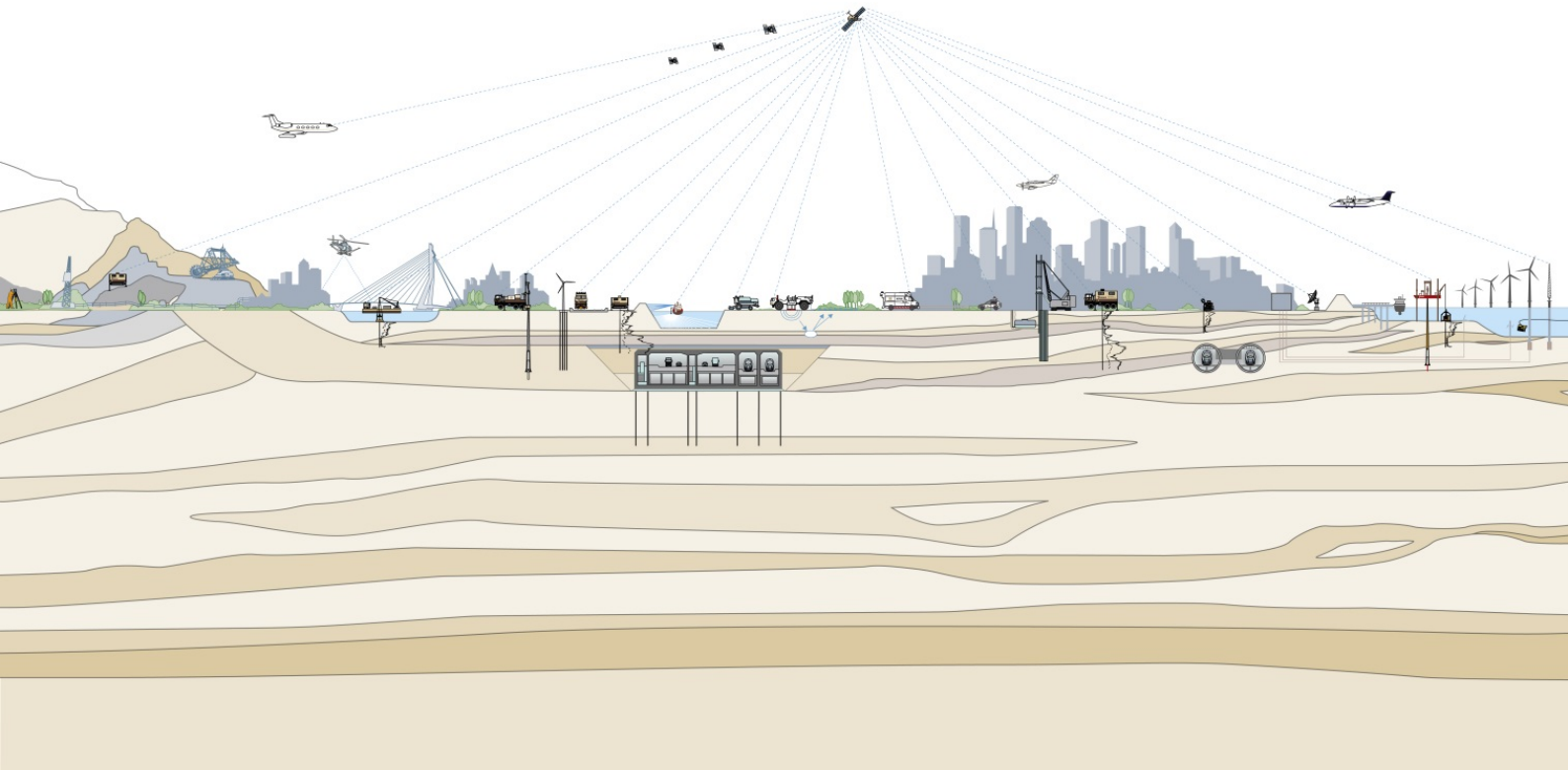
FUGRO

Report on Ground Investigation without Geotechnical Evaluation

Heathrow Expansion Project - Stage 1 Ground Investigation - Package 3

Fugro Reference: G170029U (02)
Issue Date: November 2018

Heathrow Airport Limited



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Heathrow Airport Limited

Client: Heathrow Airport Limited

Client Address: The Compass Centre, Nelson Road
Hounslow, Middlesex
London
TW6 2GW

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Date: 30 November 2018

Heathrow Airport Limited
The Compass Centre, Nelson Road
Hounslow, Middlesex
London
TW6 2GW

Attention: **Integrated Design Team Task Order 7.0**

Dear Sir,

Heathrow Expansion Project - Stage 1 Ground Investigation - Package 3

This report presents draft factual data for the above project. The geotechnical laboratory testing programme and the long-term monitoring of installations programme were not fully complete at the time of report preparation.

This report was prepared by James Deacon under the supervision of Annette Cole.

We thank you for the opportunity to be of service to you during this project. If you require any additional information or clarification please contact those listed below.

Yours faithfully,
Fugro GeoServices Limited

James Deacon
Senior Geotechnical Engineer

Annette Cole
Principal Geotechnical Engineer

Distribution: One electronic copy to Mr Darren Wilcox

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1. HEATHROW EXPANSION PROJECT – STAGE 1 GROUND INVESTIGATION

1.1 Introduction

On the instructions and under the supervision of the Integrated Design Team Task Order 7.0 (the Investigation Supervisor), acting on behalf of Heathrow Airport Limited (Heathrow) (the Client) a ground investigation has been carried out by Fugro GeoServices Limited (FGSL) at Heathrow Airport and in areas surrounding the current airport boundary in the Boroughs of Hounslow, Hillingdon, Slough and Spelthorne.

The Stage 1 Ground Investigation has been subdivided geographically into various works packages; plans showing the boundaries of the site and the various works packages are presented in Appendix B.

1.2 Proposed Development

The Heathrow Expansion Project Main Works comprise the proposed expansion of Heathrow Airport. The potential developments had not been finalised at the time of report preparation.

1.3 Objectives of the Investigation

The objectives of the investigation were to provide information that would assist the Integrated Design Team Task Order 7.0 and Heathrow in the geotechnical and geoenvironmental appraisal of the site and to substantiate assessments on land quality, geotechnics and the water environment which may be required to support a Development Consent Order (DCO).

1.4 Scope of Works for the Investigation

The original proposed scope of works, determined by the Integrated Design Team Task Order 7.0 and Heathrow, is contained in the Specification documents:

- Heathrow Airport Limited, Ground Investigation at Heathrow, Stage 1 Ground Investigation Specification, Document Number HEP71-XX-RP-900-008097, Version 0.2, Draft, prepared by the Integrated Design Team Task Order 7.0, issued 3 August 2017; and
- Heathrow Airport Limited, Ground Investigation at Heathrow, Stage 1 Ground Investigation Specification, Document Number HEP-XX-016566, Version 1.0, Final, prepared by the Integrated Design Team Task Order 7.0, issued 20 October 2017.

The Specification is provided as digital data to this report.

The final scope of works was modified where necessary to accommodate the site conditions encountered as the investigation progressed, and as the development proposals were updated.

1.5 Method Statements and Operating Procedures

The Construction Phase Plan (CPP), Environmental Management Plan (EMP), Site Waste Management Plan (SWMP) and Quality Plan (QP), along with their associated risk assessments, method statements and operating procedures set out the specific health, safety, environmental and quality requirements of the project:

- Fugro, Heathrow Expansion Project – Stage 1, Site Investigation, Construction Phase Plan, Fugro Document G170021U-OverarchingCPP, Issue 00, prepared for Heathrow Airport Limited, 28/02/2018;
- Fugro, Heathrow Expansion Project – Stage 1, Site Investigation, Environmental Management Plan, Fugro Document G170021U-OverarchingEMP, Issue 02, prepared for Heathrow Airport Limited, 06/03/2018;
- Fugro, Heathrow Expansion Project – Stage 1, Site Investigation, Site Waste Management Plan, Fugro Document G170021U-OverarchingSWMP, Issue 03, prepared for Heathrow Airport Limited, 06/03/2018;
- Fugro, Heathrow Expansion Project – Stage 1, Site Investigation, Quality Plan, Fugro Document G170021U-OverarchingQP, Issue 03, prepared for Heathrow Airport Limited, 06/03/2018.

The CPP, EMP, SWMP and QP are provided as digital data to this report.

1.6 Heathrow Expansion Project SharePoint Platform

Heathrow's project database and communication platform, the Heathrow Expansion Project SharePoint Platform, was utilised to transmit and share project documents and variations, field records and preliminary data, and to assist in the tracking and scheduling of the laboratory testing programme.

1.7 Reporting

Reports on ground investigation without geotechnical evaluation have been prepared for each individual work package. The reports include the final scope of works and the methods used when undertaking the ground investigation, and present the exploratory position records, photography records, the field test and laboratory test results, survey information and location plans. The field and laboratory data are also presented in AGS (Association of Geotechnical and Geoenvironmental Specialists) 4.0 format and photographs are presented in JPEG format.

The use of any individual work package report and its associated digital data should be undertaken with full reference to the other package reports and their associated digital data.

1.8 Health, Safety and Environment Summary

The health, safety and environment reports, trackers and statistics for the Package 3 ground investigation are held by Heathrow.

1.9 Guidelines on the Use of Report

Appendix A outlines the limitations of this report in terms of a range of considerations including, but not limited to, its purpose, its scope, the data on which it is based, its use by third parties, possible future changes in design procedures and possible changes in the conditions at the site with time. It represents a clear exposition of the constraints which apply to all reports issued by Fugro. It should be noted that these guidelines do not in any way supersede the terms and conditions of the contract between Fugro and Heathrow.

2. PACKAGE 3

2.1 Package 3 Scope for Ground Investigation

The detailed scope of works for Package 3, determined by the Integrated Design Team Task Order 7.0 and Heathrow is contained in the Scope for Ground Investigation – Package 3 document:

- Heathrow Airport Limited, Heathrow Expansion Project, Scope for Ground Investigation – Package 3, Document Number HEP70-XX-VI-900-013951, Version 1.0, prepared by the Integrated Design Team Task Order 7.0, issued 22 September 2017.

The Scope for Ground Investigation – Package 3 document is provided as digital data to this report.

The final scope of works was modified where necessary to accommodate the site conditions encountered as the investigation progressed, and as the development proposals were updated.

2.1.1 Objectives

2.1.1.1 Geotechnical

The Package 3 geotechnical objectives were to gather geological and geotechnical information to inform the design of the earthworks strategy, taking into account:

- Existing ground and groundwater conditions;
- Existing topography;
- Proposed airfield and other structures, including tunnels and bridges.

Package 3 focussed on three areas of historical landfill underlying part of the proposed expansion area: Tan House 1, Tan House 2 and Procea Products Landfills. Package 3 also included areas peripheral to these landfills: fields to the north, east and west, and the Lakeside Industrial Estate and associated facilities. The principal objectives included:

- Determination of the high wall location and geometry;
- Determination of the landfill depth;
- Confirmation of waste types;
- Confirmation of existing landfill gas/leachate infrastructure;
- Confirmation of the presence of a basal liner, its constituents and thickness;
- Confirmation of the presence of a capping layer and its composition;
- Confirmation of the geotechnical properties of the non-landfill strata in areas peripheral to the landfills, including the London Clay, to depths up to 27 m below ground level.

2.1.1.2 Land Quality

The Package 3 land quality objectives were to gather information on the geometry, composition, leachate and gassing potential of the historical landfills present and the surrounding green and brownfield areas. Exploratory positions were located to gather information on ground and groundwater conditions and, to provide an indication on migratory pathways from the landfill to the surrounding receptors. The principal objectives included:

- Definition of the geometry of the landfill;
- Determination of the presence of an engineered capping and liner;
- Identification of the composition of the landfill waste;
- Identification of the gassing and leachate generation potential of the landfill waste mass;
- Determination of the boundary conditions surrounding the landfill waste mass;
- Characterisation of the leachate and groundwater composition within and surrounding the landfill waste mass;
- Identification of whether any of the non-landfill site uses have impacted land quality;
- Maintenance of the existing landfill containment systems following the ground investigation.

2.2 Site Location and Description

The Package 3 site is located to the west of Heathrow Airport and the M25 motorway, and is bounded to the north by the M4 motorway and to the south by the Colnbrook Bypass. The Package 3 site stretches some 1 km west of the railway lines that service the Lakeside Industrial Estate. The centre of the Package 3 site is approximately located at National Grid Reference 503325 m Easting (E), 177775 m Northing (N).

A plan showing the Package 3 site boundary is presented in Appendix B.

2.2.1 Current Land Use

The majority of the Package 3 site is covered by land used for grazing by livestock. The area adjacent to the eastern boundary of the site is predominantly covered by hardstanding and is owned and occupied by Energy for Waste and its Lakeside Education Centre. A series of lakes lie immediately west of Lakeside Road, and the Colne Brook watercourse crosses the site in a general northeast-southwest direction and adjacent to these lakes. Richings Park Clay Shooting Club occupies land to the west of the northernmost lake, the Old Slade Lake.

2.3 Geology

Data provided by the British Geological Survey (BGS) online indicate the site is underlain by superficial deposits of the Shepperton Gravel Member, and locally Alluvium, overlying the London Clay Formation. Information from the Integrated Design Team Task Order 7.0 indicates that landfill is present under a large part of the Package 3 site.

Further background research such as a desk study was not required within the terms of reference for the work.

2.4 Constraints

Access to the site was via Old Slade Lane in the north and gated access via Lakeside Road in the east. The south-eastern area of the site was accessed via the Energy for Waste compound and the car parking areas surrounding the Lakeside Education Centre. Trackway matting was placed in the Lakeside Road access to maintain the viability of vehicular access.

Access was restricted to several exploratory positions along the eastern boundary of the site due to refurbishments being undertaken by Energy for Waste. Temporary placement of site offices, roll-on roll-off skips and plant covered the exploratory positions.

Access was restricted to weekend working in the Grundon compound that is located along the southern boundary of the site between Lakeside Road and the Colnbrook Bypass

Access to two compounds within the Lakeside Industrial Estate was prohibited. Access rights had not been agreed to the Hellmann Worldwide Logistics compound and the DHL compound before the site works were completed.

3. METHODS OF INVESTIGATION

3.1 General

The investigation was carried out in accordance with BS 5930:2015, BS EN ISO 14688-1:2002+A1:2013 and BS EN ISO 14689-1:2003 and BS 10175:2011+A1:2013 as appropriate.

Figure B.2.1 in Appendix B gives a location plan showing the exploratory positions. The majority of exploratory positions were scheduled "paired" with another position and located in close proximity to each other; one of the paired positions were scheduled for groundwater installation and the other for ground gas installation.

Figure C.1.1 (Schedule of Exploratory Positions), presented in Appendix C, sets out which investigation techniques were undertaken at each exploratory position and summarises the field and in situ and laboratory testing carried out, details of the monitoring installations, reasons for termination of the hole before the scheduled depth where applicable and survey details. The geotechnical and geoenvironmental laboratory testing programmes are detailed in later sections of this report.

Figure C.2.1 (Schedule of Variation to Original Scope of Works), presented in Appendix C, summarises the major variations made to the original scope of works to accommodate the site conditions that became apparent as the ground investigation progressed, and as the development proposals were updated.

3.2 Final Scope of Works

The final scope of works for Package 3 included investigation at 103 exploratory positions, to depths up to approximately 27.50 m below ground level, and may be summarised as follows:

- Geophysical surveying;
- Inspection pitting only at 12 exploratory positions;
- Cable percussion boring at 59 exploratory positions;
- Auger drilling at 6 exploratory positions;
- Dynamic sampling at 6 exploratory positions;
- Trial pitting/trial trenching at 11 exploratory positions;
- Cone penetration testing with dissipation tests at 9 exploratory positions;
- Field and in situ testing, including standard penetration tests, photo ionisation detection tests, variable head permeability tests within the boreholes and slug permeability tests within the installations;
- Geotechnical logging, sampling and photography;
- Installation of 42 groundwater monitoring standpipes in 42 exploratory positions;
- Installation of 37 ground gas monitoring standpipes in 37 exploratory positions;
- Groundwater level monitoring of installations pre-development;
- Surveying;
- Geotechnical laboratory testing;
- Geoenvironmental laboratory testing;
- Long-term monitoring programme of installations post-development;
- Reporting.

The ground investigation intrusive works were undertaken between 20 November 2017 and 18 March 2018.

3.3 Underground Hazards

PAS (publicly available specification) 128:2014 compliant underground utility surveys and Survey Category Type B (using geophysical methods) surveys were undertaken at all exploratory positions prior to intrusive works and the methods used included:

- Ground penetrating radar;
- Cable avoidance tool and signal generator;
- Drainage sonde;
- Visual identification of service trenches/scars.

PAS 128:2014 compliant underground utility surveys and Survey Category Type A (verification and positioned by physical identification) surveys were undertaken when an exploratory position was understood to be in close proximity to a major utility.

The PAS 128:2014 compliant underground utility surveys are available within the health, safety and environment reports held by Heathrow.

Cable avoidance tool (CAT) surveys to identify the presence of services were also undertaken at depth intervals during the hand-digging of inspection pits. Details of services encountered are recorded on the exploratory position records given in Appendix D.

3.4 Geophysical Survey

Prior to intrusive works, a geophysical survey was undertaken to ascertain the lateral and vertical extents of the landfill and to identify the presence of potential landfill cell walls.

The geophysical survey included frequency domain electromagnetic techniques and the results are reported in Appendix H:

- Fugro GeoServices Limited, Heathrow Expansion Programme – Geophysical Investigation, Package 3, Fugro Document Number G170021U_P4_P3_002, prepared for Heathrow Airport Limited, 26 June 2018.

3.5 Contaminated Site and Aquifer Protection Procedures

Due to the presence of underlying historical landfills the Package 3 site was designated to be in the British Drilling Association's (BDA, 2008) contaminated land classification 'red' category and appropriate protection measures were undertaken.

Red zones were established and decontamination units employed to segregate personnel and equipment. Ground protection and suitable bunds were used in areas where intrusive activities were to be undertaken to avoid contamination of the ground surface and to prevent uncontrolled surface water

runoff. Plant and equipment were washed down before demobilising from the exploratory position location.

Suitable personal protective equipment was used to mitigate any exposure risk where the possible presence of asbestos had been highlighted in the preconstruction information or its presence detected during laboratory screening. Personal protective equipment included asbestos rated (type FFP3) masks, or half-combination masks if other contaminants were also likely to be present, disposable overalls (Tyvex suits), disposable gloves and non-laced safety boots.

Air monitoring points were established across the Package 3 site during the site work period to monitor atmospheric conditions. The observations of airborne dust and odour, and the environmental laboratory test results undertaken on the gas samples, are held by Heathrow.

3.6 Waste Management

Fugro operates under a Waste Management Policy which abides by relevant current legislation and duty of care and includes the segregation of waste on all sites and appropriate processing and disposal of waste. The management of waste at the Package 3 site is detailed in the following Site Waste Management Plan which is presented as digital data to this report:

- Fugro, Heathrow Expansion Project – Stage 1, Site Investigation, Site Waste Management Plan, Fugro Document G170021U-OverarchingSWMP, Issue 03, prepared for Heathrow Airport Limited, 06/03/2018.

3.7 Groundwater Observations during Boring, Drilling and Excavation

During the course of boring, drilling and excavation, attention was given to recording any evidence of water inflow in order that the groundwater level beneath the site could be established. Water levels at breaks in boring were recorded where appropriate.

Where water was added to facilitate penetration of the strata, or to maintain a positive hydrostatic head in the granular strata, this is noted on the borehole records. The addition of water during boring or the use of drilling flush may have obscured any groundwater strikes.

3.8 Soil Description and Identification

The strata descriptions given in the exploratory position records, unless otherwise noted, are compiled from an examination of the disturbed samples together with the results of any field and laboratory testing. Density index descriptions are based on the results of the standard penetration tests and have not been amended to take into account any overburden effects. The consistency of cohesive strata is based on manual assessment. The undrained shear strength of the strata is determined by reference to laboratory triaxial tests or based on in situ vane test results.

General notes on soil description are given in Appendix D. Specific requirements for the Heathrow Expansion Project with regard to the description of landfill waste and the use of geology codes are also outlined in Appendix D. The geology codes were applied by the Integrated Design Team Task Order 7.0 with the collaboration of Fugro. It should be noted that the protocol for the description of

landfill waste was still being developed by the Integrated Design Team Task Order 7.0 during the site work period for Package 3; some of the landfill description will not conform to the protocol.

Exploratory hole positions that encountered visual and olfactory evidence of contamination, based on a word search of the exploratory position records (key words: odour, oily, staining, sheen), are noted on the Schedule of Strata Encountered given in Figure C.3.1 in Appendix C.

3.9 Sampling and Core Subsampling

The sample categories and achievable quality classes are defined in EN ISO 22475-1:2006 for each sample/sampler system.

In boreholes advanced by cable percussion boring, disturbed samples were taken at each change in soil type and at regular vertical intervals during boring in order to identify and give a record of the strata encountered. Disturbed samples of soil were placed in a plastic tub or double-sealed in plastic bags.

In cohesive soils nominal 100 mm diameter general purpose driven open tube (U100) samples were taken and subsequently sealed to preserve their natural moisture contents. Dynamically driven open tube UT (thin walled OS-T/W, achievable quality Class 1) samples were taken to depths at which the sample tubes were distorting, below which U (thick walled OS-TK/W, achievable quality Class 2/3) samples were taken. Immediately after recovery, hammer, push and piston samples were “end” logged and later sealed with wax to prevent moisture loss. No extrusion of the samples was undertaken on site.

Disturbed samples of soil were taken from cores recovered from the boreholes advanced by dynamic sampling and were placed in a plastic tub or double-sealed in plastic bags.

Samples of possible asbestos containing material were double bagged in certified heavy duty Asbestos waste bags and labelled as “red” samples.

Geotechnical samples were transported to Fugro’s laboratory in Consett, County Durham, before being distributed to the subcontracted laboratories.

Geoenvironmental samples were transported directly to the subcontracted geoenvironmental laboratory. Samples were dispatched under chain of custodies and in temperature-controlled containers and couriered to the laboratory within 24 hours of sampling.

3.10 Photographic Records

Photographic records of the trial pits and trial trenches are presented in Appendix E and referenced by their Position ID. The photographs are also presented as digital data in JPEG format.

Pre- and post- condition photographs of the exploratory position locations are held by Heathrow.

3.11 Positioning

The exploratory positions were set out, and final coordinates established, using Leica Global Positioning System (GPS) Smartnet Equipment. WGS84 (World Geographic System 84) latitude and longitude coordinates were transformed to OSGB36 (Ordnance Survey of Great Britain 36) National Grid Eastings and Northings using the OSTN02 (Ordnance Survey Transformation Model 02). GPS ellipsoid heights were transformed to orthometric (mean sea level) heights (Ordnance Datum Newlyn) using the OSGM02 (Ordnance Survey Geoid Model 02). The stated results are subject to GPS accuracies of ± 0.05 m.

The survey coordinates and ground elevations presented for the trial pits/trial trenches have been calculated as the average of readings taken from their corners. Detailed survey information, at each corner of the trial pits/trial trenches, are presented as digital data in Microsoft Excel format.

4. EXPLORATORY HOLE TYPES

4.1 Inspection Pitting

All exploratory positions were initiated with hand-dug inspection pits. Hydraulic breaking was undertaken where necessary. Twelve positions were terminated within the inspection pit due to shallow obstructions encountered or as instructed by the Integrated Design Team Task Order 7.0. These inspection pit positions are shown on the Schedule of Exploratory Positions in Figure C.1.1 in Appendix C. The inspection pit records are presented in Appendix D and referenced by their Position ID.

4.2 Cable Percussion Boring

Fifty-nine boreholes were advanced by light cable tool percussive techniques as shown on the Schedule of Exploratory Positions in Figure C.1.1 in Appendix C. The borehole records are presented in Appendix D and referenced by their Position ID.

Dando 2000 and Dando 3000 cable percussive rigs were utilised on site.

4.3 Auger Boring

Six boreholes were advanced by auger boring (hollow stem) techniques as shown on the Schedule of Exploratory Positions in Figure C.1.1 in Appendix C. The borehole records are presented in Appendix D and referenced by their Position ID.

A MC 3000 auger rig was utilised on site.

4.4 Dynamic Sampling

Six boreholes were advanced by dynamic sampling techniques as shown on the Schedule of Exploratory Positions in Figure C.1.1 in Appendix C. The borehole records are presented in Appendix D and referenced by their Position ID.

A Terrier rig was utilised on site.

4.5 Trial Pits and Trial Trenches

Eleven trial pits/trial trenches were excavated mechanically, using a JCB 3CX, to depths of between 1.00 m and 3.70 m below ground level. The trial pits/trial trenches were logged, sampled and photographed by a geotechnical engineer. On completion, the trial pits/trial trenches were backfilled with their arisings in the order of their excavation.

The trial pits/trial trenches are shown on the Schedule of Exploratory Positions in Figure C.1.1 in Appendix C. The trial pit/trial trench records are presented in Appendix D and their associated photographs are presented in Appendix E; both referenced by their Position ID.

5. IN SITU AND FIELD TESTING

5.1 Standard Penetration Tests

Standard penetration tests (SPTs) using a split spoon (S) or a solid 60º cone (C) were carried out in accordance with BS EN ISO 22476-3:2005+A1:2011 'Geotechnical investigation and testing – Field testing, Part 3 Standard Penetration Testing'.

The exploratory positions within which SPTs were undertaken are shown on the Schedule of Exploratory Positions in Figure C.1.1 in Appendix C. The exploratory position records show the SPT results as S(N) and C(N) values at the relevant depths, and are also summarised and tabulated, in Appendix D. Relevant SPT equipment calibration reports are presented in Appendix F.

5.2 Photo Ionisation Detector Tests

A hand-held photo ionisation detector (PID) was used to give a semi-quantitative indication of the presence of volatile organic compounds in the disturbed geoenvironmental soil samples by measurements made in the head space above the sample in its container.

The exploratory positions within which PIDs were undertaken are shown on the Schedule of Exploratory Positions in Figure C.1.1 in Appendix C. The exploratory position records show the PID results at the relevant depths, and the results are also tabulated in Appendix D. Relevant PID equipment calibration reports are presented in Appendix F.

5.3 Permeability Tests

5.3.1 Variable Head Permeability Tests within Boreholes

The exploratory positions in which variable head permeability tests were undertaken are shown on the Schedule of Exploratory Positions in Figure C.1.1 in Appendix C. The results of the variable head permeability tests are presented in Appendix F and referenced by Position ID and the test number.

The tests were undertaken in accordance with BS EN ISO 22282-2:2012. 'Geotechnical investigation and testing – Geohydraulic testing, Part 2: Water permeability in a borehole using open systems'. Estimates of the coefficient of permeability have been made adopting the intake factors stated in Hvorslev's paper on time lag and soil permeability in groundwater observations (Hvorslev, 1951).

The test results should be used with an awareness of the various factors that may have affected the data. Such determinations in boreholes test only a small volume of soil which may have been disturbed by the boring/drilling process and the test sections are also prone to silting up during falling head tests. Water egress may also occur via the annulus between the casing and borehole wall. Standing water levels have been assumed from readings taken from later installed monitoring installations or, within the borehole at shift change or those taken before the test was started. It should be noted that the permeability value of the soil mass as a whole may be significantly different from the values derived from these tests.

5.3.2 Slug Permeability Tests within Installations

The exploratory positions in which slug permeability tests were undertaken are shown on the Schedule of Exploratory Positions in Figure C.1.1 in Appendix C. The results of the slug permeability tests are presented as digital data only.

The tests were undertaken in accordance with BS EN ISO 14686:2003. 'Hydrometric determinations – Pumping Tests for water wells – Considerations and guidelines for design, performance and use. Pressure sensor data loggers were used to record water pressure, temperature and atmospheric pressure. Downloaded data were compensated to water level readings using Win-Situ software.

5.4 Cone Penetration Tests

The exploratory positions in which cone penetration tests were undertaken are shown on the Schedule of Exploratory Positions in Figure C.1.1 in Appendix C.

The electrical cone penetration tests were made using 20 tonne capacity hydraulic penetrometer equipment mounted on a six wheel heavy truck ballasted to provide a reaction weight of about 20 tonnes. A 15 cm^2 7.5 tonne capacity electric piezocone was used for each of the tests and, during each test, measurements of local side friction and pore-water pressure were made in addition to cone end resistance. All tests were terminated at a depth instructed on site or on the basis of refusal when the maximum safe thrust capacity of the equipment was reached.

A schedule of cone penetration tests undertaken, together with UKAS accreditation schedules and equipment calibration certificates are presented in Appendix F.

The cone presentation test results are given in Appendix F and are presented as plots for measured and calculated data and derived parameter data (referenced by Position ID), together with dissipation test results (referenced by Position ID and test number):

- Plot 1: Measured and Calculated Data:
  Cone resistance, sleeve friction, pore-water pressure and friction ratio, estimated soil type;
- Plot 2: Calculated Data:
  Corrected cone resistance, net cone resistance, net pore-water pressure, pore-water pressure ratio, estimated total vertical stress;
- Plot 3: Derived Parameter Data:
  Cone resistance, friction ratio, friction angle, shear modulus (G_{max}), undrained shear strength and volume compressibility;
- Dissipation Test Results:
  Cone resistance and pore-water pressure against the square root of time.

Methods and equations used to calculate measured and derived parameters and estimated soil type are given in Appendix F. Water level has been assumed at 1.00 m below ground level for these calculations. Layer unit weights of 19 kN/m^3 have also been assumed.

It should be noted that parameters derived from cone penetration test data are approximate and the estimated soil types have not been adjusted to account for these derived parameters; correlation should be made with other available information (intrusive works and laboratory testing on samples).

6. INSTRUMENTATION AND MONITORING

6.1 Instrumentation

On completion of the exploratory positions, a total of 79 standpipe installations were constructed, using 50 mm diameter slotted sections of standpipe placed within sand or gravel response zones. Forty-two standpipes were installed as groundwater monitoring installations and thirty-seven standpipes were installed as ground gas monitoring installations.

Details of the installations are given on the relevant exploratory position records and are also summarised in the Schedule of Exploratory Positions in Figure C.1.1 in Appendix C. The elevations at ground level, top of installation cover and top of installation pipe are also given for position installations in Figure C.1.1.

6.2 Groundwater Monitoring prior to Development

Observations of the water levels in the monitoring installations were made at weekly intervals during the site work period until the installations were developed. Records of water levels in the monitoring installations prior to development are given in Appendix G and referenced by their Position ID.

6.3 Development of Monitoring Installations

The standpipe installations were developed by purging three times the total water well volume and until stabilisation of the monitored in situ parameters (conductivity, pH, temperature and redox potential). Development was stopped, with the agreement of the Integrated Design Team Task Order 7.0 where recharge of water within the installation was not sufficient to continue purging. The records of in situ parameters recorded during development are held by Heathrow.

6.4 Groundwater Monitoring and Sampling after Development

A programme of groundwater sampling was undertaken after the development of the installations. Monitoring rounds were proposed at monthly intervals for a twelve-month period. Quarterly monitoring reports are presented separately to this report.

6.5 Ground Gas Monitoring and Sampling after Development

A programme of ground gas monitoring and sampling was undertaken after the development of the installations. Monitoring rounds were proposed at fortnightly intervals for a six-month period. Quarterly monitoring reports are presented separately to this report.

6.6 Backfilling of Exploratory Positions

The exploratory positions which did not require monitoring installations were backfilled. Details of the backfill are given on the exploratory position records and, summarised on the Schedule of Exploratory Positions given in Figure C.1.1 in Appendix C.

Boreholes were backfilled with bentonite/cement pellets and/or arisings. Inspection pits were backfilled with arisings.

The trial pits/trial trenches were backfilled with their arisings in the order of their excavation.

7. GEOTECHNICAL LABORATORY TESTING

7.1 Introduction

The geotechnical soil laboratory testing programme was determined by the Integrated Design Team Task Order 7.0. The exploratory positions from which recovered samples were geotechnically tested are shown on the Schedule of Exploratory Positions in Figure C.1.1 in Appendix C.

The type and number of geotechnical laboratory tests that had been completed at the time of report preparation are summarised in Table 7.1 below.

The geotechnical laboratory tests were undertaken at the following laboratories:

a) Fugro GeoServices Limited's laboratory in Consett, County Durham, UK;

b) SOCOTEC UK Limited's laboratories in Doncaster and Burton-on-Trent, UK.

The laboratories' UKAS accreditation certificates and relevant in-house geotechnical laboratory test procedures, and a schedule of geotechnical laboratory test notices/clarifications, are presented before the test results in Appendix I.

Table 7.1: Summary of Geotechnical Laboratory Tests Undertaken

Laboratory Test Description	Laboratory Test Method	Number of Tests	Laboratory Reference
Classification:			
Water content	BS 1377-2:1990 Clause 3 / BS EN ISO 17892-1:2014	135	a,b
Liquid limit, plastic limit and plasticity index (Atterberg limits)	BS 1377-2:1990 Clause 4 & 5	93	a,b
Particle density by gas jar or pycnometer (specific gravity)	BS 1377-2:1990 Clause 8/BS EN ISO 17892:2014	26	a,b
Particle size distribution by wet sieving alone or with sedimentation by pipette or hydrometer	BS 1377-2:1990 Clauses 9.2, 9.4 and 9.5	105	a,b
Compaction-related:			
Determination of dry density/water content relationship	BS 1377-4:1990 Clause 3	19	a,b
Maximum and minimum density	BS 1377-4:1990 Clause 4.3 and 4.5	1	a
Moisture condition value	BS 1377-4:1990 Clause 5	20	a,b
Determination of moisture condition value/water content relationship	BS 1377-4:1990 Clause 5	16	a,b
California Bearing Ratio	BS 1377-4:1990 Clause 7	10	a,b
Compressibility and Permeability:			
One-dimensional consolidation properties from one-dimensional incremental odometer test	BS 1377-5:1990 Clause 3	33	a,b
Determination of permeability in a triaxial cell	BS 1377-6:1990 Clause 6	14	b

Laboratory Test Description	Laboratory Test Method	Number of Tests	Laboratory Reference
Soil Shear Strength (Total Stress):			
Undrained shear strength tests in triaxial compression without measurement of porewater pressure (single stage test on a single specimen)	BS 1377-7-1990: Clause 8	14	a,b
Undrained shear strength tests in triaxial compression without measurement of porewater pressure (multistage test on a single specimen)	BS 1377-7-1990: Clause 9	1	a
Shear strength by direct shear (sets of three tests on 60 mm square specimens)	BS 1377-7:1990 Clause 4.5.5	5	b
Soil Shear Strength (Effective Stress):			
Consolidated undrained triaxial compression tests with measurement of pore water pressure (single stage and multistage tests on a single specimen)	BS 1377-8:1990 Clause 7	26	b
Electro-chemical:			
Electric resistivity using the Wenner probe method	BS 1377-3:1990 Clause 10.3	3	b
Soil Chemical Analyses:			
Organic matter content	BS 1377-3:1990 Clause 3	7	b
Mass loss on ignition	BS 1377-3:1990 Clause 4	1	b
Ground/groundwater Aggressivity:			
Suite D Brownfield Site (pyrite present)	BRE SD1:2001: Parts 1 and 2	27	b
Contamination Screening:			
Photo Ionisation Detector		31	a
Notes: Refer to report text for listing of Fugro in-house and subcontracted laboratory references.			

7.2 Quality of Results

In general, the results of the laboratory tests are considered good quality and, with the exception of Made Ground that is inherently variable, are considered to be representative of the soils that were tested.

8. GEOENVIRONMENTAL LABORATORY TESTING

8.1 Introduction

The exploratory positions from which recovered soil samples were geoenvironmentally analysed are shown on the Schedule of Exploratory Positions in Figure C.1.1 in Appendix C.

The geoenvironmental analyses were undertaken by Concept Life Sciences (CLS). Details of their UKAS accreditation together with notes on geoenvironmental testing are given in Appendix J.

Analytical suites specific to the Heathrow Expansion Project are detailed in Appendix J. The number of suites analysed are listed in Table 8.1.

Table 8.1: Summary of Geoenvironmental Laboratory Tests Undertaken

Determinand Suite/Group	Number of Analyses
Primary Soil Suites:	
Suite A – Made Ground and Soils with Elevated PID Readings	176
Suite A – Dependent Options – Chromium VI	176
Suite A – Dependent Options – Asbestos Quantification	11
Suite A – Dependent Options – Easily-liberatable Cyanide and Complex Cyanide	1
Suite B – Natural Material	20
Suite B – Dependent Options – Chromium VI	20
Secondary Soil Suites:	
Sub Suite 1 – Dioxins, Furans and Dioxin like PCBs	25
Sub Suite 2 – Pathogens	3
Sub Suite 3 – Radiological	15
Sub Suite 4 – Pesticides and Herbicides	5
Sub Suite 6 – Waste Acceptance Criteria (Suite J)	1
Asbestos Identification	1

Figure J.2.1 (Schedule of Geoenvironmental Testing), presented in Appendix J, correlates the chain of custodies, relevant exploratory positions, trip blanks and duplicate samples and the laboratory certificate of analysis references.

The CLS certificates of analysis are also given in Appendix J.

8.2 Quality of Results

In general, the results of the laboratory tests are considered good quality.

Figure J.2.2 (Schedule of Geoenvironmental Laboratory Test Clarifications) in Appendix J indicates which laboratory certificates of analysis contain one or more deviating samples or tests with clarifications. The laboratory certificates of analysis should be referred to for details of the specific samples or analytes affected and the reason for deviation/clarification.

9. STRATA ENCOUNTERED

Figure C.3.1 (Schedule of Strata Encountered), presented in Appendix C, sets out the strata base depths and base elevations present at each exploratory position according to their assigned geology codes (GEOL_GEOL). The Schedule also highlights those positions where visual and olfactory evidence of contamination was present.

10. DIGITAL DATA

Digital data to accompany the information presented within this Package 3 report are listed in Table 10.1.

Table 10.1: Digital Data

Digital Data	Folder Reference
Association of Geotechnical Specialists (AGS) Version 4.0 [File reference: HEP3_AGS4_20181130_rev01.ags] (Note: file contains cumulative data; geotechnical laboratory data and long-term monitoring of installations data not complete/final)	HEP3_AGS
AGS Associated Files:	
■ Photographic records (trial pits/trenches) (JPEG format)	HEP3_photographs
Additional Digital Data:	
■ Cone penetration test derived parameters data (Microsoft Excel)	HEP3_CPT
■ Trial pit/trial trench survey data (Microsoft Excel)	HEP3_survey
■ Slug permeability test data (Microsoft Excel)	HEP3_permeability
Method Statements and Operating Procedures:	
Specification	HEP3_operations
Scope for Ground Investigation – Package 3	
Construction Phase Plan	
Environmental Management Plan	
Site Waste Management Plan	
Quality Plan	

11. REFERENCES

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12. ABBREVIATIONS AND ACRONYMS

Table 12.1 lists general abbreviations and acronyms that may be used in the report.

Table 12.1: Abbreviations and Acronyms

Abbreviation/Acronym	Term or Definition
ABI	Acoustic borehole imager
AGC	Automatic gain control
AGS	Association of Geotechnical and Geoenvironmental Specialists
ALARP	As low as reasonably practicable
app	Apparent
AR	As received
ASR	Alkali-silica resistivity
ASTM	ASTM International
AV	Abrasion value
AVS	Abrasion value steel
B	Brittle failure
BDA	British Drilling Association
BE	Best estimate / Bender Element
bgl	Below ground level
BGS	British Geological Survey
BH	Borehole
BODC	British Oceanographic Data Centre
BP	Before present
BS	British Standard
BSF	Below seafloor
BSI	British Standards Institution
BTEX	Benzene, Ethylbenzene, Toluene and Xylenes
c	Circumferential
C	Compound failure / Standard penetration test using a solid 60 degree cone
C(N)	Standard penetration test result, using a solid 60 degree cone
CAL	Calliper
CAT	Cable avoidance tool
CAUc	Anisotropically consolidated undrained triaxial in compression
CAUe	Anisotropically consolidated undrained triaxial in extension
CBL	Cement evaluation suite/cement bond logging
CBR	California Bearing Ratio
CD	Consolidated drained / Chart Datum
CDP	Common depth point (interchangeable with CMP)
CEFAS	Centre for Environmental Fisheries and Aquaculture Science
CID	Isotropically consolidated drained triaxial
CIU	Isotropically consolidated undrained triaxial
CLS	Concept Life Sciences
CM	Central meridian
CMP	Common midpoint (interchangeable with CDP)
C-O	Computed minus observed
CoG	Centre of gravity
CPP	Construction phase plan

Abbreviation/Acronym	Term or Definition
CPT	Cone penetration test
CPTU	Cone penetration test with pore-pressure measurement or piezocone penetration tests
CRS	Constant rate of strain oedometer
CSEMP	Clean seas environment monitoring programme
CTXL	Cyclic triaxial
CUBE	Combined uncertainty bathymetry estimator
D	Disturbed sample condition
DCO	Development Consent Order
DDV	Drop down video
DEN	Density
DGNSS	Differential global navigation satellite system
DGPS	Differential global positioning system
DNV	Det Norske Veritas
DS	Direct shear
DSS	Dynamic simple shear
DTM	Digital terrain model
E	Easting
EGN	Empirical gain normalisation
EMP	Environmental management plan
EN	European Norm
ERP	Emergency response plan
ERT	Electrical resistivity tomography
ETRS89	European Terrestrial Reference System 1989
FGSL	Fugro GeoServices Limited
FK	Frequency-wavenumber
FVT	Field vane test
GIS	Geographical information system
GNSS	Global navigation satellite system
GPS	Global positioning system
GRS 1980	Geodetic Reference System 1980
HAT	Highest astronomical tide
HAZID	Hazard identification
HAZOP	Hazard and operability
HE	High estimate
HF	Hydroflouric acid
HIPO	High potential incident
HOC	Hazard observation card
HP	Hand-picked/ high precision
HR	High resolution
HSE	Health, safety and environment
ICES	International Council for the Exploration of the Sea congeners
ID	Identification
IGS	International GNSS Service
IMU	Inertial motion unit
ISO	International Organisation for Standardisation
ISRM	International Society for Rock Mechanics

Abbreviation/Acronym	Term or Definition
JPEG	Joint Photographic Experts Group format
JSA	Job safety analysis
l	Longitudinal
LA	Los Angeles Coefficient
LAT	Lowest astronomical tide
LBL	Long baseline
LE	Low estimate
LFAF	Low frequency array forming
LGM	Last Glacial Maximum
LiDAR	Light imaging, detection and ranging
LOD	Limit of detection
LSB	Large shear box (300 mm)
LSD	Long space detector
LTQ	Laboratory test query
LV	Laboratory vane
MBES	Multibeam echo sounder
MC	Moisture content
MDD	Maximum dry density
MDE	Micro Deval Coefficient
MDEV	Borehole deviation
MRU	Motion reference unit
MS	Magnesium sulfate value
MSL	Mean sea level
MTBE	Methyl tert-butyl ether
N	Northing
N/A or NA	Not applicable
n/s	Not specified
NEU	Neutron porosity
NGR	Natural gamma radiation
NMO	Normal moveout
NP	Non plastic
NPP	Nuclear power plant
OCR	Overconsolidation ratio
OD	Ordnance Datum (Newlyn)
OED	Incremental oedometer
OMC	Optimum moisture content
OS	Ordnance Survey
OSGB	Ordnance Survey of Great Britain
OSGM	Ordnance Survey Geoid Model
OSTN	Ordnance Survey Transformation Model
P	Plastic failure
P72	Piston sample in sample tube of 72 mm internal diameter
PAH	Polynuclear aromatic hydrocarbons
PAM	Passive acoustic monitoring
PAS	Publicly available specification
PCBs	Polychlorinated biphenyls
PCH	Permeability constant head

Abbreviation/Acronym	Term or Definition
PEP	Project execution plan
PFH	Permeability falling head
pH	Potential of hydrogen
PID	Photo ionisation detector
PLT	Plate loading test
PPE	Personal protective equipment
PPK	Post processed kinematic
PSA	Particle size analysis
PSD	Particle size distribution
PSSL	Downhole geophysical wireline logging suspension logging suite/P- and S-wave suspension logging
QA	Quality assurance
QC	Quality control
QP	Quality plan
r	radial
REM	Remoulded sample condition
RES	Resistivity
RMS	Root mean squared
ROV	Remotely operated vehicle
RPS	Radiation protection supervisor
RQD	Rock quality designation
RV	Research vessel
S	Standard penetration test using a split spoon
S(N)	Standard penetration test result, using a split spoon
S_{20}	Brittleness Value
SBES	Single beam echo sounder
SBET	Smoothed best estimate trajectory
SCPT	Seismic cone penetration test
SCR	Solid core recovery
SD	Standard deviation
SEGY	Society of Exploration Geophysicists
SFM	Impeller flow meter
SH	Horizontally polarised shear wave
SI	Shape index
SIMOPS	Offshore simultaneous operations
SIT	UXO surrogate item trial
SOW	Scope of work
Sp	Shot point
SPT	Standard penetration test
SPW	Seismic processing workshop
SRB	Sulphate-reducing bacteria
SSB	Small shear box (60 mm)
SSD	Short space detector
SSS	Sidescan sonar
SSSI	Site of Special Scientific Interest
SV	Vertically polarised shear wave
SVP	Sound velocity probe

Abbreviation/Acronym	Term or Definition
SVS	Sound velocity sensor
SVT	Surrogate verification test
SWMP	Site waste management plan
TCR	Total core recovery
TEL	Downhole geophysical wireline logging televiewer suite
THC	Total hydrocarbon content
THU	Total horizontal uncertainty
TM	Transverse Mercator
TOC	Total organic content
TPH	Total petroleum hydrocarbons
TW	Thick walled Shelby tube
TWT or TWTT	Two way travel time
U	General purpose driven open tube sample
UCS	Uniaxial compressive strength
UD	Undisturbed sample condition
UHR	Ultra-high resolution
UK	United Kingdom
UK BAP	UK Biodiversity Action Plan
UKAS	United Kingdom Accreditation Service
US	Unsuitable for testing
USBL	Ultra-short baseline
USEPA	United States Environmental Protection Agency
UT	Driven open tube sample, thin walled OS-T/W, achievable quality Class 1
UTC	Coordinated Universal Time
UTM	Universal Transverse Mercator
UU	Unconsolidated undrained triaxial
UXO	Unexploded ordnance
Vp	Vibration point
WGS	World Geographic System
WS	Wet sieved
YMPR	Young's Modulus and Poisson's Ratio
YSR	Yield Stress Ratio

13. SYMBOLS AND TERMS

Every effort is made to avoid duplication or inconsistency in the use of symbols and terms in this report. However, this is not always possible as some different terms are commonly represented by the same symbol; similarly, some terms have multiple representations.

For example, I_p and PI both mean plasticity index, and I_L and LI both mean liquidity index, whilst a can mean both acceleration and net area ratio of cone penetrometer, depending on the context.

Table 13.1 presents the general symbols and terms that may be used in this report.

Table 13.1: General Symbols and Terms

Symbol	Unit	Term or Definition
General		
A	m^2	Area
a	m/s^2	Acceleration
B	m	Width
D	m	Diameter
D_e	m	Equivalent core diameter
d	m	Depth
g	m/s^2	Acceleration due to gravity [g = 9.81 m/s^2]
h	m	Height or thickness
h_{sf}	m	Height of reference point above seafloor
i	-	Inclination
L	m	Length
ln	-	Natural logarithm
log	-	Logarithm base 10
m	kg	Mass
t	s	Time
V	m^3	Volume
v	m/s	Velocity
W	kN	Weight
w or MC	%	Moisture content
z	m	Penetration or depth below reference level (usually ground surface) or height above seafloor for drilling mode in situ probe zero reference readings
p	kg/m^3	Density
Stress Strain		
E	MPa	Modulus of linear deformation (Young's modulus)
E50	MPa	Modulus of linear deformation (Young's modulus) at vertical strain at half the maximum deviator stress
E_U	MPa	Modulus of linear deformation (Young's modulus for undrained stress change)
E_U50	MPa	Modulus of linear deformation (Young's modulus for undrained stress change) at vertical strain at half the maximum deviator stress
E_d	MPa	Modulus of linear deformation (Young's modulus for drained stress change)

Symbol	Unit	Term or Definition
E_{ext}	MPa	Modulus of linear deformation (Young's modulus) measured by external strain gauges
E_{loc}	MPa	Modulus of linear deformation (Young's modulus) measured by local strain gauges
G	MPa	Modulus of shear deformation (shear modulus)
G_{max}	MPa	Shear modulus at small strain or initial (small strain) shear modulus
G/G_{max}	-	Normalised modulus of shear deformation (shear modulus)
K	MPa	Modulus of compressibility (bulk modulus)
M	MPa	Constrained modulus [= $1/m_v$]
N	-	Number of cycles
N_f	-	Number of cycles to failure
p'	kPa	Mean effective stress [= (σ'_1+ σ'_3)/2]
q	kPa	Principal deviator stress [=σ'_1 − σ'_3] or [=σ_1 − σ_3]
r_u	-	Pore pressure ratio [= u/σ_{v0}]
s'	kPa	Principal effective stress [= (σ'_1+ 2σ'_3)/3] or [= (σ'_1 + σ'_2 + σ'_3)/3]
t	kPa	shear stress [= (σ'_1 − σ'_3)/2]
u	MPa	Pore-water pressure
u_0	MPa	Hydrostatic pore pressure relative to seafloor or phreatic surface
u_f	kPa	Pore-water pressure at failure
u_N	kPa	Pore-water pressure after N cycles
α	-	Coefficient of linear expansion
β	-	Ratio of pore-water pressure generation in cyclic test relative to number of cycles and confining pressure
$\Delta\sigma_1$	kPa	Change in major principal stress
$\Delta\sigma_2$	kPa	Change in minor principal stress
$\Delta\sigma_3$	kPa	Change in minor principal stress
$\Delta\sigma_d$	kPa	Change in deviator stress [=$\Delta\sigma_a$ − $\Delta\sigma_r$]
$\Delta\sigma'_{md}$	kPa	Change in mean effective stress
$\Delta\sigma_r$	kPa	Change in total radial stress
$\Delta\sigma'_r$	kPa	Change in effective radial stress
Δu	kPa	Change in pore-water pressure
Δu_f	kPa	Change in pore-water pressure at failure
$\Delta\sigma_v$	kPa	Change in total vertical stress
$\Delta\sigma'_v$	kPa	Change in effective vertical stress
λ	%	Damping ratio during cyclic test
λ_{ext}	%	Damping ratio during cyclic test measured by external strain gauges
λ_{loc}	%	Damping ratio during cyclic test measured by local strain gauges
ε	%	Linear strain
ε_1, ε_2, ε_3	%	Principal strains
ε_{50}	%	Vertical strain at half the maximum deviator stress
ε_{av}	%	Average vertical strain during cyclic test
ε_{cyc}	%	Vertical strain cyclic amplitude during cyclic test
ε_v	%	Vertical strain
ε_{vc}	%	Vertical strain after consolidation
ε_{vf}	%	Vertical strain at failure
ε_{vol}	%	Volumetric strain
γ	%	Shear strain

Symbol	Unit	Term or Definition
γ_{av}	%	Average cyclic shear strain
γ_{cy}	%	Cyclic shear strain
γ_f	%	Shear strain at failure
γN	%	Cyclic shear strain after N cycles
η	kPa·s	Coefficient of viscosity
μ	-	Coefficient of friction
v	-	Poisson's ratio
v_u	-	Poisson's ratio for undrained stress change
v_d	-	Poisson's ratio for drained stress change
σ	kPa	Total stress
σ'	kPa	Effective stress
σ_1 , σ_2 , σ_3	kPa	Principal stresses
σ'_c	kPa	Effective consolidation pressure (isotropic)
σ'_{rc}	kPa	Radial effective consolidation stress
σ'_h	kPa	Effective horizontal stress
σ'_{h0}	kPa	In situ horizontal effective stress
σ'_v	kPa	Effective vertical stress
σ_{v0}	kPa	Total vertical stress relative to ground surface or phreatic surface
σ'_{v0} or p'_0	kPa	In situ vertical effective stress
σ'_{vc}	kPa	Vertical effective consolidation stress
σ'_{oct}	kPa	Octahedral stress
σ'_r	kPa	Radial effective stress
τ	kPa	Shear stress
τ_{av} or q_{av}	kPa	Average shear stress during cyclic test
τ_{cyc} or q_{cyc}	kPa	Cyclic shear stress
Physical Ground Characteristics		
Density and Unit Weights		
γ	kN/m^3	Unit weight of ground (or bulk unit weight or total unit weight)
γ_d	kN/m^3	Unit weight of dry ground
γ_s	kN/m^3	Unit weight of solid particles
γ_w	kN/m^3	Unit weight of water
γ_{pf}	kN/m^3	Unit weight of pore fluid
γ_{dmin}	kN/m^3	Minimum index (dry) unit weight
γ_{dmax}	kN/m^3	Maximum index (dry) unit weight
γ' or γ_{sub}	kN/m^3	Unit weight of submerged ground or soil
ρ	Mg/m^3 [= t/m^3]	Density of ground or soil
ρ_d	Mg/m^3 [= t/m^3]	Density of dry ground
ρ_s	Mg/m^3 [= t/m^3]	Density of solid particles
σ_ω	Mg/m^3 [= t/m^3]	Density of water
D_r	-, %	Relative density [= γ_{dmax} (γ_d – γ_{dmin})/γ_d(γ_{dmax} – γ_{dmin})]
v	-	Specific volume [= 1 + e]
e	-	Void ratio
e_0	-	Initial void ratio
e_{max}	-	Maximum index void ratio
e_{min}	-	Minimum index void ratio
G_s	-	Specific gravity of solid particle
I_d	-, %	Density index [= (γ_d – γ_{dmin})/(γ_{dmax} – γ_{dmin})]

Symbol	Unit	Term or Definition
R_D	-, %	Dry density ratio [= γ_d / γ_{dmax}]
n	-, %	Porosity
w	%	Water content
S_r	%	Degree of saturation
r	-, g/kg	Salinity of pore fluid [= ratio of mass of salt to mass of pore fluid]
R	g/l	Salinity of fluid [= ratio of mass of salt to volume of distilled water]
s	g/l	Salinity of fluid [= ratio of mass of salt to volume of fluid]
S	g/kg	Salinity of seawater [= ratio of mass of salt to mass of seawater]
Consistency		
w_L	%	Liquid limit
w_P	%	Plastic limit
I_P or PI	%	Plasticity index [= $w_L - w_P$]
I_L or LI	%	Liquidity index [= $(w - w_P)/(w_L - w_P)$]
I_C	%	Consistency index [= $(w_L - w)/(w_L - w_P)$]
A	-, %	Activity [= ratio of plasticity index to percentage by weight of clay-size particles]
Particle Size		
D	mm	Particle diameter
D_n	mm	n percent diameter [n % < D]
C_u	-	Uniformity coefficient [D_{60} / D_{10}]
C_c	-	Curvature coefficient [= $(D_{30})^2 / D_{10} D_{60}$]
Dynamic Properties		
v_p or V_p	m/s	P-wave velocity (compression wave velocity)
v_s or V_s	m/s	S-wave velocity (shear wave velocity)
v_{s1}	m/s	S-wave velocity normalised to 100 kPa in situ vertical stress
v_{vh}	m/s	Vertically (v) propagated, horizontally (h) polarized shear wave velocity
D	-, %	Damping ratio of ground
Hydraulic Properties		
k	m/s	Coefficient of permeability
k_v	m/s	Coefficient of vertical permeability
k_h	m/s	Coefficient of horizontal permeability
i	-	Hydraulic gradient
Thermal and Electrical Properties		
T	°C	Temperature
k	W/(m·K)	Thermal conductivity
a_L	1/°C	Thermal expansion coefficient (linear)
α	m²/s	Thermal diffusion coefficient
ρ	Ω·m	Electrical resistivity
K	S/m	Electrical conductivity
Magnetic Properties		
B	T	Magnetic flux density (or magnetic induction)
Radioactive Properties		
γ	CPS	Natural gamma ray
Material Properties		
γ_m	-	Material factor
ζ	-	Material damping ratio

Symbol	Unit	Term or Definition
Mechanical Ground Characteristics		
Cone Penetration Test		
A_c	mm^2	Cross-sectional projected area of the cone
A_n	mm^2	Cross-sectional area of load cell or shaft
A_s	mm^2	Surface area of friction sleeve
a	-	Net area ratio of the cone penetrometer
B_q	-	Pore pressure ratio
$\Delta_{u1,2,3}$	MPa	Excess pore pressure at filter locations 1, 2 and 3
F_r	%	Normalised friction ratio [= f_t/q_n]
f_s	MPa	Sleeve friction or measured sleeve friction
f_t	MPa	Measured sleeve friction corrected for pore pressures effects
i	°	Inclination
K	-	Adjustment factor for ratio of pore pressure at u_1 to u_2 location
l	m	Penetration length
N_c	-	Cone factor between q_c and s_u or c_u
N_k	-	Cone factor between q_n and s_u or c_u
Q_t	-	Normalised cone resistance [= q_n/σ'_{v0}]
q_c	MPa	Cone resistance or measured cone resistance
q_n	MPa	Net cone resistance
q_t	MPa	Corrected cone resistance (i.e. total cone resistance) or cone penetration resistance corrected for pore water pressure effects
R_f	%	Friction ratio
R_{ft}	%	Corrected friction ratio [= f_s/q_t or f_t/q_t]
R_{ftn}	%	Net friction ratio
U	-	Normalised excess pore pressure
u	MPa	Pore pressure
u_0	MPa	In situ pore pressure
$u_{1,2,3}$	MPa	Pore pressure measured at locations 1, 2 and 3
u_i	MPa	Measured pore pressure at the start of the dissipation test
u_t	MPa	Measured pore pressure at time t during a dissipation test
α	-	Ratio of the cone shaft to the area of the cone face
β	-	Pore-water pressure correction factor (CPTu)
Standard Penetration Test		
N	Blows/0.3 m	SPT blow count
N_{60}	Blows/0.3 m	SPT blow count normalised to 60 % energy
$N_{1,60}$	Blows/0.3 m	SPT blow count normalised to 60 % energy and to 100 kPa effective in situ vertical stress
Strength of Soil		
s_u or c_u	kPa	Undrained shear strength or undrained (undisturbed) shear strength of soil
s_{uc} or s_{u^C}	kPa	Undrained shear strength from CAUc test or static triaxial compression undrained shear strength
s_{uD} or s_{u^D}	kPa	Undrained shear strength from DSS test or static DSS undrained shear strength
s_{uE} or s_{u^E}	kPa	Undrained shear strength from CAUe test or static triaxial extension undrained shear strength
s_{ufv}	kPa	Shear strength by field vane testing
$s_{ufv,rem}$	kPa	Remoulded shear strength by field vane testing
$s_{ufv,res}$	kPa	Residual shear strength by field vane testing

Symbol	Unit	Term or Definition
s_{uu} or $s_u{}^{UU}$	kPa	Undrained shear strength from UU test or static unconsolidated undrained triaxial shear strength
s_u/σ'_{v0} or c_u/σ'_{v0}	-	Undrained strength ratio
κ	kPa/m	Rate of increase of undrained shear strength with depth (linear)
c'	kPa	Effective cohesion intercept
φ'or ϕ'	° (degree)	Effective angle of internal friction
φ'_{cv}	° (degree)	Effective angle of internal friction at large strain
ε_{50}	%	Strain at 50 % of peak deviator stress (or ε_c)
E_{50}	MPa	Young's modulus at 50 % of peak deviator stress
$c_{u;r}$ or $s_u(R)$	kPa	Undrained shear strength of remoulded soil
c_R	kPa	Undrained residual shear strength
S_t	-	Soil sensitivity [= $c_u/c_{u;r}$ or $s_u/s_u(R)$]
T_x	-	Thixotropy ratio [$T_x(t) = c_{u;r}(t)/c_{u;r}(t=0)$]
σ'_c	kPa	Effective consolidation pressure
M	-	Gradient of critical state line when projected onto a constant volume plane
A	-	Pore pressure coefficient for anisotropic pressure increment
B	-	Pore pressure coefficient for isotropic pressure increment
tan ϕ	° (degree)	Internal friction
tan ρ	° (degree)	Mobilised internal friction
β	-	Ratio of pore-water pressure generation in cyclic test relative to number of cycles and confining pressure.
ϕ_u	° (degree)	Undrained friction angle
ϕ_d	° (degree)	Drained friction angle
ϕ'	° (degree)	Effective friction angle
ϕ_{cv}	° (degree)	Friction angle at constant volume
ϕ_{res}	° (degree)	Ultimate friction angle at large strain
Consolidation (One-Dimensional)		
C_c	-	Compression index
$C*_c$	-	Intrinsic compression index [= $e*_{100} - e*_{1000}$]
CR	-	Primary compression ratio [$C_c/(1+e_0)$]
C_s	-	Swelling index (or recompression)
c_v	m^2/s	Coefficient of consolidation
C_α	-	Coefficient of secondary consolidation (primary compression)
$C_{\alpha s}$	-	Coefficient of secondary consolidation (swell/recompression)
D	-	Janbu's D parameter
e	-	Void ratio
e_l	-	Void ratio at liquid limit
e_0	-	Void ratio at σ'_{v0}
$e*_{100}$	-	Void ratio at σ'_{v0} = 100 kPa during one-dimensional intrinsic compression
$e*_{1000}$	-	Void ratio at σ'_{v0} = 1000 kPa during one-dimensional intrinsic compression
H	m	Drainage path length
ICL	-	Intrinsic compression line (Burland, 1990)
I_v	-	Void index [= $(e - e*_{100})/C*_c$]
I_v	-	Void index at in situ [= $(e_0 - e*_{100})/C*_c$]
M	MPa	Constrained modulus [= $1/m_v$]

Symbol	Unit	Term or Definition
m	-	Janbu (1985) deformation parameter
m_v	m²/MN	Coefficient of compressibility
OCR	-	Overconsolidation ratio [= σ'_p / σ'_{v0} or p'_c / p'_0]
p	kPa	Vertical pressure
$p'_c = \sigma'_p$	kPa	Preconsolidation stress
p'_r	kPa	Reference stress for Janbu (1985) approach to settlement calculation
RR	-	Recompression ratio [=$C_s/(1+e_0)$]
SCL	-	Sedimentary compression line (Burland, 1990)
S_r	-	Degree of saturation
YSR	-	Yield stress ratio [=$\sigma'_{vy}/\sigma'_{v0}$]
$\Delta\rho$	kPa	$p'_c - p'_0$
$\sigma *_{ve}$	kPa	Effective vertical stress on ICL at e_0
σ'_{vy}	kPa	Effective vertical yield stress in oedometer compression
σ'_{v0}	kPa	Effective in situ vertical stress (or p'_0)
$*$	-	Indicates 'intrinsic' properties, determined on reconstituted samples one-dimensionally compressed from slurry prepared at about 1.25·w_L
Geotechnical Design		
Partial Factors		
γ_m	-	Material factor (partial safety factor)
γ_f	-	Load factor (partial action factor)
Seismicity		
a_g	m/s²	Effective peak ground acceleration (design ground acceleration)
d_g	m	Peak ground displacement
α	-	Acceleration ratio [= a_g/g]
τ_c	kPa	Seismic shear stress
Compaction		
ρ_{dmax}	Mg/m³ [= t/m³]	Maximum dry density
ρ_{max}	Mg/m³ [= t/m³]	Maximum density
w_{opt}	%	Optimum moisture content
Earth Pressure		
δ	° (degree)	Angle of interface friction (between ground and foundation)
K	-	Coefficient of lateral earth pressure
K_a	-	Coefficient of active earth pressure
K_{ac}	-	Coefficient of active earth pressure for total stress analysis
K_p	-	Coefficient of passive earth pressure
K_{pc}	-	Coefficient of passive earth pressure for total stress analysis
K_0	-	Coefficient of earth pressure at rest [= $\sigma'_{h0}/\sigma'_{v0}$]
$K_{0,nc}$	-	K_0 for normally consolidated soil
$K_{0,oc}$	-	K_0 for overconsolidated soil

Foundations		
A	m²	Total foundation area
A'	m²	Effective foundation area
B′	m	Effective width of foundation
E_s	MN/m³	Modulus of subgrade reaction

Symbol	Unit	Term or Definition
K	MPa/m	Rate of change of modulus of subgrade reaction E_s with depth z
L'	m	Effective length of foundation
H	MN	Horizontal external force or action
V	MN	Vertical external force or action
M	MN·m	External moment
T	MN·m	External torsion moment
Q	MN	Total vertical resistance of a foundation/pile
Q_p	MN	End bearing of pile
Q_s	MN	Shaft resistance of pile
q_p	MPa	Unit end bearing
q_{lim}	MPa	Limit unit end bearing
f	kPa	Unit skin friction (or q_s)
f_{lim}	kPa	Limit unit skin friction
p	MN/m	Lateral resistance per unit length of pile
p_{lim}	MN/m	Limit lateral resistance per unit length of pile
s	m	Settlement
t	MN/m	Skin friction per unit length of pile
y	mm	Lateral pile deflection
z	mm	Axial pile displacement
α	-	Adhesion factor between ground and foundation [=f/c_u]
β	-	Adhesion factor between ground and foundation [= f/σ'_v or f/σ'_{v0}]
δ	° (degree)	Angle of interface friction (between ground and foundation)
δ_{cv}	° (degree)	Constant volume or critical-state angle of interface friction (between ground and foundation)
N_c, N_q, N_γ	-	Bearing capacity factors
K_c, K_q, K_γ	-	Bearing capacity correction factors for inclined forces or actions, foundation shape and depth of embedment
i_c, i_q, i_γ	-	Bearing capacity correction factors for external force inclined from vertical s_c, s_q, s_γ Bearing capacity correction factors for foundation shape
d_c, d_q, d_γ	-	Bearing capacity correction factors for foundation embedment
Chemical		
pH	-	Potential of Hydrogen
β	-	Adhesion factor between ground and foundation [= f/σ'_v or f/σ'_{v0}]

Notes:
Hyphen (-) in unit column means no unit applies
Single prime (') applies to effective stress

APPENDICES

J.1 Guidance Notes

J.2 Schedules

J.3 Test Certificates

A. GUIDELINES ON USE OF REPORT

A.1 HEALTH AND SAFETY FILE

A.2 SAMPLE STORAGE

A.3 EUROCODES, STANDARDS AND SPECIFICATIONS

A.4 LIMITATIONS AND USE OF DATA

A.1. HEALTH AND SAFETY FILE

A.1.1 INTRODUCTION

This report forms part of Section 14 of the Health and Safety File for the project. The introductory sections of this report provide a brief description of the ground investigation works carried out for this project. The Method of Investigation section of this report describes the method of investigation including the completion of the exploratory holes. The exploratory position records in the appendices provide specific details of underground services and structures encountered as well as monitoring installations remaining in the ground and reinstatement of the exploratory positions.

Asbestos was recorded in at least one of the exploratory positions and detected during geoenvironmental laboratory testing. Records are provided in the appropriate appendices.

Made Ground, including landfill, was encountered in at least one of the exploratory holes.

Geoenvironmental laboratory testing was undertaken as part of the scope of works and the results are provided in the appropriate appendix.

Services were recorded in the vicinity of the site on records provided at the commencement of the Contract. Services were encountered during the site works as indicated on the exploratory position records

A.1.2 COMPLETION OF EXPLORATORY HOLES AND MONITORING INSTALLATIONS

On completion of each exploratory hole the excavation or boring was backfilled using arisings, or bentonite pellets or were completed with a monitoring installation before reinstatement. Inspection pits and trial pits were generally backfilled with arisings and the surface reinstated to previous condition. Trial pits which identified particularly contaminated materials were backfilled with inert materials as noted on the relevant records and the arisings disposed of. All excavations in roadways and pavements were reinstated to the appropriate NRSWA (New Roads and Street Works Act 1991, HMSO.) requirements.

Groundwater and ground gas monitoring installations comprising open 50 mm diameter plastic tubing, were placed in a number of exploratory positions. The response zones of these installations, where present, comprised inert sand or gravel and the backfill was bentonite pellets. Details of the installations including type, locations and response zones are given in the relevant appendix and are also given diagrammatically with the relevant exploratory position records. All monitoring instrumentation was placed below ground level with headworks chambers having a drain pipe into the surrounding ground and lockable covers either flush with the surface or upstanding.

A.1.3 WASTE MANAGEMENT

Fugro operates under a Waste Management Policy which abides by relevant current legislation and duty of care and includes segregation of waste on all sites and appropriate processing or disposal of waste.

During the ground investigation waste products and arisings were disposed of appropriately according to the Site Waste Management Plan.

On completion of the ground investigation, remaining soil, rock and water samples were disposed of to appropriate landfill. Soil and rock cores recovered during the investigation were retained by the Employer.

A.1.4 DECOMMISSIONING OF THE INSTALLATIONS

Decommissioning of the installations comprising tubing or pipework may be undertaken by filling the tube or pipe with bentonite and cement grout, or by drilling out the tubing or pipework and backfilling the resultant borehole with bentonite and cement grout.

A.2 SAMPLE STORAGE

Samples are stored at the geotechnical laboratory for 4 weeks after issue of the final report. After this time, Fugro will request permission from Heathrow to dispose of the samples. Should storage of the samples be required beyond this period, the following charges will apply:

Sample Type	Charge per week
Drill Core Boxes	£4.00 per core box
Bulk Samples (25kg)	£2.50 per 25kg bag
UT100/U100 and Piston Samples	£1.50 per sample
U38 Samples	£0.20 per sample
Disturbed and Water Samples	£0.20 per sample
Bulk Samples (in excess of 25kg)	£3.00 per 25kg

A3. EUROCODES, STANDARDS AND SPECIFICATIONS

A.3.1 INTRODUCTION

The investigation has been carried out in accordance with the Contract documentation and current Eurocode Standards from the following:

- EUROCODE STANDARDS (including applicable National Forewords and Annexes);
- BS EN 1997-1:2004+A1:2013 and National Annex NA to BS EN 1997-1:2004;
- BS EN 1997-2:2007 and National Annex NA to BS EN 1997-2:2007;
- The normative documents given in BS EN 1997-2:2007 Section 1.2 including:

- BS EN ISO 14688-1:2002+A1:2013 'Geotechnical investigation and testing – Identification and classification of soil. Identification and description';
- BS EN ISO 14689-1:2003 'Geotechnical investigation and testing – Identification and classification of rock. Identification and description' as appropriate; and
- BS EN ISO 22475-1:2006 Sampling methods and groundwater measurements. Technical principles for execution;
- BS EN ISO 22476 – Various In Situ Testing;
- BS EN ISO 22282 – Various Geohydraulic Tests;
- BS 10175:2011- Investigation of potentially contaminated sites. Code of practice. British Standards Institute. March 2011;
- BS EN ISO 5667. Water quality. Sampling. Various. British Standards Institute.

A.3.2 SPECIFICATION

- Site Investigation in Construction. UK Specification for ground investigation. Second edition. Site Investigation Steering Group. Thomas Telford Limited. 2012.

A.3.3 CODES OF PRACTICE

- BS 5930:2015, Code of practice for site investigations. British Standards Institution;
- Guidance for safe intrusive activities on contaminated or potentially contaminated land. British Drilling Association. 2008.

A.3.4 METHODS OF IN SITU TEST

- BS 1377:1990, Methods of test for soils for civil engineering purposes. British Standards Institution;
- BS 5930:1999+A2:2010, Code of practice for site investigations. British Standards Institution;
- BS EN ISO 22282-1:2012 'Geotechnical investigation and testing – Geohydraulic testing Part 1 : General Rules; Part 2 : Water permeability in a borehole using open systems; Part 3 : Water pressure tests in rock;
- BS EN ISO 22476-1:2012 'Geotechnical investigation and testing – Field testing. Electrical cone and piezocone penetration test;
- BS EN ISO 22476-2:2005+A1:2011 Dynamic Probing;
- BS EN ISO 22476-3:2005+A1:2011 'Geotechnical investigation and testing – Field testing, Part 3 Standard Penetration Testing';
- BS EN 1997-2:2007 Eurocode 7 – Geotechnical design – Part 2 Ground Investigation and testing. Section 4 Field tests in soil and rock.

A.3.5 METHODS OF LABORATORY TEST

- BS 1377:1990, Methods of test for soils for civil engineering purposes. British Standards Institution;
- BRE SD1:Building Research Establishment Special Digest 1 : Parts 1 and 2 on Concrete in Aggressive Ground, 2001;

- The Complete ISRM Suggested Methods For Rock Characterisation, Testing and Monitoring: 1974-2006 by R. Ulusay & J.A. Hudson;
- BS EN 12457-3:2002. Characterisation of waste. Leaching. Compliance test for granular waste materials and sludges. Two stage batch test at a liquid to solid of 2 l/kg and 8 l/kg for materials with a high solid content and with a particle size below 4mm (without or with size reduction). British Standards Institution, London (2002).

A.3.6 REPORT STATUS

The current report comprises part of the Ground Investigation Report for the project, and in particular presents the factual data from the ground investigation, including items outlined in BS EN 1997-2: 2007 Section 6 sub section 6.1 (2) part and sub section 6.2 (2) part. Specifically the report covers BS EN 1997-1: 2004 Section 3 sub section 3.4.2 excluding:

- field reconnaissance;
- history of site;
- information from aerial photographs;
- local experience of the area;
- information about seismicity of the area;
- possibility of the occurrence of Radon;
- data on frost susceptibility of the soils.

The report does not provide an evaluation of geotechnical information (BS EN 1997-1: 2004 Section 3 sub section 3.4.3 and BS EN 1997-2: 2007 Section 6 sub section 6.3 and 6.4) for the Ground Investigation Report, nor is it a Geotechnical Design Report.

Note that the ground investigation is carried out generally in accordance with the current BS 5930:2015, Code of practice for site investigations which has recently been amended to remove any conflicts with current Eurocode standards, particularly BS EN ISO 14688-1:2002, BS EN ISO 14689-1:2003 include for rock and BS EN ISO 22475-1:2006 include for groundwater.

It is understood that the proposed works include structures that are geotechnical category 3. The geotechnical category is 1 – small and relatively simple structures; 2 – conventional structures and foundations; 3 – large, complex or unconventional structures.

A.4. LIMITATIONS AND USE OF DATA

The scope of the investigation was determined by the Integrated Design Team Task Order 7.0 for the particular project requirements set out in the Specification for the Contract. A factual report only was required, without interpretation of the data from the present investigation or consideration of data from other sources, except where noted. The data presented in this report reflect the site conditions encountered at the time the ground investigation was performed. The ground investigation has disclosed evidence of conditions at point locations across the site which provides information about discrete volumes of soil or rock. Accordingly, there may be ground conditions at the site which may not have been revealed by the ground investigation, and the passage of time may give rise to changes in

the conditions encountered. Any interpolation or extrapolation of strata from the exploratory holes is subject to the interpretation of the reader. Any cross - sections or plots are generalised by necessity and have been based on information found at the exploratory holes and depths sampled and tested. The records should be read in conjunction with the Notes on Exploratory Position Records. Particular attention is drawn to the comments made on groundwater and interpretation which are given in these Notes.

The ground investigation has been carried out by Fugro GeoServices Limited and the report has been prepared for the sole internal use of Heathrow Airport Limited. This report shall not be relied upon or transferred to any other parties without the express written authorisation of Fugro GeoServices Limited. If an unauthorised third party comes into possession of this report they rely upon it at their peril and the authors owe them no duty of care and skill.

It is Fugro GeoServices Limited's understanding that this report is to be used for the purposes as described in the Specification for the investigation and as summarised in the text of the report. Should the purpose for which the report is used or the proposed use of the site change, this report may no longer be valid. Any further use or reliance upon the report in these circumstances by Heathrow Airport Limited without further review by and advice from Fugro GeoServices Limited shall be at their sole and own risk.

B. DRAWINGS

B.1 GENERAL

General Location Plan:

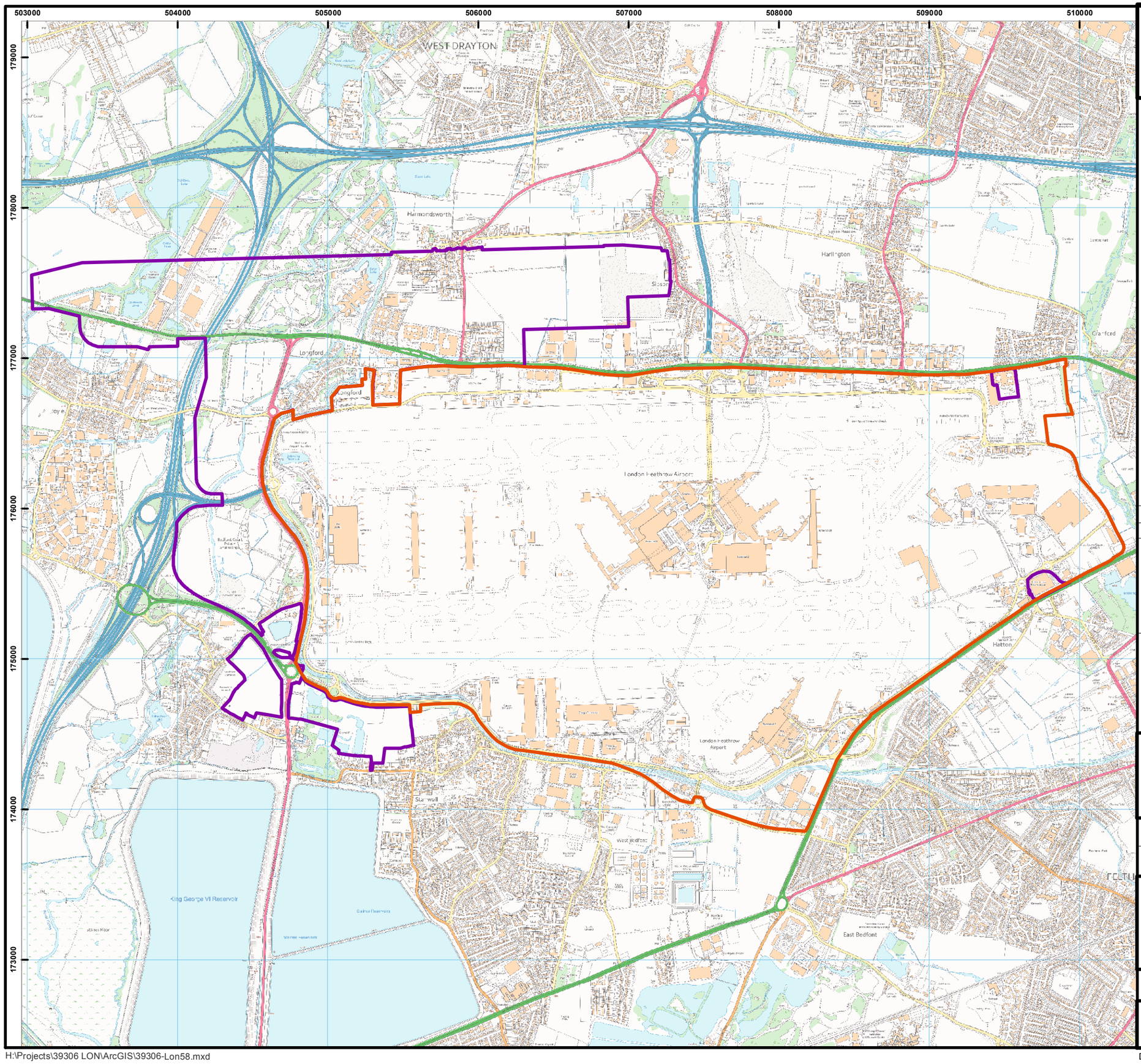
- Heathrow Airport Limited, Stage 1 Ground Investigation, Drawing 1, Heathrow Boundaries, Drawing Reference 39306-Lon58.mxd, Version XX, 3 August 2017.

General Location Plan showing Work Packages:

- Heathrow Airport Limited, Heathrow's Third Runway, Ground Investigation Packages, Drawing Reference 39153-Lon285.mxd, Version 1.1, 7 November 2017.

B.2 EXPLORATORY POSITIONS

Location Plan of Exploratory Positions Figure B.2.1



Heathrow Bye-Law Boundary

Indicative Expansion Area

Ver	Date	Description of Change	Dm

amec foster wheeler | ARUP | ATKINS | GRIMSHAW | JACOBS | MOTT MACDONALD

Heathrow

HAL Documentum Ref.

Scale 1:25,000

Project Name
STAGE 1 GROUND INVESTIGATION

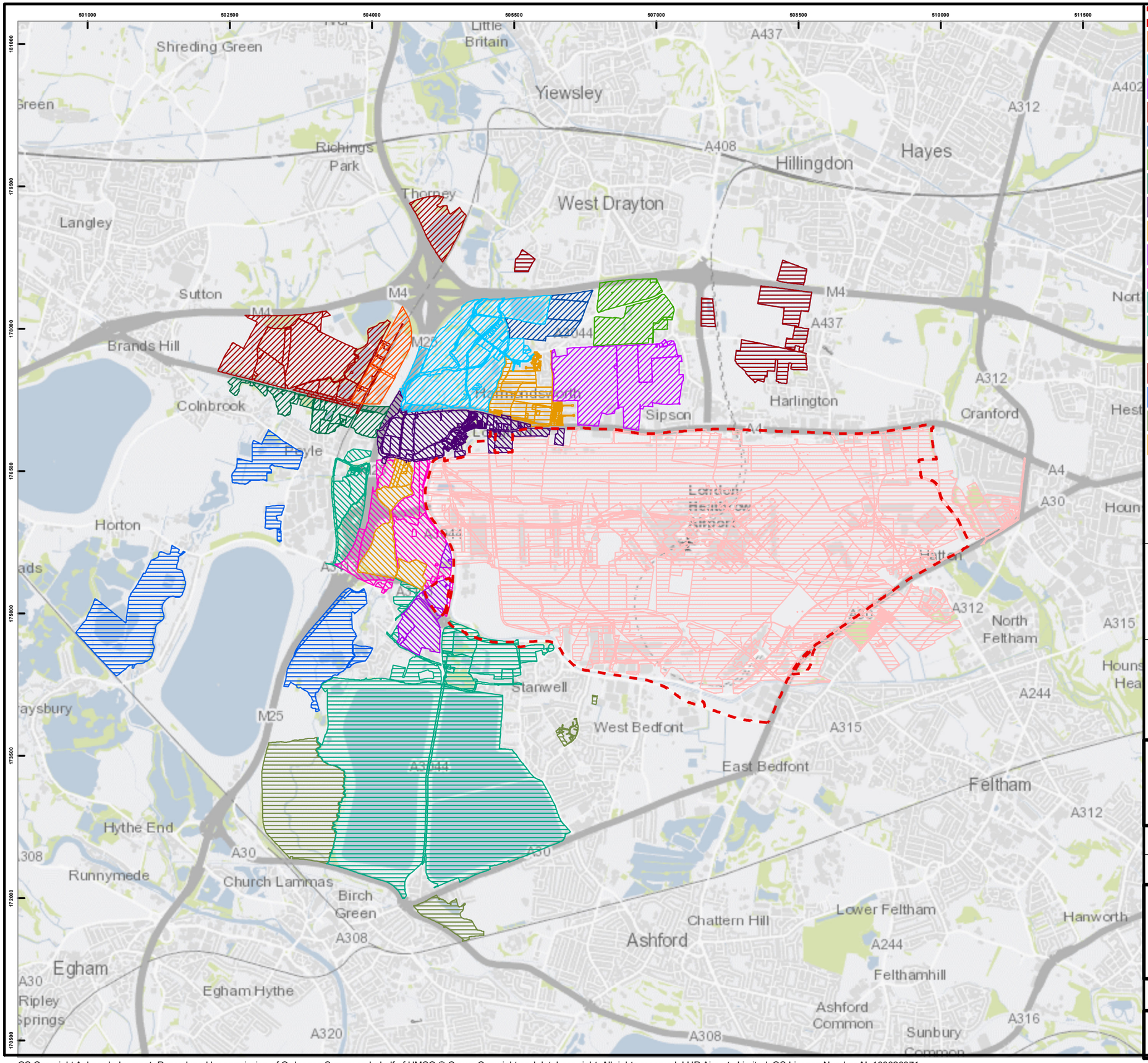
Heathrow Project No.

Title
DRAWING 1
HEATHROW BOUNDARIES

Principal Designer	Drawn By	Chk/Approved	Drawn/Date	Status
Amec Foster Wheeler	J Parkin	J Eardley	03/08/2017	X

Project/Location-Level-Doc Type-System-Unique Identifier
39306-Lon58.mxd

Version
XX



Heathrow Planning Boundary
Package 0
Package 1
Package 2
Package 3
Package 5
Package 6
Package 7
Package 8
Package 9a
Package 9b
Package 10_v2
Package 11
Package 12
Package 13
Package 14
Package 15
Package 16
Package 17

625 312.5 0 625 1,250 1,875 2,500 Meters

amec foster wheeler | ARUP | ATKINS
GRIMSHAW | JACOBS | MOTT MACDONALD

Heathrow

HAL Documentum Ref.	Scale
	1:40,000

Project Name	Heathrow Project No.
Heathrow's Third Runway	

Title
Ground Investigation Packages

Principal Designer	Drawn By	Chk/Approved	Drawn/Date	Status
Amec Foster Wheeler	BUTLS	SHEET	17/11/2017	Draft

Project/Location-Level-Doc Type-System-Unique Identifier	Version
39153-Lon285.mxd	1.1

Document Uncontrolled When Printed

ISO A3 Landscape

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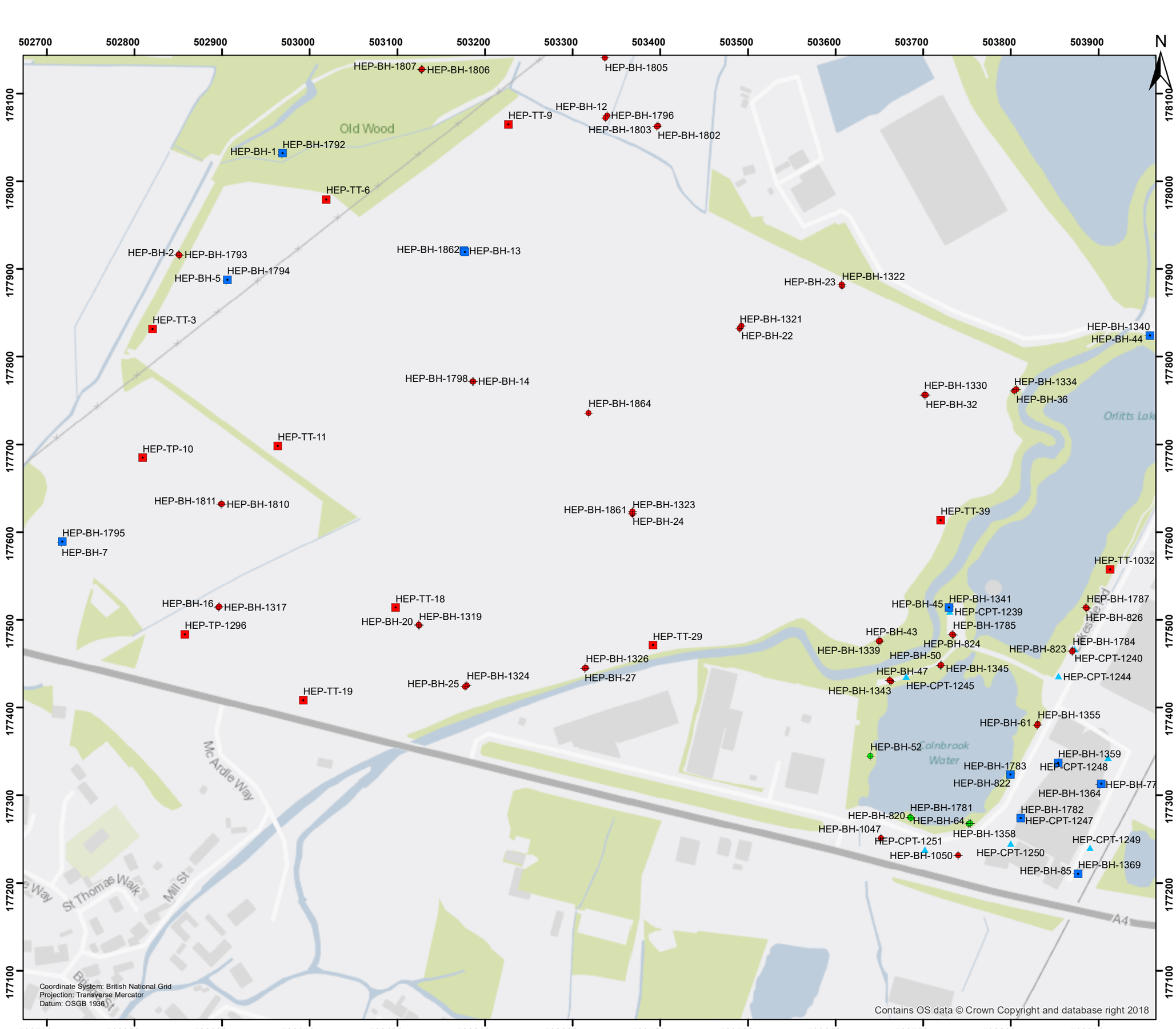

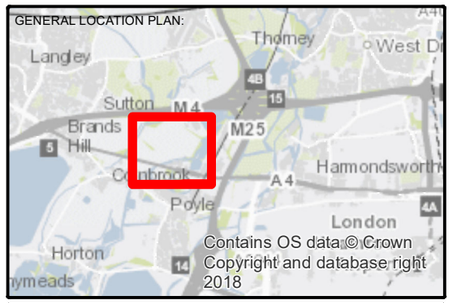

GENERAL LOCATION PLAN SCALE:

0 0.5 1 2 3 4 km

PLAN SCALE:

0 20 40 80 120 160 Meters

Legend

- Inspection Pits
- Cable Percussion Boreholes
- Dynamic Sampling Boreholes
- Trial Pits/Trial Trenches
- Cone Penetration Tests

Notes:
1. Inset map provided by ESRI UK
2. Sheet size: A3
3. Coordinate system: British National Grid

CLIENT: HEATHROW AIRPORT LIMITED

PROJECT: HEATHROW EXPANSION PROJECT - STAGE 1 GROUND INVESTIGATION PACKAGE 3

TITLE: LOCATION PLAN OF EXPLORATORY POSITIONS

GIS BY: EMM	DATE: 29/11/2018
CHECKED BY: ASC	DATE: 29/11/18
APPROVED BY: ASC	DATE: 29/11/18
CONTRACT NO.: G170029U	FIGURE NO.: B.2.1

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Heathrow FUGRO

C. SCHEDULES

C.1 SCHEDULE OF EXPLORATORY POSITIONS

C.2 SCHEDULE OF VARIATION TO ORIGINAL SCOPE OF WORKS

C.3 SCHEDULE OF STRATA ENCOUNTERED

SCHEDULE OF EXPLORATORY POSITIONS

Position ID	Method of Investigation	National Grid Coordinates (OSGB36)		Ground Elevation	Base Depth	Field/ In Situ Testing					Laboratory Testing		Installation Details/ Backfill	Paired Position ID	Remarks
		Eastings	Northings			Headspace Photo Ionisation Detector Testing	Standard Penetration Testing	Permeability Testing	Hand Penetromer/ Hand Vane Testing	CPTU Dissipation Testing	Geoenvironmental Testing	Geotechnical Testing			
		(m)	(m)	(m OD)	(m bgl)										
HEP-BH-1	CP	502968.35	178031.03	21.19	7.00	7	5	2*	None	None	Yes	Yes	50 mm SP; 1.30 to 4.80 m [21.58] {21.34}	HEP-BH-1792	* 1 slug test undertaken within installation
HEP-BH-2	CP	502851.70	177915.70	21.28	15.00	4	7	1*	None	None	Yes	Yes	50 mm SP; 1.40 to 4.50 m [21.74] {21.51}	HEP-BH-1793	* 1 slug test undertaken within installation
HEP-BH-5	CP	502904.66	177886.50	21.92	10.45	11	8	None	None	None	Yes	Yes	50 mm SP; 1.00 to 9.20 m [21.92] {21.90}	HEP-BH-1794	
HEP-BH-7	CP	502717.19	177587.93	20.45	7.00	9	5	1*	None	None	Yes	Yes	50 mm SP; 0.90 to 5.00 m [20.85] {20.68}	HEP-BH-1795	* 1 slug test undertaken within installation
HEP-BH-12	CP	503339.66	178074.55	21.83	15.00	12	6	4*	None	None	Yes	Yes	50 mm SP; 1.55 to 5.00 m [22.22] {21.98}	HEP-BH-1796	* 1 slug test undertaken within installation
HEP-BH-13	IP	503176.00	177920.90	26.07	1.00	2	None	None	None	None	Yes	Yes	Backfilled with arisings	HEP-BH-1797 HEP-BH-1862 HEP-BH-1863	Terminated at 1.05 m; obstruction
HEP-BH-14	CP	503185.98	177771.99	24.48	9.85	11	6	None	None	None	Yes	Yes	50 mm SP; 1.00 to 7.10 m [24.48] {24.34}	HEP-BH-1798	
HEP-BH-16	CP	502896.89	177515.44	22.89	10.50	11	7	None	None	None	Yes	Yes	50 mm SP; 1.00 to 6.90 m [23.27] {23.17}	HEP-BH-1317	
HEP-BH-17	AUGH	503319.45	177736.50	23.25	2.40	5	None	None	None	None	Yes	Yes	50 mm GMP; 0.70 to 2.00 m [23.25] {23.18}	HEP-BH-1318 HEP-BH-1864	
HEP-BH-20	CP	503124.67	177494.87	23.23	9.00	10	6	None	None	None	Yes	Yes	50 mm SP; 1.00 to 5.70 m [23.23] {23.03}	HEP-BH-1319	
HEP-BH-22	CP	503492.64	177835.20	23.64	10.95	10	7	None	None	None	Yes	Yes	50 mm SP; 2.90 to 6.50 m [23.64] {23.48}	HEP-BH-1321	
HEP-BH-23	CP	503607.08	177882.14	22.37	15.45	10	6	1*	None	None	Yes	Yes	50 mm SP; 2.90 to 4.70 m [22.37] {22.21}	HEP-BH-1322	* 1 slug test undertaken within installation
HEP-BH-24	CP	503368.58	177623.37	26.60	1.70	2	1	None	None	None	Yes	Yes	Backfilled with arisings	HEP-BH-1323	Terminated at 1.70 m; obstruction
HEP-BH-25	CP	503177.28	177424.13	23.15	15.00	11	7	1*	None	None	Yes	Yes	50 mm SP; 3.00 to 6.50 m [23.15] {23.13}	HEP-BH-1324	* 1 slug test undertaken within installation
HEP-BH-27	CP	503313.83	177445.04	21.80	15.00	10	5	3*	None	None	Yes	Yes	50 mm SP; 2.80 to 5.60 m [21.80] {21.76}	HEP-BH-1326	* 1 slug test undertaken within installation
HEP-BH-32	CP	503703.11	177756.61	23.74	10.95	10	6	None	None	None	Yes	Yes	50 mm SP; 1.10 to 4.50 m [23.74] {23.66}	HEP-BH-1330	
HEP-BH-33	AUGH	503655.42	177561.15	24.12	3.50	6	None	None	None	None	Yes	Yes	50 mm SP; 1.00 to 2.70 m [24.12] {24.07}	HEP-BH-1331	
HEP-BH-36	CP	503806.28	177762.75	22.36	15.50	13	7	1*	None	None	Yes	Yes	50 mm SP; 0.90 to 7.00 m [22.46] {22.26}	HEP-BH-1334	* 1 slug test undertaken within installation
HEP-BH-43	CP	503649.49	177475.77	21.83	15.00	12	5	1*	None	None	Yes	Yes	50 mm SP; 1.70 to 3.00 m [21.96] {21.70}	HEP-BH-1339	* 1 slug test undertaken within installation
HEP-BH-44	CP	503957.70	177823.99	24.05	20.00	13	9	None	None	None	Yes	Yes	50 mm SP; 1.20 to 7.00 m [24.47] {24.38}	HEP-BH-1340	
HEP-BH-45	CP	503729.73	177515.02	21.73	20.00	13	8	None	None	None	Yes	Yes	50 mm SP; 2.00 to 4.40 m [21.73] {21.68}	HEP-BH-1341	
HEP-BH-47	CP	503661.77	177431.10	21.49	27.50	14	10	1*	None	None	Yes	Yes	50 mm SP; 2.40 to 4.00 m [21.49] {21.43}	HEP-BH-1343	* 1 slug test undertaken within installation
HEP-BH-50	CP	503720.62	177448.77	21.49	20.00	21	6	None	None	None	Yes	Yes	50 mm SP; 3.40 to 20.00 m [21.49] {21.43}	HEP-BH-1345	
HEP-BH-52	WLS	503639.79	177344.72	20.72	5.45	7	5	1*	None	None	Yes	Yes	50 mm SP; 3.30 to 4.60 m [21.02] {20.98}	HEP-BH-1347	* 1 slug test undertaken within installation
HEP-BH-61	CP	503830.24	177379.82	22.65	20.20	17	7	None	None	None	Yes	Yes	50 mm SP; 3.50 to 4.50 m [22.65] {22.54}	HEP-BH-1355	
HEP-BH-64	WLS	503753.90	177268.28	21.86	5.45	7	5	None	None	None	Yes	Yes	50 mm SP; 3.00 to 5.45 m [21.86] {21.71}	HEP-BH-1358	
HEP-BH-65	CP	503854.77	177337.72	22.12	7.00	8	5	None	None	None	Yes	Yes	50 mm SP; 1.20 to 5.00 m [22.12] {22.05}	HEP-BH-1359	
HEP-BH-77	CP	503901.98	177312.72	22.37	7.50	9	5	1*	None	None	Yes	Yes	50 mm SP; 1.90 to 5.20 m [22.37] {22.31}	HEP-BH-1364	* 1 slug test undertaken within installation
HEP-BH-85	CP	503875.87	177210.91	22.10	9.00	9	6	1*	None	None	Yes	Yes	50 mm SP; 1.40 to 6.70 m [22.10] {22.04}	HEP-BH-1369	* 1 slug test undertaken within installation

SCHEDULE OF EXPLORATORY POSITIONS

Position ID	Method of Investigation	National Grid Coordinates (OSGB36)		Ground Elevation	Base Depth	Field/ In Situ Testing					Laboratory Testing		Installation Details/ Backfill	Paired Position ID	Remarks
		Eastings	Northings			Headspace Photo Ionisation Detector Testing	Standard Penetration Testing	Permeability Testing	Hand Penetromer/ Hand Vane Testing	CPTU Dissipation Testing	Geoenvironmental Testing	Geotechnical Testing			
		(m)	(m)	(m OD)	(m bgl)										
HEP-BH-820	WLS	503686.23	177274.12	21.24	5.45	7	5	None	None	None	Yes	Yes	50 mm SP; 3.00 to 4.80 m [21.24] {21.18}	HEP-BH-1781	
HEP-BH-821	CP	503811.85	177274.57	22.17	18.00	14	8	None	None	None	Yes	Yes	50 mm SP; 1.60 to 7.30 m [22.17] {22.14}	HEP-BH-1782	
HEP-BH-822	WLS	503800.14	177324.87	21.41	5.45	8	5	None	None	None	Yes	Yes	50 mm SP; 2.60 to 5.00 m [21.41] {21.34}	HEP-BH-1783	
HEP-BH-823	CP	503870.26	177463.97	22.77	18.00	12	7	None	None	None	Yes	Yes	50 mm SP; 4.30 to 5.10 m [22.77] {22.75}	HEP-BH-1784	
HEP-BH-824	CP	503733.40	177483.61	22.03	18.45	12	8	None	None	None	Yes	Yes	50 mm SP; 1.00 to 3.50 m [22.03] {22.00}	HEP-BH-1785	
HEP-BH-826	CP	503885.79	177514.20	22.42	18.00	13	8	None	None	None	Yes	Yes	50 mm SP; 4.00 to 5.80 m [22.42] {22.40}	HEP-BH-1787	
HEP-BH-1047	CP	503651.89	177251.17	22.01	20.00	15	8	None	None	None	Yes	Yes	50 mm SP; 2.60 to 4.60 m [22.01] {21.96}	Single	
HEP-BH-1050	CP	503740.10	177231.71	22.36	10.00	13	7	None	None	None	Yes	Yes	Backfilled with bentonite	Single	
HEP-BH-1317	CP	502896.01	177514.58	22.89	2.50	None	None	None	None	None	None	None	50 mm GMP; 0.80 to 2.50 m [23.32] {23.16}	HEP-BH-16	
HEP-BH-1318	AUGH	503318.38	177734.43	23.23	4.10	4	None	None	None	None	None	None	Backfilled with bentonite	HEP-BH-17 HEP-BH-1864	
HEP-BH-1319	CP	503124.80	177493.50	23.26	1.80	4	None	None	None	None	Yes	None	50 mm GMP; 0.60 to 1.80 m [23.26] {23.12}	HEP-BH-20	
HEP-BH-1321	CP	503490.66	177832.32	23.72	5.00	6	None	None	None	None	Yes	None	50 mm GMP; 1.00 to 4.00 m [23.72] {23.60}	HEP-BH-22	
HEP-BH-1322	CP	503607.50	177880.98	22.36	1.50	None	None	None	None	None	None	None	50 mm GMP; 0.80 to 1.45 m [22.36] {22.21}	HEP-BH-23	
HEP-BH-1323	CP	503368.28	177620.87	26.54	4.20	None	None	None	None	None	Yes	None	50 mm GMP; 0.90 to 3.50 m [26.54] {26.46}	HEP-BH-24	
HEP-BH-1324	CP	503179.27	177425.35	23.19	2.00	None	None	None	None	None	None	None	50 mm GMP; 0.90 to 2.00 m [23.19] {23.10}	HEP-BH-25	
HEP-BH-1326	CP	503315.13	177445.26	21.77	2.50	None	None	None	None	None	None	None	50 mm GMP; 0.50 to 2.00 m [21.77] {21.65}	HEP-BH-27	
HEP-BH-1330	CP	503701.29	177756.71	23.79	3.50	None	None	None	None	None	None	None	50 mm GMP; 0.90 to 3.00 m [23.79] {23.68}	HEP-BH-32	
HEP-BH-1331	AUGH	503546.23	177561.00	24.12	2.00	None	None	None	None	None	None	None	50 mm GMP; 0.90 to 2.00 m [24.12] {24.03}	HEP-BH-33	
HEP-BH-1334	CP	503804.19	177761.12	22.33	2.00	None	None	None	None	None	None	None	50 mm GMP; 0.90 to 1.50 m [22.33] {22.21}	HEP-BH-36	
HEP-BH-1339	CP	503651.05	177476.23	21.86	1.50	None	None	None	None	None	None	None	50 mm GMP; 0.60 to 1.50 m [21.93] {21.77}	HEP-BH-43	
HEP-BH-1340	IP	503958.91	177824.00	24.09	0.90	None	None	None	None	None	None	None	50 mm GMP; 0.50 to 0.80 m [24.48] {24.35}	HEP-BH-44	
HEP-BH-1341	IP	503729.65	177513.86	21.76	1.10	None	None	None	None	None	None	None	50 mm GMP; 0.50 to 1.00 m [21.76] {21.66}	HEP-BH-45	
HEP-BH-1343	CP	503663.56	177430.17	21.48	2.30	None	None	None	None	None	None	None	50 mm GMP; 0.50 to 2.00 m [21.48] {21.37}	HEP-BH-47	
HEP-BH-1345	CP	503719.59	177448.13	21.47	4.00	None	None	None	None	None	None	None	50 mm GMP; 0.40 to 1.50 m [21.47] {21.36}	HEP-BH-50	
HEP-BH-1355	CP	503830.73	177381.25	22.64	3.50	None	None	None	None	None	None	None	50 mm GMP; 0.50 to 3.00 m [22.64] {22.50}	HEP-BH-61	
HEP-BH-1358	WLS	503752.37	177267.45	21.84	2.00	None	None	None	None	None	None	Yes	50 mm GMP; 1.00 to 2.00 m [21.84] {21.71}	HEP-BH-64	
HEP-BH-1359	IP	503854.11	177336.97	22.13	1.00	None	None	None	None	None	None	None	50 mm GMP; 0.50 to 1.00 m [22.13] {22.04}	HEP-BH-65	
HEP-BH-1364	IP	503903.12	177312.99	22.34	1.20	None	None	None	None	None	None	None	50 mm GMP; 0.50 to 1.20 m [22.34] {22.25}	HEP-BH-77	
HEP-BH-1369	IP	503876.80	177210.43	22.11	1.00	None	None	None	None	None	None	None	50 mm GMP; 0.50 to 1.00 m [22.11] {22.02}	HEP-BH-85	
HEP-BH-1781	WLS	503685.29	177275.19	21.27	2.00	None	None	None	None	None	None	Yes	50 mm GMP; 0.60 to 1.20 m [21.27] {21.17}	HEP-BH-820	
HEP-BH-1782	IP	503811.37	177273.62	22.17	1.20	None	None	None	None	None	None	None	50 mm GMP; 0.60 to 1.20 m [22.17] {22.07}	HEP-BH-821	

SCHEDULE OF EXPLORATORY POSITIONS

Position ID	Method of Investigation	National Grid Coordinates (OSGB36)		Ground Elevation	Base Depth	Field/ In Situ Testing					Laboratory Testing		Installation Details/ Backfill	Paired Position ID	Remarks
		Eastings	Northings			Headspace Photo Ionisation Detector Testing	Standard Penetration Testing	Permeability Testing	Hand Penetromer/ Hand Vane Testing	CPTU Dissipation Testing	Geoenvironmental Testing	Geotechnical Testing			
		(m)	(m)	(m OD)	(m bgl)										
HEP-BH-1783	IP	503799.56	177323.40	21.40	1.00	None	None	None	None	None	None	Yes	50 mm GMP; 0.30 to 1.00 m [21.40] {21.30}	HEP-BH-822	
HEP-BH-1784	CP	503870.86	177465.06	22.76	4.50	None	None	None	None	None	None	None	50 mm GMP; 0.60 to 1.80 m [22.76] {22.66}	HEP-BH-823	
HEP-BH-1785	CP	503734.41	177483.09	22.04	2.20	None	None	None	None	None	None	None	50 mm GMP; 1.20 to 2.20 m [22.04] {21.91}	HEP-BH-824	
HEP-BH-1787	CP	503886.72	177513.47	22.39	3.00	None	None	None	None	None	None	None	50 mm GMP; 1.00 to 2.50 m [22.39] {22.30}	HEP-BH-826	
HEP-BH-1792	IP	502969.16	178031.57	21.20	1.20	None	None	None	None	None	None	None	50 mm GMP; 0.50 to 1.00 m [21.56] {21.41}	HEP-BH-1	
HEP-BH-1793	CP	502850.68	177916.42	21.25	1.10	None	None	None	None	None	None	None	50 mm GMP; 0.50 to 0.90 m [21.68] {21.49}	HEP-BH-2	
HEP-BH-1794	IP	502906.06	177887.70	21.98	1.20	None	None	None	None	None	None	None	50 mm GMP; 0.50 to 1.20 m [21.98] {21.85}	HEP-BH-5	
HEP-BH-1795	IP	502717.70	177588.94	20.44	1.10	3	None	None	None	None	None	None	50 mm GMP; 0.40 to 1.10 m [20.83] {20.66}	HEP-BH-7	
HEP-BH-1796	CP	503337.61	178072.20	21.78	2.00	None	None	None	None	None	None	None	50 mm GMP; 0.70 to 1.70 m [22.07] {21.96}	HEP-BH-12	
HEP-BH-1797	AUGH	503177.26	177918.02	26.09	8.40	9	None	None	None	None	Yes	None	50 mm SP; 0.60 to 7.40 m [26.17] {26.07}	HEP-BH-13 HEP-BH-1862 HEP-BH-1863	
HEP-BH-1798	CP	503187.01	177771.89	24.52	3.50	2	None	None	None	None	Yes	None	50 mm GMP; 1.10 to 3.50 m [24.52] {24.43}	HEP-BH-14	
HEP-BH-1802	CP	503397.41	178063.28	21.22	6.45	8	5	3*	None	None	Yes	Yes	50 mm SP; 1.10 to 4.20 m [21.22] {21.15}	HEP-BH-1803	* 1 slug test undertaken within installation
HEP-BH-1803	CP	503396.30	178062.37	21.20	6.20	None	None	None	None	None	None	None	50 mm GMP; to 4.10 m [21.20] {21.11}	HEP-BH-1802	
HEP-BH-1804	CP	503422.49	178162.28	21.29	6.75	8	5	None	None	None	Yes	Yes	50 mm SP; 1.20 to 4.30 m [21.29] {21.23}	Single	
HEP-BH-1805	CP	503337.11	178140.75	21.16	6.00	7	4	None	None	None	Yes	Yes	50 mm SP; 1.00 to 3.50 m [21.60] {21.56}	Single	
HEP-BH-1806	CP	503127.66	178127.24	21.36	6.50	7	4	1*	None	None	Yes	Yes	50 mm SP; 1.50 to 4.10 m [21.78] {21.34}	HEP-BH-1807	* 1 slug test undertaken within installation
HEP-BH-1807	CP	503128.23	178127.78	21.34	1.50	None	None	None	None	None	None	None	50 mm GMP; 0.50 to 1.20 m [21.72] {21.35}	HEP-BH-1806	
HEP-BH-1810	CP	502898.96	177631.91	21.86	7.50	9	7	None	None	None	Yes	Yes	50 mm GMP; 0.90 to 2.00 m [22.30] {22.14}	HEP-BH-1811	
HEP-BH-1811	CP	502900.12	177632.24	21.90	8.70	9	6	None	None	None	None	None	50 mm SP; 1.00 to 6.20 m [22.34] {22.22}	HEP-BH-1810	
HEP-BH-1861	CP	503368.22	177622.06	26.58	13.00	12	8	None	None	None	Yes	Yes	50 mm SP; 10.00 to 11.00 m [26.58] {26.54}	HEP-BH-24 HEP-BH-1323	Additional exploratory position due to obstruction in HEP-BH-24.
HEP-BH-1862	IP	503177.14	177919.37	26.08	1.05	2	None	None	None	None	None	None	Backfilled with arisings	HEP-BH-13 HEP-BH-1797 HEP-BH-1863	Terminated at 1.05 m; due to concrete obstruction.
HEP-BH-1863	AUGH	503177.94	177920.66	26.07	7.50	9	None	None	None	None	Yes	Yes	50 mm SP; 1.00 to 5.50 m [26.16] {26.00}	HEP-BH-13 HEP-BH-1797 HEP-BH-1862	
HEP-BH-1864	CP	503318.26	177736.02	23.23	6.00	5	5	None	None	None	Yes	Yes	50 mm SP; 1.00 to 3.20 m [23.23] {23.19}	HEP-BH-17 HEP-BH-1318	Exploratory position added due to collapse of HEP-BH-1318.
HEP-CPT-1239	SCP	503730.52	177509.25	21.78	19.54	None	None	None	None	3	None	None	IP backfilled with arisings	-	Cone penetration testing to 19.54 m
HEP-CPT-1240	SCP	503872.71	177466.44	22.72	19.18	None	None	None	None	3	None	None	IP backfilled with arisings	-	Cone penetration testing to 19.18 m
HEP-CPT-1244	SCP	503854.42	177435.35	22.79	23.04	None	None	None	None	2	None	None	IP backfilled with arisings	-	Cone penetration testing to 23.04 m
HEP-CPT-1245	SCP	503680.71	177435.16	21.34	17.79	None	None	None	None	2	None	None	IP backfilled with arisings	-	Cone penetration testing to 17.79 m

SCHEDULE OF EXPLORATORY POSITIONS

Position ID	Method of Investigation	National Grid Coordinates (OSGB36)		Ground Elevation	Base Depth	Field/ In Situ Testing					Laboratory Testing		Installation Details/ Backfill	Paired Position ID	Remarks
		Eastings	Northings			Headspace Photo Ionisation Detector Testing	Standard Penetration Testing	Permeability Testing	Hand Penetromer/ Hand Vane Testing	CPTU Dissipation Testing	Geoenvironmental Testing	Geotechnical Testing			
		(m)	(m)	(m OD)	(m bgl)										
HEP-CPT-1247	SCP	503811.17	177274.32	22.15	22.44	None	None	None	None	3	None	None	IP backfilled with arisings	-	Obstruction encountered at 0.42 m. IP relocated 0.70 m away and excavated to 1.20 m; not geotechnically logged. Cone penetration testing to 22.44 m
HEP-CPT-1248	SCP	503911.23	177342.58	22.04	3.93	None	None	None	None	None	None	None	IP backfilled with arisings	-	Cone penetration testing to 3.93 m
HEP-CPT-1249	SCP	503890.47	177239.97	22.21	3.76	None	None	None	None	None	None	None	IP backfilled with arisings	-	Cone penetration testing to 3.76 m
HEP-CPT-1250	SCP	503799.95	177244.76	22.26	18.51	None	None	None	None	4	None	None	IP backfilled with arisings	-	Cone penetration testing to 18.51 m
HEP-CPT-1251	SCP	503702.23	177237.96	22.41	19.90	None	None	None	None	3	None	None	IP backfilled with arisings	-	Cone penetration testing to 19.90 m
HEP-TP-10	TP	502809.65	177684.91	21.49	3.00	4	None	None	None	None	Yes	Yes	Backfilled with arisings	-	Photographs prepared
HEP-TP-1296	TP	502857.52	177483.41	23.21	3.50	5	None	None	None	None	Yes	Yes	Backfilled with arisings	-	Photographs prepared
HEP-TT-3	TP	502820.81	177831.45	21.51	2.00	4	None	None	None	None	Yes	Yes	Backfilled with arisings	-	Photographs prepared
HEP-TT-6	TP	503018.99	177979.31	21.60	1.00	3	None	None	None	None	Yes	Yes	Backfilled with arisings	-	Photographs prepared
HEP-TT-9	TP	503226.78	178064.67	22.71	2.00	4	None	None	None	None	Yes	Yes	Backfilled with arisings	-	Photographs prepared
HEP-TT-11	TP	502963.53	177698.16	22.59	2.00	4	None	None	None	None	Yes	Yes	Backfilled with arisings	-	Photographs prepared
HEP-TT-18	TP	503098.14	177513.81	22.52	2.00	4	None	None	None	None	Yes	Yes	Backfilled with arisings	-	Photographs prepared
HEP-TT-19	TP	502992.68	177408.28	24.90	3.70	5	None	None	None	None	Yes	Yes	Backfilled with arisings	-	Photographs prepared
HEP-TT-29	TP	503391.86	177471.15	22.40	2.00	3	None	None	None	None	Yes	Yes	Backfilled with arisings	-	Photographs prepared
HEP-TT-39	TP	503719.95	177613.50	22.62	2.00	3	None	None	None	None	Yes	Yes	Backfilled with arisings	-	Photographs prepared
HEP-TT-1032	TP	503913.37	177557.33	22.12	3.20	3	None	None	None	None	None	Yes	Backfilled with arisings	-	Photographs prepared

GENERAL NOTES:

All exploratory positions initiated with a PAS1 28:2014 compliant survey

METHOD OF INVESTIGATION:

IP	Inspection pitting
CP	Cable percussion boring
WLS	Dynamic (windowless) sampling
AUGH	Auger boring (hollow stem)
TP	Trial pitting/trial trenching
SCP	Cone penetration testing

SURVEY DETAILS:

m OD	metres Ordnance Datum (Newlyn)
m bgl	metres below ground level

FIELD/IN SITU TESTING:

CPTU	Cone penetration testing

INSTALLATIONS AND BACKFILL:

GMP	Gas monitoring point
SP	Standpipe
-	Diameter and type of installation; depth of response zone (m bgl) [Elevation at top of installation cover (m OD)] {Elevation at top of installation pipe (m OD)}
Bentonite	Bentonite pellets

SCHEDULE OF VARIATION TO ORIGINAL SCOPE OF WORKS

Position ID	Method of Investigation	Paired position ID	Scheduled Base Depth (m bgl)	Area	Remarks
HEP-BH-13	AUG	HEP-BH-1979	3		Obstruction encountered within inspection pit; redrilled as HEP-BH-1862 and then HEP-BH-1863
HEP-BH-17	AUG	-	3		Ground gas installation placed (change due to complications drilling through landfill)
HEP-BH-24	CP	HEP-BH-1323	3		Obstruction encountered at 1.10 m; redrilled as HEP-BH-1861
HEP-BH-1318	AUG	HEP-BH-17	3		No groundwater installation (groundwater was not encountered during drilling). Ground gas installation placed in paired position
HEP-BH-1347	WLS	-	3		Cancelled – high groundwater
HEP-BH-1797	AUG	HEP-BH-13/ HEP-BH-1863	3		Borehole used for deeper groundwater installation; borehole construction met design objective
HEP-BH-1861	CP	HEP-BH-1323	3		Redrill of HEP-BH-24; borehole construction met design objectives
HEP-BH-1864	CP	-	3		Redrill of HEP-BH-17; borehole construction met design objectives
HEP-TP-10	TP	-	3		Cancelled – proposed location too close to BPA pipeline
HEP-TP-1047	TP	-	3		Replaced by HEP-BH-1047
HEP-TP-1050	TP	-	3		Replaced by HEP-BH-1050
HEP-TT-4	TP	-	3		Cancelled – proposed location too close to BPA pipeline

GENERAL NOTES:

Information provided by the Integrated Design Team Task Order 7.0

METHOD OF INVESTIGATION:

CP	Cable percussion boring
AUG	Auger boring
WLS	Dynamic (windowless) sampling
TP	Trial pitting/trial trenching

SURVEY DETAILS:

m bgl	metres below ground level

SCHEDULE OF STRATA ENCOUNTERED

Position ID	Method of Investigation	National Grid Coordinates (OSGB36)		Ground Elevation	Base Depth	Depth to Base of Stratum (metres below ground level) Elevation at Base of Stratum [metres Ordnance Datum (Newlyn)]					Evidence of Visual/Olfactory Contamination	Remarks
		Eastings	Northings			Topsoil	Made Ground	Alluvium	River Terrace Deposits	London Clay Formation		
		(m)	(m)	(m OD)	(m bgl)							
HEP-BH-1	CP	502968.35	178031.03	21.19	7.00	-	0.40 [20.79]	1.20 [19.99]	5.00 [16.19]	> 7.00 [< 14.19]	-	
HEP-BH-2	CP	502851.70	177915.70	21.28	15.00	-	2.00 [19.28]	-	4.40 [16.88]	> 15.00 [< 6.28]	-	
HEP-BH-5	CP	502904.66	177886.50	21.92	10.45	-	9.50 [12.42]	-	-	> 10.45 [< 11.47]	-	
HEP-BH-7	CP	502717.19	177587.93	20.45	7.00	0.60 [19.85]	-	1.00 [19.45]	5.00 [15.45]	> 7.00 [< 13.45]	-	
HEP-BH-12	CP	503339.66	178074.55	21.83	15.00	-	0.80 [21.03]	1.55 [20.28]	5.00 [16.83]	> 15.00 [< 6.83]	-	
HEP-BH-13	IP	503176.00	177920.90	26.07	1.00	-	> 1.00 [< 25.07]				-	At 1.00 m; concrete slab obstruction
HEP-BH-14	CP	503185.98	177771.99	24.48	9.85	-	7.60 [16.88]	-	-	> 9.85 [< 14.63]	-	
HEP-BH-16	CP	502896.89	177515.44	22.89	10.50	-	7.40 [15.49]	-	-	> 10.50 [< 12.39]	-	
HEP-BH-17	AUGH	503319.45	177736.50	23.25	2.40	-	> 2.40 [< 20.85]				Yes	Between 1.80 m and 2.40 m; no recovery
HEP-BH-20	CP	503124.67	177494.87	23.23	9.00	-	6.20 [17.03]	-	7.00 [16.23]	> 9.00 [< 14.23]	Yes	
HEP-BH-22	CP	503492.64	177835.20	23.64	10.95	-	6.45 [17.19]	7.30 [16.34]	8.70 [14.94]	> 10.95 [< 12.69]	-	
HEP-BH-23	CP	503607.08	177882.14	22.37	15.45	-	1.65 [20.72]	-	4.70 [17.67]	> 15.45 [< 6.92]	-	
HEP-BH-24	CP	503368.58	177623.37	26.60	1.70	-	> 1.70 [< 24.90]				-	Between 1.20 m and 1.70 m; obstruction
HEP-BH-25	CP	503177.28	177424.13	23.15	15.00	-	2.60 [20.55]	-	6.50 [16.65]	> 15.00 [< 8.15]	-	
HEP-BH-27	CP	503313.83	177445.04	21.80	15.00	0.20 [21.60]	2.80 [19.00]	-	5.60 [16.20]	> 15.00 [< 6.80]	-	
HEP-BH-32	CP	503703.11	177756.61	23.74	10.95	-	6.10 [17.64]	7.50 [16.24]	8.50 [15.24]	> 10.95 [< 12.79]	Yes	At 5.00 m; gas emitting from borehole
HEP-BH-33	AUGH	503655.42	177561.15	24.12	3.50	-	3.20 [20.92]	> 3.50 [< 20.62]			Yes	
HEP-BH-36	CP	503806.28	177762.75	22.36	15.50	0.25 [22.11]	-	-	7.20 [15.16]	> 15.50 [< 6.86]	-	
HEP-BH-43	CP	503649.49	177475.77	21.83	15.00	-	1.70 [20.13]	4.20 [17.63]	5.00 [16.83]	> 15.00 [< 6.83]	-	
HEP-BH-44	CP	503957.70	177823.99	24.05	20.00	-	1.20 [22.85]	-	7.20 [16.85]	> 20.00 [< 4.05]	-	
HEP-BH-45	CP	503729.73	177515.02	21.73	20.00	-	1.10 [20.63]	1.75 [19.98]	4.40 [17.33]	> 20.00 [< 1.73]	-	

SCHEDULE OF STRATA ENCOUNTERED

Position ID	Method of Investigation	National Grid Coordinates (OSGB36)		Ground Elevation	Base Depth	Depth to Base of Stratum (metres below ground level) Elevation at Base of Stratum [metres Ordnance Datum (Newlyn)]					Evidence of Visual/Olfactory Contamination	Remarks
		Eastings	Northings			Topsoil	Made Ground	Alluvium	River Terrace Deposits	London Clay Formation		
		(m)	(m)	(m OD)	(m bgl)							
HEP-BH-47	CP	503661.77	177431.1	21.49	27.50	-	2.40 [19.09]	-	4.00 [17.49]	> 27.50 [< -6.01]	-	
HEP-BH-50	CP	503720.62	177448.77	21.49	20.00	-	2.20 [19.29]	-	-	> 20.00 [< 1.49]	-	
HEP-BH-52	WLS	503639.79	177344.72	20.72	5.45	0.15 [20.57]	-	3.45 [17.27]	4.60 [16.12]	> 5.45 [< 15.27]	-	
HEP-BH-61	CP	503830.24	177379.82	22.65	20.20	-	2.70 [19.95]	3.20 [19.45]	4.00 [18.65]	> 20.20 [< 2.45]	Yes	
HEP-BH-64	WLS	503753.90	177268.28	21.86	5.45	0.15 [21.71]	3.05* [18.81]	-	5.45 [16.41]		-	*Approximate boundary due to assumed zone of core loss
HEP-BH-65	CP	503854.77	177337.72	22.12	7.00	-	1.15 [20.97]	-	5.00 [17.12]	> 7.00 [< 15.12]	-	
HEP-BH-77	CP	503901.98	177312.72	22.37	7.50	-	1.50 [20.87]	-	5.20 [17.17]	> 7.50 [< 14.87]	Yes	
HEP-BH-85	CP	503875.87	177210.91	22.10	9.00	-	0.90 [21.20]	-	6.70 [15.40]	> 9.00 [< 13.10]	-	
HEP-BH-820	WLS	503686.23	177274.12	21.24	5.45	-	2.70 [18.54]	-	4.85 [16.39]	> 5.45 [< 15.79]	-	
HEP-BH-821	CP	503811.85	177274.57	22.17	18.00	-	2.00 [20.17]	-	7.30 [14.87]	> 18.00 [< 4.17]	-	
HEP-BH-822	WLS	503800.14	177324.87	21.41	5.45	-	2.60* [18.81]	-	5.35 [16.06]	> 5.45 [< 15.96]	-	*Approximate boundary due to assumed zone of core loss
HEP-BH-823	CP	503870.26	177463.97	22.77	18.00	-	4.30 [18.47]	-	5.10 [17.67]	> 18.00 [< 4.77]	-	
HEP-BH-824	CP	503733.40	177483.61	22.03	18.45	-	1.00 [21.03]	3.80 [18.23]	4.70 [17.33]	> 18.45 [< 3.58]	-	
HEP-BH-826	CP	503885.79	177514.20	22.42	18.00	-	3.90 [18.52]	-	5.80 [16.62]	> 18.00 [< 4.42]	-	
HEP-BH-1047	CP	503651.89	177251.17	22.01	20.00	-	1.70 [20.31]	2.60 [19.41]	4.60 [17.41]	> 20.00 [< 2.01]	-	
HEP-BH-1050	CP	503740.10	177231.71	22.36	10.00	-	2.00 [20.36]	2.80 [19.56]	5.50 [16.86]	> 10.00 [< 12.36]	-	
HEP-BH-1317	CP	502896.01	177514.58	22.89	2.50	-	> 2.50 [< 20.39]				-	
HEP-BH-1318	AUGH	503318.38	177734.43	23.23	4.10	0.20 [23.03]	3.40 [19.83]	-	> 4.10 [< 19.13]		Yes	
HEP-BH-1319	CP	503124.80	177493.50	23.26	1.80	-	> 1.80 [< 21.46]				Yes	
HEP-BH-1321	CP	503490.66	177832.32	23.72	5.00	-	> 5.00 [< 18.72]				-	
HEP-BH-1322	CP	503607.50	177880.98	22.36	1.50	-	> 1.50 [< 20.86]				Yes	

SCHEDULE OF STRATA ENCOUNTERED

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		Eastings	Northings			Topsoil	Made Ground	Alluvium	River Terrace Deposits	London Clay Formation		
		(m)	(m)	(m OD)	(m bgl)							
HEP-BH-1323	CP	503368.28	177620.87	26.54	4.20	-	> 4.20 [< 22.34]				-	
HEP-BH-1324	CP	503179.27	177425.35	23.19	2.00	-	> 2.00 [< 21.19]				-	
HEP-BH-1326	CP	503315.13	177445.26	21.77	2.50	-	> 2.50 [< 19.27]				-	
HEP-BH-1330	CP	503701.29	177756.71	23.79	3.50	-	> 3.50 [< 20.29]				-	
HEP-BH-1331	AUGH	503546.23	177561.00	24.12	2.00	-	> 2.00 [< 22.12]				Yes	
HEP-BH-1334	CP	503804.19	177761.12	22.33	2.00	0.15 [22.18]	> 2.00 [< 20.33]				-	
HEP-BH-1339	CP	503651.05	177476.23	21.86	1.50	-	1.20 [20.66]	-	> 1.50 [< 20.36]		-	
HEP-BH-1340	IP	503958.91	177824.00	24.09	0.90	-	0.80 [23.29]	-	> 0.90 [< 23.19]		-	
HEP-BH-1341	IP	503729.65	177513.86	21.76	1.10	-	1.00 [20.76]	> 1.10 [< 20.66]			-	
HEP-BH-1343	CP	503663.56	177430.17	21.48	2.30	-	> 2.30 [< 19.18]				-	
HEP-BH-1345	CP	503719.59	177448.13	21.47	4.00	-	2.00 [19.47]	-	-	> 4.00 [< 17.47]	-	
HEP-BH-1355	CP	503830.73	177381.25	22.64	3.50	-	3.10 [19.54]	> 3.50 [< 19.14]			-	
HEP-BH-1358	WLS	503752.37	177267.45	21.84	2.00	-	> 2.00 [< 19.84]				-	
HEP-BH-1359	IP	503854.11	177336.97	22.13	1.00	-	> 1.00 [< 21.13]				-	
HEP-BH-1364	IP	503903.12	177312.99	22.34	1.20	-	> 1.20 [< 21.14]				Yes	
HEP-BH-1369	IP	503876.80	177210.43	22.11	1.00	-	0.85 [21.26]	> 1.00 [< 21.11]			-	
HEP-BH-1781	WLS	503685.29	177275.19	21.27	2.00	-	1.65 [19.62]	> 2.00 [< 19.27]			-	
HEP-BH-1782	IP	503811.37	177273.62	22.17	1.20	-	> 1.20 [< 20.97]				-	
HEP-BH-1783	IP	503799.56	177323.40	21.40	1.00	-	> 1.00 [< 20.40]				-	At 1.00 m; possible concrete obstruction
HEP-BH-1784	CP	503870.86	177465.06	22.76	4.50	-	4.40 [18.36]	-	-	> 4.50 [< 18.26]	Yes	
HEP-BH-1785	CP	503734.41	177483.09	22.04	2.20	-	0.60 [21.44]	> 2.20 [< 19.84]			-	

SCHEDULE OF STRATA ENCOUNTERED

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		Eastings	Northings			Topsoil	Made Ground	Alluvium	River Terrace Deposits	London Clay Formation		
		(m)	(m)	(m OD)	(m bgl)							
HEP-BH-1787	CP	503886.72	177513.47	22.39	3.00	-	> 3.00 [< 19.39]				-	
HEP-BH-1792	IP	502969.16	178031.57	21.20	1.20	-	0.40 [20.80]	0.80 [20.40]	> 1.20 [< 20.00]		-	
HEP-BH-1793	CP	502850.68	177916.42	21.25	1.10	-	> 1.10 [< 20.15]				Yes	
HEP-BH-1794	IP	502906.06	177887.70	21.98	1.20	-	> 1.20 [< 20.78]				-	
HEP-BH-1795	IP	502717.70	177588.94	20.44	1.10	0.50 [19.94]	-	1.00 [19.44]	> 1.10 [< 19.34]		-	
HEP-BH-1796	CP	503337.61	178072.20	21.78	2.00	-	0.55 [21.23]	1.80 [19.98]	> 2.00 [< 19.78]		-	
HEP-BH-1797	AUGH	503177.26	177918.02	26.09	8.40	-	7.95 [18.14]	-	-	> 8.40 [< 17.69]	-	
HEP-BH-1798	CP	503187.01	177771.89	24.52	3.50	-	> 3.50 [< 21.02]				Yes	
HEP-BH-1802	CP	503397.41	178063.28	21.22	6.45	0.30 [20.92]	-	0.70 [20.52]	4.20 [17.02]	> 6.45 [< 14.77]	-	
HEP-BH-1803	CP	503396.30	178062.37	21.20	6.20	-	0.20 [21.00]	0.50 [20.70]	4.20 [17.00]	> 6.20 [< 15.00]	-	
HEP-BH-1804	CP	503422.49	178162.28	21.29	6.75	-	0.60 [20.69]	-	4.30 [16.99]	> 6.75 [< 14.54]	-	
HEP-BH-1805	CP	503337.11	178140.75	21.16	6.00	-	-	0.85 [20.31]	3.70 [17.46]	> 6.00 [< 15.16]	-	
HEP-BH-1806	CP	503127.66	178127.24	21.36	6.50	-	0.50 [20.86]	1.50 [19.86]	4.10 [17.26]	> 6.50 [< 14.86]	-	
HEP-BH-1807	CP	503128.23	178127.78	21.34	1.50	-	0.50 [20.84]	> 1.50 [< 19.84]			-	
HEP-BH-1810	CP	502898.96	177631.91	21.86	7.50	-	6.00 [15.86]	-	-	> 7.50 [< 14.36]	-	
HEP-BH-1811	CP	502900.12	177632.24	21.90	8.70	-	6.70 [15.20]	-	-	> 8.70 [< 13.20]	-	
HEP-BH-1861	CP	503368.22	177622.06	26.58	13.00	-	11.00 [15.58]	-	-	> 13.00 [< 13.58]	-	
HEP-BH-1862	IP	503177.14	177919.37	26.08	1.05	-	> 1.05 [< 25.03]				-	At 1.05 m; concrete slab and metal bar obstruction
HEP-BH-1863	AUGH	503177.94	177920.66	26.07	7.50	-	> 7.50 [< 18.57]				Yes	
HEP-BH-1864	CP	503318.26	177736.02	23.23	6.00	-	3.70 [19.53]	-	> 6.00 [< 17.23]		-	
HEP-CPT-1239	SCP	503730.52	177509.25	21.78	19.54	-	> 1.20 [< 20.58]				-	Cone penetration testing to 19.54 m

SCHEDULE OF STRATA ENCOUNTERED

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		Eastings	Northings			Topsoil	Made Ground	Alluvium	River Terrace Deposits	London Clay Formation		
		(m)	(m)	(m OD)	(m bgl)							
HEP-CPT-1240	SCP	503872.71	177466.44	22.72	19.18	0.35 [22.37]	> 1.20 [< 21.52]				-	Cone penetration testing to 19.18 m
HEP-CPT-1244	SCP	503854.42	177435.35	22.79	23.04	-	> 1.20 [< 21.59]				-	Cone penetration testing to 23.04 m
HEP-CPT-1245	SCP	503680.71	177435.16	21.34	17.79	-	> 1.20 [< 20.14]				-	Cone penetration testing to 17.79 m
HEP-CPT-1247	SCP	503811.17	177274.32	22.15	22.44	-	> 0.42 [< 21.73]				-	Obstruction encountered at 0.42 m. IP relocated 0.70 m away and excavated to 1.20 m; not geotechnically logged. Cone penetration testing to 22.44 m
HEP-CPT-1248	SCP	503911.23	177342.58	22.04	3.93	-	0.70 [21.34]	-	> 1.20 [< 20.84]		-	Cone penetration testing to 3.93 m
HEP-CPT-1249	SCP	503890.47	177239.97	22.21	3.76	-	> 1.20 [< 21.01]				-	Cone penetration testing to 3.76 m
HEP-CPT-1250	SCP	503799.95	177244.76	22.26	18.51	-	> 1.20 [< 21.06]				Yes	Cone penetration testing to 18.51 m
HEP-CPT-1251	SCP	503702.23	177237.96	22.41	19.90	-	0.80 [21.61]	> 1.20 [< 21.21]			-	Cone penetration testing to 19.90 m
HEP-TP-10	TP	502809.65	177684.91	21.49	3.00	-	1.80 [19.69]	-	> 3.00 [< 18.49]		-	
HEP-TP-1296	TP	502857.52	177483.41	23.21	3.50	-	> 3.50 [< 19.71]				Yes	
HEP-TT-3	TP	502820.81	177831.45	21.51	2.00	-	> 2.00 [< 19.51]				-	
HEP-TT-6	TP	503018.99	177979.31	21.60	1.00	-	> 1.00 [< 20.60]				-	
HEP-TT-9	TP	503226.78	178064.67	22.71	2.00	-	> 2.00 [< 20.71]				Yes	
HEP-TT-11	TP	502963.53	177698.16	22.59	2.00	-	> 2.00 [< 20.59]				-	
HEP-TT-18	TP	503098.14	177513.81	22.52	2.00	-	> 2.00 [< 20.52]				-	
HEP-TT-19	TP	502992.68	177408.28	24.90	3.70	-	2.90 [22.00]	> 3.70 [< 21.20]			Yes	
HEP-TT-29	TP	503391.86	177471.15	22.40	2.00	0.20 [22.20]	> 2.00 [< 20.40]				-	
HEP-TT-39	TP	503719.95	177613.50	22.62	2.00	-	> 2.00 [< 20.62]				-	
HEP-TT-1032	TP	503913.37	177557.33	22.12	3.20	-	> 3.20 [< 18.92]				-	

SCHEDULE OF STRATA ENCOUNTERED

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		Eastings	Northings			Topsoil	Made Ground	Alluvium	River Terrace Deposits	London Clay Formation		
		(m)	(m)	(m OD)	(m bgl)							

GENERAL NOTES:
Strata derived from Geology Codes (GEOL_GEOL) determined by IDT in collaboration with Fugro

METHOD OF INVESTIGATION:

IP	Inspection pitting
CP	Cable percussion boring
WLS	Dynamic (windowless) sampling
AUGH	Auger boring (hollow stem)
TP	Trial pitting/trial trenching
SCP	Cone penetration testing

SURVEY DETAILS:

m OD	metres Ordnance Datum (Newlyn)
m bgl	metres below ground level

EVIDENCE OF VISUAL/OLFACTORY CONTAMINATION:
Search on key words: odour, oily, staining, sheen.

D. EXPLORATORY POSITION RECORDS

D.1 EXPLANATORY NOTES AND KEYSHEETS

Notes on Exploratory Position Records	Figure D.1.1
Heathrow Expansion Project Landfill Logging Procedure	Figure D.1.2
Heathrow Expansion Project Geology Codes	Figure D.1.3

D.2 BOREHOLE RECORDS

Inspection Pit and Borehole Records: (referenced by Position ID)

- Inspection pit/borehole record;
- Inspection pit/borehole summary;
- Field and in situ test summary.

D.3 TRIAL PIT AND TRIAL TRENCH RECORDS

Trial Pit and Trial Trench Records: (referenced by Position ID)

- Trial pit/trial trench record;
- Trial pit/trial trench summary;
- Field and in situ test summary.

D.1.1 NOTES ON EXPLORATORY POSITION RECORDS

GENERAL NOTES

OPERATING PROCEDURES

The procedures used for cable percussion boring, rotary drilling, trial pitting, sampling, in situ and laboratory testing and sample description are generally in accordance with BS5930:2015 'Code of practice for site investigations', BS EN ISO 14688-1:2002 'Geotechnical investigation and testing – Identification and classification of soil – Part 1 Identification and description', BS EN ISO 14689-1:2003 'Geotechnical investigation and testing – Identification and classification of rock – Part 1 Identification and description' as appropriate, and BS1377:1990 'Methods of test for soils for civil engineering purposes', unless stated otherwise. Sampling is carried out in general accordance with EN ISO 22475-1 and standard penetration testing is carried out to EN ISO 22476-3:2005.

GROUNDWATER

Water levels in the exploratory holes are recorded together with the depths at which seepages or inflows of water are detected. These observations are noted on the exploratory position records but may be misleading for the following reasons:

i) The exploratory hole is rarely left open at the relevant depth for a sufficient time for the water level to reach equilibrium;
ii) A permeable stratum may have been sealed off by the borehole casing;
iii) Water may have been added to the borehole to facilitate progress;
iv) The permeability may have been altered by the excavation/boring/drilling process.

Standpipes or piezometers should be installed when an accurate record of groundwater level is required however, it should be noted that groundwater levels may vary significantly due to seasonal, climatic or man-made effects. Water levels recorded during the investigation and any advice or comment made accordingly may therefore not be appropriate to particular geotechnical design or temporary works solutions. Long-term monitoring of standpipes or piezometers is always recommended when water levels are likely to have a significant effect on design.

CHISELLING

The remarks in the exploratory position records contain information on the time spent advancing the borehole by 'chiselling techniques', and the depth of borehole over which it was required. Such information may be affected by a wide range of variable factors, unrelated to the geotechnical properties of the strata. Such factors include, but are not restricted to, plant, equipment and operator. The data should therefore only be used subjectively and with extreme caution.

IDENTIFICATION AND DESCRIPTION OF SOILS

The identification system follows the Company's Engineering Geotechnical Procedures Manual which is based on BS EN ISO 14688-1:2002 and appropriate clarifications in the National Foreword, BS 5930:2015 and BS EN ISO 14689-1:2003.

Relative density terms are given where supported by SPT 'N' values, with the exception of Made Ground. The field assessment of compactness or relative density for coarse grained soils is only given on trial pit records where appropriate assessment of the soils has been undertaken.

Where 'to' links two terms, as in 'slightly sandy to sandy' this represents a borderline case or a range, where the precise proportions cannot be determined by inspection or after consideration of in situ and/or laboratory test results.

Where there is a degree of uncertainty regarding the density index or consistency of the soil, the terms are given in brackets or "probably" or "possibly" have been used and the descriptions should be treated with caution.

The name of the geological formation is only given where this has been requested and can be determined with confidence.

INTERPRETATION OF THE RESULTS OF THE INVESTIGATION

The description of ground conditions encountered and any engineering interpretation included in the report are based on the results of the boreholes and trial pits and the field and laboratory testing carried out. There may be ground conditions at the site which have not been revealed by the investigation and consequently have not been taken into account.

Any interpolation or extrapolation of strata between exploratory positions shown on any cross sections or site plans is an estimate only of the likely stratification based on general experience of the ground conditions and is subject to the interpretation of the reader.

The term "TOPSOIL" is used in this report to describe the surface, usually organic rich, layer including turf, subsoil and weathered material with roots. The use of this term may not imply that the soil satisfies the requirements of Clause 3 of BS 3882:1994, 'Specification for topsoil', or is suitable for general horticultural and agricultural purposes.

Laboratory test results in this report give the soil properties of individual specimens tested under specified conditions. Individual results or groups of results may not be appropriate for use as design parameters for some geotechnical analyses. The samples may be non-representative, disturbed internally, or prepared and tested under conditions suited for different geotechnical applications. Unless the selection of design parameters is discussed in this report, it is recommended that the advice of a Geotechnical Specialist is sought.

IN SITU TESTING AND SAMPLING

STANDARD PENETRATION TESTS

Standard Penetration Test (SPT) (S) denotes a 50 mm diameter split barrel sampler, normally undertaken in cohesive and mixed soils and (C) indicates the test was carried out using a 50 mm diameter, 60 degree apex, solid cone normally used in coarse granular soils and weak rock. The tests are carried out in accordance with EN ISO 22476-3:2005

The distance that the SPT assembly sinks into the ground prior to the start of the test is measured and reported as Static Weight Penetration (SWP). The sampler or cone is driven up to 450 mm into the soil using a 63.6 kg hammer with a 760 mm drop. An initial seating drive of 150 mm (or 25 blows, whichever is less) is undertaken to penetrate through any ground which may be disturbed at the base of the borehole. For the test drive, the number of blows required to obtain an additional 300 mm penetration (or penetration for 50/100 blows) is recorded as the penetration resistance (also known as the 'N' value). The test is usually completed when the test drive attains the 300 mm penetration or the number of blows recorded during the 'test drive' only reaches 50 in soils or 100 in weak rock.

If the sampler advances below the bottom of the borehole under the static weight of the drive rods with the hammer assembly on top, the corresponding penetration is not included as seating drive but the information is reported separately as SWP. The test is terminated in all cases before the non-return valve reaches the level of the material at the base of the borehole, in effect about 600 mm total penetration. If SWP is greater than 150 mm then test increments of 75 mm are undertaken with the final increment being completed at less than 600 mm total penetration including SWP.

If a sample is not recovered in the sampler, or the cone is used, a disturbed sample of appropriate size for the material is taken on completion of the test over the depth of the test zone. The sample is given the same depth as the top of the SPT drive.

The depths given on the exploratory hole record are those at the start and end of the test. Where full penetration of the test drive is obtained, the penetration resistance ('N' value) is reported in the ‘Test Results' column. If full penetration in the test drive is not obtained, then the length of drive (test length in mm) and the penetration resistance (number of blows) are both reported.

Full results, including the test depth, test type, static self weight penetration, blows of each of the seating drive and test drive increments, the ‘N’ value, total penetration, hammer serial number, the energy ratio and water and casing levels are given on the separate In Situ Test Summary Sheet.

OTHER IN SITU TESTS

The following in situ tests are reported on the Exploratory Hole Records in the 'Type' and 'Results' columns, where appropriate.

k In Situ Permeability Test - refer to detailed test results for permeability values.

PMT Pressuremeter Test - refer to detailed test results for modulus values etc.

DMT High Pressure Dilatometer Test.

VHT Variable Head Permeability Test.

WPT Water Pressure Test (double packer permeability test).

BVane Borehole Shear Vane Test (undrained shear strength in kPa) - refer also to detailed test results. Remoulded shear strength presented in brackets and italic font.

HVane Hand Shear Vane Test (undrained shear strength in kPa). Remoulded shear strength as above. The values are indicative and should not be taken as being equivalent to laboratory test results. The Pilcon vane results have a factor varying from about a sixth for the 33 mm vane to a third for the 19 mm vane which reduces the BS1377 shear vane value. The values presented are therefore approximate and should be treated with great caution if used for design purposes.

Pen Pocket Penetrometer Test (undrained shear strength in kPa). Reported to the nearest 0.25 kPa. Pocket Penetrometers are an aid to logging of cohesive soils, the results are indicative and should not be relied upon. The equipment used is not calibrated.

CBR California Bearing Ratio Test (CBR %) - refer also to detailed test results.

PID Photo Ionisation Detector Readings in headspace of small disturbed chemical samples. Result given in ppm by volume.

UNDISTURBED SAMPLES

All samples recovered are recorded and handled in accordance with EN ISO 22475-1.

UT General purpose open tube sample. Sample normally taken with open tube sampler approximately 0.1 m diameter and 0.45 m long and driven with an 80 kg sinker bar and 56 kg sliding hammer, unless noted otherwise. "XX/XXX mm" in ‘Test Results’ column denotes the number of hammer blows and total sample tube penetration. The height of hammer drop can be variable depending on operator technique. Depths are given of the top and bottom of the sample.

'U' Denotes steel or plastic liner sample in general use up to year 2010 designated OS/TKW in accordance with BS EN ISO 22475-1 with an area ratio greater than 25 %. 'UT' denotes thin wall open tube sampler designated OS/TW with an area ratio less than 15 %, available from 2010.

U/UT(X) General purpose open tube sample (X) mm diameter.

TW(X) Thin wall (push) sample (X) mm diameter.

P(X) Piston/push sample (X) mm diameter.

Sample not recovered.

DISTURBED AND CORE SAMPLES

D Small disturbed sample (plastic tub or jar with air tight lid).

B Bulk disturbed sample (polythene bag, tied at neck - size dependent on purpose).

LB Large bulk disturbed sample (normally several bulk samples of the same material - size dependent on purpose).

CBR Sample taken in CBR mould.

W Water sample.

C Core sample.

ENVIRONMENTAL SAMPLES

CD Sample for chemical analysis in a plastic tub.

K Sample for chemical analysis in an amber glass jar.

V Sample for chemical analysis in a glass vial.

CDKV Set of samples for chemical analysis as above.

WAC Sample for Waste Acceptance Criteria.

ES Environmental Soil Sample.

EW Environmental Water Sample.

KEY TO EXPLORATORY POSITION RECORDS

Soil Types

Coarse grained, Non cohesive

- Boulders
- Cobbles
- Gravel
- Sand

Fine grained, Cohesive

- Silt
- Clay

Other Soil Types

- Topsoil
- Peat
- Made Ground

Note: Composite soil types may be signified by combined symbols.

Rock Types

Sedimentary

- Sandstone
- Siltstone
- Conglomerate
- Chalk
- Limestone
- Breccia
- Coal
- Mudstone/Claystone/Shale

Metamorphic

- Coarse/Medium grained
- Fine grained

Igneous

- Coarse grained
- Medium grained
- Fine grained

DESCRIPTION OF ROCK CORES

DESCRIPTIVE ORDER

Strength, (Rock Hardness Criteria), Structure, Colour, Texture, Grain Size, ROCK NAME. Minor constituents and additional information. (Geological formation - see comments under identification and description of soils). Mass characteristics - factual description of weathering state (if appropriate) and description of discontinuities and fracture state (if appropriate).

ROCK FIELD STRENGTH

Term	Field identification	Strength (MPa)
Extremely weak	Can be indented by thumbnail. Gravel sized lumps crush between finger and thumb.	< 1.0
Very weak	Crumbles under firm blows with point of geological hammer. Can be peeled by a pocket knife.	1 to 5
Weak	Peeled by a pocket knife with difficulty. Shallow indentations made by firm blow with point of geological hammer.	5 to 25
Medium strong	Cannot be scraped with pocket knife. Can be fractured with a single firm blow of geological hammer.	25 to 50
Strong	Requires more than one blow of geological hammer to fracture.	50 to 100
Very strong	Requires many blows of geological hammer to fracture.	100 to 250
Extremely strong	Can only be chipped with geological hammer.	> 250

DISCONTINUITY SPACING

Bedding Spacing & Planar Structures *	Spacing (mm)
Very thickly bedded	> 2000
Thickly bedded	2000 to 600
Medium bedded	600 to 200
Thinly bedded	200 to 60
Very thinly bedded	60 to 20
Thickly laminated (Sedimentary) narrow (Metamorphic & Igneous)	20 to 6
Thinly laminated (Sedimentary) Very narrow (Metamorphic & Igneous)	< 6

Notes:
* For igneous and metamorphic rocks the appropriate descriptive term for planar structure should be used (e.g. medium foliated gneiss, very narrowly cleaved slate, very thickly flow banded diorite).

Discontinuity Spacing	Spacing (mm)
Extremely widely spaced	> 6000
Very widely spaced	> 2000
Widely spaced	2000 to 600
Medium spaced	600 to 200
Closely spaced	200 to 60
Very closely spaced	60 to 20
Extremely closely spaced	< 20

DISCONTINUITY DESCRIPTION

Discontinuities are breaks, fractures or planes of weakness in the rock mass; the discontinuities present in the ground (natural) are the most important. A distinction can be drawn between "mechanical discontinuities", which are already open and present in the rock, and "incipient discontinuities", which are inherent potential planes of weakness. A "drilling induced" (DI) fracture is one that is of non-geological origin that has been exaggerated by the drilling process; the terms "drilling affected" (DAD) or "drilling enhanced "(DED) can also be used. The recording of induced and incipient discontinuities is important as they can indicate weakness within the mass, but they are not included within the assessment of fracture state.

The descriptive terminology may be applied to individual discontinuities, or summarised to sets or to zones of uniform character. Discontinuities usually occur in more than one direction in a rock mass, and might be present as distinct sets. Borehole cores provide essentially one-dimensional data on discontinuity spacing; exposures or orientated cores are usually needed for full evaluation of the discontinuity pattern. Very limited information is available from cores for persistence and termination and aperture or separation.

A detailed description of each discontinuity is given on the discontinuity record.

Discontinuities								
Spacing	**Discontinuity Type**	**Orientation/ Dip (degrees)**	**Persistence**	**Shape (Roughness)**	**Surface Texture (Roughness)**	**Separation or Aperture (mm)**	**Aperture infill**	**Discontinuity Remarks**
Extremely Widely > 6 m	**D - D**iscontinuity;	**V - V**ertical	Discontinous or Continous	**Medium Scale 10's mm:**	**Small Scale several mm:**	**An – An**nealed* (0 mm);	**Cl - Cl**ean (none)	Staining discolouration, penetration, colour etc
Very Widely 2 to 6 m	**J - J**oint;	Angle to Horizontal to 5 degs		**Pl - Pl**anar	**Ro - Ro**ugh (> 0.5 mm); Slightly rough*	**Vt - V**ery **Ti**ght (< 0.1 mm);	Surface Staining (Colour)	
Widely 600 mm to 2 m	**F - F**racture /**F**issure;	**SV - S**ub-**V**ertical;		**Curviplanar***	**RS - R**ough to **S**mooth (0.1 mm to 0.5 mm);	**Ti - Ti**ght (0.1 mm to 0.25 mm);	**Hd - Ha**r**d**, Dimension – #mm (Mineral coatings)	Infill material and type, colour, voids, evidence of water flow, etc
Medium 200 mm to 600 mm	**C - C**leavage;	**SH - S**ub-**H**orizontal		**Un - Un**dulating	**Sm - Sm**ooth; (< 0.1 mm)	**Po - P**artly **O**pen (0.25 mm to 0.5 mm);	**So - So**ft, Dimension - #mm (Soil Infill)	
Closely 60 mm to 200 mm	**B - B**edding Fracture	**H - H**orizontal		**St - St**epped;	**St – St**riated (slickensided)	**Op - Op**en (0.5 mm to 2.5 mm);	**Cmt – Cmt**ed*	
Very Closely 20 mm to 60 mm	**NI - N**on **I**ntact			**Ir - Ir**regular*	**Po - Po**lished* Slightly Polished*	**MW - M**od **W**ide (2.5 mm to 10 mm);		
Take a number of readings and state (min/ave/max)	**V - V**ein					**Wi - Wi**de (10 mm to 100 mm);		
						VW - Very **W**ide (100 mm to 1000 mm)		

Notes:
* Additional term added, not included in BS 5930:2015.

WEATHERING

Standard descriptions of weathered rocks for engineering purposes should always include comments on the degree, extent and nature of any weathering effects at material or mass scales. This may allow subsequent classification and provide information for separating rock into zones of like character. Indications of weathering include:

i. Changes in colour;
ii. Changes in fracture state;
iii. Reduction in strength;
iv. Presence, character and extent of weathering products.

If a systematic classification following the guidelines given in the Standard can be applied unambiguously, this is described in the text of the report. Otherwise, the rocks are not classified in terms of weathering beyond the approach described above. Weathering terms that may be used for description of rock material and these terms may be qualified or combined:

i. Discoloured - The degree and type of colour change from original is described, and if for mass or particular mineral constituents;
ii. Disintegrated - Fragmentation by physical weathering, bonding lost but material fabric intact. Material friable, not decomposed;
iii. Decomposed - Chemical alteration of mineral grains so material fabric is intact but some or all grains are decomposed.

For rock mass weathering the following terms may be used:

iv. Slightly - discolouration on surfaces and/or of material;
v. Moderately - less than half of mass decomposed/disintegrated. Fresh/discoloured rock as continuous material or corestones;
vi. Highly - more than half decomposed/disintegrated. Fresh/discoloured rock as discontinuous framework or corestones;
vii. Completely - all rock material decomposed and/or disintegrated. Original mass structure largely intact;
viii. Residual Soil - all material converted to soil, structure and fabric destroyed, may be volume change but material not moved;
ix. Fresh - used to indicate that there is no visible weathering or alteration, except possibly slight discolouration on major surfaces.

ROCK CORES

ROCK CORE SIZES

The core barrels commonly used by the Company in site investigations are as follows:

Core Barrel Type	Borehole Diameter (mm)	Standard Core Size (mm)	Core Size using Rigid Plastic Liner (mm)	Casing Size or Type	Casing O.D (mm)	Casing I.D (mm)
Standard British Sizes						
NWM	75.7	54.7	51	NX	88.9	76.2
HWF	98.8	76.2	72	HX	114.3	100.0
HWAF	99.5	70.9	-	HX	114.3	100.0
PWF	120.0	92.1	87	PX	139.7	122.3
SWF	145.4	112.8	107	SX	168.3	147.7
UWF	173.7	139.8	132	UX	193.7	176.2
Wireline Sizes						
BQ	59.9	36.4	35			
NQ	75.7	47.6	45			
HQ	96.1	63.5	61			
PQ	122.7	85.0	82			
GEOBORS	146.0	102.0	102	SX	168.3	147.7
Thin Wall Sizes						
TNX	75.7	60.8	-	NX	88.9	76.2
T2 66	66.1	51.9	-	74	74.3	67.3
T2 76	76.1	61.9	-	84	84.3	77.3
T2 86	86.1	71.9	68	98	98.0	89.0
T2 101	101.1	83.9	80	113	113.0	104.0
T6 116	116.1	92.9	89	128	128.0	118.0
T6 131	131.1	107.9	104	143	143.0	133.3
Non-standard Barrels						
4.12F TRIEFUS	105.2	74.7	72	PX	139.7	122.3
5.5x4C SINGLE TUBE	139.7	101.6	-	SX	168.3	147.7
B116	116	102	-	PX	139.7	122.3
B146	146	132	-	SX	168.3	147.7

Notes:
Core diameters may vary when different lining systems are in use.

ROCK CORE CHARACTERISTICS

TCR Total Core Recovery. The length of the total amount of core sample recovered, expressed as a percentage of the length of the core run.

SCR Solid Core Recovery. The length of solid core recovered, expressed as a percentage of the length of the core run. Solid core is defined as that length of core which has a full diameter, but not necessarily a full circumference. Only natural fractures are considered. Drilling or handling induced fractures are ignored.

RQD Rock Quality Designation. The length of solid core recovered in pieces each more than 100 mm long as a percentage of the core run length.

I_f Fracture Index. The number of discontinuities expressed as 'fractures per metre', measured over any convenient length of consistent fracture characteristics. Fracture index is normally measured axial along the core.

F_s Fracture Spacing. The minimum, average and maximum spacing of discontinuities in mm, measured over any convenient length of consistent fracture characteristics. Fracture spacing is normally measured perpendicular to the discontinuity plane unless indicated otherwise.

AZCL Assumed/Assessed Zone of Core Loss (assigned where TCR < 90 %).

Zones of atypical fracturing of restricted extent which occur within a rock unit of uniform fracture characteristics are identified within the Description of Strata, but not given a separate I_f / F_s:

- NI - Not Intact;
- NR - No Recovery;
- NA - Not Applicable;
- DI – Drilling Induced.

GENERAL DESCRIPTIVE TERMS (SOIL AND ROCK)

TERTIARY COMPONENT DESCRIPTION

The following terms should be adopted for the description of tertiary component (e.g. pockets, shell fragments etc.) (assumed to be by percentage visible volume):

- Rare <1 %;
- Occasional 1 % to 5 %;
- Some 5 % to 10 %;
- Frequent 10 % to 20 %;
- Abundant 20 % to 35 %.

IDENTIFICATION AND DESCRIPTION OF SOILS

	Basic Soil Type	Particle Size (mm)		Visual Identification
VERY COARSE SOILS	BOULDERS		200	Large Boulders >630 mm. These soils only seen complete in pits or exposures. Often difficult to recover from boreholes.
	COBBLES			
COARSE SOILS (Typically over 65 % sand and gravel fraction)	GRAVEL	coarse	63	Easily visible to naked eye; particle shape can be described, grading can be described. Well graded: wide range of grain sizes, well distributed. Poorly graded: not well graded. (May be uniform: size of most particles lies between narrow limits; or gap graded; an intermediate size of particle is markedly under represented).
		medium	20	
		fine	6.3	
	SAND	coarse	2	Visible to naked eye; no cohesion when dry; grading can be described. Well graded and poorly graded: as above
		medium	0.63	
		fine	0.2	
FINE SOILS (Typically over 35 % silt and clay fraction)	SILT	coarse	0.063	Only coarse silt visible with hand lens; exhibits little plasticity and marked dilatancy; slightly granular or silky to touch. Disintegrates in water; lumps dry quickly; possesses cohesion but powders easily between fingers. Term "SILT" or "CLAY" must be used, "SILT/CLAY" not allowed. Dry lumps can be broken but not powdered between the fingers; they also disintegrate under water but more slowly than silt; smooth to the touch; exhibits plasticity but no dilatancy; sticks to the fingers and dries slowly; shrinks appreciably on drying usually showing cracks. Intermediate and high plasticity clays show these properties to a moderate and high degree, respectively.
		medium	0.02	
		fine	0.0063	
	CLAY		0.002	
ORGANIC SOILS	ORGANIC CLAY, SILT or SAND	Variable		Contains varying amounts of organic vegetable matter - defined by colour: grey - slightly organic; dark grey – organic; black – very organic.

Composite Soil Types
(Mixtures of basic soil types)

Scale of secondary constituents with coarse and very coarse soils. Term before, description after principal

Term before (term in [ ] may be used for 2nd ry parts, matrix etc)	Principal Soil Type	Description after	Approx % 2nd ry soil type
Slightly (sandy*) [occasional/little]	SAND, GRAVEL; (COBBLES or BOULDERS See Notes)	Used to describe components of secondary constituents. e.g. Gravel is subangular fine and medium sandstone and mudstone.	<5
--(sandy*) [some]			5 – 20
Very (sandy*) [much/many]			20 to 40†
--		and (sand*) or and (cobbles+)	50†

* Fine or coarse soil type as appropriate
\+ Very coarse soil type – see Notes
† described as fine soil depending on behaviour

Scale of secondary constituents with fine soils. Terms before, description after principal constituent.

Term before	Principal Soil Type	Description after	Approx % 2nd ry soil type
Slightly (sandy*)	CLAY or SILT	Used to describe components of secondary constituents e.g. sandy gravelly CLAY. Gravel is rounded coarse quartzite	<35
-- (sandy*)			35 to 65†
Very (sandy*)			>65†

* Coarse soil type as appropriate
† or described as coarse soil depending on mass behaviour

EXAMPLES OF COMPOSITE TYPES
(indicating preferred order for description)

Loose brown very sandy subangular coarse GRAVEL with many pockets (<5mm across) of soft grey clay.

Firm thinly interlaminated brown SILT and CLAY.

Dense light brown clayey fine and medium SAND.

Density/Consistency/Peat Condition

For very coarse soils qualitative description by inspection of voids and particle packaging.

Standard Penetration Test in Boreholes for Coarse Soils

No. of blows	Relative Density
<4	Very Loose
4-10	Loose
10-30	Medium Dense
30-50	Dense
>50	Very Dense
Slightly cemented	From visual examination: pick removes soil in lumps which can be abraded.

Silty CLAY or clayey SILT – use prefix only when secondary constituent has significant effect on material characteristics. Terms 'slightly' or 'very' not applicable.

Consistency

Very soft	Finger easily pushed in up to 25 mm. Exudes between fingers
Soft	Finger pushed in up to 10 mm. Moulded by fingers
Firm	Thumb makes impression easily. Rolls to thread
Stiff	Can be indented slightly by thumb. Crumbles if rolled
Very Stiff	Indented by thumbnail. Cannot be moulded
Hard	Can be scratched by thumb nail
Firm Peat	Fibres compressed together
Spongy Peat	Very compressible, open
Plastic Peat	Moulded in hand, smears

Structure

Term	Field Identification
Homo-geneous	Deposit consists essentially of one type
Interbedded or interlaminated	Alternating layers of varying types. Pre-qualified by thickness term if in equal proportions. Otherwise thickness of, and spacing between, subordinate layers defined
Hetero-geneous	A mixture of types
Weathered (granular)	Particles may be weakened and may show concentric layering
Weathered (cohesive)	Usually has crumb or columnar structure
Fissured	Breaks into blocks along unpolished discontinuities
Sheared	Breaks into blocks along polished discontinuities
Intact	No fissures
Fibrous Peat	Plant remains recognisable and retain some strength. When squeezed only water, no solids
Pseudo-fibrous Peat	Plant remains recognisable, strength lost. Partial decomposition. Turbid water when squeezed, <50 % solids
Amorphous Peat	Recognisable plant remains absent, full decomposition. When squeezed only paste with >50 % solids
Gyttja	Decomposed plant & animal remains, maybe inorganic constituents
Humus	Plant remains, living organisms & inorganic constituents in topsoil

Interval Scales

Scale of Bedding Spacing	Mean Spacing (mm)	Scale of Spacing of Other Discontinuities/[Blocks]
Very thickly bedded	over 2000	Very widely spaced/[Very large]
Thickly bedded	2000-600	Widely spaced/[Large]
Medium bedded	600-200	Medium spaced/[Medium]
Thinly bedded	200-60	Closely spaced/[Small]
Very thinly bedded	60-20	Very closely/[Very small]
Thickly laminated	20-6	Extremely closely spaced
Thinly laminated	under 6	

Spacing terms may also be used for distance between partings, isolated beds or laminae, desiccation cracks, rootlets etc. Terms such as partings or dustings may be used for laminae less than 2 mm and less than 0.6 mm respectively.

Discontinuity Shape (See Standard for Persistence/Openness)	Small scale (mm) rough, smooth Medium scale (cm) planar, stepped, undulating Large scale (m) wavy, curved, straight

Particle Nature

Particle Shape & Form

Very angular
(Sub)angular
(Sub)rounded
Well rounded

Low Sphericity
Flat or Elongate
High Sphericity
Cuboid

Particle Surface Texture

Rough

Smooth

Polished

NOTES Identification and descriptive method, and descriptions, generally in accordance with BS 5930:2015 Section 6 clauses 41 and 43 and BS EN ISO 14688-1:2002. Modified terms for content of secondary fraction given in Annex B Table B1 BS EN ISO 14688-2:2004 are not comparable to BS 5930:2015 and are not used.
Organic content: Low 2 to 6 %; Medium 6 to 20 %; High >20 %. Terms not used on borehole records
Carbonate content: only noted if field test with dilute HCl undertaken: no effervescence carbonate free; slight effervescence calcareous; strong effervescence highly calcareous.
Undrained shear strength: terms from laboratory or in situ tests. Terms not used on borehole records.
Very Coarse Soils described by initially removing very coarse materials and describing residue before adding back the very coarse soils. If residue is cohesive, described as '…….(COBBLES/BOULDERS) with low (cobble/boulder) content with (some/much etc) matrix of …..' If residue is granular, described as ' with matrix of ' or as a coarse soil.
Cobbles: low cobble content <10 %; medium content 10 to 20 %; high content >20 %. **Boulders:** low boulder content < 5%; medium content 5 to 20 %; high content >20 %. -

HEATHROW EXPANSION PROJECT LANDFILL LOGGING PROFORMA

For soils/arisings that comprise generic fill (i.e. outside of landfills), engineered fills (e.g. road sub-bases) and soils of natural origin: *log as BS5930:2015:*

Example: MADE GROUND: (soft), brown, slightly sandy, clayey gravel. Sand is fine to coarse. Gravel is subangular to subrounded, fine to coarse of limestone aggregate and concrete.

Where the soil/arisings contain landfill waste material: *log principal and secondary constituents as BS5930:2015 and, provide percentages and dimensions of all landfill components as well as the arisings matrix if there is one:*

Example: MADE GROUND: black, sandy, gravel with low cobble content (50%). With frequent fragments of plastic (<1x<100 mm) (20%) and wood debris (5x150 mm) (D2) (20%). With some fragments (10%) of metal (<2x<100 mm), ceramic tiles (<5x<25 mm) and insulated wire (3x<100 mm). Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of brick and concrete. Cobbles (<150x150 mm) are of brick.

Percentages for tertiary constituents:

- Rare <1%;
- Occasional 1-5%;
- Some 5-10%;
- Frequent 10-20%;
- Abundant 20-35%.

Include anthropogenic inert materials within the BS5930:2015 description, such as:

- Brick;
- Concrete;
- Other road aggregates.

Estimate percentages and degradation of the following slowly degrading and potentially degradable materials:

<u>Slowly degrading materials</u>

- Macadam / asphalt;
- Plastic;
- Ash, slag or clinker.

<u>Potentially degradable materials</u>

- Wood or timber;
- Organic matter (leaves, hay etc);
- Textiles or leather;
- Paper or card;
- Food waste;
- Any other degradable material.

Decomposition:

- D1. Not decomposed (materials fresh);
- D2. Moderately decomposed (materials stained);
- D3. Highly decomposed (materials falling apart).

Potential Asbestos Containing Materials:

For suspected Asbestos Containing Materials (ACMs) provide decomposition (as above) and asbestos descriptors, as well as a description of what the ACM is.

- AD1. Intact (very good condition ACM/ ACM fragments);
- AD2. Weathered (slight degradation in ACM; materials still retains basic integrity);
- AD3. Highly decomposed (materials falling apart);
- AD4. Disaggregated (dominated by loose fibrous material; extreme degradation in ACM and/or free asbestos fibres/fibre bundles).

Other factors to note:

- Odour;
- Large obstruction or while items (e.g. doors);
- Potential voids (e.g. drums);
- Gas;
- Leachate or other liquid;
- Landfill membrane or seals;
- Hazardous materials (e.g. batteries, medical waste and animal carcasses);
- Staining from potential contamination;
- Oily sheen on water.

Further examples:

MADE GROUND: greyish brown, slightly silty, very sandy gravel (80%). With 1 plastic sheet (100x100 mm) (20%). Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of flint, brick, slate and concrete.

MADE GROUND (Topsoil): (firm), black and dark brown, slightly sandy, slightly gravelly, silty clay (70%). With frequent roots/rootlets (<2 x 15 mm). With abundant fragments of ceramic tile (<10x15 mm) (25%). With some fragments of glass (<5x5 mm) (3%) and plastic (<10x25 mm) (2%). Sand is fine to coarse. Gravel is angular to subrounded, fine and medium of flint and occasional brick.

Detail:

At 0.40 m; with 2 cobbles (<70x100x100 mm) and 1 boulder (200x300x400 mm) of concrete.

At 0.50 m; black, fibrous membrane.

MADE GROUND: (firm and stiff, becoming very stiff), dark brown and light reddish brown and locally black, slightly sandy, gravelly clay (80%). With frequent fragments (20%) of glass (<5x10 mm) and plastic (<100x150 mm). Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of flint and concrete

Detail:

At 1.40 m; with cobble (80x150x170 mm) of concrete paving slab within south side of pit.

MADE GROUND (Topsoil): (firm), black, slightly sandy, slightly gravelly, silty clay (100%). With frequent roots/rootlets (<2x15 mm). With rare fragments of glass (<5x10 mm). Sand is fine to coarse. Gravel is subangular to subrounded, fine to coarse of flint.

MADE GROUND: dark brown, slightly clayey, sandy gravel with medium cobble content (70%). With abundant fragments of timber (10x25 mm) (D2) (25%). With occasional fragments (5%) of metal rebar (15x15 mm), ceramic tile (5x15 mm) and plastic pipe (25x37 mm). Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of flint, granite and concrete. Cobbles (<75x80x80 mm) are of brick, roadstone and granite.

HEATHROW EXPANSION PROJECT GEOLOGICAL CODES

HEATHROW EXPANSION PROJECT GEOLOGICAL CODES **GEOL_GEOL**	
TPS	Topsoil
MGR	Made Ground
ALV	Alluvium
LASI	Terrace Brickearth (Langley Silt)
RTD	River Terrace Deposits
LC	London Clay
HWH	Harwich Formation
LMBE	Lambeth Group
TAB	Thanet Formation
CK	Chalk
OH	Open Hole Drilling
NR	No Recovery
NCR	No Core Recovery

HEATHROW EXPANSION PROJECT GEOLOGICAL CODES **GEOL_GEO2**	
EF	Engineered Fill
WST	Landfill
CONC	Concrete
TRMC	Tarmacadam
PE	Peat
CL	Clay
SL	Silt
SD	Sand
GR	Gravel
SV	Sand and Gravel
CO	Cobbles
UND	Undifferentiated
CK	Chalk

HEATHROW EXPANSION PROJECT GEOLOGICAL CODES **GEOL_BGS**	
TPGR	Taplow Gravel Member
SHGR	Shepperton Gravel Member
KPGR	Kempton Park Gravel Member
E	London Clay E
D	London Clay D
C	London Clay C
B	London Clay B
A3	London Clay A3 (UND)
A3ii	London Clay A3ii
A3i	London Clay A3i
A2	London Clay A2
SWCB	Swanscombe Member
OH	Oldhaven Member
BLB	Blackheath Member
UPSCL	Upper Shelley Clay (WL)
UMCL	Upper Mottled Clay (RB)
LBED	Laminated Beds (WL)
LSCL	Lower Shelley Clay (WL)
LMBED	Lower Mottled Clay (RB)
UPR	Upnor Formation
BLHB	Bullhead Beds

FUGRO	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1**
	Fugro Reference	G170029U			
	Coordinates (m)	E502968.35 N178031.03	Ground Elevation (m Datum)	21.19	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.20 - 0.30	B	1			MADE GROUND: (soft and firm), dark brownish grey, slightly sandy to sandy, slightly gravelly clay. With occasional fragments of glass (2x<63 mm). Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of flint, chalk and occasional brick. [MADE GROUND] [CLAY]	(0.40)				
0.30	D	2				0.40	20.79			
0.30 - 0.40	ES	3				(0.20)				
0.30	PID		< 0.1 ppm			0.60	20.59			
0.40 - 0.60	B	4			Below 0.15 m; greyish brown.					
0.50	D	5								
0.50 - 0.60	ES	6			Firm, greyish brown, slightly sandy, slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular and subrounded, fine and medium of flint and chalk. [ALLUVIUM] [CLAY]	(0.60)				
0.50	PID		< 0.1 ppm	1						
0.70 - 0.80	B	7				1.20	19.99			
0.80	D	8								
0.90 - 1.00	ES	9			Soft, light bluish grey, slightly sandy, slightly gravelly to gravelly CLAY. Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse, mainly fine, of chalk, flint and mudstone. [ALLUVIUM] [CLAY]					
0.90	PID		< 0.1 ppm		Below 1.00 m; very soft.					
1.20	D	10		2						
1.20 - 1.65	SPT		N = 38 (S)		Medium dense and dense, light brown, slightly sandy GRAVEL with low cobble content. Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of flint. Cobbles are well rounded (45x80x90 mm) of flint. [RIVER TERRACE DEPOSITS] [GRAVEL]					
1.50 - 2.10	B	11								
2.10 - 2.20	ES	12								
2.10	PID		< 0.1 ppm							
2.15	D	13								
2.20	D	14								
2.20 - 2.70	B	15								
2.20 - 2.65	SPT		N = 28 (S)							
3.00 - 3.10	ES	16		3		(3.80)				
3.00	PID		< 0.1 ppm							
3.20	D	17			Below 3.20 m; loose.					
3.20 - 3.65	D	18								
3.20 - 3.65	SPT		N = 9 (S)							
3.70 - 4.00	B	19								
				4						
4.20 - 4.65	D	20								
4.20 - 4.65	SPT		N = 5 (S)							
4.70 - 4.80	ES	21								
4.70	PID		< 0.1 ppm							
4.80	D	22		5		5.00	16.19			
5.00 - 5.10	ES	23			Soft, dark greyish brown, slightly gravelly CLAY. With occasional rootlets and some pockets (20x40 mm) of fine and medium sand. Gravel is subangular and subrounded, fine to coarse of flint. (Gravel possibly brought down during boring from stratum above). [LONDON CLAY FORMATION] [CLAY]	(0.10)	16.09			
5.00	PID		< 0.1 ppm			5.10				
5.10	D	24								
5.20 - 5.50	B	26								
5.20 - 5.65	D	25								
5.20 - 5.65	SPT		N = 15 (S)							
				6	Firm and stiff, fissured, dark greyish brown, slightly sandy CLAY. With occasional selenite crystals (<1 mm). With occasional partings of fine sand. Fissures are subhorizontal, closely spaced, planar and smooth. [LONDON CLAY FORMATION] [CLAY]	(1.90)				
6.50 - 6.95	UT	27	36/450 mm		Below 5.20 m; becoming stiff. Below 6.50 m; becoming stiff and very stiff.					
7.00	D	28		7	End of Borehole at 7.00 m	7.00	14.19			
				8						
				9						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-1**
Fugro Reference	G170029U			
Coordinates (m)	E502968.35 N178031.03	Ground Elevation (m Datum)	21.19	Sheet 1 of 1
Hole Type	Cable Percussion			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	24/11/2017	24/11/2017	Hand-dug			SK	SK	
1.20	7.00	CP	08/12/2017	11/12/2017	Dando 2000			CT/SB	AK	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
24/11/2017	08:00:00	0.00			
24/11/2017	18:00:00	1.20		0.90	
08/12/2017	08:00:00	1.20		Dry	
08/12/2017	18:00:00	2.50	1.50	0.00	
11/12/2017	08:00:00	2.50	1.50	0.40	
11/12/2017	18:00:00	7.00	5.00	Dry	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)
7.00	200	5.00	200

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark
1.90	2.20	00:30	

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)
1.20	0.40	20	0.00	

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located. The inspection pit was backfilled with arisings before being progressed by cable percussion.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
SP	1	1.30	4.80	11/12/2017

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	-0.15	1.40	50	Plain
Pipe1	1.40	4.80	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
-0.39	0.00	Upstanding Cover	11/12/2017
0.00	0.20	Concrete	11/12/2017
0.20	1.30	Bentonite	11/12/2017
1.30	4.80	Gravel Backfill	11/12/2017
4.80	7.00	Bentonite	11/12/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	JPD/ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS				Print Date	28/11/2018

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-1**
Fugro Reference	G170029U			
Coordinates (m)	E502968.35 N178031.03	Ground Elevation (m Datum)	21.19	Sheet 1 of 1
Hole Type	Cable Percussion			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)
1.20	S	0	N=38 (1,2/7,10,10,11)	450	CD1	75	0.00	Dry
2.20	S	0	N=28 (3,5/8,8,6,6)	450	CD1	75	2.10	0.00
3.20	S	0	N=9 (1,1/1,2,2,4)	450	CD1	75	3.10	0.00
4.20	S	0	N=5 (1,0/0,1,1,3)	450	CD1	75	4.10	0.00
5.20	S	0	N=15 (1,2/2,3,4,6)	450	CD1	75	5.00	Dry

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)
0.30	< 0.1
0.50	< 0.1
0.90	< 0.1
2.10	< 0.1
3.00	< 0.1
4.70	< 0.1
5.00	< 0.1

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion		Location ID	**HEP-BH-2**
	Client	Heathrow Airport Limited			
	Fugro Reference	G170029U			
	Coordinates (m)	E502851.70 N177915.70	Ground Elevation (m Datum) 21.28	Sheet 1 of 2	
	Hole Type	Cable Percussion		Status	Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.05	D	1			MADE GROUND (Topsoil): dark brown, slightly gravelly, silty sand.	(0.20)				
0.10 - 0.15	B	2			With abundant roots (<10x60 mm). Sand is fine to coarse. Gravel	0.20	21.08			
0.15 - 0.20	ES	3			is subangular, fine and medium of flint, brick and concrete.					
0.20	D	4			[MADE GROUND] [SAND]	(0.40)				
0.25 - 0.50	LB	5			MADE GROUND: brown, clayey, silty, very sandy, gravel, with	0.60	20.68			
0.50 - 0.60	ES	6			medium boulder content. With frequent wood chips (<4x50 mm).					
0.65	D	7			Sand is fine to coarse. Gravel is subangular and subrounded, fine	(0.60)				
0.70 - 1.00	B	8		1	and medium of flint with rare fragments of brick (<10x30 mm) and					
1.10 - 1.20	ES	9			concrete (<15x30 mm).	1.20	20.08			
1.25	D	10			[MADE GROUND] [SAND]	(0.30)				
1.25 - 1.35	B	11			MADE GROUND: (soft), brown, clayey, very silty, very sandy,	1.50	19.78			
1.35 - 1.40	ES	12			gravel with low boulder content. Sand is fine to coarse. Gravel is					
1.50 - 1.95	D	13			subangular and subrounded, fine and medium of flint, brick and	(0.50)				
1.50 - 2.00	B	14			concrete.					
1.50 - 1.95	SPT		N = 9 (S)	2	[MADE GROUND] [CLAY]	2.00	19.28			
2.05	D	15			MADE GROUND: (soft), dark grey, mottled black and orange,					
2.10 - 2.40	B	16			gravelly clay. With some fragments of roof sheeting (<50x70 mm)					
2.40 - 2.50	ES	17			and occasional plastic bags (<100x200 mm). Gravel is subangular					
2.50 - 3.00	B	18			and subrounded, fine and medium of flint, brick and concrete.					
2.50 - 2.95	SPT		N = 39 (C)		[MADE GROUND] [WASTE, e.g. LANDFILL]					
					MADE GROUND: (loose), black, clayey gravel. With some					
3.05	D	19		3	fragments of plastic (<20x110 mm) and rare fragments of brick					
3.10 - 3.40	B	20			(<15x30 mm). Gravel is subrounded, fine to coarse of flint.					
					[MADE GROUND] [WASTE, e.g. LANDFILL]	(2.40)				
3.40 - 3.50	ES	21			Black, slightly sandy GRAVEL. Gravel is subangular and					
3.50 - 4.00	B	22			subrounded, fine to coarse of flint. Dense becoming medium					
3.50 - 3.95	SPT		N = 19 (C)		dense.					
					[RIVER TERRACE DEPOSITS] [GRAVEL]					
4.05	D	23		4						
4.10 - 4.30	B	24								
4.30 - 4.40	ES	25								
4.40 - 4.50	D	26				4.40	16.88			
4.50 - 4.95	D	27			Firm, greyish brown, sandy, gravelly CLAY. Sand is fine to coarse.					
4.50 - 5.00	B	28			Gravel is subangular and subrounded, fine and medium of flint.					
4.50 - 4.95	SPT		N = 15 (S)		(Gravel possibly brought down during boring from stratum above).	(0.60)				
					[LONDON CLAY FORMATION] [CLAY]					
5.10	D	29		5	Firm, thinly laminated (<2 mm), greyish brown, sandy CLAY. Sand	5.00	16.28			
5.20 - 5.50	B	30			is fine to coarse.					
					[LONDON CLAY FORMATION] [CLAY]					
5.50 - 5.60	ES	31								
5.50	PID		< 0.1 ppm							
6.00 - 6.45	UT	32	80/450 mm	6						
						(2.50)				
6.50	D	33								
				7						
7.50 - 7.95	D	34				7.50	13.78			
7.50 - 8.00	B	35			Firm, thinly laminated (<2 mm), greyish brown, sandy CLAY. Sand					
7.50 - 7.95	SPT		N = 16 (S)		is fine and medium.	(0.50)				
					[LONDON CLAY FORMATION] [CLAY]					
8.10	D	36		8	Firm, thinly laminated (<2 mm), greyish brown, slightly sandy	8.00	13.28			
8.20 - 8.50	B	37			CLAY. With occasional lenses (<5x100 mm) of greyish brown, fine					
					and medium sand. Sand is fine to coarse.					
8.50 - 8.60	ES	38			[LONDON CLAY FORMATION] [CLAY]	(1.00)				
8.50	PID		< 0.1 ppm							
9.00 - 9.45	UT	39	106/450 mm	9	Firm, greyish brown, slightly sandy, silty CLAY. Thinly laminated	9.00	12.28			
					(<2 mm). Sand is fine and medium.					
9.50	D	40			[LONDON CLAY FORMATION] [CLAY]					

Continued next page

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-2**
	Fugro Reference	G170029U			
	Coordinates (m)	E502851.70 N177915.70	Ground Elevation (m Datum)	21.28	Sheet 2 of 2
	Hole Type	Cable Percussion			Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
					Firm, greyish brown, slightly sandy, silty CLAY. Thinly laminated (<2 mm). Sand is fine and medium. [LONDON CLAY FORMATION] [CLAY]					
11.00 - 11.45	D	41		11						
11.00 - 11.50	B	42								
11.00 - 11.45	SPT		N = 34 (S)							
11.50	D	43			Below 11.50 m; with frequent pockets (<5x18 mm) of light brown, fine and medium sand.					
11.60 - 11.90	B	44								
11.90 - 12.00	ES	45								
11.90	PID		< 0.1 ppm	12		(6.00)				
13.00 - 13.50	UT	46	93/450 mm	13						
13.50	D	47								
14.00	D	48		14						
14.10 - 14.40	B	49								
14.40 - 14.50	ES	50								
14.40	PID		< 0.1 ppm							
14.50 - 14.95	D	51								
14.50 - 15.00	B	52								
14.50 - 14.95	SPT		N = 31 (S)							
				15	End of Borehole at 15.00 m	15.00	6.28			
				16						
				17						
				18						
				19						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-2**
Fugro Reference	G170029U			
Coordinates (m)	E502851.70 N177915.70	Ground Elevation (m Datum)	21.28	Sheet 1 of 1
Hole Type	Cable Percussion			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	06/12/2017	06/12/2017	Hand-dug			SB	JJL	
1.20	15.00	CP	06/12/2017	06/12/2017	Dando 3000			SB	JJL	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
05/12/2017	08:00:00	0.00			
05/12/2017	18:00:00	5.00	4.60	2.62	
06/12/2017	08:00:00	5.00	4.60	1.15	
06/12/2017	18:00:00	15.00	5.85	14.50	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)
15.00	200	5.85	200

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)
1.40	0.64	20	1.25	

Water Added

Depth From (m)	Depth To (m)
2.00	4.40

Water Strike Remarks

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
SP	1	1.40	4.50	06/12/2017

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	-0.23	1.50	50	Plain
Pipe1	1.50	4.50	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
-0.46	0.00	Upstanding Cover	06/12/2017
0.00	0.20	Concrete	06/12/2017
0.20	1.40	Bentonite	06/12/2017
1.40	4.50	Gravel Backfill	06/12/2017
4.50	15.00	Bentonite	06/12/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 28/11/2018

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-2**
Fugro Reference	G170029U			
Coordinates (m)	E502851.70 N177915.70	Ground Elevation (m Datum)	21.28	Sheet 1 of 1
Hole Type	Cable Percussion			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)
1.50	S	0	N=9 (1,1/1,2,3,3)	450	EQU306	73	1.50	0.64
2.50	C	0	N=39 (5,11/8,10,11,10)	450	EQU306	73	2.50	1.10
3.50	C	0	N=19 (4,6/6,3,4,6)	450	EQU306	73	3.50	0.75
4.50	S	0	N=15 (2,2/4,3,4,4)	450	EQU306	73	4.50	2.50
7.50	S	0	N=16 (2,4/3,4,3,6)	450	EQU306	73	5.85	7.00
11.00	S	0	N=34 (2,4/6,6,10,12)	450	EQU306	73	5.85	10.93
14.50	S	0	N=31 (2,4/5,8,8,10)	450	EQU306	73	5.85	14.50

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)
5.50	< 0.1
8.50	< 0.1
11.90	< 0.1
14.40	< 0.1

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion			Location ID **HEP-BH-5**
	Client	Heathrow Airport Limited			
	Fugro Reference	G170029U			
	Coordinates (m)	E502904.66 N177886.50	Ground Elevation (m Datum)	21.92	Sheet 1 of 2
	Hole Type	Cable Percussion			Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.05 - 0.15	ES	1			MADE GROUND (Topsoil): brown, slightly silty, slightly gravelly sand with low cobble content. Sand is fine to coarse. Gravel is subangular to rounded, medium and coarse of flint, brick and aggregate. Cobbles (<210x100x60 mm) are of brick, concrete and aggregate.	(0.35)				
0.05	PID		< 0.1 ppm			0.35	21.57			
0.10 - 0.30	B	3				(0.45)				
0.15	D	2				0.80	21.12			
0.40 - 0.60	B	6			[MADE GROUND] [SAND]	(0.40)				
0.45	D	5			Between 0.10 m and 0.20 m; with 8 fragments of tile (20x15x4 mm) and a fragment of glass (20x15x5 mm).	1.20	20.72			
0.45 - 0.50	ES	4				(1.00)				
0.45	PID		< 0.1 ppm	1	MADE GROUND: greyish brown, slightly silty, slightly gravelly sand with low cobble content. With frequent fragments of timber (200x30x20 mm). With occasional fragments of plastic bag (120x100x2 mm) and glass (20x15x10 mm). With 1 metal plate (100x100x5 mm). Sand is fine to coarse. Gravel is rounded to subangular, fine to coarse of brick, flint, concrete, tile and aggregate. Cobbles (160x100x60 mm) are of brick.					
0.80 - 0.90	ES	7								
0.80	PID		< 0.1 ppm							
1.20 - 1.30	ES	7								
1.20 - 1.65	D	7								
1.20 - 2.20	LB	9								
1.20 - 1.65	SPT		N = 4 (C)							
1.20	PID		1.0 ppm							
				2	[MADE GROUND] [WASTE, e.g. LANDFILL]					
2.20 - 2.30	ES	11			MADE GROUND: very dark grey to black, slightly gravelly, clayey sand. With occasional fragments of ceramic tile (<60 mm) and plastic bag (80x60x2 mm). With rare fragments of timber (30x40x80 mm) and glass (40x40x10 mm). Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of flint and brick.	2.20	19.72			
2.20 - 2.65	D	10								
2.20 - 3.20	LB	12								
2.20 - 2.65	SPT		N = 5 (C)							
2.20	PID		2.0 ppm							
				3	[MADE GROUND] [WASTE, e.g. LANDFILL]					
					Between 0.90 m and 1.00 m; with 3 cobbles (40x100x100 mm) of brick.					
3.20 - 3.30	ES	14			MADE GROUND: black, slightly sandy, clayey gravel (40%). With occasional pockets (<50x50 mm) of brown, fine sandy clay. With abundant fragments of shredded plastic (<1x<100 mm) (25%) and wood debris (1x10x100 mm) (25%). With some fragments (10%) of fabric/textiles (<2x<100 mm), rigid plastic (<20x50 mm) and metal wire (<2x<100 mm). Sand is fine to coarse. Gravel is subangular to rounded fine to coarse of flint, concrete and brick.	(2.00)				
3.20 - 3.65	D	13								
3.20 - 4.20	LB	15								
3.20 - 3.65	SPT		N = 7 (C)							
3.20	PID		1.0 ppm							
				4	[MADE GROUND] [WASTE, e.g. LANDFILL]					
4.20 - 4.30	ES	17			MADE GROUND: black, sandy gravel (39%). With abundant fragments of shredded plastic (<1x<100mm) (35%). With frequent fragments of wood debris (1x100 mm) (20%). With some fragments (5%) of textiles (<2x<100 mm), rigid plastic (<20x<50 mm) and metal wire (3x<100 mm). With rare fragments of white ceramic tile (10x20x2.5 mm) and plastic sheeting (<500x5 mm). Sand is fine to coarse. Gravel is subangular to rounded, fine to coarse of flint, concrete and brick.	4.20	17.72			
4.20 - 4.65	D	16								
4.20 - 5.20	LB	18								
4.20 - 4.65	SPT		N = 3 (C)							
4.20	PID		18.0 ppm							
				5	[MADE GROUND] [WASTE, e.g. LANDFILL]					
5.20 - 5.30	ES	20			MADE GROUND: black, sandy gravel with low cobble content (50%). With frequent fragments of plastic (<1x<100 mm) (20%) and wood debris (5x150 mm) (20%). With some fragments (10%) of metal (<2x<100 mm), ceramic tiles (<5x<25 mm) and insulated wire (3x<100 mm). Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of brick and concrete. Cobbles (<150x150 mm) are of brick.	5.20	16.72			
5.20 - 5.65	D	19								
5.20 - 6.20	LB	21								
5.20 - 5.65	SPT		N = 2 (C)							
5.20	PID		2.0 ppm							
				6	[MADE GROUND] [WASTE, e.g. LANDFILL]					
6.20 - 6.30	D	22			MADE GROUND: brown, black and dark grey, slightly sandy, gravelly clay. Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of flint, chert, brick and concrete.	(3.00)				
6.20 - 6.30	ES	23								
6.20	PID		1.0 ppm							
6.70 - 7.15	D	24								
6.70 - 7.20	LB	26								
6.70 - 7.15	SPT		N = 15 (C)	7	[MADE GROUND] [CLAY]					
7.20 - 7.30	ES	25								
7.20	PID		2.0 ppm							
7.50 - 8.00	B	27			Between 7.50 m and 8.00 m; with 3 cobbles (130x180x<200 mm) of concrete.					
				8	At 8.00 m; possible metal obstruction.					
8.20 - 8.30	ES	29			MADE GROUND: brown, black and dark grey, slightly clayey, gravelly sand. Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of flint, chert, brick and concrete.	8.20	13.72			
8.20 - 8.65	D	28								
8.20 - 9.50	B	30								
8.20 - 8.65	SPT		N = 11 (C)							
8.20	PID		< 0.1 ppm		[MADE GROUND] [SAND]	(1.30)				
				9						
					Firm, greyish brown CLAY.	9.50	12.42			
9.70 - 10.00	B	32			[LONDON CLAY FORMATION] [CLAY]					
9.70 - 9.80	D	31								
10.00 - 10.45	D	33				(0.95)				
10.00 - 10.45	SPT		N = 19 (S)		Continued next page					

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-5**
	Fugro Reference	G170029U			
	Coordinates (m)	E502904.66 N177886.50	Ground Elevation (m Datum)	21.92	Sheet 2 of 2
	Hole Type	Cable Percussion			Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
					Firm, greyish brown CLAY. [LONDON CLAY FORMATION] [CLAY]					
					End of Borehole at 10.45 m	10.45	11.47			
				11						
				12						
				13						
				14						
				15						
				16						
				17						
				18						
				19						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-5**
Fugro Reference	G170029U			
Coordinates (m)	E502904.66 N177886.50	Ground Elevation (m Datum)	21.92	Sheet 1 of 1
Hole Type	Cable Percussion			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	05/12/2017	05/12/2017	Hand-dug			BH	AF	
1.20	10.45	CP	19/12/2017	20/12/2017	Dando 3000			BH	DL/LG	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
07/12/2017	08:00:00	0.00			
07/12/2017	18:00:00	1.20		Dry	
19/12/2017	10:00:00	1.20		Dry	
19/12/2017	18:00:00	8.00	8.00	2.50	
20/12/2017	08:00:00	8.00	8.00	1.35	
20/12/2017	13:30:00	10.45	9.50	2.00	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)
10.45	200	9.50	200

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark
8.00	9.20	02:30	Possible metal obstruction

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)
1.40	1.22	20		

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located. The inspection pit was backfilled with arisings before being progressed by cable percussion.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
SP	1	1.00	9.20	20/12/2017

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	0.02	1.20	50	Plain
Pipe1	1.20	9.20	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	0.05	Flush Cover	20/12/2017
0.05	0.50	Concrete	20/12/2017
0.50	1.00	Bentonite	20/12/2017
1.00	9.20	Gravel Backfill	20/12/2017
9.20	10.45	Bentonite	20/12/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 28/11/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-5**
	Fugro Reference	G170029U			
	Coordinates (m)	E502904.66 N177886.50	Ground Elevation (m Datum)	21.92	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)
1.20	C	0	N=4 (1,1/1,0,2,1)	450	EQU1616	66	0.00	Dry
2.20	C	0	N=5 (3,3/3,1,0,1)	450	EQU1616	66	2.10	1.30
3.20	C	0	N=7 (4,4/2,2,2,1)	450	EQU1616	66	3.10	2.70
4.20	C	0	N=3 (1,2/1,1,0,1)	450	EQU1616	66	4.10	1.50
5.20	C	0	N=2 (1,1/0,1,0,1)	450	EQU1616	66	5.10	1.30
6.70	C	0	N=15 (1,3/4,5,3,3)	450	EQU1616	66	6.60	2.50
8.20	C	0	N=11 (4,3/3,2,3,3)	450	EQU1616	66	8.10	2.50
10.00	S	0	N=19 (3,4/3,4,5,7)	450	EQU1616	66	9.50	2.00

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)
0.05	< 0.1
0.45	< 0.1
0.80	< 0.1
1.20	1.0
2.20	2.0
3.20	1.0
4.20	18.0
5.20	2.0
6.20	1.0
7.20	2.0
8.20	< 0.1

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-7**
	Fugro Reference	G170029U			
	Coordinates (m)	E502717.19 N177587.93	Ground Elevation (m Datum)	20.45	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.20 - 0.30	ES	1			TOPSOIL: (soft), dark brown, slightly sandy, slightly gravelly CLAY. With frequent roots/rootlets (2x10 mm). Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of flint. [TOPSOIL] [CLAY]	(0.60)				
0.20	PID		< 0.1 ppm			0.60	19.85			
0.30 - 0.40	D	2			Soft, light orangish brown, locally black, slightly sandy, slightly gravelly CLAY. With occasional pockets (<40 mm) of black, organic, silty clay. Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of flint. Slight organic odour. [ALLUVIUM] [CLAY]	(0.40)				
0.50 - 0.60	B	3				1.00	19.45			
0.70 - 0.80	ES	4		1		(0.20)				
0.70	PID		< 0.1 ppm			1.20	19.25			
0.80 - 0.90	D	5			Light yellowish brown, slightly clayey, sandy GRAVEL. With rare pockets (<40 mm) of laminated, dark grey and blue, sandy clay. Sand is fine to coarse. Gravel is subangular to well rounded, fine to coarse of flint. [RIVER TERRACE DEPOSITS] [GRAVEL]					
0.90 - 1.00	B	6								
1.00 - 1.10	ES	7								
1.00 - 1.20	B	9								
1.00	PID		< 0.1 ppm							
1.10 - 1.20	D	8								
1.20 - 1.65	D	10								
1.20 - 1.70	B	13								
1.20 - 1.65	SPT		N = 44 (S)							
1.30 - 1.40	ES	11		2	(Dense becoming medium dense), dark grey brown and multicoloured, slightly clayey, slightly sandy, GRAVEL with low cobble content. Sand is fine to coarse. Gravel is angular to well rounded, fine to coarse of flint. Cobbles are (55x75x100 mm) are well rounded flint. [RIVER TERRACE DEPOSITS] [GRAVEL]					
1.30	PID		< 0.1 ppm							
1.40	D	12								
1.70 - 2.10	B	15								
1.80	D	14								
2.20 - 2.65	D	16								
2.20 - 2.65	SPT		N = 40 (S)							
2.40 - 2.50	ES	17								
2.40	PID		< 0.1 ppm	3		(3.80)				
2.50	D	18								
2.70 - 3.00	B	19								
3.20 - 3.65	D	20								
3.20 - 3.70	B	23								
3.20 - 3.65	SPT		N = 12 (S)							
3.30 - 3.40	ES	21								
3.30	PID		< 0.1 ppm							
3.40	D	22		4						
3.80	D	24								
3.90 - 4.20	B	25								
4.20 - 4.65	D	26								
4.20 - 4.65	SPT		N = 14 (S)		Between 4.30 m and 4.60 m; medium bed of light brown, slightly clayey, sandy gravel. With rare pockets (<40 mm) of sandy clay.					
4.30 - 4.40	ES	27								
4.30 - 4.60	B	29								
4.30	PID		< 0.1 ppm							
4.40	D	28								
5.00	D	30		5	Soft, fissured, dark brownish grey and bluish grey, slightly sandy, slightly gravelly CLAY. With rare partings of fine sand. Sand is fine. Gravel is subangular and subrounded, fine and medium of flint. Fissures are subhorizontal, very closely spaced, planar and smooth. (Gravel possibly brought down during boring from stratum above). [LONDON CLAY FORMATION] [CLAY]	5.00	15.45			
5.20 - 5.65	D	31				(0.50)				
5.20 - 5.70	B	34				5.50	14.95			
5.20 - 5.65	SPT		N = 17 (S)							
5.30 - 5.40	ES	32								
5.30	PID		< 0.1 ppm							
5.40	D	33								
5.80	D	35								
5.80 - 6.20	B	36		6	Between 5.20 m and 5.80 m; with frequent selenite crystals (<1 mm).					
6.30 - 6.40	ES	37			Firm and stiff, fissured, dark bluish grey CLAY. With rare partings of fine sand. Fissures are randomly orientated, very closely and closely spaced, planar and smooth. [LONDON CLAY FORMATION] [CLAY]	(1.50)				
6.30	PID		< 0.1 ppm							
6.40	D	38								
6.50 - 6.95	UT	39	31/450 mm							
7.00	D	40		7	End of Borehole at 7.00 m	7.00	13.45			
				8						
				9						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-7**
Fugro Reference	G170029U			
Coordinates (m)	E502717.19 N177587.93	Ground Elevation (m Datum)	20.45	Sheet 1 of 1
Hole Type	Cable Percussion			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	13/12/2017	13/12/2017	Hand-dug			CT	AK	
1.20	7.00	CP	14/12/2017	14/12/2017	Dando 2000			CT	AK	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
13/12/2017	08:00:00	0.00			
13/12/2017	18:00:00	1.20		0.90	
14/12/2017	08:00:00	1.20		0.70	
14/12/2017	18:00:00	7.00	6.00	Dry	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)
7.00	200	6.00	200

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark
1.30	2.00	02:00	

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)
1.20	0.90	20		

Water Added

Depth From (m)	Depth To (m)
1.20	5.00

Water Strike Remarks

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
SP	1	0.90	5.00	14/12/2017

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	-0.23	1.00	50	Plain
Pipe1	1.00	5.00	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
-0.40	0.00	Upstanding Cover	14/12/2017
0.00	0.20	Concrete	14/12/2017
0.20	0.90	Bentonite	14/12/2017
0.90	5.00	Gravel Backfill	14/12/2017
5.00	7.00	Bentonite	14/12/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 28/11/2018

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-7**
Fugro Reference	G170029U			
Coordinates (m)	E502717.19 N177587.93	Ground Elevation (m Datum)	20.45	Sheet 1 of 1
Hole Type	Cable Percussion			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)
1.20	S	0	N=44 (5,15/15,15,8,6)	450	CD1	75	0.00	0.00
2.20	S	0	N=40 (6,8/9,10,10,11)	450	CD1	75	2.10	0.00
3.20	S	0	N=12 (1,2/2,3,3,4)	450	CD1	75	3.10	0.00
4.20	S	0	N=14 (1,1/3,3,4,4)	450	CD1	75	4.10	0.00
5.20	S	0	N=17 (1,2/3,4,4,6)	450	CD1	75	5.10	Dry

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)
0.20	< 0.1
0.70	< 0.1
1.00	< 0.1
1.30	< 0.1
2.40	< 0.1
3.30	< 0.1
4.30	< 0.1
5.30	< 0.1
6.30	< 0.1

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion		Location ID	**HEP-BH-12**
	Client	Heathrow Airport Limited			
	Fugro Reference	G170029U			
	Coordinates (m)	E503339.66 N178074.55	Ground Elevation (m Datum) 21.83	Sheet 1 of 2	
	Hole Type	Cable Percussion		Status	Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.05 - 0.10	ES	1			MADE GROUND: (soft), black, slightly sandy, slightly gravelly clay. With occasional roots (2x10 mm). With occasional fragments of timber (5x20 mm), tile (10x25 mm), ceramic (>25x60 mm) and plant fibres (2x15 mm). Sand is fine to coarse. Gravel is angular and subangular, fine to coarse of flint and brick. [MADE GROUND] [CLAY]	(0.30)				
0.05	PID		< 0.1 ppm			0.30	21.53			
0.10 - 0.20	B	3				(0.50)				
0.15	D	2								
0.30 - 0.40	B	6								
0.30 - 0.40	ES	4								
0.30	PID		< 0.1 ppm			0.80	21.03			
0.40	D	5			MADE GROUND: (soft), dark brown, slightly gravelly clay. With some root fragments (2x20 mm). Gravel is angular and subangular, fine to coarse of flint, chalk and brick. [MADE GROUND] [CLAY]					
0.80	D	8		1		(0.75)				
0.80 - 0.90	B	9								
0.80 - 0.90	ES	7								
0.80	PID		< 0.1 ppm							
0.90 - 1.00	ES	13			Soft and firm, banded dark brown and light brown, locally black, slightly sandy, silty CLAY with occasional gravel content. Sand is fine to coarse. Gravel is subangular and subrounded, fine and medium of flint and various other lithologies. (Possible Alluvium) [ALLUVIUM] [CLAY]	1.55	20.28			
0.90	PID		< 0.1 ppm							
1.00	D	11								
1.00 - 1.20	B	12								
1.00 - 1.20	ES	10		2						
1.00	PID		< 0.1 ppm		Dense, multicoloured, sandy GRAVEL. Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of flint. [RIVER TERRACE DEPOSITS] [GRAVEL]					
1.10	D	14								
1.10 - 1.20	LB	15								
1.20 - 1.55	UT	16	70/315 mm							
1.60	D	17								
1.60 - 1.70	ES	18								
1.60	PID		< 0.1 ppm							
1.80	D	19		3						
2.00 - 2.20	LB	20								
2.20 - 2.65	D	21								
2.20 - 2.65	SPT		N = 43 (S)			(3.45)				
2.30 - 2.40	ES	22								
2.30	PID		< 0.1 ppm							
2.50	D	23								
3.20 - 3.65	D	24								
3.20 - 3.65	SPT		N = 32 (S)							
3.70 - 3.80	ES	25		4						
3.70	PID		< 0.1 ppm							
3.80	D	26			At 4.20 m; very dense.					
3.80 - 4.00	LB	27								
4.20 - 4.65	D	28								
4.20 - 4.60	SPT		50/245 mm (S)							
4.50 - 4.80	LB	29								
4.70 - 4.80	D	31								
4.70 - 4.80	ES	30		5		5.00	16.83			
4.70	PID		< 0.1 ppm		Firm and stiff, fissured, dark greyish brown, silty CLAY. With occasional shell fragments (<1x1 mm) and selenite crystals (<1x1 mm). Fissures are subvertical, extremely closely spaced, planar and smooth. [LONDON CLAY FORMATION] [CLAY] Between 5.20 m and 5.70 m; locally slightly sandy silt.					
5.00 - 5.20	ES	32								
5.00	PID		< 0.1 ppm							
5.20 - 5.65	UT	33	63/450 mm							
5.20 - 5.70	B	35								
5.70	D	34								
6.00 - 6.20	ES	36		6						
6.00	PID		< 0.1 ppm							
6.20 - 6.70	LB	37								
6.70 - 7.15	D	38								
6.70 - 7.15	SPT		N = 17 (S)							
7.20 - 7.70	B	39		7						
7.70 - 7.80	D	40								
8.20 - 8.65	UT	41	100/450 mm	8						
8.70	D	42				(7.20)				
9.10 - 9.30	ES	43		9						
9.40 - 9.50	D	44								
9.50 - 9.70	LB	45								
9.70 - 10.15	D	46								
9.70 - 10.15	SPT		N = 18 (S)							
					Continued next page					

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-12**
	Fugro Reference	G170029U			
	Coordinates (m)	E503339.66 N178074.55	Ground Elevation (m Datum)	21.83	Sheet 2 of 2
	Hole Type	Cable Percussion			Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
10.50	D	47			Firm and stiff, fissured, dark greyish brown, silty CLAY. With occasional shell fragments (<1x1 mm) and selenite crystals (<1x1 mm). Fissures are subvertical, extremely closely spaced, planar and smooth. [LONDON CLAY FORMATION] [CLAY]					
11.70 - 12.15	UT	48	100/450 mm	11						
12.15	D	49		12						
12.20 - 12.30	ES	50			Stiff, fissured, dark greyish brown, silty CLAY with occasional partings (<1 mm) of fine sand. With occasional selenite crystals (<1x1 mm). Fissures are randomly orientated, very closely spaced, planar and smooth. [LONDON CLAY FORMATION] [CLAY]	12.20	9.63			
12.20 - 12.50	LB	52								
12.40	D	51		13						
13.70 - 14.15	D	53				(2.80)				
13.70 - 14.15	SPT		N = 28 (S)	14						
14.50 - 14.60	ES	54								
14.50	PID		< 0.1 ppm							
14.70	D	55								
14.80 - 15.00	LB	56		15	End of Borehole at 15.00 m	15.00	6.83			
				16						
				17						
				18						
				19						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-12**
Fugro Reference	G170029U			
Coordinates (m)	E503339.66 N178074.55	Ground Elevation (m Datum)	21.83	Sheet 1 of 1
Hole Type	Cable Percussion			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	27/11/2017	27/11/2017	Hand-dug			AF	AF	
1.20	15.00	CP	29/11/2017	04/12/2017	Dando 2000			CT/SB	AK/CM	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
27/11/2017	08:00:00	0.00			
27/11/2017	18:00:00	1.20		1.10	
29/11/2017	08:00:00	1.20		Dry	
29/11/2017	18:00:00	4.50	4.40	0.00	
30/11/2017	08:00:00	4.50	4.40	1.10	
30/11/2017	18:00:00	8.70	5.50	Dry	
01/12/2017	08:00:00	8.70	5.50	1.10	
01/12/2017	18:00:00	15.00	5.50	Dry	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)
15.00	200	5.50	200

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark
4.50	4.65	00:30	

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)
1.55	1.10	20	1.50	

Water Added

Depth From (m)	Depth To (m)
1.55	5.00

Water Strike Remarks

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located. The inspection pit was backfilled with arisings before being progressed by cable percussion.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
SP	1	1.55	5.00	04/12/2017

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	-0.15	1.70	50	Plain
Pipe1	1.70	5.00	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
-0.39	0.00	Upstanding Cover	04/12/2017
0.00	0.20	Concrete	04/12/2017
0.20	1.55	Bentonite	04/12/2017
1.55	5.00	Gravel Backfill	04/12/2017
5.00	15.00	Bentonite	04/12/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 28/11/2018

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-12**
Fugro Reference	G170029U			
Coordinates (m)	E503339.66 N178074.55	Ground Elevation (m Datum)	21.83	Sheet 1 of 1
Hole Type	Cable Percussion			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)
2.20	S	0	N=43 (4,5/10,10,11,12)	450	CD1	75	2.10	0.00
3.20	S	0	N=32 (2,3/4,9,9,10)	450	CD1	75	3.10	0.00
4.20	S	0	N=50 (7,10/50 for 245mm)	395	CD1	75	4.10	0.00
6.70	S	0	N=17 (2,4/4,4,4,5)	450	CD1	75	5.50	Dry
9.70	S	0	N=18 (3,4/4,4,5,5)	450	CD1	75	5.50	Dry
13.70	S	0	N=28 (3,5/6,7,7,8)	450	CD1	75	5.50	Dry

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)
0.05	< 0.1
0.30	< 0.1
0.80	< 0.1
0.90	< 0.1
1.00	< 0.1
1.60	< 0.1
2.30	< 0.1
3.70	< 0.1
4.70	< 0.1
5.00	< 0.1
6.00	< 0.1
14.50	< 0.1

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

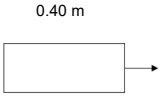
FUGRO	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-13**
	Fugro Reference	G170029U			
	Coordinates (m)	E503176.00 N177920.90	Ground Elevation (m Datum)	26.07	Sheet 1 of 2
	Hole Type	Inspection Pit			Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.05 - 0.15	ES	1			MADE GROUND (Topsoil): dark brown, slightly gravelly, clayey sand, locally sandy clay with low cobble content. With occasional roots (<1x10 mm). Sand is fine and medium. Gravel is subangular and subrounded, fine to coarse of flint, chalk and rare brick. Cobbles (70x70x110 mm) are of flint.	(0.30)				
0.05	PID		< 0.1 ppm							
0.10	D	2								
0.10 - 0.20	B	3								
0.30 - 0.40	ES	4			[MADE GROUND] [SAND]	0.30	25.77			
0.30 - 0.50	B	6								
0.30	PID		< 0.1 ppm		MADE GROUND: brownish grey, gravelly sand with low cobble content. Sand is fine and medium. Gravel is subangular to rounded, fine to coarse of flint, brick and concrete. Cobbles (85x85x90 mm) are of flint and brick.	(0.70)				
0.35	D	5			[MADE GROUND] [SAND] At 0.32 m; with boulder of concrete (50x200x250 mm). Between 0.40 m and 0.70 m; with rare fragments of glass (3x15x15 mm) and tile (5x20x40 mm). At 0.75 m; with concrete slab (60x200x>250 mm) and a metal trim section (3x40x300 mm). Between 0.80 m and 0.90 m; with 3 fragments of plastic bag (2x80x80 mm), a tile fragment (8x15x25 mm), plastic peg rail (10x40x150 mm) and a shuttlecock (30x30x60 mm). At 1.00 m; concrete slab obstruction.	1.00	25.07			
				1	End of Inspection Pit at 1.00 m					
				2						
				3						
				4						
					Continued next page					

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Plan



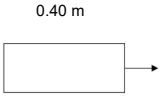
	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-13**
	Fugro Reference	G170029U			
	Coordinates (m)	E503176.00 N177920.90	Ground Elevation (m Datum)	26.07	Sheet 2 of 2
	Hole Type	Inspection Pit			Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
				6						
				7						
				8						
				9						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Plan



Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-13**
Fugro Reference	G170029U			
Coordinates (m)	E503176.00 N177920.90	Ground Elevation (m Datum)	26.07	Sheet 1 of 1
Hole Type	Inspection Pit			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.00	IP	11/12/2017	11/12/2017	Hand-dug			AF	AF	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
11/12/2017	08:00:00	0.00			
11/12/2017	18:00:00	1.00		Dry	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

Groundwater was not encountered during excavation.

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.00 m. Services were not located. The inspection pit was terminated at 1.05 m due to concrete slab obstruction.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
SP	1	1.00	5.50	15/12/2017

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	1.00	Arisings	11/12/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 28/11/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-13**
	Fugro Reference	G170029U			
	Coordinates (m)	E503176.00 N177920.90	Ground Elevation (m Datum)	26.07	Sheet 1 of 1
	Hole Type	Inspection Pit			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)
0.05	< 0.1
0.30	< 0.1

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion		Location ID	**HEP-BH-14**
	Client	Heathrow Airport Limited			
	Fugro Reference	G170029U			
	Coordinates (m)	E503185.98 N177771.99	Ground Elevation (m Datum) 24.48	Sheet 1 of 1	
	Hole Type	Cable Percussion		Status	Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.10	D	1			MADE GROUND: dark brown, slightly gravelly, sandy, silty clay (99%). With rare fragments of mixed plastic (<50x100 mm) (1%). Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of flint, brick, and rare concrete.					
0.10 - 0.50	B	2				(0.55)				
0.25 - 0.50	ES	3								
0.25	PID		< 0.1 ppm							
					[MADE GROUND] [CLAY]	0.55	23.93			
0.60	D	4			MADE GROUND: brown and reddish brown, clayey, sandy gravel (97%). With occasional fragments (3%) of mixed plastic and clinker. Sand is fine to coarse. Gravel is angular and subangular, fine to coarse of flint, concrete and brick.					
0.60 - 0.90	ES	6				(0.55)				
0.60 - 1.10	B	5								
0.60	PID		< 0.1 ppm	1						
					[MADE GROUND] [GRAVEL]	1.10	23.38			
1.20 - 1.40	ES	9			Below 1.05 m; black.	(0.40)				
1.20 - 1.45	B	8								
1.20 - 1.65	D	7			MADE GROUND: dark grey locally black, slightly clayey to clayey, sandy gravel. With some fragments (<60 mm) of clinker and charcoal. Sand is fine to coarse, and includes ash. Gravel is angular and subangular, fine and medium of brick.	1.50	22.98			
1.20 - 1.65	SPT		N = 12 (S)							
1.20	PID		< 0.1 ppm			(0.50)				
1.60 - 2.00	B	10								
1.80	D	11		2						
2.00 - 2.20	ES	14			[MADE GROUND] [GRAVEL]	2.00	22.48			
2.00 - 2.45	D	12			MADE GROUND: black, silty, sandy gravel. With 1 plastic container (5x20x100 mm), and 1 electric wire (5x<150 mm). Sand is fine to coarse, and includes ash. Gravel is angular to subrounded, fine to coarse of flint and rare concrete.					
2.00 - 2.50	B	13								
2.00 - 2.45	SPT		N = 16 (S)							
2.00	PID		1.0 ppm			(1.00)				
2.80	D	15			[MADE GROUND] [GRAVEL]					
3.00 - 3.20	ES	18		3	MADE GROUND: black, sandy, gravelly clay (95%). With occasional fragments of mixed plastic (<10x50 mm) (2%), and wood fragments (<10x50x70 mm) (3%). Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of flint, brick and concrete.	3.00	21.48			
3.00 - 3.45	D	16								
3.00 - 3.50	B	17								
3.00 - 3.45	SPT		N = 18 (S)							
3.00	PID		< 0.1 ppm			(1.00)				
					[MADE GROUND] [CLAY]					
3.80	D	19			Between 2.00 m and 2.50 m; with rare decayed organic material.					
4.00 - 4.20	ES	22		4	MADE GROUND: black, brown and greenish grey, sandy, gravelly, silty clay (85%). With frequent fragments of wood (<20x45 mm) (15%). Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of flint, brick and concrete.	4.00	20.48			
4.00 - 4.45	D	20								
4.00 - 4.50	B	21								
4.00 - 4.45	SPT		N = 9 (S)							
4.00	PID		1.0 ppm							
4.50 - 5.00	B	23			[MADE GROUND] [WASTE, e.g. LANDFILL]					
					Between 3.50 m and 3.70 m; driller noted concrete.					
4.80	D	24			MADE GROUND: dark grey, sandy, gravelly, silty clay (90%). With some fragments of wood (<20x30 mm) (10%). Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of flint, chalk, brick and concrete.					
5.00 - 5.20	ES	27		5		(1.80)				
5.00 - 5.45	D	25								
5.00 - 5.50	B	26								
5.00 - 5.45	SPT		N = 12 (S)		[MADE GROUND] [WASTE, e.g. LANDFILL]					
5.00	PID		< 0.1 ppm		Below 4.50 m; with frequent and abundant fragments of wood.					
5.80	D	28				5.80	18.68			
6.00 - 6.20	ES	30		6	MADE GROUND: dark grey, locally yellowish brown, slightly sandy, slightly gravelly, clay. With fragment of metal (<3x80x100 mm). With rare fragments of clinker (<60 mm). Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse, of flint, brick, and rare concrete.					
6.00 - 6.50	B	29								
6.00	PID		< 0.1 ppm							
6.50 - 6.95	D	31			[MADE GROUND] [WASTE, e.g. LANDFILL]					
6.50 - 6.95	SPT		N = 11 (S)			(1.70)				
7.00	D	32		7						
7.00 - 7.20	ES	34								
7.00 - 7.50	B	33								
7.00	PID		< 0.1 ppm							
7.50 - 7.60	B	35				7.50	16.98			
7.60	D	36			MADE GROUND: dark grey, slightly sandy, silty gravel. Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of flint and concrete.	(0.10)	16.88			
7.60 - 7.90	B	37				7.60				
7.80 - 8.00	ES	38				(0.40)				
7.80	PID		< 0.1 ppm	8	[MADE GROUND] [GRAVEL]	8.00	16.48			
8.00	D	39			Firm and stiff, greyish brown, slightly sandy, gravelly, CLAY. Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of flint. (Possibly reworked).					
8.00 - 8.50	B	40								
8.50 - 8.95	D	41			[LONDON CLAY FORMATION] [CLAY]					
					Stiff, fissured, greyish brown, glauconitic, CLAY. With frequent selenite crystals. Fissures are randomly orientated, extremely closely spaced, planar and smooth.					
9.00	D	42		9		(1.85)				
9.00 - 9.20	ES	44								
9.00 - 9.40	B	43			[LONDON CLAY FORMATION] [CLAY]					
9.00	PID		< 0.1 ppm							
9.40 - 9.85	UT	45	100/250 mm							
					End of Borehole at 9.85 m	9.85	14.63			

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-14**
Fugro Reference	G170029U			
Coordinates (m)	E503185.98 N177771.99	Ground Elevation (m Datum)	24.48	Sheet 1 of 1
Hole Type	Cable Percussion			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	13/12/2017	13/12/2017	Hand-dug			EA	EA	
1.20	9.85	CP	13/12/2017	15/12/2017	Dando 2000			LI	EA	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
13/12/2017	08:00:00	0.00			
13/12/2017	18:00:00	4.40	4.40	Dry	
14/12/2017	08:00:00	4.40	4.40	Dry	
14/12/2017	18:00:00	7.50	7.50	Dry	
15/12/2017	08:00:00	7.50	7.50	7.00	
15/12/2017	18:00:00	9.85	8.00	Dry	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)
9.85	200	8.00	200

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark
3.50	3.70	01:00	Concrete

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

Groundwater was not encountered during excavation or boring.

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
SP	1	1.00	7.10	15/12/2017

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	0.14	1.20	50	Plain
Pipe1	1.20	7.10	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	0.05	Flush Cover	15/12/2017
0.05	0.20	Concrete	15/12/2017
0.20	1.00	Bentonite	15/12/2017
1.00	7.10	Gravel Backfill	15/12/2017
7.10	9.85	Bentonite	15/12/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 28/11/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-14**
	Fugro Reference	G170029U			
	Coordinates (m)	E503185.98 N177771.99	Ground Elevation (m Datum)	24.48	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)
1.20	S	0	N=12 (2,3/5,2,2,3)	450	BS11	62	1.20	Dry
2.00	S	0	N=16 (2,3/3,3,5,5)	450	BS11	62	2.00	Dry
3.00	S	0	N=18 (2,3/5,4,3,6)	450	BS11	62	3.00	Dry
4.00	S	0	N=9 (2,3/2,2,2,3)	450	BS11	62	4.00	Dry
5.00	S	0	N=12 (2,3/4,4,1,3)	450	BS11	62	5.00	Dry
6.50	S	0	N=11 (2,3/6,3,1,1)	450	BS11	62	6.00	Dry

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)
0.25	< 0.1
0.60	< 0.1
1.20	< 0.1
2.00	1.0
3.00	< 0.1
4.00	1.0
5.00	< 0.1
6.00	< 0.1
7.00	< 0.1
7.80	< 0.1
9.00	< 0.1

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion		Location ID	**HEP-BH-16**
	Client	Heathrow Airport Limited			
	Fugro Reference	G170029U			
	Coordinates (m)	E502896.89 N177515.44	Ground Elevation (m Datum) 22.89	Sheet 1 of 2	
	Hole Type	Cable Percussion		Status	Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.05 - 0.15	ES	1			MADE GROUND: dark brown, slightly sandy, slightly gravelly silt. With rare fragments of tile (5x8x10 mm) and rare fragments of glass (2x5x10 mm). Sand is fine and medium. Gravel is subangular and subrounded, fine to coarse of flint and rare brick.					
0.05	PID		< 0.1 ppm			(0.65)				
0.10	D	2								
0.10 - 0.30	B	3								
					[MADE GROUND] [SILT]	0.65	22.24			
					Between 0.00 m and 0.20 m; with occasional roots.					
0.70	D	5			MADE GROUND: light brown becoming brown, slightly silty, gravelly sand. With rare fragment of tile (5x8x19 mm) and rare fragments of glass (2x5x10 mm). Sand is fine and medium. Gravel is angular and subrounded, fine to coarse of flint, brick, occasional concrete.					
0.70 - 0.80	ES	4				(0.55)				
0.70	PID		< 0.1 ppm	1						
0.80 - 0.90	B	6				1.20	21.69			
1.30 - 1.75	D	7								
1.30 - 2.20	LB	9								
1.30 - 1.75	SPT		N = 10 (C)		[MADE GROUND] [SAND]					
1.70 - 1.80	ES	8			At 1.15 m; concrete and brick slab obstruction; pit diverted and extended by 1.25 m.	(1.00)				
1.70	PID		< 0.1 ppm							
				2	MADE GROUND: (soft), brown, slightly gravelly, sandy CLAY. Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of flint and brick.					
2.20 - 2.65	D	10				2.20	20.69			
2.20 - 2.80	LB	12			[MADE GROUND] [CLAY]					
2.20 - 2.65	SPT		N = 8 (C)		Between 1.30 m and 1.75 m; medium bed of soft, sandy clay.					
2.70	PID		< 0.1 ppm		MADE GROUND: brown, slightly clayey, gravelly sand. With rare fragments of china crockery (<10x10 mm) and plastic (<10x10 mm). Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of brick.					
2.80	ES	11				(1.50)				
				3	[MADE GROUND] [SAND]					
3.20 - 3.65	D	13								
3.20 - 3.80	LB	14								
3.20 - 3.65	SPT		N = 16 (C)							
3.70 - 3.80	ES	15				3.70	19.19			
3.70	PID		< 0.1 ppm		MADE GROUND: black and brown, clayey, sandy gravel with low cobble content. With occasional fragments of wood (40x100x100 mm) and rare plastic (50x<70x70 mm). Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of brick and concrete. Cobbles (150x180x180 mm) are of concrete.					
				4						
4.20 - 4.65	D	16								
4.20 - 5.10	LB	18								
4.20 - 4.65	SPT		N = 11 (C)		[MADE GROUND] [GRAVEL]					
4.70 - 4.80	ES	17								
4.70	PID		1.0 ppm							
				5						
						(3.70)				
5.70 - 5.80	ES	20								
5.70 - 6.15	D	19								
5.70 - 6.20	LB	21								
5.70 - 6.15	SPT		N = 6 (C)	6						
5.70	PID		< 0.1 ppm							
6.70 - 6.80	ES	23								
6.70 - 7.15	D	22								
6.70 - 7.20	LB	24								
6.70 - 7.15	SPT		N = 6 (C)	7						
6.70	PID		< 0.1 ppm							
7.40 - 7.50	D	25				7.40	15.49			
7.40 - 8.00	B	27			Firm, brown, CLAY.					
7.50 - 7.80	ES	26			[LONDON CLAY FORMATION] [CLAY]					
7.50	PID		< 0.1 ppm							
				8						
8.50 - 8.60	ES	30								
8.50 - 8.95	UT	28	35/450 mm							
8.50	PID		< 0.1 ppm							
8.95 - 9.00	D	29				(3.10)				
9.00 - 9.10	D	32		9						
9.00 - 9.50	B	31								
9.50 - 10.00	B	34								
9.50 - 9.60	ES	33								
9.50	PID		< 0.1 ppm							
10.00 - 10.45	D	35								
10.00 - 10.45	SPT		N = 21 (S)		Continued next page					

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-16**
	Fugro Reference	G170029U			
	Coordinates (m)	E502896.89 N177515.44	Ground Elevation (m Datum)	22.89	Sheet 2 of 2
	Hole Type	Cable Percussion			Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
					Firm, brown, CLAY. [LONDON CLAY FORMATION] [CLAY]					
					End of Borehole at 10.50 m	10.50	12.39			
				11						
				12						
				13						
				14						
				15						
				16						
				17						
				18						
				19						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-16**
Fugro Reference	G170029U			
Coordinates (m)	E502896.89 N177515.44	Ground Elevation (m Datum)	22.89	Sheet 1 of 1
Hole Type	Cable Percussion			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	13/12/2017	13/12/2017	Hand-dug			LG	AF	
1.20	10.50	CP	14/12/2017	15/12/2017	Dando 3000			BH	LG	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
13/12/2017	08:00:00	0.00			
13/12/2017	18:00:00	1.20		Dry	
14/12/2017	10:30:00	1.20		Dry	
14/12/2017	18:00:00	5.10	5.00	3.50	
15/12/2017	08:00:00	5.10	5.00	3.37	
15/12/2017	13:30:00	10.50	7.60		

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)
10.50	200	7.60	200

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)
3.70	3.37	20	3.20	

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
SP	1	1.00	6.90	15/12/2017

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	-0.28	1.20	50	Plain
Pipe1	1.20	6.90	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
-0.38	0.00	Upstanding Cover	15/12/2017
0.00	0.50	Concrete	15/12/2017
0.50	1.00	Bentonite	15/12/2017
1.00	6.90	Gravel Backfill	15/12/2017
6.90	10.50	Bentonite	15/12/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 28/11/2018

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-16**
Fugro Reference	G170029U			
Coordinates (m)	E502896.89 N177515.44	Ground Elevation (m Datum)	22.89	Sheet 1 of 1
Hole Type	Cable Percussion			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)
1.30	C	0	N=10 (3,4/3,2,3,2)	450	EQU1616	66	0.00	Dry
2.20	C	0	N=8 (3,2/2,3,2,1)	450	EQU1616	66	0.00	Dry
3.20	C	0	N=16 (2,3/3,4,4,5)	450	EQU1616	66	3.00	Dry
4.20	C	0	N=11 (3,1/3,4,3,1)	450	EQU1616	66	4.10	3.50
5.70	C	0	N=6 (2,2/2,2,1,1)	450	EQU1616	66	5.20	3.50
6.70	C	0	N=6 (3,2/1,1,2,2)	450	EQU1616	66	6.60	3.50
10.00	S	0	N=21 (1,3/4,5,6,6)	450	EQU1616	66	7.60	Dry

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)
0.05	< 0.1
0.70	< 0.1
1.70	< 0.1
2.70	< 0.1
3.70	< 0.1
4.70	1.0
5.70	< 0.1
6.70	< 0.1
7.50	< 0.1
8.50	< 0.1
9.50	< 0.1

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-17**
	Fugro Reference	G170029U			
	Coordinates (m)	E503319.45 N177736.50	Ground Elevation (m Datum)	23.25	Sheet 1 of 1
	Hole Type	Hollow Stem Auger			Status: Final

Sampling and In Situ Testing					Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Run Depth (m) (Recovery) (%)	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.05	D	1				MADE GROUND: dark brown, slightly gravelly, sandy clay. With occasional roots and rootlets (<4 mm). Sand is fine to coarse. Gravel is angular to subrounded fine to coarse of flint, quartz and rare brick.	(0.30)				
0.05 - 0.25	B	2									
0.15 - 0.25	ES	3									
0.15	PID		< 0.1 ppm								
						[MADE GROUND] [CLAY]	0.30	22.95			
0.35	D	4				MADE GROUND: brown, slightly clayey, sandy gravel. Sand is fine to coarse. Gravel is subangular and subrounded fine to coarse of flint, concrete, rare brick and slag.	(0.30)				
0.35 - 0.50	ES	6									
0.35 - 0.60	B	6									
0.35	PID		< 0.1 ppm								
0.60 - 1.00	ES	9				[MADE GROUND] [GRAVEL]	0.60	22.65			
0.60	PID		< 0.1 ppm			MADE GROUND: brown locally brown and white, gravelly sand with low and medium cobble content. With occasional fragments of wood, mixed plastics (10%), metals, glass and ceramic. Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of flint, concrete and brick. Cobbles (80x90x90 mm) are angular of flint.	(0.60)				
0.65	D	7									
0.65 - 1.10	B	8			1						
						[MADE GROUND] [WASTE, e.g. LANDFILL]					
1.20	D	11		1.20		MADE GROUND; brown, slightly clayey, gravelly sand with low cobble content (89%). With some fragments of wood (100x100x<500 mm) (D2) (10%) and rare fragments of ceramic (<200 mm). Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of flint, brick and concrete. Cobbles (60x200x<200 mm) are angular to subrounded, fine to coarse of concrete.	1.20	22.05			
1.20 - 1.50	ES	10									
1.20 - 1.50	LB	12		(-)							
1.20	PID		< 0.1 ppm				(0.50)				
				1.50							
				(-)							
1.70 - 1.80	D	14				[MADE GROUND] [WASTE, e.g. LANDFILL]	1.70	21.55			
1.70 - 1.80	ES	13					(0.10)				
1.70 - 1.80	LB	15		1.80		MADE GROUND: (soft), blackish grey, slightly gravelly, sandy silt with low cobble content (89%). With occasional fragments of textiles (<100x100 mm) (D3) (<5%), plastic bags (20x<50 mm) (D2) (<5%). With rare fragments of coal (40x40 mm) (D2) (<1%), wood (D3) (<10x10x50 mm). Sand is fine to coarse. Gravel is angular to subrounded fine to coarse of brick, concrete and ceramic. Cobbles (<150x100x70 mm) are of brick and concrete. Strong organic odour.	1.80	21.45			
1.70	PID		< 0.1 ppm								
				(0)	2						G
				2.10			(0.60)				
				(0)							
						[MADE GROUND] [WASTE, e.g. LANDFILL]					
				2.40		No recovery.	2.40	20.85			
						[NO CORE RECOVERY]					
						End of Borehole at 2.40 m					
					3						
					4						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-17**
Fugro Reference	G170029U			
Coordinates (m)	E503319.45 N177736.50	Ground Elevation (m Datum)	23.25	Sheet 1 of 1
Hole Type	Hollow Stem Auger			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	05/12/2017	05/12/2017	Hand-dug			EA	EA	
1.20	2.40	AUGH	05/12/2017	13/12/2017	Hollow stem (barrel) auger MC 3000			DW	CM	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
12/12/2017	08:00:00	0.00			
12/12/2017	18:00:00	2.40	2.00	2.20	
13/12/2017	00:00:00	1.20			

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)
2.40	350	2.00	350

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

Groundwater was encountered at 2.20 m. Water level was not monitored.
Groundwater seepage noted between 1.50 m and 1.80 m.

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
GMP	1	0.70	2.00	12/12/2017

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	0.07	1.10	50	Plain
Pipe1	1.10	2.00	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	0.05	Flush Cover	12/12/2017
0.05	0.20	Concrete	12/12/2017
0.20	0.70	Bentonite	12/12/2017
0.70	2.00	Gravel Backfill	12/12/2017
2.00	2.40	Bentonite	12/12/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 28/11/2018

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-17**
Fugro Reference	G170029U			
Coordinates (m)	E503319.45 N177736.50	Ground Elevation (m Datum)	23.25	Sheet 1 of 1
Hole Type	Hollow Stem Auger			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)
0.15	< 0.1
0.35	< 0.1
0.60	< 0.1
1.20	< 0.1
1.70	< 0.1

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-20**
	Fugro Reference	G170029U			
	Coordinates (m)	E503124.67 N177494.87	Ground Elevation (m Datum)	23.23	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.00 - 0.05	ES	1			MADE GROUND (Topsoil): (soft), dark brownish grey and black, slightly sandy, slightly gravelly clay. With frequent root/rootlets (<5x10 mm). Sand is fine to coarse. Gravel is subangular to rounded, fine to coarse of flint and rare brick. [MADE GROUND] [CLAY]	(0.10) 0.10 (0.90)	23.13			
0.00 - 0.10	B	3								
0.00	PID		< 0.1 ppm							
0.05	D	2								
0.30 - 0.40	ES	4								
0.30 - 0.50	B	6								
0.30	PID		< 0.1 ppm							
0.50	D	5			MADE GROUND: (soft), dark greyish brown and locally black, clayey, sandy gravel (85%). With occasional roots/rootlets (5x50 mm). With occasional pockets (<50 mm) of light orangish brown, clayey, fine to coarse sand with a slight organic odour. With some fragments of burnt wood (10%) and occasional clinker (<60 mm) and glass (30x75 mm) (5%) . Sand is fine to coarse. Gravel is angular to well rounded, fine to coarse of brick, roadstone and concrete. [MADE GROUND] [WASTE, e.g. LANDFILL] Between 0.25 m and 0.35 m; with 3 concrete blocks (55x100x250 mm) (50x75x100 mm) (35x75x150 mm). Between 0.40 m and 0.60 m; with steel rebar (15 mm). At 0.90 m; with plastic strips (5x600 mm).	1.00 (0.20) 1.20	22.23 22.03			
0.60 - 0.70	ES	7		1						
0.60 - 1.00	LB	9								
0.60	PID		< 0.1 ppm							
0.80	D	8								
1.00 - 1.05	ES	10								
1.00 - 1.20	B	12								
1.00	PID		< 0.1 ppm							
1.10	D	11								
1.20	D	13		2						
1.20 - 1.65	B	15								
1.20 - 1.65	SPT		N = 5 (S)							
1.40 - 1.50	D	14								
2.20 - 2.60	B	19			MADE GROUND: (soft), dark brown locally light orangish brown and black, slightly sandy, slightly gravelly clay. With occasional rootlets (<10x100 mm). Sand is fine to coarse. Gravel is subangular to well rounded, fine to coarse of flint, mixed lithologies, brick and concrete. [MADE GROUND] [CLAY]	(3.00)				
2.20 - 2.65	D	16								
2.20 - 2.65	SPT		N = 10 (S)							
2.40 - 2.50	ES	17								
2.40	PID		< 0.1 ppm							
2.50	D	18		3						
2.60 - 3.00	B	20								
3.20 - 3.65	B	24								
3.20 - 3.65	D	21			MADE GROUND: (soft), dark brown to dark greyish brown and locally black, slightly gravelly, slightly sandy to sandy clay. With occasional to rare fragments (<60 mm) of ash and clinker. Sand is fine to coarse. Gravel is angular to well rounded, fine to coarse of flint, mixed lithologies, brick and concrete. With a slight organic odour. [MADE GROUND] [CLAY] Between 2.20 m and 2.60 m; with a plastic fragment (25x40x65 mm).	4.20	19.03			
3.20 - 3.65	SPT		N = 8 (S)							
3.30 - 3.40	ES	22								
3.30	PID		< 0.1 ppm							
3.50	D	23								
3.80 - 4.20	LB	27		4						
3.90 - 4.00	ES	25								
3.90	PID		< 0.1 ppm							
4.00 - 4.10	D	26			MADE GROUND: dark greyish brown and locally light orange, slightly clayey, sandy gravel. Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of flint, brick and concrete. [MADE GROUND] [GRAVEL]	(0.60)				
4.20 - 4.65	D	28								
4.20 - 4.65	SPT		N = 36 (S)							
4.50 - 5.00	B	31								
4.80 - 4.90	ES	29			MADE GROUND: black, slightly sandy, clayey gravel. With occasional pockets (50x<100x100 mm) of black, sandy, slightly organic clay. With occasional fragments of plastic pipe (5x5x30 mm) and wood (<20x20x45 mm) (2%), and rare tile (<60 mm). Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of flint and frequent brick and concrete. [MADE GROUND] [GRAVEL]	4.80 (0.40) 5.20	18.43 18.03			
4.80	PID		< 0.1 ppm	5						
4.90 - 5.00	D	30								
5.20 - 5.65	D	32								
5.20 - 5.70	LB	33								
5.20 - 5.65	SPT		N = 21 (S)							
5.80 - 5.90	ES	34			MADE GROUND: black, slightly clayey, slightly sandy to sandy gravel. Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of flint, brick, concrete and mixed lithologies. [MADE GROUND] [GRAVEL] Between 5.20 m and 5.70 m; with low cobble content. Cobbles are of brick (80x90x120 mm), concrete (65x75x100 mm). With rare fragments of wood (20x30x65 mm).	(1.00) 6.20 (0.80)	17.03			
5.80 - 5.90	ES	34								
5.80 - 6.20	B	36								
5.80	PID		< 0.1 ppm	6						
6.00	D	35								
6.20 - 6.70	B	37								
6.70 - 7.15	D	38			Multicoloured, slightly sandy to sandy GRAVEL with low cobble content. Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of flint. Cobbles (65x<90x90 mm) are of flint. [RIVER TERRACE DEPOSITS] [GRAVEL]	7.00 (0.50)	16.23			
6.70 - 7.15	SPT		N = 17 (S)							
7.30 - 7.40	ES	39		7						
7.30 - 7.80	B	41			Soft and firm, laminated, light brown and bluish grey, CLAY. [LONDON CLAY FORMATION] [CLAY]	7.50	15.73			
7.30	PID		< 0.1 ppm							
7.50	D	40								
7.80 - 8.00	D	42			Firm and stiff, fissured, dark grey, slightly sandy CLAY. With occasional selenite crystals (<1 mm). Sand is fine to coarse. Fissures are randomly orientated to subhorizontal, very closely and closely spaced, planar and smooth. [LONDON CLAY FORMATION] [CLAY]	(1.50)				
8.00 - 8.50	B	43		8						
8.50 - 8.90	UT	44	46/450 mm							
8.90 - 9.00	D	45								
				9	End of Borehole at 9.00 m	9.00	14.23			

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-20**
Fugro Reference	G170029U			
Coordinates (m)	E503124.67 N177494.87	Ground Elevation (m Datum)	23.23	Sheet 1 of 1
Hole Type	Cable Percussion			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	18/12/2017	18/01/2017	Hand-dug/breaker			AK	AK	
1.20	9.00	CP	19/12/2017	19/12/2017	Dando 2000			CT/SB	AK	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
18/12/2017	08:00:00	0.00			
18/12/2017	18:00:00	3.80	3.00	Dry	
19/12/2017	08:00:00	3.80	3.00	Dry	
19/12/2017	18:00:00	9.00	7.50	Dry	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)
9.00	200	7.50	200

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark
4.50	4.90	01:00	

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)
4.20	1.90	20	4.00	

Water Added

Depth From (m)	Depth To (m)
4.20	7.00

Water Strike Remarks

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
SP	1	1.00	5.70	19/12/2017

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	0.20	1.10	50	Plain
Pipe1	1.10	5.70	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	0.05	Flush Cover	19/12/2017
0.05	0.20	Concrete	19/12/2017
0.20	1.00	Bentonite	19/12/2017
1.00	5.70	Gravel Backfill	19/12/2017
5.70	9.00	Bentonite	19/12/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 28/11/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-20**
	Fugro Reference	G170029U			
	Coordinates (m)	E503124.67 N177494.87	Ground Elevation (m Datum)	23.23	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)
1.20	S	0	N=5 (1,2/2,1,1,1)	450	CD1	75	0.00	Dry
2.20	S	0	N=10 (1,2/1,1,2,6)	450	CD1	75	2.10	Dry
3.20	S	0	N=8 (1,1/1,2,2,3)	450	CD1	75	3.00	Dry
4.20	S	0	N=36 (4,5/5,10,10,11)	450	CD1	75	4.10	0.0
5.20	S	0	N=21 (3,3/3,5,6,7)	450	CD1	75	5.10	0.0
6.70	S	0	N=17 (1,2/4,5,4,4)	450	CD1	75	6.60	0.0

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)
0.00	< 0.1
0.30	< 0.1
0.60	< 0.1
1.00	< 0.1
2.40	< 0.1
3.30	< 0.1
3.90	< 0.1
4.80	< 0.1
5.80	< 0.1
7.30	< 0.1

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion		Location ID	**HEP-BH-22**
	Client	Heathrow Airport Limited			
	Fugro Reference	G170029U			
	Coordinates (m)	E503492.64 N177835.20	Ground Elevation (m Datum) 23.64	Sheet 1 of 2	
	Hole Type	Cable Percussion		Status	Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.00 - 0.20	ES	1			MADE GROUND (Topsoil): dark greyish brown, slightly sandy, slightly gravelly clay. With frequent roots/rootlets. Gravel is subangular to subrounded, fine to coarse of flint.	(0.20)				
0.10	PID		< 0.1 ppm			0.20	23.44			
0.20 - 0.40	ES	2			[MADE GROUND] [CLAY]	(0.30)				
0.20	PID		< 0.1 ppm			0.50	23.14			
0.40 - 0.50	D	3			MADE GROUND: dark brown, slightly clayey, sandy gravel with low cobble content. Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of flint and brick. Cobbles are of whole bricks.					
0.50 - 0.90	B	4		1	[MADE GROUND] [GRAVEL]	(1.00)				
1.30 - 1.50	D	5			MADE GROUND: light reddish brown, silty, sandy gravel with low cobble content. With frequent fragments of wood (<60 mm). With occasional fragments of clinker (<60 mm) and ash (<60 mm). Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of flint, quartz, various lithologies (slate) and brick. Cobbles are of whole and half bricks.					
1.40	PID		< 0.1 ppm			1.50	22.14			
1.45 - 1.50	ES	6								
1.50 - 1.95	D	7								
1.50 - 2.00	B	8								
1.50 - 1.95	SPT		N = 7 (S)	2	[MADE GROUND] [WASTE, e.g. LANDFILL]					
2.30 - 2.40	ES	9			Between 0.50 m and 0.60 m; layer of tarmacadam (60 mm) with metal pipe (5 mm diameter).					
2.30	PID		< 0.1 ppm		Between 1.30 m and 1.40 m; with abundant fragments (<60 mm) of tile, ceramic, plastic bag, burnt wood, clinker and whole bricks.					
2.50 - 2.95	D	10			Between 1.40 m and 1.50 m; thin bed of dark greyish brown, slightly silty, very gravelly, sand with low cobble content. Sand is fine to coarse. Gravel is subangular to subrounded, fine to coarse of flint and brick. Cobbles are of whole bricks.					
2.50 - 2.95	SPT		N = 29 (S)	3						
3.20 - 3.45	ES	11			MADE GROUND: (probably soft), dark greyish brown and greenish brown and locally black, slightly sandy, gravelly, organic clay with low cobble content. With frequent pockets (<50 mm) of black, medium plasticity, sandy clay (20%). With some fragments (<60 mm) of brick, clinker, ash, plastic bags, wood, and tile. With metal pipes (<20mm). Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of flint. Cobbles are of brick.	(3.45)				
3.20	PID		< 0.1 ppm							
3.50 - 3.95	D	12								
3.50 - 3.95	SPT		N = 7 (S)							
4.00 - 4.20	D	15		4	[MADE GROUND] [WASTE, e.g. LANDFILL]					
4.00 - 4.50	B	13								
4.20 - 4.40	ES	14								
4.20	PID		< 0.1 ppm							
4.50 - 4.95	D	16								
4.50 - 4.95	SPT		N = 11 (S)							
5.20 - 5.40	ES	17		5	MADE GROUND: dark greyish brown, locally black and yellow, sandy, very clayey gravel with low cobble content. With occasional fragments of wood (<60 mm). Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of flint, quartz and various other lithologies. Cobbles are of brick.	4.95	18.69			
5.20	PID		< 0.1 ppm		[MADE GROUND] [GRAVEL]	(1.50)				
6.00 - 6.45	D	18		6						
6.00 - 6.45	SPT		N = 11 (S)							
6.60 - 6.80	ES	19			(Probably soft), fissured, dark greyish brown and locally black, slightly sandy, slightly gravelly, slightly organic CLAY. With occasional roots/rootlets. Organic content comprises occasional pockets (<50 mm) of fibrous peat and black, sandy clay. Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of flint. Fissures are indistinct.	6.45	17.19			
6.60	PID		< 0.1 ppm	7	[ALLUVIUM] [CLAY]	(0.85)				
7.50 - 7.95	D	20			Probably medium dense, multicoloured, slightly sandy GRAVEL. With occasional pockets (<50 mm) of slightly sandy clay. Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of flint.	7.30	16.34			
7.50 - 7.95	SPT		N = 15 (S)			(0.70)				
8.00 - 8.60	B	22		8	[RIVER TERRACE DEPOSITS] [GRAVEL]	8.00	15.64			
8.00 - 8.60	ES	23			Dark grey GRAVEL. Gravel is subangular to subrounded, fine to coarse of flint, chert and quartz.					
8.00	PID		< 0.1 ppm							
8.20	D	21			[RIVER TERRACE DEPOSITS] [GRAVEL]	(0.70)				
9.00 - 9.45	UT	24	40/450 mm	9	Soft, dark grey, slightly gravelly CLAY. Gravel is subangular, fine of flint chert and quartz. (Gravel possibly brought down during boring from stratum above).	8.70	14.94			
9.50	D	25			[LONDON CLAY FORMATION] [CLAY]					
9.60 - 10.20	B	27								
9.60 - 10.20	ES	28								
9.60	PID		< 0.1 ppm			(2.25)				
9.70	D	26								

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Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-22**
	Fugro Reference	G170029U			
	Coordinates (m)	E503492.64 N177835.20	Ground Elevation (m Datum)	23.64	Sheet 2 of 2
	Hole Type	Cable Percussion			Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
10.50 - 10.95 10.50 - 10.95	D SPT	29	N = 27 (S)		Soft, dark grey, slightly gravelly CLAY. Gravel is subangular, fine of flint chert and quartz. (Gravel possibly brought down during boring from stratum above). [LONDON CLAY FORMATION] [CLAY]					
				11	End of Borehole at 10.95 m	10.95	12.69			
				12						
				13						
				14						
				15						
				16						
				17						
				18						
				19						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-22**
Fugro Reference	G170029U			
Coordinates (m)	E503492.64 N177835.20	Ground Elevation (m Datum)	23.64	Sheet 1 of 1
Hole Type	Cable Percussion			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	20/11/2017	20/11/2017	Hand-dug			GD	AK	
1.20	10.95	CP	20/11/2017	23/11/2017	Dando 3000			GD	AK	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
20/11/2017	08:15:00	0.00			
20/11/2017	18:00:00	1.50	1.50	Dry	
21/11/2017	08:00:00	1.50	1.50	Dry	
21/11/2017	16:00:00	7.95	7.50	7.60	
22/11/2017	08:00:00	7.95	7.50	7.50	
22/11/2017	18:00:00	10.95	10.50	Dry	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)
10.95	200	10.50	200

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)
4.50	4.30	20	4.50	

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
SP	1	2.90	6.50	23/11/2017

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	0.16	3.00	50	Plain
Pipe1	3.00	6.50	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	0.05	Flush Cover	23/11/2017
0.05	0.20	Concrete	23/11/2017
0.20	2.90	Bentonite	23/11/2017
2.90	6.50	Gravel Backfill	23/11/2017
6.50	10.95	Bentonite	23/11/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 28/11/2018

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-22**
Fugro Reference	G170029U			
Coordinates (m)	E503492.64 N177835.20	Ground Elevation (m Datum)	23.64	Sheet 1 of 1
Hole Type	Cable Percussion			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)
1.50	S	0	N=7 (3,2/2,1,2,2)	450	EQU1616	66	1.50	Dry
2.50	S	0	N=29 (2,1/2,4,6,17)	450	EQU1616	66	2.50	Dry
3.50	S	0	N=7 (1,1/3,1,2,1)	450	EQU1616	66	3.50	Dry
4.50	S	0	N=11 (1,2/2,2,2,5)	450	EQU1616	66	4.50	4.30
6.00	S	0	N=11 (2,2/2,2,2,5)	450	EQU1616	66	6.00	5.50
7.50	S	0	N=15 (1,2/2,3,4,6)	450	EQU1616	66	7.50	Dry
10.50	S	0	N=27 (3,4/6,7,6,8)	450	EQU1616	66	10.50	Dry

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)
0.10	< 0.1
0.20	< 0.1
1.40	< 0.1
2.30	< 0.1
3.20	< 0.1
4.20	< 0.1
5.20	< 0.1
6.60	< 0.1
8.00	< 0.1
9.60	< 0.1

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion		Location ID	**HEP-BH-23**
	Client	Heathrow Airport Limited			
	Fugro Reference	G170029U			
	Coordinates (m)	E503607.08 N177882.14	Ground Elevation (m Datum) 22.37	Sheet 1 of 2	
	Hole Type	Cable Percussion		Status	Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.20 - 0.30	ES	1			MADE GROUND (Topsoil): (soft), brown, clay. [MADE GROUND] [CLAY]	(0.30)				
0.20	PID		< 0.1 ppm			0.30	22.07			
0.30 - 0.40	D	2			MADE GROUND: brown, gravelly sand. With rare fragments of glass (<20x70 mm), china crockery (<50x50 mm) and ash (<40x40 mm). Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of flint, concrete and brick. [MADE GROUND] [SAND]					
0.40 - 0.50	LB	3								
0.90 - 1.00	D	5		1		(1.35)				
1.00	ES	4								
1.00 - 1.10	LB	6								
1.00	PID		< 0.1 ppm							
1.20 - 1.65	B	8								
1.50 - 1.95	D	7								
1.50 - 1.95	SPT		N = 26 (S)			1.65	20.72			
1.65 - 2.10	B	10			Medium dense, brownish grey, sandy GRAVEL. With occasional shell fragments (<3x3 mm). Sand is fine and medium. Gravel is angular and subangular, fine and medium of flint and chert. [RIVER TERRACE DEPOSITS] [GRAVEL]					
2.00 - 2.10	ES	9		2						
2.00	PID		< 0.1 ppm							
2.10	D	11								
2.50 - 2.90	B	14				(1.85)				
2.50 - 2.95	D	12								
2.50 - 2.95	SPT		N = 21 (S)							
2.70 - 3.00	ES	15								
2.70	PID		< 0.1 ppm	3						
2.80	D	13			Below 3.00 m; becoming slightly sandy. Gravel is fine to coarse.					
3.50 - 3.95	D	16				3.50	18.87			
3.50 - 4.00	B	18			Loose, dark grey and black, sandy GRAVEL. Gravel is subangular and subrounded, fine to coarse of flint and chert. [RIVER TERRACE DEPOSITS] [GRAVEL]					
3.50 - 3.95	SPT		N = 6 (C)							
3.80	D	17								
3.80 - 4.00	ES	19		4						
3.80	PID		< 0.1 ppm			(1.20)				
4.50 - 5.00	B	21								
4.80	D	20				4.70	17.67			
4.80 - 5.00	ES	22			Light grey brown, slightly sandy, gravelly, very silty CLAY with low cobble content. Gravel is subangular and subrounded, fine to coarse of flint and chert. Cobbles (70x80 mm) are of light brownish grey claystone. (Gravel possibly brought down during boring from stratum above). [LONDON CLAY FORMATION] [CLAY]					
4.80	PID		< 0.1 ppm	5						
5.00 - 5.45	UT	23	54/450 mm			(1.00)				
5.50	D	24								
5.70 - 6.20	B	26				5.70	16.67			
5.80	D	25			Firm, brownish grey, slightly gravelly CLAY. Gravel is subangular, fine and medium of flint and chert. (Gravel possibly brought down during boring from stratum above). [LONDON CLAY FORMATION] [CLAY]					
5.80 - 6.00	ES	27		6						
5.80	PID		< 0.1 ppm			(0.70)				
6.50 - 6.95	D	28				6.40	15.97			
6.50 - 7.00	B	30			Firm, brown grey, slightly sandy, very silty CLAY. [LONDON CLAY FORMATION] [CLAY]					
6.50 - 6.95	SPT		N = 16 (S)							
6.80	D	29		7						
7.50 - 8.00	B	32								
7.80	D	31								
8.00 - 8.45	UT	34	47/450 mm	8						
8.50	D	33								
8.50 - 9.00	B	37								
8.80	D	36								
8.80 - 9.00	ES	35								
8.80	PID		< 0.1 ppm	9						
9.50 - 10.00	B	40								
9.50 - 9.95	D	38								
9.50 - 9.95	SPT		N = 24 (S)							
9.80	D	39								

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Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion		Location ID
	Client	Heathrow Airport Limited		**HEP-BH-23**
	Fugro Reference	G170029U		
	Coordinates (m)	E503607.08 N177882.14	Ground Elevation (m Datum) 22.37	Sheet 2 of 2
	Hole Type	Cable Percussion		Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
					Firm, brown grey, slightly sandy, very silty CLAY. [LONDON CLAY FORMATION] [CLAY]					
10.50 - 11.00	B	44								
10.80	D	43								
11.00 - 11.45	UT	41	49/450 mm	11		(9.05)				
11.50	D	42								
11.50 - 12.00	B	47								
11.70 - 12.00	ES	45								
11.70	PID		< 0.1 ppm							
11.80	D	46		12						
12.50 - 13.00	B	49								
12.80	D	48								
13.00 - 13.45	D	50		13						
13.00 - 13.45	SPT		N = 17 (S)							
13.50 - 14.00	B	52								
13.80	D	51								
				14						
14.50 - 15.00	B	54								
14.80	D	53								
14.80 - 15.00	ES	55								
14.80	PID		< 0.1 ppm	15						
15.00 - 15.45	UT	57	46/450 mm							
15.45	D	56			End of Borehole at 15.45 m	15.45	6.92			
				16						
				17						
				18						
				19						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-23**
Fugro Reference	G170029U			
Coordinates (m)	E503607.08 N177882.14	Ground Elevation (m Datum)	22.37	Sheet 1 of 1
Hole Type	Cable Percussion			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	30/11/2017	30/11/2017	Hand-dug			GD	LG	
1.20	15.45	CP	05/12/2017	07/12/2017	Dando 3000			GD	PC	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
30/11/2017	08:00:00	0.00			
30/11/2017	18:00:00	1.20		Dry	
05/12/2017	08:00:00	1.20			
05/12/2017	18:00:00	4.50	4.50	Dry	
06/12/2017	08:00:00	4.50	4.50	Dry	
06/12/2017	18:00:00	15.45	15.00	14.90	
07/12/2017	08:00:00	15.45	15.00	1.70	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)
5.00	200	5.00	200
15.45	150	15.45	150

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)

Water Added

Depth From (m)	Depth To (m)
1.65	4.50

Water Strike Remarks

Groundwater was not encountered during excavation or boring.

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located. The inspection pit was backfilled with arisings before being progressed by cable percussion.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
SP	1	2.90	4.70	07/12/2017

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	0.16	3.00	50	Plain
Pipe1	3.00	4.70	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	0.05	Flush Cover	07/12/2017
0.05	0.20	Concrete	07/12/2017
0.20	2.90	Bentonite	07/12/2017
2.90	4.70	Gravel Backfill	07/12/2017
4.70	15.45	Bentonite	07/12/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 28/11/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-23**
	Fugro Reference	G170029U			
	Coordinates (m)	E503607.08 N177882.14	Ground Elevation (m Datum)	22.37	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)
1.50	S	0	N=26 (3,3/6,6,7,7)	450	EQU1616	66	1.50	Dry
2.50	S	0	N=21 (4,4/5,7,4,5)	450	EQU1616	66	2.50	0.00
3.50	C	0	N=6 (1,1/1,1,2,2)	450	EQU1616	66	3.50	0.00
6.50	S	0	N=16 (3,3/4,4,4,4)	450	EQU1616	66	6.50	Dry
9.50	S	0	N=24 (3,5/5,6,6,7)	157	EQU1616	66	9.50	Dry
13.00	S	0	N=17 (4,4/3,4,5,5)	153	EQU1616	66	4.00	Dry

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)
0.20	< 0.1
1.00	< 0.1
2.00	< 0.1
2.70	< 0.1
3.80	< 0.1
4.80	< 0.1
5.80	< 0.1
8.80	< 0.1
11.70	< 0.1
14.80	< 0.1

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-24**
	Fugro Reference	G170029U			
	Coordinates (m)	E503368.58 N177623.37	Ground Elevation (m Datum)	26.60	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.25 - 0.30	ES	1			MADE GROUND (Topsoil): (soft) brown, slightly gravelly clay. Gravel is subangular and subrounded fine to coarse of flint. [MADE GROUND] [CLAY]	(0.25) 0.25	26.35			
0.25	PID		< 0.1 ppm		MADE GROUND: brown, slightly clayey, gravelly sand. With rare tape waste (70x100x150mm), plastic (40x40x40mm), china crockery (<50x50x10mm) and rare possible angular ACM (20x60x<100mm). Sand is fine to coarse. Gravel is subangular and subrounded fine to coarse of concrete and brick. [MADE GROUND] [SAND]	(0.95) 1.20	25.40			
0.30 - 0.40	D	2								
0.40 - 0.50	LB	3								
0.90 - 1.00	D	5								
1.00 - 1.10	ES	4		1						
1.00 - 1.10	LB	6								
1.00	PID		< 0.1 ppm		Between 0.25 m and 1.20 m; possible ACM fragments (20x60x<100 mm) noted.					
1.20 - 1.65	LB	7			Between 0.60 m and 0.70 m; with rare cobbles (80x90x<100 mm) of brick and concrete.	(0.50)				
1.20 - 1.58	SPT		50/225 mm (C)		MADE GROUND: obstruction (driller's description). [MADE GROUND]	1.70	24.90			
				2	End of Borehole at 1.70 m					
				3						
				4						
				5						
				6						
				7						
				8						
				9						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-24**
	Fugro Reference	G170029U			
	Coordinates (m)	E503368.58 N177623.37	Ground Elevation (m Datum)	26.60	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	27/11/2017	27/11/2017	Hand-dug			BH	LG	
1.20	1.70	CP	27/11/2017	27/11/2017	Dando 3000			BH	LG	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
27/11/2017	08:00:00	0.00			
27/11/2017	13:10:00	1.70			

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)
1.70	200		

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark
1.50	1.70	00:30	

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

Groundwater was not encountered during excavation or boring.

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	0.20	Concrete	27/11/2017
0.20	1.70	Bentonite	27/11/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 29/11/2018

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-24**
Fugro Reference	G170029U			
Coordinates (m)	E503368.58 N177623.37	Ground Elevation (m Datum)	26.60	Sheet 1 of 1
Hole Type	Cable Percussion			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)
1.20	C	0	50 (1,3/50 for 225mm)	375	EQU1616	66	0.00	Dry

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)
0.25	< 0.1
1.00	< 0.1

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-25**
	Fugro Reference	G170029U			
	Coordinates (m)	E503177.28 N177424.13	Ground Elevation (m Datum)	23.15	Sheet 1 of 2
	Hole Type	Cable Percussion			Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.20 - 0.30	ES	1			MADE GROUND (Topsoil): brown, slightly gravelly clay. Gravel is subangular and subrounded, fine to coarse of flint. [MADE GROUND] [CLAY]	(0.20) 0.20	22.95			
0.20	PID		< 0.1 ppm		MADE GROUND: orangish brown, slightly silty, slightly gravelly sand. Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of flint, brick and concrete. [MADE GROUND] [SAND]	(1.00)				
1.00	ES	4		1						
1.00	PID		< 0.1 ppm							
1.20	D	7			MADE GROUND: firm, dark grey mottled black, sandy, gravelly clay. With rare fragments of glass (4x5 mm), wood (4x70 mm) and plastic (5x5 mm). Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of concrete, brick and flint. [MADE GROUND] [CLAY]	1.20	21.95			
1.20 - 1.40	B	8								
1.40 - 1.50	ES	9								
1.40	PID		< 0.1 ppm							
1.50 - 1.95	D	10								
1.50 - 2.00	B	11				(1.40)				
1.50 - 1.95	SPT		N = 13 (S)	2						
2.00	D	12								
2.05 - 2.30	LB	13								
2.30 - 2.40	ES	14								
2.30	PID		< 0.1 ppm							
2.50 - 2.74	D	15				2.60	20.55			
2.50 - 3.00	B	16			Dense, black, locally sandy, GRAVEL. Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of flint. [RIVER TERRACE DEPOSITS] [GRAVEL]					
2.50 - 2.74	SPT		50/85 mm (S)							
3.00	D	17		3						
3.10 - 3.40	B	18								
3.40 - 3.50	ES	19								
3.40	PID		< 0.1 ppm							
3.50 - 4.00	B	20								
3.50 - 3.95	SPT		N = 41 (C)							
4.00	D	21		4						
4.10 - 4.40	B	22								
4.40 - 4.50	ES	23								
4.40	PID		< 0.1 ppm			(3.90)				
4.50 - 5.00	B	24								
4.50 - 4.95	SPT		N = 30 (C)							
5.00	D	25		5						
5.10 - 5.60	B	26								
5.60 - 5.70	ES	27								
5.60	PID		< 0.1 ppm							
6.00 - 6.50	B	28		6						
6.00 - 6.45	SPT		N = 33 (C)							
6.80	D	29			Firm and stiff, thinly laminated, greyish brown, slightly sandy CLAY. Sand is fine and medium. [LONDON CLAY FORMATION] [CLAY]	6.50	16.65			
7.00 - 7.40	B	30		7						
7.40 - 7.50	ES	31								
7.40	PID		< 0.1 ppm							
7.50 - 8.00	UT	32	88/450 mm							
8.00	D	33		8						
8.50	D	34			Between 8.50 m and 11.00 m; with frequent fragments (<5x7 mm) of claystone.					
8.60 - 8.90	B	35								
8.90 - 9.00	ES	36								
8.90	PID		< 0.1 ppm	9	Between 9.00 m and 9.50 m; with rare, randomly orientated, grey burrows (<1x6 mm).					
9.00 - 9.45	D	37								
9.00 - 9.50	B	38								
9.00 - 9.45	SPT		N = 26 (S)							

Continued next page

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-25**
Fugro Reference	G170029U			
Coordinates (m)	E503177.28 N177424.13	Ground Elevation (m Datum)	23.15	Sheet 2 of 2
Hole Type	Cable Percussion			Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
					Firm and stiff, thinly laminated, greyish brown, slightly sandy CLAY. Sand is fine and medium. [LONDON CLAY FORMATION] [CLAY]	(8.50)				
11.00 - 11.50	UT	39	93/450 mm	11	Below 11.00 m; becoming sandy. Sand is fine to coarse. Between 11.00 m and 14.00 m; with rare shell fragments (1x4 mm).					
11.50	D	40								
12.00	D	41		12	Between 12.00 m and 14.00 m; with rare fragments (<10x30 mm) of claystone. Below 12.00 m; with frequent lenses (<3x30 mm) of brown, medium sand.					
12.10 - 12.40	B	42								
12.40 - 12.50	ES	43								
12.40	PID		< 0.1 ppm							
13.00 - 13.45	D	44		13						
13.00 - 13.50	B	45								
13.00 - 13.45	SPT		N = 35 (S)							
14.00	D	46		14	Below 14.00 m; sandy. Sand is fine and medium.					
14.10 - 14.40	B	47								
14.40 - 14.50	ES	48								
14.40	PID		< 0.1 ppm							
14.50 - 15.00	UT	49	131/450 mm							
15.00	D	50		15	End of Borehole at 15.00 m	15.00	8.15			
				16						
				17						
				18						
				19						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-25**
Fugro Reference	G170029U			
Coordinates (m)	E503177.28 N177424.13	Ground Elevation (m Datum)	23.15	Sheet 1 of 1
Hole Type	Cable Percussion			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	30/11/2017	30/11/2017	Hand-dug			SB	LG	
1.20	15.00	CP	12/12/2017	13/12/2017	Dando 3000			SB	JJL	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
30/11/2017	08:00:00	0.00			
30/11/2017	18:00:00	1.20		Dry	
12/12/2017	08:00:00	1.20			
12/12/2017	18:00:00	7.50	7.10	7.03	
13/12/2017	08:00:00	7.50	7.10	Dry	
13/12/2017	18:00:00	15.00	7.10	Dry	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)
15.00	200	7.10	200

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark
2.40	2.50	01:00	

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)

Water Added

Depth From (m)	Depth To (m)
2.50	6.00

Water Strike Remarks

Groundwater was not encountered during excavation or boring. IDT Engineer noted slight groundwater seepage at 9.00 m (claystone, possible layer).

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
SP	1	3.00	6.50	13/12/2017

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	0.02	3.10	50	Plain
Pipe1	3.10	6.50	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	0.05	Flush Cover	13/12/2017
0.05	0.20	Concrete	13/12/2017
0.20	3.00	Bentonite	13/12/2017
3.00	6.50	Gravel Backfill	13/12/2017
6.50	15.00	Bentonite	13/12/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 28/11/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-25**
	Fugro Reference	G170029U			
	Coordinates (m)	E503177.28 N177424.13	Ground Elevation (m Datum)	23.15	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)
1.50	S	0	N=13 (1,1/2,2,4,5)	450	EQU306	73	1.50	Dry
2.50	S	0	50 (5,18/50 for 85mm)	235	EQU306	73	2.50	Dry
3.50	C	0	N=41 (2,6/6,7,13,15)	450	EQU306	73	3.10	2.65
4.50	C	0	N=30 (2,5/4,6,10,10)	450	EQU306	73	4.50	3.65
6.00	C	0	N=33 (3,5/6,6,10,11)	450	EQU306	73	6.00	3.90
9.00	S	0	N=26 (2,4/5,5,7,9)	450	EQU306	73	7.10	9.00
13.00	S	0	N=35 (2,4/6,6,9,14)	450	EQU306	73	7.10	Dry

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)
0.20	< 0.1
1.00	< 0.1
1.40	< 0.1
2.30	< 0.1
3.40	< 0.1
4.40	< 0.1
5.60	< 0.1
7.40	< 0.1
8.90	< 0.1
12.40	< 0.1
14.40	< 0.1

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion		Location ID	**HEP-BH-27**
	Client	Heathrow Airport Limited			
	Fugro Reference	G170029U			
	Coordinates (m)	E503313.83 N177445.04	Ground Elevation (m Datum) 21.80	Sheet 1 of 2	
	Hole Type	Cable Percussion		Status	Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
					TOPSOIL: (soft), brown clay.	(0.20)				
0.20 - 0.30	ES	1			[TOPSOIL] [CLAY]	0.20	21.60			
0.20	PID		< 0.1 ppm		MADE GROUND: (soft), brown, cobbly sandy very clayey gravel. Sand is fine to coarse. Gravel is subangular to subrounded, fine to coarse of flint and brick. (Driller noted boulders of concrete). [MADE GROUND] [CLAY]					
0.30 - 0.40	D	2								
0.40 - 0.50	LB	3								
1.00	ES	4		1						
1.00 - 1.10	D	5								
1.00 - 1.10	LB	6								
1.00	PID		< 0.1 ppm							
1.20 - 2.00	D	8				(2.60)				
1.20 - 2.00	ES	7								
1.20 - 2.00	LB	9								
1.20	PID		< 0.1 ppm	2						
2.80 - 2.90	D	11				2.80	19.00			
2.80 - 2.90	ES	10			Medium dense, brown and grey, slightly clayey, sandy GRAVEL. Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of flint. [RIVER TERRACE DEPOSITS] [GRAVEL]					
2.80 - 3.00	B	12		3						
2.80	PID		< 0.1 ppm							
3.20 - 3.65	B	13								
3.20 - 3.65	SPT		N = 16 (C)							
3.80 - 3.90	D	14								
3.80 - 3.90	ES	15								
3.80	PID		< 0.1 ppm	4						
4.20 - 4.65	B	16				(2.80)				
4.20 - 4.65	SPT		N = 15 (C)							
4.80 - 4.90	D	18								
4.80 - 4.90	ES	17								
4.80	PID		< 0.1 ppm	5						
5.20 - 5.65	B	19								
5.20 - 5.65	SPT		N = 12 (C)							
5.60 - 5.70	D	20				5.60	16.20			
5.60 - 5.70	ES	21			Soft, brown, slightly gravelly CLAY. Gravel is subangular and subrounded, fine to coarse of flint. (Gravel possibly brought down during boring from stratum above). [LONDON CLAY FORMATION] [CLAY]	(0.40)				
5.60 - 6.00	B	22								
5.60	PID		< 0.1 ppm	6		6.00	15.80			
6.50 - 6.60	D	24			Firm, brown slightly sandy, slightly gravelly CLAY with occasional medium cobble content. [LONDON CLAY FORMATION] [CLAY]					
6.50 - 7.00	B	23			Between 6.50 m and 6.60 m; with nodule (<100x100x100 mm) of claystone.					
6.50 - 7.00	UTF		20/0 mm							
7.00 - 7.10	ES	25		7						
7.00	PID		< 0.1 ppm							
7.50 - 7.95	UT	26	40/450 mm							
7.50 - 8.00	B	28								
7.95 - 8.00	D	27		8						
8.50 - 9.00	B	29								
9.00 - 9.45	D	30		9						
9.00 - 9.45	SPT		N = 19 (S)							
9.50 - 10.00	B	31								
10.00 - 10.10	ES	32								
10.00	PID		< 0.1 ppm		Continued next page					

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-27**
	Fugro Reference	G170029U			
	Coordinates (m)	E503313.83 N177445.04	Ground Elevation (m Datum)	21.80	Sheet 2 of 2
	Hole Type	Cable Percussion			Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
					Firm, brown slightly sandy, slightly gravelly CLAY with occasional medium cobble content. [LONDON CLAY FORMATION] [CLAY]					
10.50 - 10.85	UT	33	85/450 mm			(9.00)				
10.50 - 11.00	B	35								
10.85 - 10.90	D	34		11						
11.50 - 12.00	B	36								
12.00 - 12.10	D	37		12						
12.50 - 12.95	D	38			Below 12.50 m; stiff.					
12.50 - 13.00	B	39								
12.50 - 12.95	SPT		N = 28 (S)							
13.00 - 13.10	ES	40		13						
13.00	PID		< 0.1 ppm							
13.50 - 13.60	D	42								
13.50 - 14.00	B	41								
				14						
14.50 - 14.90	UT	43	100/450 mm							
14.50 - 15.00	B	45								
14.90 - 14.95	D	44		15	End of Borehole at 15.00 m	15.00	6.80			
				16						
				17						
				18						
				19						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-27**
Fugro Reference	G170029U			
Coordinates (m)	E503313.83 N177445.04	Ground Elevation (m Datum)	21.80	Sheet 1 of 1
Hole Type	Cable Percussion			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	01/12/2017	01/12/2017	Hand-dug			BH	LG	
1.20	15.00	CP	01/12/2017	04/12/2017	Dando 3000			BH	LG	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
01/12/2017	08:00:00	0.00			
01/12/2017	18:00:00	6.00	6.00	3.50	
04/12/2017	08:00:00	6.00	6.00	2.92	
04/12/2017	13:30:00	15.00	6.00	Dry	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)
15.00	200	6.00	200

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark
1.20	1.40	00:30	Concrete obstruction

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)
2.20	2.15	20	2.00	5.60

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
SP	1	2.80	5.60	04/12/2017

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	0.04	3.00	50	Plain
Pipe1	3.00	5.60	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	0.05	Flush Cover	04/12/2017
0.05	0.50	Concrete	04/12/2017
0.50	2.80	Bentonite	04/12/2017
2.80	5.60	Gravel Backfill	04/12/2017
5.60	15.00	Bentonite	04/12/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 28/11/2018

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-27**
Fugro Reference	G170029U			
Coordinates (m)	E503313.83 N177445.04	Ground Elevation (m Datum)	21.80	Sheet 1 of 1
Hole Type	Cable Percussion			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)
3.20	C	0	N=16 (2,4/5,4,4,3)	450	EQU1616	66	3.10	2.50
4.20	C	0	N=15 (1,2/2,3,4,6)	450	EQU1616	66	4.10	2.00
5.20	C	0	N=12 (1,1/3,3,3,3)	450	EQU1616	66	5.10	1.70
9.00	S	0	N=19 (1,3/3,4,5,7)	450	EQU1616	66	6.00	Dry
12.50	S	0	N=28 (3,4/6,7,7,8)	450	EQU1616	66	6.00	Dry

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)
0.20	< 0.1
1.00	< 0.1
1.20	< 0.1
2.80	< 0.1
3.80	< 0.1
4.80	< 0.1
5.60	< 0.1
7.00	< 0.1
10.00	< 0.1
13.00	< 0.1

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion		Location ID	**HEP-BH-32**
	Client	Heathrow Airport Limited			
	Fugro Reference	G170029U			
	Coordinates (m)	E503703.11 N177756.61	Ground Elevation (m Datum) 23.74	Sheet 1 of 2	
	Hole Type	Cable Percussion		Status	Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.00 - 0.55	LB	2			MADE GROUND: dark brown, slightly sandy, clayey gravel. With occasional and frequent rootlets (<3x10x80 mm). With some and frequent fragments of mixed plastic (<15x25 mm) (15%), wood (<5x25 mm) (10%) and ceramic (<60 mm) (5%). Sand is fine and medium. Gravel is subangular to subrounded, fine to coarse of flint, chert, concrete and brick. [MADE GROUND] [WASTE, e.g. LANDFILL]	(0.55)				
0.20 - 0.40	ES	3								
0.20	PID		< 0.1 ppm							
0.30	D	1				0.55	23.19			
0.60 - 1.20	LB	6								
0.70	D	5				(0.65)				
1.00 - 1.20	ES	7		1	MADE GROUND: brown, slightly silty gravel (65%). With frequent rootlets (<2x10x100 mm). With frequent fragments of mixed plastic (15x30 mm) (15%) and mixed metals (<5x15 mm) (15%). With occasional fragments of wood and rubber (<10x10 mm) (5%), and rare cable casing and wire. Gravel is subangular and subrounded, fine to coarse of flint, chert, concrete and brick. [MADE GROUND] [WASTE, e.g. LANDFILL]					
1.00	PID		< 0.1 ppm			1.20	22.54			
1.50 - 1.95	D	4								
1.50 - 1.95	SPT		N = 9 (S)							
2.20 - 2.60	LB	11		2	MADE GROUND: brown, clayey gravel (84%) With occasional rootlets (<1x10x50 mm). With some fragments of mixed plastic (5x5 mm) (5%) and mixed metal (<5x10 mm) (10%), and rare wood. Gravel is subangular and subrounded, fine to coarse of flint, chert, concrete and brick. [MADE GROUND] [WASTE, e.g. LANDFILL]	(2.30)				
2.30	D	10								
2.30 - 2.50	ES	13								
2.30	PID		< 0.1 ppm							
2.50 - 2.95	SPT		N = 17 (S)							
3.00 - 3.50	LB	14		3						
3.30	D	13								
3.30 - 3.50	ES	16								
3.30	PID		< 0.1 ppm		MADE GROUND: dark grey, slightly sandy, gravelly, silty clay. With rare ceramic. Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of flint, quartz, chert, concrete, brick. [MADE GROUND] [CLAY]	3.50	20.24			
3.50 - 3.80	D	8								
3.50 - 3.80	SPT		N = 9 (S)							
4.30 - 5.00	LB	17		4		(1.50)				
4.40	D	16								
4.40 - 4.60	ES	19								
4.40	PID		< 0.1 ppm							
4.50 - 4.95	D	9								
4.50 - 4.95	SPT		N = 7 (S)							
5.30 - 5.60	ES	22		5	MADE GROUND: gravel. Gravel is angular and subangular, fine to coarse of flint, chert and slag. [MADE GROUND] [GRAVEL]	5.00	18.74			
5.30 - 5.90	LB	20								
5.30	PID		< 0.1 ppm			(1.10)				
5.40	D	19								
6.30 - 7.00	LB	24		6	Very soft, grey, slightly sandy, gravelly, silty CLAY. Sand is fine. Gravel is subangular and subrounded, fine to coarse of flint and chert. [ALLUVIUM] [CLAY]	6.10	17.64			
6.40	D	23								
6.40 - 6.70	ES	26								
6.40	PID		< 0.1 ppm			(1.40)				
7.50	D	26		7	Loose/medium dense brownish grey, silty, sandy GRAVEL. Sand is fine and medium. Gravel is subangular and subrounded, fine to coarse of mixed lithologies. [RIVER TERRACE DEPOSITS] [GRAVEL]	7.50	16.24			
7.50 - 7.65	D	22								
7.50 - 7.70	ES	29								
7.50 - 8.00	B	27								
7.50 - 7.95	SPT		N = 10 (S)							
7.50	PID		< 0.1 ppm	8		(1.00)				
8.50 - 8.80	ES	31				8.50	15.24			
8.50	PID		< 0.1 ppm		Firm and stiff, dark grey, slightly gravelly CLAY. Gravel is subangular and subrounded, fine and medium of flint and chert. (Gravel possibly brought down during boring from stratum above). [LONDON CLAY FORMATION] [CLAY]					
8.70	D	29								
9.00 - 9.45	UT	31	40/450 mm	9						
9.45	D	32								
9.50 - 9.80	ES	36								
9.50	PID		< 0.1 ppm			(2.45)				
9.70	D	33								
9.70 - 10.20	LB	34								

Continued next page

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion		Location ID
	Client	Heathrow Airport Limited		**HEP-BH-32**
	Fugro Reference	G170029U		
	Coordinates (m)	E503703.11 N177756.61	Ground Elevation (m Datum) 23.74	Sheet 2 of 2
	Hole Type	Cable Percussion		Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
10.50 - 10.95	SPT		N = 25 (S)		Firm and stiff, dark grey, slightly gravelly CLAY. Gravel is subangular and subrounded, fine and medium of flint and chert. (Gravel possibly brought down during boring from stratum above). [LONDON CLAY FORMATION] [CLAY]					
				11	End of Borehole at 10.95 m	10.95	12.79			
				12						
				13						
				14						
				15						
				16						
				17						
				18						
				19						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-32**
Fugro Reference	G170029U			
Coordinates (m)	E503703.11 N177756.61	Ground Elevation (m Datum)	23.74	Sheet 1 of 1
Hole Type	Cable Percussion			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	28/11/2017	28/11/2017	Hand-dug			PC	PC	
1.20	10.95	CP	28/11/2017	30/11/2017	Dando 3000			GD	PC	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
28/11/2017	08:00:00	0.00			
28/11/2017	18:00:00	5.00	5.00	4.00	
29/11/2017	08:00:00	5.00	5.00	3.50	
29/11/2017	18:00:00	8.00	8.00	7.50	
30/11/2017	08:00:00	8.00	8.00	6.30	
30/11/2017	18:00:00	10.95	10.50	Dry	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)
10.95	200	10.50	200

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)
3.30	2.70	20	3.00	
4.60	3.50	20	4.50	

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located. The rig stood for 5.5 hours on 29/11/18, borehole at 5.00 m, due to gas emitting from the borehole.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
SP	1	1.10	4.50	30/11/2017

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	0.08	1.20	50	Plain
Pipe1	1.20	4.50	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	0.05	Flush Cover	30/11/2017
0.05	0.20	Concrete	30/11/2017
0.20	1.10	Bentonite	30/11/2017
1.10	4.50	Gravel Backfill	30/11/2017
4.50	10.95	Bentonite	30/11/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 28/11/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-32**
	Fugro Reference	G170029U			
	Coordinates (m)	E503703.11 N177756.61	Ground Elevation (m Datum)	23.74	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)
1.50	S	0	N=9 (1,1/2,2,2,3)	450	EQU1616	66	1.50	Dry
2.50	S	0	N=17 (2,2/6,5,3,3)	450	EQU1616	66	2.50	Dry
3.50	S	0	N=9 (4 for 4mm/2,2,2,3)	304	EQU1616	66	3.50	2.70
4.50	S	0	N=7 (1,1/1,2,2,2)	450	EQU1616	66	4.50	3.50
7.50	S	0	N=10 (2,2/2,3,3,2)	153	EQU1616	66	7.50	7.30
10.50	S	0	N=25 (4,4/5,6,7,7)	450	EQU1616	66	10.50	Dry

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)
0.20	< 0.1
1.00	< 0.1
2.30	< 0.1
3.30	< 0.1
4.40	< 0.1
5.30	< 0.1
6.40	< 0.1
7.50	< 0.1
8.50	< 0.1
9.50	< 0.1

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-33**
	Fugro Reference	G170029U			
	Coordinates (m)	E503655.42 N177561.15	Ground Elevation (m Datum)	24.12	Sheet 1 of 1
	Hole Type	Hollow Stem Auger			Status: Final

Sampling and In Situ Testing					Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Run Depth (m) (Recovery) (%)	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.05 - 0.15	B	3				MADE GROUND (Topsoil): brown, slightly clayey, slightly gravelly sand. Sand is fine to coarse. Gravel is subangular and subrounded, fine and medium of flint, brick and concrete.	(0.25)				
0.05 - 0.15	ES	1				[MADE GROUND] [SAND]	0.25	23.87			
0.05	PID		< 0.1 ppm			Between 0.20 m and 0.35 m; concrete obstruction (pit diverted).					
0.10	D	2				MADE GROUND: brown, slightly gravelly, sand with low cobble content. Sand is medium. Gravel is subangular to rounded, fine to coarse of flint, aggregate and concrete. Cobbles are (60x60x70 mm) of flint and aggregate.					
0.30 - 0.40	ES	4				[MADE GROUND] [SAND]					
0.30	PID		< 0.1 ppm			Between 0.40 m and 0.50 m; thin bed of very stiff, orangish brown, slightly gravelly clay. Gravel is subangular to rounded, fine of flint.					
0.35	D	5					(1.25)				
0.40 - 0.50	B	6									
					1	Between 0.90 m and 1.00 m; with low cobble content. Cobbles (25x80x80 mm) are of brick. With 2 fragments of glass (4x20x50 mm) and a fragment of plastic cable (5x5x65 mm).					
						Between 1.00 m and 1.20 m; with low and medium cobble content. Cobbles (40x100x>120 mm) are of paving slab.					
1.20 - 1.50	D	9		1.20							
1.20 - 1.50	ES	7									
1.20 - 1.50	LB	8		(-)							
1.20	PID		< 0.1 ppm								
1.50 - 2.00	D	12		1.50		MADE GROUND: (firm and stiff), brown, slightly sandy, gravelly clay (70%). With frequent fragments (20%) of wood (<100x500 mm) (D3) and fabric (1000x2000 mm) (D2). With some (10%) plastic cups and bin lids (100x<200 mm) (D1). Sand is fine to coarse. Gravel is angular, fine to coarse of brick, concrete and ceramic.	1.50	22.62			
1.50 - 2.00	ES	10									
1.50 - 2.00	LB	11		(-)							
1.50	PID		< 0.1 ppm								
				2.00	2	[MADE GROUND] [WASTE, e.g. LANDFILL]	(1.00)				
				(-)							
2.50 - 3.00	D	15		2.50		MADE GROUND: (firm), greyish brown, slightly sandy, gravelly clay (89%). With occasional pockets (<60x60x60 mm) with black staining. With occasional fragments of wood (<40x40 mm) (D2) (5%), and glass (10x40x<50 mm) (5%). With rare plastic bags (<200x200 mm) (1%). Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of flint, pumice, concrete, brick and ceramic.	2.50	21.62			
2.50 - 3.00	ES	13									
2.50 - 3.00	LB	14		(-)							
2.50	PID		< 0.1 ppm				(0.70)				
				3.00	3	[MADE GROUND] [WASTE, e.g. LANDFILL]					
3.20 - 3.50	ES	16				Soft, brown locally mottled black, slightly gravelly, silty CLAY. Gravel is angular to rounded, mostly angular, fine to coarse of flint.	3.20	20.92			
3.20	PID		< 0.1 ppm	(-)			(0.30)				
3.40	D	18				[ALLUVIUM] [CLAY]					
3.40 - 3.50	B	17									
				3.50		End of Borehole at 3.50 m	3.50	20.62			
					4						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-33**
Fugro Reference	G170029U			
Coordinates (m)	E503655.42 N177561.15	Ground Elevation (m Datum)	24.12	Sheet 1 of 1
Hole Type	Hollow Stem Auger			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	01/12/2017	01/12/2017	Hand-dug			DW/DH	SF	
1.20	3.50	AUGH	07/01/2017	07/01/2017	Hollow stem (barrel) auger MC 3000			DW/DH	CM	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
01/12/2017	08:00:00	0.00			
01/12/2017	18:00:00	1.20		Dry	
07/12/2017	08:00:00	1.20		Dry	
07/12/2017	18:00:00	3.50	2.00	Dry	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)
3.50	350	2.00	350

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

Groundwater was not encountered during excavation or boring.

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located. The inspection pit was backfilled with arisings before being progressed by auger.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
SP	1	1.00	2.70	07/12/2017

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	0.05	1.00	50	Plain
Pipe1	1.00	2.70	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	0.05	Flush Cover	07/12/2017
0.05	0.20	Concrete	07/12/2017
0.20	1.00	Bentonite	07/12/2017
1.00	2.70	Gravel Backfill	07/12/2017
2.70	3.50	Bentonite	07/12/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 28/11/2018

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-33**
Fugro Reference	G170029U			
Coordinates (m)	E503655.42 N177561.15	Ground Elevation (m Datum)	24.12	Sheet 1 of 1
Hole Type	Hollow Stem Auger			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)
0.05	< 0.1
0.30	< 0.1
1.20	< 0.1
1.50	< 0.1
2.50	< 0.1
3.20	< 0.1

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion		Location ID	**HEP-BH-36**
	Client	Heathrow Airport Limited			
	Fugro Reference	G170029U			
	Coordinates (m)	E503806.28 N177762.75	Ground Elevation (m Datum) 22.36	Sheet 1 of 2	
	Hole Type	Cable Percussion		Status	Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.00 - 0.15	B	2			TOPSOIL: dark brown, silty, sandy gravel. With occasional shell fragments (<60 mm). Sand is fine and medium. Gravel is angular and subangular, fine to coarse of flint and chert. [TOPSOIL] [GRAVEL]	(0.25)				
0.10	D	1				0.25	22.11			
0.10 - 0.20	ES	3				(0.25)				
0.10	PID		< 0.1 ppm			0.50	21.86			
0.25 - 0.50	B	5			Dark brown, slightly sandy, clayey GRAVEL. With occasional shell fragments (<60 mm). Sand is fine and medium. Gravel is angular and subrounded, fine to coarse of flint and chert. [RIVER TERRACE DEPOSITS] [GRAVEL]					
0.40	D	4								
0.40 - 0.50	ES	6				(0.70)				
0.40	PID		< 0.1 ppm							
0.50 - 1.20	B	9		1						
1.00	D	8			Brown, slightly gravelly, clayey SAND. Sand is fine and medium. Gravel is subangular to rounded, fine to coarse of flint and chert. [RIVER TERRACE DEPOSITS] [SAND]	1.20	21.16			
1.00 - 1.10	ES	10								
1.00	PID		< 0.1 ppm							
1.50 - 1.80	D	7			Grey brown, sandy GRAVEL. With occasional shell fragments (<60 mm). Medium dense. Sand is fine and medium. Gravel is angular and subangular, fine to coarse of flint and chert. [RIVER TERRACE DEPOSITS] [GRAVEL]					
1.50 - 1.95	SPT		N = 14 (S)							
1.70 - 2.20	B	12								
2.00	D	11		2						
2.00 - 2.10	ES	13								
2.00	PID		< 0.1 ppm							
2.50 - 3.00	B	15								
2.50 - 2.95	SPT		N = 20 (C)							
2.90 - 3.00	ES	16								
2.90	PID		< 0.1 ppm	3						
3.00	D	14								
3.50 - 4.00	B	18								
3.50 - 3.95	SPT		N = 13 (C)							
						(5.00)				
3.90 - 4.00	ES	19								
3.90	PID		< 0.1 ppm	4						
4.00	D	17								
4.50 - 5.00	B	21								
4.50 - 4.95	SPT		N = 5 (C)		Between 4.50 m and 4.95 m; loose.					
4.90 - 5.00	ES	22								
4.90	PID		< 0.1 ppm	5						
5.00	D	20								
5.50 - 6.00	B	24								
5.90 - 6.00	ES	25								
5.90	PID		< 0.1 ppm	6						
6.00	D	23								
6.00 - 6.45	SPT		N = 17 (C)		Medium dense, dark greyish black, clayey GRAVEL. With occasional shell fragments (<60 mm). Gravel is subangular and subrounded, fine to coarse of flint and chert. [RIVER TERRACE DEPOSITS] [GRAVEL]	6.20	16.16			
6.50 - 7.00	B	27								
6.80	D	26				(1.00)				
6.90 - 7.00	ES	28								
6.90	PID		< 0.1 ppm	7						
					Firm and stiff, grey, slightly gravelly, slightly sandy CLAY. With rare thin laminations (1x3mm), and pockets (10x20mm) of light brown sand. Gravel is subangular and subrounded, fine to coarse of flint and chert. (Gravel possibly brought down during boring from stratum above). [LONDON CLAY FORMATION] [CLAY]	7.20	15.16			
7.50 - 7.95	UT	29	37/450 mm							
7.50 - 8.00	B	32								
7.80	D	31								
7.90 - 8.00	ES	33								
7.90	PID		< 0.1 ppm	8						
8.00	D	30								
8.50 - 9.00	B	35								
8.80	D	34								
8.90 - 9.00	ES	36								
8.90	PID		< 0.1 ppm	9						
9.00 - 9.45	D	37								
9.00 - 9.45	SPT		N = 23 (S)							
9.50 - 10.00	B	39								
9.80	D	38								
9.90 - 10.00	ES	40								
9.90	PID		< 0.1 ppm							

Continued next page

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-36**
	Fugro Reference	G170029U			
	Coordinates (m)	E503806.28 N177762.75	Ground Elevation (m Datum)	22.36	Sheet 2 of 2
	Hole Type	Cable Percussion			Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
					Firm and stiff, grey, slightly gravelly, slightly sandy CLAY. With rare thin laminations (1x3mm), and pockets (10x20mm) of light brown sand. Gravel is subangular and subrounded, fine to coarse of flint and chert. (Gravel possibly brought down during boring from stratum above). [LONDON CLAY FORMATION] [CLAY]					
10.50 - 11.20	B	44								
10.90	D	43								
11.00 - 11.45	UT	42	41/400 mm	11		(8.30)				
11.50	D	41								
11.70 - 12.20	B	46								
11.90	D	45		12						
12.50 - 13.00	B	48								
12.90	D	47								
12.90 - 13.00	ES	50		13						
12.90	PID		< 0.1 ppm							
13.00 - 13.45	D	49								
13.00 - 13.45	SPT		N = 35 (S)							
13.50 - 14.00	B	52								
13.90	D	51		14						
14.50 - 15.00	B	54								
14.90	D	53								
15.00 - 15.45	UT	55	46/450 mm	15						
15.50	D	56			End of Borehole at 15.50 m	15.50	6.86			
				16						
				17						
				18						
				19						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-36**
Fugro Reference	G170029U			
Coordinates (m)	E503806.28 N177762.75	Ground Elevation (m Datum)	22.36	Sheet 1 of 1
Hole Type	Cable Percussion			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	11/12/2017	11/12/2017	Hand-dug			GD	PC	
1.20	15.50	CP	01/12/2017	14/12/2017	Dando 3000			GD	PC	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
11/12/2017	08:15:00	0.00			
11/12/2017	18:00:00	3.50	3.50	3.20	
12/12/2017	08:00:00	3.50	3.50	2.00	
12/12/2017	18:00:00	13.45	13.00	11.00	
14/12/2017	08:00:00	13.45	13.00	11.00	
14/12/2017	12:00:00	15.50	15.00	13.00	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)
15.50	200	15.00	200

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)

Water Added

Depth From (m)	Depth To (m)
2.70	6.35

Water Strike Remarks

Groundwater was not encountered during excavation or boring.

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
SP	1	0.90	7.00	14/12/2017

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	0.10	1.00	50	Plain
Pipe1	1.00	7.00	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
-0.10	0.00	Upstanding Cover	14/12/2017
0.00	0.20	Concrete	14/12/2017
0.20	0.90	Bentonite	14/12/2017
0.90	7.00	Gravel Backfill	14/12/2017
7.00	15.50	Bentonite	14/12/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-36**
	Fugro Reference	G170029U			
	Coordinates (m)	E503806.28 N177762.75	Ground Elevation (m Datum)	22.36	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)
1.50	S	0	N=14 (3,3/3,4,4,3)	303	EQU1616	66	1.50	Dry
2.50	C	0	N=20 (3,3/4,4,5,7)	450	EQU1616	66	2.50	2.30
3.50	C	0	N=13 (2,3/3,3,3,4)	300	EQU1616	66	3.50	2.00
4.50	C	0	N=5 (4,4/2,1,1,1)	450	EQU1616	66	4.50	3.90
6.00	C	0	N=17 (2,2/3,4,4,6)	450	EQU1616	66	6.00	4.50
9.00	S	0	N=23 (3,4/4,6,6,7)	450	EQU1616	66	9.00	7.60
13.00	S	0	N=35 (4,6/7,9,9,10)	450	EQU1616	66	13.00	12.40

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)
0.10	< 0.1
0.40	< 0.1
1.00	< 0.1
2.00	< 0.1
2.90	< 0.1
3.90	< 0.1
4.90	< 0.1
5.90	< 0.1
6.90	< 0.1
7.90	< 0.1
8.90	< 0.1
9.90	< 0.1
12.90	< 0.1

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion			Location ID **HEP-BH-43**
	Client	Heathrow Airport Limited			
	Fugro Reference	G170029U			
	Coordinates (m)	E503649.49 N177475.77	Ground Elevation (m Datum)	21.83	Sheet 1 of 2
	Hole Type	Cable Percussion			Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.10	D	2			MADE GROUND: dark brown, slightly gravelly, sandy clay. With occasional fragments of timber (10x15x60 mm). Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of flint, concrete and aggregate. [MADE GROUND] [CLAY] Between 0.00 m and 0.15 m; with occasional roots (60x5x5 mm). Below 0.30 m; light brown and brown with low cobble content. Cobbles (65x70x100 mm) are of concrete.	(0.40)				
0.10 - 0.20	ES	1								
0.10 - 0.30	B	3								
0.10	PID		< 0.1 ppm			0.40	21.43			
0.40 - 0.50	ES	4								
0.40 - 0.60	D	6								
0.40	PID		< 0.1 ppm							
0.45	B	5		1						
					MADE GROUND: dark brown, slightly sandy, slightly gravelly clay with low cobble content. With a cloth strip (2x10x200 mm), metal bracket (2x20x150 mm), 2 metal nails (5x5x80 mm) and a metal bar (10x10x250 mm). Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of flint, brick and concrete. Cobbles are subangular concrete and brick (100x100x200 mm) [MADE GROUND] [CLAY] Between 0.40 m and 0.60 m; locally tending to sandy clay.	(1.30)				
						1.70	20.13			
1.90 - 2.00	ES	5								
1.90	PID		< 0.1 ppm	2						
					Yellowish brown, clayey, gravelly SAND. With occasional shell fragments (<2 mm). Sand is fine to coarse. Gravel is angular and subangular, fine and medium of flint and chert. [ALLUVIUM] [SAND]	(1.30)				
3.00	D	8		3		3.00	18.83			
					Very soft and soft, dark grey, slightly gravelly, sandy, silty CLAY. Sand is fine to coarse. Gravel is angular and subangular, fine to coarse of flint and chert. [ALLUVIUM] [CLAY]					
3.50 - 4.00	B	9				(1.00)				
3.50 - 3.95	SPT		N = 3 (S)							
3.90 - 4.00	ES	10								
3.90	PID		< 0.1 ppm	4		4.00	17.83			
4.00 - 4.20	B	12			Very soft, dark grey and grey, sandy SILT. With closely and very closely spaced, thin and thick laminations of dark orangish brown pseudofibrous peat. Strong organic odour. [ALLUVIUM] [SILT]	(0.20)				
4.00 - 4.20	ES	13				4.20	17.63			
4.00	PID		< 0.1 ppm							
4.10	D	11								
4.30 - 5.00	B	15			(Loose), dark greyish black GRAVEL. Gravel is subangular to rounded, fine to coarse of flint and chert. [RIVER TERRACE DEPOSITS] [GRAVEL]	(0.80)				
4.40	D	14								
4.50 - 4.95	SPT		N = 9 (C)							
4.90 - 5.00	ES	16		5		5.00	16.83			
4.90	PID		< 0.1 ppm		Firm and stiff, grey, slightly gravelly, silty CLAY. Gravel is angular and subangular, fine of flint and chert. (Gravel possibly brought down during boring from stratum above). [LONDON CLAY FORMATION] [CLAY]					
5.00 - 5.45	UT	17	42/450 mm							
5.50	D	18								
5.50 - 6.00	B	20								
5.60	D	19				(1.60)				
5.90 - 6.00	ES	21								
5.90	PID		< 0.1 ppm	6						
6.50 - 6.95	D	22								
6.50 - 7.00	B	24				6.60	15.23			
6.50 - 6.95	SPT		N = 13 (S)		Firm and stiff, grey, silty CLAY. [LONDON CLAY FORMATION] [CLAY]					
6.60	D	23								
6.90 - 7.00	ES	25		7						
6.90	PID		< 0.1 ppm							
7.50 - 8.00	B	28								
7.60	D	27								
7.80 - 8.00	ES	29								
7.80	PID		< 0.1 ppm							
8.00 - 8.45	UT	26	47/450 mm	8						
8.40 - 9.00	ES	32								
8.40	PID		< 0.1 ppm							
8.50 - 9.00	B	31								
8.60	D	30								
				9						
9.50 - 10.00	B	35								
9.50 - 9.95	D	33								
9.50 - 9.95	SPT		N = 16 (S)							
9.60	D	34								
9.90 - 10.00	ES	36								
9.90	PID		< 0.1 ppm		Continued next page					

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-43**
	Fugro Reference	G170029U			
	Coordinates (m)	E503649.49 N177475.77	Ground Elevation (m Datum)	21.83	Sheet 2 of 2
	Hole Type	Cable Percussion			Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
					Firm and stiff, grey, silty CLAY. [LONDON CLAY FORMATION] [CLAY]					
10.50 - 11.00	B	38								
10.60	D	37				(8.40)				
				11						
11.50 - 11.95	UT	42	49/450 mm							
11.50 - 12.00	B	40								
11.60	D	39								
12.00	D	41		12						
12.50 - 13.00	B	44								
12.60	D	43								
12.90 - 13.00	ES	46								
12.90	PID		< 0.1 ppm	13						
13.50 - 13.95	D	45								
13.50 - 14.00	B	48								
13.50 - 13.95	SPT		N = 18 (S)							
13.60	D	47		14						
14.50 - 14.95	UT	49	52/450 mm							
15.00	D	50		15	End of Borehole at 15.00 m	15.00	6.83			
				16						
				17						
				18						
				19						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-43**
Fugro Reference	G170029U			
Coordinates (m)	E503649.49 N177475.77	Ground Elevation (m Datum)	21.83	Sheet 1 of 1
Hole Type	Cable Percussion			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	13/12/2017	13/12/2017	Hand-dug			GD	AF	
1.20	15.00	CP	15/12/2017	18/12/2017	Dando 3000			GD	PC	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
13/12/2017	08:00:00	0.00			
13/12/2017	18:00:00	1.20		Dry	
15/12/2017	08:00:00	1.20		Dry	
15/12/2017	18:00:00	6.50	5.00	4.90	
18/12/2017	08:00:00	6.50	6.00	2.50	
18/12/2017	15:35:00	15.00	14.50	14.20	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)
15.00	200	14.50	200

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)
14.95	1.70	20	14.50	

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located. The inspection pit was backfilled with arisings before being progressed by cable percussion.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
SP	1	1.70	3.00	18/12/2017

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	0.13	1.80	50	Plain
Pipe1	1.80	3.00	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
-0.13	0.00	Upstanding Cover	18/12/2017
0.00	0.20	Concrete	18/12/2017
0.20	1.70	Bentonite	18/12/2017
1.70	3.00	Gravel Backfill	18/12/2017
3.00	15.00	Bentonite	18/12/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS				Print Date	28/11/2018

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-43**
Fugro Reference	G170029U			
Coordinates (m)	E503649.49 N177475.77	Ground Elevation (m Datum)	21.83	Sheet 1 of 1
Hole Type	Cable Percussion			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)
3.50	S	0	N=3 (1,1/1,0,1,1)	450	EQU1616	66	3.50	2.70
4.50	C	0	N=9 (2,2/2,2,2,3)	450	EQU1616	66	4.50	3.00
6.50	S	0	N=13 (2,2/3,3,3,4)	450	EQU1616	66	6.50	5.20
9.50	S	0	N=16 (1,2/2,4,4,6)	450	EQU1616	66	9.50	8.70
13.50	S	0	N=18 (3,4/4,5,5,4)	450	EQU1616	66	13.50	13.20

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)
0.10	< 0.1
0.40	< 0.1
1.90	< 0.1
3.90	< 0.1
4.00	< 0.1
4.90	< 0.1
5.90	< 0.1
6.90	< 0.1
7.80	< 0.1
8.40	< 0.1
9.90	< 0.1
12.90	< 0.1

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion		Location ID	**HEP-BH-44**
	Client	Heathrow Airport Limited			
	Fugro Reference	G170029U			
	Coordinates (m)	E503957.70 N177823.99	Ground Elevation (m Datum) 24.05	Sheet 1 of 2	
	Hole Type	Cable Percussion		Status	Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.10 - 0.20	D	2			MADE GROUND: black, slightly silty, slightly gravelly sand (89%) and locally black sandy silt (10%). With rare fragments of timber (20x40x80 mm) (<1%). Sand is fine to coarse. Gravel is subangular to rounded, fine to coarse of flint and brick. [MADE GROUND] [WASTE, e.g. LANDFILL]					
0.10 - 0.20	ES	1								
0.10 - 0.30	B	3								
0.10	PID		< 0.1 ppm			(1.20)				
					Below 0.60 m; becoming gravelly.					
					Between 0.60 m and 0.90 m; locally sandy silt (20%).					
1.00 - 1.10	ES	4		1						
1.00 - 1.20	B	6								
1.00	PID		< 0.1 ppm			1.20	22.85			
1.10 - 1.20	D	5			Medium dense and dense, grey and brown GRAVEL. Gravel is subangular and subrounded, fine to coarse of flint. [RIVER TERRACE DEPOSITS] [GRAVEL]					
1.20 - 1.30	ES	9								
1.20 - 1.65	D	7								
1.20 - 1.70	B	8								
1.20 - 1.53	SPT		50/205 mm (C)							
1.20	PID		< 0.1 ppm	2						
2.20 - 2.30	ES	12			Between 2.20 m and 2.30 m: thin bed of yellowish brown and locally grey gravel. Gravel is subangular and subrounded, fine to coarse of flint.					
2.20 - 2.65	D	10								
2.20 - 2.70	B	11								
2.20 - 2.65	SPT		N = 46 (C)							
2.20	PID		< 0.1 ppm							
				3						
3.20 - 3.30	ES	15								
3.20 - 3.65	D	13								
3.20 - 3.70	B	14								
3.20 - 3.65	SPT		N = 32 (C)							
3.20	PID		< 0.1 ppm							
				4						
4.20 - 4.30	ES	18				(6.00)				
4.20 - 4.65	B	17								
4.20 - 4.65	D	16								
4.20 - 4.65	SPT		N = 19 (C)							
4.20	PID		< 0.1 ppm							
				5						
5.20 - 5.65	D	19								
5.20 - 5.70	B	20								
5.20 - 5.70	ES	21								
5.20 - 5.65	SPT		N = 24 (C)							
5.20	PID		< 0.1 ppm							
				6						
6.20 - 6.30	D	22								
6.20 - 6.30	ES	23								
6.20	PID		< 0.1 ppm							
6.70 - 7.15	B	25								
6.70 - 7.15	D	24								
6.70 - 7.15	SPT		N = 10 (C)	7						
7.20 - 7.30	D	26			Firm, brown CLAY. With rare white specks (<1x1 mm). [LONDON CLAY FORMATION] [CLAY]	7.20	16.85			
7.20 - 7.30	ES	27								
7.20 - 8.00	B	28								
7.20	PID		< 0.1 ppm							
8.00 - 8.40	UT	29	50/400 mm	8	At 8.00 m; with nodule (<50x50x50 mm) of grey claystone.					
8.40 - 8.45	D	30								
				9						
9.50 - 9.95	D	31								
9.50 - 9.95	SPT		N = 20 (S)			(4.80)				
10.00 - 10.10	ES	32								
10.00	PID		< 0.1 ppm		Continued next page					

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-44**
Fugro Reference	G170029U			
Coordinates (m)	E503957.70 N177823.99	Ground Elevation (m Datum)	24.05	Sheet 2 of 2
Hole Type	Cable Percussion			Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
					Firm, brown CLAY. With rare white specks (<1x1 mm). [LONDON CLAY FORMATION] [CLAY]					
10.90 - 11.00	D	33		11						
11.50 - 11.90	UT	34	75/400 mm							
11.90 - 11.95	D	35								
12.00 - 12.50	B	36		12		12.00	12.05			
					Firm, dark brown CLAY. [LONDON CLAY FORMATION] [CLAY]					
12.90 - 13.00	D	37								
13.00 - 13.10	ES	38		13		(1.95)				
13.00	PID		< 0.1 ppm							
13.50 - 13.95	D	39								
13.50 - 13.95	SPT		N = 25 (S)							
				14	Stiff, brown and greyish brown CLAY. With occasional fragments (<50x50x50 mm) of claystone. [LONDON CLAY FORMATION] [CLAY]	13.95	10.10			
14.90 - 15.00	D	40		15						
15.50 - 15.90	UT	41	100/400 mm							
15.90 - 15.95	D	42								
16.00 - 16.10	ES	43		16						
16.00 - 16.50	B	44								
16.00	PID		< 0.1 ppm							
16.80 - 16.90	D	45								
				17		(6.05)				
17.50 - 17.95	D	46								
17.50 - 17.95	SPT		N = 28 (S)							
				18						
18.50 - 18.60	D	47								
19.00 - 19.10	ES	48		19						
19.00 - 19.50	B	49			Below 19.00 m; becoming brown.					
19.00	PID		< 0.1 ppm							
19.50 - 19.95	UT	50	120/450 mm							
19.95 - 20.00	D	51								
					End of Borehole at 20.00 m	20.00	4.05			

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-44**
Fugro Reference	G170029U			
Coordinates (m)	E503957.70 N177823.99	Ground Elevation (m Datum)	24.05	Sheet 1 of 1
Hole Type	Cable Percussion			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	18/12/2017	18/12/2017	Hand-dug			BH/JT	AF	
1.20	20.00	CP	03/01/2018	04/01/2018	Dando 3000			BH/JT	LG	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
18/12/2017	08:00:00	0.00			
18/12/2017	18:00:00	1.20		Dry	
03/01/2018	08:00:00	1.20		Dry	
03/01/2018	18:00:00	20.00	7.50	Dry	
04/01/2018	08:00:00	20.00	7.50	Dry	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)
20.00	150	7.50	150

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)

Water Added

Depth From (m)	Depth To (m)
1.20	4.00

Water Strike Remarks

Groundwater was not encountered during excavation or boring.

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located. The inspection pit was backfilled with arisings before being progressed by cable percussion.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
SP	1	1.20	7.00	04/01/2018

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	-0.33	1.40	50	Plain
Pipe1	1.40	7.00	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
-0.42	0.00	Upstanding Cover	04/01/2018
0.00	0.50	Concrete	04/01/2018
0.50	1.20	Bentonite	04/01/2018
1.20	7.00	Gravel Backfill	04/01/2018
7.00	20.00	Bentonite	04/01/2018

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 28/11/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-44**
	Fugro Reference	G170029U			
	Coordinates (m)	E503957.70 N177823.99	Ground Elevation (m Datum)	24.05	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)
1.20	C	0	50 (25 for 125mm/50 for 205mm)	330	EQU1616	66	0.00	Dry
2.20	C	0	N=46 (8,10/7,11,15,13)	450	EQU1616	66	2.10	1.50
3.20	C	0	N=32 (3,5/7,8,9,8)	450	EQU1616	66	3.10	2.50
4.20	C	0	N=19 (2,2/4,4,5,6)	450	EQU1616	66	4.10	3.00
5.20	C	200	N=24 (1,0/0,4,8,12)	450	EQU1616	66	5.10	3.00
6.70	C	0	N=10 (1,0/1,2,3,4)	450	EQU1616	66	6.60	3.50
9.50	S	0	N=20 (1,3/3,5,5,7)	450	EQU1616	66	7.50	Dry
13.50	S	0	N=25 (2,4/5,6,6,8)	450	EQU1616	66	7.50	Dry
17.50	S	0	N=28 (3,5/5,7,7,9)	450	EQU1616	66	7.50	Dry

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)
0.10	< 0.1
1.00	< 0.1
1.20	< 0.1
2.20	< 0.1
3.20	< 0.1
4.20	< 0.1
5.20	< 0.1
6.20	< 0.1
7.20	< 0.1
10.00	< 0.1
13.00	< 0.1
16.00	< 0.1
19.00	< 0.1

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-45**
	Fugro Reference	G170029U			
	Coordinates (m)	E503729.73 N177515.02	Ground Elevation (m Datum)	21.73	Sheet 1 of 2
	Hole Type	Cable Percussion			Status: Final

Sampling and In Situ Testing				Strata Details				Groundwater	
Depth (m)	Type	No.	Test Results	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.03	D	1		MADE GROUND: yellowish brown gravel within cellular geotextile system (50 mm thick). Gravel is angular to rounded, fine and medium of aggregate.	(0.15)				
0.20	D	2			0.15	21.58			
0.30 - 0.35	ES	3		[MADE GROUND] [GRAVEL]	(0.20)				
0.30	PID		< 0.1 ppm	At 0.12 m; black, synthetic, fibrous, geotextile membrane.	0.35	21.38			
0.35	D	4		MADE GROUND: light brown, sandy gravel. Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of flint, brick, concrete and possible limestone aggregate.	(0.15)	21.23			
0.35 - 0.45	B	5			0.50				
0.45 - 0.50	ES	6		[MADE GROUND] [GRAVEL]	(0.60)				
0.45	PID		< 0.1 ppm						
0.50	D	7			1.10	20.63			
0.60 - 1.00	B	8		MADE GROUND: grey, sandy gravel. Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of flint, brick and concrete.					
1.00 - 1.10	ES	9			(0.65)				
1.00	PID		< 0.1 ppm	[MADE GROUND] [GRAVEL]					
1.20	D	10			1.75	19.98			
1.25 - 1.40	B	11		MADE GROUND: (soft), dark grey mottled black, very clayey, very sandy gravel. Sand is fine to coarse. Gravel is subangular, fine and medium of brick and concrete.					
1.40 - 1.50	ES	12							
1.40	PID		< 0.1 ppm	[MADE GROUND] [CLAY]					
1.50 - 1.95	D	13							
1.50 - 2.00	B	14		Very soft, dark brownish grey,. slightly gravelly, sandy SILT With abundant shell fragments (<2x4 mm) and soft, brown peat. Sand is fine to coarse. Gravel is subangular, fine to coarse of flint.					
1.50 - 1.95	SPT		N = 8 (S)						
2.00	D	15		[ALLUVIUM] [SILT]					
2.10 - 2.40	B	16							
2.40 - 2.50	ES	17							
2.40	PID		< 0.1 ppm						
2.50 - 3.00	B	18							
2.50 - 2.95	SPT		N = 18 (C)	Medium dense to very dense, slightly clayey, sandy GRAVEL. Gravel is angular to subrounded, fine to coarse of flint.					
3.00	D	19			(2.65)				
3.10 - 3.40	B	20		[RIVER TERRACE DEPOSITS] [GRAVEL]					
3.40 - 3.50	ES	21							
3.40	PID		< 0.1 ppm						
3.50 - 4.00	B	22							
3.50 - 3.92	SPT		50/265 mm (C)						
4.00	D	23							
4.10 - 4.30	B	24							
4.30 - 4.40	ES	25							
4.30	PID		< 0.1 ppm		4.40	17.33			
4.40 - 4.50	D	26		Firm, thinly laminated, brown, slightly sandy, slightly gravelly CLAY. Sand is fine to coarse, mainly fine and medium. Gravel is subrounded, fine and medium of flint. (Gravel possibly brought down during boring from stratum above).					
4.50 - 4.95	D	27			(0.60)				
4.50 - 5.00	B	28							
4.50 - 4.95	SPT		N = 13 (S)	[LONDON CLAY FORMATION] [CLAY]					
5.00	D	29			5.00	16.73			
5.10 - 5.60	B	30		Firm and stiff, thinly laminated, greyish brown, slightly sandy CLAY. Sand is fine to coarse.					
				[LONDON CLAY FORMATION] [CLAY]					
				Between 5.00 m and 11.00 m; sand is fine and medium.					
5.60 - 5.70	ES	31							
5.60	PID		< 0.1 ppm						
6.00 - 6.50	UT	32	65/450 mm						
6.50	D	33							
7.50 - 7.95	D	34		Between 7.50 m and 8.10 m; with frequent burrows (<2x8 mm).					
7.50 - 8.00	B	35							
7.50 - 7.95	SPT		N = 22 (S)						
8.10	D	36		Between 8.10 m and 11.00 m; with occasional claystone nodules (5x8 mm).					
8.20 - 8.60	B	37							
8.60 - 8.70	ES	38							
8.60	PID		< 0.1 ppm						
9.00 - 9.50	UT	39	130/450 mm						
9.50	D	40							

Continued next page

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion		Location ID	**HEP-BH-45**
	Client	Heathrow Airport Limited			
	Fugro Reference	G170029U			
	Coordinates (m)	E503729.73 N177515.02	Ground Elevation (m Datum) 21.73	Sheet 2 of 2	
	Hole Type	Cable Percussion		Status	Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
					Firm and stiff, thinly laminated, greyish brown, slightly sandy CLAY. Sand is fine to coarse. [LONDON CLAY FORMATION] [CLAY]					
10.30	D	41								
10.40 - 10.70	B	42								
10.70 - 10.80	ES	43								
10.70	PID		< 0.1 ppm							
11.00 - 11.45	D	44		11						
11.00 - 11.50	B	45								
11.00 - 11.45	SPT		N = 33 (S)							
				12						
						(15.00)				
13.00 - 13.30	UT	46	150/300 mm	13						
13.30	D	47			Below 13.30 m; sand is fine and medium. With rare shell fragments (<1x3 mm).					
13.50	D	48								
13.60 - 13.80	B	49								
13.80 - 13.90	ES	50								
13.80	PID		< 0.1 ppm	14						
15.00 - 15.45	D	51		15						
15.00 - 15.50	B	52								
15.00 - 15.45	SPT		N = 45 (S)							
				16						
16.50	D	53			Below 16.50 m; with occasional claystone nodules (20x40 mm) and occasional lenses (<2x10 mm) of brown, fine sand.					
16.60 - 16.80	B	54								
16.80 - 16.90	ES	55								
16.80	PID		< 0.1 ppm							
17.00 - 17.50	UT	56	147/450 mm	17						
17.50	D	57								
				18						
19.00 - 19.45	D	58		19						
19.00 - 19.50	B	59								
19.00 - 19.45	SPT		N = 46 (S)							
19.50	D	60			Below 19.50 m; with occasional lenses (<3x12 mm) of brown fine sand.					
19.60 - 19.80	B	61								
19.80 - 19.90	ES	62								
19.80	PID		< 0.1 ppm							
					End of Borehole at 20.00 m	20.00	1.73			

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-45**
Fugro Reference	G170029U			
Coordinates (m)	E503729.73 N177515.02	Ground Elevation (m Datum)	21.73	Sheet 1 of 1
Hole Type	Cable Percussion			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	08/12/2017	08/12/2017	Hand-dug			SB	JJL	
1.20	20.00	CP	08/12/2017	09/12/2017	Dando 3000			SB	JJL	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
08/12/2017	08:00:00	0.00			
08/12/2017	18:00:00	7.50	7.35	5.60	
09/12/2017	08:00:00	7.50	7.35	1.40	
09/12/2017	18:00:00	20.00	12.27	18.40	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)
20.00	150	12.27	150

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)
0.40				
1.60	1.34	20	1.50	

Water Added

Depth From (m)	Depth To (m)
2.00	4.40

Water Strike Remarks

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
SP	1	2.00	4.40	09/12/2017

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	0.05	2.10	50	Plain
Pipe1	2.10	4.40	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	0.05	Flush Cover	09/12/2017
0.05	0.20	Concrete	09/12/2017
0.20	2.00	Bentonite	09/12/2017
2.00	4.40	Gravel Backfill	09/12/2017
4.40	20.00	Bentonite	09/12/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 28/11/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-45**
	Fugro Reference	G170029U			
	Coordinates (m)	E503729.73 N177515.02	Ground Elevation (m Datum)	21.73	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)
1.50	S	0	N=8 (1,0/1,1,2,4)	450	EQU306	73	1.50	1.50
2.50	C	0	N=18 (2,2/4,4,4,6)	450	EQU306	73	2.50	1.37
3.50	C	0	N=50 (7,13/50 for 265mm)	415	EQU306	73	3.50	1.31
4.50	S	0	N=13 (2,1/2,4,3,4)	450	EQU306	73	4.50	3.10
7.50	S	0	N=22 (2,2/4,4,6,8)	450	EQU306	73	5.85	6.95
11.00	S	0	N=33 (2,5/5,7,9,12)	450	EQU306	73	10.77	5.10
15.00	S	0	N=45 (3,5/10,10,12,13)	450	EQU306	73	12.27	14.70
19.00	S	0	N=46 (5,8/8,12,12,14)	450	EQU306	73	12.27	18.40

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)
0.30	< 0.1
0.45	< 0.1
1.00	< 0.1
1.40	< 0.1
2.40	< 0.1
3.40	< 0.1
4.30	< 0.1
5.60	< 0.1
8.60	< 0.1
10.70	< 0.1
13.80	< 0.1
16.80	< 0.1
19.80	< 0.1

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion		Location ID	**HEP-BH-47**
	Client	Heathrow Airport Limited			
	Fugro Reference	G170029U			
	Coordinates (m)	E503661.77 N177431.10	Ground Elevation (m Datum) 21.49	Sheet 1 of 3	
	Hole Type	Cable Percussion		Status	Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.20 - 0.30	D	2			MADE GROUND: brown, slightly clayey, sandy gravel with low cobble content. Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of brick, concrete and flint. Cobbles (130x150x170 mm) are of concrete. [MADE GROUND] [GRAVEL]	(0.40)				
0.20 - 0.30	ES	1				0.40	21.09			
0.20	PID		< 0.1 ppm							
0.30 - 0.40	LB	3			MADE GROUND: light orangey brown, clayey, silty, sandy, gravel. Sand is fine to coarse. Gravel is subangular to subrounded, fine to coarse of brick, concrete, and flint. [MADE GROUND] [SAND] At 0.90 m; with cobble (<150x150x90 mm) of concrete.	(0.60)				
0.40 - 0.50	ES	4				1.00	20.49			
0.40	PID		< 0.1 ppm	1						
0.50 - 0.60	D	5				(0.60)				
0.60 - 0.80	LB	6			MADE GROUND: (firm), black and brown, clayey, silty, sandy, gravel. Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of brick, concrete and flint. [MADE GROUND] [CLAY]	1.60	19.89			
1.00 - 1.20	D	8								
1.00 - 1.20	ES	7								
1.00 - 1.20	LB	9								
1.00	PID		< 0.1 ppm							
1.20 - 1.65	B	10								
1.20 - 1.65	SPT		N = 8 (C)							
1.60 - 2.20	B	11								
2.10 - 2.20	D	13		2	MADE GROUND: (soft), brown, slightly gravelly clay. Gravel is subangular and subrounded, fine and medium of brick and flint. [MADE GROUND] [CLAY]	(0.80)				
2.10 - 2.20	ES	12				2.40	19.09			
2.10	PID		< 0.1 ppm							
2.20 - 2.65	B	14			Grey, clayey, sandy, GRAVEL. Sand is fine to coarse. Loose and medium dense. Gravel is subangular and subrounded, fine to coarse of flint. [RIVER TERRACE DEPOSITS] [GRAVEL]					
2.20 - 2.65	SPT		N = 8 (S)							
3.00 - 3.10	D	15		3						
3.00 - 3.10	ES	16								
3.00 - 3.45	B	17				(1.60)				
3.00 - 3.45	SPT		N = 21 (C)							
3.00	PID		< 0.1 ppm							
4.00 - 4.10	D	20		4	Firm, brown, slightly gravelly CLAY. Gravel is subangular to subrounded, fine to coarse of flint. (Gravel possibly brought down during boring from stratum above). [LONDON CLAY FORMATION] [CLAY]	4.00	17.49			
4.00 - 4.10	ES	19								
4.00 - 4.45	B	18								
4.00 - 4.45	SPT		N = 9 (C)							
4.00	PID		< 0.1 ppm							
5.00 - 5.35	UT	21	30/350 mm	5		(2.00)				
5.35 - 5.40	D	22								
6.00 - 6.50	B	23		6	Firm, brown CLAY. [LONDON CLAY FORMATION] [CLAY] Between 6.00 m and 6.50 m; firm becoming stiff.	6.00	15.49			
6.00 - 6.50	D	24								
6.50 - 6.95	D	25								
6.50 - 6.95	SPT		N = 16 (S)							
7.00 - 7.10	ES	26		7		(2.40)				
7.00	PID		< 0.1 ppm							
7.50 - 7.60	D	27								
8.00 - 8.35	UT	28	100/350 mm	8						
8.35 - 8.40	D	29				8.40	13.09			
8.40 - 8.70	B	30			Stiff, brown, slightly sandy, silty CLAY. [LONDON CLAY FORMATION] [CLAY] Between 8.50 m and 9.10 m; with rare fragments of claystone (50x50x50 mm).					
9.00 - 9.10	D	31		9						
9.50 - 9.95	B	32								
9.50 - 9.95	SPT		N = 24 (S)							
10.00 - 10.10	D	34								
10.00 - 10.10	ES	33								

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Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion		Location ID	**HEP-BH-47**
	Client	Heathrow Airport Limited			
	Fugro Reference	G170029U			
	Coordinates (m)	E503661.77 N177431.10	Ground Elevation (m Datum) 21.49	Sheet 2 of 3	
	Hole Type	Cable Percussion		Status	Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
10.00	PID		< 0.1 ppm		Stiff, brown, slightly sandy, silty CLAY. [LONDON CLAY FORMATION] [CLAY]					
11.00 - 11.35	UT	35	80/350 mm	11						
11.35 - 11.40	D	36								
12.00 - 12.10	D	37		12						
13.00 - 13.10	ES	39		13						
13.00 - 13.45	D	38								
13.00 - 13.45	SPT		N = 26 (S)							
13.00	PID		< 0.1 ppm							
14.00 - 14.10	D	40		14						
15.00 - 15.45	UT	41	110/450 mm	15						
15.45 - 15.50	D	42								
16.00 - 16.10	D	44		16						
16.00 - 16.10	ES	43								
16.00	PID		< 0.1 ppm							
17.00 - 17.45	D	45		17						
17.00 - 17.45	SPT		N = 32 (S)							
17.80 - 17.90	D	46			Between 17.80 m and 19.45 m; becoming locally grey. With rare fragments of claystone (<50x50x50 mm).	(19.10)				
				18						
19.00 - 19.10	ES	49		19						
19.00 - 19.45	UT	47	110/450 mm							
19.00	PID		< 0.1 ppm							
19.45 - 19.50	D	48			Between 19.45 m to 19.50 m; becoming fissured. Fissures are subhorizontal, planar and rough.					

Continued next page

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-47**
	Fugro Reference	G170029U			
	Coordinates (m)	E503661.77 N177431.10	Ground Elevation (m Datum)	21.49	Sheet 3 of 3
	Hole Type	Cable Percussion			Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
					Stiff, brown, slightly sandy, silty CLAY. [LONDON CLAY FORMATION] [CLAY]					
20.50 - 20.60	D	50			Between 20.50 m and 20.60 m; with rare fragments of claystone (50x50x50 mm).					
21.00 - 21.45	D	51		21						
21.00 - 21.45	SPT		N = 36 (S)							
22.00 - 22.10	D	53		22						
22.00 - 22.10	ES	52								
22.00	PID		< 0.1 ppm							
23.00 - 23.45	UT	54	120/450 mm	23	Between 23.00 m and 23.45 m; with rare fragments of claystone (5x5 mm).					
23.45 - 23.50	D	55								
				24						
24.50 - 24.60	D	56			Between 24.50 m and 24.60 m; with rare fragments of claystone (50x50x50 mm).					
25.00 - 25.10	ES	58		25						
25.00 - 25.45	D	57								
25.00 - 25.45	SPT		N = 40 (S)							
25.00	PID		< 0.1 ppm							
				26						
26.30 - 26.40	D	59								
26.90 - 27.00	ES	60								
26.90	PID		< 0.1 ppm	27						
27.00 - 27.45	UT	61	120/450 mm							
27.45 - 27.50	D	62			End of Borehole at 27.50 m	27.50	-6.01			
				28						
				29						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-47**
Fugro Reference	G170029U			
Coordinates (m)	E503661.77 N177431.10	Ground Elevation (m Datum)	21.49	Sheet 1 of 1
Hole Type	Cable Percussion			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	05/12/2017	05/12/2017	Hand-dug			BH	LG	
1.20	27.50	CP	05/12/2017	06/12/2017	Dando 3000			BH	LG	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
05/12/2017	08:00:00	0.00			
05/12/2017	18:00:00	8.40	4.30	Dry	
06/12/2017	08:00:00	8.40	4.30	8.30	
06/12/2017	13:50:00	27.50	4.30	Dry	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)
27.50	150	4.50	150

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)
2.20	1.59	20	1.70	4.00

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
SP	1	2.40	4.00	06/12/2017

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	0.06	2.50	50	Plain
Pipe1	2.50	4.00	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	0.05	Flush Cover	06/12/2017
0.05	0.50	Concrete	06/12/2017
0.50	2.40	Bentonite	06/12/2017
2.40	4.00	Gravel Backfill	06/12/2017
4.00	27.50	Bentonite	06/12/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 28/11/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-47**
	Fugro Reference	G170029U			
	Coordinates (m)	E503661.77 N177431.10	Ground Elevation (m Datum)	21.49	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)
1.20	C	0	N=8 (2,1/2,2,2,2)	450	EQU1616	66	0.00	Dry
2.20	S	0	N=8 (1,2/1,1,3,3)	450	EQU1616	66	1.60	Dry
3.00	C	0	N=21 (5,7/7,4,5,5)	450	EQU1616	66	2.90	2.50
4.00	C	0	N=9 (1,1/1,2,3,3)	450	EQU1616	66	3.90	0.70
6.50	S	0	N=16 (1,3/3,4,4,5)	450	EQU1616	66	4.30	Dry
9.50	S	0	N=24 (4,5/5,6,6,7)	450	EQU1616	66	4.50	Dry
13.00	S	0	N=26 (2,4/5,6,6,9)	450	EQU1616	66	4.50	Dry
17.00	S	0	N=32 (4,4/7,7,9,9)	450	EQU1616	66	4.50	Dry
21.00	S	0	N=36 (4,5/7,8,10,11)	450	EQU1616	66	4.50	Dry
25.00	S	0	N=40 (4,7/8,9,11,12)	450	EQU1616	66	4.50	Dry

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)
0.20	< 0.1
0.40	< 0.1
1.00	< 0.1
2.10	< 0.1
3.00	< 0.1
4.00	< 0.1
7.00	< 0.1
10.00	< 0.1
13.00	< 0.1
16.00	< 0.1
19.00	< 0.1
22.00	< 0.1
25.00	< 0.1
26.90	< 0.1

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion		Location ID
	Client	Heathrow Airport Limited		**HEP-BH-50**
	Fugro Reference	G170029U		
	Coordinates (m)	E503720.62 N177448.77	Ground Elevation (m Datum) 21.49	Sheet 1 of 2
	Hole Type	Cable Percussion		Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.05	D	1			MADE GROUND: dark brown, gravelly sand. With frequent roots (<5x115 mm). Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of brick, slag and concrete. [MADE GROUND] [SAND]	(0.15)				
0.10	B	2				0.15	21.34			
0.10 - 0.15	ES	3								
0.10	PID		< 0.1 ppm							
0.15	D	4			MADE GROUND: light brown, gravelly sand. With frequent rootlets (<1x60 mm). Sand is fine to coarse, mainly fine and medium. Gravel is subangular and subrounded, fine to coarse of brick, flint and concrete. [MADE GROUND] [SAND]	(0.85)				
0.20 - 0.40	B	5								
0.40 - 0.50	ES	6								
0.40	PID		< 0.1 ppm							
1.00	D	7		1		1.00	20.49			
1.05 - 1.15	B	8			MADE GROUND: brown, gravelly sand. Sand is fine to coarse. Gravel is angular, fine to coarse of flint, brick, quartz and slag. [MADE GROUND] [SAND]	(0.20)				
1.15 - 1.20	ES	9				1.20	20.29			
1.15	PID		< 0.1 ppm							
1.20	D	10								
1.25 - 1.40	B	11								
1.40 - 1.50	ES	12			MADE GROUND: (soft and firm), brown, sandy, gravelly clay. Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of concrete, brick, flint and slag. [MADE GROUND] [CLAY]	(1.00)				
1.40	PID		< 0.1 ppm							
1.50 - 1.95	D	13		2						
1.50 - 2.00	B	14								
1.50 - 1.95	SPT		N = 8 (S)			2.20	19.29			
2.20	D	15			Firm, greyish brown, slightly sandy CLAY. Sand is fine to coarse. [LONDON CLAY FORMATION] [CLAY]					
2.30 - 2.40	B	16								
2.40 - 2.50	ES	17								
2.40	PID		< 0.1 ppm							
2.50 - 2.95	D	18								
2.50 - 3.00	B	19								
2.50 - 2.95	SPT		N = 6 (S)	3						
3.00	D	20								
3.10 - 3.40	B	21								
3.40 - 3.50	ES	22								
3.40	PID		< 0.1 ppm		Between 3.50m and 5.10m; sand is fine and medium.					
3.50 - 4.00	UT	23	25/450 mm			(2.90)				
4.00	D	24		4						
4.10	D	25								
4.20 - 4.30	B	26								
4.30 - 4.50	ES	27								
4.30	PID		< 0.1 ppm							
4.50 - 4.95	D	28								
4.50 - 5.00	B	29								
4.50 - 4.95	SPT		N = 16 (S)							
5.10	D	30		5		5.10	16.39			
5.20 - 5.50	B	31			Firm and stiff, thinly laminated (<2mm), greyish brown, slightly sandy CLAY. Sand is fine. [LONDON CLAY FORMATION] [CLAY]					
5.50 - 5.60	ES	32								
5.50	PID		< 0.1 ppm							
6.00 - 6.50	UT	33	51/450 mm	6						
6.50	D	34								
6.60 - 6.70	B	35								
6.70 - 6.80	ES	36								
6.70	PID		< 0.1 ppm							
7.10	D	37		7						
7.20 - 7.40	ES	38			Between 7.20 m and 7.40 m; with white possible burrows (2x50 mm).					
7.20	PID		< 0.1 ppm							
7.50 - 7.95	D	39								
7.50 - 8.00	B	40								
7.50 - 7.95	SPT		N = 24 (S)							
8.10	D	41		8					▼	
8.20 - 8.50	B	42				(6.40)				
8.50 - 8.60	ES	43								
8.50	PID		< 0.1 ppm							
9.00 - 9.50	UT	44	70/450 mm	9						
9.50	D	45								
9.60 - 9.80	B	46								
9.80 - 9.90	ES	47								
9.80	PID		< 0.1 ppm							

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Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion		Location ID	**HEP-BH-50**
	Client	Heathrow Airport Limited			
	Fugro Reference	G170029U			
	Coordinates (m)	E503720.62 N177448.77	Ground Elevation (m Datum) 21.49	Sheet 2 of 2	
	Hole Type	Cable Percussion		Status	Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
10.10	D	48			Firm and stiff, thinly laminated (<2mm), greyish brown, slightly sandy CLAY. Sand is fine. [LONDON CLAY FORMATION] [CLAY]					
10.20 - 10.50	B	49								
10.60 - 10.70	ES	50								
10.60	PID		< 0.1 ppm							
11.00 - 11.50	UT	51	73/450 mm	11						
11.50	D	52				11.50	9.99			
11.60 - 11.80	B	53			Firm and stiff, thinly laminated (<2 mm), greyish brown, slightly sandy CLAY. With frequent lenses of brown, fine sand and silt (2x60 mm), and rare shell fragments (10x20 mm). Sand is fine and medium. [LONDON CLAY FORMATION] [CLAY]					
11.90 - 12.00	ES	54								
11.90	PID		< 0.1 ppm	12						
12.10	D	55								
12.20 - 12.50	B	56								
12.60 - 12.70	ES	57								
12.60	PID		< 0.1 ppm							
13.00 - 13.45	D	58		13	At 13.00 m; possibly very stiff.					
13.00 - 13.50	B	59								
13.00 - 13.45	SPT		N = 38 (S)							
13.60	D	60								
13.70 - 13.80	ES	61								
13.70	PID		< 0.1 ppm							
14.10	D	62		14						
14.20 - 14.50	B	63								
14.60 - 14.70	ES	64								
14.60	PID		< 0.1 ppm							
15.00	UT	65	82/450 mm	15						
15.50	D	66								
15.60 - 15.80	B	67								
15.80 - 15.90	ES	68				(8.50)				
15.80	PID		< 0.1 ppm							
16.10	D	69		16						
16.20 - 16.50	B	70								
16.60 - 16.70	ES	71								
16.60	PID		< 0.1 ppm							
17.00 - 17.45	D	72		17	At 17.00 m; possibly very stiff.					
17.00 - 17.50	B	73								
17.00 - 17.45	SPT		N = 44 (S)							
17.60	D	74								
17.70 - 17.80	ES	75								
17.70	PID		< 0.1 ppm							
18.10	D	76		18						
18.20 - 18.50	B	77								
18.60 - 18.70	ES	78								
18.60	PID		< 0.1 ppm							
19.00 - 19.50	UT	79	95/450 mm	19						
19.50	D	80								
19.60 - 19.70	B	81								
19.80 - 20.00	ES	82								
					End of Borehole at 20.00 m	20.00	1.49			

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID	
Client	Heathrow Airport Limited			**HEP-BH-50**	
Fugro Reference	G170029U				
Coordinates (m)	E503720.62 N177448.77	Ground Elevation (m Datum)	21.49	Sheet 1 of 1	
Hole Type	Cable Percussion			Status	Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	20/11/2017	20/11/2017	Hand-dug			SB/DT	JJL	
1.20	20.00	CP	20/11/2017	21/11/2017	Dando 3000			SB/DT	JJL	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
20/11/2017	08:00:00	0.00			
20/11/2017	18:00:00	5.00	3.10	Dry	
21/11/2017	08:00:00	5.00	3.10	Dry	
21/11/2017	14:30:00	20.00	3.10	18.95	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)
20.00	200	3.10	200

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)
8.00	7.99	20	3.10	

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
SP	1	3.40	20.00	21/11/2017

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	0.06	3.50	50	Plain
Pipe1	3.50	20.00	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	0.05	Flush Cover	21/11/2017
0.05	0.20	Concrete	21/11/2017
0.20	3.40	Bentonite	21/11/2017
3.40	20.00	Gravel Backfill	21/11/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	JPD/ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS				Print Date	28/11/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-50**
	Fugro Reference	G170029U			
	Coordinates (m)	E503720.62 N177448.77	Ground Elevation (m Datum)	21.49	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)
1.50	S	0	N=8 (4,3/2,2,2,2)	450	EQU306	73	1.50	Dry
2.50	S	0	N=6 (1,0/1,1,1,3)	450	EQU306	73	2.50	Dry
4.50	S	0	N=16 (1,2/3,3,4,6)	450	EQU306	73	3.10	Dry
7.50	S	0	N=24 (1,3/3,5,8,8)	450	EQU306	73	3.10	Dry
13.00	S	0	N=38 (2,5/7,9,11,11)	450	EQU306	73	3.10	Dry
17.00	S	0	N=44 (4,8/10,10,12,12)	450	EQU306	73	3.10	17.00

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)
0.10	< 0.1
0.40	< 0.1
1.15	< 0.1
1.40	< 0.1
2.40	< 0.1
3.40	< 0.1
4.30	< 0.1
5.50	< 0.1
6.70	< 0.1
7.20	< 0.1
8.50	< 0.1
9.80	< 0.1
10.60	< 0.1
11.90	< 0.1
12.60	< 0.1
13.70	< 0.1
14.60	< 0.1
15.80	< 0.1
16.60	< 0.1
17.70	< 0.1
18.60	< 0.1

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion		Location ID
	Client	Heathrow Airport Limited		**HEP-BH-52**
	Fugro Reference	G170029U		
	Coordinates (m)	E503639.79 N177344.72	Ground Elevation (m Datum) 20.72	Sheet 1 of 2
	Hole Type	Dynamic (Windowless) Sampler		Status: Final

Sampling and In Situ Testing						Strata Details				Groundwater	
Depth (m)	Type	No.	Test Results	Run Depth (m) (Recovery) (%)	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.00 - 0.10	B	2				TOPSOIL: dark brown and black, slightly sandy, slightly gravelly clay. With frequent rootlets. Sand is fine and medium. Gravel is subrounded, fine of flint. [TOPSOIL] [CLAY]	(0.15)				
0.00 - 0.10	D	1					0.15	20.57			
0.00 - 0.10	ES	3									
0.00	PID		< 0.1 ppm								
0.15 - 0.25	B	5				Soft, dark brownish grey, slightly sandy and sandy, slightly gravelly CLAY. Sand is fine and medium. Gravel is subrounded, fine of flint. [ALLUVIUM] [CLAY]	(0.50)				
0.15 - 0.25	D	4									
0.15 - 0.25	ES	6									
0.15	PID		< 0.1 ppm								
0.65 - 0.75	D	7				Grey, slightly sandy GRAVEL. Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of flint. (Possible Made Ground). [ALLUVIUM] [GRAVEL]	0.65	20.07			
0.65 - 0.75	ES	9									
0.65	PID		< 0.1 ppm								
0.75 - 1.00	B	8			1		(0.95)				
1.20 - 1.65	SPT		0/450 (S)	1.20		Between 1.20 m and 1.45 m; assumed zone of core loss Between 1.20 m and 1.65 m; very loose.					
1.60 - 1.70	D	10		(75)		Firm and stiff, grey, slightly sandy, slightly gravelly CLAY. With frequent fragments of wood (5x12 mm) and plant material (<2x15 mm). With frequent pockets (<30 mm) of silty, sandy peaty clay, and pockets (<20 mm) of light grey, silty, fine and medium sand. Sand is fine and medium. Gravel is subangular and subrounded, fine and medium of flint. (Possible Alluvium). [ALLUVIUM] [CLAY]	1.60	19.12			
1.60 - 1.70	ES	11									
1.60	PID		< 0.1 ppm								
2.00 - 2.65	D	12		2.00	2						
2.00 - 2.45	SPT		0/450 (S)			Between 2.00 m and 2.20 m; assumed zone of core loss. Between 2.00 m and 2.45 m; probably very soft.					
				(80)			(1.85)				
2.60 - 2.70	D	13									
2.60 - 2.70	ES	15									
2.60	PID		< 0.1 ppm								
2.70 - 3.00	B	14									
3.00 - 3.45	D	16		3.00	3						
3.00 - 3.45	SPT		N = 11 (S)			Between 3.00 m and 3.60 m; assumed zone of core loss.					
						Approximate boundary.	3.45	17.27			
				(40)		Medium dense, grey, sandy GRAVEL. Sand is fine and coarse. Gravel is subangular and subrounded, fine to coarse of flint. [RIVER TERRACE DEPOSITS] [GRAVEL]					
3.60 - 4.00	B	17									
4.00 - 4.45	D	18		4.00	4						
4.00 - 4.45	SPT		N = 23 (S)			Between 4.00 m and 4.30 m; assumed zone of core loss.	(1.15)				
4.45 - 4.55	D	19									
4.45 - 4.55	ES	20		(70)							
4.45	PID		< 0.1 ppm								
4.60 - 4.70	D	21				Firm and stiff, grey CLAY. [LONDON CLAY FORMATION] [CLAY]	4.60	16.12			
4.60 - 4.70	ES	22									
4.60	PID		< 0.1 ppm								
5.00 - 5.45	D	23		5.00							
5.00 - 5.45	SPT		N = 16 (S)			Continued next page					

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-52**
	Fugro Reference	G170029U			
	Coordinates (m)	E503639.79 N177344.72	Ground Elevation (m Datum)	20.72	Sheet 2 of 2
	Hole Type	Dynamic (Windowless) Sampler			Status: Final

Sampling and In Situ Testing					Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Run Depth (m) (Recovery) (%)	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
						Firm and stiff, grey CLAY. [LONDON CLAY FORMATION] [CLAY]	(0.85)				
				5.45		End of Borehole at 5.45 m	5.45	15.27			
					6						
					7						
					8						
					9						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-52**
Fugro Reference	G170029U			
Coordinates (m)	E503639.79 N177344.72	Ground Elevation (m Datum)	20.72	Sheet 1 of 1
Hole Type	Dynamic (Windowless) Sampler			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	12/03/2018	12/03/2018	Hand-dug			MG	MG	
1.20	5.45	WLS	12/03/2018	13/03/2018	Terrier			RU	MG	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
12/03/2018	08:00:00	0.00			
12/03/2018	18:00:00	1.20			
13/03/2018	08:00:00	1.20			
13/03/2018	18:00:00	5.45	4.00	2.75	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)
5.00	101	5.00	113

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)
3.00	0.29	20	3.00	

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
SP	1	3.30	4.60	13/03/2018

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	-0.26	3.50	50	Plain
Pipe1	3.50	4.60	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
-0.30	0.00	Upstanding Cover	13/03/2018
0.00	3.30	Bentonite	13/03/2018
3.30	4.60	Gravel Backfill	13/03/2018
4.60	5.45	Bentonite	13/03/2018

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 28/11/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-52**
	Fugro Reference	G170029U			
	Coordinates (m)	E503639.79 N177344.72	Ground Elevation (m Datum)	20.72	Sheet 1 of 1
	Hole Type	Dynamic (Windowless) Sampler			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)
1.20	S	450	N=0 (0,0/0,0,0,0)	450	DT0767	71	0.00	Dry
2.00	S	450	N=0 (0,0/0,0,0,0)	450	DT0767	71	2.00	Dry
3.00	S	0	N=11 (1,2/2,2,3,4)	450	DT0767	71	3.00	3
4.00	S	0	N=23 (6,8/8,5,5,5)	450	DT0767	71	4.00	0.69
5.00	S	0	N=16 (1,2/3,3,5,5)	450	DT0767	71	5.00	2.75

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)
0.00	< 0.1
0.15	< 0.1
0.65	< 0.1
1.60	< 0.1
2.60	< 0.1
4.45	< 0.1
4.60	< 0.1

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion		Location ID	
	Client	Heathrow Airport Limited		**HEP-BH-61**	
	Fugro Reference	G170029U			
	Coordinates (m)	E503830.24 N177379.82	Ground Elevation (m Datum) 22.65	Sheet 1 of 3	
	Hole Type	Cable Percussion		Status	Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.00 - 0.20	B	3			MADE GROUND: (soft), brown, clayey, silty, very sandy, gravel. With rare roots/rootlets (<3x50 mm). With occasional fragments of tile (<15x20 mm) and with rare fragments of plastic bag (<20x20 mm). Sand is fine to coarse, mainly fine and medium. Gravel is angular to subrounded, fine to coarse of flint, brick and concrete. Cobbles (150x<300x300 mm) are of concrete.					
0.00 - 0.20	D	2								
0.00 - 0.20	ES	1								
0.00 - 0.50	LB	4								
0.00	PID		< 0.1 ppm							
0.90 - 1.00	ES	5				(1.55)				
0.90	PID		< 0.1 ppm	1	[MADE GROUND] [SAND]					
1.20 - 1.65	D	8			At 0.50 m; with angular to subrounded cobble of concrete (150x<300x300 mm).					
1.20 - 1.65	SPT		N = 4 (S)		Below 0.90 m; with occasional pockets (<50x50x50 mm) of firm, brown to greyish brown, slightly sandy, silty clay.					
1.55 - 1.70	ES	10				1.55	21.10			
1.55	PID		< 0.1 ppm		MADE GROUND: (soft), dark grey, slightly sandy, slightly gravelly, silty clay. With occasional black speckling/staining. Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of flint and rare brick.					
2.20 - 2.65	D	11		2	[MADE GROUND] [CLAY]	(1.15)				
2.20 - 2.70	B	12								
2.20 - 2.70	ES	13								
2.20 - 2.65	SPT		N = 4 (S)							
2.20	PID		< 0.1 ppm			2.70	19.95			
2.70 - 3.20	B	15			Soft, greenish grey mottled black, slightly gravelly, silty CLAY. Gravel is angular to subrounded, fine to coarse of flint.					
2.70 - 3.20	ES	14				(0.50)				
2.70	PID		< 0.1 ppm	3	[ALLUVIUM] [CLAY]					
3.20 - 3.70	B	16				3.20	19.45			
3.70	D	18			Brown and grey slightly clayey, sandy GRAVEL. Gravel is angular to subrounded, medium and coarse becoming fine to coarse, of flint.					
3.70 - 4.00	ES	19				(0.80)				
3.70 - 4.15	D	17			[RIVER TERRACE DEPOSITS] [GRAVEL]					
3.70 - 4.20	B	20		4		4.00	18.65			
3.70 - 4.15	SPT		N = 10 (C)		Stiff and very stiff, greyish brown, sandy CLAY. With occasional to frequent shell fragments (10x20x30 mm) and rare fragments of claystone (<50x50x50 mm).					
3.70	PID		< 0.1 ppm		[LONDON CLAY FORMATION] [CLAY]					
4.20 - 4.70	B	21								
4.50 - 4.70	ES	22								
4.50	PID		< 0.1 ppm							
4.70 - 5.15	UT	23	24/450 mm	5						
5.20	D	24								
5.20 - 5.50	ES	25								
5.20	PID		< 0.1 ppm							
5.50 - 6.00	B	26								
6.20 - 6.50	ES	29		6						
6.20 - 6.70	B	28								
6.20 - 6.70	D	27								
6.20 - 6.65	SPT		N = 18 (S)							
6.20	PID		< 0.1 ppm							
7.20 - 7.50	B	30		7						
7.20 - 7.50	ES	31								
7.20	PID		< 0.1 ppm							
7.70 - 8.00	UT	32	48/450 mm							
8.10	D	33		8						
8.20	D	34								
8.20 - 8.50	ES	36								
8.20 - 8.70	B	35								
8.20	PID		< 0.1 ppm							
9.20	B	38		9						
9.20 - 9.50	ES	39								
9.20 - 9.65	D	37								
9.20 - 9.65	SPT		N = 23 (S)							
9.20	PID		< 0.1 ppm							

Continued next page

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion		Location ID	**HEP-BH-61**
	Client	Heathrow Airport Limited			
	Fugro Reference	G170029U			
	Coordinates (m)	E503830.24 N177379.82	Ground Elevation (m Datum) 22.65	Sheet 2 of 3	
	Hole Type	Cable Percussion		Status	Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
10.20 - 10.50	ES	41			Stiff and very stiff, greyish brown, sandy CLAY. With occasional to frequent shell fragments (10x20x30 mm) and rare fragments of claystone (<50x50x50 mm). [LONDON CLAY FORMATION] [CLAY]					
10.20 - 10.70	B	40								
10.20	PID		< 0.1 ppm							
10.70 - 11.10	UT	42	100/400 mm		Between 10.20 m and 10.50 m; with rare shell fragments.					
				11						
11.20	D	43								
11.20 - 11.50	B	44								
11.20 - 11.50	ES	45								
11.20	PID		< 0.1 ppm							
12.00	D	46		12		(16.20)				
12.20 - 12.70	B	47								
12.70 - 13.15	D	48								
12.70 - 13.15	SPT		N = 29 (S)		Between 12.70 m and 13.15 m; with frequent bivalve shell fragments (<20x10 mm)					
				13						
13.20 - 13.50	B	49			Between 13.20 m and 13.50 m; with occasional shell fragments (<30x1 mm).					
				14						
14.20	D	51								
14.20 - 14.50	B	52								
14.30 - 14.50	ES	50								
14.30	PID		< 0.1 ppm							
				15						
15.20	D	53								
15.20 - 15.50	B	54								
15.70 - 16.15	UT	55	100/450 mm							
				16						
16.20	D	56								
16.20 - 16.50	B	57			Below 16.20 m; becoming brownish grey.					
				17						
17.20 - 17.50	B	59								
17.20 - 17.50	ES	58								
17.20	PID		< 0.1 ppm							
17.70 - 18.15	D	60								
17.70 - 18.15	SPT		N = 37 (S)		Between 17.70 m and 18.15 m; with rare black organic staining (<5x5 mm).					
				18						
18.20 - 18.50	B	61								
				19						
19.20	D	62								
19.20 - 19.50	B	63								
19.20 - 19.50	ES	64								
19.20	PID		< 0.1 ppm							
19.70 - 20.15	UT	65	100/450 mm							

Continued next page

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-61**
	Fugro Reference	G170029U			
	Coordinates (m)	E503830.24 N177379.82	Ground Elevation (m Datum)	22.65	Sheet 3 of 3
	Hole Type	Cable Percussion			Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
20.20	D	66			Stiff and very stiff, greyish brown, sandy CLAY. With occasional to frequent shell fragments (10x20x30 mm) and rare fragments of claystone (<50x50x50 mm). [LONDON CLAY FORMATION] [CLAY]	20.20	2.45			
					End of Borehole at 20.20 m					
				21						
				22						
				23						
				24						
				25						
				26						
				27						
				28						
				29						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-61**
Fugro Reference	G170029U			
Coordinates (m)	E503830.24 N177379.82	Ground Elevation (m Datum)	22.65	Sheet 1 of 1
Hole Type	Cable Percussion			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	20/11/2017	21/11/2017	Hand-dug			SB	CM	
1.20	20.20	CP	21/11/2017	22/11/2017	Dando 2000			SB	CM	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
20/11/2017	14:00:00	0.00			
20/11/2017	18:00:00	0.50		Dry	
21/11/2017	08:00:00	0.50		Dry	
21/11/2017	18:00:00	11.50	10.50	Dry	
22/11/2017	08:00:00	11.50	10.50	Dry	
22/11/2017	18:00:00	20.20	13.50	Dry	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)
20.20	150	13.50	150

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)
3.20	2.40	20	3.10	

Water Added

Depth From (m)	Depth To (m)
3.20	4.00

Water Strike Remarks

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
SP	1	3.50	4.50	22/11/2017

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	0.11	3.50	50	Plain
Pipe1	3.50	4.50	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	0.05	Flush Cover	22/11/2017
0.05	0.50	Concrete	22/11/2017
0.50	3.50	Bentonite	22/11/2017
3.50	4.50	Gravel Backfill	22/11/2017
4.50	20.20	Bentonite	22/11/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 29/11/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-61**
	Fugro Reference	G170029U			
	Coordinates (m)	E503830.24 N177379.82	Ground Elevation (m Datum)	22.65	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)
1.20	S	0	N=4 (1,1/1,1,1,1)	450	CD1	75	0.00	Dry
2.20	S	0	N=4 (1,1/1,1,1,1)	450	CD1	75	2.10	Dry
3.70	C	0	N=10 (1,2/3,2,3,2)	450	CD1	75	3.60	0.00
6.20	S	0	N=18 (2,2/4,4,5,5)	450	CD1	75	6.10	Dry
9.20	S	0	N=23 (2,3/4,6,6,7)	450	CD1	75	9.10	Dry
12.70	S	0	N=29 (4,6/7,7,7,8)	450	CD1	75	12.60	Dry
17.70	S	0	N=37 (5,7/8,9,9,11)	450	CD1	75	12.60	Dry

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)
0.00	< 0.1
0.90	< 0.1
1.55	< 0.1
2.20	< 0.1
2.70	< 0.1
3.70	< 0.1
4.50	< 0.1
5.20	< 0.1
6.20	< 0.1
7.20	< 0.1
8.20	< 0.1
9.20	< 0.1
10.20	< 0.1
11.20	< 0.1
14.30	< 0.1
17.20	< 0.1
19.20	< 0.1

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion		Location ID
	Client	Heathrow Airport Limited		**HEP-BH-64**
	Fugro Reference	G170029U		
	Coordinates (m)	E503753.90 N177268.28	Ground Elevation (m Datum) 21.86	Sheet 1 of 2
	Hole Type	Dynamic (Windowless) Sampler		Status: Final

Sampling and In Situ Testing					Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Run Depth (m) (Recovery) (%)	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.05 - 0.15	B	3				TOPSOIL: dark greyish black, slightly gravelly, silty clay. With rare roots and rootlets (1x15 mm). Gravel is subangular and subrounded, fine of flint. [TOPSOIL] [CLAY]	(0.15)				
0.05 - 0.15	D	1					0.15	21.71			
0.05 - 0.15	ES	2									
0.05	PID		< 0.1 ppm								
0.15 - 0.25	B	6				MADE GROUND: dark grey and black, slightly gravelly, silty clay. With occasional roots and rootlets (<2x25 mm). Gravel is angular to subrounded, fine and medium and occasionally coarse of flint. [MADE GROUND] [CLAY]	(0.30)				
0.15 - 0.25	D	4					0.45	21.41			
0.15 - 0.25	ES	5									
0.15	PID		< 0.1 ppm								
0.45 - 0.55	B	9				MADE GROUND: brown, slightly gravelly clay. With occasional pockets (<40x20 mm) of orangish brown, silty clay. Gravel is subrounded, fine and medium of flint. [MADE GROUND] [CLAY]	(0.40)				
0.45 - 0.55	D	7					0.85	21.01			
0.45 - 0.55	ES	8									
0.45	PID		< 0.1 ppm								
0.85 - 0.95	B	12				MADE GROUND: grey, slightly gravelly, sandy clay. With occasional rootlets (2x15 mm). With rare pockets (<100x45 mm) of dark grey and brown peaty clay. With occasional fragments of tarmacadam (<50 mm) (3%). Gravel is medium and coarse of concrete and brick. [MADE GROUND] [CLAY]	(0.35)				
0.85 - 0.95	D	10					1.20	20.66			
0.85 - 0.95	ES	11			1						
0.85	PID		< 0.1 ppm								
1.20 - 1.65	D	13		1.20							
1.20 - 1.65	SPT		N = 5 (S)								
1.65 - 1.75	B	16		(100)		MADE GROUND: dark brown, slightly gravelly, sandy, silty clay. With occasional rootlets. With rare pockets (<100 mm) of dark grey and black, peaty clay. With occasional fragments of tarmacadam (<50 mm) (3%). Gravel is medium and coarse of concrete, rare brick. [MADE GROUND] [CLAY]	(0.70)				
1.65 - 1.75	D	14					1.90	19.96			
1.65 - 1.75	ES	15									
1.65	PID		< 0.1 ppm								
2.00 - 2.45	D	17		2.00	2	MADE GROUND: dark grey, mottled greenish grey, slightly sandy, slightly gravelly clay. Sand is fine to coarse. Gravel is subangular and subrounded, fine and medium of flint, brick and concrete. [MADE GROUND] [CLAY]					
2.00 - 2.45	SPT		N = 2 (S)								
2.45 - 2.55	B	20					(1.10)				
2.45 - 2.55	D	18		(85)							
2.45 - 2.55	ES	19									
2.45	PID		< 0.1 ppm								
2.90 - 3.00	D	21				Between 2.85 m and 3.00 m; assumed zone of core loss.					
3.00 - 3.45	D	22		3.00	3	MADE GROUND: greenish grey, mottled light greenish grey and brown, slightly sandy, gravelly clay. Sand is fine and medium. Gravel is subangular and subrounded, fine to coarse of flint. [MADE GROUND] [CLAY]	3.00	18.86			
3.00 - 3.45	SPT		N = 3 (S)				(0.05)	18.81			
							3.05				
						Assumed zone of core loss; poor recovery. [NO CORE RECOVERY]					
3.45 - 3.55	D	23		(5)			(0.95)				
4.00 - 4.45	D	24		4.00	4	Medium dense, grey, sandy GRAVEL. Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of flint. [RIVER TERRACE DEPOSITS] [GRAVEL]	4.00	17.86			
4.00 - 4.45	SPT		N = 22 (S)				(0.25)				
							4.25	17.61			
						Assumed zone of core loss; poor recovery. [NO CORE RECOVERY]					
4.45 - 4.55	D	25									
4.45 - 4.55	ES	26		(25)							
4.45	PID		< 0.1 ppm				(0.75)				
5.00 - 5.45	D	27		5.00			5.00	16.86			
5.00 - 5.45	SPT		N = 14 (S)			Continued next page					

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-64**
	Fugro Reference	G170029U			
	Coordinates (m)	E503753.90 N177268.28	Ground Elevation (m Datum)	21.86	Sheet 2 of 2
	Hole Type	Dynamic (Windowless) Sampler			Status: Final

Sampling and In Situ Testing					Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Run Depth (m) (Recovery) (%)	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
						Medium dense, grey, sandy GRAVEL. Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of flint. [RIVER TERRACE DEPOSITS] [GRAVEL]	(0.45)				
				5.45		End of Borehole at 5.45 m	5.45	16.41			
					6						
					7						
					8						
					9						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID	
Client	Heathrow Airport Limited			**HEP-BH-64**	
Fugro Reference	G170029U				
Coordinates (m)	E503753.90 N177268.28	Ground Elevation (m Datum)	21.86	Sheet 1 of 1	
Hole Type	Dynamic (Windowless) Sampler			Status	Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	06/03/2018	06/03/2018	Hand-dug			MG	MG	
1.20	5.45	WLS	08/03/2018	08/03/2018	Terrier			RU	MG	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
08/03/2018	08:00:00	0.00			
08/03/2018	18:00:00	5.00	5.00	1.45	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)
5.00	101	5.00	113

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)
3.00	1.95	20	4.00	

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
SP	1	3.00	5.45	08/03/2018

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	0.15	3.70	50	Plain
Pipe1	3.70	5.00	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	0.05	Flush Cover	08/03/2018
0.05	0.30	Concrete	08/03/2018
0.30	3.00	Bentonite	08/03/2018
3.00	5.45	Gravel Backfill	08/03/2018

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS				Print Date	29/11/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-64**
	Fugro Reference	G170029U			
	Coordinates (m)	E503753.90 N177268.28	Ground Elevation (m Datum)	21.86	Sheet 1 of 1
	Hole Type	Dynamic (Windowless) Sampler			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)
1.20	S	0	N=5 (2,1/1,1,2,1)	450	DT0767	71	0.00	Dry
2.00	S	375	N=2 (0,0/0,0,0,2)	450	DT0767	71	2.00	Dry
3.00	S	0	N=3 (0,1/0,1,1,1)	450	DT0767	71	3.00	Dry
4.00	S	0	N=22 (5,5/5,5,5,7)	450	DT0767	71	4.00	1.45
5.00	S	0	N=14 (5,5/5,5,2,2)	450	DT0767	71	5.00	1.45

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)
0.05	< 0.1
0.15	< 0.1
0.45	< 0.1
0.85	< 0.1
1.65	< 0.1
2.45	< 0.1
4.45	< 0.1

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-65**
	Fugro Reference	G170029U			
	Coordinates (m)	E503854.77 N177337.72	Ground Elevation (m Datum)	22.12	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
					MADE GROUND: concrete.	(0.30)				
					[MADE GROUND] [CONCRETE]	0.30	21.82			
0.30 - 0.60	B	3			MADE GROUND: brown sand and gravel. With frequent strips of	(0.30)				
0.40	D	1			plastic (3x150 mm). Sand is fine to coarse. Gravel is subangular	0.60	21.52			
0.45 - 0.50	ES	2			and subrounded, fine to coarse of concrete, brick, granite, flint and					
0.45	PID		< 0.1 ppm		aggregate.					
0.60	D	4			[MADE GROUND] [WASTE, e.g. LANDFILL]	(0.55)				
0.65 - 0.75	ES	5								
0.65	PID		< 0.1 ppm	1	MADE GROUND: (soft), dark brown, slightly sandy, gravelly clay.	1.15	20.97			
0.75 - 1.10	B	6			With occasional fragments of glass (30x60 mm). Sand is fine to					
1.20	D	7			coarse. Gravel is subangular and subrounded, fine to coarse of					
1.25 - 1.35	ES	8			flint, brick and concrete.					
1.25	PID		< 0.1 ppm		[MADE GROUND] [CLAY]					
1.35 - 1.50	B	9								
1.50 - 2.00	B	10			Dense, brown GRAVEL. Gravel is angular to subrounded, fine to					
1.50 - 1.95	SPT		N = 44 (C)		coarse of flint.					
2.00	D	11		2	[RIVER TERRACE DEPOSITS] [GRAVEL]					
2.10 - 2.20	ES	12			Between 1.15 m and 1.20 m; sandy. Sand is fine to coarse. Gravel is					
2.10	PID		< 0.1 ppm		subangular and subrounded.					
2.20 - 2.50	B	13								
2.50 - 3.00	B	14								
2.50 - 2.95	SPT		N = 31 (C)							
3.00	D	15		3		(3.85)				
3.10 - 3.20	ES	16								
3.10	PID		< 0.1 ppm							
3.20 - 3.50	B	17								
3.50 - 4.00	B	18								
3.50 - 3.95	SPT		N = 49 (C)							
4.00	D	19		4						
4.10 - 4.20	ES	20								
4.10	PID		< 0.1 ppm							
4.20 - 4.50	B	21								
4.50 - 5.00	B	22								
4.50 - 4.95	SPT		N = 27 (C)		Between 4.50 m and 4.95 m; medium dense.					
5.00	D	23		5		5.00	17.12			
5.10 - 5.20	ES	24			Firm and stiff, greyish brown, slightly gravelly, sandy CLAY. Sand is					
5.10	PID		0.1 ppm		fine to coarse. Gravel is subangular to subrounded, fine and	(0.50)				
5.20 - 5.50	B	25			medium of flint. (Gravel possibly brought down during boring from					
5.50 - 6.00	UT	26	100/450 mm		stratum above).	5.50	16.62			
					[LONDON CLAY FORMATION] [CLAY]					
					Firm and stiff, thinly laminated, greyish brown, slightly sandy CLAY.					
					Sand is fine and medium.					
6.00	D	27		6	[LONDON CLAY FORMATION] [CLAY]					
6.10	D	28								
6.15 - 6.20	ES	29				(1.50)				
6.15	PID		11.1 ppm							
6.20 - 6.50	B	30								
6.50 - 6.95	D	31								
6.50 - 6.95	SPT		N = 19 (S)							
				7	End of Borehole at 7.00 m	7.00	15.12			
				8						
				9						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-65**
Fugro Reference	G170029U			
Coordinates (m)	E503854.77 N177337.72	Ground Elevation (m Datum)	22.12	Sheet 1 of 1
Hole Type	Cable Percussion			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	16/01/2018	16/01/2018	Hand-dug/breaker			SB	JJL	
1.20	7.00	CP	16/01/2018	17/01/2018	Dando 3000			SB	JJL	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
16/01/2018	08:00:00	0.00			
16/01/2018	18:00:00	3.00	3.00	1.35	
17/01/2018	08:00:00	3.00	3.00	1.15	
17/01/2018	14:00:00	7.00	7.00	Dry	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)
7.00	200	5.85	200

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)

Water Added

Depth From (m)	Depth To (m)
1.20	5.00

Water Strike Remarks

Groundwater was not encountered during excavation or boring.

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
SP	1	1.20	5.00	17/01/2018

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	0.07	1.40	50	Plain
Pipe1	1.40	5.00	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	0.05	Flush Cover	17/01/2018
0.05	0.20	Concrete	17/01/2018
0.20	1.20	Bentonite	17/01/2018
1.20	5.00	Gravel Backfill	17/01/2018
5.00	7.00	Bentonite	17/01/2018

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 29/11/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-65**
	Fugro Reference	G170029U			
	Coordinates (m)	E503854.77 N177337.72	Ground Elevation (m Datum)	22.12	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)
1.50	C	0	N=44 (2,7/10,6,13,15)	450	EQU306	73	1.50	1.10
2.50	C	0	N=31 (5,5/7,7,8,9)	450	EQU306	73	2.50	1.20
3.50	C	0	N=49 (5,8/8,13,14,14)	450	EQU306	73	3.50	1.25
4.50	C	0	N=27 (5,8/8,8,6,5)	450	EQU306	73	4.50	1.30
6.50	S	0	N=19 (1,3/3,5,5,6)	450	EQU306	73	5.85	Dry

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)
0.45	< 0.1
0.65	< 0.1
1.25	< 0.1
2.10	< 0.1
3.10	< 0.1
4.10	< 0.1
5.10	0.1
6.15	11.1

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-77**
	Fugro Reference	G170029U			
	Coordinates (m)	E503901.98 N177312.72	Ground Elevation (m Datum)	22.37	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
					MADE GROUND: tarmacadam. [MADE GROUND] [TARMAC/BLACKTOP]	(0.05)	22.32			
						0.05				
0.30 - 0.40	ES	1			MADE GROUND: concrete. [MADE GROUND] [CONCRETE]	(0.20)	22.12			
0.30 - 0.40	LB	3				0.25				
0.30	PID		< 0.1 ppm		At 0.23 m; geotextile membrane.	(0.65)				
0.40	D	2			MADE GROUND: greyish brown, sandy to very sandy gravel (70%). With occasional rootlets/roots (<2x25 mm). With frequent fragments of ash and clinker (<60 mm) (30%). Sand is fine. Gravel is angular to well rounded, fine to coarse of flint with rare to occasional brick and concrete. [MADE GROUND] [WASTE, e.g. LANDFILL]					
0.60 - 0.90	LB	6								
0.70 - 0.80	ES	4				0.90	21.47			
0.70	PID		< 0.1 ppm	1		(0.30)				
0.90	D	5				1.20	21.17			
0.90 - 1.00	ES	7				(0.30)				
0.90	PID		< 0.1 ppm			1.50	20.87			
1.10	D	8			MADE GROUND: dark greyish brown, slightly clayey, sandy gravel (85%). With frequent fragments of ash and clinker (<60 mm) (15%). Sand is fine to coarse. Gravel is angular to well rounded, fine to coarse of flint with occasional brick and concrete. [MADE GROUND] [WASTE, e.g. LANDFILL]					
1.20 - 1.30	ES	9								
1.20 - 1.50	LB	11								
1.20	PID		< 0.1 ppm							
1.40	D	10		2						
1.50 - 2.00	B	12								
1.50 - 1.95	SPT		N = 43 (C)		MADE GROUND: dark brownish grey, slightly sandy gravel with low cobble content. With occasional pockets (<100x70x120 mm) of laminated, dark brown, sandy clay and black, slightly organic, silty clay with slight organic odour. Sand is fine to coarse. Gravel is angular to well rounded, fine to coarse of flint. Cobbles are subangular to well rounded of flint. [MADE GROUND] [GRAVEL]					
2.10 - 2.20	ES	13								
2.10 - 2.40	B	15								
2.10	PID		< 0.1 ppm							
2.30	D	14								
2.50 - 3.00	B	17								
2.50 - 2.93	SPT		50/280 mm (C)	3						
2.60	D	16								
3.10 - 3.20	ES	18								
3.10 - 3.40	B	20			Dense becoming very dense, multicoloured, slightly sandy GRAVEL with low cobble content. Sand is fine to coarse. Gravel is subangular to well rounded, fine to coarse of flint. Cobbles (85x95x200 mm) are subangular to well rounded of flint. [RIVER TERRACE DEPOSITS] [GRAVEL]	(3.70)				
3.10	PID		< 0.1 ppm							
3.30	D	19								
3.50 - 4.00	B	21								
3.50 - 3.87	SPT		50/220 mm (C)							
				4						
4.10 - 4.20	ES	22								
4.10 - 4.40	B	24			At 4.30 m; with cobble (100x100x500 mm)					
4.10	PID		< 0.1 ppm							
4.30	D	23								
4.50 - 5.00	B	26								
4.50 - 4.92	SPT		50/265 mm (C)							
4.70	D	25		5						
5.20 - 5.30	ES	27			Firm and stiff, dark brownish grey, silty CLAY. [LONDON CLAY FORMATION] [CLAY]	5.20	17.17			
5.20	PID		< 0.1 ppm							
5.40	D	28								
5.50 - 5.80	B	29								
6.00 - 6.50	UT	30	72/450 mm	6	At 6.00 m; becoming stiff and fissured. With occasional selenite crystals (<1 mm). Fissures are subhorizontal, mainly closely spaced, smooth and planar.	(2.30)				
6.50	D	31								
6.60 - 6.70	ES	32								
6.60 - 7.00	B	34								
6.60	PID		< 0.1 ppm							
6.80	D	33		7						
7.00 - 7.45	D	35								
7.00 - 7.45	SPT		N = 21 (S)							
					End of Borehole at 7.50 m	7.50	14.87			
				8						
				9						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-77**
Fugro Reference	G170029U			
Coordinates (m)	E503901.98 N177312.72	Ground Elevation (m Datum)	22.37	Sheet 1 of 1
Hole Type	Cable Percussion			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	04/01/2018	04/01/2018	Hand-dug			SB	AK	
1.20	7.50	CP	04/01/2018	04/01/2018	Dando 3000			SB	AK	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
04/01/2018	08:00:00	0.00			
04/01/2018	18:00:00	7.50	5.85	Dry	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)
7.50	200	5.85	200

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)
1.20				

Water Added

Depth From (m)	Depth To (m)
1.30	5.20

Water Strike Remarks

Groundwater was not encountered during excavation or boring.

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
SP	1	1.90	5.20	04/01/2018

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	0.06	1.90	50	Plain
Pipe1	1.90	5.20	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	0.05	Flush Cover	04/01/2018
0.05	0.20	Concrete	04/01/2018
0.20	1.70	Bentonite	04/01/2018
1.70	5.20	Gravel Backfill	04/01/2018
5.20	7.50	Bentonite	04/01/2018

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 28/11/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-77**
	Fugro Reference	G170029U			
	Coordinates (m)	E503901.98 N177312.72	Ground Elevation (m Datum)	22.37	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)
1.50	C	0	N=43 (4,14/10,10,10,13)	450	EQU306	73	1.50	1.40
2.50	C	0	N=50 (5,10/50 for 280mm)	430	EQU306	73	2.50	1.40
3.50	C	0	50 (4,14/50 for 220mm)	370	EQU306	73	3.10	2.00
4.50	C	0	N=50 (3,7/50 for 265mm)	415	EQU306	73	4.50	2.00
7.00	S	0	N=21 (1,2/3,3,6,9)	450	EQU306	73	5.85	Dry

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)
0.30	< 0.1
0.70	< 0.1
0.90	< 0.1
1.20	< 0.1
2.10	< 0.1
3.10	< 0.1
4.10	< 0.1
5.20	< 0.1
6.60	< 0.1

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-85**
	Fugro Reference	G170029U			
	Coordinates (m)	E503875.87 N177210.91	Ground Elevation (m Datum)	22.10	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
					MADE GROUND: concrete. [MADE GROUND] [CONCRETE]	(0.30)				
0.30	D	1				0.30	21.80			
0.30 - 0.35	ES	2			MADE GROUND: purplish brown, slightly gravelly sand. Sand is fine to coarse. Gravel is subangular, fine and medium, of brick, flint, coal, and other mixed lithologies. [MADE GROUND] [SAND]	(0.20)				
0.30	PID		< 0.1 ppm			0.50	21.60			
0.35 - 0.50	B	3				(0.40)				
0.50	D	4								
0.60 - 0.65	ES	5			MADE GROUND: (soft and firm), slightly gravelly clay. Gravel is subangular and subrounded, fine and medium of flint. [MADE GROUND] [CLAY]	0.90	21.20			
0.60	PID		< 0.1 ppm	1		(0.30)				
0.70 - 0.90	LB	6				1.20	20.90			
1.00	D	7			Brown, slightly clayey GRAVEL. Gravel is angular to subrounded, fine to coarse of flint. [RIVER TERRACE DEPOSITS] [GRAVEL]					
1.50 - 1.60	ES	8								
1.50 - 1.95	SPT		N = 31 (C)							
1.50	PID		< 0.1 ppm		Dense, locally very dense, orange brown, very sandy GRAVEL with clay pockets. Sand is fine to coarse, mainly coarse. Gravel is subangular to rounded, fine to coarse of flint, with occasional quartz, sandstone, and mudstone. [RIVER TERRACE DEPOSITS] [GRAVEL]					
1.60 - 2.00	B	9								
2.00	D	10		2						
2.10	D	11								
2.10 - 2.20	ES	12								
2.10	PID		< 0.1 ppm							
2.20 - 2.50	B	13								
2.50 - 3.00	B	14								
2.50 - 2.92	SPT		50/265 mm (C)							
3.05	D	15		3						
3.10 - 3.20	ES	16								
3.10	PID		< 0.1 ppm							
3.20 - 3.50	B	17								
3.50 - 4.00	B	18								
3.50 - 3.95	SPT		N = 35 (C)							
4.05	D	19		4		(5.50)				
4.10 - 4.20	ES	20								
4.10	PID		< 0.1 ppm							
4.20 - 4.50	B	21								
4.50 - 5.00	B	22			Between 4.50 m and 5.00 m; medium dense.					
4.50 - 4.95	SPT		N = 12 (C)							
5.05	D	23		5	Below 4.90 m; with possible thin beds of soft and firm, brown, sandy clay. Sand is fine to coarse.					
5.10 - 5.20	ES	24								
5.10	PID		< 0.1 ppm							
5.20 - 5.50	B	25								
6.00 - 6.50	B	26		6						
6.00 - 6.45	SPT		N = 35 (C)							
6.70	D	27				6.70	15.40			
6.75 - 6.80	ES	28			Firm, thinly laminated, greyish brown, slightly sandy CLAY. Sand is fine to coarse, mainly fine and medium. [LONDON CLAY FORMATION] [CLAY]					
6.75	PID		< 0.1 ppm	7						
6.80 - 7.00	B	29								
7.00 - 7.50	UT	30	58/450 mm							
7.50	D	31								
8.00	D	32		8	Below 8.00 m; with rare fragments of brown claystone (<5x10 mm).	(2.30)				
8.10 - 8.20	ES	33								
8.10	PID		< 0.1 ppm							
8.20 - 8.50	B	34								
8.50 - 8.95	D	35								
8.50 - 8.95	SPT		N = 22 (S)							
				9	End of Borehole at 9.00 m	9.00	13.10			

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-85**
Fugro Reference	G170029U			
Coordinates (m)	E503875.87 N177210.91	Ground Elevation (m Datum)	22.10	Sheet 1 of 1
Hole Type	Cable Percussion			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	08/01/2018	08/01/2018	Hand-dug/breaker			SB/DT	JJL	
1.20	9.00	CP	08/01/2018	09/01/2018	Dando 3000			SB/DT	JJL	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
08/01/2018	02:00:00	0.00			
08/01/2018	18:00:00	1.40	1.40	1.30	
09/01/2018	08:00:00	1.40	1.40	Dry	
09/01/2018	18:00:00	9.00	7.10		

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)
9.00	200	7.10	200

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark
1.20	1.40	01:00	Cobble in casing
1.40	1.50	01:00	Cobble in casing
2.80	2.90	01:00	Cobble in casing

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)

Water Added

Depth From (m)	Depth To (m)
1.20	5.10

Water Strike Remarks

Groundwater was not encountered during excavation or boring.

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
SP	1	1.40	6.70	09/01/2018

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	0.06	1.50	50	Plain
Pipe1	1.50	6.70	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	0.05	Flush Cover	09/01/2018
0.05	0.20	Concrete	09/01/2018
0.20	1.40	Bentonite	09/01/2018
1.40	6.70	Gravel Backfill	09/01/2018
6.70	9.00	Bentonite	09/01/2018

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 28/11/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-85**
	Fugro Reference	G170029U			
	Coordinates (m)	E503875.87 N177210.91	Ground Elevation (m Datum)	22.10	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)
1.50	C	0	N=31 (9,7/7,7,6,11)	450	EQU306	73	1.50	Dry
2.50	C	0	N=50 (4,10/50 for 265mm)	415	EQU306	73	2.50	1.99
3.50	C	0	N=35 (4,5/5,7,9,14)	450	EQU306	73	3.50	2.30
4.50	C	0	N=12 (2,2/2,2,4,4)	450	EQU306	73	4.50	1.50
6.00	C	0	N=35 (2,4/6,7,11,11)	450	EQU306	73	5.90	2.15
8.50	S	0	N=22 (1,3/3,5,7,7)	450	EQU306	73	7.10	7.41

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)
0.30	< 0.1
0.60	< 0.1
1.50	< 0.1
2.10	< 0.1
3.10	< 0.1
4.10	< 0.1
5.10	< 0.1
6.75	< 0.1
8.10	< 0.1

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion		Location ID	
	Client	Heathrow Airport Limited		**HEP-BH-820**	
	Fugro Reference	G170029U			
	Coordinates (m)	E503686.23 N177274.12	Ground Elevation (m Datum) 21.24	Sheet 1 of 2	
	Hole Type	Dynamic (Windowless) Sampler		Status	Final

Sampling and In Situ Testing					Strata Details				Groundwater	
Depth (m)	Type	No.	Test Results	Run Depth (m) (Recovery) (%)	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.05 - 0.15	B	3				MADE GROUND: (soft and firm), black, sandy, gravelly clay. With occasional roots and rootlets (2x10 mm). Sand is fine to coarse. Gravel is subangular and subrounded, fine and medium of flint and brick. [MADE GROUND] [CLAY]					
0.05 - 0.15	D	1									
0.05 - 0.15	ES	2									
0.05	PID		< 0.1 ppm				(0.50)				
						Below 0.20 m; becoming dark grey with low cobble content. Gravel is fine and medium, occasionally coarse of brick. Cobbles (<80x80x90 mm) are subangular and subrounded of flint.					
0.50 - 0.60	D	4					0.50	20.74			
0.50 - 0.60	ES	5				MADE GROUND: (soft and firm), yellowish brown, slightly sandy, gravelly clay. With occasional rootlets (2x200 mm). With occasional pockets (5x10 mm) of firm, dark grey peaty clay. Gravel is subangular, fine to coarse of brick. [MADE GROUND] [CLAY]					
0.50	PID		< 0.1 ppm								
0.60 - 0.70	B	8									
0.60 - 0.70	D	6									
0.60 - 0.70	ES	7									
0.60	PID		< 0.1 ppm				(0.70)				
					1						
1.20 - 1.65	SPT		N = 1 (S)	1.20			1.20	20.04			
						MADE GROUND: (soft and firm), dark grey, sandy, gravelly clay. Sand is fine to coarse. Gravel is subangular and subrounded, fine and medium and occasionally coarse of flint and occasional brick. [MADE GROUND] [CLAY]	(0.40)				
1.60 - 1.70	B	11		(100)			1.60	19.64			
1.60 - 1.70	D	9				MADE GROUND: (soft and firm), dark grey, slightly sandy, slightly gravelly, silty clay. With occasional fragments of wood (<3x11 mm). With occasional pockets (<5x7 mm) of organic material. Sand is fine and coarse. Gravel is subangular and subrounded, fine and medium and occasionally coarse of flint. [MADE GROUND] [CLAY]					
1.60 - 1.70	ES	10									
1.60	PID		0.2 ppm								
2.00 - 2.45	D	12		2.00	2						
2.00 - 2.45	SPT		N = 2 (S)				(1.10)				
				(80)							
2.60 - 2.70	D	13									
2.60 - 2.70	ES	14									
2.60	PID		0.1 ppm			Grey, sandy GRAVEL. Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of flint. [RIVER TERRACE DEPOSITS] [GRAVEL]	2.70	18.54			
2.90 - 3.30	D	15					(0.30)				
3.00 - 3.45	SPT		N = 32 (S)	3.00	3	No recovery; assumed zone of core loss. [NO CORE RECOVERY]	3.00	18.24			
				(0)			(1.50)				
4.00 - 4.45	SPT		N = 17 (C)	4.00	4						
				(50)			4.50	16.74			
4.55 - 4.95	D	18				Grey, sandy GRAVEL. Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of flint. [RIVER TERRACE DEPOSITS] [GRAVEL]					
4.60 - 4.70	D	16					(0.35)				
4.60 - 4.70	ES	17									
4.60	PID		0.1 ppm								
4.85 - 4.95	ES	19					4.85	16.39			
4.85	PID		< 0.1 ppm			Stiff, fissured, dark grey CLAY. With occasional partings of dark grey, silty clay. Fissures are inclined (40 to 50 degrees), closely					
5.00 - 5.45	D	20		5.00							
5.00 - 5.45	SPT		N = 12 (S)			Continued next page					

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-820**
	Fugro Reference	G170029U			
	Coordinates (m)	E503686.23 N177274.12	Ground Elevation (m Datum)	21.24	Sheet 2 of 2
	Hole Type	Dynamic (Windowless) Sampler			Status: Final

Sampling and In Situ Testing					Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Run Depth (m) (Recovery) (%)	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
						Stiff, fissured, dark grey CLAY. With occasional partings of dark grey, silty clay. Fissures are inclined (40 to 50 degrees), closely spaced, planar and undulating, occasionally with silty surfaces. [LONDON CLAY FORMATION] [CLAY]	(0.60)				
				5.45		End of Borehole at 5.45 m	5.45	15.79			
					6						
					7						
					8						
					9						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID	
Client	Heathrow Airport Limited			**HEP-BH-820**	
Fugro Reference	G170029U				
Coordinates (m)	E503686.23 N177274.12	Ground Elevation (m Datum)	21.24	Sheet 1 of 1	
Hole Type	Dynamic (Windowless) Sampler			Status	Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	06/03/2018	06/03/2018	Hand-dug			MG	MG	
1.20	5.45	WLS	06/03/2018	06/03/2018	Terrier			RU	MG	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
06/03/2018	08:00:00	0.00			
06/03/2018	10:00:00	1.20			
06/03/2018	18:00:00	5.45	5.00	4.43	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)
5.45	101	5.00	113

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)
3.00	1.38	20		

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

Groundwater seepage at 1.10 m. Water level was not monitored.

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
SP	1	3.00	4.80	06/03/2018

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	0.06	3.20	50	Plain
Pipe1	3.20	4.80	50	Slotted
Pipe1	4.80	5.30	50	Plain

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	0.05	Flush Cover	06/03/2018
0.05	0.20	Concrete	06/03/2018
0.20	3.00	Bentonite	06/03/2018
3.00	5.45	Gravel Backfill	06/03/2018

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS				Print Date	28/11/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-820**
	Fugro Reference	G170029U			
	Coordinates (m)	E503686.23 N177274.12	Ground Elevation (m Datum)	21.24	Sheet 1 of 1
	Hole Type	Dynamic (Windowless) Sampler			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)
1.20	S	375	N=1 (0,0/0,0,0,1)	450	DT0767	71	0.00	Dry
2.00	S	0	N=2 (0,1/1,0,1,0)	450	DT0767	71	2.00	Dry
3.00	S	0	N=32 (5,5/7,7,9,9)	450	DT0767	71	3.00	3.00
4.00	C	0	N=17 (4,3/2,2,4,9)	450	DT0767	71	4.00	3.90
5.00	S	0	N=12 (2,2/2,3,3,4)	450	DT0767	71	5.00	4.43

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)
0.05	< 0.1
0.50	< 0.1
0.60	< 0.1
1.60	0.2
2.60	0.1
4.60	0.1
4.85	< 0.1

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-821**
	Fugro Reference	G170029U			
	Coordinates (m)	E503811.85 N177274.57	Ground Elevation (m Datum)	22.17	Sheet 1 of 2
	Hole Type	Cable Percussion			Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
					MADE GROUND: concrete. [MADE GROUND] [CONCRETE]	(0.30)				
0.30	D	1			MADE GROUND: brown, sand and gravel. With occasional fragments of coal (2x4 mm) and rare fragments of glass (<60 mm). Sand is fine to coarse. Gravel is subangular to subrounded, fine to coarse of concrete, brick and flint. [MADE GROUND] [GRAVEL]	0.30	21.87			
0.35 - 0.40	ES	2				(0.60)				
0.35	PID		< 0.1 ppm							
0.40 - 0.70	B	3								
0.70	D	4								
0.75 - 0.80	ES	5				0.90	21.27			
0.75	PID		< 0.1 ppm	1	MADE GROUND: brown, sandy gravel. With frequent fragments of glass (<60 mm). Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of flint and brick. [MADE GROUND] [WASTE, e.g. LANDFILL]	(0.60)				
0.80 - 0.90	B	6								
0.90	D	7								
0.95 - 1.00	ES	8				1.50	20.67			
0.95	PID		< 0.1 ppm		MADE GROUND: brown, slightly sandy gravel. With occasional pockets (10x20 mm) of soft, grey clay. With abundant fragments of glass (2x3 mm). Sand is fine to coarse. Gravel is subangular to subrounded, fine to coarse of flint and frequent brick (3x4 mm). [MADE GROUND] [WASTE, e.g. LANDFILL]	(0.50)				
1.00 - 1.20	B	9								
1.50	D	10				2.00	20.17			
1.50 - 1.95	SPT		N = 26 (S)	2	Very dense, brown GRAVEL. Gravel is angular to subrounded, fine to coarse, mainly medium and coarse, of flint, quartz, and occasional sandstone. [RIVER TERRACE DEPOSITS] [GRAVEL]					
1.55 - 1.60	ES	11								
1.55	PID		< 0.1 ppm							
1.60 - 2.00	B	12								
2.00 - 2.50	B	13								
2.50	D	14								
2.50 - 2.89	SPT		50/240 mm (C)							
2.55 - 2.65	ES	15								
2.55	PID		< 0.1 ppm		Between 2.50 m and 3.00 m; with rare pockets (10x20 mm) of soft, grey clay.					
2.65 - 3.00	B	16		3	Below 2.50 m; gravel is of flint.					
3.00	D	17								
3.10 - 3.20	ES	18								
3.10	PID		< 0.1 ppm							
3.20 - 3.50	B	19								
3.50 - 4.00	B	20								
3.50 - 3.92	SPT		50/275 mm (C)			(3.50)				
4.00	D	21		4						
4.10 - 4.20	ES	22								
4.10	PID		< 0.1 ppm							
4.20 - 4.50	B	23								
4.50 - 5.00	B	24								
4.50 - 4.95	SPT		N = 21 (C)		Between 4.50 m and 5.00 m; medium dense. With occasional pockets (30x50 mm) of soft, grey clay.					
				5						
5.50	D	25			Dense/very dense, brown SAND and GRAVEL. Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse, of flint. [RIVER TERRACE DEPOSITS] [SAND]	5.50	16.67			
5.60 - 5.70	ES	26								
5.60	PID		< 0.1 ppm							
5.70 - 6.00	B	27			Between 5.70 m and 6.00 m; with occasional pockets (80x100 mm) of soft, grey clay.					
6.00 - 6.50	B	28		6						
6.00 - 6.45	SPT		N = 50 (C)							
						(1.80)				
6.50	D	29								
6.60 - 6.70	ES	30								
6.60	PID		< 0.1 ppm							
6.70 - 7.00	B	31		7						
7.30	D	32				7.30	14.87			
7.40 - 7.50	ES	33			Firm, greyish brown, slightly sandy, slightly gravelly CLAY. Sand is fine to coarse. Gravel is rounded, fine and medium of flint. (Gravel possibly brought down during boring from stratum above). [LONDON CLAY FORMATION] [CLAY]	(0.20)				
7.40	PID		< 0.1 ppm			7.50	14.67			
7.50 - 8.00	UT	34	105/450 mm							
8.00	ES	35		8	Firm, thinly laminated, greyish brown, slightly sandy CLAY. Sand is fine and medium. [LONDON CLAY FORMATION] [CLAY]					
8.00	PID		< 0.1 ppm							
8.10	D	36								
8.20 - 8.30	ES	37								
8.20	PID		< 0.1 ppm							
8.30 - 8.60	B	38								
9.00 - 9.45	D	39		9						
9.00 - 9.50	B	40								
9.00 - 9.45	SPT		N = 24 (S)		Between 9.00 m and 11.50 m; fissured. Fissures are rare, randomly orientated, undulating, smooth, open (<1 mm) and infilled with light brown clay.					
						(4.50)				
					Continued next page					

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-821**
	Fugro Reference	G170029U			
	Coordinates (m)	E503811.85 N177274.57	Ground Elevation (m Datum)	22.17	Sheet 2 of 2
	Hole Type	Cable Percussion			Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
					Firm, thinly laminated, greyish brown, slightly sandy CLAY. Sand is fine and medium. [LONDON CLAY FORMATION] [CLAY]					
11.00 - 11.50	UT	41	90/450 mm	11						
11.50	D	42			Below 11.50 m; stiff.					
11.60	D	43								
11.70 - 11.80	ES	44								
11.70	PID		< 0.1 ppm							
11.80 - 12.00	B	45		12		12.00	10.17			
					Firm, thinly laminated, greyish brown, slightly sandy CLAY. Sand is fine to coarse, mainly fine and medium. [LONDON CLAY FORMATION] [CLAY]					
13.00 - 13.45	D	46		13						
13.00 - 13.50	B	47			Between 13.00 m and 13.50 m; with rare fragments (3x5 mm) of claystone.					
13.00 - 13.45	SPT		N = 32 (S)							
				14						
15.00 - 15.50	UT	48	60/450 mm	15		(6.00)				
15.50	D	49			Between 15.50 m and 16.00 m; with occasional dustings (2x30 mm) of brown, fine silt.					
15.60	D	50								
15.70 - 15.80	ES	51								
15.70	PID		< 0.1 ppm							
15.80 - 16.00	B	52		16						
17.00 - 17.45	D	53		17						
17.00 - 17.50	B	54								
17.00 - 17.45	SPT		N = 45 (S)							
				18	End of Borehole at 18.00 m	18.00	4.17			
				19						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-821**
Fugro Reference	G170029U			
Coordinates (m)	E503811.85 N177274.57	Ground Elevation (m Datum)	22.17	Sheet 1 of 1
Hole Type	Cable Percussion			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	11/01/2018	11/01/2018	Hand-dug/breaker			SB	JJL	
1.20	18.00	CP	11/01/2018	12/01/2018	Dando 3000			SB	JJL	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
11/01/2018	08:00:00	0.00			
11/01/2018	18:00:00	12.00	8.10	Dry	
12/01/2018	08:00:00	12.00	8.10	11.50	
12/01/2018	19:15:00	18.00	8.10	Dry	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)
18.00	200	8.10	200

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark
2.20	2.50	01:30	

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)

Water Added

Depth From (m)	Depth To (m)
1.50	5.80

Water Strike Remarks

Groundwater was not encountered during excavation or boring.

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
SP	1	1.60	7.30	12/01/2018

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	0.03	1.80	50	Plain
Pipe1	1.80	7.30	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	0.05	Flush Cover	12/01/2018
0.05	0.20	Concrete	12/01/2018
0.20	1.60	Bentonite	12/01/2018
1.60	7.30	Gravel Backfill	12/01/2018
7.30	18.00	Bentonite	12/01/2018

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 28/11/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-821**
	Fugro Reference	G170029U			
	Coordinates (m)	E503811.85 N177274.57	Ground Elevation (m Datum)	22.17	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)
1.50	S	0	N=26 (11,13/11,10,2,3)	450	EQU306	73	1.50	Dry
2.50	C	0	N=50 (6,18/50 for 240mm)	390	EQU306	73	2.50	1.80
3.50	C	0	N=50 (6,18/50 for 275mm)	425	EQU306	73	3.50	1.90
4.50	C	0	N=21 (3,1/3,3,6,9)	450	EQU306	73	4.50	2.00
6.00	C	0	N=50 (5,7/9,13,13,15)	450	EQU306	73	6.00	2.60
9.00	S	0	N=24 (1,3/3,5,7,9)	450	EQU306	73	8.10	Dry
13.00	S	0	N=32 (2,4/6,6,9,11)	450	EQU306	73	8.10	12.90
17.00	S	0	N=45 (3,5/10,10,10,15)	450	EQU306	73	8.10	Dry

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)
0.35	< 0.1
0.75	< 0.1
0.95	< 0.1
1.55	< 0.1
2.55	< 0.1
3.10	< 0.1
4.10	< 0.1
5.60	< 0.1
6.60	< 0.1
7.40	< 0.1
8.00	< 0.1
8.20	< 0.1
11.70	< 0.1
15.70	< 0.1

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion		Location ID
	Client	Heathrow Airport Limited		**HEP-BH-822**
	Fugro Reference	G170029U		
	Coordinates (m)	E503800.14 N177324.87	Ground Elevation (m Datum) 21.41	Sheet 1 of 2
	Hole Type	Dynamic (Windowless) Sampler		Status: Final

Sampling and In Situ Testing						Strata Details				Groundwater	
Depth (m)	Type	No.	Test Results	Run Depth (m) (Recovery) (%)	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.05 - 0.15	B	2				MADE GROUND: dark brown, gravelly clay. With occasional roots and rootlets (2x10 mm). Gravel is subangular and subrounded, fine and medium of quartzite and occasional brick.	(0.20)				
0.05 - 0.15	D	1				[MADE GROUND] [CLAY]	0.20	21.21			
0.05 - 0.15	ES	3				MADE GROUND: (soft), greyish brown, slightly gravelly, sandy clay (96%). With occasional rootlets (2x10 mm). With occasional fragments of roof tile (20x30 mm) (3%). With rare fragments of glass (<5x5 mm) (1%). Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of brick and concrete.					
0.05	PID		< 0.1 ppm			[MADE GROUND] [CLAY]	(1.00)				
0.20 - 0.40	B	5									
0.20 - 0.40	D	4									
0.20 - 0.40	ES	6									
0.20	PID		< 0.1 ppm								
0.50 - 0.70	B	8									
0.50 - 0.70	D	7									
0.50 - 0.70	ES	9									
0.50	PID		< 0.1 ppm		1						
1.20 - 1.65	D	10		1.20		MADE GROUND: (soft), dark grey clay. With occasional pockets (10x20 mm) of orangish brown, sandy, gravelly clay. [MADE GROUND] [CLAY]	1.20	20.21			
1.20 - 1.65	SPT		N = 1 (S)				(0.50)				
1.50 - 1.70	D	12									
1.50 - 1.70	ES	11									
1.50	PID		< 0.1 ppm	(100)							
1.70 - 1.90	D	14				MADE GROUND: (soft), greenish black, sandy, gravelly clay (96%). With occasional fragments of wood (<3x10 mm) (3%). With rare fragments of ceramic (<5x5 mm) (1%). Gravel is subangular, fine to coarse of flint. [MADE GROUND] [CLAY]	1.70	19.71			
1.70 - 1.90	ES	13									
1.70	PID		< 0.1 ppm								
2.00 - 2.45	SPT		N = 4 (S)	2.00	2		(0.80)				
2.20 - 2.50	ES	15									
2.20 - 2.95	D	16									
2.20	PID		0.1 ppm								
2.50 - 2.60	D	17		(60)		MADE GROUND: (soft), dark grey, clay with low cobble content. Gravel is angular to subrounded, fine to coarse of flint. Cobbles are of flint. [MADE GROUND] [CLAY]	2.50 (0.10) 2.60	18.91 18.81			
						Assumed zone of core loss. [NO CORE RECOVERY]	(0.40)				
3.00 - 3.20	ES	18		3.00	3	Greyish black GRAVEL. Gravel is subangular, fine to coarse of flint. [RIVER TERRACE DEPOSITS] [GRAVEL]	3.00	18.41			
3.00 - 3.45	SPT		N = 5 (S)				(0.25)				
3.00	PID		0.1 ppm			Assumed zone of core loss. [NO CORE RECOVERY]	3.25	18.16			
				(25)			(0.75)				
4.00 - 4.20	D	21		4.00	4	Medium dense, greyish black GRAVEL. Gravel is subangular, fine to coarse of flint. [RIVER TERRACE DEPOSITS] [GRAVEL]	4.00	17.41			
4.00 - 4.20	ES	20									
4.00 - 4.45	D	19									
4.00 - 4.45	SPT		N = 12 (S)				(0.50)				
4.00	PID		0.2 ppm								
				(50)		Assumed zone of core loss. [NO CORE RECOVERY]	4.50	16.91			
							(0.50)				
5.00 - 5.45	D	22		5.00		Continued next page	5.00	16.41			
5.00 - 5.45	SPT		N = 8 (S)								

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

	Contract Name	HAL Airport Expansion		Location ID
	Client	Heathrow Airport Limited		**HEP-BH-822**
	Fugro Reference	G170029U		
	Coordinates (m)	E503800.14 N177324.87	Ground Elevation (m Datum) 21.41	Sheet 2 of 2
	Hole Type	Dynamic (Windowless) Sampler		Status Final

Sampling and In Situ Testing					Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Run Depth (m) (Recovery) (%)	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
						Greyish black GRAVEL. Gravel is subangular, fine to coarse of flint. [RIVER TERRACE DEPOSITS] [GRAVEL]	(0.35)				
						Firm, dark brownish grey CLAY. [LONDON CLAY FORMATION] [CLAY]	5.35 (0.10)	16.06			
				5.45		End of Borehole at 5.45 m	5.45	15.96			
					6						
					7						
					8						
					9						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID	
Client	Heathrow Airport Limited			**HEP-BH-822**	
Fugro Reference	G170029U				
Coordinates (m)	E503800.14 N177324.87	Ground Elevation (m Datum)	21.41	Sheet 1 of 1	
Hole Type	Dynamic (Windowless) Sampler			Status	Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	05/03/2018	05/03/2018	Hand-dug			MG	MG	
1.20	5.45	WLS	05/03/2018	05/03/2018	Terrier			RU	MG	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
05/03/2018	08:00:00	0.00			
05/03/2018	18:00:00	5.45	5.00	1.48	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)
5.00	101	5.00	113

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)
3.00	0.91	20	3.00	

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

Groundwater seepage at 1.10 m. Water level was not monitored.

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
SP	1	2.60	5.00	07/03/2018

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	0.07	2.80	50	Plain
Pipe1	2.80	5.00	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	0.05	Flush Cover	05/03/2018
0.05	0.30	Concrete	05/03/2018
0.30	2.60	Bentonite	05/03/2018
2.60	5.45	Gravel Backfill	05/03/2018

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS				Print Date	28/11/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-822**
	Fugro Reference	G170029U			
	Coordinates (m)	E503800.14 N177324.87	Ground Elevation (m Datum)	21.41	Sheet 1 of 1
	Hole Type	Dynamic (Windowless) Sampler			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)
1.20	S	375	N=1 (0,0/0,0,0,1)	450	DT0767	71	0.00	Dry
2.00	S	0	N=4 (3,2/1,1,1,1)	450	DT0767	71	2.00	Dry
3.00	S	0	N=5 (2,2/1,3,1,0)	450	DT0767	71	3.00	2.80
4.00	S	0	N=12 (1,1/2,2,3,5)	450	DT0767	71	4.00	1.23
5.00	S	0	N=8 (1,1/2,2,2,2)	450	DT0767	71	5.00	1.48

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)
0.05	< 0.1
0.20	< 0.1
0.50	< 0.1
1.50	< 0.1
1.70	< 0.1
2.20	0.1
3.00	0.1
4.00	0.2

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID	
Client	Heathrow Airport Limited			**HEP-BH-823**	
Fugro Reference	G170029U				
Coordinates (m)	E503870.26 N177463.97	Ground Elevation (m Datum)	22.77	Sheet 1 of 2	
Hole Type	Cable Percussion			Status	Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.10 - 0.20	LB	1			MADE GROUND: light brown, slightly clayey, very sandy gravel. Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of flint, chalk, brick and concrete.	(0.50)				
0.30	D	2			[MADE GROUND] [GRAVEL]	0.50	22.27			
0.40 - 0.50	ES	3			At 0.20 m; black synthetic membrane.	(0.15)	22.12			
0.40	PID		< 0.1 ppm		Below 0.20 m; dark grey and brownish grey, very clayey with occasional pockets (200x200 mm) of soft, dark grey, slightly sandy, organic clay.	0.65				
0.70 - 0.80	LB	4								
0.90	D	5								
1.00 - 1.10	ES	6		1	MADE GROUND: concrete.					
1.00	PID		< 0.1 ppm		[MADE GROUND] [CONCRETE]					
					MADE GROUND: (firm and stiff) brownish grey, slightly sandy, slightly gravelly to gravelly clay. Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of flint, chalk and occasional brick, concrete and cinder.					
1.50 - 1.95	D	7								
1.50 - 2.00	B	8								
1.50 - 1.95	SPT		N = 9 (S)		[MADE GROUND] [CLAY]					
					Below 0.90 m; firm with occasional partings of black silt.					
2.00 - 2.10	ES	9		2	Below 1.50 m; soft and firm, slightly gravelly.					
2.00	PID		< 0.1 ppm							
						(3.35)				
2.40	D	10			Below 2.40m; soft.					
2.50 - 2.95	D	11			At 2.40 m; with fragment of ceramic (<20x20 mm).					
2.50 - 3.00	B	12								
2.50 - 2.95	SPT		N = 6 (S)							
3.00 - 3.10	ES	13		3						
3.00	PID		< 0.1 ppm							
3.40	D	14								
3.50 - 3.95	D	15								
3.50 - 4.00	B	16								
3.50 - 3.95	SPT		N = 42 (S)							
4.00	D	17		4	MADE GROUND: (very soft and soft), dark grey locally mottled black, slightly gravelly, sandy clay. Sand is fine to coarse. Gravel is subrounded, fine and medium of flint and rare concrete.	4.00	18.77			
4.05 - 4.20	B	18			[MADE GROUND] [CLAY]	(0.30)				
4.20 - 4.30	ES	19				4.30	18.47			
4.20	PID		< 0.1 ppm		Loose/medium dense, black, sandy GRAVEL. With frequent pockets (50x80 mm) of very soft, dark grey, sandy clay. Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of flint.	(0.80)				
4.30	D	20								
4.35 - 4.40	B	21								
4.40 - 4.50	ES	22								
4.40	PID		< 0.1 ppm							
4.50 - 5.00	B	23		5						
4.50 - 4.95	SPT		N = 10 (C)		[RIVER TERRACE DEPOSITS] [GRAVEL]	5.10	17.67			
5.10	D	24			Soft and firm, thinly laminated, grey, slightly sandy CLAY. Sand is fine and medium.					
5.20 - 5.40	B	25								
5.40 - 5.50	ES	26								
5.40	PID		< 0.1 ppm		[LONDON CLAY FORMATION] [CLAY]					
6.00 - 6.50	UT	27	85/450 mm	6		(1.90)				
6.50	D	28								
6.60	D	29			Between 6.60 m and 7.00 m; with frequent fissures. Fissures are randomly orientated, very closely spaced, planar, infilled with dark grey clay (<20 mm).					
6.70 - 6.90	B	30								
6.90 - 7.00	ES	31			Between 6.90 m and 7.00 m; with rare shell fragments (<3 mm).					
6.90	PID		< 0.1 ppm	7		7.00	15.77			
7.10	D	32			Firm, thinly laminated, greyish brown, slightly sandy CLAY. Sand is fine and medium.					
7.20 - 7.40	B	33								
7.40 - 7.50	ES	34			[LONDON CLAY FORMATION] [CLAY]					
7.40	PID		< 0.1 ppm		Between 7.00 m and 7.50 m; with rare roots (4x60 mm).					
7.50 - 7.95	D	35			Below 7.50 m; with frequent selenite crystals (<2 mm).					
7.50 - 8.00	B	36								
7.50 - 7.95	SPT		N = 23 (S)							
				8						
						(3.50)				
9.00 - 9.50	UT	37	141/450 mm	9						
9.50	D	38								
					Continued next page					

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID	
Client	Heathrow Airport Limited			**HEP-BH-823**	
Fugro Reference	G170029U				
Coordinates (m)	E503870.26 N177463.97	Ground Elevation (m Datum)	22.77	Sheet 2 of 2	
Hole Type	Cable Percussion			Status	Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
					Firm, thinly laminated, greyish brown, slightly sandy CLAY. Sand is fine and medium. [LONDON CLAY FORMATION] [CLAY]					
10.50	D	39				10.50	12.27			
10.60 - 10.90	B	40			Firm, thinly laminated, greyish brown, slightly sandy CLAY. With frequent lithorelicts (25x30 mm) of greyish brown claystone. Sand is fine to coarse. [LONDON CLAY FORMATION] [CLAY]					
10.90	PID		< 0.1 ppm							
11.00 - 11.45	D	42		11						
11.00 - 11.50	B	43								
11.00 - 11.50	ES	41								
11.00 - 11.45	SPT		N = 26 (S)							
						(2.50)				
				12						
13.00 - 13.50	UT	44	140/450 mm	13		13.00	9.77			
					Firm, thinly laminated, greyish brown, slightly sandy CLAY. Sand is fine to coarse, mainly fine and medium. [LONDON CLAY FORMATION] [CLAY]					
13.50	D	45								
13.60	D	46								
13.60 - 13.90	B	47								
13.90 - 14.00	ES	48								
13.90	PID		< 0.1 ppm	14						
15.00 - 15.45	D	49		15		(4.00)				
15.00 - 15.50	B	50			Below 15.00 m; with rare lithorelicts (50x80 mm) of greyish brown claystone and rare pyrite crystals (<3 mm).					
15.00 - 15.45	SPT		N = 34 (S)							
				16						
17.00 - 17.50	UT	51	141/450 mm	17		17.00	5.77			
					Firm and stiff, greyish brown, slightly sandy CLAY. Sand is fine and medium. [LONDON CLAY FORMATION] [CLAY]	(0.60)				
17.50	D	52								
17.60	D	53				17.60	5.17			
17.70 - 17.90	B	54			Firm, greyish brown, slightly sandy CLAY. With frequent lenses (<15 mm) of greyish brown, fine and medium sand. Sand is fine and medium. [LONDON CLAY FORMATION] [CLAY]	(0.40)				
17.90 - 18.00	ES	55								
17.90	PID		< 0.1 ppm	18		18.00	4.77			
					End of Borehole at 18.00 m					
				19						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID	
Client	Heathrow Airport Limited			**HEP-BH-823**	
Fugro Reference	G170029U				
Coordinates (m)	E503870.26 N177463.97	Ground Elevation (m Datum)	22.77	Sheet 1 of 1	
Hole Type	Cable Percussion			Status	Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	29/11/2017	29/11/2017	Hand-dug			SB/DT	SK	
1.20	18.00	CP	30/11/2017	01/12/2017	Dando 3000			SB/DT	JJL	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
29/11/2017	08:00:00	0.00			
29/11/2017	18:00:00	4.00	4.00	Dry	
30/11/2017	08:00:00	4.00	4.00	Dry	
30/11/2017	18:00:00	18.00	6.00	Dry	
01/12/2017	08:00:00	18.00	6.00	13.90	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)
18.00	200	6.00	200

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark
5.00	5.10	01:00	

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)
4.40	2.09	20	4.20	6.50

Water Added

Depth From (m)	Depth To (m)
4.30	5.10

Water Strike Remarks

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
SP	1	4.30	5.10	01/12/2017

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	0.02	4.40	50	Plain
Pipe1	4.40	5.10	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	0.05	Flush Cover	01/12/2017
0.05	0.20	Concrete	01/12/2017
0.20	4.30	Bentonite	01/12/2017
4.30	5.10	Gravel Backfill	01/12/2017
5.10	18.00	Bentonite	01/12/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS				Print Date	28/11/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-823**
	Fugro Reference	G170029U			
	Coordinates (m)	E503870.26 N177463.97	Ground Elevation (m Datum)	22.77	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)
1.50	S	0	N=9 (1,3/2,2,2,3)	450	EQU306	73	1.50	Dry
2.50	S	0	N=6 (1,1/1,1,2,2)	450	EQU306	73	1.50	Dry
3.50	S	0	N=42 (1,1/6,22,12,2)	450	EQU306	73	3.50	Dry
4.50	C	0	N=10 (3,7/4,4,1,1)	450	EQU306	73	4.50	2.40
7.50	S	0	N=23 (2,2/3,5,7,8)	450	EQU306	73	6.00	Dry
11.00	S	0	N=26 (1,5/5,5,8,8)	450	EQU306	73	6.00	10.75
15.00	S	0	N=34 (2,5/5,8,10,11)	450	EQU306	73	6.00	Dry

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)
0.40	< 0.1
1.00	< 0.1
2.00	< 0.1
3.00	< 0.1
4.20	< 0.1
4.40	< 0.1
5.40	< 0.1
6.90	< 0.1
7.40	< 0.1
10.90	< 0.1
13.90	< 0.1
17.90	< 0.1

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion		Location ID	**HEP-BH-824**
	Client	Heathrow Airport Limited			
	Fugro Reference	G170029U			
	Coordinates (m)	E503733.40 N177483.61	Ground Elevation (m Datum) 22.03	Sheet 1 of 2	
	Hole Type	Cable Percussion		Status	Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.10 - 0.15	D	2			MADE GROUND: light brown, slightly sandy gravel within cellular geotextile system. Sand is fine to coarse. Gravel is subangular and subrounded, fine and medium of flint and other various lithologies. Geotextile separator layer (2 mm thick) at base. [MADE GROUND] [ENGINEERING FILL]	(0.10)	21.93			
0.10 - 0.15	ES	1				0.10	21.88			
0.10 - 0.15	LB	3				(0.05)				
0.10	PID		< 0.1 ppm			0.15				
0.20 - 0.30	ES	4				(0.50)				
0.20 - 0.50	LB	6				0.65	21.38			
0.20	PID		< 0.1 ppm		MADE GROUND: light reddish brown and orangish brown, gravelly sand. Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of flint, and occasional fine of brick. [MADE GROUND] [ENGINEERING FILL]	(0.35)				
0.40 - 0.50	D	5				1.00	21.03			
0.70 - 0.80	ES	7		1						
0.70 - 1.10	LB	9								
0.70	PID		< 0.1 ppm		MADE GROUND: dark brownish grey, clayey cobbly very sandy gravel. With occasional fragments (<20 mm) of ash and clinker. Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of flint, concrete and construction rubble. Cobbles (90x150 mm) are of asphalt. [MADE GROUND] [GRAVEL]					
0.90 - 1.00	D	8								
1.20 - 1.65	D	10								
1.20 - 1.65	SPT		N = 4 (S)			(1.20)				
1.70 - 1.80	ES	11								
1.70 - 2.00	LB	13								
1.70	PID		< 0.1 ppm	2						
1.90 - 2.00	D	12			MADE GROUND: (soft and firm), greyish brown locally black, slightly sandy, gravelly clay. Sand is fine to coarse. Gravel is subangular to well rounded, fine to coarse of flint and occasional fine of brick. [MADE GROUND] [CLAY]	2.20	19.83			
2.20 - 2.65	D	14				(0.50)				
2.20 - 2.70	LB	15								
2.20 - 2.65	SPT		N = 3 (S)							
2.70 - 2.80	ES	16				2.70	19.33			
2.70 - 3.20	LB	18			Soft and firm, greyish brown, slightly sandy, slightly gravelly CLAY. Sand is fine to coarse. Gravel is angular to rounded, fine to coarse of flint. [ALLUVIUM] [CLAY] Below 1.70 m; becoming firm.					
2.70	PID		< 0.1 ppm			(0.50)				
2.90 - 3.00	D	17		3						
3.20 - 3.50	LB	20				3.20	18.83			
3.20 - 3.65	D	19								
3.20 - 3.65	SPT		N = 8 (S)							
3.50 - 3.60	ES	21			Soft, dark greyish brown locally black, sandy, very clayey GRAVEL With occasional organic plant matter (<2%) and pockets (50mm) of sandy clay. Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of flint. Cobbles (<90mm) are well rounded of flint. Slight organic odour. [ALLUVIUM] [GRAVEL]	(0.60)				
3.50 - 4.20	B	23								
3.50	PID		< 0.1 ppm			3.80	18.23			
3.60 - 3.70	D	22		4						
4.20 - 4.60	B	24								
4.20 - 4.65	SPT		N = 19 (C)		Dark greyish brown locally black, slightly clayey, slightly sandy GRAVEL with low cobble content. With occasional pockets (<10 mm) of black organic material (plant, wood and roots) and black silty clay. Sand is fine to coarse. Gravel is angular to well rounded, fine to coarse of flint. Cobbles are well rounded of flint. Moderate organic odour. [ALLUVIUM] [GRAVEL]	(0.90)				
4.70 - 4.80	ES	25				4.70	17.33			
4.70 - 5.20	B	27				(0.30)				
4.70	PID		< 0.1 ppm			5.00	17.03			
4.90 - 5.00	D	26		5						
5.20 - 5.65	UT	28	40/450 mm		Soft and firm, dark greyish brown, slightly sandy, slightly gravelly CLAY. With occasional pockets (<10 mm) of organic material (plant, wood and roots). Sand is fine to coarse. Gravel is subangular to well rounded ,fine to coarse of flint. [ALLUVIUM] [CLAY] Below 3.50 m; becoming very gravelly.					
5.65 - 5.70	D	29								
6.00 - 6.10	ES	30		6						
6.00	PID		< 0.1 ppm		Medium dense, dark greyish brown, slightly clayey, slightly sandy GRAVEL. With occasional pockets (50x<80 mm) of soft, black, sandy clay. Sand is fine to coarse. Gravel is angular to well rounded, fine to coarse of flint. [RIVER TERRACE DEPOSITS] [GRAVEL] At 4.00 m; with rare cobbles. Cobbles are well rounded of flint.	(2.90)				
6.50 - 6.95	D	31								
6.50 - 6.95	SPT		N = 18 (S)							
				7	Soft and firm, dark greyish brown, slightly sandy, slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular to well rounded, fine to coarse of flint. (Gravel possibly brought down during boring from stratum above). [LONDON CLAY FORMATION] [CLAY]					
					Stiff, fissured, indistinctly laminated, slightly sandy CLAY. With frequent selenite crystals (<1 mm). [LONDON CLAY FORMATION] [CLAY]					
7.90 - 8.00	D	32				7.90	14.13			
7.90 - 8.50	B	33		8	Stiff to very stiff closely fissured dark greyish brown slightly sandy gravelly CLAY. With frequent selenite crystals (<1mm). Sand is fine to coarse. Fissures are subhorizontal, closely spaced, planar and smooth. [LONDON CLAY FORMATION] [CLAY] Between 7.90 m and 8.00 m; possible thin bed/nodule of weak, grey, claystone.					
8.50 - 8.95	UT	34	100/450 mm							
8.95 - 9.00	D	35								
9.00 - 9.10	ES	36		9						
9.00	PID		< 0.1 ppm			(2.55)				
10.00 - 10.45	D	37								
10.00 - 10.45	SPT		N = 22 (S)							

Continued next page

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-824**
	Fugro Reference	G170029U			
	Coordinates (m)	E503733.40 N177483.61	Ground Elevation (m Datum)	22.03	Sheet 2 of 2
	Hole Type	Cable Percussion			Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
					Stiff to very stiff closely fissured dark greyish brown slightly sandy gravelly CLAY. With frequent selenite crystals (<1mm). Sand is fine to coarse. Fissures are subhorizontal, closely spaced, planar and smooth. [LONDON CLAY FORMATION] [CLAY]	10.45	11.58			
10.50 - 11.00	B	38		11	Stiff and very stiff, locally indistinctly laminated, greyish brown, slightly sandy slightly gravelly CLAY. Sand is fine and medium. [LONDON CLAY FORMATION] [CLAY]					
					Between 10.50 m and 12.00 m; with occasional nodules (<6 mm), subangular of calcrete.					
11.40 - 11.50	D	39								
11.40 - 12.00	B	40			Between 11.40 m and 11.50 m; recovered soft and firm, with some fragments of claystone (<60x60 mm).					
12.00 - 12.10	ES	43		12						
12.00 - 12.45	UT	41	100/450 mm							
12.00	PID		< 0.1 ppm							
12.45 - 12.50	D	42			Below 12.45 m; thinly laminated with occasional dustings of light brown, fine sandy silt. Nodules of claystone and calcrete absent.					
				13						
13.50 - 13.60	D	44								
14.00 - 14.45	D	45		14						
14.00 - 14.45	SPT		N = 30 (S)			(8.00)				
15.00 - 15.10	ES	46		15						
15.00	PID		< 0.1 ppm							
15.50 - 15.60	D	47								
16.00 - 16.35	UT	48	100/350 mm	16						
16.35 - 16.40	D	49								
				17						
17.50 - 18.00	B	50			Below 17.50 m; thinly laminated.					
17.90 - 18.00	ES	51			Below 17.90 m; very stiff.					
17.90	PID		< 0.1 ppm	18						
18.00 - 18.45	D	52								
18.00 - 18.45	SPT		N = 27 (S)							
					End of Borehole at 18.45 m	18.45	3.58			
				19						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-824**
Fugro Reference	G170029U			
Coordinates (m)	E503733.40 N177483.61	Ground Elevation (m Datum)	22.03	Sheet 1 of 1
Hole Type	Cable Percussion			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	08/12/2017	08/12/2017	Hand-dug			BH	AK	
1.20	18.45	CP	08/12/2017	09/12/2017	Dando 3000			BH	AK/SK	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
08/12/2017	08:00:00	0.00			
08/12/2017	18:00:00	10.45	5.20	8.60	
09/12/2017	08:00:00	8.40	5.20	1.65	
09/12/2017	12:00:00	18.45	5.20	Dry	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)
18.45	150	5.20	150

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)
0.40				
3.20	1.60	20	3.00	4.70

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
SP	1	1.00	3.50	09/12/2017

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	0.03	1.10	50	Plain
Pipe1	1.10	3.50	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	0.05	Flush Cover	09/12/2017
0.05	0.50	Concrete	09/12/2017
0.50	1.00	Bentonite	09/12/2017
1.00	3.50	Gravel Backfill	09/12/2017
3.50	18.45	Bentonite	09/12/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS				Print Date	28/11/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-824**
	Fugro Reference	G170029U			
	Coordinates (m)	E503733.40 N177483.61	Ground Elevation (m Datum)	22.03	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)
1.20	S	0	N=4 (1,0/1,1,1,1)	450	EQU1616	66	0.00	0.70
2.20	S	0	N=3 (1,1/1,0,1,1)	450	EQU1616	66	2.10	2.00
3.20	S	150	N=8 (1,0/1,2,2,3)	450	EQU1616	66	3.00	2.80
4.20	C	0	N=19 (4,5/6,4,4,5)	450	EQU1616	66	4.10	2.00
6.50	S	0	N=18 (2,3/3,4,5,6)	450	EQU1616	66	5.20	Dry
10.00	S	0	N=22 (4,3/4,5,6,7)	450	EQU1616	66	5.20	Dry
14.00	S	0	N=30 (3,5/6,7,8,9)	450	EQU1616	66	5.20	Dry
18.00	S	0	N=27 (3,4/6,6,7,8)	450	EQU1616	66	5.20	Dry

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)
0.10	< 0.1
0.20	< 0.1
0.70	< 0.1
1.70	< 0.1
2.70	< 0.1
3.50	< 0.1
4.70	< 0.1
6.00	< 0.1
9.00	< 0.1
12.00	< 0.1
15.00	< 0.1
17.90	< 0.1

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion		Location ID	**HEP-BH-826**
	Client	Heathrow Airport Limited			
	Fugro Reference	G170029U			
	Coordinates (m)	E503885.79 N177514.20	Ground Elevation (m Datum) 22.42	Sheet 1 of 2	
	Hole Type	Cable Percussion		Status	Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.05	D	1			MADE GROUND (Topsoil): dark brown, slightly gravelly, silty sand.	(0.15)				
0.10 - 0.15	ES	2			With abundant roots (2x220 mm). Sand is fine to coarse. Gravel is	0.15	22.27			
0.10	PID		< 0.1 ppm		subangular and subrounded, fine to coarse of flint and slag.					
0.20	D	3			[MADE GROUND] [SAND]					
0.30 - 0.50	B	4			MADE GROUND: light brown, slightly gravelly sand. With rare					
0.60 - 0.70	ES	5			fragments of ceramic (40x50 mm). Sand is fine to coarse mainly	(1.05)				
0.60	PID		< 0.1 ppm	1	medium. Gravel is subangular and subrounded, fine to coarse of					
					flint, brick and concrete.					
					[MADE GROUND] [SAND]	1.20	21.22			
1.25	D	6			MADE GROUND: (firm), brown, clayey. sandy, silty, gravel with low					
1.30 - 1.50	LB	7			boulder content. Sand is fine to coarse. Gravel is subangular and					
1.45 - 1.50	ES	8			subrounded, fine to coarse of flint and concrete.					
1.45	PID		< 0.1 ppm		[MADE GROUND] [CLAY]	(0.90)				
1.50 - 1.95	D	9								
1.50 - 2.00	B	10								
1.50 - 1.95	SPT		N = 6 (S)	2						
2.10	D	11			MADE GROUND: (soft), brown, mottled black locally mottled grey,	2.10	20.32			
2.15 - 2.40	LB	12			slightly sandy, gravelly clay. With rare fragments of glass (4x40					
2.40 - 2.50	ES	13			mm). Sand is fine to coarse mainly fine and medium. Gravel is					
2.40	PID		< 0.1 ppm		subangular and subrounded, fine to coarse of flint, brick and	(0.90)				
2.50 - 2.95	D	14			concrete.					
2.50 - 3.00	B	15			[MADE GROUND] [CLAY]					
2.50 - 2.95	SPT		N = 2 (S)							
3.10	D	16		3	MADE GROUND: (very soft), greyish brown mottled black, slightly	3.00	19.42			
3.15 - 3.40	B	17			sandy, slightly gravelly clay. With occasional pockets (2x40 mm) of					
3.40 - 3.50	ES	18			light grey fine and medium sand. Sand is fine to coarse mainly					
3.40	PID		< 0.1 ppm		medium. Gravel is subangular and subrounded, fine and medium	(0.90)				
3.50 - 3.95	D	19			of brick, flint and concrete.					
3.50 - 4.00	B	20			[MADE GROUND] [CLAY]					
3.50 - 3.95	SPT		N = 6 (S)							
4.00	D	21		4	Medium dense, black, sandy, clayey GRAVEL. Gravel is	3.90	18.52			
4.10 - 4.30	B	22			subrounded, fine to coarse of flint.					
4.30 - 4.40	ES	23			[RIVER TERRACE DEPOSITS] [GRAVEL]					
4.30	PID		< 0.1 ppm							
4.50 - 4.95	D	24			Between 4.50 m and 5.00 m; medium bed of medium dense, dark grey,					
4.50 - 5.00	B	25			clayey, gravelly sand. Sand is fine to coarse. Gravel is subrounded, fine					
4.50 - 4.95	SPT		N = 14 (S)		to coarse of flint.	(1.90)				
				5						
5.10	D	26								
5.20 - 5.40	B	27								
5.40 - 5.50	ES	28								
5.40	PID		< 0.1 ppm							
5.80	D	29				5.80	16.62			
5.85 - 5.95	B	30			Firm, brown, slightly gravelly, sandy CLAY. Sand is fine to coarse.	(0.30)				
5.95 - 6.00	ES	31		6	Gravel is subangular and subrounded, fine and medium of flint.	6.10	16.32			
5.95	PID		< 0.1 ppm		(Gravel possibly brought down during boring from stratum above).					
6.00 - 6.45	D	32			[LONDON CLAY FORMATION] [CLAY]					
6.00 - 6.50	B	33			Firm and stiff, grey brown, slightly sandy CLAY. Sand is fine and					
6.00 - 6.45	SPT		N = 17 (S)		medium.					
6.10	D	34			[LONDON CLAY FORMATION] [CLAY]					
6.20 - 6.40	B	35			Between 6.10 m and 9.00 m; thinly laminated. Laminations are <2mm.					
6.40 - 6.50	ES	36								
6.40	PID		< 0.1 ppm	7						
7.10	D	37								
7.20 - 7.40	B	38								
7.40 - 7.50	ES	39								
7.40	PID		< 0.1 ppm							
7.50 - 8.00	UT	40	80/450 mm							
8.00	D	41		8						
9.00 - 9.30	D	42		9						
9.00 - 9.50	B	43			Between 9.00 m and 11.50 m; with occasional thick laminations/nodules					
9.00 - 9.30	SPT		50/145 mm (S)		(<8 mm) of greyish brown claystone.					

Continued next page

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion		Location ID	**HEP-BH-826**
	Client	Heathrow Airport Limited			
	Fugro Reference	G170029U			
	Coordinates (m)	E503885.79 N177514.20	Ground Elevation (m Datum) 22.42	Sheet 2 of 2	
	Hole Type	Cable Percussion		Status	Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
					Firm and stiff, grey brown, slightly sandy CLAY. Sand is fine and medium. [LONDON CLAY FORMATION] [CLAY]					
11.00 - 11.50	UT	44	118/450 mm	11						
11.50	D	45			Below 11.50 m; sand is fine.					
11.60	D	46								
11.70 - 11.90	B	47								
11.90 - 12.00	ES	48								
11.90	PID		< 0.1 ppm	12		(11.90)				
13.00 - 13.45	D	49		13	Between 13.00 m and 17.00 m; with occasional very thin beds/nodules (<30 mm) of greyish brown claystone.					
13.00 - 13.50	B	50								
13.00 - 13.45	SPT		N = 36 (S)							
				14						
14.60	D	51								
14.70 - 14.90	B	52								
14.90 - 15.00	ES	53								
14.90	PID		< 0.1 ppm	15						
15.00 - 15.50	UT	54	100/450 mm							
15.50	D	55								
				16						
17.00 - 17.45	D	56		17	Between 17.00 m and 18.00 m; with occasional partings (<1 mm) of greyish brown fine sand.					
17.00 - 17.50	B	57								
17.00 - 17.45	SPT		N = 45 (S)							
17.60	D	58								
17.70 - 17.90	B	59								
17.90 - 18.00	ES	60								
17.90	PID		< 0.1 ppm	18	End of Borehole at 18.00 m	18.00	4.42			
				19						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-826**
Fugro Reference	G170029U			
Coordinates (m)	E503885.79 N177514.20	Ground Elevation (m Datum)	22.42	Sheet 1 of 1
Hole Type	Cable Percussion			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	23/11/2017	23/11/2017	Hand-dug			SB/DT	JJL	
1.20	18.00	CP	24/11/2017	27/11/2017	Dando 3000			SB/DT	JJL	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
23/11/2017	08:00:00	0.00			
23/11/2017	18:00:00	1.20	1.20	Dry	
24/11/2017	08:00:00	1.20	1.20	Dry	
24/11/2017	19:30:00	8.00	7.35	Dry	
27/11/2017	08:00:00	8.00	7.35	7.70	
27/11/2017	18:00:00	18.00	7.35		

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)
18.00	200	7.35	200

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)
3.90	1.74	20	3.10	6.50

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
SP	1	4.00	5.80	27/11/2017

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	0.02	4.20	50	Plain
Pipe1	4.20	5.80	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	0.05	Flush Cover	27/11/2017
0.05	0.20	Concrete	27/11/2017
0.20	4.00	Bentonite	27/11/2017
4.00	5.80	Gravel Backfill	27/11/2017
5.80	18.00	Bentonite	27/11/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	JPD/ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 28/11/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-826**
	Fugro Reference	G170029U			
	Coordinates (m)	E503885.79 N177514.20	Ground Elevation (m Datum)	22.42	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)
1.50	S	0	N=6 (1,1/2,2,1,1)	450	EQU306	73	1.50	Dry
2.50	S	0	N=2 (1,0/0,1,1,0)	450	EQU306	73	2.50	Dry
3.50	S	0	N=6 (1,0/0,2,2,2)	450	EQU306	73	3.10	Dry
4.50	S	0	N=14 (2,1/3,3,3,5)	450	EQU306	73	4.50	4.26
6.00	S	0	N=17 (1,2/2,3,5,7)	450	EQU306	73	6.00	5.60
9.00	S	0	50 (1,3/50 for 145mm)	295	EQU306	73	7.35	Dry
13.00	S	0	N=36 (2,6/6,8,10,12)	450	EQU306	73	7.35	12.98
17.00	S	0	N=45 (2,6/8,9,13,15)	450	EQU306	73	7.35	Dry

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)
0.10	< 0.1
0.60	< 0.1
1.45	< 0.1
2.40	< 0.1
3.40	< 0.1
4.30	< 0.1
5.40	< 0.1
5.95	< 0.1
6.40	< 0.1
7.40	< 0.1
11.90	< 0.1
14.90	< 0.1
17.90	< 0.1

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion		Location ID	
	Client	Heathrow Airport Limited		**HEP-BH-1047**	
	Fugro Reference	G170029U			
	Coordinates (m)	E503651.89 N177251.17	Ground Elevation (m Datum) 22.01	Sheet 1 of 2	
	Hole Type	Cable Percussion		Status	Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.10 - 0.20	ES	1			MADE GROUND: tarmacadam (car park surface).	(0.10)	21.91			
0.10 - 0.20	LB	3			[MADE GROUND] [TARMAC/BLACKTOP]	0.10	21.81			
0.10	PID		< 0.1 ppm		MADE GROUND: pinkish brown, slightly clayey, gravelly sand. With occasional fragments of tarmacadam (<60 mm). Sand is fine to coarse. Gravel is angular to rounded, fine to coarse of flint, brick and concrete.	(0.10)				
0.20	D	2				0.20				
0.40	D	5				(0.80)				
0.40 - 0.60	ES	4								
0.40 - 0.60	LB	6								
0.40	PID		< 0.1 ppm		[MADE GROUND] [SAND]					
				1	MADE GROUND: (soft) dark brownish grey, slightly gravelly, sandy clay. Sand is fine to coarse. Gravel is angular to rounded, fine to coarse of flint, brick and concrete.	1.00	21.01			
1.20	D	7				(0.70)				
1.20 - 1.30	ES	8								
1.20	PID		< 0.1 ppm		[MADE GROUND] [CLAY]					
1.30 - 1.40	B	9			MADE GROUND: black pseudo fibrous slightly sandy, slightly gravelly clayey peat. Sand fine to coarse. Gravel is angular to rounded, fine to coarse of flint and rare brick.	1.70	20.31			
1.50 - 1.80	B	11								
1.50 - 1.95	D	10								
1.50 - 1.95	SPT		N = 7 (S)			(0.50)				
1.80 - 2.00	ES	12		2	[MADE GROUND] [CLAY]					
1.80	PID		< 0.1 ppm		Soft, dark brown and black, slightly sandy, slightly gravelly, organic CLAY. Sand fine to coarse. Gravel is rounded, fine to coarse of flint. Slight organic odour.	2.20	19.81			
2.20	D	13				(0.40)				
2.20 - 2.30	ES	14								
2.20	PID		< 0.1 ppm		[ALLUVIUM] [CLAY]	2.60	19.41			
2.30 - 2.40	B	15			Soft, dark reddish brown, slightly gravelly PEAT. With frequent rootlets (10x1x1 mm). With occasional fragments (25x5x5 mm) of wood. Gravel is rounded, fine to coarse of flint.					
2.50 - 2.95	D	16								
2.50 - 2.95	SPT		N = 32 (S)							
2.60	D	17		3	[ALLUVIUM]					
2.60 - 2.70	ES	18			Medium dense, dark brownish grey and black, sandy GRAVEL with low cobble content. Sand is medium and coarse. Gravel is angular to rounded, fine to coarse of flint. Cobbles (<110x80x80 mm) are of flint.					
2.60	PID		< 0.1 ppm							
2.70 - 3.00	B	19								
3.20	D	20								
3.20 - 3.30	ES	21				(2.00)				
3.20	PID		< 0.1 ppm		[RIVER TERRACE DEPOSITS] [GRAVEL]					
3.50 - 4.00	B	22			Below 3.80 m; sandy. Sand is coarse.					
3.50 - 3.95	SPT		N = 22 (C)	4						
4.20	D	23								
4.20 - 4.30	ES	24								
4.20	PID		< 0.1 ppm							
4.50 - 4.95	SPT		N = 11 (C)			4.60	17.41			
4.70	D	25			Firm, dark brownish grey, slightly gravelly CLAY. Gravel is subangular to rounded, fine and medium of flint. (Gravel possibly brought down during boring from stratum above).	(0.40)				
4.70 - 4.80	ES	26								
4.70	PID		< 0.1 ppm			5.00	17.01			
4.80 - 5.00	B	27		5	[LONDON CLAY FORMATION] [CLAY]					
					Firm and stiff, dark brownish grey, slightly sandy silty CLAY. [LONDON CLAY FORMATION] [CLAY]					
5.40	D	28								
5.40 - 5.50	ES	29								
5.40	PID		< 0.1 ppm							
5.50 - 5.60	B	30								
6.00 - 6.45	UT	31	112/450 mm	6						
6.50	D	32				(3.00)				
6.60	D	33								
6.60 - 6.70	ES	34								
6.60	PID		< 0.1 ppm							
6.70 - 6.80	B	35		7						
7.00	D	36								
7.50 - 7.95	D	37								
7.50 - 8.00	B	38								
7.50 - 7.95	SPT		N = 24 (S)							
8.00	D	39		8		8.00	14.01			
					Stiff, greyish brown, slightly sandy, micaceous, silty CLAY. Sand is fine. [LONDON CLAY FORMATION] [CLAY]					
9.00	D	40		9						
9.00 - 9.45	UT	41	150/450 mm		Between 9.00 m and 9.45 m; locally black.					
						(3.00)				
9.70	D	42			Between 9.70 m and 11.00 m; with occasional bioturbation burrows (15x1x1 mm), infilled with light grey silt.					
9.70 - 9.80	ES	43								
9.70	PID		< 0.1 ppm							
9.80 - 10.00	B	44								
					Continued next page					

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion		Location ID	
	Client	Heathrow Airport Limited		**HEP-BH-1047**	
	Fugro Reference	G170029U			
	Coordinates (m)	E503651.89 N177251.17	Ground Elevation (m Datum) 22.01	Sheet 2 of 2	
	Hole Type	Cable Percussion		Status	Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
					Stiff, greyish brown, slightly sandy, micaceous, silty CLAY. Sand is fine. [LONDON CLAY FORMATION] [CLAY]					
11.00	D	45		11	Stiff, dark grey, sandy CLAY. [LONDON CLAY FORMATION] [CLAY]	11.00	11.01			
11.00 - 11.45	D	46								
11.00 - 11.50	B	47								
11.00 - 11.45	SPT		N = 46 (S)		Between 11.00 m and 12.50 m; with rare and occasional fragments (15x10x5mm) of claystone.					
12.00	D	48		12	Between 12.00 m and 14.00 m; with rare and occasional bioturbation burrows (12x1x1 mm), infilled with light grey silt.					
12.70	D	49								
12.70 - 12.80	ES	50								
12.70	PID		< 0.1 ppm							
12.80 - 13.00	B	51		13						
13.00 - 13.45	UT	52	80/450 mm							
13.50	D	53								
14.00	D	54		14	At 14.00 m; locally black.					
15.00	D	55		15						
15.00 - 15.45	D	56								
15.00 - 15.50	B	57								
15.00 - 15.45	SPT		N = 48 (S)		At 15.30 m; parting (1 mm thick) of fine sand.	(9.00)				
15.70	D	58								
15.70 - 15.80	ES	59								
15.70	PID		< 0.1 ppm	16						
17.00	D	60		17	Between 17.00 m and 20.00 m; becoming slightly sandy. With rare pockets (20x10x10 mm) of sandy clay. Sand is fine to coarse. With rare bioturbation burrows (5x1x1mm), infilled with light grey silt.					
17.00 - 17.50	UT	61	147/450 mm							
17.50	D	62								
18.00	D	63		18						
18.50 - 18.95	D	64								
18.50 - 19.00	B	65								
18.50 - 18.95	SPT		N = 39 (S)							
19.00	D	66		19						
19.20 - 19.30	ES	67								
19.20	PID		< 0.1 ppm							
19.50 - 19.95	UT	68	148/450 mm							
20.00	D	69			End of Borehole at 20.00 m	20.00	2.01			

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID	
Client	Heathrow Airport Limited			**HEP-BH-1047**	
Fugro Reference	G170029U				
Coordinates (m)	E503651.89 N177251.17	Ground Elevation (m Datum)	22.01	Sheet 1 of 1	
Hole Type	Cable Percussion			Status	Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	17/03/2018	17/03/2018	Hand-dug			AF	AF	
1.20	20.00	CP	17/03/2018	17/03/2018	Dando 3000			SB	AF	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
17/03/2018	08:00:00	0.00			
17/03/2018	19:15:00	20.00	5.35	19.10	
18/03/2018	08:00:00	20.00	5.35	16.80	
18/03/2018	18:00:00	20.00	5.35	16.80	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)
20.00	200	5.35	200

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)
2.60	2.00	20	2.50	7.00

Water Added

Depth From (m)	Depth To (m)
2.60	4.60

Water Strike Remarks

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
SP	1	2.60	4.60	18/03/2018

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	0.05	2.70	50	Plain
Pipe1	2.70	4.60	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	0.05	Flush Cover	18/03/2017
0.05	0.20	Concrete	18/03/2018
0.20	2.60	Bentonite	18/03/2018
2.60	4.60	Gravel Backfill	18/03/2018
4.60	20.00	Bentonite	18/03/2018

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS				Print Date	28/11/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1047**
	Fugro Reference	G170029U			
	Coordinates (m)	E503651.89 N177251.17	Ground Elevation (m Datum)	22.01	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)
1.50	S	0	N=7 (1,1/1,1,2,3)	450	EQU306	25	1.50	Dry
2.50	S	0	N=32 (2,9/11,8,6,7)	450	EQU306	25	2.50	Dry
3.50	C	0	N=22 (2,3/5,5,5,7)	450	EQU306	25	3.50	2.45
4.50	C	0	N=11 (5,5/5,1,2,3)	450	EQU306	25	4.50	2.70
7.50	S	0	N=24 (2,2/5,5,7,7)	450	EQU306	25	5.35	Dry
11.00	S	0	N=46 (3,5/7,7,16,16)	450	EQU306	25	5.35	Dry
15.00	S	0	N=48 (4,7/10,11,13,14)	450	EQU306	25	5.35	14.50
18.50	S	0	N=39 (4,6/7,10,10,12)	450	EQU306	25	5.35	18.20

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)
0.10	< 0.1
0.40	< 0.1
1.20	< 0.1
1.80	< 0.1
2.20	< 0.1
2.60	< 0.1
3.20	< 0.1
4.20	< 0.1
4.70	< 0.1
5.40	< 0.1
6.60	< 0.1
9.70	< 0.1
12.70	< 0.1
15.70	< 0.1
19.20	< 0.1

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1050**
	Fugro Reference	G170029U			
	Coordinates (m)	E503740.10 N177231.71	Ground Elevation (m Datum)	22.36	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.10 - 0.20	D	1			MADE GROUND: tarmacadam.	(0.10)	22.26			
0.10 - 0.30	ES	3			[MADE GROUND] [TARMAC/BLACKTOP]	0.10				
0.10 - 0.30	LB	2			MADE GROUND: yellowish brown, slightly gravelly, silty sand, with low cobble content. With occasional fragments of asphalt (<60 mm). Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of brick, concrete, and flint. Cobbles (68x91x200 mm) are of brick.	(0.50)				
0.10	PID		< 0.1 ppm			0.60	21.76			
0.60 - 0.70	D	4				(0.50)				
0.60 - 1.10	B	5								
0.70 - 0.80	ES	6								
0.70	PID		< 0.1 ppm	1	[MADE GROUND] [SAND]	1.10	21.26			
1.10 - 1.20	B	8			MADE GROUND: dark grey, clayey, sandy gravel. With some fragments of asphalt (<60 mm). Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of brick, concrete, and flint.	(0.10)	21.16			
1.10 - 1.20	D	7				1.20				
1.10 - 1.20	ES	9			[MADE GROUND] [GRAVEL]	(0.80)				
1.10	PID		< 0.1 ppm		MADE GROUND: (firm), dark grey, locally mottled black, bluish grey, and orangish brown, slightly sandy slightly gravelly, silty clay. Gravel is angular to subrounded, fine to coarse of flint, and occasional brick.					
1.20 - 1.65	B	11								
1.20 - 1.65	D	10								
1.20 - 1.65	SPT		N = 10 (S)							
1.60 - 1.70	ES	12		2	[MADE GROUND] [CLAY]	2.00	20.36			
1.60	PID		< 0.1 ppm		MADE GROUND: dark grey, mottled black and bluish grey, slightly gravelly silt. With occasional pockets (3x5 mm) of orangish brown, fine to coarse sand. Gravel is subangular to subrounded, fine to coarse of flint, and occasional brick.	(0.80)				
2.00 - 2.45	B	14								
2.00 - 2.45	D	13								
2.00 - 2.45	SPT		N = 9 (S)							
2.50 - 2.60	ES	15								
2.50	PID		< 0.1 ppm							
2.80 - 2.90	D	16				2.80	19.56			
2.90 - 3.00	ES	17			[MADE GROUND] [SILT]	(0.20)				
2.90	PID		< 0.1 ppm	3	Soft, black, slightly sandy CLAY. Sand is fine and medium.	3.00	19.36			
3.00 - 3.50	B	18			[ALLUVIUM] [CLAY]					
3.00 - 3.45	SPT		N = 31 (C)		Dark grey, slightly silty SAND. Sand is fine to coarse.					
3.10 - 3.20	ES	19			[RIVER TERRACE DEPOSITS] [SAND]	(1.00)				
3.10	PID		< 0.1 ppm		Dense, dark grey, slightly sandy GRAVEL. Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of flint.					
					[RIVER TERRACE DEPOSITS] [GRAVEL]					
4.00 - 4.10	D	20		4	Medium dense and dense, brown GRAVEL. Gravel is subangular to rounded, fine to coarse of flint and quartzite.	4.00	18.36			
4.00 - 4.50	B	21			[RIVER TERRACE DEPOSITS] [GRAVEL]					
4.00 - 4.45	SPT		N = 16 (C)							
4.10 - 4.20	ES	22								
4.10	PID		< 0.1 ppm							
						(1.50)				
5.00 - 5.10	D	23		5						
5.00 - 5.30	B	25								
5.00 - 5.45	SPT		N = 35 (C)							
5.10 - 5.20	ES	24								
5.10	PID		< 0.1 ppm			5.50	16.86			
5.50 - 5.60	D	26			Firm, thinly laminated (<2 mm), greyish brown, slightly sandy silty CLAY. Sand is fine and medium.					
5.50 - 5.60	ES	27			[LONDON CLAY FORMATION] [CLAY]					
5.80 - 5.90	ES	28								
5.80	PID		< 0.1 ppm	6						
6.50 - 6.95	D	29								
6.50 - 7.00	B	30								
6.50 - 6.95	SPT		N = 15 (S)							
6.60 - 6.70	ES	31								
6.60	PID		< 0.1 ppm	7						
7.50 - 7.60	ES	32								
7.50	PID		< 0.1 ppm							
						(4.50)				
8.00 - 8.45	UT	33	65/300 mm	8	Below 8.00 m; firm and stiff.					
8.50	D	34								
8.60 - 8.70	ES	35								
8.60	PID		< 0.1 ppm							
				9						
9.50 - 9.95	D	36								
9.50 - 9.95	SPT		N = 15 (S)							
					End of Borehole at 10.00 m	10.00	12.36			

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID	
Client	Heathrow Airport Limited			**HEP-BH-1050**	
Fugro Reference	G170029U				
Coordinates (m)	E503740.10 N177231.71	Ground Elevation (m Datum)	22.36	Sheet 1 of 1	
Hole Type	Cable Percussion			Status	Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	17/03/2018	17/03/2018	Hand-dug			JJL	JJL	
1.20	10.00	CP	17/03/2018	17/03/2018	Dando 3000			DP	JJL	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
17/03/2018	08:00:00	0.00			
17/03/2018	18:00:00	10.00	6.00	Dry	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)
10.00	200	6.00	200

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)

Water Added

Depth From (m)	Depth To (m)
2.80	3.50

Water Strike Remarks

Groundwater was not encountered during excavation or boring.

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	0.20	Concrete	17/03/2018
0.20	10.00	Bentonite	17/03/2018

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 28/11/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1050**
	Fugro Reference	G170029U			
	Coordinates (m)	E503740.10 N177231.71	Ground Elevation (m Datum)	22.36	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)
1.20	S	0	N=10 (2,2/3,2,3,2)	450	SEDS1	66	1.20	Dry
2.00	S	0	N=9 (1,2/2,2,2,3)	450	SEDS1	66	1.20	Dry
3.00	C	0	N=31 (1,6/8,10,7,6)	450	SEDS1	66	3.00	2.8
4.00	C	0	N=16 (5,4/4,4,5,3)	450	SEDS1	66	4.00	3
5.00	C	0	N=35 (3,4/7,8,10,10)	450	SEDS1	66	5.00	3
6.50	S	0	N=15 (3,2/3,4,4,4)	450	SEDS1	66	6.00	Dry
9.50	S	0	N=15 (2,3/3,4,4,4)	450	SEDS1	66	6.00	Dry

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)
0.10	< 0.1
0.70	< 0.1
1.10	< 0.1
1.60	< 0.1
2.50	< 0.1
2.90	< 0.1
3.10	< 0.1
4.10	< 0.1
5.10	< 0.1
5.80	< 0.1
6.60	< 0.1
7.50	< 0.1
8.60	< 0.1

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1317**
	Fugro Reference	G170029U			
	Coordinates (m)	E502896.01 N177514.58	Ground Elevation (m Datum)	22.89	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.10 - 0.20	D	1			MADE GROUND: brown, slightly sandy, slightly gravelly silt. With plastic bottle cap (20x20x10 mm) and 2 fragments of plastic bag (60x10x5 mm). Sand is fine and medium. Gravel is subangular and subrounded, fine to coarse of flint and rare brick.	(0.50)				
0.60 - 0.70	D	2			[MADE GROUND] [SILT] Between 0.00 m and 0.13 m; with occasional roots (5x5x50 mm).	0.50	22.39			
				1	MADE GROUND: light brown, slightly silty, gravelly sand. With rare fragments of tile (<60 mm), concrete (<130x60x40 mm) and glass (10x5x2 mm). Sand is fine and medium. Gravel is subangular and subrounded, fine to coarse of flint, rare brick. [MADE GROUND] [SAND]	(0.70)				
1.60 - 1.70	D	3			MADE GROUND: (soft), brown, sandy, gravelly clay. Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of brick and concrete. [MADE GROUND] [CLAY]	1.20	21.69			
2.40 - 2.50	D	4		2		(1.30)				
					End of Borehole at 2.50 m	2.50	20.39			G
				3						
				4						
				5						
				6						
				7						
				8						
				9						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-1317**
Fugro Reference	G170029U			
Coordinates (m)	E502896.01 N177514.58	Ground Elevation (m Datum)	22.89	Sheet 1 of 1
Hole Type	Cable Percussion			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	13/12/2017	13/12/2017	Hand-dug			BH	AF	
1.20	2.50	CP	15/12/2017	15/12/2017	Dando 3000			BH	LG	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
13/12/2017	08:00:00	0.00			
13/12/2017	18:00:00	1.20		Dry	
15/12/2017	13:30:00	1.20		Dry	
15/12/2017	18:00:00	2.50		Dry	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)
2.50	200		

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

Groundwater was not encountered during excavation or boring.

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
GMP	1	0.80	2.50	15/12/2017

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	-0.27	1.00	50	Plain
Pipe1	1.00	2.50	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
-0.43	0.00	Upstanding Cover	15/12/2017
0.00	0.50	Concrete	15/12/2017
0.50	0.80	Bentonite	15/12/2017
0.80	2.50	Gravel Backfill	15/12/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 28/11/2018

	Contract Name	HAL Airport Expansion		Location ID
	Client	Heathrow Airport Limited		**HEP-BH-1317**
	Fugro Reference	G170029U		
	Coordinates (m)	E502896.01 N177514.58	Ground Elevation (m Datum) 22.89	Sheet 1 of 1
	Hole Type	Cable Percussion		Status Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID	
Client	Heathrow Airport Limited			**HEP-BH-1318**	
Fugro Reference	G170029U				
Coordinates (m)	E503318.38 N177734.43	Ground Elevation (m Datum)	23.23	Sheet 1 of 1	
Hole Type	Not Recognised			Status	Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.10	D	1			TOPSOIL: dark brown, clayey, gravelly sand. Sand is fine and medium. Gravel is subangular, fine to coarse of flint. [TOPSOIL] [SAND]	(0.20)				
0.35	D	2				0.20	23.03			
					MADE GROUND: brown, slightly clayey, sandy gravel. Sand is fine to coarse. Gravel is angular and subangular, fine to coarse of flint, brick and concrete. [MADE GROUND] [GRAVEL]	(0.40)				
0.75	D	3				0.60	22.63			
						(0.60)				
1.20	D	4		1	MADE GROUND: brown sandy gravel with low and medium cobble content (60%). With abundant fragments of mixed plastic (30%), and some fragments of wood (10%). With rare fragments of glass and ceramic. Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of flint, brick and concrete. Cobbles (70x70x75 mm) are angular of concrete and brick. [MADE GROUND] [WASTE, e.g. LANDFILL]	1.20	22.03			
1.20 - 1.50	D	6								
1.20 - 1.50	ES	5				(0.50)				
1.20 - 1.70	LB	7								
1.20	PID		< 0.1 ppm			1.70	21.53			
1.70 - 1.90	D	9								
1.70 - 2.00	ES	8								
1.70 - 2.10	LB	10		2	MADE GROUND: (soft), brown, sandy, gravelly clay (65%) with low cobble content. With frequent fragments of wood (<250x100x100 mm) (D2) (15%) and plastic bag (100x100 mm) (D2) (10%). With MDF board (<300x70x10 mm) (D3) and rubber tyre (63x100x150 mm). Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of brick and concrete. Cobbles (<100x250x250 mm) are of concrete and brick. [MADE GROUND] [WASTE, e.g. LANDFILL]					
1.70	PID		< 0.1 ppm							
2.20 - 3.20	LB	13				(1.70)				
				3	MADE GROUND: (soft), black, sandy, gravelly silt (65%) with low cobble content. With frequent fragments of wood (<500x200x100 mm) (D2-D3) (20%). With some fragments of plastic bag (<100x10 mm) (D2) (10%). With occasional fragments of charcoal (<50x40x40 mm) (D3) (5%). With rare fragments of fabric/textiles (<50x40 mm) (D3) (<1%) and glass (<60x40x5 mm). Sand is fine to coarse. Gravel is angular, fine to coarse of brick and concrete. Cobbles (<230x150x100 mm) are angular to subrounded of brick and concrete. Strong hydrocarbon odour. [MADE GROUND] [WASTE, e.g. LANDFILL] Below 3.20m; with abundant fragments of wood (<500x200x100 mm) (D2-D3) (30%).					
3.20 - 3.40	D	12								
3.20 - 3.40	ES	11								
3.20	PID		< 0.1 ppm			3.40	19.83			
3.65 - 3.95	D	15								
3.65 - 3.95	ES	14				(0.70)				
3.65	PID		< 0.1 ppm							
3.95 - 4.10	LB	16		4		4.10	19.13			
					Soft, greyish brown, sandy, gravelly CLAY. Locally with black staining/speckling. Sand is fine to coarse. Gravel is angular to rounded, fine to coarse of flint. [RIVER TERRACE DEPOSITS] [CLAY]					
				5	End of Borehole at 4.10 m					
				6						
				7						
				8						
				9						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-1318**
Fugro Reference	G170029U			
Coordinates (m)	E503318.38 N177734.43	Ground Elevation (m Datum)	23.23	Sheet 1 of 1
Hole Type	Hollow Stem Auger			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	05/12/2017	05/12/2017	Hand-dug			EA	EA	
1.20	4.10	AUGH	13/12/2017	13/12/2017	Hollow stem (barrel) auger MC 3000			DW	CM	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
05/12/2017	08:00:00	0.00			
05/12/2017	18:00:00	1.20		Dry	
13/12/2017	08:00:00	1.20			
13/12/2017	18:00:00	4.10			

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)
4.10	350	2.00	350

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

Groundwater was not encountered during excavation or boring.

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located. The inspection pit was backfilled with arisings before being progressed by auger.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	0.20	Concrete	13/12/2017
0.20	2.50	Bentonite	13/12/2017
2.50	4.10	Arisings	13/12/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 28/11/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1318**
	Fugro Reference	G170029U			
	Coordinates (m)	E503318.38 N177734.43	Ground Elevation (m Datum)	23.23	Sheet 1 of 1
	Hole Type	Hollow Stem Auger			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)
1.20	< 0.1
1.70	< 0.1
3.20	< 0.1
3.65	< 0.1

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1319**
	Fugro Reference	G170029U			
	Coordinates (m)	E503124.80 N177493.50	Ground Elevation (m Datum)	23.26	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.00 - 0.05	ES	1			MADE GROUND (Topsoil): (soft), black, slightly sandy, slightly gravelly clay. With abundant rootlets/roots (10x45 mm). Sand is fine to coarse. Gravel is subangular and subrounded, fine and medium of flint. [MADE GROUND] [CLAY]	(0.10)	23.16			
0.00	PID		< 0.1 ppm			0.10				
0.10	D	2				(0.70)				
0.30 - 0.40	ES	3								
0.30 - 0.60	B	5								
0.30	PID		< 0.1 ppm							
0.50	D	4			MADE GROUND: (soft), dark greyish brown and light brown, slightly sandy, gravelly clay. With occasional rootlets/roots (<5x65 mm). With occasional pockets (30x<130 mm) of black, sandy clay. With some fragments of clinker (<60 mm) and wood (20x40x50 mm). Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of brick and concrete. Slight organic odour. [MADE GROUND] [CLAY]	0.80	22.46			
0.70 - 1.00	ES	6				(0.60)				
0.70	PID		< 0.1 ppm	1						
0.80 - 1.30	B	8								
1.10	D	7				1.40	21.86			
1.50 - 1.60	ES	9				(0.40)				
1.50 - 1.70	B	11								
1.50	PID		< 0.1 ppm		MADE GROUND: (soft and firm), light brown and orangish brown, slightly sandy, slightly gravelly clay. Sand is fine to coarse. Gravel is subangular to well rounded, fine to coarse of flint and various other lithologies, with frequent fine and medium brick and concrete. [MADE GROUND] [CLAY]	1.80	21.46			
1.70	D	10		2						
					MADE GROUND: (soft), dark brown and yellowish brown, slightly sandy, slightly gravelly clay. Locally black, sandy and slightly organic. Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of flint and various other lithologies with frequent brick and concrete. Slight organic odour. [MADE GROUND] [CLAY]					
				3	End of Borehole at 1.80 m					
				4						
				5						
				6						
				7						
				8						
				9						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID	
Client	Heathrow Airport Limited			**HEP-BH-1319**	
Fugro Reference	G170029U				
Coordinates (m)	E503124.80 N177493.50	Ground Elevation (m Datum)	23.26	Sheet 1 of 1	
Hole Type	Cable Percussion			Status	Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	19/12/2017	19/12/2017	Hand-dug			AK	AK	
1.20	1.80	CP	19/12/2017	19/12/2017	Dando 2000			CT	AK	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
19/12/2017	08:00:00	0.00			
19/12/2017	18:00:00	1.80		Dry	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)
1.80	200		

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

Groundwater was not encountered during excavation or boring.

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
GMP	1	0.60	1.80	19/12/2017

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	0.14	0.70	50	Plain
Pipe1	0.70	1.70	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	0.05	Flush Cover	19/12/2017
0.05	0.20	Concrete	19/12/2017
0.20	0.60	Bentonite	19/12/2017
0.60	1.80	Gravel Backfill	19/12/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS				Print Date	28/11/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1319**
	Fugro Reference	G170029U			
	Coordinates (m)	E503124.80 N177493.50	Ground Elevation (m Datum)	23.26	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)
0.00	< 0.1
0.30	< 0.1
0.70	< 0.1
1.50	< 0.1

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1321**
	Fugro Reference	G170029U			
	Coordinates (m)	E503490.66 N177832.32	Ground Elevation (m Datum)	23.72	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.10	D	1			MADE GROUND: dark brown, sandy gravel. With occasional to some rootlets (<3x120 mm). Sand is fine and medium. Gravel is angular and subangular, fine to coarse of brick, concrete and slag. [MADE GROUND] [GRAVEL]					
0.20 - 0.80	LB	2				(1.20)				
0.80 - 0.90	ES	3			At 0.80 m; ACM sheeting (cement board) (20x25 mm) recovered.					
0.80	PID		< 0.1 ppm	1	At 1.10 m; ACM sheeting (cement board) (20x25 mm) recovered.	1.20	22.52			
1.40	D	4			MADE GROUND: dark brown, sandy gravel. With abundant mixed plastics (<15x20) and wood. Sand is fine to coarse. Gravel is angular and subangular, fine to coarse of flint, chert, brick and concrete. [MADE GROUND] [WASTE, e.g. LANDFILL]					
1.50 - 1.70	LB	5								
1.70 - 1.80	ES	6								
1.70	PID		< 0.1 ppm	2						
2.40	D	7			Between 2.35m and 4.00m; slightly clayey.					
2.40 - 2.50	ES	9								
2.40 - 3.00	LB	8				(2.80)				
2.40	PID		< 0.1 ppm	3						
3.40	D	10								
3.40 - 3.50	ES	12								
3.40 - 4.00	LB	11								
3.40	PID		< 0.1 ppm							
4.00 - 4.35	LB	14		4	MADE GROUND: dark greyish brown, clayey gravel. With abundant ceramic tiles (<20x25mm), mixed plastics (<15x25mm) and wood. Gravel is angular and subangular, fine to coarse of flint, brick and concrete. [MADE GROUND] [WASTE, e.g. LANDFILL]	4.00	19.72			G
4.10	D	13				(0.35)				
4.20 - 4.50	ES	15				4.35	19.37			
4.20	PID		< 0.1 ppm							
4.40 - 4.60	ES	18				(0.65)				
4.40	PID		< 0.1 ppm							
4.50 - 5.00	LB	17			MADE GROUND: (soft), dark grey, gravelly, silty clay. Gravel is angular and subangular, fine to coarse of flint. (Probably reworked London Clay). [MADE GROUND] [CLAY]					
4.60	D	16		5	End of Borehole at 5.00 m	5.00	18.72			
				6						
				7						
				8						
				9						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-1321**
Fugro Reference	G170029U			
Coordinates (m)	E503490.66 N177832.32	Ground Elevation (m Datum)	23.72	Sheet 1 of 1
Hole Type	Cable Percussion			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	23/11/2017	23/11/2017	Hand-dug			PC	PC	
1.20	5.00	CP	23/11/2017	24/11/2017	Dando 3000			GD/DH	PC	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
23/11/2017	15:50:00	0.00			
23/11/2017	18:00:00	4.10	4.00	Dry	
24/11/2017	08:00:00	4.10	4.00	Dry	
24/11/2017	18:00:00				

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)
5.00	200	4.00	200

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark
4.00	4.30	01:00	

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

Groundwater was not encountered during excavation or boring.

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
GMP	1	1.00	4.00	24/11/2017

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	0.12	1.10	50	Plain
Pipe1	1.10	4.00	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	0.05	Flush Cover	24/11/2017
0.05	0.20	Concrete	24/11/2017
0.20	1.00	Bentonite	24/11/2017
1.00	4.00	Gravel Backfill	24/11/2017
4.00	5.00	Bentonite	24/11/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	JPD/ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 28/11/2018

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-1321**
Fugro Reference	G170029U			
Coordinates (m)	E503490.66 N177832.32	Ground Elevation (m Datum)	23.72	Sheet 1 of 1
Hole Type	Cable Percussion			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)
0.80	< 0.1
1.70	< 0.1
2.40	< 0.1
3.40	< 0.1
4.20	< 0.1
4.40	< 0.1

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1322**
	Fugro Reference	G170029U			
	Coordinates (m)	E503607.50 N177880.98	Ground Elevation (m Datum)	22.36	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.10	D	1			MADE GROUND (Topsoil): very dark brown, slightly gravelly sand with low cobble and boulder content. With occasional rootlets (2x15 mm). Sand is fine and medium. Gravel is subangular to rounded, medium and coarse of flint, aggregate and brick. Cobbles and boulders (<150x250x250 mm) are of flint and aggregate. [MADE GROUND] [SAND]	(0.30)				
0.30	D	2				0.30	22.06			
					MADE GROUND: light greyish brown, becoming dark brown, gravelly sand with low cobble content. With rare glass and polystyrene (30x30x10 mm). With rare fine to coarse gravel sized fragments of tile. Sand is fine and medium. Gravel is angular to rounded, fine and medium of flint, brick and aggregate. Cobbles (80x80x100 mm) are of brick and cemented aggregate. [MADE GROUND] [SAND]	(0.90)				
1.10	D	3		1	Between 0.45 m and 0.50 m; with abundant fragments of wood (15x20x80 mm). Between 0.50 m and 0.60 m; layer of bricks (pit diverted). Between 0.80 m and 0.85 m; with black staining.	1.20	21.16			
1.50	D	4			MADE GROUND: dark brown, silty, sandy gravel. With occasional fragments of wood (15x40 mm) and ceramic (8x10 mm). Sand is fine and medium. Gravel is angular and subangular, fine and medium of flint, chert, brick (15x20 mm) and concrete (10x15 mm). [MADE GROUND] [GRAVEL]	(0.30)				
				2		1.50	20.86			
				3	End of Borehole at 1.50 m					
				4						
				5						
				6						
				7						
				8						
				9						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-1322**
Fugro Reference	G170029U			
Coordinates (m)	E503607.50 N177880.98	Ground Elevation (m Datum)	22.36	Sheet 1 of 1
Hole Type	Cable Percussion			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	01/12/2017	01/12/2017	Hand-dug			AF	AF	
1.20	1.50	CP	07/12/2017	07/12/2017	Dando 3000			GD	PC	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
01/12/2017	08:00:00	0.00			
01/12/2017	18:00:00	1.20		Dry	
07/12/2017	14:30:00	1.20		Dry	
07/12/2017	18:00:00	1.50		Dry	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)
1.50	200		

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

Groundwater was not encountered during excavation or boring.

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located. The inspection pit was backfilled with arisings before being progressed by cable percussion.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
GMP	1	0.80	1.45	07/12/2017

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	0.15	0.90	50	Plain
Pipe1	0.90	1.45	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	0.05	Flush Cover	07/12/2017
0.05	0.20	Concrete	07/12/2017
0.20	0.80	Bentonite	07/12/2017
0.80	1.45	Gravel Backfill	07/12/2017
1.45	1.50	Bentonite	07/12/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 28/11/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1322**
	Fugro Reference	G170029U			
	Coordinates (m)	E503607.50 N177880.98	Ground Elevation (m Datum)	22.36	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1323**
	Fugro Reference	G170029U			
	Coordinates (m)	E503368.28 N177620.87	Ground Elevation (m Datum)	26.54	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.05 - 0.10	D	1			MADE GROUND (Topsoil): (soft), brown, gravelly clay. Gravel is subangular and subrounded, fine to coarse of flint. [MADE GROUND] [CLAY]	(0.05) 0.05	26.49			
0.50	B	6			MADE GROUND: brown, slightly clayey, gravelly sand (70%). With frequent fragments of timber (30x30x<200 mm) (20%). With some fragments (10%) of tape (70x100x<150 mm) and plastic (40x40x<70 mm). Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of concrete and brick. [MADE GROUND] [WASTE, e.g. LANDFILL]	(1.15)				
1.00 - 1.10	D	2		1	MADE GROUND: black, sandy gravel. With abundant fragments of wood (50x60x<150 mm). Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of flint, brick and concrete. [MADE GROUND] [WASTE, e.g. LANDFILL]	1.20	25.34			
2.00 - 2.10	D	3		2		(3.00)				
3.00 - 3.10	D	4		3						G
4.00 - 4.10	D	5		4	End of Borehole at 4.20 m	4.20	22.34		▼	
				5						
				6						
				7						
				8						
				9						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID	
Client	Heathrow Airport Limited			**HEP-BH-1323**	
Fugro Reference	G170029U				
Coordinates (m)	E503368.28 N177620.87	Ground Elevation (m Datum)	26.54	Sheet 1 of 1	
Hole Type	Cable Percussion			Status	Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	29/11/2017	29/11/2017	Hand-dug			LG	LG	
1.20	4.20	CP	29/11/2017	29/11/2017	Dando 3000			BH	LG	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
29/11/2017	08:00:00	0.00			
29/11/2017	13:00:00	4.20		4.11	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)
4.20	200		

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)
4.20	4.11	20		

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
GMP	1	0.90	3.50	29/11/2017

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	0.08	1.00	50	Plain
Pipe1	1.00	3.50	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	0.05	Flush Cover	29/11/2017
0.05	0.50	Concrete	29/11/2017
0.50	0.90	Bentonite	29/11/2017
0.90	3.50	Gravel Backfill	29/11/2017
3.50	4.20	Bentonite	29/11/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS				Print Date	28/11/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1323**
	Fugro Reference	G170029U			
	Coordinates (m)	E503368.28 N177620.87	Ground Elevation (m Datum)	26.54	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1324**
	Fugro Reference	G170029U			
	Coordinates (m)	E503179.27 N177425.35	Ground Elevation (m Datum)	23.19	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.05 - 0.15	D	1			MADE GROUND: (soft), slightly sandy, gravelly silt with low cobble content. With some fragments of tile (<60 mm). Sand is fine and medium. Gravel is angular and subangular, fine to coarse of flint and brick. Cobbles (<100x100 mm) are of flint and brick. [MADE GROUND] [SILT]	(0.15) 0.15	23.04			
0.35	D	2				(0.20) 0.35	22.84			
0.70	D	3			MADE GROUND: orangish brown, slightly silty, slightly gravelly sand. Sand is fine to coarse. Gravel is angular to subrounded, medium and coarse of flint and occasional brick. [MADE GROUND] [SAND]	(0.35) 0.70	22.49			
1.00	D	4		1		(0.30) 1.00	22.19			
1.10	D	5			MADE GROUND: dark greyish brown, sandy gravel. With frequent fragments (<60 mm) of tarmacadam. Sand is medium and coarse. Gravel is angular to subrounded, coarse of flint, aggregate and brick. [MADE GROUND] [GRAVEL]	(0.20) 1.20	21.99			
1.50	D	6				(0.80)				
				2	MADE GROUND: black, slightly gravelly sand. Locally with pockets (40x60 mm) of black, sandy clay. With rare fragments (<60 mm) of tile. Gravel is angular to subrounded, medium and coarse of flint and brick. [MADE GROUND] [SAND] At 0.90m; igneous boulder obstruction, pit diverted.	2.00	21.19			G
				3	MADE GROUND: black, slightly sandy, slightly gravelly silt. With occasional fragments of wood (10x30 mm). Sand is fine. Gravel is angular to subrounded, fine and medium of flint and brick. [MADE GROUND] [SILT]					
					MADE GROUND: (very soft and soft), dark greyish black, slightly gravelly, sandy clay. Sand is fine and medium. Gravel is subangular and subrounded, fine to coarse of brick, concrete and flint. [MADE GROUND] [CLAY]					
				4	End of Borehole at 2.00 m					
				5						
				6						
				7						
				8						
				9						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-1324**
Fugro Reference	G170029U			
Coordinates (m)	E503179.27 N177425.35	Ground Elevation (m Datum)	23.19	Sheet 1 of 1
Hole Type	Cable Percussion			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	29/11/2017	29/11/2017	Hand-dug			JJL	AF	
0.00	2.00	CP	14/12/2017	14/12/2017	Dando 3000			SB	JJL	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
14/12/2017	08:00:00	1.20			
14/12/2017	18:00:00	2.00		Dry	
29/11/2018	08:00:00	0.00			
29/11/2018	18:00:00	1.20			

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)
2.00	200	1.60	200

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

Groundwater was not encountered during excavation or boring.

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located. The inspection pit was backfilled with arisings before being progressed by cable percussion.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
GMP	1	0.90	2.00	14/12/2017

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	0.09	1.00	50	Plain
Pipe1	1.00	2.00	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	0.05	Flush Cover	14/12/2017
0.05	0.20	Concrete	14/12/2017
0.20	0.90	Bentonite	14/12/2017
0.90	2.00	Gravel Backfill	14/12/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 28/11/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1324**
	Fugro Reference	G170029U			
	Coordinates (m)	E503179.27 N177425.35	Ground Elevation (m Datum)	23.19	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1326**
	Fugro Reference	G170029U			
	Coordinates (m)	E503315.13 N177445.26	Ground Elevation (m Datum)	21.77	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.10 - 0.20	D	1			MADE GROUND (Topsoil): (soft), brown clay.	(0.05)	21.72			
0.20 - 0.30	D	2			[MADE GROUND] [CLAY]	0.05				
					MADE GROUND: (soft), brown, slightly sandy, gravelly clay. Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of brick, concrete and flint. [MADE GROUND] [CLAY]					
1.00 - 1.10	D	3		1		(2.45)				
2.00 - 2.10	D	4		2						G
					End of Borehole at 2.50 m	2.50	19.27			
				3						
				4						
				5						
				6						
				7						
				8						
				9						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-1326**
Fugro Reference	G170029U			
Coordinates (m)	E503315.13 N177445.26	Ground Elevation (m Datum)	21.77	Sheet 1 of 1
Hole Type	Cable Percussion			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	04/12/2017	04/12/2017	Hand-dug			LG	LG	
1.20	2.50	CP	04/12/2017	04/12/2017	Dando 3000			BH	LG	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
04/12/2017	08:00:00	0.00			
04/12/2017	18:00:00	2.50		2.18	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)
2.50	200		

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)
2.50	2.18	20		

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
GMP	1	0.50	2.00	04/12/2017

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	0.12	0.60	50	Plain
Pipe1	0.60	2.00	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	0.05	Flush Cover	04/12/2017
0.05	0.30	Concrete	04/12/2017
0.30	0.50	Bentonite	04/12/2017
0.50	2.00	Gravel Backfill	04/12/2017
2.00	2.50	Bentonite	04/12/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 28/11/2018

	Contract Name	HAL Airport Expansion		Location ID
	Client	Heathrow Airport Limited		**HEP-BH-1326**
	Fugro Reference	G170029U		
	Coordinates (m)	E503315.13 N177445.26	Ground Elevation (m Datum) 21.77	Sheet 1 of 1
	Hole Type	Cable Percussion		Status Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1330**
	Fugro Reference	G170029U			
	Coordinates (m)	E503701.29 N177756.71	Ground Elevation (m Datum)	23.79	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.20	D	1		0	MADE GROUND: brown, slightly sandy, silty gravel (70%). With some fragments of plastic (10x30 mm) (10%). With occasional fragments of ceramic (<10x25 mm) (5%), rubber (5x5 mm) (5%), metal (<10x15 mm) (5%) and wood (<60 mm) (5%). Sand is fine and medium. Gravel is angular and subangular, fine to coarse of brick and concrete. [MADE GROUND] [WASTE, e.g. LANDFILL]	(2.80)				
1.20	D	2								
2.20	D	3		2						
2.80	D	4			MADE GROUND: (very soft), dark brownish grey, gravelly, silty clay (65%). With some fragments of ceramic (<15x15 mm) (10%), mixed plastic (10x25 mm) (10%) and wood (<60 mm) (10%). With occasional fragments of metal (<60 mm) (5%). Gravel is angular and subangular, fine to coarse of brick and concrete. [MADE GROUND] [WASTE, e.g. LANDFILL]	2.80	20.99			
3.00	D	5		3		(0.70)				G
					End of Borehole at 3.50 m	3.50	20.29			
				4						
				5						
				6						
				7						
				8						
				9						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID	
Client	Heathrow Airport Limited			**HEP-BH-1330**	
Fugro Reference	G170029U				
Coordinates (m)	E503701.29 N177756.71	Ground Elevation (m Datum)	23.79	Sheet 1 of 1	
Hole Type	Cable Percussion			Status	Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	01/12/2017	01/12/2017	Hand-dug			PC	PC	
1.20	3.50	CP	01/12/2017	01/12/2017	Dando 3000			GD	PC	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
01/12/2017	08:00:00	0.00			
01/12/2017	18:00:00	3.50			

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)
3.50	200	3.50	200

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark
1.60	2.20	02:00	

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

Groundwater was not encountered during excavation or boring.

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
GMP	1	0.90	3.00	01/12/2017

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	0.11	2.00	50	Plain
Pipe1	2.00	3.00	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	0.05	Flush Cover	01/12/2017
0.05	0.20	Concrete	01/12/2017
0.20	0.90	Bentonite	01/12/2017
0.90	3.00	Gravel Backfill	01/12/2017
3.00	3.50	Bentonite	01/12/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS				Print Date	28/11/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1330**
	Fugro Reference	G170029U			
	Coordinates (m)	E503701.29 N177756.71	Ground Elevation (m Datum)	23.79	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1331**
	Fugro Reference	G170029U			
	Coordinates (m)	E503546.23 N177561.00	Ground Elevation (m Datum)	24.12	Sheet 1 of 1
	Hole Type	Not Recognised			Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.05	D	1			MADE GROUND (Topsoil): dark brown, slightly silty, slightly gravelly sand. Sand is fine and medium. Gravel is subangular and subrounded, medium and coarse of flint. [MADE GROUND] [SAND]	(0.20)				
0.20	D	2			MADE GROUND: light brown to brown, gravelly sand with low cobble content. With 5 glass fragments (3x8x20 mm), 3 plastic shards (4x15x25 mm), pipe joint (60x200x200 mm), 4 plastic bags (20x30x150 mm), 6 pads of compressed paper (20x40x160 mm) and a table knife (8x15x100 mm). Sand is medium to coarse. Gravel is angular to rounded fine to coarse of flint, brick and aggregates. Cobbles are of flint and brick (75x80x100mm). [MADE GROUND] [WASTE, e.g. LANDFILL]	0.20	23.92			
1.10	D	3		1		(1.00)				
1.20 - 1.50	D	4			Between 0.30 m and 0.40 m; layer of mortared bricks; pit diverted.	1.20	22.92			
1.50 - 2.00	D	5			MADE GROUND: brown, sandy, gravelly clay with medium cobble content (75%). With frequent fragments of wood (50x50x<250 mm) (15%) and plastic bag (<50x50 mm) (10%) and rare staining. Sand is fine to coarse. Gravel is angular to rounded, fine to coarse of flint, brick and concrete. Cobbles (60x70x<230 mm) are of brick and concrete. [MADE GROUND] [WASTE, e.g. LANDFILL]	(0.30)				
				2		1.50	22.62			
					MADE GROUND: brown, sandy gravel with medium cobble content (75%). With frequent fragments of wood (70x100x200 mm) (10%) and plastic bag (<100x100 mm) (15%). With rare fragments of tile (<60 mm). Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of brick, concrete and rare pumice. Cobbles (100x150x<230 mm) are of brick and concrete. [MADE GROUND] [WASTE, e.g. LANDFILL]	(0.50)				
				3	End of Borehole at 2.00 m	2.00	22.12			G
				4						
				5						
				6						
				7						
				8						
				9						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-1331**
Fugro Reference	G170029U			
Coordinates (m)	E503546.23 N177561.00	Ground Elevation (m Datum)	24.12	Sheet 1 of 1
Hole Type	Hollow Stem Auger			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	01/12/2017	01/12/2017	Hand-dug			AF	AF	
1.20	2.00	AUGH	08/12/2017	08/12/2017	Hollow stem (barrel) auger MC 3000			DW	CM	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
01/12/2017	08:00:00	0.00			
01/12/2017	18:00:00	1.20		Dry	
08/12/2017	08:00:00	1.20			
08/12/2017	18:00:00	2.00			

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)
2.00	350	2.00	350

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

Groundwater was not encountered during excavation or boring.

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located. The inspection pit was backfilled with arisings before being progressed by auger.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
GMP	1	0.90	2.00	08/12/2017

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	0.09	1.00	50	Plain
Pipe1	1.00	2.00	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	0.05	Flush Cover	08/12/2017
0.05	0.90	Bentonite	08/12/2017
0.90	2.00	Gravel Backfill	08/12/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 28/11/2018

	Contract Name	HAL Airport Expansion		Location ID
	Client	Heathrow Airport Limited		**HEP-BH-1331**
	Fugro Reference	G170029U		
	Coordinates (m)	E503546.23 N177561.00	Ground Elevation (m Datum) 24.12	Sheet 1 of 1
	Hole Type	Hollow Stem Auger		Status Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1334**
	Fugro Reference	G170029U			
	Coordinates (m)	E503804.19 N177761.12	Ground Elevation (m Datum)	22.33	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.10	D	1			TOPSOIL: gravelly silty clay. With occasional rootlets (<1x10-40 mm). Gravel is angular and subangular, fine and medium of flint and chert. [TOPSOIL] [CLAY]	(0.15) 0.15	22.18			
0.40	D	2			Light brown, sandy GRAVEL with low cobble content. With occasional shell fragments (<2 mm). Sand is fine to coarse. Gravel is subangular to rounded, fine to coarse of flint and chert. Cobbles (60x100x100 mm) are of flint. [RIVER TERRACE DEPOSITS] [GRAVEL]	(1.85)				
0.90	D	3								
1.00	D	4		1						
1.50	D	5								
				2	End of Borehole at 2.00 m	2.00	20.33			
				3						
				4						
				5						
				6						
				7						
				8						
				9						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-1334**
Fugro Reference	G170029U			
Coordinates (m)	E503804.19 N177761.12	Ground Elevation (m Datum)	22.33	Sheet 1 of 1
Hole Type	Cable Percussion			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	13/12/2017	13/12/2017	Hand-dug			PC	PC	
1.20	2.00	CP	13/12/2017	13/12/2017	Dando 3000			GD	PC	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
13/12/2017	08:00:00	0.00			
13/12/2017	18:00:00	2.00		Dry	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)
2.00	200		

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

Groundwater was not encountered during excavation or boring.

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
GMP	1	0.90	1.50	13/12/2017

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	0.12	1.00	50	Plain
Pipe1	1.00	1.50	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	0.05	Flush Cover	13/12/2017
0.05	0.20	Concrete	13/12/2017
0.20	0.90	Bentonite	13/12/2017
0.90	1.50	Gravel Backfill	13/12/2017
1.50	2.00	Bentonite	13/12/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 28/11/2018

	Contract Name	HAL Airport Expansion		Location ID
	Client	Heathrow Airport Limited		**HEP-BH-1334**
	Fugro Reference	G170029U		
	Coordinates (m)	E503804.19 N177761.12	Ground Elevation (m Datum) 22.33	Sheet 1 of 1
	Hole Type	Cable Percussion		Status Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1339**
	Fugro Reference	G170029U			
	Coordinates (m)	E503651.05 N177476.23	Ground Elevation (m Datum)	21.86	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.10	D	1			MADE GROUND: brown becoming dark brown, slightly gravelly, sandy clay. With occasional roots (<2x50 mm). With rare fragments of glass (5x15x20 mm) and concrete (100x80x40 mm). With metal pipe (1000x20x20 mm) and metal nail (100x10x10 mm). Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of flint, rare brick and rare concrete. [MADE GROUND] [CLAY]	(0.45)				
0.60	D	2				0.45	21.41			
				1	MADE GROUND: light brown becoming brown, slightly sandy, gravelly clay (100%). With metal pin (80x5x5 mm) and metal bar (450x10x10 mm). Sand is fine and medium. Gravel is angular to subrounded, fine to coarse of flint, occasional brick and rare concrete. [MADE GROUND] [CLAY] Below 0.85m; with low cobble content. Cobbles (<180x100x100 mm) are of concrete and breeze block.	(0.75)				
						1.20	20.66			
1.50	D	4		2	Brownish orangish red, clayey SAND. Sand is fine and medium. [RIVER TERRACE DEPOSITS] [SAND]	(0.30)				
					End of Borehole at 1.50 m	1.50	20.36			G
				3						
				4						
				5						
				6						
				7						
				8						
				9						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-1339**
Fugro Reference	G170029U			
Coordinates (m)	E503651.05 N177476.23	Ground Elevation (m Datum)	21.86	Sheet 1 of 1
Hole Type	Cable Percussion			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	19/12/2017	19/12/2017	Hand-dug			PC	AF	
1.20	1.50	CP	19/12/2017	19/12/2017	Dando 3000			GD	PC	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
19/12/2017	08:00:00	0.00			
19/12/2017	18:00:00	1.50		Dry	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)
1.50	200		

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

Groundwater was not encountered during excavation or boring.

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
GMP	1	0.60	1.50	19/12/2017

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	0.09	0.75	50	Plain
Pipe1	0.75	1.50	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
-0.07	0.05	Upstanding Cover	19/12/2017
0.05	0.20	Concrete	19/12/2017
0.20	0.60	Bentonite	19/12/2017
0.60	1.50	Gravel Backfill	19/12/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 28/11/2018

	Contract Name	HAL Airport Expansion		Location ID
	Client	Heathrow Airport Limited		**HEP-BH-1339**
	Fugro Reference	G170029U		
	Coordinates (m)	E503651.05 N177476.23	Ground Elevation (m Datum) 21.86	Sheet 1 of 1
	Hole Type	Cable Percussion		Status Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

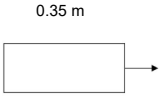
	Contract Name	HAL Airport Expansion		Location ID
	Client	Heathrow Airport Limited		**HEP-BH-1340**
	Fugro Reference	G170029U		
	Coordinates (m)	E503958.91 N177824.00	Ground Elevation (m Datum) 24.09	Sheet 1 of 1
	Hole Type	Inspection Pit		Status Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.10 - 0.20	D	1			MADE GROUND: (soft), black, slightly sandy, gravelly clay with low cobble content. Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of flint, brick and concrete. Cobbles (40x65x<75 mm) are of concrete. [MADE GROUND] [CLAY]	(0.80)				
0.80 - 0.90	D	2			Brown and grey, clayey GRAVEL. Gravel is subangular and subrounded, fine to coarse of flint. [RIVER TERRACE DEPOSITS] [GRAVEL]	0.80 (0.10) 0.90	23.29 23.19			
				1	End of Inspection Pit at 0.90 m					
				2						
				3						
				4						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Plan



Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-1340**
Fugro Reference	G170029U			
Coordinates (m)	E503958.91 N177824.00	Ground Elevation (m Datum)	24.09	Sheet 1 of 1
Hole Type	Inspection Pit			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	0.90	IP	04/01/2018	04/01/2018	Hand-dug			LG	LG	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
04/01/2018	10:50:00	0.00			
04/01/2018	12:30:00	0.90		Dry	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

Groundwater was not encountered during excavation.

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 0.90 m. Services were not located.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
GMP	1	0.50	0.80	04/01/2018

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	-0.26	0.50	50	Plain
Pipe1	0.50	0.80	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
-0.39	0.00	Upstanding Cover	04/01/2018
0.00	0.30	Concrete	04/01/2018
0.30	0.50	Bentonite	04/01/2018
0.50	0.90	Gravel Backfill	04/01/2018

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1340**
	Fugro Reference	G170029U			
	Coordinates (m)	E503958.91 N177824.00	Ground Elevation (m Datum)	24.09	Sheet 1 of 1
	Hole Type	Inspection Pit			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

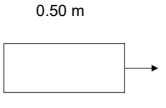
FUGRO	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1341**
	Fugro Reference	G170029U			
	Coordinates (m)	E503729.65 N177513.86	Ground Elevation (m Datum)	21.76	Sheet 1 of 1
	Hole Type	Inspection Pit			Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.10	D	1			MADE GROUND (Topsoil): light brown and light grey, slightly sandy gravel within cellular plastic grid. Sand is fine to coarse. Gravel is subangular to well rounded, fine to medium of flint. [MADE GROUND] [GRAVEL]	(0.08) 0.08	21.68			
						(0.06) 0.14	21.62			
0.40	D	2			MADE GROUND: light brown, very gravelly sand. Sand is medium and coarse. Gravel is subangular to rounded, fine to medium of flint. [MADE GROUND] [GRAVEL]	(0.36) 0.50	21.26			
0.60	D	3			At 0.14 m; black, synthetic, fibrous, geotextile membrane.					
					MADE GROUND: greyish brown, slightly clayey, sandy gravel. Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of flint, brick, chalk and concrete. [MADE GROUND] [GRAVEL]	(0.50)				
1.00	D	4		1	Below 0.30 m; with low cobble content. Cobbles are angular to subrounded of brick and concrete.	1.00	20.76			G
					MADE GROUND: dark grey, very clayey, sandy gravel. Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of flint, chalk, concrete and brick. [MADE GROUND] [GRAVEL]	(0.10) 1.10	20.66			
					At 0.50 m; black, synthetic, fibrous, geotextile membrane.					
					Soft, grey slightly sandy to sandy, slightly organic CLAY. Sand is fine to medium. [ALLUVIUM] [CLAY]					
					End of Inspection Pit at 1.10 m					
				2						
				3						
				4						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Plan



Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-1341**
Fugro Reference	G170029U			
Coordinates (m)	E503729.65 N177513.86	Ground Elevation (m Datum)	21.76	Sheet 1 of 1
Hole Type	Inspection Pit			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.10	IP	10/12/2017	10/12/2017	Hand-dug			SK	SK	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
10/12/2017	08:00:00	0.00			
10/12/2017	18:00:00	1.10		Dry	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

Groundwater was not encountered during excavation.

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.10 m. Services were not located.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
GMP	1	0.50	1.00	10/12/2017

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	0.10	0.60	50	Plain
Pipe1	0.60	1.00	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	0.05	Flush Cover	10/12/2017
0.05	0.20	Concrete	10/12/2017
0.20	0.50	Bentonite	10/12/2017
0.50	1.00	Gravel Backfill	10/12/2017
1.00	1.10	Bentonite	10/12/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 28/11/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1341**
	Fugro Reference	G170029U			
	Coordinates (m)	E503729.65 N177513.86	Ground Elevation (m Datum)	21.76	Sheet 1 of 1
	Hole Type	Inspection Pit			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1343**
	Fugro Reference	G170029U			
	Coordinates (m)	E503663.56 N177430.17	Ground Elevation (m Datum)	21.48	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.10 - 0.20	D	1			MADE GROUND: dark brown, gravelly sand. Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of flint, brick and concrete. [MADE GROUND] [SAND]	(0.20)				
0.20 - 0.30	D	2				0.20	21.28			
					MADE GROUND: light brown, gravelly sand. Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of brick, concrete and flint. [MADE GROUND] [SAND]	(0.80)				
1.00 - 1.10	D	3		1		1.00	20.48			
					MADE GROUND: dark greyish brown, gravelly sand. Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of brick, concrete and flint. [MADE GROUND] [SAND]	(1.00)				
2.00 - 2.10	D	4		2		2.00	19.48			
					MADE GROUND: (soft), dark brown, slightly gravelly clay. Gravel is subangular and subrounded, fine to coarse of brick and flint. [MADE GROUND] [CLAY]	(0.30)				
						2.30	19.18			
					End of Borehole at 2.30 m					
				3						
				4						
				5						
				6						
				7						
				8						
				9						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID	
Client	Heathrow Airport Limited			**HEP-BH-1343**	
Fugro Reference	G170029U				
Coordinates (m)	E503663.56 N177430.17	Ground Elevation (m Datum)	21.48	Sheet 1 of 1	
Hole Type	Cable Percussion			Status	Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	06/12/2017	06/12/2017	Hand-dug			LG	LG	
1.20	2.30	CP	06/12/2017	06/12/2017	Dando 3000			BH	LG	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
06/12/2017	13:50:00	0.00			
06/12/2017	18:00:00	2.30		Dry	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)
2.30	150		

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)
2.30	2.08	20		

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
GMP	1	0.50	2.00	06/12/2017

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	0.11	0.60	50	Plain
Pipe1	0.60	2.00	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	0.05	Flush Cover	06/12/2017
0.05	0.30	Concrete	06/12/2017
0.30	0.50	Bentonite	06/12/2017
0.50	2.00	Gravel Backfill	06/12/2017
2.00	2.30	Bentonite	06/12/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS				Print Date	28/11/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1343**
	Fugro Reference	G170029U			
	Coordinates (m)	E503663.56 N177430.17	Ground Elevation (m Datum)	21.48	Sheet 1 of 1
	Hole Type	Cable Percussion			Status / Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1345**
	Fugro Reference	G170029U			
	Coordinates (m)	E503719.59 N177448.13	Ground Elevation (m Datum)	21.47	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.10	D	1			MADE GROUND: dark brown, slightly gravelly, silty sand. With abundant roots (<2x150 mm). Sand is fine to coarse. Gravel is subangular and subrounded, fine and medium of flint and brick. [MADE GROUND] [SAND]	(0.15) 0.15 (0.45)	21.32			
0.25	D	2								
0.65	D	3		1	MADE GROUND: orangish brown, gravelly sand. Sand is fine to coarse. Gravel is subangular and subrounded, fine and medium of flint, brick and concrete. [MADE GROUND] [SAND]	0.60 (0.90)	20.87			
					MADE GROUND: brown, gravelly sand. Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of flint, brick, concrete and coal. [MADE GROUND] [SAND]	1.50	19.97			G
1.60	D	4			MADE GROUND: brown, clayey, gravelly sand. With rare fragments of plastic bag (80x200 mm). Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of brick, flint, concrete and coal. [MADE GROUND] [SAND]	(0.50) 2.00	19.47			
2.10	D	5		2	Firm, brown, slightly gravelly, sandy CLAY. Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of flint. (Probably reworked). [LONDON CLAY FORMATION] [CLAY]	(0.70) 2.70	18.77			
3.00	D	6		3	Firm, greyish brown, slightly sandy CLAY. Sand is fine to coarse. [LONDON CLAY FORMATION] [CLAY]	(1.30)				
4.00	D	7		4	End of Borehole at 4.00 m	4.00	17.47			
				5						
				6						
				7						
				8						
				9						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-1345**
Fugro Reference	G170029U			
Coordinates (m)	E503719.59 N177448.13	Ground Elevation (m Datum)	21.47	Sheet 1 of 1
Hole Type	Cable Percussion			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	22/11/2017	22/11/2017	Hand-dug			JJL	JJL	
1.20	4.00	CP	22/11/2017	22/11/2017	Dando 3000			SB/DT	JJL	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
22/11/2017	12:15:00	0.00			
22/11/2017	18:00:00	4.00	2.30	Dry	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)
4.00	200	3.10	200

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

Groundwater was not encountered during excavation or boring.

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
GMP	1	0.40	1.50	22/11/2017

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	0.11	0.50	50	Plain
Pipe1	0.50	1.50	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	0.05	Flush Cover	22/11/2017
0.05	0.20	Concrete	22/11/2017
0.20	0.40	Bentonite	22/11/2017
0.40	1.50	Gravel Backfill	22/11/2017
1.50	4.00	Bentonite	22/11/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	JPD/ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 28/11/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1345**
	Fugro Reference	G170029U			
	Coordinates (m)	E503719.59 N177448.13	Ground Elevation (m Datum)	21.47	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1355**
	Fugro Reference	G170029U			
	Coordinates (m)	E503830.73 N177381.25	Ground Elevation (m Datum)	22.64	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.00 - 0.10	D	1			MADE GROUND: brown, slightly clayey, slightly gravelly sand. Slightly organic with occasional rootlets (<5x10 mm). Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of flint, concrete and brick. [MADE GROUND] [SAND]	(2.00)				
2.00 - 2.10	D	2		2	MADE GROUND: (soft), brown, slightly sandy, slightly gravelly clay. Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of flint and rare brick. [MADE GROUND] [CLAY]	2.00 (0.30)	20.64			
2.30 - 2.40	D	3			MADE GROUND: (soft), dark grey, slightly sandy, slightly gravelly, silty clay. Sand is fine to coarse. Gravel is angular to subrounded, fine and medium of flint and rare brick. [MADE GROUND] [CLAY]	2.30 (0.80)	20.34			
3.10	D	4		3	Soft, dark greenish brown, slightly sandy, slightly gravelly, silty CLAY. Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of flint. [ALLUVIUM] [CLAY]	3.10 (0.40)	19.54			
3.40	D	5			Below 3.40 m; with frequent organic-rich, black staining.	3.50	19.14			
					End of Borehole at 3.50 m					
				4						
				5						
				6						
				7						
				8						
				9						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-1355**
Fugro Reference	G170029U			
Coordinates (m)	E503830.73 N177381.25	Ground Elevation (m Datum)	22.64	Sheet 1 of 1
Hole Type	Cable Percussion			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	23/11/2017	23/11/2017	Hand-dug			CM	CM	
1.20	3.50	CP	23/11/2017	23/11/2017	Dando 2000			CT	CM	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
23/11/2017	08:00:00	0.00			
23/11/2017	18:00:00	3.50		Dry	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)
3.50	200	2.30	200

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)
3.50	2.30	20	3.50	

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
GMP	1	0.50	3.00	23/11/2017

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	0.14	0.50	50	Plain
Pipe1	0.50	3.00	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	0.05	Flush Cover	23/11/2017
0.05	0.20	Concrete	23/11/2017
0.20	0.50	Bentonite	23/11/2017
0.50	3.00	Gravel Backfill	23/11/2017
3.00	3.50	Bentonite	23/11/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 28/11/2018

	Contract Name	HAL Airport Expansion		Location ID
	Client	Heathrow Airport Limited		**HEP-BH-1355**
	Fugro Reference	G170029U		
	Coordinates (m)	E503830.73 N177381.25	Ground Elevation (m Datum) 22.64	Sheet 1 of 1
	Hole Type	Cable Percussion		Status Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1358**
	Fugro Reference	G170029U			
	Coordinates (m)	E503752.37 N177267.45	Ground Elevation (m Datum)	21.84	Sheet 1 of 1
	Hole Type	Dynamic (Windowless) Sampler			Status: Final

Sampling and In Situ Testing					Strata Details				Groundwater	
Depth (m)	Type	No.	Test Results	Run Depth (m) (Recovery) (%)	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.00 - 0.10	D	1				TOPSOIL: dark grey and black, slightly gravelly, silty clay. With roots/rootlets (2x15 mm).	(0.15)				Awaiting Awaiting
0.15 - 0.25	D	2				[TOPSOIL] [CLAY]	0.15	21.69			
						MADE GROUND: dark grey and black, slightly gravelly, silty clay. With roots/rootlets (1x25 mm). Gravel is subangular and subrounded, fine and medium of flint. [MADE GROUND] [CLAY]	(0.35)				
0.50 - 0.60	D	3				MADE GROUND: orangish brown, slightly gravelly clay. With pockets (<200 mm) of light orangish brown, gravelly, silty clay. Gravel is subrounded, fine and medium of flint. [MADE GROUND] [CLAY]	0.50	21.34			
							(0.70)				
					1	At 1.00 m; concrete obstruction, pit diverted southwest.					
1.20 - 1.30	D	4				MADE GROUND: orangish brown, sandy, gravelly clay. Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of flint and brick. [MADE GROUND] [CLAY]	1.20	20.64			
				1.30			(0.40)				
1.60 - 1.70	D	5		(100)		MADE GROUND: dark grey and black, slightly sandy, slightly gravelly organic clay. Sand is fine and medium. Gravel is subrounded, fine and medium of flint. [MADE GROUND] [CLAY]	1.60	20.24			
							(0.40)				
				2.00	2	End of Borehole at 2.00 m	2.00	19.84			G
					3						
					4						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID	
Client	Heathrow Airport Limited			**HEP-BH-1358**	
Fugro Reference	G170029U				
Coordinates (m)	E503752.37 N177267.45	Ground Elevation (m Datum)	21.84	Sheet 1 of 1	
Hole Type	Dynamic (Windowless) Sampler			Status	Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.30	IP	08/03/2018	08/03/2018	Hand-dug			MG	MG	
1.30	2.00	WLS	08/03/2018	08/03/2018	Terrier			RU	MG	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
08/03/2018	08:00:00	0.00			
08/03/2018	18:00:00	2.00		Dry	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)
2.00	101		

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

Groundwater was not encountered during excavation or boring.

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.30 m. Services were not located. The inspection pit was extended south-west due to a concrete obstruction.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
GMP	1	1.00	2.00	08/03/2018

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	0.13	1.00	50	Plain
Pipe1	1.00	2.00	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	0.05	Flush Cover	08/03/2018
0.05	0.30	Concrete	08/03/2018
0.30	1.00	Bentonite	08/03/2018
1.00	2.00	Gravel Backfill	08/03/2018

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS				Print Date	28/11/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1358**
	Fugro Reference	G170029U			
	Coordinates (m)	E503752.37 N177267.45	Ground Elevation (m Datum)	21.84	Sheet 1 of 1
	Hole Type	Dynamic (Windowless) Sampler			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

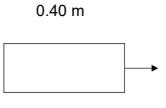
Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-1359**
Fugro Reference	G170029U			
Coordinates (m)	E503854.11 N177336.97	Ground Elevation (m Datum)	22.13	Sheet 1 of 1
Hole Type	Inspection Pit			Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
					MADE GROUND: concrete. [MADE GROUND] [CONCRETE]	(0.25)				
0.30	D	1			MADE GROUND: brown, gravelly sand. Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of flint, concrete, brick and quartz. [MADE GROUND] [SAND]	0.25 (0.15) 0.40	21.88 21.73			
0.45	D	2				(0.20)				
0.65	D	3			MADE GROUND: light yellowish brown, gravelly sand. With rare fragments of glass (3x4 mm) and coal (3x4 mm). Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of flint, concrete and brick. [MADE GROUND] [SAND]	0.60 (0.40)	21.53			
				1	MADE GROUND: (soft and firm), brown, sandy, gravelly clay. With rare fragments of glass (3x4 mm) and coal (3x4 mm). Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of flint, brick and concrete. [MADE GROUND] [CLAY]	1.00	21.13			
					End of Inspection Pit at 1.00 m					
				2						
				3						
				4						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Plan



Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-1359**
Fugro Reference	G170029U			
Coordinates (m)	E503854.11 N177336.97	Ground Elevation (m Datum)	22.13	Sheet 1 of 1
Hole Type	Inspection Pit			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.00	IP	17/01/2018	17/01/2018	Hand-dug/breaker			JJL	JJL	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
17/01/2018	14:00:00	0.00			
17/01/2018	18:00:00	1.00		Dry	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

Groundwater was not encountered during excavation.

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.00 m. Services were not located.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
GMP	1	0.50	1.00	17/01/2018

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	0.09	0.50	50	Plain
Pipe1	0.50	1.00	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	0.05	Flush Cover	17/01/2018
0.05	0.20	Concrete	17/01/2018
0.20	0.50	Bentonite	17/01/2018
0.50	1.00	Gravel Backfill	17/01/2018

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS				Print Date	28/11/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1359**
	Fugro Reference	G170029U			
	Coordinates (m)	E503854.11 N177336.97	Ground Elevation (m Datum)	22.13	Sheet 1 of 1
	Hole Type	Inspection Pit			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

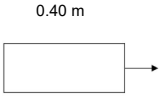
FUGRO	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1364**
	Fugro Reference	G170029U			
	Coordinates (m)	E503903.12 N177312.99	Ground Elevation (m Datum)	22.34	Sheet 1 of 1
	Hole Type	Inspection Pit			Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
					MADE GROUND: tarmacadam. [MADE GROUND] [TARMAC/BLACKTOP]	(0.05) 0.05	22.29			
					MADE GROUND: concrete. [MADE GROUND] [CONCRETE] At 0.25 m; geotextile membrane.	(0.20) 0.25	22.09			
0.30 - 0.40 0.30 - 0.50 0.40	ES LB D	1 3 2			MADE GROUND: light brownish grey, very sandy gravel. With some fragments (<20 mm) of clinker and ash. Sand is fine to coarse. Gravel is angular to well rounded, fine and medium of flint and occasional brick and concrete. [MADE GROUND] [GRAVEL]	(0.45) 0.70	21.64			
0.80 - 0.90	ES	4			MADE GROUND: dark brownish grey, sandy gravel. With frequent fragments (<60 mm) of ash and clinker. Sand is fine to coarse. Gravel is angular to well rounded, fine to coarse of flint and frequent brick and concrete.	(0.50)				
1.00 1.00 - 1.20	D LB	5 6		1	[MADE GROUND] [WASTE, e.g. LANDFILL] Between 0.90 m and 1.00 m; with low cobble content and rare roots/ rootlets (2x4x7 mm). Cobbles (85x100x140 mm) are of concrete. Slight hydrocarbon odour.	1.20	21.14			G
					End of Inspection Pit at 1.20 m					
				2						
				3						
				4						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Plan



Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-1364**
Fugro Reference	G170029U			
Coordinates (m)	E503903.12 N177312.99	Ground Elevation (m Datum)	22.34	Sheet 1 of 1
Hole Type	Inspection Pit			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	05/01/2018	05/01/2018	Hand-dug			AK	AK	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
05/01/2018	10:15:00	0.00			
05/01/2018	18:00:00	1.20		Dry	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

Groundwater was not encountered during excavation.

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
GMP	1	0.50	1.20	05/01/2018

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	0.09	0.60	50	Plain
Pipe1	0.60	1.20	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	0.05	Flush Cover	05/01/2018
0.05	0.20	Concrete	05/01/2018
0.20	0.50	Bentonite	05/01/2018
0.50	1.20	Gravel Backfill	05/01/2018

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 28/11/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1364**
	Fugro Reference	G170029U			
	Coordinates (m)	E503903.12 N177312.99	Ground Elevation (m Datum)	22.34	Sheet 1 of 1
	Hole Type	Inspection Pit			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

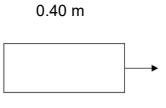
Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-1369**
Fugro Reference	G170029U			
Coordinates (m)	E503876.80 N177210.43	Ground Elevation (m Datum)	22.11	Sheet 1 of 1
Hole Type	Inspection Pit			Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
					MADE GROUND: concrete. [MADE GROUND] [CONCRETE]	(0.30)				Awaiting Awaiting
0.35	D	1			MADE GROUND: purplish brown, slightly gravelly sand. Sand is fine to coarse. Gravel is angular, fine and medium of concrete, flint, brick and mixed aggregate. [MADE GROUND] [SAND]	0.30 (0.15) 0.45	21.81 21.66			
0.50	D	2			MADE GROUND: (soft), greyish brown mottled black, slightly gravelly, sandy clay. Sand is fine to coarse. Gravel is subangular, fine and medium of brick, flint and rare granite. [MADE GROUND] [CLAY]	(0.20) 0.65 (0.20)	21.46			
0.70	D	3			MADE GROUND: (soft and firm), brown locally mottled black, slightly gravelly, sandy clay. With rare fragments of coal (<3x3 mm). Sand is fine to coarse. Gravel is subrounded, fine and medium of flint. [MADE GROUND] [CLAY]	0.85 (0.15)	21.26			
0.90	D	4		1	Soft and firm, brown, gravelly CLAY. Gravel is subrounded, fine to coarse of flint. [ALLUVIUM] [CLAY]	1.00	21.11			G
					End of Inspection Pit at 1.00 m					
				2						
				3						
				4						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Plan



	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1369**
	Fugro Reference	G170029U			
	Coordinates (m)	E503876.80 N177210.43	Ground Elevation (m Datum)	22.11	Sheet 1 of 1
	Hole Type	Inspection Pit			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.00	IP	10/01/2018	10/01/2018	Hand-dug/breaker			JJL	JJL	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
10/01/2018	08:00:00	0.00			
10/01/2018	11:15:00	1.00		Dry	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

Groundwater was not encountered during excavation.

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.00 m. Services were not located.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
GMP	1	0.50	1.00	10/01/2018

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	0.09	0.50	50	Plain
Pipe1	0.50	1.00	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	0.05	Flush Cover	10/01/2018
0.05	0.20	Concrete	10/01/2018
0.20	0.50	Bentonite	10/01/2018
0.50	1.00	Gravel Backfill	10/01/2018

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS				Print Date	28/11/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1369**
	Fugro Reference	G170029U			
	Coordinates (m)	E503876.80 N177210.43	Ground Elevation (m Datum)	22.11	Sheet 1 of 1
	Hole Type	Inspection Pit			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1781**
	Fugro Reference	G170029U			
	Coordinates (m)	E503685.29 N177275.19	Ground Elevation (m Datum)	21.27	Sheet 1 of 1
	Hole Type	Dynamic (Windowless) Sampler			Status: Final

Sampling and In Situ Testing					Strata Details				Groundwater	
Depth (m)	Type	No.	Test Results	Run Depth (m) (Recovery) (%)	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.05 - 0.15	D	1				MADE GROUND: dark brown and black, slightly sandy, gravelly, clayey silt. With rare rootlets (1x15 mm). With occasional fragments of plastic (<2x5 mm) (1%). Sand is fine to coarse. Gravel is subangular and subrounded, fine and medium of flint.	(0.30)				Awaiting/Awaiting
0.30 - 0.40	D	2				[MADE GROUND] [SILT]	0.30	20.97			
0.45 - 0.55	D	3				Below 0.15m: with low cobble content. Cobbles (90x90 mm) are subangular and subrounded of flint.	(0.15) 0.45	20.82			
0.60 - 0.70	D	4				MADE GROUND: (soft and firm), dark brown and black, slightly sandy, gravelly clay. Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of flint.	(0.15) 0.60	20.67			
						[MADE GROUND] [CLAY]					
						MADE GROUND: yellowish brown, sandy gravel with medium cobble content. Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of flint. Cobbles (100x85x80 mm) are subangular and subrounded of flint.	(0.60)				
					1	[MADE GROUND] [GRAVEL]					
1.10 - 1.20	D	5				MADE GROUND: (firm), dark grey, sandy gravelly clay. With occasional fragments of plastic (<5x10 mm) (1%). Sand is fine to coarse. Gravel is subangular to subrounded, fine to coarse of flint, brick and concrete.	1.20	20.07			G
				1.20		[MADE GROUND] [CLAY]	(0.45)				
1.50 - 1.60	D	6				MADE GROUND: (firm), dark grey mottled brownish grey, slightly sandy, gravelly clay. Sand is fine to coarse. Gravel is subangular and subrounded, fine and medium of flint, brick and concrete.					
1.60 - 1.70	D	7		(100)		[MADE GROUND] [CLAY]	1.65	19.62			
						Soft and firm, dark grey clay. With thin laminations (<1 mm) of greyish blue silt. With occasional pockets (15x20 mm) of soft, peaty clay, and decomposing plant material (20x20 mm). With rare shell fragments (<2mm).	(0.35)				
				2.00	2	[ALLUVIUM] [CLAY]	2.00	19.27			
						End of Borehole at 2.00 m					
					3						
					4						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID	
Client	Heathrow Airport Limited			**HEP-BH-1781**	
Fugro Reference	G170029U				
Coordinates (m)	E503685.29 N177275.19	Ground Elevation (m Datum)	21.27	Sheet 1 of 1	
Hole Type	Dynamic (Windowless) Sampler			Status	Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	07/03/2018	07/03/2018	Hand-dug			MG	MG	
1.20	2.00	WLS	07/03/2018	07/03/2018	Terrier			RU	MG	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
07/03/2018	08:00:00	0.00			
07/03/2018	18:00:00	2.00		1.85	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)
2.00	101		

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)
1.85	1.22	20		

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
GMP	1	0.60	1.20	07/03/2018

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	0.10	0.60	50	Plain
Pipe1	0.60	1.20	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	0.05	Flush Cover	07/03/2018
0.05	0.20	Concrete	07/03/2018
0.20	0.60	Bentonite	07/03/2018
0.60	1.20	Gravel Backfill	07/03/2018
1.20	2.00	Bentonite	07/03/2018

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS				Print Date	28/11/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1781**
	Fugro Reference	G170029U			
	Coordinates (m)	E503685.29 N177275.19	Ground Elevation (m Datum)	21.27	Sheet 1 of 1
	Hole Type	Dynamic (Windowless) Sampler			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

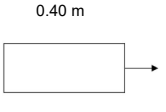
Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-1782**
Fugro Reference	G170029U			
Coordinates (m)	E503811.37 N177273.62	Ground Elevation (m Datum)	22.17	Sheet 1 of 1
Hole Type	Inspection Pit			Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
					MADE GROUND: concrete. [MADE GROUND] [CONCRETE]	(0.30)				
						0.30	21.87			
0.40	D	1			MADE GROUND: purplish brown, slightly gravelly sand. With rare fragments of coal (3x5 mm). Sand is fine to coarse. Gravel is angular, fine and medium of concrete and brick. [MADE GROUND] [SAND]	(0.20)				
						0.50	21.67			
0.65	D	2			MADE GROUND: brown, gravelly sand. With rare fragments of asphalt (<20x40 mm). Sand is fine to coarse. Gravel is angular and subangular, fine to coarse of flint, concrete and brick. [MADE GROUND] [SAND]	(0.40)				
						0.90	21.27			
1.00	D	3		1	MADE GROUND: light brown, gravelly sand. With rare fragments of glass (<60 mm). Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse, of flint, quartzite, and brick. [MADE GROUND] [SAND]	(0.30)				
					End of Inspection Pit at 1.20 m	1.20	20.97			
				2						
				3						
				4						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Plan



Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-1782**
Fugro Reference	G170029U			
Coordinates (m)	E503811.37 N177273.62	Ground Elevation (m Datum)	22.17	Sheet 1 of 1
Hole Type	Inspection Pit			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	15/01/2018	15/01/2018	Hand-dug/breaker			JJL	JJL	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
15/01/2018	02:00:00	0.00			
15/01/2018	18:00:00	1.20		Dry	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

Groundwater was not encountered during excavation.

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
GMP	1	0.60	1.20	15/01/2018

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	0.10	0.60	50	Plain
Pipe1	0.60	1.20	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	0.05	Flush Cover	15/01/2018
0.05	0.20	Concrete	15/01/2018
0.20	0.60	Bentonite	15/01/2018
0.60	1.20	Gravel Backfill	15/01/2018

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 28/11/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1782**
	Fugro Reference	G170029U			
	Coordinates (m)	E503811.37 N177273.62	Ground Elevation (m Datum)	22.17	Sheet 1 of 1
	Hole Type	Inspection Pit			Status / Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

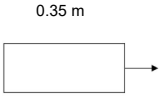
FUGRO	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1783**
	Fugro Reference	G170029U			
	Coordinates (m)	E503799.56 N177323.40	Ground Elevation (m Datum)	21.40	Sheet 1 of 1
	Hole Type	Inspection Pit			Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.05 - 0.15	D	1			MADE GROUND: dark brown, sandy, gravelly clay. With roots/ rootlets (2x15 mm). Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of flint. [MADE GROUND] [CLAY]					
0.40 - 0.50	D	2			Below 0.50 m; with low cobble content. With occasional pockets (15x15 mm) of stiff, dark brown, peaty clay. Cobbles (<90x80x80 mm) are of concrete.	(1.00)				
0.90 - 1.00	D	3		1	End of Inspection Pit at 1.00 m	1.00	20.40			
				2						
				3						
				4						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Plan



Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-1783**
Fugro Reference	G170029U			
Coordinates (m)	E503799.56 N177323.40	Ground Elevation (m Datum)	21.40	Sheet 1 of 1
Hole Type	Inspection Pit			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.00	IP	06/03/2018	06/03/2018	Hand-dug			MG	MG	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
06/03/2018	08:00:00	0.00			
06/03/2018	10:00:00	1.00		0.65	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)
0.65				

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

Groundwater was encountered at 0.65 m. Water level was not monitored.

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.00 m. Services were not located. The inspection pit was terminated at 1.00 m due to possible concrete obstruction.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
GMP	1	0.30	1.00	06/03/2018

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	0.10	0.50	50	Plain
Pipe1	0.50	1.00	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	0.05	Flush Cover	06/03/2018
0.05	0.10	Concrete	06/03/2018
0.10	0.30	Bentonite	06/03/2018
0.30	1.00	Gravel Backfill	06/03/2018

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 28/11/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1783**
	Fugro Reference	G170029U			
	Coordinates (m)	E503799.56 N177323.40	Ground Elevation (m Datum)	21.40	Sheet 1 of 1
	Hole Type	Inspection Pit			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1784**
	Fugro Reference	G170029U			
	Coordinates (m)	E503870.86 N177465.06	Ground Elevation (m Datum)	22.76	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.05	D	1			MADE GROUND: brown, sand and gravel. Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of flint, brick and concrete. [MADE GROUND] [GRAVEL]	(0.20)				
0.25	D	2				0.20	22.56			
0.50	D	3				(0.25) 0.45	22.31			
0.60	D	4			MADE GROUND: (soft) dark brown, slightly gravelly, sandy clay. Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of flint, brick and concrete. Moderate hydrocarbon odour. [MADE GROUND] [CLAY]	(0.10)	22.21			
0.80	D	5		1		0.55 (0.15) 0.70	22.06			
					MADE GROUND: (very soft and soft), dark grey, sandy, gravelly clay. Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of flint, brick and concrete. [MADE GROUND] [CLAY]					
				2	MADE GROUND: brown, gravelly sand. Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of flint, brick and concrete. [MADE GROUND] [SAND]					
2.20	D	6			MADE GROUND: (very soft and soft), dark grey mottled black, slightly gravelly, sandy clay. Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of flint, brick and concrete. Moderate hydrocarbon odour. [MADE GROUND] [CLAY]	(3.30)				
				3						
3.20	D	7								
4.00	D	8		4	MADE GROUND: (very soft), grey mottled black, bluish grey and light brown, slightly gravelly, sandy clay. With rare black rootlets (1x5 mm). Sand is fine to coarse, mainly fine and medium. Gravel is subrounded, fine to coarse of flint and brick. Slight organic odour. [MADE GROUND] [CLAY]	4.00 (0.40) 4.40 (0.10) 4.50	18.76 18.36 18.26			
4.50	D	9		5	Very soft, black mottled bluish grey, slightly sandy CLAY. Sand is fine to coarse, mainly fine and medium. Moderate organic odour. (Probably reworked). [LONDON CLAY FORMATION] [CLAY]					
					End of Borehole at 4.50 m					
				6						
				7						
				8						
				9						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-1784**
Fugro Reference	G170029U			
Coordinates (m)	E503870.86 N177465.06	Ground Elevation (m Datum)	22.76	Sheet 1 of 1
Hole Type	Cable Percussion			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	04/12/2017	04/12/2017	Hand-dug			JJL	JJL	
1.20	4.50	CP	04/12/2017	04/12/2017	Dando 3000			SB/DT	JJL	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
04/12/2017	08:00:00	0.00			
04/12/2017	18:00:00	4.50	4.40	1.90	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)
4.50	200	4.40	200

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)
4.40	1.90	20	4.40	

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
GMP	1	0.60	1.80	04/12/2017

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	0.10	0.70	50	Plain
Pipe1	0.70	1.70	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	0.05	Flush Cover	04/12/2017
0.05	0.20	Concrete	04/12/2017
0.20	0.60	Bentonite	04/12/2017
0.60	1.80	Gravel Backfill	04/12/2017
1.80	4.50	Bentonite	04/12/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	JPD/ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 28/11/2018

	Contract Name	HAL Airport Expansion		Location ID
	Client	Heathrow Airport Limited		**HEP-BH-1784**
	Fugro Reference	G170029U		
	Coordinates (m)	E503870.86 N177465.06	Ground Elevation (m Datum) 22.76	Sheet 1 of 1
	Hole Type	Cable Percussion		Status Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1785**
	Fugro Reference	G170029U			
	Coordinates (m)	E503734.41 N177483.09	Ground Elevation (m Datum)	22.04	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.10 - 0.15	D	1			MADE GROUND: light brown and light grey, slightly sandy gravel within cellular geotextile system. Sand is fine to coarse. Gravel is subangular to well rounded, fine and medium of flint and occasional other mixed lithologies. [MADE GROUND] [GRAVEL]	(0.10)	21.94			
0.20 - 0.30	D	2				0.10	21.84			
						(0.10)				
						0.20				
0.60 - 0.70	D	3				(0.40)	21.44			
				1	MADE GROUND: light brown, slightly gravelly sand. Sand is fine to coarse. Gravel is angular to subrounded, fine and medium of flint and chalk. [MADE GROUND] [SAND] At 0.15 m; black, synthetic, fibrous, geotextile membrane.	0.60				
						(1.40)				
1.50 - 1.60	D	4			MADE GROUND: greyish brown, sandy gravel with medium cobble content. Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of flint, chalk, concrete and occasional slag. Cobbles are angular to subrounded of concrete and brick. [MADE GROUND] [GRAVEL] At 0.60 m; black, synthetic, fibrous, geotextile membrane.					
2.00 - 2.10	D	5		2		2.00	20.04			
					Firm, greyish brown, slightly sandy, slightly gravelly CLAY. Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of flint and chalk. [ALLUVIUM] [CLAY] Below 1.50 m; gravel absent.	(0.20)				
						2.20	19.84			
				3	Soft and firm, greyish brown and dark grey, slightly sandy, slightly gravelly to gravelly CLAY. Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of flint and chalk. Slight organic odour. [ALLUVIUM] [CLAY]					
					End of Borehole at 2.20 m					
				4						
				5						
				6						
				7						
				8						
				9						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-1785**
Fugro Reference	G170029U			
Coordinates (m)	E503734.41 N177483.09	Ground Elevation (m Datum)	22.04	Sheet 1 of 1
Hole Type	Cable Percussion			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	09/12/2017	09/12/2017	Hand-dug			SK	SK	
1.20	2.20	CP	09/12/2017	09/12/2017	Dando 3000			BH	SK	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
09/12/2017	08:00:00	0.00			
09/12/2017	18:00:00	2.20	1.30	Dry	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)
2.20	150	1.30	150

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

Groundwater was not encountered during excavation or boring.

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
GMP	1	1.20	2.20	09/12/2017

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	0.13	1.30	50	Plain
Pipe1	1.30	2.20	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	0.05	Flush Cover	09/12/2017
0.05	0.50	Concrete	09/12/2017
0.50	1.20	Bentonite	09/12/2017
1.20	2.20	Gravel Backfill	09/12/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 28/11/2018

	Contract Name	HAL Airport Expansion		Location ID
	Client	Heathrow Airport Limited		**HEP-BH-1785**
	Fugro Reference	G170029U		
	Coordinates (m)	E503734.41 N177483.09	Ground Elevation (m Datum) 22.04	Sheet 1 of 1
	Hole Type	Cable Percussion		Status Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1787**
	Fugro Reference	G170029U			
	Coordinates (m)	E503886.72 N177513.47	Ground Elevation (m Datum)	22.39	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.10	D	1			MADE GROUND (Topsoil): dark brown, slightly gravelly, silty sand. With abundant roots (<4x120 mm). With rare fragments of ceramic (8x10 mm). Sand is fine to coarse. Gravel is subangular to rounded, fine to coarse of flint, slate and concrete. [MADE GROUND] [SAND]	(0.15) 0.15	22.24			
0.30	D	2			MADE GROUND: light brown, gravelly sand. Sand is fine to coarse. Gravel is subangular and subrounded fine to coarse of flint, brick and concrete. [MADE GROUND] [SAND]	(1.15) 1.30	21.09			
1.50	D	3		1	MADE GROUND: (very soft), orangish brown, sandy, gravelly clay. Sand is fine to coarse. Gravel is subangular and subrounded, fine and medium of flint, brick and concrete. [MADE GROUND] [CLAY]	(1.10) 2.40	19.99			
2.50	D	4		2	MADE GROUND: (very soft and soft), greyish brown, slightly gravelly, sandy clay. Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of flint and brick. [MADE GROUND] [CLAY]	(0.60) 3.00	19.39			G
				3	End of Borehole at 3.00 m					
				4						
				5						
				6						
				7						
				8						
				9						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-1787**
Fugro Reference	G170029U			
Coordinates (m)	E503886.72 N177513.47	Ground Elevation (m Datum)	22.39	Sheet 1 of 1
Hole Type	Cable Percussion			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	28/11/2017	28/11/2017	Hand-dug			JJL	JJL	
1.20	3.00	CP	28/11/2017	28/11/2017	Dando 3000			BH	JJL	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
28/11/2017	00:00:00	0.00			
28/11/2017	18:00:00	3.00	1.60	Dry	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)
3.00	200	1.60	200

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

Groundwater was not encountered during excavation or boring.

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
GMP	1	1.00	2.50	28/11/2017

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	0.09	1.10	50	Plain
Pipe1	1.10	2.50	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	0.05	Flush Cover	28/11/2017
0.05	0.20	Concrete	28/11/2017
0.20	1.00	Bentonite	28/11/2017
1.00	2.50	Gravel Backfill	28/11/2017
2.50	3.00	Bentonite	28/11/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 28/11/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1787**
	Fugro Reference	G170029U			
	Coordinates (m)	E503886.72 N177513.47	Ground Elevation (m Datum)	22.39	Sheet 1 of 1
	Hole Type	Cable Percussion			Status / Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

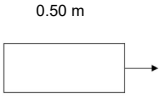
	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1792**
	Fugro Reference	G170029U			
	Coordinates (m)	E502969.16 N178031.57	Ground Elevation (m Datum)	21.20	Sheet 1 of 1
	Hole Type	Inspection Pit			Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
					MADE GROUND: (soft and firm), dark brownish grey, slightly gravelly, slightly sandy to sandy, clay. Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of flint, chalk and occasional brick.	(0.40)				
0.30	D	1			[MADE GROUND] [CLAY]					
					Below 0.15 m; greyish brown.	0.40	20.80			
0.50	D	2			Firm, greyish brown, slightly sandy, slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse, mainly fine and medium, of flint and chalk.	(0.20)				
					[ALLUVIUM] [CLAY]	0.60	20.60			
0.70	D	3			Soft, light brown, occasionally mottled light grey, sandy, gravelly CLAY. Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse, mainly fine and medium, of flint and chalk.	(0.20)				
					[ALLUVIUM] [CLAY]	0.80	20.40			
				1	Light greyish brown, slightly silty SAND and GRAVEL. Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of flint and chalk.	(0.40)				
1.10	D	4			[RIVER TERRACE DEPOSITS] [SAND AND GRAVEL]	1.20	20.00			
					Below 0.90 m; with occasional pockets (<200 mm) of soft, light bluish grey, sandy, gravelly clay.					
					End of Inspection Pit at 1.20 m					
				2						
				3						
				4						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Plan



Contract Name	HAL Airport Expansion			Location ID	
Client	Heathrow Airport Limited			**HEP-BH-1792**	
Fugro Reference	G170029U				
Coordinates (m)	E502969.16 N178031.57	Ground Elevation (m Datum)	21.20	Sheet 1 of 1	
Hole Type	Inspection Pit			Status	Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	24/11/2017	11/12/2017	Hand-dug			SK	SK	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
24/11/2017	08:00:00	0.00			
24/11/2017	18:00:00	1.20		0.80	
11/12/2017	08:00:00	1.20			
11/12/2017	18:00:00	1.20			

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)
0.80			0.80	

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

Groundwater seepage at 0.80 m. Water level was not monitored.

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located. The inspection pit was backfilled with arisings before being progressed by installation.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
GMP	1	0.50	1.00	11/12/2017

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	-0.21	0.50	50	Plain
Pipe1	0.50	1.00	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
-0.36	0.00	Upstanding Cover	11/12/2017
0.00	0.20	Concrete	11/12/2017
0.20	0.50	Bentonite	11/12/2017
0.50	1.00	Gravel Backfill	11/12/2017
1.00	1.20	Bentonite	11/12/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS				Print Date	28/11/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1792**
	Fugro Reference	G170029U			
	Coordinates (m)	E502969.16 N178031.57	Ground Elevation (m Datum)	21.20	Sheet 1 of 1
	Hole Type	Inspection Pit			Status / Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1793**
	Fugro Reference	G170029U			
	Coordinates (m)	E502850.68 N177916.42	Ground Elevation (m Datum)	21.25	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.20	D	1			MADE GROUND (Topsoil): dark brown, slightly gravelly, silty sand. With abundant roots (<2x100 mm). Sand is fine to coarse. Gravel is subangular, fine to coarse of concrete and brick. [MADE GROUND] [SAND]	(0.25) 0.25	21.00			
0.35	D	2				(0.40)				
0.70	D	3			MADE GROUND: light brown, gravelly sand. Sand is fine to coarse. Gravel is subangular, fine to coarse of flint, brick and concrete. [MADE GROUND] [SAND]	0.65 (0.15) 0.80	20.60 20.45			G
1.00	D	4		1	MADE GROUND: (soft), brown, slightly gravelly, sandy clay. With rare fragments of ceramic (5x5 mm). Sand is fine to coarse. Gravel is subangular and subrounded, fine and medium of flint, concrete and brick. [MADE GROUND] [CLAY]	(0.30) 1.10	20.15			
				2	MADE GROUND: (soft), greyish brown mottled black, slightly gravelly, sandy clay. With rare fragments of fabric (70x100 mm). Sand is fine to coarse. Gravel is subangular and subrounded, fine and medium of flint, brick and concrete. Slight hydrocarbon odour. [MADE GROUND] [CLAY]					
					End of Borehole at 1.10 m					
				3						
				4						
				5						
				6						
				7						
				8						
				9						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID	
Client	Heathrow Airport Limited			**HEP-BH-1793**	
Fugro Reference	G170029U				
Coordinates (m)	E502850.68 N177916.42	Ground Elevation (m Datum)	21.25	Sheet 1 of 1	
Hole Type	Cable Percussion			Status	Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.10	IP	07/12/2017	07/12/2017	Hand-dug			JJL	JJL	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
07/12/2017	08:00:00	0.00			
07/12/2017	18:00:00	1.10		1.10	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)
1.10				

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

Groundwater was encountered at 1.10 m. Water level was not monitored. Bentonite was added to borehole to prevent rising water.

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.10 m. Services were not located.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
GMP	1	0.50	0.90	07/12/2017

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	-0.24	0.50	50	Plain
Pipe1	0.50	0.90	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
-0.43	0.00	Upstanding Cover	07/12/2017
0.00	0.20	Concrete	07/12/2017
0.20	0.50	Bentonite	07/12/2017
0.50	0.90	Gravel Backfill	07/12/2017
0.90	1.10	Bentonite	07/12/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS				Print Date	28/11/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1793**
	Fugro Reference	G170029U			
	Coordinates (m)	E502850.68 N177916.42	Ground Elevation (m Datum)	21.25	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

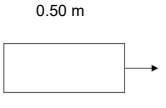
Contract Name	HAL Airport Expansion			Location ID	
Client	Heathrow Airport Limited			**HEP-BH-1794**	
Fugro Reference	G170029U				
Coordinates (m)	E502906.06 N177887.70	Ground Elevation (m Datum)	21.98	Sheet 1 of 1	
Hole Type	Inspection Pit			Status	Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.10	D	1			MADE GROUND: dark brown, slightly silty slightly gravelly sand with low cobble content. With occasional roots. With 3 fragments of plastic bag (5x5x60 mm), 2 lengths of cable (6x6x200 mm), 2 fragments of glass (5x20x100 mm) and 2 fragments of insulation foam (10x100x120 mm). Sand is fine to coarse. Gravel is subrounded, fine to coarse of flint, aggregate and brick. Cobbles are of flint and brick. [MADE GROUND] [SAND]	(0.20)				
0.35	D	2				0.20	21.78			
						(0.60)				
0.80	D	3			MADE GROUND: greyish brown, slightly gravelly sand. Locally tending to brown, slightly sandy clay. With occasional fragments of wood (10x30x40 mm) and plastic (2x20x20 mm), and rare fragments of glass (5x10x15 mm). With rare metal bolts (10x10x20 mm) and length of string (10x10x300 mm). Sand is fine to coarse. Gravel is subangular to rounded, fine to coarse of flint, brick, aggregate and tile. [MADE GROUND] [WASTE, e.g. LANDFILL]	0.80	21.18			
				1		(0.40)				
					MADE GROUND: black, slightly clayey, gravelly sand. With 2 fragments of timber (20x25x80 mm), 3 fragments of polystyrene (20x35x40 mm), fragment of plastic bag (2x70x70 mm), and a grey structural brick (50x60x130 mm). Sand is medium and coarse. Gravel is subangular to rounded, fine to coarse of flint, brick and aggregate. [MADE GROUND] [WASTE, e.g. LANDFILL] Between 0.80m and 1.00m; with brick layer in western side of pit.	1.20	20.78			
					End of Inspection Pit at 1.20 m					
				2						
				3						
				4						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Plan



	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1794**
	Fugro Reference	G170029U			
	Coordinates (m)	E502906.06 N177887.70	Ground Elevation (m Datum)	21.98	Sheet 1 of 1
	Hole Type	Inspection Pit			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	07/12/2017	20/12/2017	Hand-dug			AF	AF	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
07/12/2017	00:00:00	0.00			
07/12/2017	18:00:00	1.20		Dry	
20/12/2017	13:30:00	0.00			
20/12/2017	18:00:00	1.20		Dry	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

Groundwater was not encountered during excavation.

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located. The inspection pit was backfilled with arisings before being progressed by cable installation.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
GMP	1	0.50	1.20	20/12/2017

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	0.13	0.70	50	Plain
Pipe1	0.70	1.20	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	0.05	Flush Cover	20/12/2017
0.05	0.20	Concrete	20/12/2017
0.20	0.50	Bentonite	20/12/2017
0.50	1.20	Gravel Backfill	20/12/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1794**
	Fugro Reference	G170029U			
	Coordinates (m)	E502906.06 N177887.70	Ground Elevation (m Datum)	21.98	Sheet 1 of 1
	Hole Type	Inspection Pit			Status / Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1795**
	Fugro Reference	G170029U			
	Coordinates (m)	E502717.70 N177588.94	Ground Elevation (m Datum)	20.44	Sheet 1 of 1
	Hole Type	Inspection Pit			Status: Final

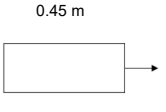
Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.20 - 0.30	ES	1			TOPSOIL: (soft), dark brown, slightly sandy, slightly gravelly clay. With frequent roots/rootlets (<10x1000 mm). Sand is fine to coarse. Gravel is subangular and subrounded, fine and medium of flint. [TOPSOIL] [CLAY]	(0.50)				
0.20	PID		< 0.1 ppm							
0.30	D	2								
0.40 - 0.50	B	3								
0.50 - 0.60	ES	4			Soft, light orangish brown and locally black, slightly sandy, slightly gravelly CLAY. With occasional pockets (20 mm) of black, silty clay with slight organic odour. Sand is fine to coarse. Gravel is subangular and subrounded, fine and medium of flint. [ALLUVIUM] [CLAY]	0.50	19.94			
0.50	PID		< 0.1 ppm							
0.60	D	5				(0.50)				
0.70 - 0.90	B	6								
1.00 - 1.05	ES	7		1	Light yellowish brown, slightly clayey, very sandy GRAVEL. With rare pockets (<20 mm) of laminated, sandy clay. Sand is fine to coarse. Gravel is subangular to well rounded, fine to coarse of flint. [RIVER TERRACE DEPOSITS] [GRAVEL]	1.00	19.44			
1.00 - 1.10	B	9				(0.10)				
1.00	PID		< 0.1 ppm			1.10	19.34			
1.05	D	8								
				2						
				3						
				4						

End of Inspection Pit at 1.10 m

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Plan



Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-1795**
Fugro Reference	G170029U			
Coordinates (m)	E502717.70 N177588.94	Ground Elevation (m Datum)	20.44	Sheet 1 of 1
Hole Type	Inspection Pit			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.10	IP	14/12/2017	14/12/2017	Dando 3000			CT	AK	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
14/12/2017	08:00:00	0.00			
14/12/2017	18:00:00	1.10		0.75	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)
1.00	0.75	20		

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.10 m. Services were not located.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
GMP	1	0.40	1.10	14/12/2017

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	-0.22	0.50	50	Plain
Pipe1	0.50	1.10	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
-0.39	0.00	Upstanding Cover	14/12/2017
0.00	0.20	Concrete	14/12/2017
0.20	0.40	Bentonite	14/12/2017
0.40	1.10	Gravel Backfill	14/12/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 28/11/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1795**
	Fugro Reference	G170029U			
	Coordinates (m)	E502717.70 N177588.94	Ground Elevation (m Datum)	20.44	Sheet 1 of 1
	Hole Type	Inspection Pit			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)
0.20	< 0.1
0.50	< 0.1
1.00	< 0.1

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1796**
	Fugro Reference	G170029U			
	Coordinates (m)	E503337.61 N178072.20	Ground Elevation (m Datum)	21.78	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.10	D	1			MADE GROUND: (soft), black, slightly sandy, slightly gravelly clay with low cobble content. With occasional roots (20x60 mm) and rootlets (2x25 mm). Sand is fine and medium. Gravel is angular to subrounded, fine to coarse of flint and chalk. Cobbles (<120x120 mm) are of flint, brick and chalk. [MADE GROUND] [CLAY]	(0.55)				
0.55	D	2			Firm. locally stiff, brown, locally orange, slightly sandy, slightly gravelly CLAY. With occasional rootlets (2x40 mm). Sand is fine and medium. Gravel is angular to subrounded, fine of flint. [ALLUVIUM] [CLAY]	0.55	21.23			
0.80	D	3			Firm and stiff, greyish black, locally light brown CLAY. With occasional plant fragments (5x10 mm). [ALLUVIUM] [CLAY]	(0.25) 0.80	20.98			
1.10	D	4		1	Soft, light brown, locally mottled orange and black CLAY. [ALLUVIUM] [CLAY]	(0.30) 1.10	20.68			
1.40 - 1.50	D	5			Firm and stiff, dark greyish brown, locally black mottled bluish brown, slightly gravelly clay. With occasional rootlets (<2x15 mm). With occasional pockets (<10 mm) of fine to coarse sand. Gravel is subangular and subrounded, fine and medium of flint. [ALLUVIUM] [CLAY]	(0.10) 1.20	20.58			
1.70 - 1.80	D	6			Soft, light brownish grey, slightly sandy, gravelly CLAY. Sand is fine to coarse. Gravel is angular to subrounded, fine and medium of flint. [ALLUVIUM] [CLAY]	(0.50) 1.70	20.08			
1.90 - 2.00	D	7		2	Light brown, white and black, slightly sandy GRAVEL. Sand is fine to coarse. Gravel is angular to subrounded, fine and medium of flint. [RIVER TERRACE DEPOSITS] [GRAVEL]	(0.10) 1.80	19.98			
					End of Borehole at 2.00 m	(0.20) 2.00	19.78			
				3						
				4						
				5						
				6						
				7						
				8						
				9						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID	
Client	Heathrow Airport Limited			**HEP-BH-1796**	
Fugro Reference	G170029U				
Coordinates (m)	E503337.61 N178072.20	Ground Elevation (m Datum)	21.78	Sheet 1 of 1	
Hole Type	Cable Percussion			Status	Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	27/11/2017	27/11/2017	Hand-dug			AF	AF	
1.20	2.00	CP	04/12/2017	04/12/2017	Dando 2000			CT	AK	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
27/11/2017	08:00:00	0.00			
27/11/2017	18:00:00	1.20		1.18	
04/12/2017	08:00:00	1.20			
04/12/2017	18:00:00	2.00	1.10		

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)
2.00	200	1.90	200

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)
1.18				
1.80	1.10	5	1.80	

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located. The inspection pit was backfilled with arisings before being progressed by cable percussion.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
GMP	1	0.70	1.70	04/12/2017

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	-0.18	0.70	50	Plain
Pipe1	0.70	1.70	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
-0.29	0.00	Upstanding Cover	04/12/2017
0.00	0.20	Concrete	04/12/2017
0.20	0.70	Bentonite	04/12/2017
0.70	1.70	Gravel Backfill	04/12/2017
1.70	2.00	Bentonite	04/12/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS				Print Date	28/11/2018

	Contract Name	HAL Airport Expansion		Location ID
	Client	Heathrow Airport Limited		**HEP-BH-1796**
	Fugro Reference	G170029U		
	Coordinates (m)	E503337.61 N178072.20	Ground Elevation (m Datum) 21.78	Sheet 1 of 1
	Hole Type	Cable Percussion		Status Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID	
Client	Heathrow Airport Limited			**HEP-BH-1797**	
Fugro Reference	G170029U				
Coordinates (m)	E503177.26 N177918.02	Ground Elevation (m Datum)	26.09	Sheet 1 of 2	
Hole Type	Hollow Stem Auger			Status	Final

Sampling and In Situ Testing					Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Run Depth (m) (Recovery) (%)	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.10	D	1				MADE GROUND (Topsoil): (soft), dark brown, slightly gravelly, sandy clay. With frequent roots. Sand is fine. Gravel is subangular to rounded, fine to coarse, of flint, chalk and occasional brick.	(0.20)				
0.25	D	2				[MADE GROUND] [CLAY]	0.20	25.89			
						MADE GROUND: greyish brown, slightly clayey, gravelly, sand with low and medium cobble content. Sand is medium and coarse. Gravel is subangular to rounded, fine to coarse, of flint, brick, chalk, aggregate and concrete. Cobbles are of flint, concrete and rare limestone.					
						[MADE GROUND] [SAND]	(1.00)				
						Between 0.25 m and 0.55 m; with concrete blocks (70x120x200 mm), metal loop (4x20x100 mm), fragment of tile (5x30x40 mm), fragment of timber (2x5x15 mm), and a metal cap (20x40x60 mm). Between 0.45 m and 1.00 m; clay absent.					
					1	Between 0.75 m and 1.15 m; with a paving slab (50x150x220 mm), iron bar (30x30x100 mm), plastic bag (2x200x400 mm), and 3 lengths of steel wire (3x3x60 mm).					
1.20	D	3		1.20		Between 1.00 m and 1.15 m; dark brown, slightly clayey.	1.20	24.89			
1.20 - 1.40	ES	5				MADE GROUND: brown and black, slightly clayey, sandy, gravel (97%). With occasional fragments of mixed plastic (<50x80 mm) (1%), and wood (<10x30x50 mm) (2%). Sand is fine to coarse. Gravel is angular and subangular, fine to coarse, of concrete and brick.					
1.20 - 1.70	LB	4				[MADE GROUND] [GRAVEL]	(0.60)				
1.20	PID		< 0.1 ppm								
				(-)							
1.80	D	6				MADE GROUND: black, slightly sandy, clayey, gravel (85%). With occasional and some fragments of wood (<15x80 mm) (10%), mixed plastics (<20x60 mm) (5%), and rare ceramic (<15x20 mm). With a metal fragment (5x10x100 mm). Sand is fine to coarse. Gravel is angular and subangular, fine to coarse of concrete, slate and brick.	1.80	24.29			
1.80 - 2.00	ES	8				[MADE GROUND] [WASTE, e.g. LANDFILL]	(0.40)				
1.80 - 2.20	LB	7				MADE GROUND: brown and black, slightly clayey, sandy gravel (95%). With rare and occasional fragments of mixed plastic (<50x50 mm) (1%), and wood (<10x30x50 mm) (4%). Sand is fine to coarse. Gravel is angular and subangular, fine to coarse, of concrete, and brick.					
1.80	PID		< 0.1 ppm		2	[MADE GROUND] [WASTE, e.g. LANDFILL]					
2.20	D	9		2.20		MADE GROUND: black, sandy, gravelly clay (75%). With occasional and some fragments of wood (<30x150 mm) (10%), mixed plastics (<10x120 mm (5%), geotextile membrane (5%), clinker (<60 mm) (5%). With rare fragments of ceramic (<10x20 mm) and glass (<10x15 mm). Sand is fine to coarse. Gravel is angular and subangular, fine to coarse of flint, concrete and brick.	2.20	23.89			
2.20 - 2.40	ES	11				[MADE GROUND] [WASTE, e.g. LANDFILL]	(0.40)				
2.20 - 2.60	LB	10									
2.20	PID		< 0.1 ppm								
2.60	D	12					2.60	23.49			
2.60 - 3.00	LB	13									
				(-)							
					3						
3.20	D	14		3.20		[MADE GROUND] [WASTE, e.g. LANDFILL]					
3.20 - 3.40	ES	16				Below 3.20 m; becoming clay (75%). With fragments of wood (<30x15 mm) (15%), ash (5%), clinker and membrane (5%).					
3.20 - 4.00	LB	15				Below 3.20 m; black.					
3.20	PID		< 0.1 ppm								
				(-)							
					4						
4.20	D	17		4.20							
4.20 - 4.40	ES	19									
4.20 - 5.00	LB	18									
4.20	PID		< 0.1 ppm								
				(-)			(4.60)				
						Continued next page					

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion		Location ID	
	Client	Heathrow Airport Limited		**HEP-BH-1797**	
	Fugro Reference	G170029U			
	Coordinates (m)	E503177.26 N177918.02	Ground Elevation (m Datum) 26.09	Sheet 2 of 2	
	Hole Type	Hollow Stem Auger		Status	Final

Sampling and In Situ Testing					Strata Details				Groundwater	
Depth (m)	Type	No.	Test Results	Run Depth (m) (Recovery) (%)	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
5.20 5.20 - 5.40 5.20 - 6.00 5.20	D ES LB PID	20 22 21	< 0.1 ppm	5.20 (-)	6	MADE GROUND: black, sandy, gravelly clay (75%). With occasional and some fragments of wood (<30x150 mm) (10%), mixed plastics (<10x120 mm (5%), geotextile membrane (5%), clinker (<60 mm) (5%). With rare fragments of ceramic (<10x20 mm) and glass (<10x15 mm). Sand is fine to coarse. Gravel is angular and subangular, fine to coarse of flint, concrete and brick. [MADE GROUND] [WASTE, e.g. LANDFILL] Between 5.20 m and 6.00 m; with fragments of glass and metal (<20x75 mm).				
6.20 6.20 - 6.40 6.20 - 7.00 6.20	D ES LB PID	23 25 24	3.0 ppm	6.20 (-)	7						
7.20 7.20 - 7.40 7.20 - 7.95 7.20	D ES LB PID	21 28 27	2.0 ppm	7.20 (-) 7.50 (-) 7.80		MADE GROUND: dark grey and black, slightly sandy, silty gravel (98%). With occasional fragments (2%) of wood (10x50 mm) and metal (20x90 mm). Sand is fine to coarse. Gravel is angular and subangular, fine to coarse of flint, brick and rare concrete. [MADE GROUND] [GRAVEL]	7.20 (0.75)	18.89			
7.95 8.10 8.10 - 8.40 8.10	D ES LB PID	29 31 30	1.0 ppm	(-) 8.10 (-) 8.40	8	Firm, greyish brown, sandy, gravelly CLAY. Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse, of flint. (Probably reworked). [LONDON CLAY FORMATION] [CLAY]	7.95 (0.45)	18.14			
						End of Borehole at 8.40 m	8.40	17.69			
					9						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-1797**
Fugro Reference	G170029U			
Coordinates (m)	E503177.26 N177918.02	Ground Elevation (m Datum)	26.09	Sheet 1 of 1
Hole Type	Hollow Stem Auger			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	08/12/2017	08/12/2017	Hand-dug			AF	AF	
1.20	8.40	AUGH	18/12/2017	19/12/2017	Hollow stem (barrel) auger MC 3000			DW	EA	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
08/12/2017	08:00:00	0.00		Dry	
08/12/2017	18:00:00	1.20		Dry	
18/12/2017	08:00:00	1.20		Dry	
18/12/2017	18:00:00	5.20			
19/12/2017	08:00:00	5.20			
19/12/2017	12:56:00	8.40			
20/12/2017	08:00:00	8.40			
20/12/2017	18:00:00	8.40			

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)
8.40	350	2.50	350

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

Groundwater was not encountered during excavation or boring.

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located. The inspection pit was backfilled with arisings before being progressed by auger.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
SP	1	0.60	7.40	20/12/2017

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	0.02	1.20	50	Plain
Pipe1	1.20	7.40	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
-0.08	0.00	Upstanding Cover	20/12/2017
0.00	0.20	Concrete	20/12/2017
0.20	0.60	Bentonite	20/12/2017
0.60	7.40	Gravel Backfill	20/12/2017
7.40	8.40	Bentonite	20/12/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 28/11/2018

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-1797**
Fugro Reference	G170029U			
Coordinates (m)	E503177.26 N177918.02	Ground Elevation (m Datum)	26.09	Sheet 1 of 1
Hole Type	Hollow Stem Auger			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)
1.20	< 0.1
1.80	< 0.1
2.20	< 0.1
3.20	< 0.1
4.20	< 0.1
5.20	< 0.1
6.20	3.0
7.20	2.0
8.10	1.0

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1798**
	Fugro Reference	G170029U			
	Coordinates (m)	E503187.01 N177771.89	Ground Elevation (m Datum)	24.52	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.00 - 0.50	B	2			MADE GROUND: dark blackish brown, slightly gravelly, sandy clay (70%). With occasional fragments of ceramic (<20x40 mm) (5%), mixed plastic (15x<100 mm to 30x65 mm) (5%) and wood (<30x30 mm to 65x90 mm) (5%). Sand is fine to coarse. Gravel is angular to rounded, fine to coarse of brick (<30x30 mm) (5%), concrete (<50x60 mm) (5%), chert/flint (<15x10 mm to 35x50 mm) (5%). [MADE GROUND] [WASTE, e.g. LANDFILL]					
0.10	D	1								
0.20 - 0.30	ES	3								
0.20	PID		< 0.1 ppm							
0.70 - 1.20	B	5								
1.00 - 1.20	ES	6		1		(2.00)				
1.00	PID		< 0.1 ppm							
1.10	D	4								
1.90	D	7		2	MADE GROUND: black, slightly sandy, clayey gravel (30%). With abundant fragments of wood and ceramic (20x30 mm to 100x200 mm) (60%). Sand is fine and medium. Gravel is angular to rounded, fine to coarse of chert and brick (30x30 mm to 60x70 mm) (5%) and concrete (32x34 mm to 65x85 mm) (5%). Strong diesel hydrocarbon odour. [MADE GROUND] [WASTE, e.g. LANDFILL]	2.00	22.52			
2.90	D	8		3		(1.50)				
3.50	D	9			End of Borehole at 3.50 m	3.50	21.02			G
				4						
				5						
				6						
				7						
				8						
				9						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-1798**
Fugro Reference	G170029U			
Coordinates (m)	E503187.01 N177771.89	Ground Elevation (m Datum)	24.52	Sheet 1 of 1
Hole Type	Cable Percussion			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	12/12/2017	12/12/2017	Hand-dug			PC	PC	
1.20	3.50	CP	12/12/2017	12/12/2017	Dando 3000			GD	PC	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
12/12/2017	08:00:00	0.00			
12/12/2017	16:30:00	3.50		Dry	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)
3.50	200		

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

Groundwater was not encountered during excavation or boring.

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
GMP	1	1.10	3.50	12/12/2017

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	0.09	1.20	50	Plain
Pipe1	1.20	3.50	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	0.05	Flush Cover	12/12/2017
0.05	0.20	Concrete	12/12/2017
0.20	1.10	Bentonite	12/12/2017
1.10	3.50	Gravel Backfill	12/12/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 28/11/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1798**
	Fugro Reference	G170029U			
	Coordinates (m)	E503187.01 N177771.89	Ground Elevation (m Datum)	24.52	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)
0.20	< 0.1
1.00	< 0.1

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1802**
	Fugro Reference	G170029U			
	Coordinates (m)	E503397.41 N178063.28	Ground Elevation (m Datum)	21.22	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.05 - 0.20	ES	1			TOPSOIL: (soft), dark brown, slightly gravelly, clay. With occasional rootlets (2x200 mm). Gravel is angular to subrounded, fine to coarse of flint. [TOPSOIL] [CLAY]	(0.30)				
0.05	PID		< 0.1 ppm			0.30	20.92			
0.10	D	2			Soft, dark brown CLAY. With occasional roots (2x150 mm). [ALLUVIUM] [CLAY]	(0.40)				
0.10 - 0.20	B	3				0.70	20.52			
0.20 - 0.30	B	6			Multicoloured, very sandy GRAVEL with low cobble content. Sand is medium and coarse. Gravel is angular and subangular, fine to coarse of flint and chalk. Cobbles (100x100x110 mm) are of flint and chalk. [RIVER TERRACE DEPOSITS] [GRAVEL] Below 0.65 m; slightly sandy.	(0.50)				
0.30	D	5				1.20	20.02			
0.30 - 0.40	ES	4								
0.30	PID		< 0.1 ppm							
0.80 - 0.90	ES	7		1						
0.80	PID		< 0.1 ppm							
1.20 - 1.50	ES	10								
1.20 - 1.65	B	9								
1.20 - 1.65	D	8								
1.20 - 1.65	SPT		N = 11 (C)							
1.20	PID		< 0.1 ppm		Medium dense, grey and brown, sandy GRAVEL. Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of flint. [RIVER TERRACE DEPOSITS] [GRAVEL]					
2.00 - 2.30	D	11		2						
2.00 - 2.30	ES	13								
2.00 - 2.50	B	12								
2.00 - 2.45	SPT		N = 26 (C)							
2.00	PID		< 0.1 ppm							
						(3.00)				
3.00 - 3.30	ES	16		3						
3.00 - 3.45	D	14								
3.00 - 3.50	B	15								
3.00 - 3.45	SPT		N = 17 (C)							
3.00	PID		< 0.1 ppm							
				4						
4.20 - 4.40	ES	19			Firm and stiff, fissured, dark grey CLAY. With occasional partings (<1 mm) of silty fine sand, rare mica (<1 mm) and rare shell fragments (<2x2 mm). Fissures are randomly orientated, extremely closely spaced, planar and smooth. [LONDON CLAY FORMATION] [CLAY]	4.20	17.02			
4.20 - 4.60	B	18								
4.20 - 4.65	D	17								
4.20 - 4.65	SPT		N = 13 (C)							
4.20	PID		< 0.1 ppm							
5.00 - 5.40	UT	20	60/400 mm	5						
						(2.25)				
5.50 - 5.80	ES	21								
5.50	PID		< 0.1 ppm							
6.00 - 6.45	D	22		6						
6.00 - 6.45	SPT		N = 20 (S)							
					At 6.30 m; with decayed, possible lignite fragment (20x25 mm).					
					End of Borehole at 6.45 m	6.45	14.77			
				7						
				8						
				9						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID	
Client	Heathrow Airport Limited			**HEP-BH-1802**	
Fugro Reference	G170029U				
Coordinates (m)	E503397.41 N178063.28	Ground Elevation (m Datum)	21.22	Sheet 1 of 1	
Hole Type	Cable Percussion			Status	Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	27/11/2017	27/11/2017	Hand-dug			AF	AF	
1.20	6.45	CP	07/12/2017	08/12/2017	Dando 2000			LI	EA	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
27/11/2017	08:00:00	0.00			
27/11/2017	18:00:00	1.20		0.90	
07/12/2017	08:00:00	1.20			
07/12/2017	18:00:00	1.20			
08/12/2017	08:00:00	1.20			
08/12/2017	18:00:00	6.45	5.00	Dry	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)
6.00	200	5.00	200

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)
2.30	0.60	20	2.00	5.00

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located. The inspection pit was backfilled with arisings before being progressed by cable percussion.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
SP	1	1.10	4.20	08/12/2017

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	0.07	1.10	50	Plain
Pipe1	1.10	4.20	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	0.05	Flush Cover	08/12/2017
0.05	0.20	Concrete	08/12/2017
0.20	1.10	Bentonite	08/12/2017
1.10	4.20	Gravel Backfill	08/12/2017
4.20	6.45	Bentonite	08/12/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS				Print Date	28/11/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1802**
	Fugro Reference	G170029U			
	Coordinates (m)	E503397.41 N178063.28	Ground Elevation (m Datum)	21.22	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)
1.20	C	0	N=11 (2,2/2,3,3,3)	450	BS11	62	1.20	Dry
2.00	C	0	N=26 (2,2/5,8,6,7)	450	BS11	62	2.00	Dry
3.00	C	0	N=17 (2,2/3,4,4,6)	450	BS11	62	3.00	Dry
4.20	C	0	N=13 (4,5/3,3,4,3)	450	BS11	62	4.20	Dry
6.00	S	0	N=20 (2,3/3,5,5,7)	450	BS11	62	5.00	Dry

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)
0.05	< 0.1
0.30	< 0.1
0.80	< 0.1
1.20	< 0.1
2.00	< 0.1
3.00	< 0.1
4.20	< 0.1
5.50	< 0.1

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1803**
	Fugro Reference	G170029U			
	Coordinates (m)	E503396.30 N178062.37	Ground Elevation (m Datum)	21.20	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.10 - 0.20	D	1			MADE GROUND: (soft), dark brown, slightly sandy clay. With occasional roots/rootlets (3x200 mm). With occasional fragments of ceramic (10x40 mm). Sand is fine. [MADE GROUND] [CLAY]	(0.20)				
0.20 - 0.40	D	2				0.20	21.00			
						(0.30)				
0.50 - 0.60	D	3			Soft and firm, dark brown, sandy CLAY. With occasional rootlets (1x15 mm). With occasional fragments of wood (5x10 mm). Sand is fine to coarse. [ALLUVIUM] [CLAY] Between 0.35 m and 0.50 m; slightly sandy.	0.50	20.70			
0.80 - 0.90	D	4				(0.40)				
0.90 - 1.00	D	5		1		0.90	20.30			
						(0.30)				
1.20 - 1.50	D	6			Light greyish brown, slightly gravelly, silty SAND with low cobble content. With some roots (4x150 mm). Sand is medium and coarse. Gravel is angular to subrounded, fine to coarse of flint and chalk. Cobbles (75x80x80 mm) are of flint. [RIVER TERRACE DEPOSITS] [SAND]	1.20	20.00			
2.00 - 2.30	D	7		2	Greyish brown, sandy GRAVEL with high cobble content. Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of flint and chalk. Cobbles (80x100 mm) are of flint and chalk. [RIVER TERRACE DEPOSITS] [GRAVEL]					
					Grey and brown, slightly sandy GRAVEL. Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of flint. [RIVER TERRACE DEPOSITS] [GRAVEL]	(3.00)				
3.00 - 3.30	D	8		3						
4.00 - 4.30	D	9		4						G
					Firm and stiff, fissured, dark grey CLAY. With occasional partings of silty, fine sand, rare mica (<1 mm) and rare shell fragments (<2x2 mm). Fissures are randomly orientated, extremely closely spaced, planar and smooth. [LONDON CLAY FORMATION] [CLAY]	4.20	17.00			
5.00 - 5.30	D	10		5		(2.00)				
6.00 - 6.20	D	11		6						
					End of Borehole at 6.20 m	6.20	15.00			
				7						
				8						
				9						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID	
Client	Heathrow Airport Limited			**HEP-BH-1803**	
Fugro Reference	G170029U				
Coordinates (m)	E503396.30 N178062.37	Ground Elevation (m Datum)	21.20	Sheet 1 of 1	
Hole Type	Cable Percussion			Status	Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	27/11/2017	27/11/2017	Hand-dug			AF	AF	
1.20	6.20	CP	11/12/2017	11/12/2017	Dando 2000			LI	EA	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
27/11/2017	08:00:00	0.00			
27/11/2017	18:00:00	1.20			
11/12/2017	08:00:00	1.20			
11/12/2017	18:00:00	6.20	4.50	Dry	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)
6.20	200	6.20	200

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)
2.50	0.60	20	2.50	

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located. The inspection pit was backfilled with arisings before being progressed by cable percussion. Installation instructions given verbally by IDT to the driller; installation and backfill details not recorded by driller or IDT. Base of installation 4.10 m, top of pipe 0.09 m below ground level, flush cover.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
GMP	1			11/12/2018

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS				Print Date	29/11/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1803**
	Fugro Reference	G170029U			
	Coordinates (m)	E503396.30 N178062.37	Ground Elevation (m Datum)	21.20	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1804**
	Fugro Reference	G170029U			
	Coordinates (m)	E503422.49 N178162.28	Ground Elevation (m Datum)	21.29	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.10 - 0.20	B	1			MADE GROUND: (soft and firm), dark greyish brown, slightly sandy, slightly gravelly clayey silt. Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of flint, brick and chalk. [MADE GROUND] [CLAY]	(0.30)				
0.20	D	2				0.30	20.99			
0.20 - 0.30	ES	3				(0.30)				
0.20	PID		< 0.1 ppm		Between 0.00 m and 0.20 m; with occasional fibrous rootlets (<2x10 mm).	0.60	20.69			
0.30 - 0.40	B	4			MADE GROUND: soft, light brownish grey, slightly sandy, slightly gravelly silt. Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse ,of flint and chalk. (Possible Made Ground) [MADE GROUND] [CLAY]	(0.35)				
0.50	D	5				0.95	20.34			
0.50 - 0.60	ES	6				(0.25)				
0.50	PID		< 0.1 ppm	1		1.20	20.09			
0.60 - 0.70	B	7			Light brownish grey, slightly gravelly, silty SAND. Sand is fine to coarse, mainly fine and medium. Gravel is subangular and subrounded, fine to coarse of flint and chalk. [RIVER TERRACE DEPOSITS] [SAND]					
0.70	D	8								
0.70 - 0.80	ES	9								
0.70	PID		< 0.1 ppm							
1.00 - 1.10	B	10								
1.20	D	11								
1.20 - 1.50	ES	12								
1.20 - 1.65	B	14								
1.20 - 1.65	SPT		N = 36 (C)	2	Light brownish grey, sandy GRAVEL. Sand is fine to coarse. Gravel is subangular and subrounded fine to coarse of flint and chalk. [RIVER TERRACE DEPOSITS] [GRAVEL]					
1.20	PID		< 0.1 ppm							
1.50	D	13								
2.00	D	15								
2.00 - 2.45	B	17								
2.00 - 2.45	ES	16								
2.00 - 2.45	SPT		N = 42 (C)		Dense becoming medium dense, brown and grey, very sandy GRAVEL. Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of flint. [RIVER TERRACE DEPOSITS] [GRAVEL]	(3.10)				
2.00	PID		< 0.1 ppm							
3.00	D	18		3	Below 3.00 m; becomes sandy.					
3.00 - 3.45	ES	19								
3.00 - 3.50	B	20								
3.00 - 3.45	SPT		N = 20 (C)							
3.00	PID		< 0.1 ppm							
4.00 - 4.45	SPT		N = 6 (C)	4						
4.30	D	21			Firm and stiff, dark greyish brown slightly sandy slightly silty CLAY becoming laminated grey slightly sandy silty CLAY towards the base. With rare shell fragments (<2x2 mm). [LONDON CLAY FORMATION] [CLAY]	4.30	16.99			
4.30 - 4.60	B	23								
4.30 - 4.60	ES	22								
4.30	PID		< 0.1 ppm							
5.00 - 5.45	D	24		5	Below 5.00 m; fissured. Fissures are randomly orientated, extremely closely spaced, planar, smooth with rare black staining.					
5.00 - 5.45	SPT		N = 16 (S)							
5.40 - 5.80	ES	25								
5.40 - 6.00	B	26				(2.45)				
5.40	PID		< 0.1 ppm							
6.30 - 6.75	UT	27	65/400 mm	6						
6.75	D	28			End of Borehole at 6.75 m	6.75	14.54			
				7						
				8						
				9						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID	
Client	Heathrow Airport Limited			**HEP-BH-1804**	
Fugro Reference	G170029U				
Coordinates (m)	E503422.49 N178162.28	Ground Elevation (m Datum)	21.29	Sheet 1 of 1	
Hole Type	Cable Percussion			Status	Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	23/11/2017	23/11/2017	Hand-dug			SK	SK	
1.20	6.75	CP	06/12/2017	06/12/2017	Dando 2000			LI	CM/EA	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
23/11/2017	08:00:00	0.00			
23/11/2017	18:00:00	1.20	0.85		
06/12/2017	00:00:00	1.20			
06/12/2017	18:00:00	6.75		Dry	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)
6.30	200	4.50	200

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)
0.85			0.00	
2.50	0.50	20	2.00	2.50

Water Added

Depth From (m)	Depth To (m)
1.20	4.30

Water Strike Remarks

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located. The inspection pit was backfilled with arisings before being progressed by cable percussion.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
SP	1	1.20	4.30	06/12/2017

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	0.06	1.20	50	Plain
Pipe1	1.20	4.30	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	0.05	Flush Cover	06/12/2017
0.05	0.20	Concrete	06/12/2017
0.20	1.20	Bentonite	06/12/2017
1.20	4.30	Gravel Backfill	06/12/2017
4.30	6.75	Bentonite	06/12/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS				Print Date	28/11/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1804**
	Fugro Reference	G170029U			
	Coordinates (m)	E503422.49 N178162.28	Ground Elevation (m Datum)	21.29	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)
1.20	C	0	N=36 (3,8/11,11,7,7)	450	BS11	62	1.20	Dry
2.00	C	0	N=42 (7,8/8,11,11,12)	450	BS11	62	2.00	Dry
3.00	C	0	N=20 (2,3/4,5,5,6)	450	BS11	62	3.00	Dry
4.00	C	0	N=6 (2,3/2,1,1,2)	450	BS11	62	4.30	Dry
5.00	S	0	N=16 (2,2/3,4,4,5)	450	BS11	62	4.50	Dry

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)
0.20	< 0.1
0.50	< 0.1
0.70	< 0.1
1.20	< 0.1
2.00	< 0.1
3.00	< 0.1
4.30	< 0.1
5.40	< 0.1

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID	
Client	Heathrow Airport Limited			**HEP-BH-1805**	
Fugro Reference	G170029U				
Coordinates (m)	E503337.11 N178140.75	Ground Elevation (m Datum)	21.16	Sheet 1 of 1	
Hole Type	Cable Percussion			Status	Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.10 - 0.20	B	1			Soft and firm, brownish grey, slightly sandy CLAY. [ALLUVIUM] [CLAY]					
0.20	D	2			Below 0.15 m; light brown occasionally mottled light grey.					
0.30 - 0.40	ES	3								
0.30	PID		< 0.1 ppm			(0.85)				
					Below 0.55 m; very sandy, slightly gravelly. With occasional pockets (<200x200 mm) of slightly gravelly, silty sand. Sand is fine to coarse, mainly fine and medium. Gravel is subangular and subrounded, fine to coarse of chalk and flint.					
0.90 - 1.00	B	4				0.85	20.31			
1.00	D	5		1	Below 0.75 m; gravelly.	(0.35)				
1.10 - 1.20	ES	6			Below 0.80 m; becoming soft, very gravelly.	1.20	19.96			
1.10	PID		< 0.1 ppm		Light brownish grey, slightly silty, slightly sandy locally sandy GRAVEL. Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of flint and chalk. [RIVER TERRACE DEPOSITS] [GRAVEL]					
1.20 - 1.65	B	8								
1.20 - 1.65	D	7								
1.20 - 1.65	SPT		N = 41 (S)							
					Medium dense and dense, brown, slightly sandy GRAVEL. Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of flint. [RIVER TERRACE DEPOSITS] [GRAVEL]					
2.00 - 2.20	ES	9		2						
2.00	PID		< 0.1 ppm							
2.20 - 2.65	B	11								
2.20 - 2.65	D	10								
2.20 - 2.65	SPT		N = 20 (S)			(2.50)				
3.00 - 3.20	ES	12		3	Below 3.00 m; sandy.					
3.00	PID		< 0.1 ppm							
3.20 - 3.65	D	13								
3.20 - 3.70	B	14								
3.20 - 3.65	SPT		N = 24 (S)							
3.70 - 4.00	ES	15				3.70	17.46			
3.70 - 4.20	B	16			Stiff, greyish brown, slightly sandy, slightly gravelly CLAY. Sand is fine to coarse. Gravel is angular to rounded, fine and medium of flint. (Gravel possibly brought down during boring from stratum above). [LONDON CLAY FORMATION] [CLAY]					
3.70	PID		< 0.1 ppm	4		(0.50)				
4.20 - 4.65	UT	17	50/450 mm			4.20	16.96			
					Stiff, greyish brown CLAY. [LONDON CLAY FORMATION] [CLAY]					
4.70	D	18								
4.70 - 5.00	ES	19								
4.70	PID		< 0.1 ppm	5						
						(1.80)				
5.20 - 5.65	D	20								
5.20 - 5.70	B	21								
5.20 - 5.65	SPT		N = 17 (S)							
5.70 - 6.00	ES	22								
5.70	PID		< 0.1 ppm							
				6	End of Borehole at 6.00 m	6.00	15.16			
				7						
				8						
				9						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-1805**
Fugro Reference	G170029U			
Coordinates (m)	E503337.11 N178140.75	Ground Elevation (m Datum)	21.16	Sheet 1 of 1
Hole Type	Cable Percussion			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	23/11/2017	23/11/2017	Hand-dug			SK	SK	
1.20	6.00	CP	27/11/2017	28/11/2017	Dando 2000			CT/SB	CM	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
23/11/2017	08:00:00	0.00			
23/11/2017	18:00:00	1.20		0.85	
27/11/2017	08:00:00	1.20			
27/11/2017	18:00:00	3.00	2.90	0.60	
28/11/2017	08:00:00	3.00	2.90	Dry	
28/11/2017	18:00:00	6.00	4.50	Dry	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)
6.00	200	4.50	200

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark
1.50	2.20	02:00	
3.20	3.50	01:00	

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)
0.85				
1.10	0.60	20	1.00	

Water Added

Depth From (m)	Depth To (m)
1.20	3.70

Water Strike Remarks

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located. The inspection pit was backfilled with arisings before being progressed by cable percussion.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
SP	1	1.00	3.50	28/11/2017

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	-0.36	1.10	50	Plain
Pipe1	1.10	3.50	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
-0.44	0.00	Upstanding Cover	28/11/2017
0.00	0.20	Concrete	28/11/2017
0.20	1.00	Bentonite	28/11/2017
1.00	3.50	Gravel Backfill	28/11/2017
3.50	6.00	Bentonite	28/11/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 28/11/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1805**
	Fugro Reference	G170029U			
	Coordinates (m)	E503337.11 N178140.75	Ground Elevation (m Datum)	21.16	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)
1.20	S	0	N=41 (3,6/8,10,11,12)	450	CD1	75	1.10	0.00
2.20	S	0	N=20 (1,2/3,4,5,8)	450	CD1	75	2.10	0.00
3.20	S	0	N=24 (10,12/13,5,3,3)	450	CD1	75	3.10	0.0
5.20	S	0	N=17 (2,2/3,4,5,5)	450	CD1	75	4.50	Dry

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)
0.30	< 0.1
1.10	< 0.1
2.00	< 0.1
3.00	< 0.1
3.70	< 0.1
4.70	< 0.1
5.70	< 0.1

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1806**
	Fugro Reference	G170029U			
	Coordinates (m)	E503127.66 N178127.24	Ground Elevation (m Datum)	21.36	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.10 - 0.20	B	1			MADE GROUND: (soft and firm), friable greyish brown, sandy, gravelly clay. With some roots and occasional rootlets (<2x13 mm). Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of flint, chalk and brick. [MADE GROUND] [CLAY]	(0.50)				
0.20	D	2				0.50	20.86			
0.30 - 0.40	ES	3			Soft and firm, grey, mottled light brown, slightly sandy slightly gravelly CLAY. Sand is fine to coarse. [ALLUVIUM] [CLAY]	(0.70)				
0.30	PID		< 0.1 ppm	1	Below 0.60 m; becoming slightly gravelly. Gravel is subrounded, fine and medium of chalk and occasional flint.	1.20	20.16			
0.50 - 0.60	B	4			Below 0.75 m; very soft.	(0.30)				
0.60	D	5			Below 1.10 m; with occasional partings/lenses (<1x2 mm) of orangish brown, fine to coarse sand.	1.50	19.86			
0.70 - 0.80	ES	6			Soft, dark brown, mottled bluish grey and locally black, slightly sandy, slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular and subrounded, fine and medium of flint. [ALLUVIUM] [CLAY]					
0.70	PID		< 0.1 ppm							
1.20 - 1.30	ES	7		2	Medium dense, light brown, creamish white and black, slightly clayey, sandy GRAVEL with low cobble content. Sand is fine to coarse. Gravel is angular to well rounded, fine to coarse of flint. Cobbles (90x90x140 mm) are well rounded of flint. [RIVER TERRACE DEPOSITS] [GRAVEL]	(2.60)				
1.20 - 1.50	B	9								
1.20	PID		< 0.1 ppm							
1.30 - 1.40	D	8								
1.50 - 1.95	D	10								
1.50 - 1.95	SPT		N = 22 (S)							
2.10 - 2.20	ES	11								
2.10	PID		< 0.1 ppm							
2.20 - 2.30	D	12								
2.40 - 2.50	B	13								
2.50 - 2.95	D	14								
2.50 - 3.00	B	15								
2.50 - 2.95	SPT		N = 20 (S)	3						
3.20 - 3.30	ES	16								
3.20	PID		< 0.1 ppm							
3.30 - 3.40	D	17			Between 3.50 m and 3.88 m; possibly very dense.					
3.50 - 3.95	D	18								
3.50 - 4.00	LB	19								
3.50 - 3.88	SPT		50/235 mm (S)	4						
4.20 - 4.30	ES	20			Firm and stiff, fissured, dark greyish brown CLAY. With occasional to abundant selenite crystals (<1 mm) and rare shell fragments (<5x5 mm). Fissures are randomly orientated, closely spaced, planar and smooth. [LONDON CLAY FORMATION] [CLAY]	4.10	17.26			
4.20	PID		< 0.1 ppm							
4.30 - 4.40	D	21								
4.40 - 4.50	LB	22								
4.50 - 4.95	D	23								
4.50 - 4.95	SPT		N = 13 (S)	5						
5.30 - 5.40	ES	24				(2.40)				
5.30	PID		< 0.1 ppm							
5.50 - 5.60	D	25			Between 5.50 m and 6.00 m; soft.					
5.70 - 5.80	LB	26								
6.00 - 6.45	UT	27	32/450 mm	6						
6.45 - 6.50	D	28				6.50	14.86			
					End of Borehole at 6.50 m					
				7						
				8						
				9						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-1806**
Fugro Reference	G170029U			
Coordinates (m)	E503127.66 N178127.24	Ground Elevation (m Datum)	21.36	Sheet 1 of 1
Hole Type	Cable Percussion			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	23/11/2017	23/11/2017	Hand-dug			SK	SK	
1.20	6.50	CP	05/12/2017	06/12/2017	Dando 2000			CT/SB	AK	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
23/11/2017	08:00:00	0.00			
23/11/2017	18:00:00	1.20		0.85	
05/12/2017	08:00:00	1.20		Dry	
05/12/2017	18:00:00	5.00	4.40	Dry	
06/12/2017	08:00:00	5.00	4.40	1.00	
06/12/2017	18:00:00	6.50	4.40	Dry	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)
6.50	200	4.40	200

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark
3.70	3.80	00:30	

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)
0.85				
1.50	1.15	20	1.40	

Water Added

Depth From (m)	Depth To (m)
1.50	4.00

Water Strike Remarks

Groundwater seepage at 0.85 m. Water level was not monitored.

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located. The inspection pit was backfilled with arisings before being progressed by cable percussion.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
SP	1	1.50	4.10	06/12/2017

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	0.02	1.60	50	Plain
Pipe1	1.60	4.10	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
-0.42	0.00	Upstanding Cover	06/12/2017
0.00	0.20	Concrete	06/12/2017
0.20	1.50	Bentonite	06/12/2017
1.50	4.10	Gravel Backfill	06/12/2017
4.10	6.50	Bentonite	06/12/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 28/11/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1806**
	Fugro Reference	G170029U			
	Coordinates (m)	E503127.66 N178127.24	Ground Elevation (m Datum)	21.36	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)
1.50	S	0	N=22 (2,3/4,6,6,6)	450	CD1	75	1.40	Dry
2.50	S	0	N=20 (1,2/3,5,6,6)	450	CD1	75	2.40	0.00
3.50	S	0	N=50 (6,10/50 for 235mm)	385	CD1	75	3.40	0.0
4.50	S	0	N=13 (1,2/2,3,4,4)	450	CD1	75	4.40	Dry

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)
0.30	< 0.1
0.70	< 0.1
1.20	< 0.1
2.10	< 0.1
3.20	< 0.1
4.20	< 0.1
5.30	< 0.1

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1807**
	Fugro Reference	G170029U			
	Coordinates (m)	E503128.23 N178127.78	Ground Elevation (m Datum)	21.34	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Sampling and In Situ Testing				Strata Details				Groundwater	
Depth (m)	Type	No.	Test Results	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.10	D	1		MADE GROUND: (soft and firm), friable, greyish brown, slightly gravelly, locally gravelly, sandy clay. With some roots (2x15 mm) and occasional fibrous rootlets (<1x8 mm). Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of flint, chalk and brick. [MADE GROUND] [CLAY]	(0.15) 0.15	21.19			
0.20	D	2			(0.15) 0.30	21.04			
0.40	D	3			(0.20) 0.50	20.84			
0.90	D	4		MADE GROUND: brown, sandy gravel. Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of flint, chalk and occasional brick. [MADE GROUND] [GRAVEL]	(1.00)				
1.20 - 1.30	D	5		MADE GROUND: (soft and firm), brown, slightly sandy, slightly gravelly clay. Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of flint, chalk and occasional brick. [MADE GROUND] [CLAY]	1.50	19.84			
				Very soft and soft, light brown and yellow, slightly sandy, slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of flint. [ALLUVIUM] [CLAY] Below 1.10 m; with occasional partings of orangish brown fine to coarse sand. Between 1.20 m and 1.50 m; with occasional rootlets (<2x10 mm). At 1.50 m; gravel encountered at base of borehole.					
				End of Borehole at 1.50 m					

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-1807**
Fugro Reference	G170029U			
Coordinates (m)	E503128.23 N178127.78	Ground Elevation (m Datum)	21.34	Sheet 1 of 1
Hole Type	Cable Percussion			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	24/11/2017	24/11/2017	Hand-dug			SK	SK	
1.20	1.50	CP	06/12/2017	06/12/2017	Dando 2000			CT/SB	AK	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
24/11/2017	08:00:00	0.00			
24/11/2017	18:00:00	1.20		0.85	
06/12/2017	08:00:00	1.20		Dry	
06/12/2017	18:00:00	1.50	1.40	0.90	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)
1.50	200	1.40	200

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)
0.85				
1.50	0.90	20	1.40	

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located. The inspection pit was backfilled with arisings before being progressed by cable percussion.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
GMP	1	0.50	1.20	06/12/2017

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	-0.01	0.50	50	Plain
Pipe1	0.50	1.20	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
-0.38	0.00	Upstanding Cover	06/12/2017
0.00	0.20	Concrete	06/12/2017
0.20	0.50	Bentonite	06/12/2017
0.50	1.20	Gravel Backfill	06/12/2017
1.20	1.50	Bentonite	06/12/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 28/11/2018

	Contract Name	HAL Airport Expansion		Location ID
	Client	Heathrow Airport Limited		**HEP-BH-1807**
	Fugro Reference	G170029U		
	Coordinates (m)	E503128.23 N178127.78	Ground Elevation (m Datum) 21.34	Sheet 1 of 1
	Hole Type	Cable Percussion		Status Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion			Location ID	
	Client	Heathrow Airport Limited			**HEP-BH-1810**	
	Fugro Reference	G170029U				
	Coordinates (m)	E502898.96 N177631.91	Ground Elevation (m Datum)	21.86	Sheet 1 of 1	
	Hole Type	Cable Percussion			Status	Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.10 - 0.20	D	1			MADE GROUND (Topsoil): brown, sandy, gravelly silt. With plastic bottle (fairy liquid 100x200 mm). Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of flint, brick and concrete.	(0.50)				
0.10 - 0.20	ES	2								
0.10 - 0.50	LB	3								
0.10	PID		< 0.1 ppm			0.50	21.36			
0.50 - 0.60	D	4			[MADE GROUND] [SILT]	(0.30)				
0.50 - 0.60	ES	5								
0.50 - 0.80	LB	6			MADE GROUND: yellowish brown, sandy gravel with low cobble content. Sand is fine to coarse. Gravel is angular and subangular, fine to coarse of concrete and brick. Cobbles (<170x190x360 mm) are of concrete.	0.80	21.06			
0.50	PID		< 0.1 ppm			(0.40)				
0.80 - 0.90	D	7		1						
0.80 - 1.20	ES	8				1.20	20.66			
0.80 - 1.20	LB	9			[MADE GROUND] [GRAVEL]					
0.80	PID		< 0.1 ppm		MADE GROUND: brown, clayey, gravelly sand (30%). With abundant shredded plastic (4x100 mm) (70%). Sand is fine to coarse. Gravel is angular to subrounded fine to coarse of aggregate (sandstone and limestone), flint, concrete and brick.					
1.20 - 1.65	LB	10				(1.00)				
1.20 - 1.65	SPT		N = 8 (C)							
1.50 - 1.60	D	11								
1.80 - 1.90	ES	12								
1.80	PID		< 0.1 ppm	2	[MADE GROUND] [WASTE, e.g. LANDFILL]					
2.20 - 2.65	D	13			MADE GROUND: (soft), black, sandy, gravelly clay. With frequent shredded plastic (4x100 mm), occasional fragments of wood (<5x100 mm) and rare fragments of glass (<4x5 mm). Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of flint, brick and concrete.	2.20	19.66			
2.20 - 3.20	LB	14								
2.20 - 2.65	SPT		N = 1 (C)							
						(1.00)				
2.80 - 2.90	ES	15			[MADE GROUND] [WASTE, e.g. LANDFILL]					
2.80	PID		< 0.1 ppm	3	MADE GROUND: (soft), black, gravelly clay. With occasional fragments of wire (2x90 mm) and plastic (<70x70 mm). Gravel is angular to subrounded, fine to coarse of flint, brick, concrete and paving slabs.					
3.20 - 3.65	D	16				3.20	18.66			
3.20 - 4.20	LB	17								
3.20 - 3.44	SPT		50/135 mm (C)		[MADE GROUND] [WASTE, e.g. LANDFILL]					
					MADE GROUND: (very soft), grey and brown, slightly sandy, gravelly clay. With occasional fragments (<60 mm) of wood, ceramic and plastic. Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of concrete and brick.	(1.00)				
3.80 - 3.90	ES	18								
3.80	PID		< 0.1 ppm	4	[MADE GROUND] [WASTE, e.g. LANDFILL]					
4.20 - 4.65	D	19			MADE GROUND: (soft), gravelly clay. With frequent fragments of metal (50x100 mm) and metal wire (<3x30 mm) and occasional fragments of plastic wrap (100x200 mm). Gravel is subangular and subrounded, fine to coarse of brick, flint and concrete.	4.20	17.66			
4.20 - 5.20	LB	20								
4.20 - 4.65	SPT		N = 20 (C)							
					[MADE GROUND] [WASTE, e.g. LANDFILL]	(1.00)				
4.80 - 4.90	ES	21								
4.80	PID		< 0.1 ppm	5						
5.20 - 5.65	D	22			MADE GROUND: (firm and stiff), greyish brown, slightly sandy clay. Sand is fine and medium. With occasional fragments of wood (5x70 mm) and rare fragments of plastic wrap (100x200 mm).	5.20	16.66			
5.20 - 6.20	LB	23								
5.20 - 5.52	SPT		50/180 mm (C)							
					[MADE GROUND] [WASTE, e.g. LANDFILL]	(0.80)				
5.80 - 5.90	ES	24								
5.80	PID		< 0.1 ppm	6						
6.20 - 6.30	D	25			Firm and stiff, greyish brown, slightly sandy CLAY. Sand is fine and medium.	6.00	15.86			
6.20 - 6.70	LB	26								
					[LONDON CLAY FORMATION] [CLAY]					
6.70 - 6.77	D	27								
6.70 - 7.50	B	28				(1.50)				
6.70 - 6.77	SPT		50/20 mm (S)	7						
7.20 - 7.30	D	29								
7.20 - 7.30	ES	30								
7.20	PID		< 0.1 ppm							
7.50	SPT				End of Borehole at 7.50 m	7.50	14.36			
				8						
				9						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-1810**
Fugro Reference	G170029U			
Coordinates (m)	E502898.96 N177631.91	Ground Elevation (m Datum)	21.86	Sheet 1 of 1
Hole Type	Cable Percussion			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	11/12/2017	11/12/2017	Hand-dug			JJL	JJL	
1.20	7.50	CP	11/12/2017	13/12/2017	Dando 3000			BH	JJL	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
11/12/2017	08:00:00	0.00			
11/12/2017	18:00:00	7.50	7.00	2.70	
13/12/2017	08:00:00	7.50	7.00	2.14	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)
7.50	200	7.00	200

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)
2.20	2.09	20		

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
GMP	1	0.90	2.00	13/12/2017

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	-0.28	1.00	50	Plain
Pipe1	1.00	2.00	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
-0.44	0.00	Upstanding Cover	13/12/2017
0.00	0.50	Concrete	13/12/2017
0.50	0.90	Bentonite	13/12/2017
0.90	2.00	Gravel Backfill	13/12/2017
2.00	7.50	Bentonite	13/12/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 28/11/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1810**
	Fugro Reference	G170029U			
	Coordinates (m)	E502898.96 N177631.91	Ground Elevation (m Datum)	21.86	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)
1.20	C	0	N=8 (5,4/3,2,1,2)	450	EQU1616	66	0.00	Dry
2.20	C	0	N=1 (1,0/0,0,1,0)	450	EQU1616	66	0.00	2.10
3.20	C	0	50 (25 for 100mm/50 for 135mm)	235	EQU1616	66	3.10	2.70
4.20	C	0	N=20 (1,3/5,7,5,3)	450	EQU1616	66	4.10	2.00
5.20	C	0	50 (25 for 135mm/50 for 180mm)	315	EQU1616	66	5.10	2.10
6.70	S	0	50 (25 for 50mm/50 for 20mm)	70	EQU1616	66	6.60	2.00
7.50	S	0	0 (5 for 0mm/0 for 0mm)	0	EQU1616	66	7.00	2.50

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)
0.10	< 0.1
0.50	< 0.1
0.80	< 0.1
1.80	< 0.1
2.80	< 0.1
3.80	< 0.1
4.80	< 0.1
5.80	< 0.1
7.20	< 0.1

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion		Location ID
Client	Heathrow Airport Limited		**HEP-BH-1811**
Fugro Reference	G170029U		
Coordinates (m)	E502900.12 N177632.24	Ground Elevation (m Datum) 21.90	Sheet 1 of 1
Hole Type	Cable Percussion		Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.10 - 0.20	D	1			MADE GROUND (Topsoil): brown, slightly clayey, gravelly sand. Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of flint and brick.	(0.40)				
0.10 - 0.20	ES	2								
0.10 - 0.40	LB	3								
0.10	PID		< 0.1 ppm			0.40	21.50			
0.40 - 0.50	D	4			[MADE GROUND] [SAND]					
0.50 - 0.60	ES	5			At 0.10 m; with white, plastic bin lid (<300x300 mm).					
0.50	PID		< 0.1 ppm		MADE GROUND: brown and black, slightly clayey, gravelly sand. With rare fragments of wood (30x40x<70 mm). Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of brick and concrete.					
0.60 - 1.10	LB	6		1		(1.30)				
1.20 - 1.65	D	7			[MADE GROUND] [SAND]					
1.20 - 1.65	LB	8								
1.20 - 1.65	SPT		N = 11 (C)							
1.70 - 1.80	ES	9			MADE GROUND: black, clayey, sandy gravel. With rare fragments of metal wire (20x20x<100 mm), wood (50x70x<100 mm) and tape waste (50x50x<100 mm). Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of concrete and brick.	1.70	20.20			
1.70 - 2.20	LB	10				(0.50)				
1.70	PID		< 0.1 ppm	2						
2.20 - 2.65	D	11			[MADE GROUND] [GRAVEL]	2.20	19.70			
2.20 - 2.80	ES	13								
2.20 - 3.20	LB	12			MADE GROUND: (firm), black clay (30%). With fragments of plastic (150x180 mm) (20%), wood (70x70x150 mm) (30%) and metal wire (20x20x100 mm) (20%).					
2.20 - 2.65	SPT		N = 2 (C)							
2.20	PID		< 0.1 ppm		[MADE GROUND] [WASTE, e.g. LANDFILL]					
3.20 - 3.65	D	14		3						
3.20 - 4.20	LB	15								
3.20 - 3.65	SPT		N = 29 (C)							
3.70 - 3.80	ES	16								
3.70	PID		< 0.1 ppm							
4.20 - 4.65	D	17		4						
4.20 - 5.20	LB	18								
4.20 - 4.65	SPT		N = 22 (C)			(4.50)				
4.70 - 4.80	ES	19								
4.70	PID		< 0.1 ppm							
5.20 - 5.65	D	20		5						
5.20 - 6.20	LB	21								
5.20 - 5.65	SPT		N = 3 (C)							
5.70 - 5.80	ES	22								
5.70	PID		< 0.1 ppm							
6.00 - 6.10	D	23		6						
6.20 - 6.70	LB	24								
6.70 - 6.80	ES	26			Soft, brown locally red, slightly gravelly CLAY. Gravel is subangular and subrounded, fine to coarse of flint. (Probably reworked).	6.70	15.20			
6.70 - 7.00	B	27								
6.70 - 7.15	D	25			[LONDON CLAY FORMATION] [CLAY]					
6.70 - 7.15	SPT		N = 13 (S)	7						
6.70	PID		< 0.1 ppm			(1.10)				
7.70 - 7.80	D	28								
7.70 - 7.80	ES	29			Firm, brown CLAY.	7.80	14.10			
7.70 - 8.00	B	30			[LONDON CLAY FORMATION] [CLAY]					
7.70	PID		< 0.1 ppm	8						
8.20 - 8.65	UT	31	30/450 mm			(0.90)				
8.65 - 8.70	D	32				8.70	13.20			
					End of Borehole at 8.70 m					
				9						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-1811**
Fugro Reference	G170029U			
Coordinates (m)	E502900.12 N177632.24	Ground Elevation (m Datum)	21.90	Sheet 1 of 1
Hole Type	Cable Percussion			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	13/12/2017	13/12/2017	Hand-dug			BH	LG	
1.20	8.70	CP	13/12/2017	14/12/2017	Dando 3000			BH	LG	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
13/12/2017	10:00:00	0.00			
13/12/2017	18:00:00	8.70	7.00	8.00	
14/12/2017	08:00:00	8.70	7.00	2.50	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)
8.70	200	7.00	200

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)
2.20	2.10	20	2.00	6.70

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
SP	1	1.00	6.20	14/12/2017

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	-0.32	1.20	50	Plain
Pipe1	1.20	6.20	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
-0.44	0.00	Upstanding Cover	18/12/2017
0.00	0.50	Concrete	18/12/2017
0.50	1.00	Bentonite	18/12/2017
1.00	6.20	Gravel Backfill	18/12/2017
6.20	8.70	Bentonite	18/12/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 28/11/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1811**
	Fugro Reference	G170029U			
	Coordinates (m)	E502900.12 N177632.24	Ground Elevation (m Datum)	21.90	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)
1.20	C	0	N=11 (1,2/2,3,2,4)	450	EQU1616	66	0.00	Dry
2.20	C	0	N=2 (1,0/1,0,1,0)	450	EQU1616	66	2.10	Dry
3.20	C	0	N=29 (7,8/10,4,10,5)	450	EQU1616	66	3.00	2.50
4.20	C	0	N=22 (9,9/6,6,6,4)	450	EQU1616	66	4.10	2.50
5.20	C	0	N=3 (1,0/1,0,1,1)	450	EQU1616	66	5.10	2.70
6.70	S	0	N=13 (1,2/2,3,3,5)	450	EQU1616	66	6.60	2.00

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)
0.10	< 0.1
0.50	< 0.1
1.70	< 0.1
2.20	< 0.1
3.70	< 0.1
4.70	< 0.1
5.70	< 0.1
6.70	< 0.1
7.70	< 0.1

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion		Location ID	
	Client	Heathrow Airport Limited		**HEP-BH-1861**	
	Fugro Reference	G170029U			
	Coordinates (m)	E503368.22 N177622.06	Ground Elevation (m Datum) 26.58	Sheet 1 of 2	
	Hole Type	Cable Percussion		Status	Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
					MADE GROUND (Topsoil): (soft), brown, gravelly clay. Gravel is subangular and subrounded, fine to coarse of flint. [MADE GROUND] [CLAY]	(0.25) 0.25	26.33			
0.25 - 0.30	ES	1								
0.25	PID		< 0.1 ppm							
0.30 - 0.40	D	2			MADE GROUND: brown, slightly clayey, gravelly sand. With rare fragments of tape waste (<40x40x40 mm) and china crockery (10x50x50 mm). Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of concrete and brick. [MADE GROUND] [SAND]	(0.95)				
0.40 - 0.50	LB	3								
0.90 - 1.00	D	5								
1.00 - 1.10	ES	4		1						
1.00 - 1.10	LB	6								
1.00	PID		< 0.1 ppm			1.20	25.38			
1.20 - 1.65	LB	7			MADE GROUND: dark brown, slightly clayey, sandy gravel. With frequent fragments of wood (<100x100x100 mm). Sand is fine to coarse. Gravel is subangular and subrounded fine to coarse of brick and concrete. [MADE GROUND] [WASTE, e.g. LANDFILL]					
1.20 - 1.65	SPT		N = 12 (C)							
1.50 - 1.60	D	8								
2.00 - 2.10	ES	9		2						
2.00 - 3.00	LB	11								
2.00	PID		< 0.1 ppm							
2.50 - 2.60	D	10								
3.00 - 3.10	ES	12		3						
3.00	PID		< 0.1 ppm							
3.20 - 3.65	LB	13			Between 3.20 m and 3.65 m; with abundant fragments of wood fragments (50x70x<200 mm) and rare fragments of plastic (30x30x<70 mm).					
3.20 - 3.65	SPT		N = 21 (C)							
3.50 - 3.60	D	14				(4.80)				
4.00 - 4.10	ES	15		4						
4.00	PID		< 0.1 ppm							
4.20 - 4.65	LB	16								
4.20 - 4.65	SPT		N = 16 (C)							
4.50 - 4.60	D	17								
5.00 - 5.10	ES	18		5						
5.00	PID		< 0.1 ppm							
5.20 - 5.65	LB	19			Between 5.20 m and 5.65 m; medium bed of black, gravelly sand.					
5.20 - 5.65	SPT		N = 20 (C)							
5.50 - 5.60	D	20								
6.00 - 6.10	ES	21		6		6.00	20.58			
6.00 - 6.50	LB	22			MADE GROUND: (soft), brown, slightly gravelly clay. With occasional fragments of plastic (30x30x70 mm). Gravel is subangular and subrounded, fine to coarse of flint and brick. [MADE GROUND] [CLAY] Between 6.50 m and 9.65 m; medium bed of sandy clay, locally orange.					
6.00	PID		< 0.1 ppm							
6.50 - 6.95	D	23								
6.50 - 7.00	B	24								
6.50 - 6.95	SPT		N = 16 (S)							
7.00 - 7.10	ES	25		7						
7.00 - 7.50	B	26								
7.00	PID		< 0.1 ppm			(2.50)				
8.00 - 8.10	ES	28		8						
8.00 - 8.45	D	27								
8.00 - 8.50	B	29								
8.00 - 8.45	SPT		N = 17 (S)							
8.00	PID		< 0.1 ppm			8.50	18.08			
8.50 - 9.00	LB	30			MADE GROUND: (stiff), brownish grey, slightly gravelly clay. With rare fragments of plastic (30x30x70 mm). Gravel is subangular and subrounded, fine to coarse of flint and brick. [MADE GROUND] [CLAY]					
9.00 - 9.10	D	31		9						
9.00 - 9.10	ES	32								
9.00 - 9.50	LB	33								
9.00	PID		< 0.1 ppm							
9.50 - 10.00	LB	35								
9.50 - 9.95	D	34								
9.50 - 9.95	SPT		N = 7 (S)			(2.50)				
10.00 - 10.10	D	37								
10.00 - 10.10	ES	36								
					Continued next page					

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1861**
	Fugro Reference	G170029U			
	Coordinates (m)	E503368.22 N177622.06	Ground Elevation (m Datum)	26.58	Sheet 2 of 2
	Hole Type	Cable Percussion			Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
10.00 - 10.50 10.00	LB PID	38	< 0.1 ppm		MADE GROUND: (stiff), brownish grey, slightly gravelly clay. With rare fragments of plastic (30x30x70 mm). Gravel is subangular and subrounded, fine to coarse of flint and brick. [MADE GROUND] [CLAY]					
11.00 - 11.10 11.00 - 11.45 11.00 - 12.00 11.00 - 11.45 11.00	ES D B SPT PID	40 39 41	 N = 13 (S) < 0.1 ppm	11	Firm, brown, CLAY [LONDON CLAY FORMATION] [CLAY]	11.00	15.58			
12.00 - 12.10	D	42		12		(2.00)				
12.50 - 12.95	UT	43	40/450 mm							
12.95 - 13.00	D	44		13	End of Borehole at 13.00 m	13.00	13.58			
				14						
				15						
				16						
				17						
				18						
				19						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-1861**
Fugro Reference	G170029U			
Coordinates (m)	E503368.22 N177622.06	Ground Elevation (m Datum)	26.58	Sheet 1 of 1
Hole Type	Cable Percussion			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	27/11/2017	27/11/2017	Hand-dug			BH	LG	
1.20	13.00	CP	27/11/2017	28/11/2017	Dando 3000			BH	LG	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
27/11/2017	13:10:00	0.00			
27/11/2017	18:00:00	3.00	3.00	Dry	
28/11/2017	08:00:00	3.00	3.00	Dry	
28/11/2017	18:00:00	13.00	11.20	Dry	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)
11.00	200	7.00	200
13.00	150	11.20	150

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)
4.20	4.05	20	4.00	6.50
10.70	7.77	20	7.00	11.20

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
SP	1	10.10	11.00	28/11/2017

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	0.04	10.10	50	Plain
Pipe1	10.10	11.00	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	0.05	Flush Cover	28/11/2017
0.05	0.50	Concrete	28/11/2017
0.50	10.00	Bentonite	28/11/2017
10.00	11.00	Gravel Backfill	28/11/2017
11.00	13.00	Bentonite	28/11/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 28/11/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1861**
	Fugro Reference	G170029U			
	Coordinates (m)	E503368.22 N177622.06	Ground Elevation (m Datum)	26.58	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)
1.20	C	0	N=12 (7,9/3,2,3,4)	450	EQU1616	66	0.00	Dry
3.20	C	0	N=21 (3,4/6,3,4,8)	450	EQU1616	66	3.00	Dry
4.20	C	0	N=16 (3,4/7,7,1,1)	450	EQU1616	66	4.00	Dry
5.20	C	0	N=20 (7,5/4,5,4,7)	450	EQU1616	66	5.10	4.50
6.50	S	0	N=16 (1,2/3,4,4,5)	450	EQU1616	66	6.40	6.00
8.00	S	0	N=17 (1,2/3,4,4,6)	450	EQU1616	66	7.00	Dry
9.50	S	0	N=7 (1,1/1,2,2,2)	450	EQU1616	66	7.00	Dry
11.00	S	0	N=13 (2,2/3,3,3,4)	450	EQU1616	66	10.90	7.70

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)
0.25	< 0.1
1.00	< 0.1
2.00	< 0.1
3.00	< 0.1
4.00	< 0.1
5.00	< 0.1
6.00	< 0.1
7.00	< 0.1
8.00	< 0.1
9.00	< 0.1
10.00	< 0.1
11.00	< 0.1

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

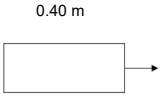
Contract Name	HAL Airport Expansion			Location ID	
Client	Heathrow Airport Limited			**HEP-BH-1862**	
Fugro Reference	G170029U				
Coordinates (m)	E503177.14 N177919.37	Ground Elevation (m Datum)	26.08	Sheet 1 of 1	
Hole Type	Inspection Pit			Status	Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.05 - 0.15	ES	1			MADE GROUND (Topsoil): dark brown, slightly clayey, slightly gravelly sand with low cobble content. Locally tending to slightly sandy clay. Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of brick, flint and chalk. Cobbles (70x75x80 mm) are of flint. [MADE GROUND] [SAND]	(0.30)				
0.05	PID		< 0.1 ppm			0.30	25.78			
0.10	D	2			MADE GROUND: greyish brown, gravelly sand with low and medium cobble content. Sand is fine and medium. Gravel is subangular to rounded, fine to coarse of flint, chalk, aggregates and concrete. Cobbles are of concrete and aggregate. [MADE GROUND] [SAND]	(0.75)				
0.10 - 0.20	B	3			Between 0.40 m and 0.55 m; with wire pipe (5x40x60 mm), 3 lengths of string (3x3x80 mm), and a plastic bag (2x60x80 mm). Between 0.70m and 0.90m; with rare fragments of timber (5x5x10 mm), 2 fragments of tile (5x10x15 mm), 2 fragments of textile (2x5x15 mm), a plastic bag (10x40x60 mm) and a glass inkwell (40x30x30 mm). Between 1.00m and 1.05m; with fragment of carpet (8x300x400 mm) and carpet and cloth scraps (2x70x100 mm).					
0.30 - 0.50	B	6		1		1.05	25.03			
0.30 - 0.50	ES	2			End of Inspection Pit at 1.05 m					
0.30	PID		< 0.1 ppm							
0.40	D	5								
				2						
				3						
				4						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Plan



Contract Name	HAL Airport Expansion			Location ID	
Client	Heathrow Airport Limited			**HEP-BH-1862**	
Fugro Reference	G170029U				
Coordinates (m)	E503177.14 N177919.37	Ground Elevation (m Datum)	26.08	Sheet 1 of 1	
Hole Type	Inspection Pit			Status	Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.05	IP	08/12/2017	08/12/2017	Hand-dug			BH	AF	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
08/12/2017	08:00:00	0.00			
08/12/2017	18:00:00	1.05		Dry	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

Groundwater was not encountered during excavation.

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.05 m. Services were not located. The inspection pit was terminated at 1.05 m due to concrete slab and metal bar obstruction.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	1.05	Arisings	08/12/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS				Print Date	28/11/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1862**
	Fugro Reference	G170029U			
	Coordinates (m)	E503177.14 N177919.37	Ground Elevation (m Datum)	26.08	Sheet 1 of 1
	Hole Type	Inspection Pit			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)
0.05	< 0.1
0.30	< 0.1

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1863**
	Fugro Reference	G170029U			
	Coordinates (m)	E503177.94 N177920.66	Ground Elevation (m Datum)	26.07	Sheet 1 of 2
	Hole Type	Hollow Stem Auger			Status: Final

Sampling and In Situ Testing					Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Run Depth (m) (Recovery)	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.05 - 0.15	ES	1				MADE GROUND: dark brown, slightly sandy slightly gravelly silty CLAY with low cobble content. Locally tending to sandy silt. With rare fragments of tile (10x30x40 mm) and 4 fragments of clay pipe (10x40x50 mm). Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of flint, brick and rare chalk. Cobbles (70x85x85 mm) are of flint, brick and concrete.					
0.05	PID		< 0.1 ppm				(0.30)				
0.10	D	2									
0.10 - 0.20	B	3									
0.30 - 0.40	ES	4					0.30	25.77			
0.30 - 0.50	B	6									
0.30	PID		< 0.1 ppm								
0.35	D	5				[MADE GROUND] [SAND] Between 0.25 m and 0.30 m; greyish brown.	(0.55)				
				(-)		MADE GROUND: brownish, very sandy, very clayey, very silty, gravel with low boulder content. Locally sandy silt. With rare fragments of green glass (3x10x15 mm) and a concrete slab (60x120x150 mm). Sand is fine and medium. Gravel is subangular and subrounded, fine to coarse of flint, brick, concrete, aggregate.					
0.85 - 1.00	B	9					0.85	25.22			
0.85 - 1.00	ES	7									
0.85	PID		< 0.1 ppm	1.00	1						
0.90	D	8				[MADE GROUND] [SILT]	(0.35)				
1.20 - 1.50	D	11		1.20		MADE GROUND: light brown clayey, sandy, very silty, gravel, with medium boulder content. With rare fragments of plastic (5x10x20 mm), 3 fragments of tile (5x15x30 mm), a timber log (5x15x60 mm), metal bar (20x40x90 mm) and a tap screw (20x30x30 mm). Sand is fine. Gravel is subangular and subrounded, fine to coarse of flint, brick and concrete. Cobbles (50x100x<100mm) are of concrete and brick.	1.20	24.87			
1.20 - 1.50	ES	10									
1.20 - 1.50	LB	12									
1.20	PID		< 0.1 ppm								
						[MADE GROUND] [WASTE, e.g. LANDFILL] Below 1.05 m; dark brown.					
				(-)		MADE GROUND: (soft locally firm), dark brown, sandy gravelly clay (95%). With rare rootlets (<3x10 mm). With some fragments (5%) of glass (<30x30 mm) and plastic (<40x40x50 mm) (D2). Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of flint, chalk, brick and concrete.	(1.00)				
					2						
						[MADE GROUND] [CLAY] Below 1.80 m; with occasional pockets (<100x100x100 mm) of soft, black clay. At 2.00 m; with a breeze block (<100x150x150 mm).					
2.20 - 2.50	D	14		2.20			2.20	23.87			
2.20 - 2.50	ES	13									
2.20	PID		< 0.1 ppm			MADE GROUND: (soft), black and blackish grey, sandy, gravelly clay with low cobble content (55%). With frequent fragments of wood (10x200x<300 mm) (D2-D3) (40%) and occasional fragments of plastic bag (100x<200 mm) (D2) (<5%). With rare fragments of glass (<40x40 mm) and an ACM insulation board (10x40x<150 mm) (D1). Sand is fine to coarse. Gravel is angular and subangular, fine to coarse of brick and concrete. Cobbles (73x100x<230 mm) are angular of brick and concrete. Strong organic odour.					
2.50 - 3.20	LB	15									
				(-)							
					3	[MADE GROUND] [WASTE, e.g. LANDFILL] Between 2.20 m and 7.50 m; ACM insulation board (10x40x<150 mm) (D1) recovered.					
3.20 - 3.50	D	17		3.20							
3.20 - 3.50	ES	16									
3.20	PID		< 0.1 ppm								
3.50 - 4.20	LB	18									
				(-)		At 3.60 m; with some pockets (100x250x300 mm) of yellowish brown, fine sand.					
					4						
4.20 - 4.50	D	20		4.20		At 4.20 m; with a metal hinge (40x40x130 mm).					
4.20 - 4.50	ES	19									
4.20	PID		< 0.1 ppm								
4.50 - 5.20	LB	21									
				(-)			(5.30)				
						Continued next page					

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID	
Client	Heathrow Airport Limited			**HEP-BH-1863**	
Fugro Reference	G170029U				
Coordinates (m)	E503177.94 N177920.66	Ground Elevation (m Datum)	26.07	Sheet 2 of 2	
Hole Type	Hollow Stem Auger			Status	Final

Sampling and In Situ Testing					Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Run Depth (m) (Recovery) (%)	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
5.20 - 5.50 5.20 - 5.50 5.20	D ES PID	23 22	1.0 ppm	5.20		MADE GROUND: (soft), black and blackish grey, sandy, gravelly clay with low cobble content (55%). With frequent fragments of wood (10x200x<300 mm) (D2-D3) (40%) and occasional fragments of plastic bag (100x<200 mm) (D2) (<5%). With rare fragments of glass (<40x40 mm) and an ACM insulation board (10x40x<150 mm) (D1). Sand is fine to coarse. Gravel is angular and subangular, fine to coarse of brick and concrete. Cobbles (73x100x<230 mm) are angular of brick and concrete. Strong organic odour. [MADE GROUND] [WASTE, e.g. LANDFILL]					
5.50 - 6.20	LB	24		(-)		Between 5.10 m and 5.20 m; with frequent fragments of plastic (10x100x150 mm).					
					6						
6.20 - 6.50	D	26		6.20		At 6.20 m; with rare fragments of metal (10x10x<60 mm).					
6.50 - 7.20 6.50 - 7.20 6.50	ES LB PID	25 27	< 0.1 ppm	(-)		At 6.60 m; with metal pipe (70x200x<300 mm) Below 6.60 m; with black, oily sheen. Strong hydrocarbon odour.					
					7						
				7.20							
				(-)							
				7.50		End of Borehole at 7.50 m	7.50	18.57			
					8						
					9						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-1863**
Fugro Reference	G170029U			
Coordinates (m)	E503177.94 N177920.66	Ground Elevation (m Datum)	26.07	Sheet 1 of 1
Hole Type	Hollow Stem Auger			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.00	IP	08/12/2017	08/12/2017	Hand-dug			AF	AF	
1.00	7.50	AUGH	14/12/2017	15/12/2017	Hollow stem (barrel) auger MC 3000			DW	CM	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
08/12/2017	08:00:00	0.00			
08/12/2017	18:00:00	1.00		Dry	
14/12/2017	08:00:00	1.00		Dry	
14/12/2017	18:00:00	6.20	2.00		
15/12/2017	08:00:00	6.20	2.00		
15/12/2017	18:00:00	7.50	2.00		

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)
7.50	350	2.00	350

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

Groundwater was not encountered during excavation or boring.

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.00 m. Services were not located. The inspection pit was backfilled with arisings before being progressed by auger.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
SP	1	1.00	5.50	15/12/2017

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	0.07	1.00	50	Plain
Pipe1	1.00	5.50	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
-0.09	0.00	Upstanding Cover	15/12/2017
0.00	0.10	Concrete	15/12/2017
0.10	0.90	Bentonite	15/12/2017
0.90	5.50	Gravel Backfill	15/12/2017
5.50	7.50	Bentonite	15/12/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 28/11/2018

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-1863**
Fugro Reference	G170029U			
Coordinates (m)	E503177.94 N177920.66	Ground Elevation (m Datum)	26.07	Sheet 1 of 1
Hole Type	Hollow Stem Auger			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)
0.05	< 0.1
0.30	< 0.1
0.85	< 0.1
1.20	< 0.1
2.20	< 0.1
3.20	< 0.1
4.20	< 0.1
5.20	1.0
6.50	< 0.1

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

FUGRO	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1864**
	Fugro Reference	G170029U			
	Coordinates (m)	E503318.26 N177736.02	Ground Elevation (m Datum)	23.23	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.10 - 0.20	D	1			MADE GROUND: brown, slightly sandy, slightly gravelly, clayey silt. Sand is fine and medium. Gravel is angular to rounded, fine to coarse of flint, concrete and brick. [MADE GROUND] [SILT]	(0.70)				
					At 0.30 m; with flint cobble (180x100x90 mm). At 0.60 m; with fragments of hard, yellow plastic (150x80x80 mm) and metal bar (230x10x10 mm). Below 0.60 m; dark brown.	0.70	22.53			
0.80 - 0.90	D	2		1	MADE GROUND: greyish brown, slightly silty, gravelly sand. With some fragments of timber (100x40x30 mm). With occasional fragments of plastic (100x60x40 mm). With rare fragments of polystyrene (30x20x10 mm), cloth (200x20x5 mm) and yellow plastic (100x40x40 mm). With fragment of chalk (100x100x70 mm), fragment of slag (180x150x80 mm), fragment of glass (30x10x5 mm), 2 plastic bags (400x250x2 mm) and rubber tube (150x30x30 mm). Sand is fine to coarse. Gravel is subangular to rounded, of flint, concrete and brick. [MADE GROUND] [WASTE, e.g. LANDFILL]	(0.50)				
1.20 - 1.30	ES	4				1.20	22.03			
1.20 - 1.65	D	3								
1.20 - 2.20	LB	5								
1.20 - 1.65	SPT		N = 11 (C)							
1.20	PID		< 0.1 ppm							
2.20 - 2.30	ES	7		2						
2.20 - 2.65	D	6								
2.20 - 3.20	LB	8			MADE GROUND: black, slightly clayey, sandy gravel. With occasional fragments of wood (<100x<100x40 mm). With rare fragments of fabric (<70x30 mm) and plastic (30x30x30 mm) and single brick cobble (<170x150x90 mm). Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of concrete and brick. [MADE GROUND] [WASTE, e.g. LANDFILL]	(2.50)				
2.20 - 2.65	SPT		N = 8 (C)							
2.20	PID		< 0.1 ppm							
3.20 - 3.30	ES	10		3						
3.20 - 3.65	D	9								
3.20 - 3.70	LB	11								
3.20 - 3.65	SPT		N = 2 (C)							
3.20	PID		< 0.1 ppm			3.70	19.53			
3.70 - 3.80	D	12			(Dense and very dense), grey clayey sandy GRAVEL. Gravel is subangular and subrounded, fine to coarse of flint. [RIVER TERRACE DEPOSITS] [GRAVEL]					
3.70 - 4.20	B	13		4						
4.20 - 4.30	D	14								
4.20 - 4.30	ES	15								
4.20 - 4.70	B	16								
4.20 - 4.54	SPT		50/215 mm (C)							
4.20	PID		< 0.1 ppm							
				5		(2.30)				
5.20 - 5.30	ES	18								
5.20 - 5.65	D	17								
5.20 - 5.70	B	19								
5.20 - 5.65	SPT		N = 32 (C)							
5.20	PID		< 0.1 ppm							
				6	End of Borehole at 6.00 m	6.00	17.23			
				7						
				8						
				9						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-BH-1864**
Fugro Reference	G170029U			
Coordinates (m)	E503318.26 N177736.02	Ground Elevation (m Datum)	23.23	Sheet 1 of 1
Hole Type	Cable Percussion			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	18/12/2017	18/12/2017	Hand-dug			BH	AF	
1.20	6.00	CP	18/12/2017	19/12/2017	Dando 3000			BH	LG	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
18/12/2017	08:00:00	0.00			
18/12/2017	18:00:00	6.00	6.00	3.50	
19/12/2017	08:00:00	6.00	6.00	3.37	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)
6.00	200	6.00	200

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)
2.20	2.06	20		

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date
SP	1	1.00	3.20	19/12/2017

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type
Pipe1	0.04	1.20	50	Plain
Pipe1	1.20	3.20	50	Slotted

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	0.05	Flush Cover	19/12/2017
0.05	0.50	Concrete	19/12/2017
0.50	1.00	Bentonite	19/12/2017
1.00	3.20	Gravel Backfill	19/12/2017
3.20	6.00	Bentonite	19/12/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 28/11/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1864**
	Fugro Reference	G170029U			
	Coordinates (m)	E503318.26 N177736.02	Ground Elevation (m Datum)	23.23	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)
1.20	C	0	N=11 (1,1/2,2,4,3)	450	EQU1616	66	0.00	Dry
2.20	C	0	N=8 (2,2/2,1,2,3)	450	EQU1616	66	0.00	Dry
3.20	C	0	N=2 (1,1/0,1,1,0)	450	EQU1616	66	2.90	2.70
4.20	C	0	50 (25 for 120mm/50 for 215mm)	335	EQU1616	66	4.10	3.00
5.20	C	0	N=32 (4,6/8,8,8,8)	450	EQU1616	66	5.10	3.50

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)
1.20	< 0.1
2.20	< 0.1
3.20	< 0.1
4.20	< 0.1
5.20	< 0.1

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

	Contract Name	HAL Airport Expansion		Location ID
	Client	Heathrow Airport Limited		**HEP-CPT-1239**
	Fugro Reference	G170029U		
	Coordinates (m)	E503730.52 N177509.25	Ground Elevation (m Datum) 21.78	Sheet 1 of 2
	Hole Type	Static Cone Penetrometer		Status Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
					MADE GROUND: light brown, gravel within cellular geotextile membrane. Gravel is subangular to well rounded, fine and medium of flint and occasional other mixed lithologies. [MADE GROUND] [GRAVEL]	(0.10)	21.68			
					At 0.09 m; black, fibrous, geotextile membrane.	0.10	21.58			
						(0.10)				
						0.20				
						(0.50)				
					MADE GROUND: brownish grey, slightly sandy gravel with low cobble content. Sand is fine to coarse. Gravel is subangular to rounded, fine to coarse of flint, quartz and sandstone. Cobbles (65x80x100mm) are of flint and brick. [MADE GROUND] [GRAVEL]	0.70	21.08			
1						(0.50)				
					MADE GROUND: dark brown and greyish brown, slightly silty, sandy gravel with low cobble content. With rare roots (30x10x10 mm). Sand is medium and coarse. Gravel is subangular to rounded, fine to coarse of flint, brick and sandstone. Cobbles are of flint, brick concrete and aggregate. [MADE GROUND] [GRAVEL]	1.20	20.58			
2					Below 0.60 m; locally clayey.					
					MADE GROUND: (firm and stiff), grey and black, slightly gravelly clay with low cobble content. Gravel is angular to subrounded, fine to coarse of flint. Cobbles are of brick, flint and concrete. [MADE GROUND] [CLAY]					
					Below 0.80 m; light brown.					
3					Cone penetration testing; refer to separate test record. [NO RECOVERY]					
4										
5										
6										
7										
8										
9										
					Continued next page					

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-CPT-1239**
	Fugro Reference	G170029U			
	Coordinates (m)	E503730.52 N177509.25	Ground Elevation (m Datum)	21.78	Sheet 2 of 2
	Hole Type	Static Cone Penetrometer			Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
					Cone penetration testing; refer to separate test record. [NO RECOVERY]	(18.34)				
				11						
				12						
				13						
				14						
				15						
				16						
				17						
				18						
				19						
					End of Borehole at 19.54 m	19.54	2.24			

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID	
Client	Heathrow Airport Limited			**HEP-CPT-1239**	
Fugro Reference	G170029U				
Coordinates (m)	E503730.52 N177509.25	Ground Elevation (m Datum)	21.78	Sheet 1 of 1	
Hole Type	Static Cone Penetrometer			Status	Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	11/12/2017	11/12/2017	Hand-dug			AF	AF	
0.00	19.54	SCP	12/12/2017	12/12/2017	GB7			BATT/SMO		

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
11/12/2017	08:00:00	0.00			
11/12/2017	18:00:00	1.20			
12/12/2017	08:00:00	0.00			
12/12/2017	18:00:00	19.54			

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)
0.40				

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

Groundwater seepage at 0.40 m. Water level was not monitored. Oily sheen noted on groundwater.

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located. Sampling not required. The inspection pit was backfilled with arisings before being progressed by cone penetration test.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	1.20	Arisings	11/12/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 28/11/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-CPT-1239**
	Fugro Reference	G170029U			
	Coordinates (m)	E503730.52 N177509.25	Ground Elevation (m Datum)	21.78	Sheet 1 of 1
	Hole Type	Static Cone Penetrometer			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

	Contract Name	HAL Airport Expansion		Location ID
	Client	Heathrow Airport Limited		**HEP-CPT-1240**
	Fugro Reference	G170029U		
	Coordinates (m)	E503872.71 N177466.44	Ground Elevation (m Datum) 22.72	Sheet 1 of 2
	Hole Type	Static Cone Penetrometer		Status Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
					TOPSOIL: dark brownish black, slightly gravelly, sandy silt. Sand is fine and medium. Gravel is angular to subrounded, fine to coarse of flint, quartz and quartzite. [TOPSOIL] [CLAY]	(0.35)				
						0.35	22.37			
					MADE GROUND: brown, slightly clayey, sandy gravel with low cobble content. Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of flint, concrete and rare brick. Cobbles (85x90x140 mm) are of concrete. [MADE GROUND] [GRAVEL]	(0.35)				
						0.70	22.02			
				1		(0.50)				
					MADE GROUND: dark greyish black, slightly sandy, clayey gravel. Sand is fine to coarse. Gravel is angular and subangular, fine to coarse of flint. [MADE GROUND] [GRAVEL]	1.20	21.52			
					Cone penetration testing; refer to separate test record. [NO RECOVERY]					
				2						
				3						
				4						
				5						
				6						
				7						
				8						
				9						

Continued next page

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

	Contract Name	HAL Airport Expansion		Location ID	
	Client	Heathrow Airport Limited		**HEP-CPT-1240**	
	Fugro Reference	G170029U			
	Coordinates (m)	E503872.71 N177466.44	Ground Elevation (m Datum) 22.72	Sheet 2 of 2	
	Hole Type	Static Cone Penetrometer		Status	Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
					Cone penetration testing; refer to separate test record. [NO RECOVERY]	(17.98)				
				11						
				12						
				13						
				14						
				15						
				16						
				17						
				18						
				19						
					End of Borehole at 19.18 m	19.18	3.54			

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-CPT-1240**
Fugro Reference	G170029U			
Coordinates (m)	E503872.71 N177466.44	Ground Elevation (m Datum)	22.72	Sheet 1 of 1
Hole Type	Static Cone Penetrometer			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	06/12/2017	06/12/2017	Hand-dug			EA	EA	
0.00	19.18	SCP	12/12/2017	12/12/2017	GB7			BATT/SMO		

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
06/12/2017	08:00:00	0.00			
06/12/2017	18:00:00	1.20		Dry	
12/12/2017	08:00:00	0.00			
12/12/2017	18:00:00	19.18			

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

Groundwater was not encountered during excavation.

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located. Sampling not required. The inspection pit was backfilled with arisings before being progressed by cone penetration test.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	1.20	Arisings	06/12/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 28/11/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-CPT-1240**
	Fugro Reference	G170029U			
	Coordinates (m)	E503872.71 N177466.44	Ground Elevation (m Datum)	22.72	Sheet 1 of 1
	Hole Type	Static Cone Penetrometer			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

	Contract Name	HAL Airport Expansion		Location ID
	Client	Heathrow Airport Limited		**HEP-CPT-1244**
	Fugro Reference	G170029U		
	Coordinates (m)	E503854.42 N177435.35	Ground Elevation (m Datum) 22.79	Sheet 1 of 3
	Hole Type	Static Cone Penetrometer		Status Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
					MADE GROUND: brown, sandy gravel. Sand is fine to coarse. Gravel is angular and subangular, fine to coarse of flint, concrete and rare brick. [MADE GROUND] [GRAVEL]	(0.25) 0.25	22.54			
					MADE GROUND: brown, slightly clayey, sandy gravel. With a welding rod (0.28 m in length). Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of flint, brick and concrete. [MADE GROUND] [GRAVEL]	(0.35) 0.60	22.19			
				1	MADE GROUND: brown, slightly sandy, clayey gravel. Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of flint, quartz and rare brick. [MADE GROUND] [GRAVEL]	(0.60) 1.20	21.59			
					Cone penetration testing; refer to separate test record. [NO RECOVERY]					
				2						
				3						
				4						
				5						
				6						
				7						
				8						
				9						

Continued next page

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

	Contract Name	HAL Airport Expansion		Location ID
	Client	Heathrow Airport Limited		**HEP-CPT-1244**
	Fugro Reference	G170029U		
	Coordinates (m)	E503854.42 N177435.35	Ground Elevation (m Datum) 22.79	Sheet 2 of 3
	Hole Type	Static Cone Penetrometer		Status Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
				11 12 13 14 15 16 17 18 19	Cone penetration testing; refer to separate test record. [NO RECOVERY]	(21.84)				

Continued next page

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

	Contract Name	HAL Airport Expansion		Location ID
	Client	Heathrow Airport Limited		**HEP-CPT-1244**
	Fugro Reference	G170029U		
	Coordinates (m)	E503854.42 N177435.35	Ground Elevation (m Datum) 22.79	Sheet 3 of 3
	Hole Type	Static Cone Penetrometer		Status Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
					Cone penetration testing; refer to separate test record. [NO RECOVERY]					
				21						
				22						
				23	End of Borehole at 23.04 m	23.04	-0.25			
				24						
				25						
				26						
				27						
				28						
				29						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-CPT-1244**
Fugro Reference	G170029U			
Coordinates (m)	E503854.42 N177435.35	Ground Elevation (m Datum)	22.79	Sheet 1 of 1
Hole Type	Static Cone Penetrometer			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	06/12/2017	06/12/2017	Hand-dug			EA	EA	
0.00	23.04	SCP	13/12/2017	13/12/2017	GB7			BATT/SMO		

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
06/12/2017	08:00:00	0.00			
06/12/2017	18:00:00	1.20		Dry	
13/12/2017	08:00:00	0.00			
13/12/2017	18:00:00	23.04			

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

Groundwater was not encountered during excavation.

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located. Sampling not required. The inspection pit was backfilled with arisings before being progressed by cone penetration test.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	1.20	Arisings	06/12/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 28/11/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-CPT-1244**
	Fugro Reference	G170029U			
	Coordinates (m)	E503854.42 N177435.35	Ground Elevation (m Datum)	22.79	Sheet 1 of 1
	Hole Type	Static Cone Penetrometer			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

	Contract Name	HAL Airport Expansion		Location ID
	Client	Heathrow Airport Limited		**HEP-CPT-1245**
	Fugro Reference	G170029U		
	Coordinates (m)	E503680.71 N177435.16	Ground Elevation (m Datum) 21.34	Sheet 1 of 2
	Hole Type	Static Cone Penetrometer		Status Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
					MADE GROUND: dark brown, sandy gravel. With rare fragments (<60 mm) of tarmacadam. Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of brick and flint. [MADE GROUND] [GRAVEL]	(0.40)				
						0.40	20.94			
					MADE GROUND: creamish white, and brown, slightly sandy, silty gravel. Sand is fine to coarse. Gravel is angular and subangular, fine to coarse of chalk. [MADE GROUND] [GRAVEL] At 0.75 m; with cobble (80x90x110 mm) of black flint.	(0.55)				
				1		0.95	20.39			
						(0.25)				
					MADE GROUND: brown, slightly clayey, gravelly sand. Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of flint and rare chalk. [MADE GROUND] [SAND]	1.20	20.14			
					Cone penetration testing; refer to separate test record. [NO RECOVERY]					
				2						
				3						
				4						
				5						
				6						
				7						
				8						
				9						
						(16.59)				
					Continued next page					

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

	Contract Name	HAL Airport Expansion		Location ID
	Client	Heathrow Airport Limited		**HEP-CPT-1245**
	Fugro Reference	G170029U		
	Coordinates (m)	E503680.71 N177435.16	Ground Elevation (m Datum) 21.34	Sheet 2 of 2
	Hole Type	Static Cone Penetrometer		Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
					Cone penetration testing; refer to separate test record. [NO RECOVERY]					
				11						
				12						
				13						
				14						
				15						
				16						
				17						
					End of Borehole at 17.79 m	17.79	3.55			
				18						
				19						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-CPT-1245**
Fugro Reference	G170029U			
Coordinates (m)	E503680.71 N177435.16	Ground Elevation (m Datum)	21.34	Sheet 1 of 1
Hole Type	Static Cone Penetrometer			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	06/12/2017	06/12/2017	Hand-dug			EA	EA	
0.00	17.79	SCP	12/12/2017	12/12/2017	GB7			BATT/SMO		

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
06/12/2017	08:00:00	0.00			
06/12/2017	18:00:00	1.20		Dry	
12/12/2017	08:00:00	0.00			
12/12/2017	18:00:00	17.79			

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

Groundwater was not encountered during excavation.

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located. Sampling not required. The inspection pit was backfilled with arisings before being progressed by cone penetration test.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	1.20	Arisings	06/12/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 28/11/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-CPT-1245**
	Fugro Reference	G170029U			
	Coordinates (m)	E503680.71 N177435.16	Ground Elevation (m Datum)	21.34	Sheet 1 of 1
	Hole Type	Static Cone Penetrometer			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

	Contract Name	HAL Airport Expansion		Location ID	
	Client	Heathrow Airport Limited		**HEP-CPT-1247**	
	Fugro Reference	G170029U			
	Coordinates (m)	E503811.17 N177274.32	Ground Elevation (m Datum) 22.15	Sheet 1 of 3	
	Hole Type	Static Cone Penetrometer		Status	Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
					MADE GROUND: concrete with fibreglass reinforcement.	(0.22)				
					[MADE GROUND] [CONCRETE]	0.22	21.93			
					At 0.22 m; black, plastic membrane (1 mm).	(0.20)				
					MADE GROUND: light brown and brown, gravelly sand. Sand is fine to coarse. Gravel is subrounded to angular, fine to coarse of flint, concrete and brick.	0.42	21.73			
					[MADE GROUND] [SAND]					
				1	At 0.35 m; with fragment of black, fabric membrane (<150x185 mm). At 0.42 m; concrete obstruction across base of pit; pit terminated. Pit relocated 0.70 m away and excavated to 1.20 m (geotechnical logging not undertaken).					
					Cone penetration testing; refer to separate test record.					
					[NO RECOVERY]					
				2						
				3						
				4						
				5						
				6						
				7						
				8						
				9						

Continued next page

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

	Contract Name	HAL Airport Expansion		Location ID
	Client	Heathrow Airport Limited		**HEP-CPT-1247**
	Fugro Reference	G170029U		
	Coordinates (m)	E503811.17 N177274.32	Ground Elevation (m Datum) 22.15	Sheet 2 of 3
	Hole Type	Static Cone Penetrometer		Status Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
					Cone penetration testing; refer to separate test record. [NO RECOVERY]	(22.02)				
				11						
				12						
				13						
				14						
				15						
				16						
				17						
				18						
				19						
					Continued next page					

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-CPT-1247**
	Fugro Reference	G170029U			
	Coordinates (m)	E503811.17 N177274.32	Ground Elevation (m Datum)	22.15	Sheet 3 of 3
	Hole Type	Static Cone Penetrometer			Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
					Cone penetration testing; refer to separate test record. [NO RECOVERY]					
				21						
				22						
					End of Borehole at 22.44 m	22.44	-0.29			
				23						
				24						
				25						
				26						
				27						
				28						
				29						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID	
Client	Heathrow Airport Limited			**HEP-CPT-1247**	
Fugro Reference	G170029U				
Coordinates (m)	E503811.17 N177274.32	Ground Elevation (m Datum)	22.15	Sheet 1 of 1	
Hole Type	Static Cone Penetrometer			Status	Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	0.42	IP	12/01/2018	12/01/2018	Hand-dug			AF	AF	
0.00	22.44	SCP	13/02/2018	13/02/2018	GB17			BATT*DRUM MONSD		

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
12/01/2018	08:00:00	0.00			
12/01/2018	18:00:00	0.42		Dry	
13/02/2018	08:00:00	0.00			
13/02/2018	18:00:00	22.44			

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

Groundwater was not encountered during excavation.

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 0.42 m. Services were not located. Sampling not required. The inspection pit was terminated at 0.42 m due to concrete obstruction. A further inspection pit was excavated to 1.20 m, located 0.70 m away, before being progressed by cone penetration testing.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	0.42	Arisings	12/01/2018

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 28/11/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-CPT-1247**
	Fugro Reference	G170029U			
	Coordinates (m)	E503811.17 N177274.32	Ground Elevation (m Datum)	22.15	Sheet 1 of 1
	Hole Type	Static Cone Penetrometer			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

	Contract Name	HAL Airport Expansion		Location ID
	Client	Heathrow Airport Limited		**HEP-CPT-1248**
	Fugro Reference	G170029U		
	Coordinates (m)	E503911.23 N177342.58	Ground Elevation (m Datum) 22.04	Sheet 1 of 1
	Hole Type	Static Cone Penetrometer		Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
					MADE GROUND: asphalt. [MADE GROUND] [TARMAC/BLACKTOP]	(0.10) 0.10	21.94			
					MADE GROUND: concrete. [MADE GROUND] [CONCRETE]	(0.30) 0.40	21.64			
					MADE GROUND: brown, slightly gravelly sand. Sand is fine to coarse. Gravel is angular and subangular, fine and medium of flint, concrete and brick. [MADE GROUND] [SAND]	(0.30) 0.70	21.34			
				1	Brown, locally mottled black, slightly clayey, sandy GRAVEL. Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of flint. [RIVER TERRACE DEPOSITS] [GRAVEL] Below 0.80 m; mottling absent.	(0.50) 1.20	20.84			
				2	Cone penetration testing; refer to separate test record. [NO RECOVERY]	(2.73)				
				3						
				4	End of Borehole at 3.93 m	3.93	18.11			
				5						
				6						
				7						
				8						
				9						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-CPT-1248**
Fugro Reference	G170029U			
Coordinates (m)	E503911.23 N177342.58	Ground Elevation (m Datum)	22.04	Sheet 1 of 1
Hole Type	Static Cone Penetrometer			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	15/01/2018	15/01/2018	Hand-dug/breaker			JJL	JJL	
0.00	3.93	SCP	16/01/2018	16/01/2018	GB7			NF/IB		

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
15/01/2018	08:00:00	0.00			
15/01/2018	18:00:00	1.20			
16/01/2018	08:00:00	0.00			
16/01/2018	18:00:00	3.93			

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

Groundwater was not encountered during excavation.

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located. Sampling not required. The inspection pit was backfilled with arisings before being progressed by cone penetration test.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	1.20	Arisings	15/01/2018

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 28/11/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-CPT-1248**
	Fugro Reference	G170029U			
	Coordinates (m)	E503911.23 N177342.58	Ground Elevation (m Datum)	22.04	Sheet 1 of 1
	Hole Type	Static Cone Penetrometer			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-CPT-1249**
	Fugro Reference	G170029U			
	Coordinates (m)	E503890.47 N177239.97	Ground Elevation (m Datum)	22.21	Sheet 1 of 1
	Hole Type	Static Cone Penetrometer			Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
					MADE GROUND: tarmacadam.	(0.05)	22.16			
					[MADE GROUND] [TARMAC/BLACKTOP]	0.05	22.03			
					MADE GROUND: concrete with fibreglass reinforcement.	(0.13)				
					[MADE GROUND] [CONCRETE]	0.18				
					At 0.17 m; black, plastic membrane (1 mm).	(0.67)				
					MADE GROUND: brown, becoming dark brown, gravelly sand. Sand is fine to coarse. Gravel is subrounded to angular of flint, rare brick and aggregate.	0.85	21.36			
				1		(0.35)				
					[MADE GROUND] [SAND]	1.20	21.01			
					At 0.45 m; black, fabric membrane (2 mm). Below 0.70 m; with low cobble content. Cobbles (<180x150x120 mm) are of concrete, brick and aggregate.					
					MADE GROUND: brown and dark brown, slightly clayey, gravelly sand with low cobble content Sand is fine to coarse. Gravel is subrounded to angular, fine to coarse of flint, aggregate, concrete, rare brick. Cobbles (<150x130x100 mm) are of concrete, brick and aggregate.					
				2	[MADE GROUND] [SAND]					
					Cone penetration testing; refer to separate test record.	(2.56)				
					[NO RECOVERY]					
				3						
					End of Borehole at 3.76 m	3.76	18.45			
				4						
				5						
				6						
				7						
				8						
				9						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID	
Client	Heathrow Airport Limited			**HEP-CPT-1249**	
Fugro Reference	G170029U				
Coordinates (m)	E503890.47 N177239.97	Ground Elevation (m Datum)	22.21	Sheet 1 of 1	
Hole Type	Static Cone Penetrometer			Status	Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	11/01/2018	11/01/2018	Hand-dug			AF	AF	
0.00	3.76	SCP	15/01/2018	15/01/2018	GB7			NF/IB		

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
11/01/2018	08:00:00	0.00			
11/01/2018	18:00:00	1.20			
15/01/2018	08:00:00	0.00			
15/01/2018	18:00:00	3.76			

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

Groundwater was not encountered during excavation.

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located. Sampling not required. The inspection pit was backfilled with arisings before being progressed by cone penetration test.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	1.20	Arisings	11/01/2018

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 28/11/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-CPT-1249**
	Fugro Reference	G170029U			
	Coordinates (m)	E503890.47 N177239.97	Ground Elevation (m Datum)	22.21	Sheet 1 of 1
	Hole Type	Static Cone Penetrometer			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

	Contract Name	HAL Airport Expansion		Location ID
	Client	Heathrow Airport Limited		**HEP-CPT-1250**
	Fugro Reference	G170029U		
	Coordinates (m)	E503799.95 N177244.76	Ground Elevation (m Datum) 22.26	Sheet 1 of 2
	Hole Type	Static Cone Penetrometer		Status Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
					MADE GROUND: tarmacadam. [MADE GROUND] [TARMAC/BLACKTOP]	(0.05) 0.05	22.21			
					MADE GROUND: concrete with fibreglass reinforcement [MADE GROUND] [CONCRETE] At 0.05 m; black, plastic membrane (1 mm thick).	(0.20) 0.25	22.01 21.81			
					MADE GROUND: dark grey and brownish grey, gravelly sand. Sand is medium and coarse. Gravel is angular to subrounded, fine and medium of flint, brick and aggregate. [MADE GROUND] [SAND]	(0.20) 0.45 (0.25) 0.70 (0.50)	21.56		▼	
				1	MADE GROUND: dark grey and black, locally slightly silty, gravelly sand. With rare fragments of ceramic tile (5x5x10 mm). Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of flint and occasional concrete. [MADE GROUND] [SAND] At 0.45 m; black, fabric membrane. At 0.50 m; with fragment of timber (20x20x80 mm).	1.20	21.06			
				2	MADE GROUND: dark greyish brown, slightly silty, gravelly sand. Sand is fine to coarse. Gravel is subangular to rounded, fine to coarse of flint, aggregate, concrete and occasional brick. [MADE GROUND] [SAND] At 0.90 m; with oily sheen. At 1.00 m; with cobble (80x80x100 mm) of concrete and whole brick (60x80x240 mm).					
				3	Cone penetration testing; refer to separate test record. [NO RECOVERY]					
				4						
				5						
				6						
				7						
				8						
				9		(17.31)				
					Continued next page					

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-CPT-1250**
	Fugro Reference	G170029U			
	Coordinates (m)	E503799.95 N177244.76	Ground Elevation (m Datum)	22.26	Sheet 2 of 2
	Hole Type	Static Cone Penetrometer			Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
					Cone penetration testing; refer to separate test record. [NO RECOVERY]					
				11						
				12						
				13						
				14						
				15						
				16						
				17						
				18						
					End of Borehole at 18.51 m	18.51	3.75			
				19						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-CPT-1250**
Fugro Reference	G170029U			
Coordinates (m)	E503799.95 N177244.76	Ground Elevation (m Datum)	22.26	Sheet 1 of 1
Hole Type	Static Cone Penetrometer			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	08/01/2018	08/01/2018	Hand-dug			AF	AF	
0.00	18.51	SCP	15/01/2018	15/01/2018	GB7			NF/IB		

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
08/01/2018	08:00:00	0.00			
08/01/2018	18:00:00	1.20		0.90	
15/01/2018	08:00:00	0.00			
15/01/2018	18:00:00	18.51			

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)
0.90				

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

Groundwater was encountered at 0.90 m. Water level was not monitored. Oily sheen noted on groundwater.

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located. Sampling not required. The inspection pit was backfilled with arisings before being progressed by cone penetration test.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	1.20	Arisings	08/01/2018

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 28/11/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-CPT-1250**
	Fugro Reference	G170029U			
	Coordinates (m)	E503799.95 N177244.76	Ground Elevation (m Datum)	22.26	Sheet 1 of 1
	Hole Type	Static Cone Penetrometer			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

	Contract Name	HAL Airport Expansion		Location ID
	Client	Heathrow Airport Limited		**HEP-CPT-1251**
	Fugro Reference	G170029U		
	Coordinates (m)	E503702.23 N177237.96	Ground Elevation (m Datum) 22.41	Sheet 1 of 2
	Hole Type	Static Cone Penetrometer		Status Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
					MADE GROUND: tarmacadam (car park surface). [MADE GROUND] [TARMAC/BLACKTOP]	(0.10) 0.10	22.31			
					MADE GROUND: brown, locally greyish brown, gravelly sand with low cobble content. Sand is fine and coarse. Gravel is angular to rounded, fine to coarse of flint, brick and concrete. Cobbles are of concrete (<100x80x80 mm) and brick (<80x70x70 mm). [MADE GROUND] [SAND] Below 0.40 m; becoming greenish grey and slightly clayey.	(0.40) 0.50 (0.30) 0.80	21.91 21.61			
				1	MADE GROUND: (soft and firm), greenish grey, slightly sandy, slightly gravelly, silty clay. Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of flint, brick and concrete. [MADE GROUND] [CLAY]	(0.40) 1.20	21.21			
				2	Soft and firm, greenish grey, slightly sandy, slightly gravelly, silty CLAY. Sand is fine to coarse. Gravel is angular to subrounded, fine and medium of flint. [ALLUVIUM] [CLAY]					
					Cone penetration testing; refer to separate test record. [NO RECOVERY]					
				3						
				4						
				5						
				6						
				7						
				8						
				9						

Continued next page

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

	Contract Name	HAL Airport Expansion		Location ID
	Client	Heathrow Airport Limited		**HEP-CPT-1251**
	Fugro Reference	G170029U		
	Coordinates (m)	E503702.23 N177237.96	Ground Elevation (m Datum) 22.41	Sheet 2 of 2
	Hole Type	Static Cone Penetrometer		Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
					Cone penetration testing; refer to separate test record. [NO RECOVERY]	(18.70)				
				11						
				12						
				13						
				14						
				15						
				16						
				17						
				18						
				19						
					End of Borehole at 19.90 m	19.90	2.51			

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-CPT-1251**
Fugro Reference	G170029U			
Coordinates (m)	E503702.23 N177237.96	Ground Elevation (m Datum)	22.41	Sheet 1 of 1
Hole Type	Static Cone Penetrometer			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.20	IP	17/03/2018	17/03/2018	Hand-dug			AF	AF	
0.00	19.90	SCP	22/03/2018	22/03/2018	GB9			HG/KL		

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
17/03/2018	08:00:00	0.00			
17/03/2018	10:00:00	1.20		Dry	
22/03/2018	08:00:00	0.00			
22/03/2018	18:00:00	19.90			

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

Groundwater was not encountered during excavation.

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works and an inspection pit was excavated to 1.20 m. Services were not located. Sampling not required. The inspection pit was backfilled before being progressed by cone penetration test.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	1.20	Arisings	17/03/2018

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 28/11/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-CPT-1251**
	Fugro Reference	G170029U			
	Coordinates (m)	E503702.23 N177237.96	Ground Elevation (m Datum)	22.41	Sheet 1 of 1
	Hole Type	Static Cone Penetrometer			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

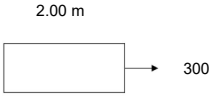
Contract Name	HAL Airport Expansion			Location ID	
Client	Heathrow Airport Limited			**HEP-TT-3**	
Fugro Reference	G170029U				
Coordinates (m)	E502820.81 N177831.45	Ground Elevation (m Datum)	21.51	Sheet 1 of 1	
Hole Type	Trial Pit / Trench			Status	Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.00 - 0.10 0.00 - 0.10 0.00 - 0.10 0.00	B D ES PID	2 1 3	< 0.1 ppm		MADE GROUND (Topsoil): dark greyish brown and black, slightly gravelly, silty clay. With abundant roots/rootlets (<2x15 mm). Gravel is subangular to well rounded, fine to coarse of flint and occasional brick. [MADE GROUND] [CLAY]	(0.20) 0.20	21.31			
0.40 - 0.50 0.40 - 0.50 0.40 - 0.50 0.40	B D ES PID	5 4 6	< 0.1 ppm		MADE GROUND: dark brown, locally black, slightly clayey, slightly sandy gravel. With occasional fragments of clinker (<10 mm), and rare fragments of plastic (<10 mm), tile (20x25 mm), fabric (<15x30 mm) and metal strips (<15x30 mm). Sand is fine to coarse. Gravel is angular to well rounded, fine to coarse of flint, brick, concrete, roadstone aggregate and various other lithologies. [MADE GROUND] [GRAVEL]	(0.70) 0.90	20.61			
1.00 - 1.30 1.00 - 1.30 1.00 - 1.30 1.00	B D ES PID	8 7 9	< 0.1 ppm	1	MADE GROUND: (soft), black and dark greyish brown, slightly sandy, gravelly clay. With some fragments of clinker (<60 mm) and plastic (15x20 mm). Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of flint and brick. [MADE GROUND] [WASTE, e.g. LANDFILL]	(0.90) 1.80	19.71			
1.80 - 2.00 1.80 - 2.00 1.80 - 2.00 1.80	B D ES PID	11 10 12	< 0.1 ppm	2	MADE GROUND: black, slightly sandy, clayey gravel. With occasional fragments of glass (5x25 mm), clinker (<10 mm) and metal (3-5x<55 mm). Sand is fine to coarse. Gravel is angular and subangular, fine to coarse of flint and other mixed lithologies. [MADE GROUND] [WASTE, e.g. LANDFILL]	(0.20) 2.00	19.51			
				3	End of Trial Pit / Trench at 2.00 m					
				4						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Plan



Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-TT-3**
Fugro Reference	G170029U			
Coordinates (m)	E502820.81 N177831.45	Ground Elevation (m Datum)	21.51	Sheet 1 of 1
Hole Type	Trial Pit			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	2.00	TP	22/11/2017	22/11/2017	JCB 3CX			AK	AK	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
22/11/2017	08:00:00	0.00			
22/11/2017	18:00:00	2.00		Dry	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

Groundwater was not encountered during excavation.

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works. Services were not located.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	2.00	Arisings	22/11/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 28/11/2018

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-TT-3**
Fugro Reference	G170029U			
Coordinates (m)	E502820.81 N177831.45	Ground Elevation (m Datum)	21.51	Sheet 1 of 1
Hole Type	Trial Pit			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)
0.00	< 0.1
0.40	< 0.1
1.00	< 0.1
1.80	< 0.1

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

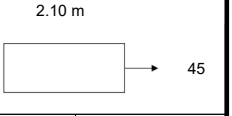
Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-TT-6**
Fugro Reference	G170029U			
Coordinates (m)	E503018.99 N177979.31	Ground Elevation (m Datum)	21.60	Sheet 1 of 1
Hole Type	Trial Pit / Trench			Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.00 - 0.10 0.00 - 0.10 0.00 - 0.10 0.00	D ES LB PID	3 1 2	< 0.1 ppm		MADE GROUND: black, slightly sandy, slightly gravelly clay. With frequent roots/rootlets (2x10 mm). With occasional fragments (<60 mm) of tile and glass. Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of flint and occasional brick. [MADE GROUND] [CLAY]	(0.20) 0.20	21.40			
0.50 - 0.60 0.50 - 0.60 0.50 - 0.60 0.50	D ES LB PID	6 4 5	< 0.1 ppm		MADE GROUND: dark greyish brown locally black, slightly clayey, very sandy gravel. With frequent fragments (<60 mm) of tile, clinker, plastic and timber, and fragments of glass (15x20mm). Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of mixed lithologies including flint and brick. [MADE GROUND] [WASTE, e.g. LANDFILL]	(0.50) 0.70	20.90		▼	
0.80 - 1.00 0.80 - 1.00 0.80 - 1.00 0.80	D ES LB PID	9 7 8	< 0.1 ppm	1	MADE GROUND: dark greyish brown and black, clayey, sandy gravel with low cobble content. With a concrete slab (350x500 mm). With some fragments of wooden plank (<10x50 mm), plastic bag, plastic (<5x15 mm), rubber hoses (<10x70 mm) and bottles (<40x110 mm). Sand is fine to coarse. Gravel is angular, fine to coarse of brick and concrete. [MADE GROUND] [WASTE, e.g. LANDFILL]	(0.30) 1.00	20.60			
				2	End of Trial Pit / Trench at 1.00 m					
				3						
				4						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Plan



Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-TT-6**
Fugro Reference	G170029U			
Coordinates (m)	E503018.99 N177979.31	Ground Elevation (m Datum)	21.60	Sheet 1 of 1
Hole Type	Trial Pit			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	1.00	TP	23/11/2017	23/11/2017	JCB 3CX			AK	AK	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
23/11/2017	08:00:00	0.00			
23/11/2017	18:00:00	1.00		0.70	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)
0.70				

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

Groundwater was encountered at 0.70 m. Water level was not monitored.

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works. Services were not located. The trial pit was terminated at 1.00m due to water inflow and collapse of the sidewalls.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	1.00	Arisings	23/11/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	JPD/ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 28/11/2018

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-TT-6**
Fugro Reference	G170029U			
Coordinates (m)	E503018.99 N177979.31	Ground Elevation (m Datum)	21.60	Sheet 1 of 1
Hole Type	Trial Pit			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)
0.00	< 0.1
0.50	< 0.1
0.80	< 0.1

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

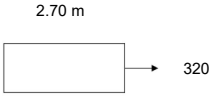
Contract Name	HAL Airport Expansion			Location ID	
Client	Heathrow Airport Limited			**HEP-TT-9**	
Fugro Reference	G170029U				
Coordinates (m)	E503226.78 N178064.67	Ground Elevation (m Datum)	22.71	Sheet 1 of 1	
Hole Type	Trial Pit / Trench			Status	Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.00 - 0.10 0.00 - 0.10 0.00 - 0.10 0.00	D ES LB PID	2 1 3	< 0.1 ppm		MADE GROUND (Topsoil): (soft), black, slightly sandy, slightly gravelly, silty clay. With occasional roots/rootlets (<2x30 mm). Sand is fine to coarse. Gravel is angular to subrounded, fine and medium of flint and other lithologies. [MADE GROUND] [CLAY]	(0.20) 0.20	22.51			
0.50 - 0.60 0.50 - 0.60 0.50 - 0.60 0.50	B D ES PID	6 5 4	< 0.1 ppm		MADE GROUND: dark brown, slightly silty, gravelly sand. With frequent fragments of tile (<60 mm), and occasional fragments of plastic (<15x25 mm) and glass (<5x10 mm). Sand is fine to coarse. Gravel is angular and subangular, fine to coarse of flint, brick, roadstone aggregate and various lithologies. [MADE GROUND] [WASTE, e.g. LANDFILL]	(0.70) 0.90	21.81			
1.20 - 1.40 1.20 - 1.40 1.20 - 1.40 1.20	B D ES PID	9 8 7	< 0.1 ppm	1	MADE GROUND: dark greyish brown, slightly clayey, very gravelly sand with low cobble content. With some fragments (<60 mm) of metal, plastic, wood, plastic bag and clinker and some fragments of tile (20x25 mm) and glass (<10x10 mm). Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of flint, brick, concrete, roadstone aggregate and various lithologies. Cobbles are of concrete and half and whole bricks. [MADE GROUND] [WASTE, e.g. LANDFILL] Below 1.40 m; with occasional pockets (<50 mm) of dark greyish black, slightly organic clay. At 1.50 m; with concrete slab (250x350 mm).	(0.80) 1.70	21.01			
1.80 - 2.00 1.80 - 2.00 1.80 - 2.00 1.80	B D ES PID	12 11 10	< 0.1 ppm	2	MADE GROUND: black, slightly clayey, very sandy gravel with low cobble content. With some fragments of timber (25x45 mm), plastic (<10x25 mm), basin, pottery, glass (20x35 mm) and roof slate (30x35 mm). Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of flint, brick, construction rubble and various lithologies. [MADE GROUND] [WASTE, e.g. LANDFILL] At 1.90 m; groundwater is black with polluted odour. End of Trial Pit / Trench at 2.00 m	(0.30) 2.00	20.71		▼	
				3						
				4						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Plan



Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-TT-9**
Fugro Reference	G170029U			
Coordinates (m)	E503226.78 N178064.67	Ground Elevation (m Datum)	22.71	Sheet 1 of 1
Hole Type	Trial Pit			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	2.00	TP	23/11/2017	23/11/2017	JCB 3CX			TB/AK	TB/AK	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
23/11/2017	08:00:00	0.00			
23/11/2017	18:00:00	2.00		1.90	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)
1.90				

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

Groundwater was encountered at 1.90 m. Water level was not monitored.

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works. Services were not located.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	2.00	Arisings	23/11/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	JPD/ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 28/11/2018

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-TT-9**
Fugro Reference	G170029U			
Coordinates (m)	E503226.78 N178064.67	Ground Elevation (m Datum)	22.71	Sheet 1 of 1
Hole Type	Trial Pit			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)
0.00	< 0.1
0.50	< 0.1
1.20	< 0.1
1.80	< 0.1

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

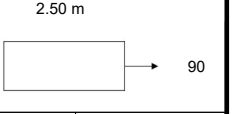
Contract Name	HAL Airport Expansion			Location ID	
Client	Heathrow Airport Limited			**HEP-TT-11**	
Fugro Reference	G170029U				
Coordinates (m)	E502963.53 N177698.16	Ground Elevation (m Datum)	22.59	Sheet 1 of 1	
Hole Type	Trial Pit / Trench			Status	Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.00 - 0.10 0.00 - 0.10 0.00 - 0.10 0.00	B D ES PID	3 2 1	< 0.1 ppm		MADE GROUND: (firm), black and dark brown, slightly sandy, slightly gravelly, silty clay. With frequent roots/rootlets (<2x15 mm). With occasional fragments of tile (<20x20 mm), rare fragments of glass (15x25 mm) and plastic (<10x25 mm). Sand is fine to coarse. Gravel is angular to subrounded, fine and medium of flint and occasional brick. [MADE GROUND] [CLAY]	(0.15) 0.15	22.44			
0.40 - 0.50 0.40 - 0.50 0.40 - 0.50 0.40	B D ES PID	6 5 4	< 0.1 ppm	1	MADE GROUND: greyish brown, slightly silty, very sandy gravel with low cobble and boulder content. Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of flint, slate and some construction rubble. Cobbles and boulders are of concrete. [MADE GROUND] [GRAVEL] At 0.40 m; with 4 cobbles (70x200x200 mm) and boulder (200x200x400 mm) of concrete. At 0.80 m; with plastic sheet (100x100 mm)	(1.05)				
1.30 - 1.40 1.30 - 1.40 1.30 - 1.40 1.30	B D ES PID	9 8 7	< 0.1 ppm		MADE GROUND: (firm and stiff, becoming very stiff), dark brown, light reddish brown and locally black, sandy, gravelly clay with low cobble content. With rare to occasional fragments of plastic (100x150 mm), glass (35x45 mm), wood and clinker. Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of flint and concrete. Cobbles are of brick and concrete. [MADE GROUND] [WASTE, e.g. LANDFILL] At 1.30 m; with fragment of tarmacadam (200x100x80 mm). At 1.40 m; with concrete slab (200x150x80 mm) within southern wall.	1.20 (0.80)	21.39			
1.80 - 2.00 1.80 - 2.00 1.80 - 2.00 1.80	B D ES PID	12 11 10	< 0.1 ppm	2	End of Trial Pit / Trench at 2.00 m	2.00	20.59			
				3						
				4						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Plan



Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-TT-11**
Fugro Reference	G170029U			
Coordinates (m)	E502963.53 N177698.16	Ground Elevation (m Datum)	22.59	Sheet 1 of 1
Hole Type	Trial Pit			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	2.00	TP	24/11/2017	24/11/2017	JCB 3CX			AK	AK	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
24/11/2017	08:00:00	0.00			
24/11/2017	18:00:00	2.00		Dry	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

Groundwater was not encountered during excavation.

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works. Services were not located.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	2.00	Arisings	24/11/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 28/11/2018

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-TT-11**
Fugro Reference	G170029U			
Coordinates (m)	E502963.53 N177698.16	Ground Elevation (m Datum)	22.59	Sheet 1 of 1
Hole Type	Trial Pit			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)
0.00	< 0.1
0.40	< 0.1
1.30	< 0.1
1.80	< 0.1

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

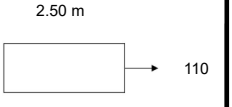
Contract Name	HAL Airport Expansion			Location ID	
Client	Heathrow Airport Limited			**HEP-TT-18**	
Fugro Reference	G170029U				
Coordinates (m)	E503098.14 N177513.81	Ground Elevation (m Datum)	22.52	Sheet 1 of 1	
Hole Type	Trial Pit / Trench			Status	Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.00 - 0.10 0.00 - 0.10 0.00 - 0.10 0.00	B D ES PID	3 2 1	< 0.1 ppm		MADE GROUND (Topsoil): (firm), black, slightly sandy, slightly gravelly, silty clay. With frequent roots/rootlets (<2x15 mm). With occasional fragments of glass (<60 mm). Sand is fine to coarse. Gravel is angular to subrounded, fine and medium of flint. [MADE GROUND] [CLAY]	(0.20) 0.20	22.32			
0.50 - 0.60 0.50 - 0.60 0.50 - 0.60 0.50	B D ES PID	6 5 4	< 0.1 ppm		MADE GROUND: light brown, slightly clayey, very sandy gravel. With some fragments of clinker (<60 mm), glass (20x23 mm), plastic (10x15 mm), metal strips (2x8 mm), fabric (10x27 mm) and tile (10x10 mm). Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of flint, brick and construction rubble. [MADE GROUND] [WASTE, e.g. LANDFILL]	(0.60) 0.80	21.72			
1.00 - 1.10 1.00 - 1.10 1.00 - 1.10 1.00	B D ES PID	9 8 7	< 0.1 ppm	1	MADE GROUND: dark brown, clayey, very sandy gravel with low cobble content. With frequent fragments of timber (10x25 mm), metal (15x15 mm), plastic pipe (25x37 mm) and tile (5x15 mm). Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of flint, granite, concrete and construction rubble. Cobbles (75x80x80 mm) are of brick, roadstone aggregate and granite. [MADE GROUND] [WASTE, e.g. LANDFILL]	(0.40) 1.20	21.32			
1.60 - 1.80 1.60 - 1.80 1.60 - 1.80 1.60	B D ES PID	12 11 10	< 0.1 ppm		MADE GROUND: (firm), light greenish mottled grey and locally black, slightly sandy, slightly gravelly clay with low cobble content. With occasional pockets (30x30 mm) of black, sandy clay. With some fragments of timber (30x45 mm), plastic (35x35 mm) and metal (5x20 mm). Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of granite, rare brick and concrete. Cobbles (85x100x100 mm) are subangular to subrounded of concrete and granite. [MADE GROUND] [WASTE, e.g. LANDFILL]	(0.80)				
				2	End of Trial Pit / Trench at 2.00 m	2.00	20.52			
				3						
				4						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Plan



Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-TT-18**
Fugro Reference	G170029U			
Coordinates (m)	E503098.14 N177513.81	Ground Elevation (m Datum)	22.52	Sheet 1 of 1
Hole Type	Trial Pit			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	2.00	TP	24/11/2017	24/11/2018	JCB 3CX			AK	AK	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
24/11/2017	08:00:00	0.00			
24/11/2017	18:00:00	2.00		Dry	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

Groundwater was not encountered during excavation.

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works. Services were not located.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	2.00	Arisings	24/11/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 28/11/2018

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-TT-18**
Fugro Reference	G170029U			
Coordinates (m)	E503098.14 N177513.81	Ground Elevation (m Datum)	22.52	Sheet 1 of 1
Hole Type	Trial Pit			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)
0.00	< 0.1
0.50	< 0.1
1.00	< 0.1
1.60	< 0.1

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

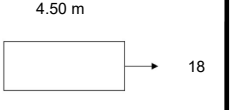
FUGRO	Contract Name	HAL Airport Expansion		Location ID	**HEP-TT-19**
	Client	Heathrow Airport Limited			
	Fugro Reference	G170029U			
	Coordinates (m)	E502992.68 N177408.28	Ground Elevation (m Datum) 24.90	Sheet 1 of 1	
	Hole Type	Trial Pit / Trench		Status	Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.05 - 0.15	D	2			MADE GROUND (Topsoil): brown, slightly sandy, gravelly clay. With frequent rootlets (<1x2x100 mm). Sand is fine to coarse. Gravel is subangular to rounded, fine to coarse of flint, concrete and brick.	(0.20)				
0.05 - 0.15	ES	3								
0.05 - 0.15	LB	1								
0.05	PID		< 0.1 ppm			0.20	24.70			
0.30 - 0.50	D	5			[MADE GROUND] [CLAY]					
0.30 - 0.50	ES	6			MADE GROUND: (firm), brown, gravelly clay with medium cobble and medium boulder content. With rare fragments of plastic sheeting (1x<200x300 mm) and wood (<50x50x100 mm). Gravel is subangular to rounded, fine to coarse of flint, brick and concrete. Cobbles (<200x200 mm) are angular and subangular of brick and concrete. Boulders (<350x350 mm) are angular of brick, masonry and concrete.					
0.30 - 0.50	LB	4								
0.30	PID		< 0.1 ppm			(0.60)				
					[MADE GROUND] [CLAY]	0.80	24.10			
				1	MADE GROUND: brown mottled light brown, very clayey gravel with high cobble content and low boulder content (60%). With frequent plastic sheeting (<1x4x4 mm) (20%), and some black plastic ducting (5x100x300 mm) (10%). With some fragments (10%) of ceramic and wood (<50x<200 mm), plastic tonne sacks and metal fragments (<100x<600 mm). Gravel is subangular to rounded, fine to coarse of flint, brick and concrete. Cobbles (<200x200 mm) are subangular and angular of brick and concrete. Boulders (<400x400 mm) are subangular and angular of brick, masonry and concrete.					
1.10 - 1.40	D	8								
1.10 - 1.40	ES	9								
1.10 - 1.40	LB	7								
1.10	PID		< 0.1 ppm							
						(1.30)				
					[MADE GROUND] [WASTE, e.g. LANDFILL]					
					Below 1.10 m; with occasional pockets (<200x200 mm) of firm, light brown, gravelly clay. Gravel is subrounded and rounded, fine to coarse of flint.					
				2						
					MADE GROUND: (firm and stiff), light brown, mottled orangish brown, slightly gravelly clay. With frequent fragments (<20 mm) of ash. Gravel is angular to subrounded, fine and medium of brick. [MADE GROUND] [WASTE, e.g. LANDFILL]	2.10	22.80			
2.20 - 2.40	D	11								
2.20 - 2.40	ES	12								
2.20 - 2.40	LB	10								
2.20	PID		< 0.1 ppm			(0.80)				
					Stiff, locally weakly cemented, brown to light brown, gravelly, silty CLAY. Gravel is subrounded and rounded, fine to coarse of flint. Moderate organic odour. [ALLUVIUM] [CLAY]	2.90	22.00			
				3						
3.10 - 3.40	D	14								
3.10 - 3.40	ES	15								
3.10 - 3.40	LB	13								
3.10	PID		< 0.1 ppm		Between 2.90 m and 3.10 m; with occasional rootlets (1x<10 mm).					
						(0.80)				
					Below 3.50 m; thinly laminated.					
					End of Trial Pit / Trench at 3.70 m	3.70	21.20			
				4						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Plan



Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-TT-19**
Fugro Reference	G170029U			
Coordinates (m)	E502992.68 N177408.28	Ground Elevation (m Datum)	24.90	Sheet 1 of 1
Hole Type	Trial Pit			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	3.70	TP	13/12/2017	13/12/2017	JCB 3CX			DL	DK	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
13/12/2017	08:00:00	0.00			
13/12/2017	18:00:00	3.70		Dry	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

Groundwater was not encountered during excavation.

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works. Services were not located.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	3.70	Arisings	13/12/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	JPD/ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 28/11/2018

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-TT-19**
Fugro Reference	G170029U			
Coordinates (m)	E502992.68 N177408.28	Ground Elevation (m Datum)	24.90	Sheet 1 of 1
Hole Type	Trial Pit			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)
0.05	< 0.1
0.30	< 0.1
1.10	< 0.1
2.20	< 0.1
3.10	< 0.1

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

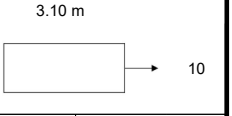
Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-TT-29**
Fugro Reference	G170029U			
Coordinates (m)	E503391.86 N177471.15	Ground Elevation (m Datum)	22.40	Sheet 1 of 1
Hole Type	Trial Pit / Trench			Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.00 - 0.10	ES	1			TOPSOIL: black, locally dark brown, slightly gravelly, silty clay.					
0.00	PID		< 0.1 ppm		With frequent roots/rootlets (<10 mm). Gravel is subangular and	(0.20)				
0.10	D	2			subrounded, fine to coarse of flint and other mixed lithologies.					
0.10 - 0.20	B	3			[TOPSOIL] [CLAY]	0.20	22.20			
					MADE GROUND: (firm and stiff), sandy, gravelly clay with low cobble content. Sand is fine to coarse. Gravel is subangular to well rounded, fine to coarse of flint and other mixed lithologies. Cobbles are well rounded of flint.					
0.50 - 0.60	ES	4								
0.50	PID		< 0.1 ppm		[MADE GROUND] [CLAY]					
0.70	D	5				(1.00)				
0.80 - 0.90	B	6		1						
					MADE GROUND: black and dark greyish brown, slightly clayey, very sandy gravel with low cobble content. With frequent fragments (<60 mm) of ash and clinker. Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of flint and other mixed lithologies. Cobbles are well rounded of flint.	1.20	21.20			
1.50 - 1.60	ES	7								
1.50	PID		< 0.1 ppm		[MADE GROUND] [GRAVEL]	(0.80)				
1.70	D	8								
1.80 - 1.90	B	9		2						
					End of Trial Pit / Trench at 2.00 m	2.00	20.40			
				3						
				4						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Plan



Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-TT-29**
Fugro Reference	G170029U			
Coordinates (m)	E503391.86 N177471.15	Ground Elevation (m Datum)	22.40	Sheet 1 of 1
Hole Type	Trial Pit			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	2.00	TP	28/11/2017	28/11/2017	JCB 3CX			AK	AK	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
28/11/2017	08:00:00	0.00			
28/11/2017	18:00:00	2.00		Dry	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

Groundwater was not encountered during excavation.

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works. Services were not located.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	2.00	Arisings	28/11/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 28/11/2018

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-TT-29**
Fugro Reference	G170029U			
Coordinates (m)	E503391.86 N177471.15	Ground Elevation (m Datum)	22.40	Sheet 1 of 1
Hole Type	Trial Pit			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)
0.00	< 0.1
0.50	< 0.1
1.50	< 0.1

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

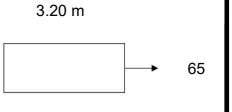
Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-TT-39**
Fugro Reference	G170029U			
Coordinates (m)	E503719.95 N177613.50	Ground Elevation (m Datum)	22.62	Sheet 1 of 1
Hole Type	Trial Pit / Trench			Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.10	D	2			MADE GROUND: dark brown and black, slightly gravelly, silty sand with low cobble content (80%). With frequent roots/rootlets. With frequent fragments of plastic (20%). Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of brick. Cobbles (20x80x100 mm) are of brick. [MADE GROUND] [WASTE, e.g. LANDFILL]	(0.20)				
0.10	ES	1				0.20	22.42			
0.10 - 0.20	B	3								
0.10	PID		< 0.1 ppm							
0.50 - 0.60	ES	4			MADE GROUND: brown, slightly gravelly sand (90%). With occasional pockets (50x100 mm) of clay. With occasional fragments (5%) of glass (5x15 mm) and plastic (15x25 mm). Gravel is subangular to well rounded, fine to coarse of flint and other mixed lithologies. [MADE GROUND] [WASTE, e.g. LANDFILL]					
0.50	PID		< 0.1 ppm							
0.70	D	5								
0.80 - 0.90	B	6				(1.20)				
				1						
						1.40	21.22			
1.50 - 1.60	ES	7			MADE GROUND: (probably firm), dark brown, greenish grey and locally black, slightly sandy, very gravelly clay. With occasional pockets (<20 mm) of black, slightly organic, silty clay. Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of flint and occasional brick. [MADE GROUND] [CLAY]					
1.50	PID		< 0.1 ppm							
1.70	D	7				(0.60)				
1.80 - 1.90	B	9								
				2	End of Trial Pit / Trench at 2.00 m	2.00	20.62			
				3						
				4						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Plan



Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-TT-39**
Fugro Reference	G170029U			
Coordinates (m)	E503719.95 N177613.50	Ground Elevation (m Datum)	22.62	Sheet 1 of 1
Hole Type	Trial Pit			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	2.00	TP	28/11/2017	28/11/2017	JCB 3CX			AK	AK	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
28/11/2017	08:00:00	0.00			
28/11/2017	18:00:00	2.00		Dry	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

Groundwater was not encountered during excavation.

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works. Services were not located.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	2.00	Arisings	28/11/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 28/11/2018

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-TT-39**
Fugro Reference	G170029U			
Coordinates (m)	E503719.95 N177613.50	Ground Elevation (m Datum)	22.62	Sheet 1 of 1
Hole Type	Trial Pit			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)
0.10	< 0.1
0.50	< 0.1
1.50	< 0.1

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

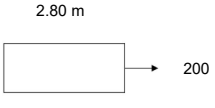
FUGRO	Contract Name	HAL Airport Expansion		Location ID	
	Client	Heathrow Airport Limited		**HEP-TT-1032**	
	Fugro Reference	G170029U			
	Coordinates (m)	E503913.37 N177557.33	Ground Elevation (m Datum) 22.12	Sheet 1 of 1	
	Hole Type	Trial Pit / Trench		Status	Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.10	D	2			MADE GROUND (Topsoil): dark grey and locally black, slightly clayey, slightly gravelly sand. With frequent roots/rootlets (<15 mm). Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of flint and occasional brick. [MADE GROUND] [SAND]	(0.20)				
0.10	ES	1				0.20	21.92			
0.10 - 0.20	LB	3								
0.10	PID		< 0.1 ppm							
0.50	PID		< 0.1 ppm		MADE GROUND: light orangish brown, slightly clayey, sandy gravel with low cobble content. With some fragments of burnt wood (80x200 mm). Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of flint. Cobbles are well rounded of flint and brick. [MADE GROUND] [GRAVEL]					
						(1.20)				
1.00 - 1.10	ES	4		1						
1.20	D	5								
1.30 - 1.40	LB	6								
						1.40	20.72			
1.50	PID		< 0.1 ppm		MADE GROUND: dark greenish grey and locally black, slightly sandy, gravelly clay with low cobble content. Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of flint. Cobbles are well rounded of flint and half brick. [MADE GROUND] [CLAY]					
2.00 - 2.10	ES	7		2						
2.20	D	8				(1.60)				
2.30 - 2.40	LB	9								
2.80 - 2.90	ES	10								
3.00	D	11		3		3.00	19.12			
3.10 - 3.20	LB	12			MADE GROUND: dark greenish grey and locally black, clayey, sandy gravel with low cobble content. Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of flint and other mixed lithologies. Cobbles are as gravel. [MADE GROUND] [GRAVEL]	(0.20)				
						3.20	18.92			
					End of Trial Pit / Trench at 3.20 m					
				4						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Plan



Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-TT-1032**
Fugro Reference	G170029U			
Coordinates (m)	E503913.37 N177557.33	Ground Elevation (m Datum)	22.12	Sheet 1 of 1
Hole Type	Trial Pit			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	3.20	TP	28/11/2017	28/11/2017	JCB 3CX			AK	AK	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
28/11/2017	08:00:00	0.00			
28/11/2017	18:00:00	3.20		1.90	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)
3.20	1.90	40		

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works. Services were not located.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	3.20	Arisings	28/11/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 28/11/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-TT-1032**
	Fugro Reference	G170029U			
	Coordinates (m)	E503913.37 N177557.33	Ground Elevation (m Datum)	22.12	Sheet 1 of 1
	Hole Type	Trial Pit			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)
0.10	< 0.1
0.50	< 0.1
1.50	< 0.1

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

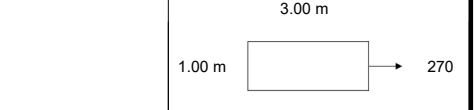
Contract Name	HAL Airport Expansion			Location ID	**HEP-TP-10**
Client	Heathrow Airport Limited				
Fugro Reference	G170029U				
Coordinates (m)	E502809.65 N177684.91	Ground Elevation (m Datum)	21.49	Sheet 1 of 1	
Hole Type	Trial Pit / Trench			Status	Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
					MADE GROUND (Topsoil): brown, slightly sandy, slightly gravelly, silty clay. With frequent rootlets (<1x3 mm). Sand is fine to coarse. Gravel is subangular to rounded, fine to coarse of flint, brick and concrete. [MADE GROUND] [CLAY]	(0.10) 0.10	21.39			
0.20 - 0.30	D	2								
0.20 - 0.30	ES	3								
0.20 - 0.30	LB	1								
0.20	PID		< 0.1 ppm		MADE GROUND: light brown to brown, slightly sandy gravelly clay with low cobble and boulder content. With a mesh fencing (500x1900 mm), rare fragments of plastic (<1x100x500 mm) and wood (<100x100x500 mm). Sand is fine to coarse. Gravel is angular to subrounded fine to coarse of flint, brick and concrete. Cobbles (<200x200 mm) are angular and subangular of concrete. Boulders (<350x350 mm) are angular and subangular of concrete and masonry. [MADE GROUND] [CLAY]	(0.75) 0.85	20.64			
0.90 - 1.10	D	5								
0.90 - 1.10	ES	6								
0.90 - 1.10	LB	4		1	MADE GROUND: light brown, slightly sandy, clayey gravel. With rare fragments (<60 mm) of ceramic and glass. Sand is fine to coarse. Gravel is subrounded and rounded, fine to coarse of flint and rare brick. [MADE GROUND] [GRAVEL]	(0.35) 1.20	20.29			
0.90	PID		< 0.1 ppm							
1.30 - 1.50	D	8								
1.30 - 1.50	ES	9								
1.30 - 1.50	LB	7			MADE GROUND: dark brown to brown, gravelly sand with low cobble content (75%). With frequent (20%) burnt ash and glass (<60 mm) and occasional (5%) fragments of plastic sheet (10x100 mm). Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of brick and concrete (<200x200 mm). [MADE GROUND] [WASTE, e.g. LANDFILL]	(0.60) 1.80	19.69			
1.30	PID		< 0.1 ppm							
					Light greenish grey, slightly clayey, silty, sandy GRAVEL. Sand is fine to coarse. Gravel is subrounded and rounded, fine to coarse flint. [RIVER TERRACE DEPOSITS] [GRAVEL]					
2.00 - 2.20	D	11		2						
2.00 - 2.20	ES	12								
2.00 - 2.20	LB	10				(1.20)				
2.00	PID		< 0.1 ppm							
				3	End of Trial Pit / Trench at 3.00 m	3.00	18.49			
				4						

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Plan



Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-TP-10**
Fugro Reference	G170029U			
Coordinates (m)	E502809.65 N177684.91	Ground Elevation (m Datum)	21.49	Sheet 1 of 1
Hole Type	Trial Pit			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	3.00	TP	12/12/2017	12/12/2017	JCB 3CX			DL	DL	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
12/12/2017	00:00:00	0.00			
12/12/2017	18:00:00	3.00		2.40	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)
3.00	2.40	20		

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works. Services were not located. The trial pit was terminated at 3.00m due to water inflow at 2.40 m and collapse of the sidewalls below 1.10 m.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	3.00	Arisings	12/12/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 28/11/2018

Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-TP-10**
Fugro Reference	G170029U			
Coordinates (m)	E502809.65 N177684.91	Ground Elevation (m Datum)	21.49	Sheet 1 of 1
Hole Type	Trial Pit			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)
0.20	< 0.1
0.90	< 0.1
1.30	< 0.1
2.00	< 0.1

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

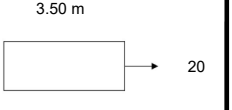
FUGRO	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-TP-1296**
	Fugro Reference	G170029U			
	Coordinates (m)	E502857.52 N177483.41	Ground Elevation (m Datum)	23.21	Sheet 1 of 1
	Hole Type	Trial Pit / Trench			Status: Final

Sampling and In Situ Testing				Strata Details					Groundwater	
Depth (m)	Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.05 - 0.15 0.05 - 0.15 0.05 - 0.15 0.05	D ES LB PID	2 3 1	< 0.1 ppm		MADE GROUND (Topsoil): slightly clayey, gravelly sand. With frequent rootlets (<2x<100 mm). Sand is fine to coarse. Gravel is angular to rounded, fine to coarse of flint, brick and concrete. [MADE GROUND] [SAND]	(0.20) 0.20	23.01			
0.40 - 0.60 0.40 - 0.60 0.40 - 0.60 0.40	D ES LB PID	5 6 4	< 0.1 ppm	1	MADE GROUND: brown, sand and gravel. With rare fragments of ceramic tile (<60 mm). Sand is fine to coarse. Gravel is subrounded and rounded, fine to coarse of flint and rare brick and concrete. [MADE GROUND] [SAND AND GRAVEL]	(0.90)				
1.30 - 1.50 1.30 - 1.50 1.30 - 1.50 1.30	D ES LB PID	8 9 7	< 0.1 ppm		MADE GROUND: (soft and firm), dark grey to black, slightly sandy, gravelly clay. With rare fragments (<1%) of plastic (<1x<10 mm) and plastic cable insulator (5x100x200 mm). Sand is fine to coarse. Gravel is subangular and subrounded, fine to coarse of flint, brick and concrete. Strong organic odour. [MADE GROUND] [CLAY]	1.10 (0.60)	22.11			
1.90 - 2.00 1.90 - 2.00 1.90 - 2.00 1.90	D D ES PID	10 11 12	< 0.1 ppm	2	MADE GROUND: brown, very sandy gravel with low cobble content and low boulder content. With occasional pockets (<300x300 mm) of black, organic, silty clay. With occasional fragments of wood (<30x<200mm) and plastic sheeting (<1x100x1000 mm). Sand is fine to coarse. Gravel is subangular to rounded, fine to coarse of flint, brick and concrete. Cobbles are angular and subangular of concrete and brick. Boulders (<300x300 mm) are angular and subangular of concrete and brick. [MADE GROUND] [WASTE, e.g. LANDFILL]	1.70 (0.80)	21.51			
2.70 - 3.00 2.70 - 3.00 2.70 - 3.00 2.70	D ES LB PID	14 15 13	< 0.1 ppm	3	MADE GROUND: brown, clayey sandy, gravelly cobbles. With abundant fragments of plastic sheeting (<1x500x500 mm) (30%) and some fragments of wood debris (5x100x600 mm) (10%) With occasional fragments of white ceramic tiles (2x10x<25 mm) (5%) and textiles, various clothing and fibrous bags (5%). Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse of gravel, brick and concrete. Cobbles are angular and subangular of concrete and brick. Boulders (<300x300 mm) are angular of concrete and brick masonry. [MADE GROUND] [WASTE, e.g. LANDFILL]	2.50 (1.00)	20.71			
				4	End of Trial Pit / Trench at 3.50 m	3.50	19.71			

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Plan



Contract Name	HAL Airport Expansion			Location ID
Client	Heathrow Airport Limited			**HEP-TP-1296**
Fugro Reference	G170029U			
Coordinates (m)	E502857.52 N177483.41	Ground Elevation (m Datum)	23.21	Sheet 1 of 1
Hole Type	Trial Pit			Status: Final

Equipment

Depth From (m)	Depth To (m)	Hole Type	Date From	Date To	Equipment	Core Barrel	Core Bit	Drilling Crew	Logged By	Remarks
0.00	3.50	TP	13/12/2017	13/12/2017	JCB 3CX			DL	DL	

Progress

Date (dd/mm/yyyy)	Time (hh:mm:ss)	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Weather
13/12/2017	08:00:00	0.00			
13/12/2017	18:00:00	3.50		Dry	

Rotary Details

Depth From (m)	Depth To (m)	Flush Type	Flush Return (%)	Flush Colour	Run Time (hh:mm)

Core Details

Depth From (m)	Depth To (m)	Diameter (mm)

Hole and Casing

Depth To (m)	Hole Diameter (mm)	Depth To (m)	Casing Diameter (mm)

Chiselling / Slow Progress

Depth From (m)	Depth To (m)	Duration (hh:mm)	Tool / Remark

Water Strike

Strike At (m)	Rise To (m)	Time Elapsed (mins)	Casing Depth (m)	Depth Sealed (m)

Water Added

Depth From (m)	Depth To (m)

Water Strike Remarks

Groundwater was not encountered during excavation.

General Remarks

A PAS128:2014 compliant survey was carried out for underground utility mapping prior to intrusive works. Services were not located.

Installation

Type	ID	Response Zone Top (m)	Response Zone Base (m)	Installation Date

Pipe

ID	Top Depth (m)	Base Depth (m)	Diameter (mm)	Type

Backfill

Depth From (m)	Depth To (m)	Backfill Material	Date
0.00	3.50	Arisings	13/12/2017

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB

Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/21/11/2018/TS — Print Date: 28/11/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-TP-1296**
	Fugro Reference	G170029U			
	Coordinates (m)	E502857.52 N177483.41	Ground Elevation (m Datum)	23.21	Sheet 1 of 1
	Hole Type	Trial Pit			Status: Final

Standard Penetration Test Results

Test Depth (m)	Test Type	Self Weight Penetration (mm)	Test Result	Total Penetration (mm)	Hammer Serial Number	Energy Ratio (%)	Casing Depth (m)	Water Depth (m)

In Situ Vane Test Results

Test Depth (m)	Test Type	Undisturbed Undrained Shear Strength (kPa)	Residual Undrained Shear Strength (kPa)

In Situ Hand Penetrometer Results

Test Depth (m)	Undisturbed Undrained Shear Strength (kPa)

Volatile Headspace Testing by Photoionisation Detector

Test Depth (m)	PID Result (ppm)
0.05	< 0.1
0.40	< 0.1
1.30	< 0.1
1.90	< 0.1
2.70	< 0.1

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

E. PHOTOGRAPHS

E.1 TRIAL PIT AND TRIAL TRENCH PHOTOGRAPHS

Trial Pit and Trial Trench Photographs (referenced by Position ID)

HEP-TP-10 (Pre Condition)

HEP-TP-10 (Face A)

HEP-TP-10 (Face B)

HEP-TP-10 (Face C)

HEP-TP-10 (Face D)

HEP-TP-10 (Spoil)

HEP-TP-10 (Post Condition)

HEP-TP-1296 (Pre Condition)

HEP-TP-1296 (Face A)

HEP-TP-1296 (Face B)

HEP-TP-1296 (Face C)

HEP-TP-1296 (Face D)

HEP-TP-1296 (Spoil)

HEP-TP-1296 (Post Condition)

HEP-TT-3 (Face A)

HEP-TT-3 (Face B)

HEP-TT-3 (Face C)

HEP-TT-3 (Face D)

HEP-TT-3 (Spoil)

HEP-TT-6 (Pre Condition)

HEP-TT-6 (Face A)

HEP-TT-6 (Face B)

HEP-TT-6 (Face C)

HEP-TT-6 (Spoil)

HEP-TT-6 (Post Condition)

HEP-TT-9 (Pre Condition)

HEP-TT-9 (East Face)

HEP-TT-9 (North Face)

HEP-TT-9 (West Face)

HEP-TT-9 (South Face)

HEP-TT-9 (Spoil)

HEP-TT-9 (Post Condition)

HEP-TT-11 (East Face)

HEP-TT-11 (South Face)

HEP-TT-11 (Spoil)

HEP-TT-18 (Pre Condition)

HEP-TT-18 (North Face)

HEP-TT-18 (West Face)

HEP-TT-18 (South Face)

HEP-TT-18 (East Face)

HEP-TT-19 (Pre Condition)

HEP-TT-19 (Face A)

HEP-TT-19 (Face B)

HEP-TT-19 (Face C)

HEP-TT-19 (Face D)

HEP-TT-19 (Spoil)

HEP-TT-19 (Post Condition)

HEP-TT-29 (Pre Condition)

HEP-TT-29 (Face A)

HEP-TT-29 (Face B)

HEP-TT-29 (Face C)

HEP-TT-29 (Face D)

HEP-TT-39 (Pre Condition)

HEP-TT-39 (Face A)

HEP-TT-39 (Face B)

HEP-TT-39 (Face C)

F. FIELD TESTS

F.1 STANDARD PENETRATION TESTS

Standard Penetration Test Equipment Calibration Reports:

- EQU306;
- EQU1616;
- BS11;
- CD1;
- DT0767;
- SEDS1.

F.2 PHOTO IONISATION DETECTOR TESTS

Photo Ionisation Detector Equipment Calibration Reports:

- MiniRAE Lite M01C008972;
- MultiRAE M01C008973;
- MultiRAE Multigas Monitor M01E007171;
- MultiRAE Multigas Monitor M01E008183;
- PHD6 Multigas Monitor 530908008;
- PHD6 Multigas Monitor 530934014;
- PHD6 Multigas Monitor 531114028.

F.3 PERMEABILITY TESTS

Variable Head Permeability Test Results within Boreholes (referenced by Position ID and test number)

Slug Tests within Installations (results presented as digital data only)

F.4 CONE PENETRATION TESTS

F.4.1 Accreditation and Calibration Reports

Cone Penetration Testing Schedules of UKAS Accreditation

Cone Penetration Equipment Calibration Reports:

- 1701-1515;
- 1701-1529;
- 1701-1987;
- 1701-2904.

F.4.2 Schedules and Data Sheets

Schedule of Cone Penetration Testing Figure F.4.2.1

Heathrow Expansion Project Cone Penetration Testing - Measured and Derived Parameters	Figure F.4.2.2

F.4.3 Cone Penetration Test Results

Plot 1: Measured and Calculated Data	(referenced by Position ID)
Plot 2: Calculated Data	(referenced by Position ID)
Plot 3: Derived Parameters	(referenced by Position ID)
Dissipation Test Results	(referenced by Position ID and test number)

SPT Calibration Report

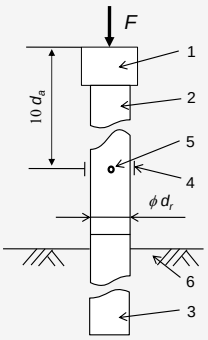
www.equipegroup.com

Hammer Energy Measurement Report

Type of Hammer		SPT HAMMER
Client		FUGRO
Test No		EQU1911
Test Depth (m)		8.50
Mass of the hamn	m =	63.5kg
Falling height	h =	0.76m
E_{theor} =	$m \times g \times h$ =	473J

Characteristics of the instrumented rod

Diameter	d_r =	0.052 m
Length of instrumented rod		0.558 m
Area	A =	11.61 cm²
Modulus	E_a =	206843 MPa



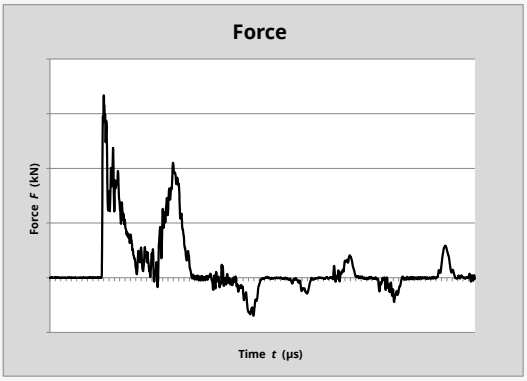
Key

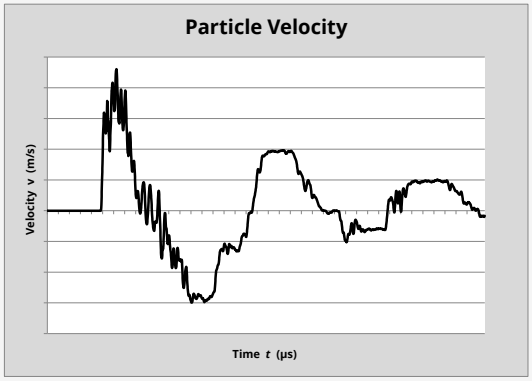
1 Anvil
2 Part of instrumented rod
3 Drive Rod
4 Strain Gauge
5 Accelerometer
6 Ground

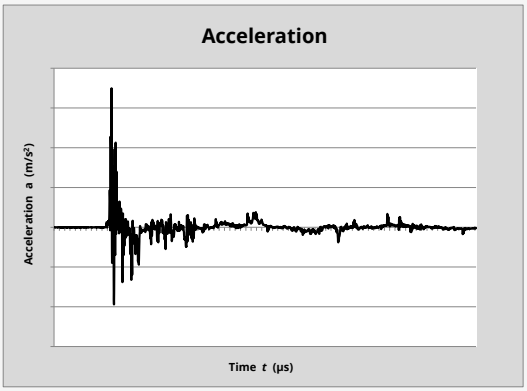
F Force
d_r Diameter of rod

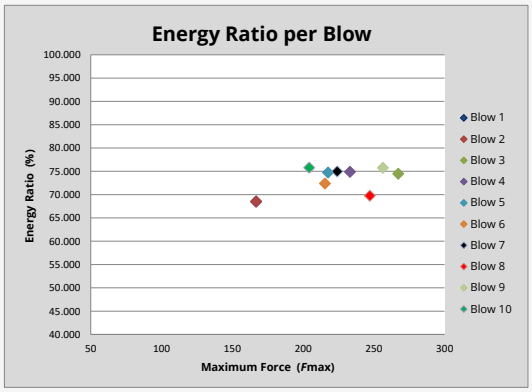
Fig. B.1 and B.2
BS EN ISO 22476-3 : 2005 + A1 : 2011

DATE OF TEST	VALID UNTIL	HAMMER ID
06 October 2017	06 October 2018	EQU306









Observations:
1.

E_{meas} =	**0.344**	kN-m
E_{theor} =	**0.473**	kN-m

Energy Ratio = $\frac{E_{meas}}{E_{theor}}$ (E_r) = 72.71%

Equipe SPT Analyzer Operators: AF

Prepared by:	**Checked by:**	**Date:**
	10/10/2017	10/10/2017

 Equipe Group, The Paddocks, Home Farm Offices, The Upton Estate, Banbury, Oxfordshire, OX15 6HU
Tel: +44 (0)1295 670990 Fax: +44 (0)1295 678232 Email: info@equipegroup.com

SPT Calibration Report

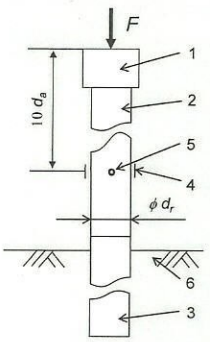
EQUIPE GROUP
www.equipegroup.com

Hammer Energy Measurement Report

Type of Hammer		SPT HAMMER
Client		FUGRO
Test No		EQU1913
Test Depth (m)		8.50
Mass of the hamn	m =	63.5kg
Falling height	h =	0.76m
E_{theor} =	$m \times g \times h$ =	473J

Characteristics of the instrumented rod

Diameter	d_r =	0.052 m
Length of instrumented rod		0.558 m
Area	A =	11.61 cm²
Modulus	E_a =	206843 MPa



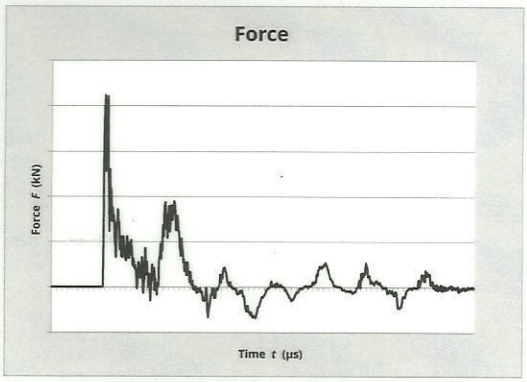
Key

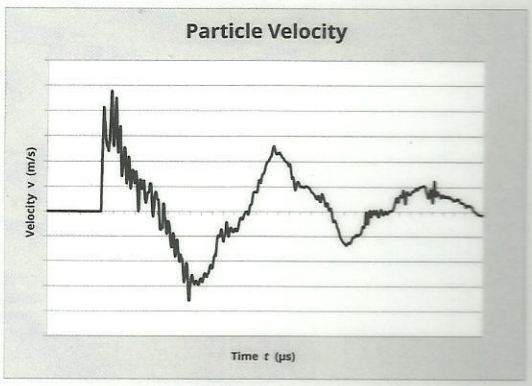
1 Anvil
2 Part of instrumented rod
3 Drive Rod
4 Strain Gauge
5 Accelerometer
6 Ground

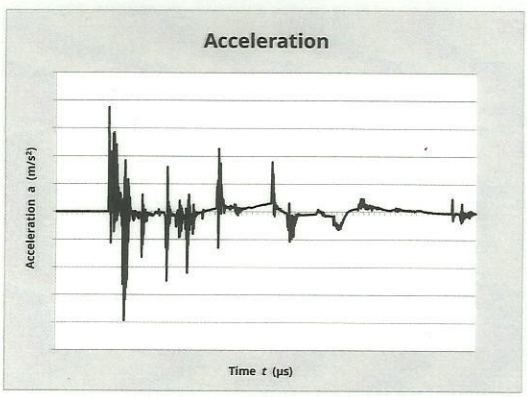
F Force
d_r Diameter of rod

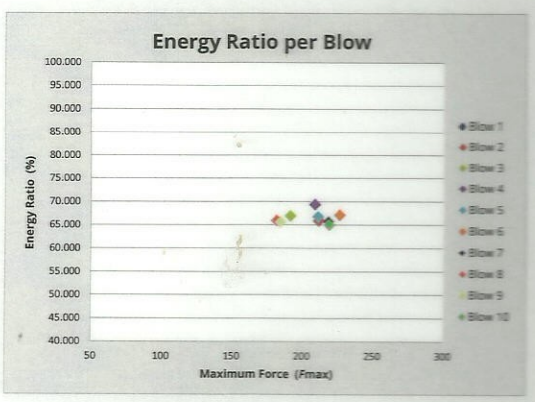
Fig. B.1 and B.2
BS EN ISO 22476-3 : 2005 + A1 : 2011

DATE OF TEST	VALID UNTIL	HAMMER ID
06 October 2017	06 October 2018	EQU1616









Observations:
1.

E_{meas} =	**0.313** kN-m	
E_{theor} =	**0.473** kN-m	
Energy Ratio = $\frac{E_{meas}}{E_{theor}}$ (E_r)		**66.19%**

Equipe SPT Analyzer Operators: AF

Prepared by: [signature] **Checked by:** [signature] **Date:** 10/10/2017

Hammer Energy Test Report

in accordance with BSEN ISO 22476-3:2005

Dynamic sampling uk ltd
6-8 victory parkway
victory road
Derby
DE24 8ZF

Hammer Ref:	BS11
Test Date:	17/08/2017
Report Date:	21/08/2017
File Name:	BS11.spt
Test Operator:	TP

Instrumented Rod Data

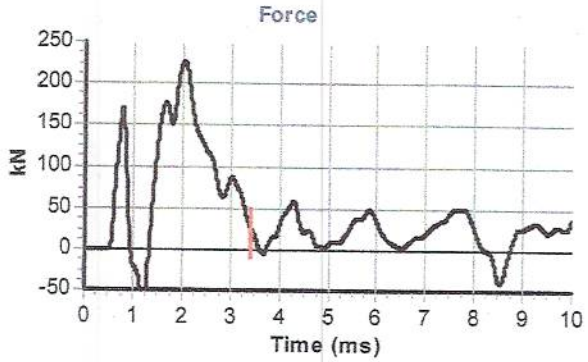
Diameter d_r (mm):	54
Wall Thickness t_r (mm):	6.9
Assumed Modulus E_a (GPa):	208
Accelerometer No.1:	6455
Accelerometer No.2:	6457

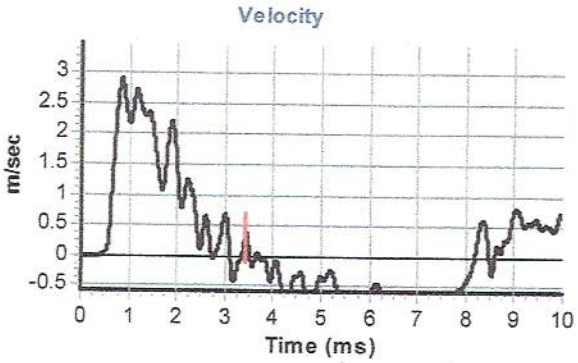
Hammer Information

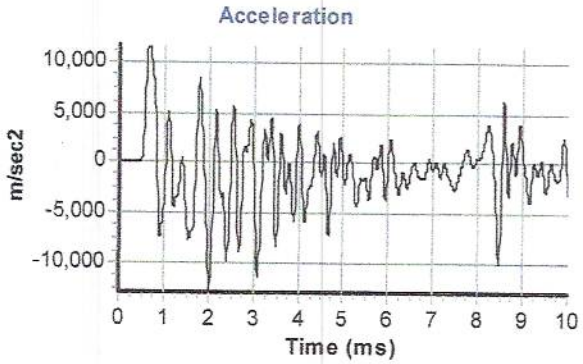
Hammer Mass m (kg):	63.5
Falling Height h (mm):	760
String Length L (m):	15.0

Comments / Location

Borehole solutions hammer tested at Dynmamic samplngs yard.



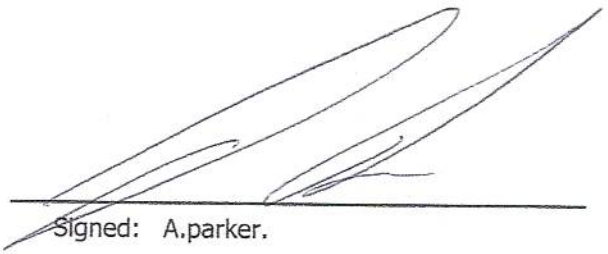




Calculations

Area of Rod A (mm2):	1021
Theoretical Energy E_{theor} (J):	473
Measured Energy E_{meas} (J):	293

Energy Ratio E_r (%): **62**



Signed: A.parker.

Title: Associate Director.

The recommended calibration interval is 12 months

Allied Exploration & Geotechnics Ltd.

Unit 25 Stella Gill Industrial Esatate
Pelton Fell
Chester-le-Street
DH2 2RG

SPT Hammer Energy Test Report

in accordance with BSEN ISO 22476-3:2005

SPT Hammer Ref:	CD1
Test Date:	06/06/2017
Report Date:	06/06/2017
File Name:	CD1.spt
Test Operator:	BP

Instrumented Rod Data

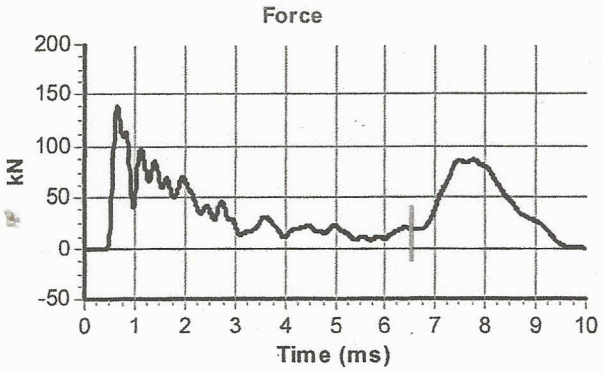
Diameter d_r (mm):	54
Wall Thickness t_r (mm):	6.2
Assumed Modulus E_a (GPa):	208
Accelerometer No.1:	5990
Accelerometer No.2:	5991

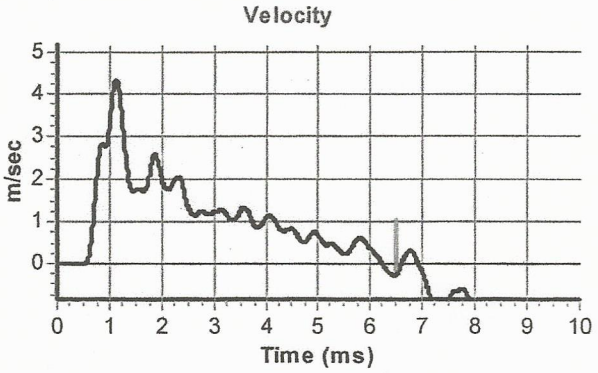
SPT Hammer Information

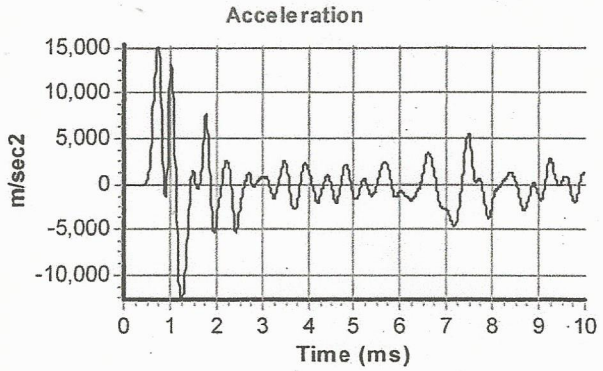
Hammer Mass m (kg):	63.5
Falling Height h (mm):	760
SPT String Length L (m):	14.0

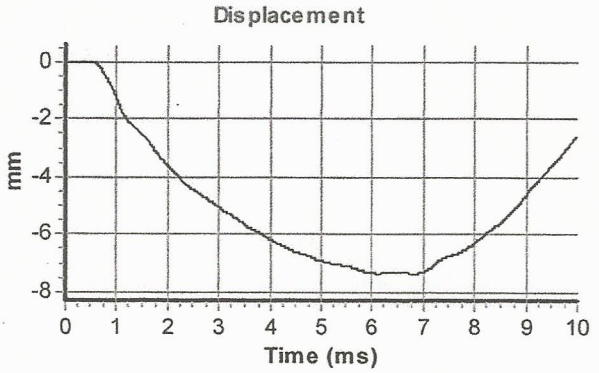
Comments / Location

Mass and drop supplied by client









Calculations

Area of Rod A (mm2):	931
Theoretical Energy E_{theor} (J):	473
Measured Energy E_{meas} (J):	353

Energy Ratio E_r (%): **75**

B Proctor

Signed: Brian Proctor

Title: Technician

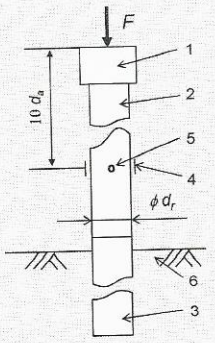
The recommended calibration interval is 12 months

SPT Calibration Report

EQUIPE GROUP
www.equipegroup.com

Hammer Energy Measurement Report

Type of Hammer	TERRIER
Client	FUGRO
Test No	EQU1928_4
Test Depth (m)	8.50
Mass of the hamn	m = 63.5kg
Falling height	h = 0.76m
E_{theor} =	$m \times g \times h$ = 473J



Key
1 Anvil
2 Part of instrumented rod
3 Drive Rod
4 Strain Gauge
5 Accelerometer
6 Ground

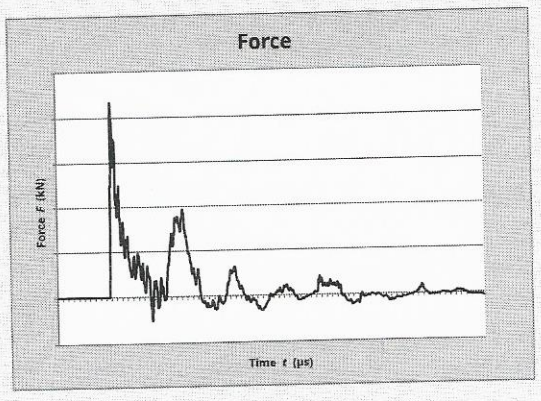
F Force
d_r Diameter of rod

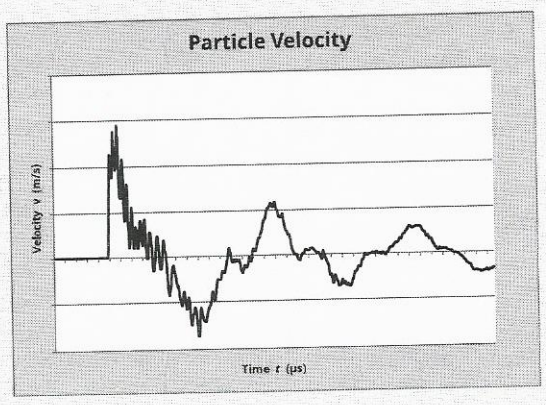
Fig. B.1 and B.2
BS EN ISO 22476-3 : 2005 + A1 : 2011

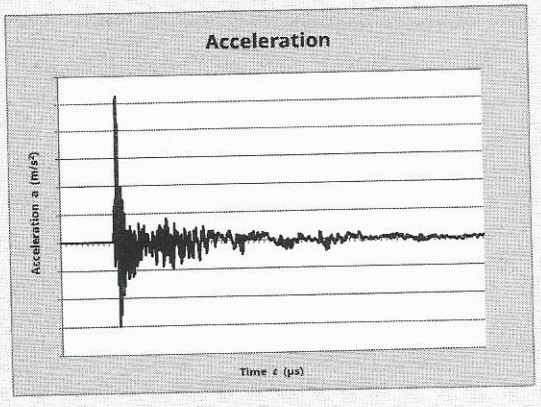
Characteristics of the instrumented rod

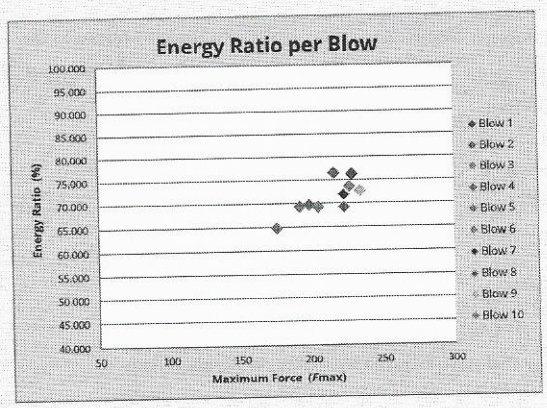
Diameter	d_r = 0.052 m
Length of instrumented rod	0.558 m
Area	A = 11.61 cm²
Modulus	E_a = 206843 MPa

DATE OF TEST	VALID UNTIL	HAMMER ID
14/11/2017	14/11/2018	DT/0767









Observations:
1.

E_{meas} =	**0.336** kN-m	**Energy Ratio =** E_r	$\frac{E_{meas}}{E_{theor}}$ = **71.00%**
E_{theor} =	**0.473** kN-m		

Equipe SPT Analyzer Operators: AF

Prepared by: [signature] **Checked by:** [signature] **Date:** 14/11/2017

Equipe Group, The Paddocks, Home Farm Offices, The Upton Estate, Banbury, Oxfordshire, OX15 6HU
Tel: +44 (0)1295 670990 Fax: +44 (0)1295 678232 Email: info@equipegroup.com

Southern Testing

SPT Hammer Energy Test Report

in accordance with BSEN ISO 22476-3:2005

Southern Testing Laboratories Ltd
Unit 11
Charlwoods Road
East Grinstead
West Sussex
RH19 2HU

SPT Hammer Ref:	SEDS1.
Test Date:	29/04/2017
Report Date:	29/04/2017
File Name:	SEDS1..spt
Test Operator:	NPB

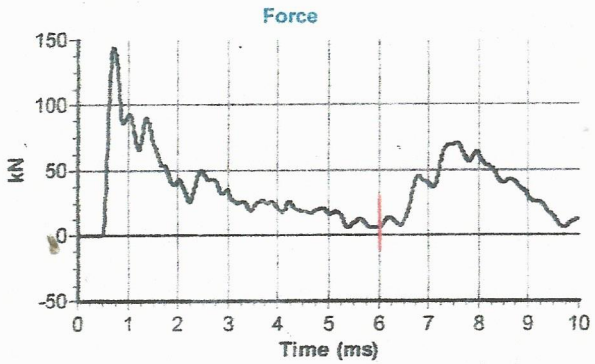
Instrumented Rod Data

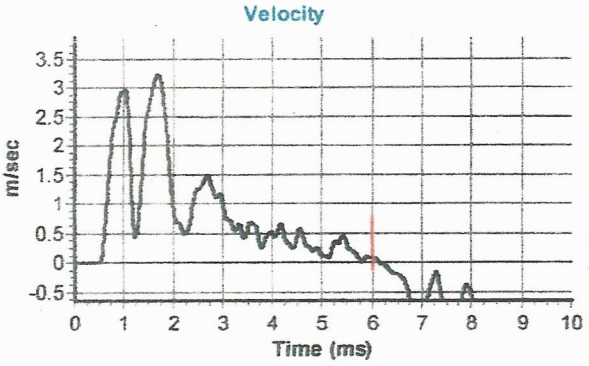
Diameter d_r (mm):	54
Wall Thickness t_r (mm):	6.0
Assumed Modulus E_a (GPa):	200
Accelerometer No.1:	6458
Accelerometer No.2:	9607

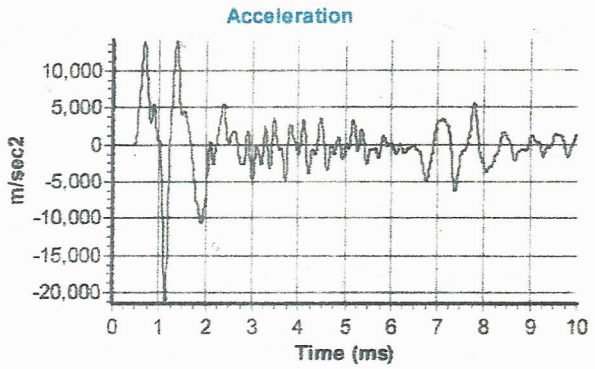
SPT Hammer Information

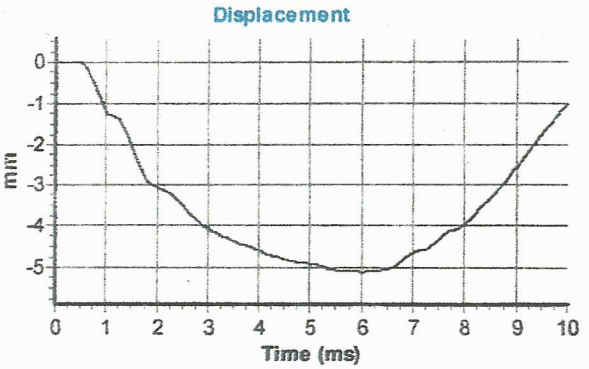
Hammer Mass m (kg):	63.5
Falling Height h (mm):	750
SPT String Length L (m):	14.5

Comments / Location









Calculations

Area of Rod A (mm2):	905
Theoretical Energy E_{theor} (J):	473
Measured Energy E_{meas} (J):	314

Energy Ratio E_r (%): **66**

N P Burrows

Signed: N P Burrows

Title: Field Operations Manager

The recommended calibration interval is 12 months

shawcity LIMITED
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CERTIFICATE OF CALIBRATION
MiniRAE Lite

CALIBRATION CERTIFICATE NO: 61689

ISSUED BY: SHAWCITY LIMITED
DATE: 29.08.17

APPROVED SIGNATORY: P A Gunter

NAME: PeterGunter

CUSTOMER: Shawcity Ltd -Exhibition equipment
INSTRUMENT: MiniRAE Lite
SERIAL NUMBER: M01C008972

CALIBRATION METHOD: CM03
AMBIENT CONDITIONS: 20°C ± 2°C and 50% (± 20%) RH

Prior to calibration the instrument was allowed to stabilise in the laboratory for at least 30 minutes.
The instrument was calibrated by exposing the sensor to known values of gas concentrations.
All gases were sampled through the complete probe and in line filter, where applicable.
The reference value is that generated by the certified source and the indicated value is that measured by the instrument.

CALIBRATION RESULTS

GAS	LOT No	REF. VALUE	INDICATED VALUE
Oxygen	Ambient Air	20.9% O2	20.9% O2
Nitrogen	161373	>99.999%	0.0% O2
Methane	WO148051	50% LEL	50% LEL
Carbon Monoxide	WO148051	50 ppm	50 ppm
Hydrogen Sulphide	WO148051	10 ppm	10 ppm
Isobutylene	170262	100 ppm	100 ppm

COMMENTS:
The reported uncertainty is based on a standard uncertainty multiplied by a coverage factor of $k=2$.
This provides a level of confidence of uncertainty of approximately 95%.
The uncertainty of measurement is ±2 %
The results indicate that the instrument conforms to the applicable parts of the published specification.

Tel: 01793 780622
www.shawcity.co.uk
Instrument House, 91-92 Shrivenham Hundred Business Park
Watchfield, Oxfordshire, SN6 8TY
Fax: 01793 784466
service@shawcity.co.uk

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CERTIFICATE OF CALIBRATION
MultiRAE

CALIBRATION CERTIFICATE NO: 60480

ISSUED BY: SHAWCITY LIMITED
DATE: 08.03.17

APPROVED SIGNATORY:

NAME: PeterGunter

CUSTOMER: Shawcity Ltd -Exhibition equipment
INSTRUMENT: MultiRAE
SERIAL NUMBER: M01C008973

CALIBRATION METHOD: CM03
AMBIENT CONDITIONS: 20°C ± 2°C and 50% (± 20%) RH

Prior to calibration the instrument was allowed to stabilise in the laboratory for at least 30 minutes.
The instrument was calibrated by exposing the sensor to known values of gas concentrations.
All gases were sampled through the complete probe and in line filter, where applicable.
The reference values are those generated by the certified sources and the indicated values are those measured by the instrument.

CALIBRATION RESULTS

GAS	LOT No	REF. VALUE	INDICATED VALUE
Oxygen	Ambient Air	20.9% 02	20.9% 02
Nitrogen	WO151148-9	>99.999%	>99.99%
Methane	WO151148-9	50% LEL	50% LEL
Carbon Monoxide	WO151148-9	50 ppm	50 ppm
Hydrogen Sulphide	WO151148-9	10 ppm	10 ppm
Isobutylene	170262	100 ppm	100 ppm

COMMENTS:
The reported uncertainty is based on a standard uncertainty multiplied by a coverage factor of $k = 2$.
This provides a level of confidence of uncertainty of approximately 95%.
The uncertainty of measurement is ±2% of range.
The results indicate that the instrument conforms to the applicable parts of the published specification.

Tel: 01793 780622
www.shawcity.co.uk
Instrument House, 91-92 Shrivenham Hundred Business Park
Watchfield, Oxfordshire, SN6 8TY
Fax: 01
service@sh

shawcity LIMITED
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CERTIFICATE OF CALIBRATION
MultiRAE

CALIBRATION CERTIFICATE NO: 58641

ISSUED BY: SHAWCITY LIMITED
DATE: 03.11.17

APPROVED SIGNATORY: PA Gunter

NAME: PeterGunter

CUSTOMER: Shawcity Ltd -Exhibition equipment
INSTRUMENT: MultiRAE
SERIAL NUMBER: M01E007171

CALIBRATION METHOD: CM03
AMBIENT CONDITIONS: 20°C ± 2°C and 50% (± 20%) RH

Prior to calibration the instrument was allowed to stabilise in the laboratory for at least 30 minutes.
The instrument was calibrated by exposing the sensor to known values of gas concentrations.
All gases were sampled through the complete probe and in line filter, where applicable.
The reference values are those generated by the certified sources and the indicated values are those measured by the instrument.

CALIBRATION RESULTS

GAS	LOT No	REF. VALUE	INDICATED VALUE
LEL	WO163068-2	50.00%	50.00%
CO	WO163068-2	50 ppm	50 ppm
H2S	WO163068-2	10 ppm	10 ppm
O2	WO163068-2	18.00%	18.00%
PID	WO165469-2	100 ppm	100 ppm

The reported uncertainty is based on a standard uncertainty multiplied by a coverage factor of $k=2$.
This provides a level of confidence of uncertainty of approximately 95%.
The uncertainty of measurement is ±2% of range.
The results indicate that the instrument conforms to the applicable parts of the published specification.

Tel: 01793 780622
www.shawcity.co.uk
Instrument House, 91-92 Shrivenham Hundred Business Park
Watchfield, Oxfordshire, SN6 8TY
Fax: 01793 784466
service@shawcity.co.uk

shawcity LIMITED
Be sure. Be safe

CERTIFICATE OF CALIBRATION
MultiRAE

CALIBRATION CERTIFICATE NO: 62413

ISSUED BY: SHAWCITY LIMITED
DATE: 04.12.17

APPROVED SIGNATORY: P A Gunter

NAME: PeterGunter

CUSTOMER: Shawcity Ltd -Exhibition equipment
INSTRUMENT: MultiRAE
SERIAL NUMBER: M01E008183

CALIBRATION METHOD: CM03
AMBIENT CONDITIONS: 20°C ± 2°C and 50% (± 20%) RH

Prior to calibration the instrument was allowed to stabilise in the laboratory for at least 30 minutes.
The instrument was calibrated by exposing the sensor to known values of gas concentrations.
All gases were sampled through the complete probe and in line filter, where applicable.
The reference values are those generated by the certified sources and the indicated values are those measured by the instrument.

CALIBRATION RESULTS

GAS	LOT No	REF. VALUE	INDICATED VALUE
LEL	WO163068-2	50.00%	50.00%
CO	WO163068-2	50 ppm	50 ppm
H2S	WO163068-2	10 ppm	10 ppm
O2	WO163068-2	18.00%	18.00%
PID	WO165469-2	100 ppm	100 ppm

COMMENTS:
The reported uncertainty is based on a standard uncertainty multiplied by a coverage factor of $k=2$.
This provides a level of confidence of uncertainty of approximately 95%.
The uncertainty of measurement is ±2% of range.
The results indicate that the instrument conforms to the applicable parts of the published specification.

Tel: 01793 780622
www.shawcity.co.uk
Instrument House, 91-92 Shrivenham Hundred Business Park
Watchfield, Oxfordshire, SN6 8TY
Fax: 01793 784466
service@shawcity.co.uk

Be sure. Be safe

CERTIFICATE OF CALIBRATION
PHD6

CALIBRATION CERTIFICATE NO: 61712

ISSUED BY: SHAWCITY LIMITED
DATE: 31.08.17

APPROVED SIGNATORY: P A Gunter

NAME: Peter Gunter

CUSTOMER: Shawcity Hire
INSTRUMENT: PHD6
SERIAL NUMBER: 530908008

CALIBRATION METHOD: CM03
AMBIENT CONDITIONS: 20°C ± 2°C and 50% (± 20%) RH

Prior to calibration the instrument was allowed to stabilise in the laboratory for at least 30 minutes.
The instrument was calibrated by exposing the sensor to known values of gas concentrations.
All gases were sampled through the complete probe and in line filter, where applicable.
The reference values are those generated by the certified sources and the indicated values are those measured by the instrument.

CALIBRATION RESULTS

GAS	LOT No	REF. VALUE	INDICATED VALUE
LEL	WO163068-2	50.00%	50%
CO	WO163068-2	50 ppm	50 ppm
H2S	WO163068-2	10 ppm	10 ppm
O2	WO163068-2	18.00%	18%
PID	WO165469-2	100 ppm	100 ppm

COMMENTS:
The reported uncertainty is based on a standard uncertainty multiplied by a coverage factor of $k=20$
This provides a level of confidence of uncertainty of approximately 95%0
The uncertainty of measurement is ±2% of range.
The results indicate that the instrument conforms to the applicable parts of the published specification.

Tel: 01793 780622
www.shawcity.co.uk
Instrument House, 91-92 Shrivenham Hundred Business Park
Watchfield, Oxfordshire, SN6 8TY
Fax: 01793 784466
service@shawcity.co.uk

Be sure. Be safe

CERTIFICATE OF CALIBRATION
PHD6

CALIBRATION CERTIFICATE NO: 61794

ISSUED BY: SHAWCITY LIMITED
DATE: 12.09.17

APPROVED SIGNATORY:

NAME: Peter Gunter

CUSTOMER: Shawcity Ltd -Exhibition equipment
INSTRUMENT: PHD6
SERIAL NUMBER: 530934014

CALIBRATION METHOD: CM03
AMBIENT CONDITIONS: 20°C ± 2°C and 50% (± 20%) RH

Prior to calibration the instrument was allowed to stabilise in the laboratory for at least 30 minutes.
The instrument was calibrated by exposing the sensor to known values of gas concentrations.
All gases were sampled through the complete probe and in line filter, where applicable.
The reference values are those generated by the certified sources and the indicated values are those measured by the instrument.

CALIBRATION RESULTS

GAS	LOT No	REF. VALUE	INDICATED VALUE
LEL	WO163068-2	50.00%	50.00%
CO	WO163068-2	50 ppm	50 ppm
H2S	WO163068-2	10 ppm	10 ppm
O2	WO163068-2	18.00%	18.00%
PID	WO165469-2	100 ppm	100 ppm

COMMENTS:
The reported uncertainty is based on a standard uncertainty multiplied by a coverage factor of $k=20$
This provides a level of confidence of uncertainty of approximately 95%0
The uncertainty of measurement is ±2% of range.
The results indicate that the instrument conforms to the applicable parts of the published specification.

Tel: 01793 780622
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Watchfield, Oxfordshire, SN6 8TY
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shawcity LIMITED
Be sure. Be safe

CERTIFICATE OF CALIBRATION
PHD6

CALIBRATION CERTIFICATE NO: 62373

ISSUED BY: SHAWCITY LIMITED
DATE: 28.11.17

APPROVED SIGNATORY: 

NAME: Peter Gunter

CUSTOMER: Shawcity Hire
INSTRUMENT: PHD6
SERIAL NUMBER: 531114028

CALIBRATION METHOD: CM03
AMBIENT CONDITIONS: 20°C ± 2°C and 50% (± 20%) RH

Prior to calibration the instrument was allowed to stabilise in the laboratory for at least 30 minutes.
The instrument was calibrated by exposing the sensor to known values of gas concentrations.
All gases were sampled through the complete probe and in line filter, where applicable.
The reference values are those generated by the certified sources and the indicated values are those measured by the instrument.

CALIBRATION RESULTS

GAS	LOT No	REF. VALUE	INDICATED VALUE
LEL	WO163068-2	50.00%	50.00%
CO	WO163068-2	50 ppm	50 ppm
H2S	WO163068-2	10 ppm	10 ppm
O2	WO163068-2	18.00%	18.00%
PID	WO165469-2	100 ppm	100 ppm

COMMENTS:
The reported uncertainty is based on a standard uncertainty multiplied by a coverage factor of $k=20$
This provides a level of confidence of uncertainty of approximately 95%0
The uncertainty of measurement is ±2% of range.
The results indicate that the instrument conforms to the applicable parts of the published specification.

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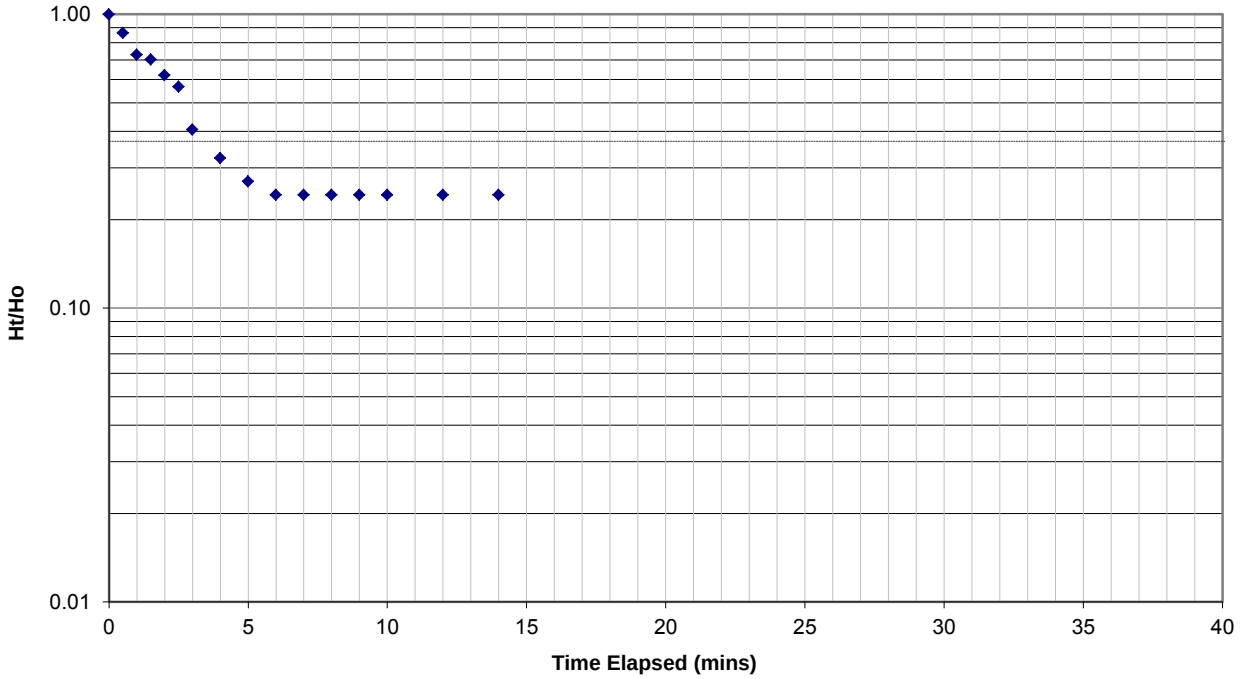
VARIABLE HEAD PERMEABILITY TEST RECORD

Date	03/12/2017	Test No.	1	Depth (m)	1.50 - 2.50	Borehole No.	HEP-BH-1



Time Elapsed ([d:]hh:mm:ss)	Depth of Water Below Datum (m)	Ht	Ht/Ho
00:00:00	0.40	0.37	1.00
00:00:30	0.45	0.32	0.86
00:01:00	0.50	0.27	0.73
00:01:30	0.51	0.26	0.70
00:02:00	0.54	0.23	0.62
00:02:30	0.56	0.21	0.57
00:03:00	0.62	0.15	0.41
00:04:00	0.65	0.12	0.32
00:05:00	0.67	0.10	0.27
00:06:00	0.68	0.09	0.24
00:07:00	0.68	0.09	0.24
00:08:00	0.68	0.09	0.24
00:09:00	0.68	0.09	0.24
00:10:00	0.68	0.09	0.24
00:12:00	0.68	0.09	0.24
00:14:00	0.68	0.09	0.24
00:16:00	0.68	0.09	0.24
00:18:00	0.68	0.09	0.24
00:20:00	0.68	0.09	0.24
00:25:00	0.68	0.09	0.24
00:30:00	0.68	0.09	0.24
00:40:00	0.68	0.09	0.24
00:50:00	0.68	0.09	0.24
01:00:00	0.68	0.09	0.24

Test Details (All water depths were measured below datum)

Test Type			Falling Head in Borehole	
Depth of Test Section	Casing Depth:		1.50	mbgl
	Borehole Depth:		2.50	mbgl
Datum Level			0.25	magl
Depth to Standing Water Level			0.77	mbdl
Depth to Water	Start of Test		0.40	mbdl
	End of Test		0.68	mbdl
Diameter of Casing			200	mm
Response Zone Length		(L) =	1.00	m
Borehole Diameter in Test Section		(D) =	200	mm
Cross Sectional Area of Borehole		(A) =	0.03142	m^2
Intake Factor (Hvorslev, 1951)		(F) =	2.72	
Basic Time Lag (in secs)		(T) =	210	Sec

Coefficient of Permeability using

$$k = \frac{A}{F(t2-t1)} \log_e \frac{H1}{H2} = \quad \mathbf{5.5 \times 10^{-5}} \text{ m/s}$$

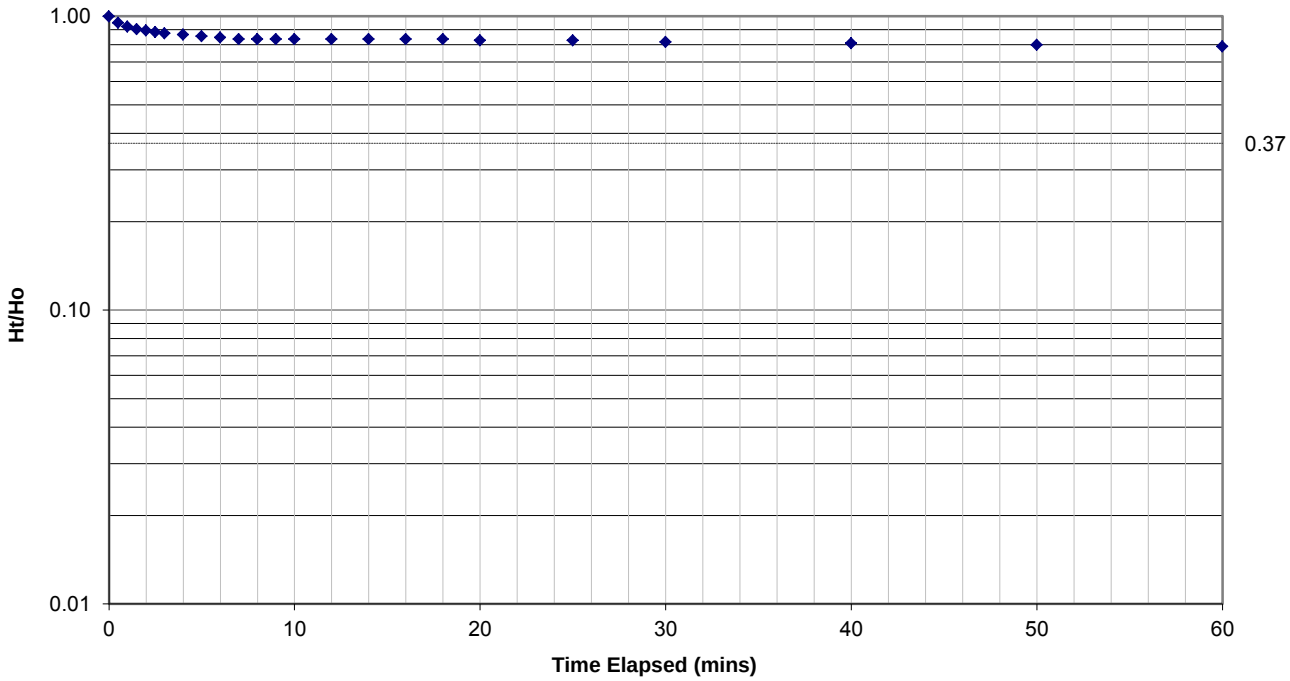
Remarks

ma/bgl = metres above/below ground level mbdl = metres below datum level

Input by	AH	Date	09/01/18	Checked by	TR	Date	07/08/18

VARIABLE HEAD PERMEABILITY TEST RECORD

Date	29/11/2017	Test No.	1	Depth (m)	1.50 - 2.50	Borehole No.	HEP-BH-12



Time Elapsed ([d:]hh:mm:ss)	Depth of Water Below Datum (m)	Ht	Ht/Ho
00:00:00	0.25	1.05	1.00
00:00:30	0.30	1.00	0.95
00:01:00	0.33	0.97	0.92
00:01:30	0.35	0.95	0.90
00:02:00	0.36	0.94	0.90
00:02:30	0.37	0.93	0.89
00:03:00	0.38	0.92	0.88
00:04:00	0.39	0.91	0.87
00:05:00	0.40	0.90	0.86
00:06:00	0.41	0.89	0.85
00:07:00	0.42	0.88	0.84
00:08:00	0.42	0.88	0.84
00:09:00	0.42	0.88	0.84
00:10:00	0.42	0.88	0.84
00:12:00	0.42	0.88	0.84
00:14:00	0.42	0.88	0.84
00:16:00	0.42	0.88	0.84
00:18:00	0.42	0.88	0.84
00:20:00	0.43	0.87	0.83
00:25:00	0.43	0.87	0.83
00:30:00	0.44	0.86	0.82
00:40:00	0.45	0.85	0.81
00:50:00	0.46	0.84	0.80
01:00:00	0.47	0.83	0.79

Test Details (All water depths were measured below datum)

Test Type			Falling Head in Borehole	
Depth of Test Section	Casing Depth:		1.50	mbgl
	Borehole Depth:		2.50	mbgl
Datum Level			0.20	magl
Depth to Standing Water Level			1.30	mbdl
Depth to Water	Start of Test		0.25	mbdl
	End of Test		0.47	mbdl
Diameter of Casing			200	mm
Response Zone Length		(L) =	1.00	m
Borehole Diameter in Test Section		(D) =	200	mm
Cross Sectional Area of Borehole		(A) =	0.03142	m^2
Intake Factor (Hvorslev, 1951)		(F) =	2.72	
General Approach	(H1) = 0.97	(t1) =	60	Sec
	(H2) = 0.88	(t2) =	600	Sec

Coefficient of Permeability using

$$k = \frac{A}{F(t2-t1)} \log_e \frac{H1}{H2} = \quad \mathbf{2.1 \times 10^{-6}} \text{ m/s}$$

Remarks

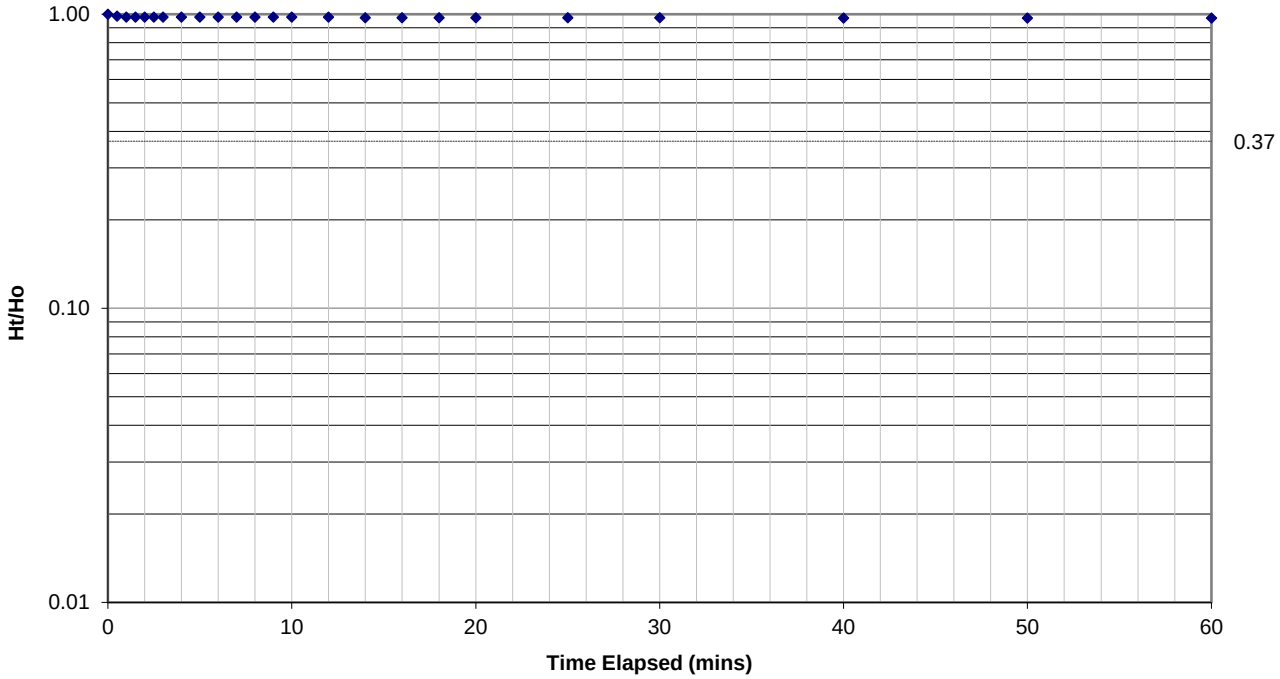
Groundwater struck at 1.55 mbgl and observed to rise to 1.08 m after 20 minutes and to 1.03 m after 30 minutes.

ma/bgl = metres above/below ground level mbdl = metres below datum level

Input by	AH	Date	09/01/18	Checked by	TR	Date	07/08/18

VARIABLE HEAD PERMEABILITY TEST RECORD

Date	30/11/2018	Test No.	2	Depth (m)	1.30 - 3.80	Borehole No.	HEP-BH-12



Time Elapsed ([d:]hh:mm:ss)	Depth of Water Below Datum (m)	Ht	Ht/Ho
00:00:00	3.80	2.70	1.00
00:00:30	3.76	2.66	0.99
00:01:00	3.74	2.64	0.98
00:01:30	3.74	2.64	0.98
00:02:00	3.74	2.64	0.98
00:02:30	3.74	2.64	0.98
00:03:00	3.74	2.64	0.98
00:04:00	3.74	2.64	0.98
00:05:00	3.74	2.64	0.98
00:06:00	3.74	2.64	0.98
00:07:00	3.74	2.64	0.98
00:08:00	3.74	2.64	0.98
00:09:00	3.74	2.64	0.98
00:10:00	3.74	2.64	0.98
00:12:00	3.74	2.64	0.98
00:14:00	3.73	2.63	0.97
00:16:00	3.73	2.63	0.97
00:18:00	3.73	2.63	0.97
00:20:00	3.73	2.63	0.97
00:25:00	3.73	2.63	0.97
00:30:00	3.73	2.63	0.97
00:40:00	3.72	2.62	0.97
00:50:00	3.72	2.62	0.97
01:00:00	3.72	2.62	0.97

Test Details (All water depths were measured below datum)

Test Type			Rising Head in Borehole	
Depth of Test Section	Casing Depth:		1.30	mbgl
	Borehole Depth:		3.80	mbgl
Datum Level			0.00	magl
Depth to Standing Water Level			1.10	mbdl
Depth to Water	Start of Test		3.80	mbdl
	End of Test		3.72	mbdl
Diameter of Casing			200	mm
Response Zone Length		(L) =	2.50	m
Borehole Diameter in Test Section		(D) =	200	mm
Cross Sectional Area of Borehole		(A) =	0.03142	m^2
Intake Factor (Hvorslev, 1951)		(F) =	0.55	
General Approach	(H1) = 2.70	(t1) =	0	Sec
	(H2) = 2.64	(t2) =	60	Sec

Coefficient of Permeability using

$$k = \frac{A}{F(t2-t1)} \log_e \frac{H1}{H2} = \quad \mathbf{2.1 \times 10^{-5}} \text{ m/s}$$

Remarks

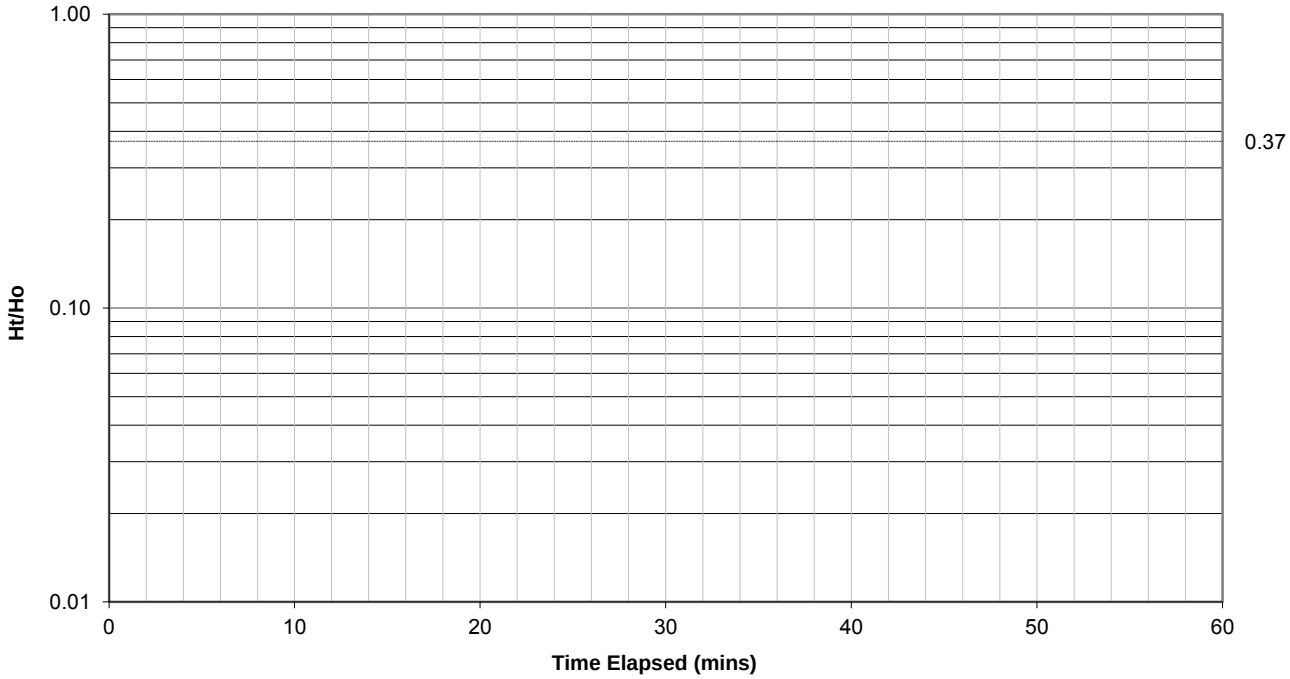
Water pumped out by suction before test started (09:45 am). Assumed standing water level 1.10 m. Base of hole 4.50 mbgl before test and 4.30 mbgl after test.

ma/bgl = metres above/below ground level mbdl = metres below datum level

Input by	AH	Date	09/01/18	Checked by	TR	Date	07/08/18

VARIABLE HEAD PERMEABILITY TEST RECORD

Date	30/11/2018	Test No.	3	Depth (m)	3.40 - 4.50	Borehole No.	HEP-BH-12



Time Elapsed ([d:]hh:mm:ss)	Depth of Water Below Datum (m)	Ht	Ht/Ho
00:00:00	1.10	0.00	#DIV/0!
00:00:30	1.10	0.00	#DIV/0!
00:01:00	1.10	0.00	#DIV/0!
00:01:30			
00:02:00			
00:02:30			
00:03:00			
00:04:00			
00:05:00			
00:06:00			
00:07:00			
00:08:00			
00:09:00			
00:10:00			
00:12:00			
00:14:00			
00:16:00			
00:18:00			
00:20:00			
00:25:00			
00:30:00			
00:40:00			
00:50:00			
01:00:00			

Test Details (All water depths were measured below datum)

Test Type			Rising Head in Borehole	
Depth of Test Section	Casing Depth:		3.40	mbgl
	Borehole Depth:		4.50	mbgl
Datum Level			0.00	magl
Depth to Standing Water Level			1.10	mbdl
Depth to Water	Start of Test		1.10	mbdl
	End of Test		0.00	mbdl
Diameter of Casing			200	mm
Response Zone Length		(L) =	1.10	m
Borehole Diameter in Test Section		(D) =	200	mm
Cross Sectional Area of Borehole		(A) =	0.03142	m^2
Intake Factor (Hvorslev, 1951)		(F) =	2.87	
General Approach	(H1) = 0.00	(t1) =	0	Sec
	(H2) = 0.00	(t2) =	30	Sec

Coefficient of Permeability using

$$k = \frac{A}{F(t2-t1)} \log_e \frac{H1}{H2} =$$ #DIV/0! #### ##### m/s

Remarks

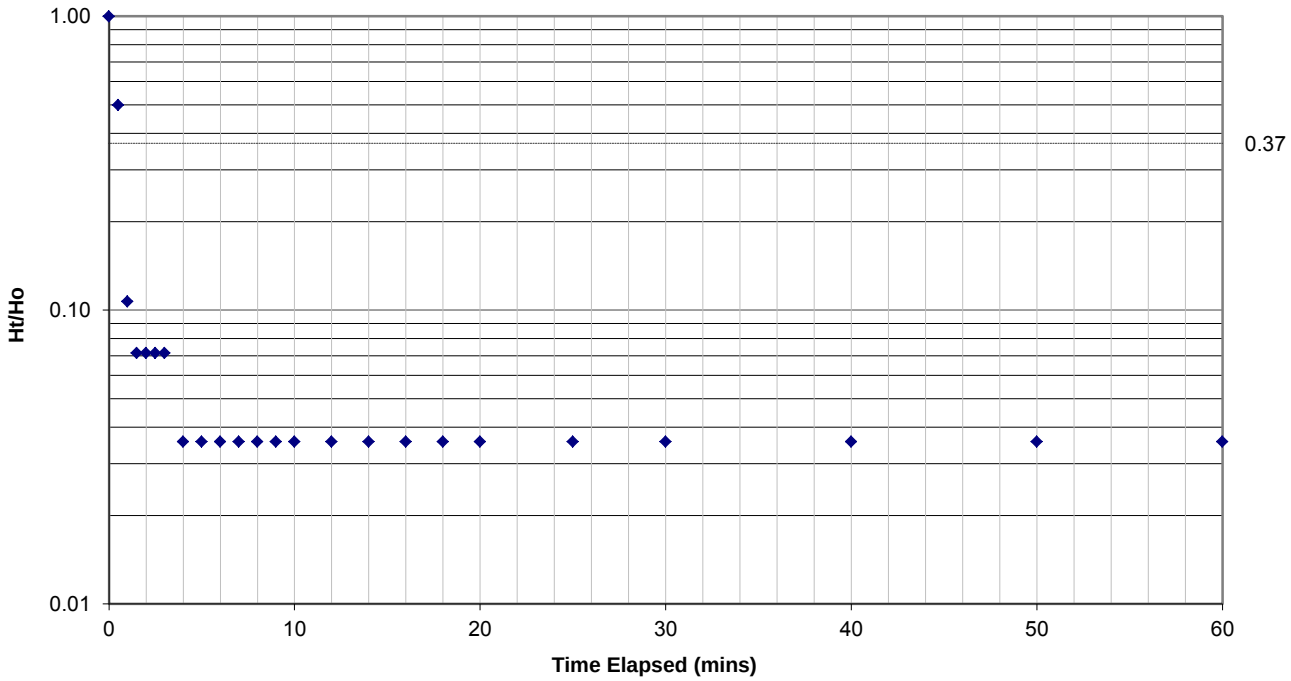
Pea gravel added from 4.50-3.50 mbgl and casing pulled. Test terminated at 1 min as water inflow too fast for pump.

ma/bgl = metres above/below ground level mbdl = metres below datum level

Input by	AH	Date	09/01/18	Checked by	TR	Date	07/08/18

VARIABLE HEAD PERMEABILITY TEST RECORD

Date	01/12/2017	Test No.	1	Depth (m)	2.80 - 3.80	Borehole No.	HEP-BH-27



Time Elapsed ([d:]hh:mm:ss)	Depth of Water Below Datum (m)	Ht	Ht/Ho
00:00:00	3.51	0.28	1.00
00:00:30	3.65	0.14	0.50
00:01:00	3.76	0.03	0.11
00:01:30	3.77	0.02	0.07
00:02:00	3.77	0.02	0.07
00:02:30	3.77	0.02	0.07
00:03:00	3.77	0.02	0.07
00:04:00	3.78	0.01	0.04
00:05:00	3.78	0.01	0.04
00:06:00	3.78	0.01	0.04
00:07:00	3.78	0.01	0.04
00:08:00	3.78	0.01	0.04
00:09:00	3.78	0.01	0.04
00:10:00	3.78	0.01	0.04
00:12:00	3.78	0.01	0.04
00:14:00	3.78	0.01	0.04
00:16:00	3.78	0.01	0.04
00:18:00	3.78	0.01	0.04
00:20:00	3.78	0.01	0.04
00:25:00	3.78	0.01	0.04
00:30:00	3.78	0.01	0.04
00:40:00	3.78	0.01	0.04
00:50:00	3.78	0.01	0.04
01:00:00	3.78	0.01	0.04

Test Details (All water depths were measured below datum)

Test Type			Falling Head in Borehole	
Depth of Test Section	Casing Depth:		2.80	mbgl
	Borehole Depth:		3.80	mbgl
Datum Level			1.60	magl
Depth to Standing Water Level			3.79	mbdl
Depth to Water	Start of Test		3.51	mbdl
	End of Test		3.78	mbdl
Diameter of Casing			200	mm
Response Zone Length		(L) =	1.00	m
Borehole Diameter in Test Section		(D) =	200	mm
Cross Sectional Area of Borehole		(A) =	0.03142	m^2
Intake Factor (Hvorslev, 1951)		(F) =	2.72	
Basic Time Lag (in secs)		(T) =	1	Sec

Coefficient of Permeability using

$$k = \frac{A}{F(t2-t1)} \log_e \frac{H1}{H2} = \quad \mathbf{1.2 \times 10^{-2}} \text{ m/s}$$

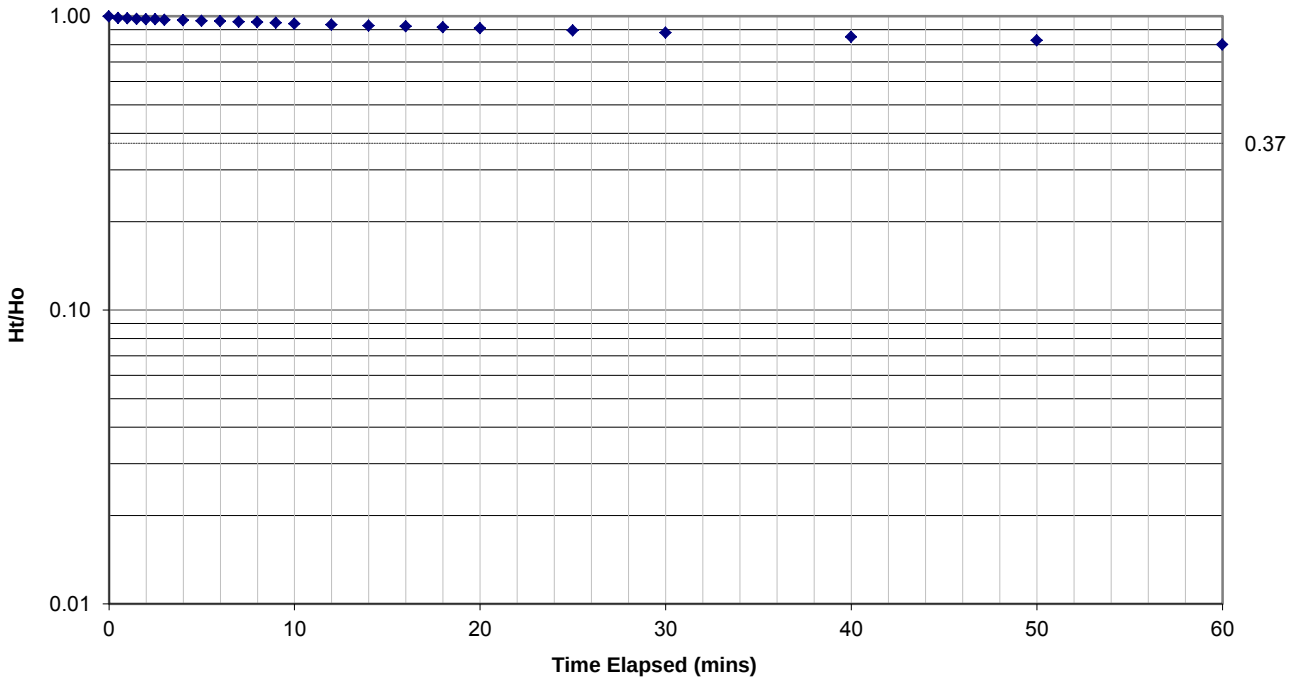
Remarks

ma/bgl = metres above/below ground level mbdl = metres below datum level

Input by	AH	Date	08/01/18	Checked by	TR	Date	07/08/17

VARIABLE HEAD PERMEABILITY TEST RECORD

Date	01/12/2017	Test No.	2	Depth (m)	4.60 - 5.60	Borehole No.	HEP-BH-27



Time Elapsed ([d:]hh:mm:ss)	Depth of Water Below Datum (m)	Ht	Ht/Ho
00:00:00	0.00	2.69	1.00
00:00:30	0.03	2.66	0.99
00:01:00	0.04	2.65	0.99
00:01:30	0.05	2.64	0.98
00:02:00	0.06	2.63	0.98
00:02:30	0.06	2.63	0.98
00:03:00	0.07	2.62	0.97
00:04:00	0.08	2.61	0.97
00:05:00	0.09	2.60	0.97
00:06:00	0.10	2.59	0.96
00:07:00	0.11	2.58	0.96
00:08:00	0.12	2.57	0.96
00:09:00	0.13	2.56	0.95
00:10:00	0.15	2.54	0.94
00:12:00	0.17	2.52	0.94
00:14:00	0.19	2.50	0.93
00:16:00	0.20	2.49	0.93
00:18:00	0.22	2.47	0.92
00:20:00	0.24	2.45	0.91
00:25:00	0.28	2.41	0.90
00:30:00	0.32	2.37	0.88
00:40:00	0.40	2.29	0.85
00:50:00	0.46	2.23	0.83
01:00:00	0.53	2.16	0.80

Test Details (All water depths were measured below datum)

Test Type			Falling Head in Borehole	
Depth of Test Section	Casing Depth:		4.60	mbgl
	Borehole Depth:		5.60	mbgl
Datum Level			0.50	magl
Depth to Standing Water Level			2.69	mbdl
Depth to Water	Start of Test		0.00	mbdl
	End of Test		0.53	mbdl
Diameter of Casing			200	mm
Response Zone Length		(L) =	1.00	m
Borehole Diameter in Test Section		(D) =	200	mm
Cross Sectional Area of Borehole		(A) =	0.03142	m^2
Intake Factor (Hvorslev, 1951)		(F) =	2.72	
General Approach	(H1) = 2.63	(t1) =	120	Sec
	(H2) = 2.37	(t2) =	1800	Sec

Coefficient of Permeability using

$$k = \frac{A}{F(t2-t1)} \log_e \frac{H1}{H2} = \quad \mathbf{7.2 \times 10^{-7}} \text{ m/s}$$

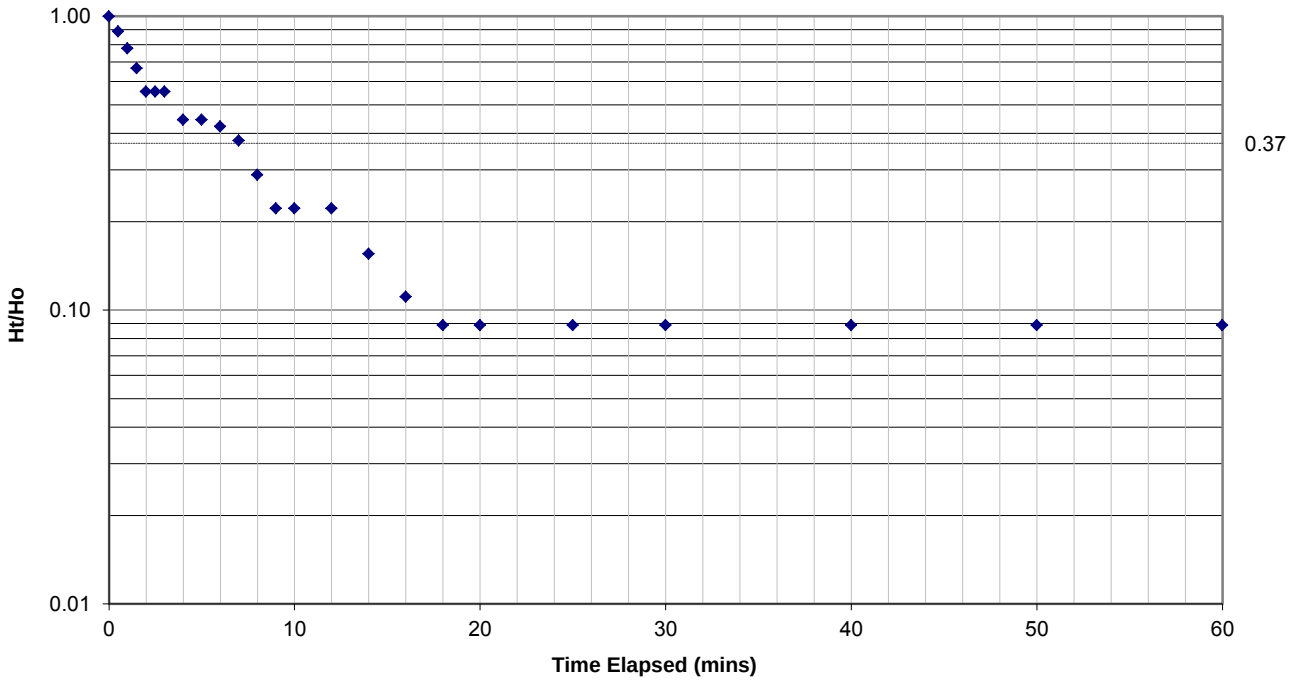
Remarks

ma/bgl = metres above/below ground level mbdl = metres below datum level

Input by	AH	Date	08/01/18	Checked by	TR	Date	07/08/18

VARIABLE HEAD PERMEABILITY TEST RECORD

Date	05/12/2017	Test No.	1	Depth (m)	1.30 - 1.65	Borehole No.	HEP-BH-1802



Time Elapsed ([d:]hh:mm:ss)	Depth of Water Below Datum (m)	Ht	Ht/Ho
00:00:00	0.05	0.45	1.00
00:00:30	0.10	0.40	0.89
00:01:00	0.15	0.35	0.78
00:01:30	0.20	0.30	0.67
00:02:00	0.25	0.25	0.56
00:02:30	0.25	0.25	0.56
00:03:00	0.25	0.25	0.56
00:04:00	0.30	0.20	0.44
00:05:00	0.30	0.20	0.44
00:06:00	0.31	0.19	0.42
00:07:00	0.33	0.17	0.38
00:08:00	0.37	0.13	0.29
00:09:00	0.40	0.10	0.22
00:10:00	0.40	0.10	0.22
00:12:00	0.40	0.10	0.22
00:14:00	0.43	0.07	0.16
00:16:00	0.45	0.05	0.11
00:18:00	0.46	0.04	0.09
00:20:00	0.46	0.04	0.09
00:25:00	0.46	0.04	0.09
00:30:00	0.46	0.04	0.09
00:40:00	0.46	0.04	0.09
00:50:00	0.46	0.04	0.09
01:00:00	0.46	0.04	0.09

Test Details (All water depths were measured below datum)

Test Type			Falling Head in Borehole	
Depth of Test Section	Casing Depth:		1.30	mbgl
	Borehole Depth:		1.65	mbgl
Datum Level			0.30	magl
Depth to Standing Water Level			0.50	mbdl
Depth to Water	Start of Test		0.05	mbdl
	End of Test		0.46	mbdl
Diameter of Casing			200	mm
Response Zone Length		(L) =	0.35	m
Borehole Diameter in Test Section		(D) =	200	mm
Cross Sectional Area of Borehole		(A) =	0.03142	m^2
Intake Factor (Hvorslev, 1951) Basic Time		(F) =	1.66	
Lag (in secs)		(T) =	420	Sec

Coefficient of Permeability using

$$k = \frac{A}{F(t2-t1)} \log_e \frac{H1}{H2} = \quad \mathbf{4.5 \times 10^{-5}} \text{ m/s}$$

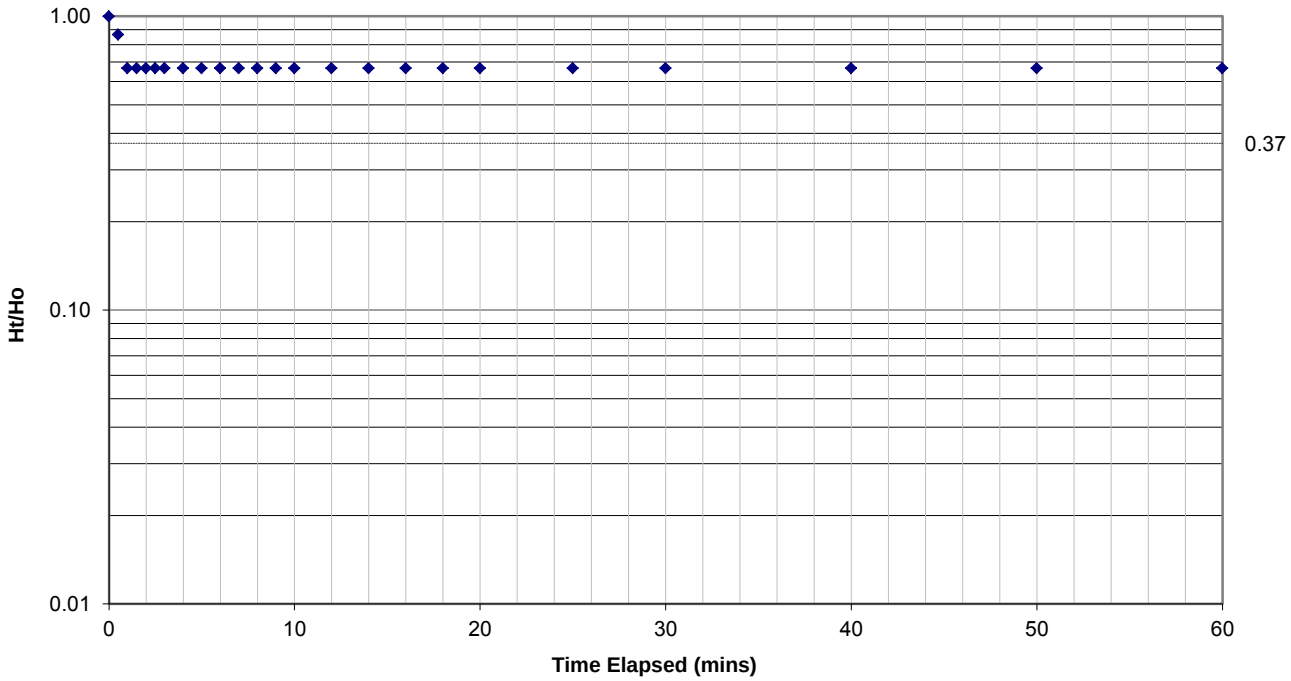
Remarks

ma/bgl = metres above/below ground level mbdl = metres below datum level

Input by	AH	Date	08/01/18	Checked by	TR	Date	07/08/18

VARIABLE HEAD PERMEABILITY TEST RECORD

Date	08/12/2017	Test No.	2	Depth (m)	2.50 - 3.00	Borehole No.	HEP-BH-1802



Time Elapsed ([d:]hh:mm:ss)	Depth of Water Below Datum (m)	Ht	Ht/Ho
00:00:00	0.00	0.30	1.00
00:00:30	0.04	0.26	0.87
00:01:00	0.10	0.20	0.67
00:01:30	0.10	0.20	0.67
00:02:00	0.10	0.20	0.67
00:02:30	0.10	0.20	0.67
00:03:00	0.10	0.20	0.67
00:04:00	0.10	0.20	0.67
00:05:00	0.10	0.20	0.67
00:06:00	0.10	0.20	0.67
00:07:00	0.10	0.20	0.67
00:08:00	0.10	0.20	0.67
00:09:00	0.10	0.20	0.67
00:10:00	0.10	0.20	0.67
00:12:00	0.10	0.20	0.67
00:14:00	0.10	0.20	0.67
00:16:00	0.10	0.20	0.67
00:18:00	0.10	0.20	0.67
00:20:00	0.10	0.20	0.67
00:25:00	0.10	0.20	0.67
00:30:00	0.10	0.20	0.67
00:40:00	0.10	0.20	0.67
00:50:00	0.10	0.20	0.67
01:00:00	0.10	0.20	0.67

Test Details (All water depths were measured below datum)

Test Type			Falling Head in Borehole	
Depth of Test Section	Casing Depth:		2.50	mbgl
	Borehole Depth:		3.00	mbgl
Datum Level			0.50	magl
Depth to Standing Water Level			0.30	mbdl
Depth to Water	Start of Test		0.00	mbdl
	End of Test		0.10	mbdl
Diameter of Casing			200	mm
Response Zone Length		(L) =	0.50	m
Borehole Diameter in Test Section		(D) =	200	mm
Cross Sectional Area of Borehole		(A) =	0.03142	m^2
Intake Factor (Hvorslev, 1951)		(F) =	1.91	
General Approach	(H1) = 0.30	(t1) =	0	Sec
	(H2) = 0.20	(t2) =	60	Sec

Coefficient of Permeability using

$$k = \frac{A}{F(t2-t1)} \log_e \frac{H1}{H2} = \quad \mathbf{1.1 \times 10^{-4}} \text{ m/s}$$

Remarks

ma/bgl = metres above/below ground level mbdl = metres below datum level

Input by	AH	Date	09/01/18	Checked by	TR	Date	07/08/18

United Kingdom Accreditation Service

ACCREDITATION CERTIFICATE

UKAS
UNITED KINGDOM ACCREDITATION SERVICE

TESTING LABORATORY
No. 0925

Fugro Seacore Limited
(t/a Fugro Engineering Services)

is accredited in accordance with the recognised International Standard ISO/IEC 17025:2005
General Requirements for the competence of testing and calibration laboratories.

This accreditation demonstrates technical competence for a defined scope as detailed in and at the locations specified in the schedule to this certificate, and the operation of a laboratory quality management system (refer joint ISO-ILAC-IAF Communiqué dated January 2009).

The schedule to this certificate is an essential accreditation document and from time to time may be revised and reissued by the United Kingdom Accreditation Service. The most recent issue of the schedule of accreditation, which bears the same accreditation number as this certificate, is available from the UKAS website www.ukas.com.

This accreditation is subject to continuing conformity
with United Kingdom Accreditation Service requirements. The absence of a schedule on the UKAS website indicates that the accreditation is no longer in force.

Accreditation Manager, United Kingdom Accreditation Service

Initial Accreditation date
9 September 1993

This certificate issued on
4 February 2013

UKAS is appointed as the sole national accreditation body for the UK by The Accreditation Regulations 2009 (SI No 3155/2009) and operates under a Memorandum of Understanding (MoU) with the Department for Business, Innovation and Skills (BIS).

Schedule of Accreditation

issued by

United Kingdom Accreditation Service

2 Pine Trees, Chertsey Lane, Staines-upon-Thames, TW18 3HR, UK

0925

Accredited to ISO/IEC 17025:2005

Fugro Geoservices Limited

Issue No: 011 **Issue date:** 16 February 2016

Fugro House
Hithercroft Road
Wallingford
Oxfordshire
OX10 9RB

Contact: Neil Breach
Tel: +44 (0)870 4021467
Fax: +44 (0)870 4021499
E-Mail: n.breach@fes.co.uk
Website: www.fes.co.uk

Testing performed by the Organisation at the locations specified below

Locations covered by the organisation and their relevant activities

Site activities performed away from the locations listed above:

Location details	Activity	Location code
Ground Investigation Sites	Cone penetration testing including UXO detection	B

0925 **Accredited to** **ISO/IEC 17025:2005**	**Schedule of Accreditation** **issued by** **United Kingdom Accreditation Service** 2 Pine Trees, Chertsey Lane, Staines-upon-Thames, TW18 3HR, UK
	Fugro Geoservices Limited **Issue No:** 011 **Issue date:** 16 February 2016
Testing performed by the Organisation at the locations specified	

DETAIL OF ACCREDITATION

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
SOILS for civil engineering purposes	Penetration resistance using the fixed 60° cone and friction sleeve (static cone penetration test CPT)	BS 1377:Part 9:1990 and Eurocode 7, Geotechnical Design, Clause 4.3 Continuous measurement using a penetrometer tip with electrical sensors for cone and sleeve resistance and inclination. BS EN ISO 22476-1:2012	B
	Penetration resistance using the fixed 60° cone and friction sleeve (static cone penetration test CPT)	BS 1377:Part 9:1990 and Eurocode 7, Geotechnical Design, Clause 4.3, Continuous measurement using a penetrometer tip with electrical sensors for cone and sleeve resistance, inclination and piezometric pressure. BS EN ISO 22476-1:2012	B
	UXO detection for clearance of site investigations and piling using a tri-axial magnetometer	Cone Penetration Testing Procedures Manual. Continuous measurement using a magnetometer housed in a penetrometer with electrical sensors for cone and sleeve resistance, inclination and piezometric pressure.	B
END			

CALIBRATION CERTIFICATE

CALIBRATION
RvA K 167

Certificate Number
FCN17010360

Applicant	**Fugro GeoServices Ltd.**
	Fugro House, Hithercroft Road
	OX10 9RB, Wallingford
	United Kingdom

Instrument	**Cone Penetrometer**
Manufacturer	Fugro
Type	CP15-CF75PB7SN2-P1E1M4-V5
Serial Number	1701-1515

Calibration method The instrument was calibrated according to Fugro procedures using a comparison technique against a reference standard.

Environmental Conditions	
Temperature during calibration	20.5 ± 3 °C
Atmospheric pressure during calibration	1000 ± 100 mbar

Result The result is shown on the next page(s).

Uncertainty The reported uncertainty is based on a standard uncertainty multiplied by a coverage factor k = 2, which provides a confidence level of approximately 95%. The standard uncertainty has been determined in accordance with EA-4/02.

Traceability The measurements have been executed using standards for which the traceability to (inter)national standards has been demonstrated towards the RvA (Raad voor Accreditatie).

Calibration period 18-Sep-2017 through 19-Sep-2017

Calibrate before 18-Sep-2018

Calibrated Sensor	Manufacturer / Type	Calibrated Range	Maximum Rating	Procedure
Cone [Force]	Fugro Loadcell	0 to 75 kN	0 to 150 kN	FEBV.CAL.PRO.003
Cone+Fric. [Force]	Fugro Loadcell	0 to 75 kN	0 to 150 kN	FEBV.CAL.PRO.003
Pore 2 [Pressure]	Kistler 4043A50V0408	0 to 7 MPa	0 to 10.5 MPa	FEBV.CAL.PRO.004
Slope [Inclination]	ADXL	0 to 15 Deg	0 to 20 Deg	FEBV.CAL.PRO.005

Member of the Fugro group of companies with offices throughout the world
FUGRO ENGINEERS B.V.
The Netherlands
VAT No: NL005621409B07
Trade Register No: 27114149

Nootdorp, 20-Sep-2017

This certificate is issued provided that neither Fugro nor the Raad voor Accreditatie assumes any liability.

The Raad voor Accreditatie is one of the signatories of the Multilateral Agreement of the European Cooperation for Accreditation (EA) for the mutual recognition of calibration certificates.

Ruud Schrijvers
Deputy Manager Transducer Workshop

CONE CALIBRATION RESULT [FORCE]

Instrument	
Manufacturer	Fugro
Type	CP15-CF75PB7SN2-P1E1M4-V5
Serial Number	1701-1515
Electronics	5251
Node Type	7001
Hardware Version	4.00
Software Version	7.09

Reference	
Manufacturer	Zwick/Roell
Serial Number	6034-0003
Uncertainty	0.003•Fw+0.015 [kN]

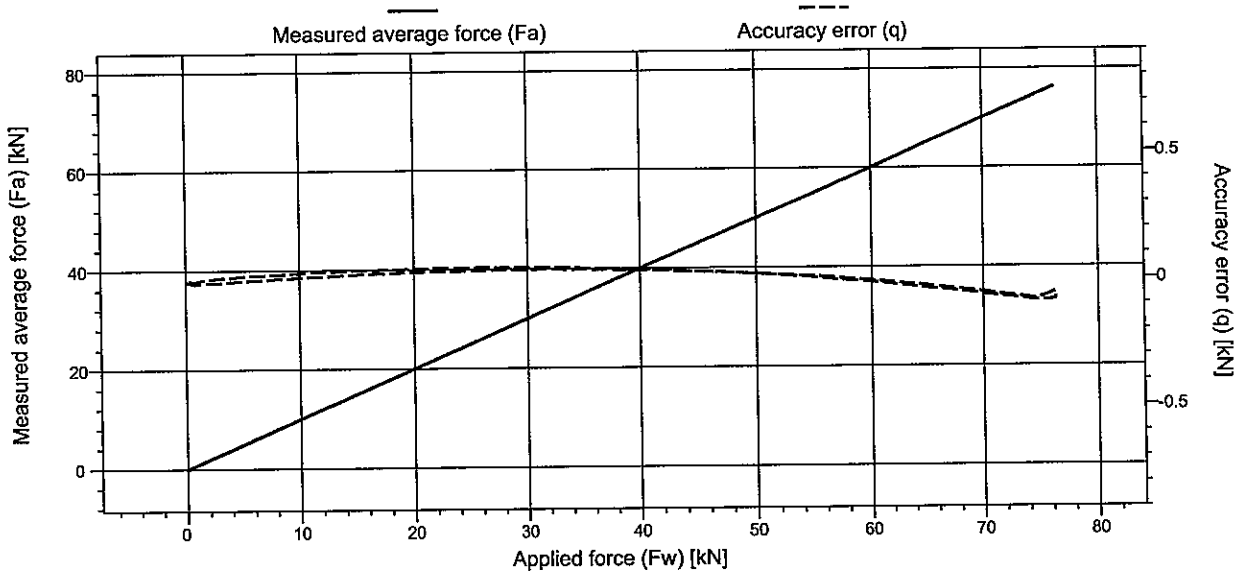
Calibration Details	
Calibration Date	18 Sep 2017 09:57:38
Procedure	FEBV.CAL.PRO.003
Software Version	2.0.0.19464

CALIBRATION
RvA K 167

Certificate Number
FCN17010360

Sensor	
Channel	Cone [Force]
Manufacturer / Type	Fugro Loadcell
Calibrated Range	0 to 75 kN
Maximum Rating	0 to 150 kN

Characteristics	Unit	Value
Max accuracy error (q)	[kN]	0.081
Max repeatability error (b)	[kN]	0.018
Max reversibility error (v)	[kN]	0.016
Zero load error (Fc0)	[kN]	0.002
Zero load offset (F0)	[kN]	-0.017
Resolution	[kN]	5.71E-05
Noise RMS	[kN]	0.001



Applied force (Fw) [kN]	Measured force 1 (Fa,1) [kN]	Measured force 2 (Fa,2) [kN]	Measured force 3 (Fa,3) [kN]	Measured average force (Fa) [kN]	Accuracy error (q) [kN]	Repeatability error (b) [kN]	Reversibility error (v) [kN]	Expanded Uncertainty (U) [kN]
0.000	0.002	0.000	-0.002	0.000	0.000	0.004		0.016
15.000	15.027	15.027	15.025	15.026	0.026	0.002	0.016	0.064
30.000	30.038	30.041	30.039	30.040	0.040	0.003	0.010	0.108
45.000	45.024	45.030	45.034	45.029	0.029	0.010	0.001	0.154
60.000	59.981	59.992	59.998	59.990	-0.010	0.017	-0.006	0.201
75.000	74.909	74.922	74.927	74.919	-0.081	0.018		0.247
60.000	59.974	59.987	59.992	59.984	-0.016	0.017		0.201
45.000	45.024	45.029	45.037	45.030	0.030	0.013		0.155
30.000	30.047	30.049	30.051	30.049	0.049	0.004		0.108
15.000	15.044	15.041	15.040	15.042	0.042	0.004		0.062
0.000	0.001	-0.001	0.006	0.002	0.002	0.006		0.017

CONE+FRIC. CALIBRATION RESULT [FORCE]

Instrument	
Manufacturer	Fugro
Type	CP15-CF75PB7SN2-P1E1M4-V5
Serial Number	1701-1515
Electronics	5251
Node Type	7001
Hardware Version	4.00
Software Version	7.09

Reference	
Manufacturer	Zwick/Roell
Serial Number	6034-0003
Uncertainty	0.003•Fw+0.015 [kN]

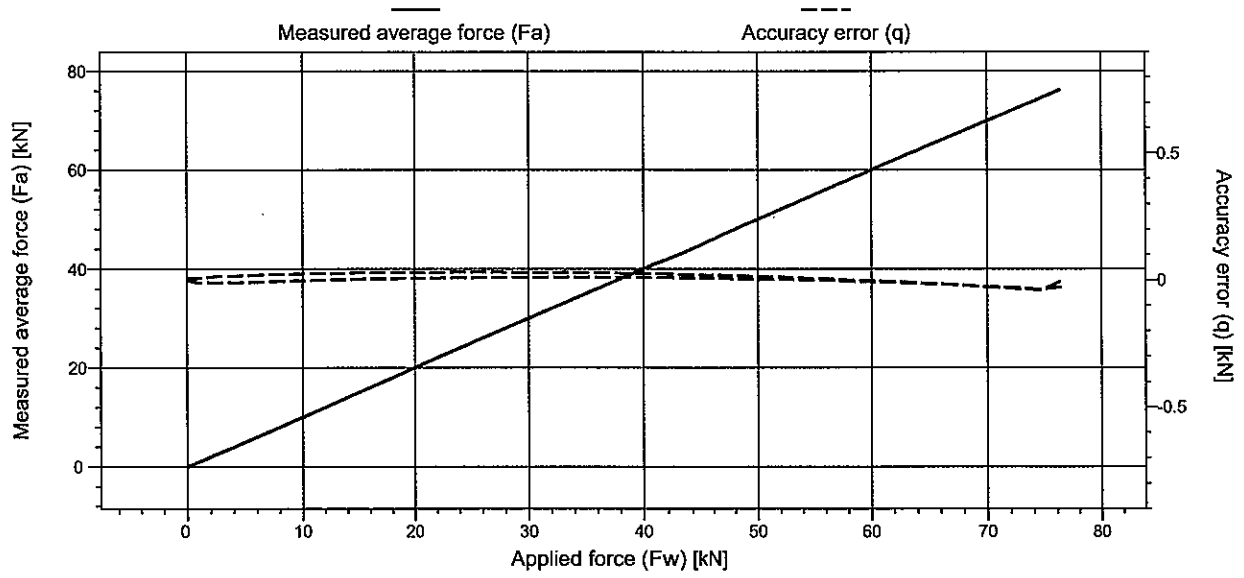
Calibration Details	
Calibration Date	18 Sep 2017 09:57:38
Procedure	FEBV.CAL.PRO.003
Software Version	2.0.0.19464

CALIBRATION
RvA K 167

Certificate Number
FCN17010360

Sensor	
Channel	Cone+Fric. [Force]
Manufacturer / Type	Fugro Loadcell
Calibrated Range	0 to 75 kN
Maximum Rating	0 to 150 kN

Characteristics	Unit	Value
Max accuracy error (q)	[kN]	0.035
Max repeatability error (b)	[kN]	0.053
Max reversibility error (v)	[kN]	0.025
Zero load error (Fc0)	[kN]	0.006
Zero load offset (F0)	[kN]	-0.011
Resolution	[kN]	5.67E-05
Noise RMS	[kN]	0.001
Tip-Sleeve Interaction	[kPa]	3.8
Tip-Sleeve Interaction %	[%]	0.77



Applied force (Fw) [kN]	Measured force 1 (Fa,1) [kN]	Measured force 2 (Fa,2) [kN]	Measured force 3 (Fa,3) [kN]	Measured average force (Fa) [kN]	Accuracy error (q) [kN]	Repeatability error (b) [kN]	Reversibility error (v) [kN]	Expanded Uncertainty (U) [kN]
0.000	-0.001	0.001	0.000	0.000	0.000	0.002		0.017
15.000	14.999	15.002	15.005	15.002	0.002	0.005	0.025	0.069
30.000	30.002	30.011	30.015	30.009	0.009	0.014	0.019	0.111
45.000	44.987	45.006	45.021	45.005	0.005	0.034	0.013	0.160
60.000	59.964	59.996	60.016	59.992	-0.008	0.052	0.004	0.209
75.000	74.936	74.969	74.989	74.965	-0.035	0.053		0.254
60.000	59.970	60.000	60.020	59.996	-0.004	0.050		0.209
45.000	44.998	45.019	45.036	45.018	0.018	0.038		0.160
30.000	30.021	30.028	30.037	30.029	0.029	0.015		0.109
15.000	15.027	15.027	15.027	15.027	0.027	0.001		0.062
0.000	0.005	0.003	0.010	0.006	0.006	0.007		0.020

PORE 2 CALIBRATION RESULT [PRESSURE]

Instrument	
Manufacturer	Fugro
Type	CP15-CF75PB7SN2-P1E1M4-V5
Serial Number	1701-1515
Electronics	5251
Node Type	7001
Hardware Version	4.00
Software Version	7.09

Reference	
Manufacturer	Keller PA-33X
Serial Number	3257-0002
Uncertainty	0.0005•Pw+0.002 [MPa]

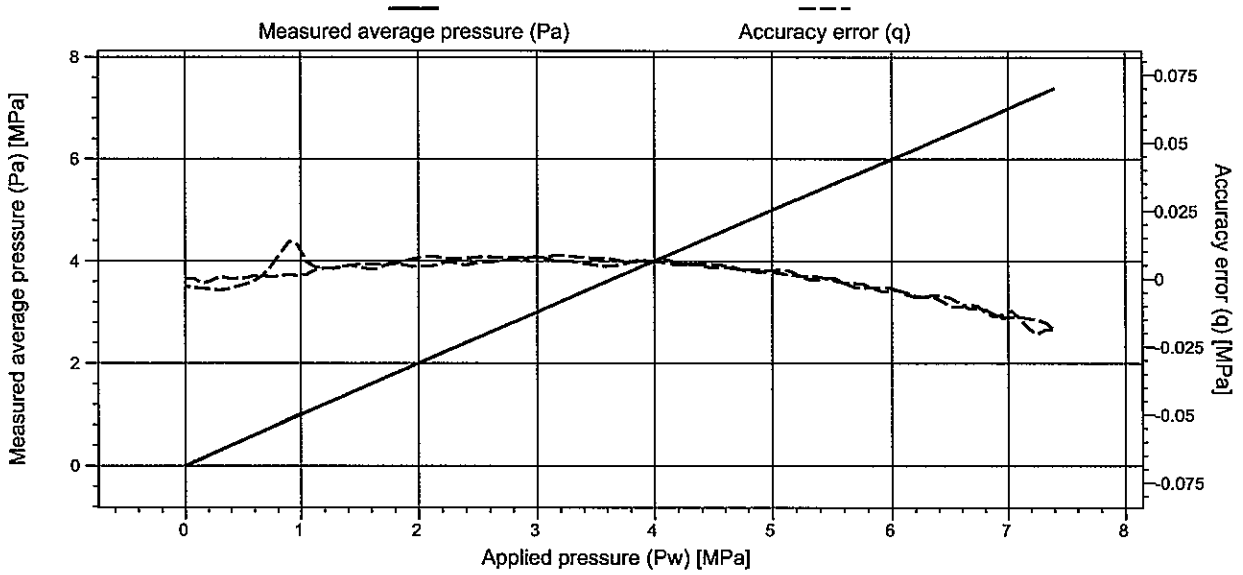
Calibration Details	
Calibration Date	18 Sep 2017 10:57:48
Procedure	FEBV.CAL.PRO.004
Software Version	2.0.0.19464

CALIBRATION RvA K 167

Certificate Number FCN17010360

Sensor	
Channel	Pore 2 [Pressure]
Manufacturer / Type	Kistler 4043A50V0408
Calibrated Range	0 to 7 MPa
Maximum Rating	0 to 10.5 MPa

Characteristics	Unit	Value
Max accuracy error (q)	[MPa]	0.014
Max repeatability error (b)	[MPa]	0.004
Max reversibility error (v)	[MPa]	0.001
Zero load error (Pc0)	[MPa]	0.003
Zero load offset (P0)	[MPa]	-0.003
Resolution	[MPa]	2.67E-06
Noise RMS	[MPa]	0.000



Applied pressure (Pw) [MPa]	Measured pressure 1 (Pa,1) [MPa]	Measured pressure 2 (Pa,2) [MPa]	Measured pressure 3 (Pa,3) [MPa]	Measured average pressure (Pa) [MPa]	Accuracy error (q) [MPa]	Repeatability error (b) [MPa]	Reversibility error (v) [MPa]	Expanded Uncertainty (U) [MPa]
0.000	-0.002	0.000	0.002	0.000	0.000	0.004		0.009
1.400	1.405	1.405	1.404	1.405	0.005	0.000	0.000	0.006
2.800	2.807	2.809	2.805	2.807	0.007	0.004	0.001	0.009
4.200	4.207	4.205	4.205	4.206	0.006	0.002	0.000	0.007
5.600	5.599	5.598	5.598	5.598	-0.002	0.001	0.000	0.007
7.000	6.986	6.984	6.986	6.986	-0.014	0.002		0.007
5.600	5.599	5.598	5.599	5.598	-0.002	0.001		0.007
4.200	4.205	4.207	4.204	4.205	0.005	0.003		0.007
2.800	2.808	2.808	2.808	2.808	0.008	0.001		0.006
1.400	1.405	1.405	1.405	1.405	0.005	0.000		0.006
0.000	-0.003	-0.003	-0.003	-0.003	-0.003	0.000		0.007

SLOPE CALIBRATION RESULT [INCLINATION]

Instrument	
Manufacturer	Fugro
Type	CP15-CF75PB7SN2-P1E1M4-V5
Serial Number	1701-1515
Electronics	5251
Node Type	7001
Hardware Version	4.00
Software Version	7.09

Reference	
Manufacturer	Hoek-O-Mat
Serial Number	2109-0002
Uncertainty	0.6 [Deg]

Calibration Details	
Calibration Date	18 Sep 2017 10:02:28
Procedure	FEBV.CAL.PRO.005
Software Version	2.0.0.19464

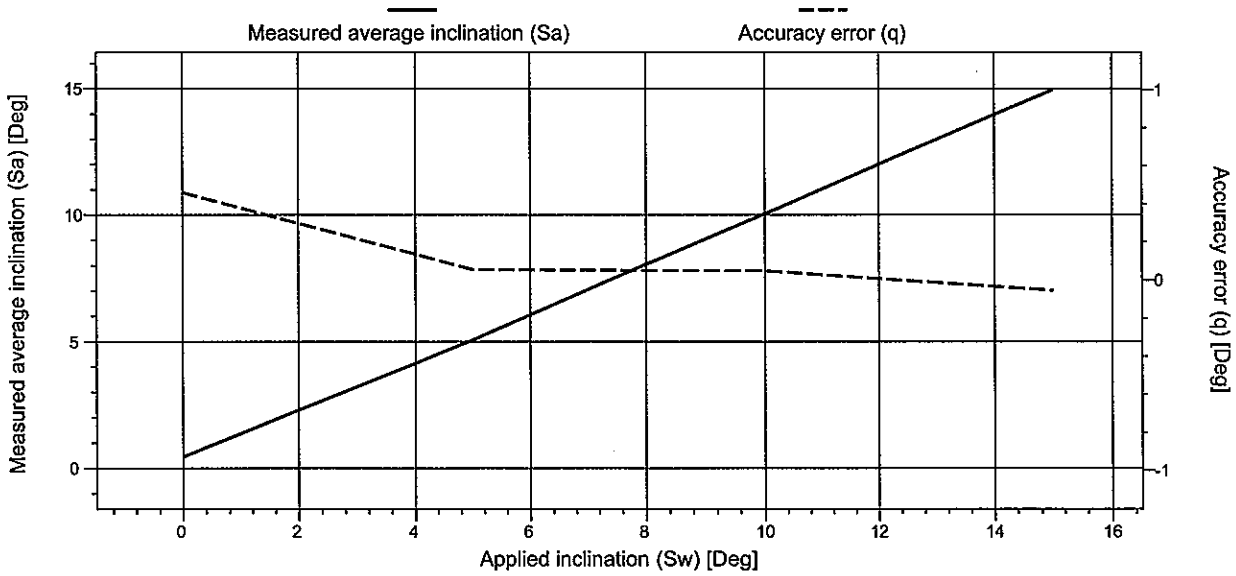
CALIBRATION
RvA K 167

Certificate Number
FCN17010360

Sensor	
Channel	Slope [Inclination]
Manufacturer / Type	ADXL
Calibrated Range	0 to 15 Deg
Maximum Rating	0 to 20 Deg

Characteristics	Unit	Value
Max accuracy error (q)	[Deg]	0.5
Max repeatability error (b)	[Deg]	0.1
Zero load error (Sc0)	[Deg]	0.0
Zero load offset (S0)	[Deg]	0.5
Resolution	[Deg]	1.4E-05
Noise RMS	[Deg]	0.0

Inclination is defined as the angular deviation of the cone penetrometer from the vertical.



Applied inclination (Sw) [Deg]	Measured inclination 1 (Sa,1) [Deg]	Measured inclination 2 (Sa,2) [Deg]	Measured inclination 3 (Sa,3) [Deg]	Measured average inclination (Sa) [Deg]	Accuracy error (q) [Deg]	Repeatability error (b) [Deg]	Expanded Uncertainty (U) [Deg]
0.0	0.5	0.4	0.4	0.5	0.5	0.1	0.6
5.0	5.1	5.0	5.1	5.1	0.1	0.1	0.6
10.0	10.0	10.1	10.1	10.0	0.0	0.1	0.6
15.0	15.0	14.9	15.0	14.9	-0.1	0.0	0.6

CALIBRATION
RvA K 167

Certificate Number
FCN17010360

Symbols and Definitions (general)

b	Repeatability error, defined as the maximum difference between the measurements of the instrument at the applied value.
Noise RMS	Signal noise, defined as the quadratic mean when the sensor is not subjected to load.
q	Accuracy error, defined as the difference between the average indicated value by the instrument and the applied value.
Resolution	Smallest change in a quantity being measured that causes a perceptible change in the corresponding indication.
Tip-Sleeve Interaction	Effect of cone tip measurements on derived friction measurements, due to coupling of the cone tip and friction sleeve element. Expressed in terms of friction and as a percentage of the full scale output of the cone tip.
U	The stated uncertainty is that of the average indicated quantity, and includes the entire calibration method, including the reference and calibrated sensor, but excludes the difference between average indicated value by the instrument and the applied value.
v	Reversibility error, defined as the difference between the average indicated value by the instrument at a certain applied value when it was increased and when it was decreased.

Symbols and Definitions (quantity specific: Q may be substituted for F, P or S, as appropriate)

Q0	Zero load offset, instrument output where the specified measured quantity value is zero.
Qa	Average indicated quantity value by the instrument.
Qa,x	Quantity value indicated by the instrument at measurement x.
Qc0	Zero load error, defined as the difference between the average indicated value by the instrument before and after the load cycle has been applied.
Qw	Applied reference quantity value.

Quantities

F	Force
P	Pressure
S	Inclination

References

European Co-operation For Accreditation (2013), "Evaluation of the uncertainty of measurement in calibration", European Co-operation For Accreditation, 75 p. (Publication ; EA-4/02 M:2013)

TYPICAL DIMENSIONS

Instrument	
Manufacturer	Fugro
Type	CP15-CF75PB7SN2-P1E1M4-V5
Serial Number	1701-1515

Appendix Applicable to Certificate Number FCN17010360

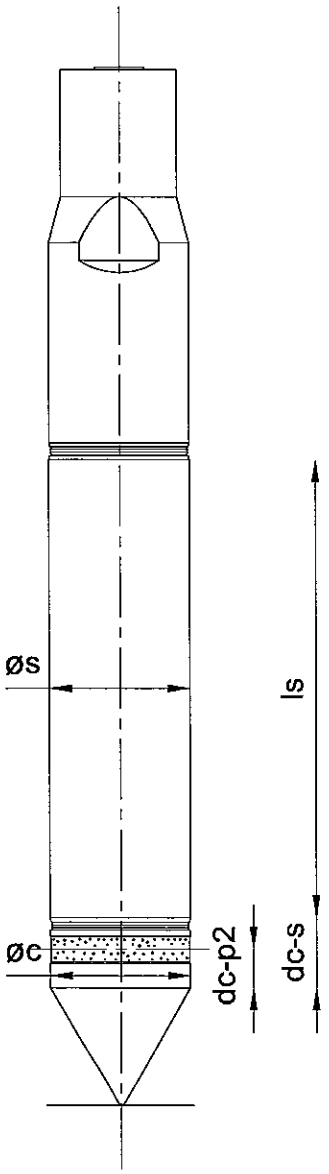


Diagram is not to scale

Typical Dimensions		
Ac	Cross-sectional projected area of the cone	0.0015 m²
As	Surface area of the friction sleeve	0.02 m²
af	Cone net area ratio	0.58
scf	Friction sleeve net area ratio	0.01392
øc	Diameter of the cylindrical part of the cone	43.85 mm
øs	Diameter of the friction sleeve	44.1 mm
ls	Length of the friction sleeve	143.6 mm
dc-s	Cone - friction sleeve distance	16 mm
dc-p2	Cone - pore 2 distance	6.9 mm

CONE NET AREA RATIO RESULT

Instrument	
Manufacturer	Fugro
Type	CP15-CF75PB7SN2-P1E1M4-V5
Serial Number	1701-1515
Electronics	5251
Node Type	7001
Hardware Version	4.00
Software Version	7.09

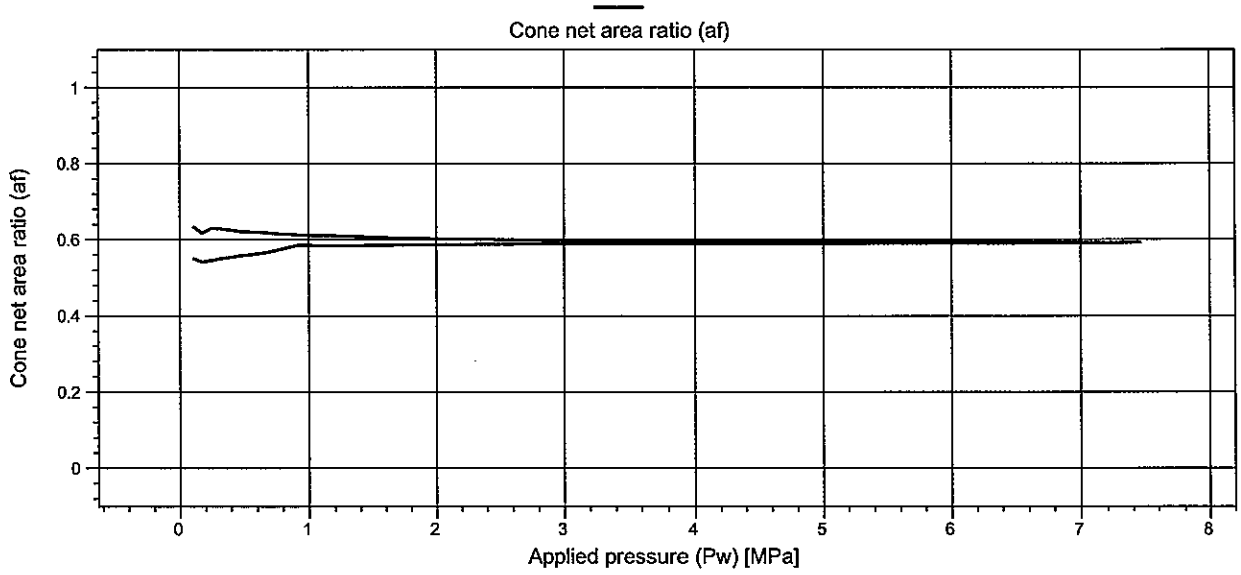
Reference	
Manufacturer	Keller PA-33X
Serial Number	3257-0002
Uncertainty	0.0005•Pw+0.002 [MPa]

Measurement Details	
Measurement Date	18 Sep 2017 10:57:49
Procedure	FEBV.CAL.PRO.003
Software Version	2.0.0.19464

Appendix Applicable to Certificate Number FCN17010360

Characteristics	Unit	Value
Cone net area ratio (af)	[-]	0.59

The cone net area ratio presented above is determined at the maximum applied pressure during the measurement.



Applied pressure (Pw) [MPa]	Measured cone net area ratio 1 (af,1)	Measured cone net area ratio 2 (af,2)	Measured cone net area ratio 3 (af,3)	Measured average cone net area ratio (af)
1.400	0.608	0.608	0.607	0.607
2.800	0.599	0.599	0.598	0.599
4.200	0.595	0.595	0.595	0.595
5.600	0.594	0.593	0.593	0.593
7.000	0.593	0.592	0.593	0.593
5.600	0.590	0.590	0.590	0.590
4.200	0.590	0.590	0.589	0.590
2.800	0.589	0.589	0.588	0.589
1.400	0.585	0.585	0.584	0.585

FRICTION SLEEVE NET AREA RATIO RESULT

Instrument	
Manufacturer	Fugro
Type	CP15-CF75PB7SN2-P1E1M4-V5
Serial Number	1701-1515
Electronics	5251
Node Type	7001
Hardware Version	4.00
Software Version	7.09

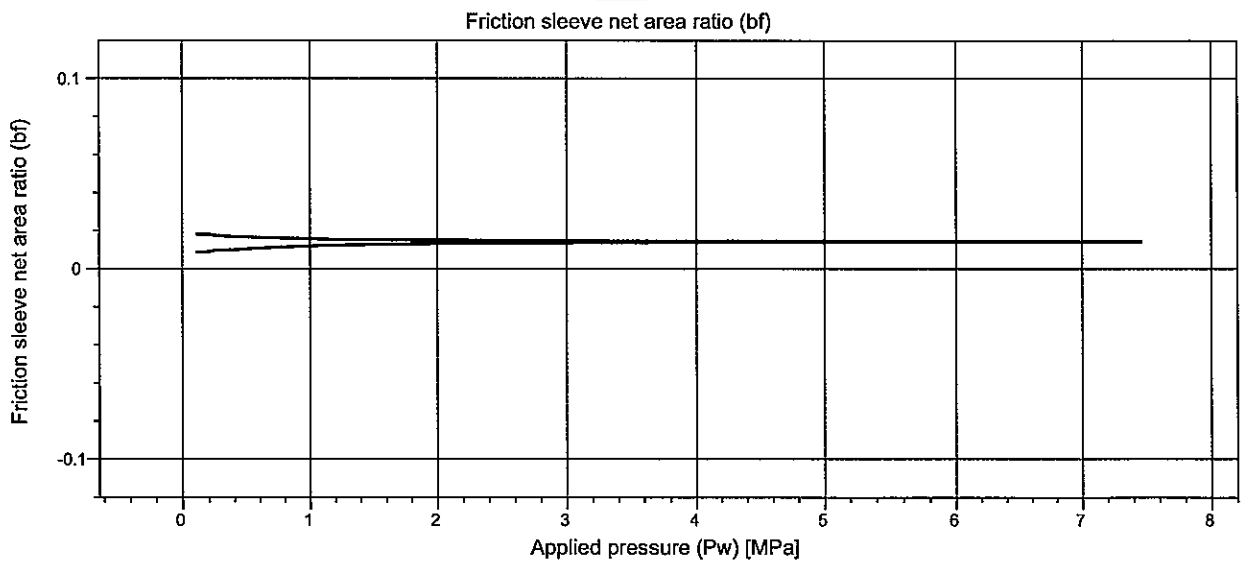
Reference	
Manufacturer	Keller PA-33X
Serial Number	3257-0002
Uncertainty	0.0005•Pw+0.002 [MPa]

Measurement Details	
Measurement Date	18 Sep 2017 10:57:49
Procedure	FEBV.CAL.PRO.003
Software Version	2.0.0.19464

Appendix Applicable to Certificate Number FCN17010360

Characteristics	Unit	Value
Friction sleeve net area ratio (bf)	[-]	0.01417

The friction sleeve net area ratio presented above is determined at the maximum applied pressure during the measurement.



Applied pressure (Pw) [MPa]	Measured friction sleeve net area ratio (bf) 1 (bf,1)	Measured friction sleeve net area ratio (bf) 2 (bf,2)	Measured friction sleeve net area ratio (bf) 3 (bf,3)	Measured average Friction sleeve net area ratio (bf)
1.400	0.013	0.012	0.013	0.013
2.800	0.014	0.013	0.013	0.014
4.200	0.014	0.014	0.014	0.014
5.600	0.014	0.014	0.014	0.014
7.000	0.014	0.014	0.014	0.014
5.600	0.014	0.014	0.014	0.014
4.200	0.015	0.015	0.015	0.015
2.800	0.015	0.015	0.015	0.015
1.400	0.015	0.015	0.015	0.015

SYMBOLS AND DEFINITIONS

Appendix Applicable to Certificate Number FCN17010360

Symbols and Definitions (general)

af	Cone net area ratio, defined as the factor between the applied pressure to the instrument and the indicated cone resistance.
af,x	Measured cone net area ratio at measurement x.
bf	Friction sleeve net area ratio, defined as the factor between the applied pressure to the instrument and the indicated sleeve friction.
bf,x	The measured friction sleeve net area ratio at measurement x.

Symbols and Definitions (quantity specific: Q may be substituted for P, as appropriate)

Qw	Applied reference quantity value.

Quantities

P	Pressure

CALIBRATION CERTIFICATE

CALIBRATION
RvA K 167

Certificate Number
FCN17010225

Applicant	**Fugro GeoServices Ltd.**
	Fugro House, Hithercroft Road
	OX10 9RB, Wallingford
	United Kingdom

Instrument	**Cone Penetrometer**
Manufacturer	Fugro
Type	CP15-CF75PB7SN2-P1E1M4-V6
Serial Number	1701-1529

Calibration method The instrument was calibrated according to Fugro procedures using a comparison technique against a reference standard.

Environmental Conditions	
Temperature during calibration	20.5 ± 3 °C
Atmospheric pressure during calibration	1000 ± 100 mbar

Result The result is shown on the next page(s).

Uncertainty The reported uncertainty is based on a standard uncertainty multiplied by a coverage factor k = 2, which provides a confidence level of approximately 95%. The standard uncertainty has been determined in accordance with EA-4/02.

Traceability The measurements have been executed using standards for which the traceability to (inter)national standards has been demonstrated towards the RvA (Raad voor Accreditatie).

Calibration period 04-Sep-2017 through 05-Sep-2017

Calibrate before 04-Sep-2018

Calibrated Sensor	Manufacturer / Type	Calibrated Range	Maximum Rating	Procedure
Cone [Force]	Fugro Loadcell	0 to 75 kN	0 to 150 kN	FEBV.CAL.PRO.003
Cone+Fric. [Force]	Fugro Loadcell	0 to 75 kN	0 to 150 kN	FEBV.CAL.PRO.003
Pore 2 [Pressure]	Kulite HKM-150-375-70bar SG	0 to 7 MPa	0 to 10.5 MPa	FEBV.CAL.PRO.004
Slope [Inclination]	ADXL	0 to 15 Deg	0 to 20 Deg	FEBV.CAL.PRO.005

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The Netherlands
VAT No: NL005621409B07
Trade Register No: 27114149

Nootdorp, 06-Sep-2017

This certificate is issued provided that neither Fugro nor the Raad voor Accreditatie assumes any liability.

The Raad voor Accreditatie is one of the signatories of the Multilateral Agreement of the European Cooperation for Accreditation (EA) for the mutual recognition of calibration certificates.

Ruud Schrijvers
Deputy Manager Transducer Workshop

CONE CALIBRATION RESULT [FORCE]

Instrument	
Manufacturer	Fugro
Type	CP15-CF75PB7SN2-P1E1M4-V6
Serial Number	1701-1529
Electronics	5489
Node Type	7001
Hardware Version	4.00
Software Version	7.09

Reference	
Manufacturer	Zwick/Roell
Serial Number	6034-0003
Uncertainty	0.003•Fw+0.015 [kN]

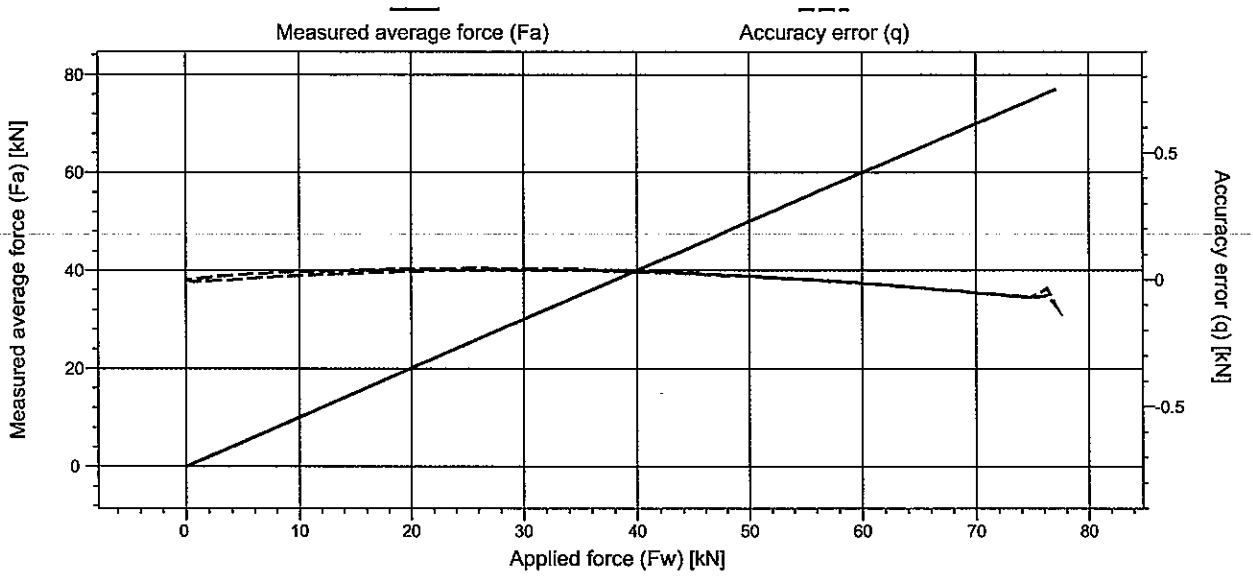
Calibration Details	
Calibration Date	05 Sep 2017 11:15:22
Procedure	FEBV.CAL.PRO.003
Software Version	2.0.0.19464

CALIBRATION
RvA K 167

Certificate Number
FCN17010225

Sensor	
Channel	Cone [Force]
Manufacturer / Type	Fugro Loadcell
Calibrated Range	0 to 75 kN
Maximum Rating	0 to 150 kN

Characteristics	Unit	Value
Max accuracy error (q)	[kN]	0.068
Max repeatability error (b)	[kN]	0.023
Max reversibility error (v)	[kN]	0.013
Zero load error (Fc0)	[kN]	0.000
Zero load offset (F0)	[kN]	-0.004
Resolution	[kN]	5.71E-05
Noise RMS	[kN]	0.001



Applied force (Fw) [kN]	Measured force 1 (Fa,1) [kN]	Measured force 2 (Fa,2) [kN]	Measured force 3 (Fa,3) [kN]	Measured average force (Fa) [kN]	Accuracy error (q) [kN]	Repeatability error (b) [kN]	Reversibility error (v) [kN]	Expanded Uncertainty (U) [kN]
0.000	-0.001	0.000	0.001	0.000	0.000	0.002		0.016
15.000	15.028	15.026	15.022	15.025	0.025	0.006	0.013	0.064
30.000	30.046	30.038	30.030	30.038	0.038	0.016	0.007	0.110
45.000	45.032	45.021	45.014	45.022	0.022	0.019	0.003	0.155
60.000	59.995	59.985	59.978	59.986	-0.014	0.017	0.001	0.201
75.000	74.941	74.935	74.918	74.932	-0.068	0.023		0.247
60.000	59.996	59.987	59.978	59.987	-0.013	0.018		0.201
45.000	45.035	45.025	45.017	45.025	0.025	0.018		0.155
30.000	30.053	30.045	30.037	30.045	0.045	0.016		0.109
15.000	15.043	15.038	15.033	15.038	0.038	0.010		0.063
0.000	0.000	0.000	0.001	0.000	0.000	0.001		0.015

CONE+FRIC. CALIBRATION RESULT [FORCE]

Instrument	
Manufacturer	Fugro
Type	CP15-CF75PB7SN2-P1E1M4-V6
Serial Number	1701-1529
Electronics	5489
Node Type	7001
Hardware Version	4.00
Software Version	7.09

Reference	
Manufacturer	Zwick/Roell
Serial Number	6034-0003
Uncertainty	0.003•Fw+0.015 [kN]

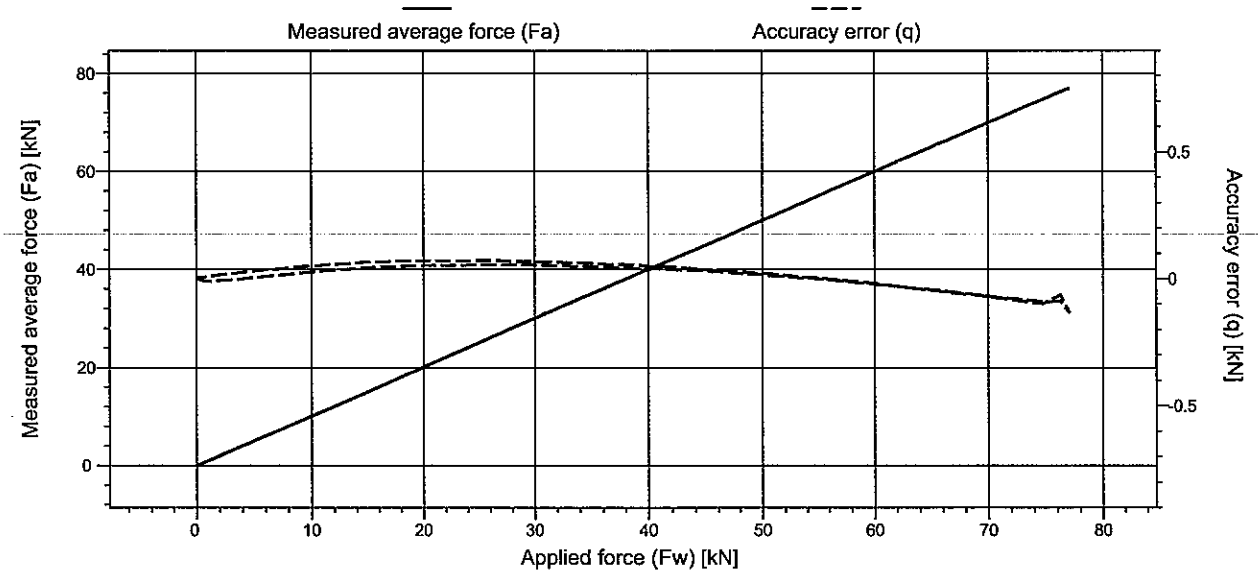
Calibration Details	
Calibration Date	05 Sep 2017 11:15:23
Procedure	FEBV.CAL.PRO.003
Software Version	2.0.0.19464

CALIBRATION
RvA K 167

Certificate Number
FCN17010225

Sensor	
Channel	Cone+Fric. [Force]
Manufacturer / Type	Fugro Loadcell
Calibrated Range	0 to 75 kN
Maximum Rating	0 to 150 kN

Characteristics	Unit	Value
Max accuracy error (q)	[kN]	0.095
Max repeatability error (b)	[kN]	0.031
Max reversibility error (v)	[kN]	0.022
Zero load error (Fc0)	[kN]	0.002
Zero load offset (F0)	[kN]	-0.003
Resolution	[kN]	5.68E-05
Noise RMS	[kN]	0.000
Tip-Sleeve Interaction	[kPa]	1.7
Tip-Sleeve Interaction %	[%]	0.35



Applied force (Fw) [kN]	Measured force 1 (Fa,1) [kN]	Measured force 2 (Fa,2) [kN]	Measured force 3 (Fa,3) [kN]	Measured average force (Fa) [kN]	Accuracy error (q) [kN]	Repeatability error (b) [kN]	Reversibility error (v) [kN]	Expanded Uncertainty (U) [kN]
0.000	0.001	0.000	0.000	0.000	0.000	0.001		0.016
15.000	15.050	15.045	15.035	15.044	0.044	0.015	0.022	0.069
30.000	30.068	30.052	30.042	30.054	0.054	0.026	0.014	0.113
45.000	45.043	45.029	45.017	45.030	0.030	0.027	0.007	0.157
60.000	59.991	59.977	59.966	59.978	-0.022	0.025	0.004	0.202
75.000	74.918	74.909	74.887	74.905	-0.095	0.031		0.249
60.000	59.994	59.983	59.969	59.982	-0.018	0.025		0.202
45.000	45.049	45.036	45.024	45.036	0.036	0.026		0.157
30.000	30.081	30.067	30.056	30.068	0.068	0.025		0.112
15.000	15.072	15.066	15.057	15.065	0.065	0.015		0.064
0.000	0.003	0.002	0.002	0.002	0.002	0.002		0.016

PORE 2 CALIBRATION RESULT [PRESSURE]

Instrument	
Manufacturer	Fugro
Type	CP15-CF75PB7SN2-P1E1M4-V6
Serial Number	1701-1529
Electronics	5489
Node Type	7001
Hardware Version	4.00
Software Version	7.09

Reference	
Manufacturer	Keller PA-33X
Serial Number	3257-0002
Uncertainty	0.0005•Pw+0.002 [MPa]

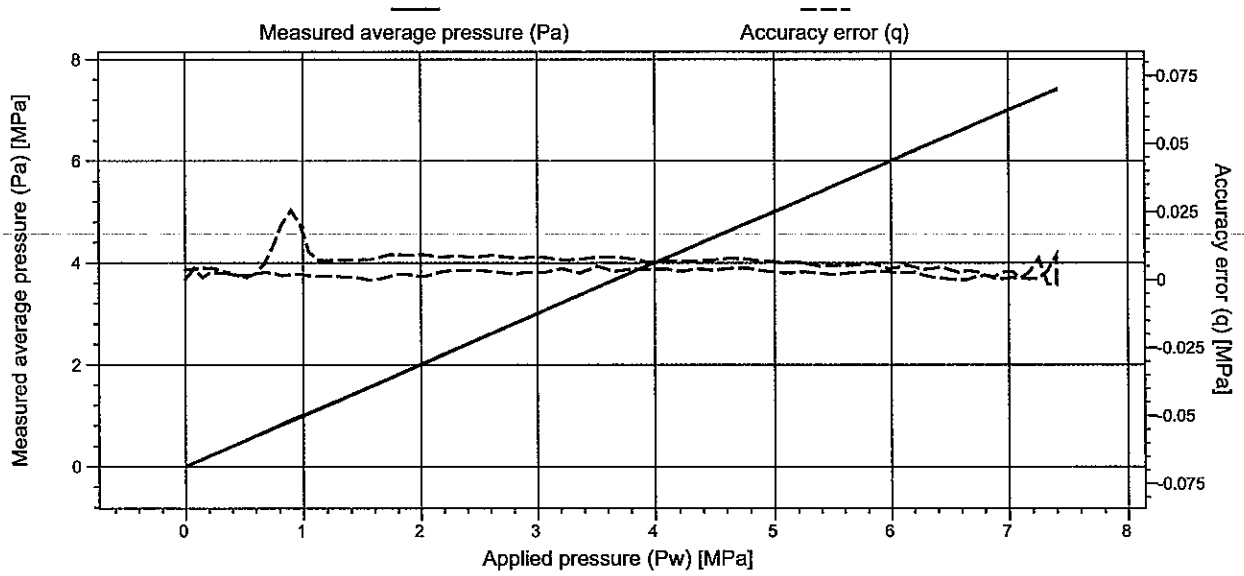
Calibration Details	
Calibration Date	05 Sep 2017 11:26:08
Procedure	FEBV.CAL.PRO.004
Software Version	2.0.0.19464

CALIBRATION
RvA K 167

Certificate Number
FCN17010225

Sensor	
Channel	Pore 2 [Pressure]
Manufacturer / Type	Kulite HKM-150-375-70bar SG
Calibrated Range	0 to 7 MPa
Maximum Rating	0 to 10.5 MPa

Characteristics	Unit	Value
Max accuracy error (q)	[MPa]	0.008
Max repeatability error (b)	[MPa]	0.002
Max reversibility error (v)	[MPa]	0.006
Zero load error (Pc0)	[MPa]	0.004
Zero load offset (P0)	[MPa]	-0.021
Resolution	[MPa]	2.57E-06
Noise RMS	[MPa]	0.000



Applied pressure (Pw) [MPa]	Measured pressure 1 (Pa,1) [MPa]	Measured pressure 2 (Pa,2) [MPa]	Measured pressure 3 (Pa,3) [MPa]	Measured average pressure (Pa) [MPa]	Accuracy error (q) [MPa]	Repeatability error (b) [MPa]	Reversibility error (v) [MPa]	Expanded Uncertainty (U) [MPa]
0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.011
1.400	1.402	1.401	1.400	1.401	0.001	0.002	0.006	0.013
2.800	2.801	2.802	2.803	2.802	0.002	0.002	0.006	0.012
4.200	4.202	4.204	4.202	4.203	0.003	0.002	0.004	0.009
5.600	5.601	5.602	5.603	5.602	0.002	0.002	0.003	0.009
7.000	7.001	7.000	7.001	7.001	0.001	0.001		0.008
5.600	5.605	5.607	5.604	5.605	0.005	0.002		0.008
4.200	4.206	4.207	4.207	4.207	0.007	0.001		0.008
2.800	2.808	2.807	2.808	2.808	0.008	0.001		0.008
1.400	1.407	1.408	1.407	1.407	0.007	0.001		0.009
0.000	0.004	0.004	0.004	0.004	0.004	0.001		0.011

SLOPE CALIBRATION RESULT [INCLINATION]

Instrument	
Manufacturer	Fugro
Type	CP15-CF75PB7SN2-P1E1M4-V6
Serial Number	1701-1529
Electronics	5489
Node Type	7001
Hardware Version	4.00
Software Version	7.09

Reference	
Manufacturer	Hoek-O-Mat
Serial Number	2109-0002
Uncertainty	0.6 [Deg]

Calibration Details	
Calibration Date	04 Sep 2017 11:23:47
Procedure	FEBV.CAL.PRO.005
Software Version	2.0.0.19464

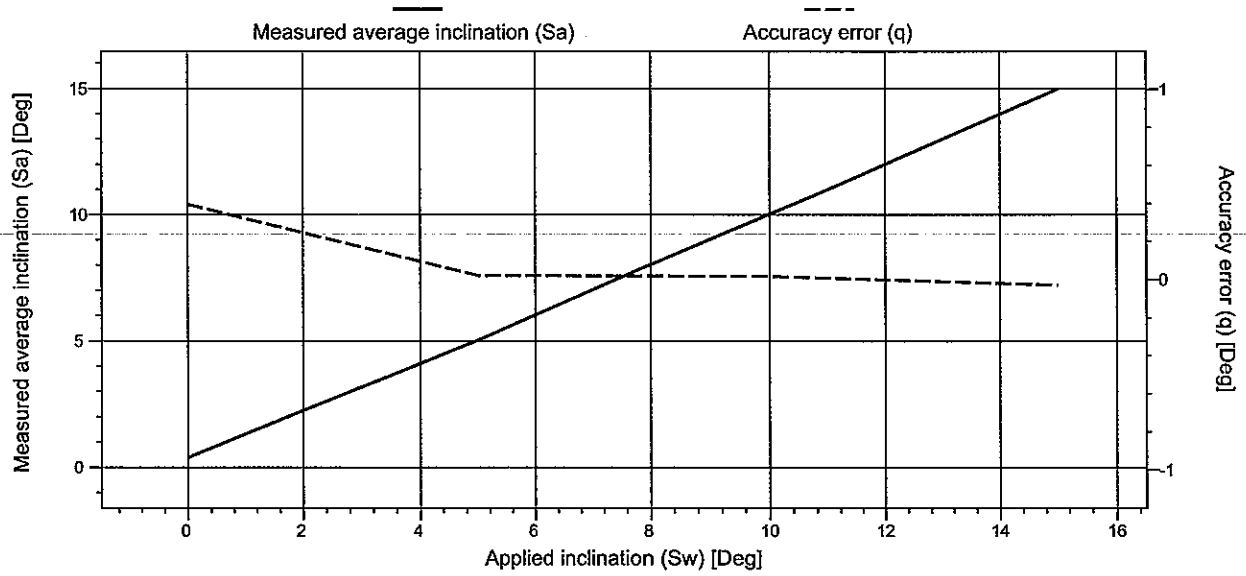
CALIBRATION
RvA K 167

Certificate Number
FCN17010225

Sensor	
Channel	Slope [Inclination]
Manufacturer / Type	ADXL
Calibrated Range	0 to 15 Deg
Maximum Rating	0 to 20 Deg

Characteristics	Unit	Value
Max accuracy error (q)	[Deg]	0.4
Max repeatability error (b)	[Deg]	0.1
Zero load error (Sc0)	[Deg]	0.0
Zero load offset (S0)	[Deg]	0.4
Resolution	[Deg]	1.33E-05
Noise RMS	[Deg]	0.0

Inclination is defined as the angular deviation of the cone penetrometer from the vertical.



Applied inclination (Sw) [Deg]	Measured inclination 1 (Sa,1) [Deg]	Measured inclination 2 (Sa,2) [Deg]	Measured inclination 3 (Sa,3) [Deg]	Measured average inclination (Sa) [Deg]	Accuracy error (q) [Deg]	Repeatability error (b) [Deg]	Expanded Uncertainty (U) [Deg]
0.0	0.4	0.4	0.3	0.4	0.4	0.1	0.6
5.0	5.0	5.0	5.1	5.0	0.0	0.1	0.6
10.0	10.0	10.0	10.0	10.0	0.0	0.1	0.6
15.0	15.0	15.0	15.0	15.0	0.0	0.0	0.6

Symbols and Definitions (general)

b	Repeatability error, defined as the maximum difference between the measurements of the instrument at the applied value.
Noise RMS	Signal noise, defined as the quadratic mean when the sensor is not subjected to load.
q	Accuracy error, defined as the difference between the average indicated value by the instrument and the applied value.
Resolution	Smallest change in a quantity being measured that causes a perceptible change in the corresponding indication.
Tip-Sleeve Interaction	Effect of cone tip measurements on derived friction measurements, due to coupling of the cone tip and friction sleeve element. Expressed in terms of friction and as a percentage of the full scale output of the cone tip.
U	The stated uncertainty is that of the average indicated quantity, and includes the entire calibration method, including the reference and calibrated sensor, but excludes the difference between average indicated value by the instrument and the applied value.
v	Reversibility error, defined as the difference between the average indicated value by the instrument at a certain applied value when it was increased and when it was decreased.

Symbols and Definitions (quantity specific: Q may be substituted for F, P or S, as appropriate)

Q0	Zero load offset, instrument output where the specified measured quantity value is zero.
Qa	Average indicated quantity value by the instrument.
Qa,x	Quantity value indicated by the instrument at measurement x.
Qc0	Zero load error, defined as the difference between the average indicated value by the instrument before and after the load cycle has been applied.
Qw	Applied reference quantity value.

Quantities

F	Force
P	Pressure
S	Inclination

References

European Co-operation For Accreditation (2013), "Evaluation of the uncertainty of measurement in calibration", European Co-operation For Accreditation, 75 p. (Publication ; EA-4/02 M:2013)

TYPICAL DIMENSIONS

Instrument	
Manufacturer	Fugro
Type	CP15-CF75PB7SN2-P1E1M4-V6
Serial Number	1701-1529

Appendix Applicable to Certificate Number FCN17010225

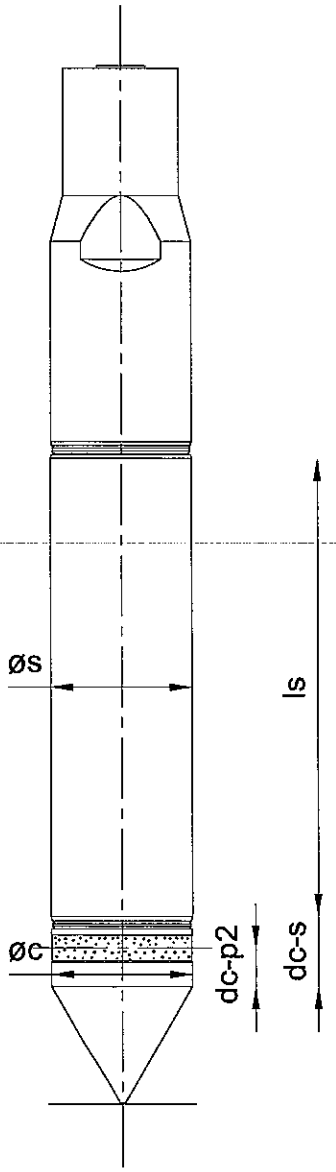


Diagram is not to scale

Typical Dimensions		
Ac	Cross-sectional projected area of the cone	0.0015 m²
As	Surface area of the friction sleeve	0.02 m²
af	Cone net area ratio	0.58
scf	Friction sleeve net area ratio	0.01392
øc	Diameter of the cylindrical part of the cone	43.85 mm
øs	Diameter of the friction sleeve	44.1 mm
ls	Length of the friction sleeve	143.6 mm
dc-s	Cone - friction sleeve distance	16 mm
dc-p2	Cone - pore 2 distance	6.9 mm

CONE NET AREA RATIO RESULT

Instrument	
Manufacturer	Fugro
Type	CP15-CF75PB7SN2-P1E1M4-V6
Serial Number	1701-1529
Electronics	5489
Node Type	7001
Hardware Version	4.00
Software Version	7.09

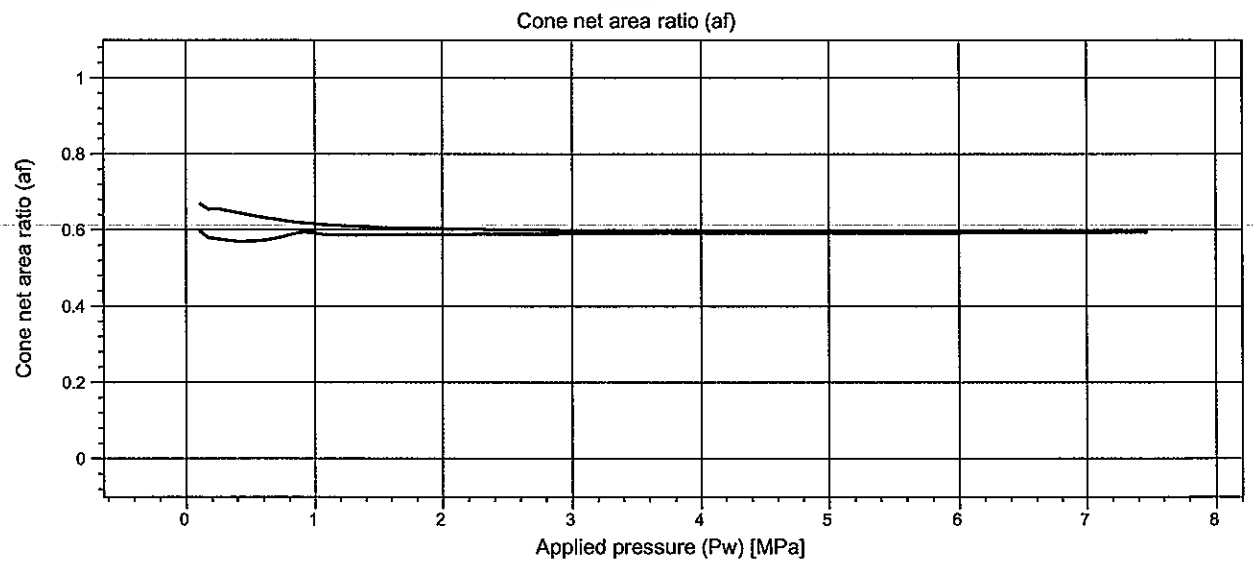
Reference	
Manufacturer	Keller PA-33X
Serial Number	3257-0002
Uncertainty	0.0005•Pw+0.002 [MPa]

Measurement Details	
Measurement Date	05 Sep 2017 11:26:08
Procedure	FEBV.CAL.PRO.003
Software Version	2.0.0.19464

Appendix Applicable to Certificate Number FCN17010225

Characteristics	Unit	Value
Cone net area ratio (af)	[-]	0.59

The cone net area ratio presented above is determined at the maximum applied pressure during the measurement.



Applied pressure (Pw) [MPa]	Measured cone net area ratio 1 (af,1)	Measured cone net area ratio 2 (af,2)	Measured cone net area ratio 3 (af,3)	Measured average cone net area ratio (af)
1.400	0.608	0.608	0.608	0.608
2.800	0.599	0.599	0.600	0.599
4.200	0.597	0.597	0.597	0.597
5.600	0.596	0.596	0.596	0.596
7.000	0.595	0.595	0.595	0.595
5.600	0.592	0.593	0.592	0.593
4.200	0.592	0.592	0.592	0.592
2.800	0.590	0.590	0.590	0.590
1.400	0.587	0.587	0.587	0.587

FRICTION SLEEVE NET AREA RATIO RESULT

Instrument	
Manufacturer	Fugro
Type	CP15-CF75PB7SN2-P1E1M4-V6
Serial Number	1701-1529
Electronics	5489
Node Type	7001
Hardware Version	4.00
Software Version	7.09

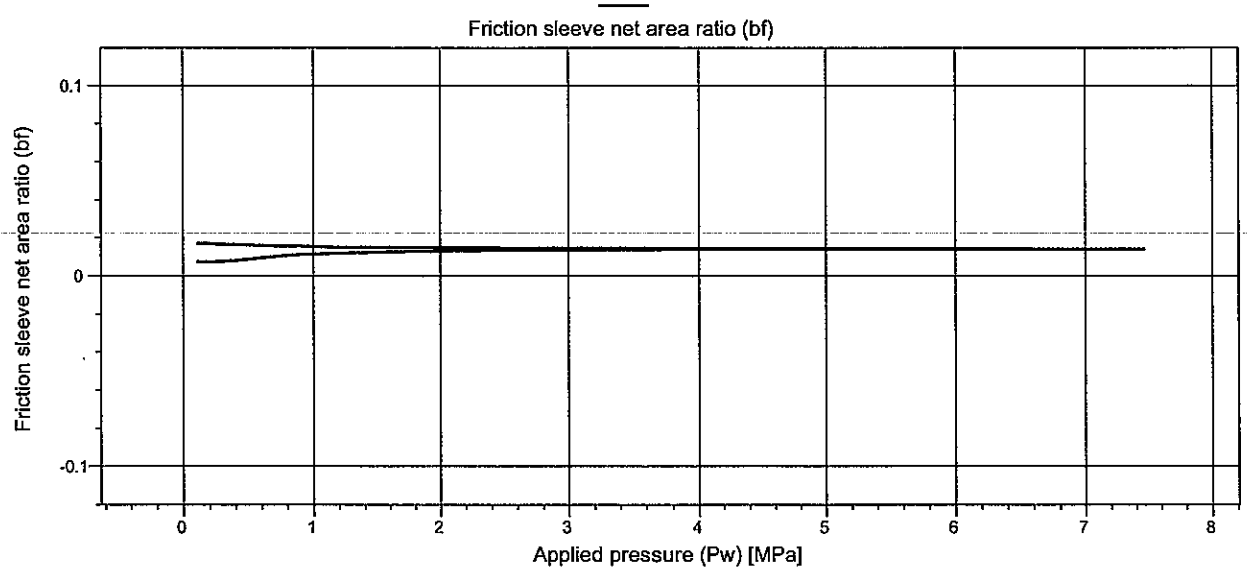
Reference	
Manufacturer	Keller PA-33X
Serial Number	3257-0002
Uncertainty	0.0005•Pw+0.002 [MPa]

Measurement Details	
Measurement Date	05 Sep 2017 11:26:08
Procedure	FEBV.CAL.PRO.003
Software Version	2.0.0.19464

Appendix Applicable to Certificate Number FCN17010225

Characteristics	Unit	Value
Friction sleeve net area ratio (bf)	[-]	0.01405

The friction sleeve net area ratio presented above is determined at the maximum applied pressure during the measurement.



Applied pressure (Pw) [MPa]	Measured friction sleeve net area ratio (bf) 1 (bf,1)	Measured friction sleeve net area ratio (bf) 2 (bf,2)	Measured friction sleeve net area ratio (bf) 3 (bf,3)	Measured average Friction sleeve net area ratio (bf)
1.400	0.012	0.012	0.012	0.012
2.800	0.013	0.013	0.013	0.013
4.200	0.014	0.014	0.014	0.014
5.600	0.014	0.014	0.014	0.014
7.000	0.014	0.014	0.014	0.014
5.600	0.014	0.014	0.014	0.014
4.200	0.014	0.014	0.014	0.014
2.800	0.015	0.015	0.015	0.015
1.400	0.015	0.015	0.015	0.015

SYMBOLS AND DEFINITIONS

Appendix Applicable to Certificate Number FCN17010225

Symbols and Definitions (general)	
af	Cone net area ratio, defined as the factor between the applied pressure to the instrument and the indicated cone resistance.
af,x	Measured cone net area ratio at measurement x.
bf	Friction sleeve net area ratio, defined as the factor between the applied pressure to the instrument and the indicated sleeve friction.
bf,x	The measured friction sleeve net area ratio at measurement x.

Symbols and Definitions (quantity specific: Q may be substituted for P, as appropriate)	
Qw	Applied reference quantity value.

Quantities	
P	Pressure

CALIBRATION CERTIFICATE

CALIBRATION
RvA K 167

Certificate Number
FCN17010206

Applicant	**Fugro GeoServices Ltd.**
	Fugro House, Hithercroft Road
	OX10 9RB, Wallingford
	United Kingdom

Instrument	**Cone Penetrometer**
Manufacturer	Fugro
Type	CP15-CF75PB7SN2-P1E1M4-V5
Serial Number	1701-1987

Calibration method The instrument was calibrated according to Fugro procedures using a comparison technique against a reference standard.

Environmental Conditions	
Temperature during calibration	20.5 ± 3 °C
Atmospheric pressure during calibration	1000 ± 100 mbar

Result The result is shown on the next page(s).

Uncertainty The reported uncertainty is based on a standard uncertainty multiplied by a coverage factor k = 2, which provides a confidence level of approximately 95%. The standard uncertainty has been determined in accordance with EA-4/02.

Traceability The measurements have been executed using standards for which the traceability to (inter)national standards has been demonstrated towards the RvA (Raad voor Accreditatie).

Calibration date 31-Aug-2017

Calibrate before 31-Aug-2018

Calibrated Sensor	Manufacturer / Type	Calibrated Range	Maximum Rating	Procedure
Cone [Force]	Fugro Loadcell	0 to 75 kN	0 to 150 kN	FEBV.CAL.PRO.003
Cone+Fric. [Force]	Fugro Loadcell	0 to 75 kN	0 to 150 kN	FEBV.CAL.PRO.003
Pore 2 [Pressure]	Kistler 4043A50V0408	0 to 7 MPa	0 to 10.5 MPa	FEBV.CAL.PRO.004
Slope [Inclination]	ADXL	0 to 15 Deg	0 to 20 Deg	FEBV.CAL.PRO.005

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Trade Register No: 27114149

Nootdorp, 01-Sep-2017

This certificate is issued provided that neither Fugro nor the Raad voor Accreditatie assumes any liability.

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Ruud Schrijvers
Deputy Manager Transducer Workshop

CONE CALIBRATION RESULT [FORCE]

Instrument	
Manufacturer	Fugro
Type	CP15-CF75PB7SN2-P1E1M4-V5
Serial Number	1701-1987
Electronics	5471
Node Type	7001
Hardware Version	4.00
Software Version	7.09

Reference	
Manufacturer	Zwick/Roell
Serial Number	6034-0003
Uncertainty	0.003•Fw+0.015 [kN]

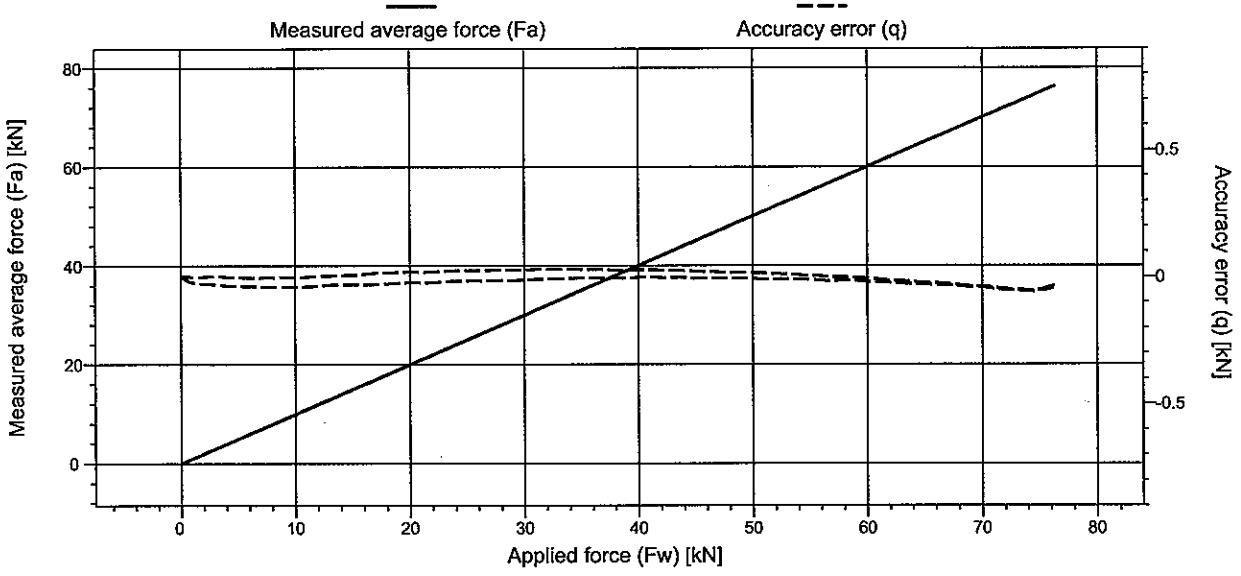
Calibration Details	
Calibration Date	31 Aug 2017 15:06:59
Procedure	FEBV.CAL.PRO.003
Software Version	2.0.0.19464

CALIBRATION
RvA K 167

Certificate Number
FCN17010206

Sensor	
Channel	Cone [Force]
Manufacturer / Type	Fugro Loadcell
Calibrated Range	0 to 75 kN
Maximum Rating	0 to 150 kN

Characteristics	Unit	Value
Max accuracy error (q)	[kN]	0.057
Max repeatability error (b)	[kN]	0.052
Max reversibility error (v)	[kN]	0.040
Zero load error (Fc0)	[kN]	0.001
Zero load offset (F0)	[kN]	0.001
Resolution	[kN]	5.76E-05
Noise RMS	[kN]	0.002



Applied force (Fw) [kN]	Measured force 1 (Fa,1) [kN]	Measured force 2 (Fa,2) [kN]	Measured force 3 (Fa,3) [kN]	Measured average force (Fa) [kN]	Accuracy error (q) [kN]	Repeatability error (b) [kN]	Reversibility error (v) [kN]	Expanded Uncertainty (U) [kN]
0.000	0.002	-0.001	-0.002	0.000	0.000	0.004		0.017
15.000	14.947	14.971	14.986	14.968	-0.032	0.039	0.039	0.100
30.000	29.962	29.990	30.007	29.987	-0.013	0.045	0.040	0.134
45.000	44.966	44.996	45.015	44.992	-0.008	0.049	0.029	0.168
60.000	59.950	59.986	60.002	59.979	-0.021	0.052	0.013	0.210
75.000	74.921	74.950	74.958	74.943	-0.057	0.037		0.250
60.000	59.966	59.997	60.014	59.992	-0.008	0.047		0.208
45.000	44.998	45.023	45.041	45.021	0.021	0.042		0.162
30.000	30.005	30.027	30.046	30.026	0.026	0.041		0.118
15.000	14.992	15.005	15.024	15.007	0.007	0.032		0.075
0.000	0.002	0.001	0.001	0.001	0.001	0.001		0.016

CONE+FRIC. CALIBRATION RESULT [FORCE]

Instrument	
Manufacturer	Fugro
Type	CP15-CF75PB7SN2-P1E1M4-V5
Serial Number	1701-1987
Electronics	5471
Node Type	7001
Hardware Version	4.00
Software Version	7.09

Reference	
Manufacturer	Zwick/Roell
Serial Number	6034-0003
Uncertainty	0.003•Fw+0.015 [kN]

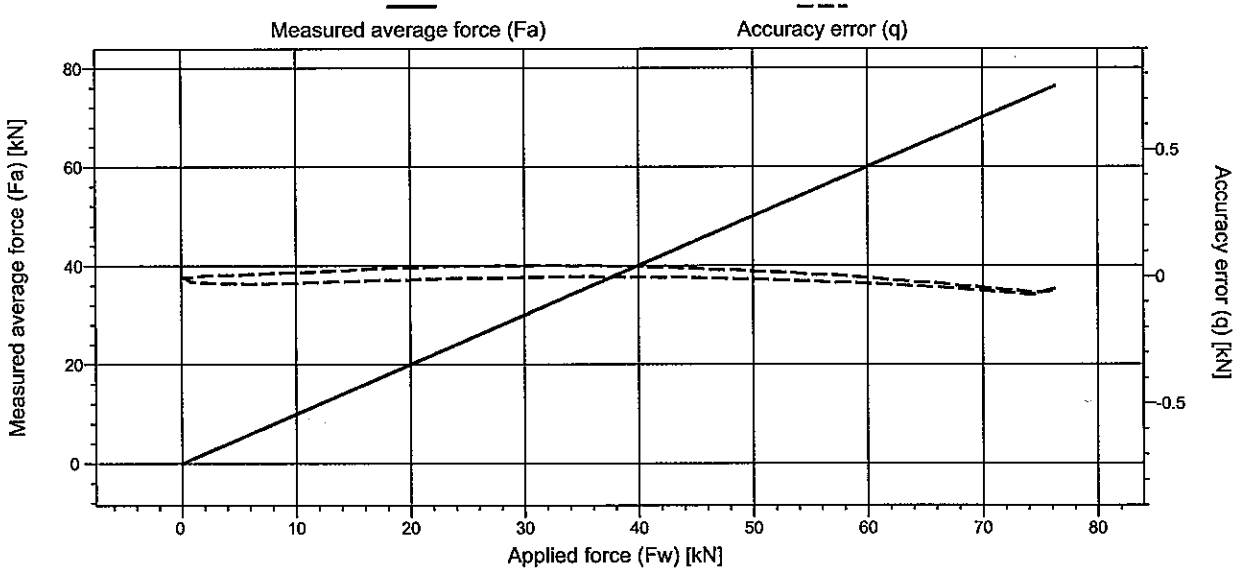
Calibration Details	
Calibration Date	31 Aug 2017 15:06:59
Procedure	FEBV.CAL.PRO.003
Software Version	2.0.0.19464

CALIBRATION
RvA K 167

Certificate Number
FCN17010206

Sensor	
Channel	Cone+Fric. [Force]
Manufacturer / Type	Fugro Loadcell
Calibrated Range	0 to 75 kN
Maximum Rating	0 to 150 kN

Characteristics	Unit	Value
Max accuracy error (q)	[kN]	0.068
Max repeatability error (b)	[kN]	0.031
Max reversibility error (v)	[kN]	0.045
Zero load error (Fc0)	[kN]	0.000
Zero load offset (F0)	[kN]	-0.006
Resolution	[kN]	5.73E-05
Noise RMS	[kN]	0.002
Tip-Sleeve Interaction	[kPa]	1.5
Tip-Sleeve Interaction %	[%]	0.30



Applied force (Fw) [kN]	Measured force 1 (Fa,1) [kN]	Measured force 2 (Fa,2) [kN]	Measured force 3 (Fa,3) [kN]	Measured average force (Fa) [kN]	Accuracy error (q) [kN]	Repeatability error (b) [kN]	Reversibility error (v) [kN]	Expanded Uncertainty (U) [kN]
0.000	0.004	-0.001	-0.002	0.000	0.000	0.006		0.017
15.000	14.969	14.984	14.990	14.981	-0.019	0.021	0.045	0.095
30.000	29.984	30.001	30.008	29.998	-0.002	0.024	0.045	0.123
45.000	44.981	44.998	45.006	44.995	-0.005	0.025	0.038	0.163
60.000	59.956	59.975	59.985	59.972	-0.028	0.029	0.024	0.205
75.000	74.919	74.938	74.940	74.932	-0.068	0.020		0.247
60.000	59.979	59.998	60.009	59.995	-0.005	0.031		0.203
45.000	45.019	45.036	45.042	45.033	0.033	0.022		0.156
30.000	30.033	30.041	30.053	30.042	0.042	0.021		0.111
15.000	15.017	15.027	15.034	15.026	0.026	0.016		0.065
0.000	0.001	-0.001	-0.001	0.000	0.000	0.002		0.016

PORE 2 CALIBRATION RESULT [PRESSURE]

Instrument	
Manufacturer	Fugro
Type	CP15-CF75PB7SN2-P1E1M4-V5
Serial Number	1701-1987
Electronics	5471
Node Type	7001
Hardware Version	4.00
Software Version	7.09

Reference	
Manufacturer	Keller PA-33X
Serial Number	3257-0002
Uncertainty	0.0005•Pw+0.002 [MPa]

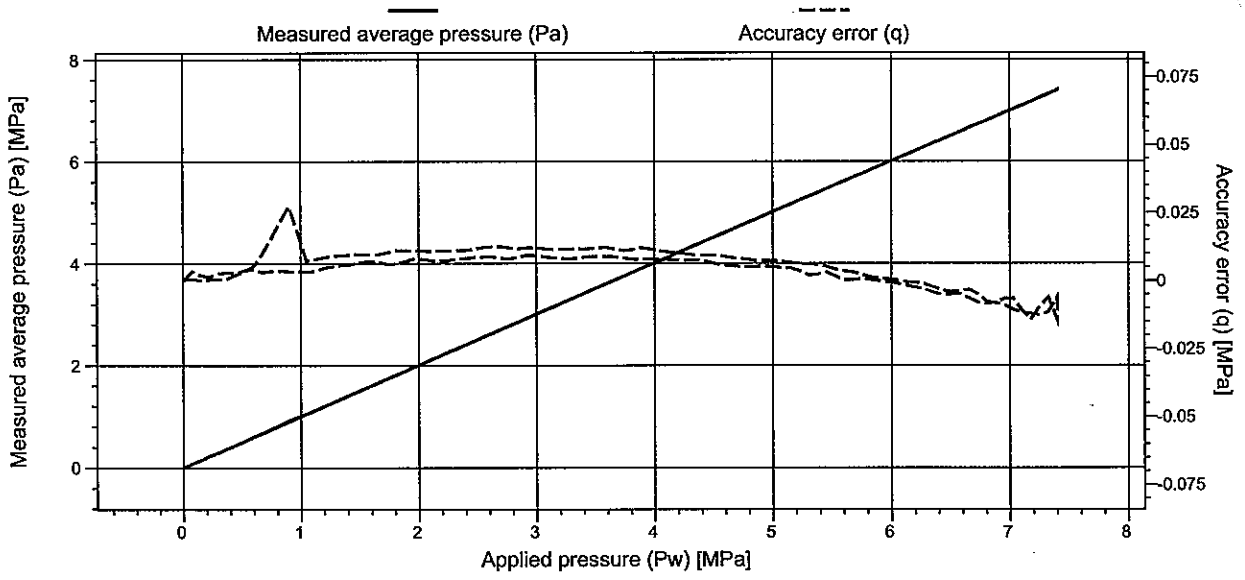
Calibration Details	
Calibration Date	31 Aug 2017 15:57:51
Procedure	FEBV.CAL.PRO.004
Software Version	2.0.0.19464

CALIBRATION
RvA K 167

Certificate Number
FCN17010206

Sensor	
Channel	Pore 2 [Pressure]
Manufacturer / Type	Kistler 4043A50V0408
Calibrated Range	0 to 7 MPa
Maximum Rating	0 to 10.5 MPa

Characteristics	Unit	Value
Max accuracy error (q)	[MPa]	0.012
Max repeatability error (b)	[MPa]	0.004
Max reversibility error (v)	[MPa]	0.004
Zero load error (Pc0)	[MPa]	0.001
Zero load offset (P0)	[MPa]	-0.004
Resolution	[MPa]	2.71E-06
Noise RMS	[MPa]	0.000



Applied pressure (Pw) [MPa]	Measured pressure 1 (Pa,1) [MPa]	Measured pressure 2 (Pa,2) [MPa]	Measured pressure 3 (Pa,3) [MPa]	Measured average pressure (Pa) [MPa]	Accuracy error (q) [MPa]	Repeatability error (b) [MPa]	Reversibility error (v) [MPa]	Expanded Uncertainty (U) [MPa]
0.000	0.002	-0.001	-0.001	0.000	0.000	0.004		0.008
1.400	1.406	1.408	1.404	1.406	0.006	0.003	0.004	0.008
2.800	2.807	2.809	2.809	2.808	0.008	0.002	0.004	0.007
4.200	4.206	4.208	4.208	4.208	0.008	0.002	0.003	0.006
5.600	5.601	5.601	5.599	5.600	0.000	0.001	0.003	0.007
7.000	6.991	6.990	6.989	6.990	-0.010	0.002		0.006
5.600	5.603	5.605	5.602	5.603	0.003	0.002		0.006
4.200	4.210	4.209	4.212	4.210	0.010	0.002		0.005
2.800	2.814	2.811	2.811	2.812	0.012	0.003		0.006
1.400	1.410	1.410	1.408	1.409	0.009	0.002		0.004
0.000	0.001	0.000	0.000	0.001	0.001	0.001		0.002

SLOPE CALIBRATION RESULT [INCLINATION]

Instrument	
Manufacturer	Fugro
Type	CP15-CF75PB7SN2-P1E1M4-V5
Serial Number	1701-1987
Electronics	5471
Node Type	7001
Hardware Version	4.00
Software Version	7.09

Reference	
Manufacturer	Hoek-O-Mat
Serial Number	2109-0002
Uncertainty	0.6 [Deg]

Calibration Details	
Calibration Date	31 Aug 2017 15:11:32
Procedure	FEBV.CAL.PRO.005
Software Version	2.0.0.19464

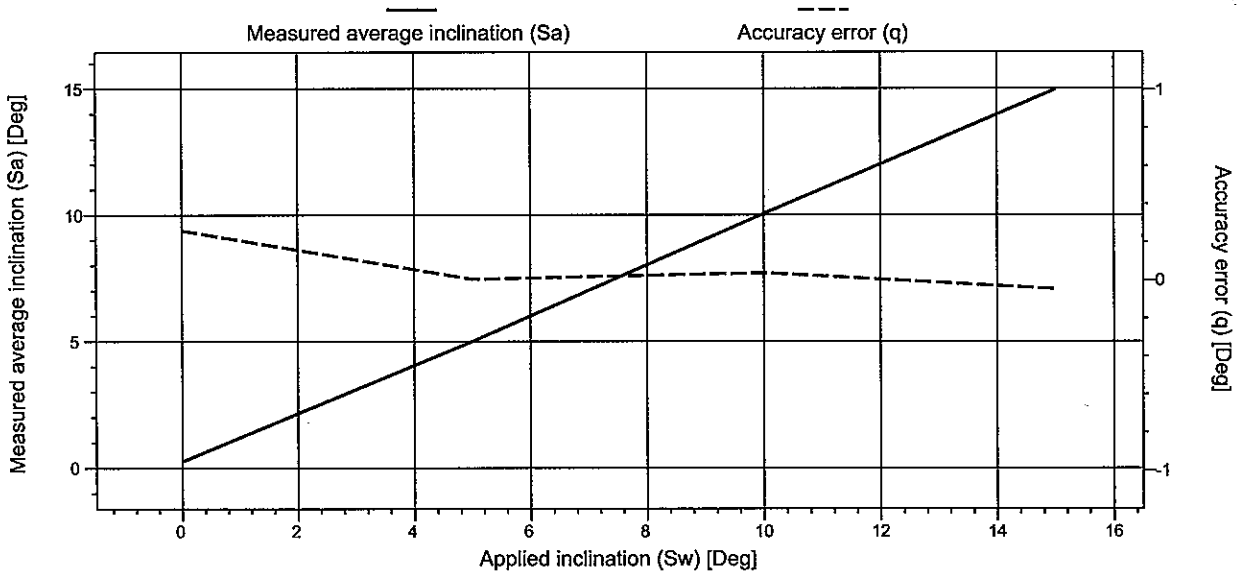
CALIBRATION
RvA K 167

Certificate Number
FCN17010206

Sensor	
Channel	Slope [Inclination]
Manufacturer / Type	ADXL
Calibrated Range	0 to 15 Deg
Maximum Rating	0 to 20 Deg

Characteristics	Unit	Value
Max accuracy error (q)	[Deg]	0.3
Max repeatability error (b)	[Deg]	0.1
Zero load error (Sc0)	[Deg]	0.0
Zero load offset (S0)	[Deg]	0.2
Resolution	[Deg]	1.31E-05
Noise RMS	[Deg]	0.0

Inclination is defined as the angular deviation of the cone penetrometer from the vertical.



Applied inclination (Sw) [Deg]	Measured inclination 1 (Sa,1) [Deg]	Measured inclination 2 (Sa,2) [Deg]	Measured inclination 3 (Sa,3) [Deg]	Measured average inclination (Sa) [Deg]	Accuracy error (q) [Deg]	Repeatability error (b) [Deg]	Expanded Uncertainty (U) [Deg]
0.0	0.2	0.3	0.3	0.3	0.3	0.1	0.6
5.0	5.0	5.0	5.0	5.0	0.0	0.1	0.6
10.0	10.0	10.0	10.1	10.0	0.0	0.1	0.6
15.0	14.9	14.9	15.0	15.0	0.0	0.1	0.6

SYMBOLS, DEFINITIONS AND REFERENCES

CALIBRATION
RvA K 167

Certificate Number
FCN17010206

Symbols and Definitions (general)

b	Repeatability error, defined as the maximum difference between the measurements of the instrument at the applied value.
Noise RMS	Signal noise, defined as the quadratic mean when the sensor is not subjected to load.
q	Accuracy error, defined as the difference between the average indicated value by the instrument and the applied value.
Resolution	Smallest change in a quantity being measured that causes a perceptible change in the corresponding indication.
Tip-Sleeve Interaction	Effect of cone tip measurements on derived friction measurements, due to coupling of the cone tip and friction sleeve element. Expressed in terms of friction and as a percentage of the full scale output of the cone tip.
U	The stated uncertainty is that of the average indicated quantity, and includes the entire calibration method, including the reference and calibrated sensor, but excludes the difference between average indicated value by the instrument and the applied value.
v	Reversibility error, defined as the difference between the average indicated value by the instrument at a certain applied value when it was increased and when it was decreased.

Symbols and Definitions (quantity specific: Q may be substituted for F, P or S, as appropriate)

Q0	Zero load offset, instrument output where the specified measured quantity value is zero.
Qa	Average indicated quantity value by the instrument.
Qa,x	Quantity value indicated by the instrument at measurement x.
Qc0	Zero load error, defined as the difference between the average indicated value by the instrument before and after the load cycle has been applied.
Qw	Applied reference quantity value.

Quantities

F	Force
P	Pressure
S	Inclination

References

European Co-operation For Accreditation (2013), "Evaluation of the uncertainty of measurement in calibration", European Co-operation For Accreditation, 75 p. (Publication ; EA-4/02 M:2013)

TYPICAL DIMENSIONS

Instrument	
Manufacturer	Fugro
Type	CP15-CF75PB7SN2-P1E1M4-V5
Serial Number	1701-1987

Appendix Applicable to Certificate Number FCN17010206

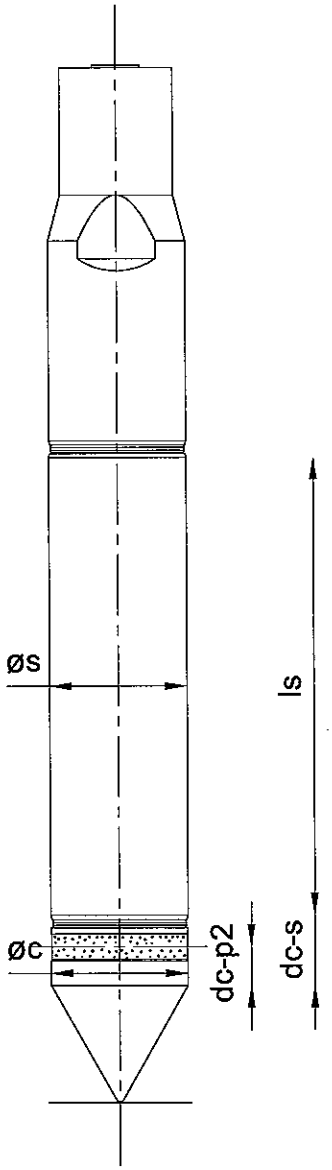


Diagram is not to scale

Typical Dimensions		
Ac	Cross-sectional projected area of the cone	0.0015 m²
As	Surface area of the friction sleeve	0.02 m²
af	Cone net area ratio	0.58
scf	Friction sleeve net area ratio	0.01392
øc	Diameter of the cylindrical part of the cone	43.85 mm
øs	Diameter of the friction sleeve	44.1 mm
ls	Length of the friction sleeve	143.6 mm
dc-s	Cone - friction sleeve distance	16 mm
dc-p2	Cone - pore 2 distance	6.9 mm

CONE NET AREA RATIO RESULT

Instrument	
Manufacturer	Fugro
Type	CP15-CF75PB7SN2-P1E1M4-V5
Serial Number	1701-1987
Electronics	5471
Node Type	7001
Hardware Version	4.00
Software Version	7.09

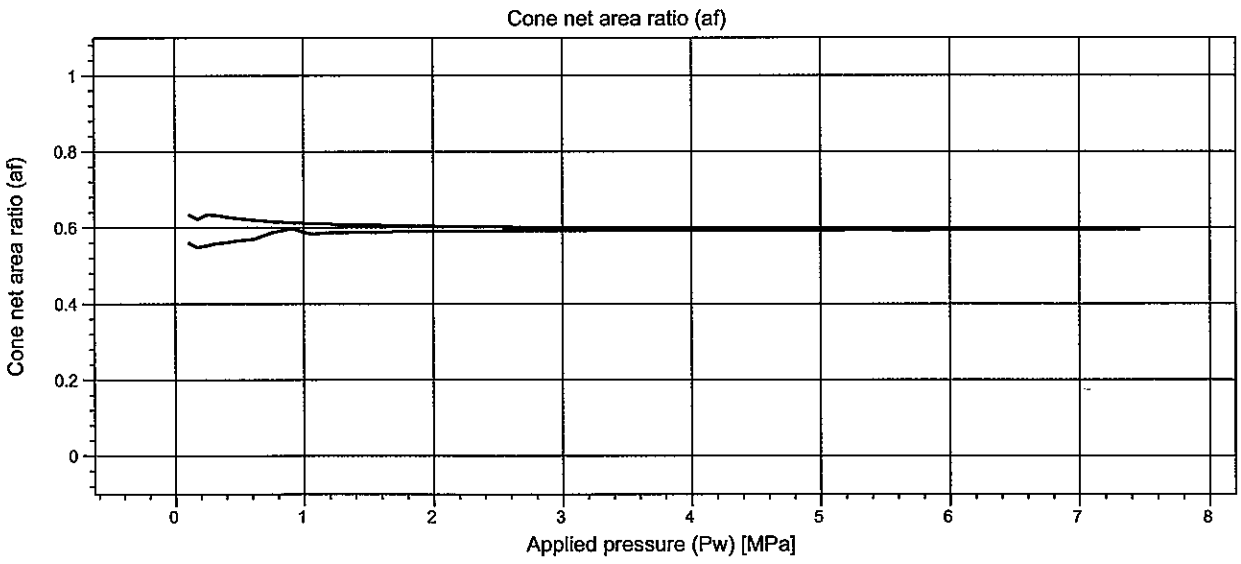
Reference	
Manufacturer	Keller PA-33X
Serial Number	3257-0002
Uncertainty	0.0005•Pw+0.002 [MPa]

Measurement Details	
Measurement Date	31 Aug 2017 15:57:51
Procedure	FEBV.CAL.PRO.003
Software Version	2.0.0.19464

Appendix Applicable to Certificate Number FCN17010206

Characteristics	Unit	Value
Cone net area ratio (af)	[-]	0.59

The cone net area ratio presented above is determined at the maximum applied pressure during the measurement.



Applied pressure (Pw) [MPa]	Measured cone net area ratio 1 (af,1)	Measured cone net area ratio 2 (af,2)	Measured cone net area ratio 3 (af,3)	Measured average cone net area ratio (af)
1.400	0.608	0.605	0.606	0.606
2.800	0.600	0.600	0.600	0.600
4.200	0.597	0.597	0.597	0.597
5.600	0.596	0.596	0.596	0.596
7.000	0.596	0.595	0.595	0.595
5.600	0.593	0.593	0.592	0.593
4.200	0.592	0.592	0.592	0.592
2.800	0.591	0.591	0.591	0.591
1.400	0.588	0.588	0.587	0.588

FRICTION SLEEVE NET AREA RATIO RESULT

Instrument	
Manufacturer	Fugro
Type	CP15-CF75PB7SN2-P1E1M4-V5
Serial Number	1701-1987
Electronics	5471
Node Type	7001
Hardware Version	4.00
Software Version	7.09

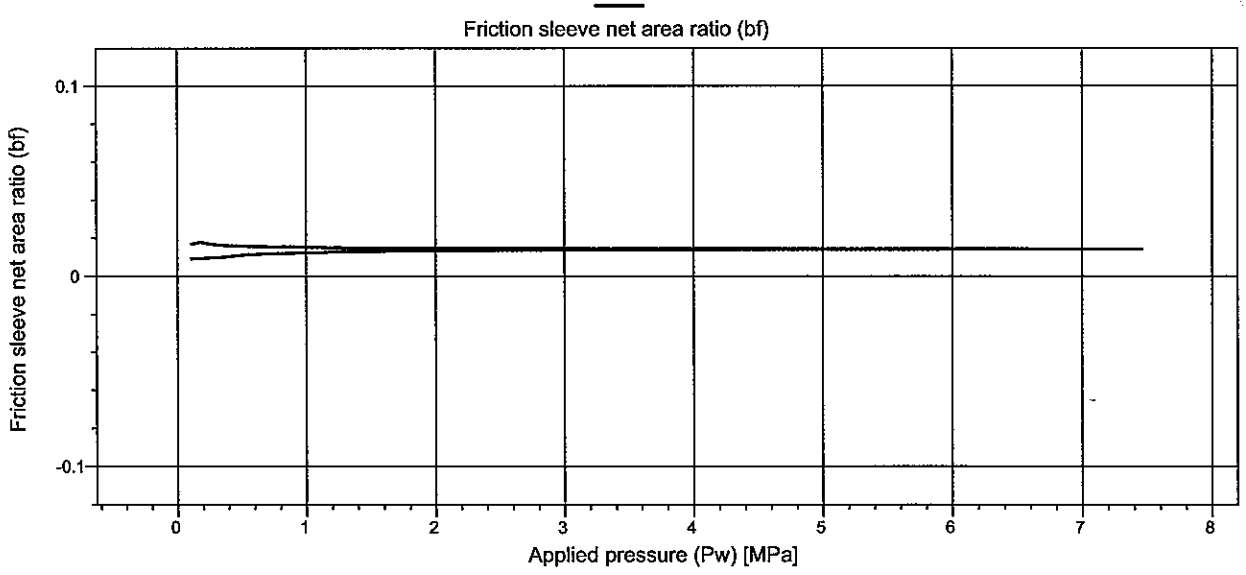
Reference	
Manufacturer	Keller PA-33X
Serial Number	3257-0002
Uncertainty	0.0005•Pw+0.002 [MPa]

Measurement Details	
Measurement Date	31 Aug 2017 15:57:51
Procedure	FEBV.CAL.PRO.003
Software Version	2.0.0.19464

Appendix Applicable to Certificate Number FCN17010206

Characteristics	Unit	Value
Friction sleeve net area ratio (bf)	[-]	0.01405

The friction sleeve net area ratio presented above is determined at the maximum applied pressure during the measurement.



Applied pressure (Pw) [MPa]	Measured friction sleeve net area ratio (bf) 1 (bf,1)	Measured friction sleeve net area ratio (bf) 2 (bf,2)	Measured friction sleeve net area ratio (bf) 3 (bf,3)	Measured average Friction sleeve net area ratio (bf)
1.400	0.013	0.013	0.013	0.013
2.800	0.014	0.014	0.014	0.014
4.200	0.014	0.014	0.014	0.014
5.600	0.014	0.014	0.014	0.014
7.000	0.014	0.014	0.014	0.014
5.600	0.014	0.014	0.014	0.014
4.200	0.014	0.014	0.014	0.014
2.800	0.014	0.014	0.014	0.014
1.400	0.015	0.015	0.015	0.015

SYMBOLS AND DEFINITIONS

Appendix Applicable to Certificate Number FCN17010206

Symbols and Definitions (general)

af	Cone net area ratio, defined as the factor between the applied pressure to the instrument and the indicated cone resistance.
af,x	Measured cone net area ratio at measurement x.
bf	Friction sleeve net area ratio, defined as the factor between the applied pressure to the instrument and the indicated sleeve friction.
bf,x	The measured friction sleeve net area ratio at measurement x.

Symbols and Definitions (quantity specific: Q may be substituted for P, as appropriate)

Qw	Applied reference quantity value.

Quantities

P	Pressure

CALIBRATION CERTIFICATE

CALIBRATION
RvA K 167

Certificate Number
FCN17010226

Applicant	**Fugro GeoServices Ltd.**
	Fugro House, Hithercroft Road OX10 9RB, Wallingford United Kingdom

Instrument	**Cone Penetrometer**
Manufacturer	Fugro
Type	CP15-CF75PB7SN2-P1E1M4-V5
Serial Number	1701-2904

Calibration method The instrument was calibrated according to Fugro procedures using a comparison technique against a reference standard.

Environmental Conditions	
Temperature during calibration	20.5 ± 3 °C
Atmospheric pressure during calibration	1000 ± 100 mbar

Result The result is shown on the next page(s).

Uncertainty The reported uncertainty is based on a standard uncertainty multiplied by a coverage factor k = 2, which provides a confidence level of approximately 95%. The standard uncertainty has been determined in accordance with EA-4/02.

Traceability The measurements have been executed using standards for which the traceability to (inter)national standards has been demonstrated towards the RvA (Raad voor Accreditatie).

Calibration period 04-Sep-2017 through 05-Sep-2017

Calibrate before 04-Sep-2018

Calibrated Sensor	Manufacturer / Type	Calibrated Range	Maximum Rating	Procedure
Cone [Force]	Fugro Loadcell	0 to 75 kN	0 to 150 kN	FEBV.CAL.PRO.003
Cone+Fric. [Force]	Fugro Loadcell	0 to 75 kN	0 to 150 kN	FEBV.CAL.PRO.003
Pore 2 [Pressure]	Kistler 4043A50V0408	0 to 7 MPa	0 to 10.5 MPa	FEBV.CAL.PRO.004
Slope [Inclination]	ADXL	0 to 15 Deg	0 to 20 Deg	FEBV.CAL.PRO.005

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FUGRO ENGINEERS B.V.
The Netherlands
VAT No: NL005621409B07
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Nootdorp, 06-Sep-2017

This certificate is issued provided that neither Fugro nor the Raad voor Accreditatie assumes any liability.

The Raad voor Accreditatie is one of the signatories of the Multilateral Agreement of the European Cooperation for Accreditation (EA) for the mutual recognition of calibration certificates.

Ruud Schrijvers
Deputy Manager Transducer Workshop

CONE CALIBRATION RESULT [FORCE]

Instrument	
Manufacturer	Fugro
Type	CP15-CF75PB7SN2-P1E1M4-V5
Serial Number	1701-2904
Electronics	5656
Node Type	7001
Hardware Version	4.00
Software Version	7.09

Reference	
Manufacturer	Zwick/Roell
Serial Number	6034-0003
Uncertainty	0.003•Fw+0.015 [kN]

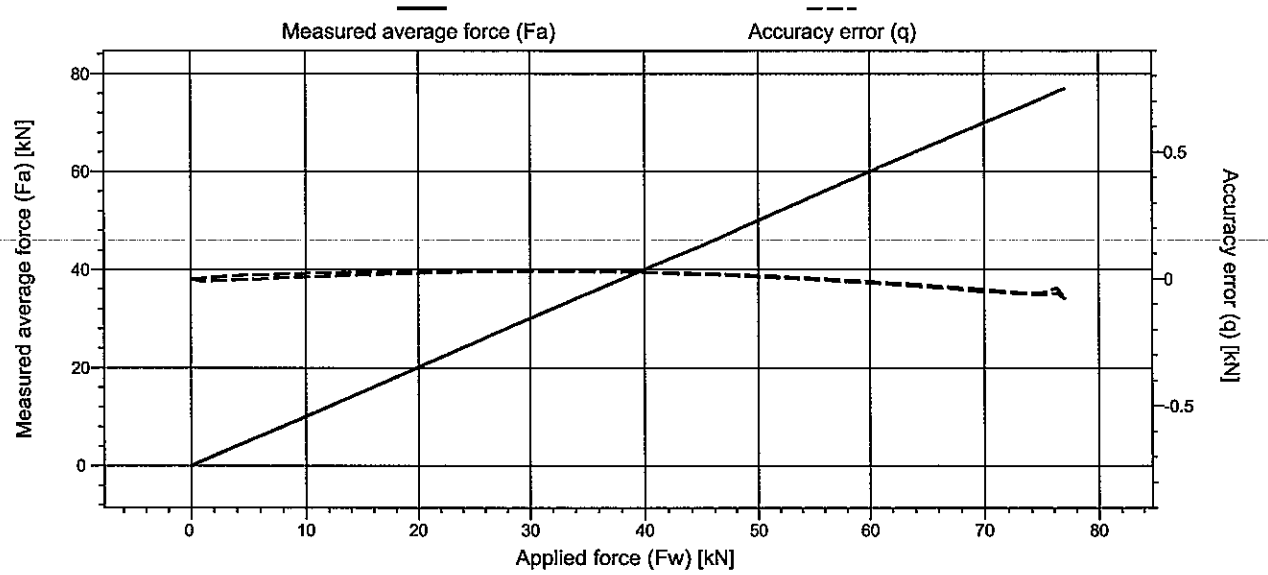
Calibration Details	
Calibration Date	05 Sep 2017 13:46:47
Procedure	FEBV.CAL.PRO.003
Software Version	2.0.0.19464

CALIBRATION
RvA K 167

Certificate Number
FCN17010226

Sensor	
Channel	Cone [Force]
Manufacturer / Type	Fugro Loadcell
Calibrated Range	0 to 75 kN
Maximum Rating	0 to 150 kN

Characteristics	Unit	Value
Max accuracy error (q)	[kN]	0.057
Max repeatability error (b)	[kN]	0.018
Max reversibility error (v)	[kN]	0.012
Zero load error (Fc0)	[kN]	0.001
Zero load offset (F0)	[kN]	-0.005
Resolution	[kN]	5.67E-05
Noise RMS	[kN]	0.001



Applied force (Fw) [kN]	Measured force 1 (Fa,1) [kN]	Measured force 2 (Fa,2) [kN]	Measured force 3 (Fa,3) [kN]	Measured average force (Fa) [kN]	Accuracy error (q) [kN]	Repeatability error (b) [kN]	Reversibility error (v) [kN]	Expanded Uncertainty (U) [kN]
0.000	-0.002	0.000	0.002	0.000	0.000	0.005		0.016
15.000	15.013	15.015	15.018	15.015	0.015	0.005	0.012	0.063
30.000	30.024	30.030	30.033	30.029	0.029	0.009	0.004	0.108
45.000	45.017	45.021	45.024	45.021	0.021	0.008	-0.001	0.154
60.000	59.985	59.990	59.992	59.989	-0.011	0.007	-0.006	0.200
75.000	74.936	74.941	74.953	74.943	-0.057	0.018		0.247
60.000	59.978	59.984	59.988	59.983	-0.017	0.010		0.200
45.000	45.015	45.018	45.024	45.019	0.019	0.009		0.154
30.000	30.029	30.033	30.037	30.033	0.033	0.009		0.108
15.000	15.025	15.027	15.030	15.027	0.027	0.005		0.062
0.000	-0.001	0.001	0.004	0.001	0.001	0.005		0.017

CONE+FRIC. CALIBRATION RESULT [FORCE]

Instrument	
Manufacturer	Fugro
Type	CP15-CF75PB7SN2-P1E1M4-V5
Serial Number	1701-2904
Electronics	5656
Node Type	7001
Hardware Version	4.00
Software Version	7.09

Reference	
Manufacturer	Zwick/Roell
Serial Number	6034-0003
Uncertainty	0.003•Fw+0.015 [kN]

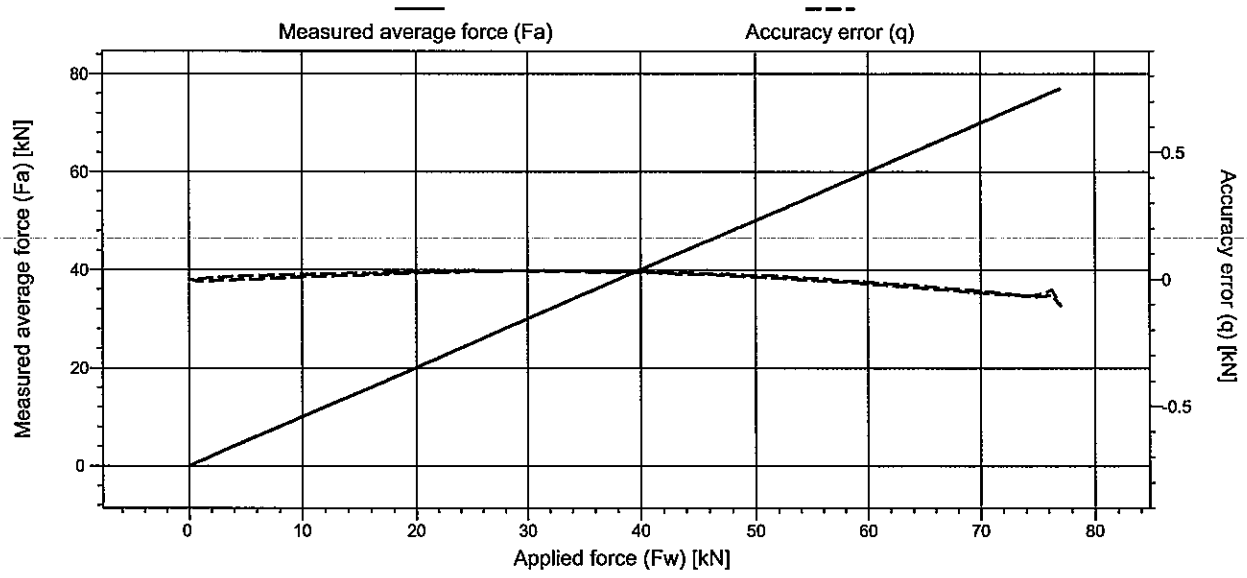
Calibration Details	
Calibration Date	05 Sep 2017 13:46:48
Procedure	FEBV.CAL.PRO.003
Software Version	2.0.0.19464

CALIBRATION
RvA K 167

Certificate Number
FCN17010226

Sensor	
Channel	Cone+Fric. [Force]
Manufacturer / Type	Fugro Loadcell
Calibrated Range	0 to 75 kN
Maximum Rating	0 to 150 kN

Characteristics	Unit	Value
Max accuracy error (q)	[kN]	0.063
Max repeatability error (b)	[kN]	0.025
Max reversibility error (v)	[kN]	0.009
Zero load error (Fc0)	[kN]	0.000
Zero load offset (F0)	[kN]	0.006
Resolution	[kN]	5.62E-05
Noise RMS	[kN]	0.001
Tip-Sleeve Interaction	[kPa]	1.4
Tip-Sleeve Interaction %	[%]	0.27



Applied force (Fw) [kN]	Measured force 1 (Fa,1) [kN]	Measured force 2 (Fa,2) [kN]	Measured force 3 (Fa,3) [kN]	Measured average force (Fa) [kN]	Accuracy error (q) [kN]	Repeatability error (b) [kN]	Reversibility error (v) [kN]	Expanded Uncertainty (U) [kN]
0.000	-0.001	0.000	0.000	0.000	0.000	0.001		0.015
15.000	15.017	15.016	15.013	15.015	0.015	0.004	0.009	0.063
30.000	30.038	30.033	30.028	30.033	0.033	0.010	0.000	0.108
45.000	45.033	45.023	45.014	45.023	0.023	0.020	-0.004	0.156
60.000	60.001	59.988	59.977	59.989	-0.011	0.025	-0.008	0.202
75.000	74.948	74.935	74.928	74.937	-0.063	0.020		0.247
60.000	59.993	59.979	59.971	59.981	-0.019	0.022		0.202
45.000	45.030	45.016	45.013	45.019	0.019	0.017		0.155
30.000	30.038	30.033	30.028	30.033	0.033	0.010		0.108
15.000	15.027	15.024	15.022	15.025	0.025	0.005		0.062
0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.015

PORE 2 CALIBRATION RESULT [PRESSURE]

Instrument	
Manufacturer	Fugro
Type	CP15-CF75PB7SN2-P1E1M4-V5
Serial Number	1701-2904
Electronics	5656
Node Type	7001
Hardware Version	4.00
Software Version	7.09

Reference	
Manufacturer	Keller PA-33X
Serial Number	3257-0002
Uncertainty	0.0005•Pw+0.002 [MPa]

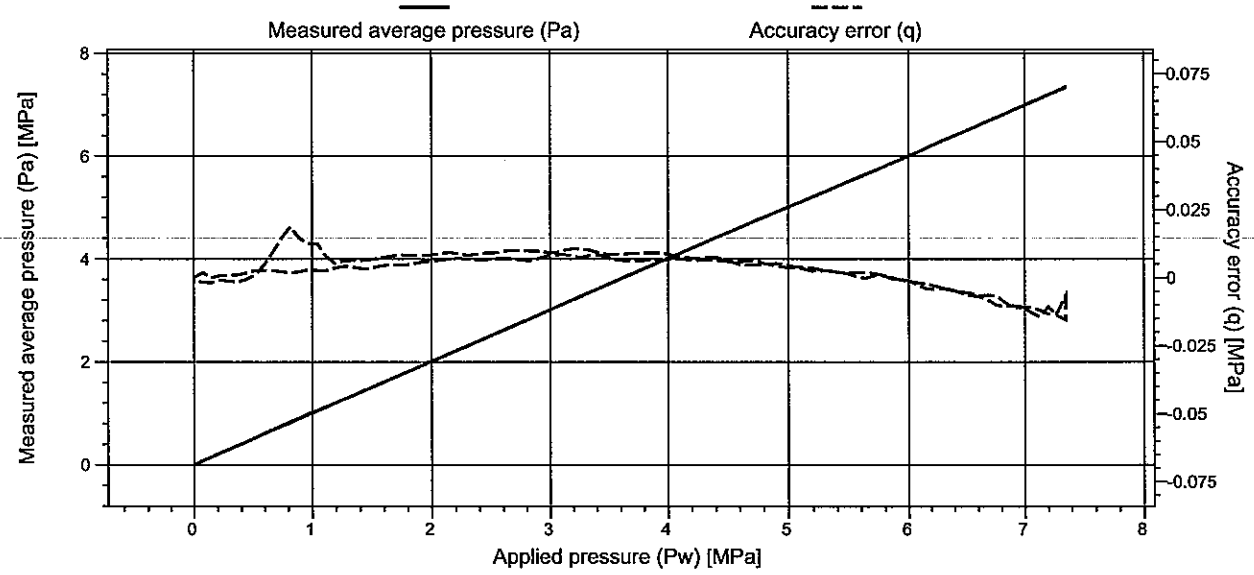
Calibration Details	
Calibration Date	05 Sep 2017 14:00:13
Procedure	FEBV.CAL.PRO.004
Software Version	2.0.0.19464

CALIBRATION
RvA K 167

Certificate Number
FCN17010226

Sensor	
Channel	Pore 2 [Pressure]
Manufacturer / Type	Kistler 4043A50V0408
Calibrated Range	0 to 7 MPa
Maximum Rating	0 to 10.5 MPa

Characteristics	Unit	Value
Max accuracy error (q)	[MPa]	0.011
Max repeatability error (b)	[MPa]	0.008
Max reversibility error (v)	[MPa]	0.004
Zero load error (Pc0)	[MPa]	0.001
Zero load offset (P0)	[MPa]	-0.007
Resolution	[MPa]	2.7E-06
Noise RMS	[MPa]	0.000



Applied pressure (Pw) [MPa]	Measured pressure 1 (Pa,1) [MPa]	Measured pressure 2 (Pa,2) [MPa]	Measured pressure 3 (Pa,3) [MPa]	Measured average pressure (Pa) [MPa]	Accuracy error (q) [MPa]	Repeatability error (b) [MPa]	Reversibility error (v) [MPa]	Expanded Uncertainty (U) [MPa]
0.000	-0.003	-0.003	0.005	0.000	0.000	0.008		0.021
1.400	1.403	1.403	1.404	1.403	0.003	0.002	0.003	0.006
2.800	2.804	2.808	2.807	2.806	0.006	0.004	0.004	0.009
4.200	4.207	4.206	4.205	4.206	0.006	0.003	0.001	0.006
5.600	5.600	5.599	5.600	5.600	0.000	0.001	0.002	0.006
7.000	6.989	6.991	6.987	6.989	-0.011	0.004		0.008
5.600	5.602	5.602	5.602	5.602	0.002	0.000		0.005
4.200	4.207	4.206	4.208	4.207	0.007	0.002		0.005
2.800	2.810	2.809	2.811	2.810	0.010	0.001		0.004
1.400	1.408	1.404	1.407	1.406	0.006	0.004		0.007
0.000	-0.001	-0.001	-0.001	-0.001	-0.001	0.000		0.003

SLOPE CALIBRATION RESULT [INCLINATION]

Instrument	
Manufacturer	Fugro
Type	CP15-CF75PB7SN2-P1E1M4-V5
Serial Number	1701-2904
Electronics	5656
Node Type	7001
Hardware Version	4.00
Software Version	7.09

Reference	
Manufacturer	Hoek-O-Mat
Serial Number	2109-0002
Uncertainty	0.6 [Deg]

Calibration Details	
Calibration Date	04 Sep 2017 11:38:48
Procedure	FEBV.CAL.PRO.005
Software Version	2.0.0.19464

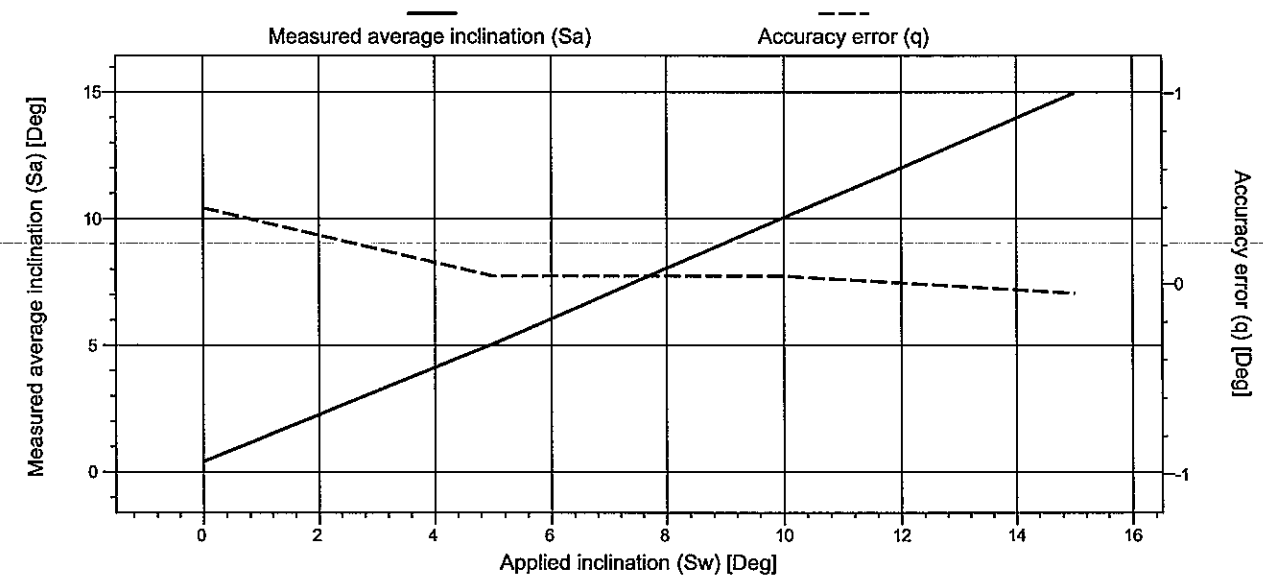
CALIBRATION
RvA K 167

Certificate Number
FCN17010226

Sensor	
Channel	Slope [Inclination]
Manufacturer / Type	ADXL
Calibrated Range	0 to 15 Deg
Maximum Rating	0 to 20 Deg

Characteristics	Unit	Value
Max accuracy error (q)	[Deg]	0.4
Max repeatability error (b)	[Deg]	0.1
Zero load error (Sc0)	[Deg]	0.1
Zero load offset (S0)	[Deg]	0.4
Resolution	[Deg]	1.35E-05
Noise RMS	[Deg]	0.0

Inclination is defined as the angular deviation of the cone penetrometer from the vertical.



Applied inclination (Sw) [Deg]	Measured inclination 1 (Sa,1) [Deg]	Measured inclination 2 (Sa,2) [Deg]	Measured inclination 3 (Sa,3) [Deg]	Measured average inclination (Sa) [Deg]	Accuracy error (q) [Deg]	Repeatability error (b) [Deg]	Expanded Uncertainty (U) [Deg]
0.0	0.3	0.4	0.4	0.4	0.4	0.1	0.6
5.0	5.0	5.0	5.1	5.0	0.0	0.0	0.6
10.0	10.0	10.0	10.1	10.0	0.0	0.1	0.6
15.0	15.0	14.9	15.0	14.9	-0.1	0.1	0.7

Symbols and Definitions (general)

b	Repeatability error, defined as the maximum difference between the measurements of the instrument at the applied value.
Noise RMS	Signal noise, defined as the quadratic mean when the sensor is not subjected to load.
q	Accuracy error, defined as the difference between the average indicated value by the instrument and the applied value.
Resolution	Smallest change in a quantity being measured that causes a perceptible change in the corresponding indication.
Tip-Sleeve Interaction	Effect of cone tip measurements on derived friction measurements, due to coupling of the cone tip and friction sleeve element. Expressed in terms of friction and as a percentage of the full scale output of the cone tip.
U	The stated uncertainty is that of the average indicated quantity, and includes the entire calibration method, including the reference and calibrated sensor, but excludes the difference between average indicated value by the instrument and the applied value.
v	Reversibility error, defined as the difference between the average indicated value by the instrument at a certain applied value when it was increased and when it was decreased.

Symbols and Definitions (quantity specific: Q may be substituted for F, P or S, as appropriate)

Q0	Zero load offset, instrument output where the specified measured quantity value is zero.
Qa	Average indicated quantity value by the instrument.
Qa,x	Quantity value indicated by the instrument at measurement x.
Qc0	Zero load error, defined as the difference between the average indicated value by the instrument before and after the load cycle has been applied.
Qw	Applied reference quantity value.

Quantities

F	Force
P	Pressure
S	Inclination

References

European Co-operation For Accreditation (2013), "Evaluation of the uncertainty of measurement in calibration", European Co-operation For Accreditation, 75 p. (Publication ; EA-4/02 M:2013)

TYPICAL DIMENSIONS

Instrument	
Manufacturer	Fugro
Type	CP15-CF75PB7SN2-P1E1M4-V5
Serial Number	1701-2904

Appendix Applicable to Certificate Number FCN17010226

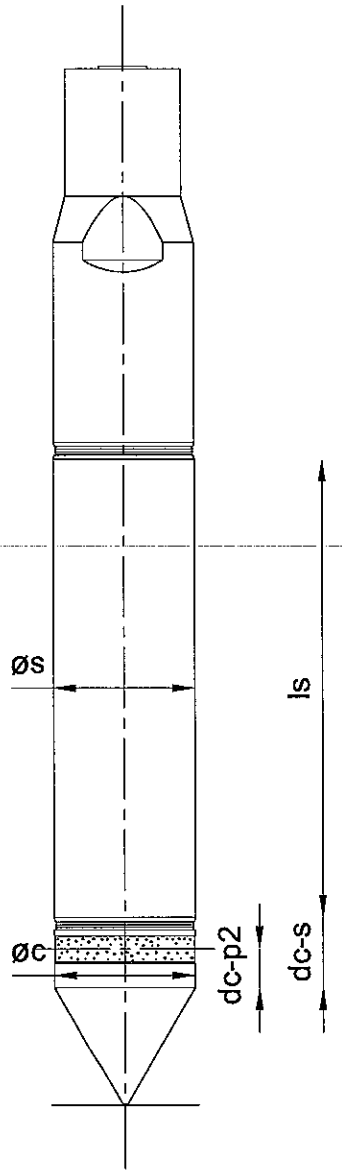


Diagram is not to scale

Typical Dimensions		
Ac	Cross-sectional projected area of the cone	0.0015 m²
As	Surface area of the friction sleeve	0.02 m²
af	Cone net area ratio	0.58
scf	Friction sleeve net area ratio	0.01392
øc	Diameter of the cylindrical part of the cone	43.85 mm
øs	Diameter of the friction sleeve	44.1 mm
ls	Length of the friction sleeve	143.6 mm
dc-s	Cone - friction sleeve distance	16 mm
dc-p2	Cone - pore 2 distance	6.9 mm

CONE NET AREA RATIO RESULT

Instrument	
Manufacturer	Fugro
Type	CP15-CF75PB7SN2-P1E1M4-V5
Serial Number	1701-2904
Electronics	5656
Node Type	7001
Hardware Version	4.00
Software Version	7.09

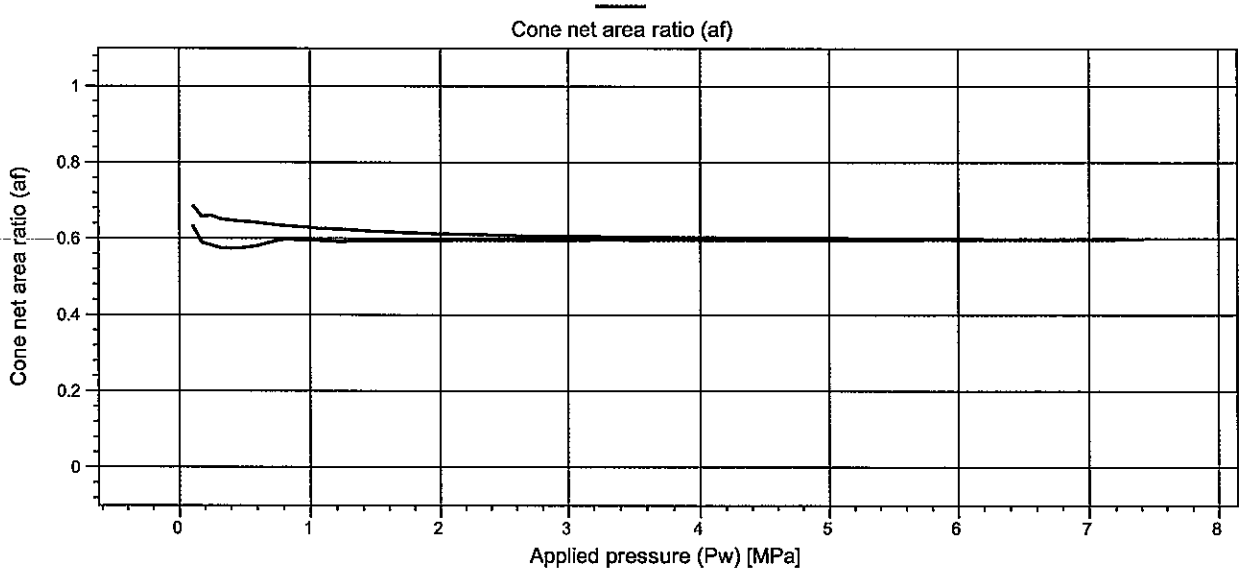
Reference	
Manufacturer	Keller PA-33X
Serial Number	3257-0002
Uncertainty	0.0005•Pw+0.002 [MPa]

Measurement Details	
Measurement Date	05 Sep 2017 14:00:13
Procedure	FEBV.CAL.PRO.003
Software Version	2.0.0.19464

Appendix Applicable to Certificate Number FCN17010226

Characteristics	Unit	Value
Cone net area ratio (af)	[-]	0.60

The cone net area ratio presented above is determined at the maximum applied pressure during the measurement.



Applied pressure (Pw) [MPa]	Measured cone net area ratio 1 (af,1)	Measured cone net area ratio 2 (af,2)	Measured cone net area ratio 3 (af,3)	Measured average cone net area ratio (af)
1.400	0.618	0.620	0.623	0.620
2.800	0.605	0.607	0.608	0.606
4.200	0.602	0.602	0.603	0.602
5.600	0.599	0.600	0.600	0.600
7.000	0.598	0.599	0.599	0.599
5.600	0.596	0.597	0.597	0.597
4.200	0.595	0.596	0.597	0.596
2.800	0.595	0.596	0.597	0.596
1.400	0.592	0.593	0.595	0.593

FRICTION SLEEVE NET AREA RATIO RESULT

Instrument	
Manufacturer	Fugro
Type	CP15-CF75PB7SN2-P1E1M4-V5
Serial Number	1701-2904
Electronics	5656
Node Type	7001
Hardware Version	4.00
Software Version	7.09

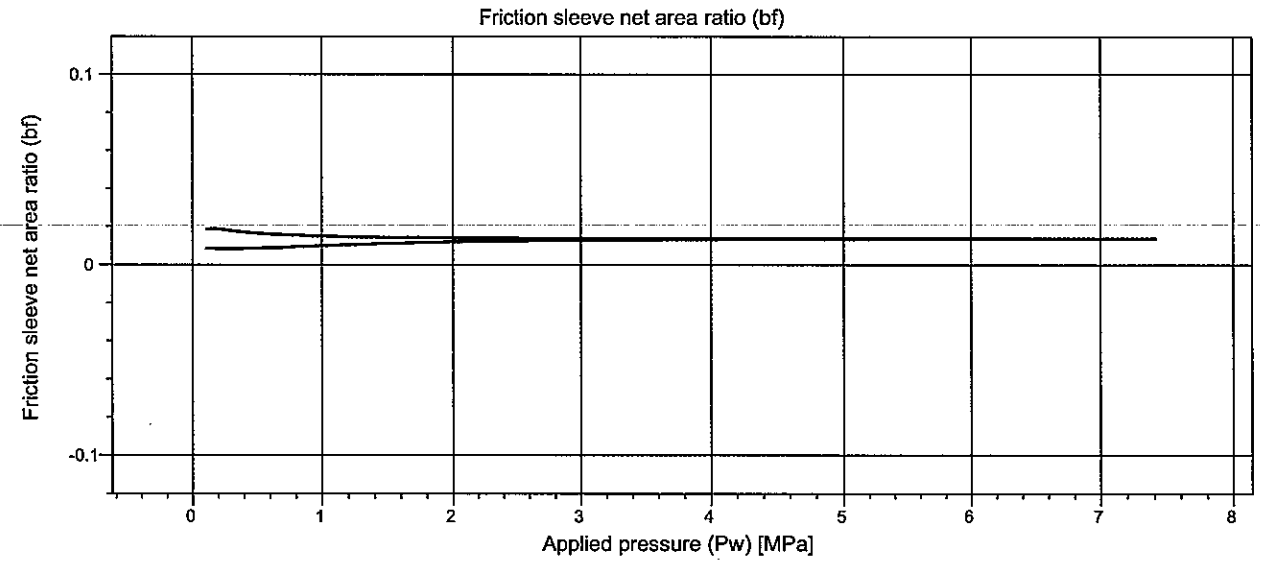
Reference	
Manufacturer	Keller PA-33X
Serial Number	3257-0002
Uncertainty	0.0005•Pw+0.002 [MPa]

Measurement Details	
Measurement Date	05 Sep 2017 14:00:14
Procedure	FEBV.CAL.PRO.003
Software Version	2.0.0.19464

Appendix Applicable to Certificate Number FCN17010226

Characteristics	Unit	Value
Friction sleeve net area ratio (bf)	[-]	0.01375

The friction sleeve net area ratio presented above is determined at the maximum applied pressure during the measurement.



Applied pressure (Pw) [MPa]	Measured friction sleeve net area ratio (bf) 1 (bf,1)	Measured friction sleeve net area ratio (bf) 2 (bf,2)	Measured friction sleeve net area ratio (bf) 3 (bf,3)	Measured average Friction sleeve net area ratio (bf)
1.400	0.011	0.011	0.011	0.011
2.800	0.013	0.013	0.013	0.013
4.200	0.013	0.013	0.013	0.013
5.600	0.014	0.014	0.014	0.014
7.000	0.014	0.014	0.014	0.014
5.600	0.014	0.014	0.014	0.014
4.200	0.014	0.014	0.014	0.014
2.800	0.014	0.014	0.014	0.014
1.400	0.014	0.014	0.014	0.014

SYMBOLS AND DEFINITIONS

Appendix Applicable to Certificate Number FCN17010226

Symbols and Definitions (general)	
af	Cone net area ratio, defined as the factor between the applied pressure to the instrument and the indicated cone resistance.
af,x	Measured cone net area ratio at measurement x.
bf	Friction sleeve net area ratio, defined as the factor between the applied pressure to the instrument and the indicated sleeve friction.
bf,x	The measured friction sleeve net area ratio at measurement x.

Symbols and Definitions (quantity specific: Q may be substituted for P, as appropriate)	
Qw	Applied reference quantity value.

Quantities	
P	Pressure

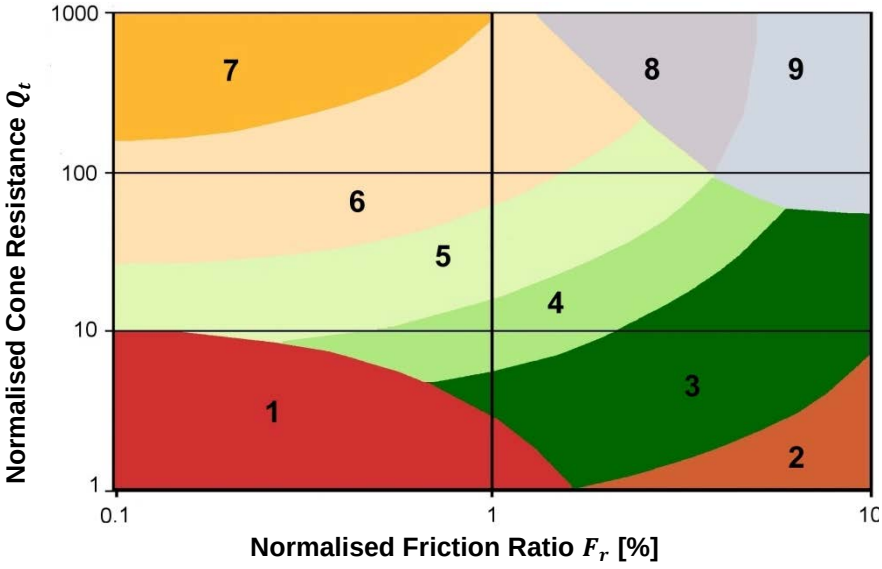
SCHEDULE OF CONE PENETRATION TESTING

Test Name	Depth (m)	Date	Cone Number	Cone Area (cm^2)	Piezocone	Number of Dissipation Tests	Vehicle Reference	Operator	Remarks
HEP-CPT-1239	19.54	12/12/2017	CP15-CF75PB7SN2 1701-1515	15	X	3	GB7	IB/SMO	
HEP-CPT-1240	19.18	12/12/2017	CP15-CF75PB7SN2 1701-2904	15	X	3	GB7	IB/SMO	
HEP-CPT-1244	23.04	13/12/2017	CP15-CF75PB7SN2 1701-2904	15	X	2	GB7	IB/SMO	
HEP-CPT-1245	17.79	12/12/2017	CP15-CF75PB7SN2 1701-2904	15	X	2	GB7	IB/SMO	
HEP-CPT-1247	22.44	13/02/2018	CP15-CF75PB7SN2 1701-1529	15	X	3	GB17	IB/CD	
HEP-CPT-1248	3.93	16/01/2018	CP15-CF75PB7SN2 1701-1515	15	X	-	GB7	NF/IB	
HEP-CPT-1249	3.76	15/01/2018	CP15-CF75PB7SN2 1701-2904	15	X	-	GB7	NF/IB	
HEP-CPT-1250	18.51	15/01/2018	CP15-CF75PB7SN2 1701-2904	15	X	4	GB7	NF/IB	
HEP-CPT-1251	19.90	22/03/2018	CP15-CF75PB7SN2 1701-1987	15	X	3	GB9	HG/KL	

HEATHROW EXPANSION PROJECT CONE PENETRATION TESTING – MEASURED AND DERIVED PARAMETERS

CLASSIFICATION OF SOIL BEHAVIOUR TYPE

Robertson (1990) Classification



MEASURED CONE PENETRATION TEST DATA

- Measured cone resistance q_c
- Measure sleeve friction f_s
- Pore-water pressure u_2

CALCULATED CONE PENETRATION TEST PARAMETERS

Total (Corrected) Cone Resistance

$$q_t = q_c + u_2(1 - \alpha)$$

Net Cone Resistance

$$q_n = q_t - \sigma_{vo}$$

Friction Ratio

$$R_f = (f_s/q_t)$$

Pore-water Pressure Ratio

$$\beta q = \Delta u / q_n$$

Net Pore-water Pressure

$$\Delta u = u_2 - u_0$$

Total Vertical Stress

Based on unit weight, assumed value 19 kN/m^3 used

DERIVED CONE PENETRATION TEST PARAMETERS

Friction Angle:

$$\phi' = 17.6 + 11 \log\left(\frac{10 q_t}{(\sigma'_{v0}/100)^{0.5}}\right)$$

For granular soils only from (Mayne, 2007)

Shear Modulus:

$$G_{max} = 1.634(1000 q_c)^{0.25} . (\sigma'_{v0})^{0.375}$$

For granular soils only from Rix and Stokoe (1991)

Undrained Shear Strength:

$$c_u = (1000 q_n)/N_k$$

N_k = empirical factor relating cone resistance to undrained shear strength

Provided for N_k values of 15 and 20 from Rad and Lunne (1988)

Coefficient of Volume Compressibility:

Calculated from the relationship with the Constrained Modulus (M)

$$M = \frac{1}{m_v}$$

Constrained Modulus from Kulhawy and Mayne (1990)

$$M = 8.25(q_t - (\sigma_{vo}/1000) = 8.25q_n$$

DISSIPATION TESTS

Estimated Coefficient of Horizontal Consolidation

Dissipation plotted as square root time against pore pressure u_2

From the value of the modified time factor T^* it is possible to determine c_h from the following formula:

$$T^* = c_h . t/r^2 . I_r{}^{0.5}$$

Where:

T^* = the modified time factor
t = the actual time
r = the radius of the probe
I_r = the rigidity index = G/c_u. (assumed to be 100)
c_h = the coefficient of horizontal consolidation

From Teh and Houlsby (1988)

Estimated Coefficient of Horizontal Permeability

A very approximate value for k_h, the coefficient of permeability in the horizontal direction, may be determined from c_h (Lunne et al, 1997):

$$k_h = \frac{c_h . \gamma_w}{M}$$

Where:

k_h = the coefficient of permeability in the horizontal direction
c_h = the coefficient of consolidation in horizontal direction
M = the constrained modulus (calculated as 8.25. q_n from Kulhawy and Mayne (1990))
γ_w = the unit weight of water assumed at 10 kN/m^3

REFERENCES

Kulhawy, F. and Mayne, P. (1990). Manual on estimating soil properties for foundation design, EPRI Report EL-6800.

Lunne, T., Robertson, P. K. and Powell, J. J. M. (1997). Cone Penetration Testing in Geotechnical Practice. Blackie.

Mayne, P.W. (2007), “In-Situ Test Calibrations for Evaluating Soil Parameters”, in Tan, T.S., Phoon, K.K., Hight, D.W. and Leroueil, S. (Eds.), Characterisation and Engineering Properties of Natural Soils Volume 3", Taylor & Francis, London, pp. 1601-1652.

Rad, N.S. and Lunne, T. (1988), "Direct Correlations between Piezocone Test Results and Undrained Shear Strength of Clay", in De Ruiter, J. (Ed.), Penetration Testing 1988: Proceedings of the First International Symposium on Penetration Testing, ISOPT-1, Orlando, 20-24 March 1988, Vol. 2, A.A. Balkema, Rotterdam, pp. 911-917.

Rix, G.J. and Stokoe, K.H. (1991), "Correlation of initial tangent modulus and cone penetration resistance", Huang, A.B. (Ed.), Calibration Chamber Testing: Proceedings of the First International Symposium on Calibration Chamber Testing ISOCCTI, Potsdam, New York, 28-29 June 1991, Elsevier Science Publishing Company, New York, pp. 351-362.

Robertson, P.K., (1990). Soil classification using the cone penetration test. Canadian Geotechnical Journal, 27(1): 151-158.

Teh, C.I., and Houlsby, G.T., (1991). An analytical study of the cone penetration test in clay. Geotechnique, Vol. 41, No. 1, pp 17-34.

CONE PENETRATION TESTING - ABBREVIATIONS/SYMBOLS

Symbol	Unit	Term or Definition
Standard Cone Measurements and Factors – Friction and Piezocone		
q_c	[MPa]	Measured cone end resistance
q_t	[MPa]	Total cone end resistance, corrected for pore-water pressure effects
q_n	[MPa]	Net cone end resistance
f_s	[MPa]	Sleeve friction
R_f	[%]	Friction ratio – sleeve friction to cone end resistance ratio
βq	[-]	Excess pore-water pressure ratio
α	[-]	Cone shaft to face area ratio (0.58 for 15 cm^2 cones, 0.75 for 10cm^2)
β	[-]	Value of excess pore-water pressure cone ratio (0.8 for face (u_1), 1.0 for shoulder (u_2))
u_0	[MPa]	Theoretical hydrostatic pore-water pressure relative to ground level acting at the cone elevation
u_1	[MPa]	The measured pore-water pressure relative to ground level acting at the cone face
u_2	[MPa]	The measured pore-water pressure relative to ground level acting at the cone shoulder
Δu	[MPa]	The pore-water pressure in excess of hydrostatic pore-water pressure
I_c	[-]	Soil Behaviour Type Index

Symbol	Unit	Term or Definition
Normalised Parameters for Overburden Pressure		
Q_t	[-]	Normalised cone resistance
F_r	[-]	Normalised friction ratio
SBT_N		Normalised Soil Behaviour Type
Strength and Various Parameters		
I_D	[%]	The density index – equivalent to relative density D_r
ϕ'	[degrees]	The effective angle of shearing resistance
c_u	[kPa]	The undrained shear strength
$N_k$or N_c		Bearing capacity factors normally taken as 15 to 20 with values from 4 to >30
G_{max}	[-]	The maximum small strain shear modulus
E	[-]	Young's Modulus
OCR	[-]	Overconsolidation ratio
SPT	[-]	Standard penetration test
SPT_N	[-]	Number of standard penetration test blows for 300 mm penetration.
N_{60}	[-]	SPT_N value for SPT with energy ratio of 60%
Pressure		
σ_{v0}	[kPa]	The total overburden pressure relative to ground level
P_a	[kPa]	Atmospheric pressure taken as 100 kPa
σ'_{v0}	[kPa]	The effective overburden pressure
K_0	[-]	The coefficient of earth pressure
Consolidation and Permeability		
c_h	[m^2/s]	The coefficient of consolidation in the horizontal direction
γ_w	[kN/m^3]	The unit weight of water
γ	[kN/m^3]	The unit weight of soil
u_t	[MPa]	The pore-water pressure at time, t
u_i	[MPa]	The initial pore-water pressure at $t = 0$
T^*		Modified time factor (from Teh and Houlsby)
t	[s]	The actual elapsed time
r	[m]	The radius of probe
Ir	[-]	The rigidity index = G / c_u (Assumed to be 100)
k_h	[m/s]	The coefficient of permeability in the horizontal direction
Compression		
m_h	[m^2/MN]	The coefficient of volume compressibility in the horizontal direction
m_v	[m^2/MN]	The coefficient of volume compressibility in the vertical direction
α_M	[-]	is a factor generally taken between 5 and 7.5 (normally 6)
M	[MPa]	The Constrained Modulus

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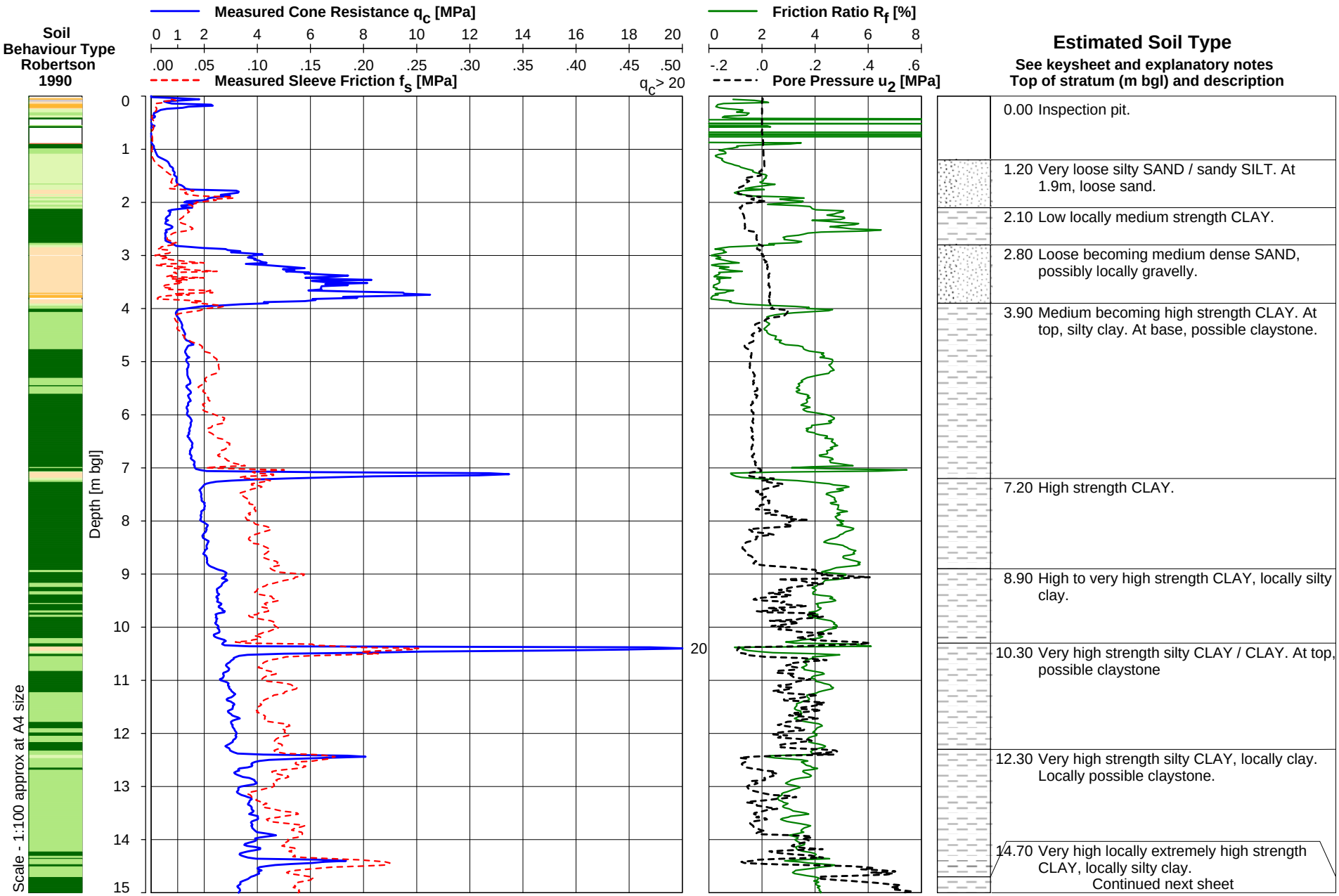
Fugro Reference: G170029U

HEATHROW AIRPORT LIMITED
HEATHROW EXPANSION PROJECT GROUND INVESTIGATION - PACKAGE 3



Estimated Soil Type

See keysheet and explanatory notes
Top of stratum (m bgl) and description

0.00	Inspection pit.
1.20	Very loose silty SAND / sandy SILT. At 1.9m, loose sand.
2.10	Low locally medium strength CLAY.
2.80	Loose becoming medium dense SAND, possibly locally gravelly.
3.90	Medium becoming high strength CLAY. At top, silty clay. At base, possible claystone.
7.20	High strength CLAY.
8.90	High to very high strength CLAY, locally silty clay.
10.30	Very high strength silty CLAY / CLAY. At top, possible claystone
12.30	Very high strength silty CLAY, locally clay. Locally possible claystone.
14.70	Very high locally extremely high strength CLAY, locally silty clay.

Continued next sheet

HEP-CPT-1239

Remarks:

CPT Rig/Cone : GB7 1701-1515
Date of Test : 12-Dec-2017
Start / End Time 09:31:52 12:09:28
Assumed Soil Unit Weight : 19.0 [kN/m^3]
Assumed Water Level [m gl] : -1.0

Status : DRAFT
Operator : IB/SMO
Compiled by : JAG
Checked by : NJB

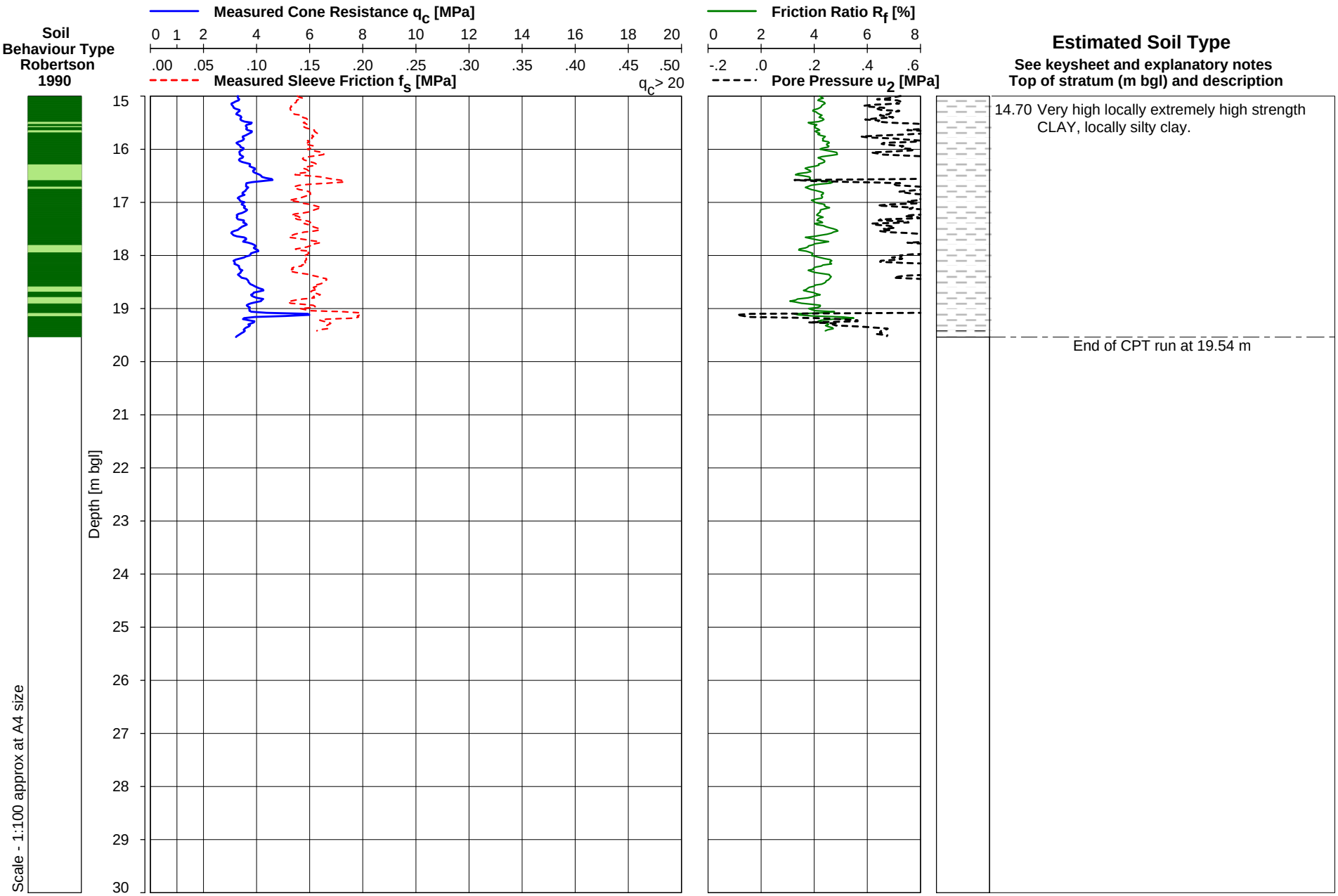
PIEZOCONE PENETRATION TEST

Location : **HEP-CPT-1239**
Coordinates : E 503731 N 177509
Ground Level [m OD] : +21.78

FUGRO GEOSERVICES LIMITED

Fugro Reference: G170029U

HEATHROW AIRPORT LIMITED
HEATHROW EXPANSION PROJECT GROUND INVESTIGATION - PACKAGE 3



Estimated Soil Type

See keysheet and explanatory notes
Top of stratum (m bgl) and description

14.70 Very high locally extremely high strength CLAY, locally silty clay.

End of CPT run at 19.54 m

HEP-CPT-1239

Remarks:

CPT Rig/Cone : GB7 1701-1515
Date of Test : 12-Dec-2017
Start / End Time 09:31:52 12:09:28
Assumed Soil Unit Weight : 19.0 [kN/m^3]
Assumed Water Level [m gl] : -1.0

Status : DRAFT
Operator : IB/SMO
Compiled by : JAG
Checked by : NJB

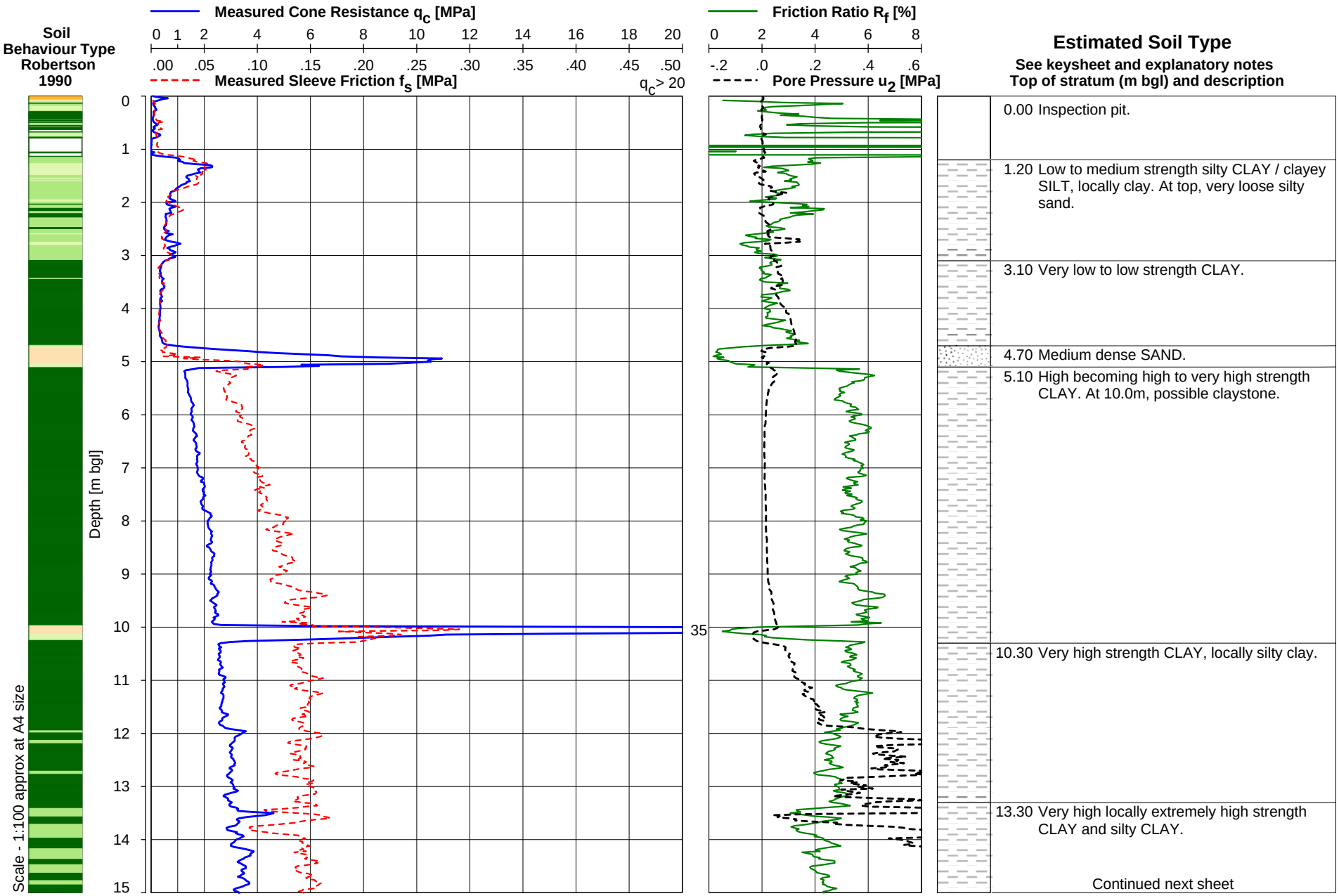
PIEZOCONE PENETRATION TEST

Location : **HEP-CPT-1239**
Coordinates : E 503731 N 177509
Ground Level [m OD] : +21.78

FUGRO GEOSERVICES LIMITED

Fugro Reference: G170029U

HEATHROW AIRPORT LIMITED
HEATHROW EXPANSION PROJECT GROUND INVESTIGATION - PACKAGE 3



Estimated Soil Type

See keysheet and explanatory notes
Top of stratum (m bgl) and description

0.00	Inspection pit.
1.20	Low to medium strength silty CLAY / clayey SILT, locally clay. At top, very loose silty sand.
3.10	Very low to low strength CLAY.
4.70	Medium dense SAND.
5.10	High becoming high to very high strength CLAY. At 10.0m, possible claystone.
10.30	Very high strength CLAY, locally silty clay.
13.30	Very high locally extremely high strength CLAY and silty CLAY.

Continued next sheet

HEP-CPT-1240

Remarks:

CPT Rig/Cone : GB7 1701-2904
Date of Test : 12-Dec-2017
Start / End Time 14:34:51 17:09:55
Assumed Soil Unit Weight : 19.0 [kN/m^3]
Assumed Water Level [m gl] : -1.0

Status : DRAFT
Operator : IB/SMO
Compiled by : JAG
Checked by : NJB

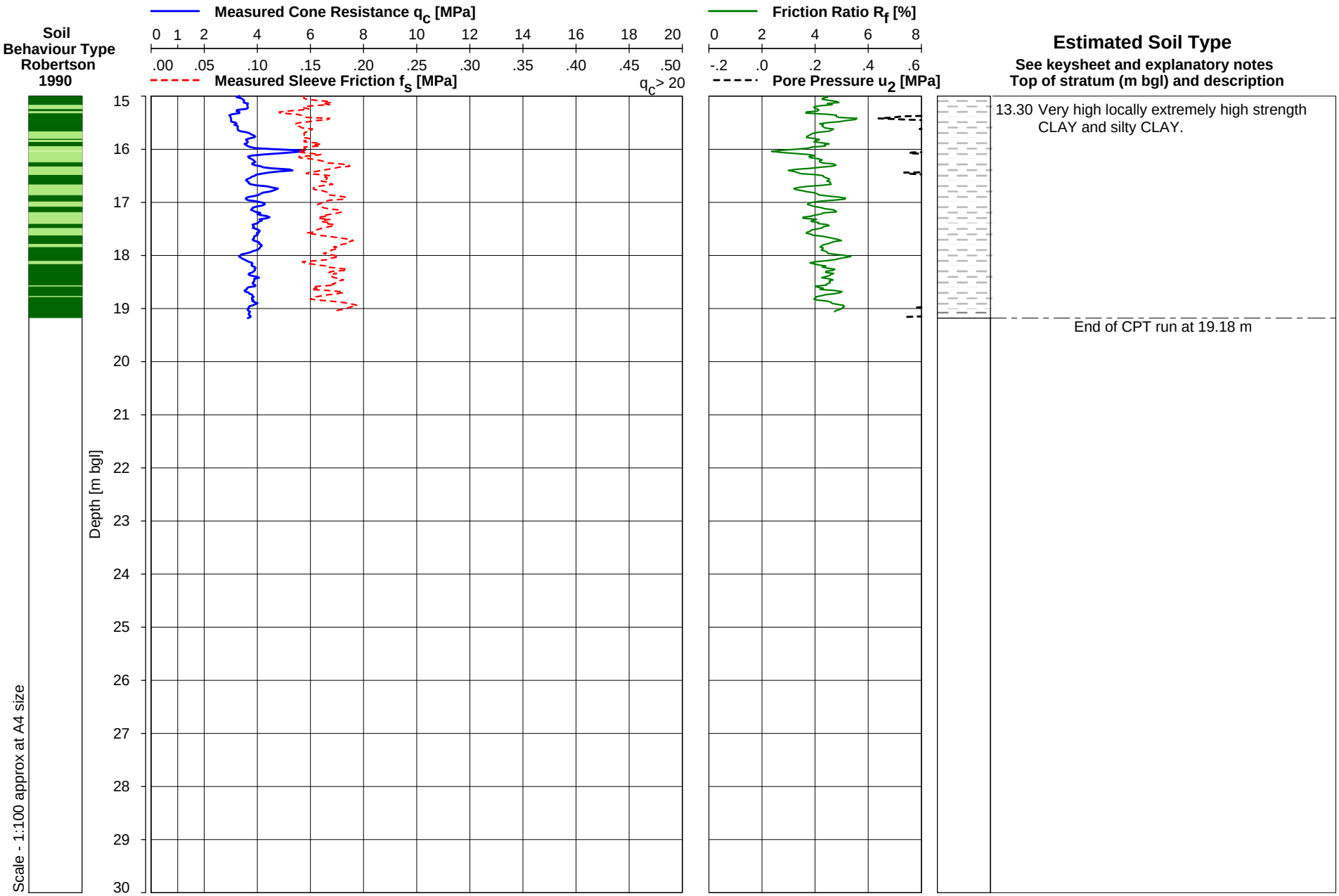
PIEZOCONE PENETRATION TEST

Location : **HEP-CPT-1240**
Coordinates : E 503873 N 177466
Ground Level [m OD] : +22.72

FUGRO GEOSERVICES LIMITED

Fugro Reference: G170029U

HEATHROW AIRPORT LIMITED
HEATHROW EXPANSION PROJECT GROUND INVESTIGATION - PACKAGE 3



HEP-CPT-1240

Remarks:

CPT Rig/Cone : GB7 1701-2904
Date of Test : 12-Dec-2017
Start / End Time 14:34:51 17:09:55

Assumed Soil Unit Weight : 19.0 [kN/m^3]
Assumed Water Level [m gl] : -1.0

Status : DRAFT
Operator : IB/SMO
Compiled by : JAG
Checked by : NJB

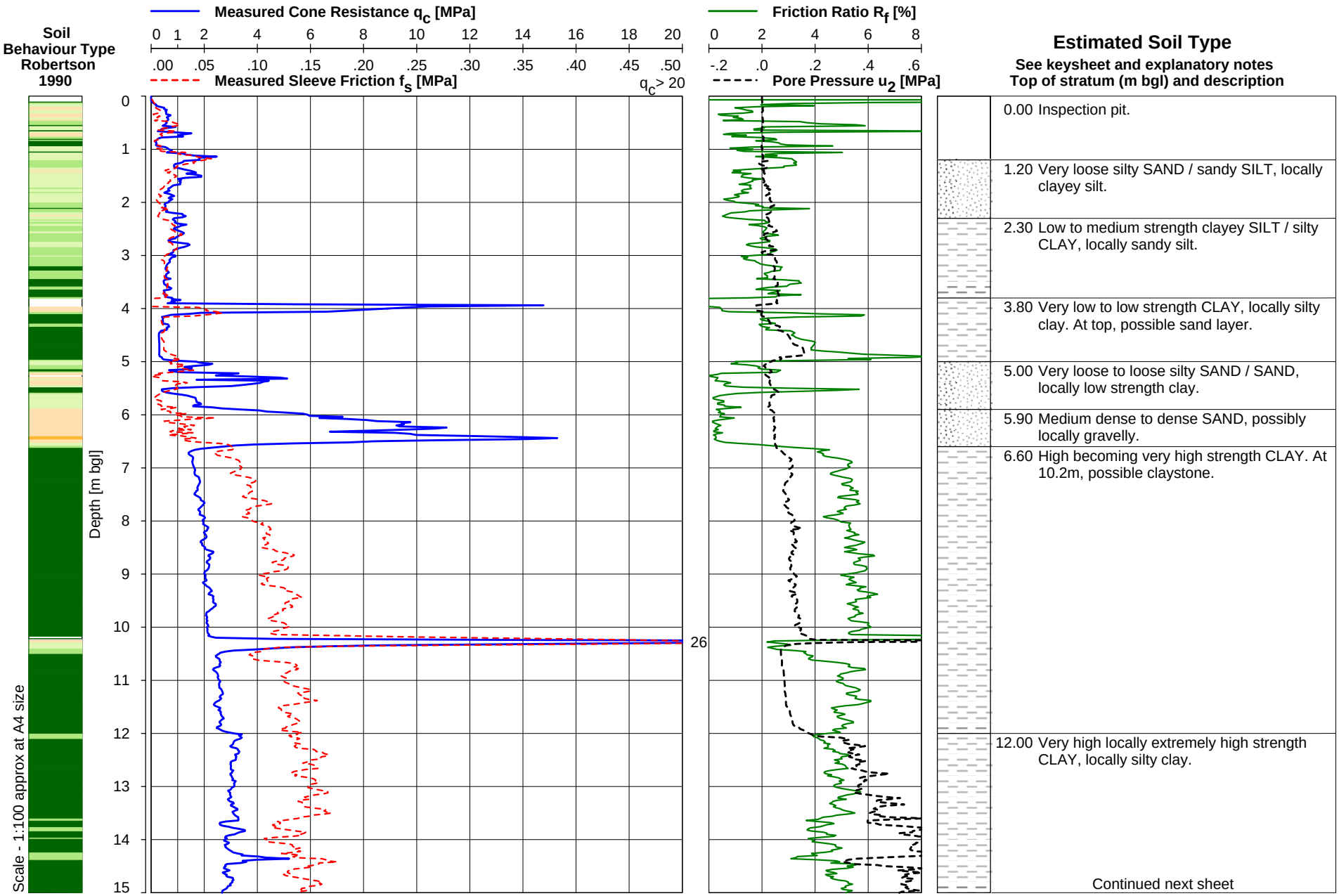
PIEZOCONE PENETRATION TEST

Location : **HEP-CPT-1240**
Coordinates : E 503873 N 177466
Ground Level [m OD] : +22.72

FUGRO GEOSERVICES LIMITED

Fugro Reference: G170029U

HEATHROW AIRPORT LIMITED
HEATHROW EXPANSION PROJECT GROUND INVESTIGATION - PACKAGE 3



Estimated Soil Type

See keysheet and explanatory notes
Top of stratum (m bgl) and description

0.00	Inspection pit.
1.20	Very loose silty SAND / sandy SILT, locally clayey silt.
2.30	Low to medium strength clayey SILT / silty CLAY, locally sandy silt.
3.80	Very low to low strength CLAY, locally silty clay. At top, possible sand layer.
5.00	Very loose to loose silty SAND / SAND, locally low strength clay.
5.90	Medium dense to dense SAND, possibly locally gravelly.
6.60	High becoming very high strength CLAY. At 10.2m, possible claystone.
12.00	Very high locally extremely high strength CLAY, locally silty clay.

Continued next sheet

HEP-CPT-1244

Remarks:

CPT Rig/Cone : GB7 1701-2904
Date of Test : 13-Dec-2017
Start / End Time 08:51:18 10:28:43
Assumed Soil Unit Weight : 19.0 [kN/m^3]
Assumed Water Level [m gl] : -1.0

Status : DRAFT
Operator : IB/SMO
Compiled by : JAG
Checked by : NJB

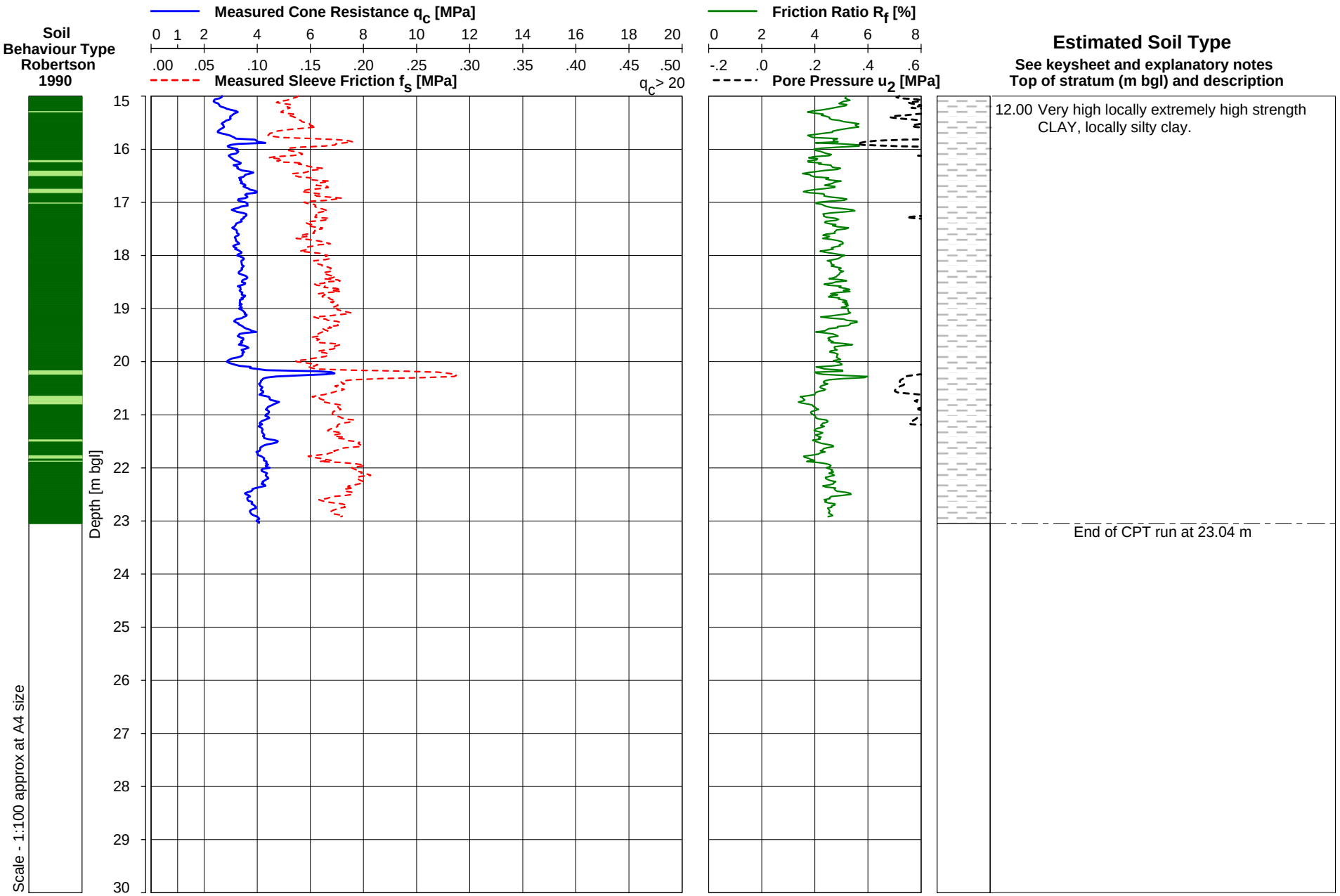
PIEZOCONE PENETRATION TEST

Location : **HEP-CPT-1244**
Coordinates : E 503854 N 177435
Ground Level [m OD] : +22.79

FUGRO GEOSERVICES LIMITED

Fugro Reference: G170029U

HEATHROW AIRPORT LIMITED
HEATHROW EXPANSION PROJECT GROUND INVESTIGATION - PACKAGE 3



HEP-CPT-1244

Remarks:

CPT Rig/Cone : GB7 1701-2904
Date of Test : 13-Dec-2017
Start / End Time 08:51:18 10:28:43
Assumed Soil Unit Weight : 19.0 [kN/m^3]
Assumed Water Level [m gl] : -1.0

Status : DRAFT
Operator : IB/SMO
Compiled by : JAG
Checked by : NJB

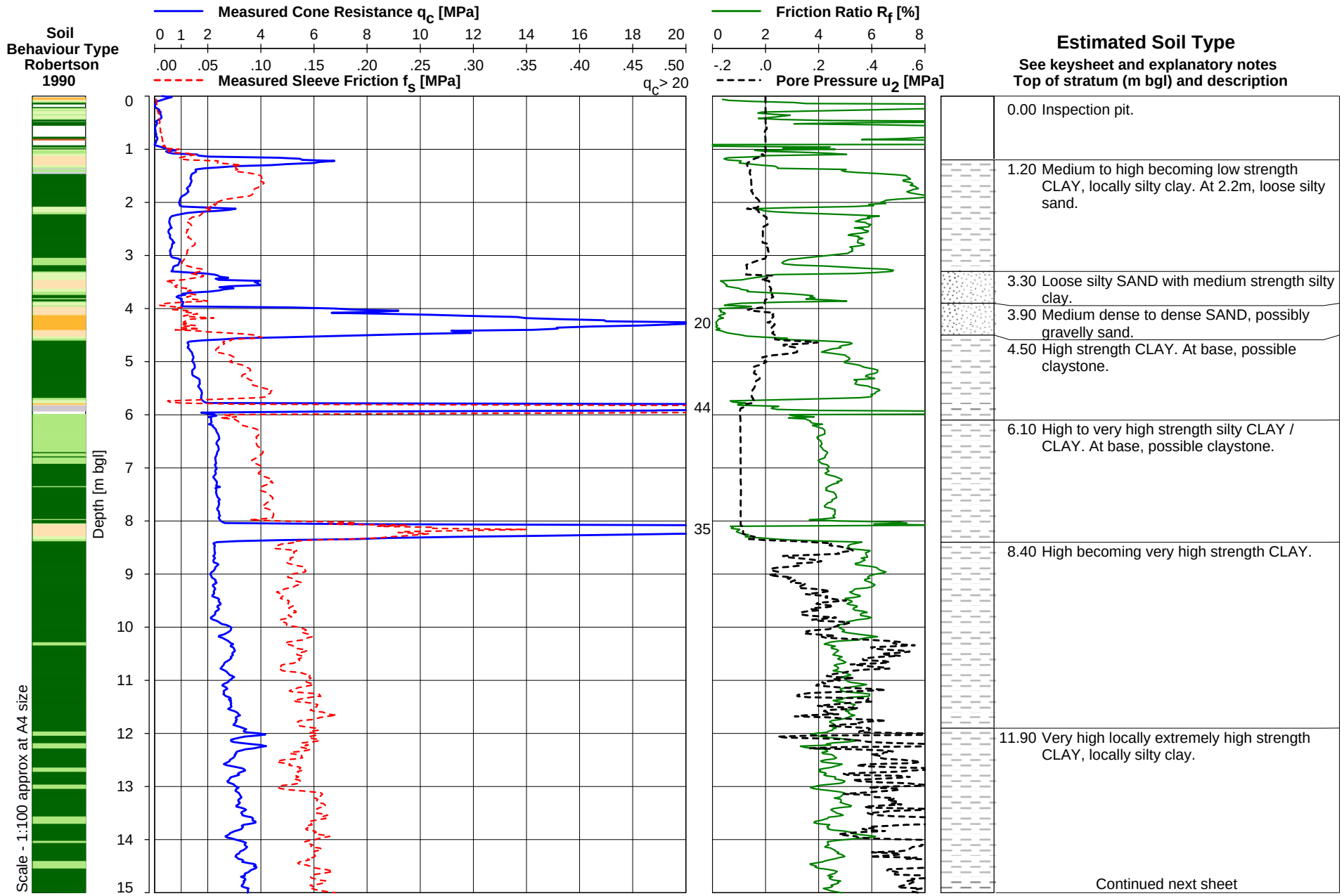
PIEZOCONE PENETRATION TEST

Location : **HEP-CPT-1244**
Coordinates : E 503854 N 177435
Ground Level [m OD] : +22.79

FUGRO GEOSERVICES LIMITED

Fugro Reference: G170029U

HEATHROW AIRPORT LIMITED
HEATHROW EXPANSION PROJECT GROUND INVESTIGATION - PACKAGE 3



Estimated Soil Type

See keysheet and explanatory notes
Top of stratum (m bgl) and description

0.00	Inspection pit.
1.20	Medium to high becoming low strength CLAY, locally silty clay. At 2.2m, loose silty sand.
3.30	Loose silty SAND with medium strength silty clay.
3.90	Medium dense to dense SAND, possibly gravelly sand.
4.50	High strength CLAY. At base, possible claystone.
6.10	High to very high strength silty CLAY / CLAY. At base, possible claystone.
8.40	High becoming very high strength CLAY.
11.90	Very high locally extremely high strength CLAY, locally silty clay.

Continued next sheet

HEP-CPT-1245

Remarks:

CPT Rig/Cone : GB7 1701-2904
Date of Test : 12-Dec-2017
Start / End Time 12:23:59 14:05:12

Assumed Soil Unit Weight : 19.0 [kN/m^3]
Assumed Water Level [m gl] : -1.0

Status : DRAFT
Operator : IB/SMO
Compiled by : JAG
Checked by : NJB

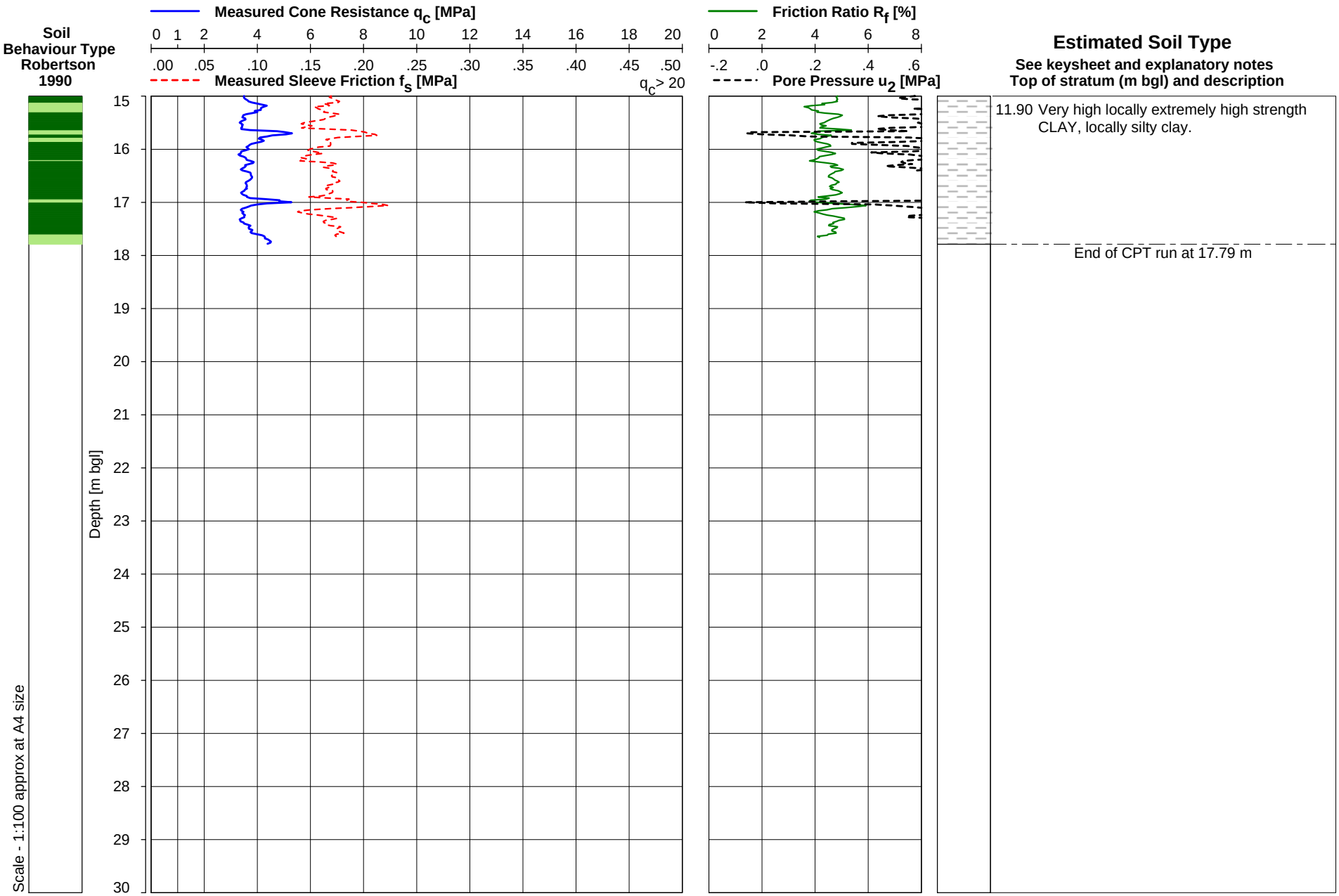
PIEZOCONE PENETRATION TEST

Location : **HEP-CPT-1245**
Coordinates : E 503681 N 177435
Ground Level [m OD] : +21.34

FUGRO GEOSERVICES LIMITED

Fugro Reference: G170029U

HEATHROW AIRPORT LIMITED
HEATHROW EXPANSION PROJECT GROUND INVESTIGATION - PACKAGE 3



HEP-CPT-1245

Remarks:

CPT Rig/Cone : GB7 1701-2904
Date of Test : 12-Dec-2017
Start / End Time 12:23:59 14:05:12
Assumed Soil Unit Weight : 19.0 [kN/m^3]
Assumed Water Level [m gl] : -1.0

Status : DRAFT
Operator : IB/SMO
Compiled by : JAG
Checked by : NJB

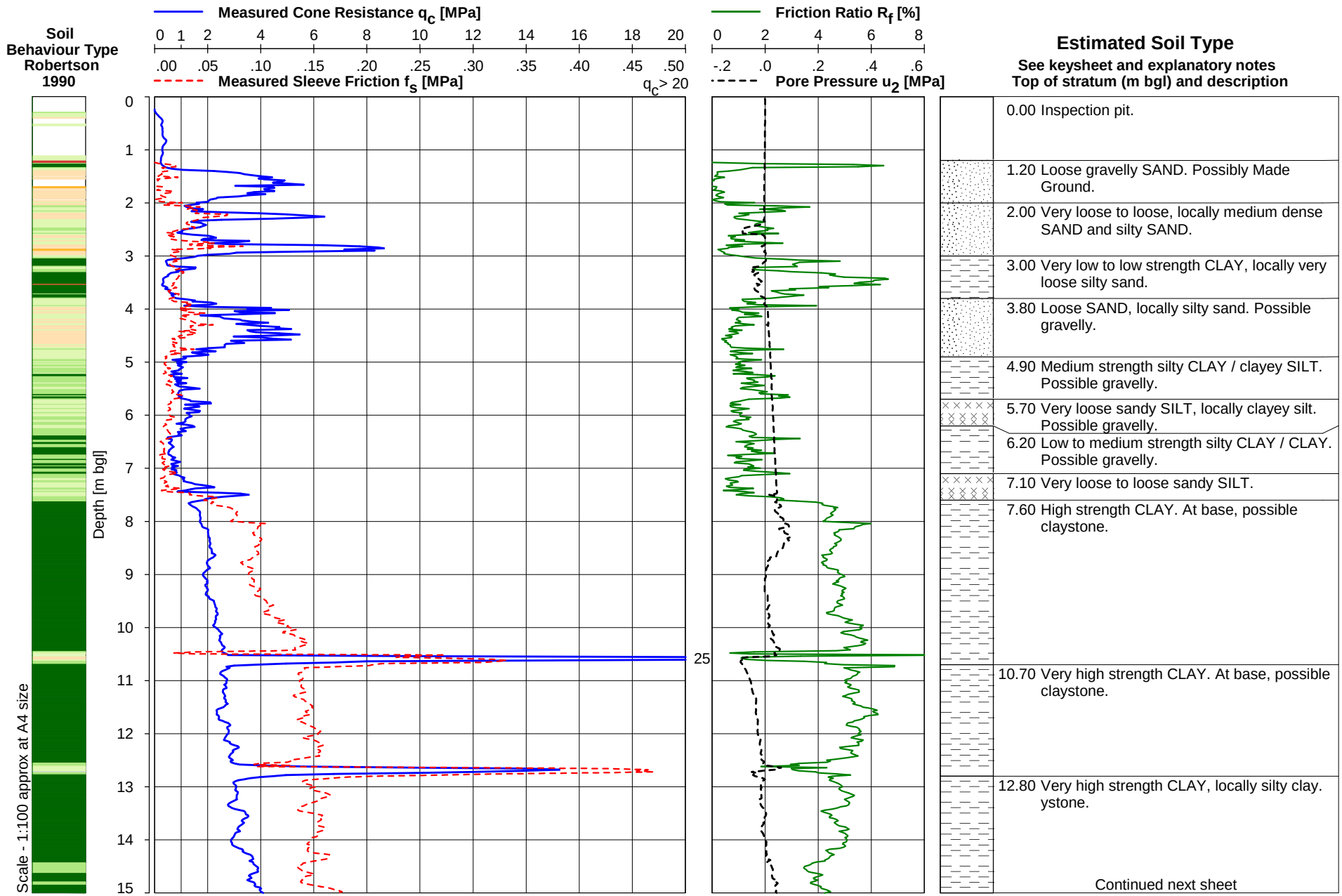
PIEZOCONE PENETRATION TEST

Location : **HEP-CPT-1245**
Coordinates : E 503681 N 177435
Ground Level [m OD] : +21.34

FUGRO GEOSERVICES LIMITED

Fugro Reference: G170029U

HEATHROW AIRPORT LIMITED
HEATHROW EXPANSION PROJECT GROUND INVESTIGATION - PACKAGE 3



Estimated Soil Type

See keysheet and explanatory notes
Top of stratum (m bgl) and description

0.00	Inspection pit.
1.20	Loose gravelly SAND. Possibly Made Ground.
2.00	Very loose to loose, locally medium dense SAND and silty SAND.
3.00	Very low to low strength CLAY, locally very loose silty sand.
3.80	Loose SAND, locally silty sand. Possible gravelly.
4.90	Medium strength silty CLAY / clayey SILT. Possible gravelly.
5.70	Very loose sandy SILT, locally clayey silt. Possible gravelly.
6.20	Low to medium strength silty CLAY / CLAY. Possible gravelly.
7.10	Very loose to loose sandy SILT.
7.60	High strength CLAY. At base, possible claystone.
10.70	Very high strength CLAY. At base, possible claystone.
12.80	Very high strength CLAY, locally silty clay. ystone.

Continued next sheet

HEP-CPT-1247

Remarks:

CPT Rig/Cone : GB17 1701-1529
Date of Test : 13-Feb-2018
Start / End Time 08:48:48 10:21:00

Assumed Soil Unit Weight : 19.0 [kN/m^3]
Assumed Water Level [m gl]: -1.0

Status : DRAFT
Operator : IB/CD
Compiled by : JAG
Checked by : KES

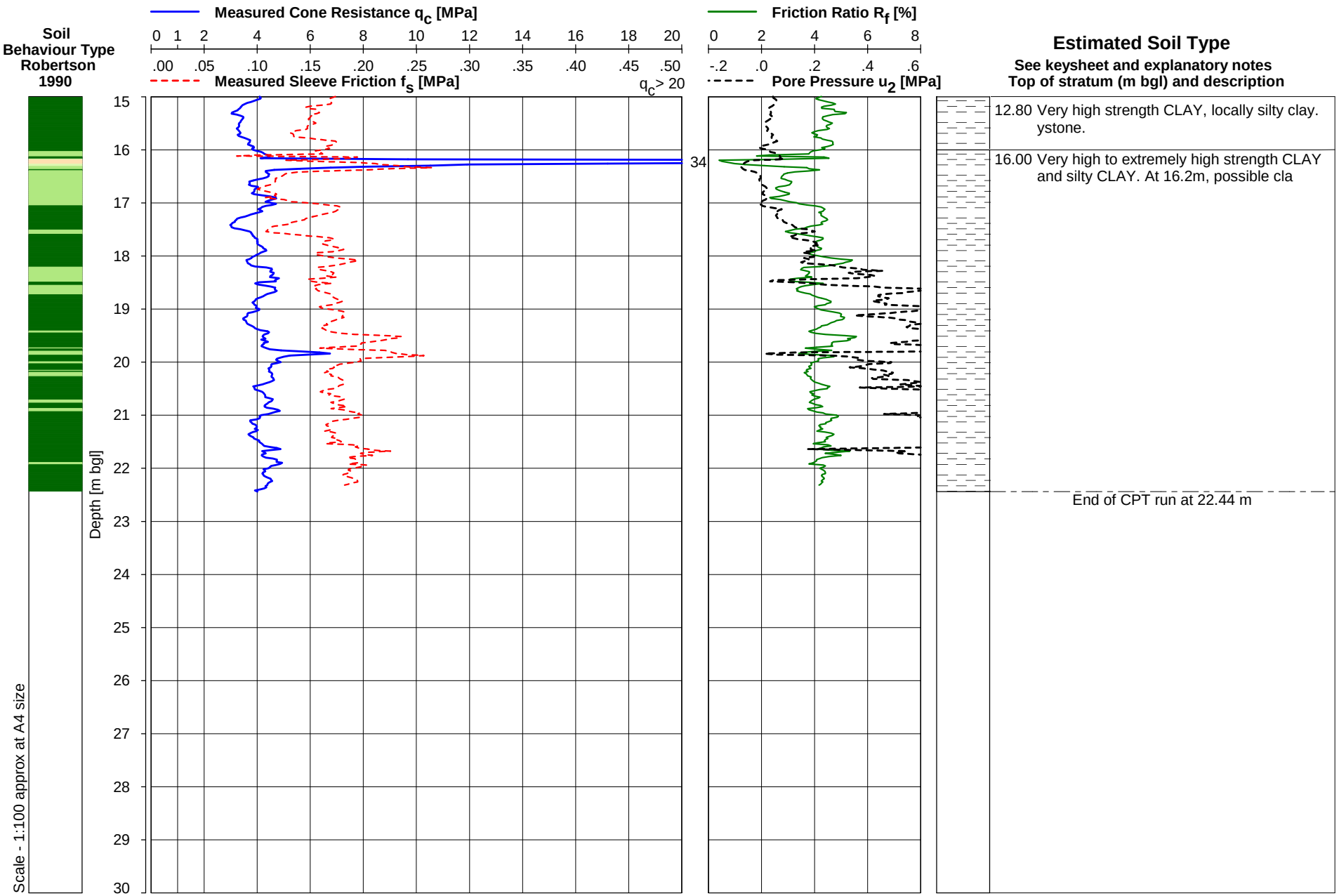
PIEZOCONE PENETRATION TEST

Location : **HEP-CPT-1247**
Coordinates : E 503811 N 177274
Ground Level [m OD] : +22.15

FUGRO GEOSERVICES LIMITED

Fugro Reference: G170029U

HEATHROW AIRPORT LIMITED
HEATHROW EXPANSION PROJECT GROUND INVESTIGATION - PACKAGE 3



Estimated Soil Type

See keysheet and explanatory notes
Top of stratum (m bgl) and description

12.80 Very high strength CLAY, locally silty clay. ystone.

16.00 Very high to extremely high strength CLAY and silty CLAY. At 16.2m, possible cla

End of CPT run at 22.44 m

HEP-CPT-1247

Remarks:

CPT Rig/Cone : GB17 1701-1529
Date of Test : 13-Feb-2018
Start / End Time 08:48:48 10:21:00
Assumed Soil Unit Weight : 19.0 [kN/m^3]
Assumed Water Level [m gl]: -1.0

Status : DRAFT
Operator : IB/CD
Compiled by : JAG
Checked by : KES

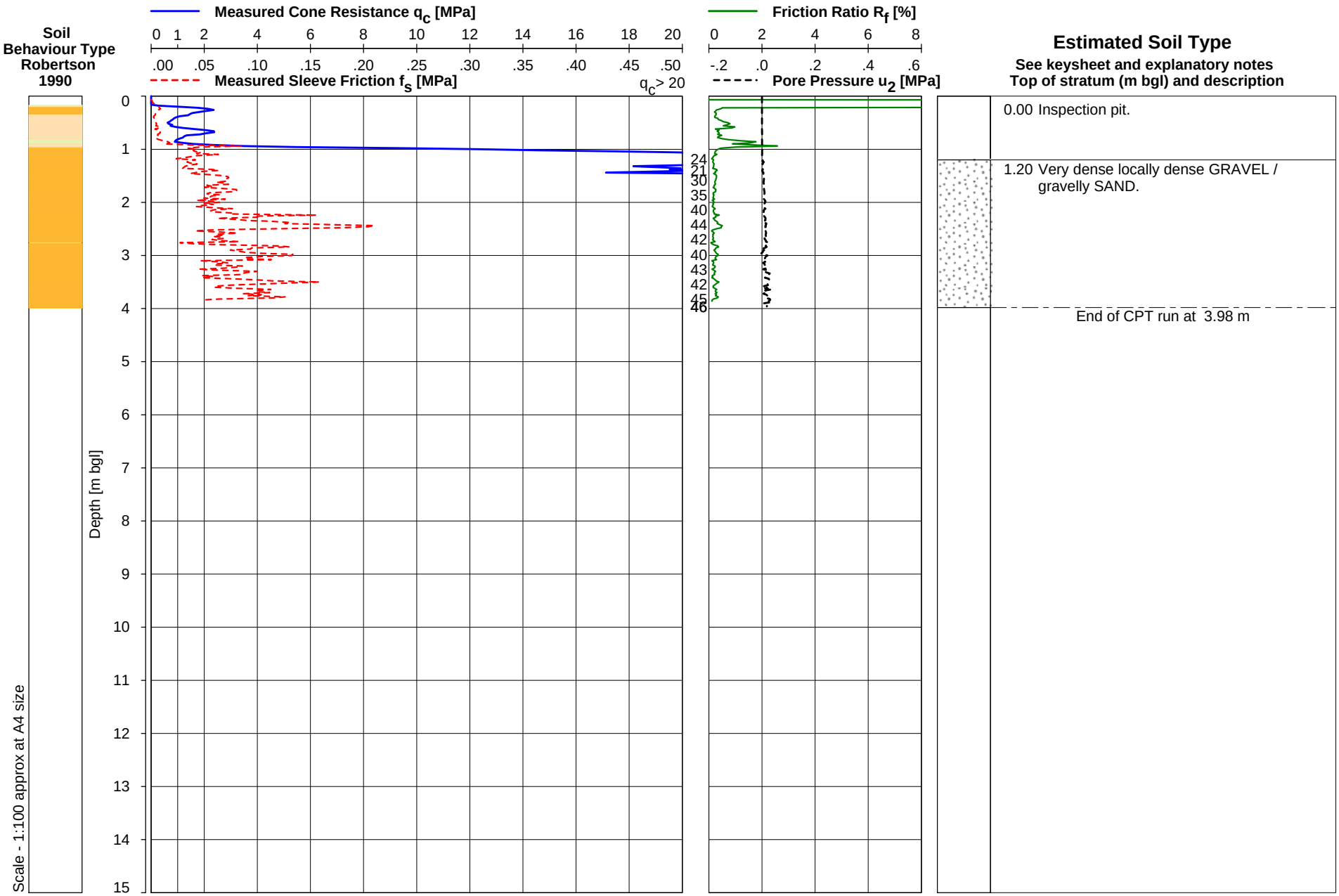
PIEZOCONE PENETRATION TEST

Location : **HEP-CPT-1247**
Coordinates : E 503811 N 177274
Ground Level [m OD] : +22.15

FUGRO GEOSERVICES LIMITED

Fugro Reference: G170029U

HEATHROW AIRPORT LIMITED
HEATHROW EXPANSION PROJECT GROUND INVESTIGATION - PACKAGE 3



Estimated Soil Type

See keysheet and explanatory notes
Top of stratum (m bgl) and description

0.00 Inspection pit.

1.20 Very dense locally dense GRAVEL / gravelly SAND.

End of CPT run at 3.98 m

HEP-CPT-1248

Remarks:

CPT Rig/Cone : GB7 1701-1515
Date of Test : 16-Jan-2018
Start / End Time 08:48:46 09:01:44
Assumed Soil Unit Weight : 19.0 [kN/m^3]
Assumed Water Level [m gl] : -1.0

Status : DRAFT
Operator : NF/IB
Compiled by : JAG
Checked by : NJB

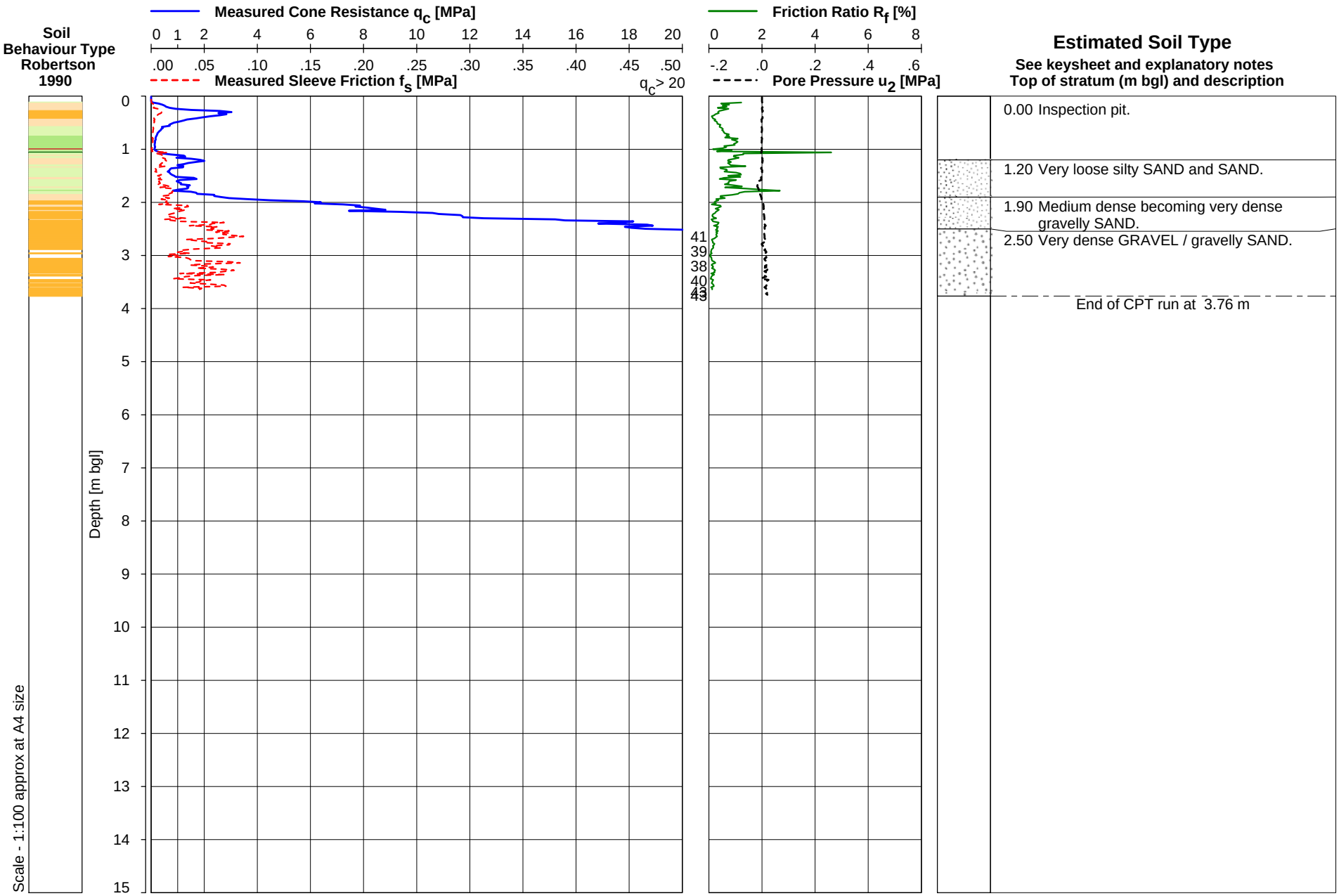
PIEZOCONE PENETRATION TEST

Location : **HEP-CPT-1248**
Coordinates : E 503911 N 177343
Ground Level [m OD] : +22.04

FUGRO GEOSERVICES LIMITED

Fugro Reference: G170029U

HEATHROW AIRPORT LIMITED
HEATHROW EXPANSION PROJECT GROUND INVESTIGATION - PACKAGE 3



HEP-CPT-1249

Remarks:

CPT Rig/Cone : GB7 1701-2904
Date of Test : 15-Jan-2018
Start / End Time 13:36:20 13:46:04
Assumed Soil Unit Weight : 19.0 [kN/m^3]
Assumed Water Level [m gl] : -1.0

Status : DRAFT
Operator : NF/IB
Compiled by : JAG
Checked by : NJB

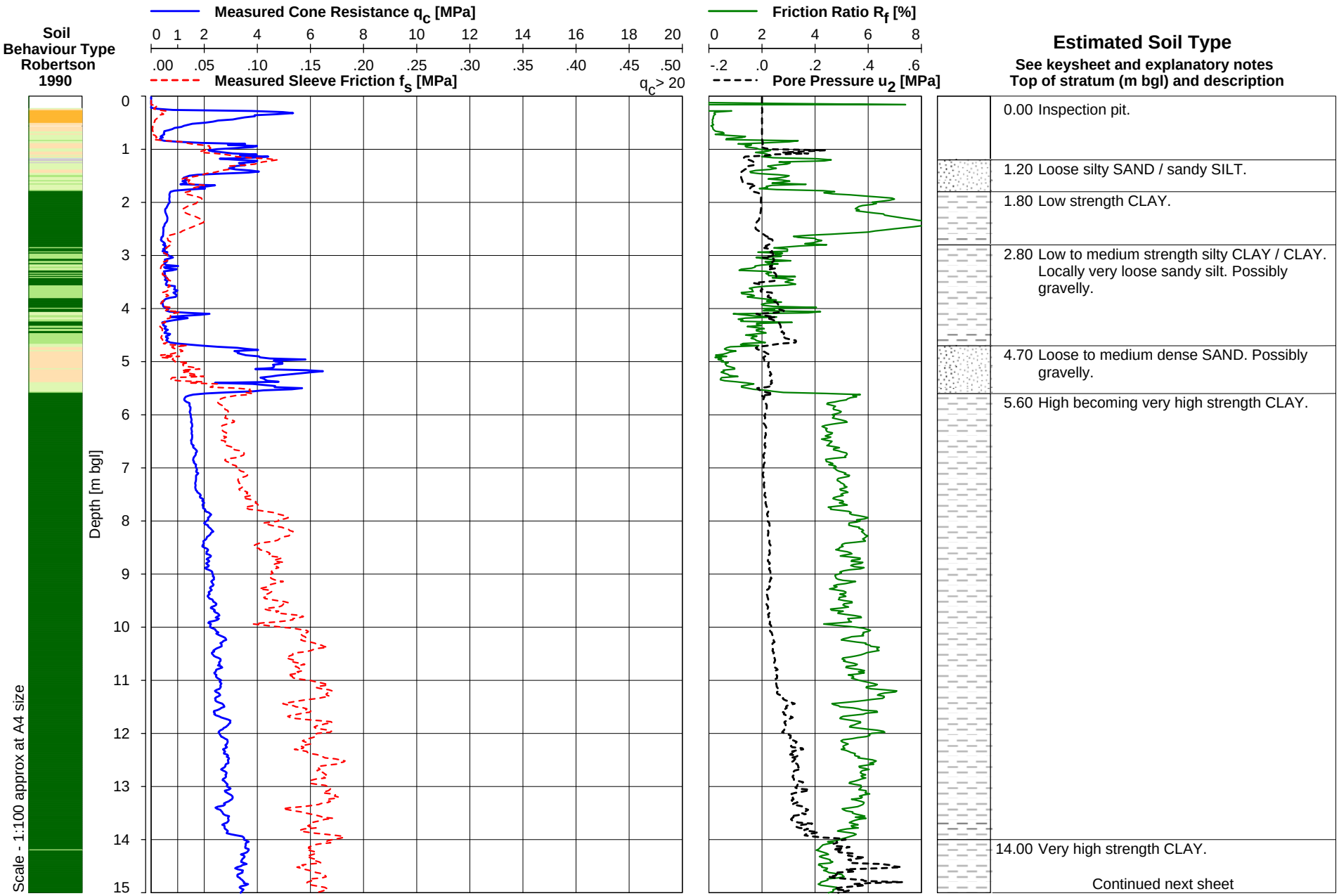
PIEZOCONE PENETRATION TEST

Location : **HEP-CPT-1249**
Coordinates : E 503890 N 177240
Ground Level [m OD] : +22.21

FUGRO GEOSERVICES LIMITED

Fugro Reference: G170029U

HEATHROW AIRPORT LIMITED
HEATHROW EXPANSION PROJECT GROUND INVESTIGATION - PACKAGE 3



Estimated Soil Type

See keysheet and explanatory notes
Top of stratum (m bgl) and description

0.00	Inspection pit.
1.20	Loose silty SAND / sandy SILT.
1.80	Low strength CLAY.
2.80	Low to medium strength silty CLAY / CLAY. Locally very loose sandy silt. Possibly gravelly.
4.70	Loose to medium dense SAND. Possibly gravelly.
5.60	High becoming very high strength CLAY.
14.00	Very high strength CLAY.

Continued next sheet

HEP-CPT-1250

Remarks:

CPT Rig/Cone : GB7 1701-2904
Date of Test : 15-Jan-2018
Start / End Time 11:18:05 13:23:53

Assumed Soil Unit Weight : 19.0 [kN/m^3]
Assumed Water Level [m gl] : -1.0

Status : DRAFT
Operator : NF/IB
Compiled by : JAG
Checked by : NJB

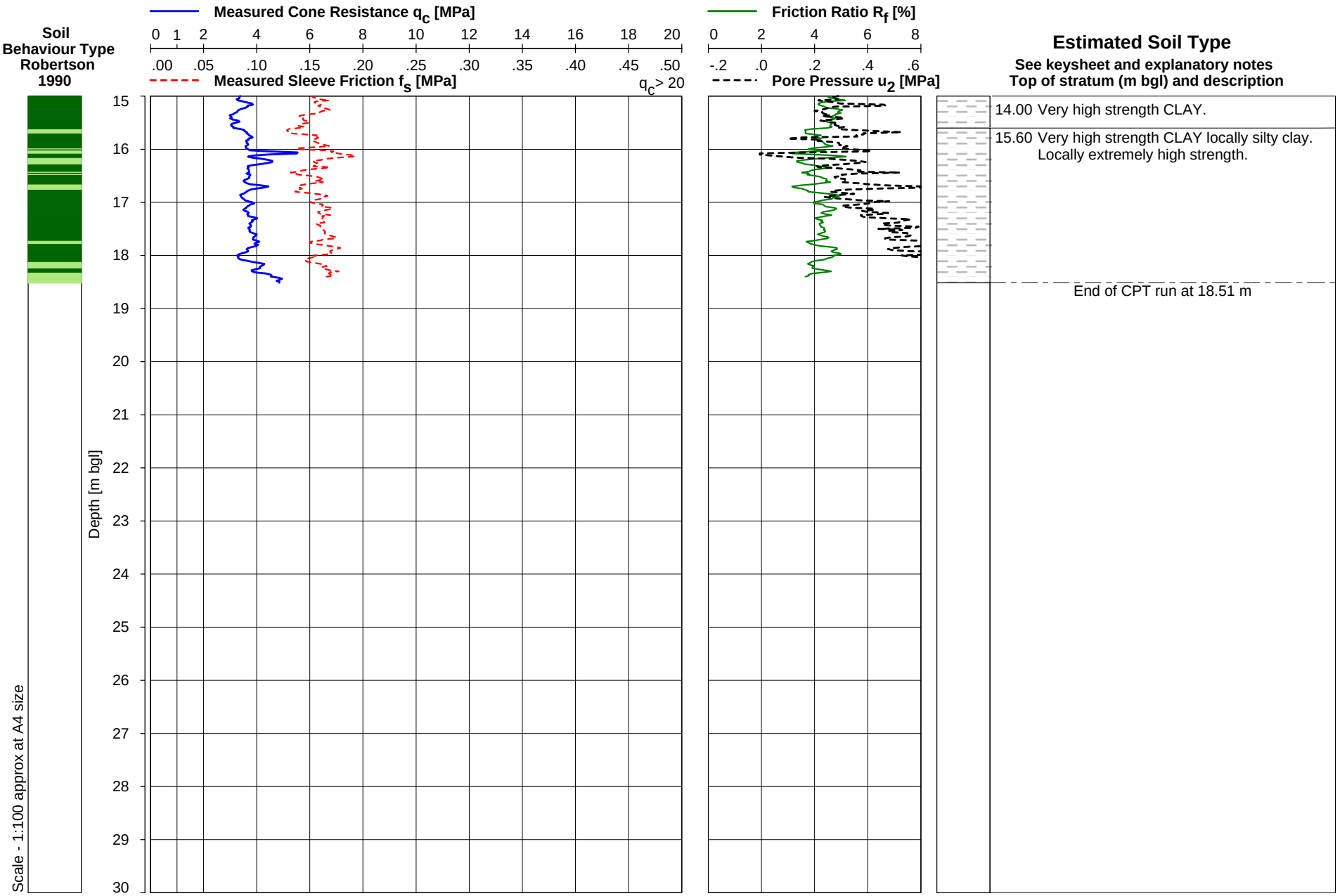
PIEZOCONE PENETRATION TEST

Location : **HEP-CPT-1250**
Coordinates : E 503800 N 177245
Ground Level [m OD] : +22.26

FUGRO GEOSERVICES LIMITED

Fugro Reference: G170029U

HEATHROW AIRPORT LIMITED
HEATHROW EXPANSION PROJECT GROUND INVESTIGATION - PACKAGE 3



Estimated Soil Type

See keysheet and explanatory notes
Top of stratum (m bgl) and description

14.00 Very high strength CLAY.

15.60 Very high strength CLAY locally silty clay. Locally extremely high strength.

End of CPT run at 18.51 m

HEP-CPT-1250

Remarks:

CPT Rig/Cone : GB7 1701-2904
Date of Test : 15-Jan-2018
Start / End Time 11:18:05 13:23:53

Assumed Soil Unit Weight : 19.0 [kN/m^3]
Assumed Water Level [m gl] : -1.0

Status : DRAFT
Operator : NF/IB
Compiled by : JAG
Checked by : NJB

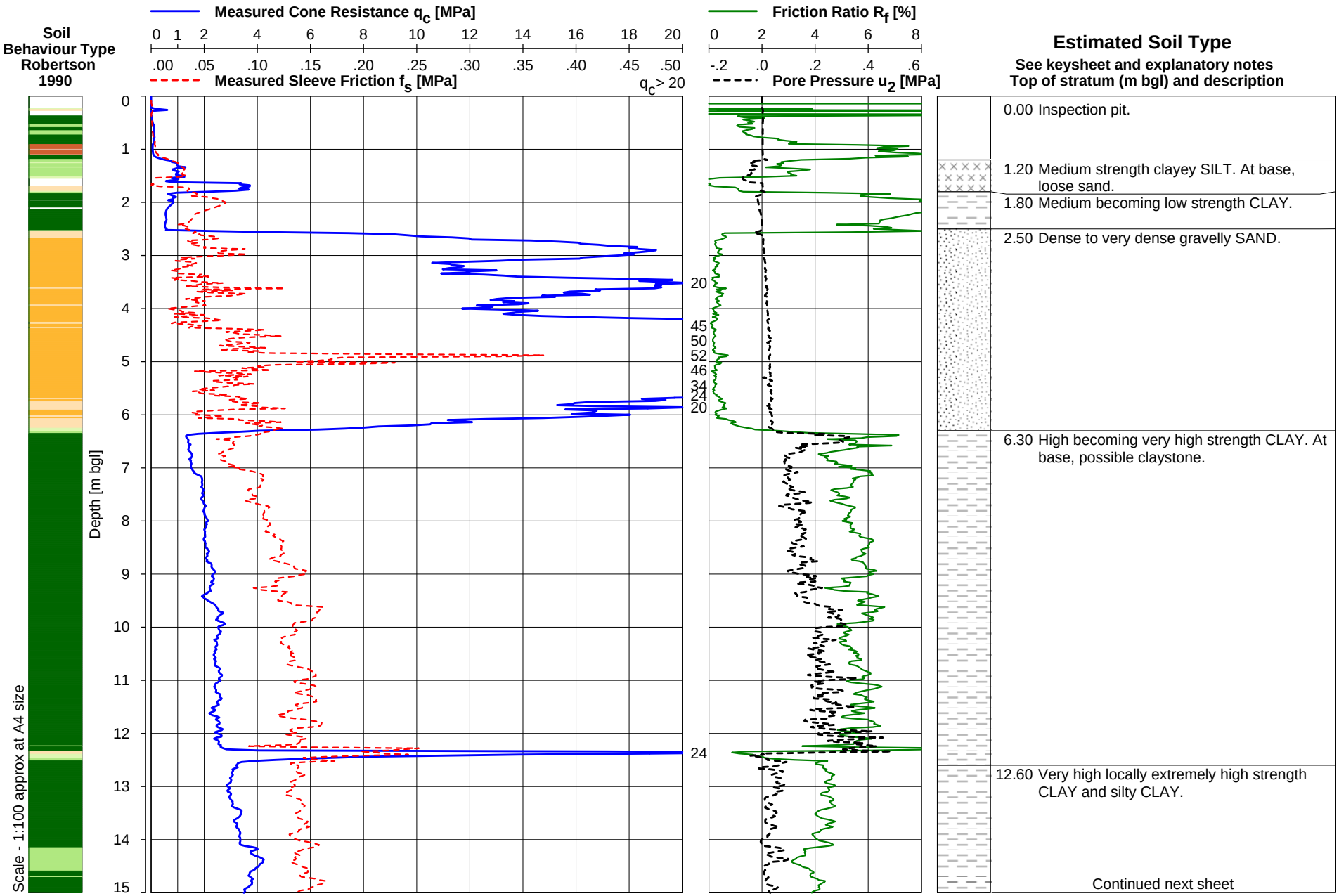
PIEZOCONE PENETRATION TEST

Location : **HEP-CPT-1250**
Coordinates : E 503800 N 177245
Ground Level [m OD] : +22.26

FUGRO GEOSERVICES LIMITED

Fugro Reference: G170029U

HEATHROW AIRPORT LIMITED
HEATHROW EXPANSION PROJECT GROUND INVESTIGATION - PACKAGE 3



Estimated Soil Type

See keysheet and explanatory notes
Top of stratum (m bgl) and description

0.00 Inspection pit.

1.20 Medium strength clayey SILT. At base, loose sand.

1.80 Medium becoming low strength CLAY.

2.50 Dense to very dense gravelly SAND.

6.30 High becoming very high strength CLAY. At base, possible claystone.

12.60 Very high locally extremely high strength CLAY and silty CLAY.

Continued next sheet

HEP-CPT-1251

Remarks:

CPT Rig/Cone : GB9 1701-1987
Date of Test : 22-Mar-2018
Start / End Time 17:22:29 20:05:07

Assumed Soil Unit Weight : 19.0 [kN/m^3]
Assumed Water Level [m gl] : -1.0

Status : DRAFT
Operator : HG,KL
Compiled by : JAG
Checked by : NJB

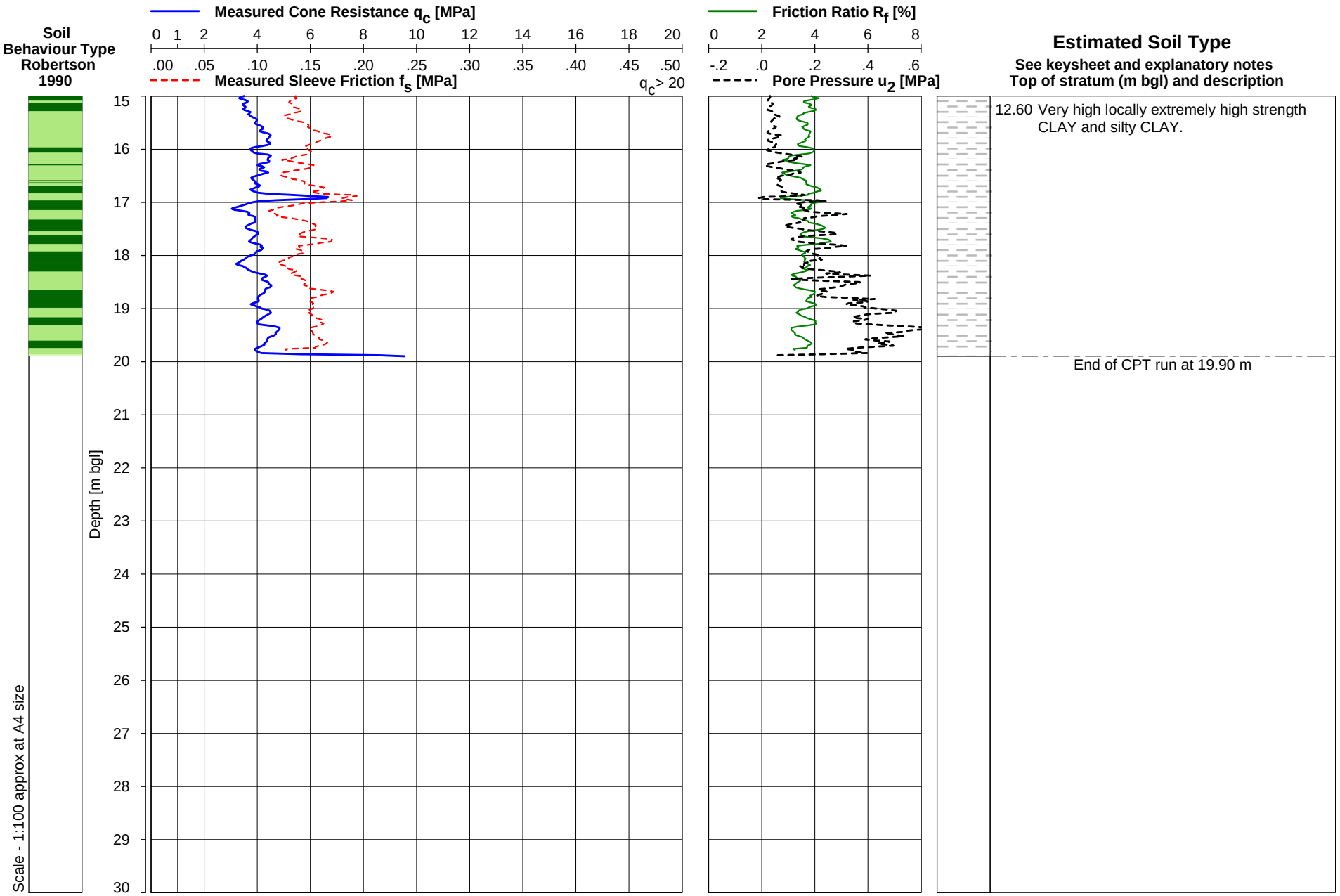
PIEZOCONE PENETRATION TEST

Location : **HEP-CPT-1251**
Coordinates : E 503702 N 177238
Ground Level [m OD] : +22.41

FUGRO GEOSERVICES LIMITED

Fugro Reference: G170029U

HEATHROW AIRPORT LIMITED
HEATHROW EXPANSION PROJECT GROUND INVESTIGATION - PACKAGE 3



HEP-CPT-1251

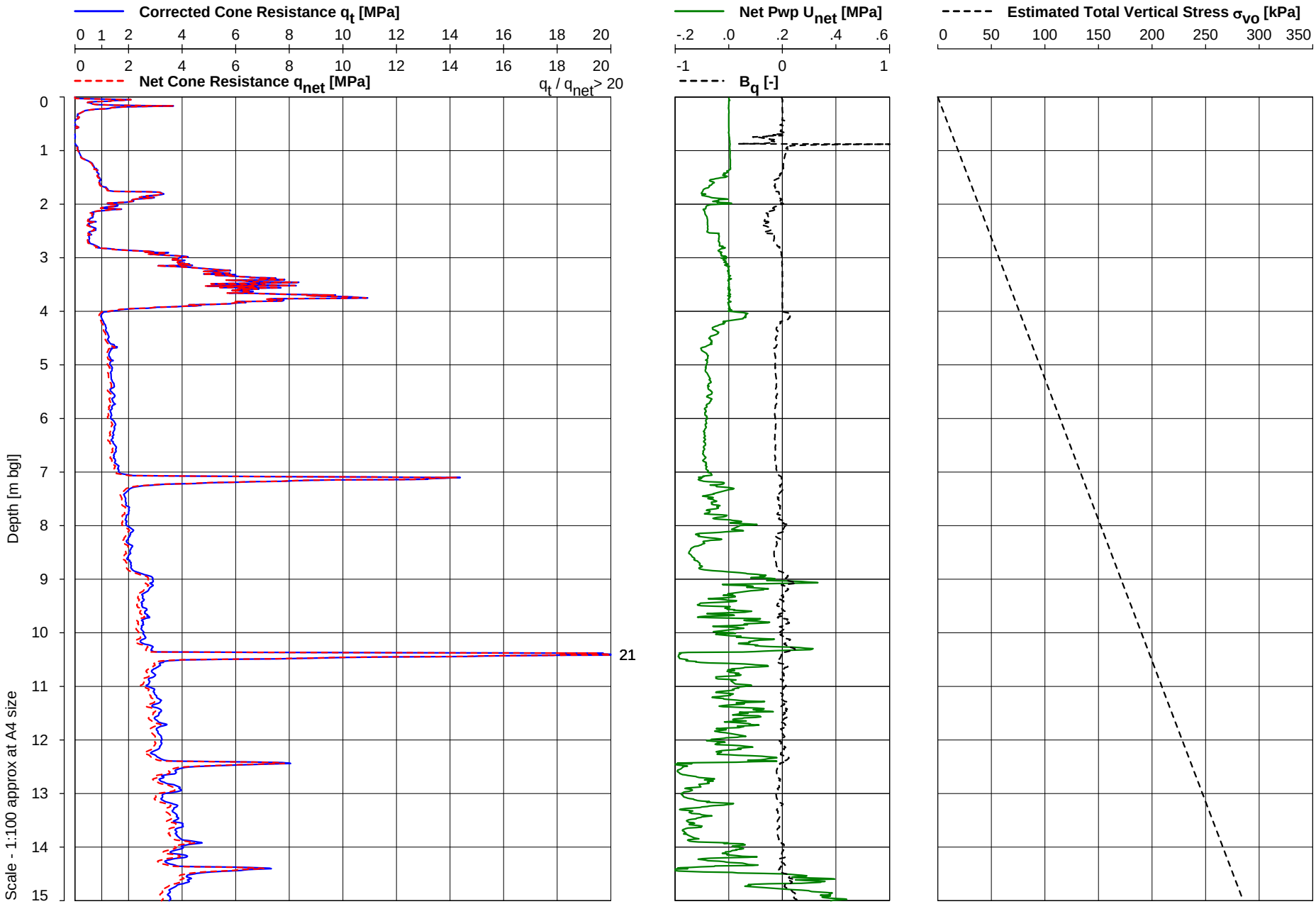
Remarks:

CPT Rig/Cone : GB9 1701-1987
Date of Test : 22-Mar-2018
Start / End Time 17:22:29 20:05:07
Assumed Soil Unit Weight : 19.0 [kN/m^3]
Assumed Water Level [m gl] : -1.0

Status : DRAFT
Operator : HG,KL
Compiled by : JAG
Checked by : NJB

PIEZOCONE PENETRATION TEST

Location : **HEP-CPT-1251**
Coordinates : E 503702 N 177238
Ground Level [m OD] : +22.41



Scale - 1:100 approx at A4 size

HEP-CPT-1239

Remarks:

CPT Rig/Cone : GB7 1701-1515

Date of Test : 12-Dec-2017

Start / End Time 09:31:52 12:09:28

Assumed Soil Unit Weight : 19.0 [kN/m^3]

Assumed Water Level [m gl] : -1.0

Status : DRAFT

Operator : IB/SMO

Compiled by : JAG

Checked by : KES

CALCULATED CPT PARAMETERS

Location : **HEP-CPT-1239**

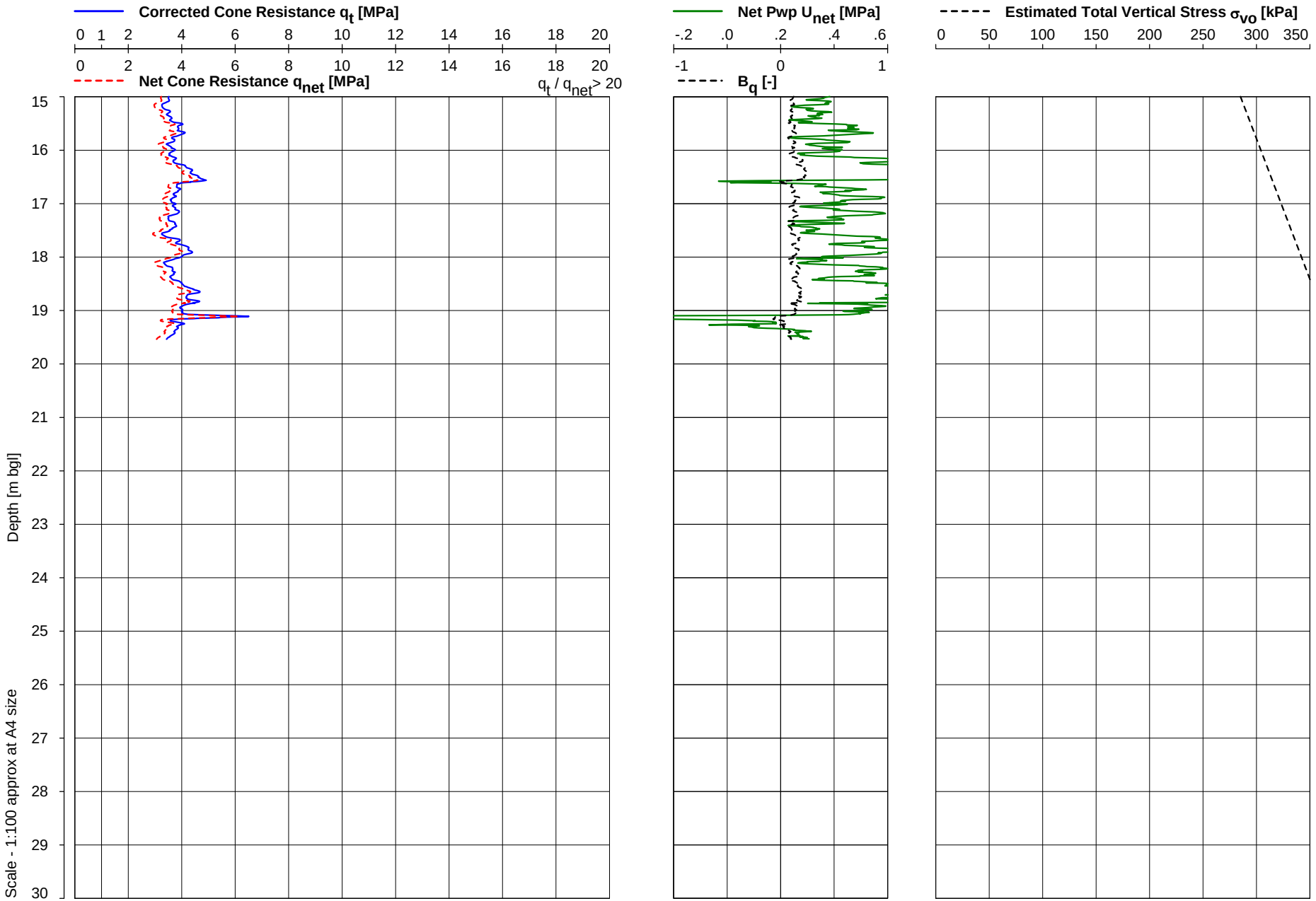
Coordinates : E 503731 N 177509

Ground Level [m OD] : +21.78

HEATHROW AIRPORT LIMITED

HEATHROW EXPANSION PROJECT GROUND INVESTIGATION - PACKAGE 3

Fugro Reference: G170029U



HEP-CPT-1239

Remarks:

CPT Rig/Cone : GB7 1701-1515

Date of Test : 12-Dec-2017

Start / End Time 09:31:52 12:09:28

Assumed Soil Unit Weight : 19.0 [kN/m^3]

Assumed Water Level [m gl] : -1.0

Status : DRAFT

Operator : IB/SMO

Compiled by : JAG

Checked by : KES

CALCULATED CPT PARAMETERS

Location : **HEP-CPT-1239**

Coordinates : E 503731 N 177509

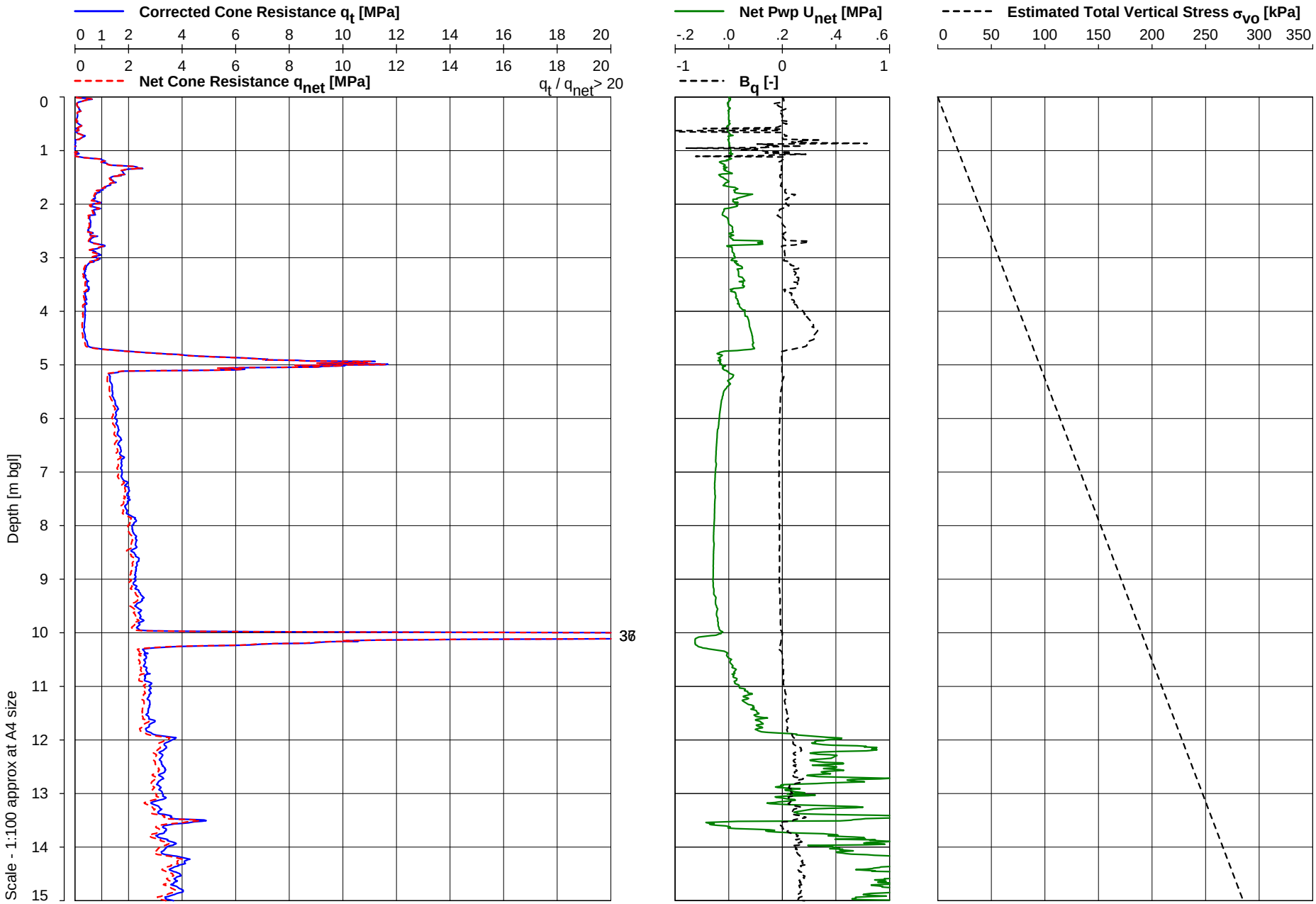
Ground Level [m OD] : +21.78

HEATHROW AIRPORT LIMITED

HEATHROW EXPANSION PROJECT GROUND INVESTIGATION - PACKAGE 3

Fugro Reference: G170029U

HEATHROW AIRPORT LIMITED
HEATHROW EXPANSION PROJECT GROUND INVESTIGATION - PACKAGE 3



HEP-CPT-1240

Remarks:

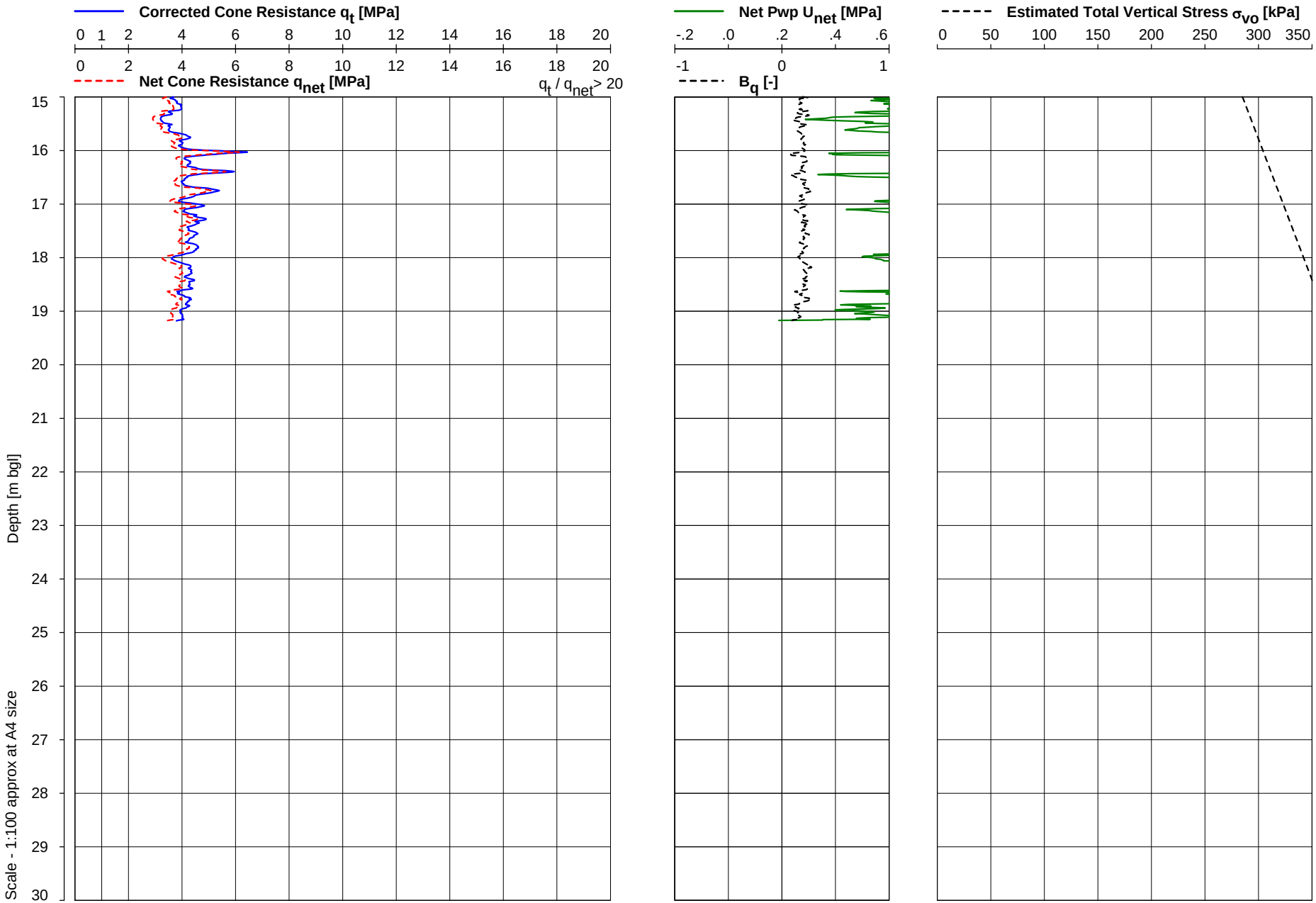
CPT Rig/Cone : GB7 1701-2904
Date of Test : 12-Dec-2017
Start / End Time 14:34:51 17:09:55
Assumed Soil Unit Weight : 19.0 [kN/m^3]
Assumed Water Level [m gl] : -1.0

Status : DRAFT
Operator : IB/SMO
Compiled by : JAG
Checked by : KES

CALCULATED CPT PARAMETERS

Location : **HEP-CPT-1240**
Coordinates : E 503873 N 177466
Ground Level [m OD] : +22.72

Fugro Reference: G170029U



HEP-CPT-1240

Remarks:

CPT Rig/Cone : GB7 1701-2904

Date of Test : 12-Dec-2017

Start / End Time 14:34:51 17:09:55

Assumed Soil Unit Weight : 19.0 [kN/m^3]

Assumed Water Level [m gl] : -1.0

Status : DRAFT

Operator : IB/SMO

Compiled by : JAG

Checked by : KES

CALCULATED CPT PARAMETERS

Location : **HEP-CPT-1240**

Coordinates : E 503873 N 177466

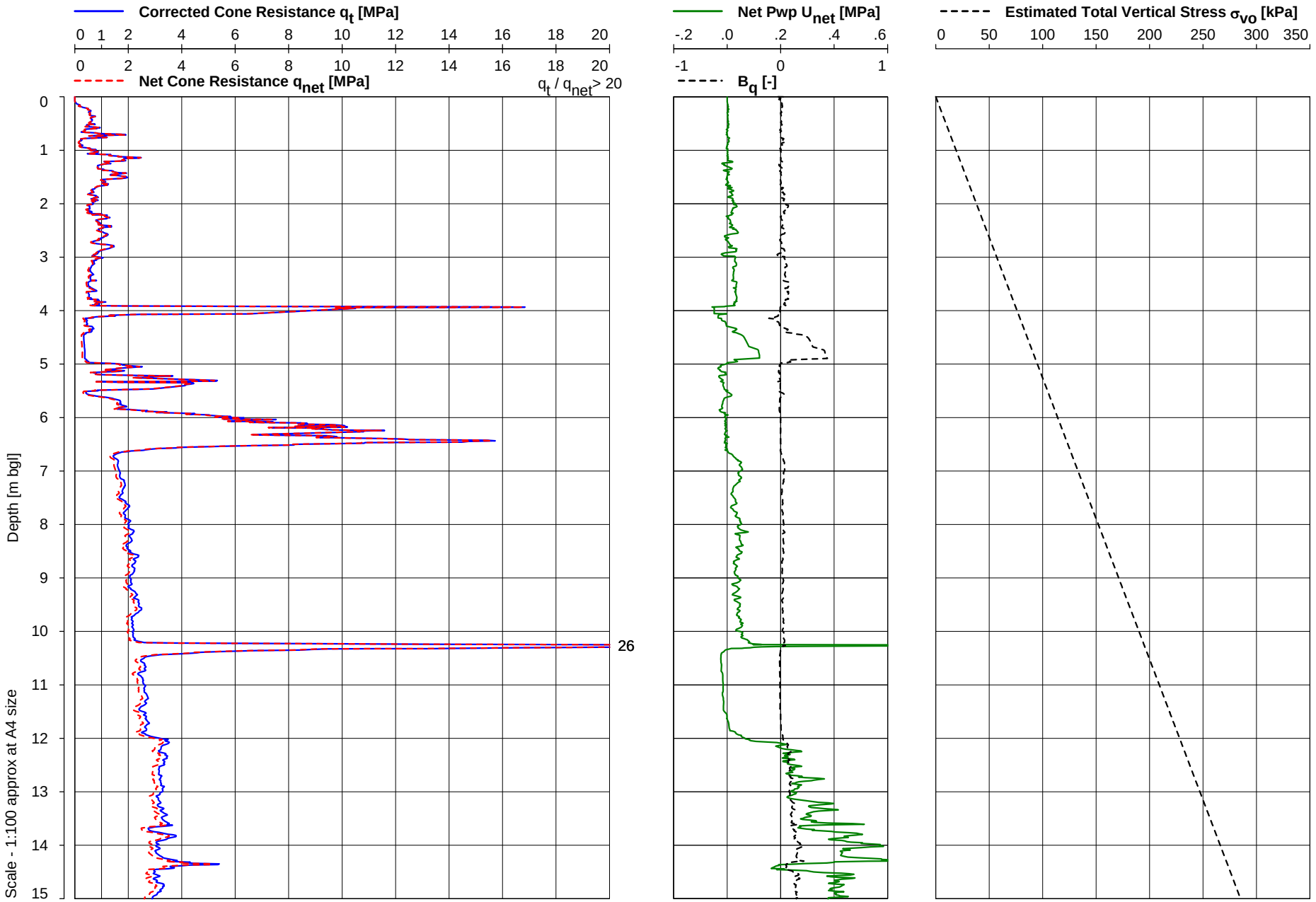
Ground Level [m OD] : +22.72

HEATHROW AIRPORT LIMITED

HEATHROW EXPANSION PROJECT GROUND INVESTIGATION - PACKAGE 3

Fugro Reference: G170029U

HEATHROW AIRPORT LIMITED
HEATHROW EXPANSION PROJECT GROUND INVESTIGATION - PACKAGE 3



HEP-CPT-1244

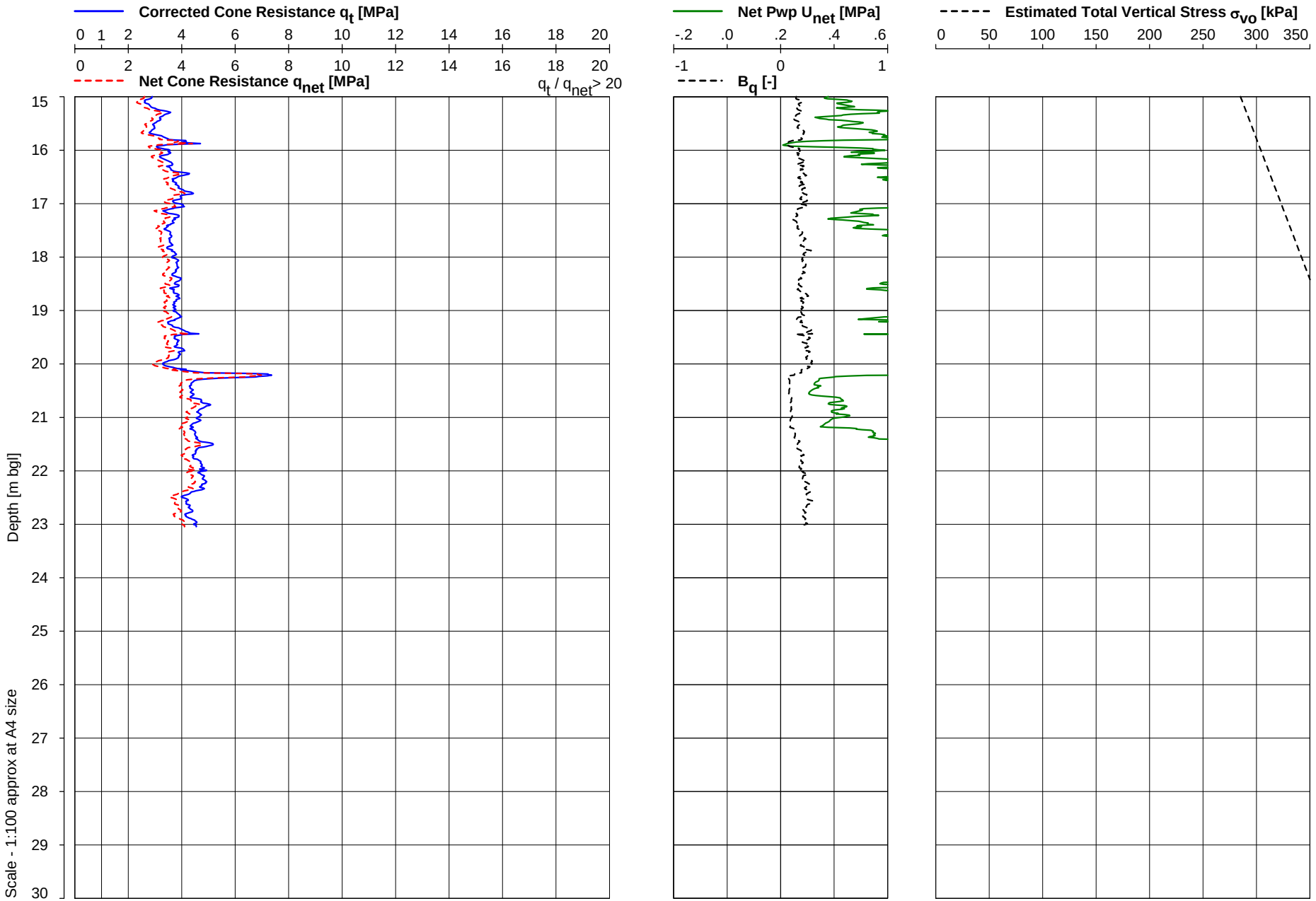
Remarks:

CPT Rig/Cone : GB7 1701-2904
Date of Test : 13-Dec-2017
Start / End Time 08:51:18 10:28:43
Assumed Soil Unit Weight : 19.0 [kN/m^3]
Assumed Water Level [m gl] : -1.0

Status : DRAFT
Operator : IB/SMO
Compiled by : JAG
Checked by : KES

CALCULATED CPT PARAMETERS

Location : **HEP-CPT-1244**
Coordinates : E 503854 N 177435
Ground Level [m OD] : +22.79



HEP-CPT-1244

Remarks:

CPT Rig/Cone : GB7 1701-2904

Date of Test : 13-Dec-2017

Start / End Time 08:51:18 10:28:43

Assumed Soil Unit Weight : 19.0 [kN/m^3]

Assumed Water Level [m gl] : -1.0

Status : DRAFT

Operator : IB/SMO

Compiled by : JAG

Checked by : KES

CALCULATED CPT PARAMETERS

Location : **HEP-CPT-1244**

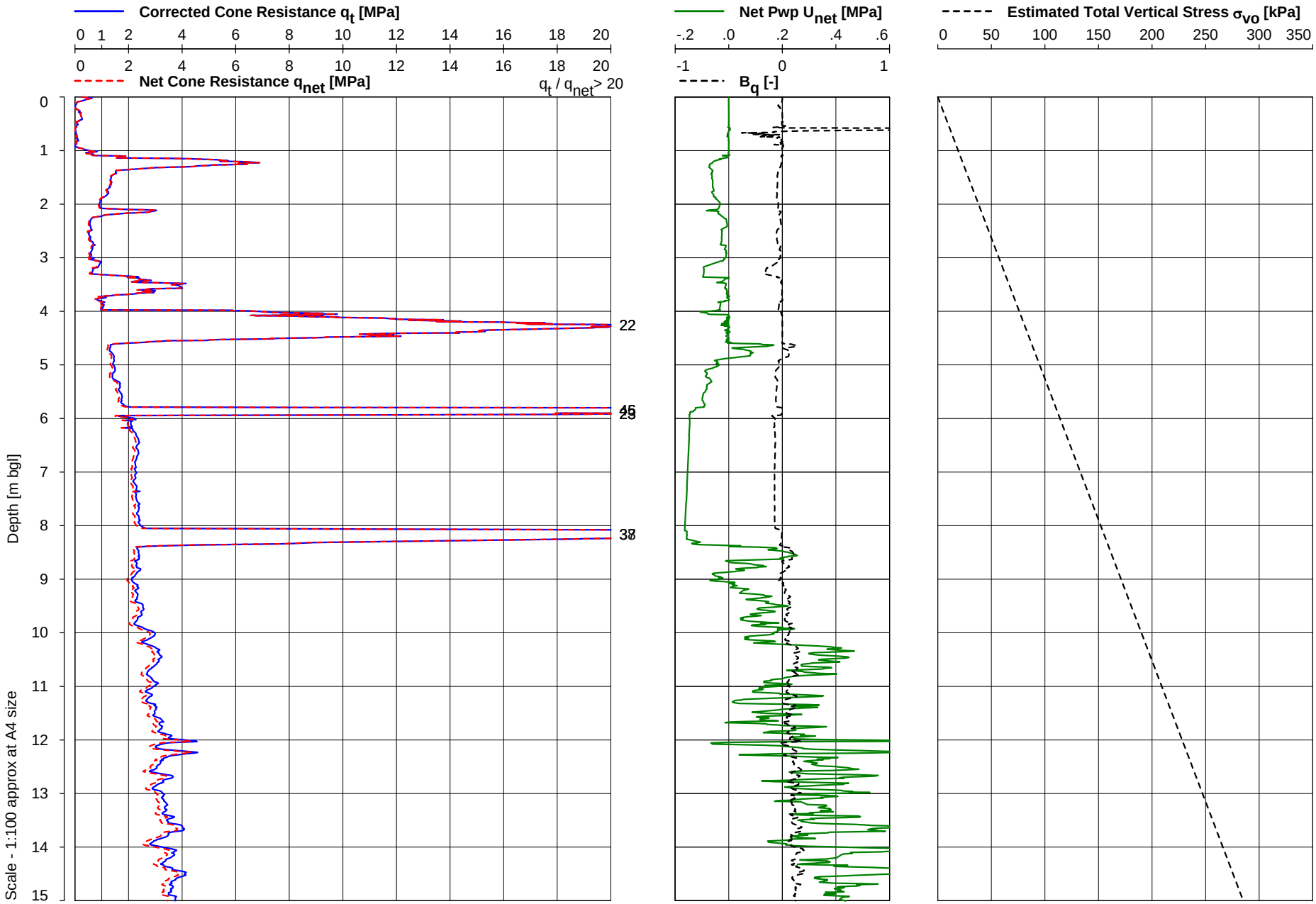
Coordinates : E 503854 N 177435

Ground Level [m OD] : +22.79

HEATHROW AIRPORT LIMITED

HEATHROW EXPANSION PROJECT GROUND INVESTIGATION - PACKAGE 3

Fugro Reference: G170029U



HEP-CPT-1245

Remarks:

CPT Rig/Cone : GB7 1701-2904

Date of Test : 12-Dec-2017

Start / End Time 12:23:59 14:05:12

Assumed Soil Unit Weight : 19.0 [kN/m^3]

Assumed Water Level [m gl] : -1.0

Status : DRAFT

Operator : IB/SMO

Compiled by : JAG

Checked by : KES

CALCULATED CPT PARAMETERS

Location : **HEP-CPT-1245**

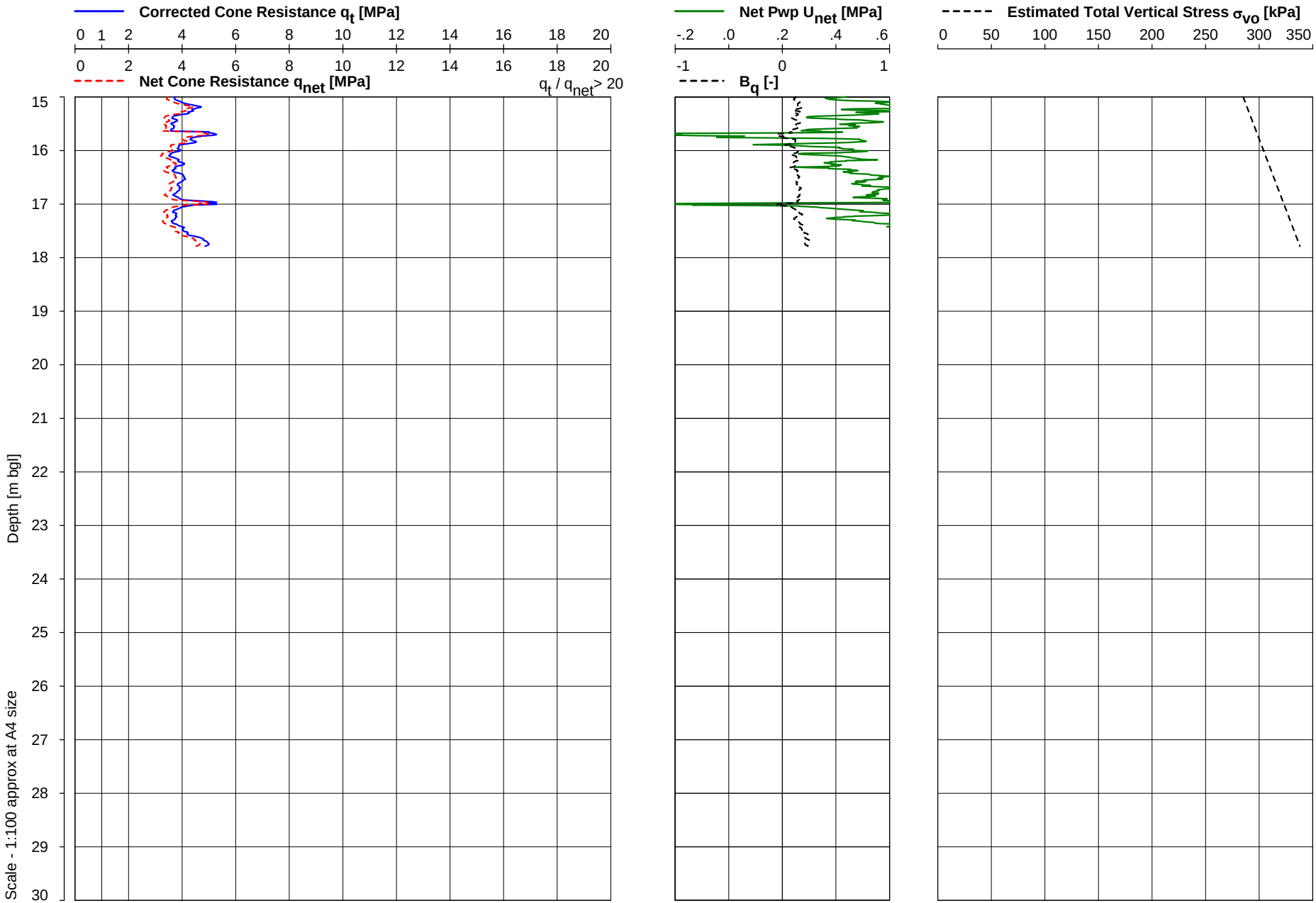
Coordinates : E 503681 N 177435

Ground Level [m OD] : +21.34

HEATHROW AIRPORT LIMITED

HEATHROW EXPANSION PROJECT GROUND INVESTIGATION - PACKAGE 3

Fugro Reference: G170029U



HEP-CPT-1245

Remarks:

CPT Rig/Cone : GB7 1701-2904

Date of Test : 12-Dec-2017

Start / End Time 12:23:59 14:05:12

Assumed Soil Unit Weight : 19.0 [kN/m^3]

Assumed Water Level [m gl] : -1.0

Status : DRAFT

Operator : IB/SMO

Compiled by : JAG

Checked by : KES

CALCULATED CPT PARAMETERS

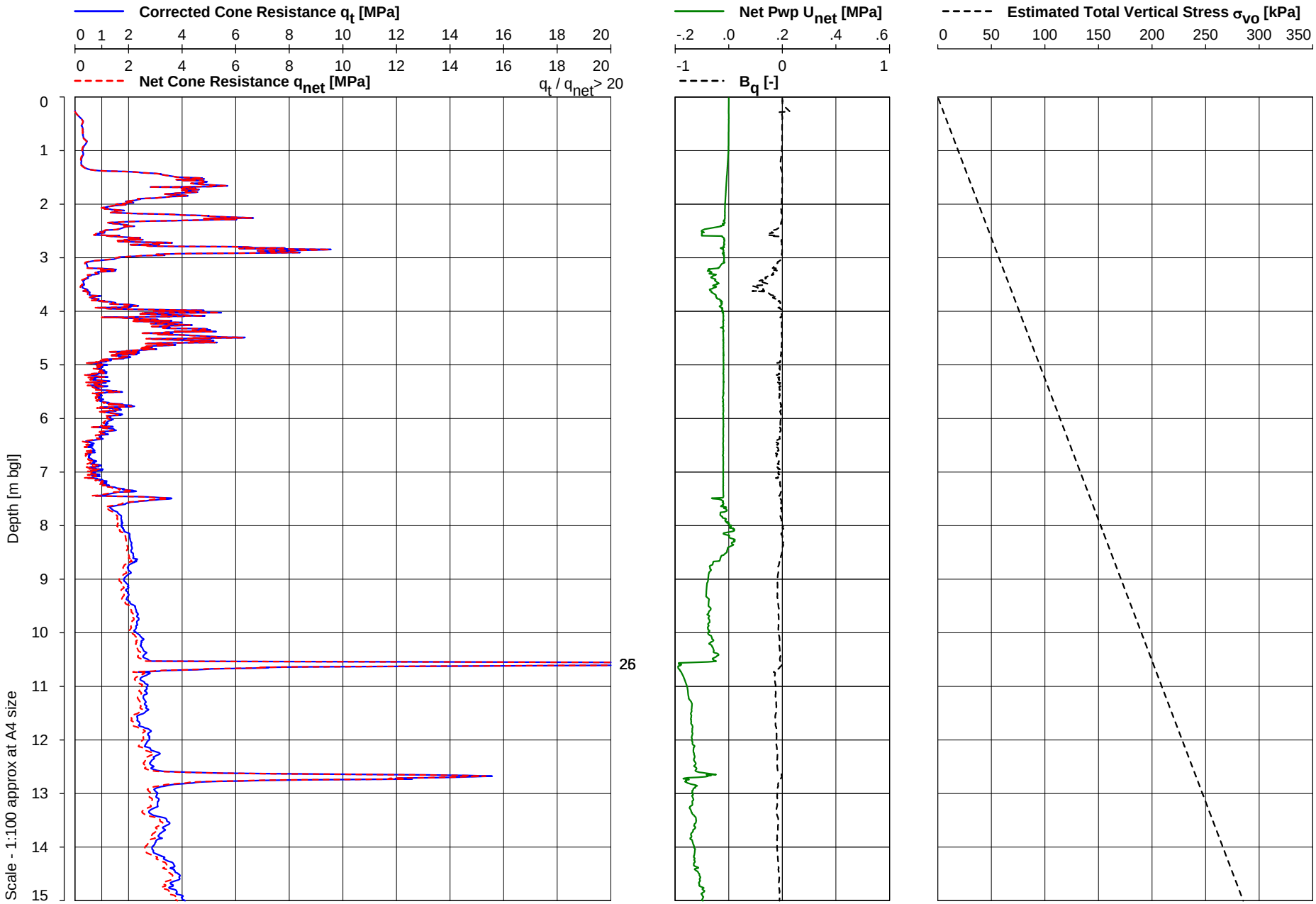
Location : **HEP-CPT-1245**

Coordinates : E 503681 N 177435

Ground Level [m OD] : +21.34

HEATHROW AIRPORT LIMITED

HEATHROW EXPANSION PROJECT GROUND INVESTIGATION - PACKAGE 3



HEP-CPT-1247

Remarks:

CPT Rig/Cone : GB17 1701-1529

Date of Test : 13-Feb-2018

Start / End Time 08:48:48 10:21:00

Assumed Soil Unit Weight : 19.0 [kN/m^3]

Assumed Water Level [m gl] : -1.0

Status : DRAFT

Operator : IB/CD

Compiled by : JAG

Checked by : KES

CALCULATED CPT PARAMETERS

Location : **HEP-CPT-1247**

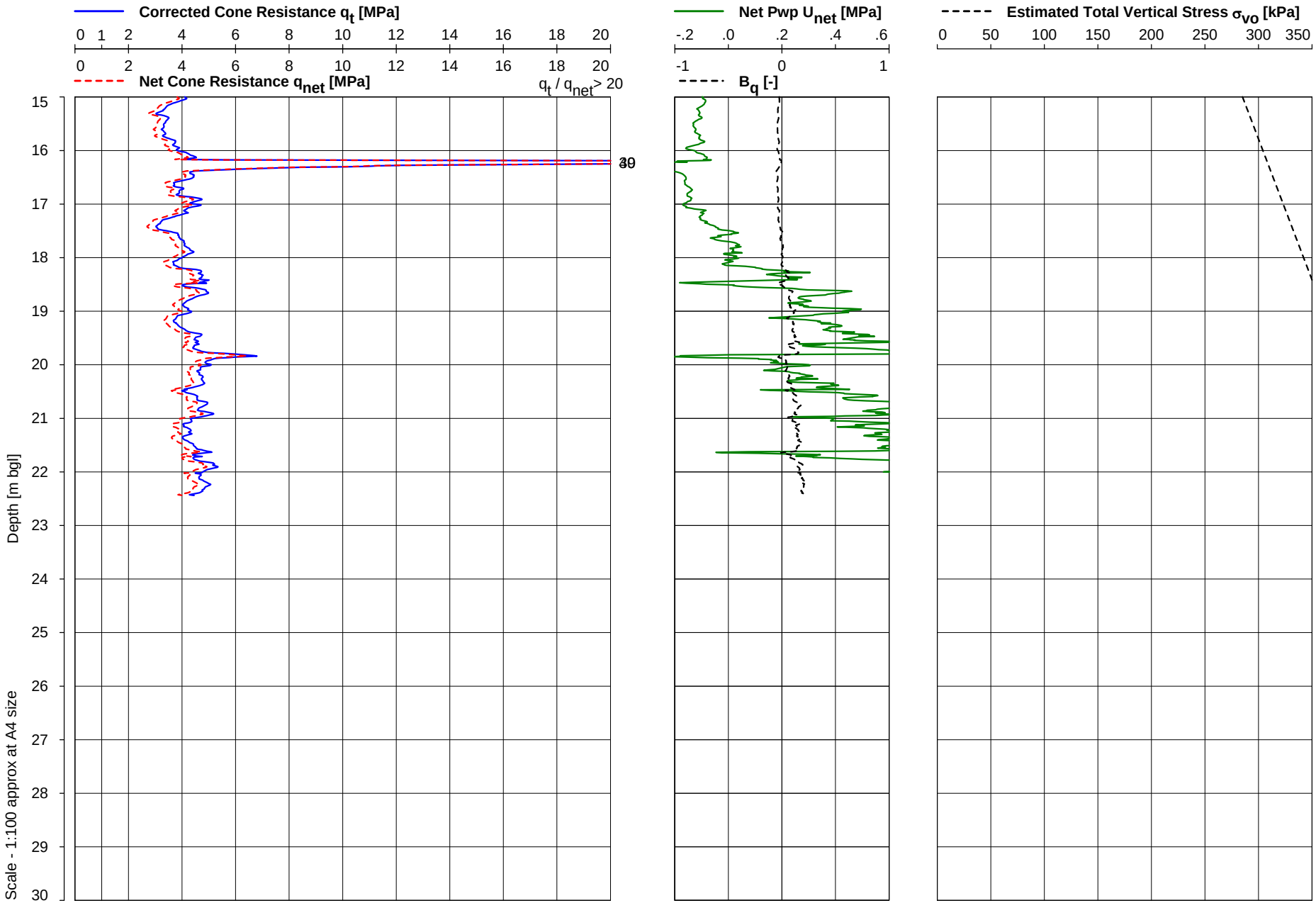
Coordinates : E 503811 N 177274

Ground Level [m OD] : +22.15

HEATHROW AIRPORT LIMITED

HEATHROW EXPANSION PROJECT GROUND INVESTIGATION - PACKAGE 3

Fugro Reference: G170029U



HEP-CPT-1247

Remarks:

CPT Rig/Cone : GB17 1701-1529

Date of Test : 13-Feb-2018

Start / End Time 08:48:48 10:21:00

Assumed Soil Unit Weight : 19.0 [kN/m^3]

Assumed Water Level [m gl] : -1.0

Status : DRAFT

Operator : IB/CD

Compiled by : JAG

Checked by : KES

CALCULATED CPT PARAMETERS

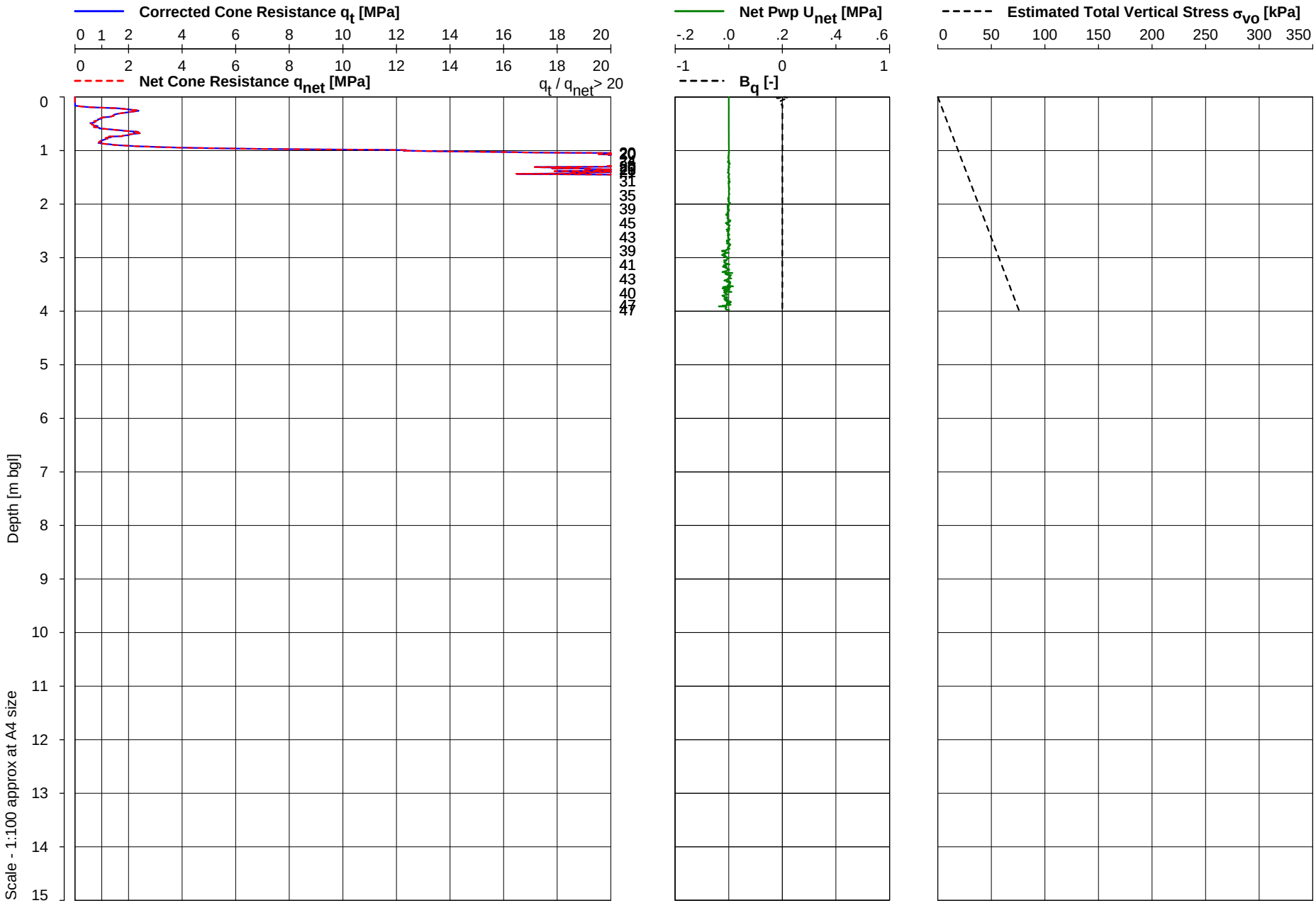
Location : **HEP-CPT-1247**

Coordinates : E 503811 N 177274

Ground Level [m OD] : +22.15

HEATHROW AIRPORT LIMITED

HEATHROW EXPANSION PROJECT GROUND INVESTIGATION - PACKAGE 3



HEP-CPT-1248

Remarks:

CPT Rig/Cone : GB7 1701-1515

Date of Test : 16-Jan-2018

Start / End Time 08:48:46 09:01:44

Assumed Soil Unit Weight : 19.0 [kN/m^3]

Assumed Water Level [m gl] : -1.0

Status : DRAFT

Operator : NF/IB

Compiled by : JAG

Checked by : KES

CALCULATED CPT PARAMETERS

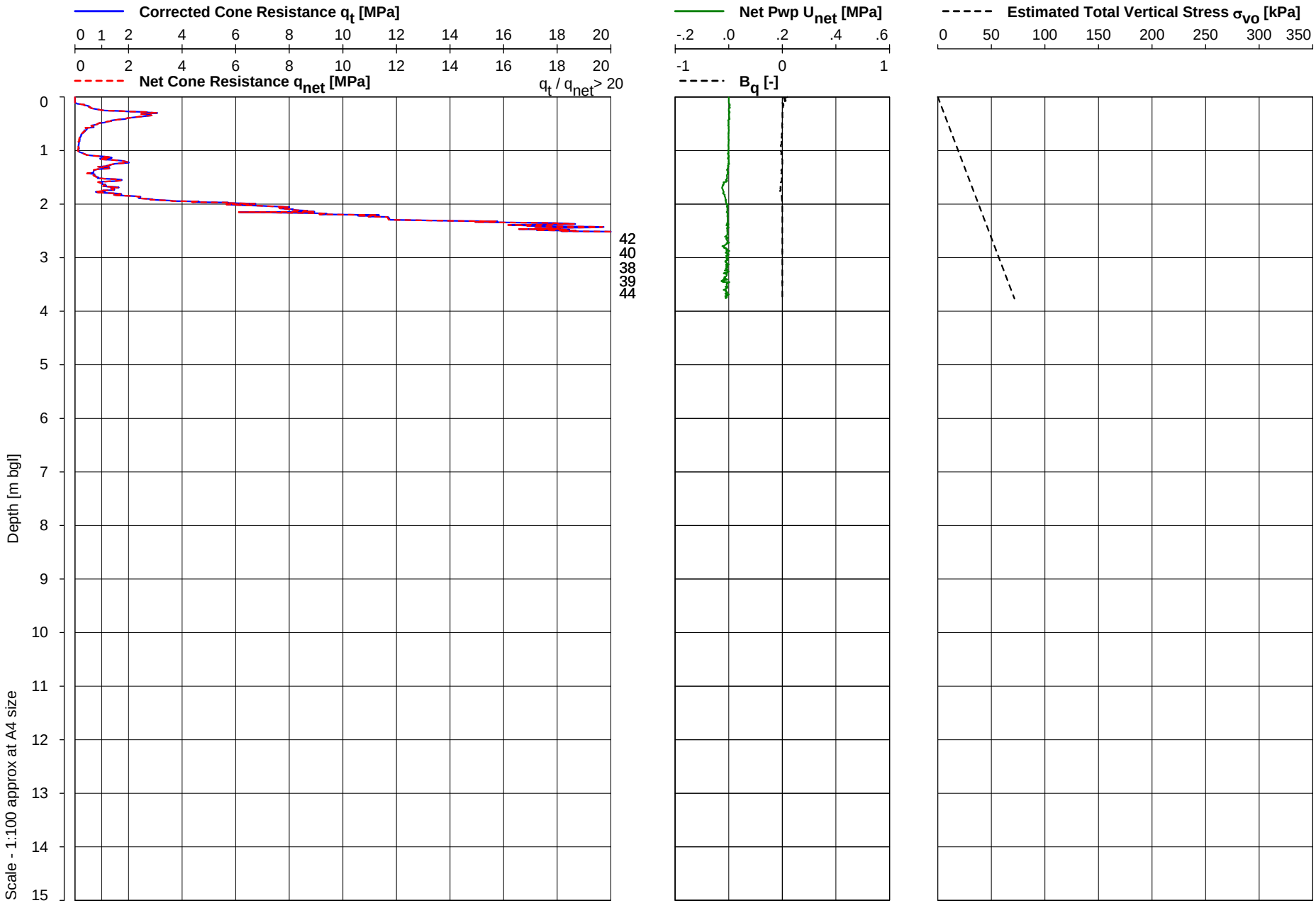
Location : **HEP-CPT-1248**

Coordinates : E 503911 N 177343

Ground Level [m OD] : +22.04

HEATHROW AIRPORT LIMITED

HEATHROW EXPANSION PROJECT GROUND INVESTIGATION - PACKAGE 3



HEP-CPT-1249

Remarks:

CPT Rig/Cone : GB7 1701-2904

Date of Test : 15-Jan-2018

Start / End Time 13:36:20 13:46:04

Assumed Soil Unit Weight : 19.0 [kN/m^3]

Assumed Water Level [m gl] : -1.0

Status : DRAFT

Operator : NF/IB

Compiled by : JAG

Checked by : KES

CALCULATED CPT PARAMETERS

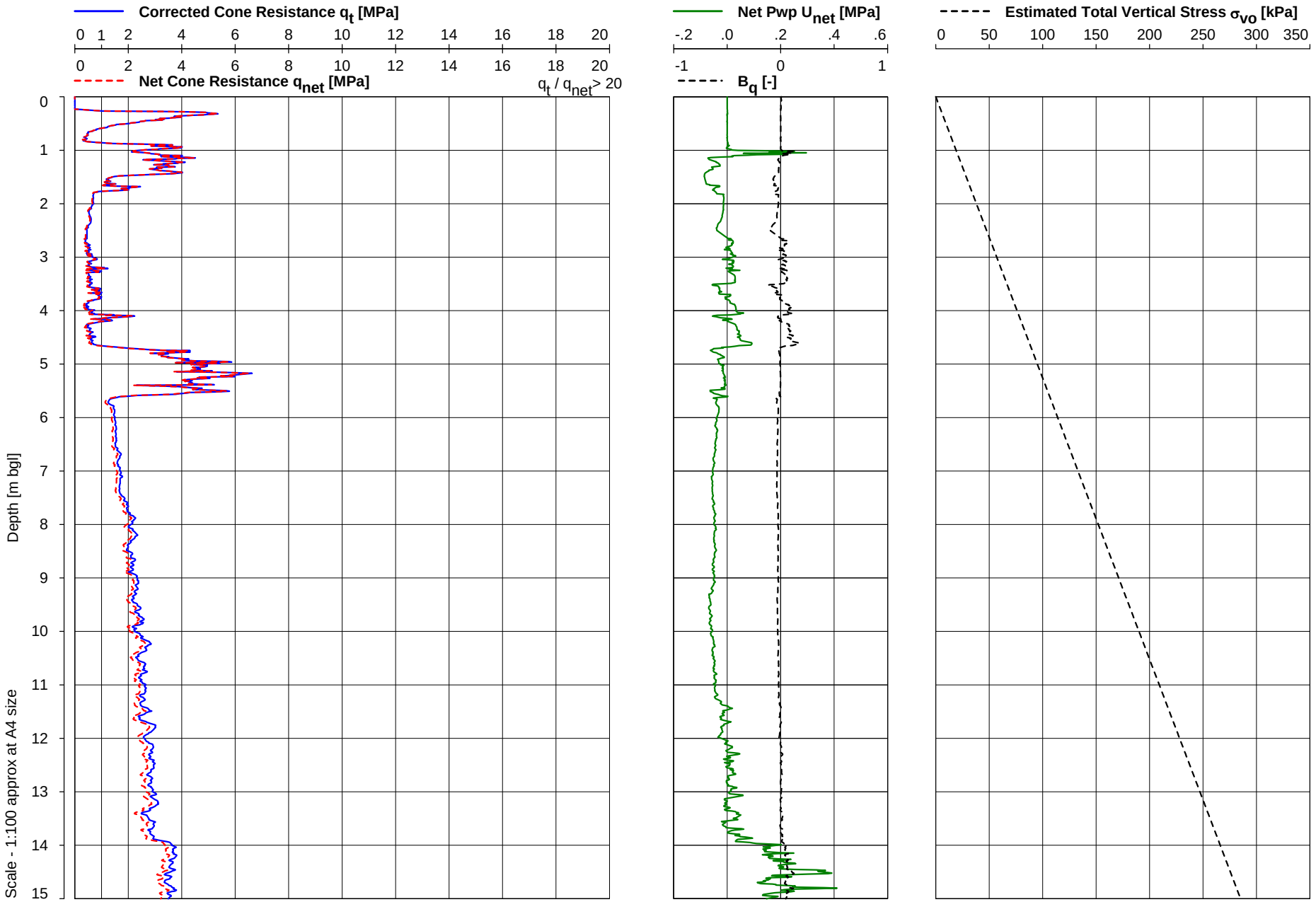
Location : **HEP-CPT-1249**

Coordinates : E 503890 N 177240

Ground Level [m OD] : +22.21

HEATHROW AIRPORT LIMITED

HEATHROW EXPANSION PROJECT GROUND INVESTIGATION - PACKAGE 3



HEP-CPT-1250

Remarks:

CPT Rig/Cone : GB7 1701-2904

Date of Test : 15-Jan-2018

Start / End Time 11:18:05 13:23:53

Assumed Soil Unit Weight : 19.0 [kN/m^3]

Assumed Water Level [m gl] : -1.0

Status : DRAFT

Operator : NF/IB

Compiled by : JAG

Checked by : KES

CALCULATED CPT PARAMETERS

Location : **HEP-CPT-1250**

Coordinates : E 503800 N 177245

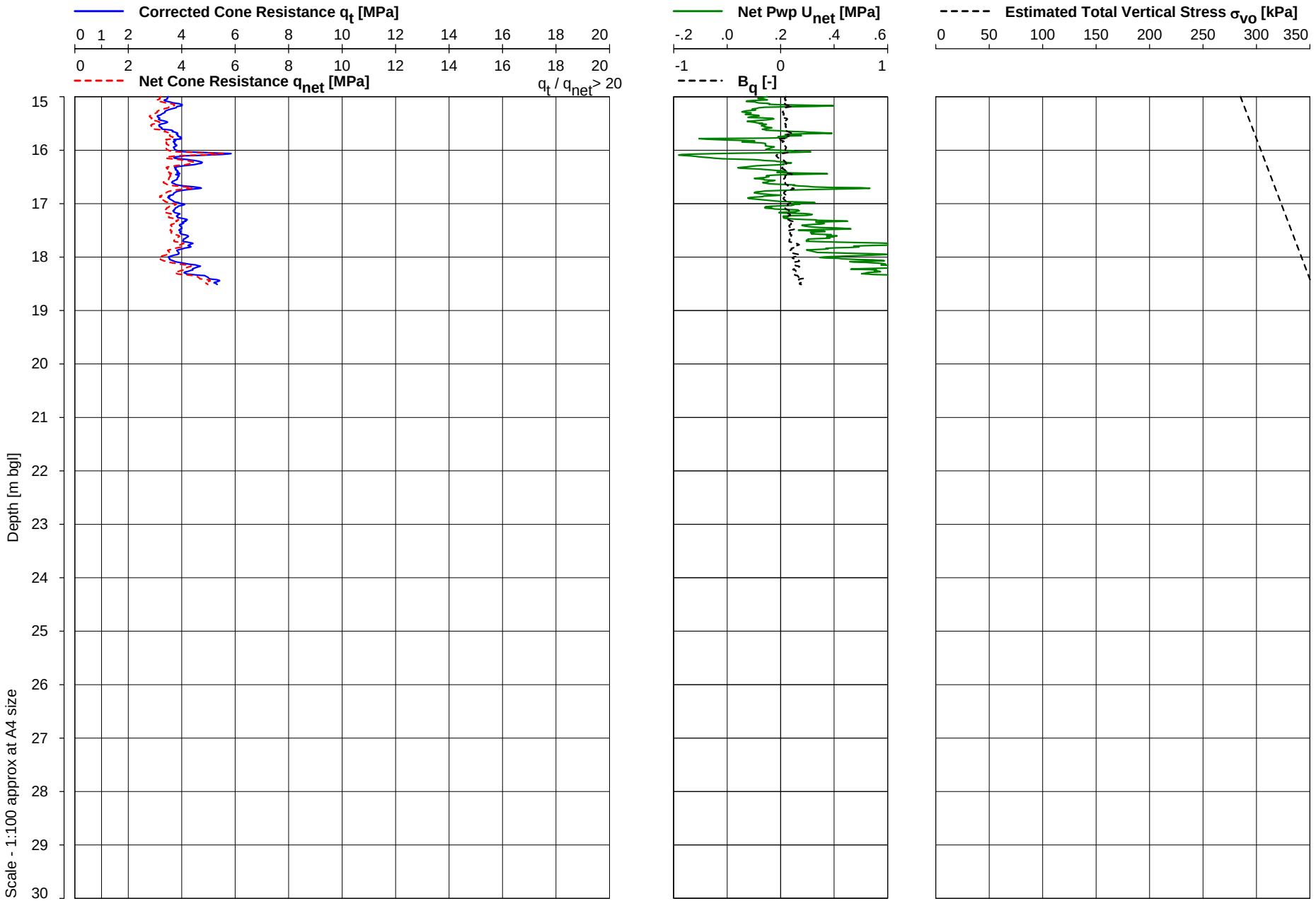
Ground Level [m OD] : +22.26

HEATHROW AIRPORT LIMITED

HEATHROW EXPANSION PROJECT GROUND INVESTIGATION - PACKAGE 3

Fugro Reference: G170029U

HEATHROW AIRPORT LIMITED
HEATHROW EXPANSION PROJECT GROUND INVESTIGATION - PACKAGE 3



HEP-CPT-1250

Remarks:

CPT Rig/Cone : GB7 1701-2904
Date of Test : 15-Jan-2018
Start / End Time 11:18:05 13:23:53
Assumed Soil Unit Weight : 19.0 [kN/m^3]
Assumed Water Level [m gl] : -1.0

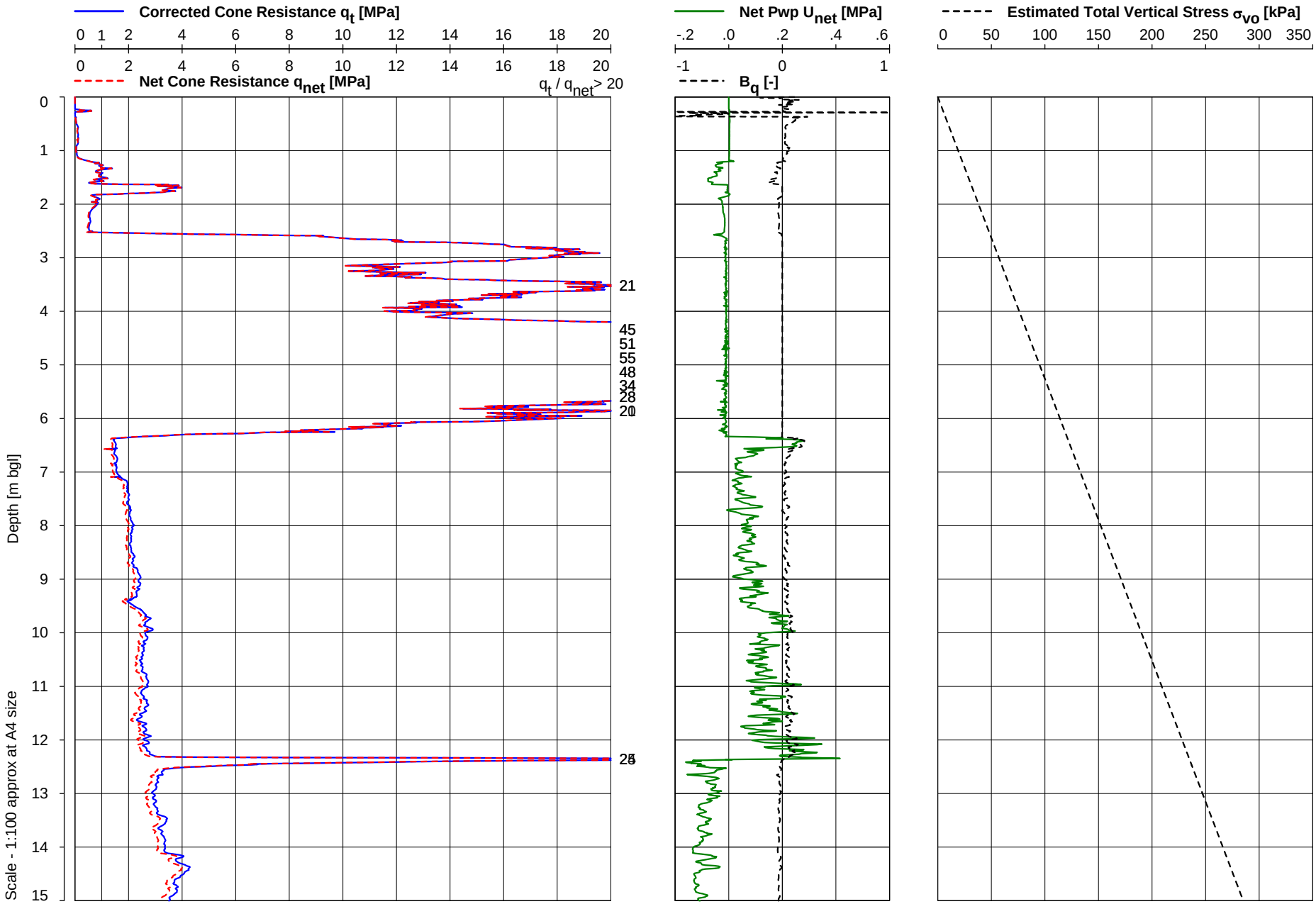
Status : DRAFT
Operator : NF/IB
Compiled by : JAG
Checked by : KES

CALCULATED CPT PARAMETERS

Location : **HEP-CPT-1250**
Coordinates : E 503800 N 177245
Ground Level [m OD] : +22.26

Fugro Reference: G170029U

HEATHROW AIRPORT LIMITED
HEATHROW EXPANSION PROJECT GROUND INVESTIGATION - PACKAGE 3



HEP-CPT-1251

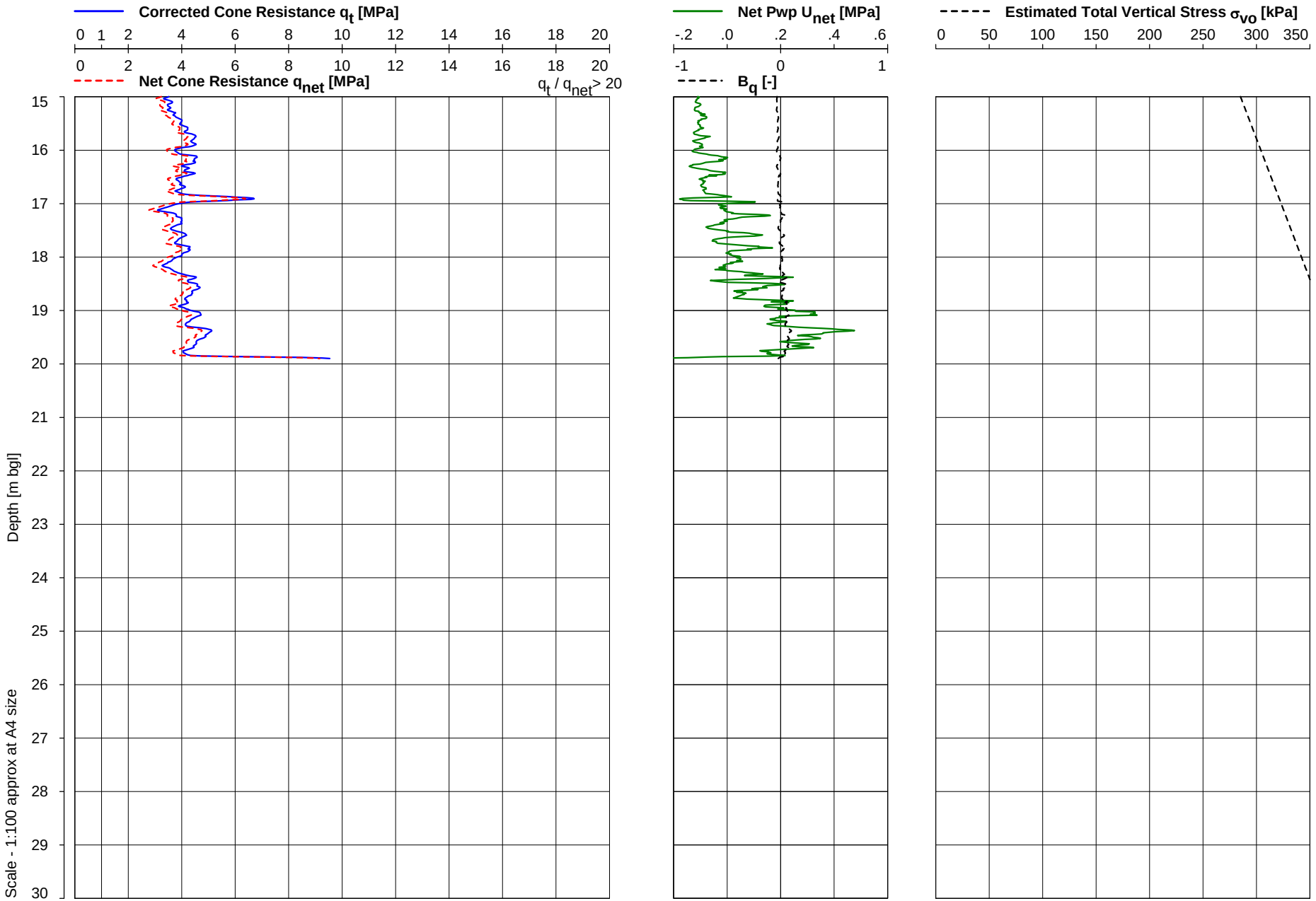
Remarks:

CPT Rig/Cone : GB9 1701-1987
Date of Test : 22-Mar-2018
Start / End Time 17:22:29 20:05:07
Assumed Soil Unit Weight : 19.0 [kN/m^3]
Assumed Water Level [m gl] : -1.0

Status : DRAFT
Operator : HG,KL
Compiled by : JAG
Checked by : KES

CALCULATED CPT PARAMETERS

Location : **HEP-CPT-1251**
Coordinates : E 503702 N 177238
Ground Level [m OD] : +22.41



HEP-CPT-1251

Remarks:

CPT Rig/Cone : GB9 1701-1987

Date of Test : 22-Mar-2018

Start / End Time 17:22:29 20:05:07

Assumed Soil Unit Weight : 19.0 [kN/m^3]

Assumed Water Level [m gl] : -1.0

Status : DRAFT

Operator : HG,KL

Compiled by : JAG

Checked by : KES

CALCULATED CPT PARAMETERS

Location : **HEP-CPT-1251**

Coordinates : E 503702 N 177238

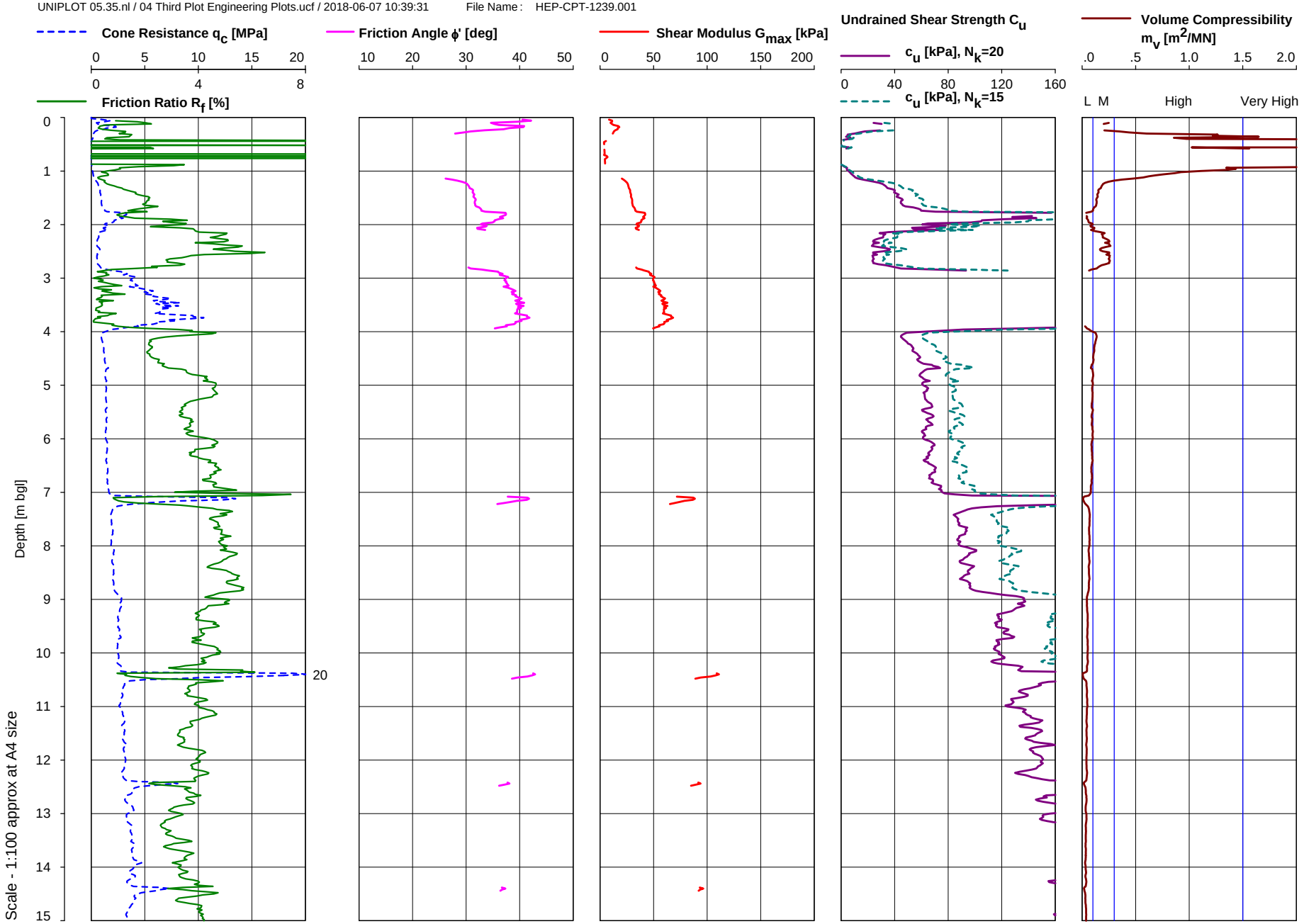
Ground Level [m OD] : +22.41

HEATHROW AIRPORT LIMITED

HEATHROW EXPANSION PROJECT GROUND INVESTIGATION - PACKAGE 3

Contract Ref: G170029U

HEATHROW AIRPORT LIMITED
HEATHROW EXPANSION PROJECT GROUND INVESTIGATION - PACKAGE 3



HEP-CPT-1239

Remarks:

CPT Rig/Cone : GB7 1701-1515
Date of Test : 12-Dec-2017
Start / End Time 09:31:52 12:09:28

Assumed Soil Unit Weight : 19.0 [kN/m^3]
Assumed Water Level [m gl] : -1.0

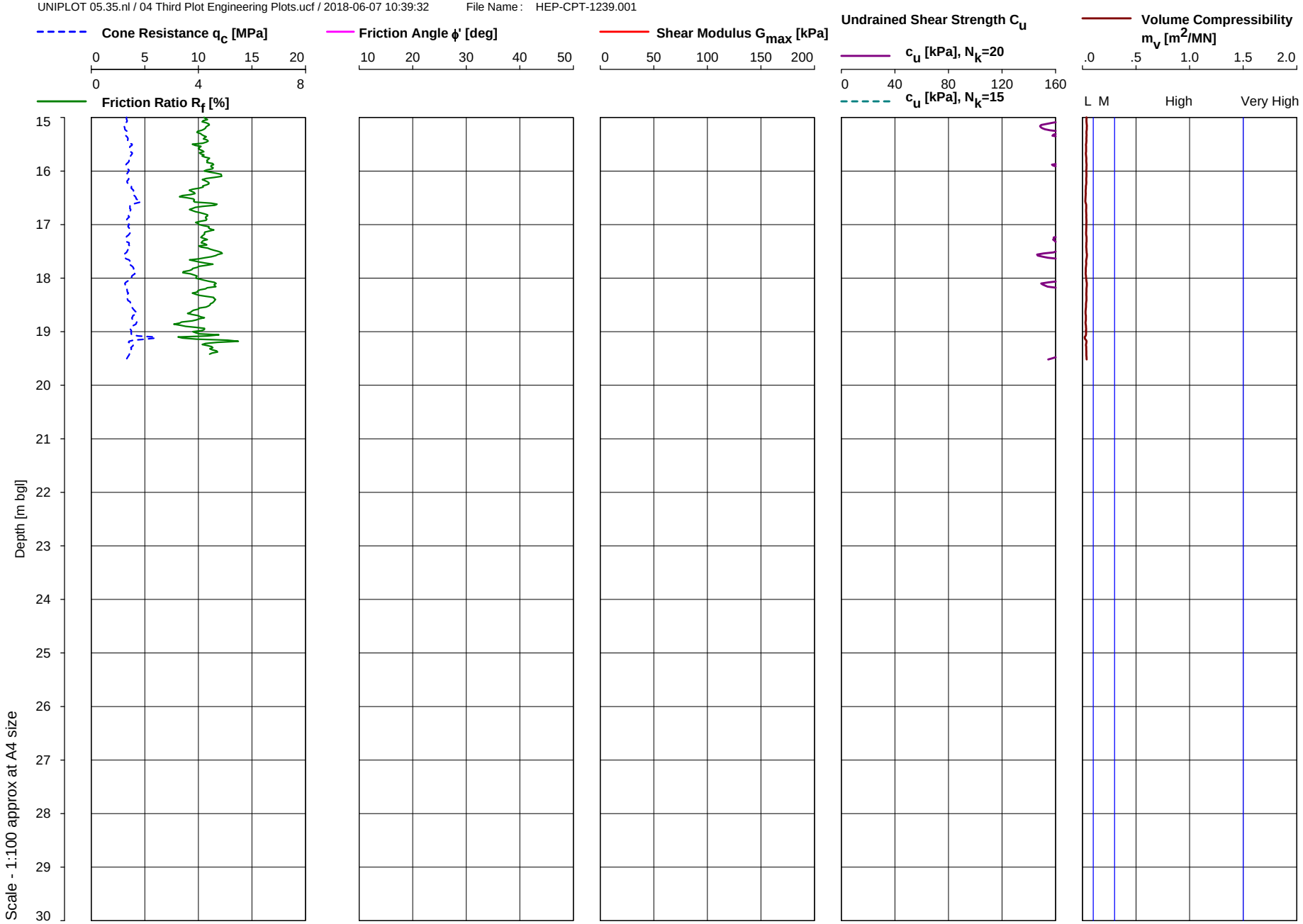
Status : DRAFT
Operator : IB/SMO
Compiled by : JAG
Checked by : KES

ENGINEERING PARAMETERS

Location : **HEP-CPT-1239**
Coordinates : E 503731 N 177509
Ground Level [m OD] : +21.78

Contract Ref: G170029U

HEATHROW AIRPORT LIMITED
HEATHROW EXPANSION PROJECT GROUND INVESTIGATION - PACKAGE 3



HEP-CPT-1239

Remarks:

CPT Rig/Cone : GB7 1701-1515
Date of Test : 12-Dec-2017
Start / End Time 09:31:52 12:09:28

Assumed Soil Unit Weight : 19.0 [kN/m^3]
Assumed Water Level [m gl] : -1.0

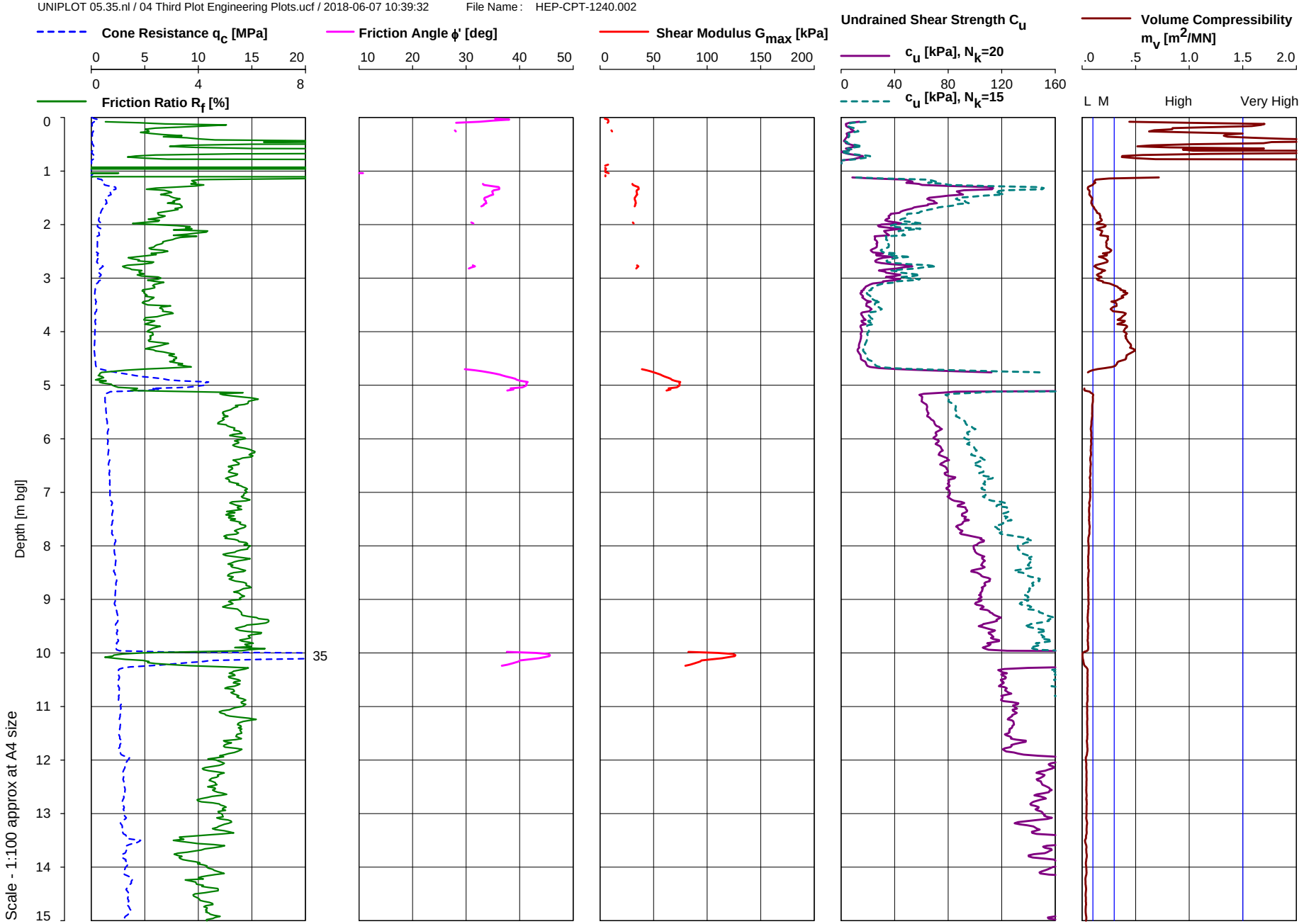
Status : DRAFT
Operator : IB/SMO
Compiled by : JAG
Checked by : KES

ENGINEERING PARAMETERS

Location : **HEP-CPT-1239**
Coordinates : E 503731 N 177509
Ground Level [m OD] : +21.78

Contract Ref: G170029U

HEATHROW AIRPORT LIMITED
HEATHROW EXPANSION PROJECT GROUND INVESTIGATION - PACKAGE 3



HEP-CPT-1240

Remarks:

CPT Rig/Cone : GB7 1701-2904
Date of Test : 12-Dec-2017
Start / End Time 14:34:51 17:09:55

Assumed Soil Unit Weight : 19.0 [kN/m^3]
Assumed Water Level [m gl] : -1.0

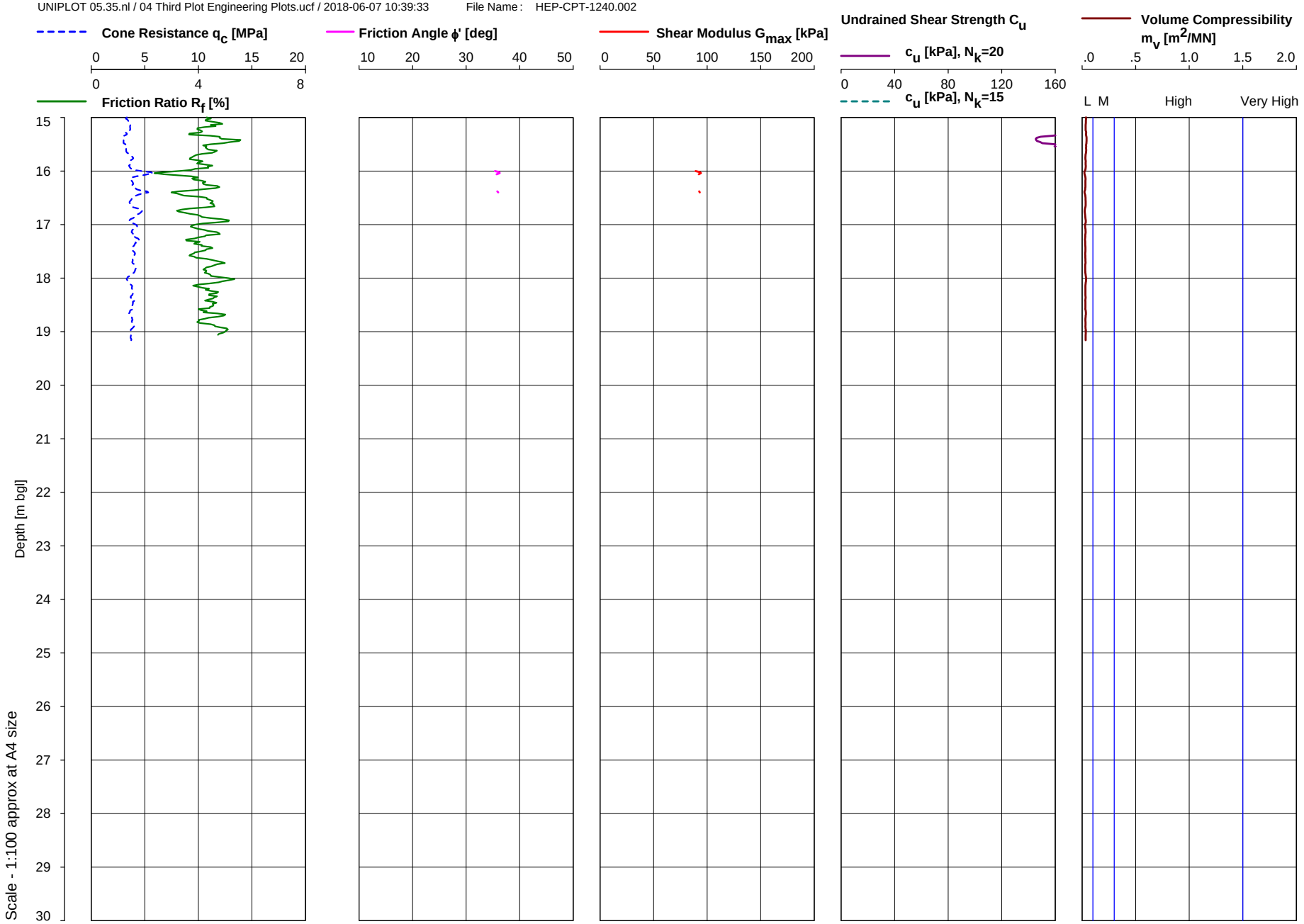
Status : DRAFT
Operator : IB/SMO
Compiled by : JAG
Checked by : KES

ENGINEERING PARAMETERS

Location : **HEP-CPT-1240**
Coordinates : E 503873 N 177466
Ground Level [m OD] : +22.72

Contract Ref: G170029U

HEATHROW AIRPORT LIMITED
HEATHROW EXPANSION PROJECT GROUND INVESTIGATION - PACKAGE 3



HEP-CPT-1240

Remarks:

CPT Rig/Cone : GB7 1701-2904
Date of Test : 12-Dec-2017
Start / End Time 14:34:51 17:09:55

Assumed Soil Unit Weight : 19.0 [kN/m^3]
Assumed Water Level [m gl] : -1.0

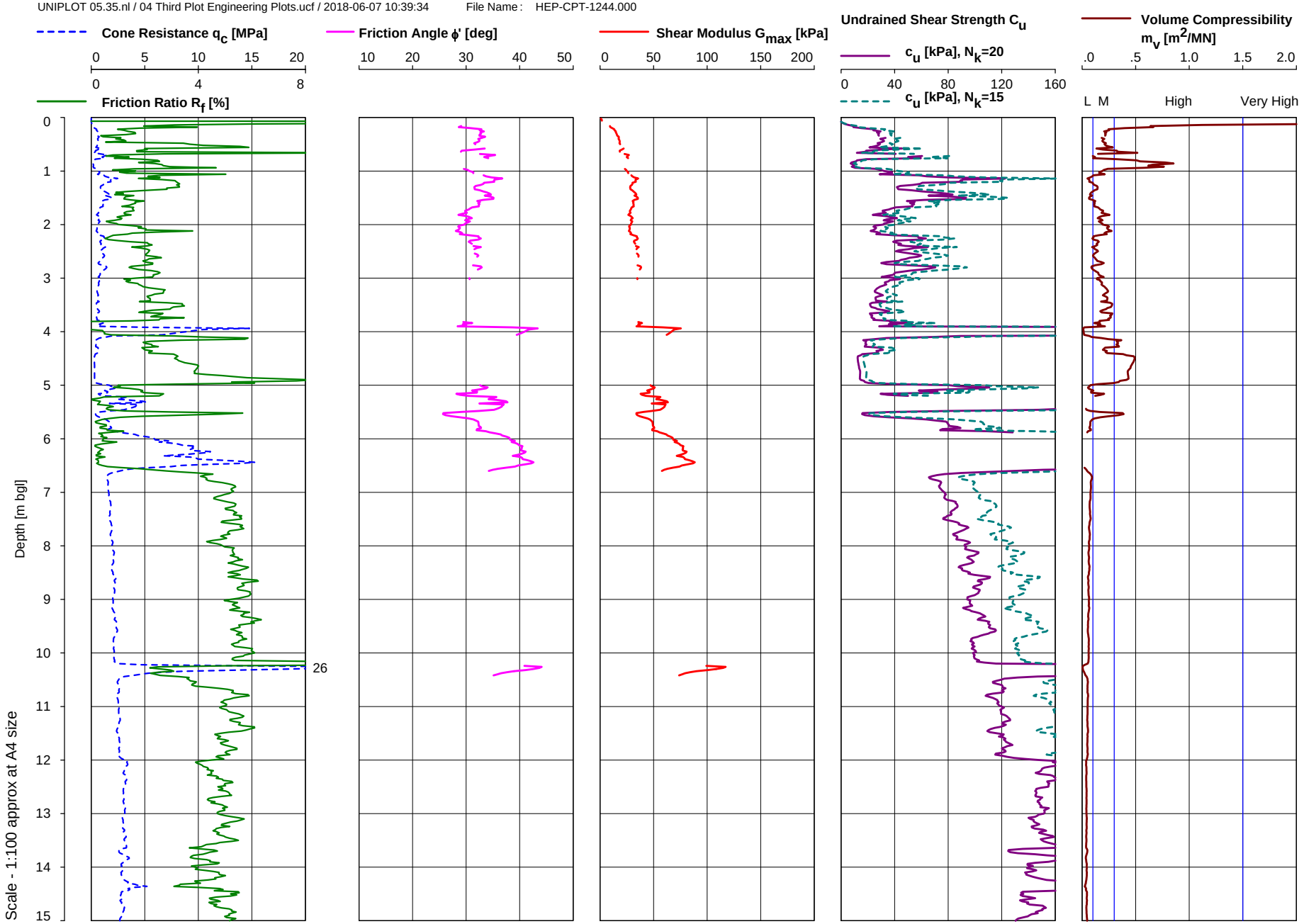
Status : DRAFT
Operator : IB/SMO
Compiled by : JAG
Checked by : KES

ENGINEERING PARAMETERS

Location : **HEP-CPT-1240**
Coordinates : E 503873 N 177466
Ground Level [m OD] : +22.72

Contract Ref: G170029U

HEATHROW AIRPORT LIMITED
HEATHROW EXPANSION PROJECT GROUND INVESTIGATION - PACKAGE 3



HEP-CPT-1244

Remarks:

CPT Rig/Cone : GB7 1701-2904
Date of Test : 13-Dec-2017
Start / End Time 08:51:18 10:28:43

Assumed Soil Unit Weight : 19.0 [kN/m^3]
Assumed Water Level [m gl] : -1.0

Status : DRAFT
Operator : IB/SMO
Compiled by : JAG
Checked by : KES

ENGINEERING PARAMETERS

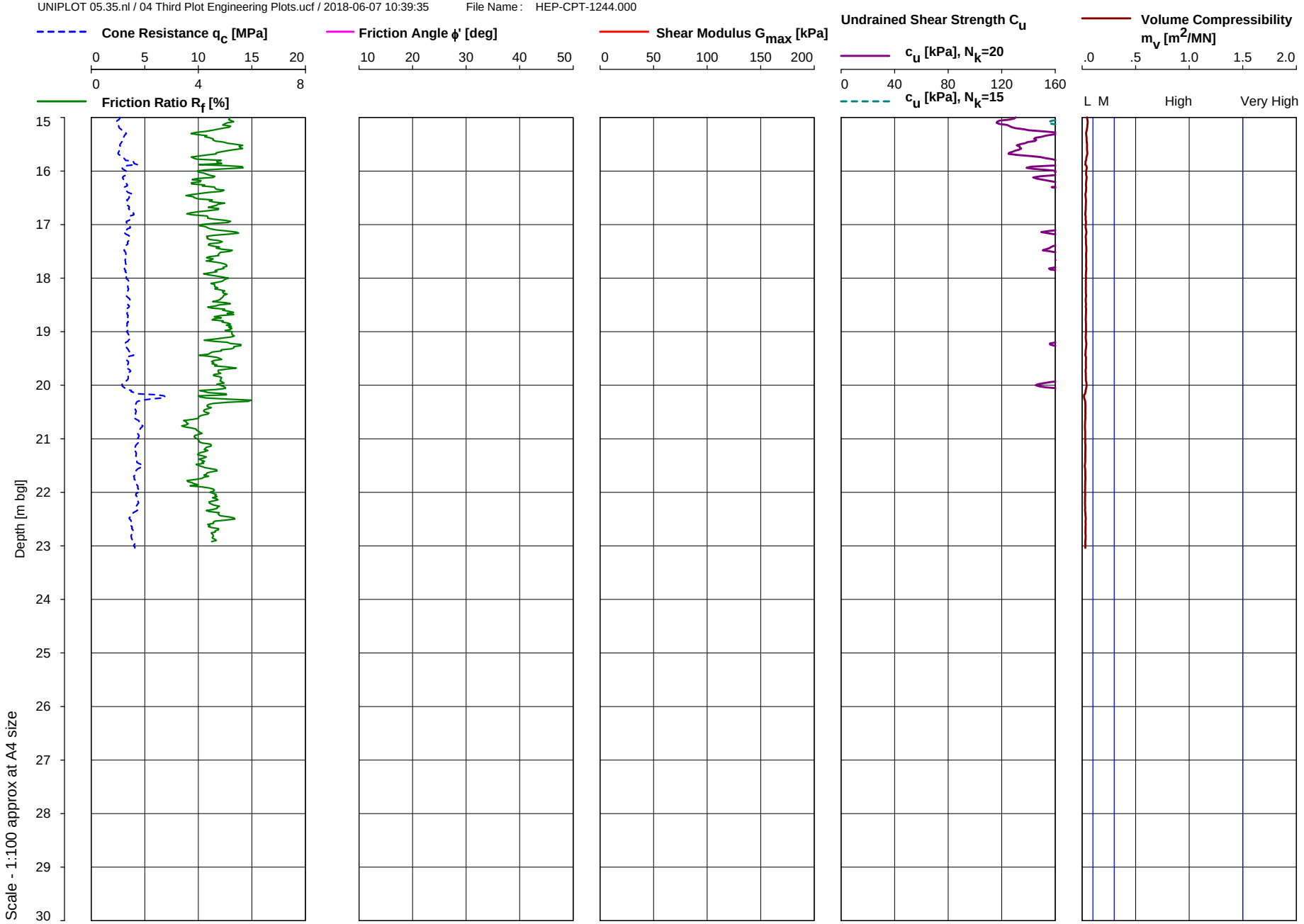
Location : **HEP-CPT-1244**
Coordinates : E 503854 N 177435
Ground Level [m OD] : +22.79

UNIPLOT 05.35.nl / 04 Third Plot Engineering Plots.ucf / 2018-06-07 10:39:35 File Name : HEP-CPT-1244.000

Contract Ref: G170029U

HEATHROW AIRPORT LIMITED

HEATHROW EXPANSION PROJECT GROUND INVESTIGATION - PACKAGE 3



HEP-CPT-1244

Remarks:

CPT Rig/Cone : GB7 1701-2904

Date of Test : 13-Dec-2017

Start / End Time 08:51:18 10:28:43

Assumed Soil Unit Weight : 19.0 [kN/m^3]

Assumed Water Level [m gl] : -1.0

Status : DRAFT

Operator : IB/SMO

Compiled by : JAG

Checked by : KES

ENGINEERING PARAMETERS

Location : **HEP-CPT-1244**

Coordinates : E 503854 N 177435

Ground Level [m OD] : +22.79

Contract Ref: G170029U

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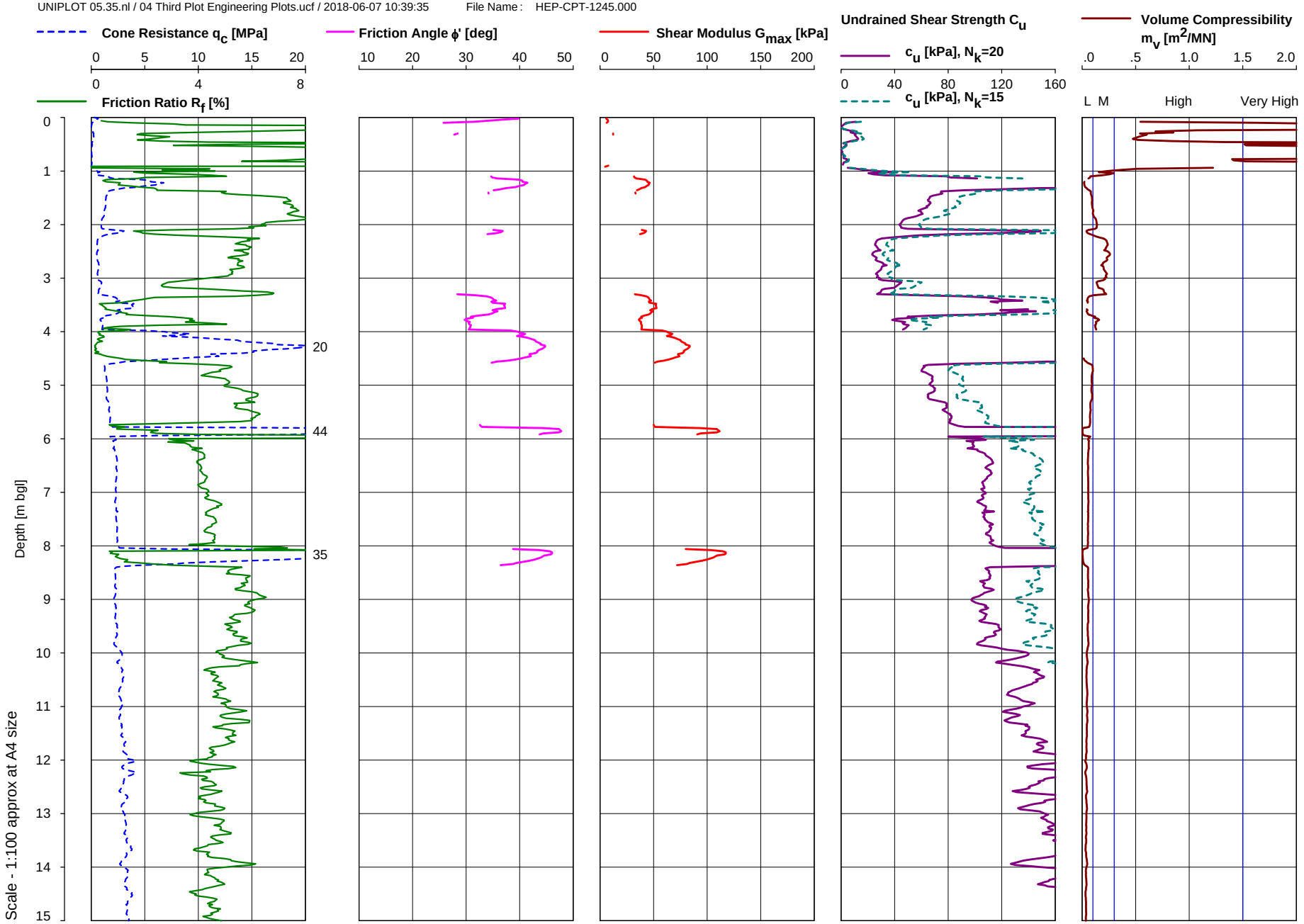


Scale - 1:100 approx at A4 size

HEP-CPT-1245

Remarks:

CPT Rig/Cone : GB7 1701-2904

Date of Test : 12-Dec-2017

Start / End Time 12:23:59 14:05:12

Assumed Soil Unit Weight : 19.0 [kN/m^3]

Assumed Water Level [m gl] : -1.0

Status : DRAFT

Operator : IB/SMO

Compiled by : JAG

Checked by : KES

ENGINEERING PARAMETERS

Location : **HEP-CPT-1245**

Coordinates : E 503681 N 177435

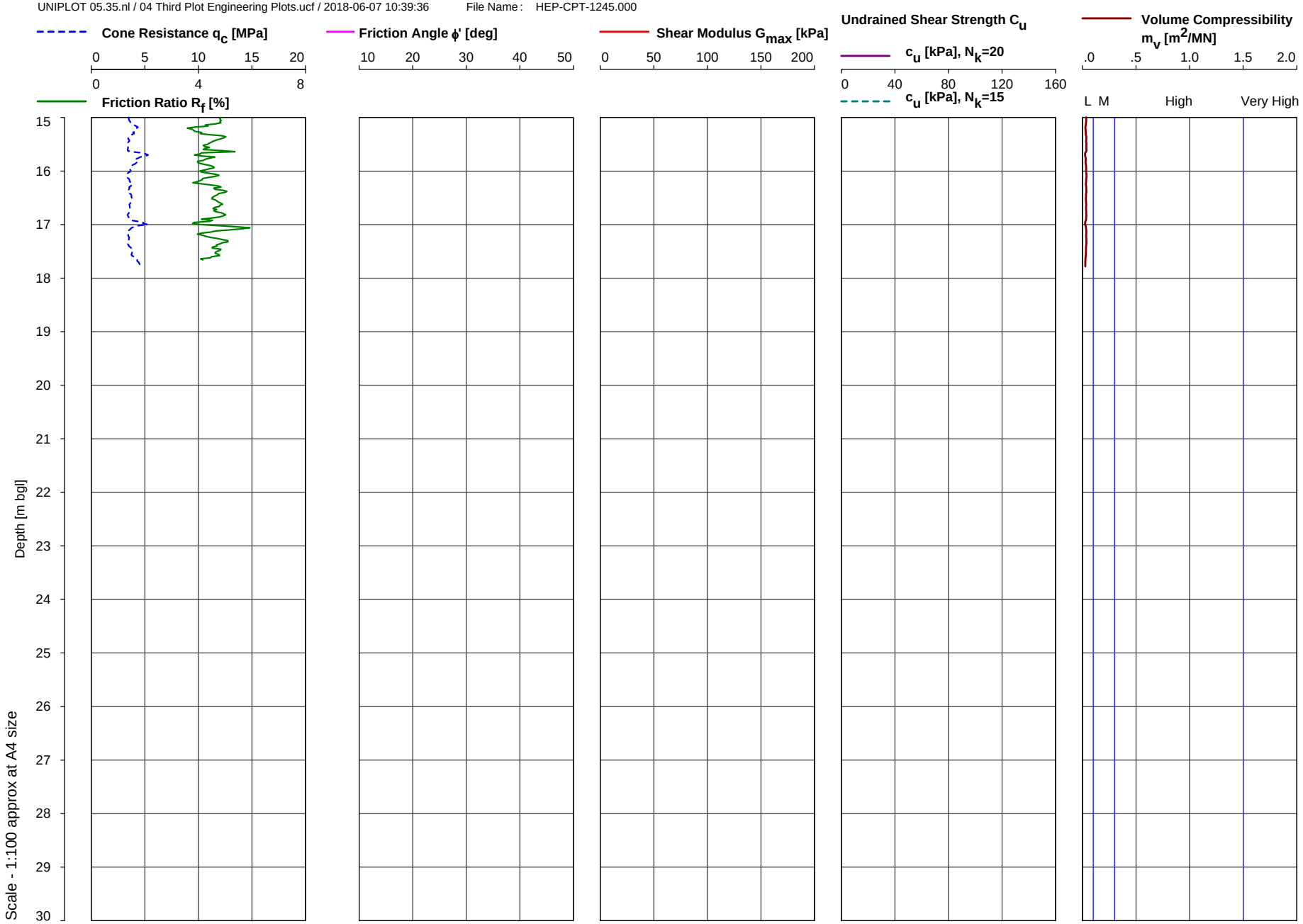
Ground Level [m OD] : +21.34

HEATHROW AIRPORT LIMITED

HEATHROW EXPANSION PROJECT GROUND INVESTIGATION - PACKAGE 3

Contract Ref: G170029U

HEATHROW AIRPORT LIMITED
HEATHROW EXPANSION PROJECT GROUND INVESTIGATION - PACKAGE 3



Scale - 1:100 approx at A4 size

HEP-CPT-1245

Remarks:

CPT Rig/Cone : GB7 1701-2904
Date of Test : 12-Dec-2017
Start / End Time 12:23:59 14:05:12

Assumed Soil Unit Weight : 19.0 [kN/m^3]
Assumed Water Level [m gl] : -1.0

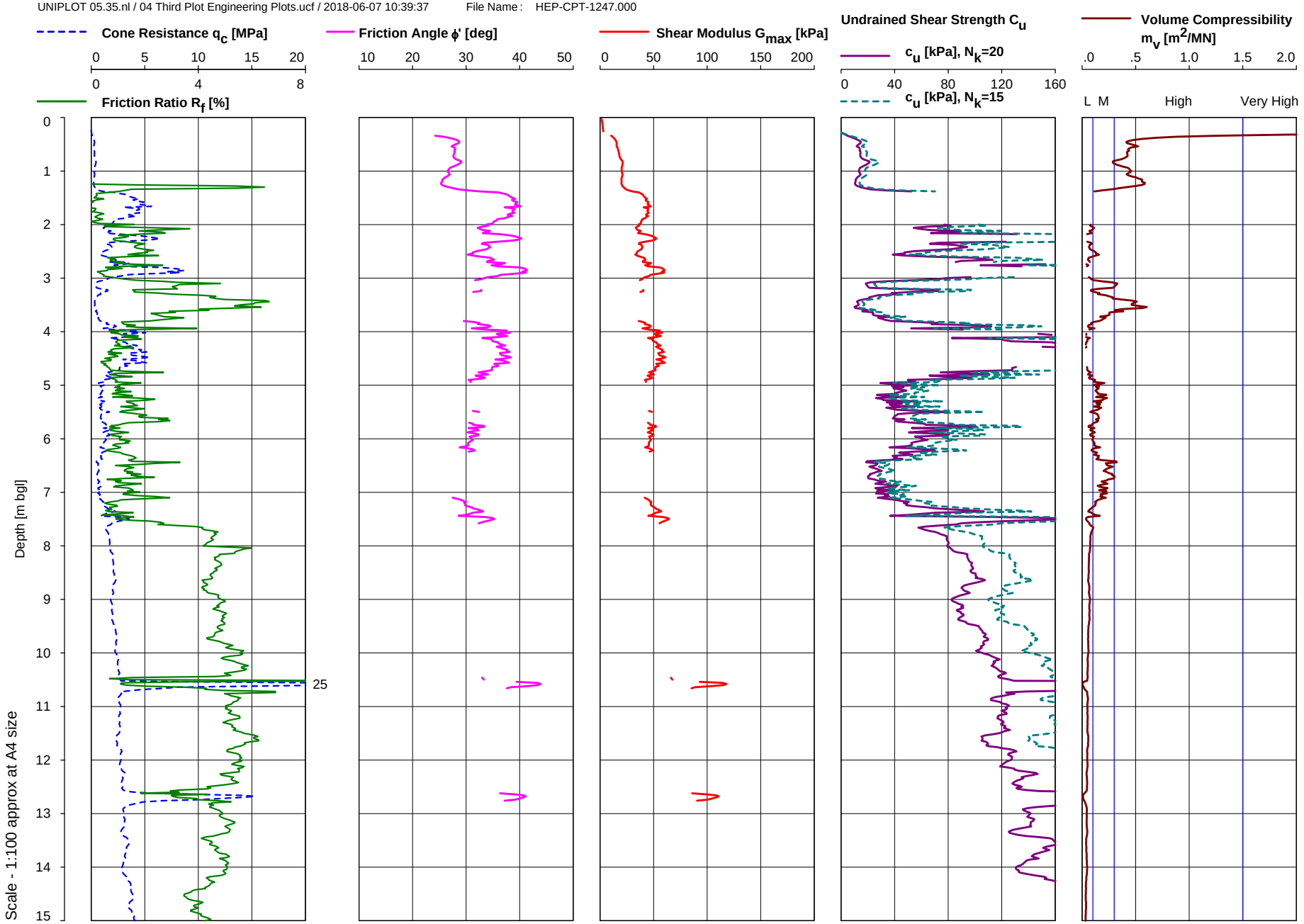
Status : DRAFT
Operator : IB/SMO
Compiled by : JAG
Checked by : KES

ENGINEERING PARAMETERS

Location : **HEP-CPT-1245**
Coordinates : E 503681 N 177435
Ground Level [m OD] : +21.34

Contract Ref: G170029U

HEATHROW AIRPORT LIMITED
HEATHROW EXPANSION PROJECT GROUND INVESTIGATION - PACKAGE 3



HEP-CPT-1247

Remarks:

CPT Rig/Cone : GB17 1701-1529
Date of Test : 13-Feb-2018
Start / End Time 08:48:48 10:21:00

Assumed Soil Unit Weight : 19.0 [kN/m^3]
Assumed Water Level [m gl] : -1.0

Status : DRAFT
Operator : IB/CD
Compiled by : JAG
Checked by : KES

ENGINEERING PARAMETERS

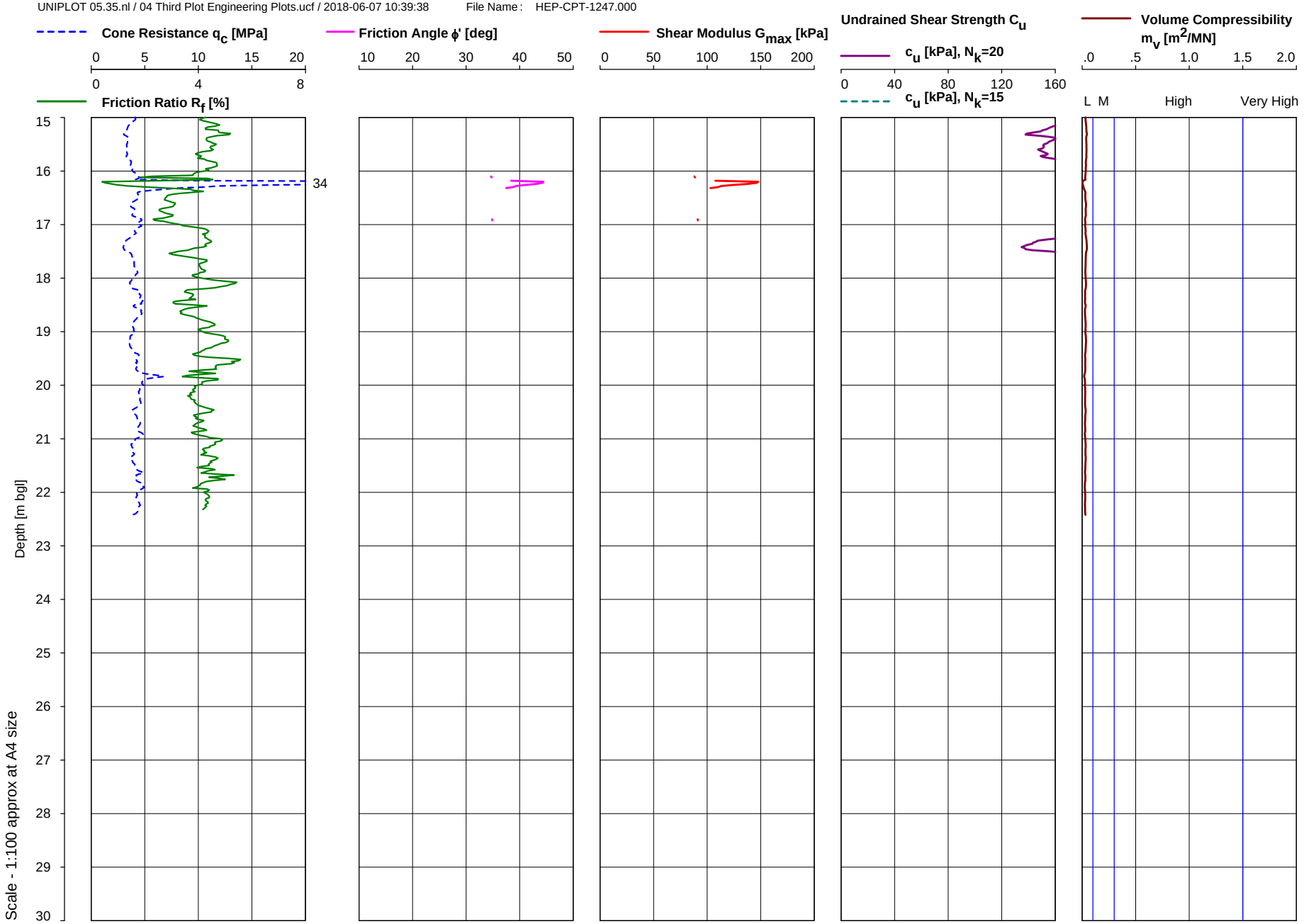
Location : **HEP-CPT-1247**
Coordinates : E 503811 N 177274
Ground Level [m OD] : +22.15

UNIPLOT 05.35.nl / 04 Third Plot Engineering Plots.ucf / 2018-06-07 10:39:38 File Name : HEP-CPT-1247.000

Contract Ref: G170029U

HEATHROW AIRPORT LIMITED

HEATHROW EXPANSION PROJECT GROUND INVESTIGATION - PACKAGE 3



HEP-CPT-1247

Remarks:

CPT Rig/Cone : GB17 1701-1529

Date of Test : 13-Feb-2018

Start / End Time 08:48:48 10:21:00

Assumed Soil Unit Weight : 19.0 [kN/m^3]

Assumed Water Level [m gl] : -1.0

Status : DRAFT

Operator : IB/CD

Compiled by : JAG

Checked by : KES

ENGINEERING PARAMETERS

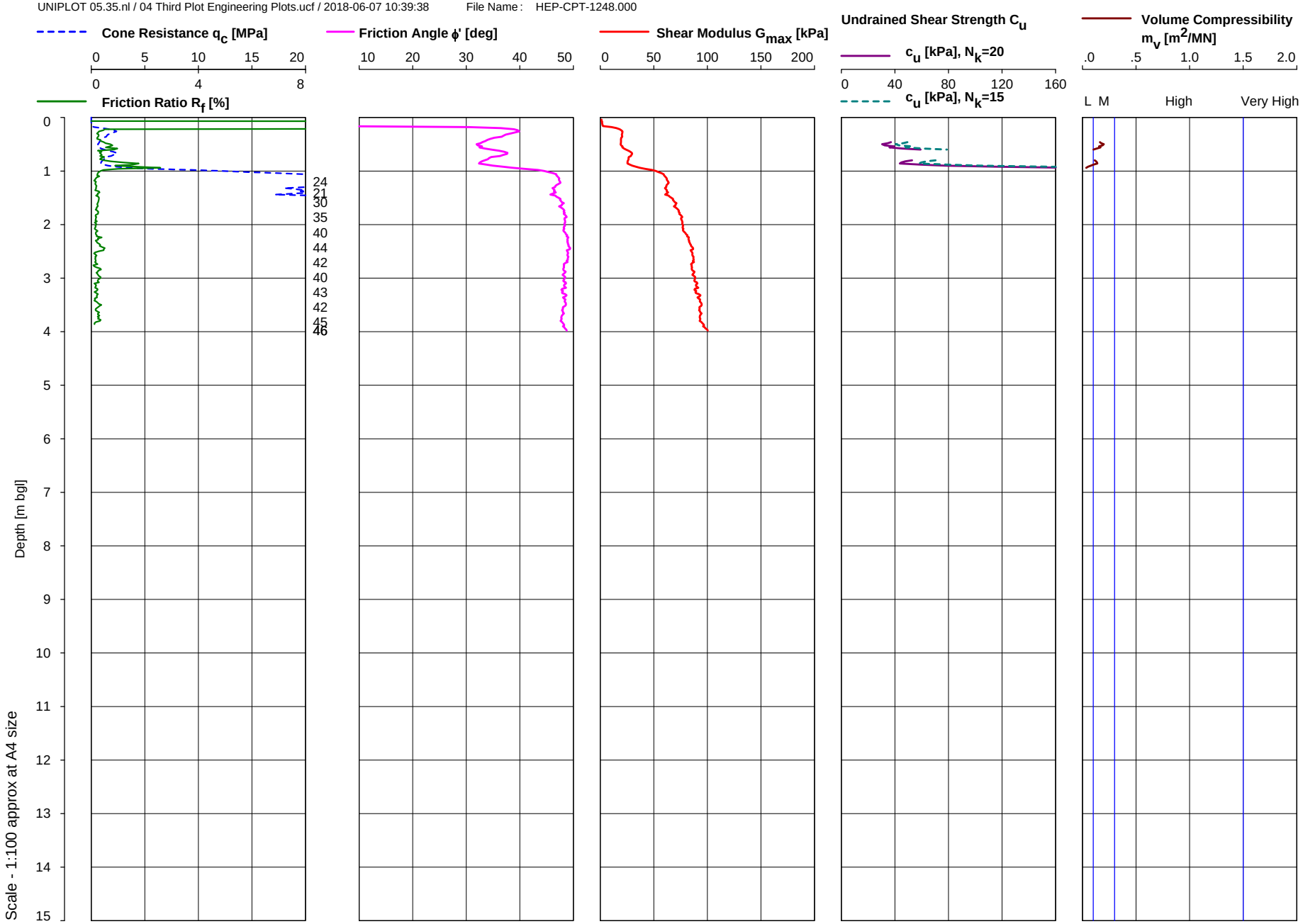
Location : **HEP-CPT-1247**

Coordinates : E 503811 N 177274

Ground Level [m OD] : +22.15

Contract Ref: G170029U

HEATHROW AIRPORT LIMITED
HEATHROW EXPANSION PROJECT GROUND INVESTIGATION - PACKAGE 3



HEP-CPT-1248

Remarks:

CPT Rig/Cone : GB7 1701-1515
Date of Test : 16-Jan-2018
Start / End Time 08:48:46 09:01:44

Assumed Soil Unit Weight : 19.0 [kN/m^3]
Assumed Water Level [m gl] : -1.0

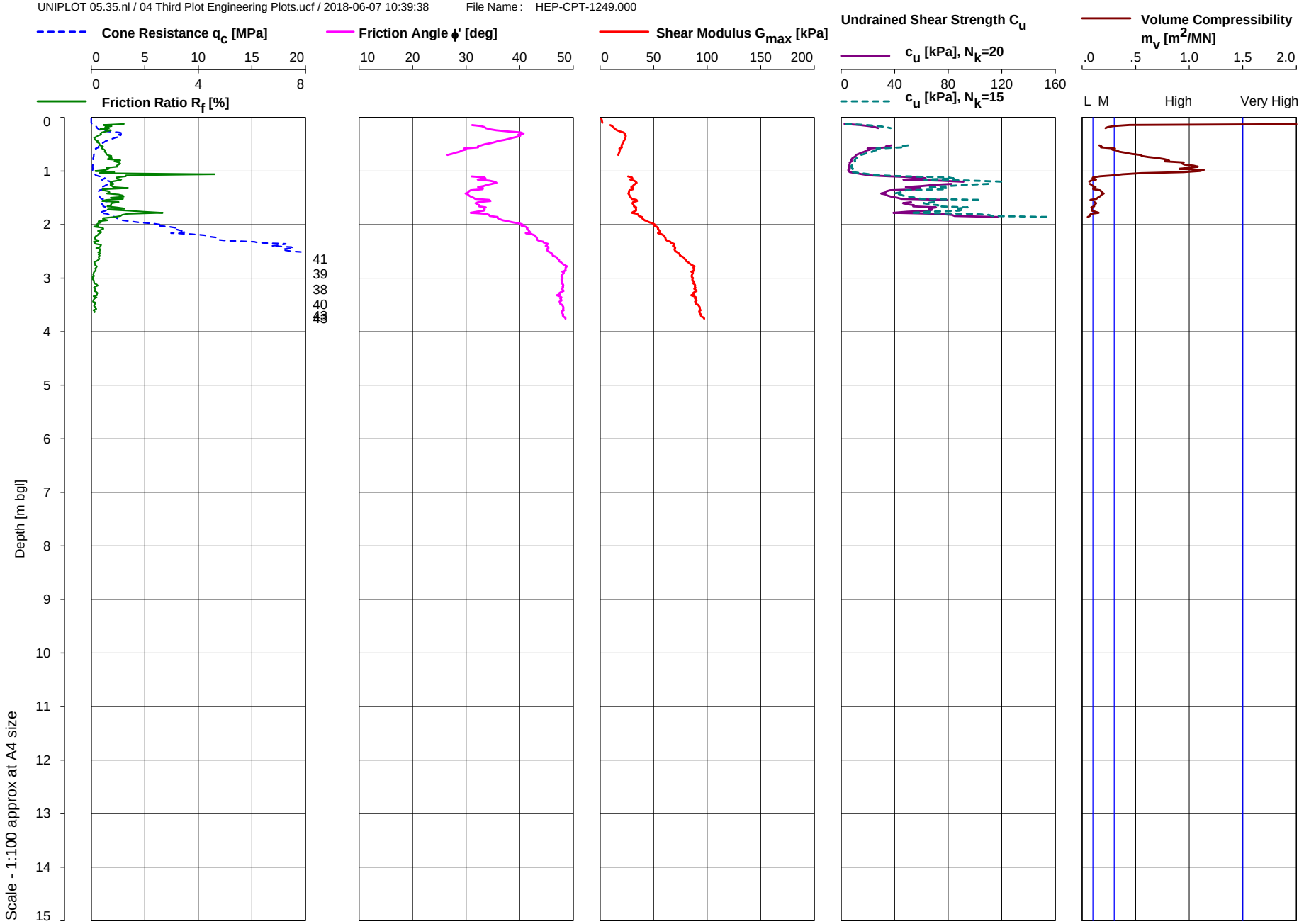
Status : DRAFT
Operator : NF/IB
Compiled by : JAG
Checked by : KES

ENGINEERING PARAMETERS

Location : **HEP-CPT-1248**
Coordinates : E 503911 N 177343
Ground Level [m OD] : +22.04

Contract Ref: G170029U

HEATHROW AIRPORT LIMITED
HEATHROW EXPANSION PROJECT GROUND INVESTIGATION - PACKAGE 3



HEP-CPT-1249

Remarks:

CPT Rig/Cone : GB7 1701-2904
Date of Test : 15-Jan-2018
Start / End Time 13:36:20 13:46:04

Assumed Soil Unit Weight : 19.0 [kN/m^3]
Assumed Water Level [m gl] : -1.0

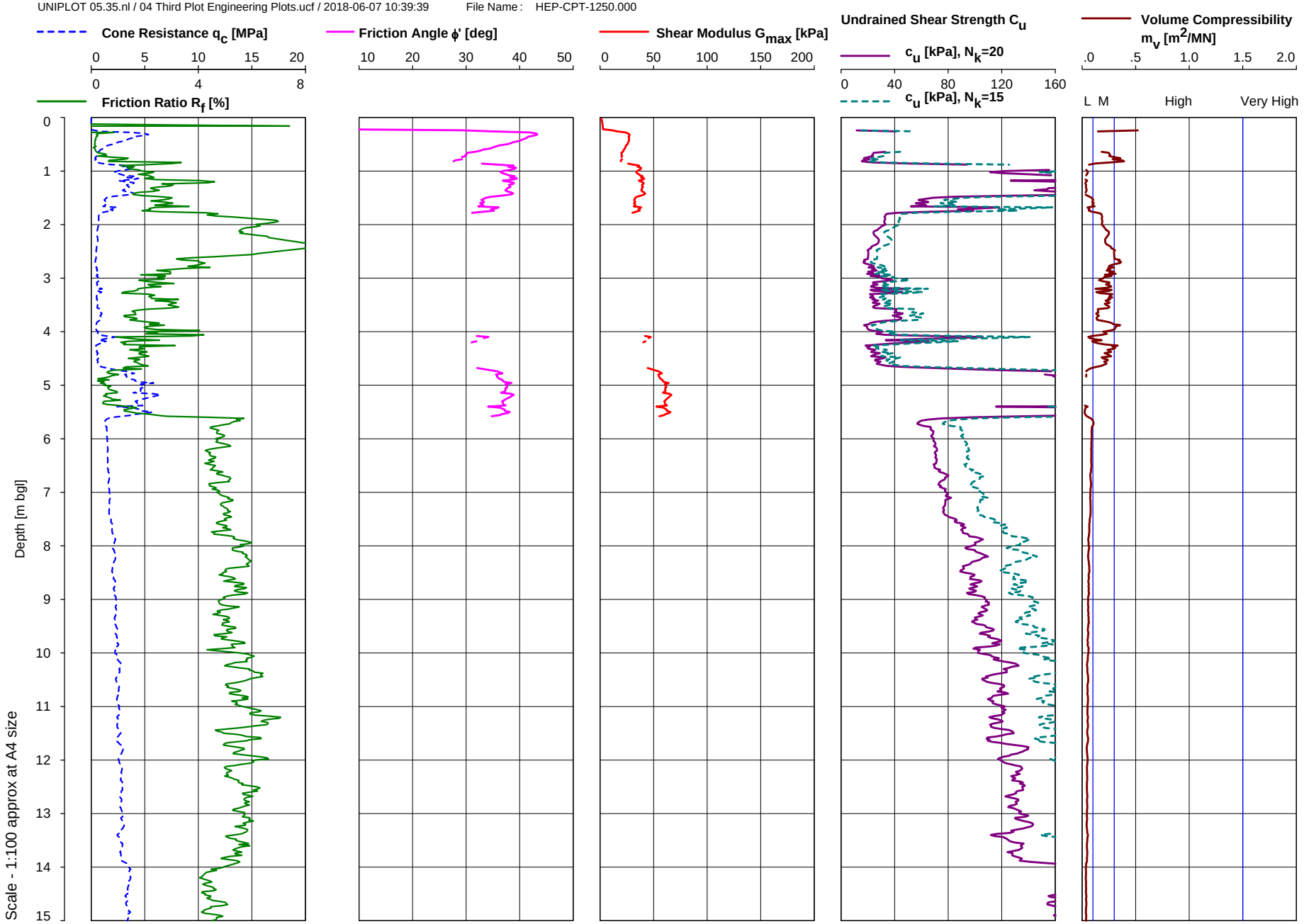
Status : DRAFT
Operator : NF/IB
Compiled by : JAG
Checked by : KES

ENGINEERING PARAMETERS

Location : **HEP-CPT-1249**
Coordinates : E 503890 N 177240
Ground Level [m OD] : +22.21

Contract Ref: G170029U

HEATHROW AIRPORT LIMITED
HEATHROW EXPANSION PROJECT GROUND INVESTIGATION - PACKAGE 3



Scale - 1:100 approx at A4 size

HEP-CPT-1250

Remarks:

CPT Rig/Cone : GB7 1701-2904
Date of Test : 15-Jan-2018
Start / End Time 11:18:05 13:23:53

Assumed Soil Unit Weight : 19.0 [kN/m^3]
Assumed Water Level [m gl] : -1.0

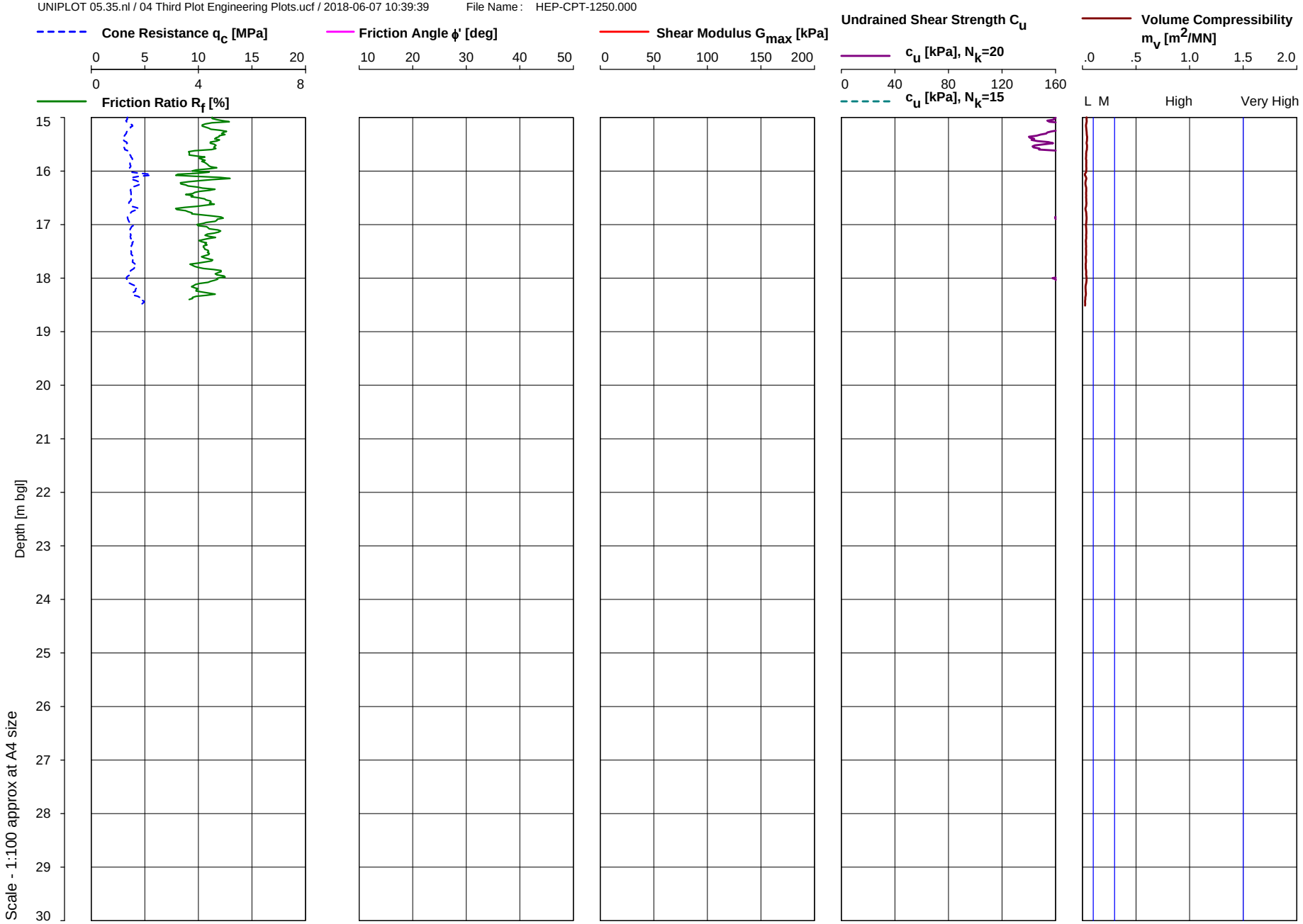
Status : DRAFT
Operator : NF/IB
Compiled by : JAG
Checked by : KES

ENGINEERING PARAMETERS

Location : **HEP-CPT-1250**
Coordinates : E 503800 N 177245
Ground Level [m OD] : +22.26

Contract Ref: G170029U

HEATHROW AIRPORT LIMITED
HEATHROW EXPANSION PROJECT GROUND INVESTIGATION - PACKAGE 3



HEP-CPT-1250

Remarks:

CPT Rig/Cone : GB7 1701-2904
Date of Test : 15-Jan-2018
Start / End Time 11:18:05 13:23:53

Assumed Soil Unit Weight : 19.0 [kN/m^3]
Assumed Water Level [m gl] : -1.0

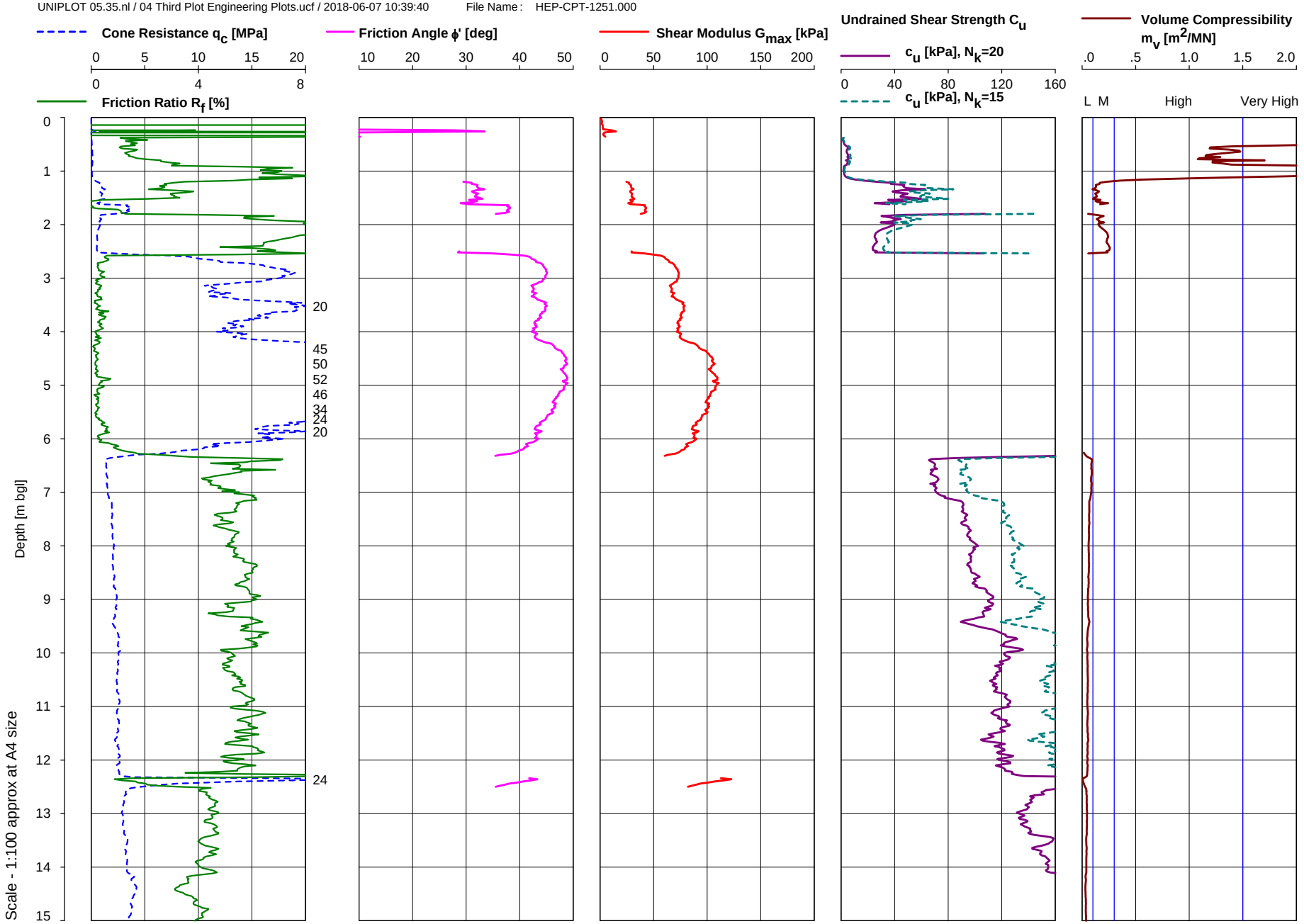
Status : DRAFT
Operator : NF/IB
Compiled by : JAG
Checked by : KES

ENGINEERING PARAMETERS

Location : **HEP-CPT-1250**
Coordinates : E 503800 N 177245
Ground Level [m OD] : +22.26

Contract Ref: G170029U

HEATHROW AIRPORT LIMITED
HEATHROW EXPANSION PROJECT GROUND INVESTIGATION - PACKAGE 3



Scale - 1:100 approx at A4 size

HEP-CPT-1251

Remarks:

CPT Rig/Cone : GB9 1701-1987
Date of Test : 22-Mar-2018
Start / End Time 17:22:29 20:05:07

Assumed Soil Unit Weight : 19.0 [kN/m^3]
Assumed Water Level [m gl] : -1.0

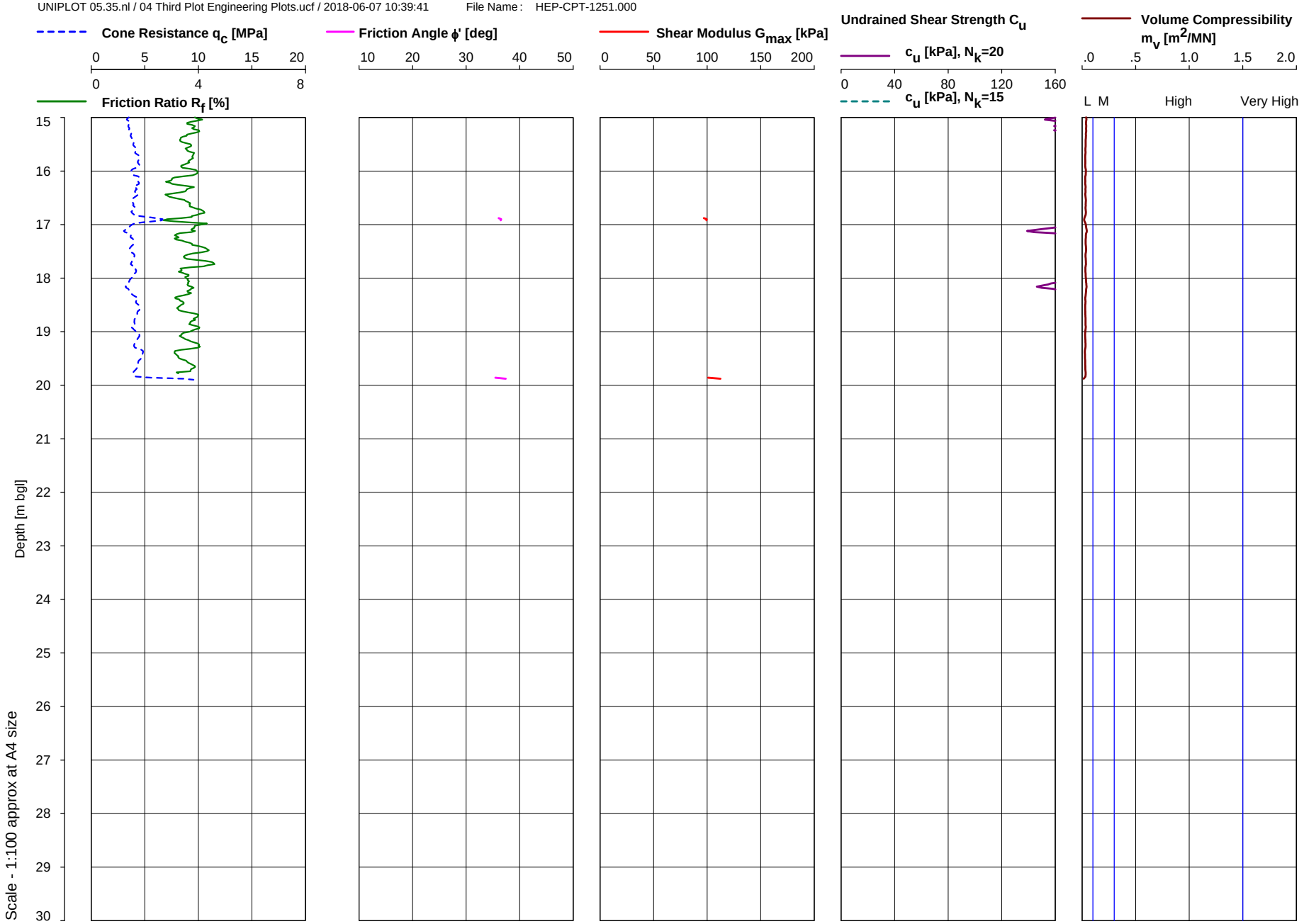
Status : DRAFT
Operator : HG,KL
Compiled by : JAG
Checked by : KES

ENGINEERING PARAMETERS

Location : **HEP-CPT-1251**
Coordinates : E 503702 N 177238
Ground Level [m OD] : +22.41

Contract Ref: G170029U

HEATHROW AIRPORT LIMITED
HEATHROW EXPANSION PROJECT GROUND INVESTIGATION - PACKAGE 3



HEP-CPT-1251

Remarks:

CPT Rig/Cone : GB9 1701-1987
Date of Test : 22-Mar-2018
Start / End Time 17:22:29 20:05:07

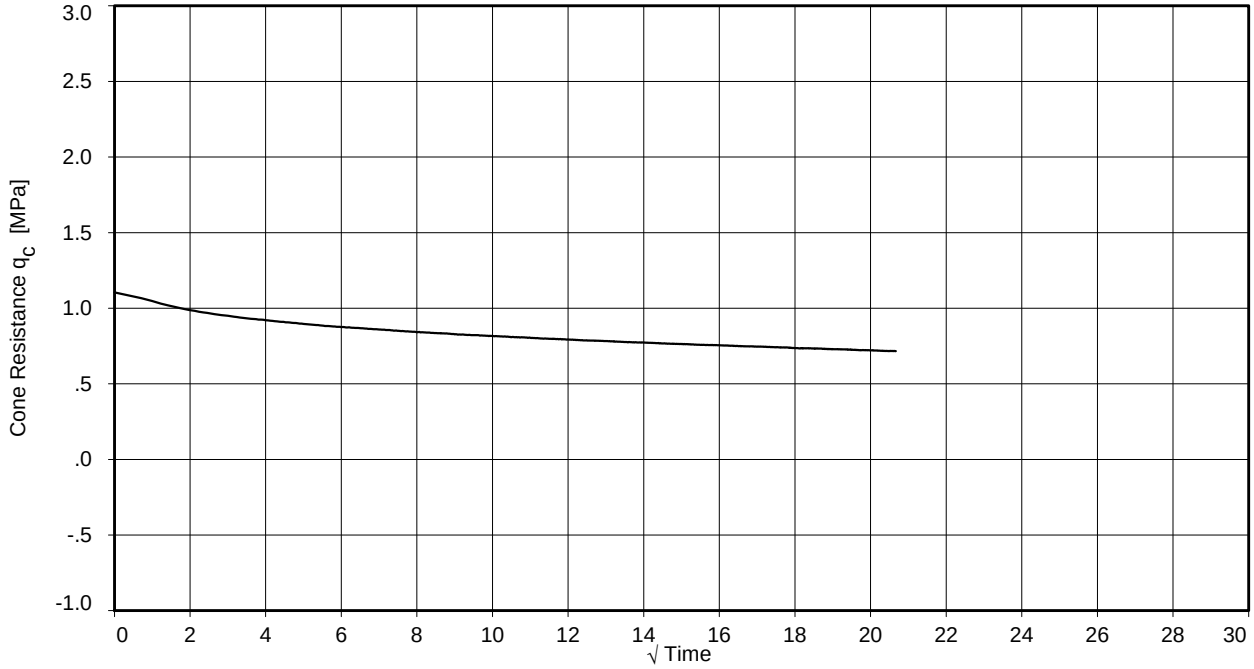
Assumed Soil Unit Weight : 19.0 [kN/m^3]
Assumed Water Level [m gl] : -1.0

Status : DRAFT
Operator : HG,KL
Compiled by : JAG
Checked by : KES

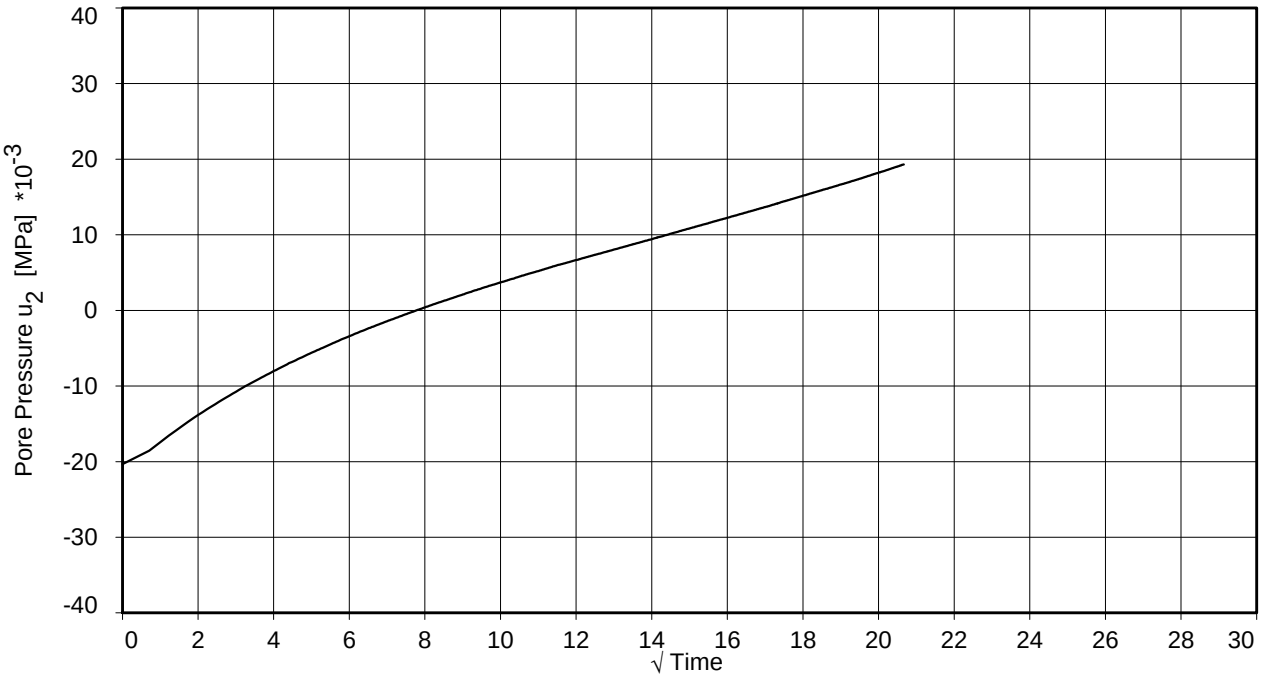
ENGINEERING PARAMETERS

Location : **HEP-CPT-1251**
Coordinates : E 503702 N 177238
Ground Level [m OD] : +22.41

Penetrometer : CP15-CF75PB7SN2



CPT File Name : HEP-CPT-1239.001

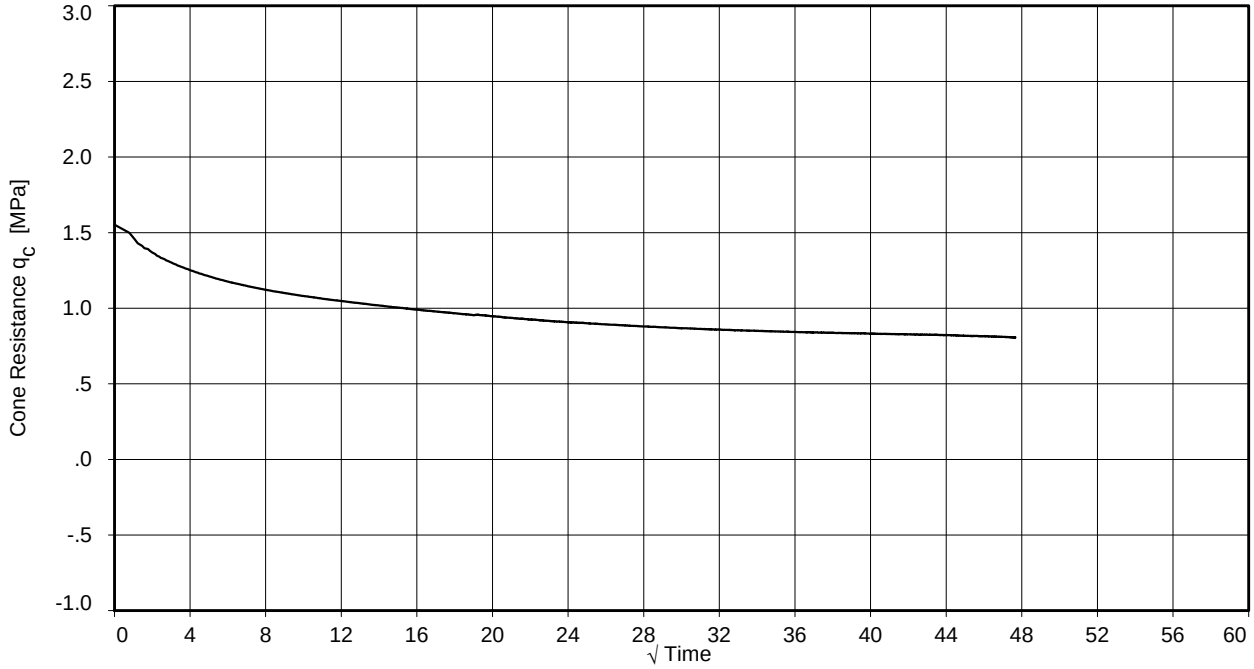


UNIPLOT 05.35.nl/05 Diss SqrTime Ch calculation u2.ucf/2018-06-08 11:35:13

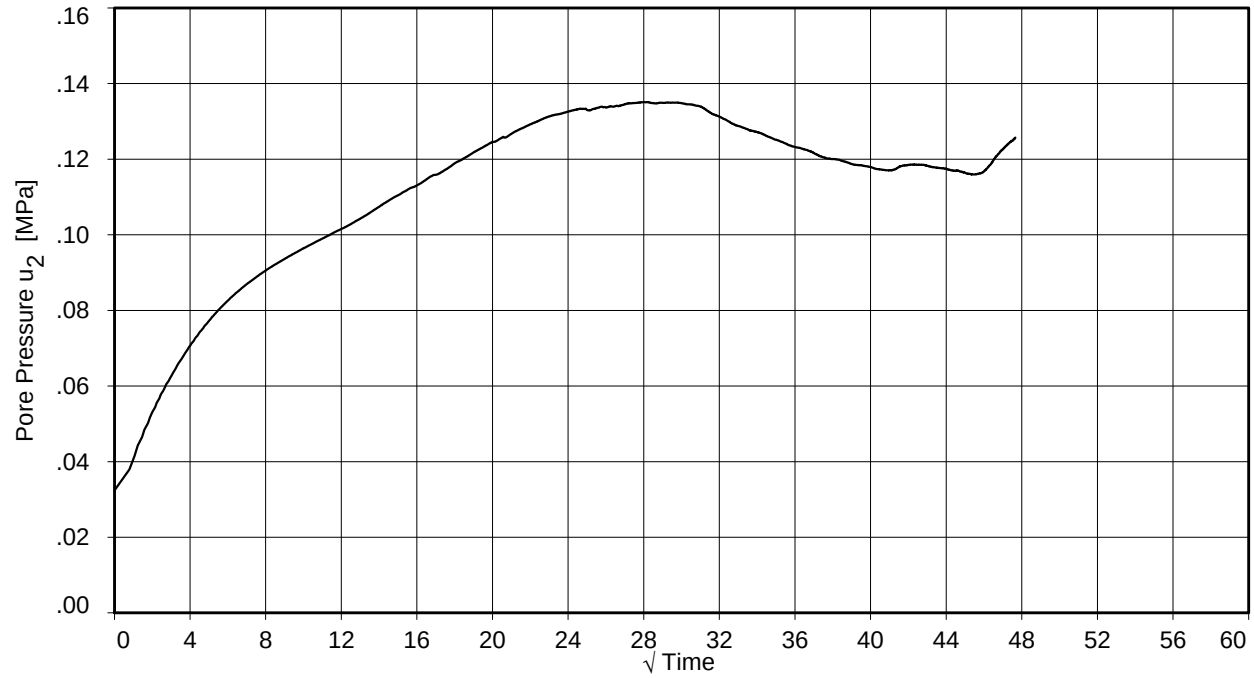
Pore Pressure U0%	:	--	MPa	U0%	:	--	method
Pore Pressure U100%	:	--	MPa	U100%	:	--	method
Dissipation Test No.	:	1		q_c at start	:	1.10	MPa
Dissipation Test Depth	:	5.31	m	q_c at end	:	0.72	MPa
Time at Start of Test	:	09:54		t50	:	--	s
Time at End of Test	:	10:01		c_h	:	--	m²/s
Test Date	:	12-Dec-2017		k_h	:	--	m/s
				Ir	:	--	
Remarks :				Eastings	:	503731	
				Northings	:	177509	
				Ground Level	:	+21.78	m OD

CPT No. : **HEP-CPT-1239**

Penetrometer : CP15-CF75PB7SN2



CPT File Name : HEP-CPT-1239.001

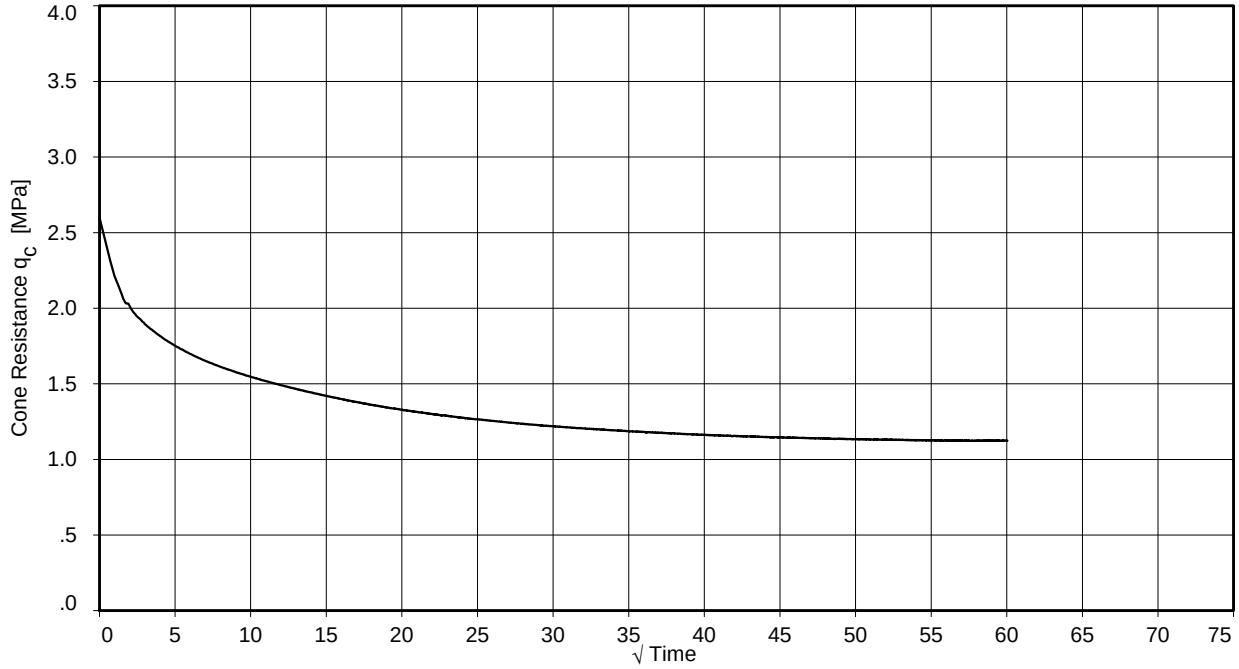


UNIPLOT 05.35.nl/05 Diss SqrTime Ch calculation u2.ucf/2018-06-08 11:35:13

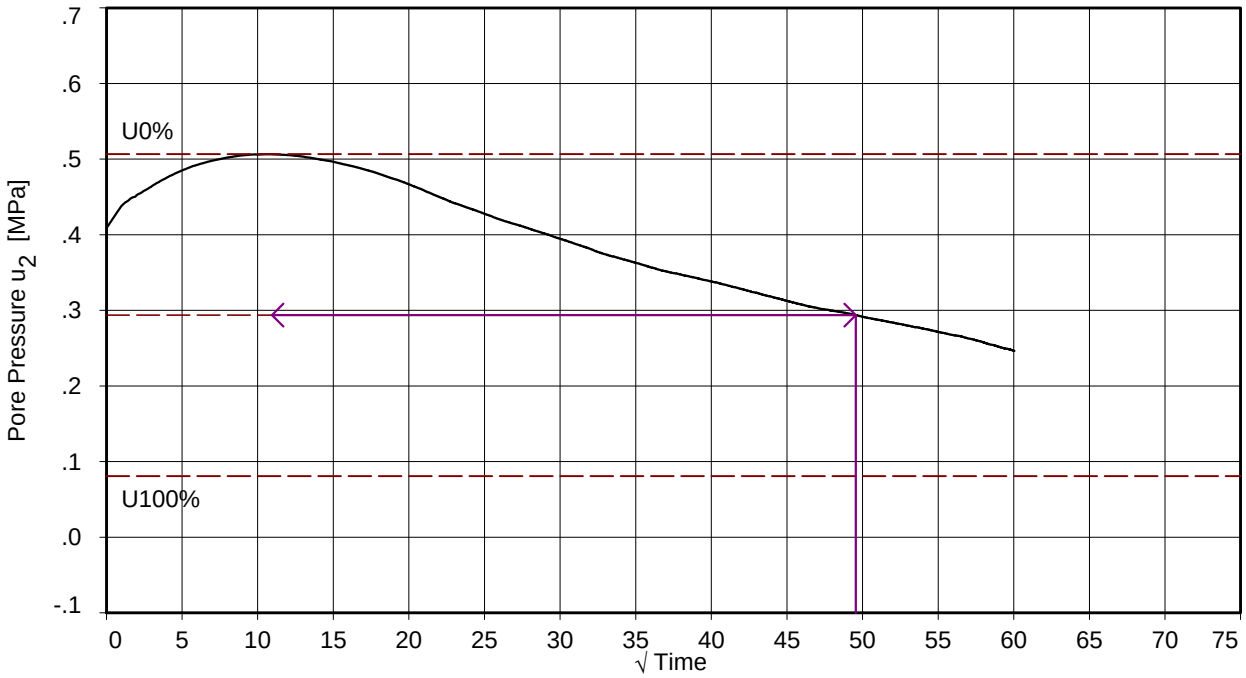
Pore Pressure U0%	:	--	MPa	U0%	:	--	method
Pore Pressure U100%	:	--	MPa	U100%	:	--	method
Dissipation Test No.	:	2		q_c at start	:	1.55	MPa
Dissipation Test Depth	:	7.51	m	q_c at end	:	0.81	MPa
Time at Start of Test	:	10:04		t50	:	--	s
Time at End of Test	:	10:42		c_h	:	--	m²/s
Test Date	:	12-Dec-2017		k_h	:	--	m/s
				Ir	:	--	
Remarks :				Eastings	:	503731	
				Northings	:	177509	
				Ground Level	:	+21.78	m OD

CPT No. : **HEP-CPT-1239**

Penetrometer : CP15-CF75PB7SN2



CPT File Name : HEP-CPT-1239.001

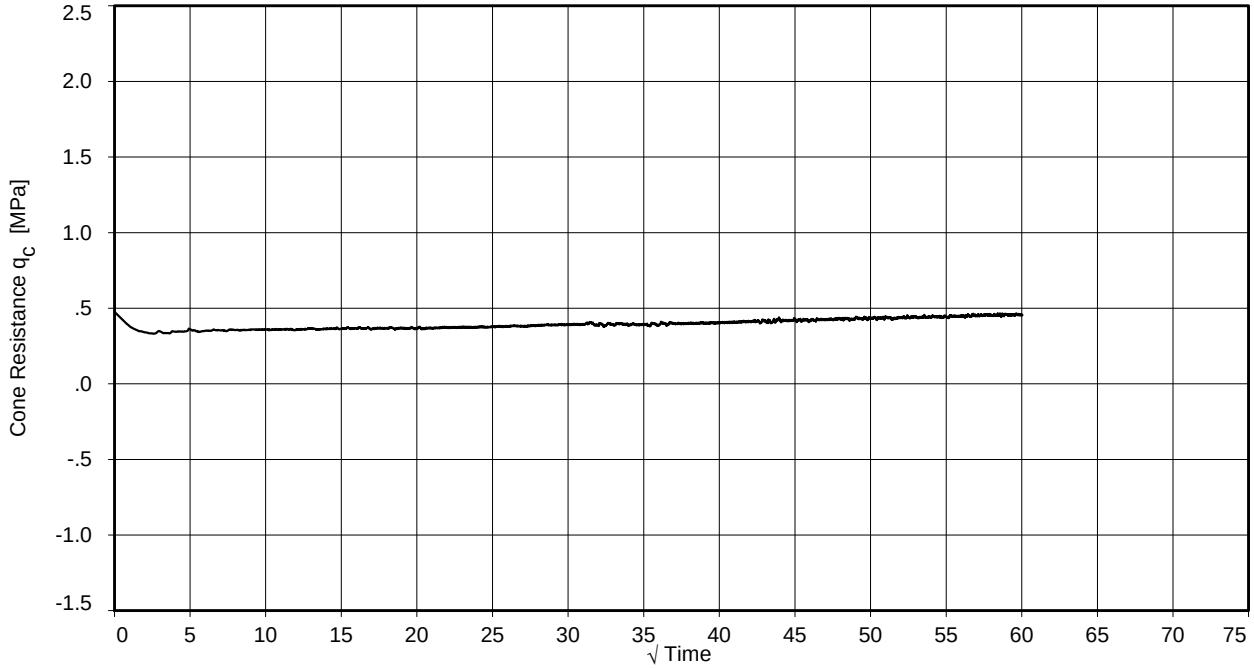


UNIPLOT 05.35.nl/05 Diss SqrTime Ch calculation u2.ucf/2018-06-08 11:35:13

Pore Pressure U0%	:	0.507	MPa	U0%	:	maximum value	method
Pore Pressure U100%	:	0.081	MPa	U100%	:	hydrostatic	method
Dissipation Test No.	:	3		q_c at start	:	2.60	MPa
Dissipation Test Depth	:	9.19	m	q_c at end	:	1.12	MPa
Time at Start of Test	:	10:45		t50	:	2336	s
Time at End of Test	:	11:45		c_h	:	5.04E-07	m²/s
Test Date	:	12-Dec-2017		k_h	:	2.25E-10	m/s
				Ir	:	100	
Remarks :				Eastings	:	503731	
				Northings	:	177509	
				Ground Level	:	+21.78	m OD

CPT No. : **HEP-CPT-1239**

Penetrometer : CP15-CF75PB7SN2



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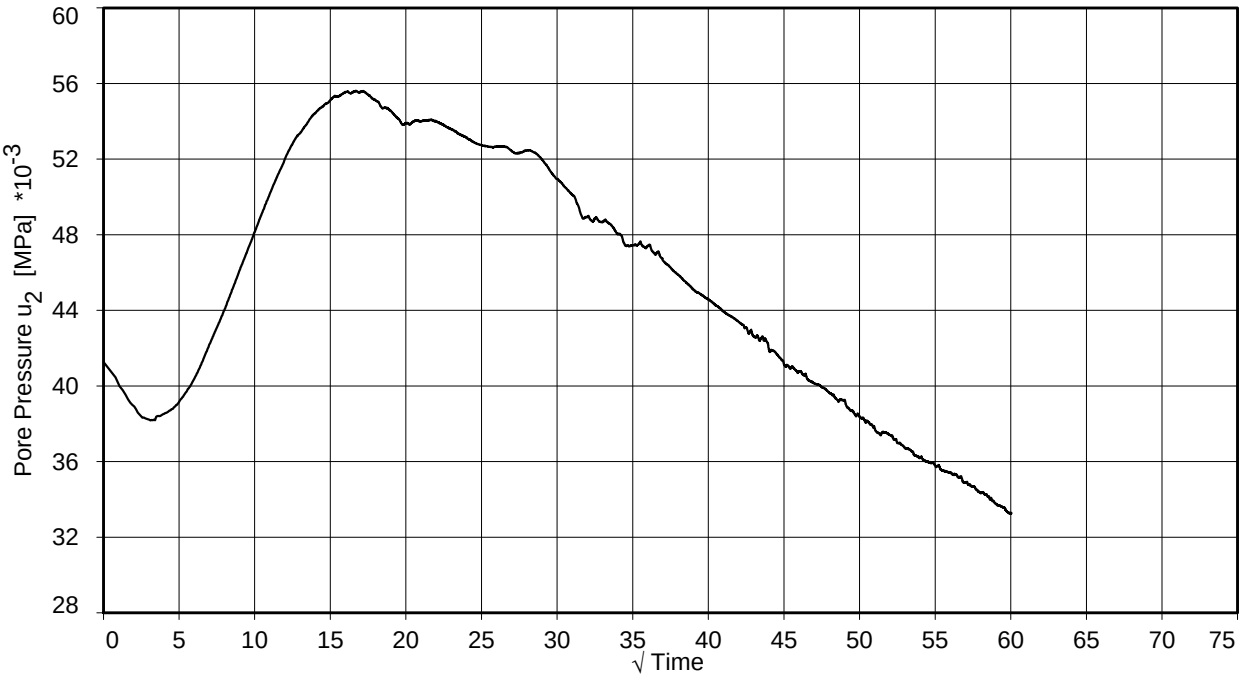
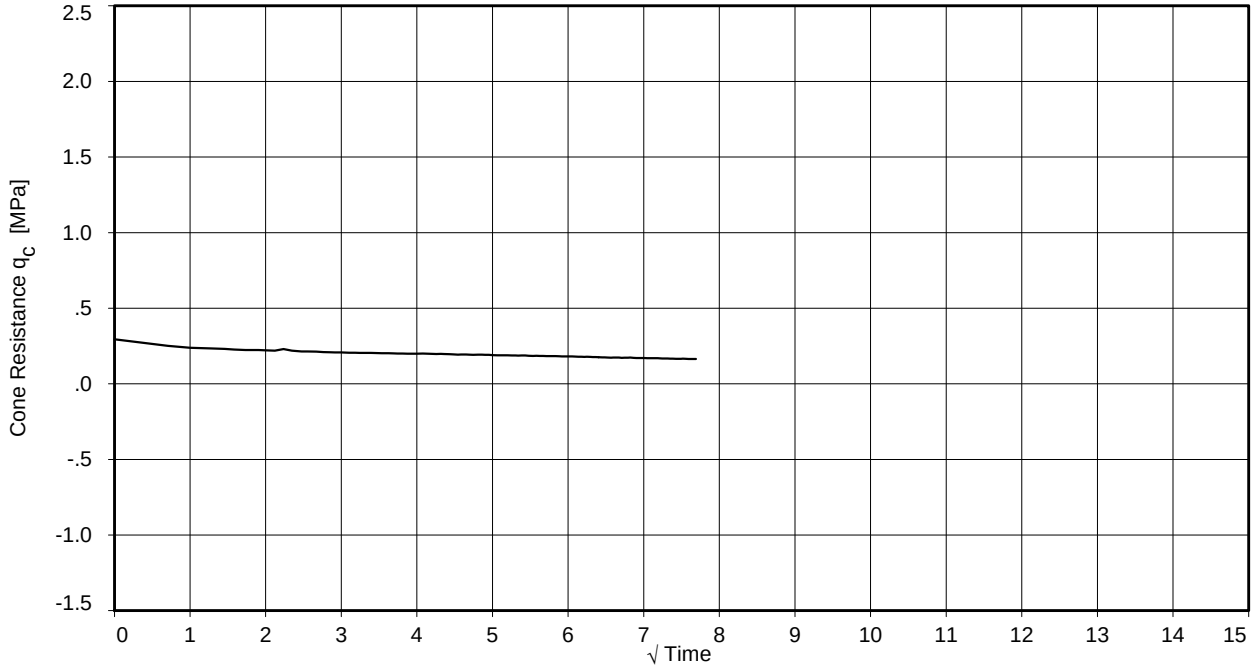


UNIPLOT 05.35.nl/05 Diss SqrTime Ch calculation u2.ucf/2018-06-08 11:35:13

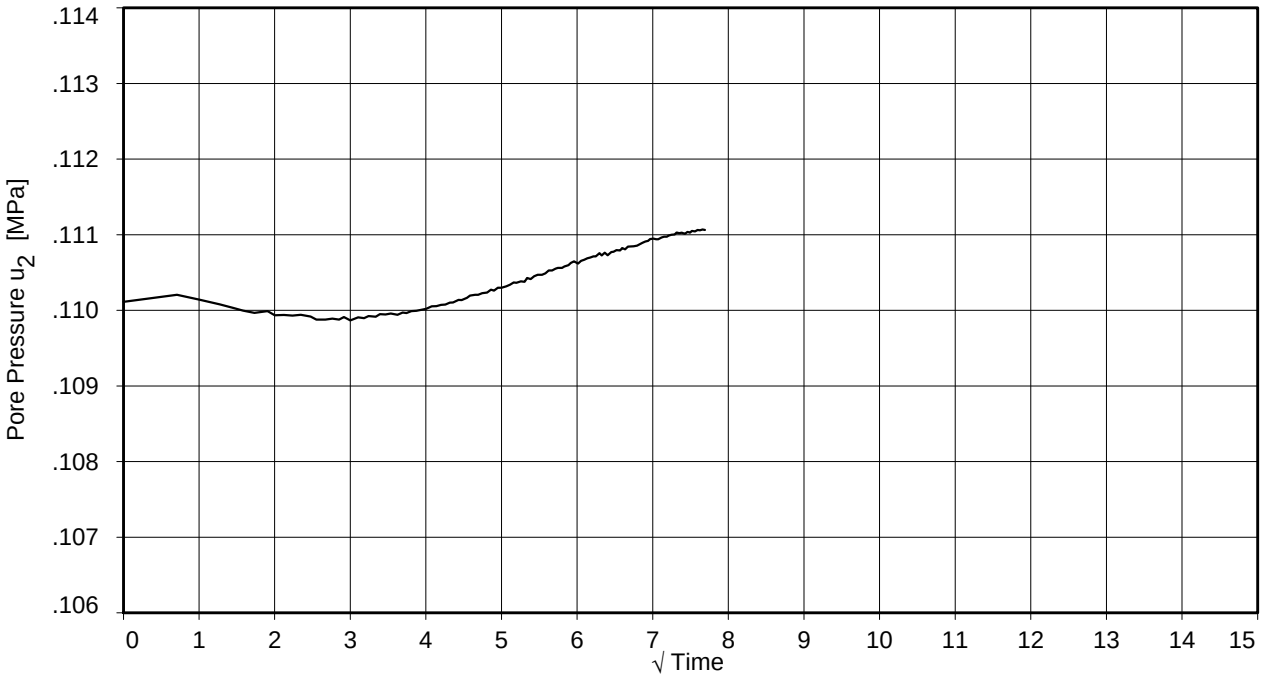
Pore Pressure U0%	:	--	MPa	U0%	:	--	method
Pore Pressure U100%	:	--	MPa	U100%	:	--	method
Dissipation Test No.	:	1		q_c at start	:	0.48	MPa
Dissipation Test Depth	:	2.05	m	q_c at end	:	0.45	MPa
Time at Start of Test	:	14:38		t50	:	--	s
Time at End of Test	:	15:38		c_h	:	--	m²/s
Test Date	:	12-Dec-2017		k_h	:	--	m/s
				Ir	:	--	
Remarks :				Eastings	:	503873	
				Northings	:	177466	
				Ground Level	:	+22.72	m OD

CPT No. : **HEP-CPT-1240**

Penetrometer : CP15-CF75PB7SN2



CPT File Name : HEP-CPT-1240.002

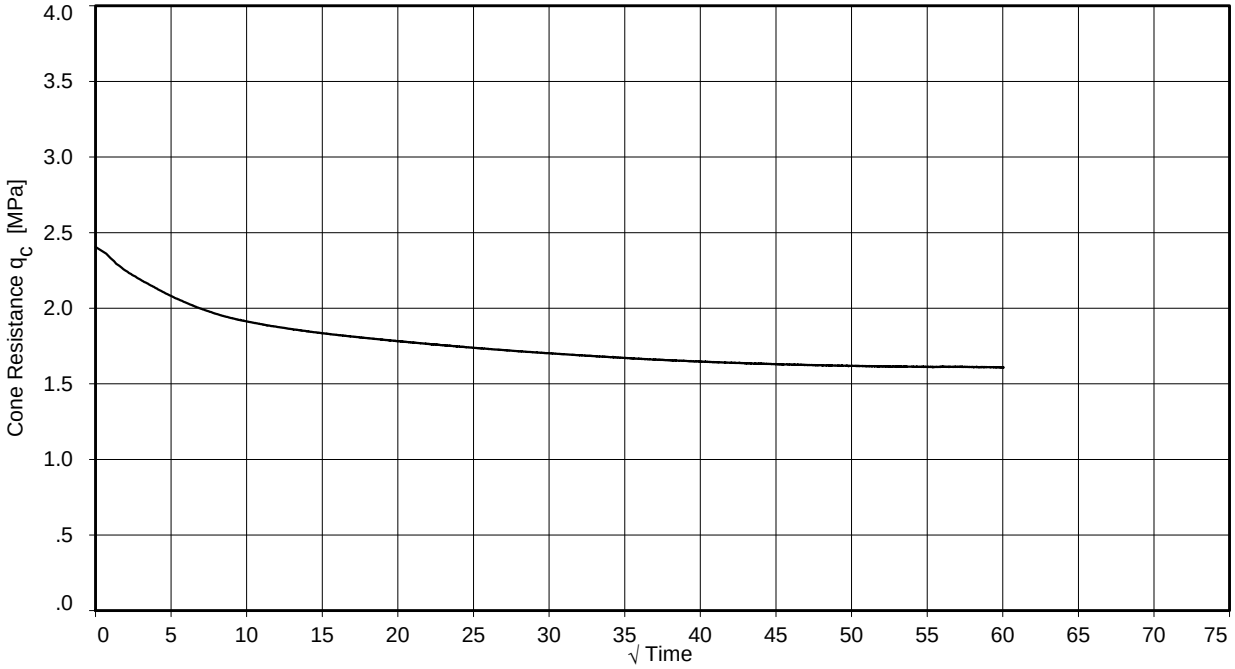


UNIPLOT 05.35.nl/05 Diss SqrTime Ch calculation u2.ucf/2018-06-08 11:35:14

Pore Pressure U0%	:	--	MPa	U0%	:	--	method
Pore Pressure U100%	:	--	MPa	U100%	:	--	method
Dissipation Test No.	:	2		q_c at start	:	0.30	MPa
Dissipation Test Depth	:	4.29	m	q_c at end	:	0.16	MPa
Time at Start of Test	:	15:41		t50	:	--	s
Time at End of Test	:	15:42		c_h	:	--	m²/s
Test Date	:	12-Dec-2017		k_h	:	--	m/s
				Ir	:	--	
Remarks :				Eastings	:	503873	
				Northings	:	177466	
				Ground Level	:	+22.72	m OD

CPT No. : **HEP-CPT-1240**

Penetrometer : CP15-CF75PB7SN2



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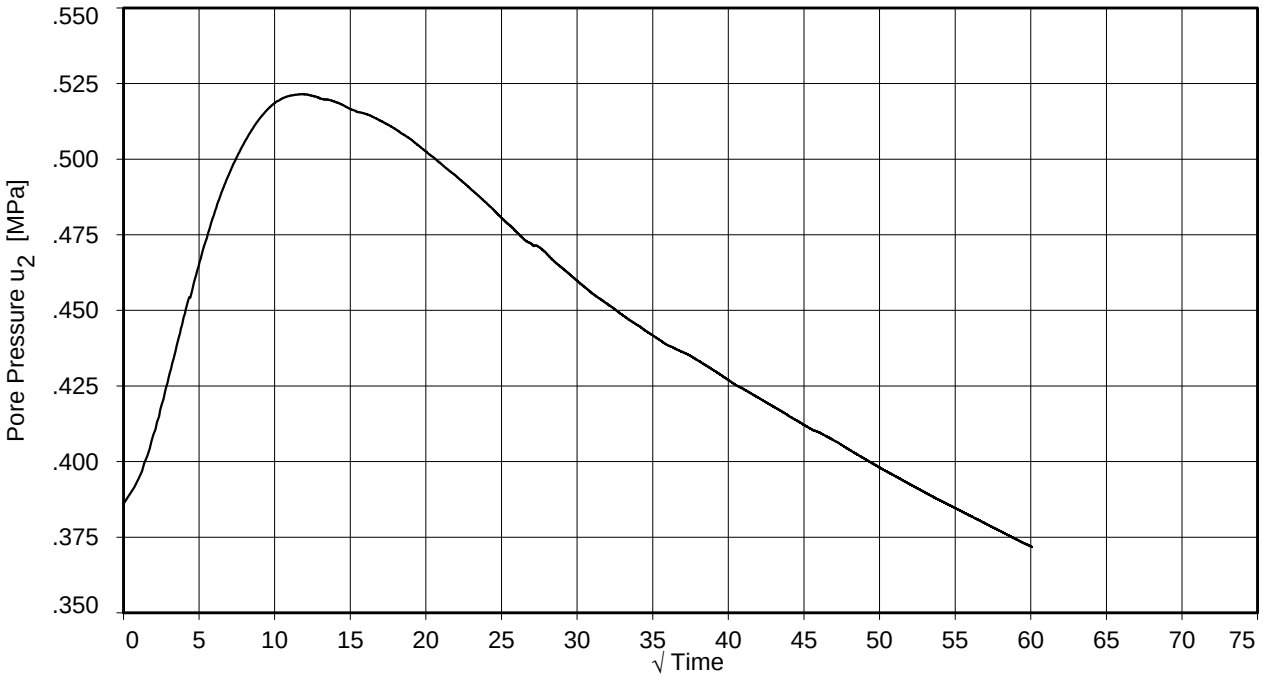
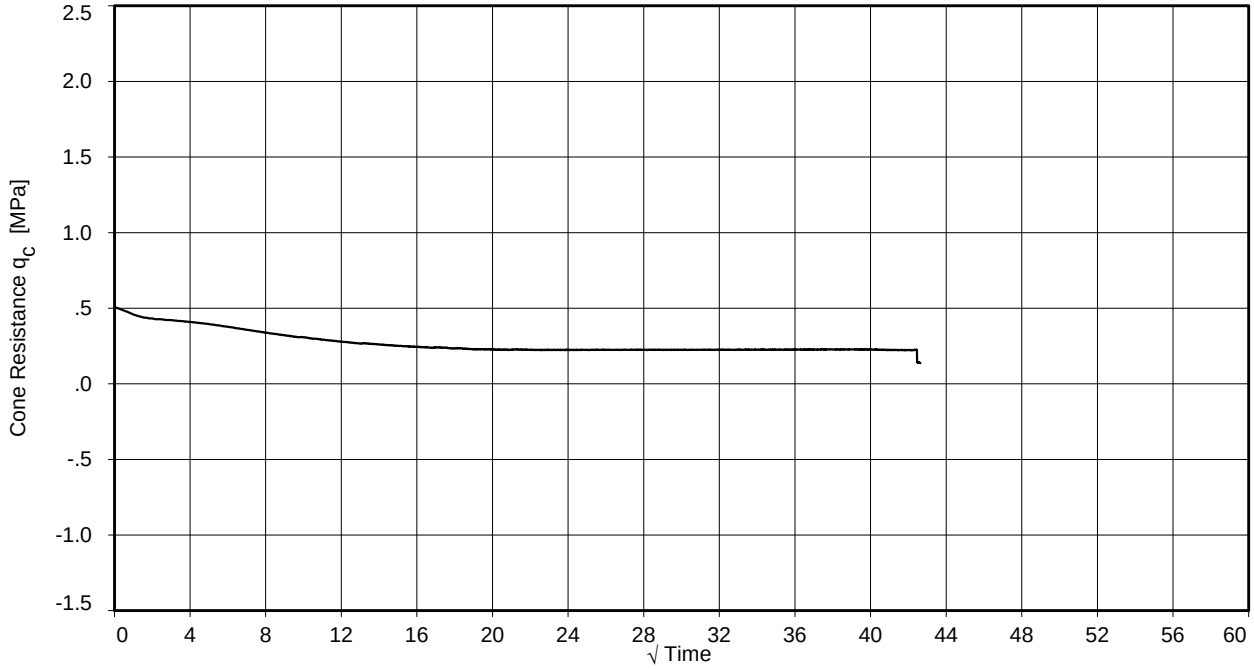


UNIPLOT 05.35.nl/05 Diss SqrTime Ch calculation u2.ucf/2018-06-08 11:35:14

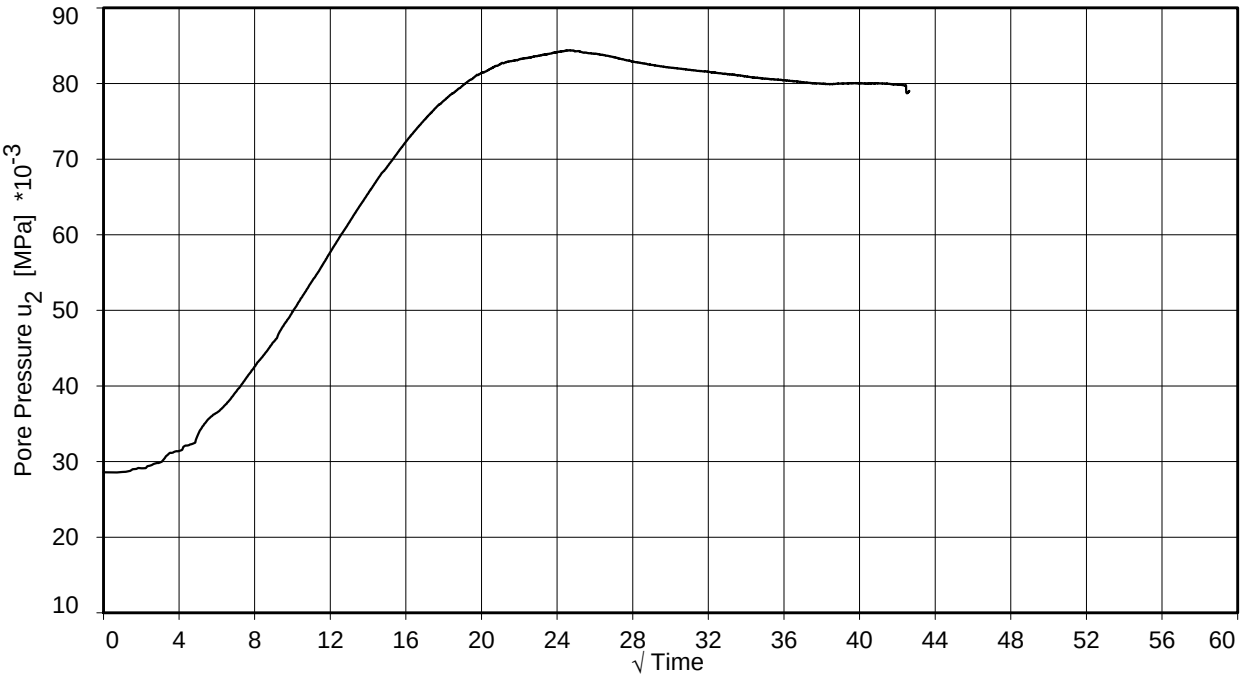
Pore Pressure U0%	:	--	MPa	U0%	:	--	method
Pore Pressure U100%	:	--	MPa	U100%	:	--	method
Dissipation Test No.	:	3		q_c at start	:	2.41	MPa
Dissipation Test Depth	:	11.93	m	q_c at end	:	1.61	MPa
Time at Start of Test	:	15:52		t50	:	--	s
Time at End of Test	:	16:52		c_h	:	--	m²/s
Test Date	:	12-Dec-2017		k_h	:	--	m/s
				Ir	:	--	
Remarks :				Eastings	:	503873	
				Northings	:	177466	
				Ground Level	:	+22.72	m OD

CPT No. : **HEP-CPT-1240**

Penetrometer : CP15-CF75PB7SN2



CPT File Name : HEP-CPT-1244.000

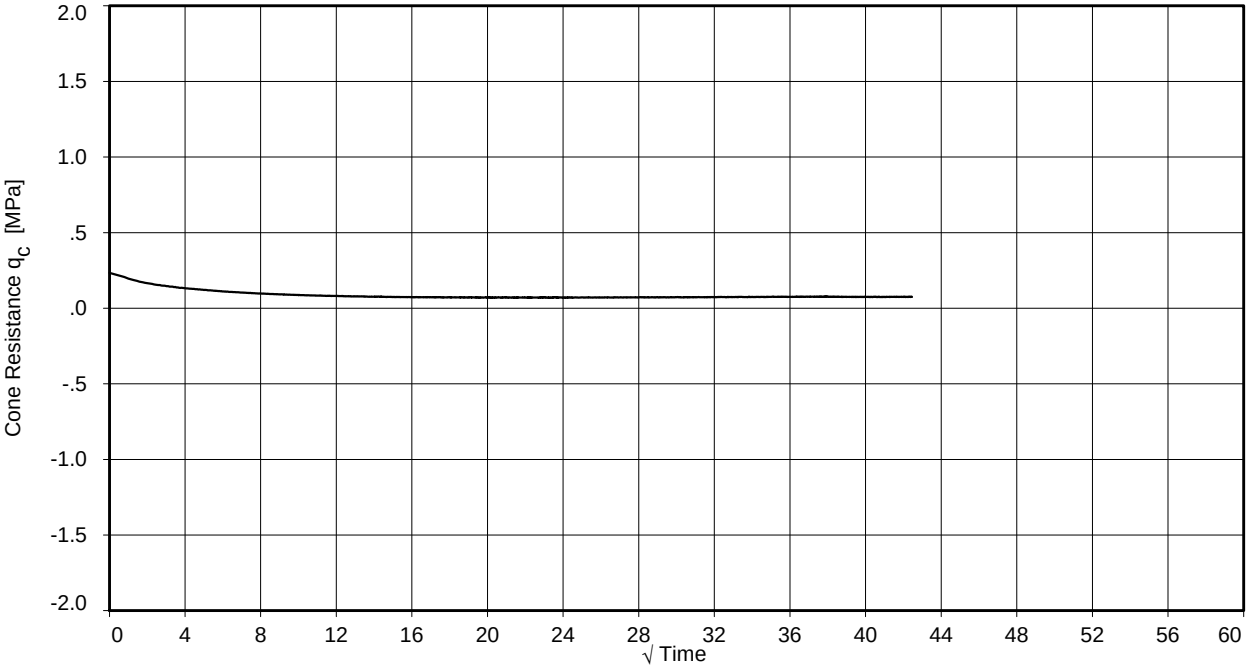


UNIPLOT 05.35.nl/05 Diss SqrTime Ch calculation u2.ucf/2018-06-08 11:35:14

Pore Pressure U0%	:	--	MPa	U0%	:	--	method
Pore Pressure U100%	:	--	MPa	U100%	:	--	method
Dissipation Test No.	:	1		q_c at start	:	0.51	MPa
Dissipation Test Depth	:	4.31	m	q_c at end	:	0.14	MPa
Time at Start of Test	:	08:57		t50	:	--	s
Time at End of Test	:	09:27		c_h	:	--	m²/s
Test Date	:	13-Dec-2017		k_h	:	--	m/s
				Ir	:	--	
Remarks :				Eastings	:	503854	
				Northings	:	177435	
				Ground Level	:	+22.79	m OD

CPT No. : **HEP-CPT-1244**

Penetrometer : CP15-CF75PB7SN2



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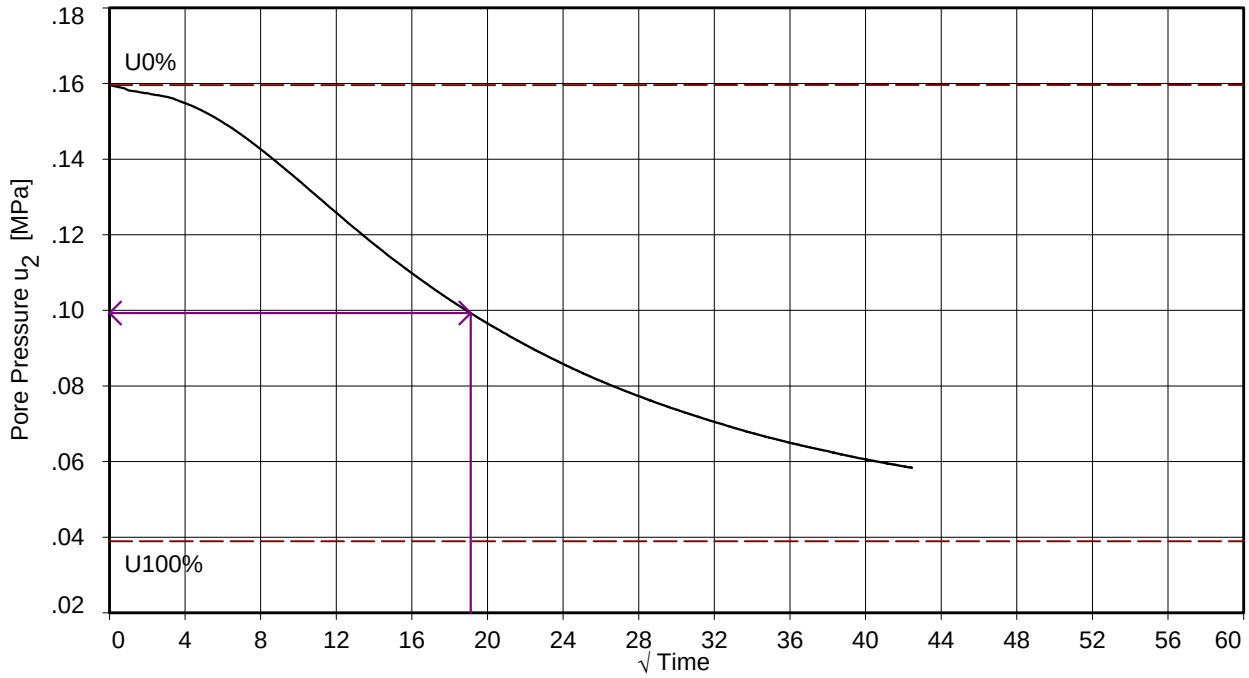
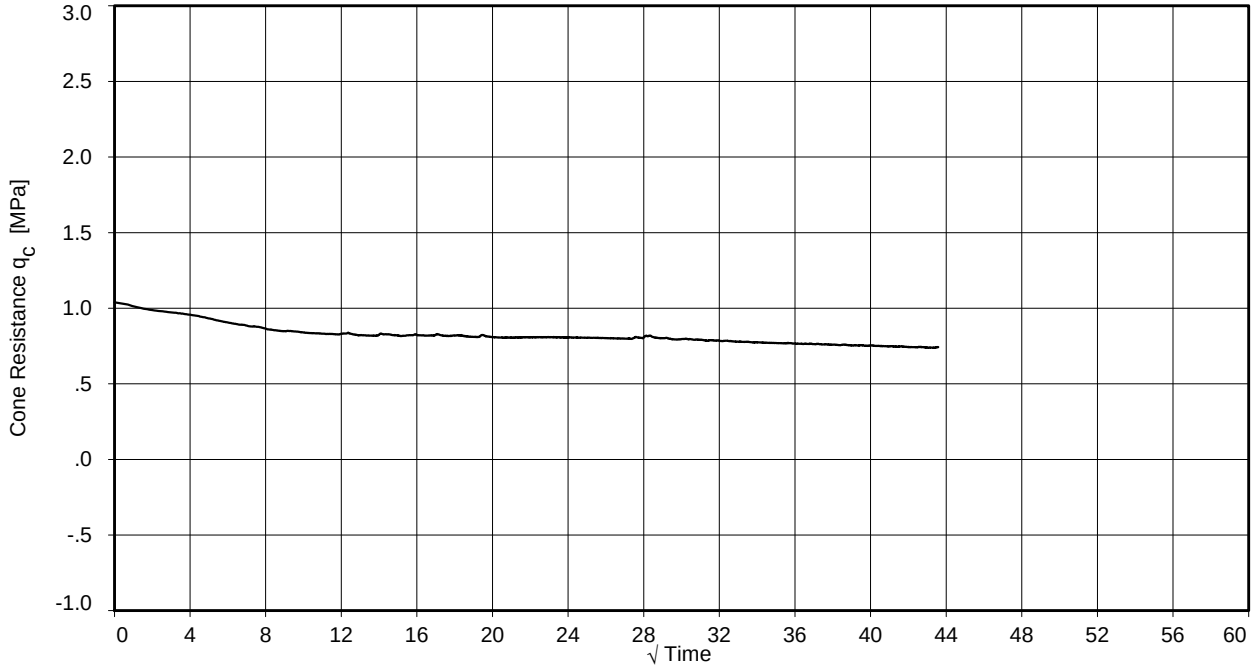


UNIPLOT 05.35.nl/05 Diss SqrTime Ch calculation u2.ucf/2018-06-08 11:35:14

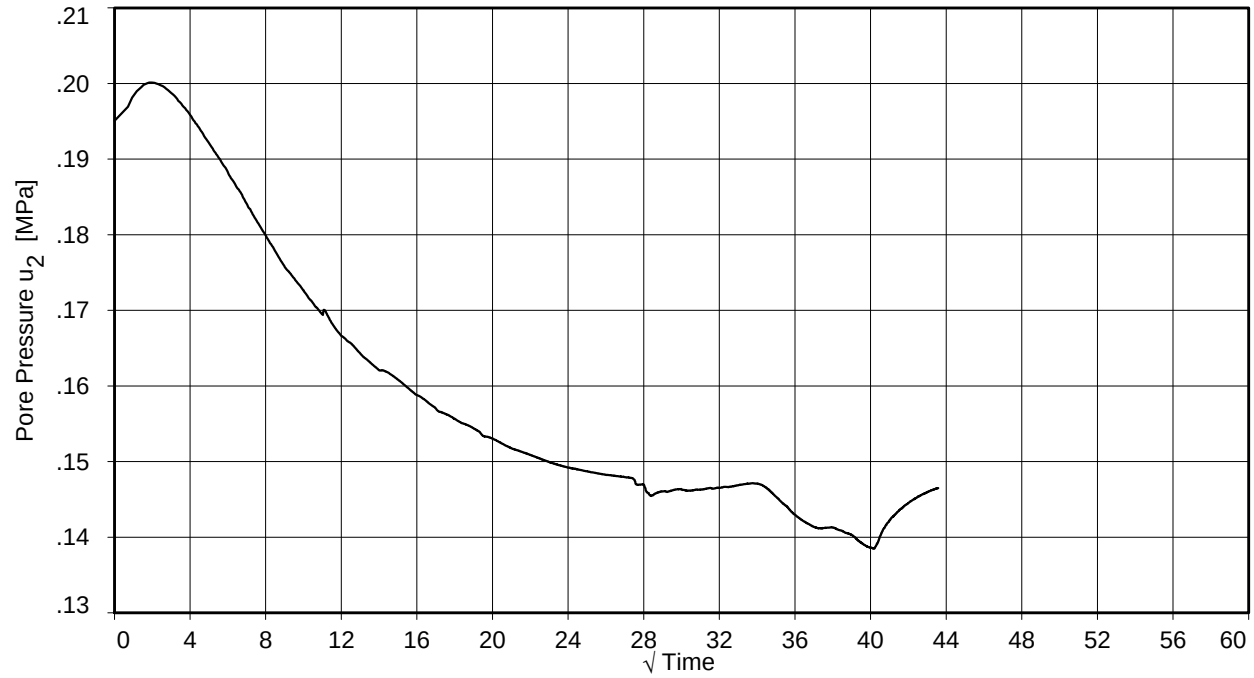
Pore Pressure U0%	:	0.160	MPa	U0%	:	at t=0 s	method
Pore Pressure U100%	:	0.039	MPa	U100%	:	hydrostatic	method
Dissipation Test No.	:	2		q_c at start	:	0.23	MPa
Dissipation Test Depth	:	4.90	m	q_c at end	:	0.08	MPa
Time at Start of Test	:	09:30		t50	:	365	s
Time at End of Test	:	10:00		c_h	:	3.23E-06	m²/s
Test Date	:	13-Dec-2017		k_h	:	1.39E-08	m/s
				Ir	:	100	
Remarks :				Eastings	:	503854	
				Northings	:	177435	
				Ground Level	:	+22.79	m OD

CPT No. : **HEP-CPT-1244**

Penetrometer : CP15-CF75PB7SN2



CPT File Name : HEP-CPT-1245.000

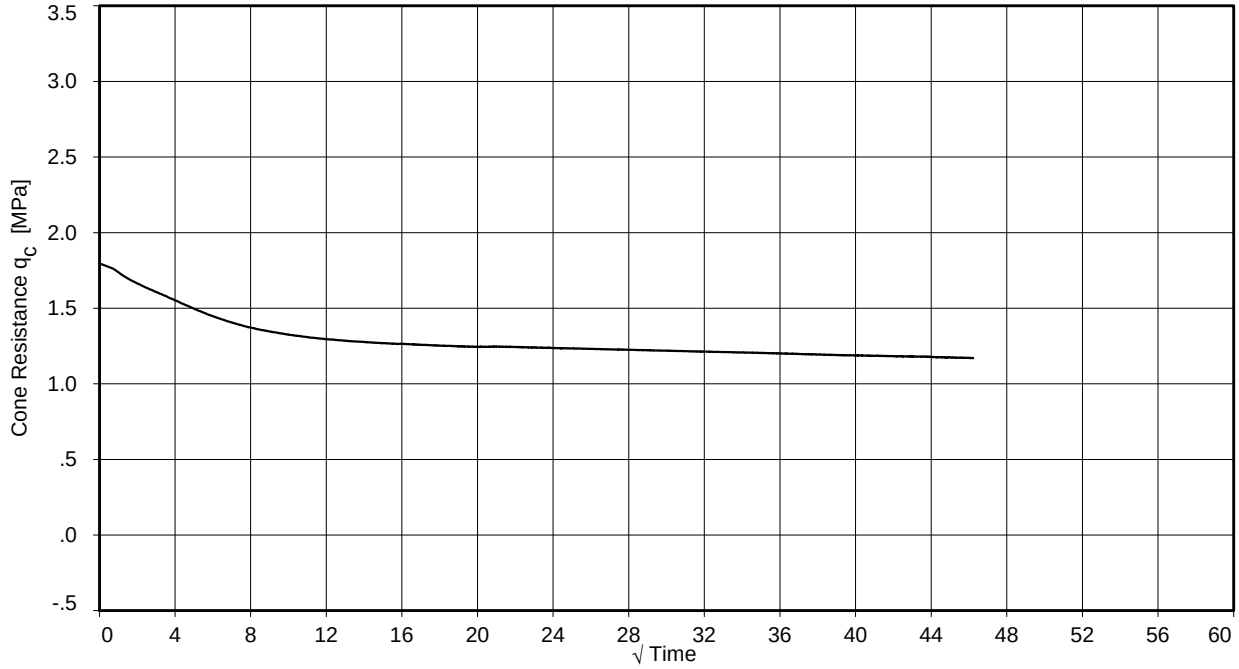


UNIPLOT 05.35.nl/05 Diss SqrTime Ch calculation u2.ucf/2018-06-08 11:35:14

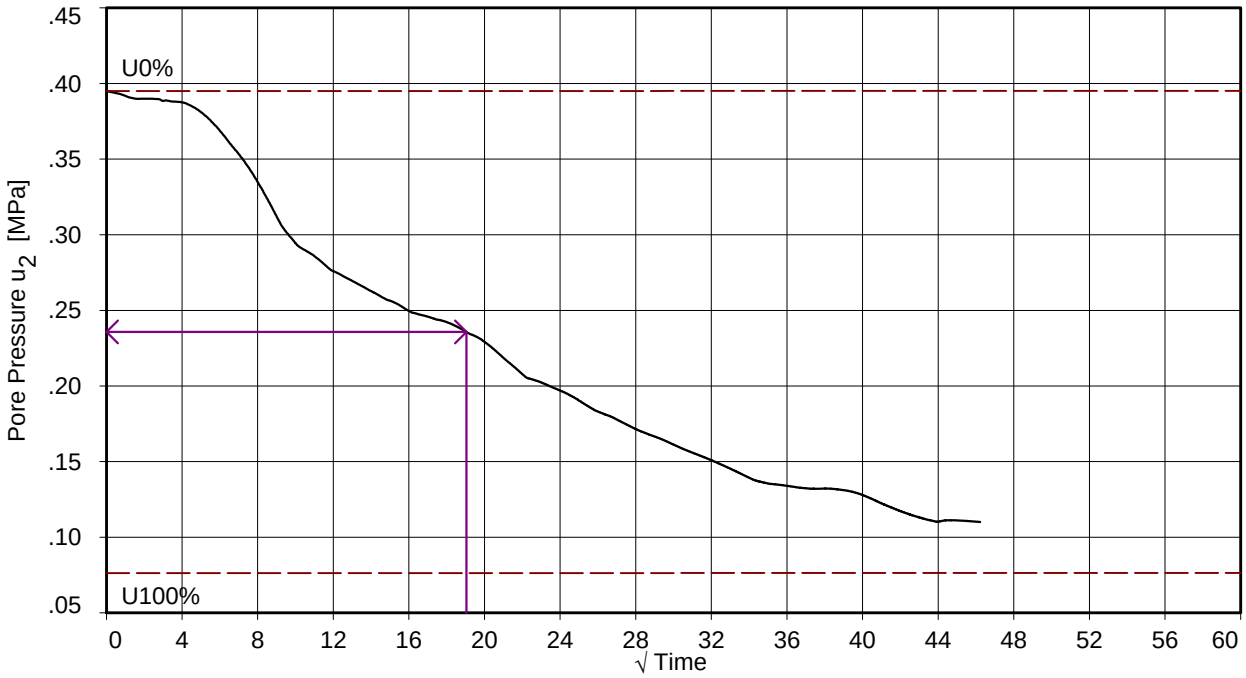
Pore Pressure U0%	:	--	MPa	U0%	:	--	method
Pore Pressure U100%	:	--	MPa	U100%	:	--	method
Dissipation Test No.	:	1		q_c at start	:	1.04	MPa
Dissipation Test Depth	:	4.67	m	q_c at end	:	0.74	MPa
Time at Start of Test	:	12:32		t50	:	--	s
Time at End of Test	:	13:03		c_h	:	--	m²/s
Test Date	:	12-Dec-2017		k_h	:	--	m/s
				Ir	:	--	
Remarks :				Eastings	:	503681	
				Northings	:	177435	
				Ground Level	:	+21.34	m OD

CPT No. : **HEP-CPT-1245**

Penetrometer : CP15-CF75PB7SN2



CPT File Name : HEP-CPT-1245.000

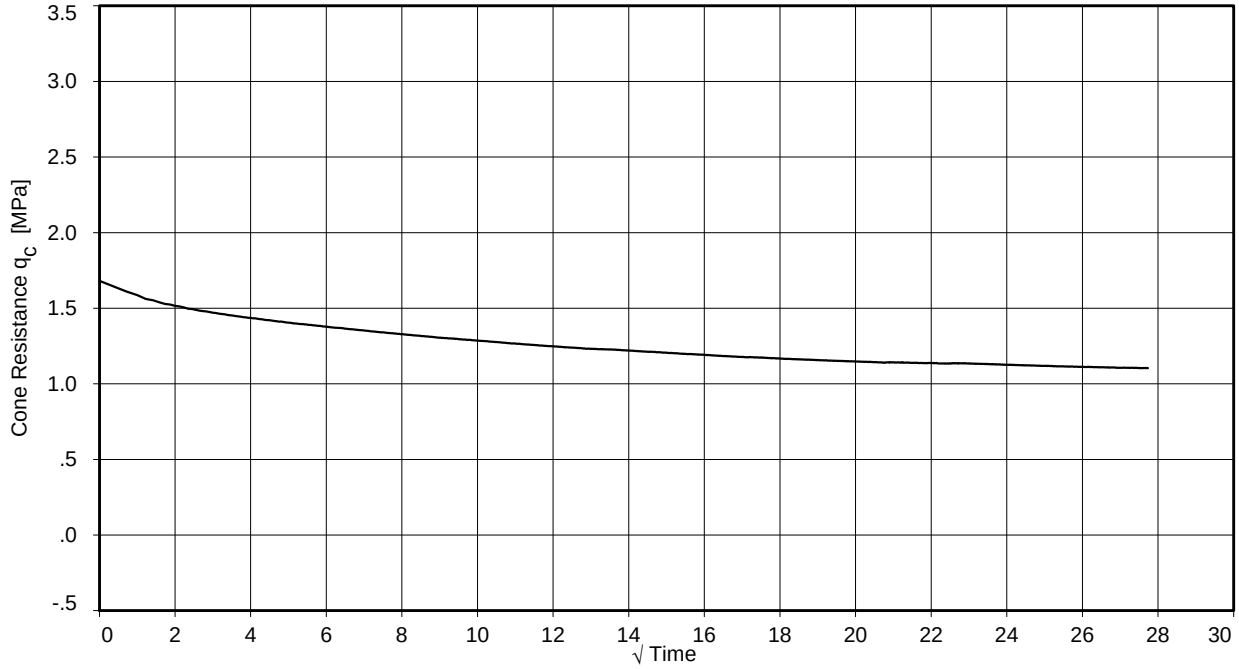


UNIPLOT 05.35.nl/05 Diss SqrTime Ch calculation u2.ucf/2018-06-08 11:35:14

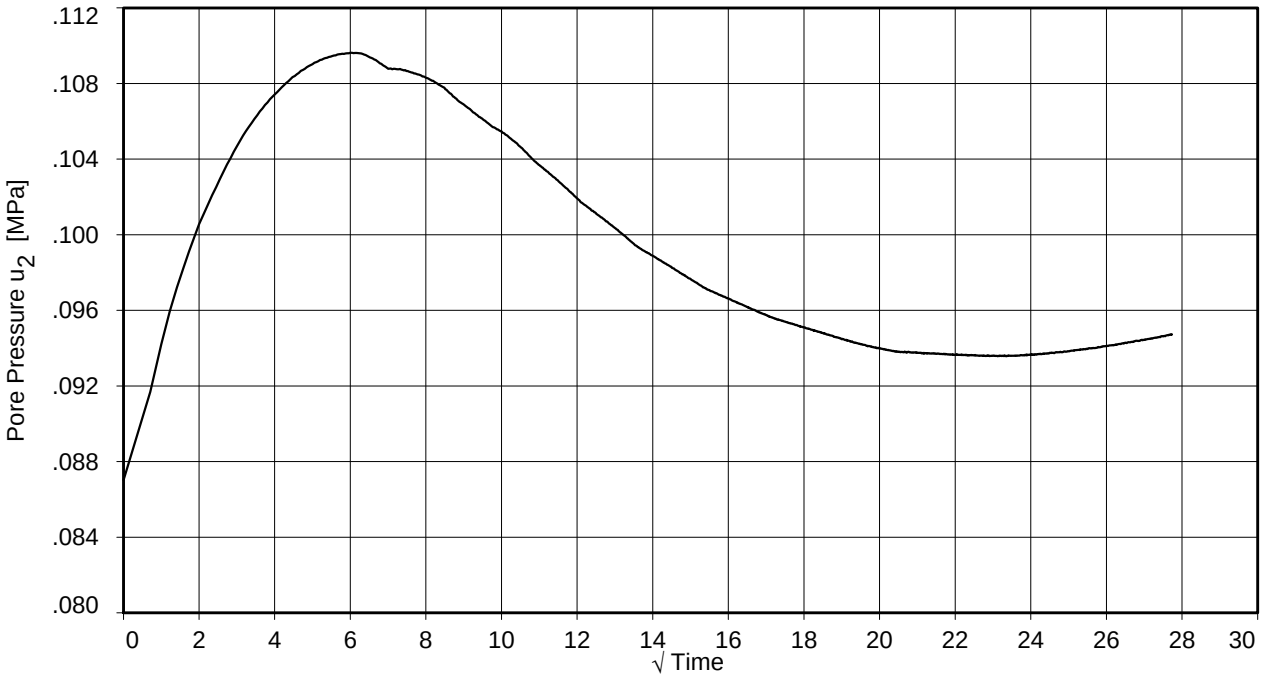
Pore Pressure U0%	:	0.395	MPa	U0%	:	at t=0 s	method
Pore Pressure U100%	:	0.076	MPa	U100%	:	hydrostatic	method
Dissipation Test No.	:	2		q_c at start	:	1.80	MPa
Dissipation Test Depth	:	8.66	m	q_c at end	:	1.17	MPa
Time at Start of Test	:	13:09		t50	:	363	s
Time at End of Test	:	13:44		c_h	:	3.25E-06	m²/s
Test Date	:	12-Dec-2017		k_h	:	1.78E-09	m/s
				Ir	:	100	
Remarks :				Eastings	:	503681	
				Northings	:	177435	
				Ground Level	:	+21.34	m OD

CPT No. : **HEP-CPT-1245**

Penetrometer : CP15-CF75PB7SN2



CPT File Name : HEP-CPT-1247.000

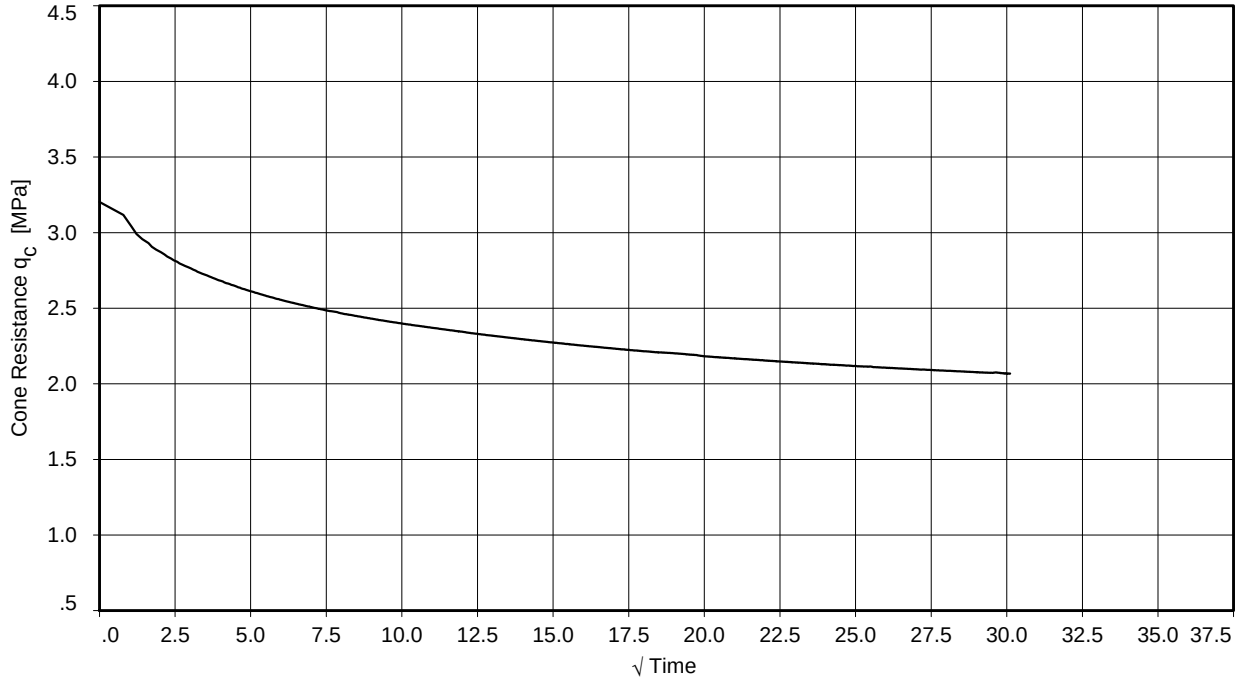


UNIPLOT 05.35.nl/05 Diss SqrTime Ch calculation u2.ucf/2018-06-08 11:35:15

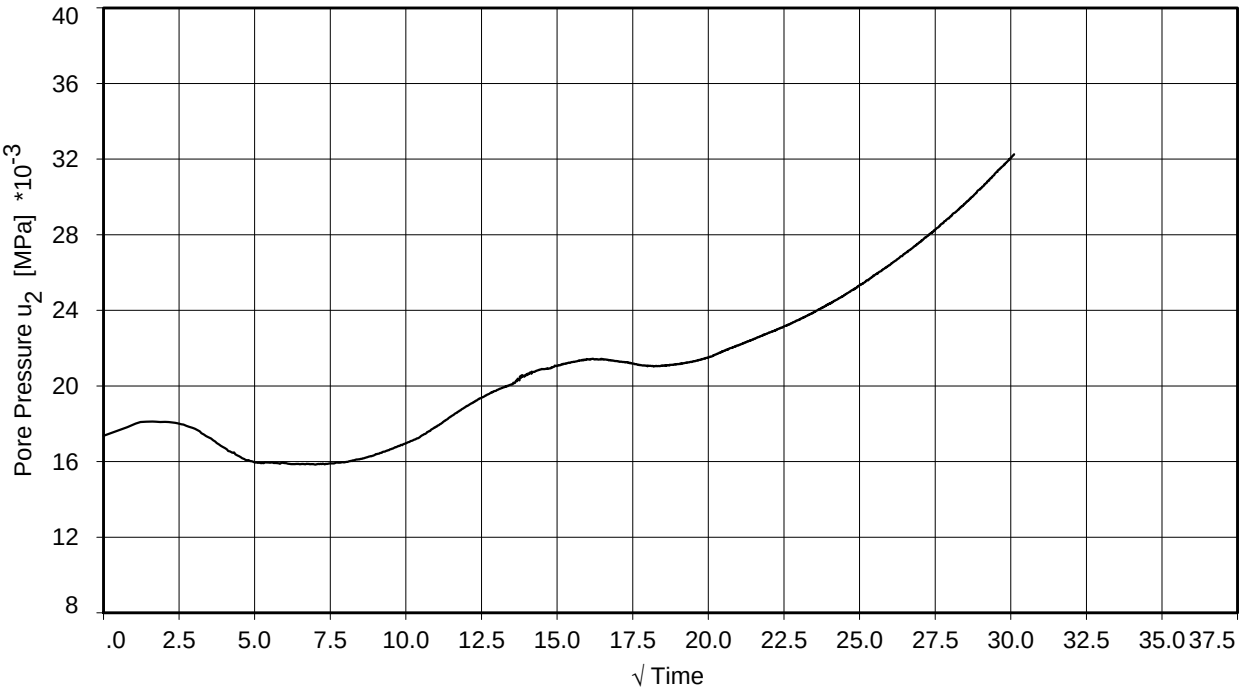
Pore Pressure U0%	:	--	MPa	U0%	:	--	method
Pore Pressure U100%	:	--	MPa	U100%	:	--	method
Dissipation Test No.	:	1		q_c at start	:	1.68	MPa
Dissipation Test Depth	:	8.19	m	q_c at end	:	1.10	MPa
Time at Start of Test	:	09:08		t50	:	--	s
Time at End of Test	:	09:21		c_h	:	--	m²/s
Test Date	:	13-Feb-2018		k_h	:	--	m/s
				Ir	:	--	
Remarks :				Eastings	:	503811	
				Northings	:	177274	
				Ground Level	:	+22.15	m OD

CPT No. : **HEP-CPT-1247**

Penetrometer : CP15-CF75PB7SN2



CPT File Name : HEP-CPT-1247.000

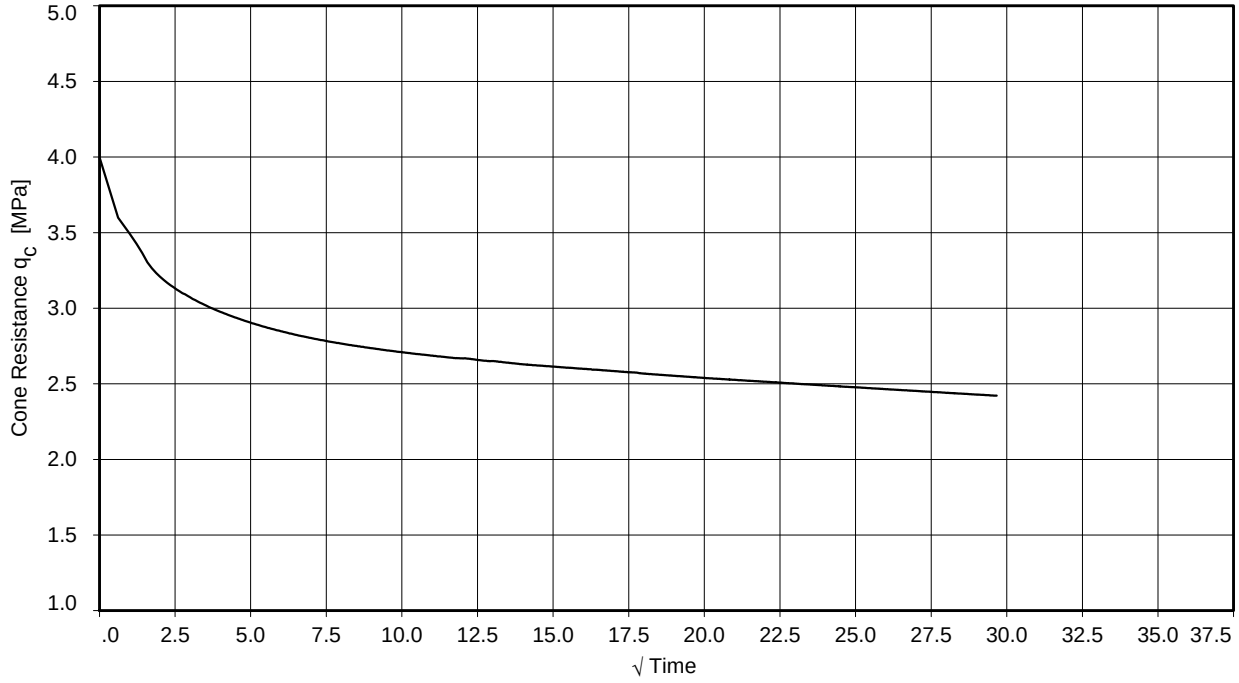


UNIPLOT 05.35.nl/05 Diss SqrTime Ch calculation u2.ucf/2018-06-08 11:35:15

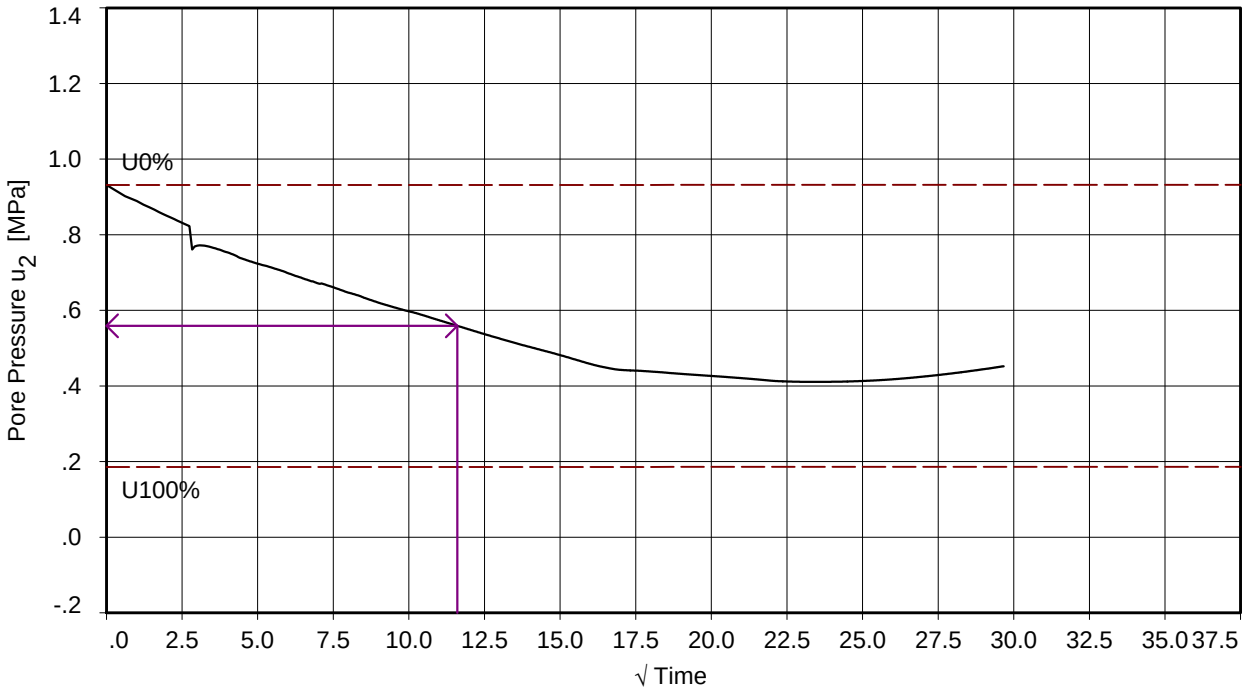
Pore Pressure U0%	:	--	MPa	U0%	:	--	method
Pore Pressure U100%	:	--	MPa	U100%	:	--	method
Dissipation Test No.	:	2		q_c at start	:	3.20	MPa
Dissipation Test Depth	:	16.15	m	q_c at end	:	2.07	MPa
Time at Start of Test	:	09:31		t50	:	--	s
Time at End of Test	:	09:47		c_h	:	--	m²/s
Test Date	:	13-Feb-2018		k_h	:	--	m/s
				Ir	:	--	
Remarks :				Eastings	:	503811	
				Northings	:	177274	
				Ground Level	:	+22.15	m OD

CPT No. : **HEP-CPT-1247**

Penetrometer : CP15-CF75PB7SN2



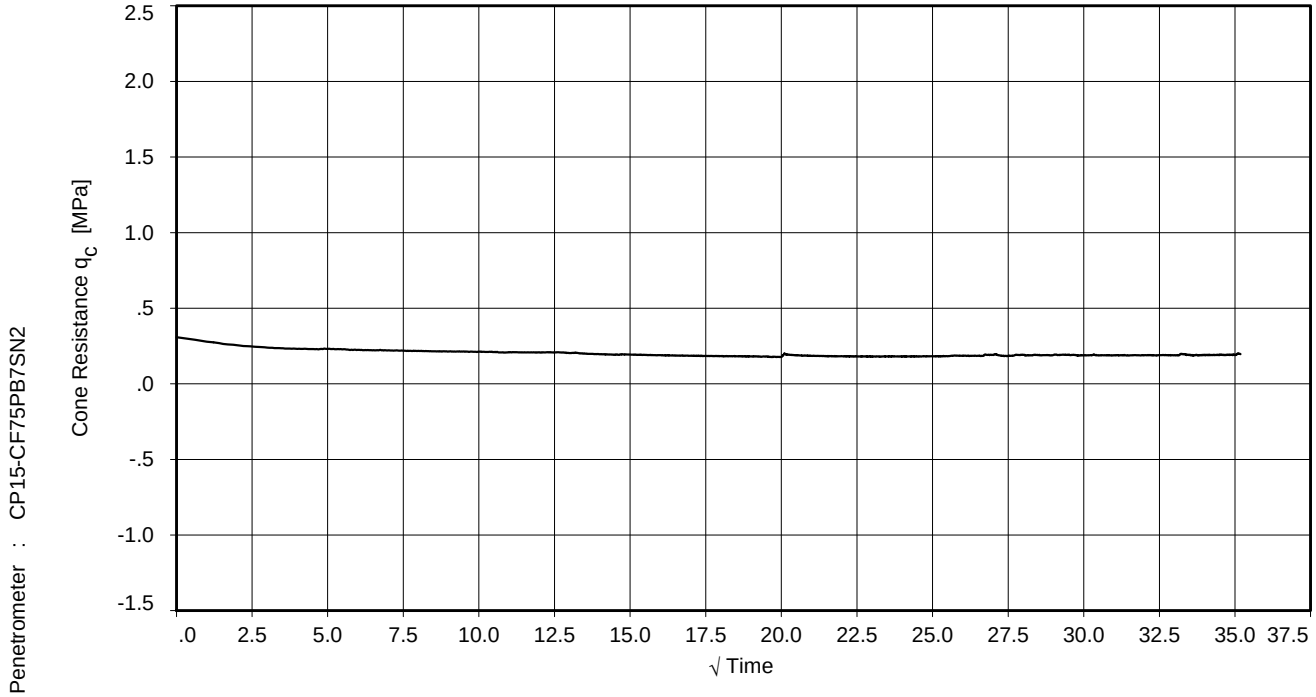
CPT File Name : HEP-CPT-1247.000

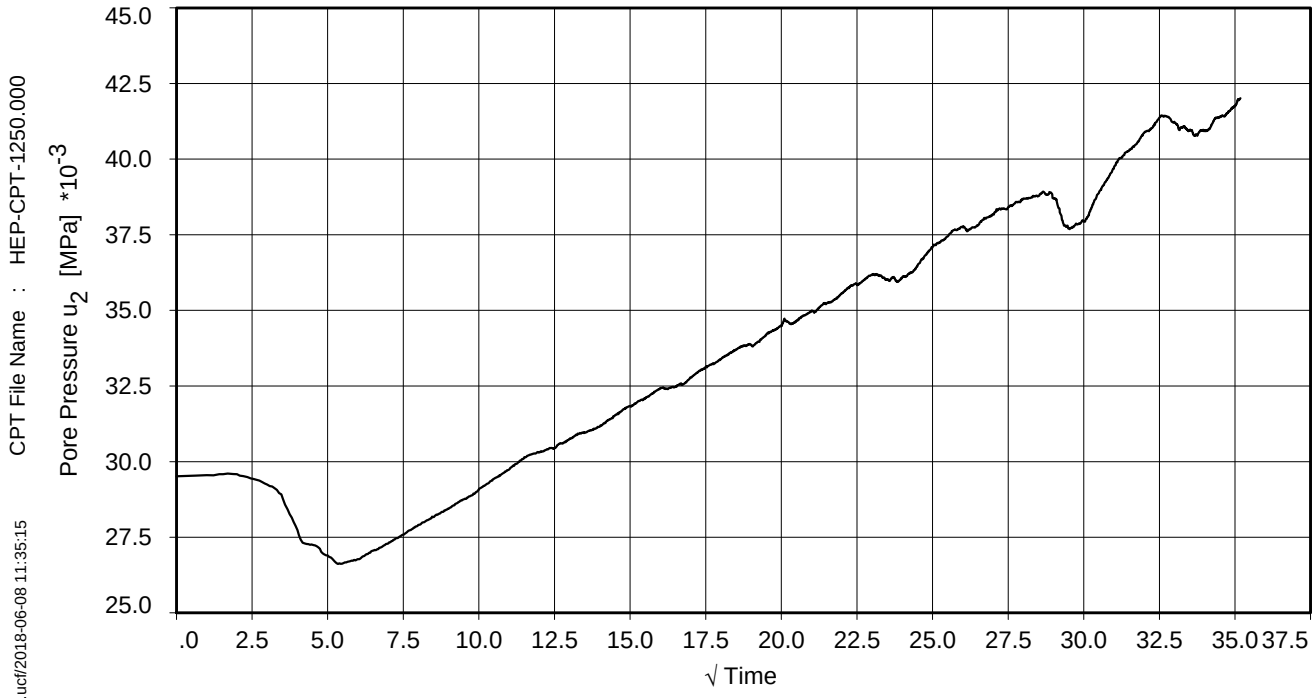


Pore Pressure U0%	:	0.932	MPa	U0%	:	at t=0 s	method
Pore Pressure U100%	:	0.186	MPa	U100%	:	hydrostatic	method
Dissipation Test No.	:	3		q_c at start	:	4.00	MPa
Dissipation Test Depth	:	19.89	m	q_c at end	:	2.42	MPa
Time at Start of Test	:	09:53		t50	:	135	s
Time at End of Test	:	10:08		c_h	:	8.76E-06	m²/s
Test Date	:	13-Feb-2018		k_h	:	2.51E-09	m/s
				Ir	:	100	
Remarks :				Eastings	:	503811	
				Northings	:	177274	
				Ground Level	:	+22.15	m OD

CPT No. : **HEP-CPT-1247**

UNIPLOT 05.35.nl/05 Diss SqrTime Ch calculation u2.ucf/2018-06-08 11:35:15



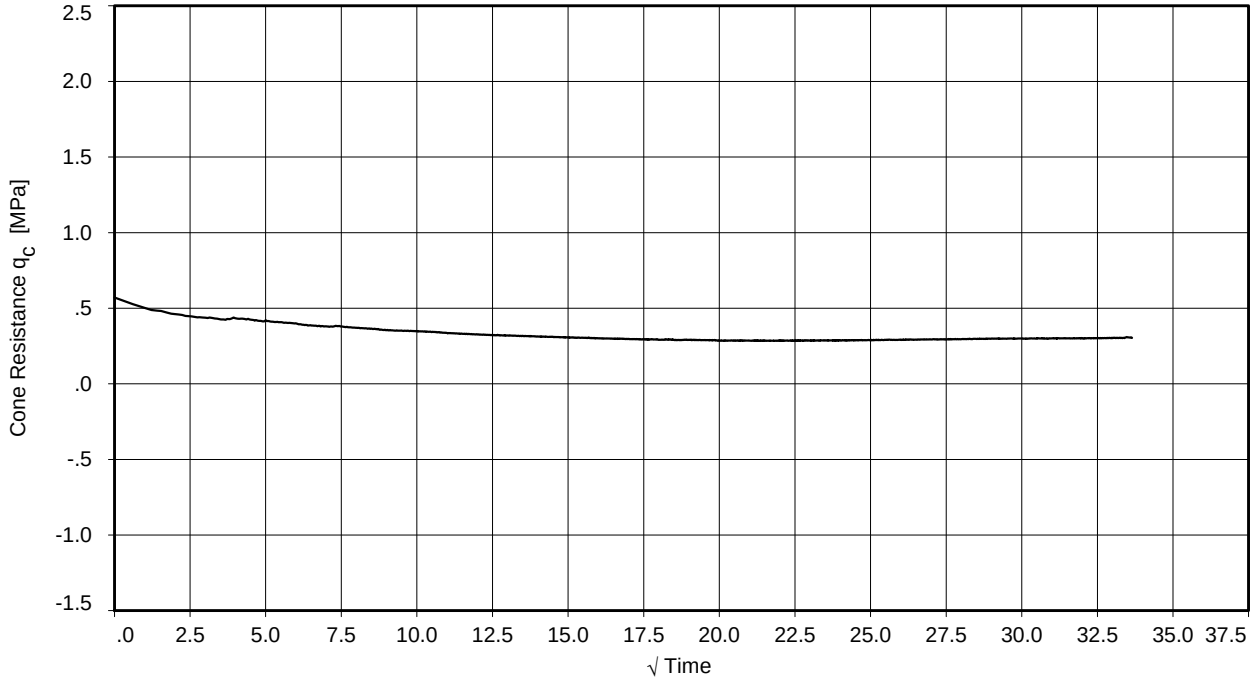


UNIPLOT 05.35.nl/05 Diss SqrTime Ch calculation u2.ucf/2018-06-08 11:35:15

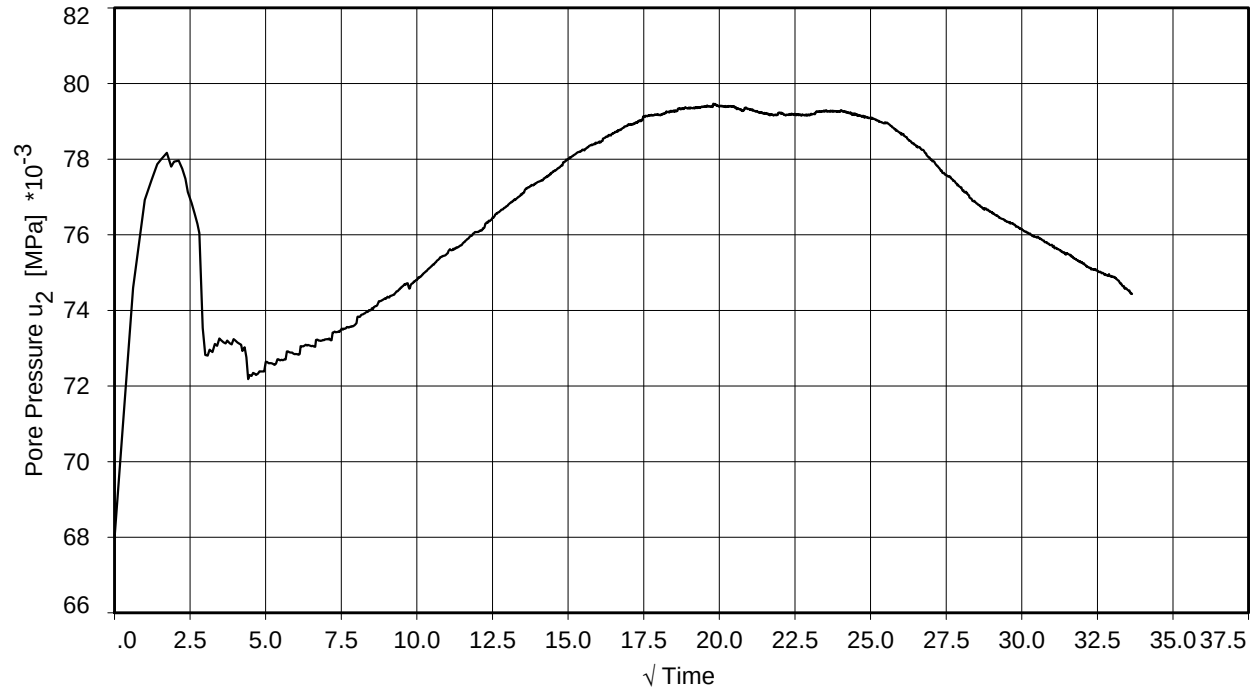
Pore Pressure U0%	:	--	MPa	U0%	:	--	method
Pore Pressure U100%	:	--	MPa	U100%	:	--	method
Dissipation Test No.	:	1		q_c at start	:	0.31	MPa
Dissipation Test Depth	:	2.80	m	q_c at end	:	0.20	MPa
Time at Start of Test	:	11:33		t50	:	--	s
Time at End of Test	:	11:53		c_h	:	--	m²/s
Test Date	:	15-Jan-2018		k_h	:	--	m/s
				Ir	:	--	
Remarks :				Eastings	:	503800	
				Northings	:	177245	
				Ground Level	:	+22.26	m OD

CPT No. : **HEP-CPT-1250**

Penetrometer : CP15-CF75PB7SN2



CPT File Name : HEP-CPT-1250.000

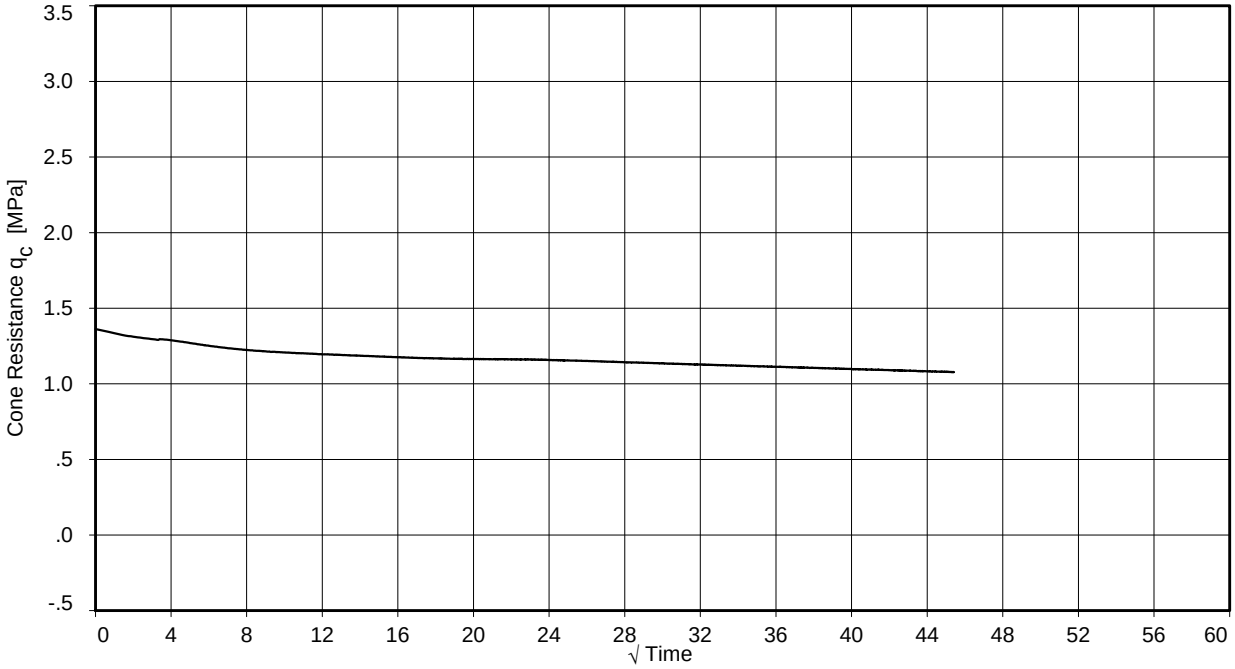


UNIPLOT 05.35.nl/05 Diss SqrTime Ch calculation u2.ucf/2018-06-08 11:35:15

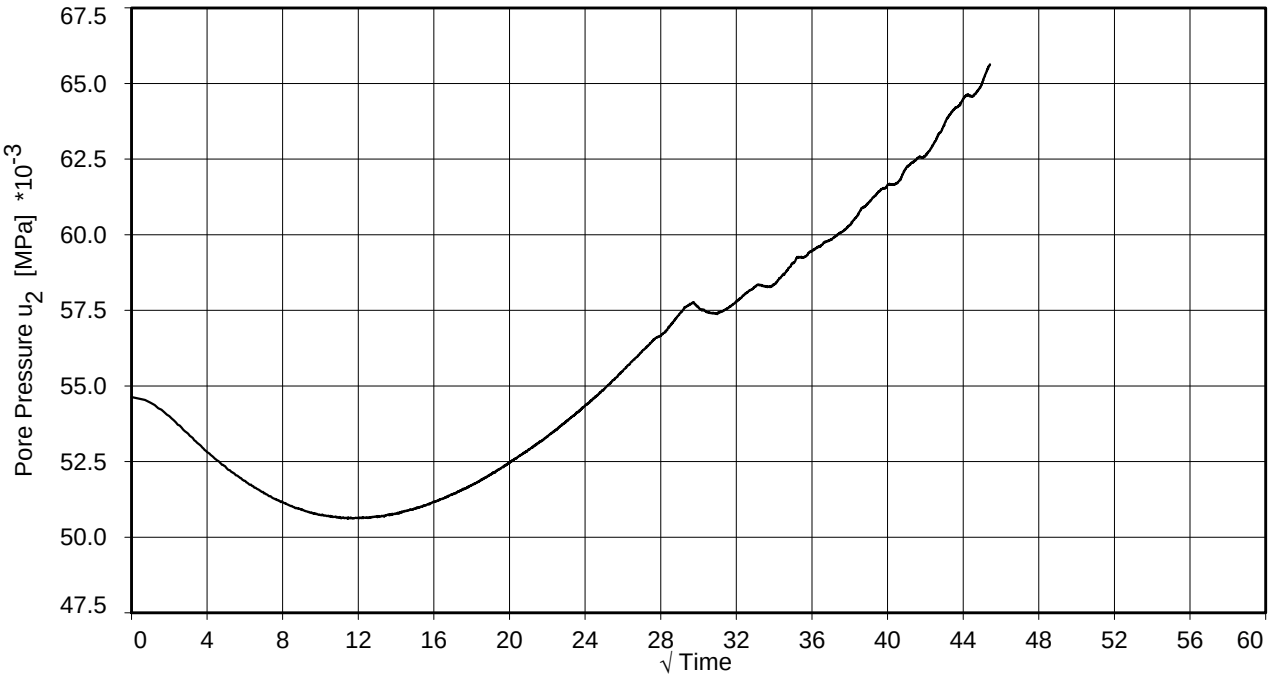
Pore Pressure U0%	:	--	MPa	U0%	:	--	method
Pore Pressure U100%	:	--	MPa	U100%	:	--	method
Dissipation Test No.	:	2		q_c at start	:	0.57	MPa
Dissipation Test Depth	:	4.02	m	q_c at end	:	0.30	MPa
Time at Start of Test	:	12:00		t50	:	--	s
Time at End of Test	:	12:19		c_h	:	--	m²/s
Test Date	:	15-Jan-2018		k_h	:	--	m/s
				Ir	:	--	
Remarks :				Eastings	:	503800	
				Northings	:	177245	
				Ground Level	:	+22.26	m OD

CPT No. : **HEP-CPT-1250**

Penetrometer : CP15-CF75PB7SN2



CPT File Name : HEP-CPT-1250.000

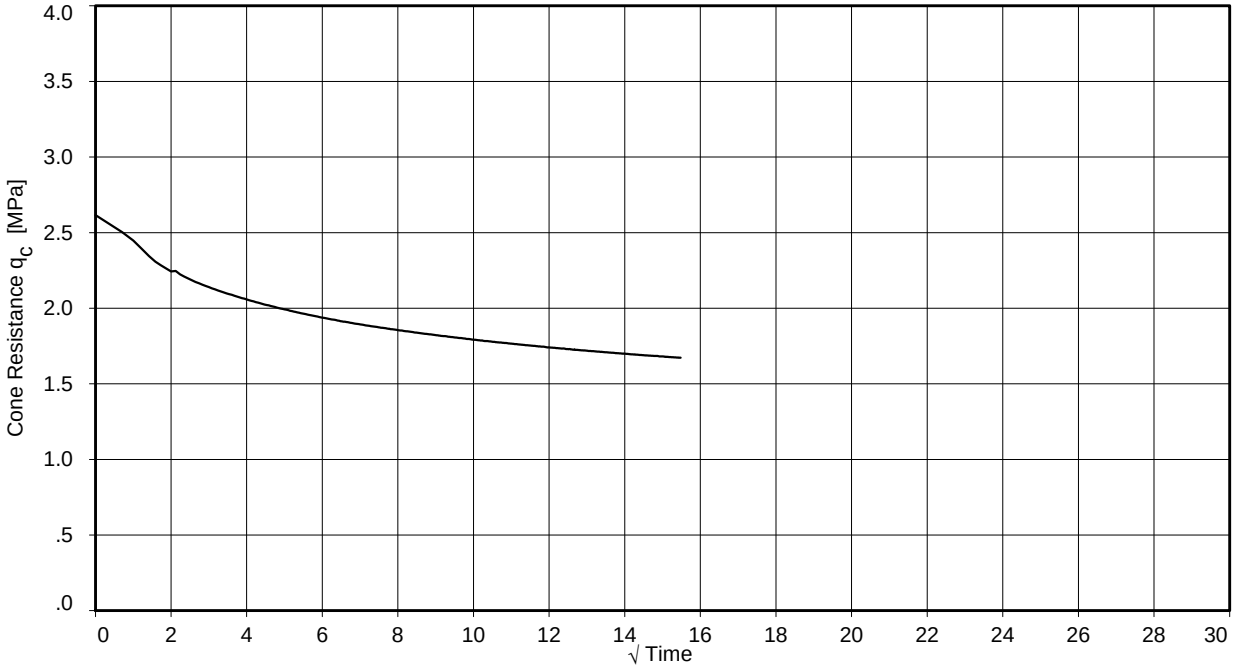


UNIPLOT 05.35.nl/05 Diss SqrTime Ch calculation u2.ucf/2018-06-08 11:35:15

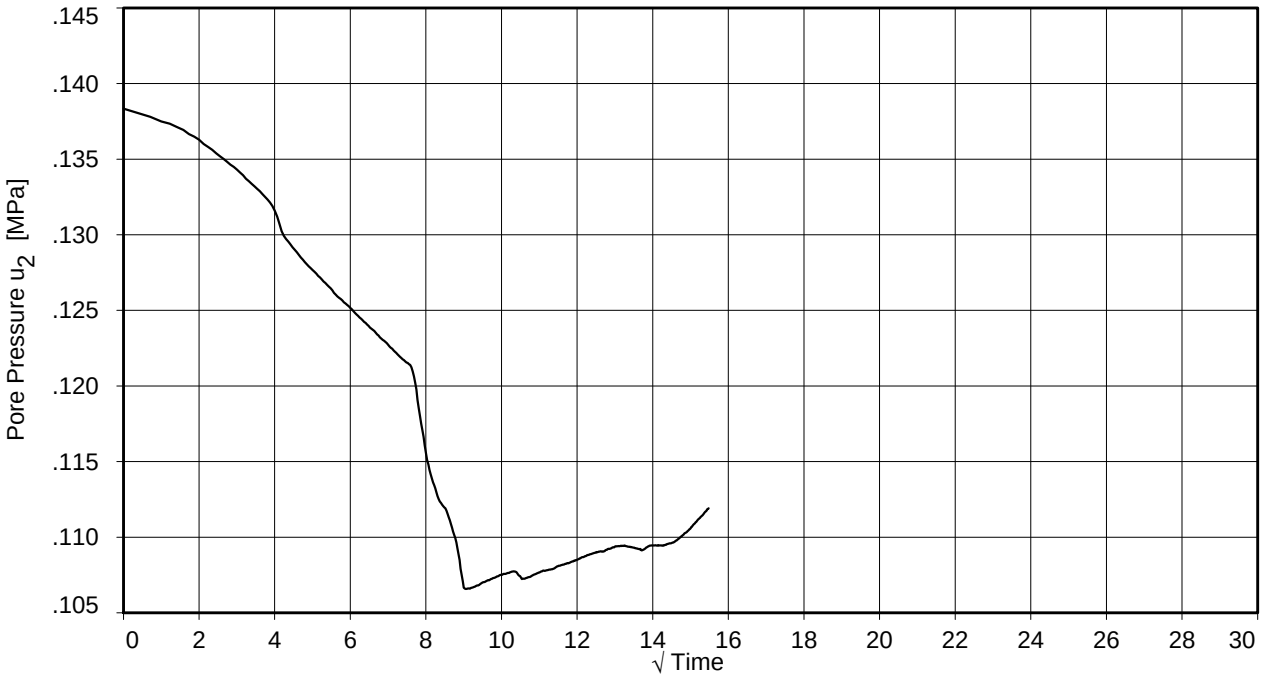
Pore Pressure U0%	:	--	MPa	U0%	:	--	method
Pore Pressure U100%	:	--	MPa	U100%	:	--	method
Dissipation Test No.	:	3		q_c at start	:	1.36	MPa
Dissipation Test Depth	:	11.27	m	q_c at end	:	1.08	MPa
Time at Start of Test	:	12:27		t50	:	--	s
Time at End of Test	:	13:01		c_h	:	--	m²/s
Test Date	:	15-Jan-2018		k_h	:	--	m/s
				Ir	:	--	
Remarks :				Eastings	:	503800	
				Northings	:	177245	
				Ground Level	:	+22.26	m OD

CPT No. : **HEP-CPT-1250**

Penetrometer : CP15-CF75PB7SN2



CPT File Name : HEP-CPT-1250.000

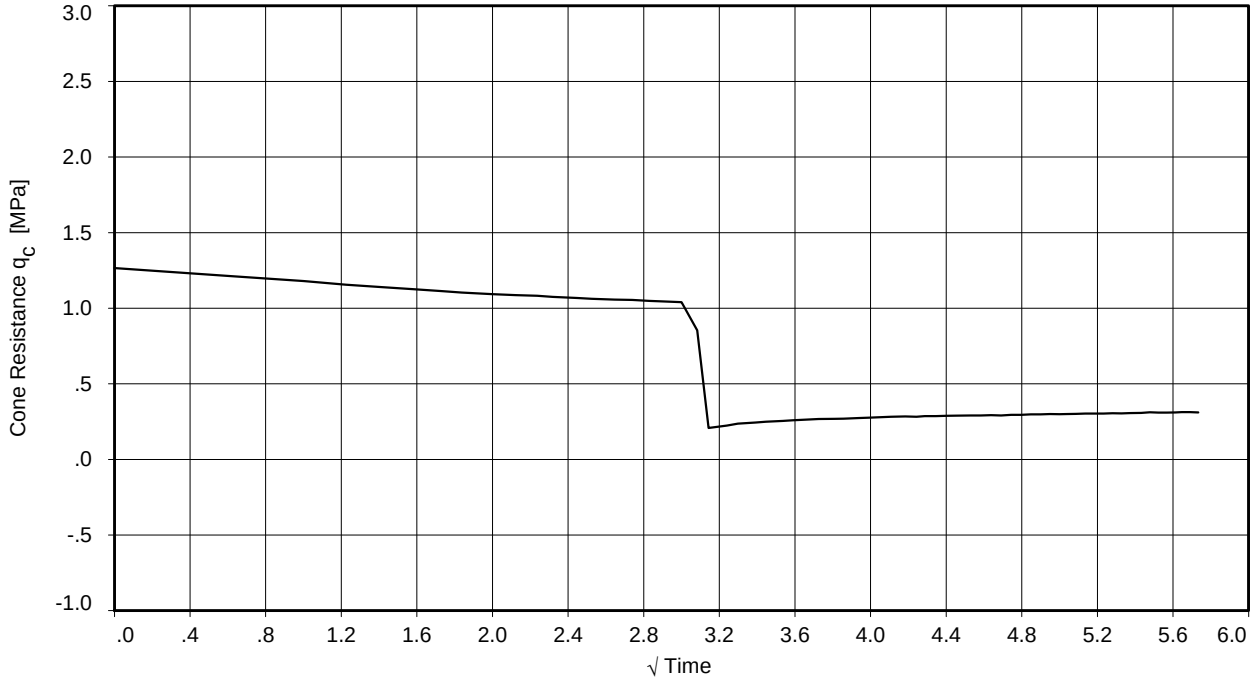


UNIPLOT 05.35.nl/05 Diss SqrTime Ch calculation u2.ucf/2018-06-08 11:35:15

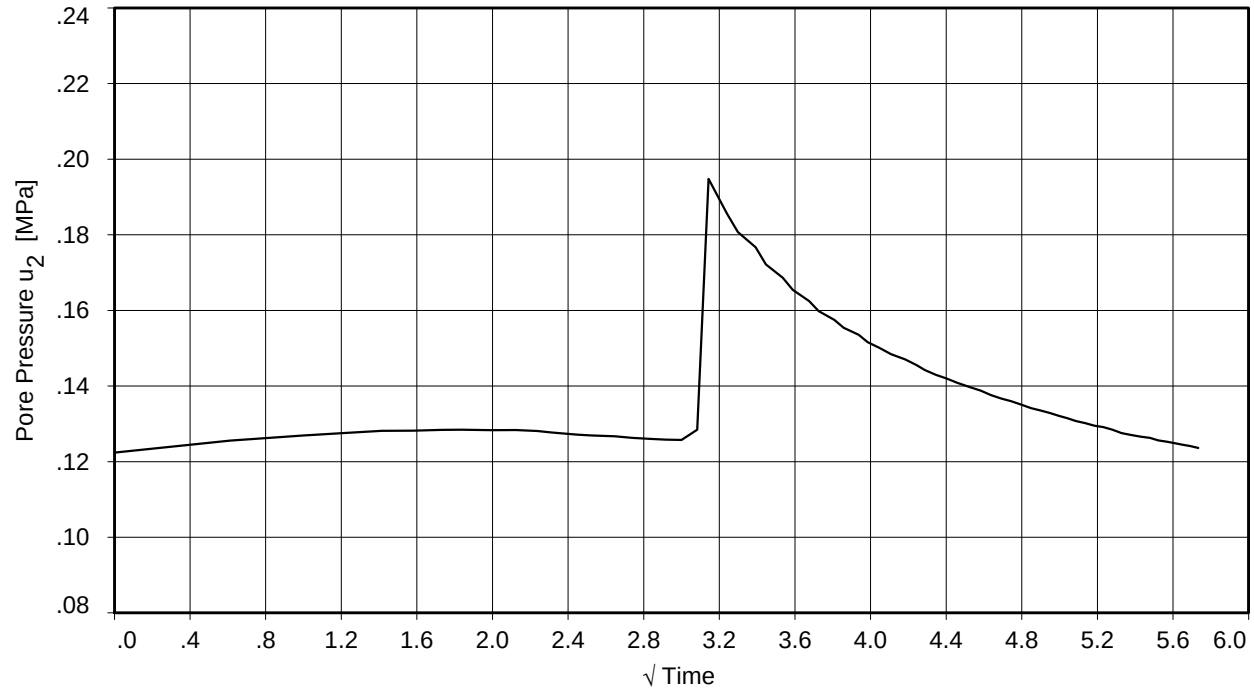
Pore Pressure U0%	:	--	MPa	U0%	:	--	method
Pore Pressure U100%	:	--	MPa	U100%	:	--	method
Dissipation Test No.	:	4		q_c at start	:	2.62	MPa
Dissipation Test Depth	:	13.60	m	q_c at end	:	1.67	MPa
Time at Start of Test	:	13:04		t50	:	--	s
Time at End of Test	:	13:08		c_h	:	--	m²/s
Test Date	:	15-Jan-2018		k_h	:	--	m/s
				Ir	:	--	
Remarks :				Eastings	:	503800	
				Northings	:	177245	
				Ground Level	:	+22.26	m OD

CPT No. : **HEP-CPT-1250**

Penetrometer : CP15-CF75PB7SN2



CPT File Name : HEP-CPT-1251.000

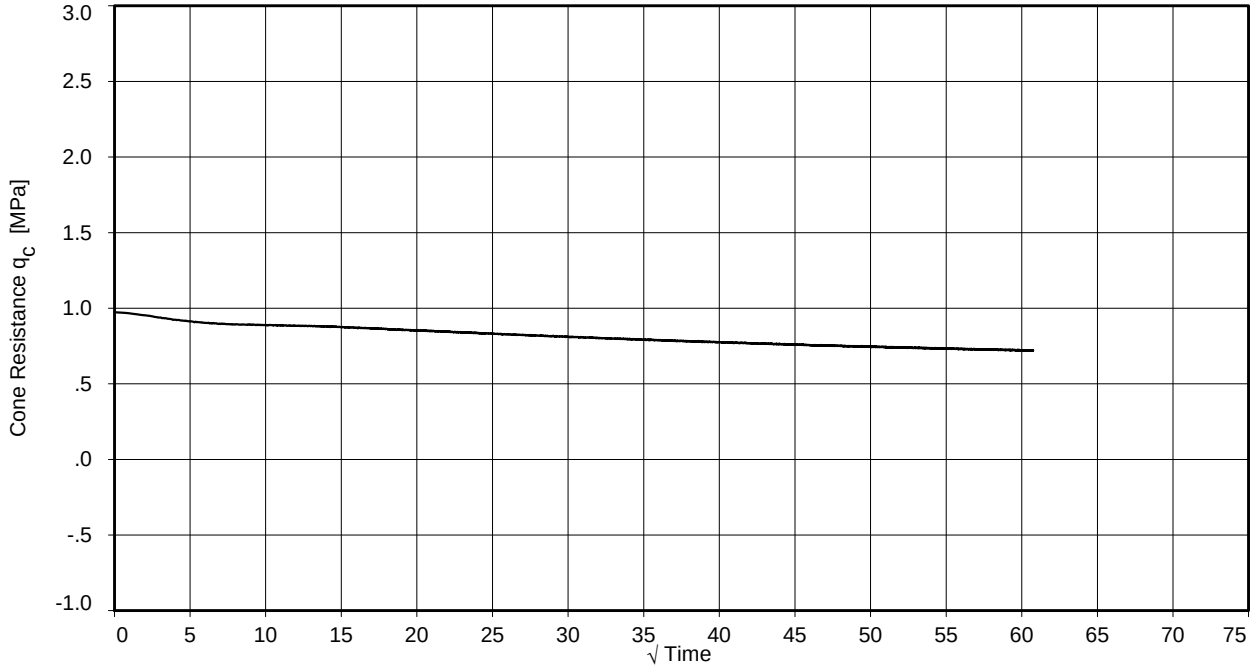


UNIPLOT 05.35.nl/05 Diss SqrTime Ch calculation u2.ucf/2018-06-08 11:35:15

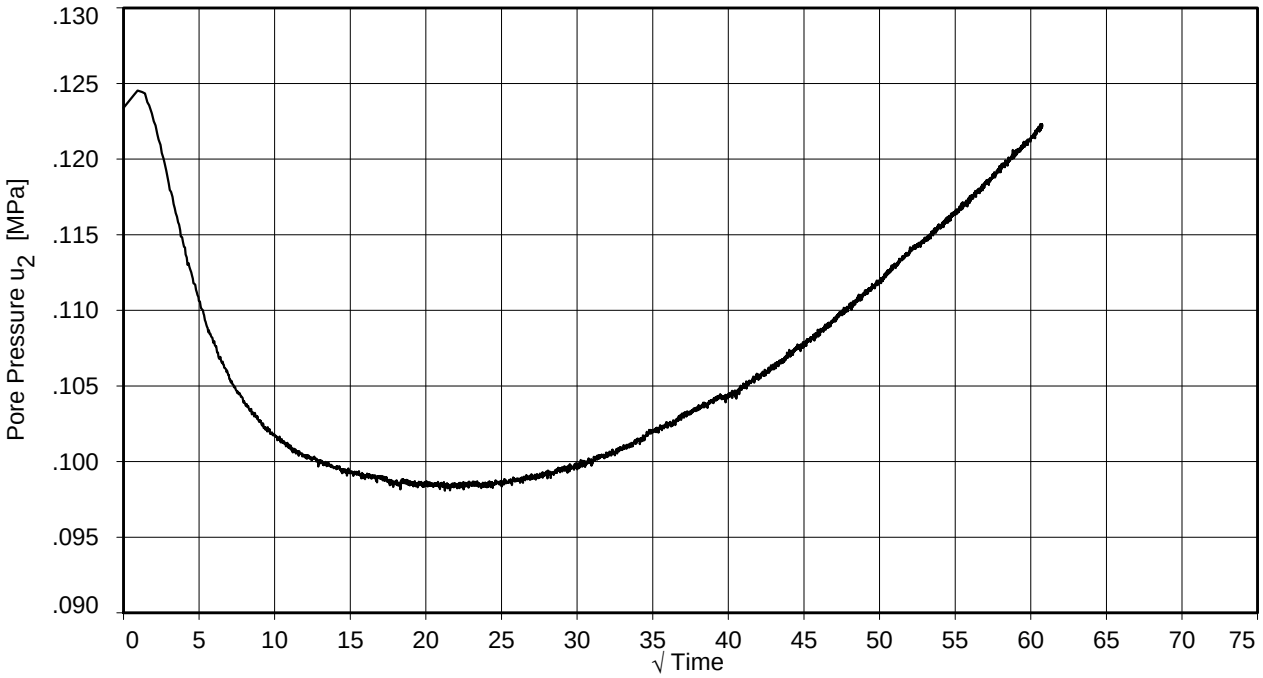
Pore Pressure U0%	:	--	MPa	U0%	:	--	method
Pore Pressure U100%	:	--	MPa	U100%	:	--	method
Dissipation Test No.	:	1		q_c at start	:	1.27	MPa
Dissipation Test Depth	:	7.05	m	q_c at end	:	0.31	MPa
Time at Start of Test	:	17:34		t50	:	--	s
Time at End of Test	:	17:34		c_h	:	--	m²/s
Test Date	:	22-Mar-2018		k_h	:	--	m/s
				Ir	:	--	
Remarks :				Eastings	:	503702	
				Northings	:	177238	
				Ground Level	:	+22.41	m OD

CPT No. : **HEP-CPT-1251**

Penetrometer : CP15-CF75PB7SN2



CPT File Name : HEP-CPT-1251.000

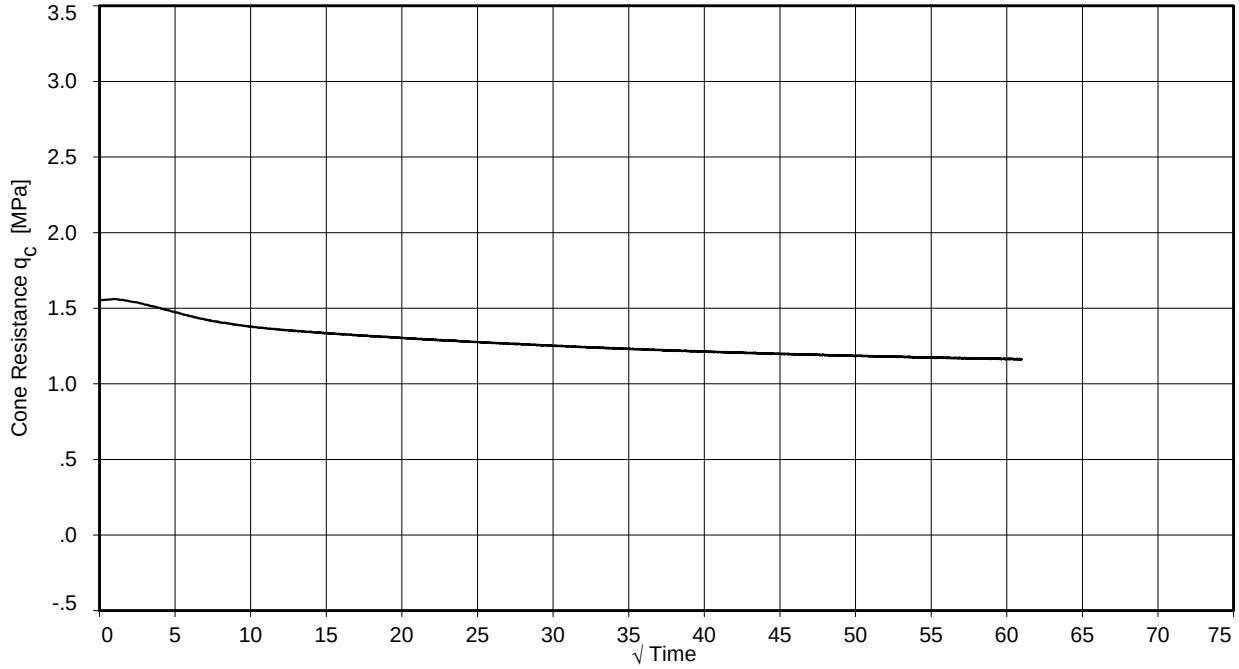


UNIPLOT 05.35.nl/05 Diss SqrTime Ch calculation u2.ucf/2018-06-08 11:35:15

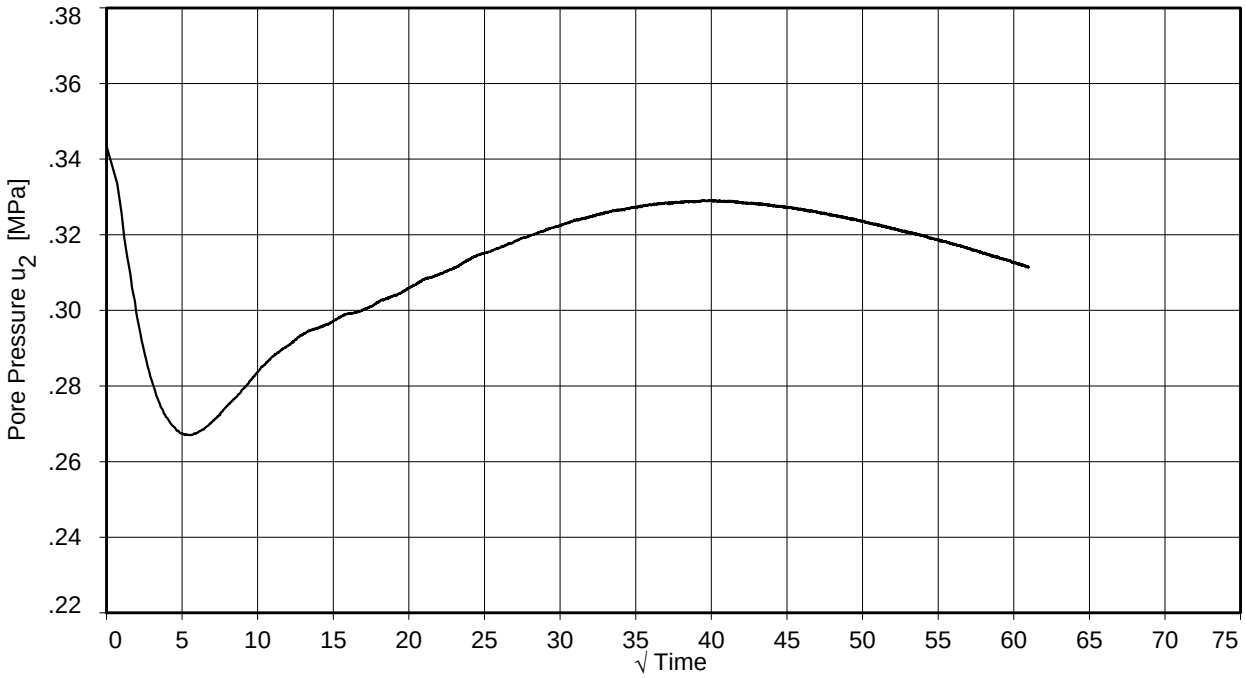
Pore Pressure U0%	:	--	MPa	U0%	:	--	method
Pore Pressure U100%	:	--	MPa	U100%	:	--	method
Dissipation Test No.	:	2		q_c at start	:	0.97	MPa
Dissipation Test Depth	:	7.14	m	q_c at end	:	0.72	MPa
Time at Start of Test	:	17:34		t50	:	--	s
Time at End of Test	:	18:36		c_h	:	--	m²/s
Test Date	:	22-Mar-2018		k_h	:	--	m/s
				Ir	:	--	
Remarks :				Eastings	:	503702	
				Northings	:	177238	
				Ground Level	:	+22.41	m OD

CPT No. : **HEP-CPT-1251**

Penetrometer : CP15-CF75PB7SN2



CPT File Name : HEP-CPT-1251.000



UNIPLOT 05.35.nl/05 Diss SqrTime Ch calculation u2.ucf/2018-06-08 11:35:16

Pore Pressure U0%	:	--	MPa	U0%	:	--	method
Pore Pressure U100%	:	--	MPa	U100%	:	--	method
Dissipation Test No.	:	3		q_c at start	:	1.55	MPa
Dissipation Test Depth	:	9.72	m	q_c at end	:	1.16	MPa
Time at Start of Test	:	18:39		t50	:	--	s
Time at End of Test	:	19:41		c_h	:	--	m²/s
Test Date	:	22-Mar-2018		k_h	:	--	m/s
				Ir	:	--	
Remarks :				Eastings	:	503702	
				Northings	:	177238	
				Ground Level	:	+22.41	m OD

CPT No. : **HEP-CPT-1251**

G. MONITORING WITHIN INSTALLATIONS PRIOR TO DEVELOPMENT

G.1 GROUNDWATER MONITORING

Records of Water Levels in Installations Prior to Development (referenced by Position ID)

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1**
	Fugro Reference	G170029U			
	Coordinates (m)	E502968.35 N178031.03	Ground Elevation (m Datum)	21.19	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Record of Water Levels in Installations

Installation Details

		Depth from (m)	Depth to (m)	Pipe Type
Installation Type	Standpipe	0.00	1.40	Plain
Cover Details	Upstanding cover	1.40	4.80	Slotted
Response Zone	1.30 m to 4.80 m			
Installation Date	11/12/2017			

Reading Details

Date	Time	Operator	Depth to Water (m)	Water Level (m Datum)	Remarks
09/01/2018	10:00	AF	0.24	20.95	base 4.25m
18/01/2018	13:00	DM	0.35	20.84	base 4.23m
06/02/2018	11:52	DM	0.51	20.68	base 4.22m
14/02/2018	14:00	DM	0.25	20.94	base 4.22m

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	JPD/ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL Installation Summary.hbt/Config Fugro Rev4/26/06/2018/TS				Print Date	15/08/2018

FUGRO	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-2**
	Fugro Reference	G170029U			
	Coordinates (m)	E502851.70 N177915.70	Ground Elevation (m Datum)	21.28	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Record of Water Levels in Installations

Installation Details

		Depth from (m)	Depth to (m)	Pipe Type
Installation Type	Standpipe	0.00	1.50	Plain
Cover Details	Upstanding cover	1.50	4.50	Slotted
Response Zone	1.40 m to 4.50 m			
Installation Date	06/12/2017			

Reading Details

Date	Time	Operator	Depth to Water (m)	Water Level (m Datum)	Remarks
30/01/2018	12:40	DM	0.38	20.90	base 4.53m
13/02/2018	13:20	DM	0.33	20.95	base 4.51m
21/02/2018	14:20	DM	0.38	20.90	base 4.50m

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL Installation Summary.hbt/Config Fugro Rev4/26/06/2018/TS				Print Date	15/08/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-5**
	Fugro Reference	G170029U			
	Coordinates (m)	E502904.66 N177886.50	Ground Elevation (m Datum)	21.92	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Record of Water Levels in Installations

Installation Details

Installation Type	Standpipe	Depth from (m)	Depth to (m)	Pipe Type
Cover Details	Flush cover	0.00	1.20	Plain
Response Zone	1.00 m to 9.20 m	1.20	9.20	Slotted
Installation Date	20/12/2017			

Reading Details

Date	Time	Operator	Depth to Water (m)	Water Level (m Datum)	Remarks
20/12/2017	12:00		1.50	20.42	
03/01/2018	15:00	AF	1.10	20.82	base 9.07m
18/01/2018	16:00	DM	1.00	20.92	base 9.10m
30/01/2018	12:37	DM	0.93	20.99	base 8.99m
13/02/2018	13:12	DM	0.87	21.05	base 8.99m
21/02/2018	14:10	DM	0.94	20.98	base 9.00m

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL Installation Summary.hbt/Config Fugro Rev4/26/06/2018/TS				Print Date	15/08/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-7**
	Fugro Reference	G170029U			
	Coordinates (m)	E502717.19 N177587.93	Ground Elevation (m Datum)	20.45	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Record of Water Levels in Installations

Installation Details

		Depth from (m)	Depth to (m)	Pipe Type
Installation Type	Standpipe	0.00	1.00	Plain
Cover Details	Upstanding cover	1.00	5.00	Slotted
Response Zone	0.90 m to 5.00 m			
Installation Date	14/12/2017			

Reading Details

Date	Time	Operator	Depth to Water (m)	Water Level (m Datum)	Remarks
30/01/2018	12:31	DM	0.88	19.57	base 4.93m
13/02/2018	14:35	DM	0.59	19.86	base 4.95m
21/02/2018	14:00	DM	0.62	19.83	base 4.93m

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL Installation Summary.hbt/Config Fugro Rev4/26/06/2018/TS				Print Date	15/08/2018

FUGRO	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-12**
	Fugro Reference	G170029U			
	Coordinates (m)	E503339.66 N178074.55	Ground Elevation (m Datum)	21.83	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Record of Water Levels in Installations

Installation Details

Installation Type	Standpipe	Depth from (m)	Depth to (m)	Pipe Type
Cover Details	Upstanding cover	-0.15	1.70	Plain
Response Zone	1.55 m to 5.00 m	1.70	5.00	Slotted
Installation Date	04/12/2017			

Reading Details

Date	Time	Operator	Depth to Water (m)	Water Level (m Datum)	Remarks
06/02/2018	12:12	DM	1.15	20.68	base 4.96m
14/02/2018	14:35	DM	1.07	20.76	base 4.96m

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL Installation Summary.hbt/Config Fugro Rev4/26/06/2018/TS				Print Date	15/08/2018

FUGRO	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-14**
	Fugro Reference	G170029U			
	Coordinates (m)	E503185.98 N177771.99	Ground Elevation (m Datum)	24.48	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Record of Water Levels in Installations

Installation Details

		Depth from (m)	Depth to (m)	Pipe Type
Installation Type	Standpipe	1.20	7.10	Slotted
Cover Details	Upstanding cover	13.50	1.20	Plain
Response Zone	1.00 m to 7.10 m			
Installation Date	15/12/2017			

Reading Details

Date	Time	Operator	Depth to Water (m)	Water Level (m Datum)	Remarks
17/01/2018	00:00	DM	3.75	20.73	base 7.14m
13/02/2018	13:45	DM	3.57	20.91	base 7.12m
19/02/2018	00:00	DM	3.60	20.88	base 7.15m

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL Installation Summary.hbt/Config Fugro Rev4/26/06/2018/TS				Print Date	15/08/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-16**
	Fugro Reference	G170029U			
	Coordinates (m)	E502896.89 N177515.44	Ground Elevation (m Datum)	22.89	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Record of Water Levels in Installations

Installation Details

		Depth from (m)	Depth to (m)	Pipe Type
Installation Type	Standpipe	0.00	1.20	Plain
Cover Details	Upstanding cover	1.20	6.90	Slotted
Response Zone	1.00 m to 6.90 m			
Installation Date	15/12/2017			

Reading Details

Date	Time	Operator	Depth to Water (m)	Water Level (m Datum)	Remarks
15/12/2017	13:25		3.50	19.39	
30/01/2018	12:06	DM	3.11	19.78	base 6.93m
13/02/2018	14:10	DM	3.12	19.77	base 6.90m

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL Installation Summary.hbt/Config Fugro Rev4/26/06/2018/TS				Print Date	15/08/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-17**
	Fugro Reference	G170029U			
	Coordinates (m)	E503319.45 N177736.50	Ground Elevation (m Datum)	23.25	Sheet 1 of 1
	Hole Type	Hollow Stem Auger			Status: Final

Record of Water Levels in Installations

Installation Details

Installation Type	Gas Monitoring Point	Depth from (m)	Depth to (m)	Pipe Type
Cover Details	Flush cover	0.00	1.10	Plain
Response Zone	0.70 m to 2.00 m	1.10	2.00	Slotted
Installation Date	12/12/2017			

Reading Details

Date	Time	Operator	Depth to Water (m)	Water Level (m Datum)	Remarks
06/02/2018	12:40	DM	1.92	21.33	base 2.13m
13/02/2018	11:10	DM	1.60	21.65	base 3.16m
21/02/2018	12:55	DM	1.51	21.74	base 3.16m

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL Installation Summary.hbt/Config Fugro Rev4/26/06/2018/TS				Print Date	15/08/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-20**
	Fugro Reference	G170029U			
	Coordinates (m)	E503124.67 N177494.87	Ground Elevation (m Datum)	23.23	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Record of Water Levels in Installations

Installation Details

		Depth from (m)	Depth to (m)	Pipe Type
Installation Type	Standpipe	0.00	1.10	Plain
Cover Details	Flush cover	1.10	5.70	Slotted
Response Zone	1.00 m to 5.70 m			
Installation Date	19/12/2017			

Reading Details

Date	Time	Operator	Depth to Water (m)	Water Level (m Datum)	Remarks
17/01/2018	00:00	DM	2.90	20.33	base 5.63m
30/01/2018	11:55	DM	2.73	20.50	base 5.63m
13/02/2018	10:55	DM	2.68	20.55	base 5.63m
21/02/2018	13:15	DM	2.76	20.47	base 5.63m

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL Installation Summary.hbt/Config Fugro Rev4/26/06/2018/TS				Print Date	15/08/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-22**
	Fugro Reference	G170029U			
	Coordinates (m)	E503492.64 N177835.20	Ground Elevation (m Datum)	23.64	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Record of Water Levels in Installations

Installation Details

Installation Type	Standpipe	Depth from (m)	Depth to (m)	Pipe Type
Cover Details	Flush cover	0.00	3.00	Plain
Response Zone	2.90 m to 6.50 m	3.00	6.50	Slotted
Installation Date	23/11/2017			

Reading Details

Date	Time	Operator	Depth to Water (m)	Water Level (m Datum)	Remarks
23/11/2017	15:50		5.00	18.64	
09/01/2018	10:00	AF	2.46	21.18	base 6.73m
17/01/2018	13:00	DM	2.40	21.24	base 6.75m
30/01/2018	14:00	DM	2.23	21.41	base 6.74m
13/02/2018	14:59	DM	1.90	21.74	base 6.75m
21/02/2018	12:45	DM	2.09	21.55	base 6.75m

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL Installation Summary.hbt/Config Fugro Rev4/26/06/2018/TS				Print Date	15/08/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-23**
	Fugro Reference	G170029U			
	Coordinates (m)	E503607.08 N177882.14	Ground Elevation (m Datum)	22.37	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Record of Water Levels in Installations

Installation Details

		Depth from (m)	Depth to (m)	Pipe Type
Installation Type	Standpipe	0.00	3.00	Plain
Cover Details	Flush cover	3.00	4.70	Slotted
Response Zone	2.90 m to 4.70 m			
Installation Date	07/12/2017			

Reading Details

Date	Time	Operator	Depth to Water (m)	Water Level (m Datum)	Remarks
09/01/2018	10:00	AF	1.44	20.93	base 4.82m
18/01/2018	13:00	DM	1.42	20.95	base 4.83m
30/01/2018	14:00	DM	1.33	21.04	base 4.84m
13/02/2018	13:01	DM	1.34	21.03	base 4.83m
21/02/2018	12:30	DM	1.33	21.04	base 4.82m

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL Installation Summary.hbt/Config Fugro Rev4/26/06/2018/TS				Print Date	15/08/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-25**
	Fugro Reference	G170029U			
	Coordinates (m)	E503177.28 N177424.13	Ground Elevation (m Datum)	23.15	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Record of Water Levels in Installations

Installation Details

Installation Type	Standpipe	Depth from (m)	Depth to (m)	Pipe Type
Cover Details	Flush cover	0.00	3.10	Plain
Response Zone	3.00 m to 6.50 m	3.10	6.50	Slotted
Installation Date	13/12/2017			

Reading Details

Date	Time	Operator	Depth to Water (m)	Water Level (m Datum)	Remarks
13/12/2017	14:30		2.44	20.71	
10/01/2018	13:00	DM	3.40	19.75	base 6.45m
30/01/2018	11:40	DM	3.42	19.73	base 6.48m
13/02/2018	10:40	DM	3.42	19.73	base 6.45m
19/02/2018	12:10	DM	3.42	19.73	base 6.46m

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL Installation Summary.hbt/Config Fugro Rev4/26/06/2018/TS				Print Date	15/08/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-27**
	Fugro Reference	G170029U			
	Coordinates (m)	E503313.83 N177445.04	Ground Elevation (m Datum)	21.80	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Record of Water Levels in Installations

Installation Details

Installation Type	Standpipe	Depth from (m)	Depth to (m)	Pipe Type
Cover Details	Flush cover	0.00	3.00	Plain
Response Zone	2.80 m to 5.60 m	3.00	5.60	Slotted
Installation Date	04/12/2017			

Reading Details

Date	Time	Operator	Depth to Water (m)	Water Level (m Datum)	Remarks
04/12/2017	13:30		3.00	18.80	
05/01/2018	10:00	AF	1.83	19.97	base 5.65m
18/01/2018	13:00	DM	1.87	19.93	base 5.61m
30/01/2018	11:35	DM	1.81	19.99	base 5.61m
13/02/2018	10:35	DM	1.84	19.96	base 5.61m
19/02/2018	12:00	DM	1.84	19.96	base 5.61m

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL Installation Summary.hbt/Config Fugro Rev4/26/06/2018/TS				Print Date	15/08/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-33**
	Fugro Reference	G170029U			
	Coordinates (m)	E503655.42 N177561.15	Ground Elevation (m Datum)	24.12	Sheet 1 of 1
	Hole Type	Hollow Stem Auger			Status: Final

Record of Water Levels in Installations

Installation Details

		Depth from (m)	Depth to (m)	Pipe Type
Installation Type	Standpipe	0.00	1.00	Plain
Cover Details	Flush cover	1.00	2.70	Slotted
Response Zone	1.00 m to 2.70 m			
Installation Date	07/12/2017			

Reading Details

Date	Time	Operator	Depth to Water (m)	Water Level (m Datum)	Remarks
03/01/2018	10:45	AF	1.80	22.32	base 2.72m
18/01/2018	14:30	DM	1.72	22.40	base 2.75m
30/01/2018	11:29	DM	1.67	22.45	base 2.72m
13/02/2018	10:15	DM	1.66	22.46	base 2.72m
19/02/2018	11:50	DM	1.65	22.47	base 2.71m

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL Installation Summary.hbt/Config Fugro Rev4/26/06/2018/TS				Print Date	15/08/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-36**
	Fugro Reference	G170029U			
	Coordinates (m)	E503806.28 N177762.75	Ground Elevation (m Datum)	22.36	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Record of Water Levels in Installations

Installation Details

		Depth from (m)	Depth to (m)	Pipe Type
Installation Type	Standpipe	0.00	1.00	Plain
Cover Details	Flush cover	1.00	7.00	Slotted
Response Zone	0.90 m to 7.00 m			
Installation Date	14/12/2017			

Reading Details

Date	Time	Operator	Depth to Water (m)	Water Level (m Datum)	Remarks
05/01/2018	10:00	AF	1.20	21.16	base 7.09m
10/01/2018	10:00	DM	1.25	21.11	base 7.07m
18/01/2018	00:00	DM	1.25	21.11	base 7.08m
30/01/2018	11:11	DM	1.20	21.16	base 7.09m
06/02/2018	11:15	DM	1.51	20.85	base 7.08m
19/02/2018	11:35	DM	1.17	21.19	base 7.05m

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL Installation Summary.hbt/Config Fugro Rev4/26/06/2018/TS				Print Date	15/08/2018

FUGRO	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-43**
	Fugro Reference	G170029U			
	Coordinates (m)	E503649.49 N177475.77	Ground Elevation (m Datum)	21.83	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Record of Water Levels in Installations

Installation Details

Installation Type	Standpipe	Depth from (m)	Depth to (m)	Pipe Type
Cover Details	Flush cover	0.00	1.80	Plain
Response Zone	1.70 m to 3.00 m	1.80	3.00	Slotted
Installation Date	18/12/2017			

Reading Details

Date	Time	Operator	Depth to Water (m)	Water Level (m Datum)	Remarks
18/12/2017	15:30		1.70	20.13	
10/01/2018	10:00	DM	0.96	20.87	base 3.14
18/01/2018	00:00	DM	1.51	20.32	base 3.12m
30/01/2018	15:30	DM	1.39	20.44	base 3.13m
13/02/2018	09:55	DM	1.46	20.37	base 3.12m
19/02/2018	11:45	DM	1.43	20.40	base 3.12m

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL Installation Summary.hbt/Config Fugro Rev4/26/06/2018/TS				Print Date	15/08/2018

FUGRO	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-44**
	Fugro Reference	G170029U			
	Coordinates (m)	E503957.70 N177823.99	Ground Elevation (m Datum)	24.05	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Record of Water Levels in Installations

Installation Details

Installation Type	Standpipe	Depth from (m)	Depth to (m)	Pipe Type
Cover Details	Upstanding cover	0.00	1.40	Plain
Response Zone	1.20 m to 7.00 m	1.40	7.00	Slotted
Installation Date	04/01/2018			

Reading Details

Date	Time	Operator	Depth to Water (m)	Water Level (m Datum)	Remarks
04/01/2018	10:00		2.75	21.30	
10/01/2018	10:00	DM	2.82	21.23	base 6.94m
17/01/2018	00:00	DM	2.90	21.15	base 6.91m
30/01/2018	11:00	DM	2.86	21.19	base 6.93m
06/02/2018	11:10	DM	3.15	20.90	base 6.94m
13/02/2018	09:20	DM	2.86	21.19	base 6.94m
19/02/2018	11:30	DM	2.86	21.19	base 6.92m

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL Installation Summary.hbt/Config Fugro Rev4/26/06/2018/TS				Print Date	15/08/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-45**
	Fugro Reference	G170029U			
	Coordinates (m)	E503729.73 N177515.02	Ground Elevation (m Datum)	21.73	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Record of Water Levels in Installations

Installation Details

Installation Type	Standpipe	Depth from (m)	Depth to (m)	Pipe Type
Cover Details	Flush cover	0.00	2.10	Plain
Response Zone	2.00 m to 4.40 m	2.10	4.40	Slotted
Installation Date	09/12/2017			

Reading Details

Date	Time	Operator	Depth to Water (m)	Water Level (m Datum)	Remarks
09/12/2017	16:25		1.82	19.91	
03/01/2018	10:20	DM	0.85	20.88	base 4.36m
10/01/2018	13:20	DM	0.90	20.83	base 4.36m
18/01/2018	00:00	DM	0.89	20.84	base 4.35m
29/01/2018	15:35	DM	0.81	20.92	base 4.37m
12/02/2018	15:40	DM	0.80	20.93	base 4.35m
19/02/2018	10:40	DM	0.80	20.93	base 4.35m

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL Installation Summary.hbt/Config Fugro Rev4/26/06/2018/TS				Print Date	15/08/2018

FUGRO	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-47**
	Fugro Reference	G170029U			
	Coordinates (m)	E503661.77 N177431.10	Ground Elevation (m Datum)	21.49	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Record of Water Levels in Installations

Installation Details

Installation Type	Standpipe	Depth from (m)	Depth to (m)	Pipe Type
Cover Details	Flush cover	0.00	2.50	Plain
Response Zone	2.40 m to 4.00 m	2.50	4.00	Slotted
Installation Date	06/12/2017			

Reading Details

Date	Time	Operator	Depth to Water (m)	Water Level (m Datum)	Remarks
06/12/2017	13:45		1.30	20.19	
10/01/2018	10:00	DM	1.03	20.46	base 4.00m
18/01/2018	00:00	DM	1.14	20.35	base 4.02m
29/01/2018	16:00	DM	0.96	20.53	base 4.01m
12/02/2018	15:40	DM	1.01	20.48	base 4.01m
19/02/2018	10:50	DM	1.01	20.48	base 3.97m

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL Installation Summary.hbt/Config Fugro Rev4/26/06/2018/TS				Print Date	15/08/2018

FUGRO	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-50**
	Fugro Reference	G170029U			
	Coordinates (m)	E503720.62 N177448.77	Ground Elevation (m Datum)	21.49	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Record of Water Levels in Installations

Installation Details

Installation Type	Standpipe	Depth from (m)	Depth to (m)	Pipe Type
Cover Details	Upstanding cover	0.00	3.50	Plain
Response Zone	3.40 m to 20.00 m	3.50	20.00	Slotted
Installation Date	21/11/2017			

Reading Details

Date	Time	Operator	Depth to Water (m)	Water Level (m Datum)	Remarks
21/11/2017	16:30		19.55	1.94	

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	JPD/ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL Installation Summary.hbt/Config Fugro Rev4/26/06/2018/TS				Print Date	15/08/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-61**
	Fugro Reference	G170029U			
	Coordinates (m)	E503830.24 N177379.82	Ground Elevation (m Datum)	22.65	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Record of Water Levels in Installations

Installation Details

		Depth from (m)	Depth to (m)	Pipe Type
Installation Type	Standpipe	0.00	3.50	Plain
Cover Details	Flush cover	3.50	4.50	Slotted
Response Zone	3.50 m to 4.50 m			
Installation Date	22/11/2017			

Reading Details

Date	Time	Operator	Depth to Water (m)	Water Level (m Datum)	Remarks
03/01/2018	10:50	DM	2.00	20.65	base 4.51m
10/01/2018	13:40	DM	1.95	20.70	base 4.53m
18/01/2018	00:00	DM	1.95	20.70	base 4.53m
29/01/2018	00:00	DM	1.89	20.76	base 4.52m
12/02/2018	15:10	DM	1.85	20.80	base 4.52m
20/02/2018	11:20	DM	1.87	20.78	base 4.52m

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL Installation Summary.hbt/Config Fugro Rev4/26/06/2018/TS				Print Date	15/08/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-65**
	Fugro Reference	G170029U			
	Coordinates (m)	E503854.77 N177337.72	Ground Elevation (m Datum)	22.12	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Record of Water Levels in Installations

Installation Details

Installation Type	Standpipe	Depth from (m)	Depth to (m)	Pipe Type
Cover Details	Flush cover	0.00	1.40	Plain
Response Zone	1.20 m to 5.00 m	1.40	5.00	Slotted
Installation Date	17/01/2018			

Reading Details

Date	Time	Operator	Depth to Water (m)	Water Level (m Datum)	Remarks
17/01/2018	13:15		1.22	20.90	

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL Installation Summary.hbt/Config Fugro Rev4/26/06/2018/TS				Print Date	15/08/2018

FUGRO	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-821**
	Fugro Reference	G170029U			
	Coordinates (m)	E503811.85 N177274.57	Ground Elevation (m Datum)	22.17	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Record of Water Levels in Installations

Installation Details

Installation Type	Standpipe	Depth from (m)	Depth to (m)	Pipe Type
Cover Details	Flush cover	0.03	1.80	Plain
Response Zone	1.60 m to 7.30 m	1.80	7.30	Slotted
Installation Date	12/01/2018			

Reading Details

Date	Time	Operator	Depth to Water (m)	Water Level (m Datum)	Remarks
12/01/2018	13:00		2.05	20.12	

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL Installation Summary.hbt/Config Fugro Rev4/26/06/2018/TS				Print Date	18/10/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-823**
	Fugro Reference	G170029U			
	Coordinates (m)	E503870.26 N177463.97	Ground Elevation (m Datum)	22.77	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Record of Water Levels in Installations

Installation Details

Installation Type	Standpipe	Depth from (m)	Depth to (m)	Pipe Type
Cover Details	Flush cover	0.00	4.40	Plain
Response Zone	4.30 m to 5.10 m	4.40	5.10	Slotted
Installation Date	01/12/2017			

Reading Details

Date	Time	Operator	Depth to Water (m)	Water Level (m Datum)	Remarks
01/12/2017	11:00		1.96	20.81	
03/01/2018	10:10	DM	1.77	21.00	base 4.76m
10/01/2018	12:30	DM	1.72	21.05	base 4.94m
18/01/2018	00:00	DM	1.74	21.03	base 4.97m
29/01/2018	15:30	DM	169.00	-146.23	base 4.96m
12/02/2018	15:20	DM	1.70	21.07	base 4.95m
19/02/2018	10:30	DM	1.68	21.09	base 4.95m

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL Installation Summary.hbt/Config Fugro Rev4/26/06/2018/TS				Print Date	15/08/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-824**
	Fugro Reference	G170029U			
	Coordinates (m)	E503733.40 N177483.61	Ground Elevation (m Datum)	22.03	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Record of Water Levels in Installations

Installation Details

Installation Type	Standpipe	Depth from (m)	Depth to (m)	Pipe Type
Cover Details	Flush cover	0.00	1.10	Plain
Response Zone	1.00 m to 3.50 m	1.10	3.50	Slotted
Installation Date	09/12/2017			

Reading Details

Date	Time	Operator	Depth to Water (m)	Water Level (m Datum)	Remarks
09/12/2017	11:50		1.90	20.13	
03/01/2018	10:10	DM	1.19	20.84	base 3.50m
10/01/2018	12:30	DM	1.20	20.83	base 3.50m
18/01/2018	00:00	DM	1.27	20.76	base 3.50m
29/01/2018	15:40	DM	1.12	20.91	base 3.50m
12/02/2018	15:30	DM	1.13	20.90	base 3.50m
19/02/2018	10:35	DM	1.10	20.93	base 3.50m

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL Installation Summary.hbt/Config Fugro Rev4/26/06/2018/TS				Print Date	15/08/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-826**
	Fugro Reference	G170029U			
	Coordinates (m)	E503885.79 N177514.20	Ground Elevation (m Datum)	22.42	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Record of Water Levels in Installations

Installation Details

Installation Type	Standpipe	Depth from (m)	Depth to (m)	Pipe Type
Cover Details	Flush cover	0.02	4.20	Plain
Response Zone	4.00 m to 5.80 m	4.20	5.80	Slotted
Installation Date	27/11/2017			

Reading Details

Date	Time	Operator	Depth to Water (m)	Water Level (m Datum)	Remarks
27/11/2017	16:25		1.52	20.90	

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	JPD/ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL Installation Summary.hbt/Config Fugro Rev4/26/06/2018/TS				Print Date	18/10/2018

FUGRO	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-85**
	Fugro Reference	G170029U			
	Coordinates (m)	E503875.87 N177210.91	Ground Elevation (m Datum)	22.10	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Record of Water Levels in Installations

Installation Details

Installation Type	Standpipe	Depth from (m)	Depth to (m)	Pipe Type
Cover Details	Flush cover	0.06	1.50	Plain
Response Zone	1.40 m to 6.70 m	1.50	6.70	Slotted
Installation Date	09/01/2018			

Reading Details

Date	Time	Operator	Depth to Water (m)	Water Level (m Datum)	Remarks
09/01/2018	16:15		2.86	19.24	

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL Installation Summary.hbt/Config Fugro Rev4/26/06/2018/TS				Print Date	18/10/2018

FUGRO	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1047**
	Fugro Reference	G170029U			
	Coordinates (m)	E503651.89 N177251.17	Ground Elevation (m Datum)	22.01	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Record of Water Levels in Installations

Installation Details

Installation Type	Standpipe	Depth from (m)	Depth to (m)	Pipe Type
Cover Details	Flush cover	0.00	2.70	Plain
Response Zone	2.60 m to 4.60 m	2.70	4.60	Slotted
Installation Date	18/03/2018			

Reading Details

Date	Time	Operator	Depth to Water (m)	Water Level (m Datum)	Remarks
18/03/2018	11:25		1.84	20.17	

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL Installation Summary.hbt/Config Fugro Rev4/26/06/2018/TS				Print Date	15/08/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1317**
	Fugro Reference	G170029U			
	Coordinates (m)	E502896.01 N177514.58	Ground Elevation (m Datum)	22.89	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Record of Water Levels in Installations

Installation Details

Installation Type	Gas Monitoring Point	Depth from (m)	Depth to (m)	Pipe Type
Cover Details	Upstanding cover	0.00	1.00	Plain
Response Zone	0.80 m to 2.50 m	1.00	2.50	Slotted
Installation Date	15/12/2017			

Reading Details

Date	Time	Operator	Depth to Water (m)	Water Level (m Datum)	Remarks
15/12/2017	14:20		Dry		
30/01/2018	12:05	DM	Dry		base 2.56m
13/02/2018	14:02	DM	Dry		base 2.55m
21/02/2018	13:25	DM	Dry		base 2.55m

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL Installation Summary.hbt/Config Fugro Rev4/26/06/2018/TS				Print Date	15/08/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1319**
	Fugro Reference	G170029U			
	Coordinates (m)	E503124.80 N177493.50	Ground Elevation (m Datum)	23.26	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Record of Water Levels in Installations

Installation Details

Installation Type	Gas Monitoring Point	Depth from (m)	Depth to (m)	Pipe Type
Cover Details	Flush cover	0.00	0.70	Plain
Response Zone	0.60 m to 1.80 m	0.70	1.70	Slotted
Installation Date	19/12/2017			

Reading Details

Date	Time	Operator	Depth to Water (m)	Water Level (m Datum)	Remarks
17/01/2018	00:00	DM	1.45	21.81	base 2.00m
30/01/2018	11:55	DM	1.24	22.02	base 2.00m
13/02/2018	10:55	DM	1.23	22.03	base 1.99m
19/02/2018	13:15	DM	1.18	22.08	base 1.99m

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL Installation Summary.hbt/Config Fugro Rev4/26/06/2018/TS				Print Date	15/08/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1321**
	Fugro Reference	G170029U			
	Coordinates (m)	E503490.66 N177832.32	Ground Elevation (m Datum)	23.72	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Record of Water Levels in Installations

Installation Details

Installation Type	Gas Monitoring Point	Depth from (m)	Depth to (m)	Pipe Type
Cover Details	Flush cover	0.00	1.10	Plain
Response Zone	1.00 m to 4.00 m	1.10	4.00	Slotted
Installation Date	24/11/2017			

Reading Details

Date	Time	Operator	Depth to Water (m)	Water Level (m Datum)	Remarks
24/11/2017	11:30		3.00	20.72	
09/01/2018	10:00	AF	2.60	21.12	base 4.18m
17/01/2018	13:00	DM	2.40	21.32	base 4.17m
30/01/2018	14:00	DM	2.34	21.38	base 4.18m
13/02/2018	00:00	DM	1.95	21.77	base 4.18m
21/02/2018	12:55	DM	2.12	21.60	base 4.16m

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	JPD/ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL Installation Summary.hbt/Config Fugro Rev4/26/06/2018/TS				Print Date	15/08/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1322**
	Fugro Reference	G170029U			
	Coordinates (m)	E503607.50 N177880.98	Ground Elevation (m Datum)	22.36	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Record of Water Levels in Installations

Installation Details

Installation Type	Gas Monitoring Point	Depth from (m)	Depth to (m)	Pipe Type
Cover Details	Flush cover	0.00	0.90	Plain
Response Zone	0.80 m to 1.45 m	0.90	1.45	Slotted
Installation Date	07/12/2017			

Reading Details

Date	Time	Operator	Depth to Water (m)	Water Level (m Datum)	Remarks
07/12/2017	13:20		Dry		
09/01/2018	10:00	AF	1.34	21.02	base 1.65m
17/01/2018	13:00	DM	1.40	20.96	base 1.63m
30/01/2018	14:00	DM	1.33	21.03	base 1.64m
13/02/2018	13:00	DM	1.32	21.04	base 1.63m
21/02/2018	12:30	DM	1.33	21.03	base 1.63m

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL Installation Summary.hbt/Config Fugro Rev4/26/06/2018/TS				Print Date	15/08/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1323**
	Fugro Reference	G170029U			
	Coordinates (m)	E503368.28 N177620.87	Ground Elevation (m Datum)	26.54	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Record of Water Levels in Installations

Installation Details

Installation Type	Gas Monitoring Point	Depth from (m)	Depth to (m)	Pipe Type
Cover Details	Flush cover	0.00	1.00	Plain
Response Zone	0.90 m to 3.50 m	1.00	3.50	Slotted
Installation Date	29/11/2017			

Reading Details

Date	Time	Operator	Depth to Water (m)	Water Level (m Datum)	Remarks
29/11/2017	12:55		Dry		

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL Installation Summary.hbt/Config Fugro Rev4/26/06/2018/TS				Print Date	15/08/2018

FUGRO	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1324**
	Fugro Reference	G170029U			
	Coordinates (m)	E503179.27 N177425.35	Ground Elevation (m Datum)	23.19	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Record of Water Levels in Installations

Installation Details

Installation Type	Gas Monitoring Point	Depth from (m)	Depth to (m)	Pipe Type
Cover Details	Flush cover	0.00	1.00	Plain
Response Zone	0.90 m to 2.00 m	1.00	2.00	Slotted
Installation Date	14/12/2017			

Reading Details

Date	Time	Operator	Depth to Water (m)	Water Level (m Datum)	Remarks
14/12/2017	12:30		Dry		
19/02/2018	12:15	DM	1.16	22.03	base 1.87m, borehole flooded, water bailed 19/2/2018

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL Installation Summary.hbt/Config Fugro Rev4/26/06/2018/TS				Print Date	15/08/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1326**
	Fugro Reference	G170029U			
	Coordinates (m)	E503315.13 N177445.26	Ground Elevation (m Datum)	21.77	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Record of Water Levels in Installations

Installation Details

Installation Type	Gas Monitoring Point	Depth from (m)	Depth to (m)	Pipe Type
Cover Details	Flush cover	0.00	0.60	Plain
Response Zone	0.50 m to 2.00 m	0.60	2.00	Slotted
Installation Date	04/12/2017			

Reading Details

Date	Time	Operator	Depth to Water (m)	Water Level (m Datum)	Remarks
04/12/2017	15:30		Dry		
05/01/2018	10:00	AF	Dry		base 2.00m
10/01/2018	10:00	DM	1.90	19.87	base 2.00m
30/01/2018	11:37	DM	1.85	19.92	base 2.00m
13/02/2018	10:25	DM	1.86	19.91	base 1.99m
19/02/2018	12:00	DM	1.85	19.92	base 1.99m

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL Installation Summary.hbt/Config Fugro Rev4/26/06/2018/TS				Print Date	15/08/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1331**
	Fugro Reference	G170029U			
	Coordinates (m)	E503546.23 N177561.00	Ground Elevation (m Datum)	24.12	Sheet 1 of 1
	Hole Type	Hollow Stem Auger			Status: Final

Record of Water Levels in Installations

Installation Details

Installation Type	Gas Monitoring Point	Depth from (m)	Depth to (m)	Pipe Type
Cover Details	Flush cover	0.00	1.00	Plain
Response Zone	0.90 m to 2.00 m	1.00	2.00	Slotted
Installation Date	08/12/2017			

Reading Details

Date	Time	Operator	Depth to Water (m)	Water Level (m Datum)	Remarks
05/01/2018	10:00	AF	Dry		base 2.09m
18/01/2018	10:00	DM	1.75	22.37	base 2.08m
30/01/2018	11:30	DM	1.65	22.47	base 2.08m
13/02/2018	10:10	DM	1.69	22.43	base 2.07m
19/02/2018	11:50	DM	1.63	22.49	base 2.07m

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL Installation Summary.hbt/Config Fugro Rev4/26/06/2018/TS				Print Date	15/08/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1334**
	Fugro Reference	G170029U			
	Coordinates (m)	E503804.19 N177761.12	Ground Elevation (m Datum)	22.33	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Record of Water Levels in Installations

Installation Details

Installation Type	Gas Monitoring Point	Depth from (m)	Depth to (m)	Pipe Type
Cover Details	Flush cover	0.00	1.00	Plain
Response Zone	0.90 m to 1.50 m	1.00	1.50	Slotted
Installation Date	13/12/2017			

Reading Details

Date	Time	Operator	Depth to Water (m)	Water Level (m Datum)	Remarks
13/12/2017	07:55		Dry		
05/01/2018	10:00	AF	Dry		base 1.50m
10/01/2018	10:00	DM	Dry		base 1.50m
18/01/2018	00:00	DM	Dry		base 1.50m
30/01/2018	11:10	DM	Dry		base 1.50m
06/02/2018	11:14	DM	1.39	20.94	base 1.49m
19/02/2018	11:35	DM	1.39	20.94	base 1.48m

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL Installation Summary.hbt/Config Fugro Rev4/26/06/2018/TS				Print Date	15/08/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1339**
	Fugro Reference	G170029U			
	Coordinates (m)	E503651.05 N177476.23	Ground Elevation (m Datum)	21.86	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Record of Water Levels in Installations

Installation Details

Installation Type	Gas Monitoring Point	Depth from (m)	Depth to (m)	Pipe Type
Cover Details	Flush cover	0.00	0.75	Plain
Response Zone	0.60 m to 1.50 m	0.75	1.50	Slotted
Installation Date	19/12/2017			

Reading Details

Date	Time	Operator	Depth to Water (m)	Water Level (m Datum)	Remarks
19/12/2017	15:35		Dry		
05/01/2018	10:00	AF	0.93	20.93	base 1.63m
10/01/2018	10:00	DM	1.23	20.63	base 1.62m
18/01/2018	00:00	DM	1.46	20.40	base 1.60m
30/01/2018	15:30	DM	1.34	20.52	base 1.62m
13/02/2018	09:40	DM	1.41	20.45	base 1.61m
19/02/2018	11:45	DM	1.36	20.50	base 1.61m

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL Installation Summary.hbt/Config Fugro Rev4/26/06/2018/TS				Print Date	15/08/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1340**
	Fugro Reference	G170029U			
	Coordinates (m)	E503958.91 N177824.00	Ground Elevation (m Datum)	24.09	Sheet 1 of 1
	Hole Type	Inspection Pit			Status: Final

Record of Water Levels in Installations

Installation Details

Installation Type	Gas Monitoring Point	Depth from (m)	Depth to (m)	Pipe Type
Cover Details	Upstanding cover	0.00	0.50	Plain
Response Zone	0.50 m to 0.80 m	0.50	0.80	Slotted
Installation Date	04/01/2018			

Reading Details

Date	Time	Operator	Depth to Water (m)	Water Level (m Datum)	Remarks
04/01/2018	11:50		Dry		
10/01/2018	10:00	DM	Dry		base 0.80m
17/01/2018	11:00	DM	Dry		base 0.79m
30/01/2018	11:00	DM	Dry		base 0.82m
06/02/2018	11:10	DM	Dry		base 0.82m
13/02/2018	09:20	DM	Dry		base 0.77m
19/02/2018	11:30	DM	Dry		base 0.77m

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL Installation Summary.hbt/Config Fugro Rev4/26/06/2018/TS				Print Date	15/08/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1341**
	Fugro Reference	G170029U			
	Coordinates (m)	E503729.65 N177513.86	Ground Elevation (m Datum)	21.76	Sheet 1 of 1
	Hole Type	Inspection Pit			Status: Final

Record of Water Levels in Installations

Installation Details

Installation Type	Gas Monitoring Point	Depth from (m)	Depth to (m)	Pipe Type
Cover Details	Flush cover	0.10	0.60	Plain
Response Zone	0.50 m to 1.00 m	0.60	1.00	Slotted
Installation Date	10/12/2017			

Reading Details

Date	Time	Operator	Depth to Water (m)	Water Level (m Datum)	Remarks
10/12/2017	13:00		0.87	20.89	
03/01/2018	10:20	DM	0.37	21.39	base 1.00m
10/01/2018	13:20	DM	0.40	21.36	base 1.00m
18/01/2018	00:00	DM	0.48	21.28	base 1.00m
29/01/2018	15:30	DM	0.42	21.34	base 1.00m
12/02/2018	15:20	DM	0.45	21.31	base 1.00m
19/02/2018	10:30	DM	0.90	20.86	base 1.01m water bailed before dipping, cap regulaly flooded

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL Installation Summary.hbt/Config Fugro Rev4/26/06/2018/TS				Print Date	18/10/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1343**
	Fugro Reference	G170029U			
	Coordinates (m)	E503663.56 N177430.17	Ground Elevation (m Datum)	21.48	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Record of Water Levels in Installations

Installation Details

Installation Type	Gas Monitoring Point	Depth from (m)	Depth to (m)	Pipe Type
Cover Details	Flush cover	0.00	0.60	Plain
Response Zone	0.50 m to 2.00 m	0.60	2.00	Slotted
Installation Date	06/12/2017			

Reading Details

Date	Time	Operator	Depth to Water (m)	Water Level (m Datum)	Remarks
06/12/2017	15:45		Dry		
10/01/2018	10:00	DM	0.80	20.68	base 2.00m
18/01/2018	00:00	DM	0.87	20.61	base 2.00m
29/01/2018	15:55	DM	0.81	20.67	base 2.00m
12/02/2018	15:45	DM	0.81	20.67	base 2.00m
19/02/2018	10:50	DM	0.82	20.66	base 1.99m

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL Installation Summary.hbt/Config Fugro Rev4/26/06/2018/TS				Print Date	15/08/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1345**
	Fugro Reference	G170029U			
	Coordinates (m)	E503719.59 N177448.13	Ground Elevation (m Datum)	21.47	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Record of Water Levels in Installations

Installation Details

Installation Type	Gas Monitoring Point	Depth from (m)	Depth to (m)	Pipe Type
Cover Details	Flush cover	0.00	0.50	Plain
Response Zone	0.40 m to 1.50 m	0.50	1.50	Slotted
Installation Date	22/11/2017			

Reading Details

Date	Time	Operator	Depth to Water (m)	Water Level (m Datum)	Remarks
22/11/2017	16:00		Dry		
10/01/2018	14:10	DM	0.85	20.62	base 1.50m
18/01/2018	00:00	DM	0.87	20.60	base 1.50m
29/01/2018	15:55	DM	0.78	20.69	base 1.49m
12/02/2018	15:45	DM	0.74	20.73	base 1.50m
19/02/2018	10:55	DM	0.74	20.73	base 1.49m

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	JPD/ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL Installation Summary.hbt/Config Fugro Rev4/26/06/2018/TS				Print Date	15/08/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1355**
	Fugro Reference	G170029U			
	Coordinates (m)	E503830.73 N177381.25	Ground Elevation (m Datum)	22.64	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Record of Water Levels in Installations

Installation Details

Installation Type	Gas Monitoring Point	Depth from (m)	Depth to (m)	Pipe Type
Cover Details	Flush cover	0.00	0.50	Plain
Response Zone	0.50 m to 3.00 m	0.50	3.00	Slotted
Installation Date	23/11/2017			

Reading Details

Date	Time	Operator	Depth to Water (m)	Water Level (m Datum)	Remarks
10/01/2018	11:20	DM	1.25	21.39	base 3.07m
18/01/2018	00:00	DM	1.30	21.34	base 3.03m
29/01/2018	15:25	DM	1.21	21.43	base 3.01m
12/02/2018	15:10	DM	1.20	21.44	base 2.99m
20/02/2018	11:10	DM	1.20	21.44	base 3.01m

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL Installation Summary.hbt/Config Fugro Rev4/26/06/2018/TS				Print Date	15/08/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1359**
	Fugro Reference	G170029U			
	Coordinates (m)	E503854.11 N177336.97	Ground Elevation (m Datum)	22.13	Sheet 1 of 1
	Hole Type	Inspection Pit			Status: Final

Record of Water Levels in Installations

Installation Details

Installation Type	Gas Monitoring Point	Depth from (m)	Depth to (m)	Pipe Type
Cover Details	Flush cover	0.00	0.50	Plain
Response Zone	0.50 m to 1.00 m	0.50	1.00	Slotted
Installation Date	17/01/2018			

Reading Details

Date	Time	Operator	Depth to Water (m)	Water Level (m Datum)	Remarks
17/01/2018	16:25		Dry		

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL Installation Summary.hbt/Config Fugro Rev4/26/06/2018/TS				Print Date	15/08/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1364**
	Fugro Reference	G170029U			
	Coordinates (m)	E503903.12 N177312.99	Ground Elevation (m Datum)	22.34	Sheet 1 of 1
	Hole Type	Inspection Pit			Status: Final

Record of Water Levels in Installations

Installation Details

Installation Type	Gas Monitoring Point	Depth from (m)	Depth to (m)	Pipe Type
Cover Details	Flush cover	0.00	0.60	Plain
Response Zone	0.50 m to 1.20 m	0.60	1.20	Slotted
Installation Date	05/01/2018			

Reading Details

Date	Time	Operator	Depth to Water (m)	Water Level (m Datum)	Remarks
05/01/2018	12:35		Dry		

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL Installation Summary.hbt/Config Fugro Rev4/26/06/2018/TS				Print Date	15/08/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1369**
	Fugro Reference	G170029U			
	Coordinates (m)	E503876.80 N177210.43	Ground Elevation (m Datum)	22.11	Sheet 1 of 1
	Hole Type	Inspection Pit			Status: Final

Record of Water Levels in Installations

Installation Details

Installation Type	Gas Monitoring Point	Depth from (m)	Depth to (m)	Pipe Type
Cover Details	Flush cover	0.00	0.50	Plain
Response Zone	0.50 m to 1.00 m	0.50	1.00	Slotted
Installation Date	10/01/2018			

Reading Details

Date	Time	Operator	Depth to Water (m)	Water Level (m Datum)	Remarks
10/01/2018	11:05		Dry		

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL Installation Summary.hbt/Config Fugro Rev4/26/06/2018/TS				Print Date	15/08/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1782**
	Fugro Reference	G170029U			
	Coordinates (m)	E503811.37 N177273.62	Ground Elevation (m Datum)	22.17	Sheet 1 of 1
	Hole Type	Inspection Pit			Status: Final

Record of Water Levels in Installations

Installation Details

Installation Type	Gas Monitoring Point	Depth from (m)	Depth to (m)	Pipe Type
Cover Details	Flush cover	0.00	0.60	Plain
Response Zone	0.60 m to 1.20 m	0.60	1.20	Slotted
Installation Date	15/01/2018			

Reading Details

Date	Time	Operator	Depth to Water (m)	Water Level (m Datum)	Remarks
15/01/2018	11:10		Dry		

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL Installation Summary.hbt/Config Fugro Rev4/26/06/2018/TS				Print Date	15/08/2018

FUGRO	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1784**
	Fugro Reference	G170029U			
	Coordinates (m)	E503870.86 N177465.06	Ground Elevation (m Datum)	22.76	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Record of Water Levels in Installations

Installation Details

Installation Type	Gas Monitoring Point	Depth from (m)	Depth to (m)	Pipe Type
Cover Details	Flush cover	0.00	0.70	Plain
Response Zone	0.60 m to 1.80 m	0.70	1.70	Slotted
Installation Date	04/12/2017			

Reading Details

Date	Time	Operator	Depth to Water (m)	Water Level (m Datum)	Remarks
04/12/2017	14:20		0.65	22.11	

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	JPD/ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL Installation Summary.hbt/Config Fugro Rev4/26/06/2018/TS				Print Date	15/08/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1785**
	Fugro Reference	G170029U			
	Coordinates (m)	E503734.41 N177483.09	Ground Elevation (m Datum)	22.04	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Record of Water Levels in Installations

Installation Details

Installation Type	Gas Monitoring Point	Depth from (m)	Depth to (m)	Pipe Type
Cover Details	Flush cover	0.00	1.30	Plain
Response Zone	1.20 m to 2.20 m	1.30	2.20	Slotted
Installation Date	09/12/2017			

Reading Details

Date	Time	Operator	Depth to Water (m)	Water Level (m Datum)	Remarks
09/12/2017	14:45		Dry		
03/01/2018	10:00	DM	1.05	20.99	base 2.20m
10/01/2018	13:00	DM	1.12	20.92	base 2.20m
18/01/2018	00:00	DM	1.18	20.86	base 2.20m
29/01/2018	15:40	DM	1.21	20.83	base 2.20m
12/02/2018	15:30	DM	1.24	20.80	base 2.20m
19/02/2018	10:40	DM	1.25	20.79	base 2.20m

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL Installation Summary.hbt/Config Fugro Rev4/26/06/2018/TS				Print Date	15/08/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1787**
	Fugro Reference	G170029U			
	Coordinates (m)	E503886.72 N177513.47	Ground Elevation (m Datum)	22.39	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Record of Water Levels in Installations

Installation Details

Installation Type	Gas Monitoring Point	Depth from (m)	Depth to (m)	Pipe Type
Cover Details	Flush cover	0.00	1.10	Plain
Response Zone	1.00 m to 2.50 m	1.10	2.50	Slotted
Installation Date	28/11/2017			

Reading Details

Date	Time	Operator	Depth to Water (m)	Water Level (m Datum)	Remarks
28/11/2017	14:00		Dry		

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL Installation Summary.hbt/Config Fugro Rev4/26/06/2018/TS				Print Date	15/08/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1792**
	Fugro Reference	G170029U			
	Coordinates (m)	E502969.16 N178031.57	Ground Elevation (m Datum)	21.20	Sheet 1 of 1
	Hole Type	Inspection Pit			Status: Final

Record of Water Levels in Installations

Installation Details

Installation Type	Gas Monitoring Point	Depth from (m)	Depth to (m)	Pipe Type
Cover Details	Upstanding cover	0.00	0.50	Plain
Response Zone	0.50 m to 1.00 m	0.50	1.00	Slotted
Installation Date	11/12/2017			

Reading Details

Date	Time	Operator	Depth to Water (m)	Water Level (m Datum)	Remarks
09/01/2018	10:00	AF	0.25	20.95	base 1.00m
18/01/2018	13:00	DM	0.38	20.82	base 1.05m
06/02/2018	11:54	DM	0.58	20.62	base 1.01m
14/02/2018	14:10	DM	0.30	20.90	base 1.01m

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL Installation Summary.hbt/Config Fugro Rev4/26/06/2018/TS				Print Date	15/08/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1793**
	Fugro Reference	G170029U			
	Coordinates (m)	E502850.68 N177916.42	Ground Elevation (m Datum)	21.25	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Record of Water Levels in Installations

Installation Details

Installation Type	Gas Monitoring Point	Depth from (m)	Depth to (m)	Pipe Type
Cover Details	Upstanding cover	0.00	0.50	Plain
Response Zone	0.50 m to 0.90 m	0.50	0.90	Slotted
Installation Date	07/12/2017			

Reading Details

Date	Time	Operator	Depth to Water (m)	Water Level (m Datum)	Remarks
07/12/2017	11:30		0.88	20.37	
30/01/2018	12:40	DM	0.41	20.84	base 0.81m
13/02/2018	13:20	DM	0.36	20.89	base 0.77m
21/02/2018	14:20	DM	0.44	20.81	base 0.80m

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL Installation Summary.hbt/Config Fugro Rev4/26/06/2018/TS				Print Date	15/08/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1794**
	Fugro Reference	G170029U			
	Coordinates (m)	E502906.06 N177887.70	Ground Elevation (m Datum)	21.98	Sheet 1 of 1
	Hole Type	Inspection Pit			Status: Final

Record of Water Levels in Installations

Installation Details

Installation Type	Gas Monitoring Point	Depth from (m)	Depth to (m)	Pipe Type
Cover Details	Flush cover	0.00	0.70	Plain
Response Zone	0.50 m to 1.20 m	0.70	1.20	Slotted
Installation Date	20/12/2017			

Reading Details

Date	Time	Operator	Depth to Water (m)	Water Level (m Datum)	Remarks
20/12/2017	14:30		Dry		
03/01/2018	10:00	AF	1.12	20.86	base 1.71m
18/01/2018	00:00	DM	1.03	20.95	base 1.70m
30/01/2018	12:38	DM	1.00	20.98	base 1.18m
13/02/2018	13:13	DM	0.95	21.03	base 1.17m
21/02/2018	14:10	DM	1.00	20.98	base 1.17m

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL Installation Summary.hbt/Config Fugro Rev4/26/06/2018/TS				Print Date	15/08/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1795**
	Fugro Reference	G170029U			
	Coordinates (m)	E502717.70 N177588.94	Ground Elevation (m Datum)	20.44	Sheet 1 of 1
	Hole Type	Inspection Pit			Status: Final

Record of Water Levels in Installations

Installation Details

Installation Type	Gas Monitoring Point	Depth from (m)	Depth to (m)	Pipe Type
Cover Details	Upstanding cover	0.00	0.50	Plain
Response Zone	0.40 m to 1.10 m	0.50	1.10	Slotted
Installation Date	14/12/2017			

Reading Details

Date	Time	Operator	Depth to Water (m)	Water Level (m Datum)	Remarks
30/01/2018	12:30	DM	0.57	19.87	base 0.88m
13/02/2018	14:34	DM	0.60	19.84	base 0.87m
21/02/2018	13:35	DM	0.61	19.83	base 0.88m

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL Installation Summary.hbt/Config Fugro Rev4/26/06/2018/TS				Print Date	15/08/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1796**
	Fugro Reference	G170029U			
	Coordinates (m)	E503337.61 N178072.20	Ground Elevation (m Datum)	21.78	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Record of Water Levels in Installations

Installation Details

Installation Type	Standpipe	Depth from (m)	Depth to (m)	Pipe Type
Cover Details	Upstanding cover	-0.18	0.70	Plain
Response Zone	0.70 m to 1.70 m	0.70	1.70	Slotted
Installation Date	04/12/2017			

Reading Details

Date	Time	Operator	Depth to Water (m)	Water Level (m Datum)	Remarks
06/02/2018	12:10	DM	1.20	20.58	base 1.70m
14/02/2018	14:35	DM	1.12	20.66	base 1.70m
27/03/2018	14:30		0.85	20.93	

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL Installation Summary.hbt/Config Fugro Rev4/26/06/2018/TS				Print Date	18/10/2018

FUGRO	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1797**
	Fugro Reference	G170029U			
	Coordinates (m)	E503177.26 N177918.02	Ground Elevation (m Datum)	26.09	Sheet 1 of 1
	Hole Type	Hollow Stem Auger			Status: Final

Record of Water Levels in Installations

Installation Details

Installation Type	Standpipe	Depth from (m)	Depth to (m)	Pipe Type
Cover Details	Upstanding cover	0.02	1.20	Plain
Response Zone	0.60 m to 7.40 m	1.20	7.40	Slotted
Installation Date	20/12/2017			

Reading Details

Date	Time	Operator	Depth to Water (m)	Water Level (m Datum)	Remarks
05/01/2018	10:00	AF	Dry		base 4.90m
18/01/2018	00:00	DM	Dry		base 4.95m
30/01/2018	12:51	DM	Dry		base 4.93m
06/02/2018	12:20	DM	Dry		base 4.93m
13/02/2018	14:44	DM	Dry		base 4.93m
21/02/2018	14:40	DM	Dry		base 4.92m

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL Installation Summary.hbt/Config Fugro Rev4/26/06/2018/TS				Print Date	15/08/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1798**
	Fugro Reference	G170029U			
	Coordinates (m)	E503187.01 N177771.89	Ground Elevation (m Datum)	24.52	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Record of Water Levels in Installations

Installation Details

Installation Type	Gas Monitoring Point	Depth from (m)	Depth to (m)	Pipe Type
Cover Details	Flush cover	0.00	1.20	Plain
Response Zone	1.10 m to 3.50 m	1.20	3.50	Slotted
Installation Date	12/12/2017			

Reading Details

Date	Time	Operator	Depth to Water (m)	Water Level (m Datum)	Remarks
12/12/2017	15:25		Dry		
17/01/2018	00:00	DM	2.68	21.84	base 3.37m
13/02/2018	13:45	DM	2.65	21.87	base 3.36m
19/02/2018	00:00	DM	2.67	21.85	base 3.38m

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL Installation Summary.hbt/Config Fugro Rev4/26/06/2018/TS				Print Date	15/08/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1802**
	Fugro Reference	G170029U			
	Coordinates (m)	E503397.41 N178063.28	Ground Elevation (m Datum)	21.22	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Record of Water Levels in Installations

Installation Details

Installation Type	Standpipe	Depth from (m)	Depth to (m)	Pipe Type
Cover Details	Flush cover	0.00	1.10	Plain
Response Zone	1.10 m to 4.20 m	1.10	4.20	Slotted
Installation Date	08/12/2017			

Reading Details

Date	Time	Operator	Depth to Water (m)	Water Level (m Datum)	Remarks
06/02/2018	12:00	DM	0.15	21.07	base 1.10m
14/02/2018	14:30	DM	0.15	21.07	base 1.10m

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL Installation Summary.hbt/Config Fugro Rev4/26/06/2018/TS				Print Date	15/08/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1803**
	Fugro Reference	G170029U			
	Coordinates (m)	E503396.30 N178062.37	Ground Elevation (m Datum)	21.20	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Record of Water Levels in Installations

Installation Details

Installation Type	Gas Monitoring Point	Depth from (m)	Depth to (m)	Pipe Type
Cover Details	Flush cover			
Response Zone				
Installation Date	11/12/2018			

Reading Details

Date	Time	Operator	Depth to Water (m)	Water Level (m Datum)	Remarks
06/02/2018	12:00	DM	0.22	20.98	base 4.13m
14/02/2018	14:30	DM	0.26	20.94	base 4.13m

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL Installation Summary.hbt/Config Fugro Rev4/26/06/2018/TS				Print Date	15/08/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1806**
	Fugro Reference	G170029U			
	Coordinates (m)	E503127.66 N178127.24	Ground Elevation (m Datum)	21.36	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Record of Water Levels in Installations

Installation Details

Installation Type	Standpipe	Depth from (m)	Depth to (m)	Pipe Type
Cover Details	Upstanding cover	0.00	1.60	Plain
Response Zone	1.50 m to 4.10 m	1.60	4.10	Slotted
Installation Date	06/12/2017			

Reading Details

Date	Time	Operator	Depth to Water (m)	Water Level (m Datum)	Remarks
10/01/2018	13:25	AF	0.50	20.86	base 4.05m
18/01/2018	14:20	DM	0.45	20.91	base 3.99m
06/02/2018	11:40	DM	0.64	20.72	base 4.00m
14/02/2018	14:00	DM	0.32	21.04	base 4.00m

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL Installation Summary.hbt/Config Fugro Rev4/26/06/2018/TS				Print Date	15/08/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1807**
	Fugro Reference	G170029U			
	Coordinates (m)	E503128.23 N178127.78	Ground Elevation (m Datum)	21.34	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Record of Water Levels in Installations

Installation Details

Installation Type	Gas Monitoring Point	Depth from (m)	Depth to (m)	Pipe Type
Cover Details	Upstanding cover	0.00	0.50	Plain
Response Zone	0.50 m to 1.20 m	0.50	1.20	Slotted
Installation Date	06/12/2017			

Reading Details

Date	Time	Operator	Depth to Water (m)	Water Level (m Datum)	Remarks
10/01/2018	13:20	AF	0.48	20.86	base 1.20m
18/01/2018	14:15	DM	0.38	20.96	base 1.20m
06/02/2018	11:42	DM	0.60	20.74	base 1.21m
14/02/2018	14:00	DM	0.25	21.09	base 1.20m

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL Installation Summary.hbt/Config Fugro Rev4/26/06/2018/TS				Print Date	15/08/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1810**
	Fugro Reference	G170029U			
	Coordinates (m)	E502898.96 N177631.91	Ground Elevation (m Datum)	21.86	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Record of Water Levels in Installations

Installation Details

Installation Type	Gas Monitoring Point	Depth from (m)	Depth to (m)	Pipe Type
Cover Details	Upstanding cover	0.00	1.00	Plain
Response Zone	0.90 m to 2.00 m	1.00	2.00	Slotted
Installation Date	13/12/2017			

Reading Details

Date	Time	Operator	Depth to Water (m)	Water Level (m Datum)	Remarks
13/12/2017	09:45		Dry		
17/01/2018	00:00	DM	1.79	20.07	base 2.10m
30/01/2018	12:16	DM	1.76	20.10	base 2.12m
13/02/2018	14:30	DM	1.70	20.16	base 2.10m
21/02/2018	13:35	DM	1.75	20.11	base 2.10m

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL Installation Summary.hbt/Config Fugro Rev4/26/06/2018/TS				Print Date	15/08/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1811**
	Fugro Reference	G170029U			
	Coordinates (m)	E502900.12 N177632.24	Ground Elevation (m Datum)	21.90	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Record of Water Levels in Installations

Installation Details

Installation Type	Standpipe	Depth from (m)	Depth to (m)	Pipe Type
Cover Details	Upstanding cover	0.00	1.20	Plain
Response Zone	1.00 m to 6.20 m	1.20	6.20	Slotted
Installation Date	14/12/2017			

Reading Details

Date	Time	Operator	Depth to Water (m)	Water Level (m Datum)	Remarks
14/12/2017	14:05		2.00	19.90	
17/01/2018	00:00	DM	1.86	20.04	base 6.32m
30/01/2018	12:16	DM	1.78	20.12	base 6.45m
13/02/2018	14:30	DM	1.72	20.18	base 6.34m
21/02/2018	13:35	DM	1.80	20.10	base 6.31m

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL Installation Summary.hbt/Config Fugro Rev4/26/06/2018/TS				Print Date	15/08/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1863**
	Fugro Reference	G170029U			
	Coordinates (m)	E503177.94 N177920.66	Ground Elevation (m Datum)	26.07	Sheet 1 of 1
	Hole Type	Hollow Stem Auger			Status: Final

Record of Water Levels in Installations

Installation Details

Installation Type	Standpipe	Depth from (m)	Depth to (m)	Pipe Type
Cover Details	Flush cover	0.00	1.00	Plain
Response Zone	1.00 m to 5.50 m	1.00	5.50	Slotted
Installation Date	15/12/2017			

Reading Details

Date	Time	Operator	Depth to Water (m)	Water Level (m Datum)	Remarks
05/01/2018	10:00	AF	5.27	20.80	base 7.46m
18/01/2018	00:00	DM	5.22	20.85	base 7.47m
30/01/2018	12:51	DM	5.18	20.89	base 7.48m
06/02/2018	12:20	DM	5.48	20.59	base 7.38m
13/02/2018	14:44	DM	5.16	20.91	base 7.36m
21/02/2018	14:40	DM	5.17	20.90	base 7.36m

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL Installation Summary.hbt/Config Fugro Rev4/26/06/2018/TS				Print Date	15/08/2018

	Contract Name	HAL Airport Expansion			Location ID
	Client	Heathrow Airport Limited			**HEP-BH-1864**
	Fugro Reference	G170029U			
	Coordinates (m)	E503318.26 N177736.02	Ground Elevation (m Datum)	23.23	Sheet 1 of 1
	Hole Type	Cable Percussion			Status: Final

Record of Water Levels in Installations

Installation Details

Installation Type	Standpipe	Depth from (m)	Depth to (m)	Pipe Type
Cover Details	Flush cover	0.00	1.20	Plain
Response Zone	1.00 m to 3.20 m	1.20	3.20	Slotted
Installation Date	19/12/2017			

Reading Details

Date	Time	Operator	Depth to Water (m)	Water Level (m Datum)	Remarks
19/12/2017	09:25		2.50	20.73	

Notes

- Abbreviations and results data defined on 'Notes on Exploratory Position Records'

Checked By	ASC	Elevation Datum	Ordnance Datum (Newlyn)	Grid Coordinate System	OSGB
Template: FGSL/HBSI/FGSL Installation Summary.hbt/Config Fugro Rev4/26/06/2018/TS				Print Date	15/08/2018

H. GEOPHYSICAL SURVEY REPORT

FUGRO GEOSERVICES LIMITED

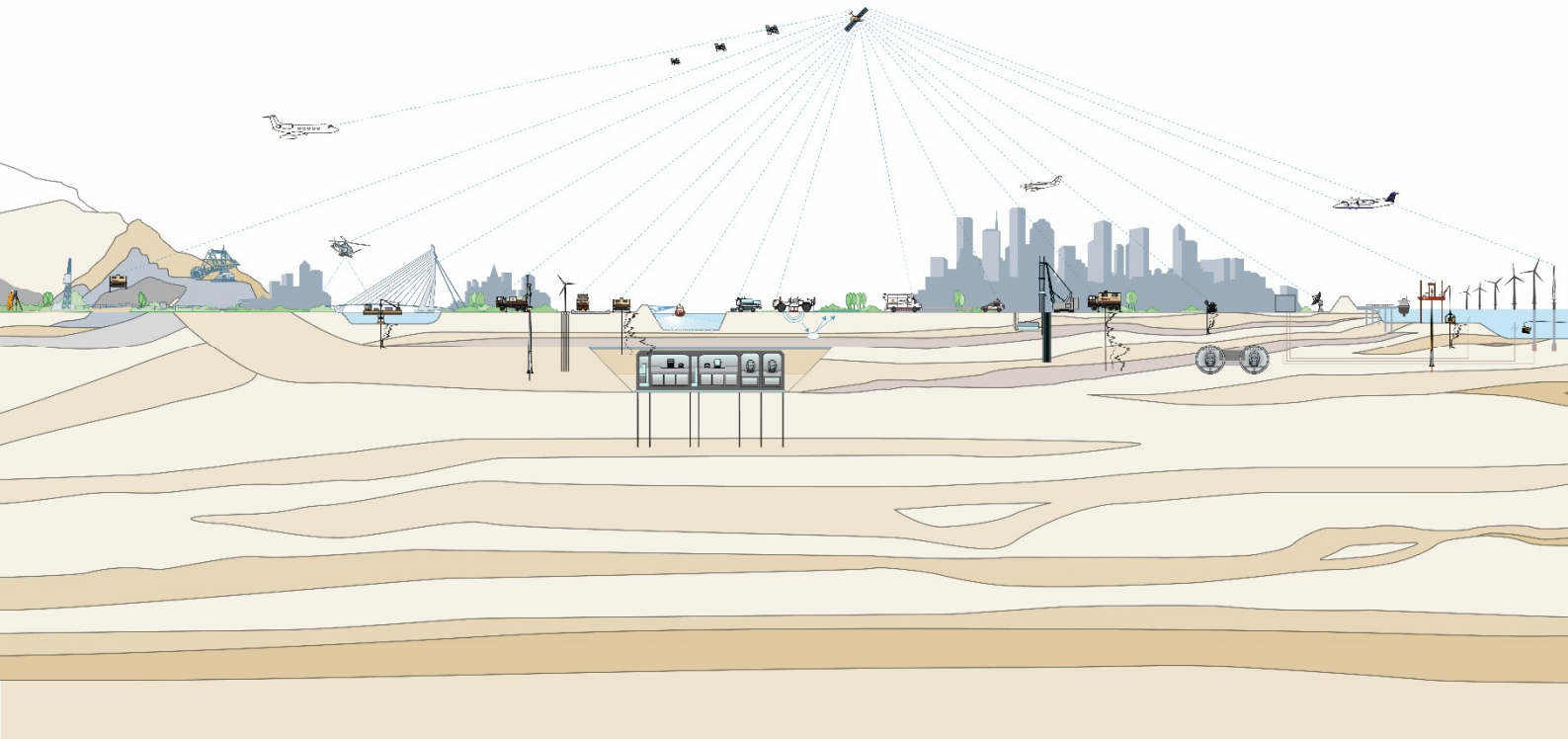
Heathrow Expansion Programme – Geophysical Investigation

Package 3

Fugro Document No.: G170021U_P4_P3_002
26 June 2018

Heathrow Airport Limited

Final



Heathrow Expansion Programme – Geophysical Investigation

Package 3

Fugro Document No.: G170021U_P4_P3_002
26 June 2018

Prepared for:

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02	Final	JF	WLC	D.Kilcoyne	26/06/2018
01	Draft	JF	WLC	D.Kilcoyne	19/06/2018
Issue	**Report Status**	**Prepared**	**Checked**	**Approved**	**Date**

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FIGURES IN THE MAIN TEXT

APPENDICES

1. INTRODUCTION

1.1 General

This report documents a geophysical investigation using Frequency Domain Electromagnetics and Electrical Resistivity Tomography techniques carried out as part of Heathrow Expansion Programme, Package 3 area for Heathrow Airport Limited.

1.2 Objective

The objectives of the investigation were:

- To map the lateral spatial extents of landfill material

1.3 Site Work

The geophysical investigation was carried out between 30th October and 4th December 2017.

1.4 Terms of Reference

This report is based upon data acquired between 30th October and 4th December 2017.

This investigation employed geophysical methods and therefore the majority of the findings presented here are the result of the measurement and interpretation of electrical and electromagnetic signals. As such any results derived from the geophysical investigation should be taken in the context of and in reference to the complete ground investigation. Reasonable skill and care was taken to ensure that the results are accurate and reliable, including reference where appropriate to published data from this and/or other sites. However, as with other indirect methods there is a possibility of localised inconsistencies and inaccuracies within the results.

This final report supersedes any previous reports, whether written or oral and completes the work currently commissioned by Heathrow Airport Limited.

1.5 Service Constraints

Appendix A (Service Constraints) outlines the limitations of this report in terms of a range of considerations including, but not limited to, its purpose, its scope, the data on which it is based, its use by Third Parties, possible future changes in design procedures and possible changes in the conditions at the site with time. Appendix A represents a clear exposition of the constraints, which apply to all reports issued by Fugro Geoservices Limited. It should be noted that the Service Constraints do not in any way supersede the terms and conditions of the contract between Fugro Geoservices Limited and the Client.

2. BACKGROUND INFORMATION & SURVEY RATIONALE

2.1 General

Heathrow Airport is located inside the M25 London Orbital Motorway to the west of London. The airport is centred on National Grid reference TQ 074 756 and surrounded by the districts of Hounslow, Feltham, Hayes and Ashford. The existing airport covers an area of 1,227 hectares (ha), including two runways, 5 terminal buildings, 125 aircraft stands, 40 remote stands, 12 cargo stands and associated ancillary structures / infrastructure. The area to be assessed / investigated includes areas of the existing airport, as well as significant additional areas of land surrounding the current airport boundary

The Main works (Heathrow Expansion Programme) comprise the proposed expansion of HAL Airport. The options for the potential development of the Main works are still being developed. In summary, the Main works may comprise the following:

- A third runway, located to the north of the existing northern runway;
- Aircraft movement and taxiways;
- Terminal / airport buildings / service and apron areas in association with the runway;
- Development of ancillary buildings; offices, hotels, car parking;
- Development of associated above and below ground infrastructure;
- Works to the M25 motorway; and
- Works to the existing rivers networks and associated catchments.

Although no definitive 'site boundary' is defined the majority of the development works associated with the expansion will be undertaken in an area to the north, northwest, west and southwest of the current airport perimeter.

The purpose of this contract is to provide land quality and geotechnical information in support of assessments which may be required to support a Development Consent Order (DCO) application for the expansion works at HAL Airport. The scope and design of the initial Stage of intrusive ground investigation and monitoring works is to obtain information on ground and groundwater conditions, identify potential contamination sources, assess the geotechnical properties of the ground, obtain information on possible mineral resources and assess the possibilities for re-use of surplus (waste) materials.

This report applies to a geophysical survey for the Heathrow Expansion Programme. The geophysical survey is required as part of the combined geophysical and ground investigation.

2.2 Site Information

The site comprised 3 fields collectively referred to as Package 3. Individual field names are listed below:

- A. Tanhouse Farm No.1
- B. Tanhouse Farm No.2
- C. Tanhouse Area 22 & Procea Products

However, access could only be gained to Tanhouse Farm No.1 and so this report relates to this area only.

2.3 Survey methods

The investigation was carried out using the following geophysical methods:

- Electromagnetic conductivity (EM)

2.4 Rationale

The survey methods listed above were selected to meet the objectives of the investigation based upon expected physical characteristics of the target.

The EM31 technique allows measurement of both conductivity and Inphase response. Inphase response is sensitive to metallic material which highlights areas of high metal content, should it be expected that the landfill material contains metallic waste this could be a key diagnostic marker.

Areas of relatively low conductivity or anomalous to the site norm (natural ground) could be indicative of potential landfill extents and used to delineate the lateral position of the landfill.

3. FREQUENCY DOMAIN ELECTROMAGNETICS

3.1 Theory

Frequency domain electromagnetic measurements are often carried out to provide rapid, reconnaissance surveys across large physical areas. The technique is sensitive to both changes in ground conductivity and metallic objects within the ground (e.g. an increase in clay content, solution features, leachate/contamination, services, landfill material etc). Surface positions of such buried targets can therefore be identified for further intrusive or remediation work.

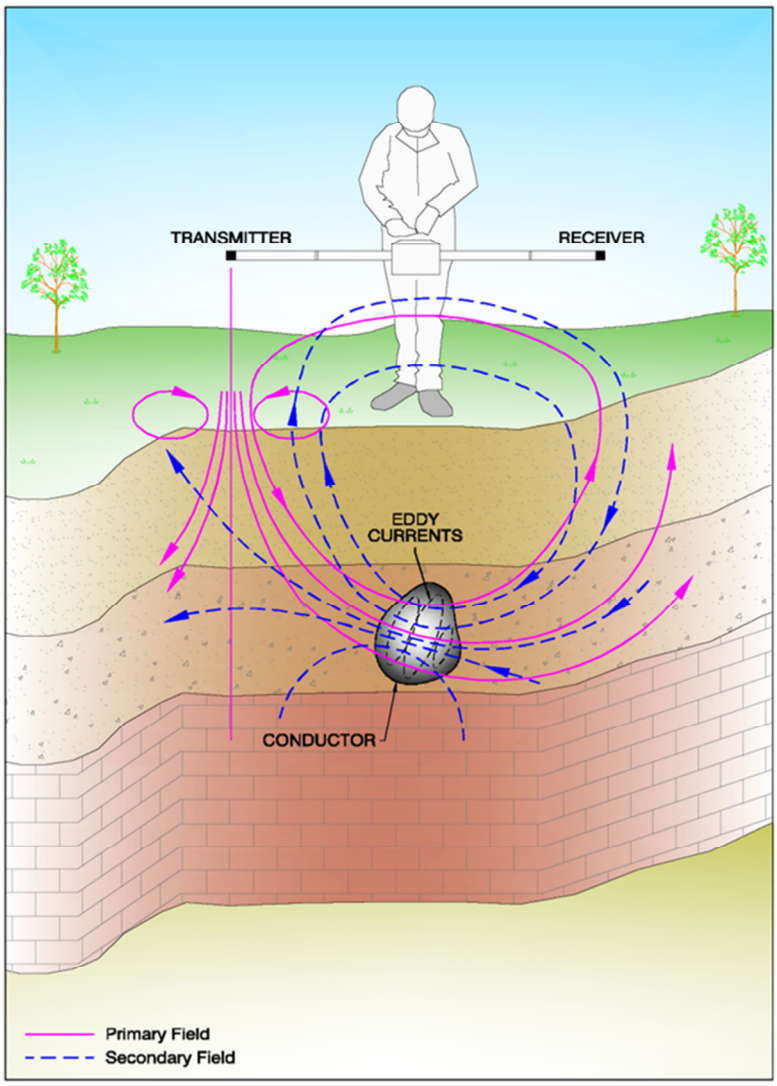


Figure 3.1 – Schematic illustration of the frequency domain electromagnetic technique

A primary electromagnetic field is generated at the surface by a low voltage alternating current within a dipole transmitter. When the primary field interacts with conductive materials within the subsurface, eddy currents are generated. These eddy currents in turn generate their own (secondary) electromagnetic field, the strength of which is proportional to the bulk average conductivity of the subsurface. The resultant electromagnetic field is recorded at the surface by a dipole receiver, from which the secondary magnetic field can be deduced. A schematic of the technique is presented on Figure 3.1.

The instrument records the quadrature response of the electromagnetic field, which is directly related to the average bulk conductivity of the subsurface. This is usually recorded in milli-Siemens per metre (mS/m). The instrument also records Inphase response which is usually recorded in Parts Per Thousand (PPT).

Changes in the electrical properties of the subsurface mass, e.g. presence of man-made structures or geological features generally give rise to a contrast in the ground electrical conductivity which can be measured by the electromagnetic instruments.

Data is normally filtered to remove erroneous noise and plotted as profiles or contour plots, from which the extent of anomalous features can be identified.

3.2 Survey methodology

The EM survey was carried out across an area measuring 43.74 hectares. The position of the survey area is provided on Drawing P1_GenLoc and summarised in the table below:

Table 3.1 – EM31 survey areas

Field	Area covered
A. Tanhouse Farm No.1	43.74 Ha
B. Tanhouse Farm No.2	0.00 Ha (Not accessible)
C. Tanhouse Area 22 & Procea Products	0.00 Ha (Not Accessible)

Data were acquired using a Geonics EM31 meter. Key survey parameters defined for this survey are summarised in Table 3.2.

Table 3.2 – EM31 survey acquisition parameters/equipment

Parameter	Description
Meter	EM31
Dipole mode	Vertical
Approx depth penetration	5 m
Line orientation	Parallel
Line spacing	2 m
Positioning mode	dGPS
Measurement interval	<0.2 m

An initial local reference grid was established on site covering the required survey area. The EM system was set up according to manufacturer instructions and nulled at a designated base station.

Prior to commencement of data acquisition a number of quality control checks were carried out to assess equipment function and site conductivity characteristics. In general data quality across all areas of the site was considered to be of good quality.

Data were saved digitally on a dedicated data logger to enable office based post-processing.

Coordinates of all measurement stations were recorded using dGPS equipment to an accuracy of +/- 0.3 m.

3.3 Data processing

Raw data were imported into Oasis Montaj software for post processing.

Post processing steps included:

- Instrument drift correction
- Incorporation of positional information
- Correction for GPS-instrument offset
- Coordinate transform to project coordinate system
- De-spiking and removal of spurious data point
- Spatial frequency filtering as appropriate
- Minimum curvature contouring
- Presentation at appropriate colour scales

Post processed contour sections showing site variations in conductivity and Inphase response were overlain onto an AutoCAD baseplan provided by the client to allow identification and annotation of anomalous features relating to buried targets.

Final conductivity and Inphase response contour sections are presented on plates in Appendix B.

4. HISTORICAL DATA

4.1 General

Historical data were provided by the client. From these data, bodies of water relating to Tanhouse Farm No.1 were extracted and presented along with the geophysics data to assist understanding of the subsurface structure.

4.2 A. Tanhouse Farm No.1

Reports produced by Envirocheck provided information relating to the surface position of landfill features. These features were represented as bodies of water which were likely related to historical gravel and sand extraction. These features have been transposed onto plates provided in Appendix B.

A further report "AG1041-08-PII" prepared by Applied Geology for Environmental Resources Management (ERM) in 2009 indicates the site has been subject to historical sand and gravel extraction and subsequent landfill of waste material. The main purpose of this historical report is to document borings and trial pits undertaken at this time across Tanhouse Farm No. 1 and No. 2.

In total 53 No. boreholes and 69 No. trial pits are captured within the report with the borehole information indicating Made Ground containing fill material ranging from 15.00 to 21.00 mOD underlain by River Terrace Deposits underlain by London Clay.

The position of the historic boreholes was transposed onto plates provided in Appendix B.

5. FINDINGS

5.1 General

Electromagnetic data were collected across all accessible areas of Package 3; total coverage measured 43.74 Ha. Conductivity and In-phase response data are presented in Appendix B.

5.2 Interpretation rationale

Conductivity of ground materials is a function of both matrix material and porosity, but is largely controlled by the latter and in particular the nature of the fluid/gas filling the pore space. Dry ground with high porosity will yield relatively low conductivity values. Water saturated ground with high porosity will yield relatively high conductivity values. The presence of clayey material will generally result in high conductivity values which will also be affected by the presence or absence of groundwater.

Mindful of these relationships it might be expected that:

- dry, unsaturated landfill material would be represented by relatively low conductivity
- saturated landfill material would be represented by relatively high conductivity
- clay material would be represented by relatively high conductivity
- near surface materials with laterally variable composition and porosity would likely yield similarly variable conductivity

For the purposes of interpretation of the electromagnetic conductivity data, areas of high conductivity were highlighted and digitised following the rationale that shallow landfill material had been capped with a material containing clay. In addition, the presence of isolated, discrete anomalies were also identified that might represent shallow buried metallic or conductive objects.

Where historical information was available relating to borehole and trial pit locations as well as previous water filled excavations these data were plotted on the plans to assist with further consideration of intrusive investigations.

5.3 Interpretation

The EM data shows variable conductivity across much of the site with historical information indicating landfill material to be present across almost the entire site.

Subtle near surface variations in conductivity across the site map out to form geometric shapes which are coincident with the positon of historical bodies of water. It is thought likely that this is due to higher saturation levels or more clayey cap material used in these areas. In addition within these relatively higher conductivity areas there are localised areas of very high conductivity which have also been highlighted.

These areas of localised very high conductivity are thought to relate to thickness of clay capping material or localised very highly conductive fill material.

Areas with relatively lower conductivity are thought to represent potentially dryer material in the near surface that may not have been worked as recently as the higher conductivity area.

Discrete anomalies have been highlighted from the Inphase response data, it is worth noting that in areas coincident with previous water filled excavation the number of discrete anomalies increases. This is likely a function of the fill material containing metallic waste.

A linear anomaly running approximately South-west to North-east across the area was highlighted and may be representative of a buried utility.

6. SUMMARY & CONCLUSIONS

6.1 General

This report documents a geophysical investigation using Frequency Domain Electromagnetic technique carried out at Heathrow Expansion Programme, Package 3. The objectives of the investigation were to map the lateral spatial extents of landfill material.

The geophysical investigation was carried out between 30th October and 4th December 2017.

6.2 Summary

Electromagnetic data were acquired across the field covering 43.74 Ha.

The data collected were generally of good quality.

Data were acquired and processed following protocols described in this report. The final processed data and respective interpretation are summarised on drawings and presented in Appendix B.

6.3 Conclusion

The investigation identified changes within the near surface thought likely to be a result of changes in fill material and/or thickness variation of clay capping material.

It must be emphasised that geophysical methods can only identify areas yielding results that are different, i.e. anomalous to the site norm. The interpretation of the cause of such anomalies is inevitably based on assumptions utilising the best information available on the historic use of the site. Positive identification of these anomalies can only be made through using visual or intrusive investigation techniques.

7. REFERENCES

Reynolds, J. M. (1997) *An Introduction to Applied and Environmental Geophysics*. Chichester, John Wiley & Sons

Applied Geology (2009) report on Ground Investigation as SIFE, Colnbrook, Slough. Report Number AG1041-08-PII

Jacobs UK Ltd Borehole sections generated using “HEP Historical AGS_MML_130817.ags” file

Envirocheck (2017) report Historical Mapping “292244_EC_D_Histslice10000.pdf” & “292244_EC_G_Histslice10000.pdf”

A. APPENDIX A

A.1 SERVICE CONSTRAINTS

Appendix A – Service Constraints

i. This report and the assessment carried out in connection with the report (together the "Services") were compiled and carried out by Fugro GeoServices Limited (FGSL) for Heathrow Airport Limtied (the "Client") in accordance with the terms of a contract between FGSL and the Client. The Services were performed by Fugro Geoservices with the skill and care ordinarily exercised by a reasonable specialist at the time the Services were performed. Further, and in particular, the Services were performed by FGSL taking into account the limits of the scope of works required by the Client, the time scale involved and the resources, including financial and manpower resources, agreed between FGSL and the Client.

ii. Other than that expressly contained in paragraph 1 above, FGSL provides no other representation or warranty whether express or implied, in relation to the Services.

iii. The Services were performed by FGSL exclusively for the purposes of the Client. FGSL is not aware of any interest of or reliance by any party other than the Client in or on the Services. Unless expressly provided in writing, FGSL does not authorise, consent or condone any party other than the Client relying upon the Services. Should this report or any part of this report, or otherwise details of the Services or any part of the Services be made known to any such party, and such party relies thereon that party does so wholly at its own and sole risk and FGSL disclaims any liability to such party. Any such party would be advised to seek independent advice from a competent specialist and / or lawyer.

iv. It is FGSL's understanding that this report is to be used for the purpose described in Section 1 - "Introduction" of this report. That purpose was a significant factor in determining the scope and level of the Services. Should the purpose for which the report is used, and/or should the Client's proposed development or use of the site change (including in particular any change in any design and/or specification relating to the proposed use or development of the site), this report may no longer be valid or appropriate and any further use of or reliance upon the report in those circumstances by the Client without FGSL's review and advice shall be at the Client's sole and own risk. Should FGSL be requested, and FGSL agree, to review the report after the date hereof, FGSL shall be entitled to additional payment at the then existing rates or such other terms as may be agreed between FGSL and the Client.

v. The passage of time may result in changes (whether man-made or otherwise) in site conditions and changes in regulatory or other legal provisions, technology, methods of analysis, or economic conditions which could render the report inaccurate or unreliable. The information, recommendations and conclusions contained in this report should not be relied upon if any such changes have taken place or after a period of 2 years from the date of this report or such other period as maybe expressly stated in the report, without the written agreement of FGSL. In the absence of such written agreement of FGSL, reliance on the report after any such changes have occurred or after the period of 2 years has expired shall be at the Client's own and sole risk. Should FGSL agree to review the report after the period of 2 years has expired, FGSL shall be entitled to additional payment at the then existing rates or such other terms as may be agreed between FGSL and the Client.

vi. The observations, recommendations and conclusions in this report are based solely upon the Services, which were provided pursuant to the contract between the Client and FGSL. FGSL has not performed any observations, investigations, studies or testing not specifically set out or required by the contract between the Client and FGSL. FGSL is not liable for the existence of any condition, the discovery of which would require performance of services not otherwise contained in the Services.

vii. Where the Services have involved FGSL's interpretation and/or other use of any information (including documentation or materials, analysis, recommendations and conclusions) provided by third parties (including independent testing and/or information services or laboratories) or the Client and upon which

FGSL was reasonably entitled to rely or involved FGSL's observations of existing physical conditions of any site involved in the Services, then the Services clearly are limited by the accuracy of such information and the observations which were reasonably possible of the said site. Unless otherwise stated, FGSL was not authorised and did not attempt to independently verify the accuracy or completeness of such information, received from the Client or third parties during the performance of the Services. FGSL is not liable for any inaccuracies (including any incompleteness) in the said information, the discovery of which inaccuracies required the doing of any act including the gathering of any information which it was not reasonably possible for FGSL to do including the doing of any independent investigation of the information provided to FGSL save as otherwise provided in the terms of the contract between the Client and FGSL.

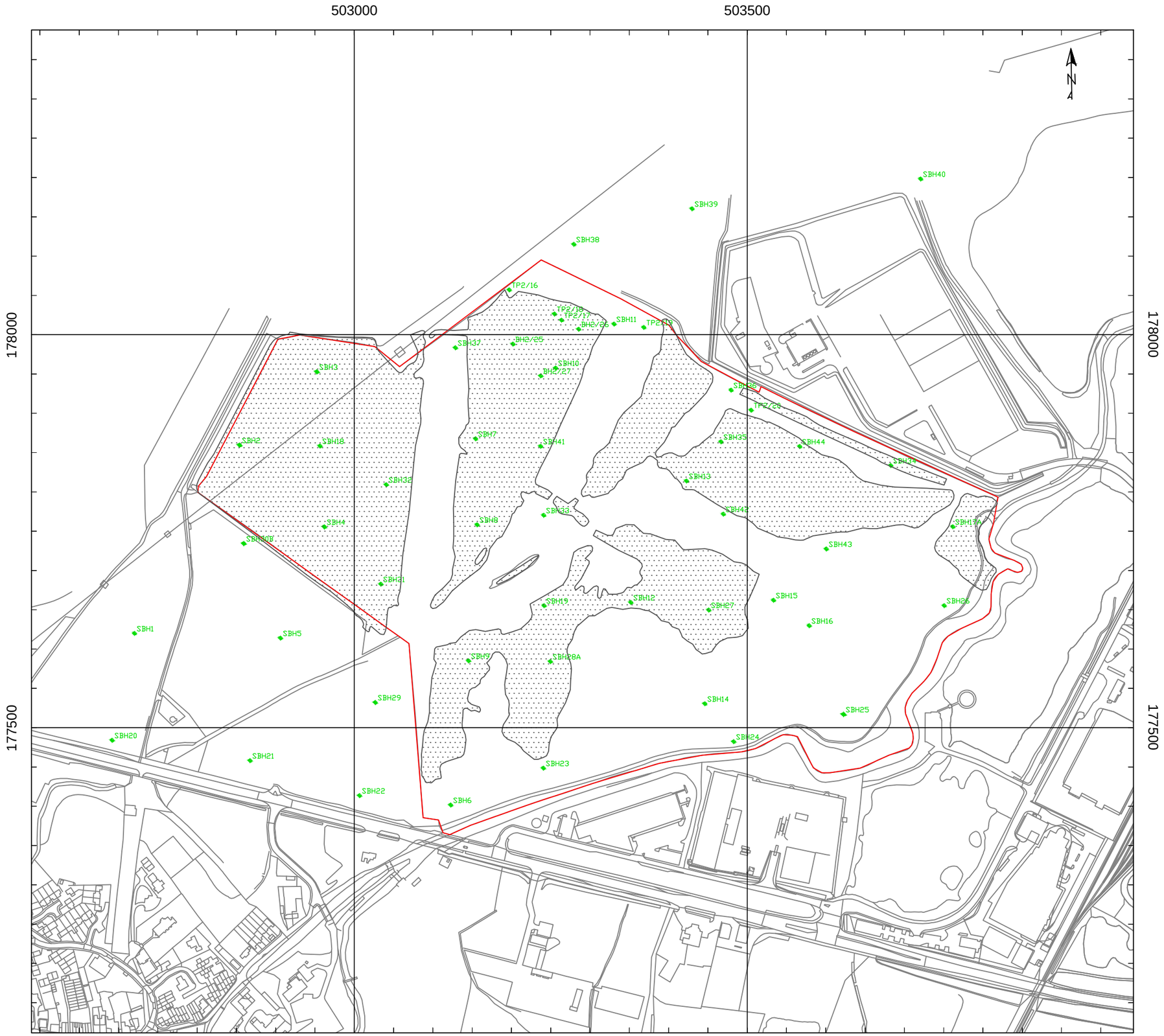
B. APPENDIX B

B.1 PLATES

LIST OF Plates

P3_GenLoc		Package 3 General Location Plan
P3_EM-Q	-	Package 3 Colour Contour Plot Showing Conductivity
P3_EM-I	-	Package 3 Colour Contour Plot Showing InPhase Response
P3_Anom	-	Package 3 EM Anomaly Plan

P3 LOCATION PLAN



PLOT SCALE:

Scale 1:5,000

0 50 100 150 200 250 300 350 400

metres

LEGEND:

Historical Location of Water Filled Excavations

Historical Borehole Location

NOTES:

1. Baseplan reproduced from drawing no. 20171211__Geophysics__Package9a.dwg provided by Client.
2. Coordinates relative to OSGB (1936)

CLIENT: HEATHROW AIRPORT LIMITED

PROJECT: HEATHROW EXPANSION PROGRAMME
GEOPHYSICAL INVESTIGATION

TITLE: GENERAL LOCATION
PACKAGE 3 - A. TANHOUSE FARM NO. 1

INTERP. BY: JF	DATE: 26/06/2018	DRAWN BY: JF	DATE: 26/06/2018
CHECKED BY: WLC	DATE: 27/06/2018	APPROVED BY: DK	DATE: 27/06/2018

CONTRACT No.: G170021U

PLATE P3__GENLOC

FUGRO DOCUMENT NO: G170021U__P4__P3__002

PLOTTED DRAWING SIZE: A3 (420 x 297)

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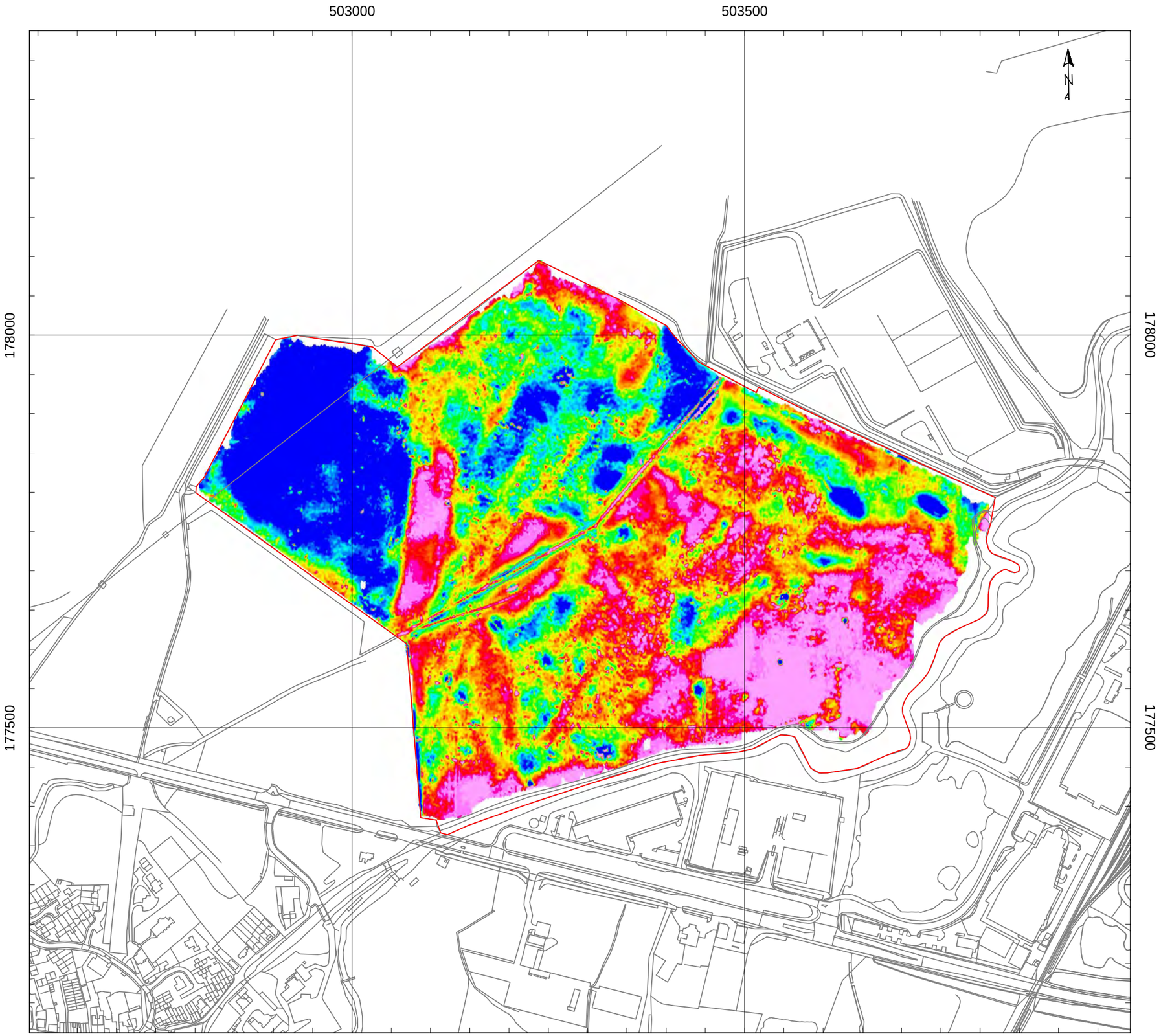
EM CONDUCTIVITY



PLOT SCALE:

Scale 1:5,000

0 50 100 150 200 250 300 350 400

metres

LEGEND:

Apparent Ground Conductivity (mS/m)

49.6 55.4 58.5 60.7 62.5 64.2 65.6 67.0 68.4 69.7 71.0 72.3 73.6 75.1 76.6 78.3 80.3 82.9 86.8

NOTES:

1. Baseplan reproduced from drawing no. 20171211__Geophysics__Package9a.dwg provided by Client.
2. Coordinates relative to OSGB (1936)

CLIENT:

HEATHROW AIRPORT LIMITED

PROJECT:

HEATHROW EXPANSION PROGRAMME
GEOPHYSICAL INVESTIGATION

TITLE:

ELECTRO-MAGNETIC GROUND CONDUCTIVITY
PACKAGE 3 - A. TANHOUSE FARM NO. 1

INTERP. BY:	DATE:	DRAWN BY: JF	DATE: 26/06/2018
CHECKED BY: WLC	DATE: 27/06/2018	APPROVED BY: DK	DATE: 27/06/2018

CONTRACT No.: G170021U

PLATE P3__EM-I

FUGRO DOCUMENT NO: G170021U__P4__P3__002

PLOTTED DRAWING SIZE: A3 (420 x 297)

FUGRO GEOSERVICES LIMITED
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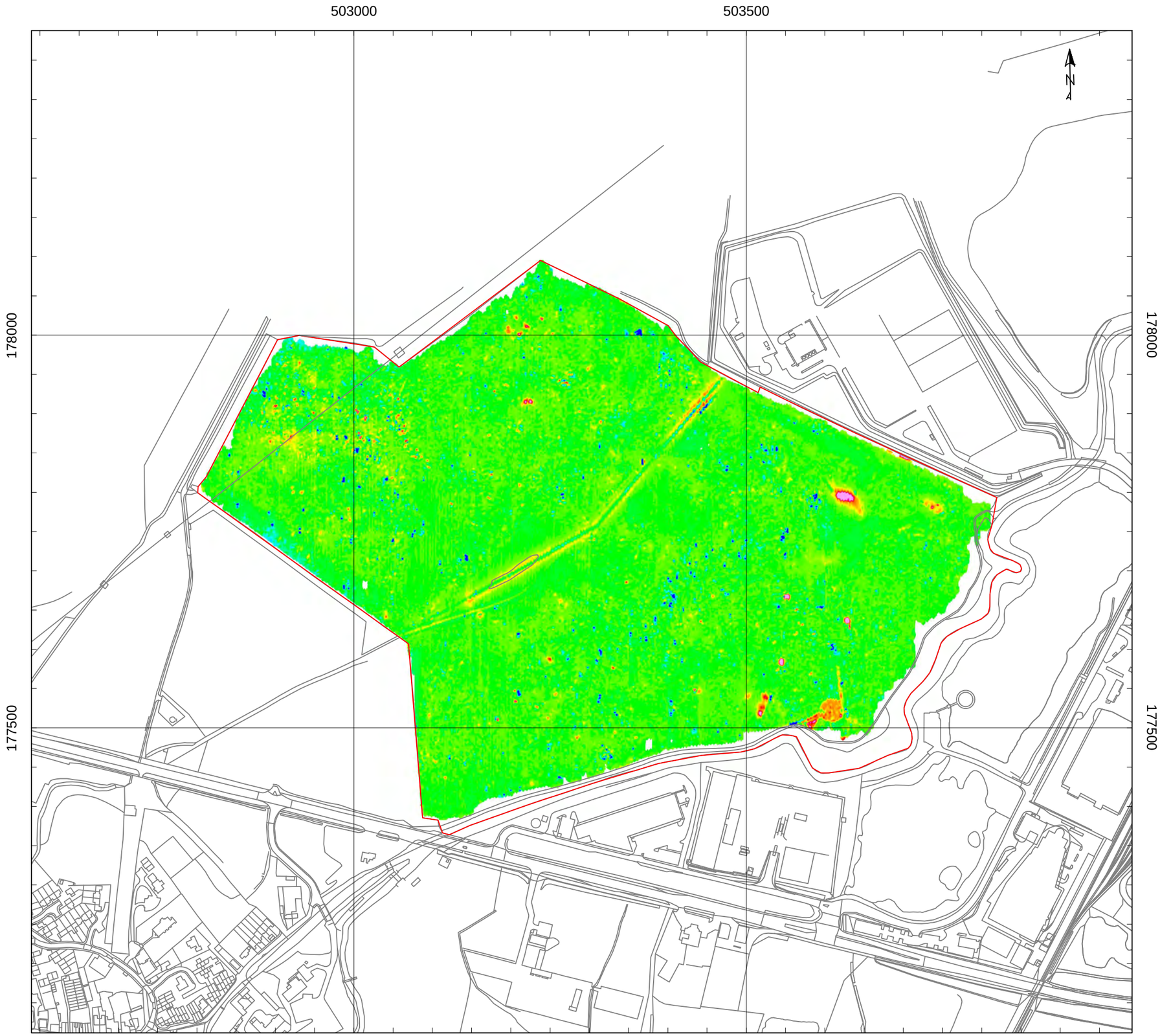
EM INPHASE RESPONSE



PLOT SCALE:

Scale 1:5,000

0 50 100 150 200 250 300 350 400

metres

LEGEND:

Inphase Response (ppt)

-9.2 -7.7 -6.2 -4.6 -3.1 -1.5 0.0 1.5 3.1 4.6 6.2 7.7 9.2 10.8 12.3 13.8 15.4 16.9 18.5

NOTES:

1. Baseplan reproduced from drawing no. 20171211__Geophysics__Package9a.dwg provided by Client.
2. Coordinates relative to OSGB (1936)

CLIENT:

HEATHROW AIRPORT LIMITED

PROJECT:

HEATHROW EXPANSION PROGRAMME
GEOPHYSICAL INVESTIGATION

TITLE:

ELECTRO-MAGNETIC INPHASE RESPONSE
PACKAGE 3 - A. TANHOUSE FARM NO. 1

INTERP. BY:	DATE:	DRAWN BY: JF	DATE: 26/06/2018
CHECKED BY: WLC	DATE: 27/06/2018	APPROVED BY: DK	DATE: 27/06/2018

CONTRACT No.: G170021U

PLATE P3__EM-I

FUGRO DOCUMENT NO: G170021U__P4__P3__002

PLOTTED DRAWING SIZE: A3 (420 x 297)

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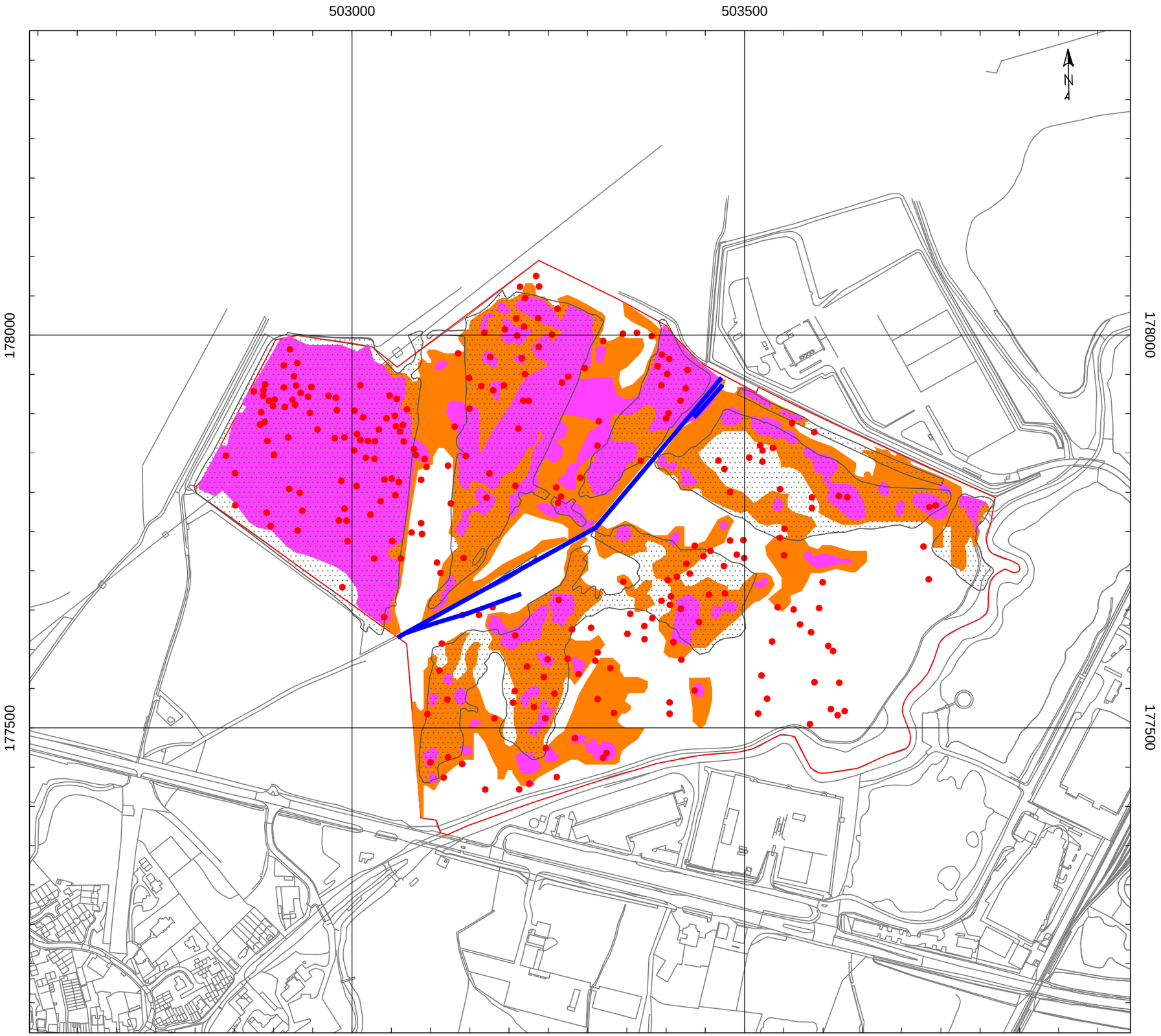
EM ANOMALY PLAN



PLOT SCALE:

Scale 1:5,000

0 50 100 150 200 250 300 350 400

metres

LEGEND:

- Localised very high conductivity
- EM Area of Relatively High Conductivity
- Historical Location of Bodies of Water
- EM Linear Feature
- Discrete EM Anomaly (likely buried metal object)

NOTES:

1. Baseplan reproduced from drawing no. 20171211__Geophysics__Package9a.dwg provided by Client.
2. Coordinates relative to OSGB (1936)

CLIENT:

HEATHROW AIRPORT LIMITED

PROJECT:

HEATHROW EXPANSION PROGRAMME
GEOPHYSICAL INVESTIGATION

TITLE:

EM ANOMALY PLAN
PACKAGE 3 - A. TANHOUSE FARM NO. 1

INTERP. BY: JF	DATE: 26/06/2018	DRAWN BY: JF	DATE: 26/06/2018
CHECKED BY: WLC	DATE: 27/06/2018	APPROVED BY: DK	DATE: 27/06/2018

CONTRACT No.: G170021U

PLATE P3__ANOM

FUGRO DOCUMENT NO: G170021U__P4__P3__002

PLOTTED DRAWING SIZE: A3 (420 x 297)

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I. GEOTECHNICAL LABORATORY TEST RESULTS

I.1 GUIDANCE NOTES

I.2 UKAS SCHEDULES

I.3 LAORATORY SCHEDULES

I.4 RESULTS

(referenced by Position ID, sample type and reference, and depth)

Classification:

Summary of Classification Tests

Particle Size Distribution Curves

Compaction-Related:

Determination of Dry Density/Water Content Relationship

Maximum and Minimum Density

Moisture Condition Value

Determination of Moisture Condition Value/Water Content Relationship

California Bearing Ratio

Compressibility and Permeability:

One-dimensional Consolidation Properties from One-dimensional Incremental Oedometer Test

Determination of Permeability in a Triaxial Cell

Soil Shear Strength (Total Stress):

Undrained Shear Strength in Triaxial Compression without Measurement of Porewater Pressure (single stage test on a single specimen)

Undrained Shear Strength in Triaxial Compression without Measurement of Porewater Pressure (multistage test on a single specimen)

Shear Strength by Direct Shear (sets of three tests on 60 mm square specimens)

Soil Shear Strength (Effective Stress):

Consolidated Undrained Triaxial Compression Tests with measurement of porewater pressure (single stage and multistage tests on a single specimen)

Electro-chemical:

Electric Resistivity using the Wenner Probe

Ground Aggressivity Tests and Soil Chemical Analyses:

SOCOTEC UK Limited, Test Reports:

- EFS/187038 (ver.1);
- EFS/187039 (ver.1);
- EFS/187040 (ver.1);
- EFS/187203 (ver.1);
- EFS/187293 (ver.1);
- EFS/187666 (ver.1);
- EFS/188847 (ver.1);
- EFS/189339 (ver.1).

Contamination Screening:

Summary of Photo Ionisation Detector Readings

GENERAL NOTES ON LABORATORY TEST RESULTS

TEST METHODS

The tests reported on the following sheets have been carried out in accordance with the methods given in BS 1377:1990 ‘Methods of test for soils for civil engineering purposes', subject to a small number of variances as described below under the respective headings. These notes also serve as keysheets to any notation used in reporting the laboratory tests.

KEY TO NOTATION OF SAMPLE TYPE

D	Small disturbed sample
B	Bulk disturbed sample
LB	Large bulk disturbed sample
U/UT	General purpose open drive tube sample
P	Piston sample
TW	Thin wall sample
C	Rotary core sample

CLASSIFICATION TESTS

WS	sample prepared by wet sieving
HP	sample prepared by hand picking and removal of gravel sized fragments
AR	sample tested as received
NP	non plastic
% passing 425µm	this figure is only correctly reported when WS is shown in the 'Method of preparation' column. For ‘HP’ and ‘AR’, the reported figure is an estimate only

COMPACTION-RELATED TESTS

Individual sample preparation - indicates test carried out on individual sub-samples
Single sample preparation - indicates test carried out on a single sample
Assumed values of particle density are reported in brackets, for example (2.67)

SAMPLE DESCRIPTIONS

The sample descriptions shown on the test report sheets are the technician’s visual descriptions of the test samples, in accordance with Clause 9.1 of Part 1 of BS 1377:1990, and do not necessarily comply with the requirements of BS 5930:2015 or BS EN ISO 14688-1:2002. For a more comprehensive description of the soil samples to these standards, reference should be made to the exploratory position records, or an engineering description can be provided on request.

INTERPRETATION OF TEST RESULTS

Laboratory test results in this report give the soil properties of individual specimens tested under specified conditions. Individual results or groups of results may not be appropriate for use as design parameters for some geotechnical analyses. The samples may be non-representative, disturbed internally, or prepared and tested under conditions suited for different geotechnical applications. Unless the selection of design parameters is discussed in this report, it is recommended that the advice of an appropriately qualified and experienced specialist is sought.

U100 DRIVEN OPEN TUBE SAMPLES

It should be noted that the sampling method using standard U100 (thick walled or liner OS-TK/W) samplers may give Class 2 samples, i.e. for use for laboratory classification, moisture content and density testing, but more generally Class 3. The sampling procedure using thin wall samples (OS-T/W) can achieve Class 1 samples (strength, deformation and consolidation testing as well as Class 2 type testing) in non-sensitive fine cohesive soils of stiff or lower consistency. In brittle or closely fissured materials such as hard clays, the lower sampling class is more frequently achieved, i.e. for use for laboratory classification and moisture content testing. UT samples are thin wall (OS-T/W) samples and so may provide Class 1 samples.

NOTES ON CHEMICAL ANALYSES FOR ASSESSING AGGRESSIVE GROUND

INTRODUCTION

The Building Research Establishment (BRE) issued guidance in 2001 on assessing the aggressive chemical environment with particular regard to concrete in the ground. The BRE guidance includes sampling and testing methods and requirements. The guidance states that for BRE aggressiveness samples the analysis must start as soon as possible after sampling and in all cases within 3 weeks. The BRE guidance also states that samples for aggressiveness testing should be kept in the temperature range of 2 to 4 degrees Celsius and in a dark place.

SAMPLING, SAMPLE PRESERVATION, TRANSPORT AND STORAGE

The sampling, storage and testing requirements for BRE aggressiveness testing are similar to those for chemical contamination testing. The standard transport, storage and testing requirements for samples for physical geotechnical testing is unacceptable for the BRE aggressiveness testing. In consideration of this, samples for BRE testing are taken, handled and stored as if they were environmental chemistry samples. Due to the sample mass requirements, environmental chemistry samples may also be used for BRE aggressiveness testing, but BRE samples are unlikely to be of sufficient mass to undertake environmental chemistry test suites.

The BRE samples taken on site have been preserved by control of temperature to between 2 and 4 degrees Celsius and dispatched to the analytical laboratory on the day of sampling under Chain of Custody (CoC) in temperature controlled cool-boxes. Sample temperature control is maintained at the laboratory prior to receipt of testing instructions, preparation and analysis.

Blank testing schedules are provided to the party responsible for scheduling the testing within 1 to 2 working days of sampling.

All environmental chemistry samples are prefixed with an "E" and suffixed with “S” (soil) or “W” (water). The BRE aggressiveness samples are designated "D" or “W” and may additionally be identified with “BRE”; these samples contain less mass than environmental samples and, are normally in plastic containers.

DEVIATING SAMPLES

UKAS is the accreditation body responsible for auditing laboratories to both ISO 17025 and MCERTS in the UK. All UKAS accredited laboratories are required to operate appropriate procedures for the handling of deviating samples.

Deviating (or non-conforming) samples are defined as those which may have been compromised in some way during sampling, transportation, storage or analysis, and which may cause the integrity of the analytical data to be in doubt. These procedures are also applicable to BRE testing and so the handling of these samples must be appropriate to prevent them being classed as deviating.

Examples of deviating samples that can occur from sampling, transportation and storage issues include:

- Incorrect sample containers for analyses requested;
- No sampling date supplied (mandatory for MCERTS);
- No sampling time supplied (applicable for certain water parameters);
- Temperature exceeded;
- Holding time for the analysis exceeded.

Where deviating samples are subsequently analysed, UKAS requires that the competent laboratory "shall include a disclaimer in the report, clearly stating that the sample was deviating and that, as a result, the test result(s) may be invalid". It is also a condition of MCERTS that the whole results certificate is included in reports sent to clients, not just the results sheet, including all supporting information. Each analytical report therefore contains a page detailing the deviating samples and the reasons for the non-conformity.

Fugro undertakes to sample, record, transport and store samples in such a way that deviating samples should not occur unless for reasons outside of Fugro's control.

References

BRE SD1: Building Research Establishment Special Digest 1: Parts 1 and 2 on Concrete in Aggressive Ground. Building Research Establishment, 2001.

United Kingdom Accreditation Service

ACCREDITATION CERTIFICATE

UKAS
UNITED KINGDOM ACCREDITATION SERVICE

TESTING LABORATORY
No. 1483

Fugro Engineering Services
A trading name of Fugro Seacore Limited

is accredited in accordance with the recognised International Standard ISO/IEC 17025:2005
General Requirements for the competence of testing and calibration laboratories.

This accreditation demonstrates technical competence for a defined scope as detailed in and at the locations specified in the schedule to this certificate, and the operation of a laboratory quality management system (refer joint ISO-ILAC-IAF Communiqué dated 18 June 2005).

The schedule to this certificate is an essential accreditation document and from time to time may be revised and reissued by the United Kingdom Accreditation Service. The most recent issue of the schedule of accreditation, which bears the same accreditation number as this certificate, is available from the UKAS website www.ukas.com.

This accreditation is subject to continuing conformity
with United Kingdom Accreditation Service requirements. The absence of a schedule on the UKAS website indicates that the accreditation is no longer in force.

Accreditation Manager, United Kingdom Accreditation Service

Initial Accreditation date
30 March 1994

This certificate issued on
05 April 2012

UKAS is appointed as the sole national accreditation body for the UK by The Accreditation Regulations 2009 (SI No 3155/2009) and operates under a Memorandum of Understanding (MoU) with the Department for Business, Innovation and Skills (BIS).

Schedule of Accreditation

issued by

United Kingdom Accreditation Service

2 Pine Trees, Chertsey Lane, Staines-upon-Thames, TW18 3HR, UK

1483

Accredited to ISO/IEC 17025:2005

Fugro GeoServices Limited

Issue No: 024 **Issue date:** 30 June 2016

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DETAIL OF ACCREDITATION

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used
ROCK	Point load strength and anisotropy indices	The Complete ISRM Suggested Methods for Rock Characterisation, Testing and Monitoring:1974-2006. Editors: R Ulusay & J A Hudson
	Water content	
	Porosity and density - by saturation and calliper techniques	
	Porosity and density - by saturation and buoyancy techniques	
	Slake-durability index	
SOILS for civil engineering purposes	California Bearing Ratio (CBR)	BS 1377- 4:1990
	Shear strength by direct shear (small shear box apparatus)	BS 1377- 7:1990
	Shear strength by direct shear (large shear box apparatus	BS 1377- 7:1990
	Unconfined compressive strength - load frame method	BS 1377- 7:1990
	Undrained shear strength - triaxial compression without measurement of pore pressure	BS 1377- 7:1990
	Undrained shear strength - triaxial compression with multistage loading and without measurement of pore pressure	BS 1377- 7:1990

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used
SOILS for civil engineering purposes (cont'd)	Moisture content - oven drying method	BS 1377- 2:1990
	Saturation moisture content of chalk	BS 1377- 2:1990
	Liquid limit - cone penetrometer	BS 1377- 2:1990
	Liquid limit - cone penetrometer - one point	BS 1377- 2:1990
	Plastic limit	BS 1377- 2:1990
	Plasticity index and liquidity index	BS 1377- 2:1990
	Density - linear measurement	BS 1377- 2:1990
	Density - immersion in water	BS 1377- 2:1990
	Density - water displacement	BS 1377- 2:1990
	Particle density - gas jar	BS 1377- 2:1990
	Particle density - small pyknometer	BS 1377- 2:1990
	Particle size distribution - wet sieving	BS 1377- 2:1990
	Particle size distribution - dry sieving	BS 1377- 2:1990
	Particle size distribution - sedimentation - pipette method	BS 1377- 2:1990
	Dry density/moisture content relationship (2.5 kg rammer)	BS 1377- 4:1990
	Dry density/moisture content relationship (4.5 kg rammer)	BS 1377- 4:1990
	Dry density/moisture content relationship (vibrating hammer)	BS 1377- 4:1990
	Moisture condition value (MCV)	BS 1377- 4:1990

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used
SOILS for civil engineering purposes (cont'd)	Chalk crushing value	BS 1377- 4:1990
	One-dimensional consolidation properties	BS 1377- 5:1990
	Constant head permeability in a triaxial cell	BS 1377- 6:1990
	Consolidated undrained triaxial compression test with the measurement of pore water pressure	BS 1377- 8:1990
	Consolidated undrained triaxial compression test with the measurement of pore water pressure using multistage loading	Documented In-House Method LTPMS 41
	Consolidated drained triaxial compression test with measurement of volume change	BS 1377- 8:1990
	Consolidated drained triaxial compression test with measurement of volume change using multistage loading	Documented In-House Method LTPMS 42
GEOTECHNICAL INVESTIGATION and TESTING - Laboratory testing of soil	Water content	BS EN ISO 17892-1:2014
	Bulk density - linear measurement method - immersion in fluid method - fluid displacement method	BS EN ISO 17892-2:2014
	Determination of particle density - fluid pyknometer method	BS EN ISO 17892-3:2015
END		

Schedule of Accreditation

issued by

United Kingdom Accreditation Service

2 Pine Trees, Chertsey Lane, Staines-upon-Thames, TW18 3HR, UK

1157

Accredited to ISO/IEC 17025:2005

SOCOTEC UK Limited

Issue No: 034 **Issue date:** 01 November 2017

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Testing performed by the Organisation at the locations specified below

Locations covered by the organisation and their relevant activities

Laboratory locations:

Location details		Activity	Location code
Address Askern Road Carcroft Doncaster South Yorkshire DN6 8DG	**Local contact** Jason Charles	Testing of soil and rock for civil engineering purposes	A

Site activities performed away from the locations listed above:

Location details		Activity	Location code
Ground Investigation Sites	Jason Charles	In-situ testing of soils for civil engineering purposes	B
Ground Investigation Sites	Mr John Holt (Geocone) Tel: 01302 723456 Fax: 01302 725240 Email: geocone@socotec.co.uk	Cone penetration testing	C

DETAIL OF ACCREDITATION

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
ROCK	Point load strength and anisotropy indices	ISRM Commission on Testing Methods, Suggested Method for Determining Point Load Strength 1985	A
	Slake durability index	ISRM Suggested Methods - Rock Characterization Testing and Monitoring Ed. E T Brown - 1981	A
	Uniaxial compressive strength	ISRM Commission on Testing Methods, Suggested Method for Determining Uniaxial Compressive Strength 1985	A
	Water content	ISRM Suggested Methods - Rock Characterization Testing and Monitoring Ed. E T Brown - 1981	A
	Porosity and density - by saturation and buoyancy techniques	ISRM Suggested Methods - Rock Characterization Testing and Monitoring Ed. E T Brown – 1981	A
	Porosity and density - by saturation and caliper techniques	ISRM Suggested Methods - Rock Characterization Testing and Monitoring Ed. E T Brown – 1981	A
AGGREGATES	Magnesium sulphate test	BS EN 1367-2:2009	A
	Resistance to fragmentation by the Los Angeles method	BS EN 1097-2:2010	A
SOILS for civil engineering purposes	California Bearing Ratio (CBR)	BS 1377:Part 4:1990	A
	Shear strength - small shearbox	BS 1377:Part 7:1990	A
	Shear strength - large shearbox	BS 1377:Part 7:1990	A
	Residual strength - small ring shear apparatus	BS 1377:Part 7:1990	A

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
SOILS for civil engineering purposes (cont'd)	Unconfined compressive strength - load frame method	BS 1377:Part 7:1990	A
	Undrained shear strength - triaxial compression without measurement of pore pressure	BS 1377:Part 7:1990	A
	Undrained shear strength - triaxial compression with multistage loading and without measurement of pore pressure	BS 1377:Part 7:1990	A
	Effective shear strength - consolidated-undrained triaxial compression test with measurement of pore pressure	BS 1377:Part 8:1990	A
	Effective shear strength consolidated-drained triaxial compression test with measurement of volume change	BS 1377:Part 8:1990	A
	Effective shear strength - (isotropically) consolidated undrained multistage triaxial compression test with measurement of pore pressure	Documented In-House Method SML PROC/0041 based on BS 1377:Part 8:1990	A
	Effective shear strength - consolidated drained multistage triaxial compression test with measurement of volume change	Documented In-House Method TP 0043 based on BS 1377: Part 8:1990	A
	Linear shrinkage	BS 1377:Parts 1 & 2: 1990	A
	Moisture content - oven drying method	BS 1377:Part 2:1990	A
	Saturation moisture content of chalk	BS 1377:Part 2:1990	A
	Liquid limit - cone penetrometer	BS 1377:Part 2:1990	A

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
SOILS for civil engineering purposes (cont'd)	Liquid limit - cone penetrometer - one point	BS 1377:Part 2:1990	A
	Plastic limit	BS 1377:Part 2:1990	A
	Plasticity index and liquidity index	BS 1377:Part 2:1990	A
	Density - linear measurement	BS 1377:Part 2:1990	A
	Density - immersion in water	BS 1377:Part 2:1990	A
	Particle density - gas jar	BS 1377:Part 2:1990	A
	Particle density - small pyknometer	BS 1377:Part 2:1990	A
	Particle density - large pyknometer	BS 1377:Part 2:1990	A
	Particle size distribution - wet sieving	BS 1377:Part 2:1990	A
	Particle size distribution - dry sieving	BS 1377:Part 2:1990	A
	Particle size distribution - sedimentation - pipette method	BS 1377:Part 2:1990	A
	Particle size distribution - sedimentation - hydrometer method	BS 1377:Part 2:1990	A
	Resistivity - Wenner probe method	BS 1377:Part 3:1990	A
	Dry density/moisture content relationship (2.5 kg rammer)	BS 1377:Part 4:1990	A
	Dry density/moisture content relationship (4.5 kg rammer)	BS 1377:Part 4:1990	A
	Dry density/moisture content relationship (vibrating hammer)	BS 1377:Part 4:1990	A

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
SOILS for civil engineering purposes (cont'd)	Maximum and minimum dry densities for granular soils	BS 1377:Part 4:1990	A
	Moisture condition value (MCV)	BS 1377:Part 4:1990	A
	Chalk crushing value	BS 1377:Part 4:1990	A
	One-dimensional consolidation properties	BS 1377:Part 5:1990	A
	Swelling and collapse characteristics	BS 1377:Part 5:1990	A
	Permeability - constant head method	BS 1377:Part 5:1990	A
	Consolidation properties using a hydraulic cell	BS 1377:Part 6:1990	A
	Permeability in a hydraulic consolidation cell	BS 1377:Part 6:1990	A
	Isotropic consolidation properties using a triaxial cell	BS 1377:Part 6:1990	A
	Permeability in a triaxial cell	BS 1377:Part 6:1990	A
	Accelerated permeability test	Environment Agency R & D Technical Report P1-398/TR/2	A
	One-dimensional consolidation properties	Documented In-House Method SML PROC/0023A	A
	Permeability - falling head method	Documented In-House Method SML PROC/0040 based on Head, K H: Manual of Soil Laboratory Testing, Vol 2, Sect 10.7.2	A
	Thermal conductivity - transient heat method	Documented In-House Method TP 044 based on ASTM D5334-08 using KD2 PRO equipment	A

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
SOILS for civil engineering purposes (cont'd)	In-situ density - sand replacement method (large pouring cylinder)	BS 1377:Part 9:1990	B
	Vertical deformation and strength characteristics of soil by the plate loading test	BS 1377:Part 9:1990	B
	Equivalent CBR value by the plate loading test	BS 1377:Part 9:1990 and Design Manual for Roads and Bridges: volume 7: HD 25/94	B
GEOCONE	Penetration resistance using the fixed 60° cone and friction sleeve (static cone penetration test CPT)	BS 1377:Part 9:1990 Continuous measurement using a penetrometer tip with electrical sensors for cone and sleeve resistance and inclination	C
GEOCONE	Penetration resistance using the fixed 60° cone and friction sleeve (static cone penetration test CPT)	BS 1377:Part 9:1990 Continuous measurement using a penetrometer tip with electrical sensors for cone and sleeve resistance and inclination and piezometric pressure	C
GEOTECHNICAL INVESTIGATION and TESTING - Laboratory testing of soil	Water content	BS EN ISO 17892-1:2014	A
	Density - linear measurement method	BS EN ISO 17892-2:2014	A
	Density - immersion in water method	BS EN ISO 17892-2:2014	A
END			

SCHEDULE OF GEOTECHNICAL LABORATORY TEST NOTICES/CLARIFICATIONS

Laboratory Abortive Test Notice Reference	Exploratory Position	Sample Reference	Sample Depth (m)	Scheduled Tests	Restriction	IDT Instruction
Fugro:						
ATN001	HEP-BH-824	B13	1.70	Max/Min Densities	Unsuitable material for test.	No further action required.
ATN002	HEP-BH-45	B8	0.60	Max/Min Densities	Unsuitable material for test.	No further action required.
ATN003	HEP-BH-45	B16	2.10	Max/Min Densities/MCR	Unsuitable material for test.	No further action required.
ATN004	HEP-BH-61	U32	7.70	CU (multi stage)	Insufficient material for 110 mm test. Oed in progress, AL and PSD on hold.	Move PSD to B30 (7.20 m) and AL to D33 (8.10 m).
ATN005	HEP-BH-61	U42	10.70	CU (multi stage)	Unsuitable material.	Test U55 (15.7 m) 60 mm: 200, 400, 800 kPa.
SOCOTEC:						
N8135-18/ENS1	HEP-BH-45	UT32	6.00	Oed	Sample swelled under first pressure (60 kPa).	Change to 100, 200, 400, 800, 100 kPa.
N8135-18/ENS1	HEP-BH-47	UT21	5.00	Oed	Sample swelled under first pressure (50 kPa).	Change to 100, 200, 400, 800, 100 kPa.
N8135-18/ENS1	HEP-BH-47	UT35	11.00	Oed	Sample swelled under first pressure (200 kPa).	Keep as 200, 400, 800, 1600, 200 kPa (unloading stage not previously provided).
N8135-18/ENS1	HEP-BH-824	UT28	5.20	Oed	Sample swelled under first pressure (50 kPa).	Proceed as per schedule.
N8135-18/ENS1	HEP-BH-824	UT41	12.00	Oed	Sample swelled under first pressure (200 kPa).	If swelling at 400 kPa then add additional pressure level of 3200 kPa.
N8135-18/ENS1A	HEP-BH-45	UT32	6.00	Oed	After the test swelled at 60 kPa, it was moved onto scheduled pressure 120 kPa. ENS raised to inform swelled and consolidated at 120 kPa.	Revise as you have stated in latest response.
N8135-18/ENS2	HEP-BH-23	UT23	5.00	Oed	Sample swelled under first pressure (50 kPa).	Start test at 100 kPa and final stage to drop back to 100 kPa.

Laboratory Abortive Test Notice Reference	Exploratory Position	Sample Reference	Sample Depth (m)	Scheduled Tests	Restriction	IDT Instruction
N8135-18/ENS2	HEP-BH-36	UT29	7.50	Oed	Sample swelled under first pressure (100 kPa).	New range: 200, 400, 800, 1600, 200 kPa.
N8135-18/ENS2	HEP-BH-1802	UT20	5.00	Oed	Sample swelled under first pressure (50 kPa).	New range: 100, 200, 400, 800, 1600, 200 kPa.
N8135-18/ENS3	HEP-BH-1804	UT27	6.30	UU Triaxial	Insufficient material after CU Triaxial.	Cancel UU test on this sample.
N8135-18/ENS4	HEP-BH-50	UT33	6.00	Oed	Sample swelled under first pressure (100 kPa).	Proceed as per schedule.
N8135-18/ENS4	HEP-BH-1050	UT33	8.00-8.45	UU Triaxial	Insufficient material for test.	No further action required.
N8135-18/ENS5	HEP-BH-1047	UT31	6.00	Oed	Sample swelled under first pressure (70 kPa).	Use following sequence: 100, 200, 400, 800, 1600, 100 kPa.
N8135-18/ENS5	HEP-BH-1047	UT52	13.00	Oed	Sample swelled under first pressure (120 kPa).	Use following sequence: 200, 400, 800, 1600, 200 kPa.
N8135-18/ENS5	HEP-BH-1050	UT33	8.00	Oed	Sample swelled under first pressure (100 kPa).	Use following sequence: 200, 400, 800, 1600 kPa
N8135-18/ENS5A	HEP-BH-1047	UT31	6.00	Oed	Test had already been moved on to the next consolidation stage (140 kPa).	Carry on with 140/280 kPa etc.
N8135-18/ENS5	HEP-BH-1047	UT52	13.00	Oed	Test had already been moved on to the next consolidation stage (240 kPa).	Carry on with 240/480 kPa etc.
N8135-18/ENS6	HEP-BH-1047	UT31	6.00-6.45	UU Triaxial	Insufficient material for test. All other testing completed.	Move to U52 at 13.00 m. Pressure = 240 kPa.
N8135-18/ENS6	HEP-BH-1804	B20	3.00	LSB	Insufficient material for test.	Combine with Bulk samples B17 and B14. If sample size too small undertake small shear box.
N8135-18/ENS7	HEP-BH-41	UT41	11.00	Oed	Sample swelled under its first pressure (100 kPa) and has been moved onto its next consolidation stage (200 kPa).	Proceed as per schedule. Add extra stage if less than 4 loading stages.
N8135-18/ENS9	HEP-TT-3	B11	1.80	Comp, Max/Min Densities	Insufficient material for Comp. Unsuitable material for Max/Min (clay).	No further action required.
N8135-18/ENS9	HEP-TT-11	B9	1.30	Max/Min Densities	Sample cohesive; unsuitable for test.	Please determine plasticity index and organic matter content.

Laboratory Abortive Test Notice Reference	Exploratory Position	Sample Reference	Sample Depth (m)	Scheduled Tests	Restriction	IDT Instruction
N8135-18/ENS10	HEP-BH-12	LB20	2.00	SSB	Insufficient material for test. All other scheduled tests carried out.	Combine with LB samples from 1.10 m in the same borehole.
N8135-18/ENS10	HEP-BH-23	UT41	11.00	CU Triaxial	Insufficient intact material for test.	Use samples from 8.00 m (if possible) with pressure of 50, 100, and 200 kPa.
N8135-18/ENS10	HEP-BH-77	B26	4.50	LSB	Insufficient material for test.	Combine bulk samples from the gravel stratum at 2.50 m, 3.50 m, and 4.50 m where possible.
N8135-18/ENS10	HEP-BH-826	B25	4.50	LSB	Insufficient material for test.	Combine bulk samples from the gravel stratum at 4.10 m, 4.50 m, and 5.20 m where possible.
N8135-18/ENS10	HEP-BH-1050	UT33	8.00	SD1 Suite	Insufficient material for test.	Please provide a reason why the sample is insufficient for SD1 for our further consideration.
N8135-18/ENS10A	HEP-BH-1050	UT33	8.00	SD1 Suite	Other scheduled testing on this sample (CU, AL, Oed, PSD, Water content) taken prior to SD1.	Cancel test.
N8135-18/ENS13	HEP-BH-826	B10	1.50-2.00	Comp, Max/Min Densities	Insufficient material for Comp. Unsuitable material for Max/Min (clay).	Combine with LB7 to increase sample size.
N8135-18/ENS13	HEP-BH-1047	B19	2.70	MCV Relationship, Max/Min Densities, CBR	Insufficient material for tests.	Combine with B22.
N8135-18/ENS16	HEP-BH-36	B24	5.50	LSB	Insufficient suitable material for test. Sample is almost entirely fine to coarse gravel, also insufficient for SSB.	Combine with bulk samples from same stratum (i.e. B12, B15, B18, B21).
N8135-18/ENS16	HEP-BH-61	B20	3.70	LSB	Insufficient material for test. Sample is almost entirely fine to coarse gravel, also insufficient for SSB.	Combine with B16 sample. If there is not enough sample, then cancel test.
N8135-18/ENS16	HEP-BH-822	D12	1.50	RES	Insufficient material for test.	Cancel test.
N8135-18/ENS16	HEP-BH-822	B19	2.70	Comp	Insufficient material for test.	Combine with B22 sample. If there is not enough sample, then cancel test.

Laboratory Abortive Test Notice Reference	Exploratory Position	Sample Reference	Sample Depth (m)	Scheduled Tests	Restriction	IDT Instruction
N8135-18/ENS16A	HEP-BH-61	B20	3.70	LSB	Combined with B16. Not enough sample to test LSB although may be enough for SSB.	Cancel test
N8135-18/ENS17	HEP-BH-61	LB4	0.00	Max/Min Dry Densities	Unsuitable material (clay).	Noted.
N8135-18/ENS17	HEP-BH-826	B10	1.50	MCV Relationship	Insufficient material for test	Combine with LB17.
N8135-18/ENS19	HEP-BH-77	D31	6.50	SD1 Suite	Insufficient material after MC and AL.	Test on sample D33 at 6.80 m.
N8135-18/ENS20	HEP-BH-65	B14	2.50	RES	Insufficient material for test and also contains too much gravel.	Cancel test.
N8135-18/ENS22	HEP-BH-1047	B19	2.70	Max/Min Dry Densities	Combined with B22 as per ENS 13 response – unsuitable material (contains clay).	Cancel test.
N8135-18/ENS32	HEP-BH-820	D15	2.30	AL	Insufficient material for test.	Schedule on D13.
N8135-18/ENS32A	HEP-BH-820	D15	2.30	AL	Could you please provide a depth as the samples have been received with no sample number?	2.60 m
N8135-18/ENS33	HEP-BH-1358	D4	1.20	AL, RES, SD1 Suite, OMC, LOI	Insufficient material for tests.	Test AL and SD1 on this sample. OMC and LOI (if possible) on D5 (with ASB). Cancel resistivity.
N8135-18/ENS33	HEP-BH-1781	D6	1.50	RES, SD1 Suite, OMC, LOI	Insufficient material for tests.	Cancel tests.
N8135-18/ENS33	HEP-BH-1783	D3	0.90	RES, SD1 Suite, OMC, LOI	Insufficient material for tests.	Cancel tests.
N8135-18/ENS38	HEP-BH-787	B9	1.50-2.00	RES	Insufficient material. Sample is too gravelly.	Cancel test.
N8135-18/ENS41	HEP-BH-821	UT41	11.00	Undrained Triaxial	Insufficient material in U41 after other tests conducted.	Test on UT48 with pressure 275 kPa.
N8135-18/ENS41	HEP-TT-6	LB8	0.80	Max/Min Dry Density	Sample unsuitable for test (clay).	Cancel test.

Laboratory Abortive Test Notice Reference	Exploratory Position	Sample Reference	Sample Depth (m)	Scheduled Tests	Restriction	IDT Instruction
N8135-18/ENS42	HEP-BH-823	B21	4.35-4.40	Comp	Insufficient material passing <20 mm sieve.	Undertake test on combination of B25 and B30 if possible. If not, then cancel test JPD Update 19-09-2018: Test cancelled, B25 and B30 are different material and not of the same strata.
N8135-18/ENS43	HEP-TT-29	B9	1.80-1.90	Max/Min Dry Densities	Unsuitable material for test (clay).	Cancel test.
N8135-18/ENS44	HEP-TT-9	B9	1.20	Max/Min Dry Densities	Unsuitable sample (clay).	Cancel test.
N8135-18/ENS45	HEP-BM-821	U41	11.00	Undrained Triaxial	Insufficient material after other tests conducted.	Cancel test.
N8135-18/ENS45	HEP-TT-39	B9	1.80	Max/Min Densities	Unsuitable sample (clay).	Cancel test.

Notes:

IDT	Integrated Design Team Task Order 7.0	LSB / SSB	Large Shear box / Small Shear box
ATN	Abortive Test Notice	LOI	Loss on Ignition
ENS	Engineer's Notification Sheet	MCV/MCR	Moisture Condition Value / Moisture Content Relationship
AL	Atterberg Limits	Oed	Oedometer
ASB	Asbestos Screening	OMC	Organic Matter Content
CBR	California Bearing Ratio	PSD	Particle Size Distribution
CHP	Constant Head Permeability	RES	Electric Resistivity
CU	Consolidated Undrained Triaxial	SD1 Suite	(BRE) Special Digest 1
Comp	Heavy Compaction	UU Triaxial	Unconsolidated Undrained Triaxial

Summary of Classification Test Results

Project Name: HAL Airport Expansion

Project No.: G170029U

Hole	Sample Ref	Sample Top (m)	Sample Type	Description	Density bulk (Mg/m3)	Density dry (Mg/m3)	w %	Passing 425µm %	LL %	PL %	PI %	Particle density Mg/m3	Remarks
HEP-BH-1802	17	4.20	D	Brown slightly sandy gravelly CLAY			21.9	57	71 (1pt)	24	47		
HEP-BH-1804	4	0.30	B	Brown slightly gravelly slightly sandy clayey SILT			51.8	84	58	30	28		
HEP-BH-1805	1	0.10	B	Brown slightly sandy CLAY			33.6	100	62	26	36		
HEP-BH-1806	5	0.60	D	Brown slightly gravelly slightly sandy CLAY			36.8	98	41	20	21		
HEP-BH-27	23	6.50	B	Brown slightly sandy slightly gravelly CLAY			38.5	70	69	23	46		
HEP-BH-27	26	7.50	UT	Brown slightly sandy CLAY			29.2	100	76	23	53		
HEP-BH-27	45	14.50	B	Brown slightly sandy CLAY			32.9	100	69	25	44		
HEP-BH-36	30	8.00	D	Brown slightly sandy CLAY			28.5	100	72	24	48		
HEP-BH-36	51	13.90	D	Brown slightly gravelly slightly sandy CLAY			34.0	92	66	27	39		
HEP-BH-45	8	0.60	B	Brown very clayey very sandy GRAVEL			30.3	19	60 (1pt)	38	22	2.59 (sp)	
HEP-BH-45	11	1.25	B	Brown slightly gravelly slightly sandy CLAY			70.1	99	99	37	62		
HEP-BH-45	16	2.10	B	Grey brown slightly clayey sandy GRAVEL			8.1					2.60 (gj)	
HEP-BH-45	28	4.50	B	Brown slightly sandy CLAY			29.2	100	74	26	48		
HEP-BH-61	33	8.10	D	Brown slightly sandy CLAY			29.0	100	73	26	47		
HEP-BH-61	42	10.70	UT	Brown slightly sandy CLAY			30.6	100	72	25	47		
HEP-BH-824	12	1.90	D	Brown slightly sandy slightly gravelly CLAY			34.2	97	75 (1pt)	27	48		

Methods:

Water Content - BS EN IS 17892-1 Bulk Density - BS EN ISO 17892-2 Particle Density (Pycnometer) - BS EN ISO 17892-3

Particle Density (Gas Jar) - BS 1377 : Part 2 Atterberg Limits - BS 1377 : Part 2

Key

Density Tests
Linear measurement (lm) unless :
wd - water displacement
wi - immersion in water

Atterberg Limits (al)
Liquid limit 4pt cone unless :
1pt - single point test

Particle Density
sp - small pycnometer
gj - gas jar

Date Printed	Figure Number	Sheet Number
09/08/2018		

Summary of Classification Test Results

Project Name: HAL Airport Expansion

Project No.: G170029U

Hole	Sample Ref	Sample Top (m)	Sample Type	Description	Density bulk (Mg/m3)	Density dry (Mg/m3)	w (%)	Passing 425µm (%)	LL (%)	PL (%)	PI (%)	Particle density (Mg/m3)	Remarks
HEP-BH-824	32	7.90	D	Brown slightly sandy gravelly CLAY			20.7	40	66 (1pt)	25	41		
HEP-BH-824	45	14.00	D	Brown slightly gravelly slightly sandy CLAY			25.3	98	62	25	37		

Methods:

Water Content - BS EN IS 17892-1 Bulk Density - BS EN ISO 17892-2 Particle Density (Pycnometer) - BS EN ISO 17892-3

Particle Density (Gas Jar) - BS 1377 : Part 2 Atterberg Limits - BS 1377 : Part 2

Key

Density Tests
Linear measurement (lm) unless :
wd - water displacement
wi - immersion in water

Atterberg Limits (al)
Liquid limit 4pt cone unless :
1pt - single point test

Particle Density
sp - small pycnometer
gj - gas jar

Date Printed	Figure Number	Sheet Number
09/08/2018		

INDEX PROPERTIES - SUMMARY OF RESULTS

Hole No.	Sample No.	Depth (m) from	Depth (m) to	type	Soil Description	ρ Mg/m3	ρ_d Mg/m3	w %	< 425 µm sieve %	W_L %	W_P %	I_P	ρ_s Mg/m3	Remarks
HEP-BH-1861	31	9.00		D	Brown slightly sandy slightly gravelly CLAY.			16.0*	51 s	44 a	20	24		
HEP-BH-1861	42	12.00		D	Greyish brown slightly gravelly slightly sandy CLAY.			28.2*	99 n	73 a	26	47		
HEP-BH-20	9	0.60		LB	Brown slightly gravelly sandy CLAY.			17.6*	61 s	44 a	22	22		
HEP-BH-25	30	7.00		B	Brown slightly sandy silty CLAY.				100 n	48 a	23	25		
HEP-BH-25	32	7.50		UT	Firm to stiff brown slightly sandy slightly gravelly CLAY.			25.0*						
HEP-BH-25	42	12.10		B	Brown slightly sandy CLAY.				100 n	61 a	25	36		
HEP-BH-25	47	14.10		B	Brown slightly sandy silty CLAY.				100 n	59 a	24	35		
HEP-BH-25	49	14.50		UT	Stiff greyish brown slightly sandy CLAY.			21.9*						
HEP-BH-32	8	3.50		D	Brown slightly sandy slightly gravelly CLAY.			26.7*	60 s	58 a	25	33		
HEP-BH-33	18	3.40		D	Brown slightly sandy slightly gravelly CLAY.			32.1*	98 n	71 a	28	43		
HEP-BH-5	32	9.70		B	Brown slightly sandy silty CLAY.				97 n	66 a	27	39		
HEP-BH-65	27	6.00		D	Greyish brown slightly sandy CLAY.			28.0*	100 n	75 a	25	50		
HEP-BH-821	9	1.00		B	Brownish grey very sandy clayey GRAVEL.			7.2*						
HEP-BH-821	12	1.60		B	Greyish brown sandy GRAVEL.			9.5*						
HEP-BH-821	23	4.20		B	Brown sandy GRAVEL.			2.6*					2.60-g	
HEP-BH-821	28	6.00		B	Yellowish brown slightly sandy very gravelly CLAY.			13.3*						
HEP-BH-821	34	7.50		UT	Firm grey slightly sandy CLAY.			24.6*	100 n	72 a	26	46		
HEP-BH-821	41	11.00		UT	Stiff to very stiff brownish grey slightly sandy silty CLAY.			26.0*	100 n	72 a	27	45		
HEP-BH-821	48	15.00		UT	Firm laminated grey slightly sandy CLAY.			28.4*	100 n	82 a	28	54		
HEP-TT-11	9	1.30		B	Brown slightly sandy slightly gravelly silty CLAY.			22.4*	89 s	54 a	22	32	2.65-g	
HEP-TT-3	11	1.80		B	Brown slightly sandy gravelly silty CLAY with four cobbles.			21.8*					2.56-g	
HEP-TT-39	9	1.80		B	Brownish grey slightly sandy gravelly silty CLAY with one cobble.			14.2*	34 s	44 a	24	20	2.60-g	
HEP-TT-6	8	0.80		LB	Brown slightly sandy slightly gravelly silty CLAY.			33.6*					2.62-g	
HEP-TT-9	9	1.20		B	Greyish brown slightly sandy gravelly silty CLAY.			18.1*					2.59-g	

General notes: All above tests carried out to BS1377 : 1990 unless annotated otherwise. See Remarks for further details

Key : p bulk density, linear; *pd* dry density; *w* moisture content; * test carried out to BS EN ISO 17892-1 2014

WL Liquid limit; a 4 point cone test; b 1 point cone test

WP Plastic limit; NP non - plastic; IP Plasticity Index

<425um preparation: n from natural soil; s sieved specimen

ps particle density: -g = gas jar; -p = small pyknometer

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Project Name Heathrow Airport Limited

Figure

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INDEX PROPERTIES - SUMMARY OF RESULTS

Hole No.	Sample No.	Depth (m) from	Depth (m) to	type	Soil Description	ρ Mg/m3	ρ_d Mg/m3	w %	< 425 µm sieve %	W_L %	W_P %	I_P	ρ_s Mg/m3	Remarks
HEP-BH-1	27	6.50		UT	Firm grey slightly sandy CLAY.			25.5*						
HEP-BH-1047	11	1.50		B	Black spongy pseudo fibrous slightly sandy slightly gravelly clayey PEAT.			65.4*						
HEP-BH-1047	19	2.70		B	Black sandy GRAVEL.			8.5*					2.52-g	
HEP-BH-1047	31	6.00		UT	Firm brown slightly sandy silty CLAY.			28.8*	99 n	68 a	26	42		
HEP-BH-1047	52	13.00		UT	Firm laminated brown slightly sandy CLAY.			27.4*	100 n	81 a	31	50		
HEP-BH-1047	61	17.00		UT	Firm laminated brownish grey CLAY.			25.6*	100 n	63 a	27	36		
HEP-BH-1050	8	1.10		B	Brown slightly sandy slightly gravelly silty CLAY.			14.0*	63 s	36 a	21	15		
HEP-BH-1050	14	2.00		B	Dark brown slightly sandy silty CLAY.			85.8*	98 n	122 a	55	67		
HEP-BH-1050	21	4.00		B	Brown sandy GRAVEL.			4.1*					2.58-g	
HEP-BH-1050	33	8.00		UT	Firm laminated brown slightly sandy silty CLAY.			27.1*	99 n	67 a	25	42		
HEP-BH-12	33	5.20		UT	Soft to firm brown slightly sandy slightly gravelly CLAY.			32.7*						
HEP-BH-12	35	5.20		B	Brown slightly sandy SILT.				99 s	70 a	27	43		
HEP-BH-12	41	8.20		UT	Stiff to very stiff thinly laminated dark brown slightly sandy CLAY.			25.6*	100 n	63 a	25	38		
HEP-BH-1358	4	1.20		D	Brownish grey slightly sandy gravelly CLAY.			10.1*	37 s	43 a	21	22		
HEP-BH-14	13	2.00		B	Dark brown slightly sandy slightly gravelly CLAY.			24.3*	53 s	42 a	28	14		
HEP-BH-14	21	4.00		B	Brown slightly sandy slightly gravelly CLAY with wood fragments.			30.0*	65 s	43 b	25	18		
HEP-BH-14	29	6.00		B	Brown slightly sandy slightly gravelly CLAY.			30.4*	67 s	51 a	28	23		
HEP-BH-16	9	1.30		LB	Brown slightly sandy slightly gravelly CLAY with rootlets.			20.1*						
HEP-BH-16	18	4.20		LB	Brownish grey sandy GRAVEL.			22.2*						
HEP-BH-17	12	1.20		LB	Brown slightly sandy gravelly CLAY with wood fragments and eight cobbles.			20.8*						
HEP-BH-17	15	1.70		LB	Greenish grey slightly sandy gravelly CLAY.			35.2*						
HEP-BH-1781	6	1.50		D	Brownish grey slightly sandy slightly gravelly CLAY.			28.3*	53 s	45 a	22	23		
HEP-BH-1783	3	0.90		D	Brownish grey slightly sandy slightly gravelly CLAY.			32.7*	62 s	45 a	23	22		
HEP-BH-1804	14	1.20		B	Dark brown very sandy GRAVEL.			8.0*					2.58-g	
HEP-BH-1804	20	3.00		B	Multicoloured sandy GRAVEL with one cobble.			3.9*						
HEP-BH-1804	27	6.30		UT	Firm brown slightly sandy silty CLAY becoming laminated grey slightly sandy silty CLAY towards			26.2*	100 n	55 a	24	31		
HEP-BH-1805	8	1.20		B	Brown slightly sandy slightly gravelly CLAY with one cobble.			19.6*					2.61-g	
HEP-BH-1805	11	2.20		B	Brown sandy GRAVEL.			3.3*						
HEP-BH-1805	14	3.20		B	Brown very sandy GRAVEL.			5.9*						
HEP-BH-1805	16	3.70		B	Brown slightly sandy slightly gravelly silty CLAY with one cobble.			27.8*	60 s	64 a	24	40		
HEP-BH-1805	17	4.20		UT	Firm to stiff greyish brown slightly sandy slightly gravelly CLAY.			31.2*	86 n	80 a	30	50		

General notes: All above tests carried out to BS1377 : 1990 unless annotated otherwise. See Remarks for further details

Key : p bulk density, linear; *pd* dry density; *w* moisture content; * test carried out to BS EN ISO 17892-1 2014

WL Liquid limit; a 4 point cone test; b 1 point cone test

WP Plastic limit; NP non - plastic; IP Plasticity Index

<425um preparation: n from natural soil; s sieved specimen

ps particle density; -g = gas jar; -p = small pyknometer

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INDEX PROPERTIES - SUMMARY OF RESULTS

Hole No.	Sample No.	Depth (m) from	Depth (m) to	type	Soil Description	ρ Mg/m3	ρ_d Mg/m3	w %	< 425 µm sieve %	W_L %	W_P %	I_P	ρ_s Mg/m3	Remarks
HEP-BH-1863	3	0.10		B	Brown slightly sandy slightly gravelly silty CLAY with rare rootlets.			23.8*						
HEP-BH-1863	6	0.30		B	Brown slightly sandy slightly gravelly silty CLAY with occasional rootlets and one cobble.			23.5*						
HEP-BH-1863	9	0.85		B	Brown sandy GRAVEL with gravel sized clay pockets and one cobble			14.1*						
HEP-BH-1864	1	0.10		D	Brown slightly sandy slightly gravelly CLAY.			17.4*	86 s	37 a	18	19		
HEP-BH-2	8	0.70		B	Brown slightly sandy gravelly silty CLAY with two cobbles.				50 s	41 a	20	21		
HEP-BH-2	52	14.50		B	Brown slightly sandy silty CLAY.				99 n	73 a	30	43		
HEP-BH-23	20	4.80		D	Brown slightly sandy silty CLAY.				93 n	66 a	28	38		
HEP-BH-23	23	5.00		UT	Firm grey slightly sandy slightly gravelly CLAY.			20.5*						
HEP-BH-23	41	11.00		UT	Firm laminated brown CLAY.			25.2*						
HEP-BH-23	54	14.50		B	Brown slightly sandy silty CLAY.				99 n	63 a	27	36		
HEP-BH-23	57	15.00		UT	Firm laminated grey CLAY.			25.9*						
HEP-BH-43	9	3.50		B	Brown gravelly clayey SAND.			21.3*	73 s	27 a	18	9		
HEP-BH-43	30	8.60		D	Brown slightly sandy slightly gravelly CLAY.			29.7*	63 s	65 a	29	36		
HEP-BH-43	45	13.50		D	Brown slightly sandy CLAY.			19.1*	100 n	65 a	29	36		
HEP-BH-44	28	7.20		B	Brown slightly sandy silty CLAY.				93 s	69 a	27	42		
HEP-BH-44	29	8.00		UT	Stiff brown CLAY.			28.1*						
HEP-BH-44	34	11.50		UT	Firm brown slightly sandy CLAY.			24.9*						
HEP-BH-44	44	16.00		B	Brown slightly sandy silty CLAY.				100 n	68 a	27	41		
HEP-BH-44	49	19.00		B	Brown slightly sandy silty CLAY.				100 n	68 a	27	41		
HEP-BH-44	50	19.50		UT	Firm to stiff brown slightly sandy CLAY.			26.1*						
HEP-BH-45	32	6.00		UT	Firm brownish grey slightly sandy CLAY.			28.6*	100 n	79 a	29	50		
HEP-BH-47	8	1.00		D	Brown sandy very clayey GRAVEL.			13.6*	26 s	57 b	37	20		
HEP-BH-47	25	6.50		D	Brown slightly sandy CLAY.			23.6*	100 n	73 a	29	44		
HEP-BH-47	34	10.00		D	Brown slightly sandy CLAY.			24.6*	100 n	75 a	27	48		
HEP-BH-47	45	17.00		D	Brownish grey slightly sandy CLAY.			24.1*	100 n	66 a	27	39		
HEP-BH-50	16	2.30		B	Brown slightly sandy slightly gravelly silty CLAY.				98 n	73 a	29	44		
HEP-BH-50	21	3.10		B	Brown slightly sandy CLAY.				100 n	72 a	29	43	2.73-p	
HEP-BH-50	33	6.00		UT	Firm laminated brown slightly sandy CLAY.			27.9*						
HEP-BH-50	44	9.00		UT	Firm to stiff grey slightly sandy CLAY.			28.9*						
HEP-BH-50	49	10.20		B	Brown slightly sandy silty CLAY.				100 n	76 a	29	47		
HEP-BH-50	51	11.00		UT	Soft to firm laminated brown slightly sandy CLAY.			32.9*						

General notes: All above tests carried out to BS1377 : 1990 unless annotated otherwise. See Remarks for further details

Key : p bulk density, linear; *pd* dry density; *w* moisture content; * test carried out to BS EN ISO 17892-1 2014

WL Liquid limit; a 4 point cone test; b 1 point cone test

WP Plastic limit; NP non - plastic; IP Plasticity Index

<425um preparation: n from natural soil; s sieved specimen

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INDEX PROPERTIES - SUMMARY OF RESULTS

Hole No.	Sample No.	Depth (m) from	Depth (m) to	type	Soil Description	ρ Mg/m3	ρ_d Mg/m3	w %	< 425 µm sieve %	W_L %	W_P %	I_P	ρ_s Mg/m3	Remarks
HEP-BH-50	65	15.00		U	Firm to stiff brownish grey slightly sandy CLAY.			26.2*						
HEP-BH-61	4	0.00		LB	Brown slightly sandy gravelly silty CLAY.			11.9*					2.56-g	
HEP-BH-61	12	2.20		B	Brown slightly sandy slightly gravelly silty CLAY.			19.5*	65 n	39 a	21	18		
HEP-BH-61	15	2.70		B	Brown slightly sandy slightly gravelly CLAY.			19.5*	74 s	39 a	19	20		
HEP-BH-61	20	3.70		B	Grey slightly sandy slightly clayey GRAVEL.			1.4*						
HEP-BH-61	23	4.70		UT	Firm to stiff thinly laminated greyish brown slightly sandy CLAY.			31.1*	99 n	46 a	20	26		
HEP-BH-64	6	0.15		B	Dark brown slightly sandy silty CLAY.			33.1*	61 n	86 a	42	44		
HEP-BH-64	12	0.85		B	Brown slightly sandy slightly gravelly silty CLAY.			26.3*	72 s	49 a	23	26		
HEP-BH-64	16	1.65		B	Brown slightly sandy slightly gravelly CLAY.			34.3*	73 s	43 a	28	15		
HEP-BH-64	20	2.45		B	Dark brown slightly sandy slightly gravelly silty CLAY			33.2*	72 s	46 a	30	16	2.57-g	
HEP-BH-64	24	4.00		D	Brown very sandy silty GRAVEL.			8.7*						
HEP-BH-7	6	0.90		B	Brown slightly sandy slightly gravelly silty CLAY.			30.1*	89 s	43 a	24	19		
HEP-BH-7	13	1.20		B	Brown sandy GRAVEL.			6.1*					2.56-g	
HEP-BH-7	39	6.50		UT	Firm greyish brown slightly sandy CLAY.			27.1*	99 n	61 a	26	35		
HEP-BH-77	31	6.50		D	Brown slightly sandy CLAY.			27.6*	100 n	71 a	32	39		
HEP-BH-820	8	0.60		B	Dark brown slightly sandy gravelly clayey SILT.			37.6*					2.53-g	
HEP-BH-820	11	1.60		B	Dark brown slightly sandy gravelly CLAY.			19.4*	42 s	51 a	24	27		
HEP-BH-820	15	2.90		D	Greyish brown clayey SAND and GRAVEL.			10.3*						
HEP-BH-820	18	4.55		D	Brownish grey slightly sandy CLAY			28.3*						
HEP-BH-820	20	5.00		D	Brownish grey slightly sandy CLAY			28.1*	99 n	65 a	24	41		
HEP-BH-822	5	0.20		B	Brown slightly sandy slightly gravelly CLAY.			36.7*						
HEP-BH-822	8	0.50		B	Brown slightly sandy slightly gravelly CLAY with frequent rootlets and three cobbles.			31.1*	73 s	43 a	26	17		
HEP-BH-822	12	1.50		D	Brown slightly sandy slightly gravelly CLAY.			12.0*	51 s	33 a	20	13		
HEP-BH-822	16	2.20		D	Brown slightly sandy gravelly CLAY.			16.9*	50 s	35 a	19	16		
HEP-BH-823	7	1.50		D	Brown slightly sandy gravelly CLAY.			30.4*						
HEP-BH-823	8	1.50		B	Brown slightly sandy slightly gravelly CLAY.								2.64-p	
HEP-BH-823	24	5.10		D	Brown slightly sandy CLAY.			31.3*	100 n	63 a	27	36		
HEP-BH-823	32	7.10		D	Grey slightly sandy CLAY.			29.0*	100 n	75 a	30	45		
HEP-BH-823	49	15.00		D	Grey slightly sandy CLAY.			25.1*	100 n	67 a	26	41		
HEP-BH-824	8	0.90		D	Brown slightly sandy slightly gravelly CLAY.			36.2*	92 s	67 a	29	38		
HEP-BH-826	6	1.25		D	Brown sandy gravelly CLAY			7.1*	43 s	35 a	19	16		

General notes: All above tests carried out to BS1377 : 1990 unless annotated otherwise. See Remarks for further details

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INDEX PROPERTIES - SUMMARY OF RESULTS

Hole No.	Sample No.	Depth (m) from	Depth (m) to	type	Soil Description	ρ Mg/m3	ρ_d Mg/m3	w %	< 425 µm sieve %	W_L %	W_P %	I_P	ρ_s Mg/m3	Remarks
HEP-BH-826	10	1.50		B	Brown slightly sandy slightly gravelly CLAY.								2.61-g	
HEP-BH-826	14	2.50		D	Brown slightly sandy CLAY.			29.7*	68 s	59 b	25	34		
HEP-BH-826	41	8.00		D	Greenish grey slightly sandy CLAY.			36.3*	100 n	71 a	31	40		
HEP-BH-85	6	0.70		LB	Brown slightly sandy gravelly CLAY.			14.7*						
HEP-BH-85	9	1.60		B	Brown very sandy GRAVEL with clay pockets.			7.9*						
HEP-TP-10	10	2.00		LB	Grey sandy silty GRAVEL.			8.1*						
HEP-TP-1296	13	2.70		LB	Brown sandy gravelly clayey COBBLES.			16.7*						
HEP-TT-1032	9	2.30		LB	Brown slightly sandy slightly gravelly silty CLAY.			21.6*	67 s	35 a	20	15	2.63-p	
HEP-TT-29	9	1.80		B	Dark brown slightly sandy very gravelly silty CLAY.			15.2*					2.61-p	

General notes: All above tests carried out to BS1377 : 1990 unless annotated otherwise. See Remarks for further details

Key : p bulk density, linear; *pd* dry density; *w* moisture content; * test carried out to BS EN ISO 17892-1 2014

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Figure

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INDEX PROPERTIES - SUMMARY OF RESULTS

Hole No.	Sample No.	Depth (m) from	Depth (m) to	type	Soil Description	ρ Mg/m3	ρ_d Mg/m3	w %	< 425 µm sieve %	W_L %	W_P %	I_P	ρ_s Mg/m3	Remarks
HEP-BH-1050	21	4.00		B	Brown sandy GRAVEL.			4.1*					2.58-g	
HEP-BH-1804	14	1.20		B	Dark brown very sandy GRAVEL.			8.0*					2.58-g	
HEP-BH-1805	8	1.20		B	Brown slightly sandy slightly gravelly CLAY with one cobble.			19.6*					2.61-g	
HEP-BH-23	41	11.00		UT	Firm laminated brown CLAY.			25.2*						
HEP-BH-43	30	8.60		D	Brown slightly sandy slightly gravelly CLAY.			29.7*	63 s	65 a	29	36		
HEP-BH-44	41	15.50		UT	Stiff to very stiff laminated greyish brown CLAY.			22.9*						
HEP-BH-61	4	0.00		LB	Brown slightly sandy gravelly silty CLAY.			11.9*					2.56-g	
HEP-BH-64	20	2.45		B	Dark brown slightly sandy slightly gravelly silty CLAY			33.2*	72 s	46 a	30	16	2.57-g	
HEP-BH-820	8	0.60		B	Dark brown slightly sandy gravelly clayey SILT.			37.6*					2.53-g	
HEP-BH-821	23	4.20		B	Brown sandy GRAVEL.			2.6*					2.60-g	
HEP-BH-826	10	1.50		B	Brown slightly sandy slightly gravelly CLAY.								2.61-g	
HEP-TT-1032	9	2.30		LB	Brown slightly sandy slightly gravelly silty CLAY.			21.6*	67 s	35 a	20	15	2.63-p	
HEP-TT-11	9	1.30		B	Brown slightly sandy slightly gravelly silty CLAY.			22.4*	89 s	54 a	22	32	2.65-g	
HEP-TT-3	11	1.80		B	Brown slightly sandy gravelly silty CLAY with four cobbles.			21.8*					2.56-g	
HEP-TT-39	9	1.80		B	Brownish grey slightly sandy gravelly silty CLAY with one cobble.			14.2*	34 s	44 a	24	20	2.60-g	
HEP-TT-6	8	0.80		LB	Brown slightly sandy slightly gravelly silty CLAY.			33.6*					2.62-g	
HEP-TT-9	9	1.20		B	Greyish brown slightly sandy gravelly silty CLAY.			18.1*					2.59-g	

General notes: All above tests carried out to BS1377 : 1990 unless annotated otherwise. See Remarks for further details

Key : p bulk density, linear; *pd* dry density; *w* moisture content; * test carried out to BS EN ISO 17892-1 2014

WL Liquid limit; a 4 point cone test; b 1 point cone test

WP Plastic limit; NP non - plastic; IP Plasticity Index

<425um preparation; n from natural soil; s sieved specimen

ps particle density; -g = gas jar; -p = small pyknometer

QA Ref
SLR 1
Rev 2.92
Mar 17

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Project No N8135-18

Project Name Heathrow Airport Limited

Figure

INDX

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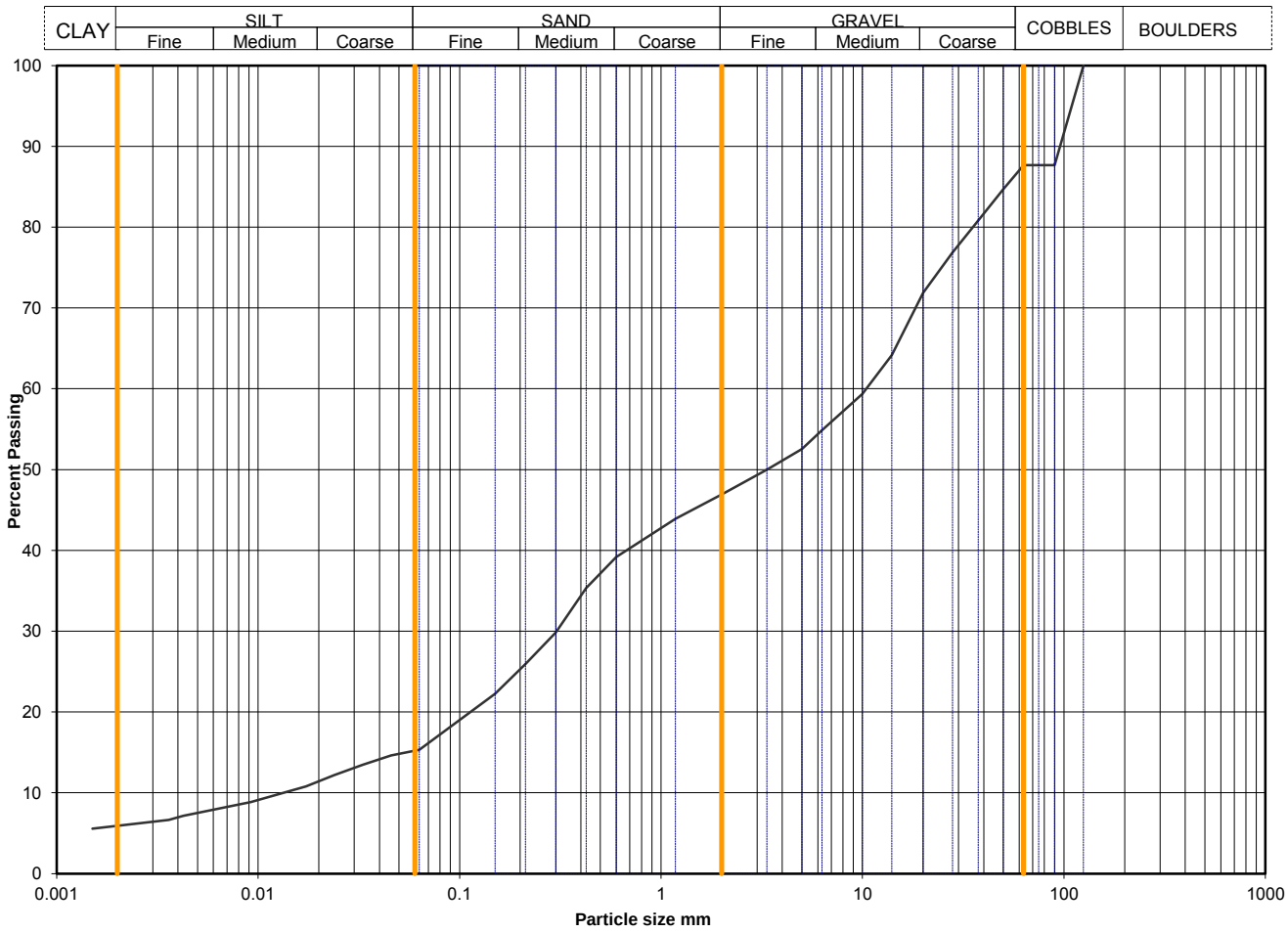
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	FES1171205005

Hole No	HEP-BH-2
Sample Depth (m BGL)	0.25
Sample Type and No	LB5
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	15
90	88	0.0458	15
75	88	0.0331	13
63	88	0.0239	12
50	85	0.0173	11
37.5	81	0.0092	9
28	77	0.0042	7
20	72	0.0036	7
14	64	0.0015	6
10	59		
6.3	55		
5.0	53		
3.35	50		
2.00	47		
1.18	44	Particle density, Mg/m3	
0.600	39		
0.425	35	2.65 assumed	
0.300	30	Dry mass of sample, kg	
0.212	26		
0.150	22	20.8	
0.063	15		

Soil description	Brown slightly sandy gravelly silty CLAY with one cobble.
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	12	0
	Gravel	41	47
	Sand	32	36
*<60mm values to aid description only	Silt	9	10
	Clay	6	7

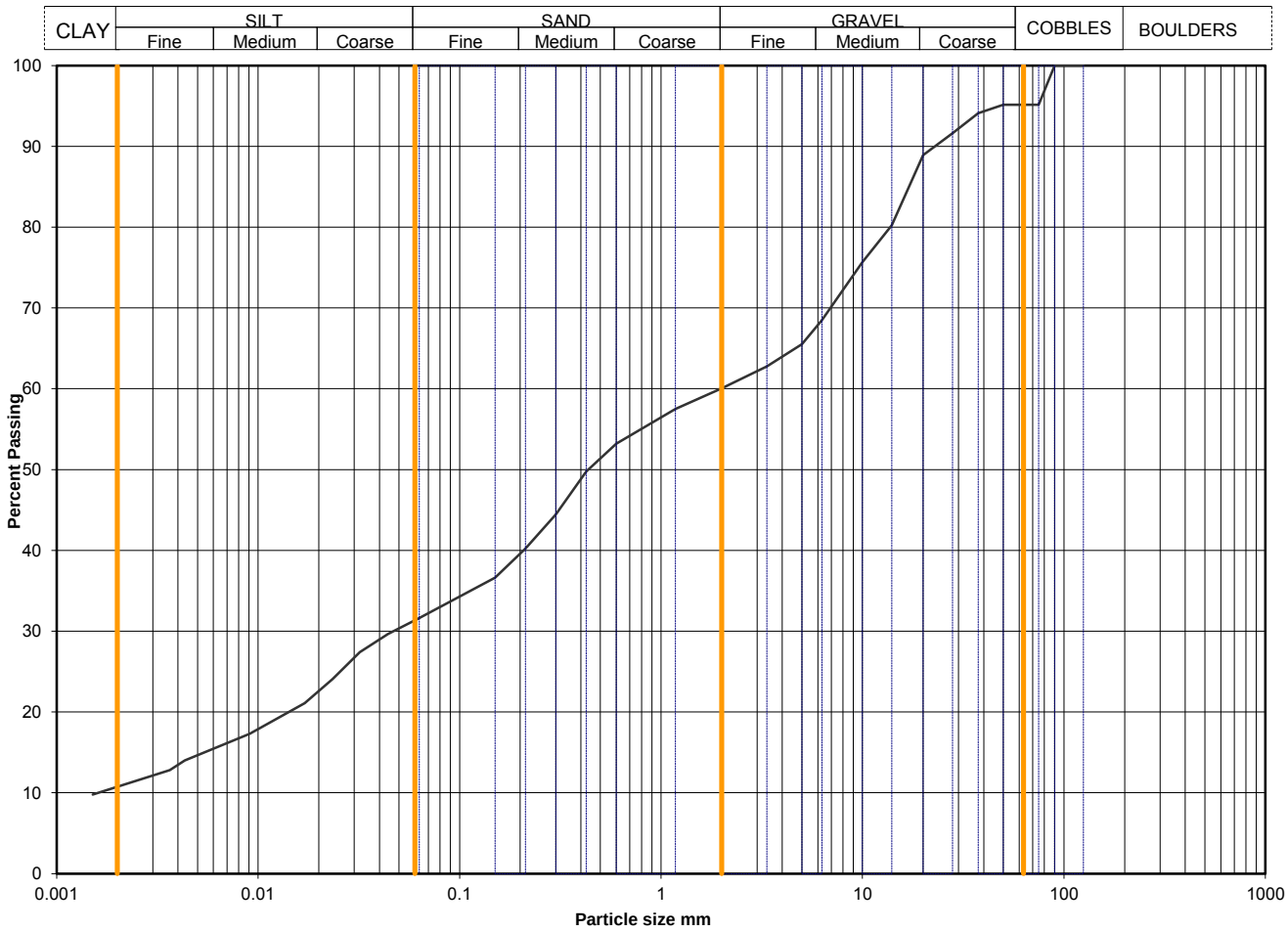
Uniformity Coefficient	D60 / D10	777

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	FES1171205008

Hole No	HEP-BH-2
Sample Depth (m BGL)	0.7
Sample Type and No	B8
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	32
90	100	0.0442	30
75	95	0.0320	27
63	95	0.0234	24
50	95	0.0170	21
37.5	94	0.0091	17
28	92	0.0043	14
20	89	0.0036	13
14	80	0.0015	10
10	76		
6.3	68		
5.0	66		
3.35	63		
2.00	60		
1.18	58	Particle density, Mg/m3	
0.600	53		
0.425	50	2.65 assumed	
0.300	44	Dry mass of sample, kg	
0.212	40		
0.150	37	24.4	
0.063	32		

Soil description	Brown slightly sandy gravelly silty CLAY with two cobbles.
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	5	0
	Gravel	35	37
	Sand	28	29
*<60mm values to aid description only	Silt	21	22
	Clay	11	11

Uniformity Coefficient	D60 / D10	1386

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

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Figure

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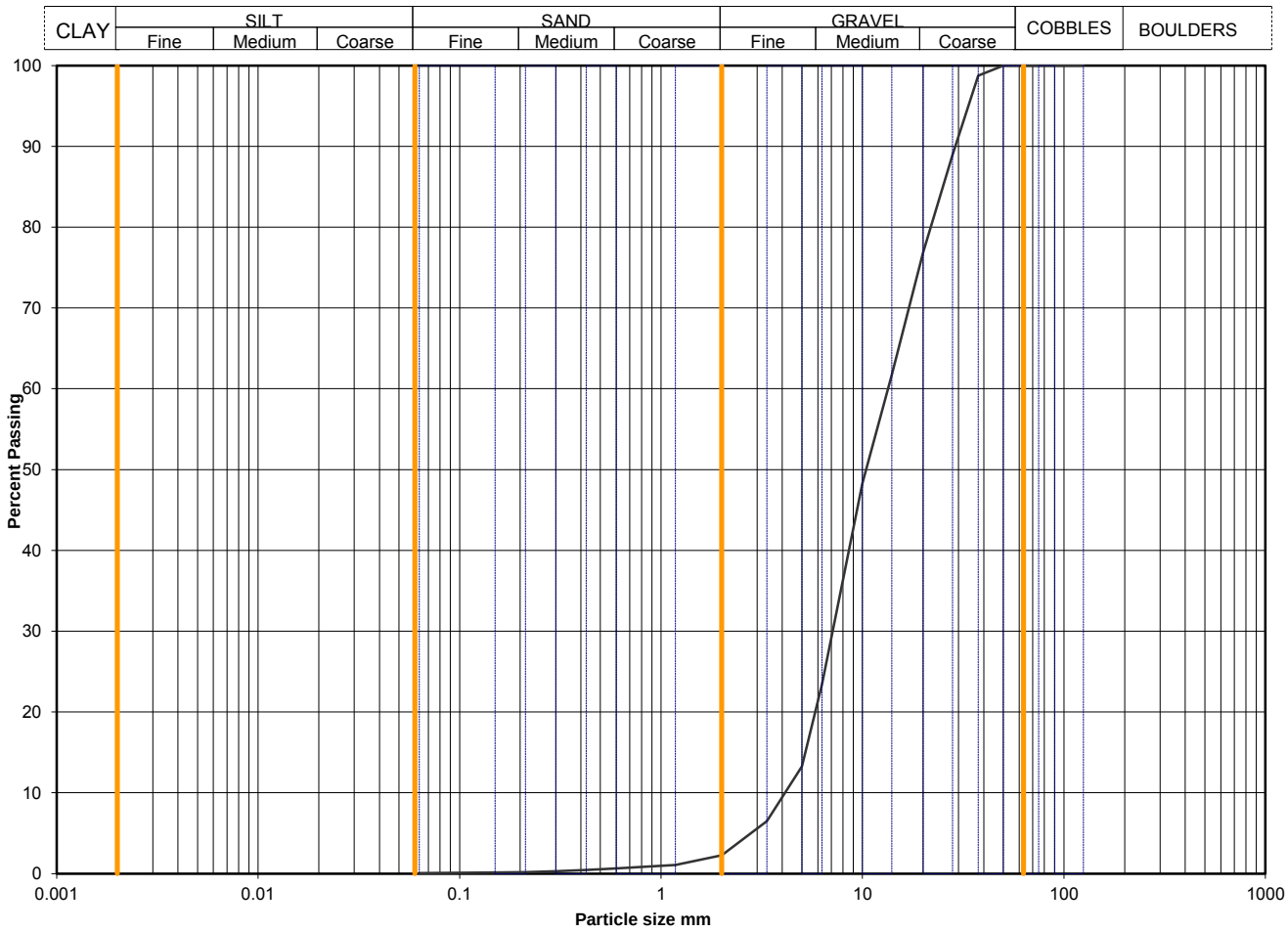
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	FES1171205022

Hole No	HEP-BH-2
Sample Depth (m BGL)	3.5
Sample Type and No	B22
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	99		
28	89		
20	77		
14	62		
10	48		
6.3	23		
5.0	13		
3.35	6		
2.00	2		
1.18	1		
0.600	1		
0.425	0		
0.300	0	Dry mass of sample, kg	
0.212	0		
0.150	0	10.5	
0.063	0		

Soil description	Brown slightly sandy GRAVEL.
Preparation / Pretreatment	Sieve: pre dried,
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	98	98
	Sand	2	2
*<60mm values to aid description only	Silt	silt+clay =	
	Clay	0	0

Uniformity Coefficient	D60 / D10	3

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.3 dry sieve
	Sedimentation	none

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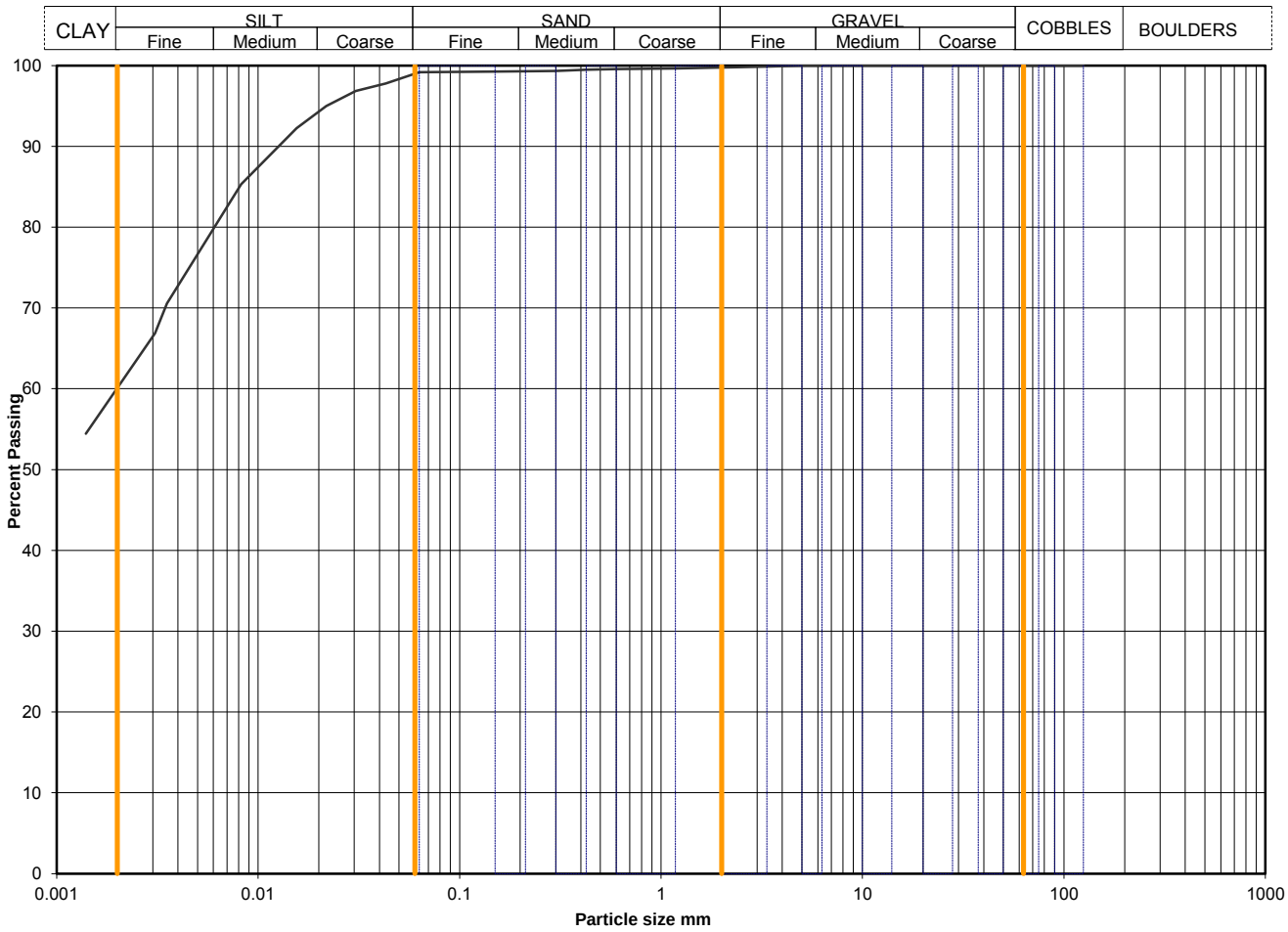
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	FES1171207025

Hole No	HEP-BH-2
Sample Depth (m BGL)	14.5
Sample Type and No	B52
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	99
90	100	0.0431	98
75	100	0.0306	97
63	100	0.0218	95
50	100	0.0155	92
37.5	100	0.0082	85
28	100	0.0035	71
20	100	0.0031	67
14	100	0.0014	54
10	100		
6.3	100		
5.0	100		
3.35	100		
2.00	100		
1.18	100	Particle density, Mg/m3	
0.600	100		
0.425	99	2.65 assumed	
0.300	99	Dry mass of sample, kg	
0.212	99		
0.150	99	11.2	
0.063	99		

Soil description	Brown slightly sandy silty CLAY.		
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377		
Remarks			
Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	0	0
	Sand	1	1
*<60mm values to aid description only	Silt	39	39
	Clay	60	60

Uniformity Coefficient	**D60 / D10**	Not applicable

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

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Figure

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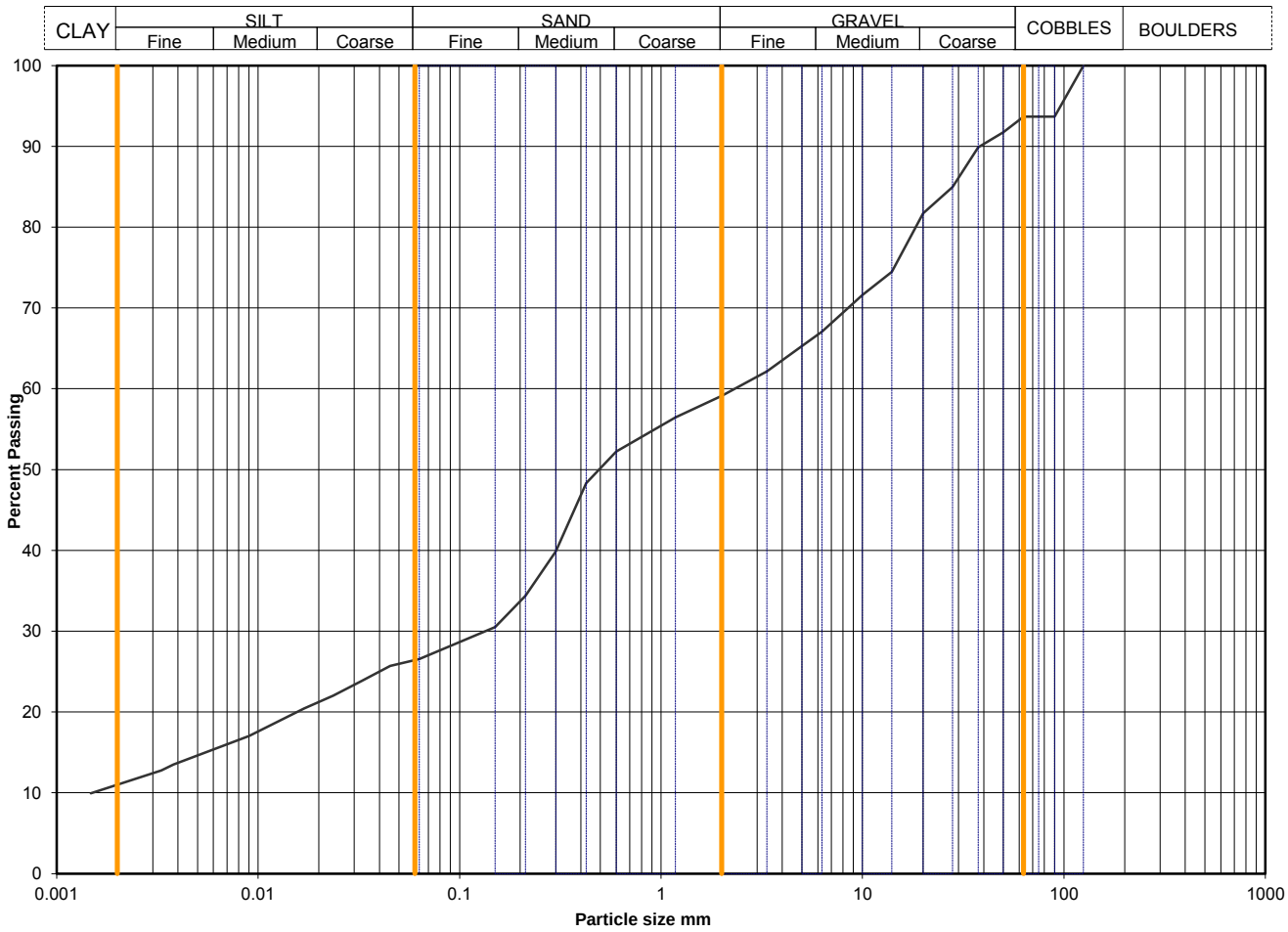
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	FES2171219003

Hole No	HEP-BH-5
Sample Depth (m BGL)	1.2
Sample Type and No	LB9
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	27
90	94	0.0453	26
75	94	0.0327	24
63	94	0.0236	22
50	92	0.0169	20
37.5	90	0.0090	17
28	85	0.0038	13
20	82	0.0033	13
14	74	0.0015	10
10	72		
6.3	67		
5.0	65		
3.35	62		
2.00	59		
1.18	56	Particle density, Mg/m3	
0.600	52		
0.425	48	2.65 assumed	
0.300	40	Dry mass of sample, kg	
0.212	34		
0.150	31	12.8	
0.063	27		

Soil description	Brown sandy gravelly silty CLAY with one cobble.		
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377		
Remarks			
Sample Proportions		Whole	*<60mm
	Cobbles / boulders	6	0
	Gravel	35	37
	Sand	33	35
*<60mm values to aid description only	Silt	16	17
	Clay	11	12

Uniformity Coefficient	**D60 / D10**	1688

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

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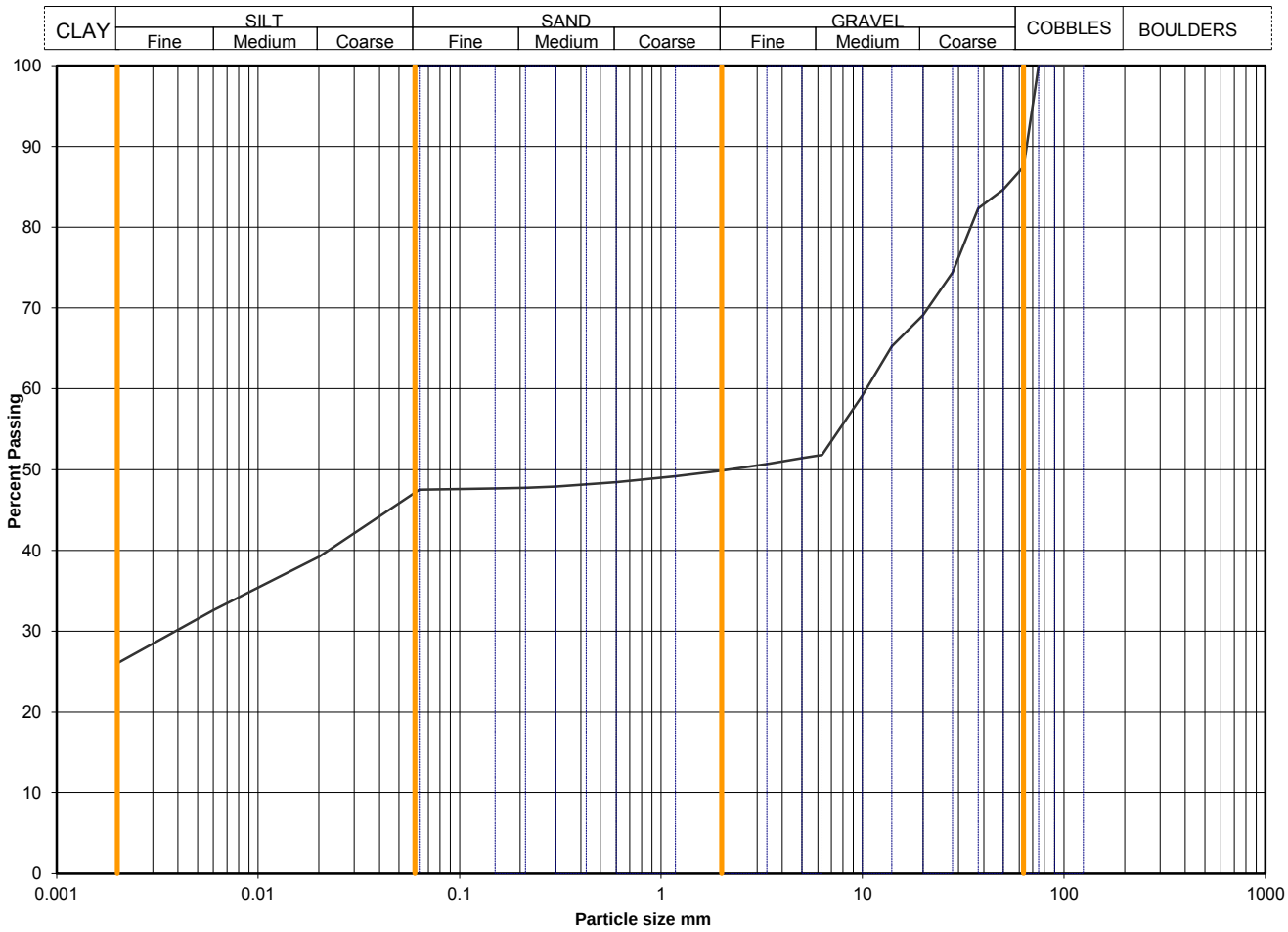
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	FES2171220003

Hole No	HEP-BH-5
Sample Depth (m BGL)	8.2
Sample Type and No	B30
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0201	39
90	100	0.0060	33
75	100	0.0020	26
63	87		
50	85		
37.5	82		
28	74		
20	69		
14	65		
10	59		
6.3	52		
5.0	51		
3.35	51		
2.00	50		
1.18	49	Particle density, Mg/m3	
0.600	48		
0.425	48	2.65 assumed	
0.300	48	Dry mass of sample, kg	
0.212	48		
0.150	48	12.8	
0.063	48		

Soil description	Brownish grey slightly sandy GRAVEL with frequent cobbled sized clay pockets and four cobbles.		
Preparation / Pretreatment	Sieve: natural material Pipette: as BS1377		
Remarks			
Sample Proportions		Whole	*<60mm
	Cobbles / boulders	13	0
	Gravel	38	44
	Sand	2	2
*<60mm values to aid description only	Silt	22	25
	Clay	26	30

Uniformity Coefficient	**D60 / D10**	Not applicable

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.4 pipette

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Figure

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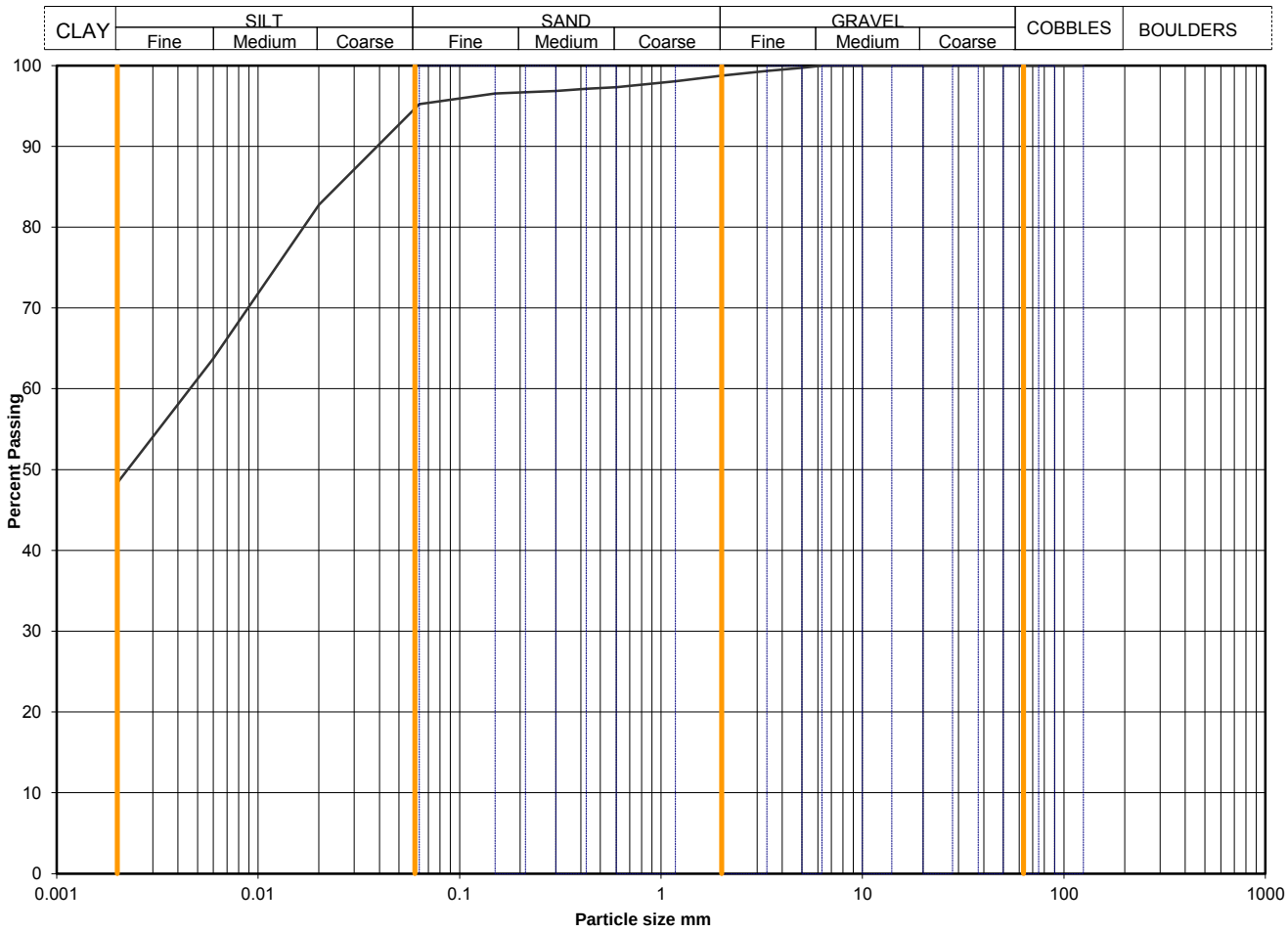
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	FES2171220005

Hole No	HEP-BH-5
Sample Depth (m BGL)	9.7
Sample Type and No	B32
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0201	83
90	100	0.0060	64
75	100	0.0020	48
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5.0	100		
3.35	99		
2.00	99		
1.18	98	Particle density, Mg/m3	
0.600	97		
0.425	97	2.65 assumed	
0.300	97	Dry mass of sample, kg	
0.212	97		
0.150	97	2.6	
0.063	95		

Soil description	Brown slightly sandy silty CLAY.
Preparation / Pretreatment	Sieve: natural material Pipette: as BS1377
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	1	1
	Sand	4	4
*<60mm values to aid description only	Silt	47	47
	Clay	48	48

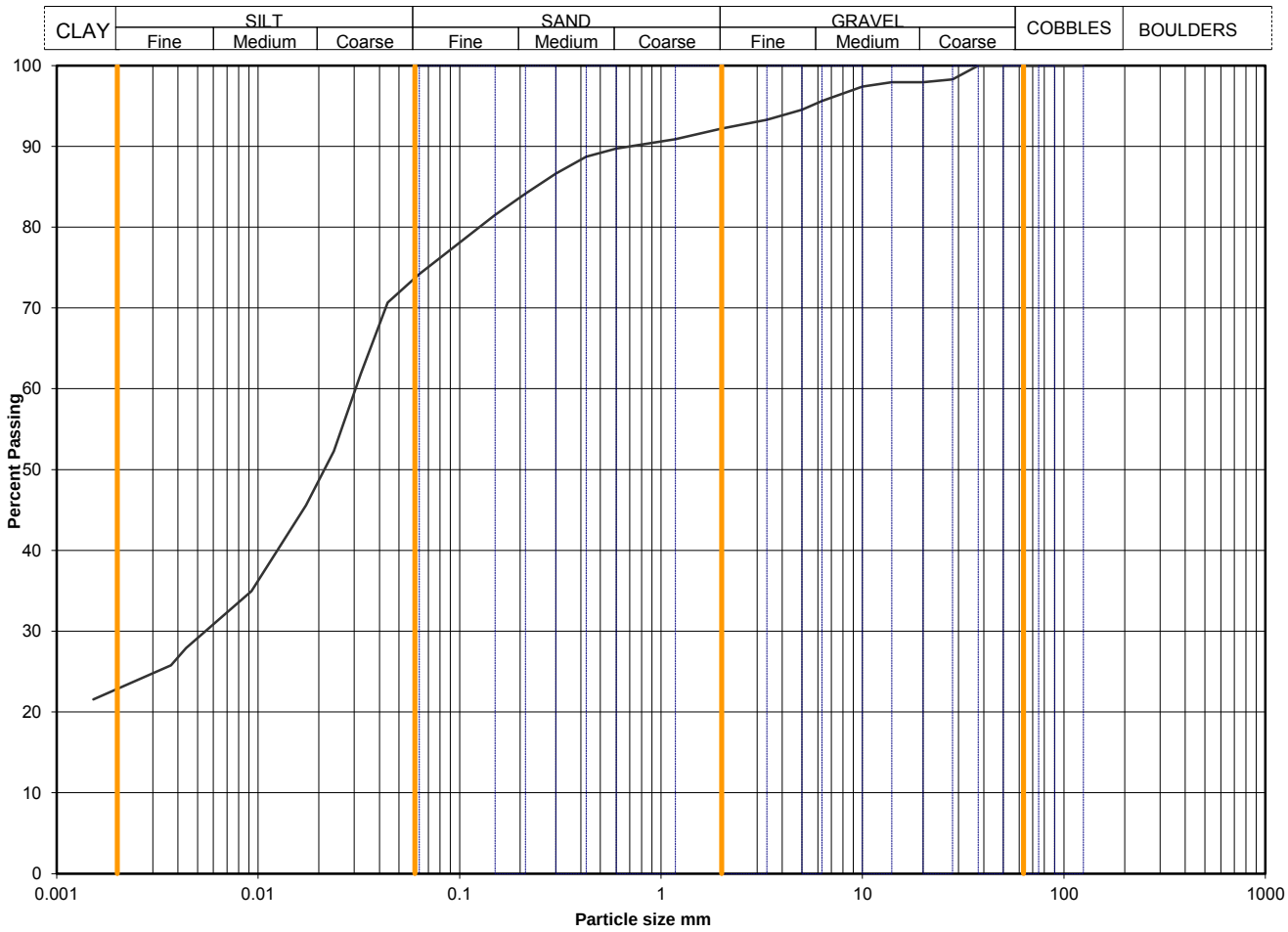
Uniformity Coefficient	D60 / D10	Not applicable

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.4 pipette

Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	HEPBH720171213007

Hole No	HEP-BH-7
Sample Depth (m BGL)	0.9
Sample Type and No	B6
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	74
90	100	0.0440	71
75	100	0.0323	62
63	100	0.0238	52
50	100	0.0173	46
37.5	100	0.0093	35
28	98	0.0044	28
20	98	0.0037	26
14	98	0.0015	22
10	97		
6.3	96		
5.0	95		
3.35	93		
2.00	92		
1.18	91	Particle density, Mg/m3	
0.600	90		
0.425	89	2.65 assumed	
0.300	87	Dry mass of sample, kg	
0.212	84		
0.150	82	4.6	
0.063	74		

Soil description	Brown slightly sandy slightly gravelly silty CLAY.
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	8	8
	Sand	18	18
*<60mm values to aid description only	Silt	51	51
	Clay	23	23

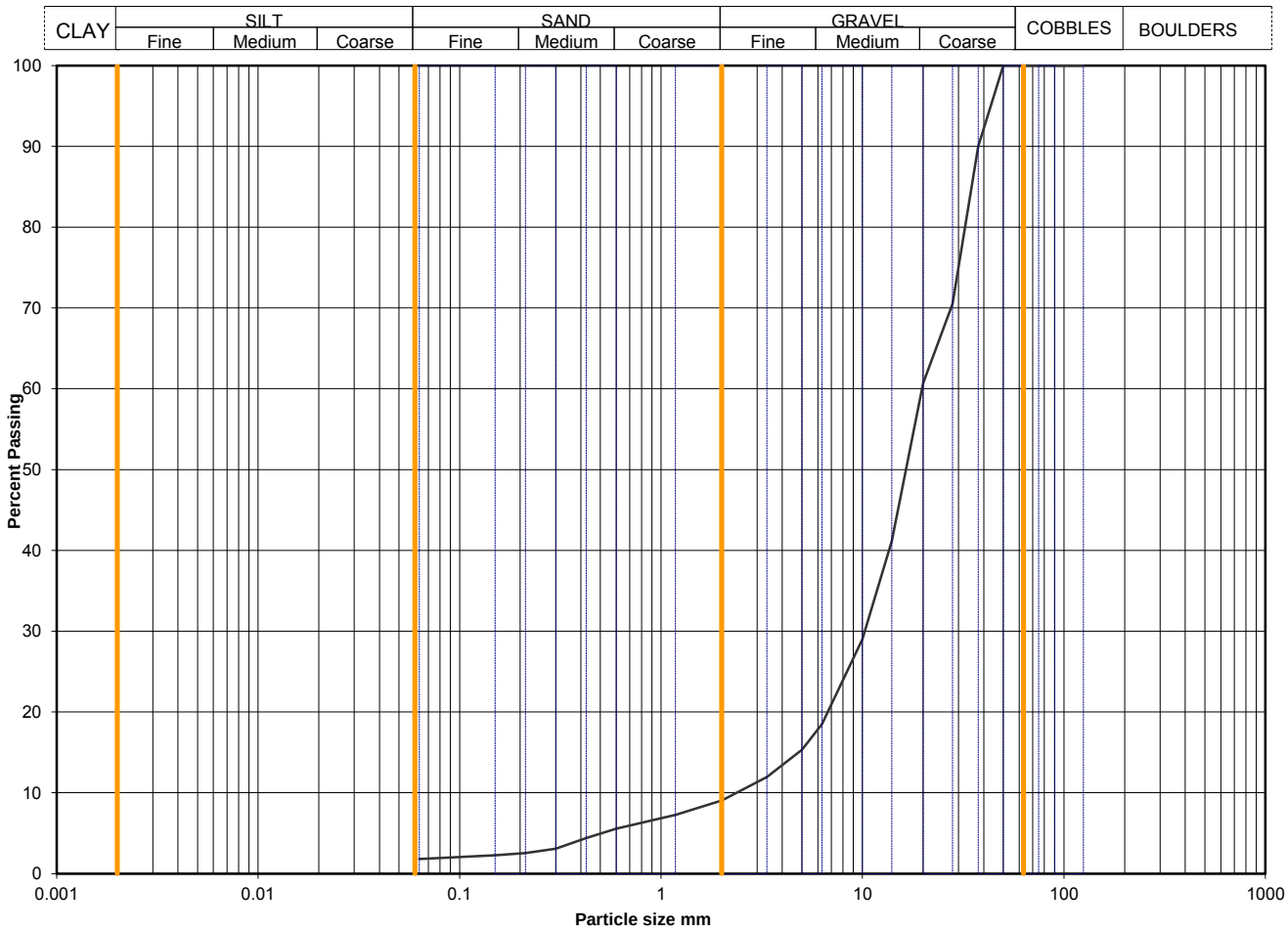
Uniformity Coefficient	D60 / D10	Not applicable

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	HEPBH720171214009

Hole No	HEP-BH-7
Sample Depth (m BGL)	1.2
Sample Type and No	B13
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	90		
28	70		
20	61		
14	41		
10	29		
6.3	19		
5.0	15		
3.35	12		
2.00	9		
1.18	7		
0.600	6		
0.425	4		
0.300	3	Dry mass of sample, kg	
0.212	3		
0.150	2	14.9	
0.063	2		

Soil description	Brown sandy GRAVEL.
Preparation / Pretreatment	Sieve: natural material
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	91	91
	Sand	7	7
*<60mm values to aid description only	Silt	silt+clay =	
	Clay	2	2

Uniformity Coefficient	D60 / D10	8

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.3 dry sieve
	Sedimentation	none

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Figure

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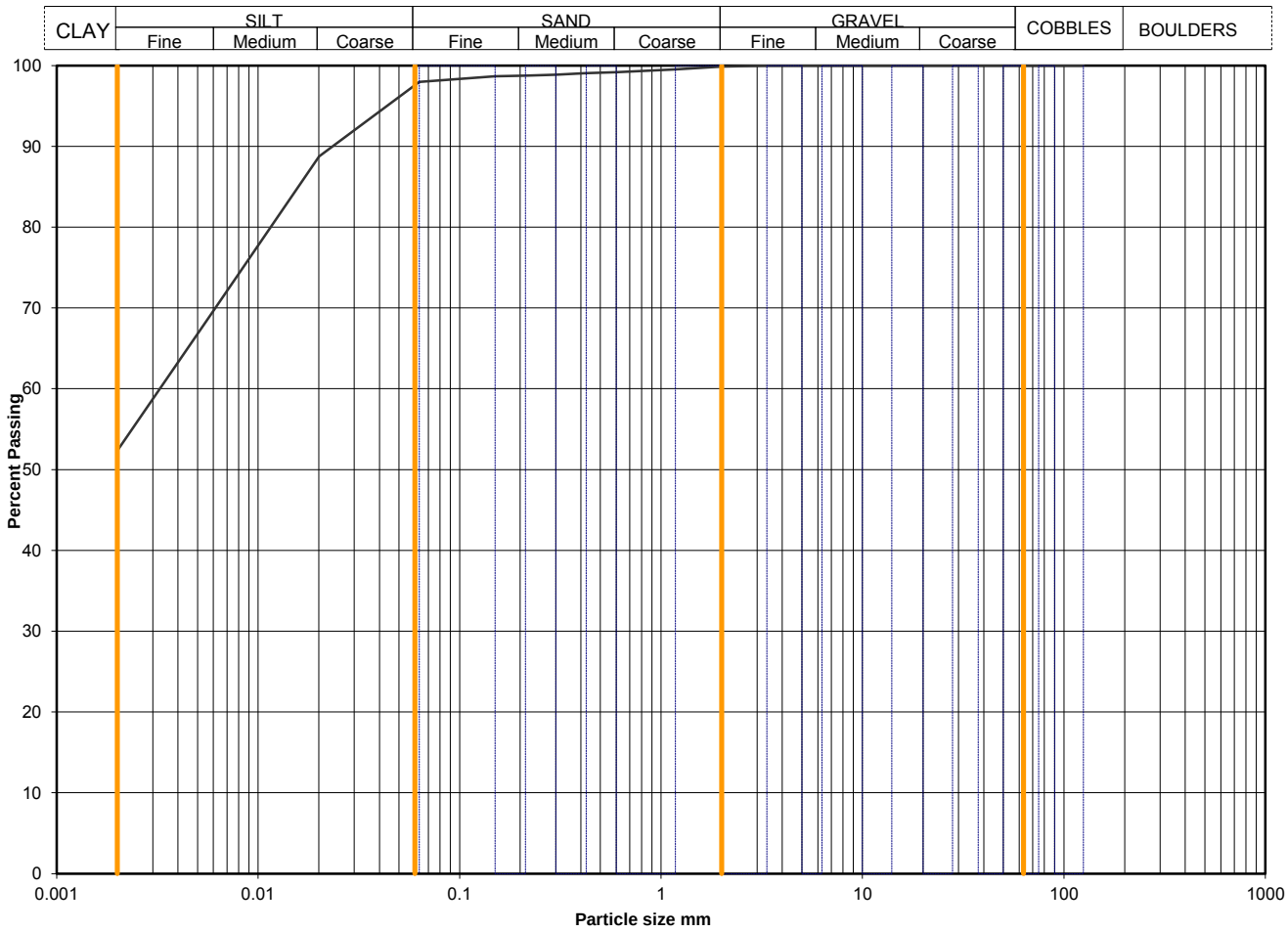
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	HEPBH720171214030

Hole No	HEP-BH-7
Sample Depth (m BGL)	6.5
Sample Type and No	UT39
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0201	89
90	100	0.0060	70
75	100	0.0020	52
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5.0	100		
3.35	100		
2.00	100		
1.18	100	Particle density, Mg/m3	
0.600	99		
0.425	99	2.65 assumed	
0.300	99	Dry mass of sample, kg	
0.212	99		
0.150	99	2.0	
0.063	98		

Soil description	Firm greyish brown slightly sandy CLAY.
Preparation / Pretreatment	Sieve: natural material Pipette: as BS1377
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	0	0
	Sand	2	2
*<60mm values to aid description only	Silt	46	46
	Clay	52	52

Uniformity Coefficient	D60 / D10	Not applicable

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.4 pipette

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Figure

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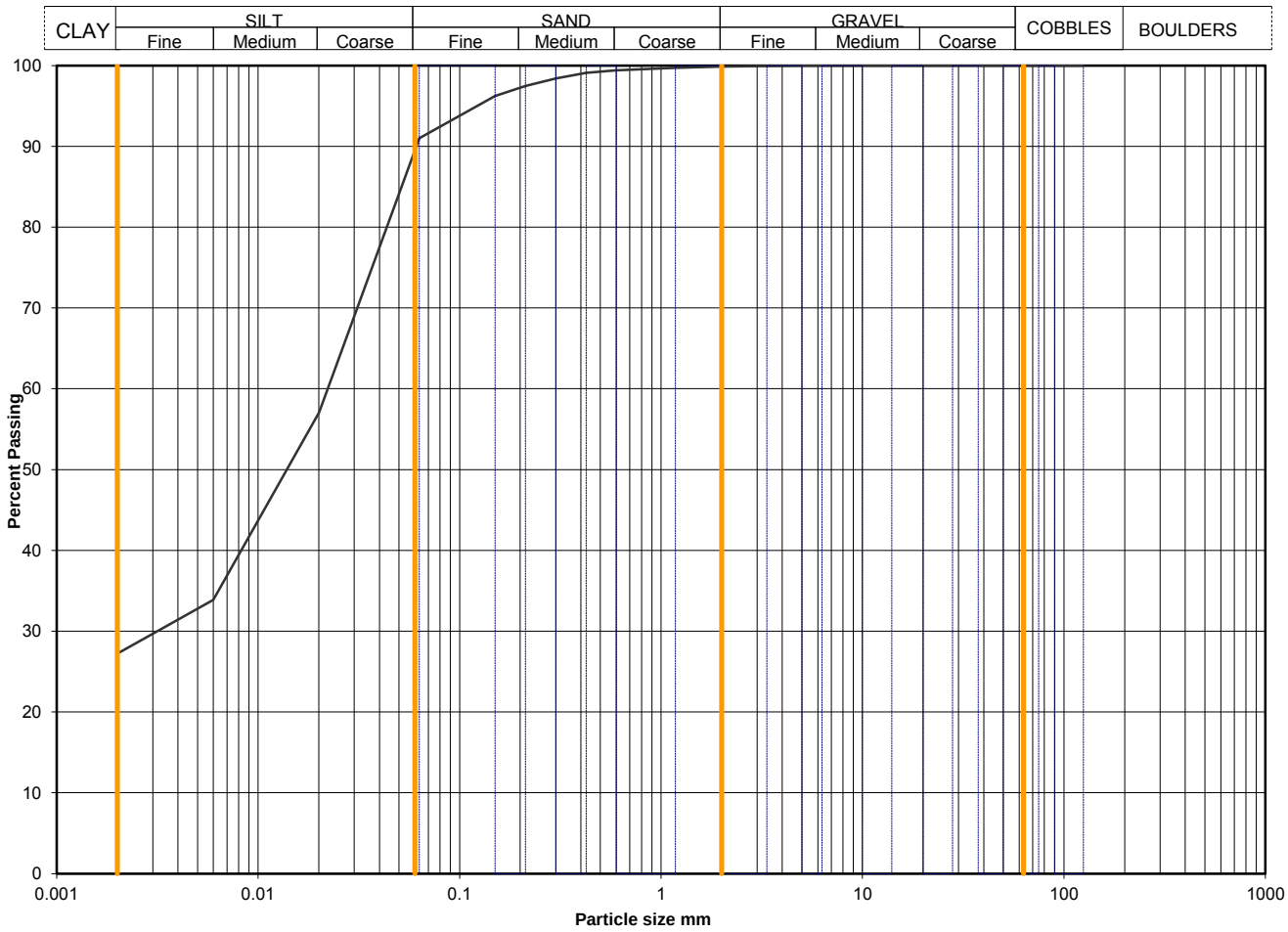
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	HEPBH1220171127012

Hole No	HEP-BH-12
Sample Depth (m BGL)	1
Sample Type and No	B12
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0201	57
90	100	0.0060	34
75	100	0.0020	27
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5.0	100		
3.35	100		
2.00	100		
1.18	100	Particle density, Mg/m3	
0.600	99		
0.425	99	2.65 assumed	
0.300	98	Dry mass of sample, kg	
0.212	97		
0.150	96	9.3	
0.063	91		

Soil description	Brown slightly sandy silty CLAY.
Preparation / Pretreatment	Sieve: natural material Pipette: as BS1377
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	0	0
	Sand	9	9
*<60mm values to aid description only	Silt	64	64
	Clay	27	27

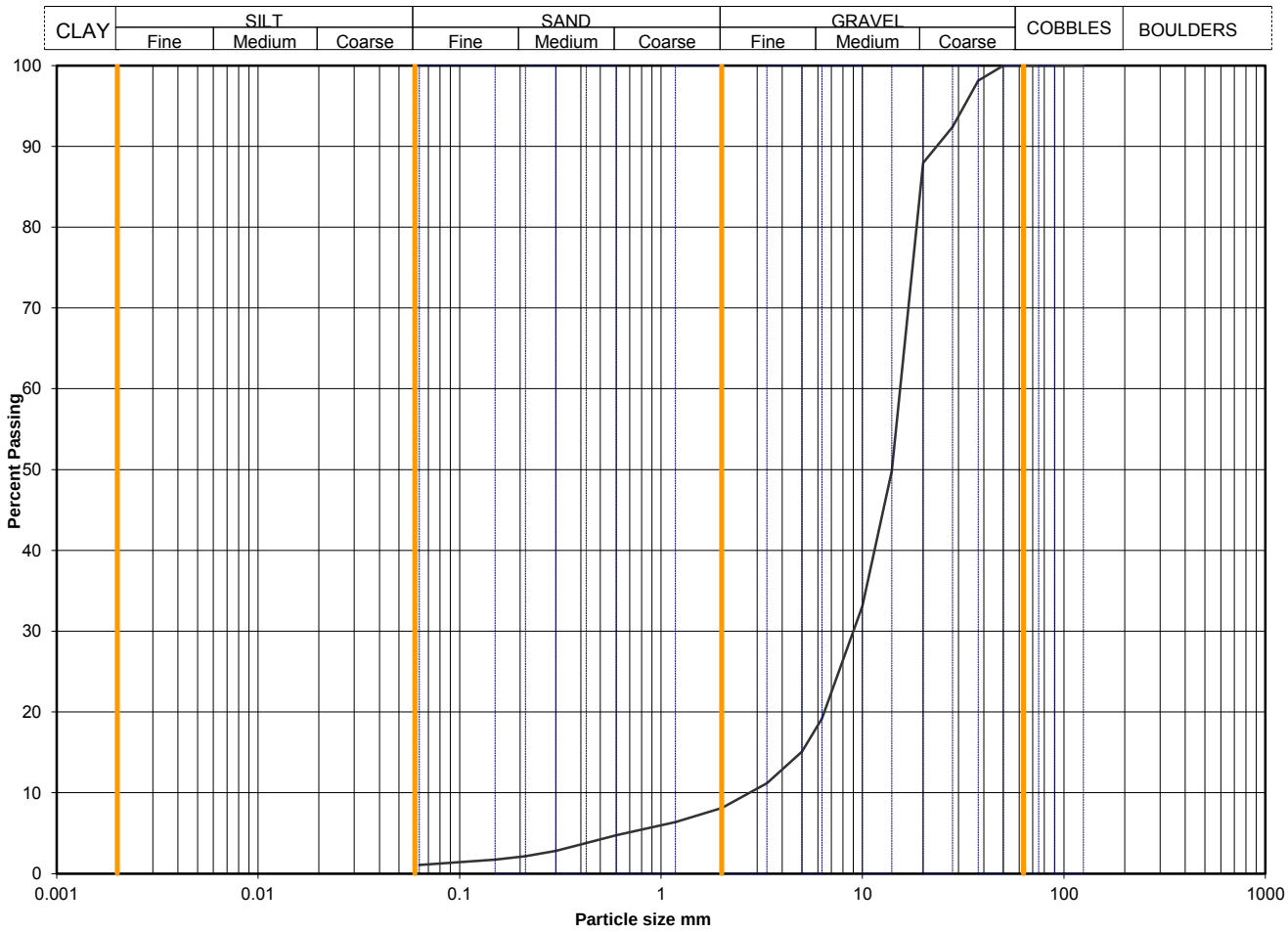
Uniformity Coefficient	D60 / D10	Not applicable

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.4 pipette

Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	HEPBH1220171129010

Hole No	HEP-BH-12
Sample Depth (m BGL)	2
Sample Type and No	LB20
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	98		
28	92		
20	88		
14	50		
10	33		
6.3	19		
5.0	15		
3.35	11		
2.00	8		
1.18	6		
0.600	5		
0.425	4		
0.300	3	Dry mass of sample, kg	
0.212	2		
0.150	2	10.0	
0.063	1		

Soil description	Brown sandy GRAVEL.
Preparation / Pretreatment	Sieve: natural material
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	92	92
	Sand	7	7
*<60mm values to aid description only	Silt	silt+clay =	
	Clay	1	1

Uniformity Coefficient	D60 / D10	6

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.3 dry sieve
	Sedimentation	none

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Project Name Heathrow Airport Limited

Figure

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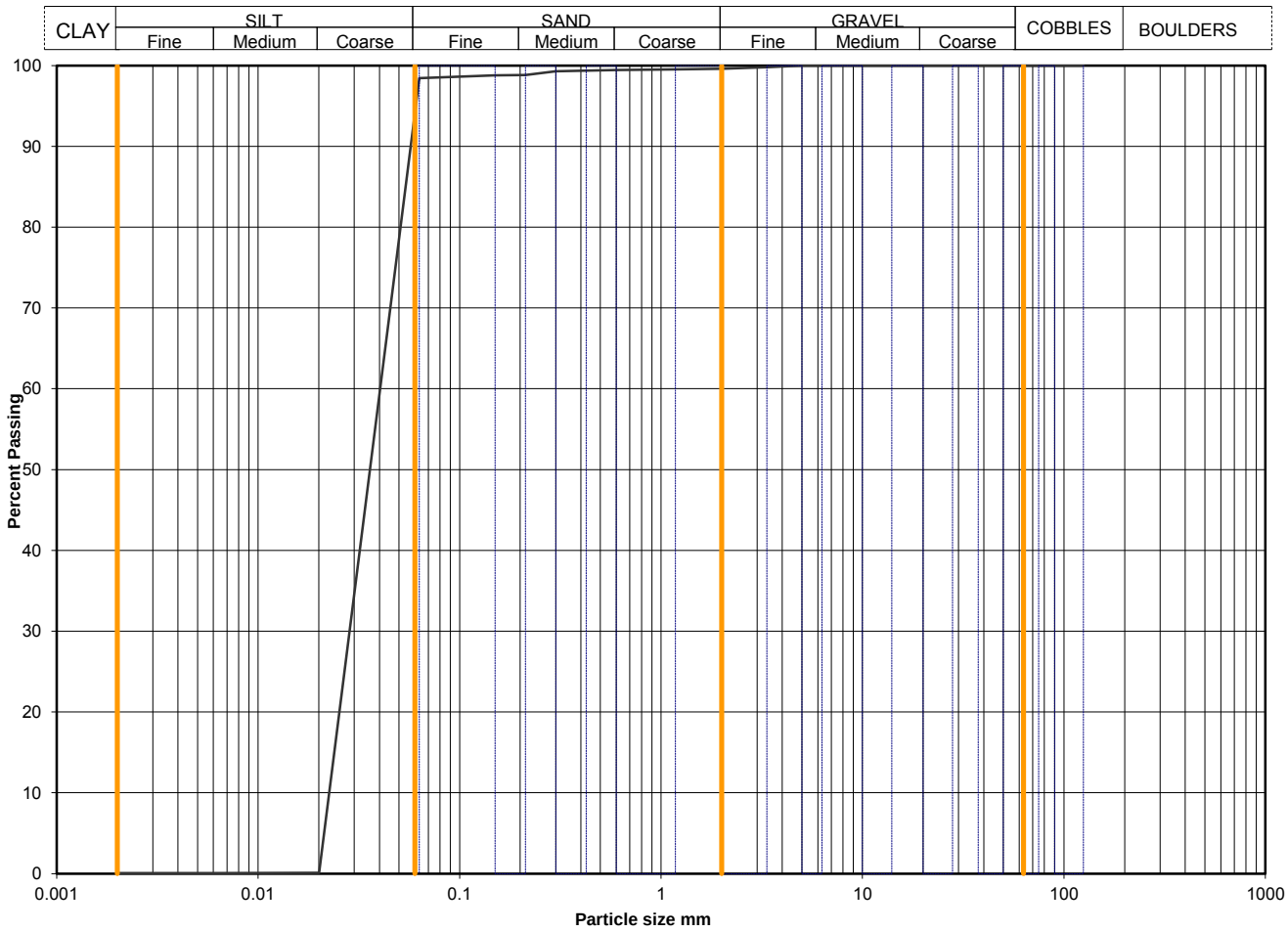
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	HEPBH1220171130008

Hole No	HEP-BH-12
Sample Depth (m BGL)	5.2
Sample Type and No	B35
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0201	0
90	100	0.0060	0
75	100	0.0020	0
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5.0	100		
3.35	100		
2.00	100		
1.18	100	Particle density, Mg/m3	
0.600	99		
0.425	99	2.65 assumed	
0.300	99	Dry mass of sample, kg	
0.212	99		
0.150	99	6.4	
0.063	98		

Soil description	Brown slightly sandy SILT.
Preparation / Pretreatment	Sieve: natural material Pipette: as BS1377
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	0	0
	Sand	1	1
*<60mm values to aid description only	Silt	98	98
	Clay	0	0

Uniformity Coefficient	D60 / D10	2

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.4 pipette

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Project Name Heathrow Airport Limited

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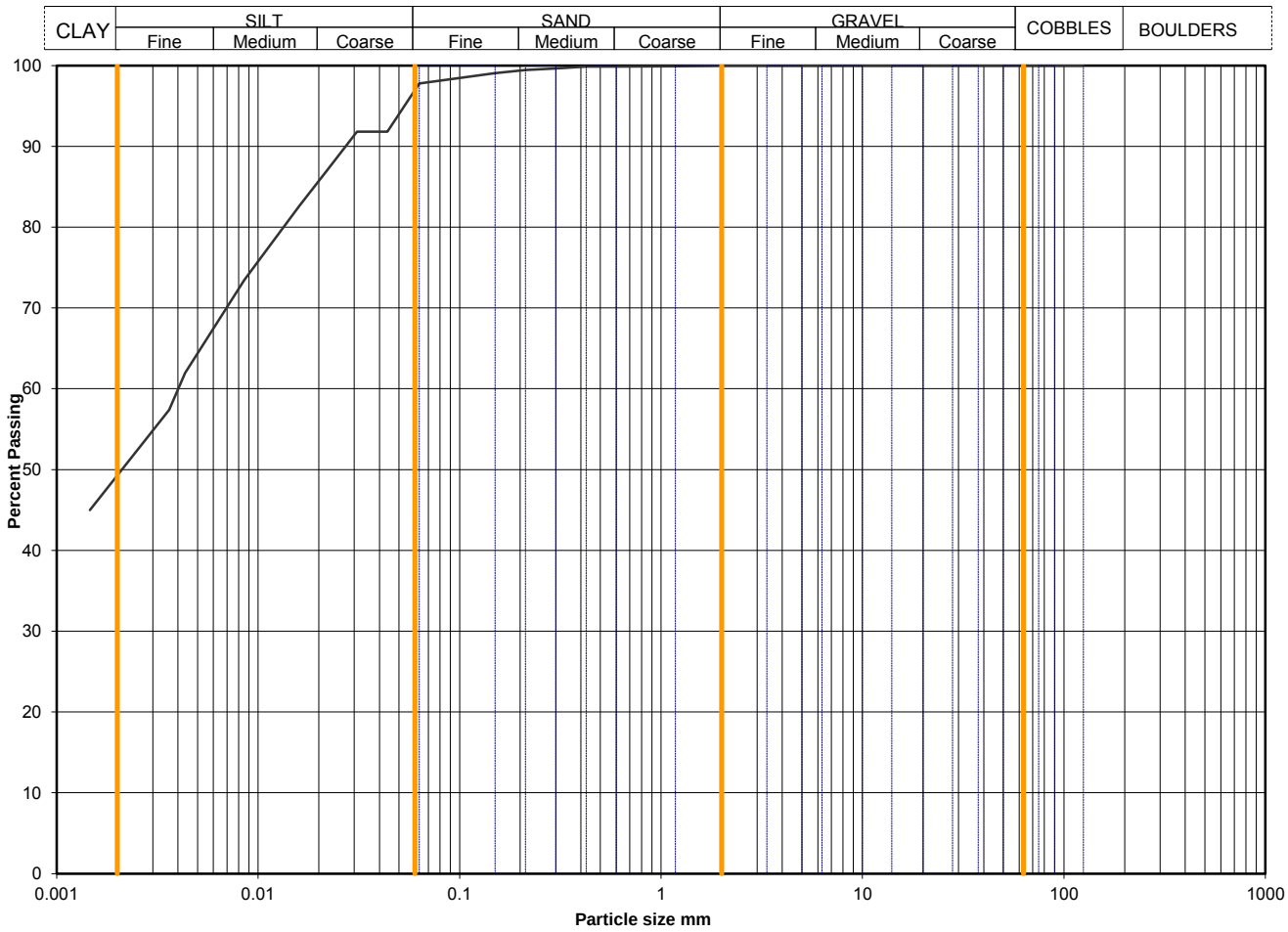
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	HEPBH1220171130013

Hole No	HEP-BH-12
Sample Depth (m BGL)	8.2
Sample Type and No	UT41
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	98
90	100	0.0439	92
75	100	0.0310	92
63	100	0.0223	87
50	100	0.0160	83
37.5	100	0.0085	73
28	100	0.0043	62
20	100	0.0036	57
14	100	0.0015	45
10	100		
6.3	100		
5.0	100		
3.35	100		
2.00	100		
1.18	100	Particle density, Mg/m3	
0.600	100		
0.425	100	2.65 assumed	
0.300	100	Dry mass of sample, kg	
0.212	99		
0.150	99	0.9	
0.063	98		

Soil description	Stiff to very stiff thinly laminated dark brown slightly sandy CLAY.
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	0	0
	Sand	2	2
*<60mm values to aid description only	Silt	49	49
	Clay	49	49

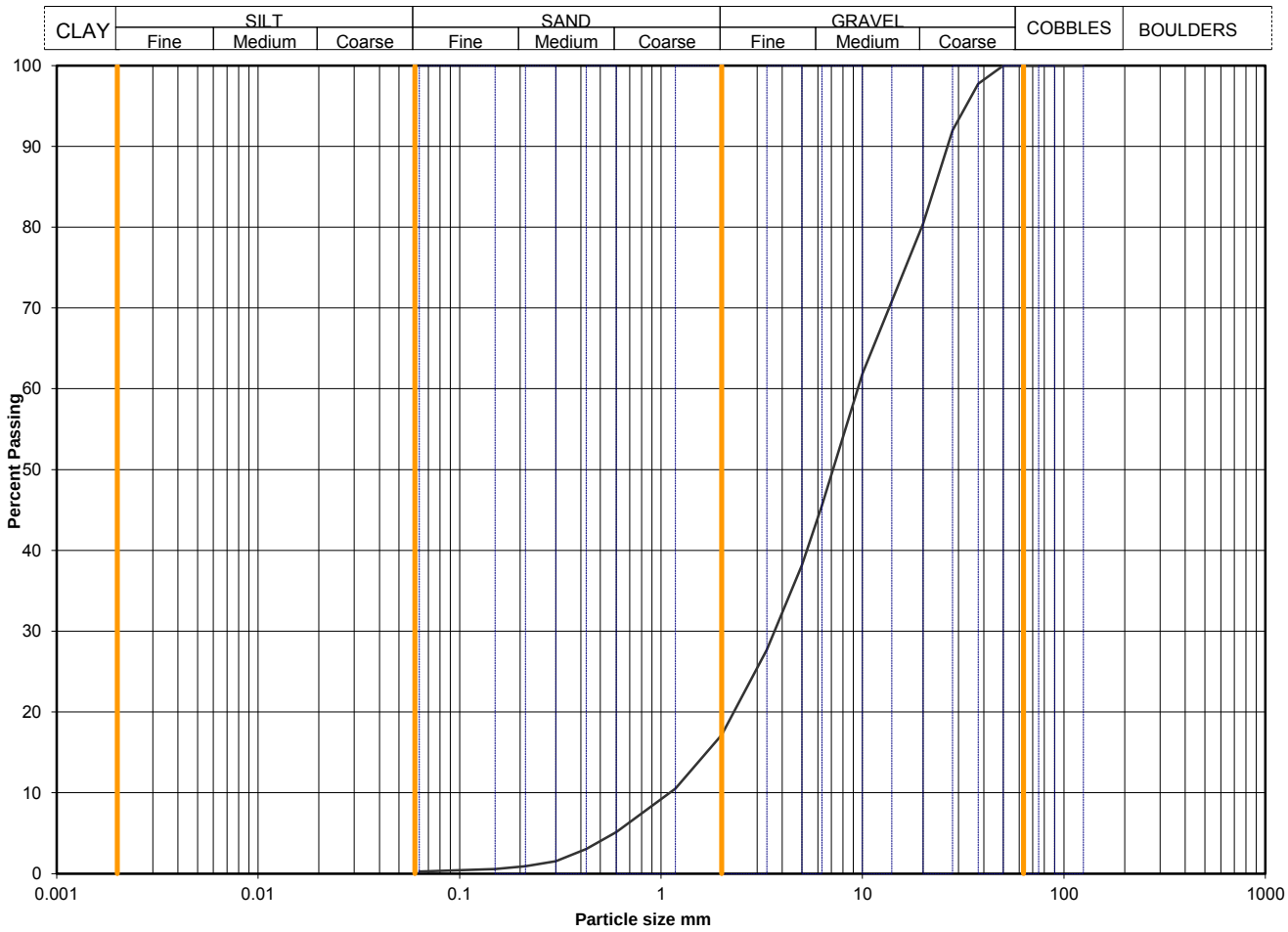
Uniformity Coefficient	D60 / D10	Not applicable

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	HEPBH2320171205009

Hole No	HEP-BH-23
Sample Depth (m BGL)	3.5
Sample Type and No	B18
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	98		
28	92		
20	80		
14	71		
10	62		
6.3	46		
5.0	38		
3.35	28		
2.00	17		
1.18	11		
0.600	5		
0.425	3		
0.300	2	Dry mass of sample, kg	
0.212	1		
0.150	1	6.4	
0.063	0		

Soil description	Brown sandy GRAVEL.
Preparation / Pretreatment	Sieve: natural material
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	83	83
	Sand	17	17
*<60mm values to aid description only	Silt	silt+clay =	
	Clay	0	0

Uniformity Coefficient	D60 / D10	9

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.3 dry sieve
	Sedimentation	none

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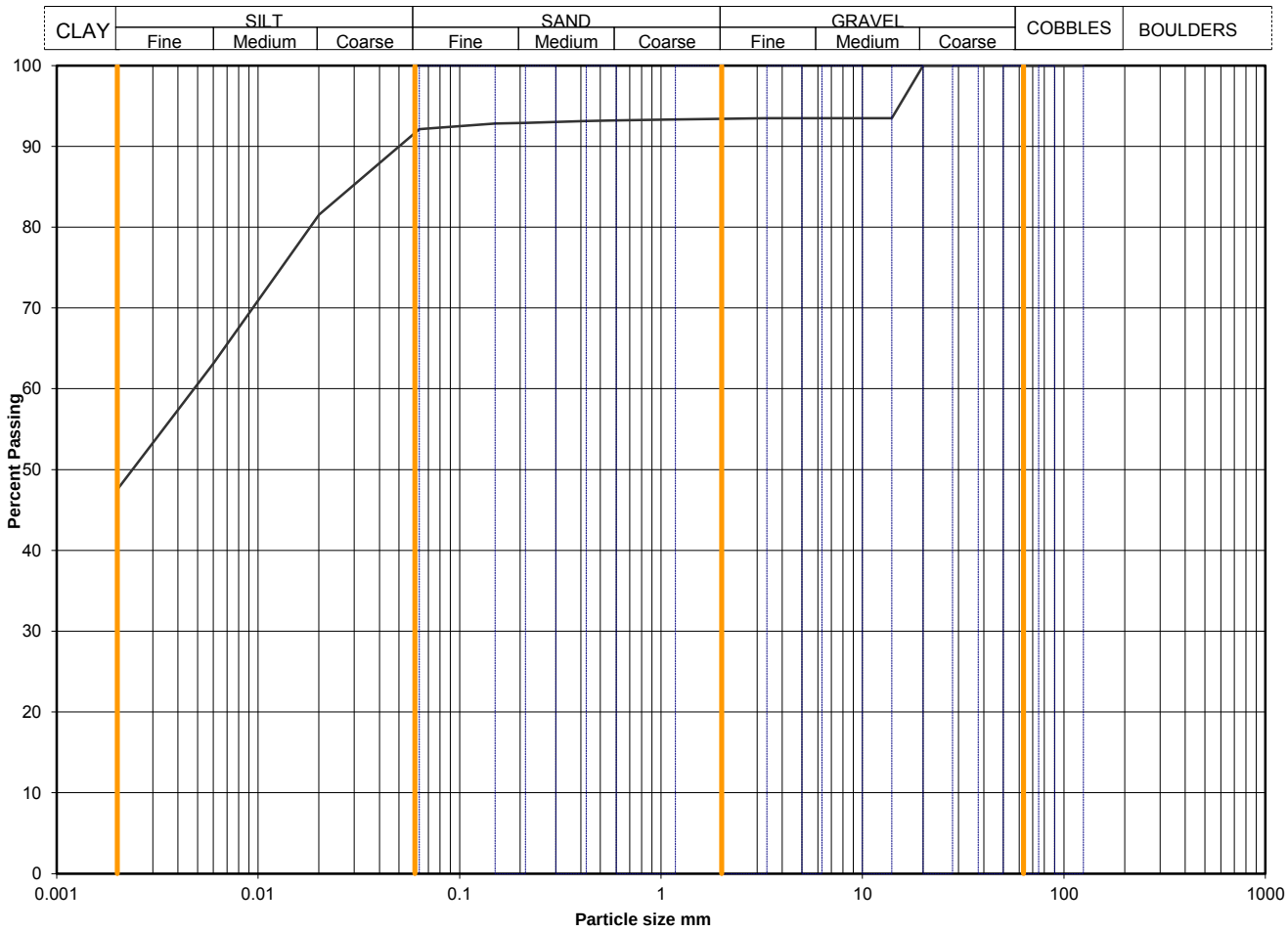
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	HEPBH2320171205012

Hole No	HEP-BH-23
Sample Depth (m BGL)	4.8
Sample Type and No	D20
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0201	82
90	100	0.0060	63
75	100	0.0020	47
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	93		
10	93		
6.3	93		
5.0	93		
3.35	93		
2.00	93		
1.18	93	Particle density, Mg/m3	
0.600	93		
0.425	93	2.65 assumed	
0.300	93	Dry mass of sample, kg	
0.212	93		
0.150	93	0.4	
0.063	92		

Soil description	Brown slightly sandy silty CLAY.
Preparation / Pretreatment	Sieve: natural material Pipette: as BS1377
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	7	7
	Sand	1	1
*<60mm values to aid description only	Silt	45	45
	Clay	48	48

Uniformity Coefficient	D60 / D10	Not applicable

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.4 pipette

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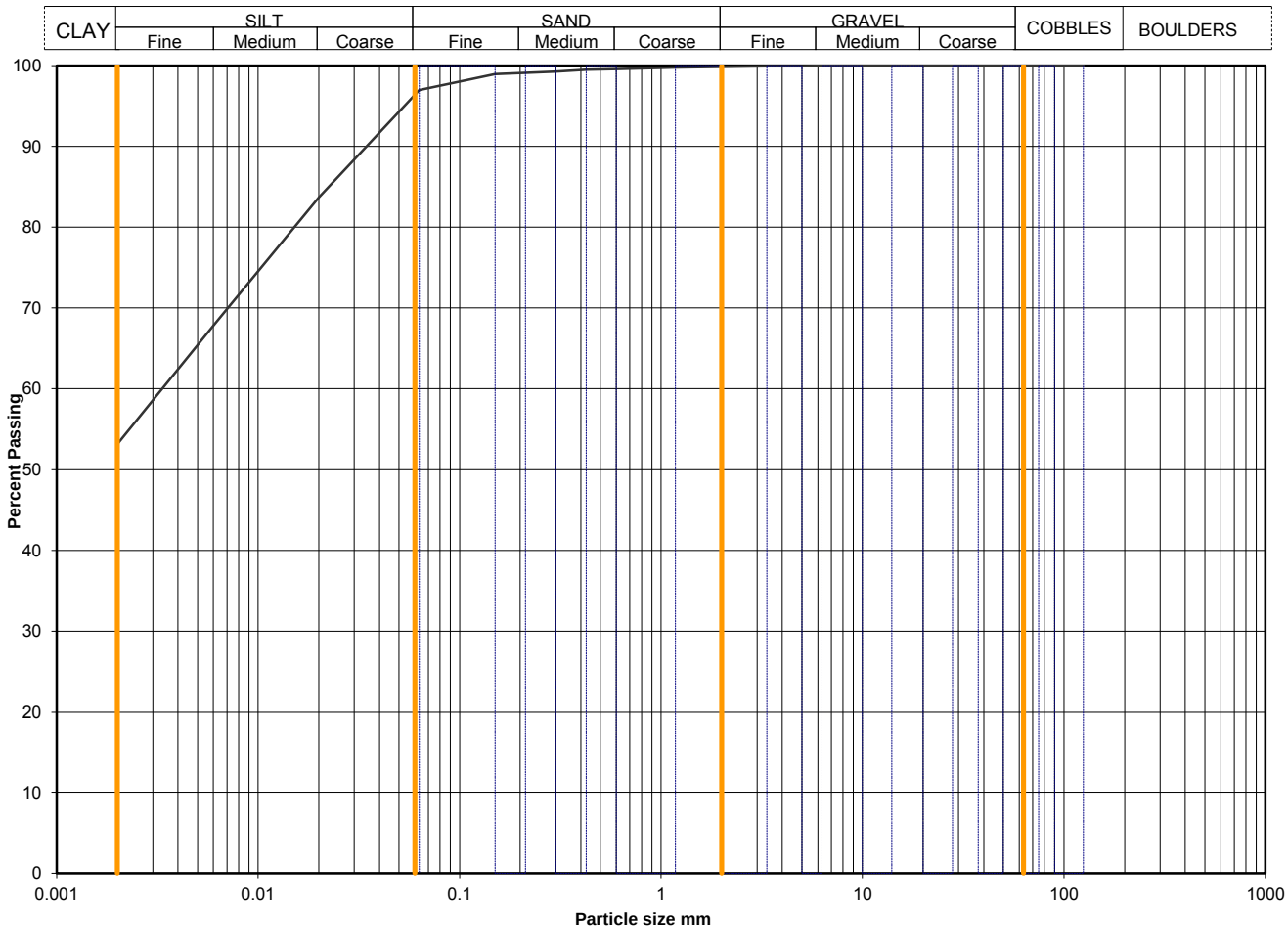
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	HEPBH2320171206032

Hole No	HEP-BH-23
Sample Depth (m BGL)	14.5
Sample Type and No	B54
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0201	84
90	100	0.0060	68
75	100	0.0020	53
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5.0	100		
3.35	100		
2.00	100		
1.18	100	Particle density, Mg/m3	
0.600	100		
0.425	99	2.65 assumed	
0.300	99	Dry mass of sample, kg	
0.212	99		
0.150	99	6.0	
0.063	97		

Soil description	Brown slightly sandy silty CLAY.
Preparation / Pretreatment	Sieve: natural material Pipette: as BS1377
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	0	0
	Sand	3	3
*<60mm values to aid description only	Silt	44	44
	Clay	53	53

Uniformity Coefficient	D60 / D10	Not applicable

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.4 pipette

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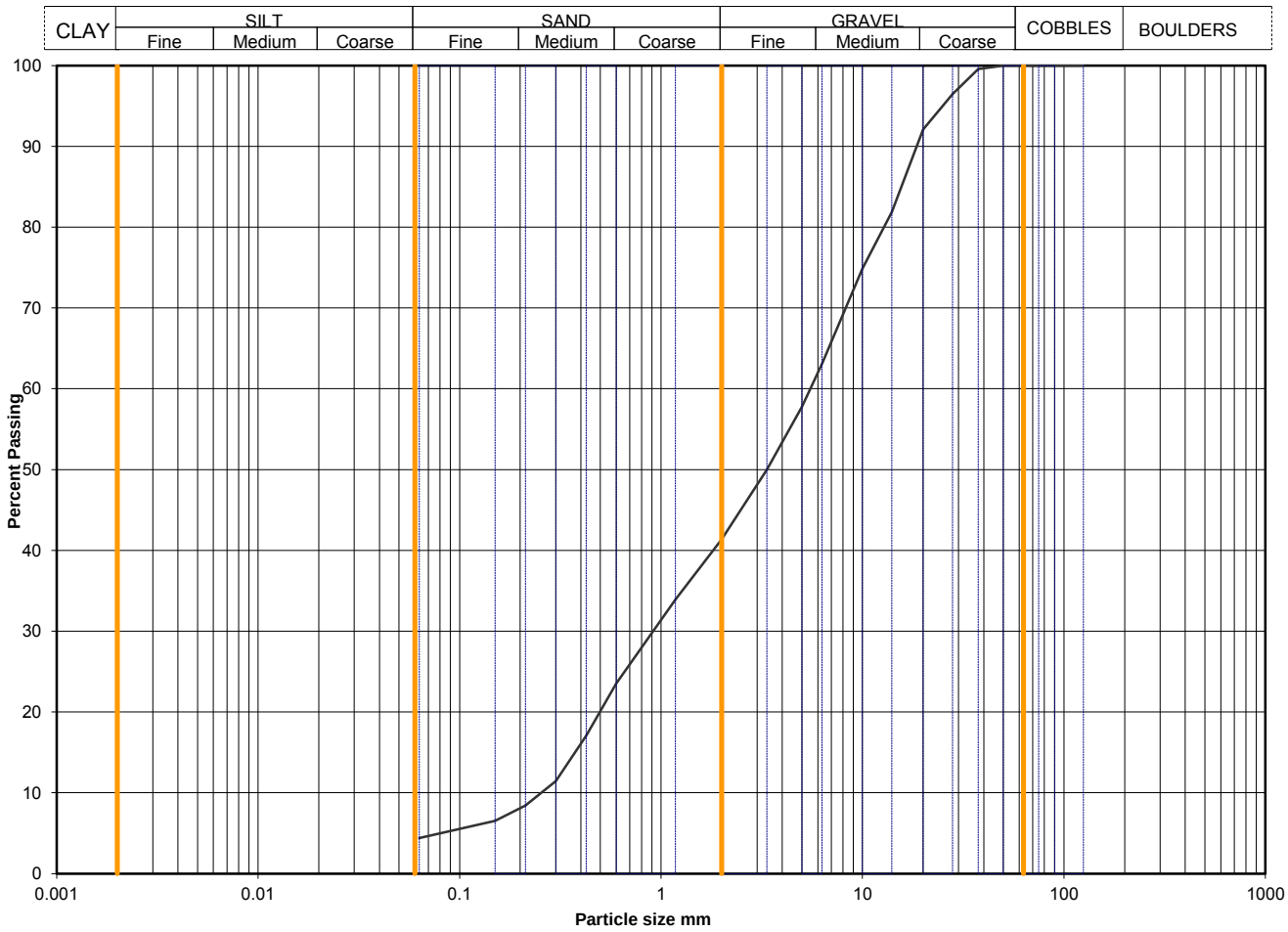
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	FES1171212012

Hole No	HEP-BH-25
Sample Depth (m BGL)	3.1
Sample Type and No	B18
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	96		
20	92		
14	82		
10	75		
6.3	63		
5.0	58		
3.35	50		
2.00	41		
1.18	34		
0.600	24		
0.425	17		
0.300	11	Dry mass of sample, kg	
0.212	8		
0.150	7	20.9	
0.063	4		

Soil description	Greyish brown very sandy clayey GRAVEL.
Preparation / Pretreatment	Sieve: natural material
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	59	59
	Sand	37	37
*<60mm values to aid description only	Silt	silt+clay =	
	Clay	4	4

Uniformity Coefficient	D60 / D10	22

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	none

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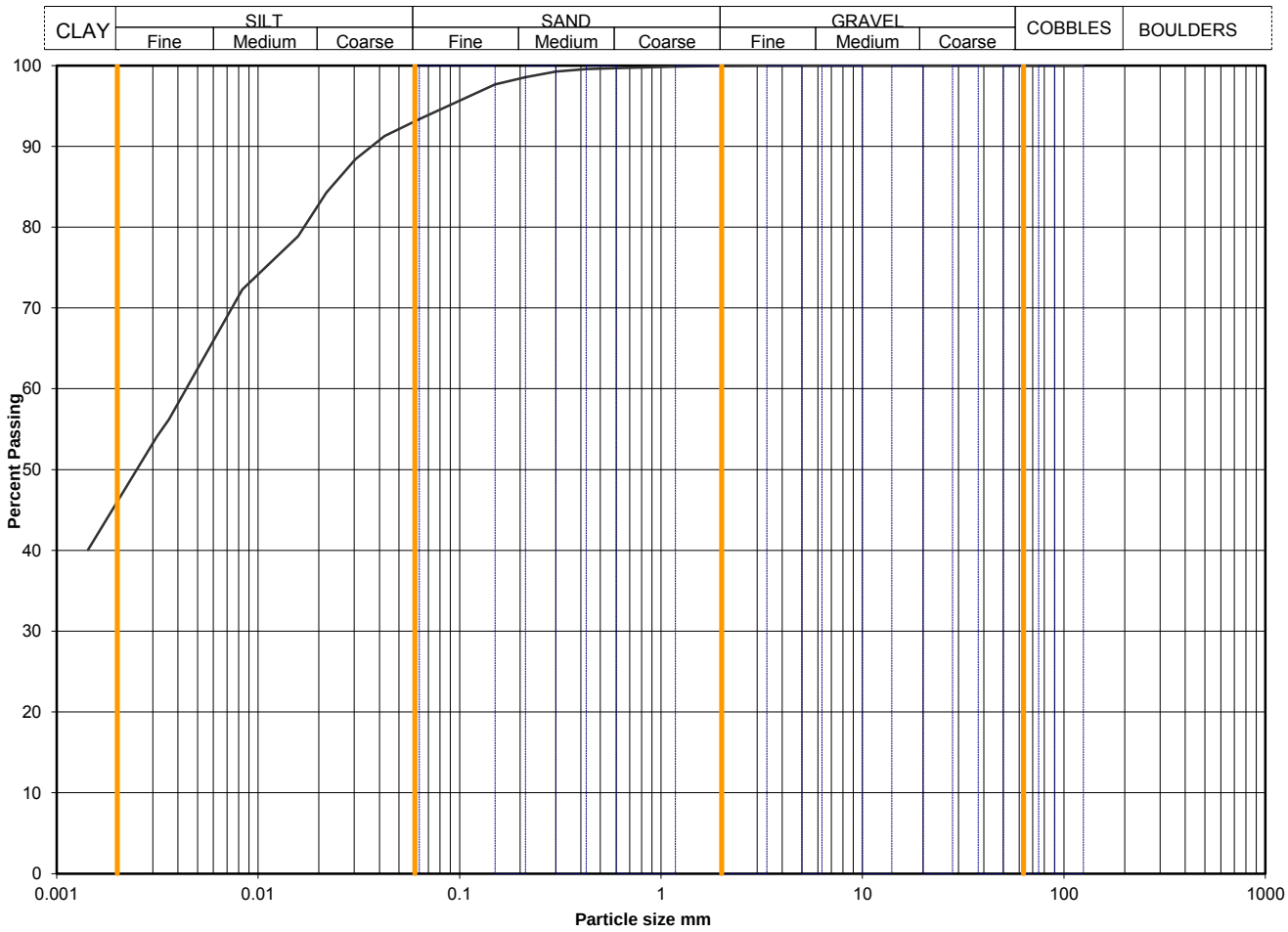
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	FES1171212024

Hole No	HEP-BH-25
Sample Depth (m BGL)	7
Sample Type and No	B30
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	93
90	100	0.0424	91
75	100	0.0304	88
63	100	0.0218	84
50	100	0.0158	79
37.5	100	0.0083	72
28	100	0.0036	56
20	100	0.0031	54
14	100	0.0014	40
10	100		
6.3	100		
5.0	100		
3.35	100		
2.00	100		
1.18	100	Particle density, Mg/m3	
0.600	100		
0.425	100	2.65 assumed	
0.300	99	Dry mass of sample, kg	
0.212	99		
0.150	98	1.8	
0.063	93		

Soil description	Brown slightly sandy silty CLAY.
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	0	0
	Sand	7	7
*<60mm values to aid description only	Silt	47	47
	Clay	46	46

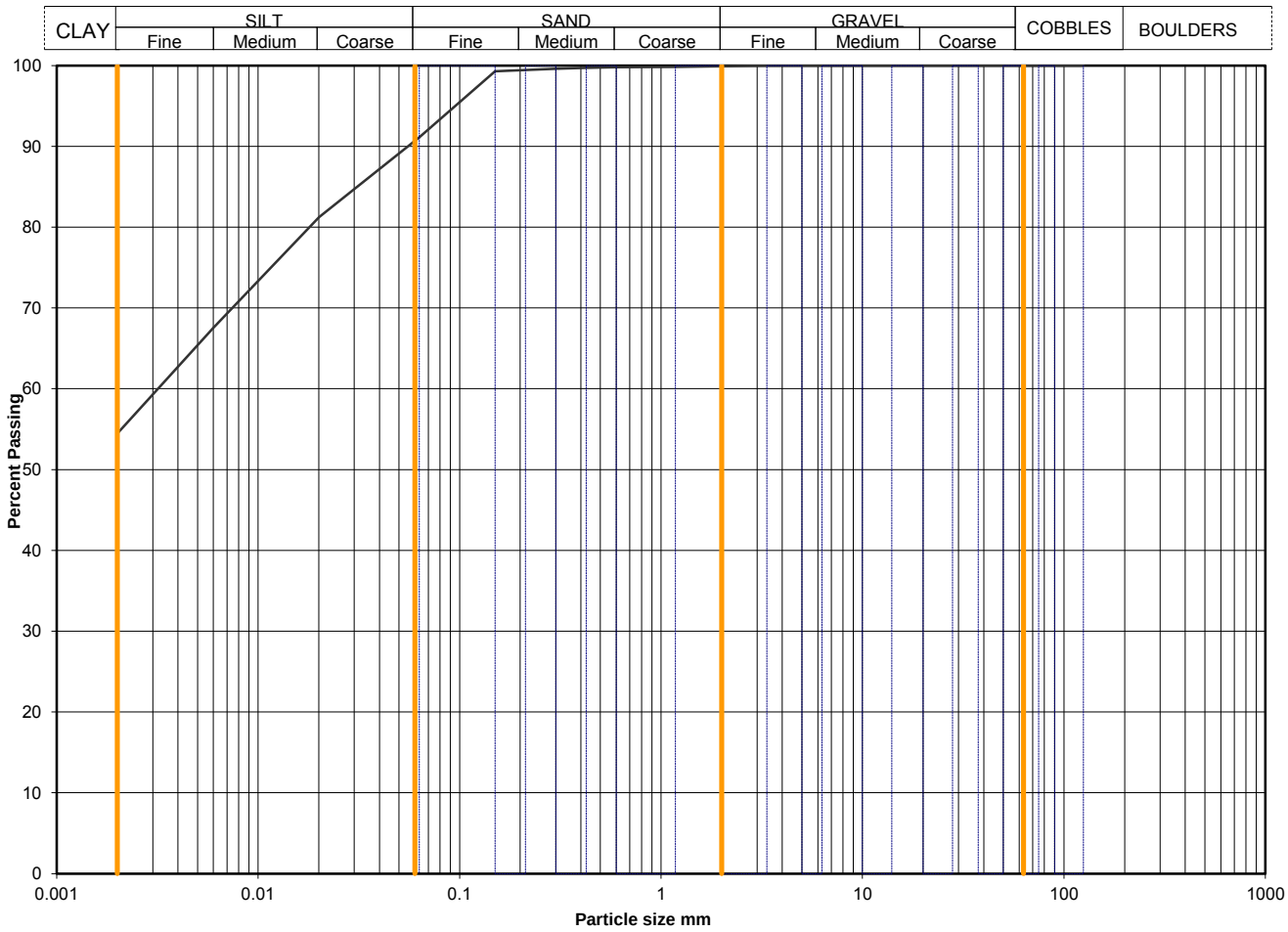
Uniformity Coefficient	D60 / D10	Not applicable

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	FES1171215016

Hole No	HEP-BH-25
Sample Depth (m BGL)	14.1
Sample Type and No	B47
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0201	81
90	100	0.0060	68
75	100	0.0020	54
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5.0	100		
3.35	100		
2.00	100		
1.18	100	Particle density, Mg/m3	
0.600	100		
0.425	100	2.65 assumed	
0.300	100	Dry mass of sample, kg	
0.212	99		
0.150	99	1.2	
0.063	91		

Soil description	Brown slightly sandy silty CLAY.
Preparation / Pretreatment	Sieve: natural material Pipette: as BS1377
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	0	0
	Sand	9	9
*<60mm values to aid description only	Silt	37	37
	Clay	54	54

Uniformity Coefficient	D60 / D10	Not applicable

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.4 pipette

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Project No N8135-18

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Figure
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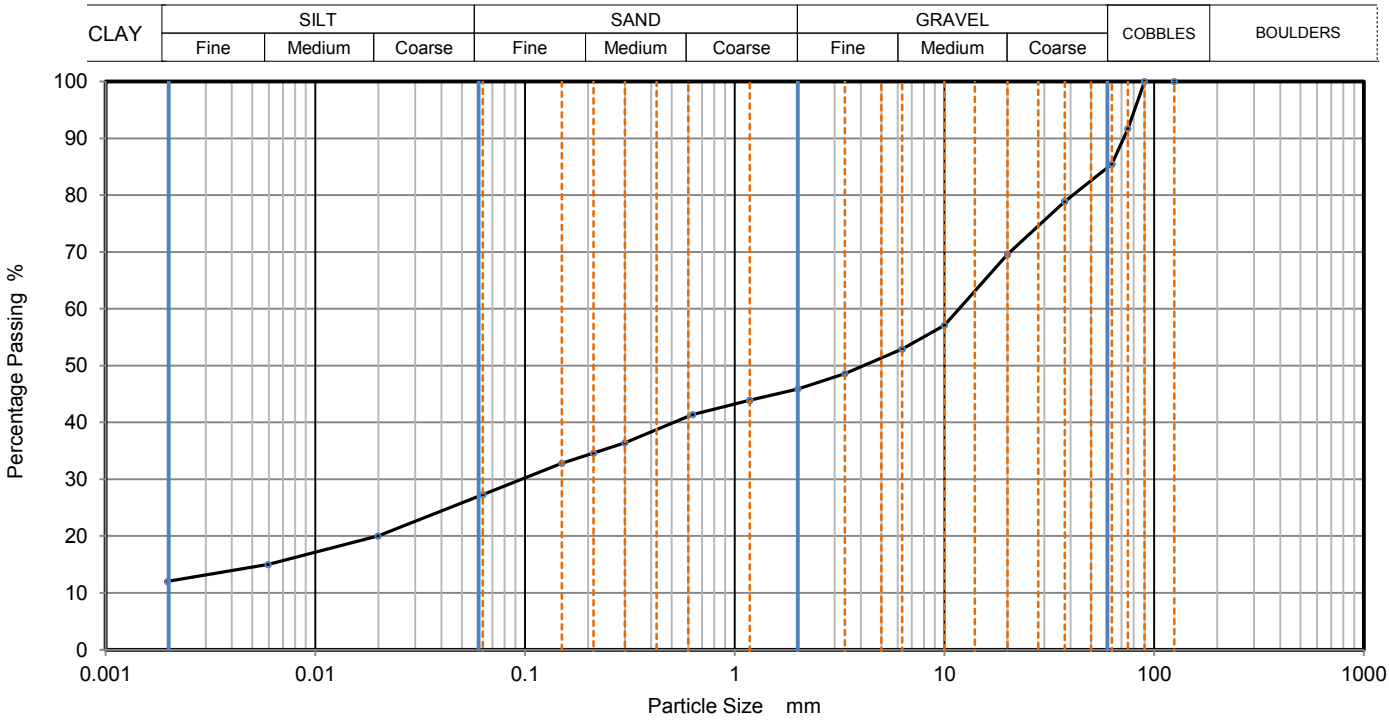
FUGRO	**Particle Size Distribution**			Project No.	G170029U
				Hole	HEP-BH-27
Project Name	HAL Airport Expansion			Sample No.	6
Description	Brown cobbly sandy very clayey GRAVEL			Depth, m	1.00
Specimen Reference		Specimen Depth	m	Sample Type	LB
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.4			KeyLAB ID	FES2171201006



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0199	20
90	100	0.0060	15
75	92	0.0020	12
63	86		
37.5	79		
20	70		
10	57		
6.3	53		
3.35	49		
2	46		
1.18	44		
		Particle density	(assumed)
0.63	41	2.70	Mg/m3
0.3	36		
0.212	35		
0.15	33		
0.063	27		

Dry Mass of sample, g: 21738

Sample Proportions	% dry mass
Very coarse	14.5
Gravel	39.5
Sand	18.6
Silt	15.4
Clay	12.0

Grading Analysis		
D100	mm	90
D60	mm	11.7
D30	mm	0.0959
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Insufficient material to comply with BS1377. Treat results with caution.

Date printed	Figure number	Sheet number
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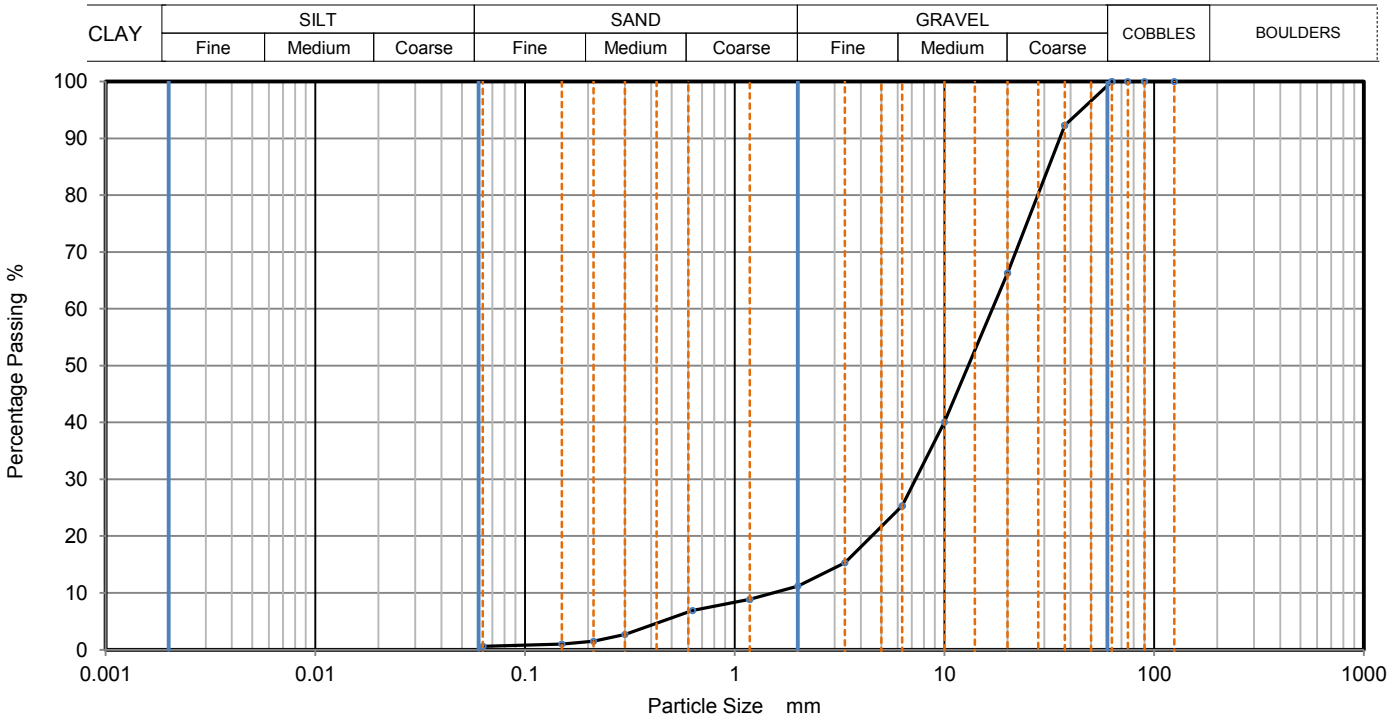
FUGRO	**Particle Size Distribution**			Project No.	G170029U
				Hole	HEP-BH-27
Project Name	HAL Airport Expansion			Sample No.	13
Description	Brown slightly clayey sandy GRAVEL			Depth, m	3.20
Specimen Reference		Specimen Depth	m	Sample Type	B
Test Method	BS1377:Part 2:1990, clause 9.2			KeyLAB ID	FES2171201013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
37.5	92		
20	66		
10	40		
6.3	25		
3.35	15		
2	11		
1.18	9		
0.63	7		
0.3	3		
0.212	2		
0.15	1		
0.063	1		

Dry Mass of sample, g	15306

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	88.8
Sand	10.6
Fines <0.063mm	0.6

Grading Analysis		
D100	mm	63
D60	mm	16.9
D30	mm	7.29
D10	mm	1.5
Uniformity Coefficient		11
Curvature Coefficient		2.1

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Date printed	Figure number	Sheet number
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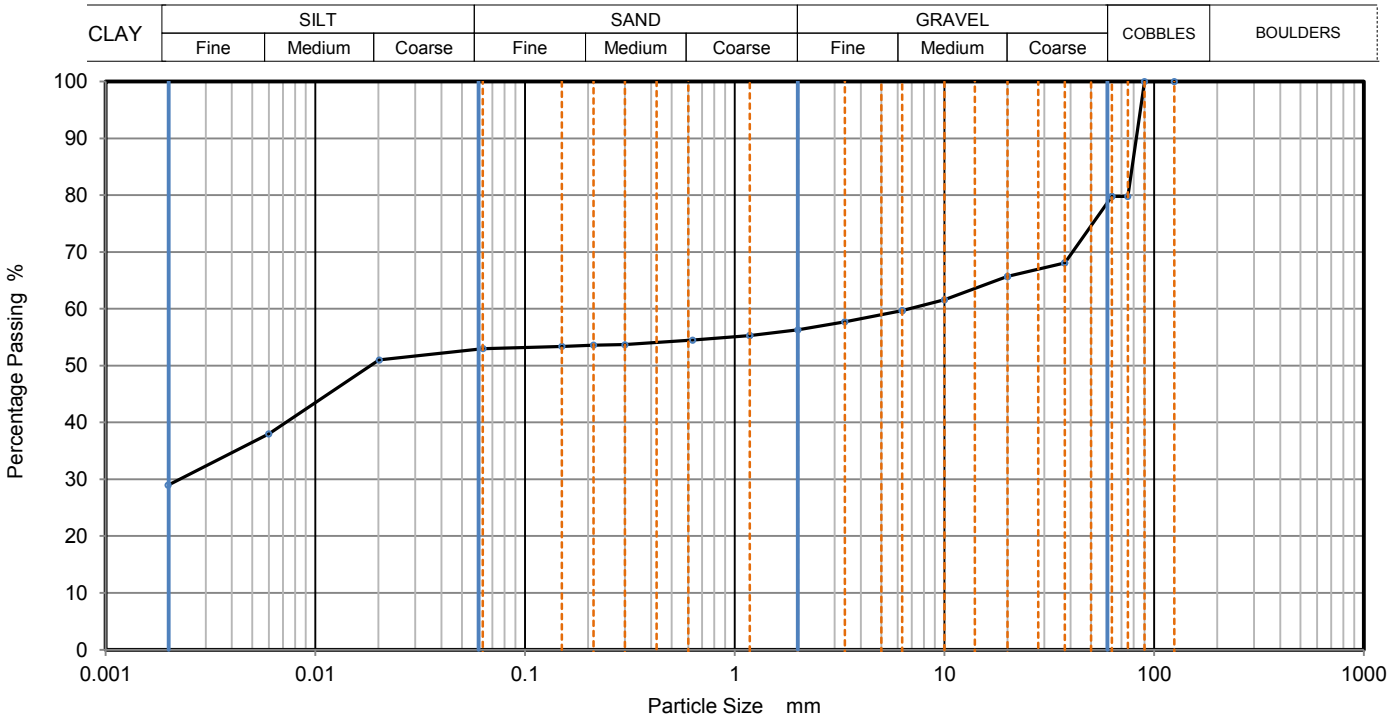
FUGRO	**Particle Size Distribution**			Project No.	G170029U
				Hole	HEP-BH-27
Project Name	HAL Airport Expansion			Sample No.	23
Description	Brown slightly sandy slightly cobbly slightly gravelly CLAY			Depth, m	6.50
Specimen Reference		Specimen Depth	m	Sample Type	B
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.4			KeyLAB ID	FES2171204001



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0202	51
90	100	0.0060	38
75	80	0.0020	29
63	80		
37.5	68		
20	66		
10	62		
6.3	60		
3.35	58		
2	56		
1.18	55		
		Particle density (assumed)	
0.63	55	2.70	Mg/m3
0.3	54		
0.212	54		
0.15	53		
0.063	53		

Dry Mass of sample, g: 10037

Sample Proportions	% dry mass
Very coarse	20.2
Gravel	23.4
Sand	3.4
Silt	23.8
Clay	29.2

Grading Analysis		
D100	mm	90
D60	mm	6.78
D30	mm	0.0022
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Insufficient material to comply with BS1377. Treat results with caution.

Date printed	Figure number	Sheet number
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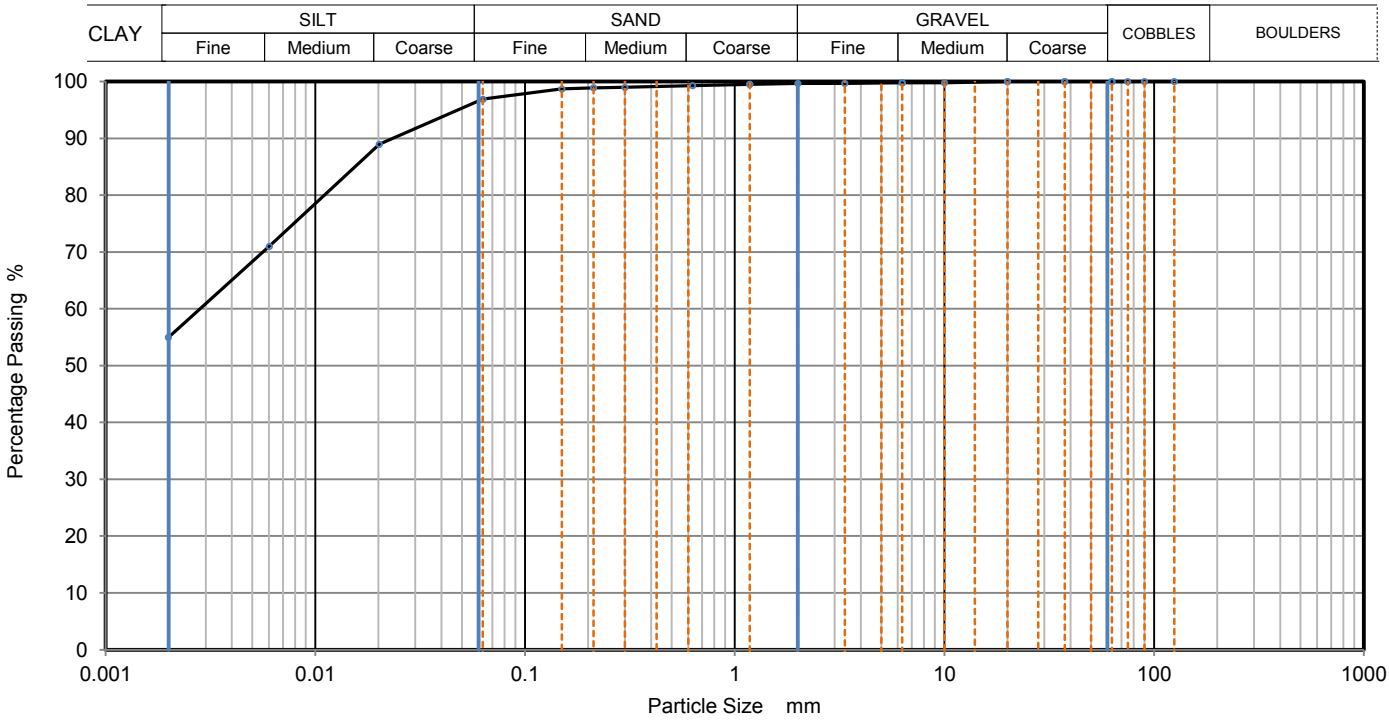
FUGRO	**Particle Size Distribution**			Project No.	G170029U
				Hole	HEP-BH-27
Project Name	HAL Airport Expansion			Sample No.	45
Description	Brown slightly gravelly slightly sandy CLAY			Depth, m	14.50
Specimen Reference		Specimen Depth	m	Sample Type	B
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.4			KeyLAB ID	FES2171204023



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0202	89
90	100	0.0060	71
75	100	0.0020	55
63	100		
37.5	100		
20	100		
10	100		
6.3	100		
3.35	100		
2	100		
1.18	100		
		Particle density	(assumed)
0.63	99	2.70	Mg/m3
0.3	99		
0.212	99		
0.15	99		
0.063	97		

Dry Mass of sample, g	780

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	0.3
Sand	2.7
Silt	41.9
Clay	55.1

Grading Analysis		
D100	mm	20
D60	mm	0.00282
D30	mm	
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks

Preparation and testing in accordance with BS1377 unless noted below

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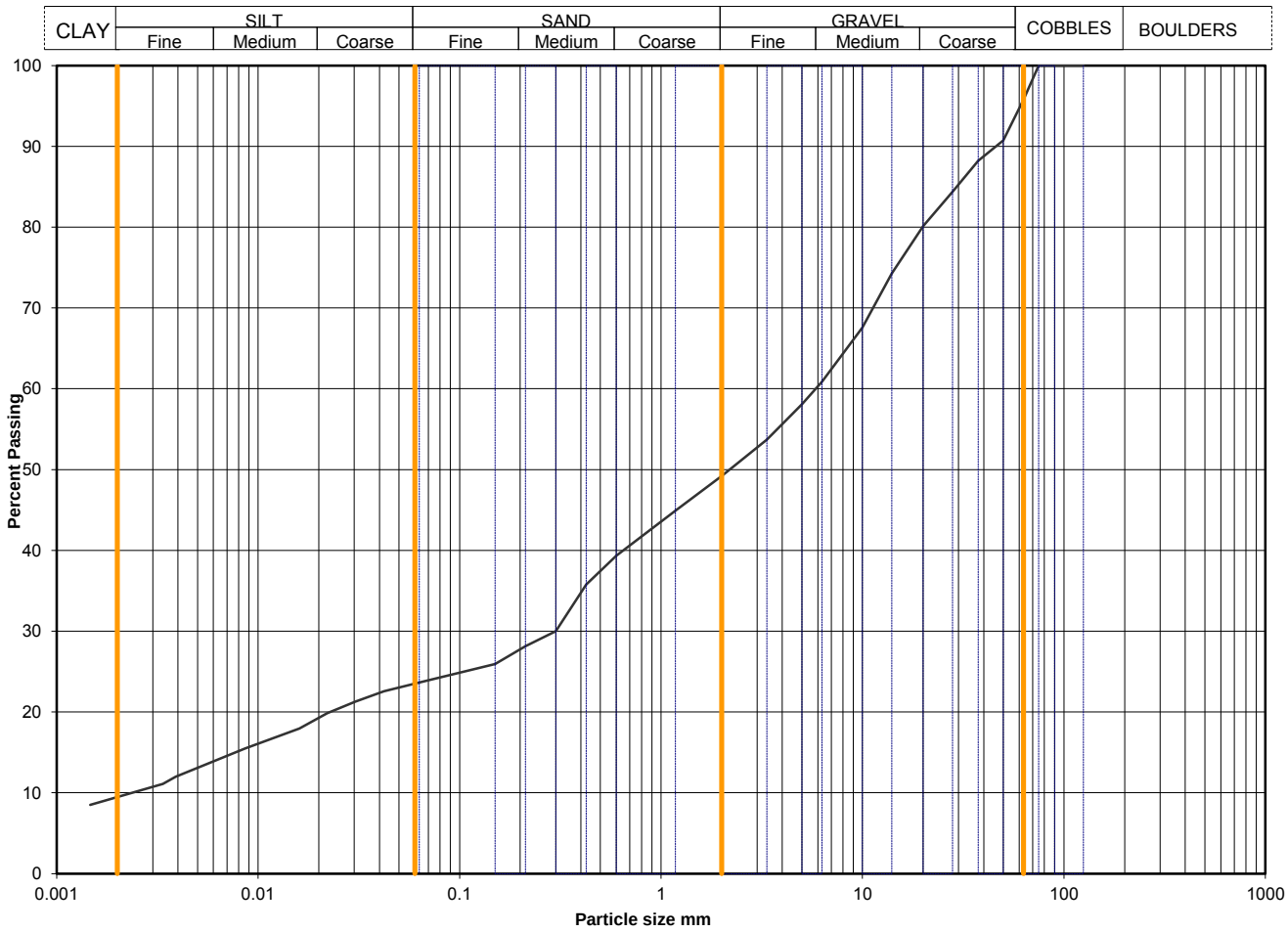
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	FES4171201011

Hole No	HEP-BH-32
Sample Depth (m BGL)	5.3
Sample Type and No	LB20
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	24
90	100	0.0420	23
75	100	0.0304	21
63	96	0.0220	20
50	91	0.0160	18
37.5	88	0.0086	15
28	84	0.0039	12
20	80	0.0034	11
14	74	0.0015	8
10	68		
6.3	61		
5.0	58		
3.35	54		
2.00	49		
1.18	45	Particle density, Mg/m3	
0.600	39		
0.425	36	2.65 assumed	
0.300	30	Dry mass of sample, kg	
0.212	28		
0.150	26	18.6	
0.063	24		

Soil description	Greyish brown slightly sandy gravelly silty CLAY with two cobbles.
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	4	0
	Gravel	47	49
	Sand	26	27
*<60mm values to aid description only	Silt	14	15
	Clay	9	10

Uniformity Coefficient	D60 / D10	2491

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

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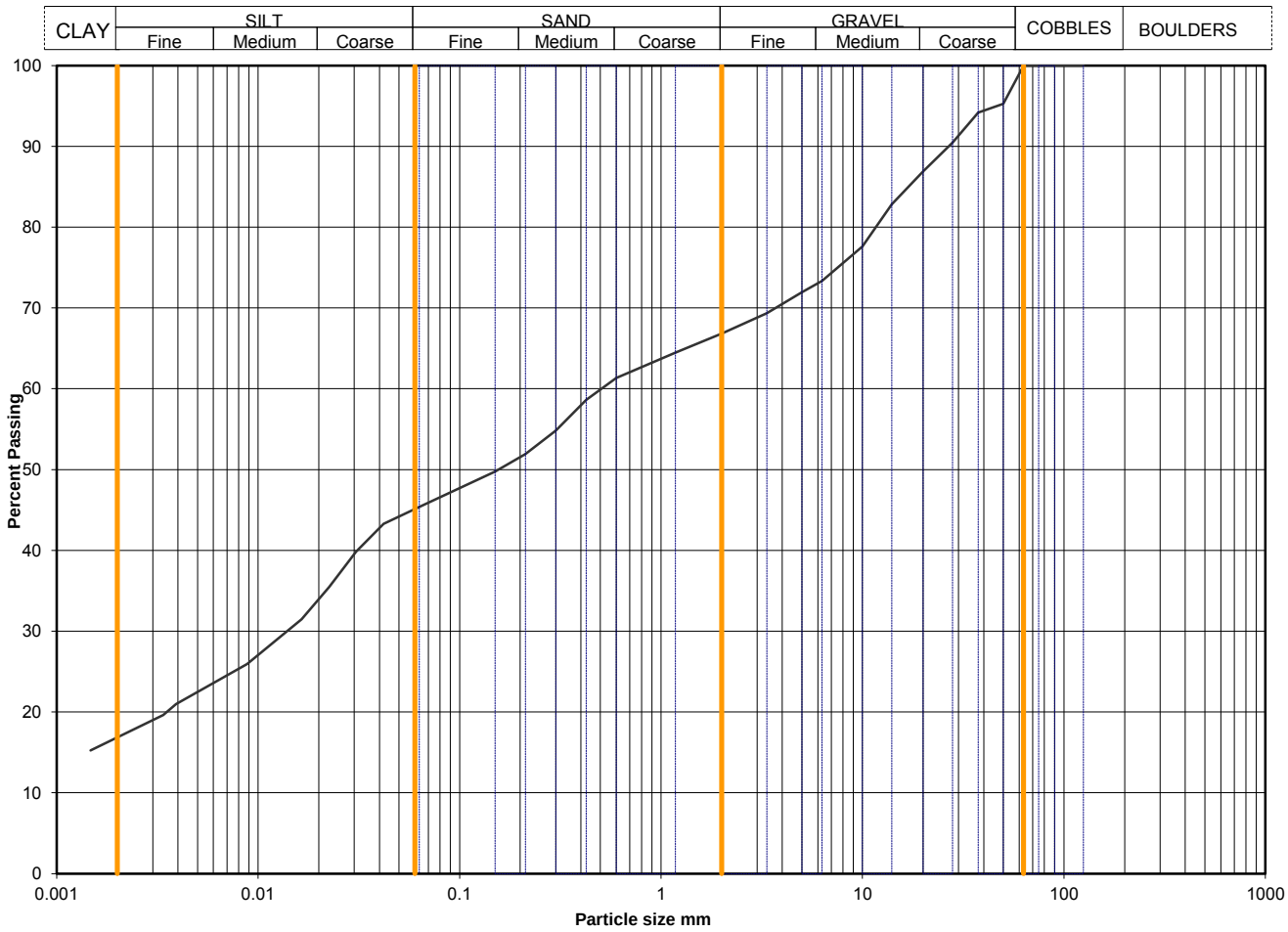
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	HEPBH3320171207009

Hole No	HEP-BH-33
Sample Depth (m BGL)	1.2
Sample Type and No	LB8
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	45
90	100	0.0420	43
75	100	0.0306	40
63	100	0.0225	35
50	95	0.0164	31
37.5	94	0.0088	26
28	90	0.0039	21
20	87	0.0034	20
14	83	0.0015	15
10	78		
6.3	73		
5.0	72		
3.35	69		
2.00	67		
1.18	64	Particle density, Mg/m3	
0.600	61		
0.425	59	2.65 assumed	
0.300	55	Dry mass of sample, kg	
0.212	52		
0.150	50	7.8	
0.063	45		

Soil description	Brown slightly sandy slightly gravelly silty CLAY.
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	33	33
	Sand	21	21
*<60mm values to aid description only	Silt	28	28
	Clay	17	17

Uniformity Coefficient	D60 / D10	Not applicable

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

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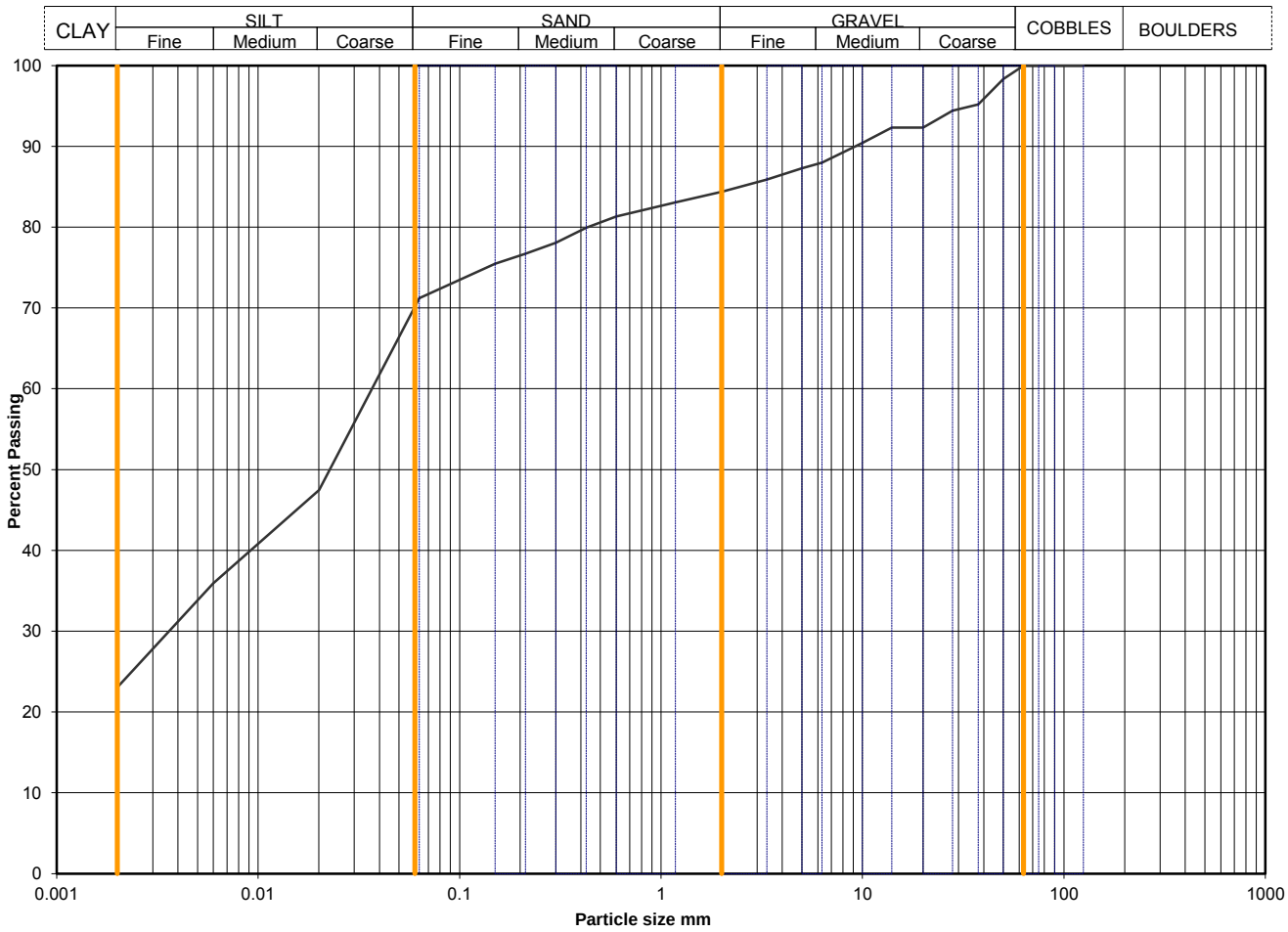
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	FES4171212009

Hole No	HEP-BH-36
Sample Depth (m BGL)	0.5
Sample Type and No	B9
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0201	47
90	100	0.0060	36
75	100	0.0020	23
63	100		
50	98		
37.5	95		
28	94		
20	92		
14	92		
10	90		
6.3	88		
5.0	87		
3.35	86		
2.00	84		
1.18	83	Particle density, Mg/m3	
0.600	81		
0.425	80	2.65 assumed	
0.300	78	Dry mass of sample, kg	
0.212	77		
0.150	75	11.5	
0.063	71		

Soil description	Brown slightly sandy slightly gravelly silty CLAY.
Preparation / Pretreatment	Sieve: natural material Pipette: as BS1377
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	16	16
	Sand	13	13
*<60mm values to aid description only	Silt	48	48
	Clay	23	23

Uniformity Coefficient	D60 / D10	Not applicable

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.4 pipette

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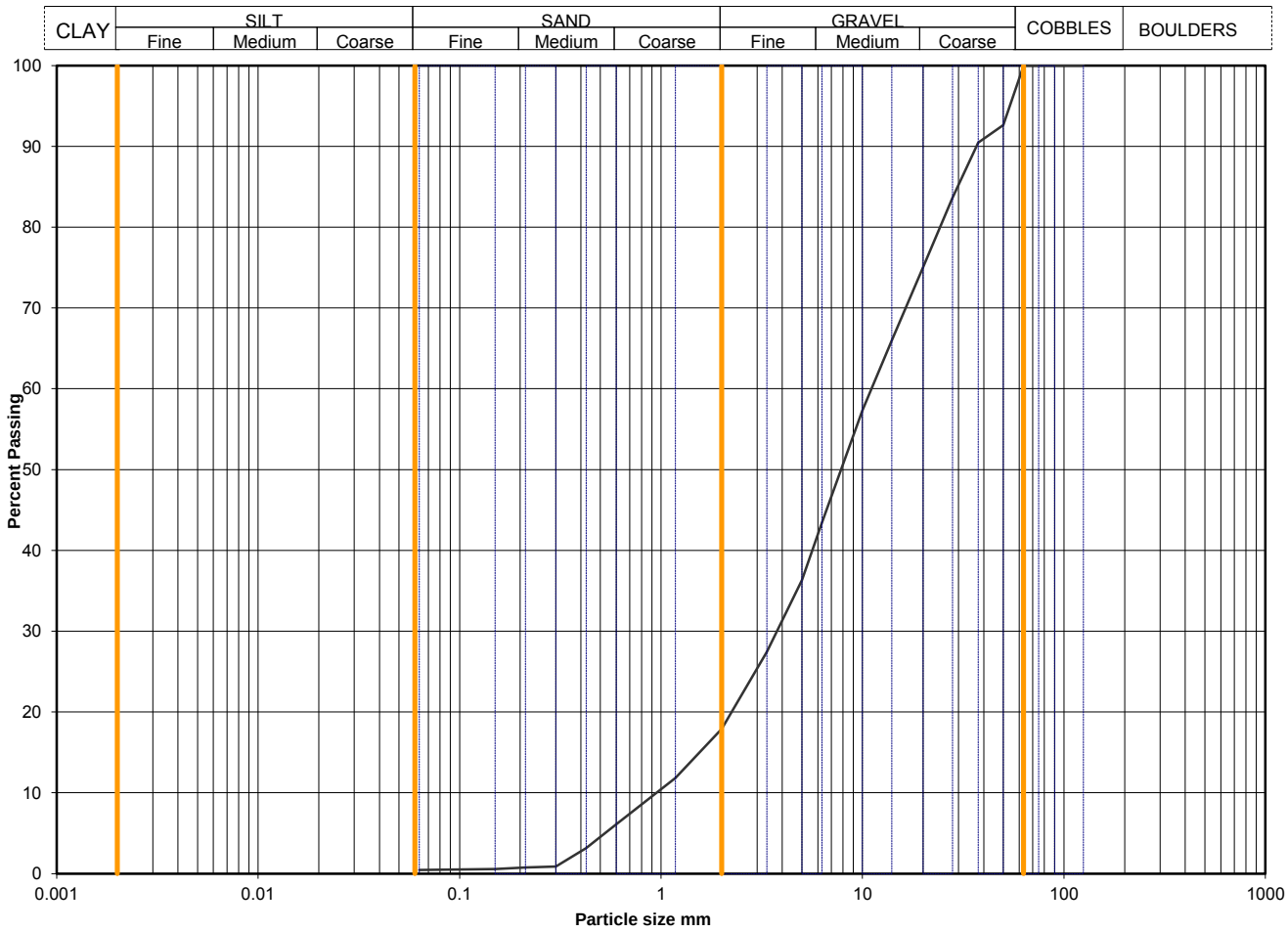
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	FES4171214005

Hole No	HEP-BH-36
Sample Depth (m BGL)	3.5
Sample Type and No	B18
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	93		
37.5	90		
28	84		
20	75		
14	66		
10	57		
6.3	43		
5.0	36		
3.35	27		
2.00	18		
1.18	12		
0.600	6		
0.425	3		
0.300	1	Dry mass of sample, kg	
0.212	1		
0.150	1	9.9	
0.063	0		

Soil description	Brown sandy GRAVEL.
Preparation / Pretreatment	Sieve: natural material
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	82	82
	Sand	17	17
*<60mm values to aid description only	Silt	silt+clay =	
	Clay	0	0

Uniformity Coefficient	D60 / D10	12

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.3 dry sieve
	Sedimentation	none

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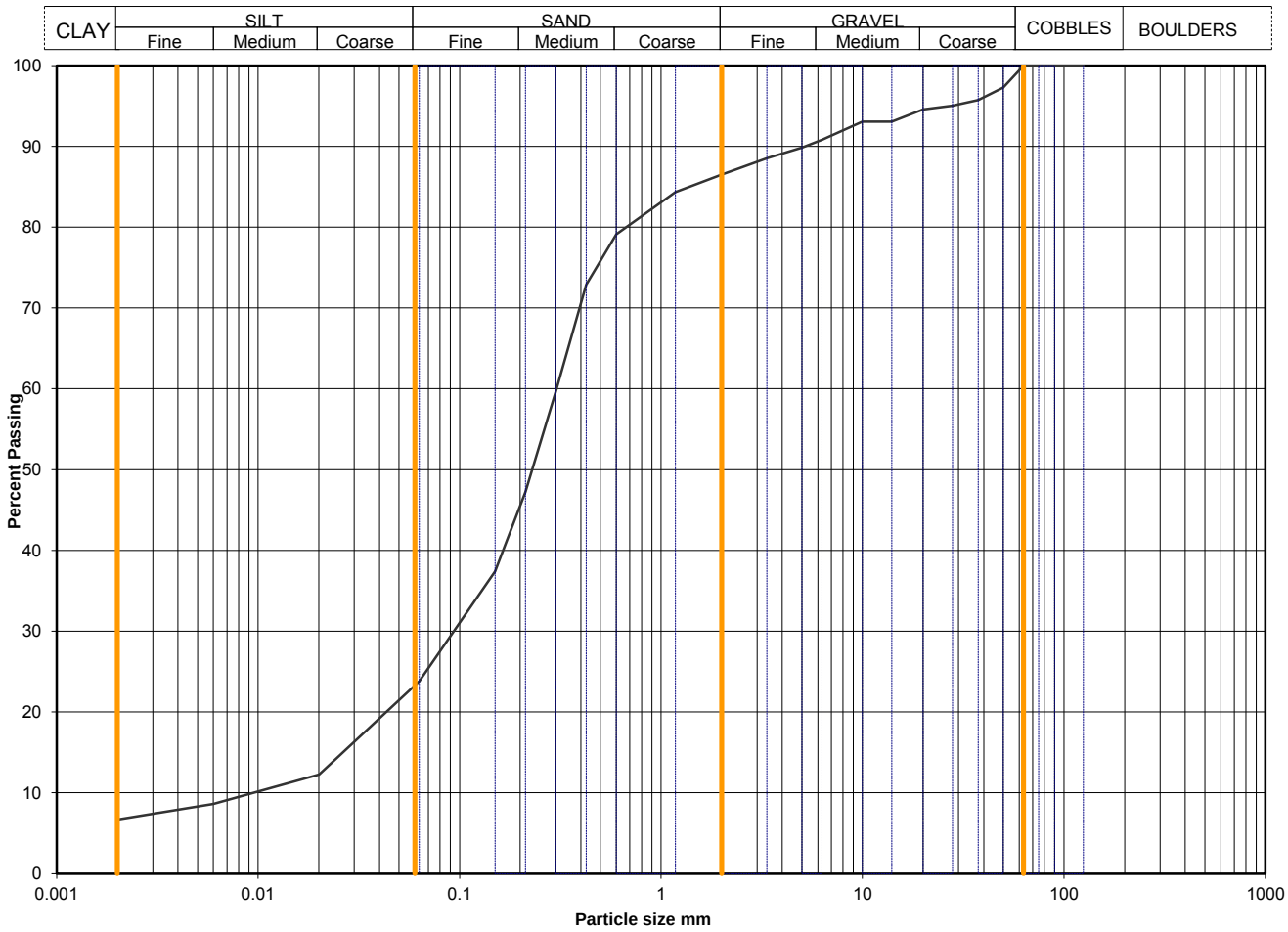
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	FES4171218003

Hole No	HEP-BH-43
Sample Depth (m BGL)	3.5
Sample Type and No	B9
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0201	12
90	100	0.0060	9
75	100	0.0020	7
63	100		
50	97		
37.5	96		
28	95		
20	95		
14	93		
10	93		
6.3	91		
5.0	90		
3.35	89		
2.00	86		
1.18	84	Particle density, Mg/m3	
0.600	79		
0.425	73	2.65 assumed	
0.300	60	Dry mass of sample, kg	
0.212	47		
0.150	37	9.8	
0.063	24		

Soil description	Brown gravelly clayey SAND.
Preparation / Pretreatment	Sieve: natural material Pipette: as BS1377
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	14	14
	Sand	63	63
*<60mm values to aid description only	Silt	17	17
	Clay	7	7

Uniformity Coefficient	D60 / D10	32

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.4 pipette

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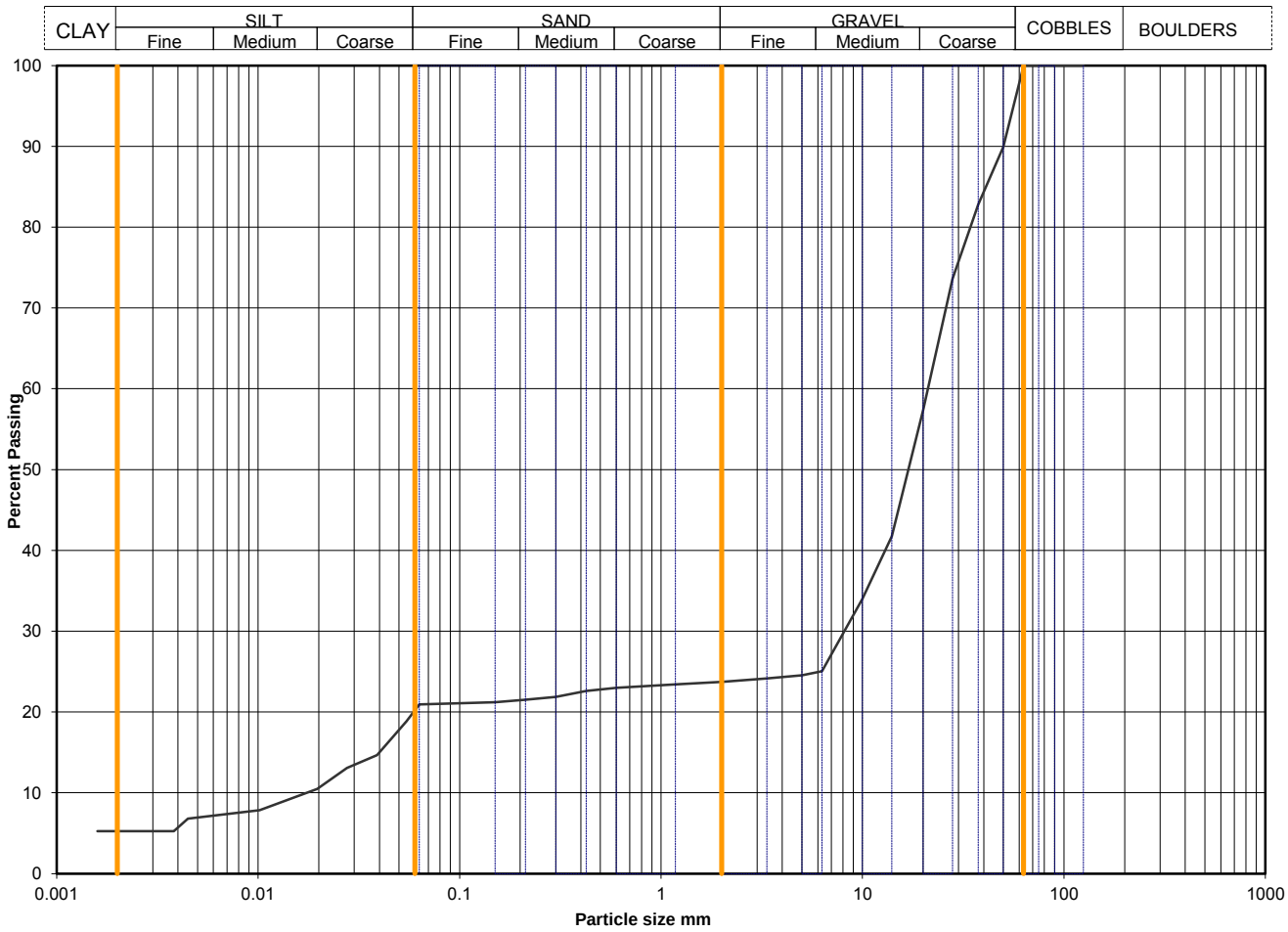
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	FES4171218010

Hole No	HEP-BH-43
Sample Depth (m BGL)	4.3
Sample Type and No	B15
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	21
90	100	0.0546	19
75	100	0.0389	15
63	100	0.0276	13
50	90	0.0196	10
37.5	83	0.0102	8
28	74	0.0045	7
20	57	0.0038	5
14	42	0.0016	5
10	34		
6.3	25		
5.0	25		
3.35	24		
2.00	24		
1.18	23	Particle density, Mg/m3	
0.600	23		
0.425	23	2.65 assumed	
0.300	22	Dry mass of sample, kg	
0.212	22		
0.150	21	10.0	
0.063	21		

Soil description	Brown slightly sandy silty GRAVEL.		
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377		
Remarks			
Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	76	76
	Sand	3	3
*<60mm values to aid description only	Silt	16	16
	Clay	5	5

Uniformity Coefficient	**D60 / D10**	1209

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

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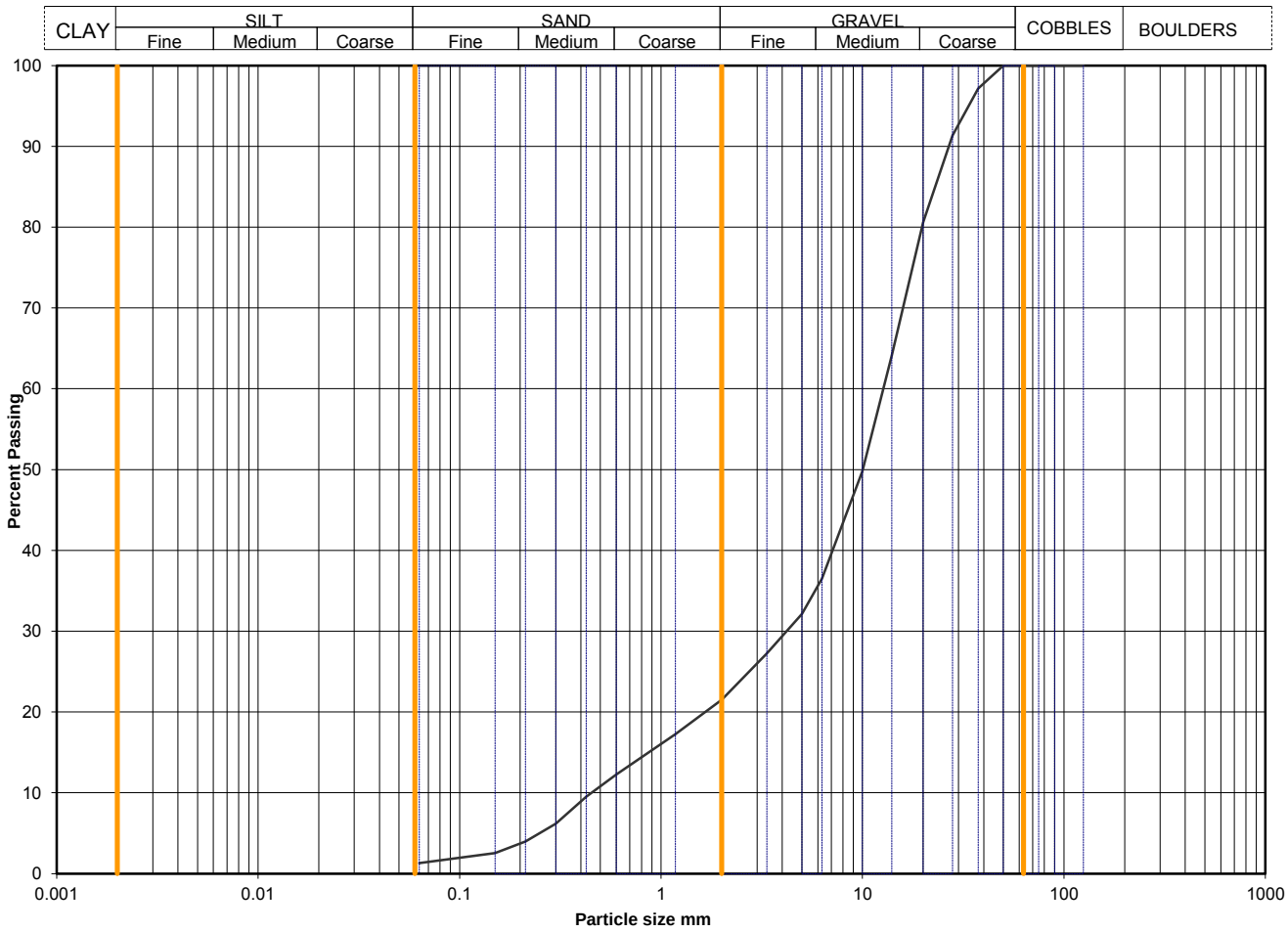
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	FES2180103008

Hole No	HEP-BH-44
Sample Depth (m BGL)	1.2
Sample Type and No	B8
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	97		
28	91		
20	81		
14	64		
10	50		
6.3	37		
5.0	32		
3.35	27		
2.00	21		
1.18	17		
0.600	12		
0.425	9		
0.300	6	Dry mass of sample, kg	
0.212	4		
0.150	3	12.7	
0.063	1		

Soil description	Brown very sandy GRAVEL.
Preparation / Pretreatment	Sieve: natural material
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	79	79
	Sand	20	20
*<60mm values to aid description only	Silt	silt+clay =	
	Clay	1	1

Uniformity Coefficient	D60 / D10	28

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	none

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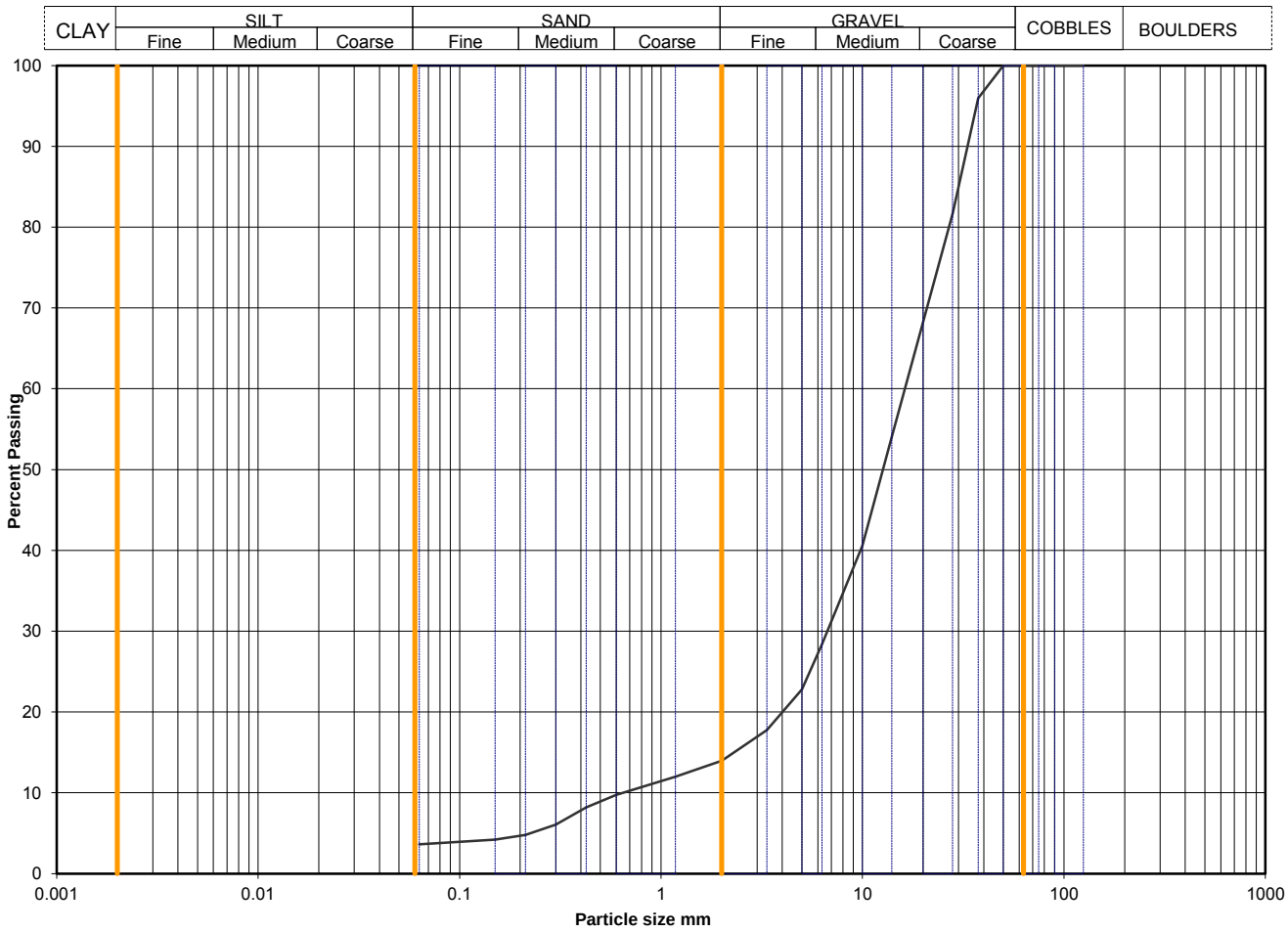
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	FES2180103017

Hole No	HEP-BH-44
Sample Depth (m BGL)	4.2
Sample Type and No	B17
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	96		
28	82		
20	68		
14	54		
10	41		
6.3	28		
5.0	23		
3.35	18		
2.00	14		
1.18	12		
0.600	10		
0.425	8		
0.300	6	Dry mass of sample, kg	
0.212	5		
0.150	4	10.9	
0.063	4		

Soil description	Brown sandy slightly clayey GRAVEL.
Preparation / Pretreatment	Sieve: natural material
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	86	86
	Sand	10	10
*<60mm values to aid description only	Silt	silt+clay =	
	Clay	4	4

Uniformity Coefficient	D60 / D10	25

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	none

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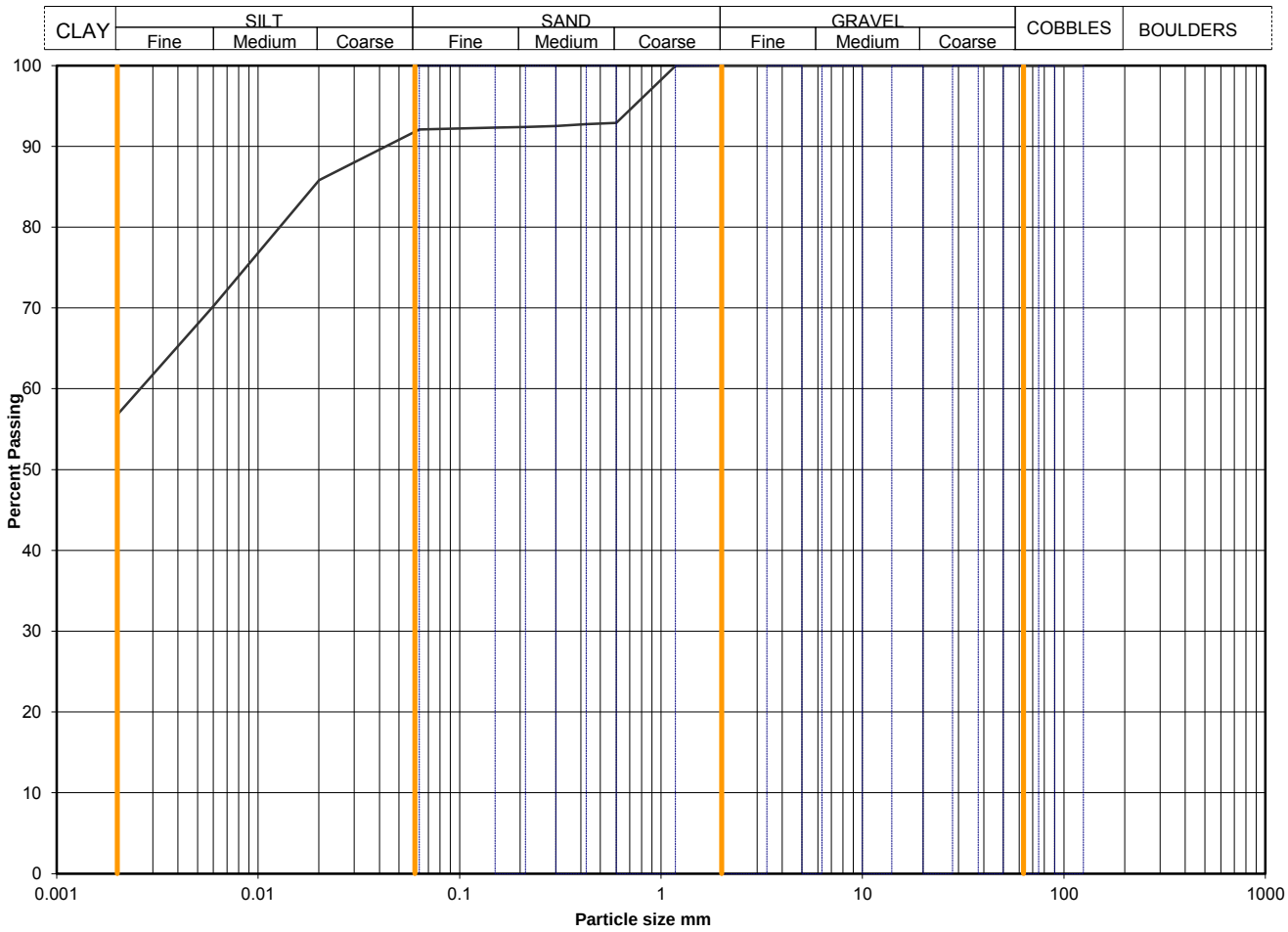
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	FES2180103028

Hole No	HEP-BH-44
Sample Depth (m BGL)	7.2
Sample Type and No	B28
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0201	86
90	100	0.0060	70
75	100	0.0020	57
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5.0	100		
3.35	100		
2.00	100		
1.18	100	Particle density, Mg/m3	
0.600	93		
0.425	93	2.65 assumed	
0.300	93	Dry mass of sample, kg	
0.212	92		
0.150	92	9.5	
0.063	92		

Soil description	Brown slightly sandy silty CLAY.
Preparation / Pretreatment	Sieve: natural material Pipette: as BS1377
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	0	0
	Sand	8	8
*<60mm values to aid description only	Silt	35	35
	Clay	57	57

Uniformity Coefficient	D60 / D10	Not applicable

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.4 pipette

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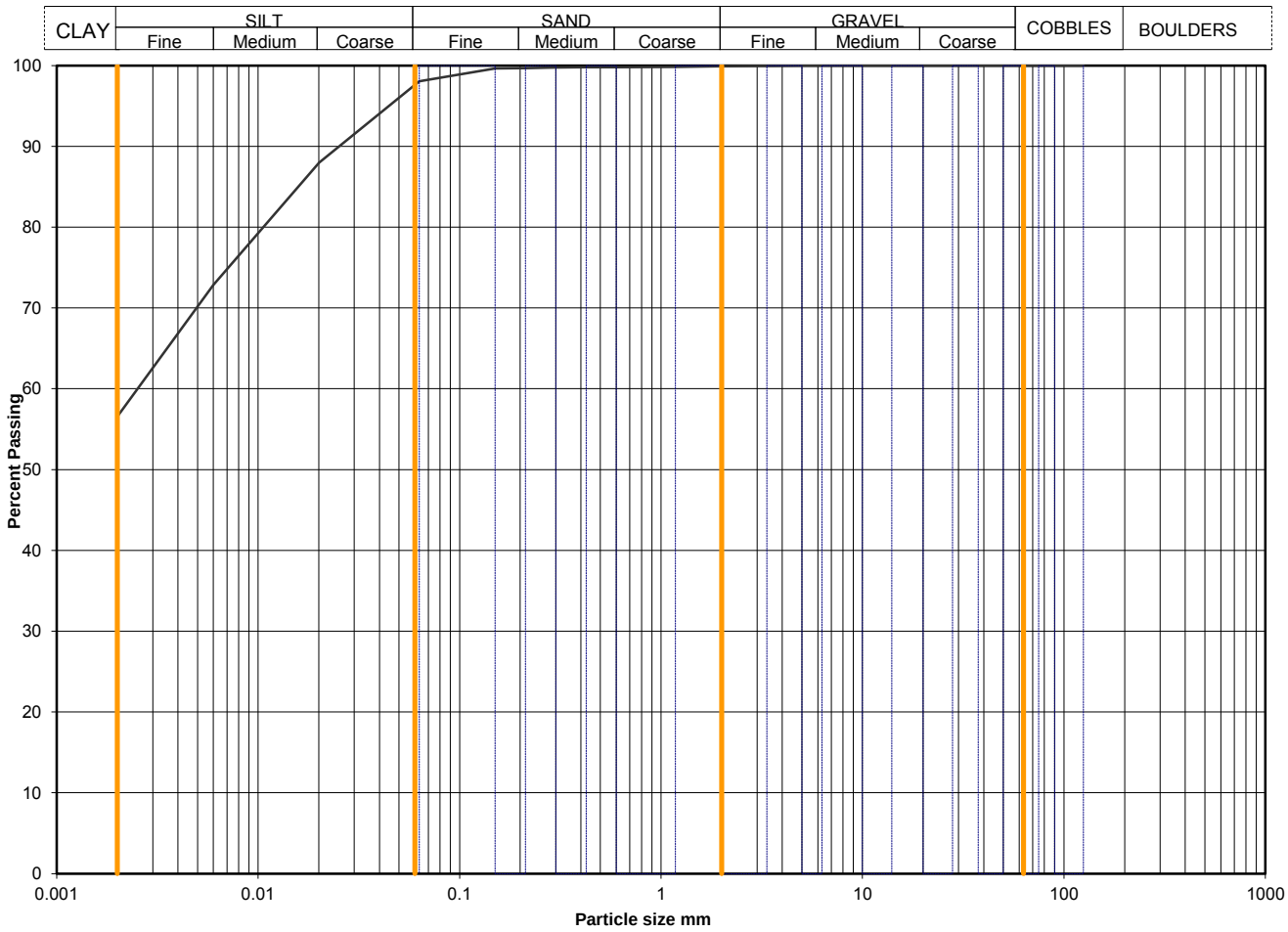
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	FES2180103044

Hole No	HEP-BH-44
Sample Depth (m BGL)	16
Sample Type and No	B44
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0201	88
90	100	0.0060	73
75	100	0.0020	57
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5.0	100		
3.35	100		
2.00	100		
1.18	100	Particle density, Mg/m3	
0.600	100		
0.425	100	2.65 assumed	
0.300	100	Dry mass of sample, kg	
0.212	100		
0.150	100	8.4	
0.063	98		

Soil description	Brown slightly sandy silty CLAY.
Preparation / Pretreatment	Sieve: natural material Pipette: as BS1377
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	0	0
	Sand	2	2
*<60mm values to aid description only	Silt	41	41
	Clay	57	57

Uniformity Coefficient	D60 / D10	Not applicable

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.4 pipette

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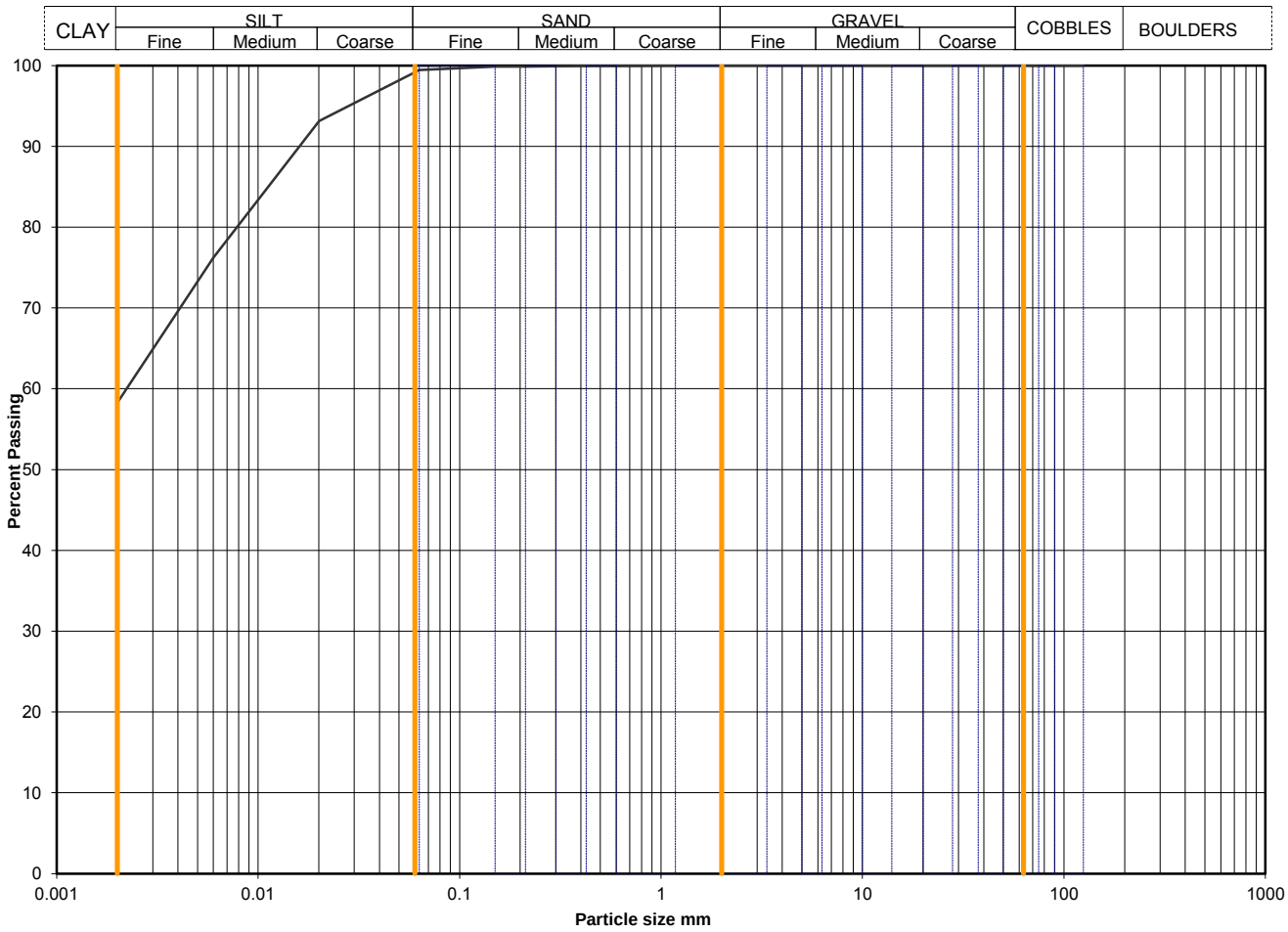
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	FES2180103049

Hole No	HEP-BH-44
Sample Depth (m BGL)	19
Sample Type and No	B49
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0201	93
90	100	0.0060	76
75	100	0.0020	58
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5.0	100		
3.35	100		
2.00	100		
1.18	100	Particle density, Mg/m3	
0.600	100		
0.425	100	2.65 assumed	
0.300	100	Dry mass of sample, kg	
0.212	100		
0.150	100	11.0	
0.063	99		

Soil description	Brown slightly sandy silty CLAY.		
Preparation / Pretreatment	Sieve: natural material Pipette: as BS1377		
Remarks			
Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	0	0
	Sand	1	1
*<60mm values to aid description only	Silt	41	41
	Clay	58	58

Uniformity Coefficient	**D60 / D10**	Not applicable

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.4 pipette

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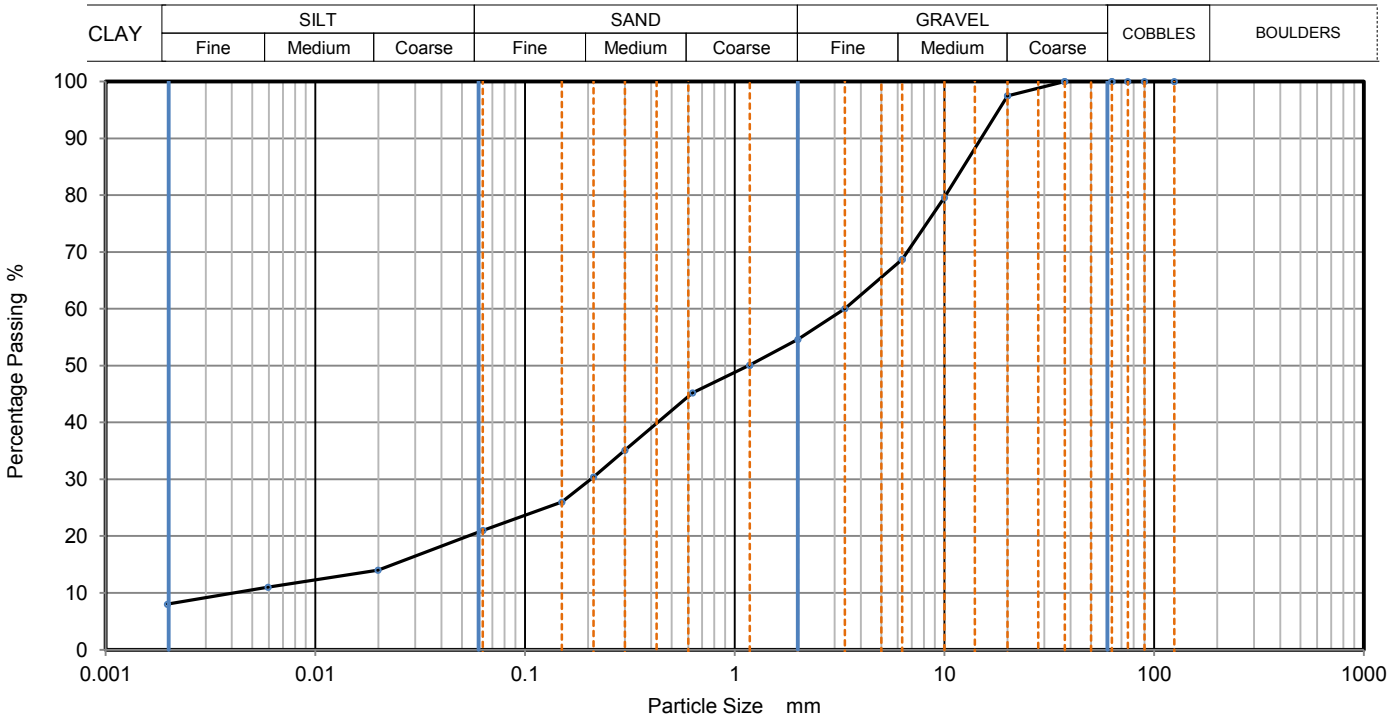
FUGRO	**Particle Size Distribution**			Project No.	G170029U
				Hole	HEP-BH-45
Project Name	HAL Airport Expansion			Sample No.	8
Description	Brown very clayey very sandy GRAVEL			Depth, m	0.60
Specimen Reference		Specimen Depth	m	Sample Type	B
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.4			KeyLAB ID	FES1171208008



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0199	14
90	100	0.0060	11
75	100	0.0020	8
63	100		
37.5	100		
20	98		
10	80		
6.3	69		
3.35	60		
2	55		
1.18	50		
		Particle density	(assumed)
0.63	45	2.70	Mg/m3
0.3	35		
0.212	30		
0.15	26		
0.063	21		

Dry Mass of sample, g	14856

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	45.4
Sand	33.6
Silt	12.7
Clay	8.3

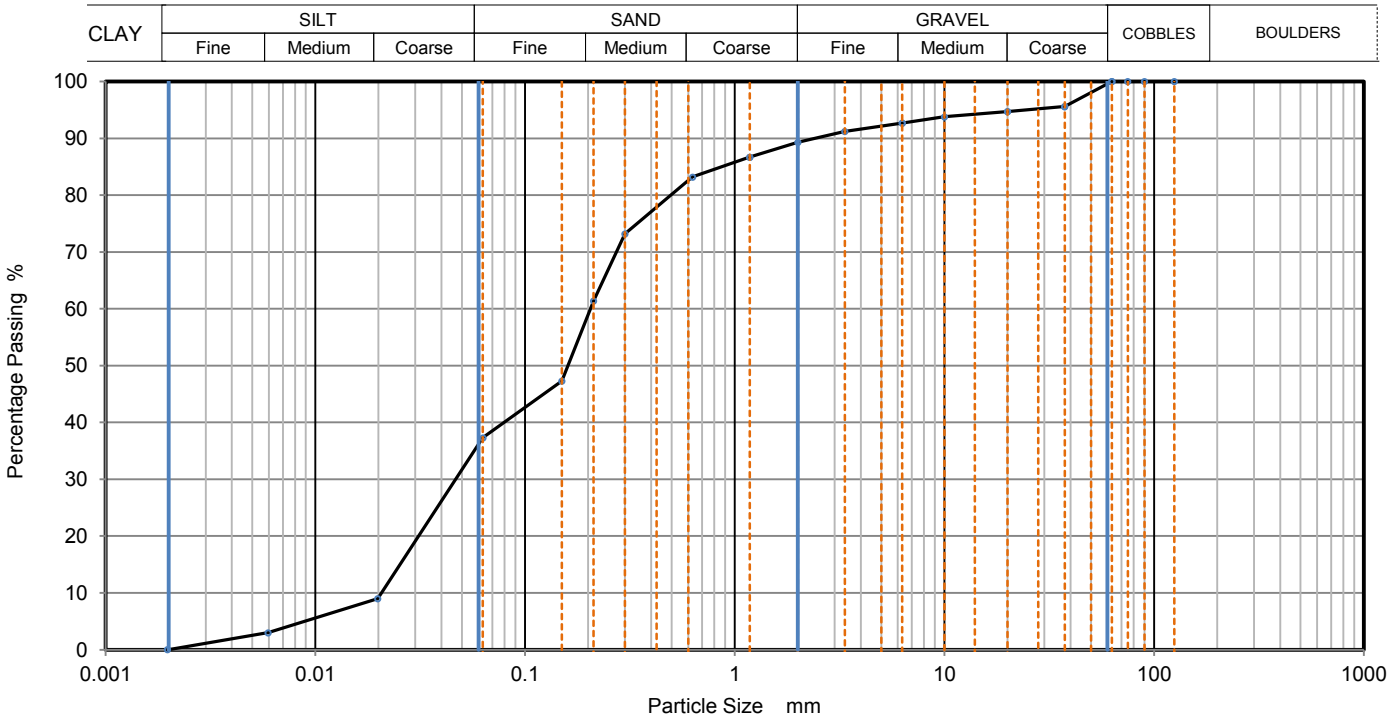
Grading Analysis		
D100	mm	37.5
D60	mm	3.36
D30	mm	0.206
D10	mm	0.00416
Uniformity Coefficient		810
Curvature Coefficient		3

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Date printed	Figure number	Sheet number
09/08/2018		

FUGRO	**Particle Size Distribution**			Project No.	G170029U
				Hole	HEP-BH-45
Project Name	HAL Airport Expansion			Sample No.	11
Description	Brown slightly gravelly sandy SILT			Depth, m	1.25
Specimen Reference		Specimen Depth	m	Sample Type	B
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.4			KeyLAB ID	FES1171208011



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0199	9
90	100	0.0060	3
75	100	0.0020	0
63	100		
37.5	96		
20	95		
10	94		
6.3	93		
3.35	91		
2	89		
1.18	87		
		Particle density	(assumed)
0.63	83	2.70	Mg/m3
0.3	73		
0.212	61		
0.15	47		
0.063	37		

Dry Mass of sample, g	4480

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	10.7
Sand	51.9
Silt	37.2
Clay	0.2

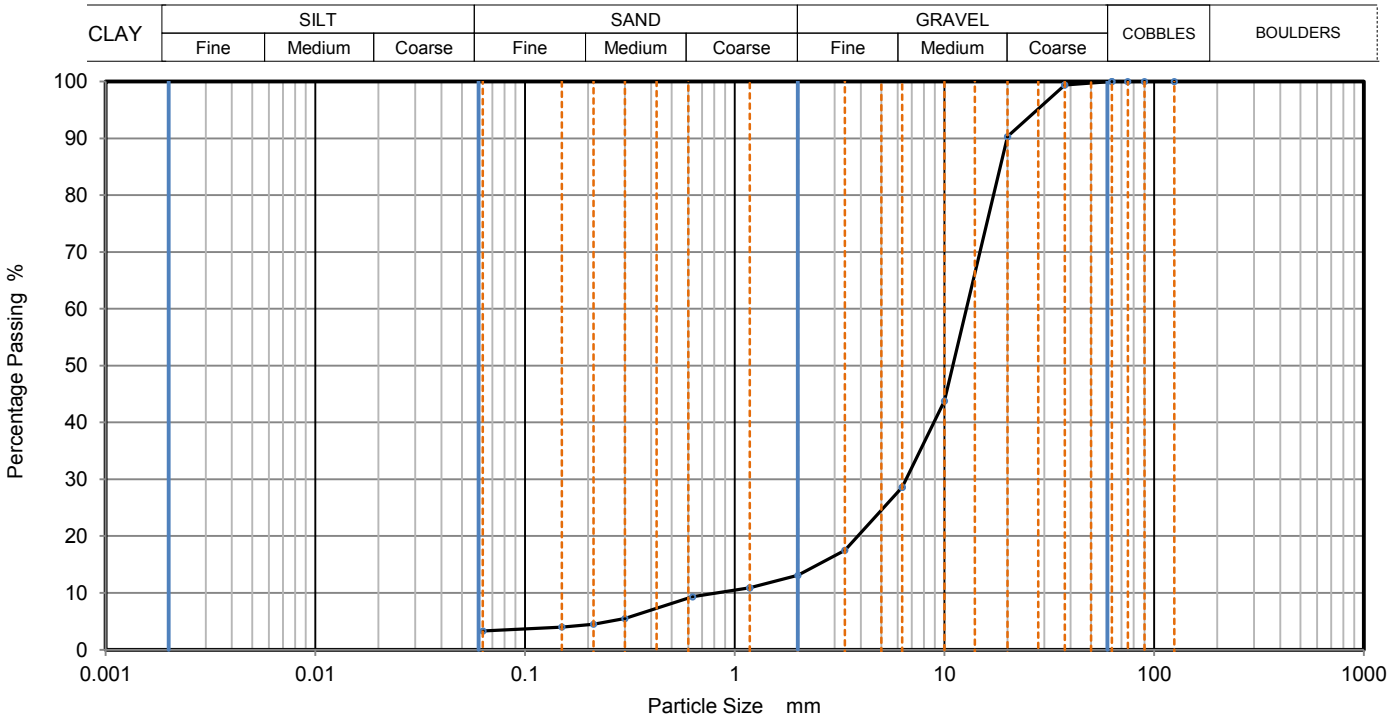
Grading Analysis		
D100	mm	63
D60	mm	0.205
D30	mm	0.0467
D10	mm	0.0206
Uniformity Coefficient		10
Curvature Coefficient		0.52

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Date printed	Figure number	Sheet number
09/08/2018		

FUGRO	**Particle Size Distribution**			Project No.	G170029U
				Hole	HEP-BH-45
Project Name	HAL Airport Expansion			Sample No.	16
Description	Brown slightly clayey sandy GRAVEL			Depth, m	2.10
Specimen Reference		Specimen Depth	m	Sample Type	B
Test Method	BS1377:Part 2:1990, clause 9.2			KeyLAB ID	FES1171208016



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
37.5	99		
20	90		
10	44		
6.3	29		
3.35	18		
2	13		
1.18	11		
0.63	9		
0.3	6		
0.212	5		
0.15	4		
0.063	3		

Dry Mass of sample, g	18998

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	86.9
Sand	9.8
Fines <0.063mm	3.3

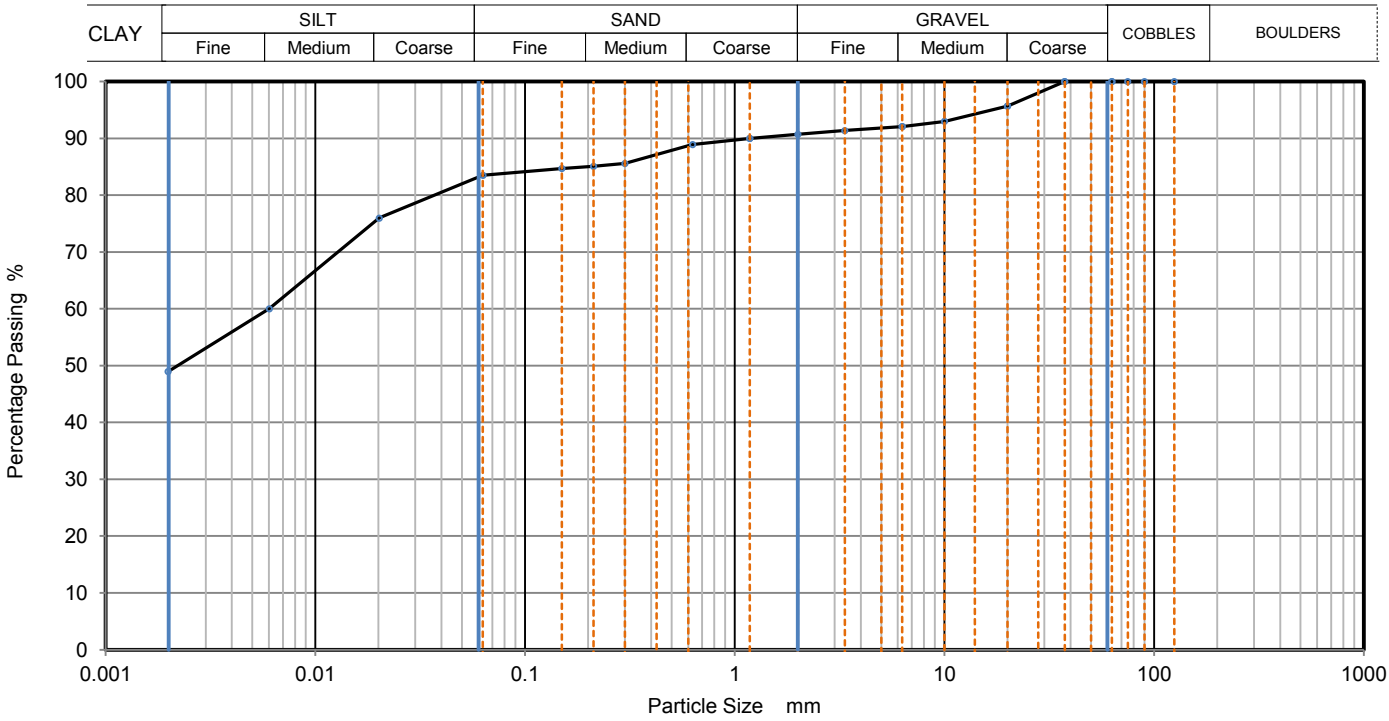
Grading Analysis		
D100	mm	63
D60	mm	12.7
D30	mm	6.58
D10	mm	0.829
Uniformity Coefficient		15
Curvature Coefficient		4.1

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Date printed	Figure number	Sheet number
09/08/2018		

FUGRO	**Particle Size Distribution**			Project No.	G170029U
				Hole	HEP-BH-45
Project Name	HAL Airport Expansion			Sample No.	28
Description	Brown slightly sandy slightly gravelly CLAY			Depth, m	4.50
Specimen Reference		Specimen Depth	m	Sample Type	B
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.4			KeyLAB ID	FES1171208028



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0202	76
90	100	0.0060	60
75	100	0.0020	49
63	100		
37.5	100		
20	96		
10	93		
6.3	92		
3.35	91		
2	91		
1.18	90		
		Particle density	(assumed)
0.63	89	2.70	Mg/m3
0.3	86		
0.212	85		
0.15	85		
0.063	84		

Dry Mass of sample, g	2379

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	9.3
Sand	7.2
Silt	34.4
Clay	49.1

Grading Analysis		
D100	mm	37.5
D60	mm	0.00596
D30	mm	
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Date printed	Figure number	Sheet number
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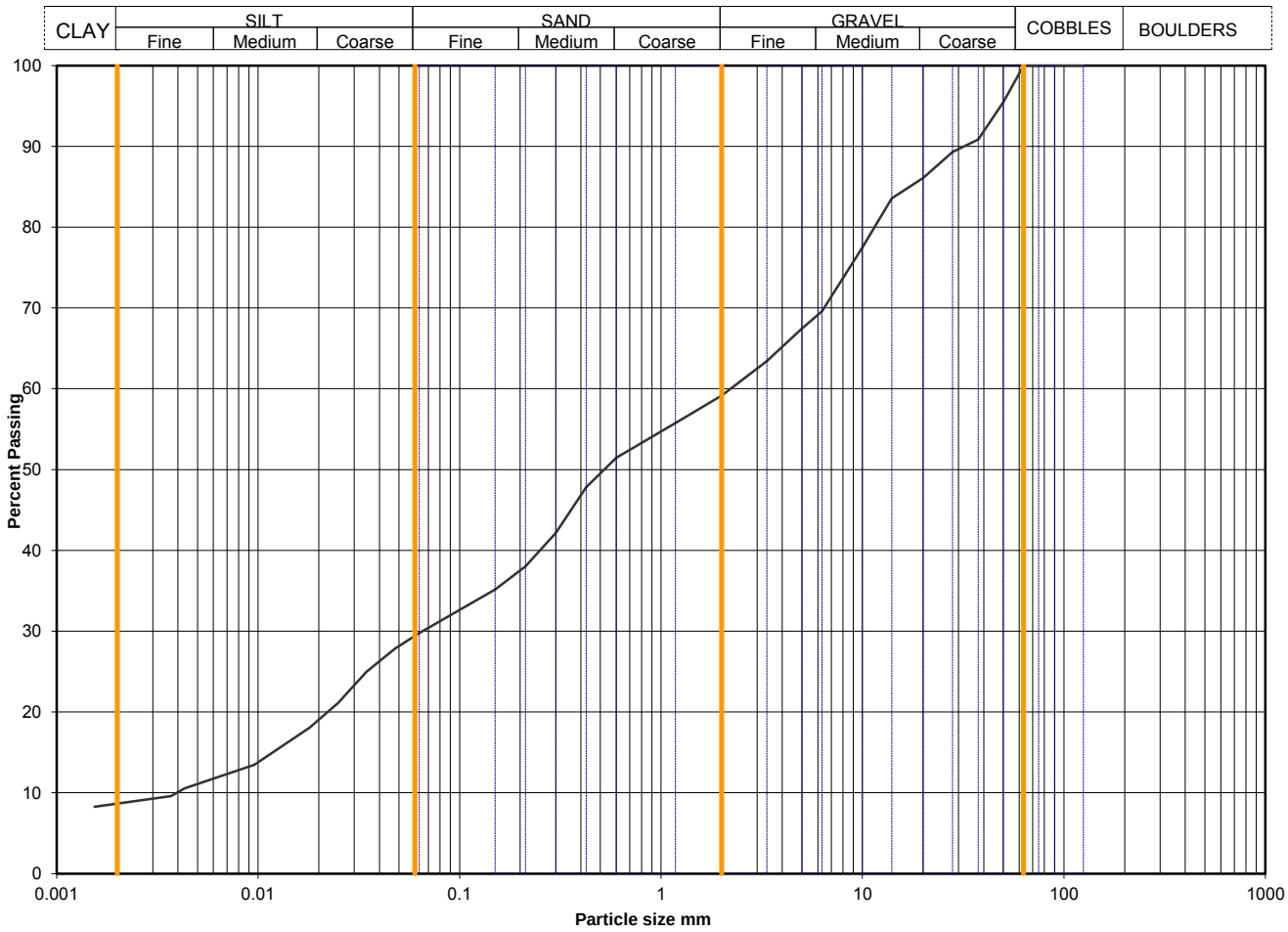
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	FES2171205006

Hole No	HEP-BH-47
Sample Depth (m BGL)	0.6
Sample Type and No	LB6
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	30
90	100	0.0478	28
75	100	0.0345	25
63	100	0.0250	21
50	95	0.0180	18
37.5	91	0.0096	13
28	89	0.0043	11
20	86	0.0037	10
14	84	0.0015	8
10	77		
6.3	70		
5.0	67		
3.35	63		
2.00	59		
1.18	56	Particle density, Mg/m3	
0.600	51		
0.425	48	2.65 assumed	
0.300	42	Dry mass of sample, kg	
0.212	38		
0.150	35	11.5	
0.063	30		

Soil description	Brown slightly sandy gravelly silty CLAY.		
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377		
Remarks			
Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	41	41
	Sand	29	29
*<60mm values to aid description only	Silt	21	21
	Clay	9	9

Uniformity Coefficient	**D60 / D10**	562

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

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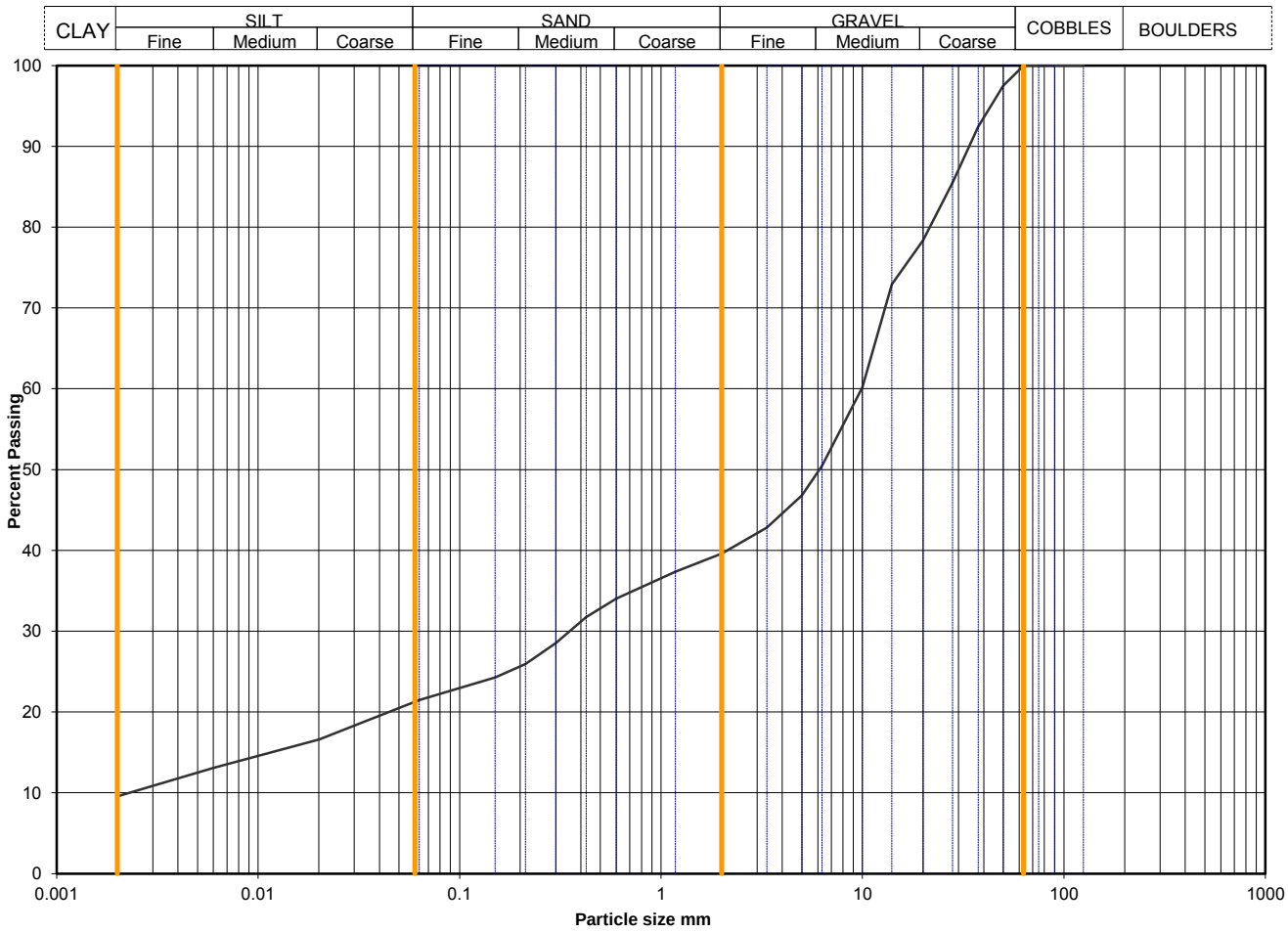
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	FES2171205009

Hole No	HEP-BH-47
Sample Depth (m BGL)	1
Sample Type and No	LB9
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0201	17
90	100	0.0060	13
75	100	0.0020	10
63	100		
50	98		
37.5	92		
28	86		
20	78		
14	73		
10	60		
6.3	50		
5.0	47		
3.35	43		
2.00	40		
1.18	37	Particle density, Mg/m3	
0.600	34		
0.425	32	2.65 assumed	
0.300	29	Dry mass of sample, kg	
0.212	26		
0.150	24	17.2	
0.063	21		

Soil description	Brown slightly sandy gravelly silty CLAY
Preparation / Pretreatment	Sieve: natural material Pipette: as BS1377
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	60	60
	Sand	18	18
*<60mm values to aid description only	Silt	12	12
	Clay	10	10

Uniformity Coefficient	D60 / D10	4354

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.4 pipette

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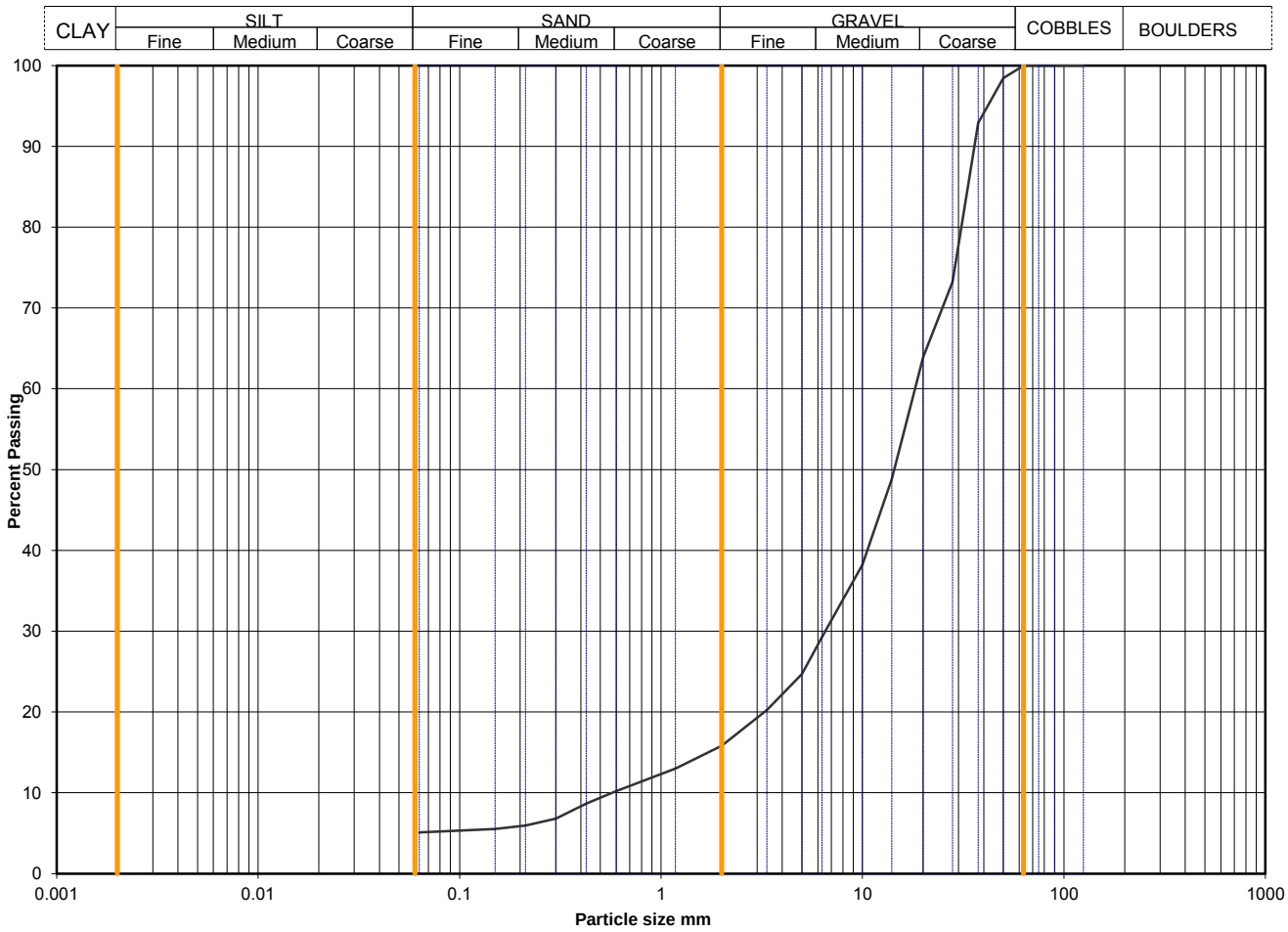
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	FES2171205017

Hole No	HEP-BH-47
Sample Depth (m BGL)	3
Sample Type and No	B17
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	98		
37.5	93		
28	73		
20	64		
14	49		
10	38		
6.3	29		
5.0	25		
3.35	20		
2.00	16		
1.18	13		
0.600	10		
0.425	9		
0.300	7	Dry mass of sample, kg	
0.212	6		
0.150	6	16.0	
0.063	5		

Soil description	Brown sandy clayey GRAVEL.
Preparation / Pretreatment	Sieve: natural material
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	84	84
	Sand	11	11
*<60mm values to aid description only	Silt	silt+clay =	
	Clay	5	5

Uniformity Coefficient	D60 / D10	32

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	none

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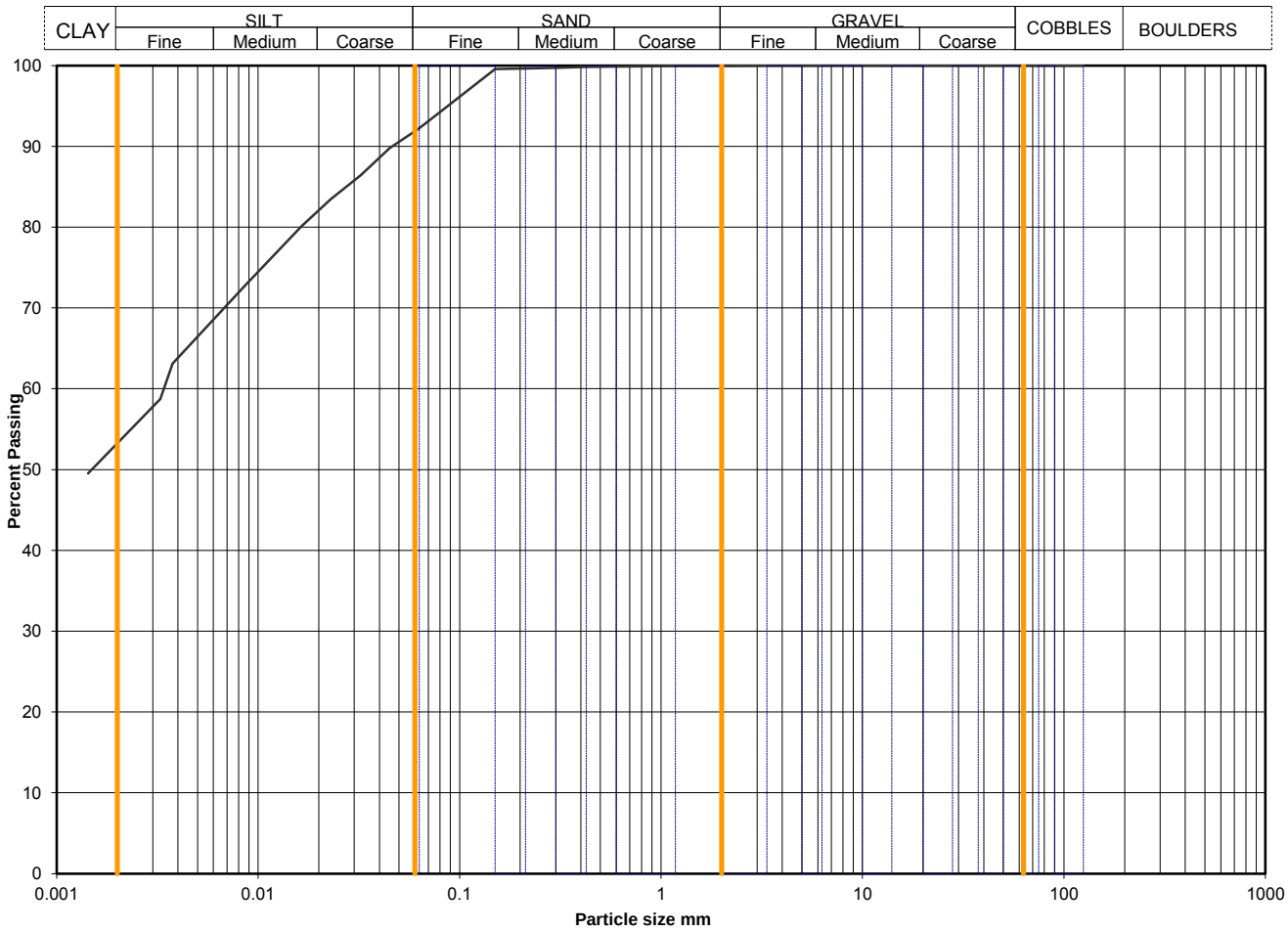
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	FES2171206003

Hole No	HEP-BH-47
Sample Depth (m BGL)	9.5
Sample Type and No	B32
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	92
90	100	0.0450	90
75	100	0.0322	86
63	100	0.0230	83
50	100	0.0164	80
37.5	100	0.0087	73
28	100	0.0038	63
20	100	0.0033	59
14	100	0.0014	50
10	100		
6.3	100		
5.0	100		
3.35	100		
2.00	100		
1.18	100	Particle density, Mg/m3	
0.600	100		
0.425	100	2.65 assumed	
0.300	100	Dry mass of sample, kg	
0.212	100		
0.150	100	4.2	
0.063	92		

Soil description	Brown slightly sandy silty CLAY.
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	0	0
	Sand	8	8
*<60mm values to aid description only	Silt	39	39
	Clay	53	53

Uniformity Coefficient	D60 / D10	Not applicable

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

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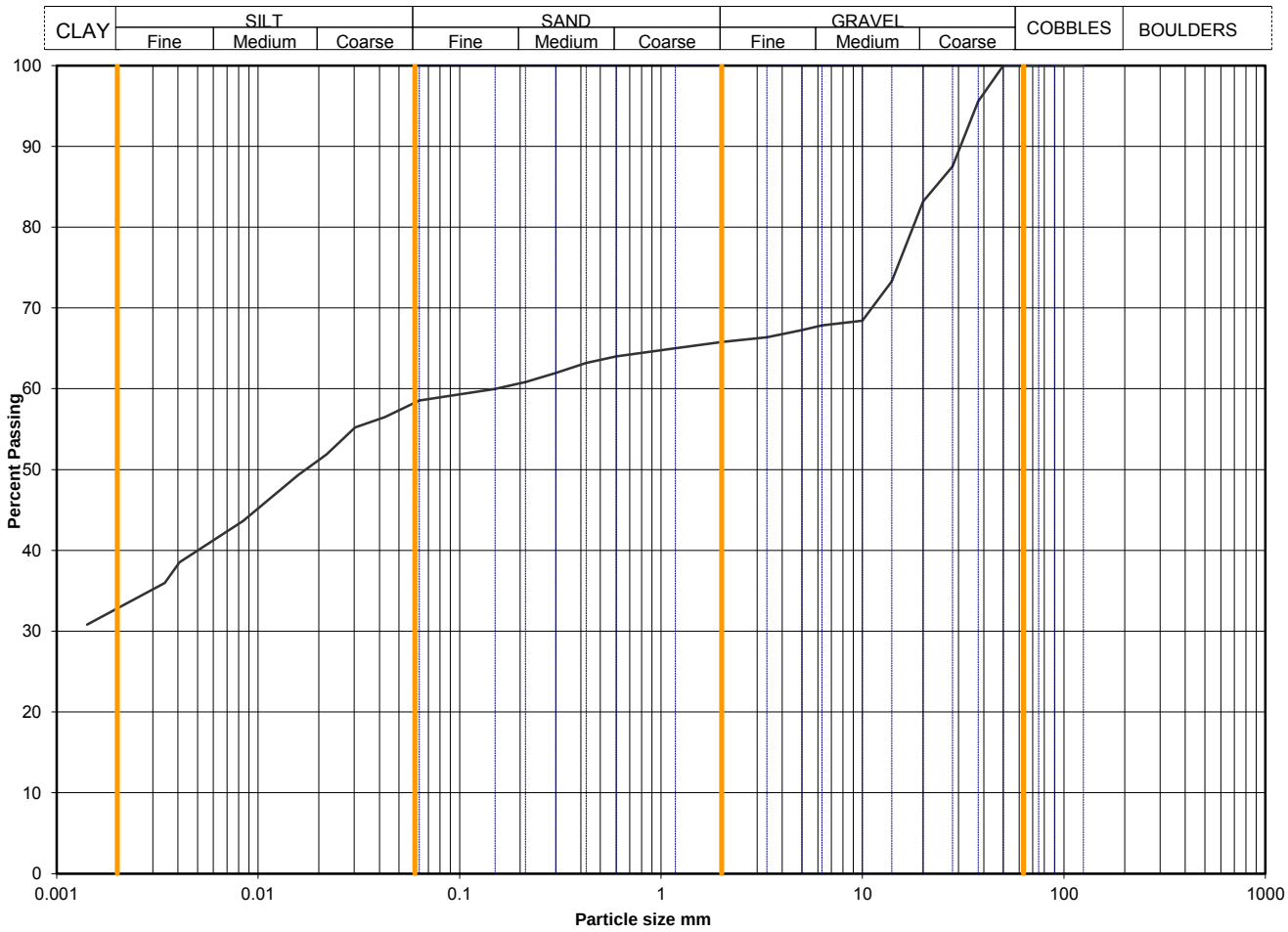
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	FES1171121014

Hole No	HEP-BH-50
Sample Depth (m BGL)	1.5
Sample Type and No	B14
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	59
90	100	0.0425	56
75	100	0.0303	55
63	100	0.0219	52
50	100	0.0157	49
37.5	96	0.0084	44
28	88	0.0041	39
20	83	0.0034	36
14	73	0.0014	31
10	68		
6.3	68		
5.0	67		
3.35	66		
2.00	66		
1.18	65	Particle density, Mg/m3	
0.600	64		
0.425	63	2.65 assumed	
0.300	62	Dry mass of sample, kg	
0.212	61		
0.150	60	7.7	
0.063	59		

Soil description	Brown slightly sandy slightly gravelly CLAY.		
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377		
Remarks			
Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	34	34
	Sand	7	7
*<60mm values to aid description only	Silt	26	26
	Clay	33	33

Uniformity Coefficient	**D60 / D10**	Not applicable

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

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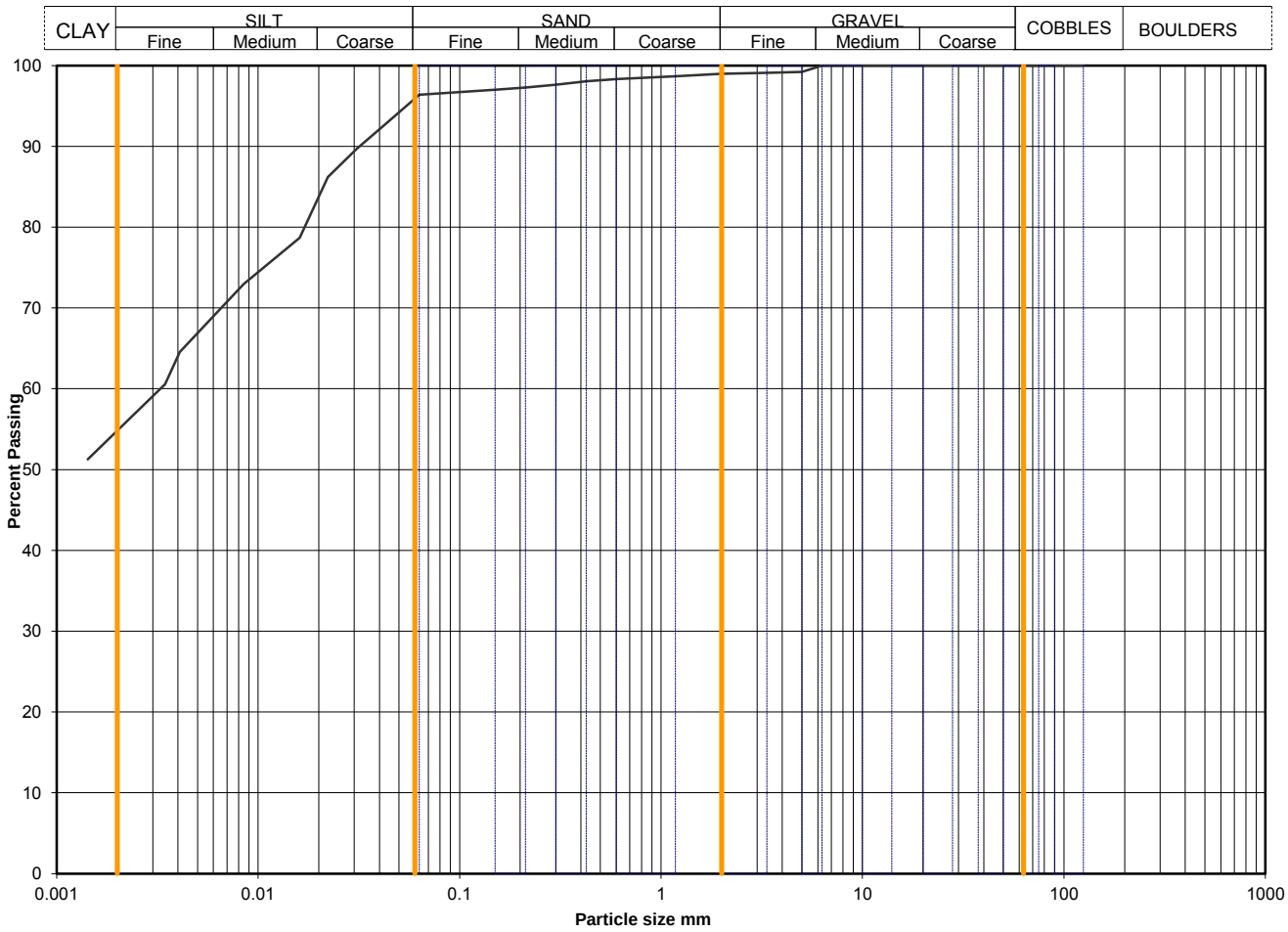
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	FES1171121016

Hole No	HEP-BH-50
Sample Depth (m BGL)	2.3
Sample Type and No	B16
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	96
90	100	0.0432	93
75	100	0.0309	90
63	100	0.0222	86
50	100	0.0161	79
37.5	100	0.0085	73
28	100	0.0041	65
20	100	0.0034	61
14	100	0.0014	51
10	100		
6.3	100		
5.0	99		
3.35	99		
2.00	99		
1.18	99	Particle density, Mg/m3	
0.600	98		
0.425	98	2.65 assumed	
0.300	98	Dry mass of sample, kg	
0.212	97		
0.150	97	7.7	
0.063	96		

Soil description	Brown slightly sandy slightly gravelly silty CLAY.
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	1	1
	Sand	3	3
*<60mm values to aid description only	Silt	42	42
	Clay	55	55

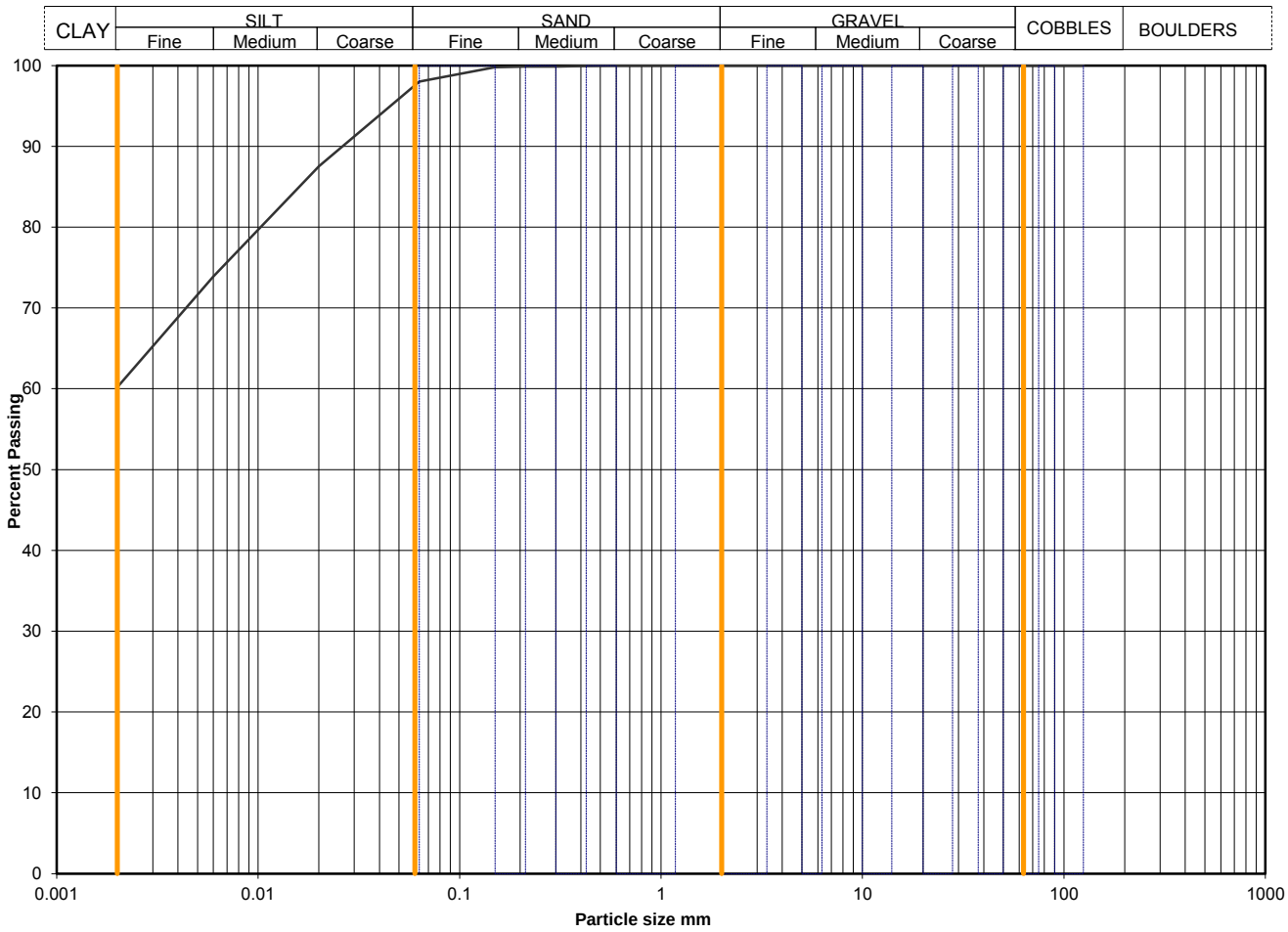
Uniformity Coefficient	D60 / D10	Not applicable

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	FES1171121049

Hole No	HEP-BH-50
Sample Depth (m BGL)	10.2
Sample Type and No	B49
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0201	88
90	100	0.0060	74
75	100	0.0020	60
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5.0	100		
3.35	100		
2.00	100		
1.18	100	Particle density, Mg/m3	
0.600	100		
0.425	100	2.65 assumed	
0.300	100	Dry mass of sample, kg	
0.212	100		
0.150	100	11.4	
0.063	98		

Soil description	Brown slightly sandy silty CLAY.
Preparation / Pretreatment	Sieve: natural material Pipette: as BS1377
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	0	0
	Sand	2	2
*<60mm values to aid description only	Silt	38	38
	Clay	60	60

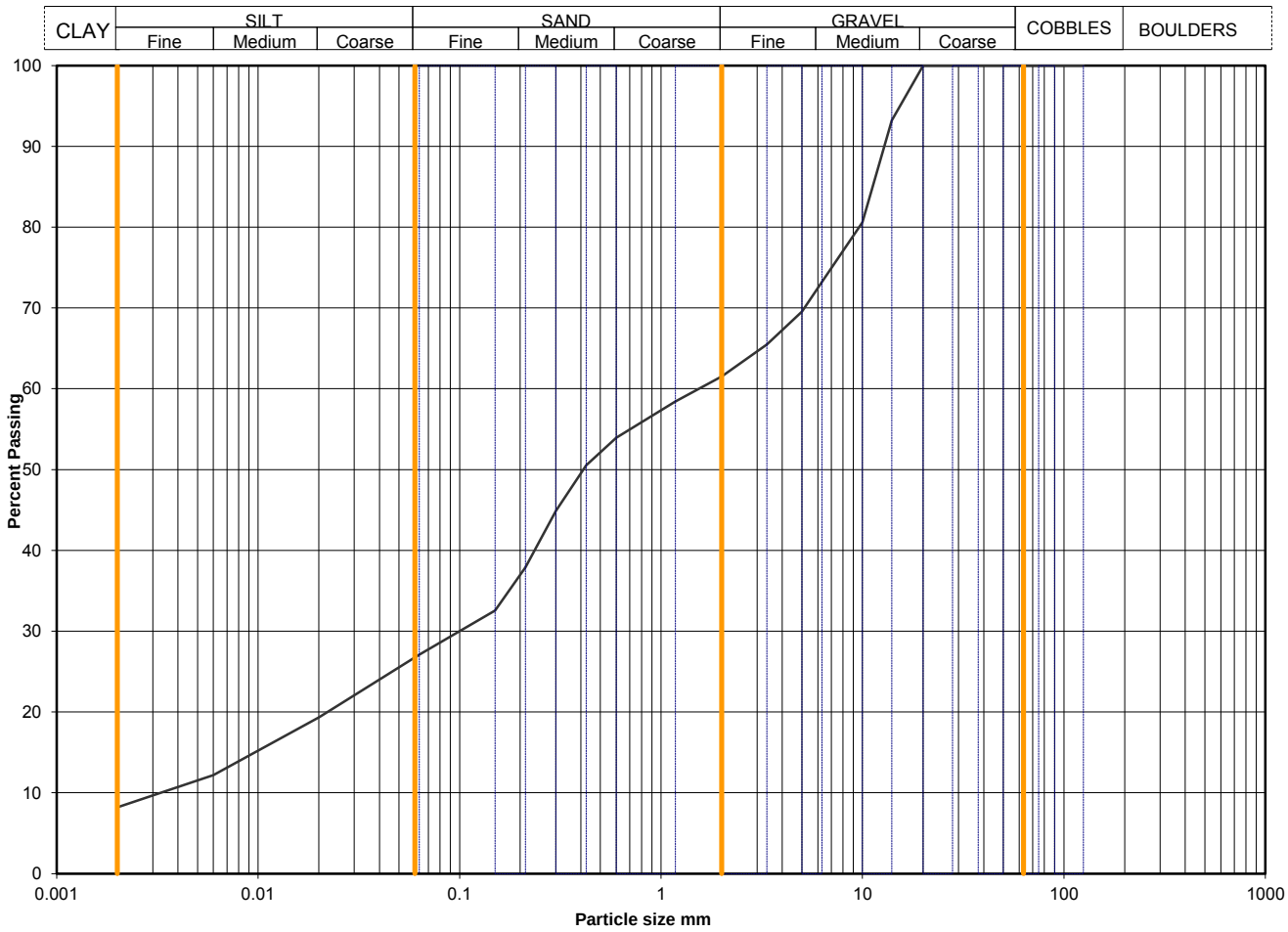
Uniformity Coefficient	D60 / D10	Not applicable

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.4 pipette

Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	HEPBH6120171120016

Hole No	HEP-BH-61
Sample Depth (m BGL)	0
Sample Type and No	LB4
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0201	19
90	100	0.0060	12
75	100	0.0020	8
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	93		
10	81		
6.3	73		
5.0	70		
3.35	65		
2.00	62		
1.18	58	Particle density, Mg/m3	
0.600	54		
0.425	51	2.65 assumed	
0.300	45	Dry mass of sample, kg	
0.212	38		
0.150	33	20.2	
0.063	27		

Soil description	Brown slightly sandy gravelly silty CLAY.
Preparation / Pretreatment	Sieve: natural material Pipette: as BS1377
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	38	38
	Sand	34	34
*<60mm values to aid description only	Silt	19	19
	Clay	8	8

Uniformity Coefficient	D60 / D10	498

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.4 pipette

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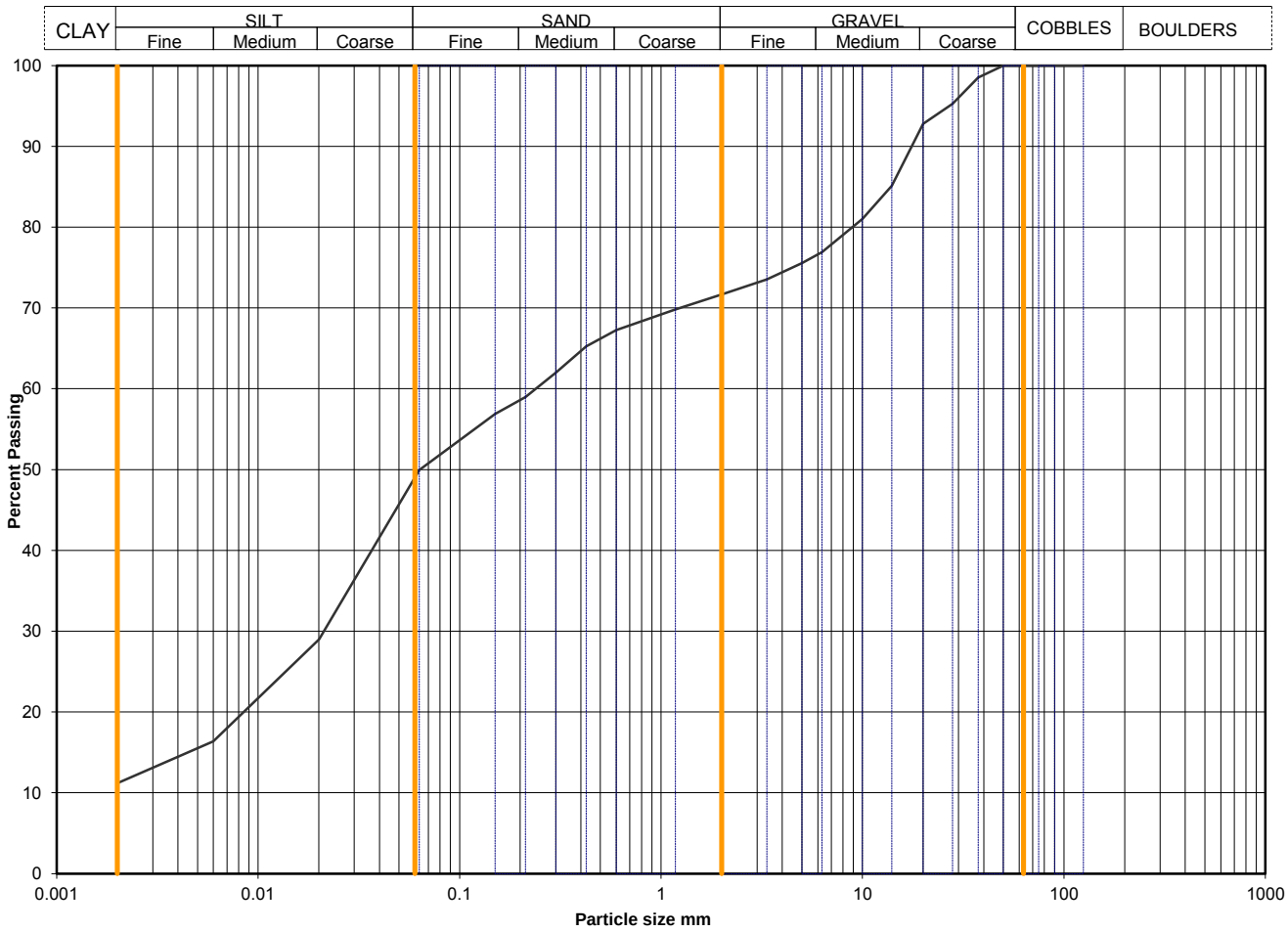
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	HEPBH6120171121019

Hole No	HEP-BH-61
Sample Depth (m BGL)	2.2
Sample Type and No	B12
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0201	29
90	100	0.0060	16
75	100	0.0020	11
63	100		
50	100		
37.5	99		
28	95		
20	93		
14	85		
10	81		
6.3	77		
5.0	76		
3.35	74		
2.00	72		
1.18	70	Particle density, Mg/m3	
0.600	67		
0.425	65	2.65 assumed	
0.300	62	Dry mass of sample, kg	
0.212	59		
0.150	57	12.1	
0.063	50		

Soil description	Brown slightly sandy slightly gravelly silty CLAY.		
Preparation / Pretreatment	Sieve: natural material Pipette: as BS1377		
Remarks			
Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	28	28
	Sand	22	22
*<60mm values to aid description only	Silt	39	39
	Clay	11	11

Uniformity Coefficient	**D60 / D10**	Not applicable

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.4 pipette

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Figure

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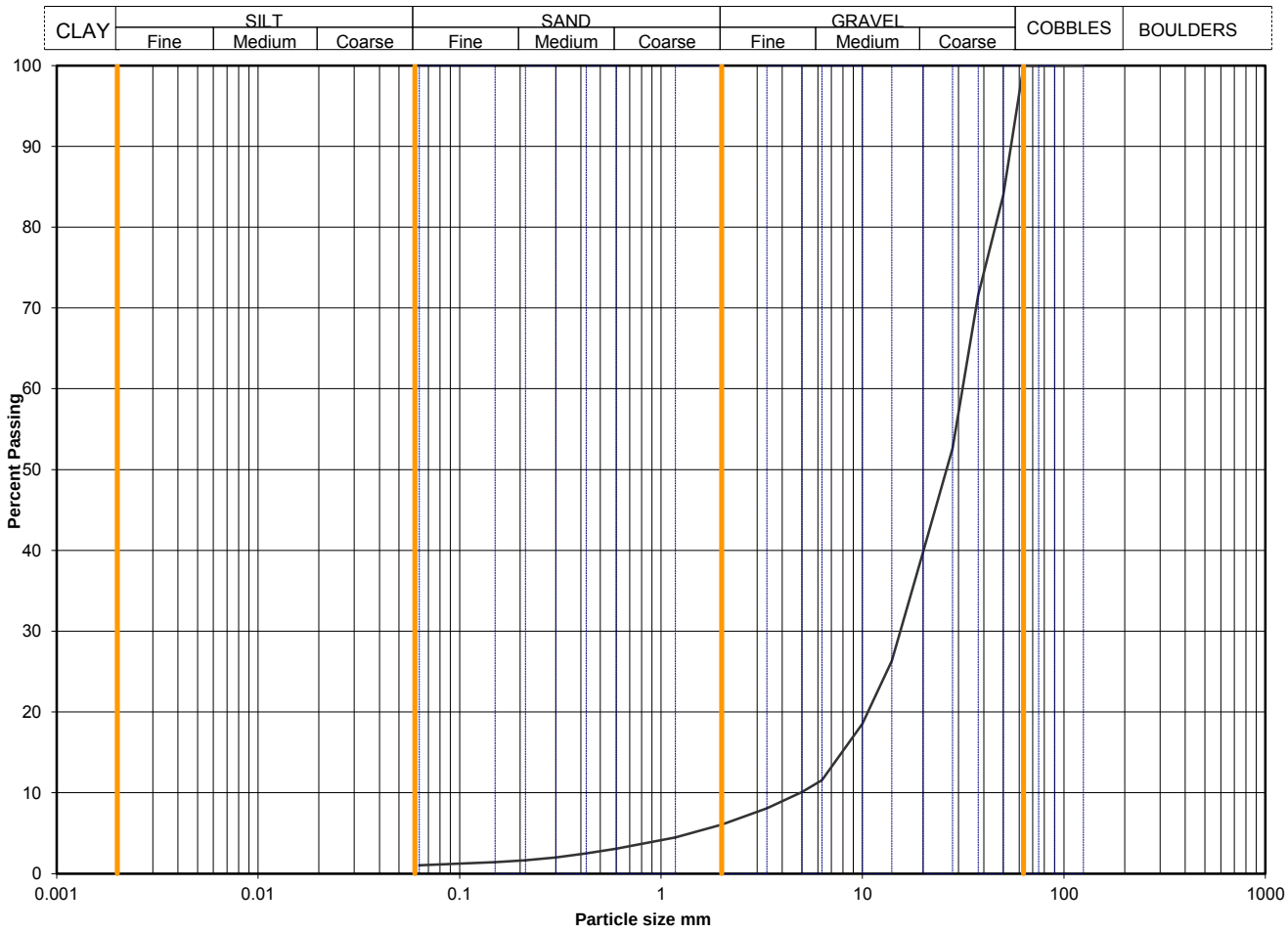
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	HEPBH6120171121024

Hole No	HEP-BH-61
Sample Depth (m BGL)	3.7
Sample Type and No	B20
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	84		
37.5	72		
28	53		
20	40		
14	26		
10	19		
6.3	12		
5.0	10		
3.35	8		
2.00	6		
1.18	4		
0.600	3		
0.425	3		
0.300	2	Dry mass of sample, kg	
0.212	2		
0.150	1	8.3	
0.063	1		

Soil description	Grey slightly sandy slightly clayey GRAVEL.
Preparation / Pretreatment	Sieve: pre dried,
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	94	94
	Sand	5	5
*<60mm values to aid description only	Silt	silt+clay =	
	Clay	1	1

Uniformity Coefficient	D60 / D10	6

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.3 dry sieve
	Sedimentation	none

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Project Name	Heathrow Airport Limited

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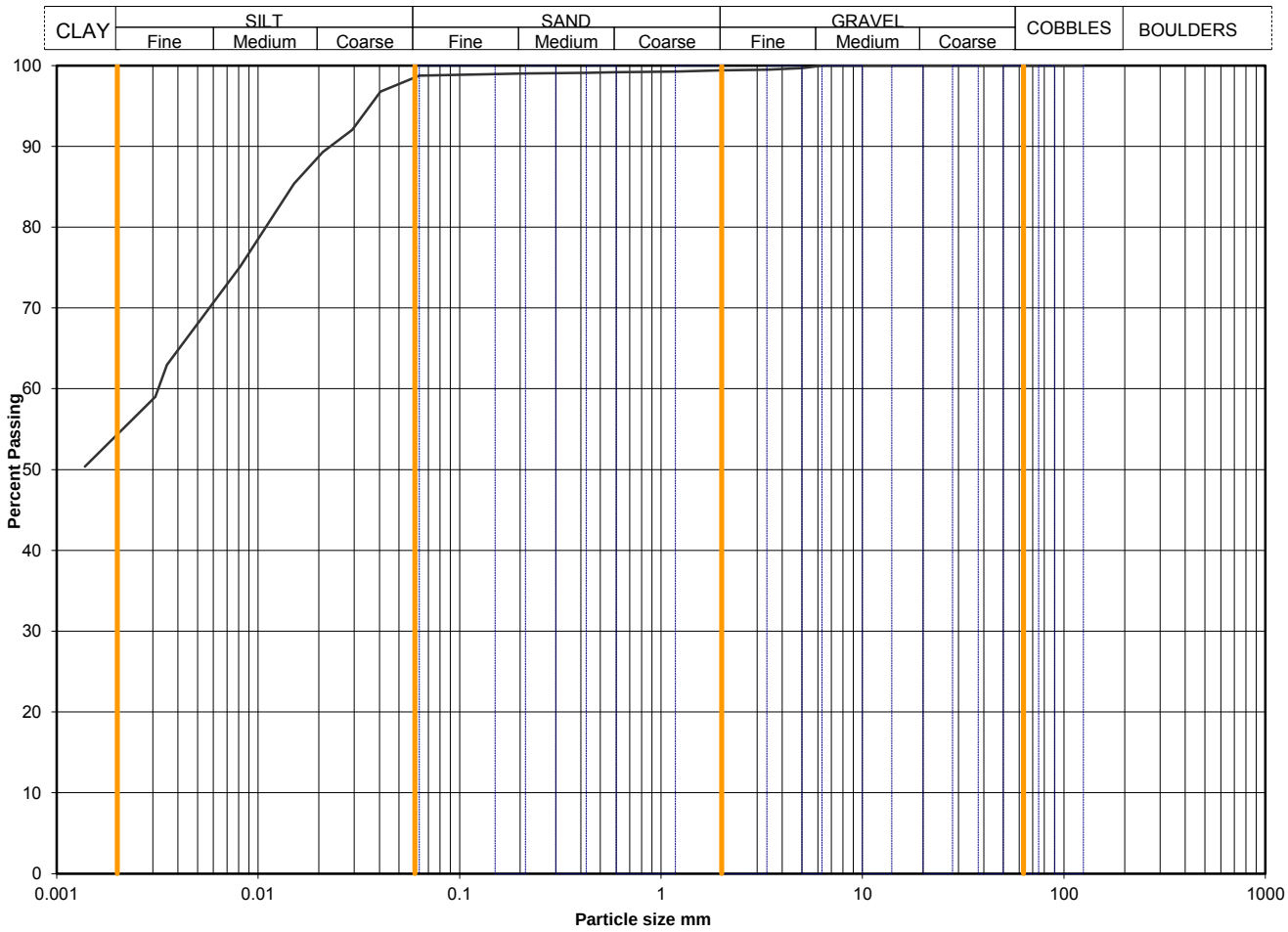
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	HEPBH6120171121026

Hole No	HEP-BH-61
Sample Depth (m BGL)	4.7
Sample Type and No	UT23
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	99
90	100	0.0405	97
75	100	0.0293	92
63	100	0.0210	89
50	100	0.0151	85
37.5	100	0.0081	75
28	100	0.0035	63
20	100	0.0031	59
14	100	0.0014	50
10	100		
6.3	100		
5.0	100		
3.35	99		
2.00	99		
1.18	99	Particle density, Mg/m3	
0.600	99		
0.425	99	2.65 assumed	
0.300	99	Dry mass of sample, kg	
0.212	99		
0.150	99	3.3	
0.063	99		

Soil description	Firm to stiff thinly laminated greyish brown slightly sandy CLAY.
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	1	1
	Sand	1	1
*<60mm values to aid description only	Silt	44	44
	Clay	54	54

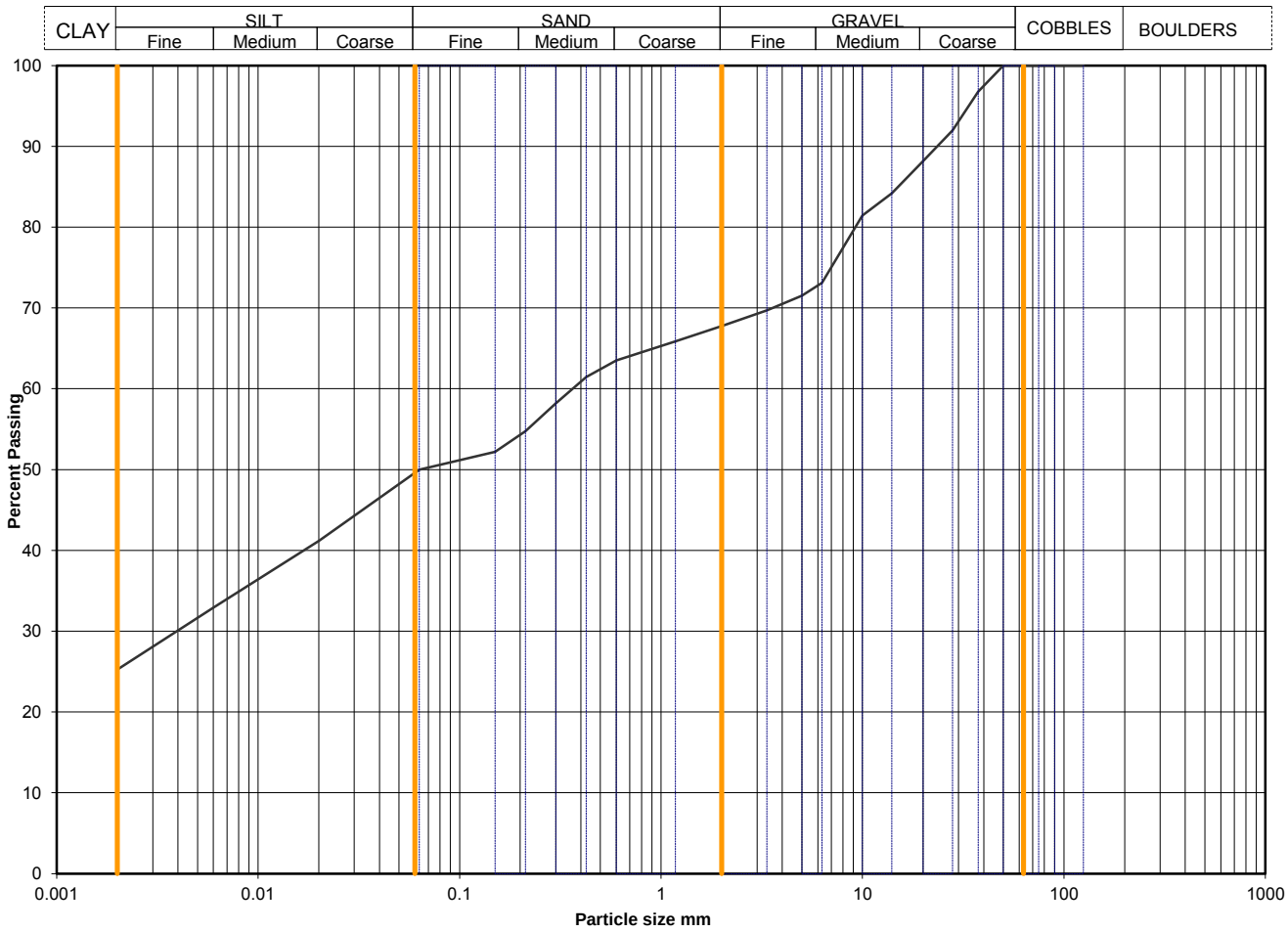
Uniformity Coefficient	D60 / D10	Not applicable

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	HEPBH6420180306010

Hole No	HEP-BH-64
Sample Depth (m BGL)	0.15
Sample Type and No	B6
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0201	41
90	100	0.0060	33
75	100	0.0020	25
63	100		
50	100		
37.5	97		
28	92		
20	88		
14	84		
10	81		
6.3	73		
5.0	72		
3.35	70		
2.00	68		
1.18	66	Particle density, Mg/m3	
0.600	64		
0.425	61	2.65 assumed	
0.300	58	Dry mass of sample, kg	
0.212	55		
0.150	52	11.9	
0.063	50		

Soil description	Dark brown slightly sandy silty CLAY.		
Preparation / Pretreatment	Sieve: natural material Pipette: as BS1377		
Remarks			
Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	32	32
	Sand	18	18
*<60mm values to aid description only	Silt	25	25
	Clay	25	25

Uniformity Coefficient	**D60 / D10**	Not applicable

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.4 pipette

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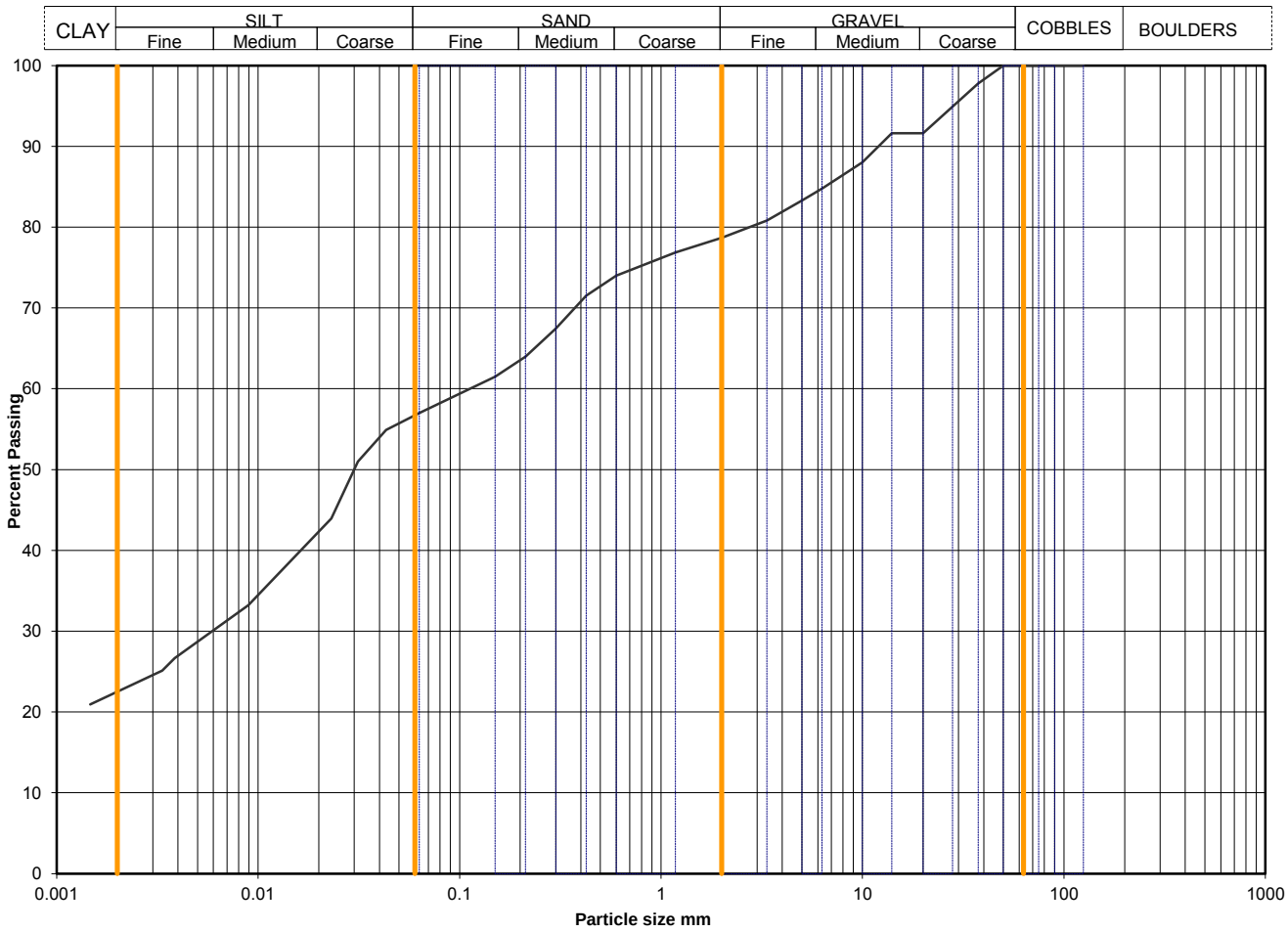
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	HEPBH6420180306014

Hole No	HEP-BH-64
Sample Depth (m BGL)	0.85
Sample Type and No	B12
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	57
90	100	0.0432	55
75	100	0.0313	51
63	100	0.0231	44
50	100	0.0167	40
37.5	98	0.0089	33
28	95	0.0039	27
20	92	0.0033	25
14	92	0.0015	21
10	88		
6.3	85		
5.0	83		
3.35	81		
2.00	79		
1.18	77	Particle density, Mg/m3	
0.600	74		
0.425	72	2.65 assumed	
0.300	67	Dry mass of sample, kg	
0.212	64		
0.150	61	12.4	
0.063	57		

Soil description	Brown slightly sandy slightly gravelly silty CLAY.		
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377		
Remarks			
Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	21	21
	Sand	22	22
*<60mm values to aid description only	Silt	35	35
	Clay	22	22

Uniformity Coefficient	**D60 / D10**	Not applicable

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

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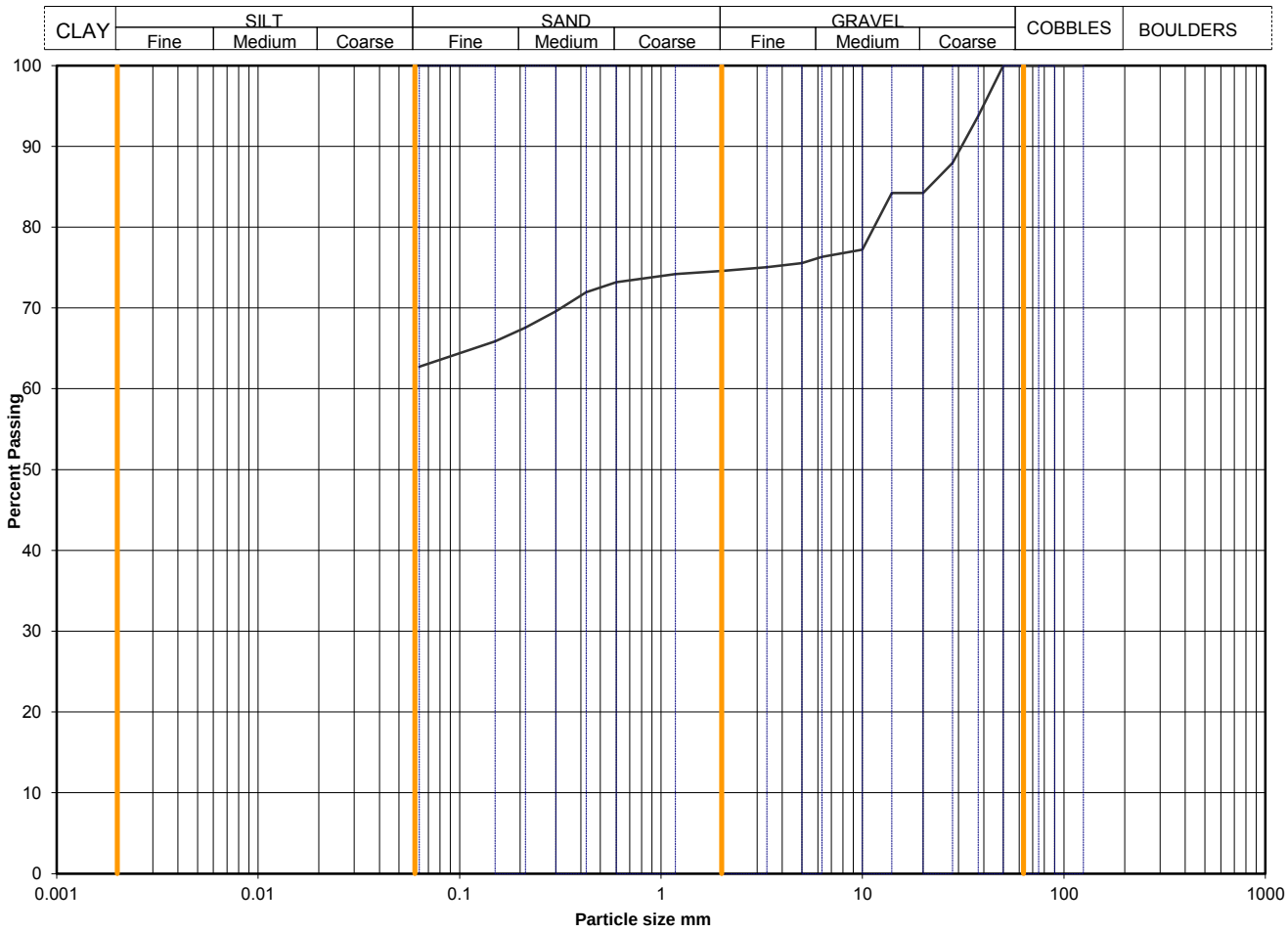
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	HEPBH6420180308018

Hole No	HEP-BH-64
Sample Depth (m BGL)	2.45
Sample Type and No	B20
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	94		
28	88		
20	84		
14	84		
10	77		
6.3	76		
5.0	76		
3.35	75		
2.00	75		
1.18	74		
0.600	73		
0.425	72		
0.300	70	Dry mass of sample, kg	
0.212	68		
0.150	66	4.6	
0.063	63		

Soil description	Dark brown slightly sandy slightly gravelly silty CLAY
Preparation / Pretreatment	Sieve: natural material
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	25	25
	Sand	12	12
*<60mm values to aid description only	Silt	silt+clay =	
	Clay	63	63

Uniformity Coefficient	D60 / D10	Not applicable

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	none

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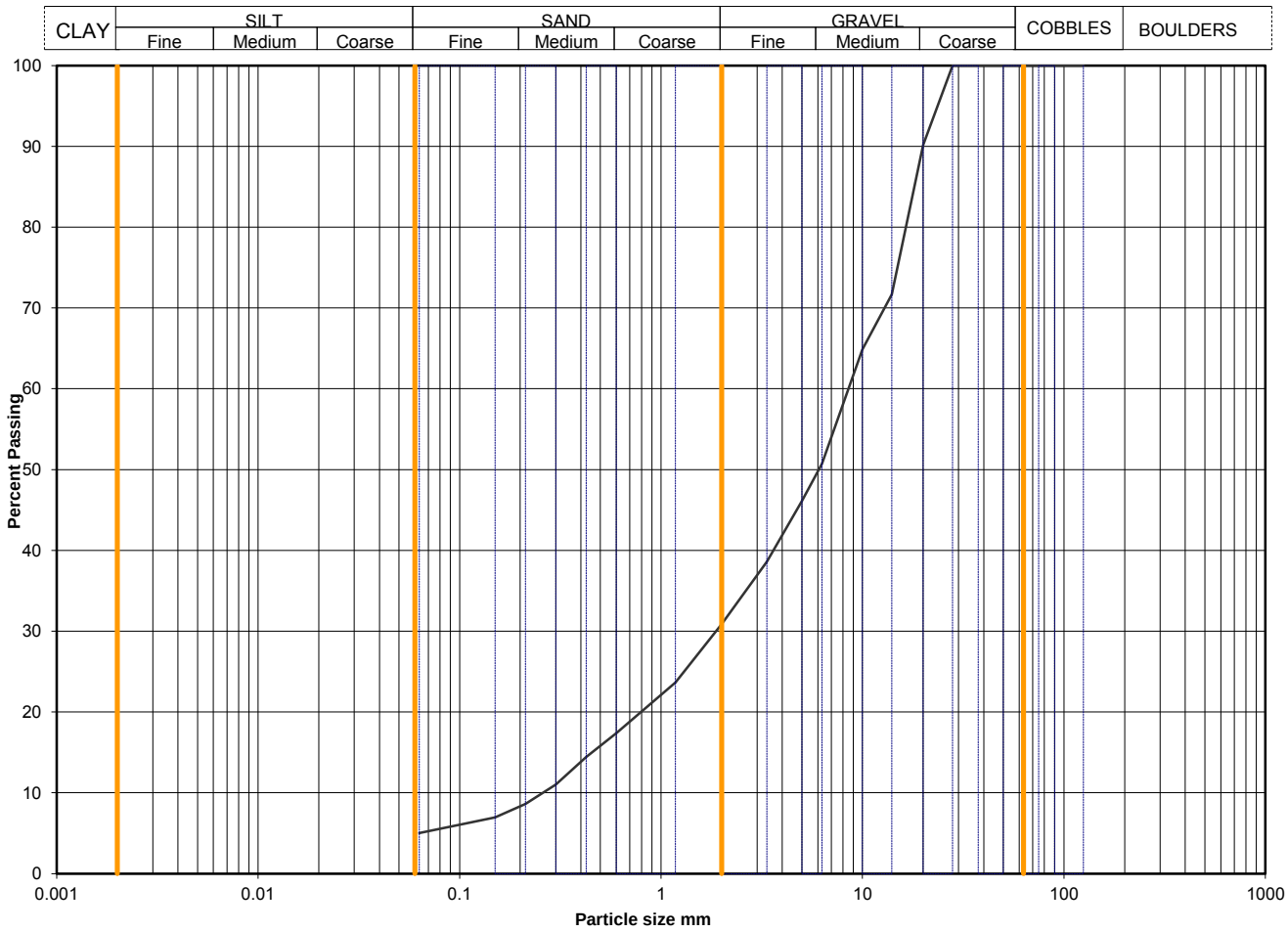
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	HEPBH6420180308023

Hole No	HEP-BH-64
Sample Depth (m BGL)	4
Sample Type and No	D24
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	90		
14	72		
10	65		
6.3	51		
5.0	46		
3.35	39		
2.00	31		
1.18	24		
0.600	17		
0.425	14		
0.300	11	Dry mass of sample, kg	
0.212	9		
0.150	7	0.4	
0.063	5		

Soil description	Brown very sandy silty GRAVEL.
Preparation / Pretreatment	Sieve: pre dried,
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	69	69
	Sand	26	26
*<60mm values to aid description only	Silt	silt+clay =	
	Clay	5	5

Uniformity Coefficient	D60 / D10	33

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	none

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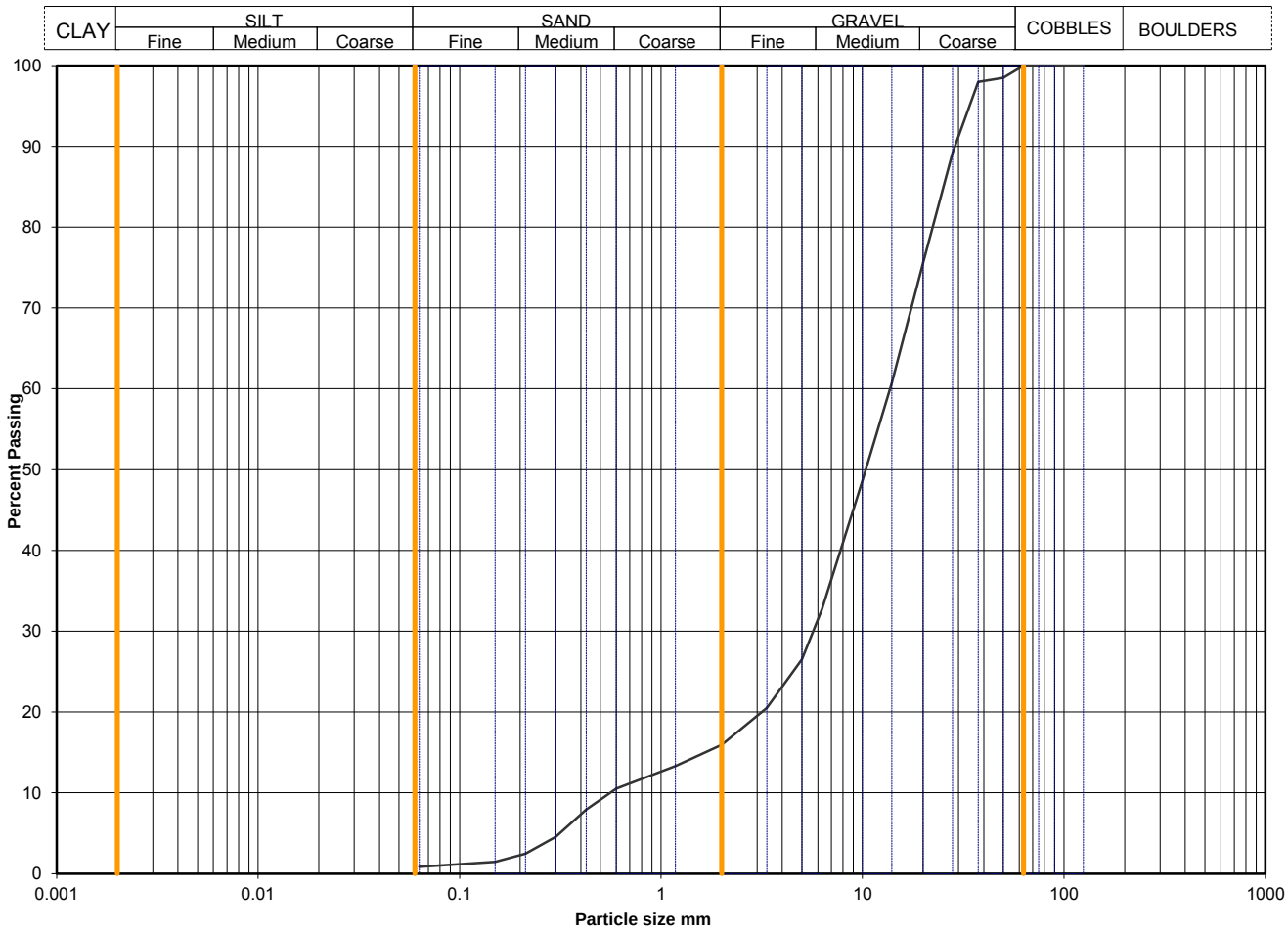
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	FES1180117013

Hole No	HEP-BH-65
Sample Depth (m BGL)	2.2
Sample Type and No	B13
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	98		
37.5	98		
28	89		
20	76		
14	61		
10	49		
6.3	33		
5.0	27		
3.35	21		
2.00	16		
1.18	13		
0.600	10		
0.425	8		
0.300	5	Dry mass of sample, kg	
0.212	2		
0.150	1	16.9	
0.063	1		

Soil description	Brown sandy GRAVEL.
Preparation / Pretreatment	Sieve: natural material
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	84	84
	Sand	15	15
*<60mm values to aid description only	Silt	silt+clay =	
	Clay	1	1

Uniformity Coefficient	D60 / D10	25

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	none

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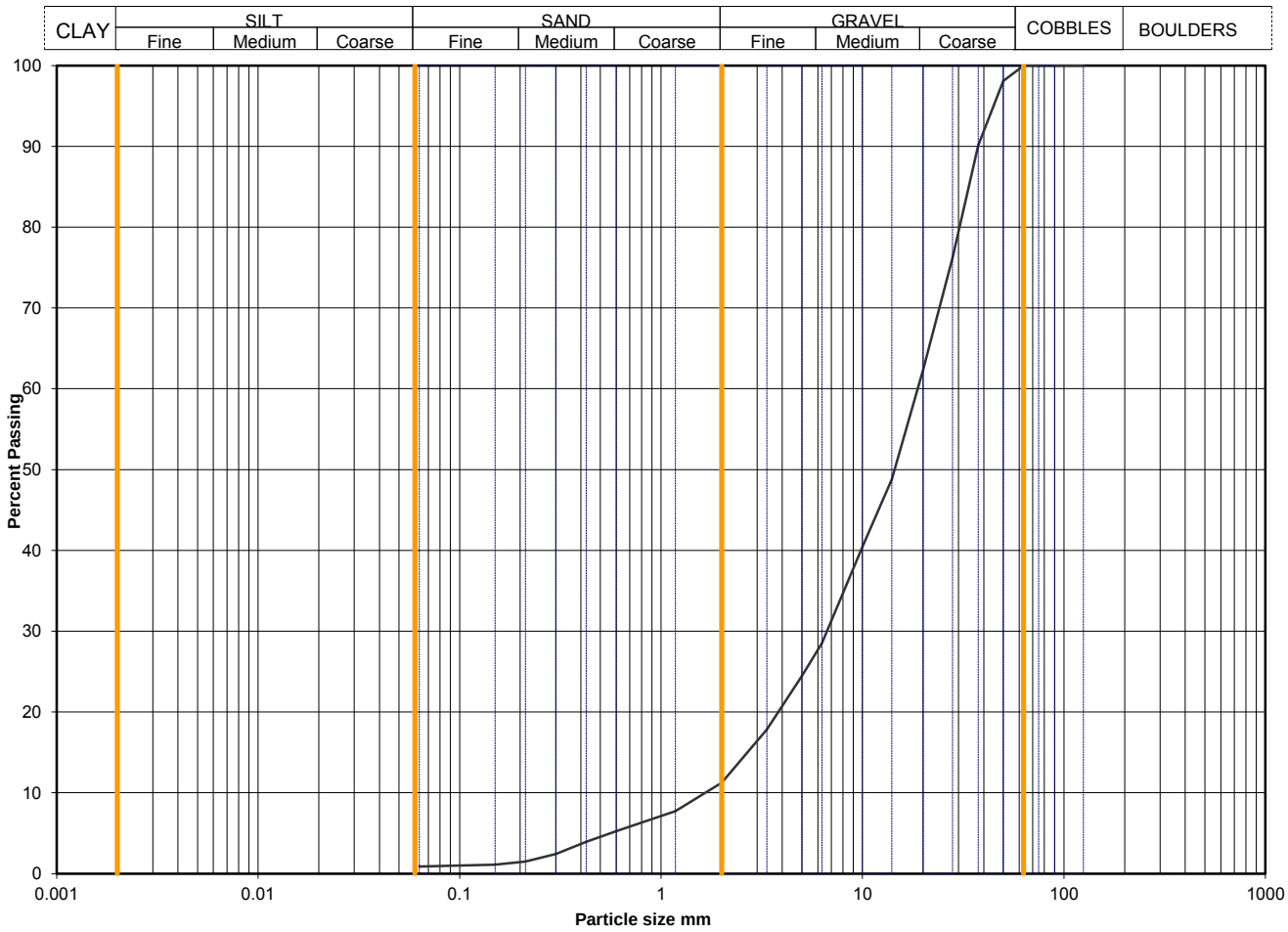
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	FES1180117022

Hole No	HEP-BH-65
Sample Depth (m BGL)	4.5
Sample Type and No	B22
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	98		
37.5	90		
28	76		
20	62		
14	49		
10	40		
6.3	29		
5.0	24		
3.35	18		
2.00	11		
1.18	8		
0.600	5		
0.425	4		
0.300	2	Dry mass of sample, kg	
0.212	1		
0.150	1	15.1	
0.063	1		

Soil description	Brown sandy GRAVEL.		
Preparation / Pretreatment	Sieve: natural material		
Remarks			
Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	89	89
	Sand	10	10
*<60mm values to aid description only	Silt	silt+clay =	
	Clay	1	1

Uniformity Coefficient	**D60 / D10**	11

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	none

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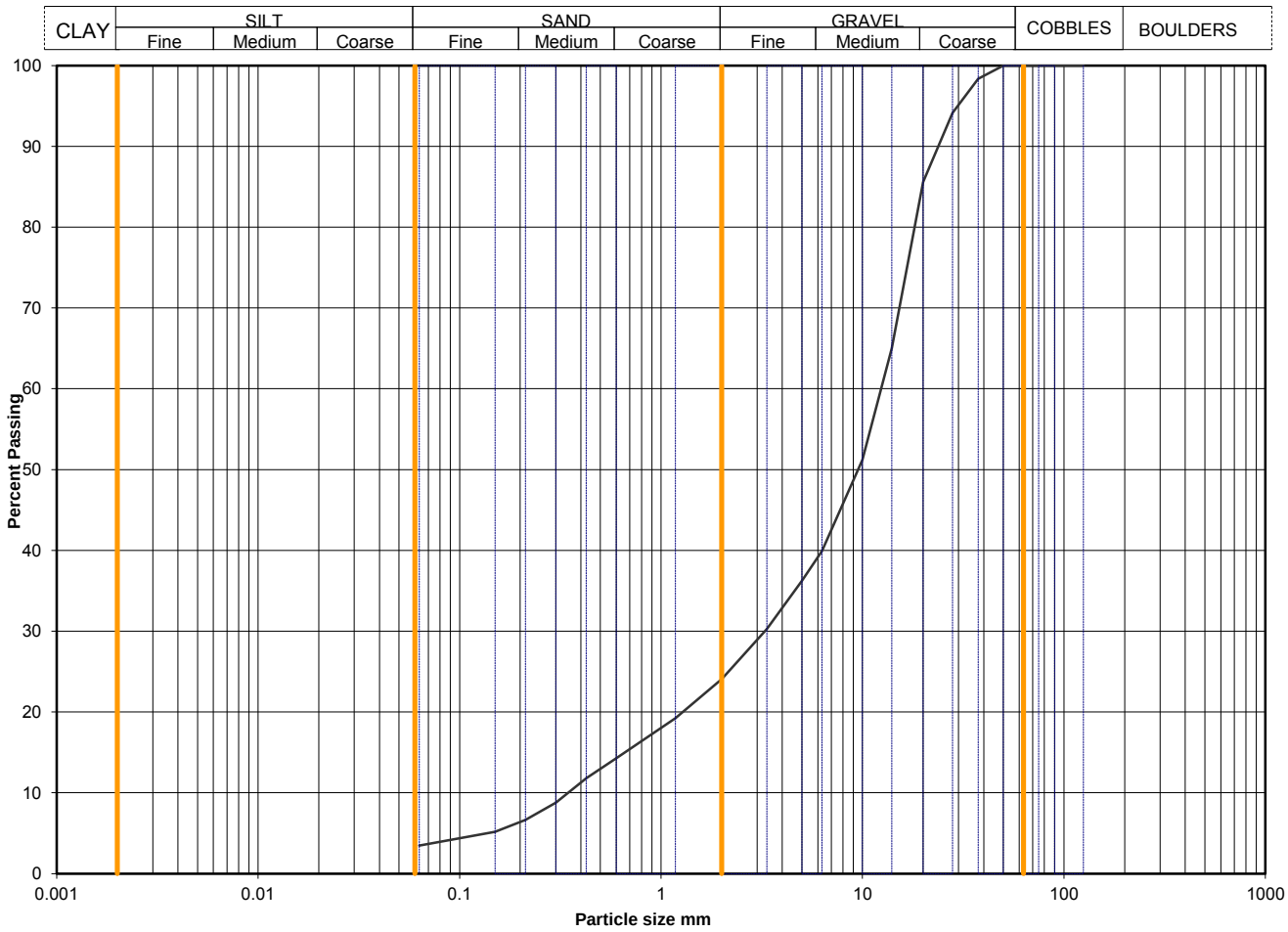
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	FES1180104006

Hole No	HEP-BH-77
Sample Depth (m BGL)	0.6
Sample Type and No	LB6
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	98		
28	94		
20	86		
14	65		
10	51		
6.3	40		
5.0	36		
3.35	30		
2.00	24		
1.18	19		
0.600	14		
0.425	12		
0.300	9	Dry mass of sample, kg	
0.212	7		
0.150	5	5.0	
0.063	3		

Soil description	Brown very sandy silty GRAVEL		
Preparation / Pretreatment	Sieve: natural material		
Remarks			
Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	76	76
	Sand	21	21
*<60mm values to aid description only	Silt	silt+clay =	
	Clay	3	3

Uniformity Coefficient	**D60 / D10**	36

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	none

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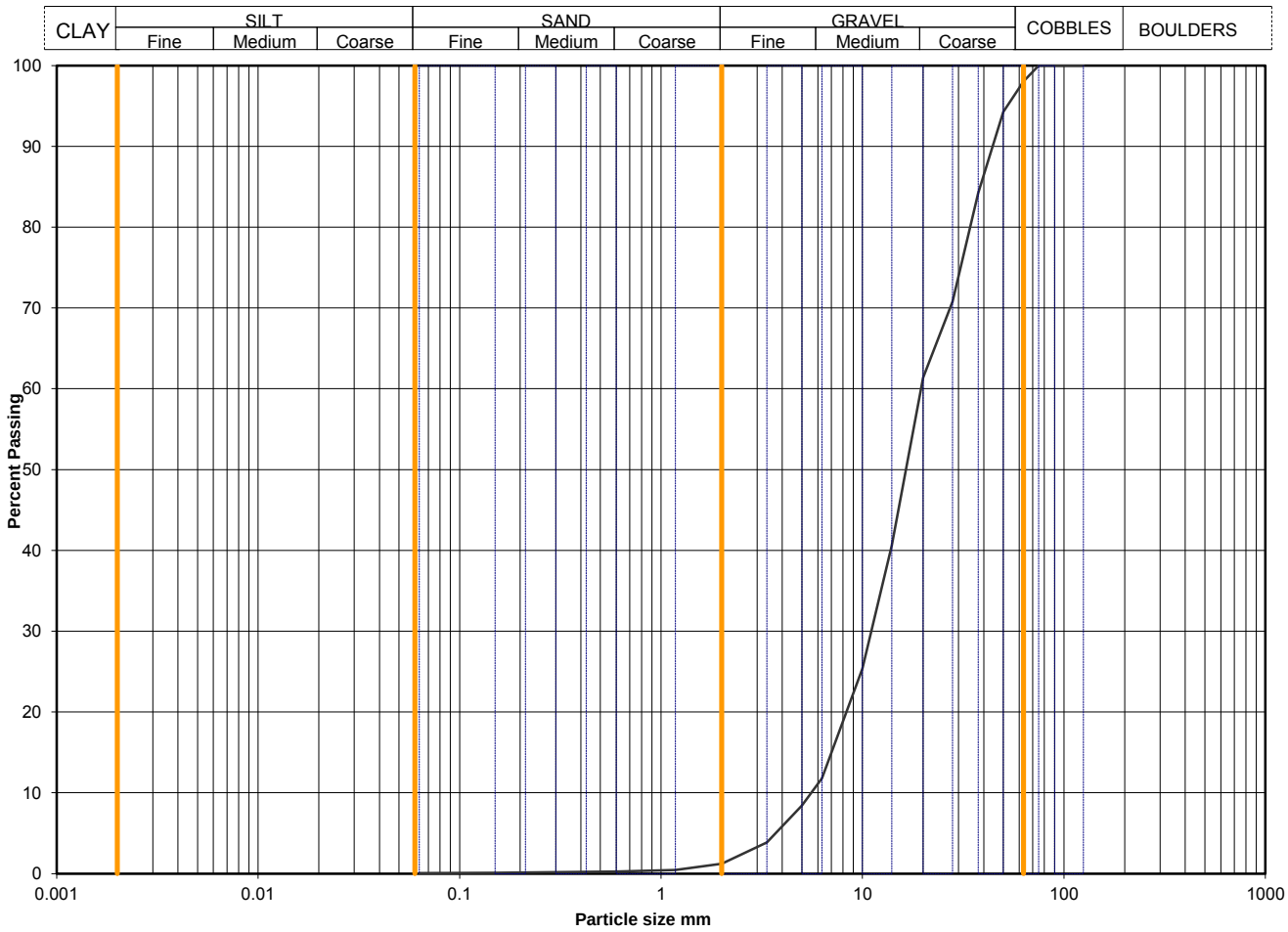
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	FES1180104021

Hole No	HEP-BH-77
Sample Depth (m BGL)	3.5
Sample Type and No	B21
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	98		
50	94		
37.5	84		
28	71		
20	61		
14	41		
10	25		
6.3	12		
5.0	8		
3.35	4		
2.00	1		
1.18	0		
0.600	0		
0.425	0		
0.300	0	Dry mass of sample, kg	
0.212	0		
0.150	0	17.9	
0.063	0		

Soil description	Brown slightly sandy GRAVEL with one cobble.
Preparation / Pretreatment	Sieve: natural material
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	2	0
	Gravel	97	99
	Sand	1	1
*<60mm values to aid description only	Silt	silt+clay =	
	Clay	0	0

Uniformity Coefficient	D60 / D10	3

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.3 dry sieve
	Sedimentation	none

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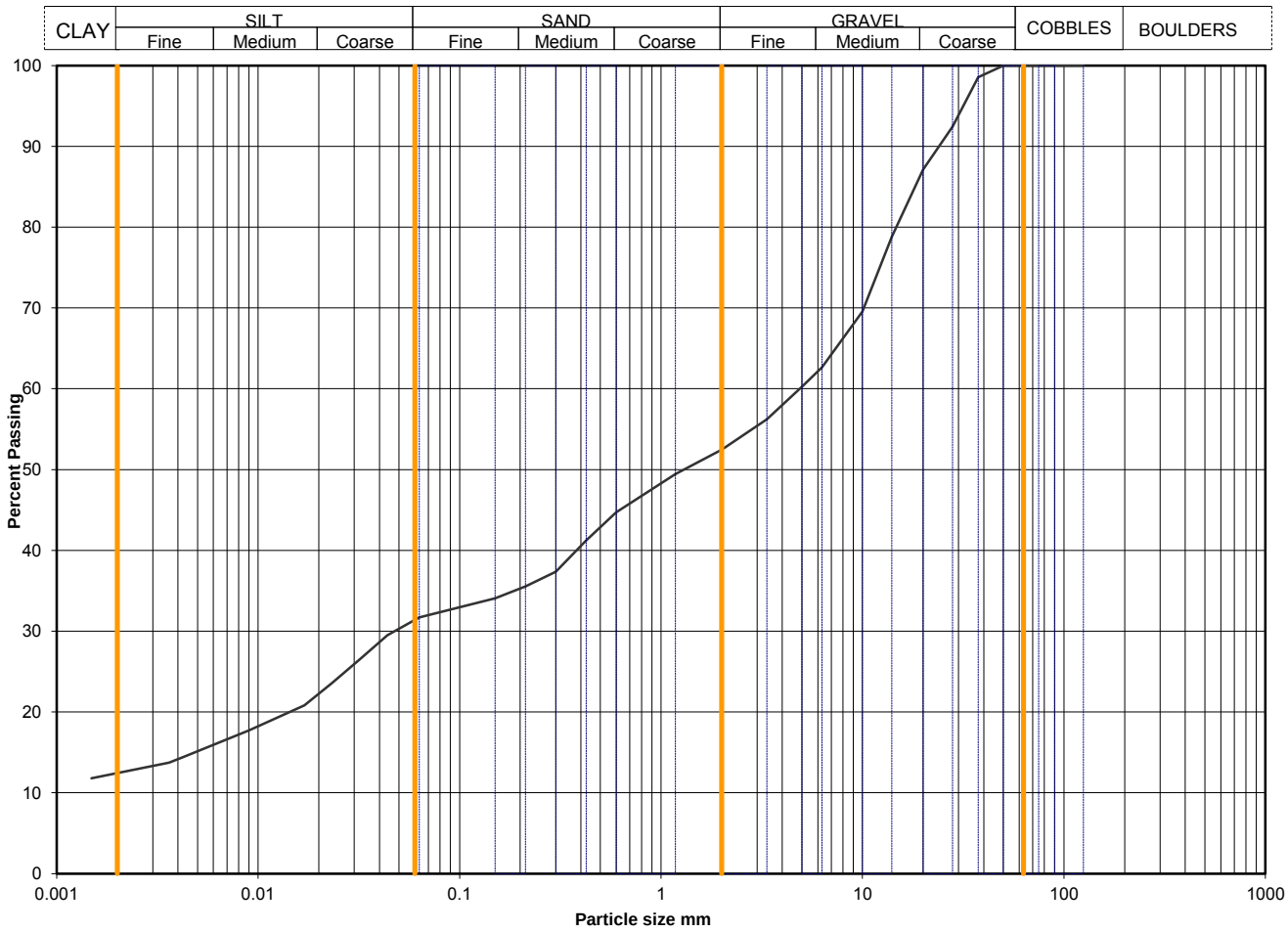
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	FES1180108006

Hole No	HEP-BH-85
Sample Depth (m BGL)	0.7
Sample Type and No	LB6
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	32
90	100	0.0439	30
75	100	0.0320	27
63	100	0.0234	24
50	100	0.0170	21
37.5	99	0.0090	18
28	92	0.0043	14
20	87	0.0036	14
14	79	0.0015	12
10	70		
6.3	63		
5.0	60		
3.35	56		
2.00	52		
1.18	49	Particle density, Mg/m3	
0.600	45		
0.425	41	2.65 assumed	
0.300	37	Dry mass of sample, kg	
0.212	36		
0.150	34	12.7	
0.063	32		

Soil description	Brown slightly sandy gravelly CLAY.		
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377		
Remarks			
Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	48	48
	Sand	21	21
*<60mm values to aid description only	Silt	19	19
	Clay	12	12

Uniformity Coefficient	**D60 / D10**	Not applicable

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

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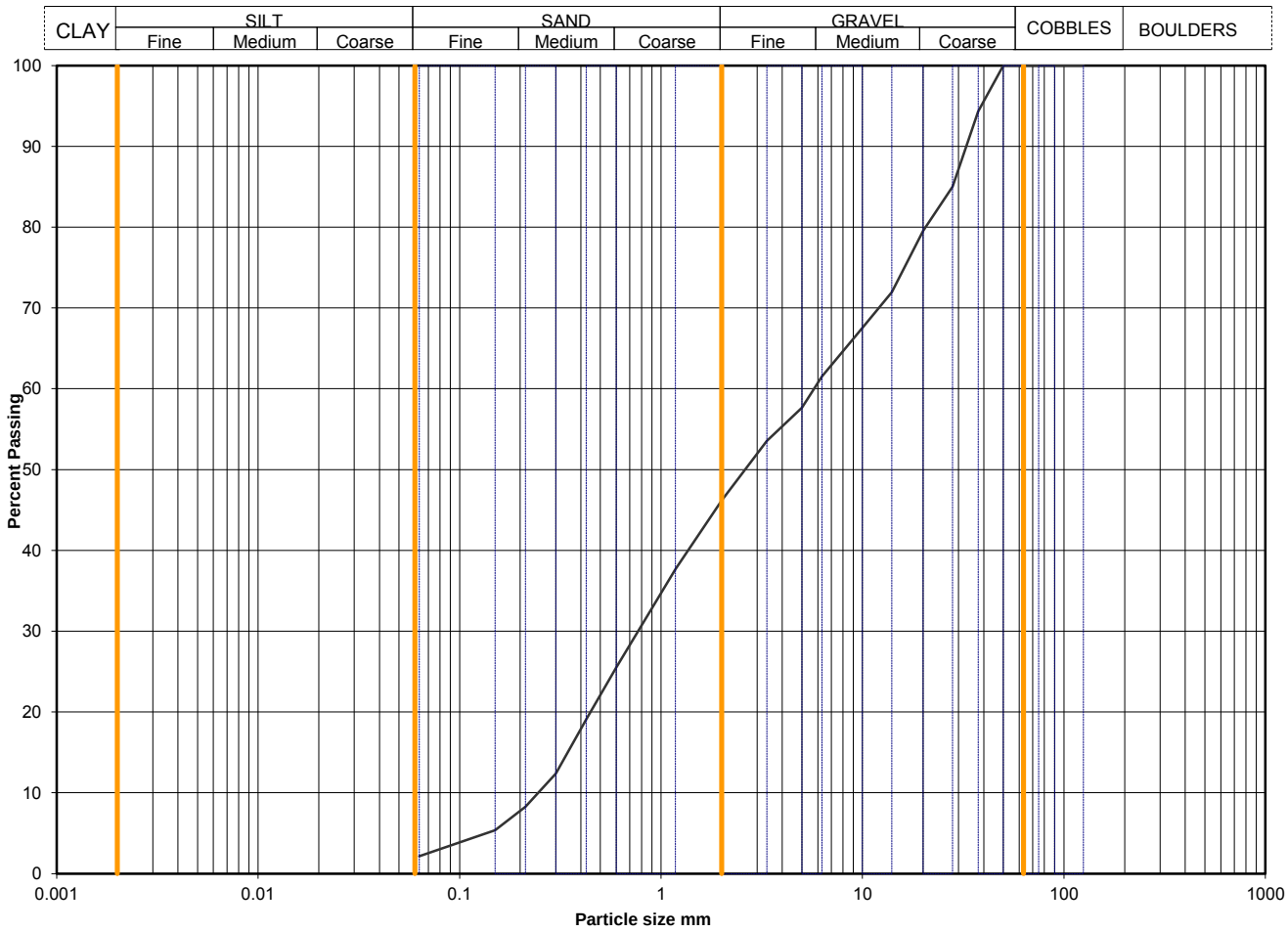
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	FES1180109002

Hole No	HEP-BH-85
Sample Depth (m BGL)	1.6
Sample Type and No	B9
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	94		
28	85		
20	80		
14	72		
10	68		
6.3	62		
5.0	58		
3.35	54		
2.00	46		
1.18	38		
0.600	25		
0.425	19		
0.300	12	Dry mass of sample, kg	
0.212	8		
0.150	5	19.3	
0.063	2		

Soil description	Brown very sandy GRAVEL with clay pockets.		
Preparation / Pretreatment	Sieve: pre dried,		
Remarks			
Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	54	54
	Sand	44	44
*<60mm values to aid description only	Silt	silt+clay =	
	Clay	2	2

Uniformity Coefficient	**D60 / D10**	23

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	none

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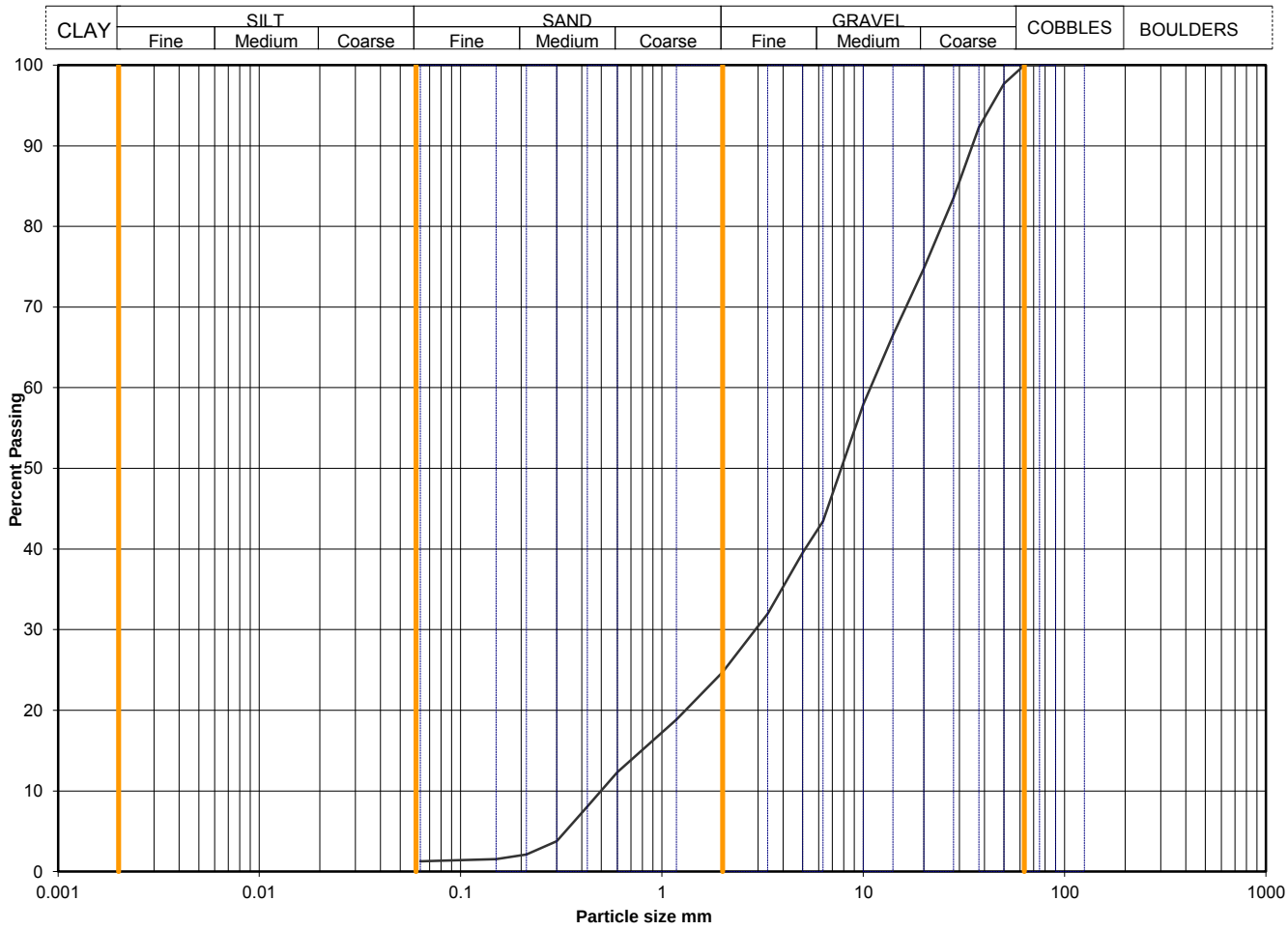
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	FES1180110009

Hole No	HEP-BH-85
Sample Depth (m BGL)	4.5
Sample Type and No	B22
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	98		
37.5	92		
28	84		
20	75		
14	67		
10	58		
6.3	43		
5.0	40		
3.35	32		
2.00	25		
1.18	19		
0.600	12		
0.425	8		
0.300	4	Dry mass of sample, kg	
0.212	2		
0.150	2	21.5	
0.063	1		

Soil description	Brown very sandy GRAVEL.		
Preparation / Pretreatment	Sieve: pre dried,		
Remarks			
Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	75	75
	Sand	23	23
*<60mm values to aid description only	Silt	silt+clay =	
	Clay	1	1

Uniformity Coefficient	**D60 / D10**	22

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	none

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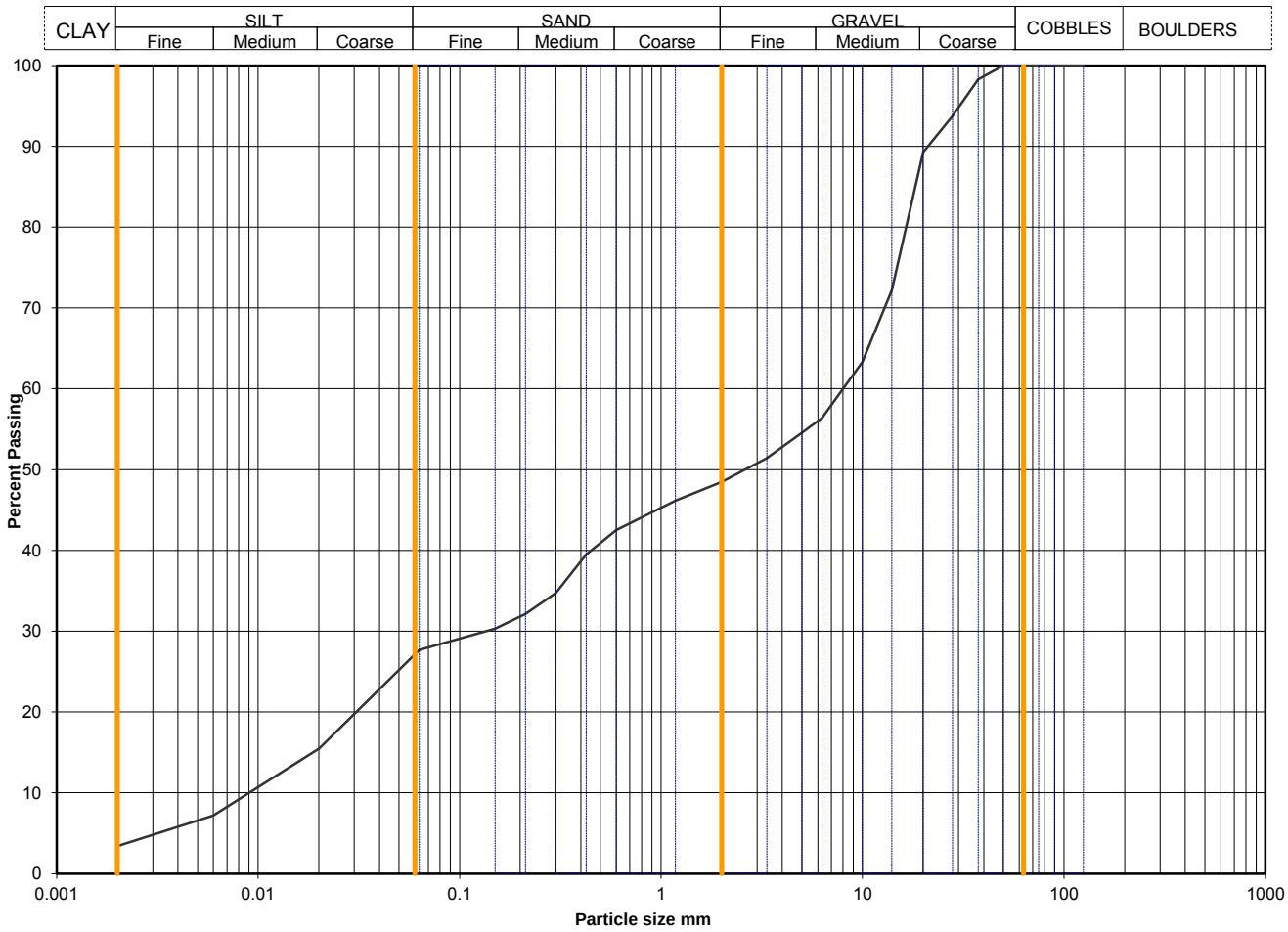
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	HEPBH82020180306012

Hole No	HEP-BH-820
Sample Depth (m BGL)	0.6
Sample Type and No	B8
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0201	15
90	100	0.0060	7
75	100	0.0020	3
63	100		
50	100		
37.5	98		
28	94		
20	89		
14	72		
10	63		
6.3	56		
5.0	55		
3.35	51		
2.00	48		
1.18	46	Particle density, Mg/m3	
0.600	43		
0.425	39	2.65 assumed	
0.300	35	Dry mass of sample, kg	
0.212	32		
0.150	30	14.0	
0.063	28		

Soil description	Dark brown slightly sandy gravelly clayey SILT.
Preparation / Pretreatment	Sieve: natural material Pipette: as BS1377
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	52	52
	Sand	21	21
*<60mm values to aid description only	Silt	24	24
	Clay	3	3

Uniformity Coefficient	D60 / D10	885

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.4 pipette

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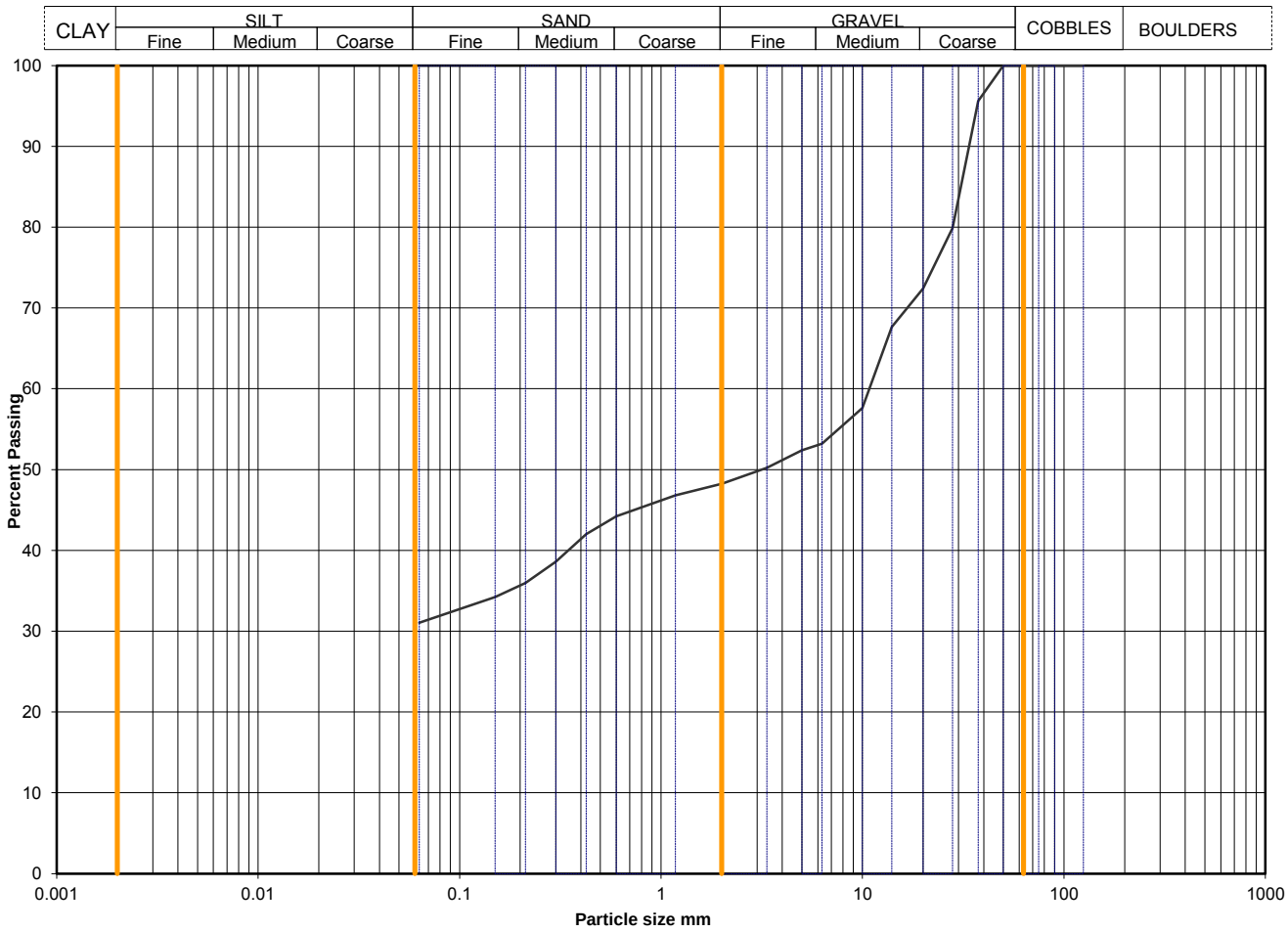
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	HEPBH82020180306013

Hole No	HEP-BH-820
Sample Depth (m BGL)	1.6
Sample Type and No	B11
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	96		
28	80		
20	72		
14	68		
10	58		
6.3	53		
5.0	52		
3.35	50		
2.00	48		
1.18	47		
0.600	44		
0.425	42		
0.300	39	Dry mass of sample, kg	
0.212	36		
0.150	34	1.9	
0.063	31		

Soil description	Dark brown slightly sandy gravelly CLAY.
Preparation / Pretreatment	Sieve: natural material
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	52	52
	Sand	17	17
*<60mm values to aid description only	Silt	silt+clay =	
	Clay	31	31

Uniformity Coefficient	D60 / D10	Not applicable

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	none

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Project Name Heathrow Airport Limited

Figure
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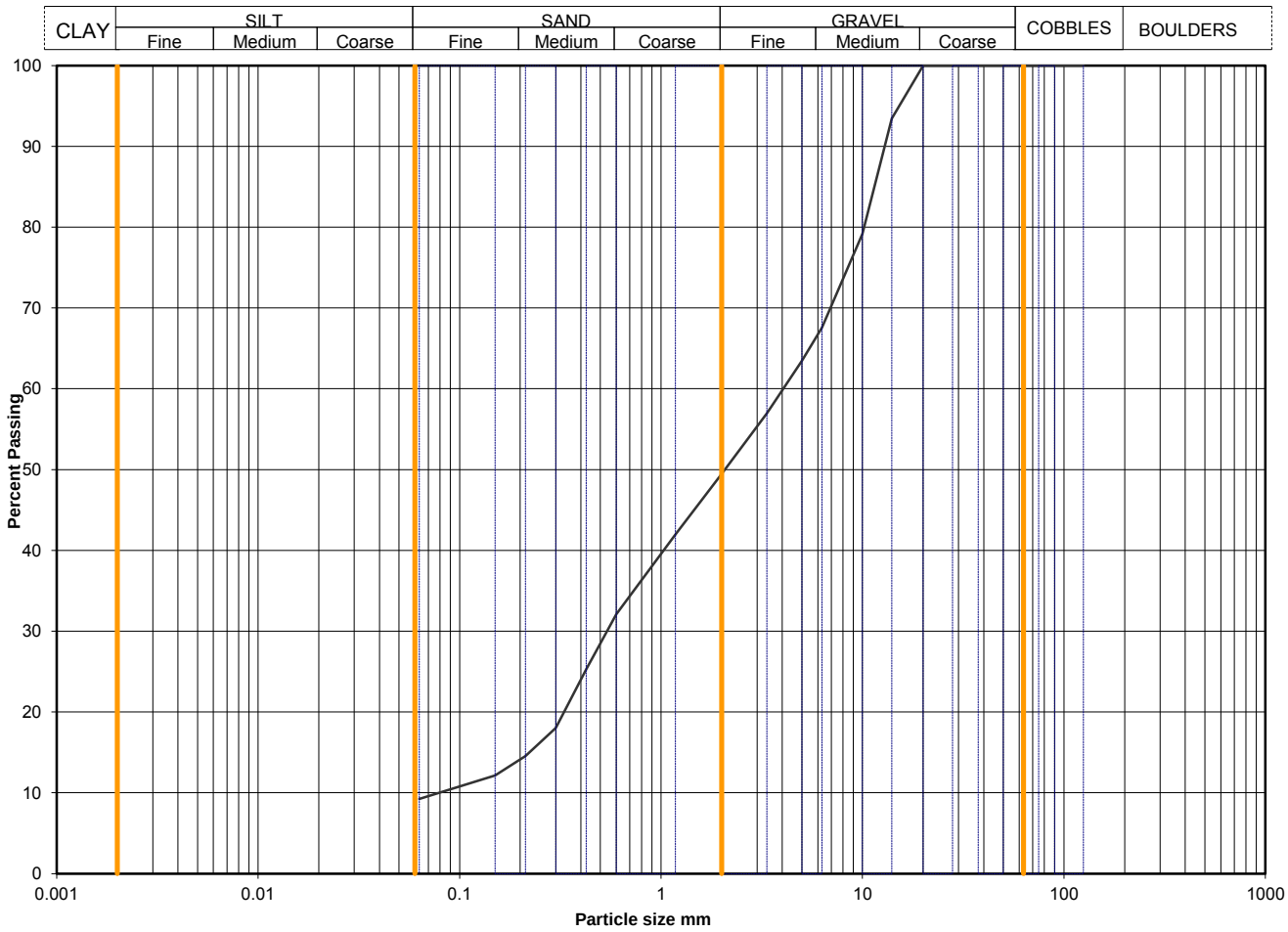
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	HEPBH82020180306016

Hole No	HEP-BH-820
Sample Depth (m BGL)	2.3
Sample Type and No	D15
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	93		
10	79		
6.3	68		
5.0	63		
3.35	57		
2.00	49		
1.18	42		
0.600	32		
0.425	25		
0.300	18	Dry mass of sample, kg	
0.212	15		
0.150	12	0.4	
0.063	9		

Soil description	Greyish brown clayey SAND and GRAVEL.		
Preparation / Pretreatment	Sieve: pre dried,		
Remarks			
Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	51	51
	Sand	40	40
*<60mm values to aid description only	Silt	silt+clay =	
	Clay	9	9

Uniformity Coefficient	**D60 / D10**	51

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	none

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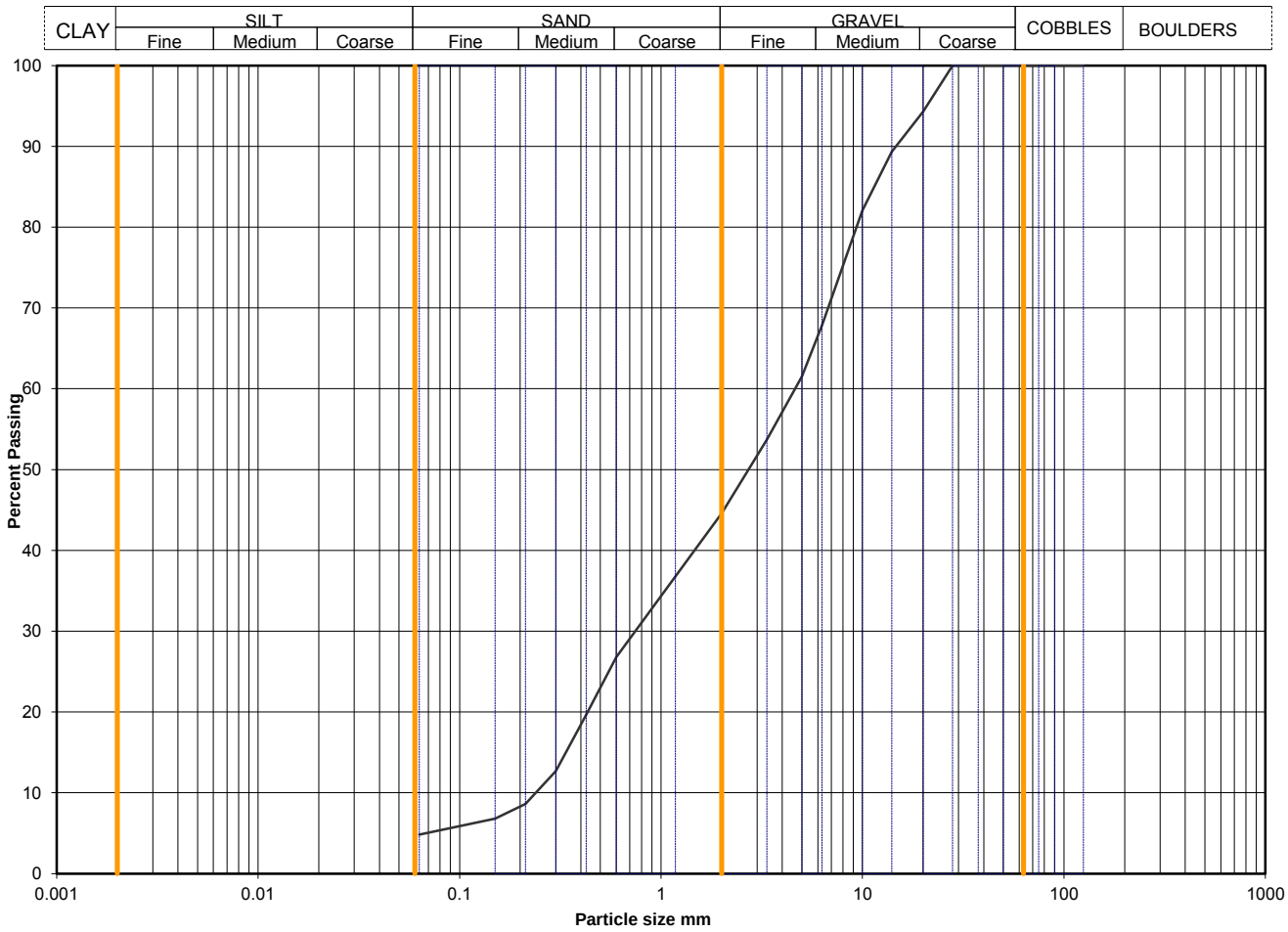
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	HEPBH82020180306017

Hole No	HEP-BH-820
Sample Depth (m BGL)	4.6
Sample Type and No	D16
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	94		
14	89		
10	82		
6.3	68		
5.0	62		
3.35	54		
2.00	45		
1.18	37		
0.600	27		
0.425	20		
0.300	13	Dry mass of sample, kg	
0.212	9		
0.150	7	0.4	
0.063	5		

Soil description	Brownish grey clayey SAND and GRAVEL.		
Preparation / Pretreatment	Sieve: pre dried,		
Remarks			
Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	55	55
	Sand	40	40
*<60mm values to aid description only	Silt	silt+clay =	
	Clay	5	5

Uniformity Coefficient	**D60 / D10**	20

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	none

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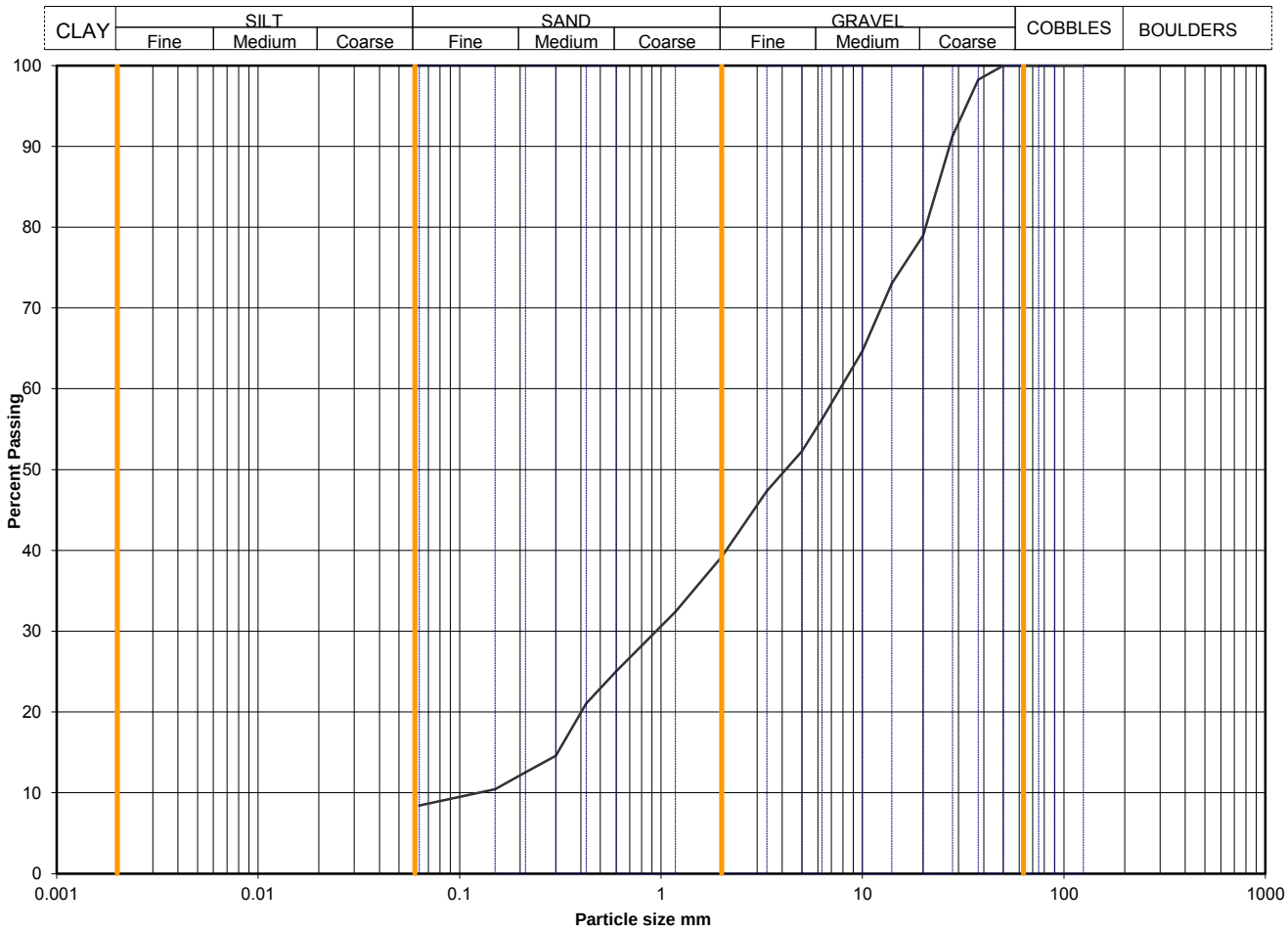
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	FES1180111009

Hole No	HEP-BH-821
Sample Depth (m BGL)	1
Sample Type and No	B9
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	98		
28	91		
20	79		
14	73		
10	65		
6.3	56		
5.0	52		
3.35	47		
2.00	39		
1.18	32		
0.600	25		
0.425	21		
0.300	15	Dry mass of sample, kg	
0.212	13		
0.150	10	9.6	
0.063	8		

Soil description	Brownish grey very sandy clayey GRAVEL.
Preparation / Pretreatment	Sieve: natural material
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	61	61
	Sand	31	31
*<60mm values to aid description only	Silt	silt+clay =	
	Clay	8	8

Uniformity Coefficient	D60 / D10	63

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	none

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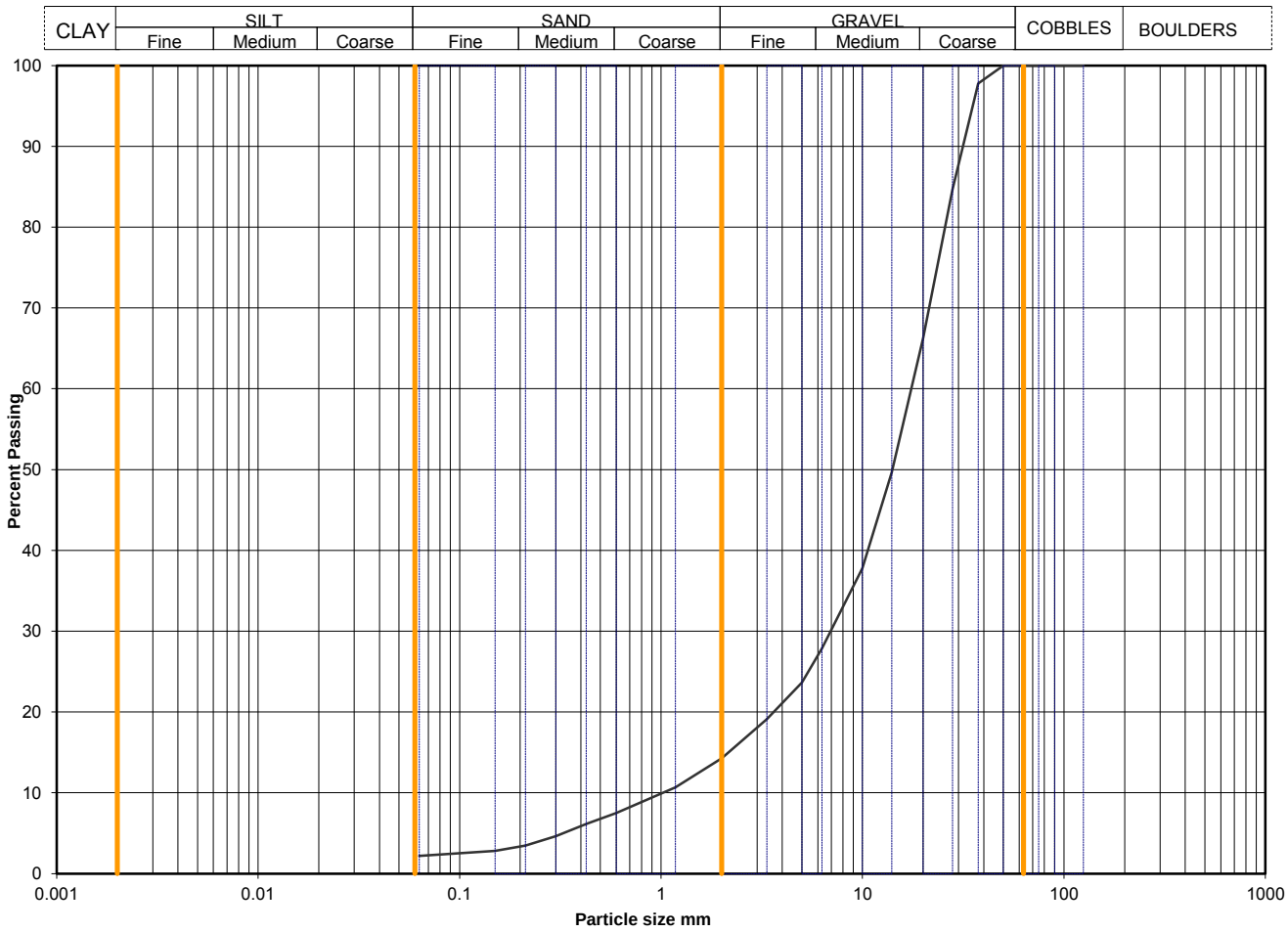
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	FES1180111012

Hole No	HEP-BH-821
Sample Depth (m BGL)	1.6
Sample Type and No	B12
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	98		
28	85		
20	66		
14	50		
10	38		
6.3	28		
5.0	24		
3.35	19		
2.00	14		
1.18	11		
0.600	8		
0.425	6		
0.300	5	Dry mass of sample, kg	
0.212	3		
0.150	3	3.6	
0.063	2		

Soil description	Greyish brown sandy GRAVEL.
Preparation / Pretreatment	Sieve: pre dried,
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	86	86
	Sand	12	12
*<60mm values to aid description only	Silt	silt+clay =	
	Clay	2	2

Uniformity Coefficient	D60 / D10	17

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	none

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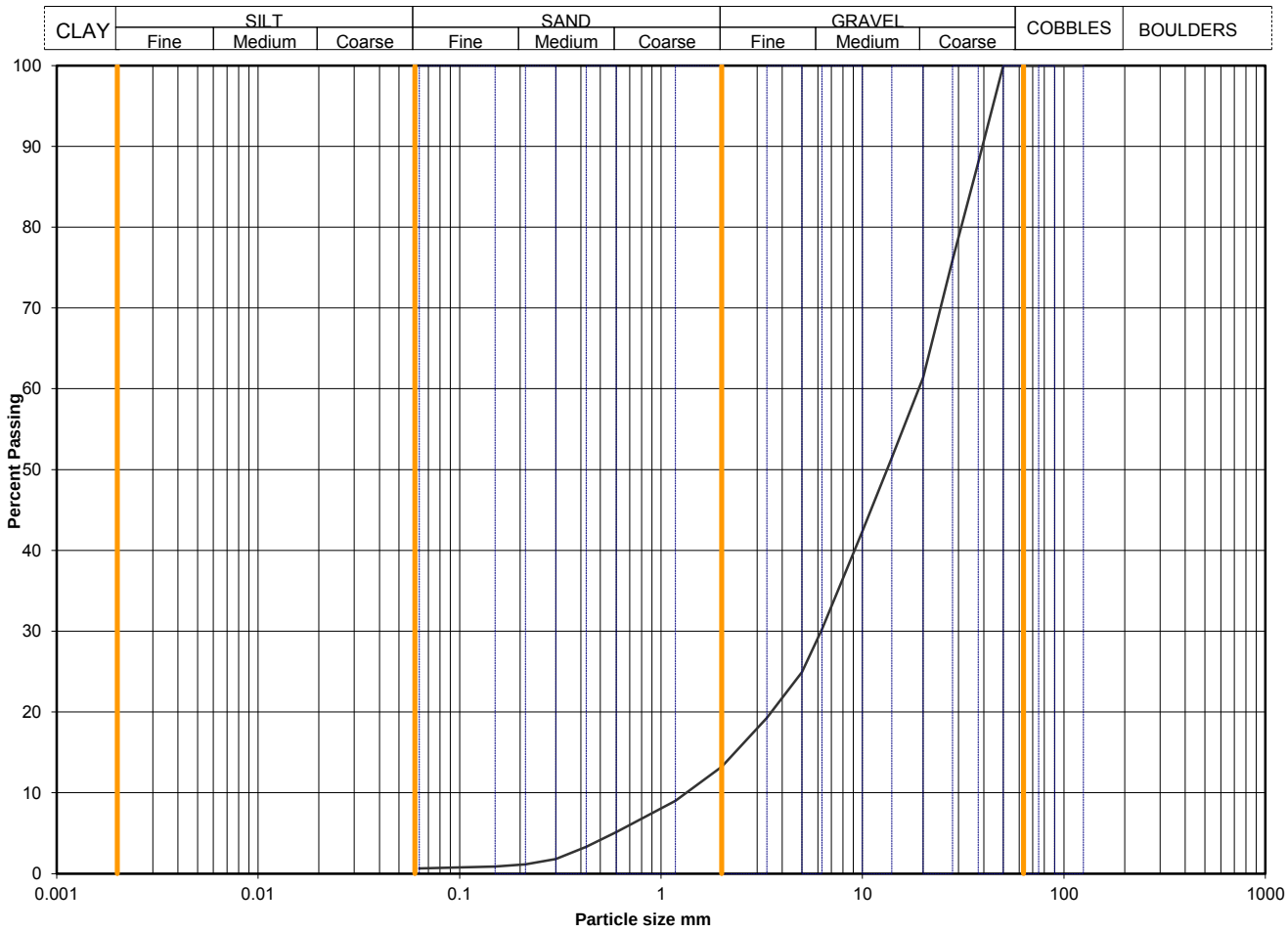
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	FES1180111023

Hole No	HEP-BH-821
Sample Depth (m BGL)	4.2
Sample Type and No	B23
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	88		
28	76		
20	61		
14	51		
10	42		
6.3	30		
5.0	25		
3.35	19		
2.00	13		
1.18	9		
0.600	5		
0.425	3		
0.300	2	Dry mass of sample, kg	
0.212	1		
0.150	1	17.2	
0.063	1		

Soil description	Brown sandy GRAVEL.
Preparation / Pretreatment	Sieve: natural material
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	87	87
	Sand	13	13
*<60mm values to aid description only	Silt	silt+clay =	
	Clay	1	1

Uniformity Coefficient	D60 / D10	14

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	none

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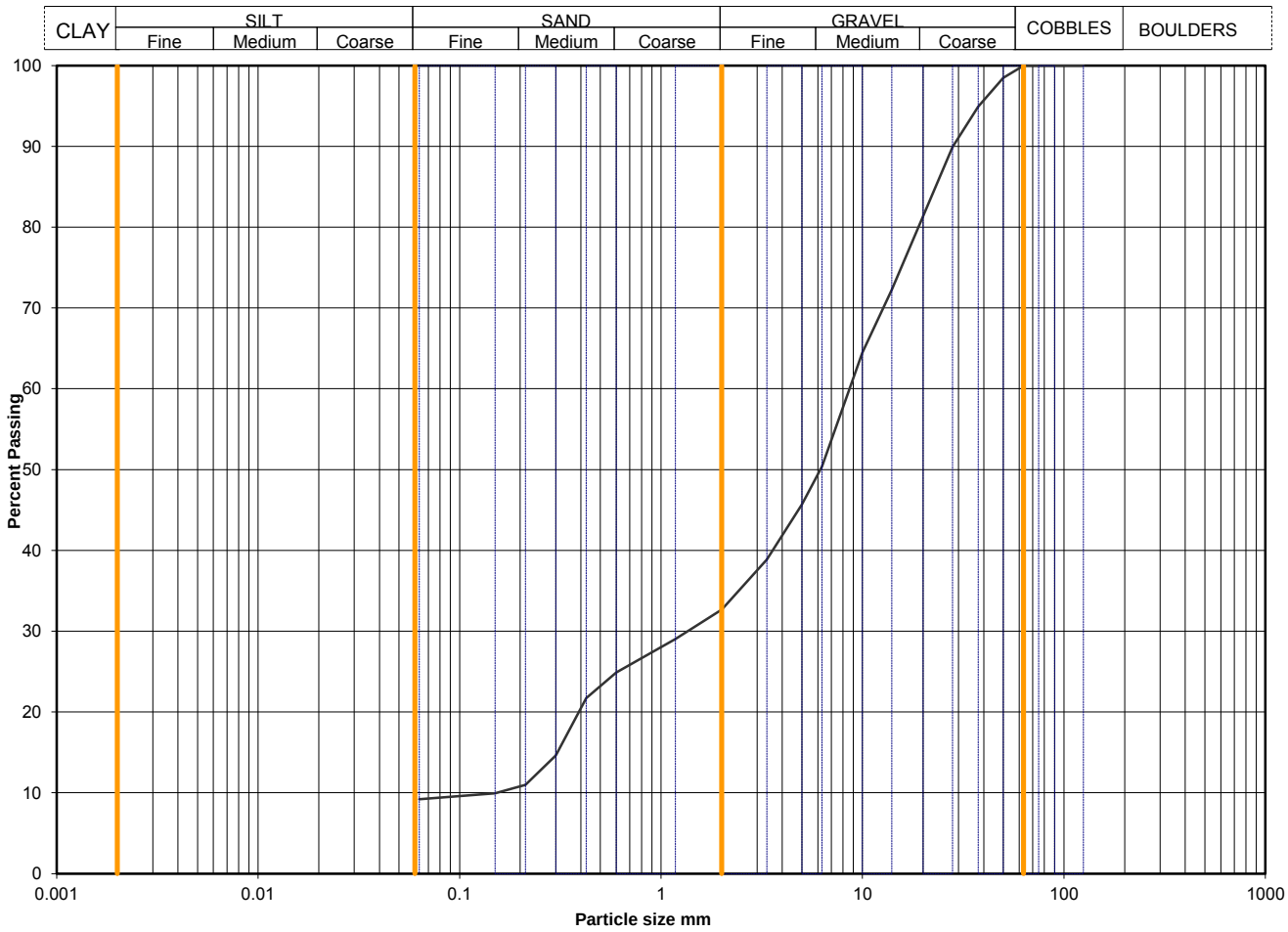
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	FES1180111028

Hole No	HEP-BH-821
Sample Depth (m BGL)	6
Sample Type and No	B28
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	98		
37.5	95		
28	90		
20	81		
14	72		
10	64		
6.3	50		
5.0	46		
3.35	39		
2.00	33		
1.18	29		
0.600	25		
0.425	22		
0.300	15	Dry mass of sample, kg	
0.212	11		
0.150	10	17.3	
0.063	9		

Soil description	Yellowish brown slightly sandy very gravelly CLAY.
Preparation / Pretreatment	Sieve: natural material
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	67	67
	Sand	23	23
*<60mm values to aid description only	Silt	silt+clay =	
	Clay	9	9

Uniformity Coefficient	D60 / D10	57

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	none

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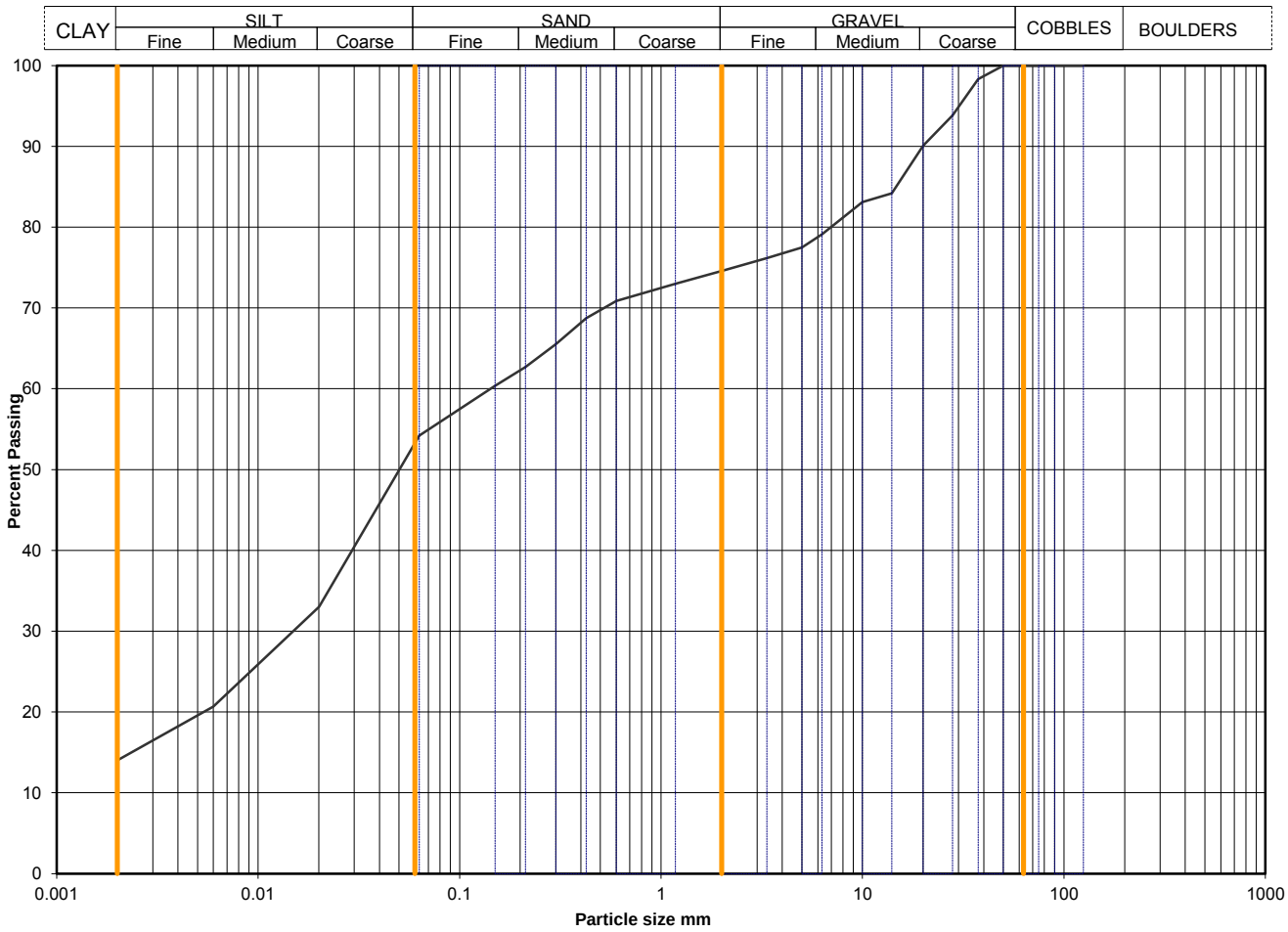
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	FES1171130012

Hole No	HEP-BH-823
Sample Depth (m BGL)	2.5
Sample Type and No	B12
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0201	33
90	100	0.0060	21
75	100	0.0020	14
63	100		
50	100		
37.5	98		
28	94		
20	90		
14	84		
10	83		
6.3	79		
5.0	77		
3.35	76		
2.00	75		
1.18	73	Particle density, Mg/m3	
0.600	71		
0.425	69	2.65 assumed	
0.300	66	Dry mass of sample, kg	
0.212	63		
0.150	60	10.3	
0.063	54		

Soil description	Brown slightly sandy slightly gravelly silty CLAY.		
Preparation / Pretreatment	Sieve: natural material Pipette: as BS1377		
Remarks			
Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	25	25
	Sand	20	20
*<60mm values to aid description only	Silt	40	40
	Clay	14	14

Uniformity Coefficient	**D60 / D10**	Not applicable

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.4 pipette

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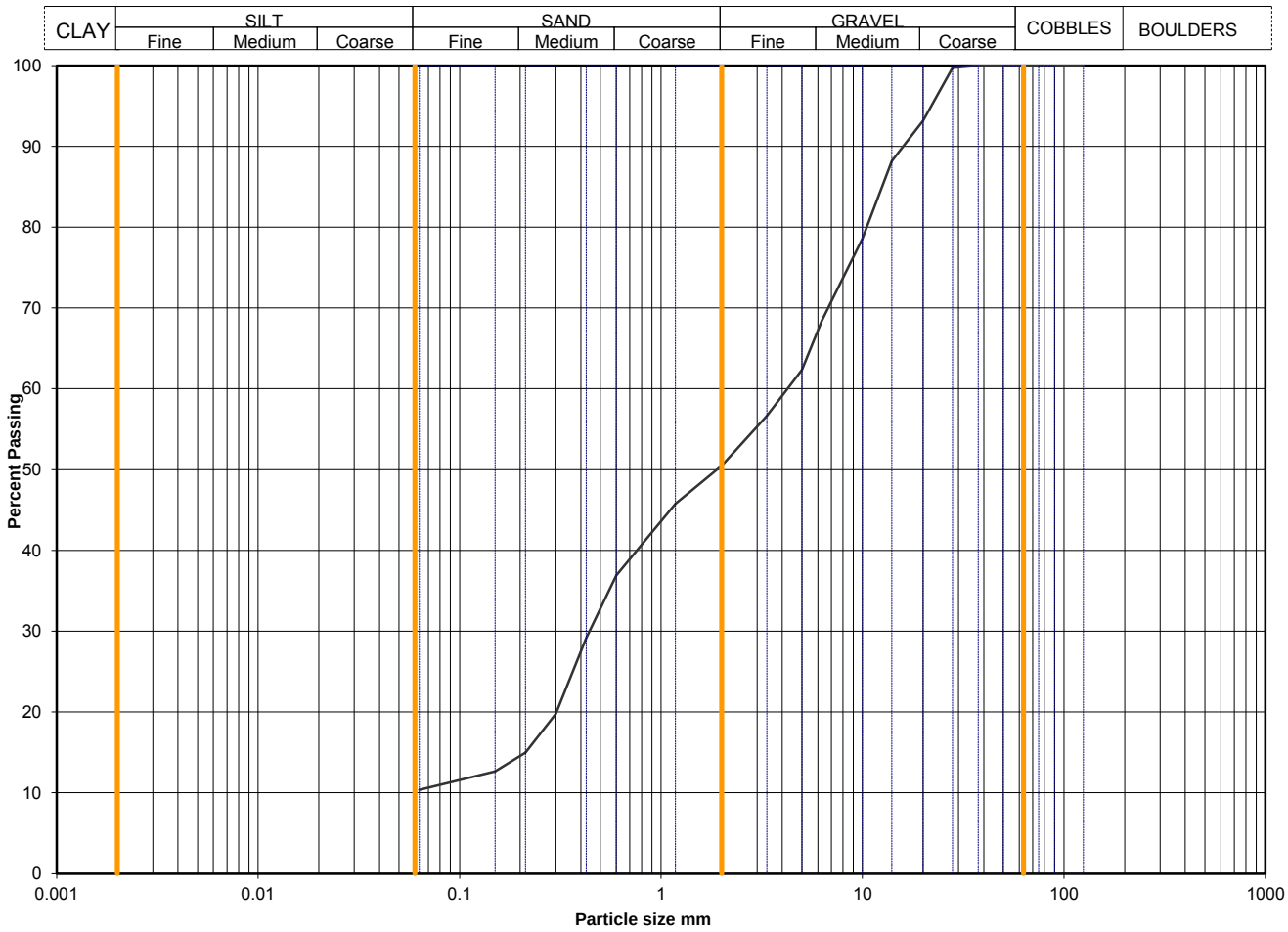
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	FES1171130021

Hole No	HEP-BH-823
Sample Depth (m BGL)	4.35
Sample Type and No	B21
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	93		
14	88		
10	79		
6.3	68		
5.0	62		
3.35	57		
2.00	50		
1.18	46		
0.600	37		
0.425	29		
0.300	20	Dry mass of sample, kg	
0.212	15		
0.150	13	11.3	
0.063	10		

Soil description	Brown very sandy silty GRAVEL.
Preparation / Pretreatment	Sieve: natural material
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	50	50
	Sand	40	40
*<60mm values to aid description only	Silt	silt+clay =	
	Clay	10	10

Uniformity Coefficient	D60 / D10	Not applicable

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	none

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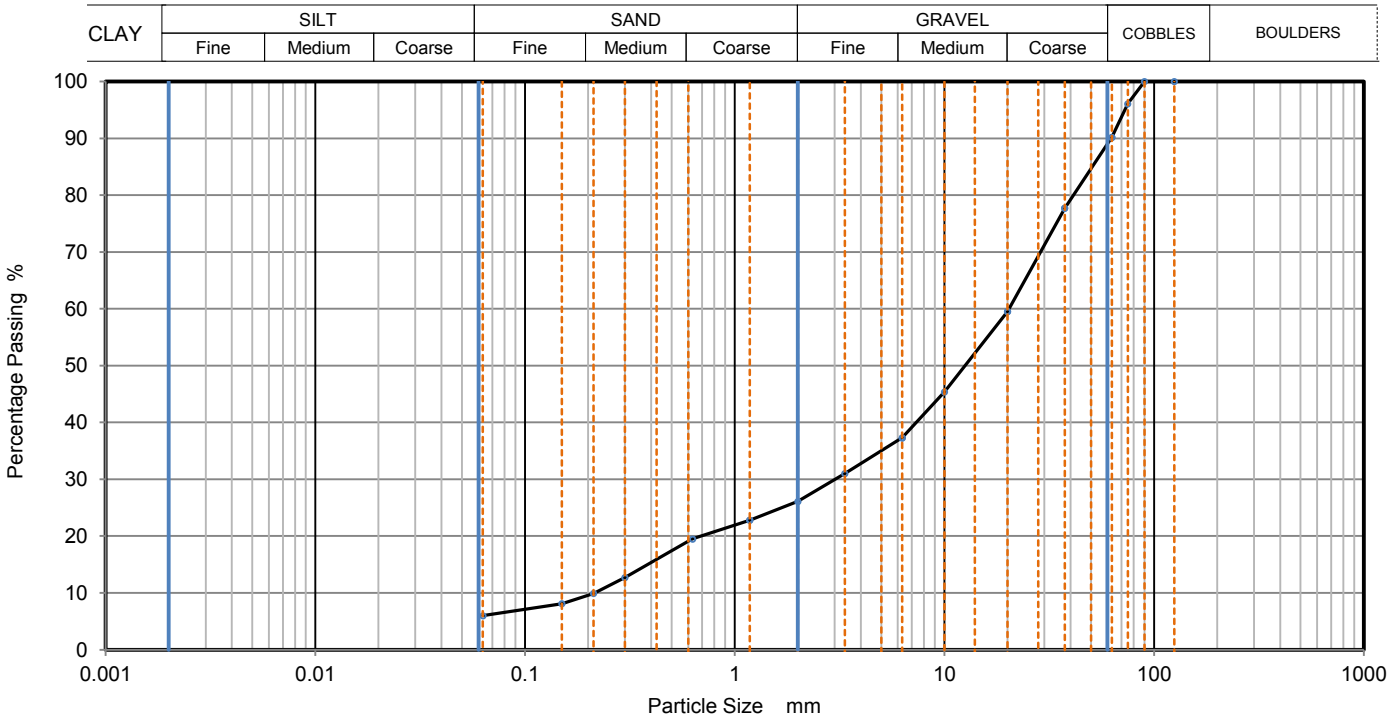
FUGRO	**Particle Size Distribution**			Project No.	G170029U
				Hole	HEP-BH-824
Project Name	HAL Airport Expansion			Sample No.	6
Description	Brown clayey cobbly very sandy GRAVEL			Depth, m	0.20
Specimen Reference		Specimen Depth	m	Sample Type	LB
Test Method	BS1377:Part 2:1990, clause 9.2			KeyLAB ID	FES2171208006



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	96		
63	90		
37.5	78		
20	60		
10	45		
6.3	37		
3.35	31		
2	26		
1.18	23		
0.63	20		
0.3	13		
0.212	10		
0.15	8		
0.063	6		

Dry Mass of sample, g	15964

Sample Proportions	% dry mass
Very coarse	9.8
Gravel	64.2
Sand	20.1
Fines <0.063mm	6.0

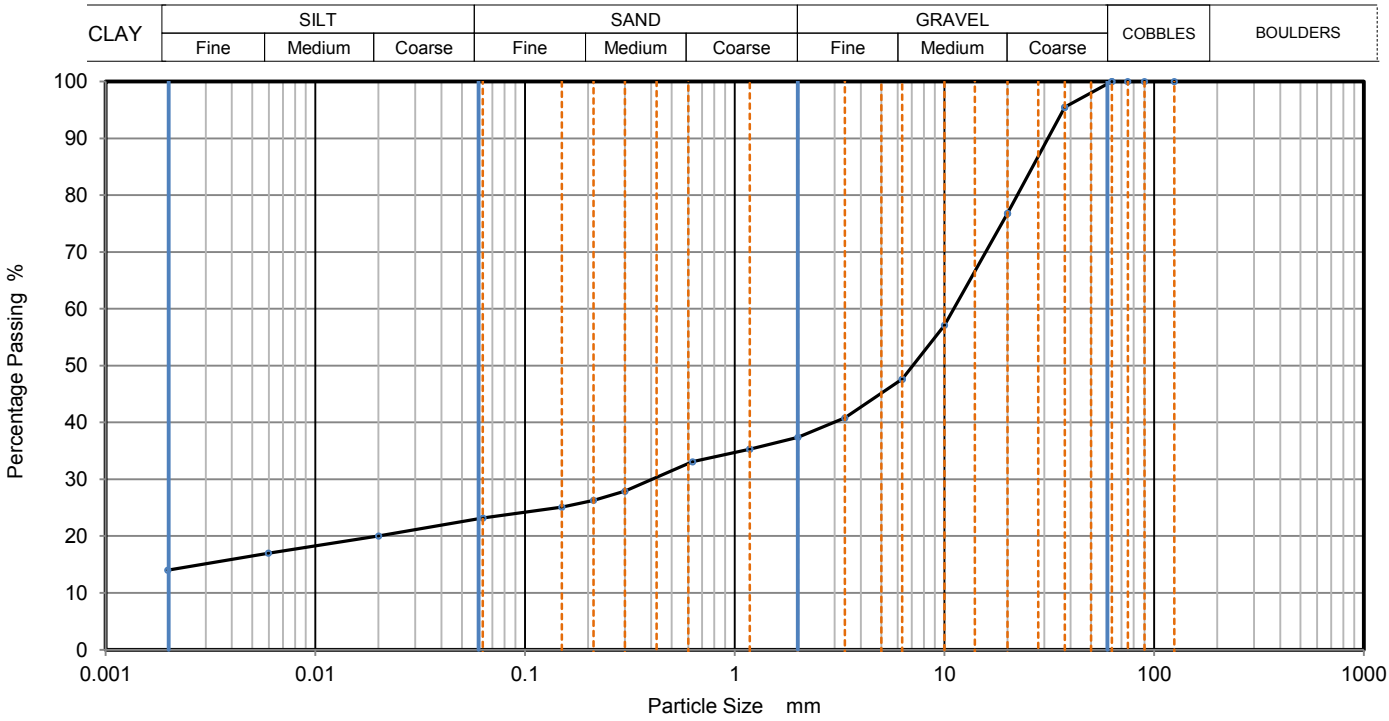
Grading Analysis		
D100	mm	90
D60	mm	20.3
D30	mm	3.03
D10	mm	0.214
Uniformity Coefficient		95
Curvature Coefficient		2.1

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Date printed	Figure number	Sheet number
09/08/2018		

FUGRO	**Particle Size Distribution**			Project No.	G170029U
				Hole	HEP-BH-824
Project Name	HAL Airport Expansion			Sample No.	15
Description	Brown sandy very clayey GRAVEL			Depth, m	2.20
Specimen Reference		Specimen Depth	m	Sample Type	LB
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.4			KeyLAB ID	FES2171208024



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0201	20
90	100	0.0060	17
75	100	0.0020	14
63	100		
37.5	96		
20	77		
10	57		
6.3	48		
3.35	41		
2	37		
1.18	35		
		Particle density	(assumed)
0.63	33	2.70	Mg/m3
0.3	28		
0.212	26		
0.15	25		
0.063	23		

Dry Mass of sample, g	7443

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	62.6
Sand	14.3
Silt	9.4
Clay	13.7

Grading Analysis		
D100	mm	63
D60	mm	11.1
D30	mm	0.404
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Date printed	Figure number	Sheet number
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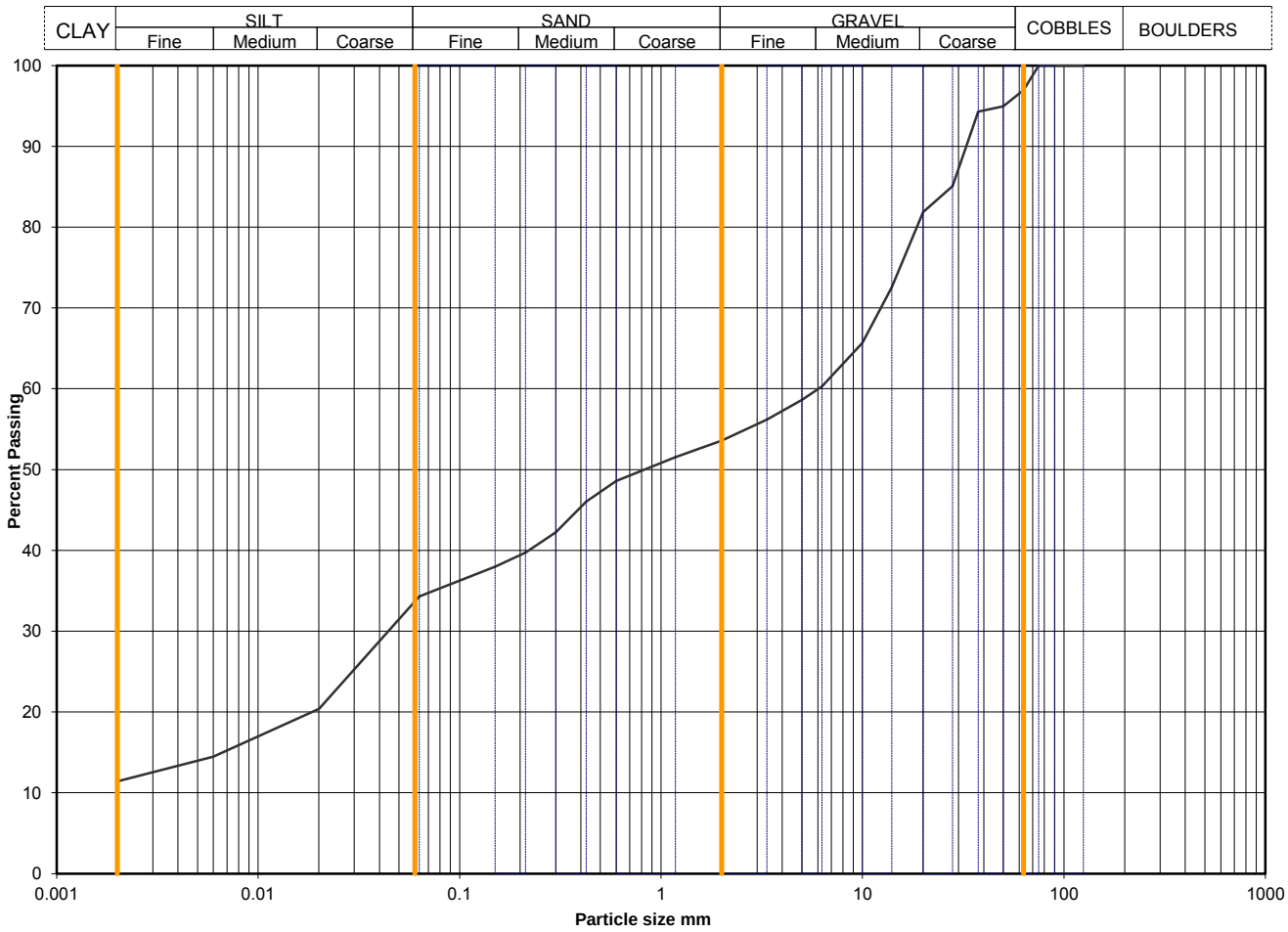
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	FES1171124002

Hole No	HEP-BH-826
Sample Depth (m BGL)	1.3
Sample Type and No	LB7
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0201	20
90	100	0.0060	14
75	100	0.0020	11
63	97		
50	95		
37.5	94		
28	85		
20	82		
14	73		
10	66		
6.3	60		
5.0	59		
3.35	56		
2.00	54		
1.18	52	Particle density, Mg/m3	
0.600	49		
0.425	46	2.65 assumed	
0.300	42	Dry mass of sample, kg	
0.212	40		
0.150	38	13.0	
0.063	34		

Soil description	Brown slightly sandy gravelly silty CLAY with one cobble.
Preparation / Pretreatment	Sieve: natural material Pipette: as BS1377
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	3	0
	Gravel	43	44
	Sand	19	20
*<60mm values to aid description only	Silt	23	24
	Clay	11	12

Uniformity Coefficient	D60 / D10	Not applicable

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.4 pipette

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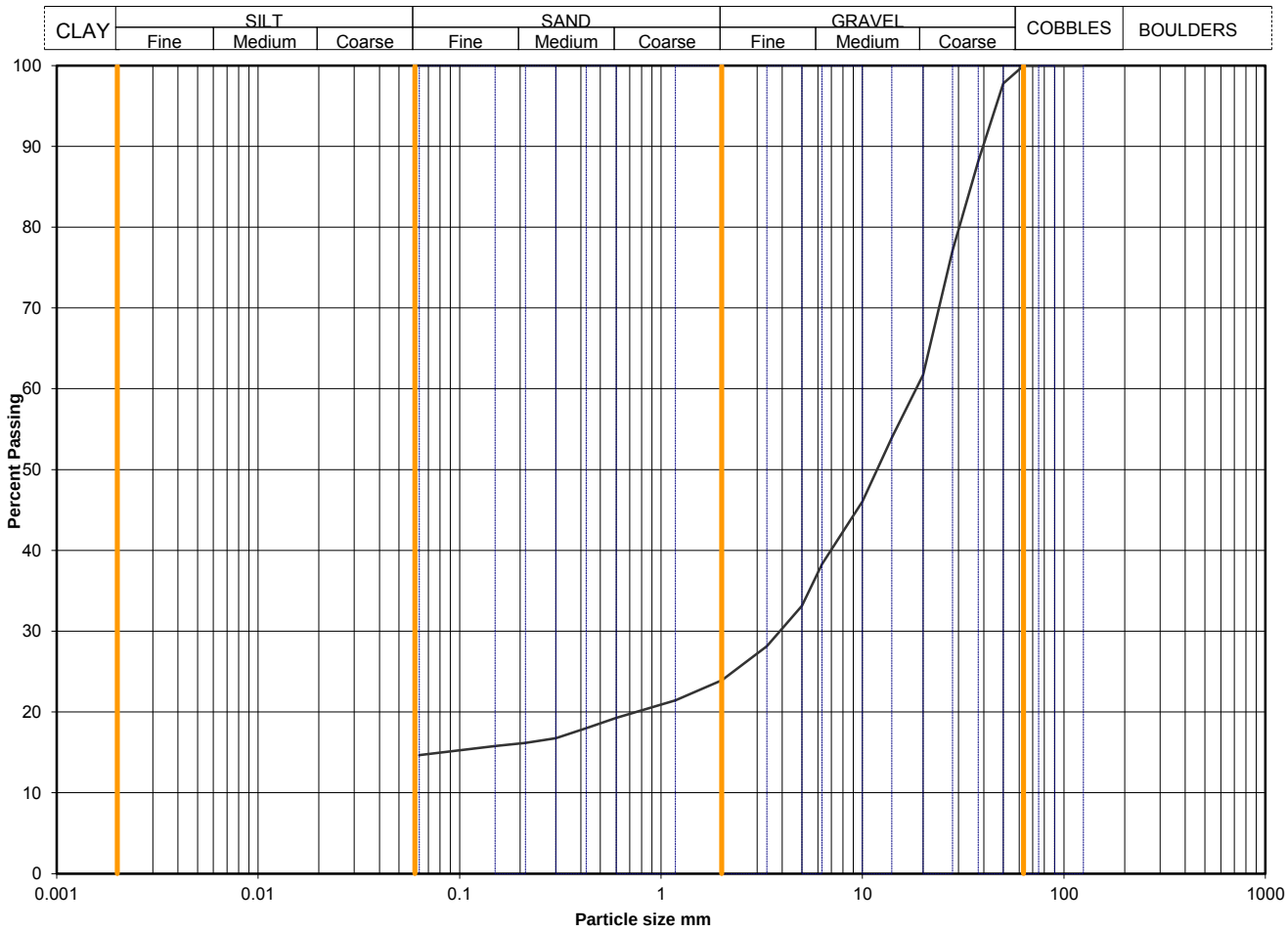
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	FES1171124017

Hole No	HEP-BH-826
Sample Depth (m BGL)	4.1
Sample Type and No	B22
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	98		
37.5	88		
28	77		
20	62		
14	54		
10	46		
6.3	38		
5.0	33		
3.35	28		
2.00	24		
1.18	21		
0.600	19		
0.425	18		
0.300	17	Dry mass of sample, kg	
0.212	16		
0.150	16	10.2	
0.063	15		

Soil description	Brown sandy clayey GRAVEL.
Preparation / Pretreatment	Sieve: natural material
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	76	76
	Sand	9	9
*<60mm values to aid description only	Silt	silt+clay =	
	Clay	15	15

Uniformity Coefficient	D60 / D10	Not applicable

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	none

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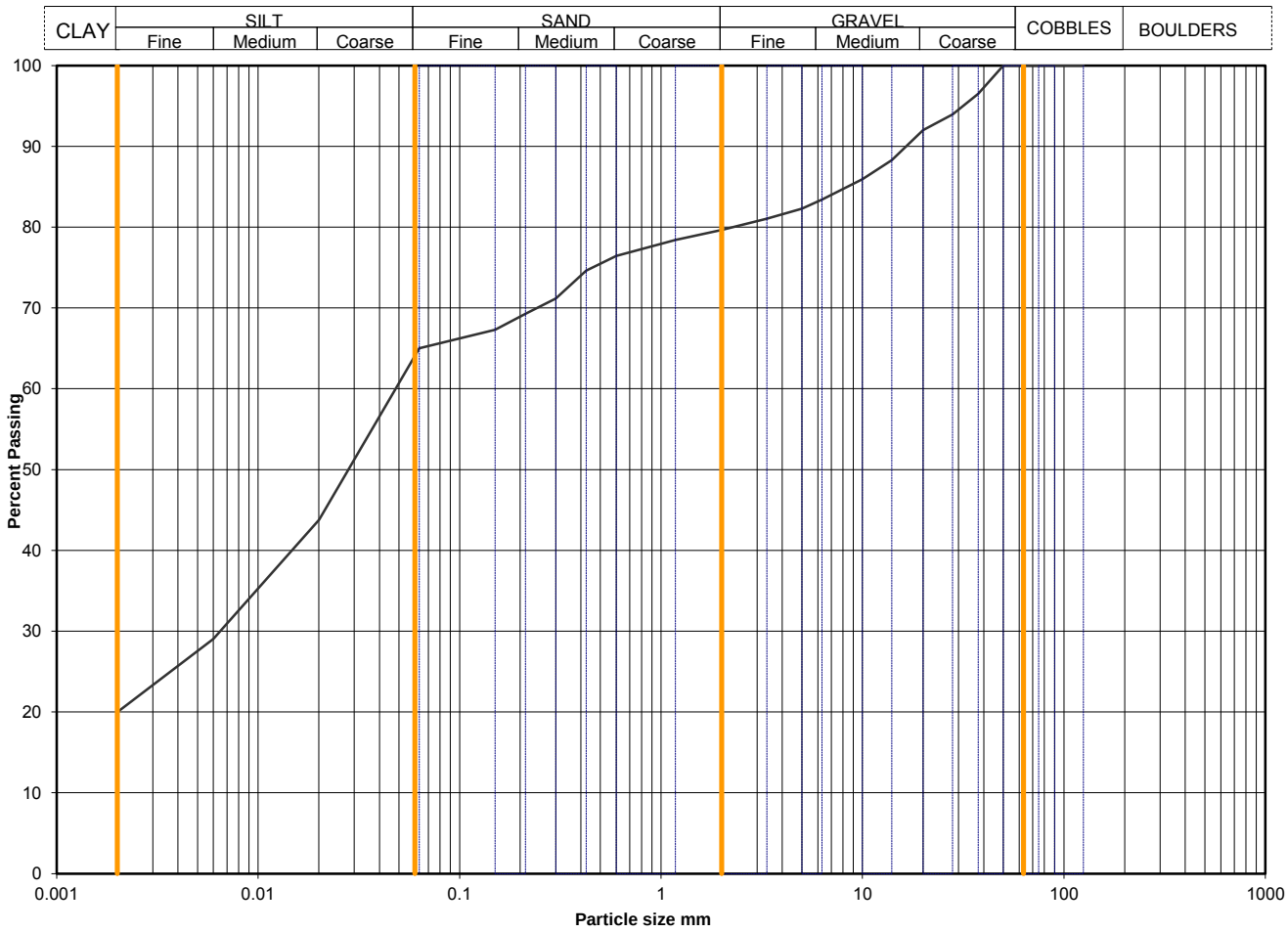
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	FES1180318011

Hole No	HEP-BH-1047
Sample Depth (m BGL)	1.5
Sample Type and No	B11
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0201	44
90	100	0.0060	29
75	100	0.0020	20
63	100		
50	100		
37.5	96		
28	94		
20	92		
14	88		
10	86		
6.3	83		
5.0	82		
3.35	81		
2.00	80		
1.18	78	Particle density, Mg/m3	
0.600	76		
0.425	75	2.65 assumed	
0.300	71	Dry mass of sample, kg	
0.212	69		
0.150	67	9.2	
0.063	65		

Soil description	Black spongy pseudo fibrous slightly sandy slightly gravelly clayey PEAT.
Preparation / Pretreatment	Sieve: natural material Pipette: as BS1377
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	20	20
	Sand	15	15
*<60mm values to aid description only	Silt	45	45
	Clay	20	20

Uniformity Coefficient	D60 / D10	Not applicable

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.4 pipette

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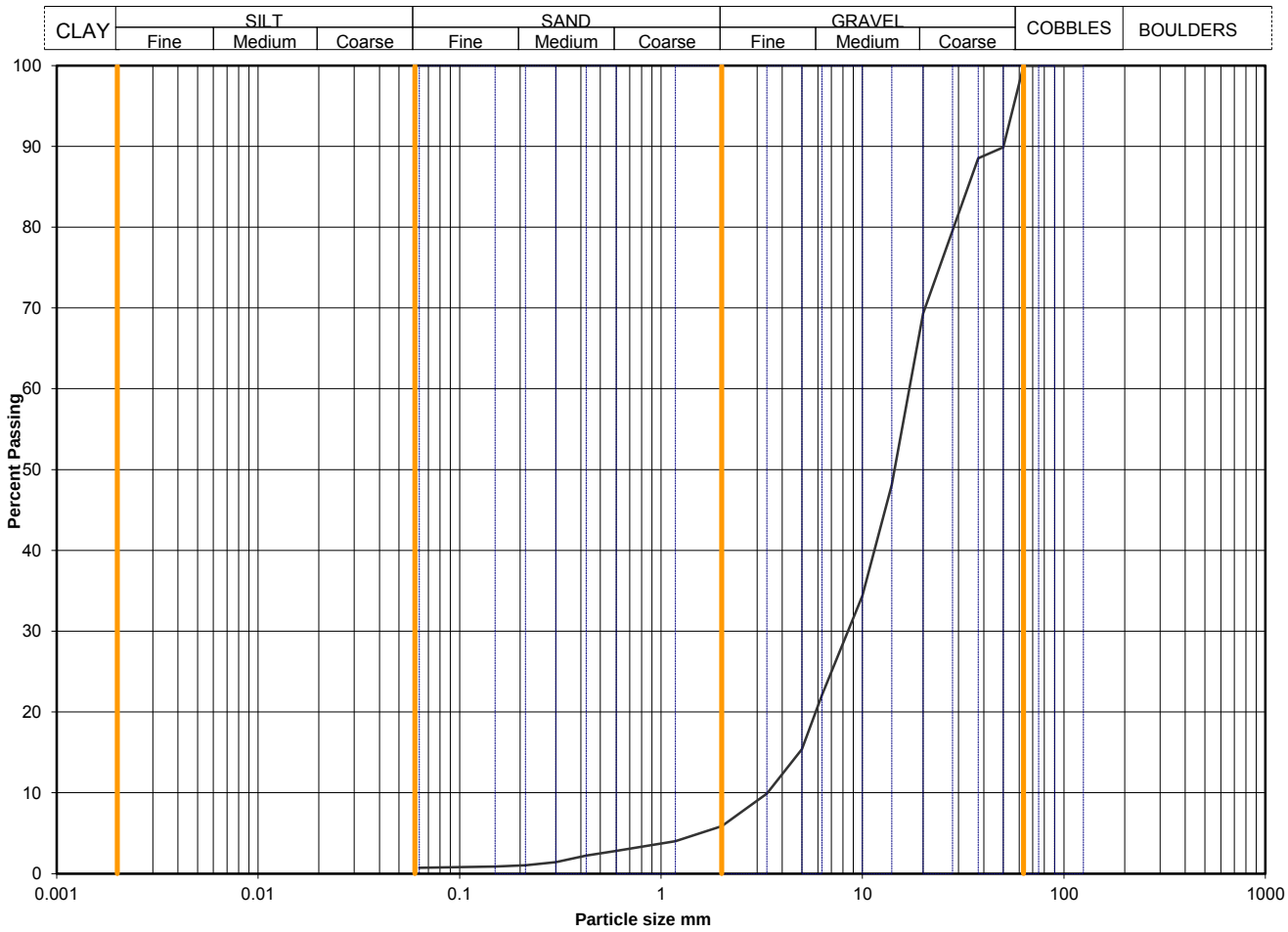
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	FES1180318019

Hole No	HEP-BH-1047
Sample Depth (m BGL)	2.7
Sample Type and No	B19
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	90		
37.5	89		
28	80		
20	69		
14	48		
10	34		
6.3	22		
5.0	15		
3.35	10		
2.00	6		
1.18	4		
0.600	3		
0.425	2		
0.300	1	Dry mass of sample, kg	
0.212	1		
0.150	1	7.7	
0.063	1		

Soil description	Black sandy GRAVEL.		
Preparation / Pretreatment	Sieve: natural material		
Remarks			
Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	94	94
	Sand	5	5
*<60mm values to aid description only	Silt	silt+clay =	
	Clay	1	1

Uniformity Coefficient	**D60 / D10**	5

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	none

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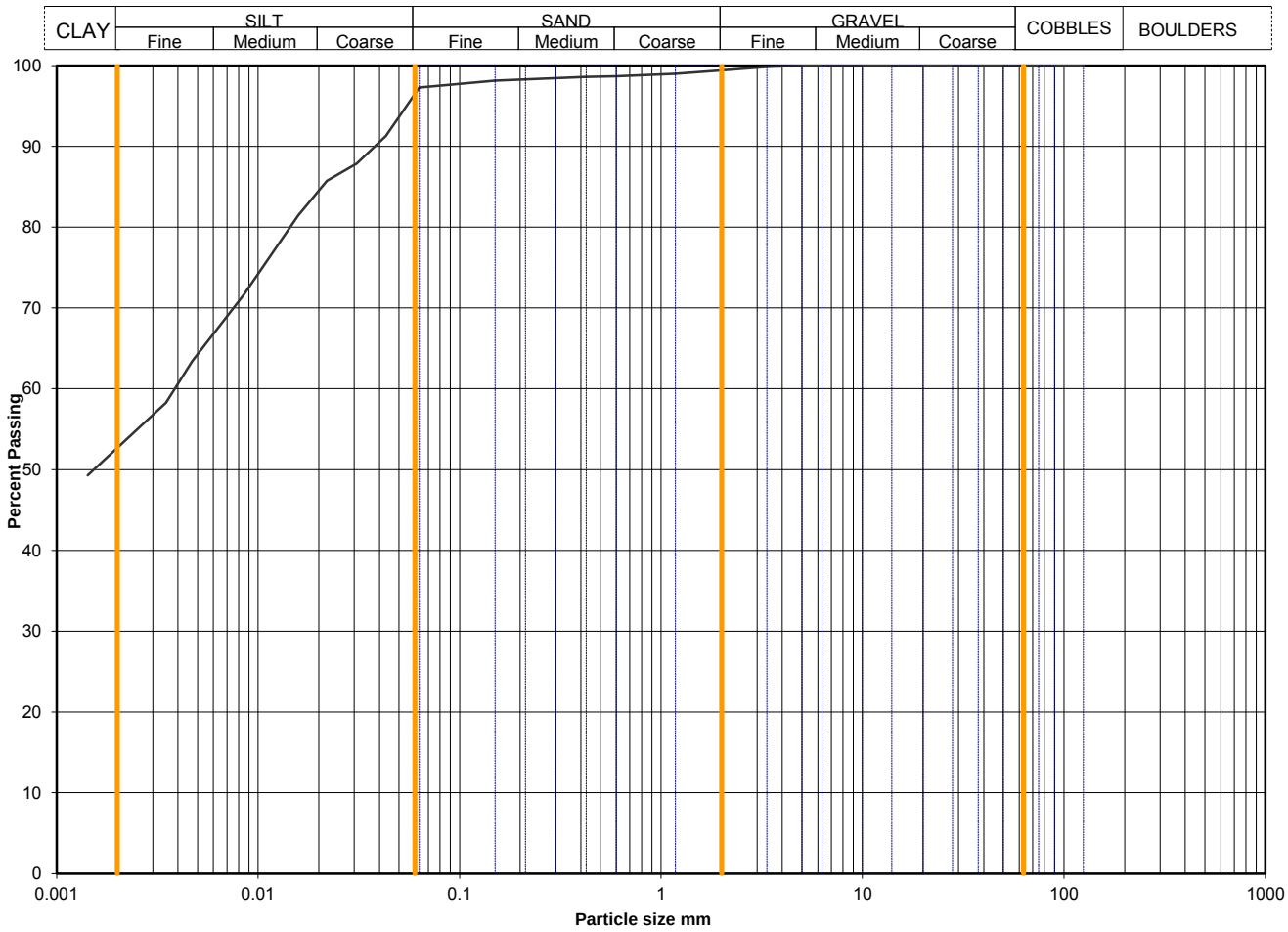
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	FES1180318031

Hole No	HEP-BH-1047
Sample Depth (m BGL)	6
Sample Type and No	UT31
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	97
90	100	0.0430	91
75	100	0.0308	88
63	100	0.0220	86
50	100	0.0158	81
37.5	100	0.0085	72
28	100	0.0047	63
20	100	0.0035	58
14	100	0.0014	49
10	100		
6.3	100		
5.0	100		
3.35	100		
2.00	99		
1.18	99	Particle density, Mg/m3	
0.600	99		
0.425	99	2.65 assumed	
0.300	98	Dry mass of sample, kg	
0.212	98		
0.150	98	1.2	
0.063	97		

Soil description	Firm brown slightly sandy silty CLAY.
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	1	1
	Sand	2	2
*<60mm values to aid description only	Silt	45	45
	Clay	53	53

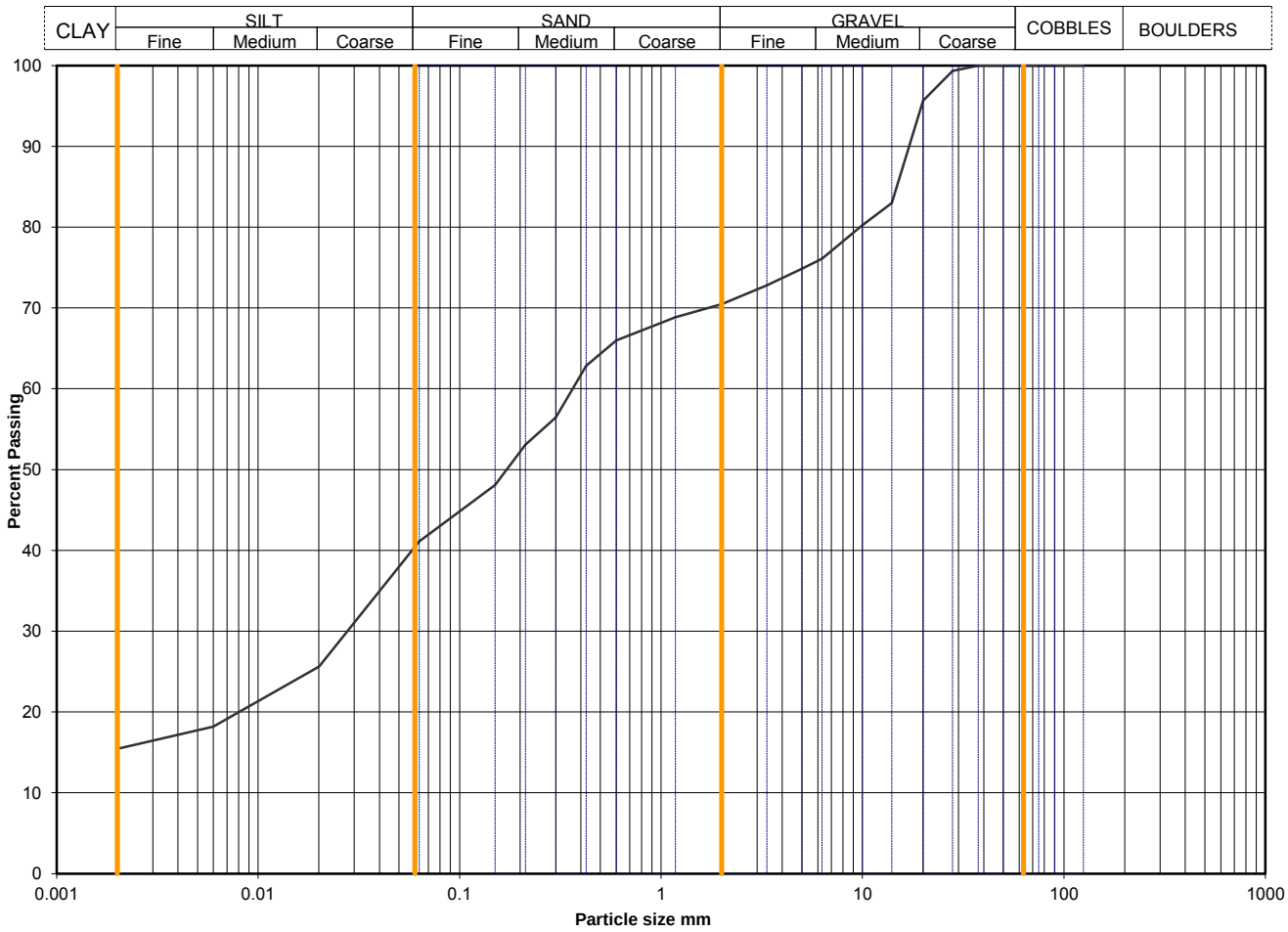
Uniformity Coefficient	D60 / D10	Not applicable

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	HEPBH105020180320006

Hole No	HEP-BH-1050
Sample Depth (m BGL)	1.1
Sample Type and No	B8
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0201	26
90	100	0.0060	18
75	100	0.0020	15
63	100		
50	100		
37.5	100		
28	99		
20	96		
14	83		
10	80		
6.3	76		
5.0	75		
3.35	73		
2.00	70		
1.18	69	Particle density, Mg/m3	
0.600	66		
0.425	63	2.65 assumed	
0.300	56	Dry mass of sample, kg	
0.212	53		
0.150	48	7.0	
0.063	41		

Soil description	Brown slightly sandy slightly gravelly silty CLAY.		
Preparation / Pretreatment	Sieve: natural material Pipette: as BS1377		
Remarks			
Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	30	30
	Sand	29	29
*<60mm values to aid description only	Silt	26	26
	Clay	15	15

Uniformity Coefficient	**D60 / D10**	Not applicable

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.4 pipette

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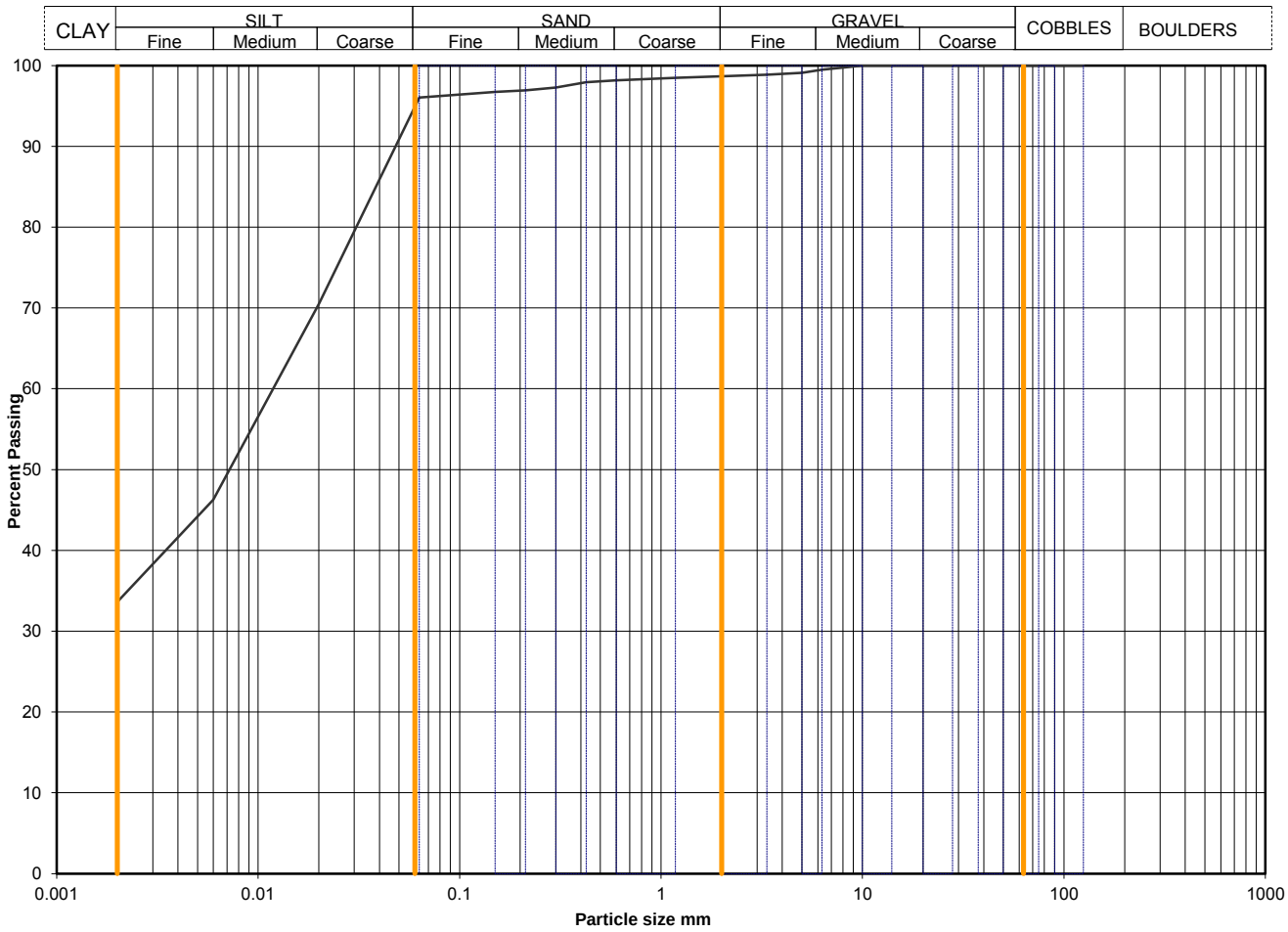
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	HEPBH105020180320010

Hole No	HEP-BH-1050
Sample Depth (m BGL)	2
Sample Type and No	B14
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0201	71
90	100	0.0060	46
75	100	0.0020	34
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	99		
5.0	99		
3.35	99		
2.00	99		
1.18	98	Particle density, Mg/m3	
0.600	98		
0.425	98	2.65 assumed	
0.300	97	Dry mass of sample, kg	
0.212	97		
0.150	97	6.2	
0.063	96		

Soil description	Dark brown slightly sandy silty CLAY.
Preparation / Pretreatment	Sieve: natural material Pipette: as BS1377
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	1	1
	Sand	3	3
*<60mm values to aid description only	Silt	62	62
	Clay	34	34

Uniformity Coefficient	D60 / D10	Not applicable

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.4 pipette

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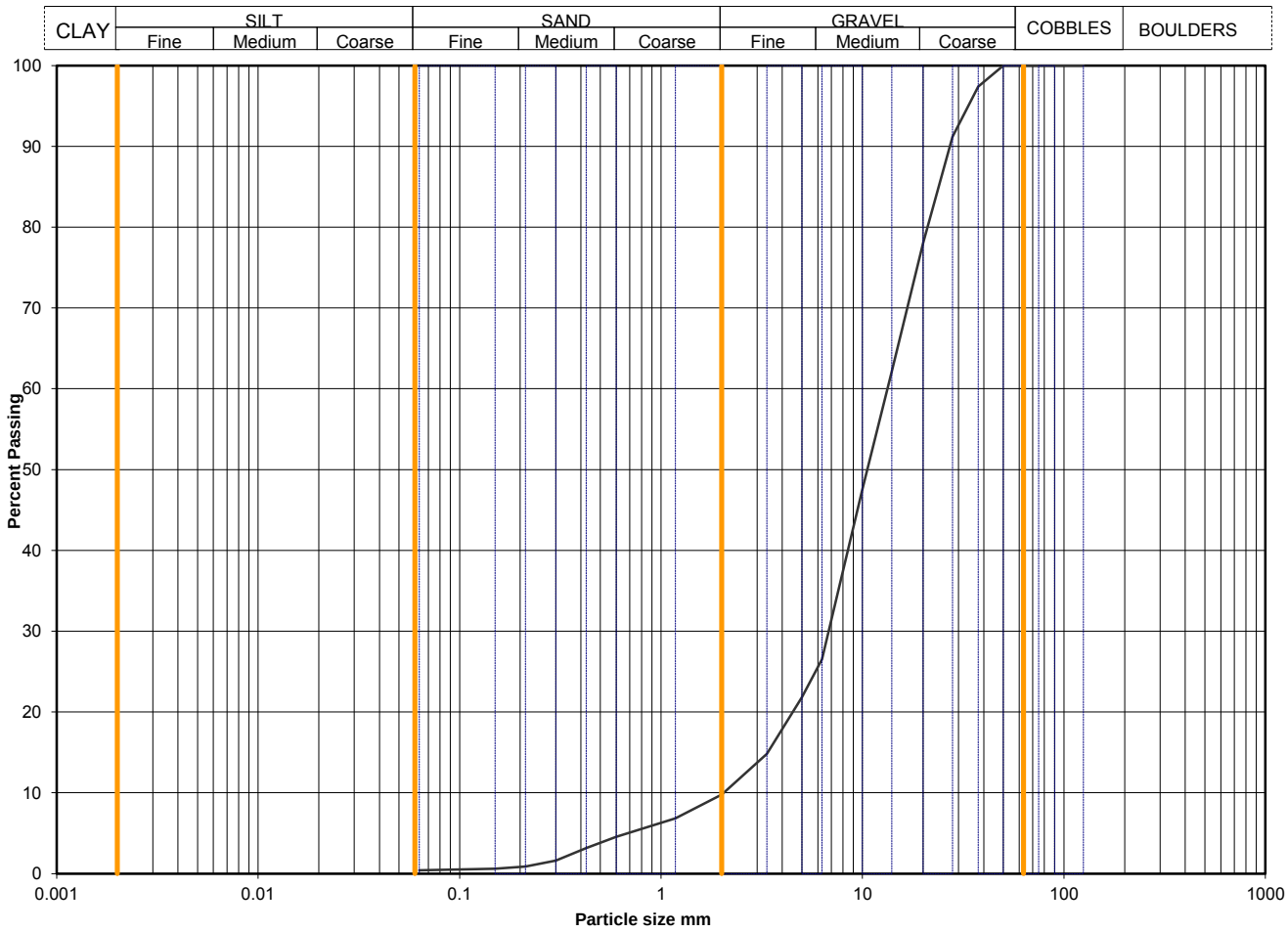
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	HEPBH105020180320014

Hole No	HEP-BH-1050
Sample Depth (m BGL)	4
Sample Type and No	B21
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	97		
28	91		
20	78		
14	62		
10	48		
6.3	26		
5.0	22		
3.35	15		
2.00	10		
1.18	7		
0.600	5		
0.425	3		
0.300	2	Dry mass of sample, kg	
0.212	1		
0.150	1	27.3	
0.063	0		

Soil description	Brown sandy GRAVEL.
Preparation / Pretreatment	Sieve: natural material
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	90	90
	Sand	9	9
*<60mm values to aid description only	Silt	silt+clay =	
	Clay	0	0

Uniformity Coefficient	D60 / D10	7

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	none

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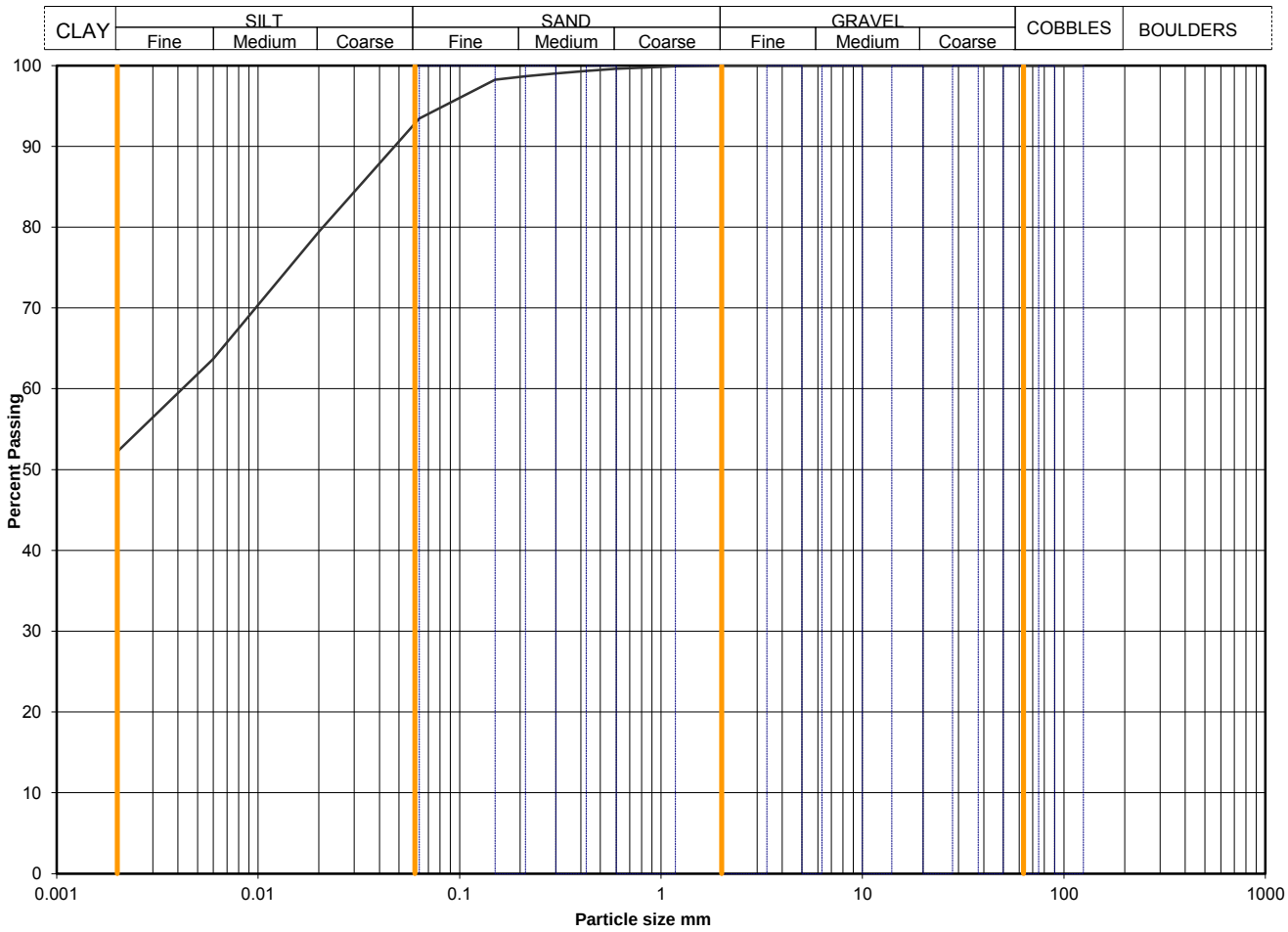
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	HEPBH105020180320020

Hole No	HEP-BH-1050
Sample Depth (m BGL)	8
Sample Type and No	UT33
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0201	79
90	100	0.0060	64
75	100	0.0020	52
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5.0	100		
3.35	100		
2.00	100		
1.18	100	Particle density, Mg/m3	
0.600	100		
0.425	99	2.65 assumed	
0.300	99	Dry mass of sample, kg	
0.212	99		
0.150	98	0.5	
0.063	93		

Soil description	Firm laminated brown slightly sandy silty CLAY.
Preparation / Pretreatment	Sieve: natural material Pipette: as BS1377
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	0	0
	Sand	7	7
*<60mm values to aid description only	Silt	41	41
	Clay	52	52

Uniformity Coefficient	D60 / D10	Not applicable

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.4 pipette

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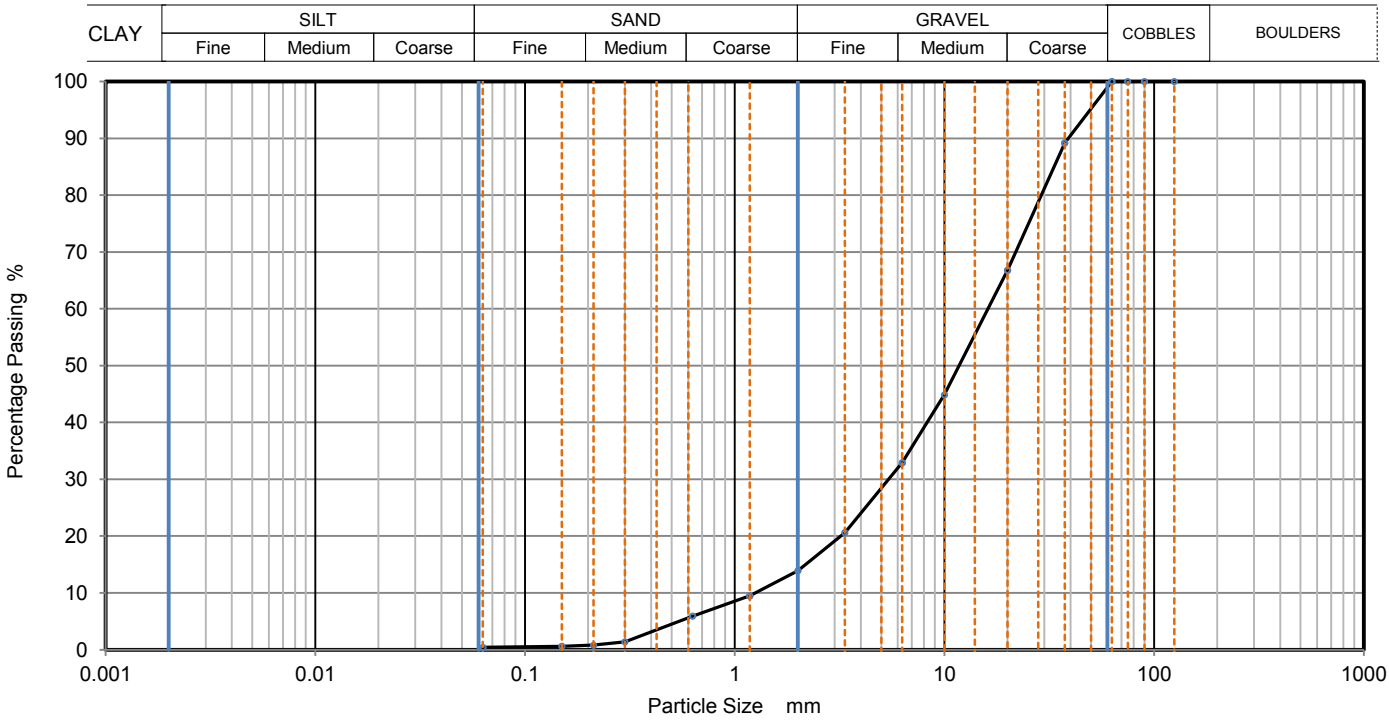
FUGRO	**Particle Size Distribution**			Project No.	G170029U
				Hole	HEP-BH-1802
Project Name	HAL Airport Expansion			Sample No.	9
Description	Brown slightly clayey sandy GRAVEL			Depth, m	1.20
Specimen Reference		Specimen Depth	m	Sample Type	B
Test Method	BS1377:Part 2:1990, clause 9.2			KeyLAB ID	HEPBH180220171208006



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
37.5	89		
20	67		
10	45		
6.3	33		
3.35	21		
2	14		
1.18	10		
0.63	6		
0.3	1		
0.212	1		
0.15	1		
0.063	0		

Dry Mass of sample, g: 9412

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	86.1
Sand	13.4
Fines <0.063mm	0.4

Grading Analysis		
D100	mm	63
D60	mm	16.1
D30	mm	5.42
D10	mm	1.25
Uniformity Coefficient		13
Curvature Coefficient		1.5

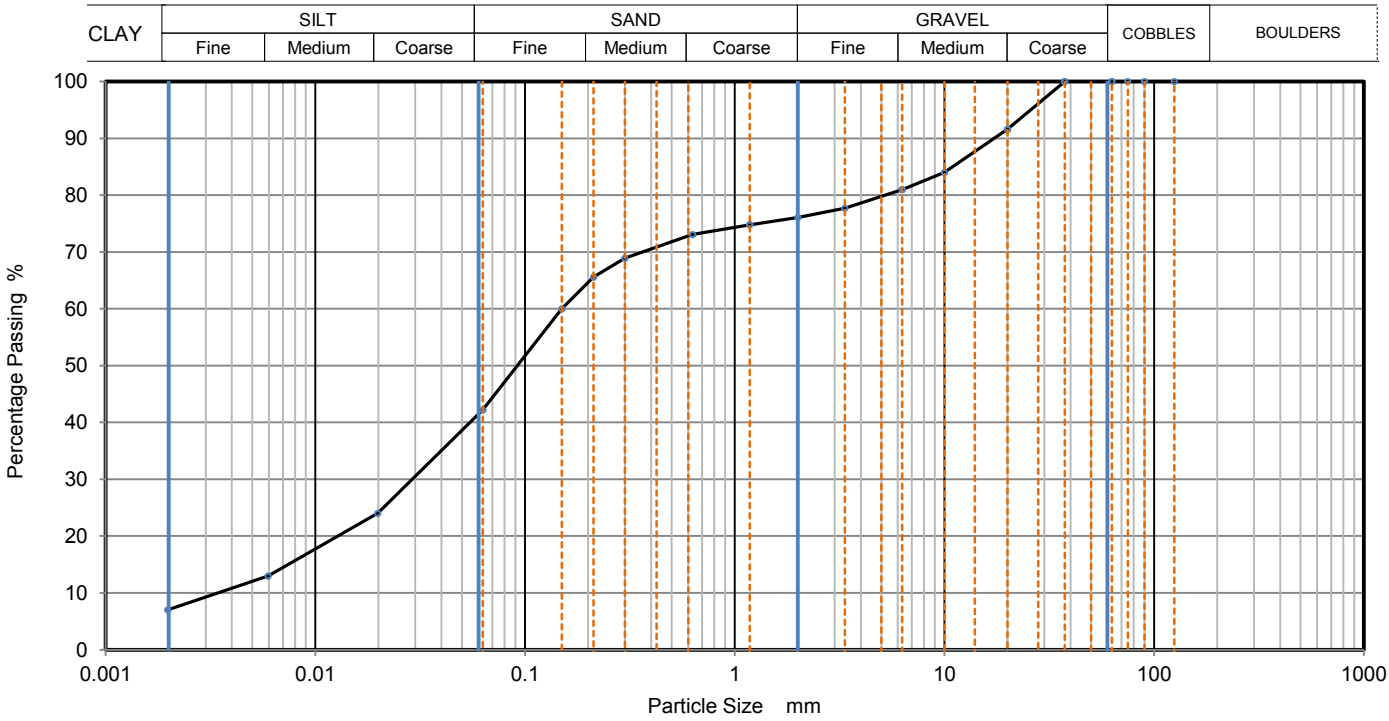
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Insufficient material to comply with BS1377. Treat results with caution.

Date printed	Figure number	Sheet number
09/08/2018		

FUGRO	**Particle Size Distribution**			Project No.	G170029U
				Hole	HEP-BH-1804
Project Name	HAL Airport Expansion			Sample No.	4
Description	Brown slightly gravelly slightly sandy SILT			Depth, m	0.30
Specimen Reference		Specimen Depth	m	Sample Type	B
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.4			KeyLAB ID	HEPBH180420171123006



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0199	24
90	100	0.0060	13
75	100	0.0020	7
63	100		
37.5	100		
20	92		
10	84		
6.3	81		
3.35	78		
2	76		
1.18	75		
		Particle density	(assumed)
0.63	73	2.70	Mg/m3
0.3	69		
0.212	66		
0.15	60		
0.063	42		

Dry Mass of sample, g	6458

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	23.9
Sand	33.9
Silt	35.0
Clay	7.2

Grading Analysis		
D100	mm	37.5
D60	mm	0.15
D30	mm	0.0294
D10	mm	0.0034
Uniformity Coefficient		44
Curvature Coefficient		1.7

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Date printed	Figure number	Sheet number
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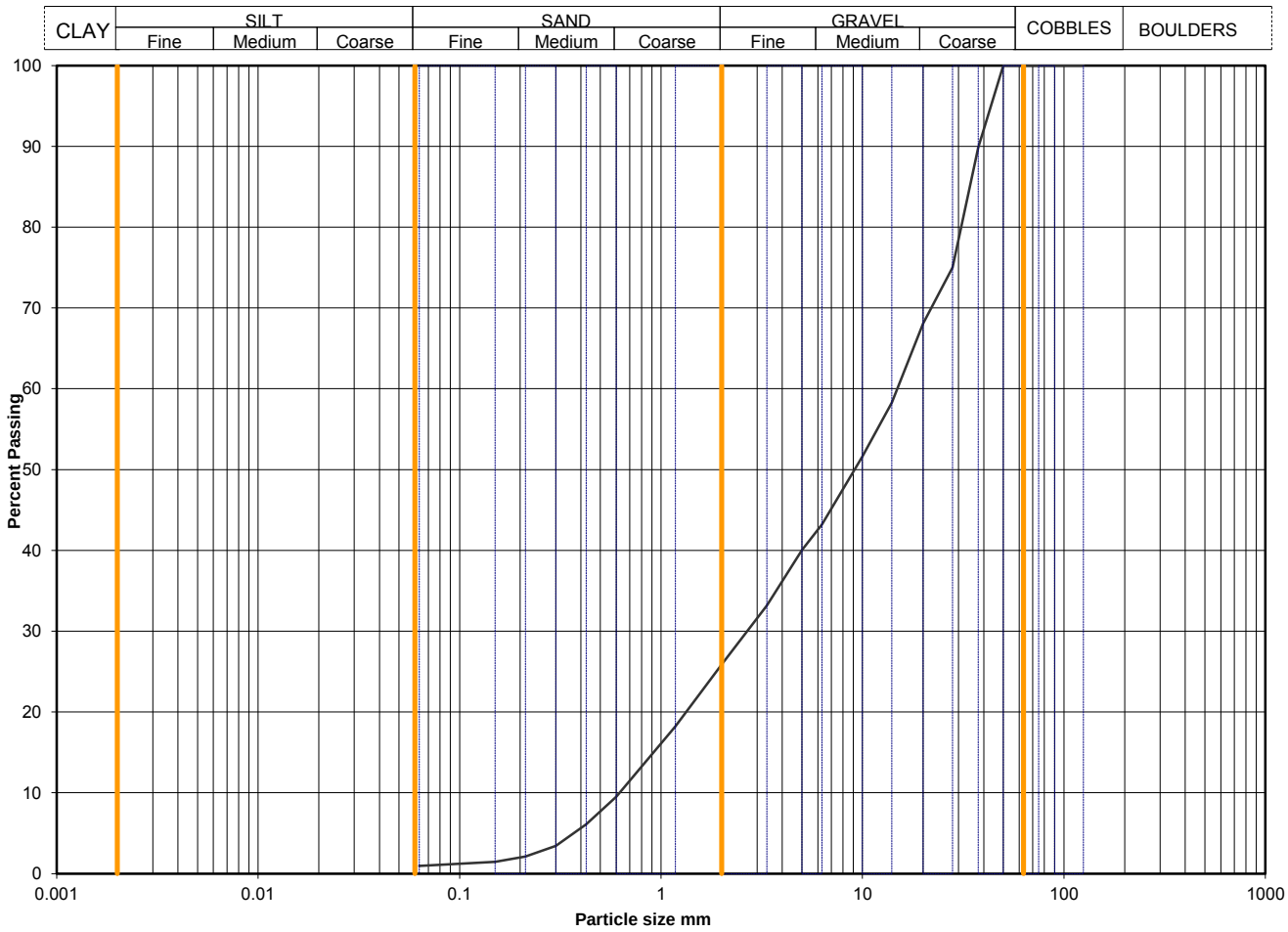
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	HEPBH180420171206007

Hole No	HEP-BH-1804
Sample Depth (m BGL)	1.2
Sample Type and No	B14
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	90		
28	75		
20	68		
14	58		
10	52		
6.3	43		
5.0	40		
3.35	33		
2.00	26		
1.18	18		
0.600	10		
0.425	6		
0.300	3	Dry mass of sample, kg	
0.212	2		
0.150	1	10.0	
0.063	1		

Soil description	Dark brown very sandy GRAVEL.
Preparation / Pretreatment	Sieve: natural material
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	74	74
	Sand	25	25
*<60mm values to aid description only	Silt	silt+clay =	
	Clay	1	1

Uniformity Coefficient	D60 / D10	24

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.3 dry sieve
	Sedimentation	none

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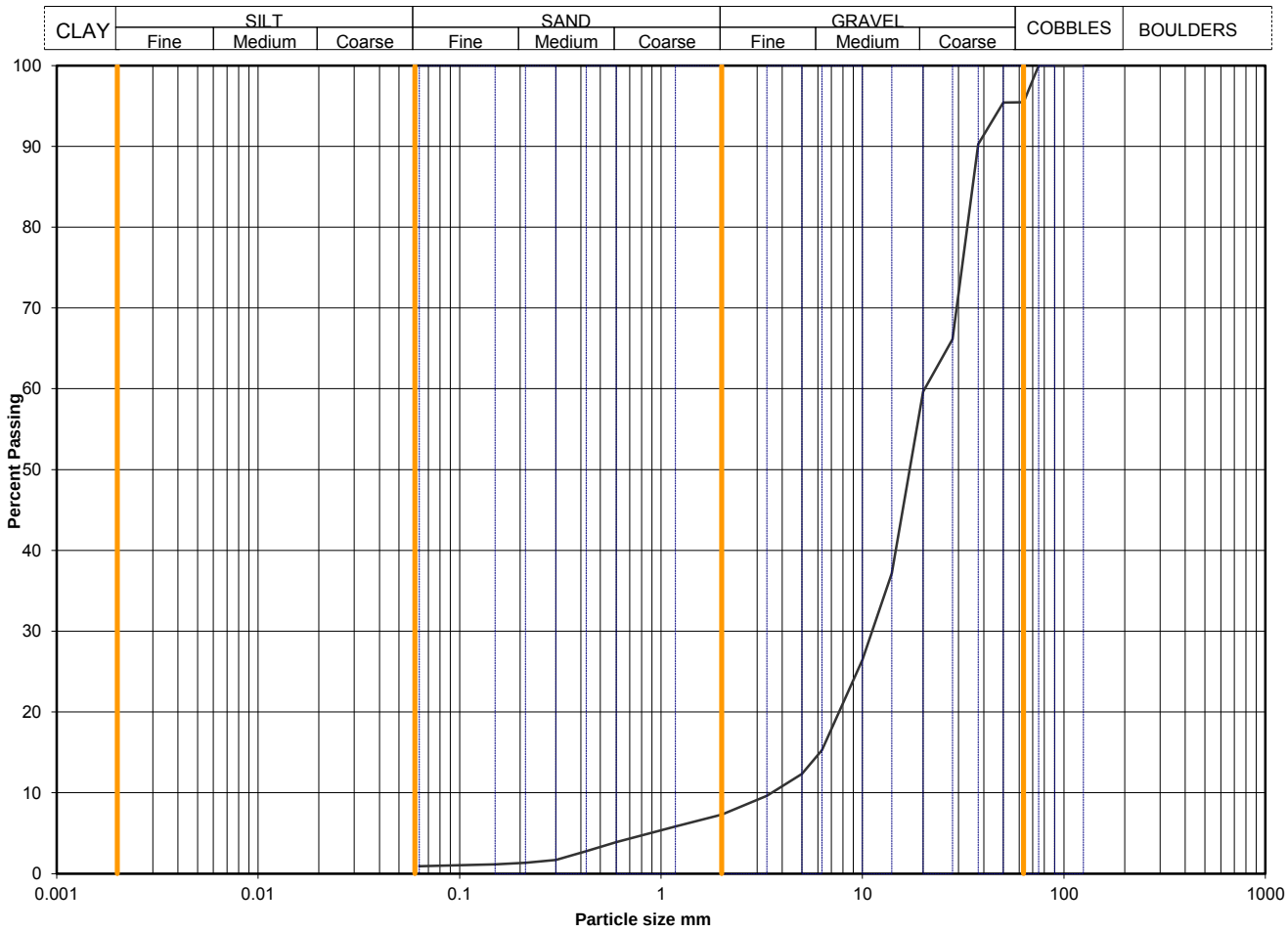
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	HEPBH180420171206011

Hole No	HEP-BH-1804
Sample Depth (m BGL)	3
Sample Type and No	B20
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	95		
50	95		
37.5	90		
28	66		
20	60		
14	37		
10	26		
6.3	15		
5.0	12		
3.35	10		
2.00	7		
1.18	6		
0.600	4		
0.425	3		
0.300	2	Dry mass of sample, kg	
0.212	1		
0.150	1	14.3	
0.063	1		

Soil description	Multicoloured sandy GRAVEL with one cobble.
Preparation / Pretreatment	Sieve: natural material
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	5	0
	Gravel	88	93
	Sand	6	6
*<60mm values to aid description only	Silt	silt+clay =	
	Clay	1	1

Uniformity Coefficient	D60 / D10	6

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	none

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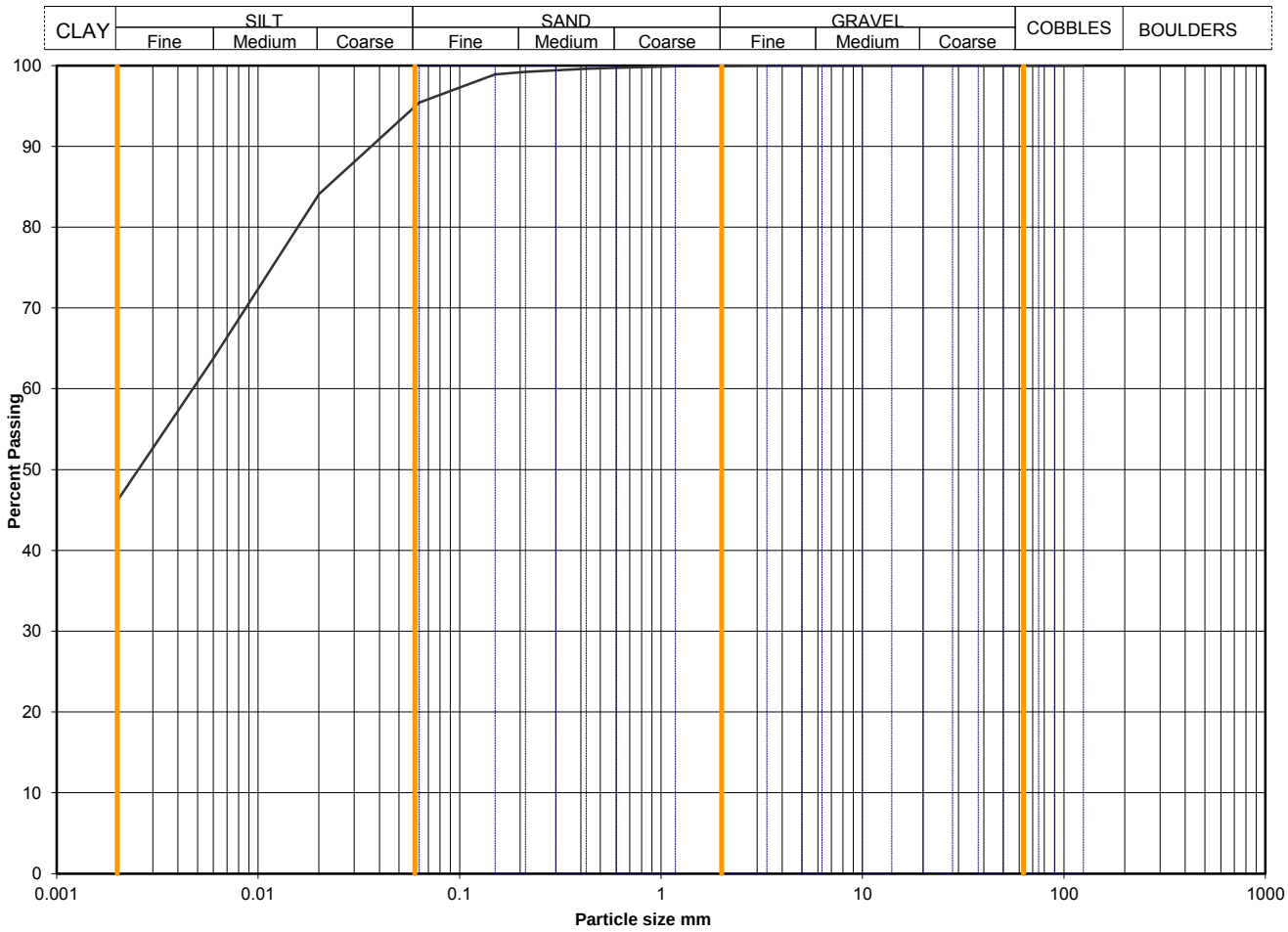
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	HEPBH180420171206016

Hole No	HEP-BH-1804
Sample Depth (m BGL)	6.3
Sample Type and No	UT27
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0201	84
90	100	0.0060	64
75	100	0.0020	46
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5.0	100		
3.35	100		
2.00	100		
1.18	100	Particle density, Mg/m3	
0.600	100		
0.425	100	2.65 assumed	
0.300	99	Dry mass of sample, kg	
0.212	99		
0.150	99	0.3	
0.063	95		

Soil description	Firm brown slightly sandy silty CLAY becoming laminated grey slightly sandy silty CLAY towards base.
Preparation / Pretreatment	Sieve: natural material Pipette: as BS1377
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	0	0
	Sand	5	5
*<60mm values to aid description only	Silt	49	49
	Clay	46	46

Uniformity Coefficient	D60 / D10	Not applicable

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.4 pipette

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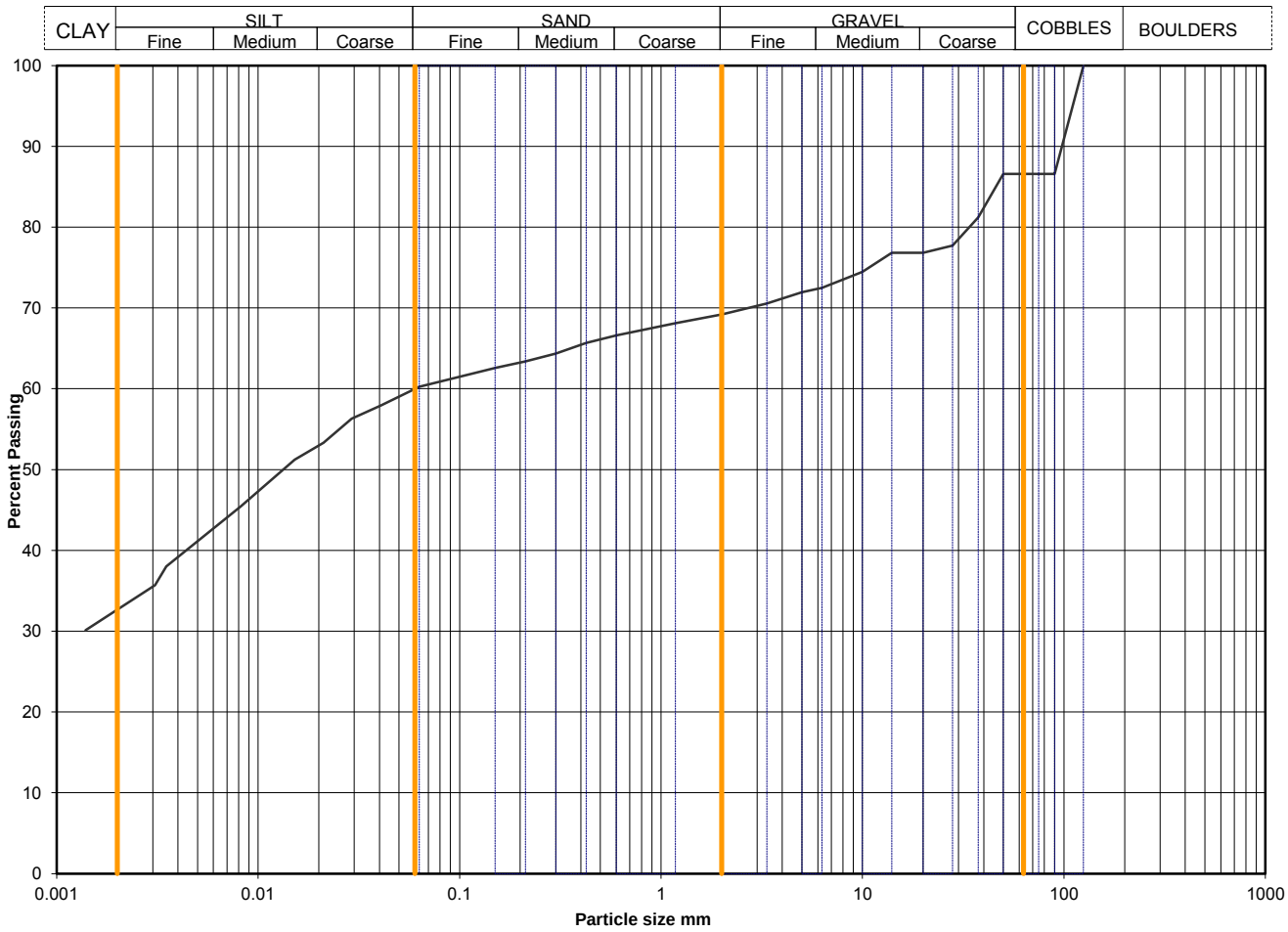
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	HEPBH180520170127003

Hole No	HEP-BH-1805
Sample Depth (m BGL)	1.2
Sample Type and No	B8
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	60
90	87	0.0407	58
75	87	0.0292	56
63	87	0.0211	53
50	87	0.0152	51
37.5	81	0.0082	45
28	78	0.0035	38
20	77	0.0031	36
14	77	0.0014	30
10	74		
6.3	72		
5.0	72		
3.35	71		
2.00	69		
1.18	68	Particle density, Mg/m3	
0.600	67		
0.425	66	2.61 measured	
0.300	64	Dry mass of sample, kg	
0.212	63		
0.150	63	12.3	
0.063	60		

Soil description	Brown slightly sandy slightly gravelly CLAY with one cobble.
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377
Remarks	hydro: 194.58

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	13	0
	Gravel	17	20
	Sand	9	10
*<60mm values to aid description only	Silt	28	32
	Clay	33	38

Uniformity Coefficient	D60 / D10	Not applicable

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

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Project Name Heathrow Airport Limited

Figure

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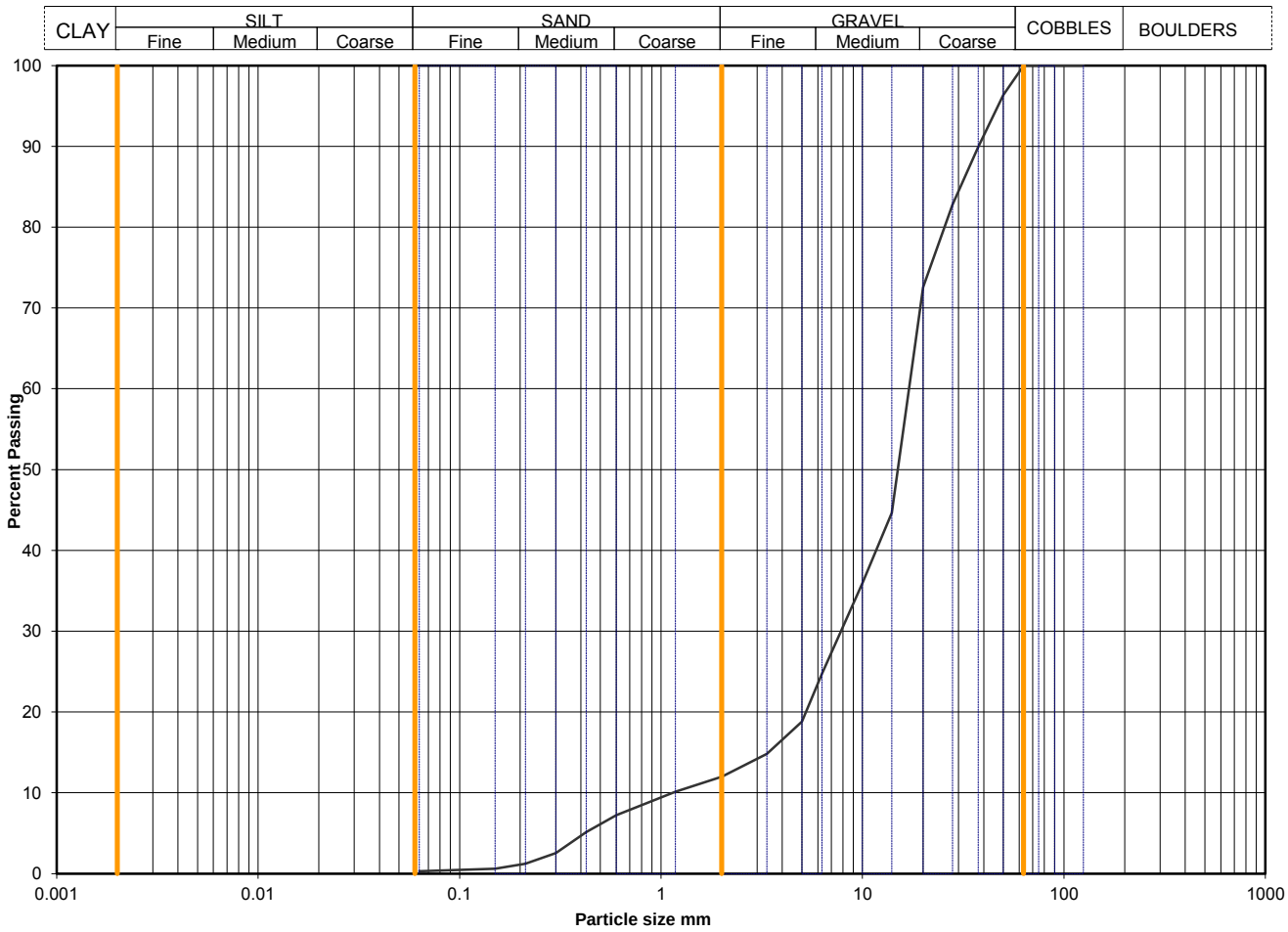
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	HEPBH180520170127005

Hole No	HEP-BH-1805
Sample Depth (m BGL)	2.2
Sample Type and No	B11
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	96		
37.5	90		
28	83		
20	73		
14	45		
10	36		
6.3	25		
5.0	19		
3.35	15		
2.00	12		
1.18	10		
0.600	7		
0.425	5		
0.300	3	Dry mass of sample, kg	
0.212	1		
0.150	1	19.2	
0.063	0		

Soil description	Brown sandy GRAVEL.
Preparation / Pretreatment	Sieve: natural material
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	88	88
	Sand	12	12
*<60mm values to aid description only	Silt	silt+clay =	
	Clay	0	0

Uniformity Coefficient	D60 / D10	15

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	none

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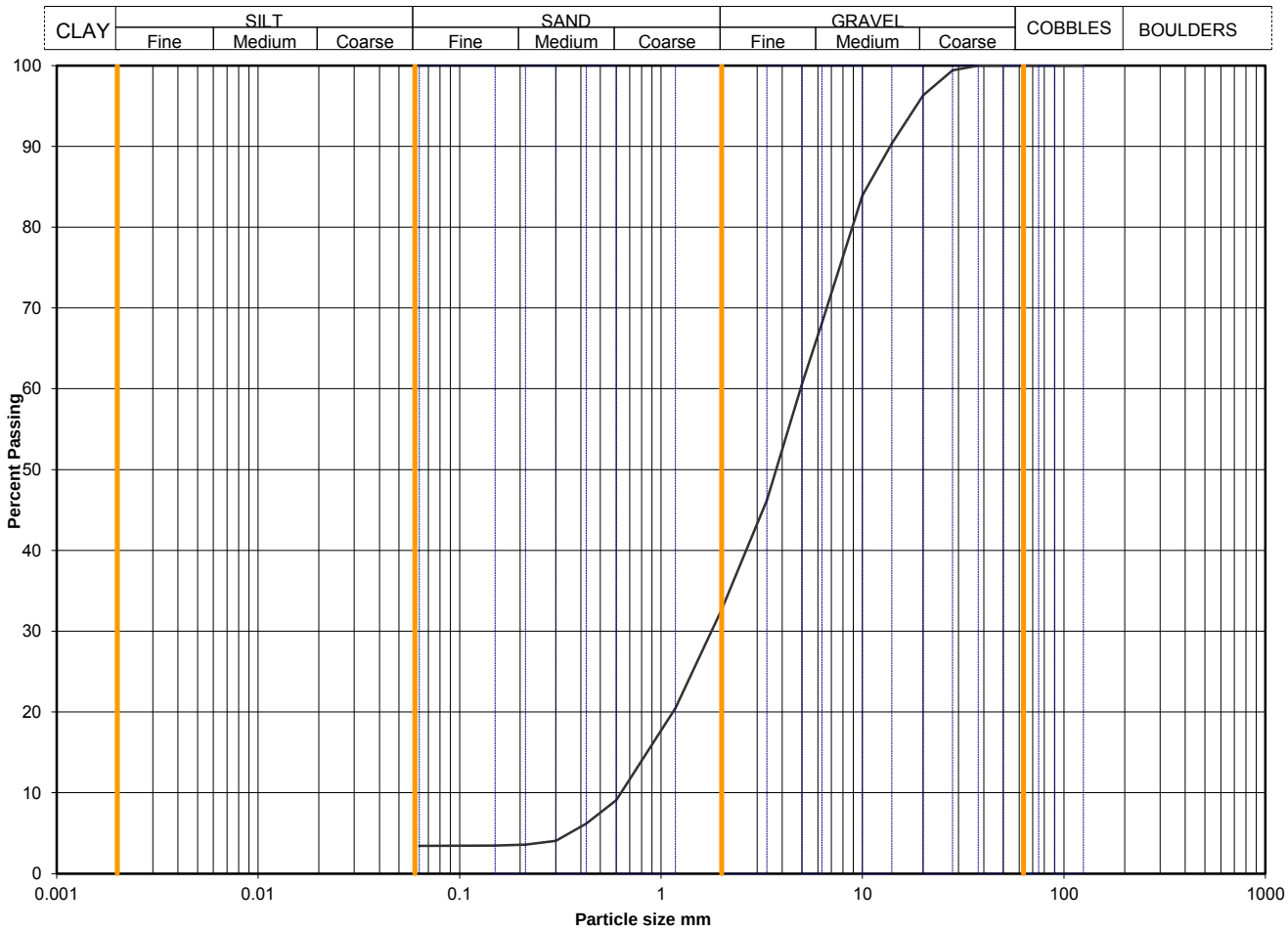
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	HEPBH180520170128006

Hole No	HEP-BH-1805
Sample Depth (m BGL)	3.2
Sample Type and No	B14
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	99		
20	96		
14	90		
10	84		
6.3	68		
5.0	61		
3.35	46		
2.00	33		
1.18	20		
0.600	9		
0.425	6		
0.300	4	Dry mass of sample, kg	
0.212	4		
0.150	3	7.8	
0.063	3		

Soil description	Brown very sandy GRAVEL.
Preparation / Pretreatment	Sieve: natural material
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	67	67
	Sand	29	29
*<60mm values to aid description only	Silt	silt+clay =	
	Clay	3	3

Uniformity Coefficient	D60 / D10	8

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	none

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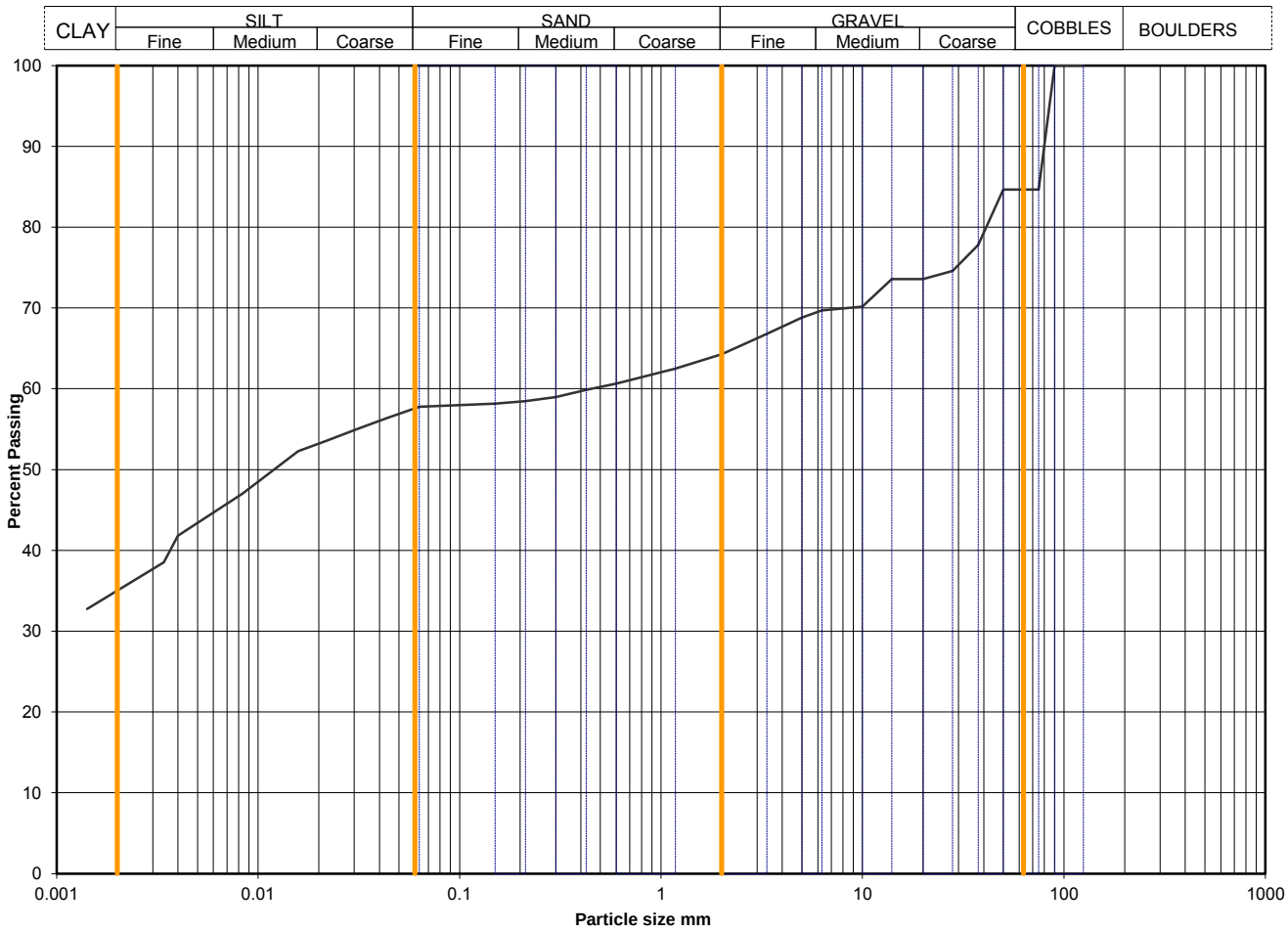
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	HEPBH180520170128007

Hole No	HEP-BH-1805
Sample Depth (m BGL)	3.7
Sample Type and No	B16
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	58
90	100	0.0436	56
75	85	0.0311	55
63	85	0.0222	54
50	85	0.0158	52
37.5	78	0.0084	47
28	75	0.0040	42
20	74	0.0034	39
14	74	0.0014	33
10	70		
6.3	70		
5.0	69		
3.35	67		
2.00	64		
1.18	62	Particle density, Mg/m3	
0.600	61		
0.425	60	2.65 assumed	
0.300	59	Dry mass of sample, kg	
0.212	58		
0.150	58	7.0	
0.063	58		

Soil description	Brown slightly sandy slightly gravelly silty CLAY with one cobble.
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	15	0
	Gravel	20	24
	Sand	7	8
*<60mm values to aid description only	Silt	23	27
	Clay	35	41

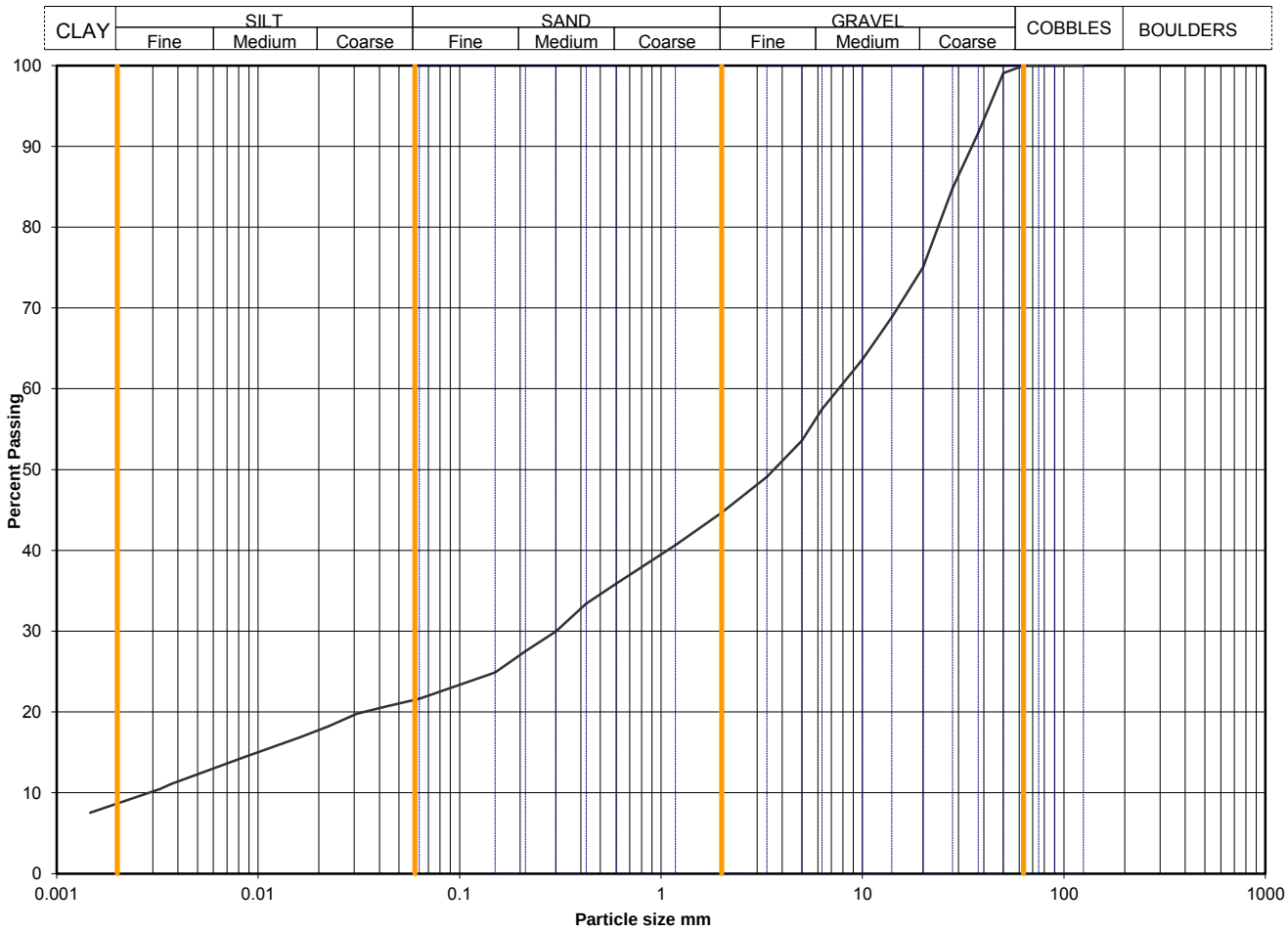
Uniformity Coefficient	D60 / D10	Not applicable

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	FES2171127018

Hole No	HEP-BH-1861
Sample Depth (m BGL)	2
Sample Type and No	LB11
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	22
90	100	0.0429	21
75	100	0.0308	20
63	100	0.0224	18
50	99	0.0162	17
37.5	92	0.0087	14
28	85	0.0037	11
20	75	0.0032	10
14	69	0.0015	8
10	64		
6.3	57		
5.0	54		
3.35	49		
2.00	45		
1.18	41	Particle density, Mg/m3	
0.600	36		
0.425	33	2.65 assumed	
0.300	30	Dry mass of sample, kg	
0.212	28		
0.150	25	15.7	
0.063	22		

Soil description	Brown slightly sandy gravelly silty CLAY.
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	55	55
	Sand	23	23
*<60mm values to aid description only	Silt	13	13
	Clay	9	9

Uniformity Coefficient	D60 / D10	2641

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

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Figure

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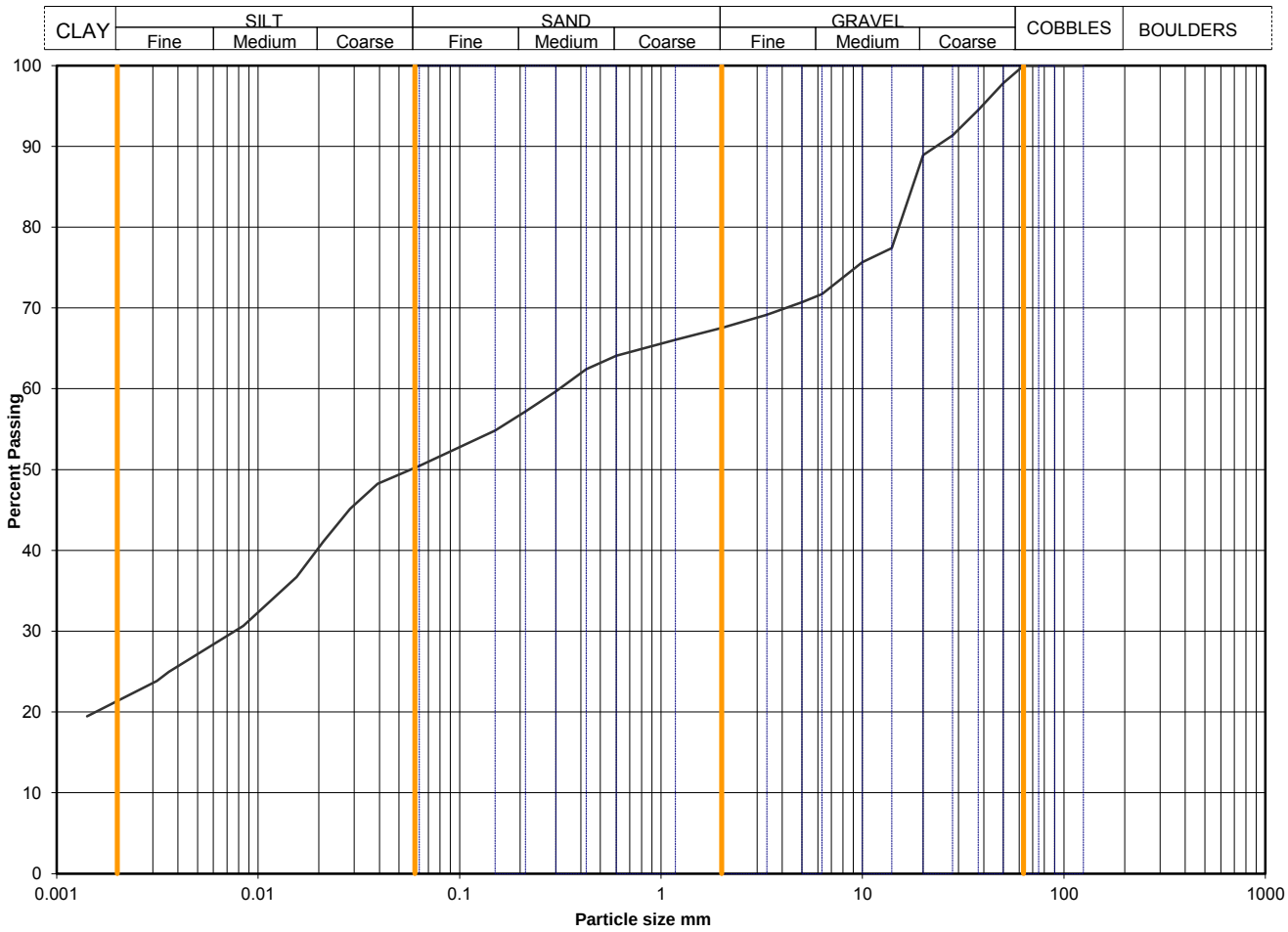
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	HEPBH186320171211005

Hole No	HEP-BH-1863
Sample Depth (m BGL)	0.1
Sample Type and No	B3
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	50
90	100	0.0392	48
75	100	0.0286	45
63	100	0.0211	41
50	98	0.0155	37
37.5	94	0.0085	31
28	91	0.0036	25
20	89	0.0031	24
14	77	0.0014	19
10	76		
6.3	72		
5.0	71		
3.35	69		
2.00	68		
1.18	66	Particle density, Mg/m3	
0.600	64		
0.425	62	2.65 assumed	
0.300	60	Dry mass of sample, kg	
0.212	57		
0.150	55	12.6	
0.063	50		

Soil description	Brown slightly sandy slightly gravelly silty CLAY with rare rootlets.		
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377		
Remarks			
Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	32	32
	Sand	17	17
*<60mm values to aid description only	Silt	29	29
	Clay	21	21

Uniformity Coefficient	**D60 / D10**	Not applicable

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

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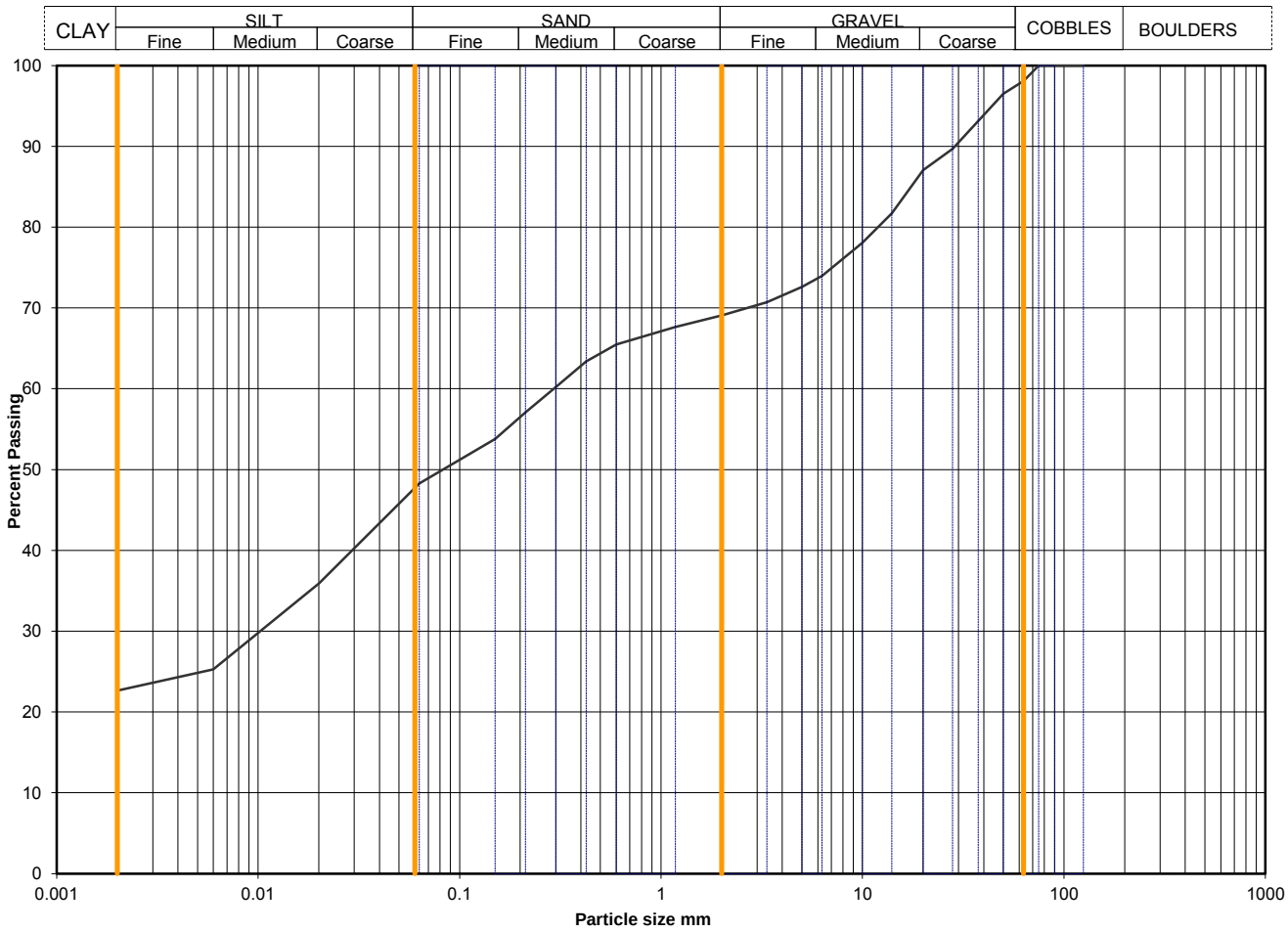
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	HEPBH186320171211007

Hole No	HEP-BH-1863
Sample Depth (m BGL)	0.3
Sample Type and No	B6
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0201	36
90	100	0.0060	25
75	100	0.0020	23
63	98		
50	97		
37.5	93		
28	90		
20	87		
14	82		
10	78		
6.3	74		
5.0	73		
3.35	71		
2.00	69		
1.18	68	Particle density, Mg/m3	
0.600	65		
0.425	63	2.65 assumed	
0.300	60	Dry mass of sample, kg	
0.212	57		
0.150	54	14.8	
0.063	48		

Soil description	Brown slightly sandy slightly gravelly silty CLAY with occasional rootlets and one cobble.		
Preparation / Pretreatment	Sieve: natural material Pipette: as BS1377		
Remarks			
Sample Proportions		Whole	*<60mm
	Cobbles / boulders	2	0
	Gravel	29	30
	Sand	21	21
*<60mm values to aid description only	Silt	26	27
	Clay	23	23

Uniformity Coefficient	**D60 / D10**	Not applicable

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.4 pipette

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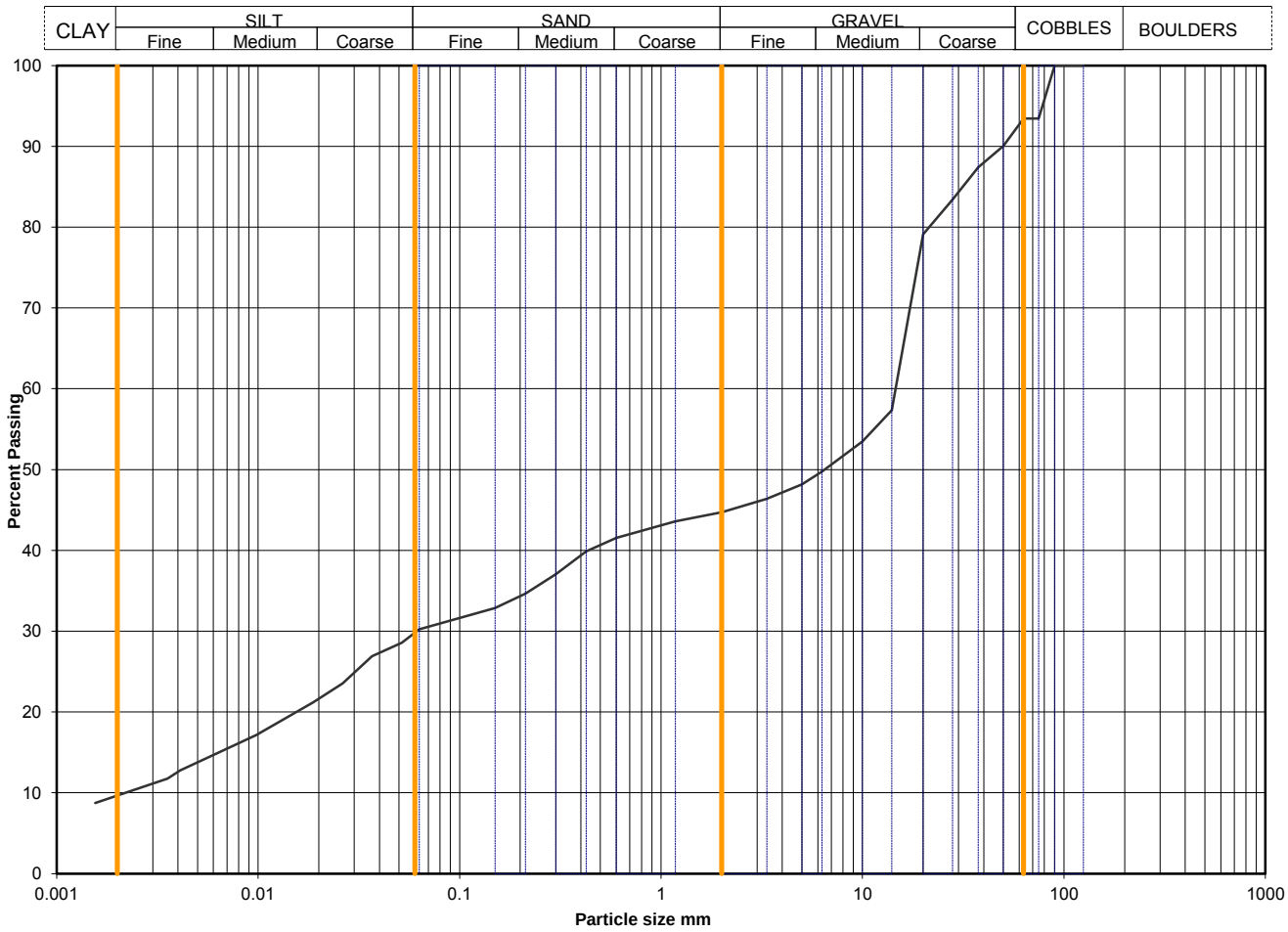
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	HEPBH186320171211009

Hole No	HEP-BH-1863
Sample Depth (m BGL)	0.85
Sample Type and No	B9
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	30
90	100	0.0516	29
75	93	0.0367	27
63	93	0.0263	24
50	90	0.0187	21
37.5	87	0.0098	17
28	83	0.0041	13
20	79	0.0036	12
14	57	0.0016	9
10	53		
6.3	50		
5.0	48		
3.35	46		
2.00	45		
1.18	44	Particle density, Mg/m3	
0.600	42		
0.425	40	2.65 assumed	
0.300	37	Dry mass of sample, kg	
0.212	35		
0.150	33	15.5	
0.063	30		

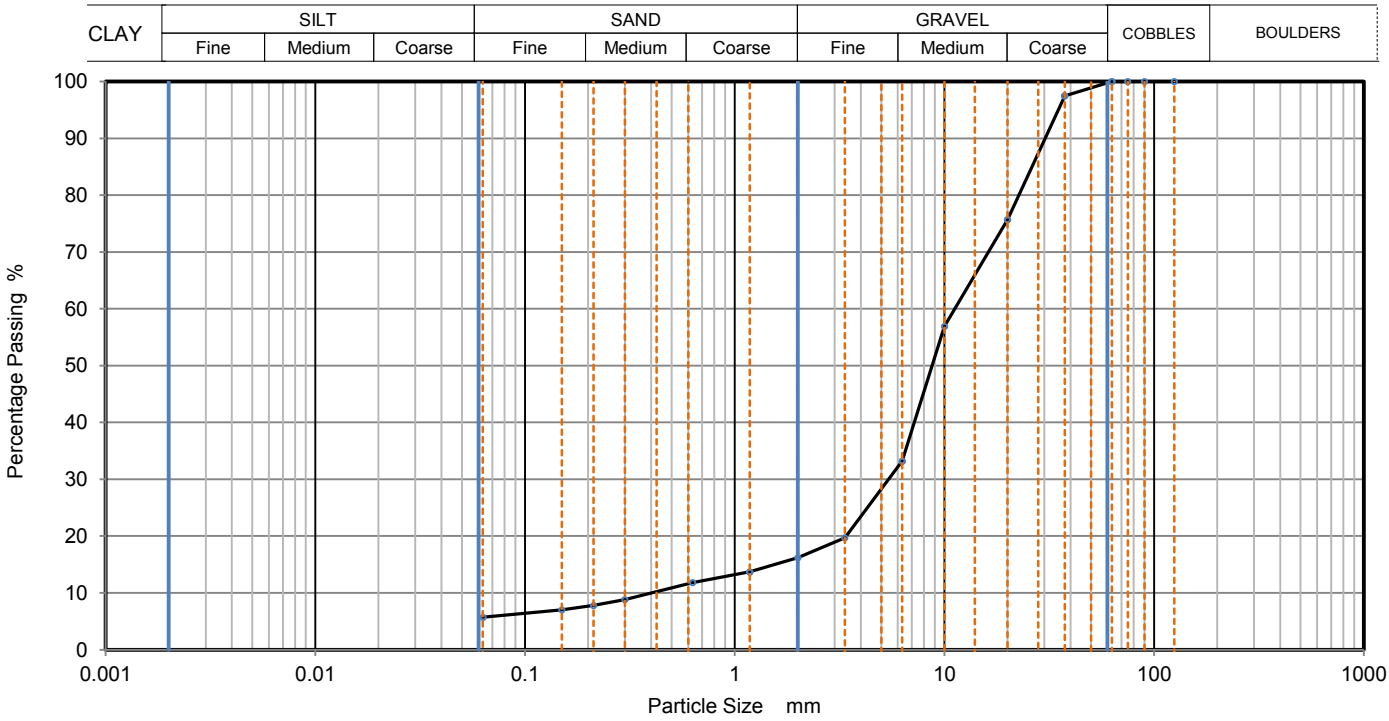
Soil description	Brown sandy GRAVEL with gravel sized clay pockets and one cobble
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	7	0
	Gravel	49	53
	Sand	14	15
*<60mm values to aid description only	Silt	21	23
	Clay	10	10

Uniformity Coefficient	D60 / D10	6662

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

FUGRO	**Particle Size Distribution**			Project No.	G170029U
				Hole	HEP-BH-1864
Project Name	HAL Airport Expansion			Sample No.	16
Description	Brown clayey sandy GRAVEL			Depth, m	4.20
Specimen Reference		Specimen Depth	m	Sample Type	B
Test Method	BS1377:Part 2:1990, clause 9.2			KeyLAB ID	FES2171218016



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
37.5	98		
20	76		
10	57		
6.3	33		
3.35	20		
2	16		
1.18	14		
0.63	12		
0.3	9		
0.212	8		
0.15	7		
0.063	6		

Dry Mass of sample, g	10964

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	83.8
Sand	10.5
Fines <0.063mm	5.7

Grading Analysis		
D100	mm	63
D60	mm	11.2
D30	mm	5.43
D10	mm	0.407
Uniformity Coefficient		28
Curvature Coefficient		6.5

Remarks

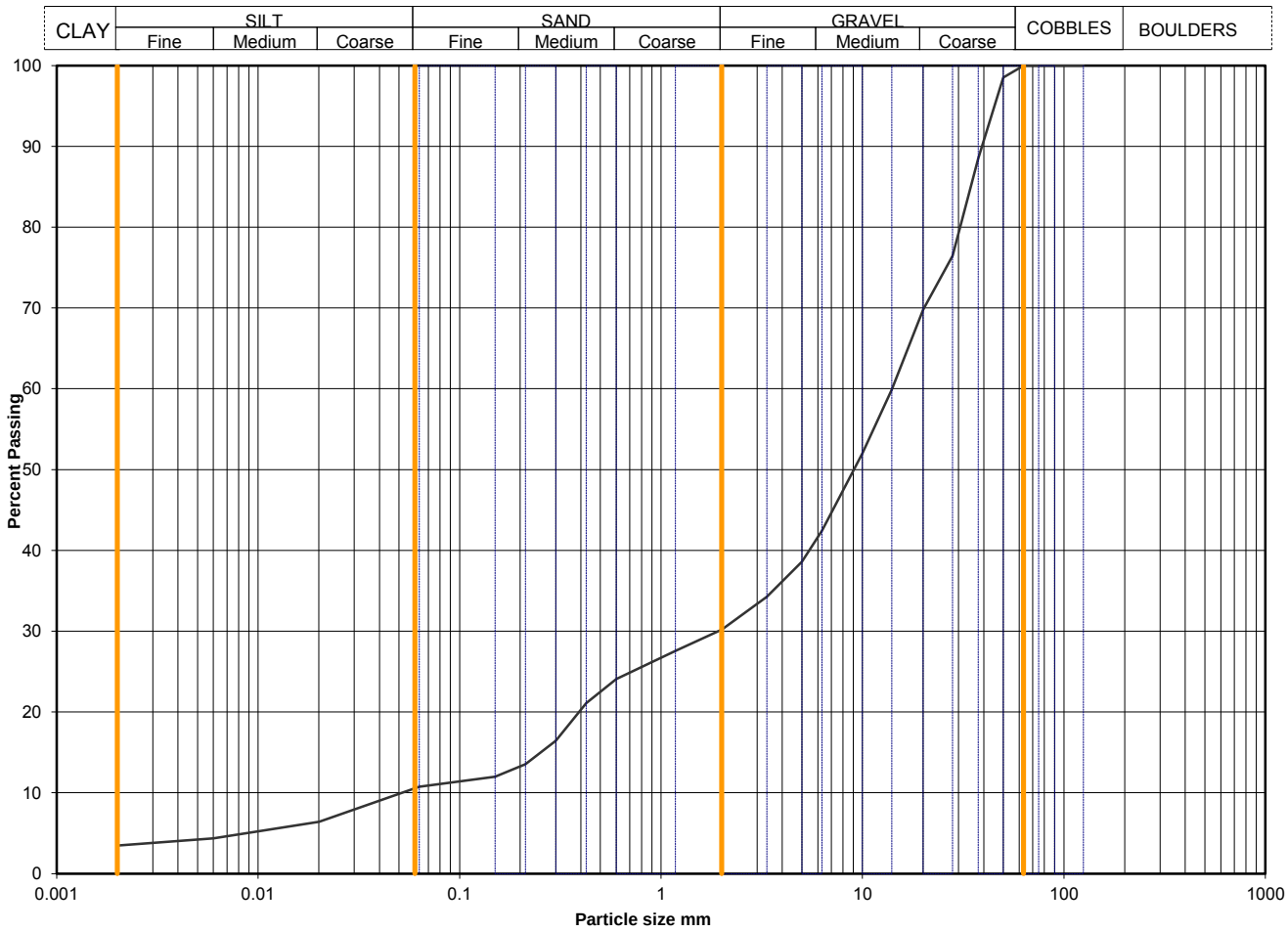
Preparation and testing in accordance with BS1377 unless noted below

Date printed	Figure number	Sheet number
09/08/2018		

Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	HEPTP1020171212011

Hole No	HEP-TP-10
Sample Depth (m BGL)	2
Sample Type and No	LB10
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0201	6
90	100	0.0060	4
75	100	0.0020	3
63	100		
50	99		
37.5	89		
28	76		
20	70		
14	60		
10	52		
6.3	42		
5.0	39		
3.35	34		
2.00	30		
1.18	28	Particle density, Mg/m3	
0.600	24		
0.425	21	2.65 assumed	
0.300	16	Dry mass of sample, kg	
0.212	14		
0.150	12	34.2	
0.063	11		

Soil description	Grey sandy silty GRAVEL.		
Preparation / Pretreatment	Sieve: natural material Pipette: as BS1377		
Remarks			
Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	70	70
	Sand	19	19
*<60mm values to aid description only	Silt	7	7
	Clay	3	3

Uniformity Coefficient	**D60 / D10**	272

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.4 pipette

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Figure

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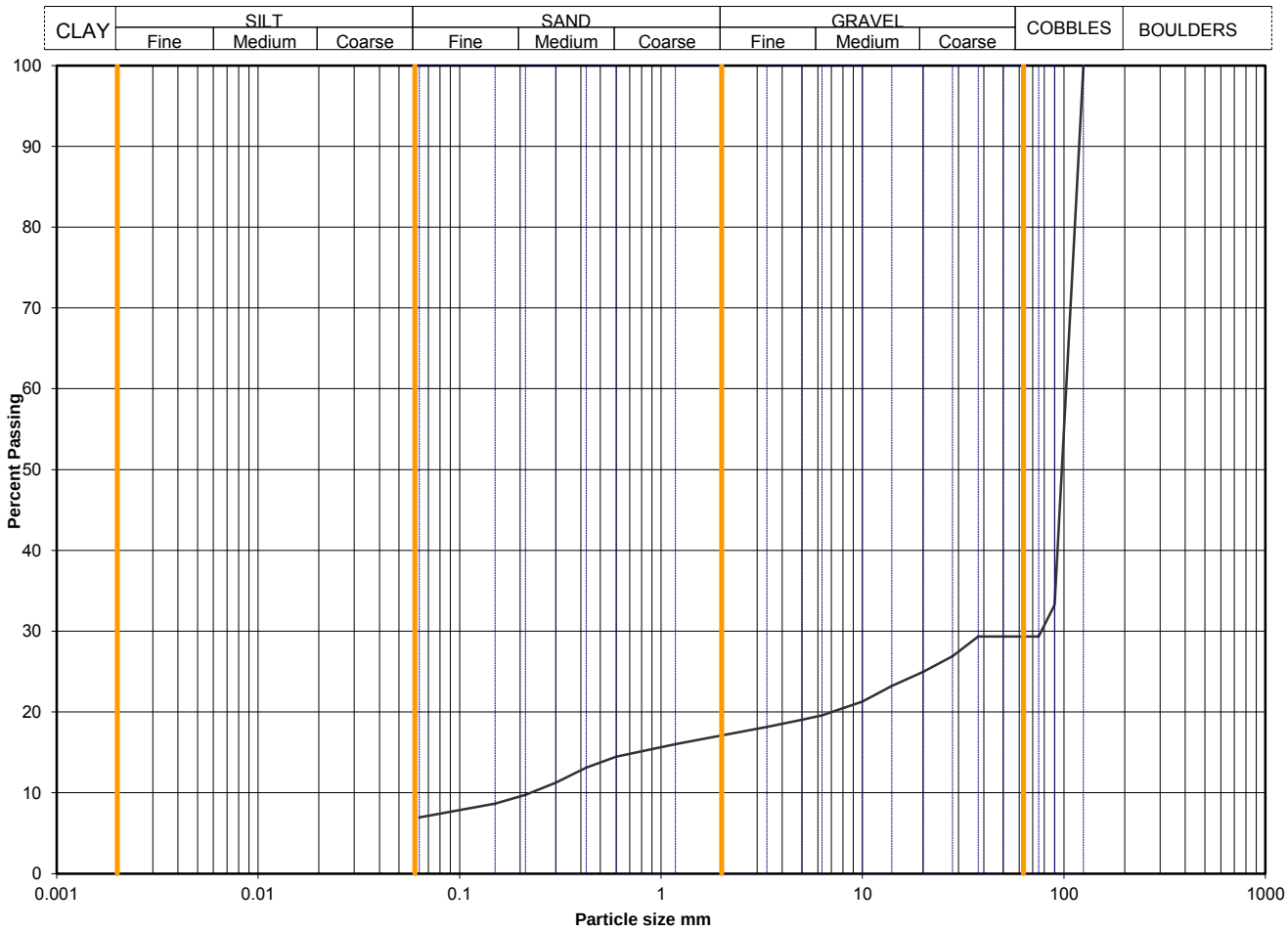
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	HEPBH129620171213014

Hole No	HEP-TP-1296
Sample Depth (m BGL)	2.7
Sample Type and No	LB13
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	33		
75	29		
63	29		
50	29		
37.5	29		
28	27		
20	25		
14	23		
10	21		
6.3	20		
5.0	19		
3.35	18		
2.00	17		
1.18	16		
0.600	14		
0.425	13		
0.300	11	Dry mass of sample, kg	
0.212	10		
0.150	9	7.3	
0.063	7		

Soil description	Brown sandy gravelly clayey COBBLES.
Preparation / Pretreatment	Sieve: natural material
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	71	0
	Gravel	12	41
	Sand	10	34
*<60mm values to aid description only	Silt	silt+clay =	
	Clay	7	24

Uniformity Coefficient	D60 / D10	458

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.3 dry sieve
	Sedimentation	none

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Figure

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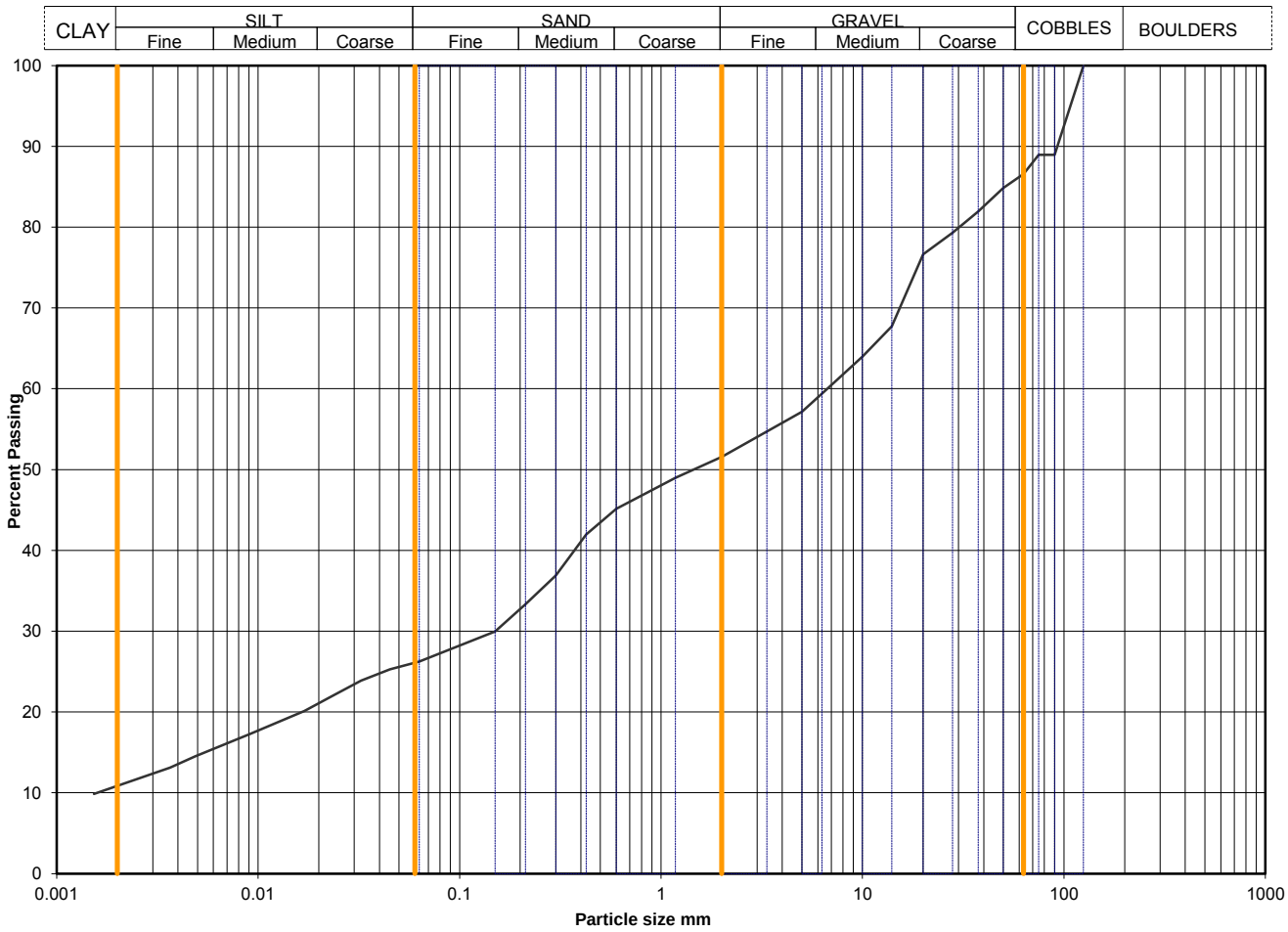
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	HEPTT320171122012

Hole No	HEP-TT-3
Sample Depth (m BGL)	1.8
Sample Type and No	B11
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	26
90	89	0.0451	25
75	89	0.0324	24
63	87	0.0235	22
50	85	0.0170	20
37.5	82	0.0091	17
28	79	0.0049	15
20	77	0.0037	13
14	68	0.0015	10
10	64		
6.3	59		
5.0	57		
3.35	55		
2.00	52		
1.18	49	Particle density, Mg/m3	
0.600	45		
0.425	42	2.56 measured	
0.300	37	Dry mass of sample, kg	
0.212	33		
0.150	30	7.6	
0.063	26		

Soil description	Brown slightly sandy gravelly silty CLAY with four cobbles.
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	13	0
	Gravel	35	40
	Sand	25	29
*<60mm values to aid description only	Silt	15	17
	Clay	11	13

Uniformity Coefficient	D60 / D10	4241

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

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Figure

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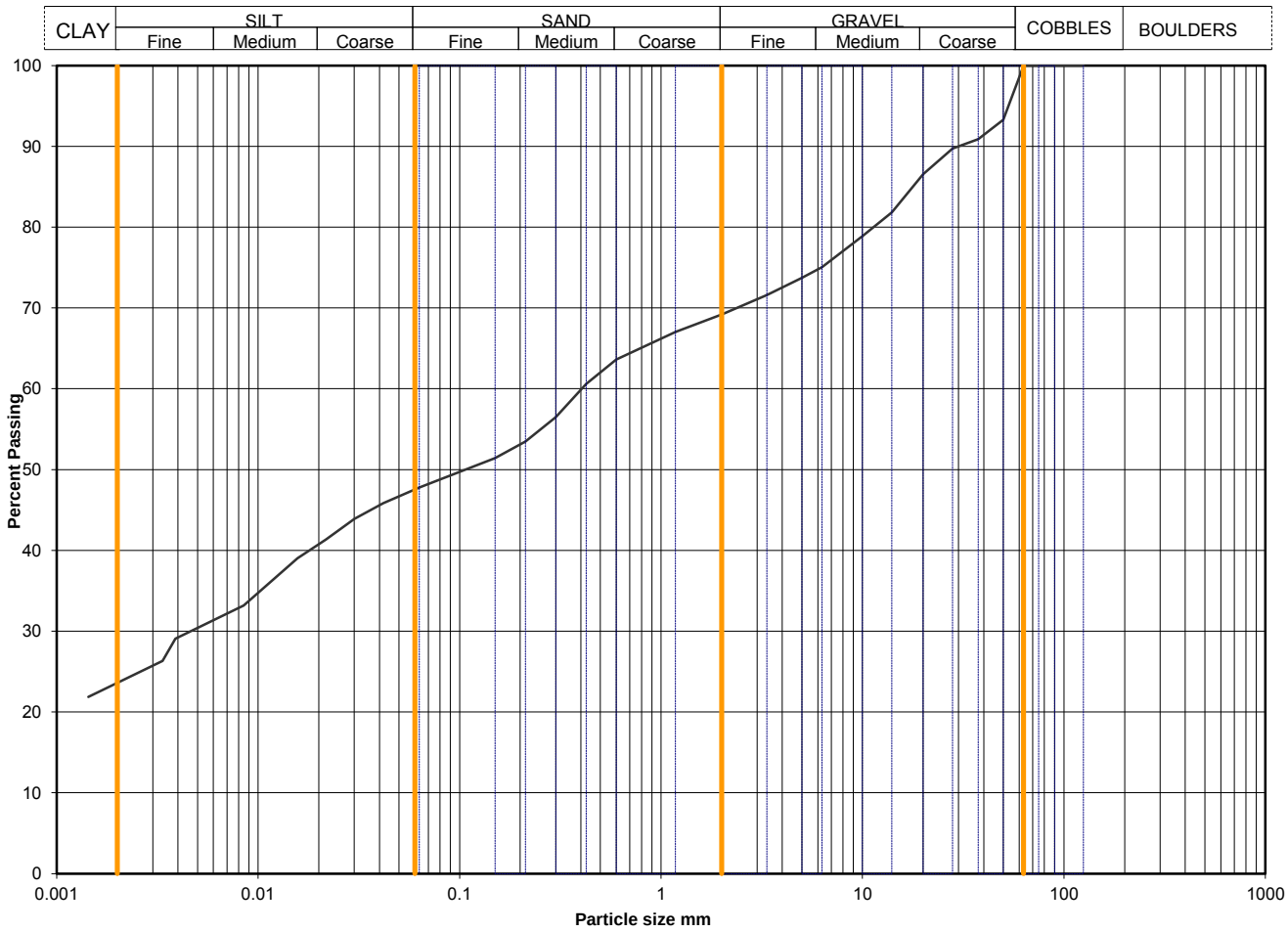
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	HEPTT620171123008

Hole No	HEP-TT-6
Sample Depth (m BGL)	0.8
Sample Type and No	LB8
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	48
90	100	0.0417	46
75	100	0.0301	44
63	100	0.0217	41
50	93	0.0157	39
37.5	91	0.0085	33
28	90	0.0039	29
20	87	0.0034	26
14	82	0.0014	22
10	79		
6.3	75		
5.0	74		
3.35	72		
2.00	69		
1.18	67	Particle density, Mg/m3	
0.600	64		
0.425	61	2.62 measured	
0.300	56	Dry mass of sample, kg	
0.212	53		
0.150	51	11.6	
0.063	48		

Soil description	Brown slightly sandy slightly gravelly silty CLAY.
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	31	31
	Sand	21	21
*<60mm values to aid description only	Silt	24	24
	Clay	24	24

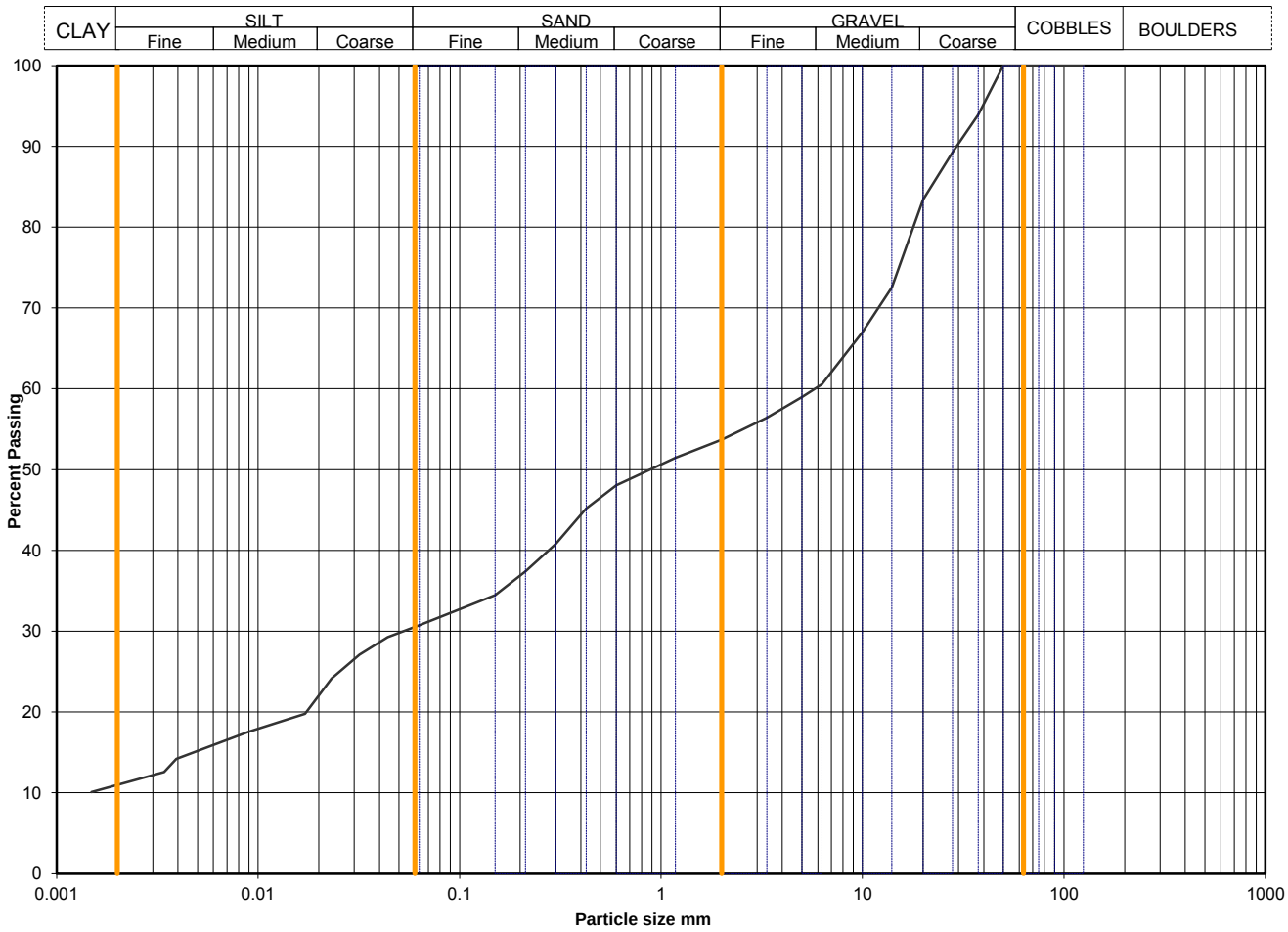
Uniformity Coefficient	D60 / D10	Not applicable

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	HEPTT920171123010

Hole No	HEP-TT-9
Sample Depth (m BGL)	1.2
Sample Type and No	B9
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	31
90	100	0.0440	29
75	100	0.0318	27
63	100	0.0232	24
50	100	0.0171	20
37.5	94	0.0090	18
28	89	0.0039	14
20	83	0.0034	13
14	73	0.0015	10
10	67		
6.3	61		
5.0	59		
3.35	56		
2.00	54		
1.18	51	Particle density, Mg/m3	
0.600	48		
0.425	45	2.65 assumed	
0.300	41	Dry mass of sample, kg	
0.212	37		
0.150	34	17.7	
0.063	31		

Soil description	Greyish brown slightly sandy gravelly silty CLAY.
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	46	46
	Sand	23	23
*<60mm values to aid description only	Silt	20	20
	Clay	11	11

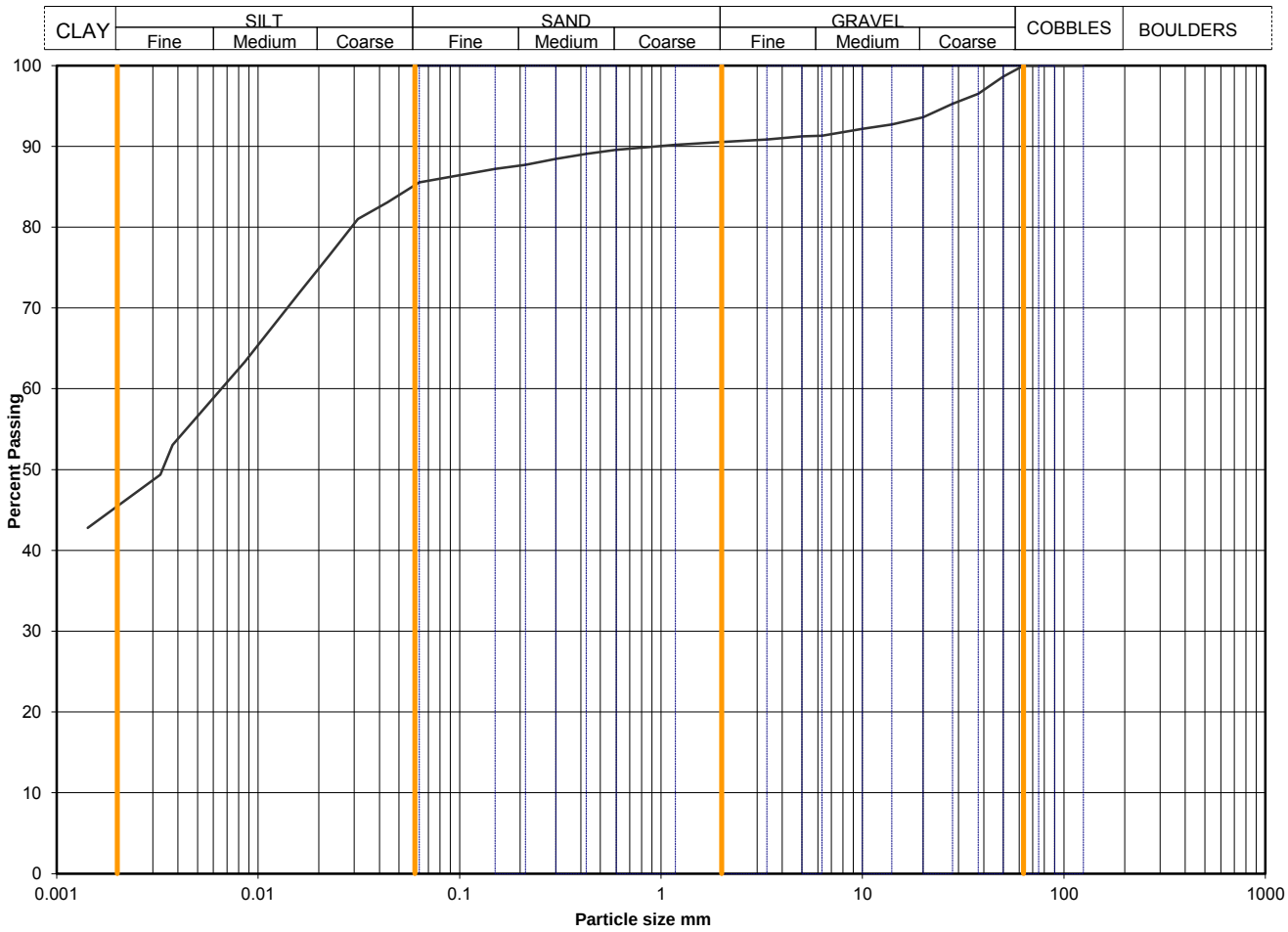
Uniformity Coefficient	D60 / D10	Not applicable

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	HEPTT1120171124010

Hole No	HEP-TT-11
Sample Depth (m BGL)	1.3
Sample Type and No	B9
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	86
90	100	0.0438	83
75	100	0.0312	81
63	100	0.0225	76
50	99	0.0162	72
37.5	97	0.0086	63
28	95	0.0038	53
20	94	0.0033	49
14	93	0.0014	43
10	92		
6.3	91		
5.0	91		
3.35	91		
2.00	91		
1.18	90	Particle density, Mg/m3	
0.600	90		
0.425	89	2.65 measured	
0.300	88	Dry mass of sample, kg	
0.212	88		
0.150	87	18.1	
0.063	86		

Soil description	Brown slightly sandy slightly gravelly silty CLAY.
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	9	9
	Sand	5	5
*<60mm values to aid description only	Silt	40	40
	Clay	45	45

Uniformity Coefficient	D60 / D10	Not applicable

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

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Project No N8135-18

Project Name Heathrow Airport Limited

Figure
PSD

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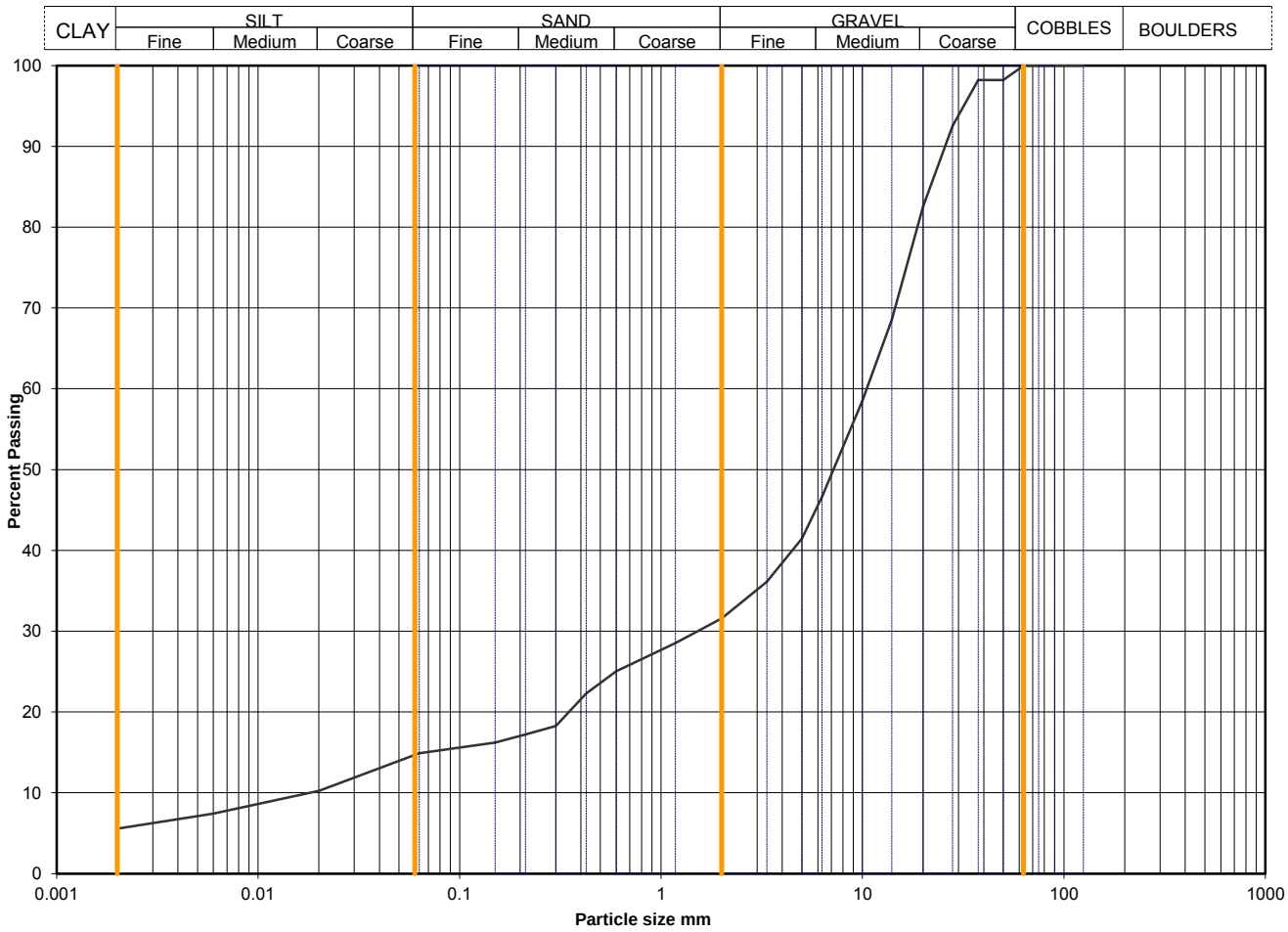
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	HEPTT2920171128009

Hole No	HEP-TT-29
Sample Depth (m BGL)	1.8
Sample Type and No	B9
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0201	10
90	100	0.0060	7
75	100	0.0020	6
63	100		
50	98		
37.5	98		
28	93		
20	83		
14	69		
10	59		
6.3	47		
5.0	41		
3.35	36		
2.00	32		
1.18	29	Particle density, Mg/m3	
0.600	25		
0.425	22	2.65 assumed	
0.300	18	Dry mass of sample, kg	
0.212	17		
0.150	16	11.2	
0.063	15		

Soil description	Dark brown slightly sandy very gravelly silty CLAY.
Preparation / Pretreatment	Sieve: natural material Pipette: as BS1377
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	68	68
	Sand	17	17
*<60mm values to aid description only	Silt	9	9
	Clay	6	6

Uniformity Coefficient	D60 / D10	582

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.4 pipette

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Project No N8135-18

Project Name Heathrow Airport Limited

Figure

PSD

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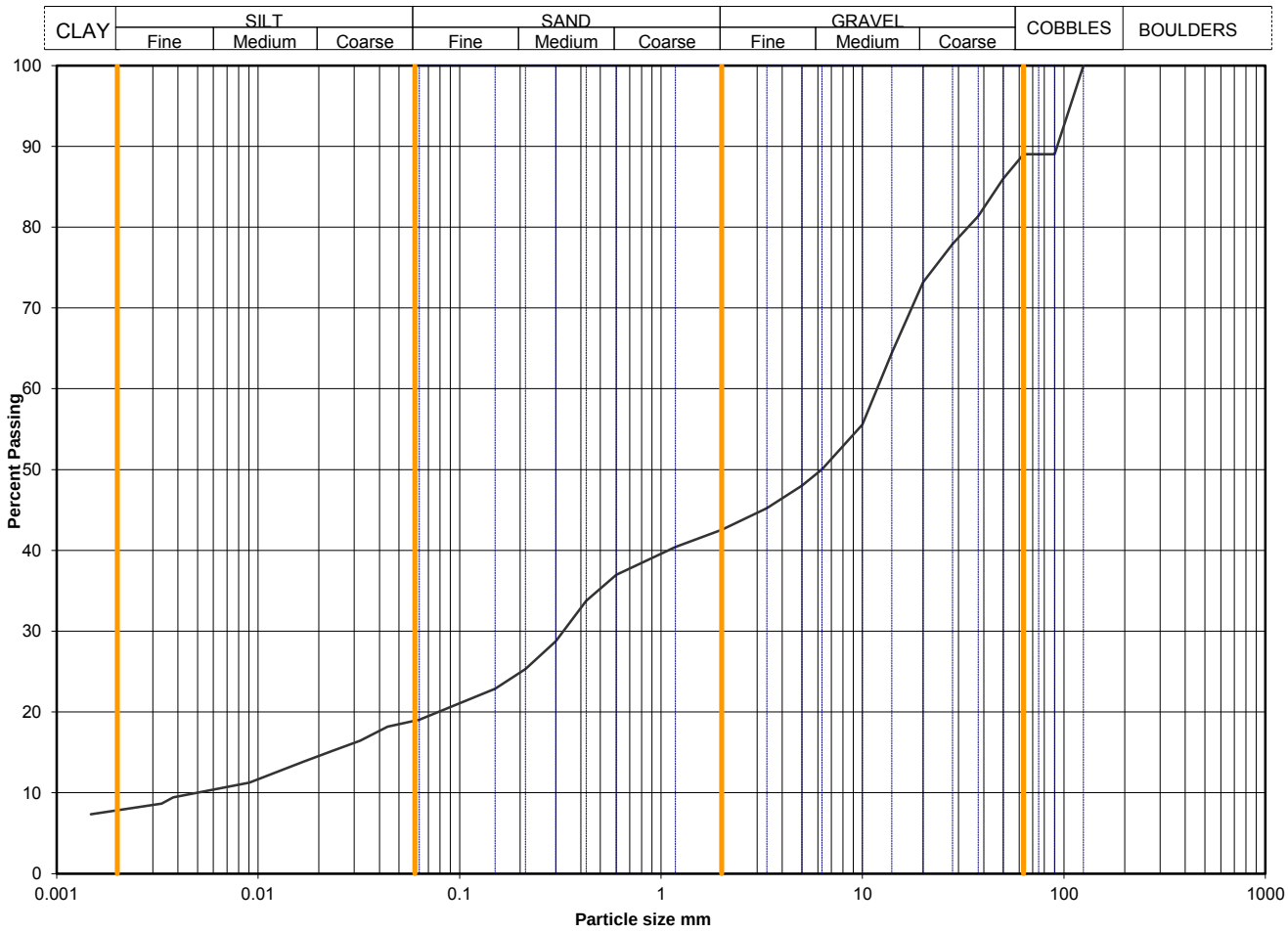
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	HEPTT3920171128009

Hole No	HEP-TT-39
Sample Depth (m BGL)	1.8
Sample Type and No	B9
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	19
90	89	0.0439	18
75	89	0.0321	16
63	89	0.0232	15
50	86	0.0168	14
37.5	81	0.0090	11
28	78	0.0038	9
20	73	0.0033	9
14	64	0.0015	7
10	56		
6.3	50		
5.0	48		
3.35	45		
2.00	43		
1.18	40	Particle density, Mg/m3	
0.600	37		
0.425	34	2.60 measured	
0.300	29	Dry mass of sample, kg	
0.212	25		
0.150	23	19.1	
0.063	19		

Soil description	Brownish grey slightly sandy gravelly silty CLAY with one cobble.		
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377		
Remarks			
Sample Proportions		Whole	*<60mm
	Cobbles / boulders	11	0
	Gravel	46	52
	Sand	23	26
*<60mm values to aid description only	Silt	11	12
	Clay	8	9

Uniformity Coefficient	**D60 / D10**	2384

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

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Project Name Heathrow Airport Limited

Figure

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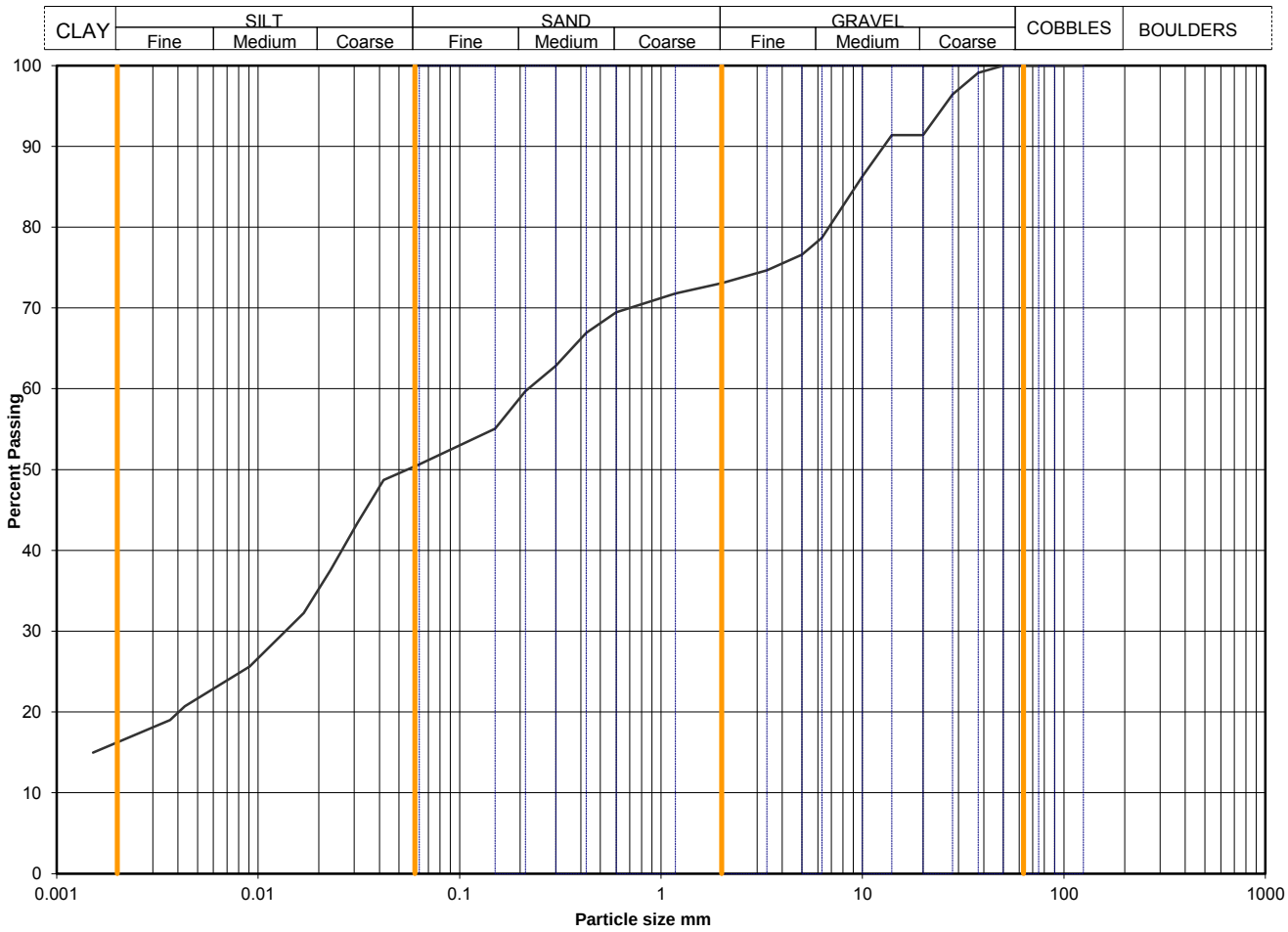
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	HEPTT03220171128010

Hole No	HEP-TT-1032
Sample Depth (m BGL)	2.3
Sample Type and No	LB9
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	51
90	100	0.0420	49
75	100	0.0310	43
63	100	0.0229	38
50	100	0.0168	32
37.5	99	0.0091	26
28	96	0.0043	21
20	91	0.0037	19
14	91	0.0015	15
10	86		
6.3	79		
5.0	77		
3.35	75		
2.00	73		
1.18	72	Particle density, Mg/m3	
0.600	69		
0.425	67	2.63 measured	
0.300	63	Dry mass of sample, kg	
0.212	60		
0.150	55	8.7	
0.063	51		

Soil description	Brown slightly sandy slightly gravelly silty CLAY.		
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377		
Remarks			
Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	27	27
	Sand	22	22
*<60mm values to aid description only	Silt	34	34
	Clay	16	16

Uniformity Coefficient	**D60 / D10**	Not applicable

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

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Project Name Heathrow Airport Limited

Figure

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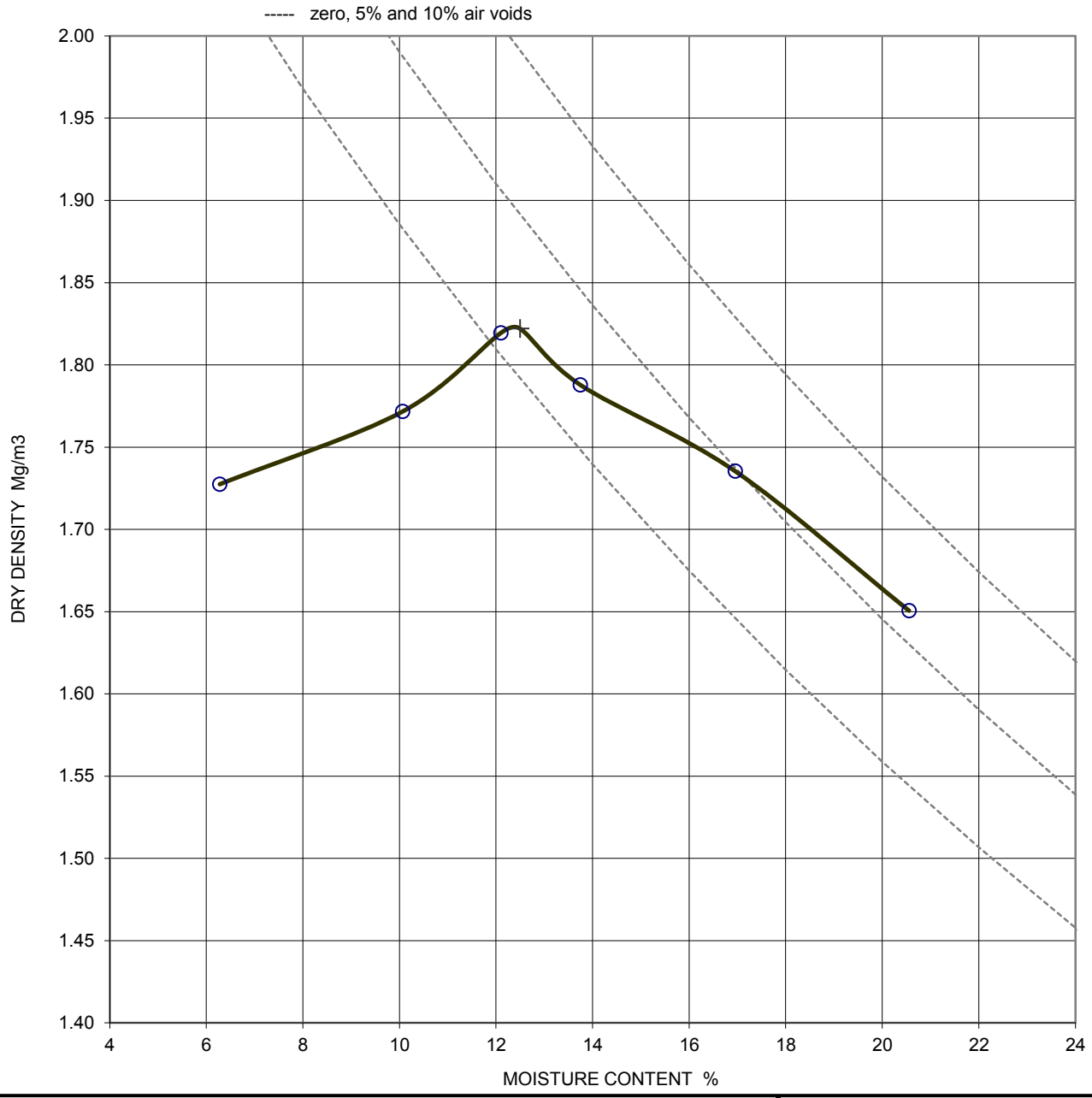
DRY DENSITY / MOISTURE CONTENT RELATIONSHIP
BS1377 : PART 4 : 1990 : LIGHT COMPACTION, 2.5 kg rammer

Sample Details:	SAMPLE ID:
	FES2180103017

Hole No	HEP-BH-44
Sample Depth (m BGL)	4.2
Sample Type and No	B17
Specimen Ref	



Soil description	Brown sandy slightly clayey GRAVEL.		
Test method	BS 1377:part 4:1990: clause 3.5, 2.5 kg rammer in a 1 litre mould		
Preparation	Original material was natural, single sample tested		
Material > 37.5mm	4	%	
Material < 37.5mm > 20mm	28	%	
Particle density	2.65	assumed	
Remarks			

Derived Parameters +

Maximum dry density, Mg/m3
1.82

Optimum moisture content, %
13

Grading Zone X

QA Ref
SLD 4, 3.5/6
Rev 2.5
Sep 17

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SOCOTEC

Project No	N8135-18
Project Name	Heathrow Airport Limited

Figure
COMPL

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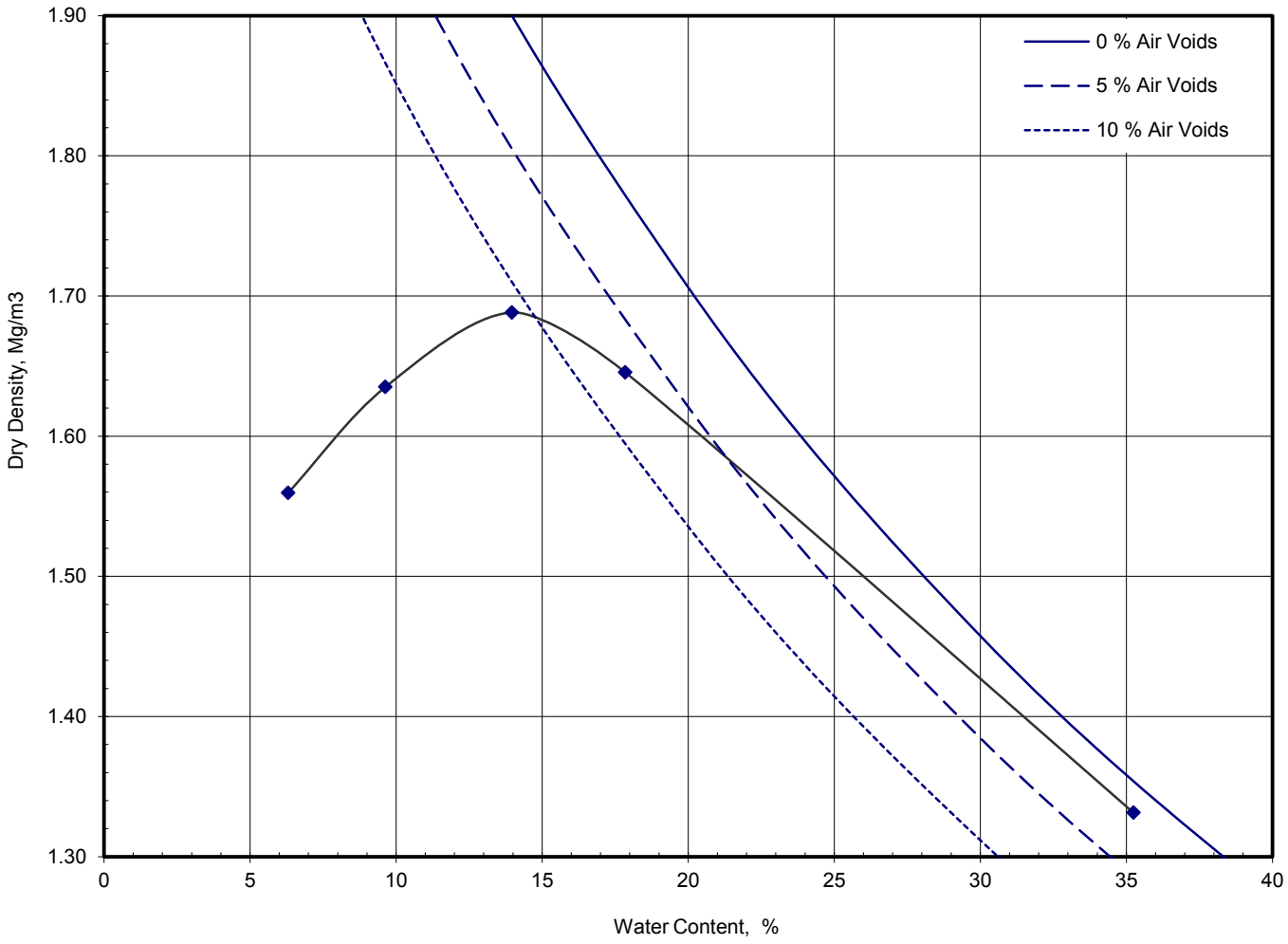
FUGRO	**Determination of Dry Density / Water Content Relationship Light (2.5kg) Compaction**			Project No.	G170029U
				Hole	HEP-BH-45
				Sample No	8
Project Name	HAL Airport Expansion			Depth	0.60 m
Specimen Ref.		Specimen Depth	m	Sample Type	B
Description	Browm very clayey very sandy GRAVEL			Keylab ID	FES1171208008
Test Method	BS1377:Part 4:1990, clause 3.3, 2.5kg rammer				

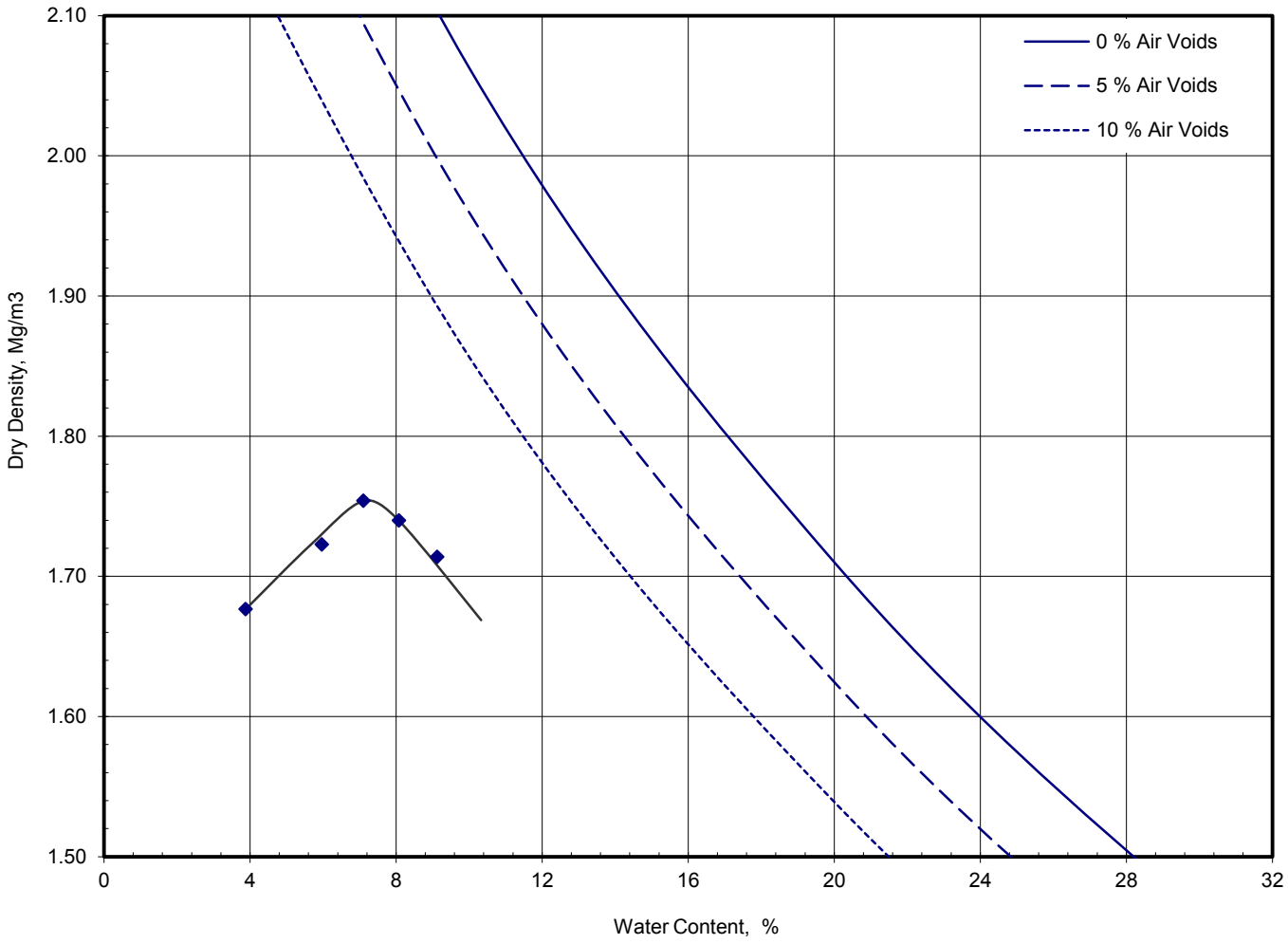


Preparation		Material used was natural
Mould Type		1 LITRE
Samples Used		Single sample tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	4
Particle Density - Measured	Mg/m³	2.59

Maximum Dry Density	Mg/m³	**1.69**
Optimum Water Content	%	**14.0**

Remarks	Date printed	Figure Number	Sheet Number
	09/08/2018		

FUGRO	**Determination of Dry Density / Water Content Relationship Light (2.5kg) Compaction**			Project No.	G170029U
				Hole	HEP-BH-45
				Sample No	16
Project Name	HAL Airport Expansion			Depth	2.10 m
Specimen Ref.		Specimen Depth	m	Sample Type	B
Description	Brown slightly clayey sandy GRAVEL			Keylab ID	FES1171208016
Test Method	BS1377:Part 4:1990, clause 3.4, 2.5kg rammer				



Preparation		Material used was natural
Mould Type		CBR
Samples Used		Single sample tested
Material Retained on 37.5 mm Sieve	%	2
Material Retained on 20.0 mm Sieve	%	12
Particle Density - Measured	Mg/m³	2.60

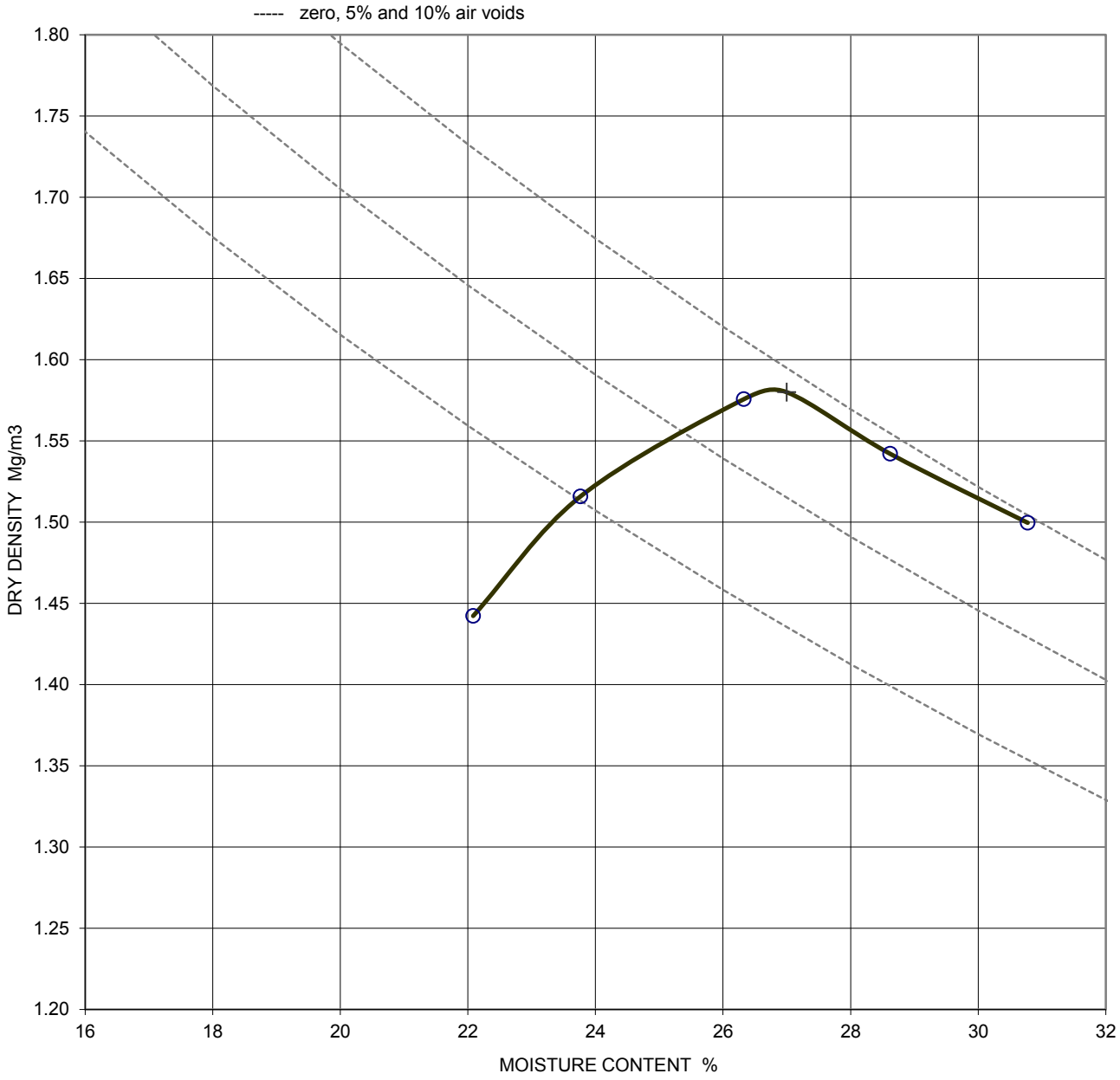
Maximum Dry Density	Mg/m³	**1.76**
Optimum Water Content	%	**7.2**

Remarks	Date printed	Figure Number	Sheet Number
	09/08/2018		

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP
BS1377 : PART 4 : 1990 : HEAVY COMPACTION, 4.5 kg rammer

Sample Details:	SAMPLE ID:
	FES1171121016

Hole No	HEP-BH-50
Sample Depth (m BGL)	2.3
Sample Type and No	B16
Specimen Ref	



Soil description	Brown slightly sandy slightly gravelly silty CLAY.		
Test method	BS 1377:part 4:1990: clause 3.5, 4.5 kg rammer in a 1 litre mould		
Preparation	Original material was natural, single sample tested		
Material > 37.5mm	0	%	
Material < 37.5mm > 20mm	0	%	
Particle density	2.80	assumed	
Remarks			

Derived Parameters +

Maximum dry density, Mg/m3
1.58

Optimum moisture content, %
27

QA Ref
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Project No N8135-18

Project Name Heathrow Airport Limited

Figure
COMPH

Printed:
30/10/2018
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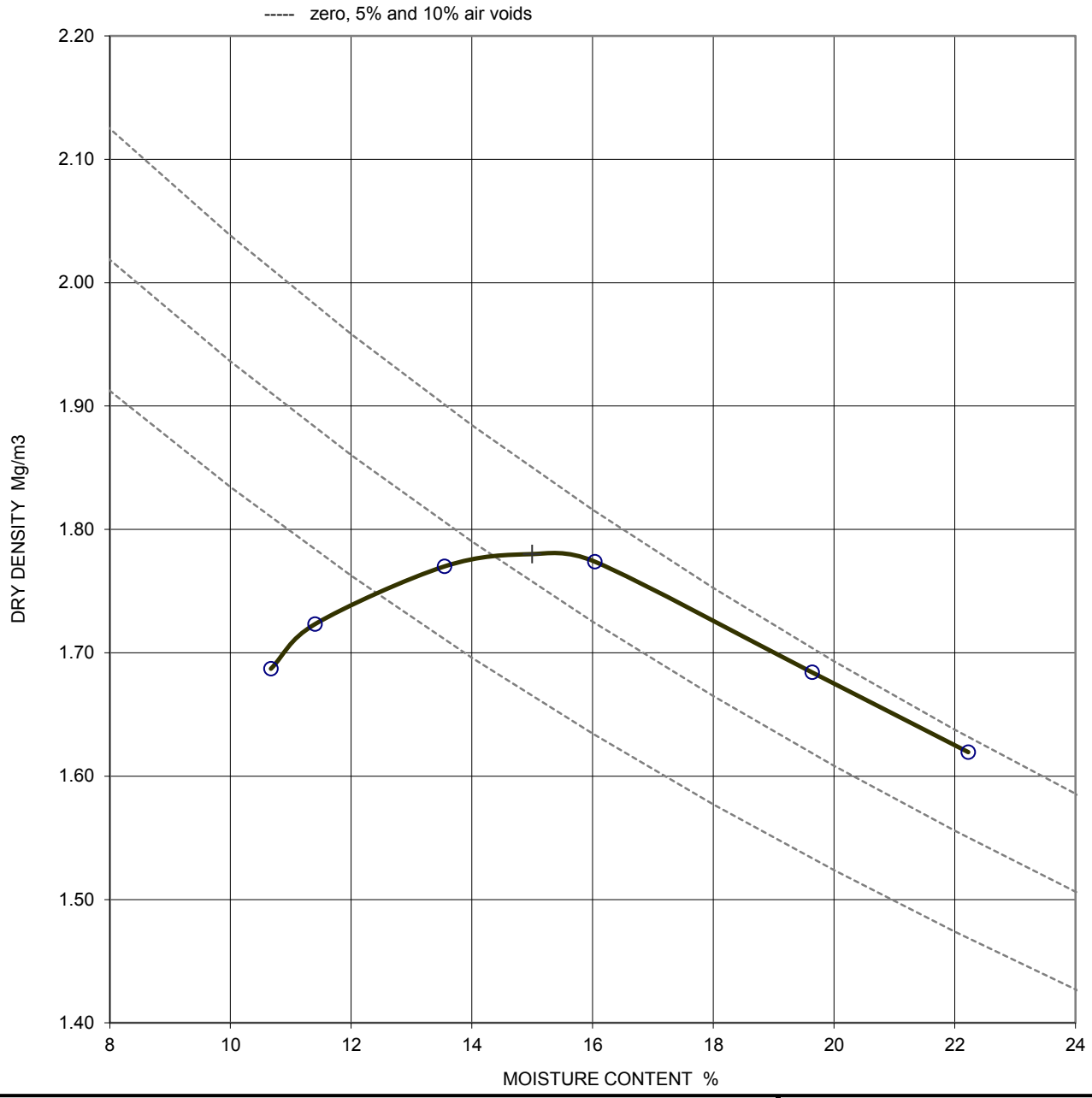
DRY DENSITY / MOISTURE CONTENT RELATIONSHIP
BS1377 : PART 4 : 1990 : LIGHT COMPACTION, 2.5 kg rammer

Sample Details:	SAMPLE ID:
	HEPBH6120171120016

Hole No	HEP-BH-61
Sample Depth (m BGL)	0
Sample Type and No	LB4
Specimen Ref	



Soil description	Brown slightly sandy gravelly silty CLAY.		
Test method	BS 1377:part 4:1990: clause 3.5, 2.5 kg rammer in a 1 litre mould		
Preparation	Original material was natural, single sample tested		
Material > 37.5mm	0	%	
Material < 37.5mm > 20mm	0	%	
Particle density	2.56	measured - gas jar	
Remarks			

Derived Parameters +

Maximum dry density, Mg/m3 **1.78**

Optimum moisture content, % **15**

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Project No N8135-18

Project Name Heathrow Airport Limited

Figure
COMPL

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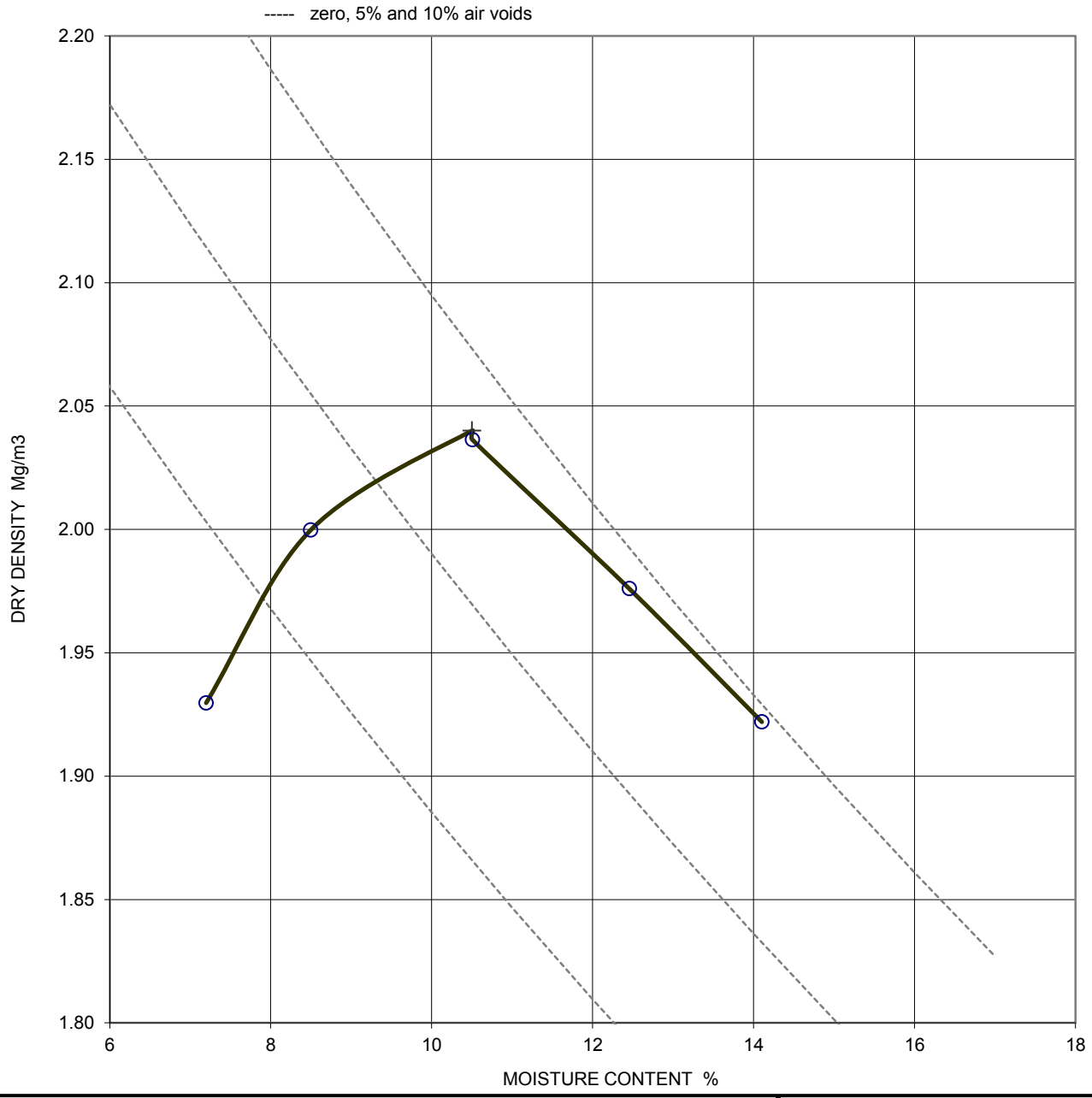
DRY DENSITY / MOISTURE CONTENT RELATIONSHIP
BS1377 : PART 4 : 1990 : LIGHT COMPACTION, 2.5 kg rammer

Sample Details:	SAMPLE ID:
	FES1180117009

Hole No	HEP-BH-65
Sample Depth (m BGL)	1.35
Sample Type and No	B9
Specimen Ref	



Soil description	Brownish grey sandy gravelly CLAY.		
Test method	BS 1377:part 4:1990: clause 3.6, 2.5 kg rammer in a CBR mould		
Preparation	Original material was natural, single sample tested		
Material > 37.5mm	5	%	
Material < 37.5mm > 20mm	13	%	
Particle density	2.65	assumed	
Remarks			

Derived Parameters +

Maximum dry density, Mg/m3 **2.04**

Optimum moisture content, % **11**

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Sep 17

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SOCOTEC

Project No	N8135-18
Project Name	Heathrow Airport Limited

Figure
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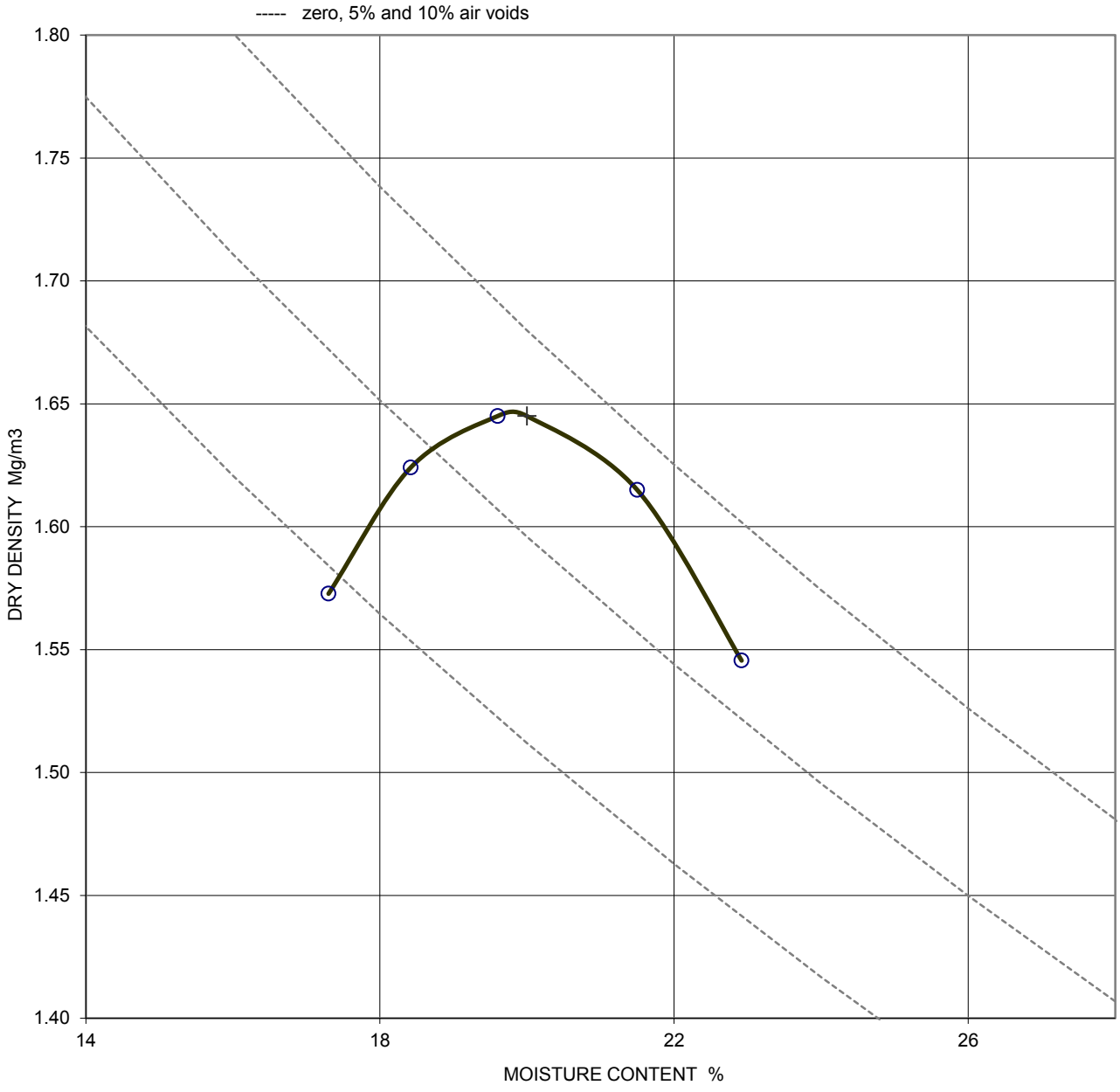
DRY DENSITY / MOISTURE CONTENT RELATIONSHIP
BS1377 : PART 4 : 1990 : HEAVY COMPACTION, 4.5 kg rammer

Sample Details:	SAMPLE ID:
	HEPBH82020180306012

Hole No	HEP-BH-820
Sample Depth (m BGL)	0.6
Sample Type and No	B8
Specimen Ref	



Soil description	Dark brown slightly sandy gravelly clayey SILT.		
Test method	BS 1377:part 4:1990: clause 3.6, 4.5 kg rammer in a CBR mould		
Preparation	Original material was natural, single sample tested		
Material > 37.5mm	2	%	
Material < 37.5mm > 20mm	9	%	
Particle density	2.53	measured - gas jar	
Remarks			

Derived Parameters +

Maximum dry density, Mg/m3 **1.65**

Optimum moisture content, % **20**

QA Ref
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Project Name Heathrow Airport Limited

Figure
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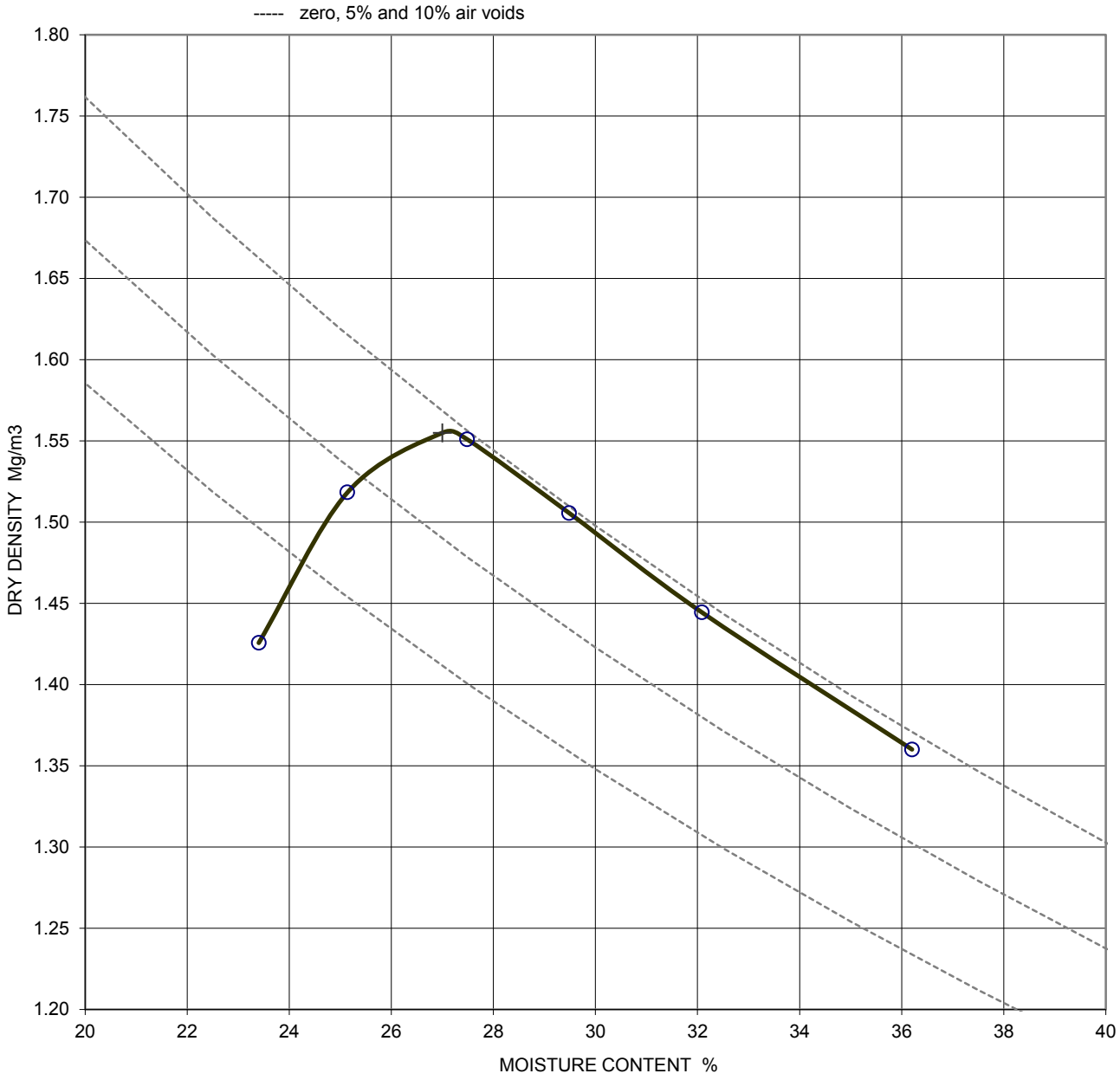
DRY DENSITY / MOISTURE CONTENT RELATIONSHIP
BS1377 : PART 4 : 1990 : HEAVY COMPACTION, 4.5 kg rammer

Sample Details:	SAMPLE ID:
	SOCO201809200

Hole No	HEP-BH-823
Sample Depth (m BGL)	5.20 - 5.40
Sample Type and No	B25
Specimen Ref	



Soil description	Brown slightly gravelly CLAY.		
Test method	BS 1377:part 4:1990: clause 3.5, 4.5 kg rammer in a 1 litre mould		
Preparation	Original material was natural, single sample tested		
Material > 37.5mm	0	%	
Material < 37.5mm > 20mm	0	%	
Particle density	2.72	assumed	
Remarks			

Derived Parameters +

Maximum dry density, Mg/m3 **1.56**

Optimum moisture content, % **27**

QA Ref
SLD 4, 3.5/6
Rev 2.5
Sep 17

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Project No N8135-18

Project Name Heathrow Airport Limited

Figure
COMPH

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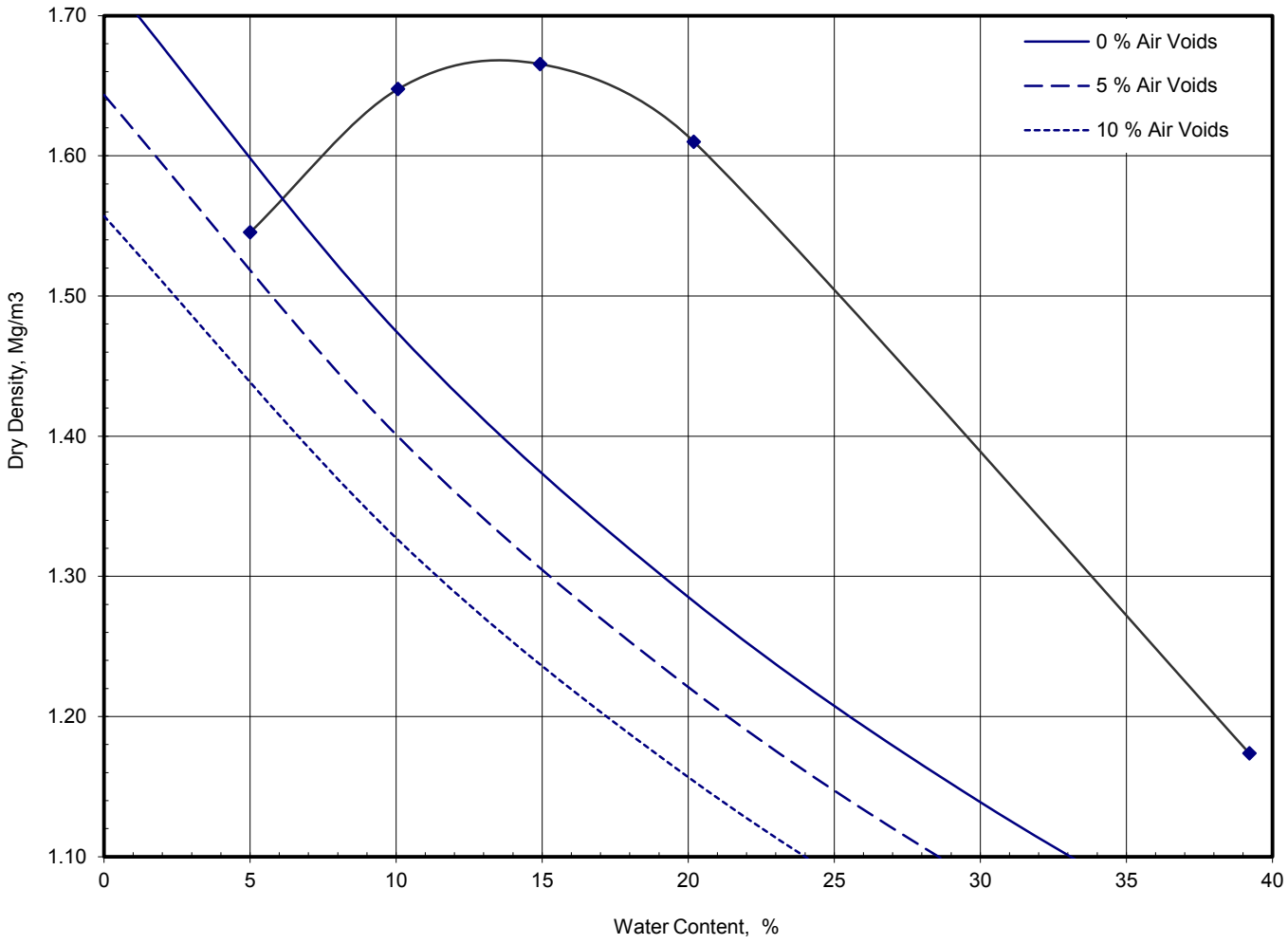
FUGRO	**Determination of Dry Density / Water Content Relationship Light (2.5kg) Compaction**			Project No.	G170029U
				Hole	HEP-BH-824
				Sample No	13
Project Name	HAL Airport Expansion			Depth	1.70 m
Specimen Ref.		Specimen Depth	m	Sample Type	LB
Description	Brown slightly sandy slightly gravelly CLAY			Keylab ID	FES2171208022
Test Method	BS1377:Part 4:1990, clause 3.3, 2.5kg rammer				



Preparation		Material used was natural
Mould Type		1 LITRE
Samples Used		Single sample tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	0
Particle Density - Measured	Mg/m³	1.73

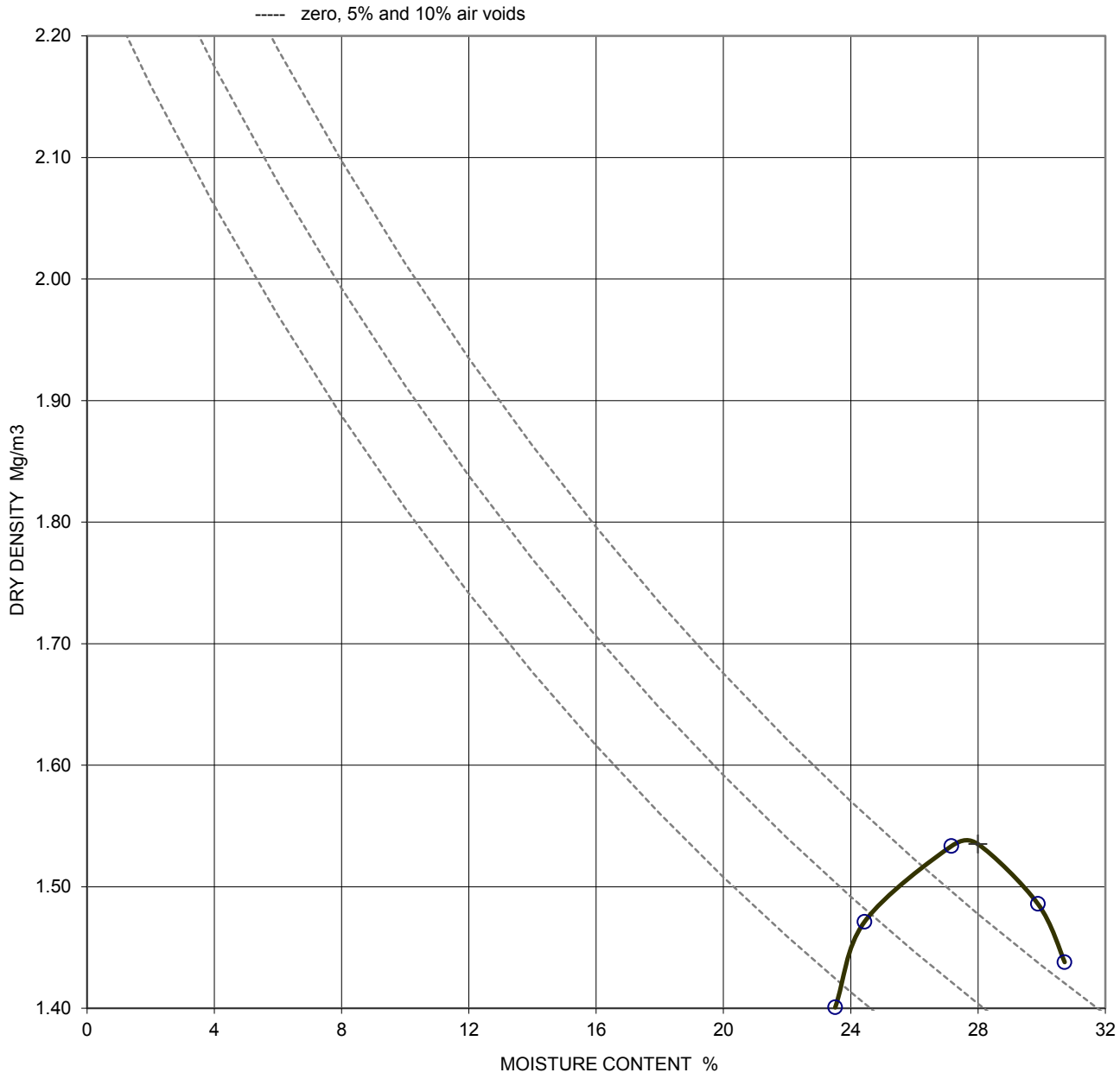
Maximum Dry Density	Mg/m³	**1.67**
Optimum Water Content	%	**14.0**

Remarks	Date printed	Figure Number	Sheet Number
	09/08/2018		

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP
BS1377 : PART 4 : 1990 : HEAVY COMPACTION, 4.5 kg rammer

Sample Details:	SAMPLE ID:
	FES1180318019

Hole No	HEP-BH-1047
Sample Depth (m BGL)	2.7
Sample Type and No	B19
Specimen Ref	



Soil description	Black sandy GRAVEL.		
Test method	BS 1377:part 4:1990: clause 3.6, 4.5 kg rammer in a CBR mould		
Preparation	Original material was natural, single sample tested		
Material > 37.5mm	11	%	
Material < 37.5mm > 20mm	20	%	
Particle density	2.52	measured - gas jar	
Remarks			

Derived Parameters +

Maximum dry density, Mg/m3 **1.54**

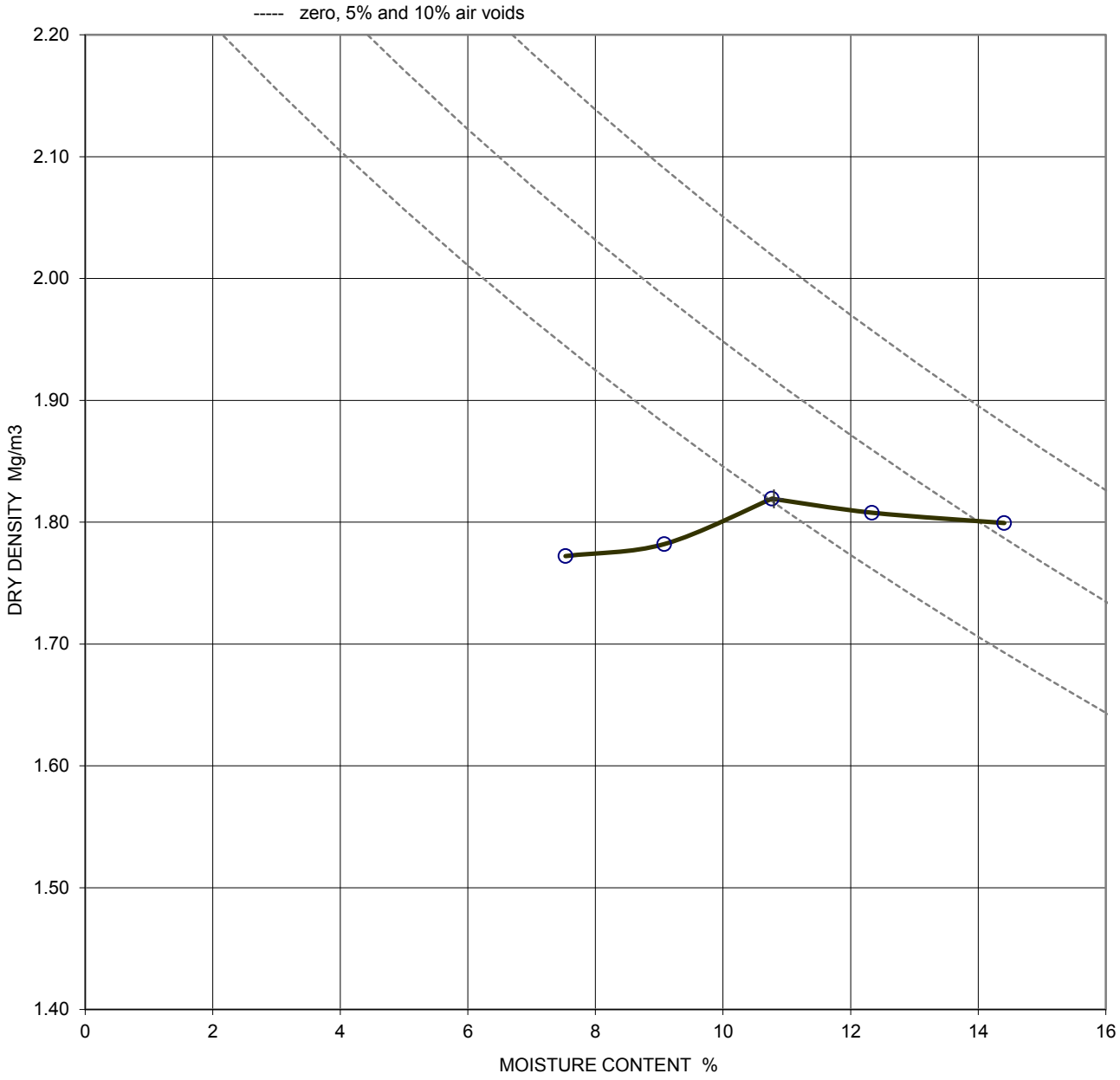
Optimum moisture content, % **28**

Grading Zone X

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP
BS1377 : PART 4 : 1990 : HEAVY COMPACTION, 4.5 kg rammer

Sample Details:	SAMPLE ID:
	HEPBH105020180320014

Hole No	HEP-BH-1050
Sample Depth (m BGL)	4
Sample Type and No	B21
Specimen Ref	



Soil description	Brown sandy GRAVEL.		
Test method	BS 1377:part 4:1990: clause 3.6, 4.5 kg rammer in a CBR mould		
Preparation	Original material was natural, single sample tested		
Material > 37.5mm	3	%	
Material < 37.5mm > 20mm	19	%	
Particle density	2.58	measured - gas jar	
Remarks			

Derived Parameters +

Maximum dry density, Mg/m3
1.82

Optimum moisture content, %
11

QA Ref
SLD 4, 3.5/6
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Sep 17

UKAS TESTING
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Project No N8135-18

Project Name Heathrow Airport Limited

Figure
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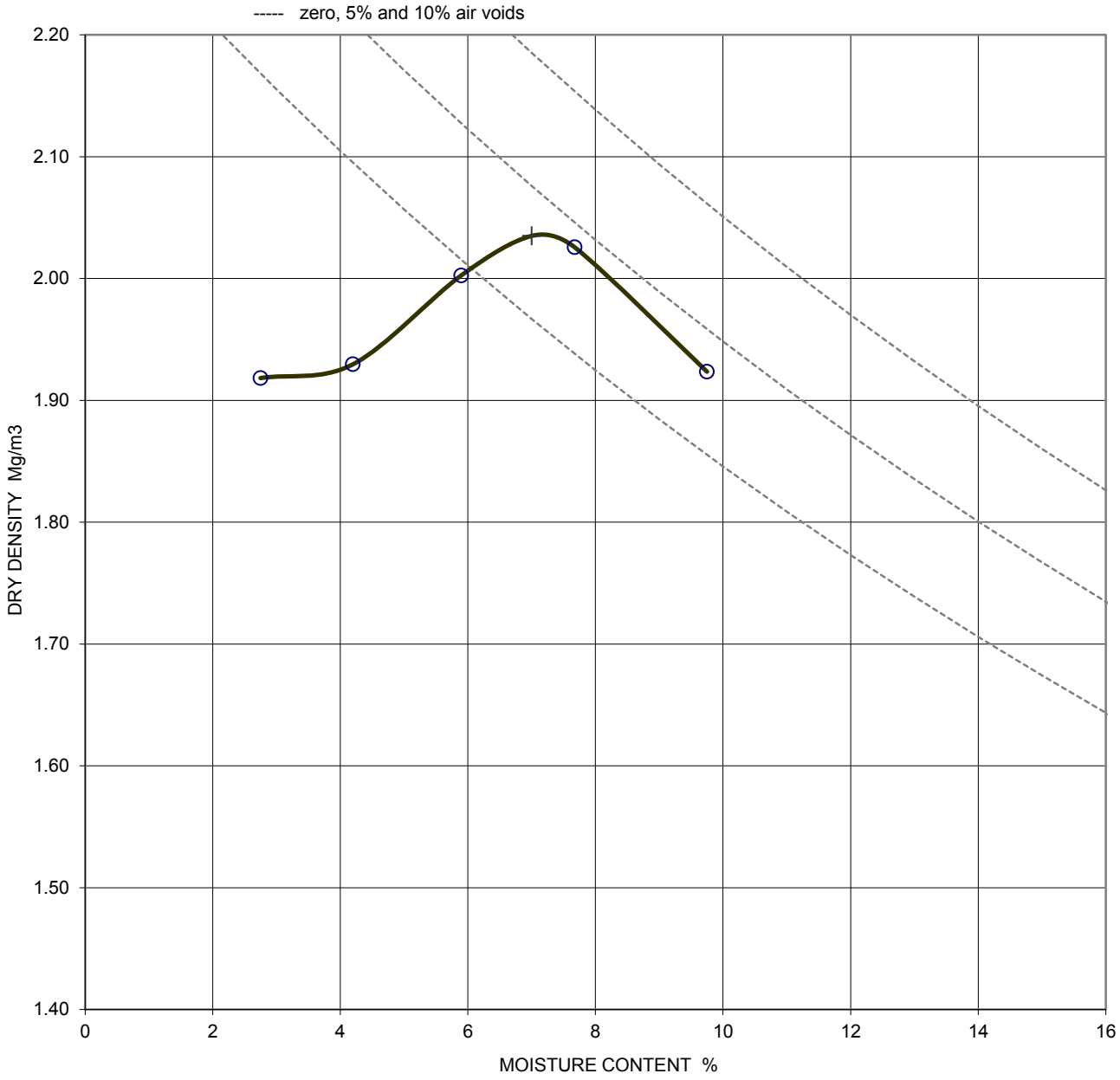
DRY DENSITY / MOISTURE CONTENT RELATIONSHIP
BS1377 : PART 4 : 1990 : HEAVY COMPACTION, 4.5 kg rammer

Sample Details:	SAMPLE ID:
	HEPBH180420171206007

Hole No	HEP-BH-1804
Sample Depth (m BGL)	1.20
Sample Type and No	B14
Specimen Ref	



Soil description	Dark brown very sandy GRAVEL.		
Test method	BS 1377:part 4:1990: clause 3.6, 4.5 kg rammer in a CBR mould		
Preparation	Original material was natural, single sample tested		
Material > 37.5mm	0	%	
Material < 37.5mm > 20mm	32	%	
Particle density	2.58	measured - gas jar	
Remarks			

Derived Parameters +

Maximum dry density, Mg/m3
2.04

Optimum moisture content, %
7.0

Grading Zone X

QA Ref
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Figure
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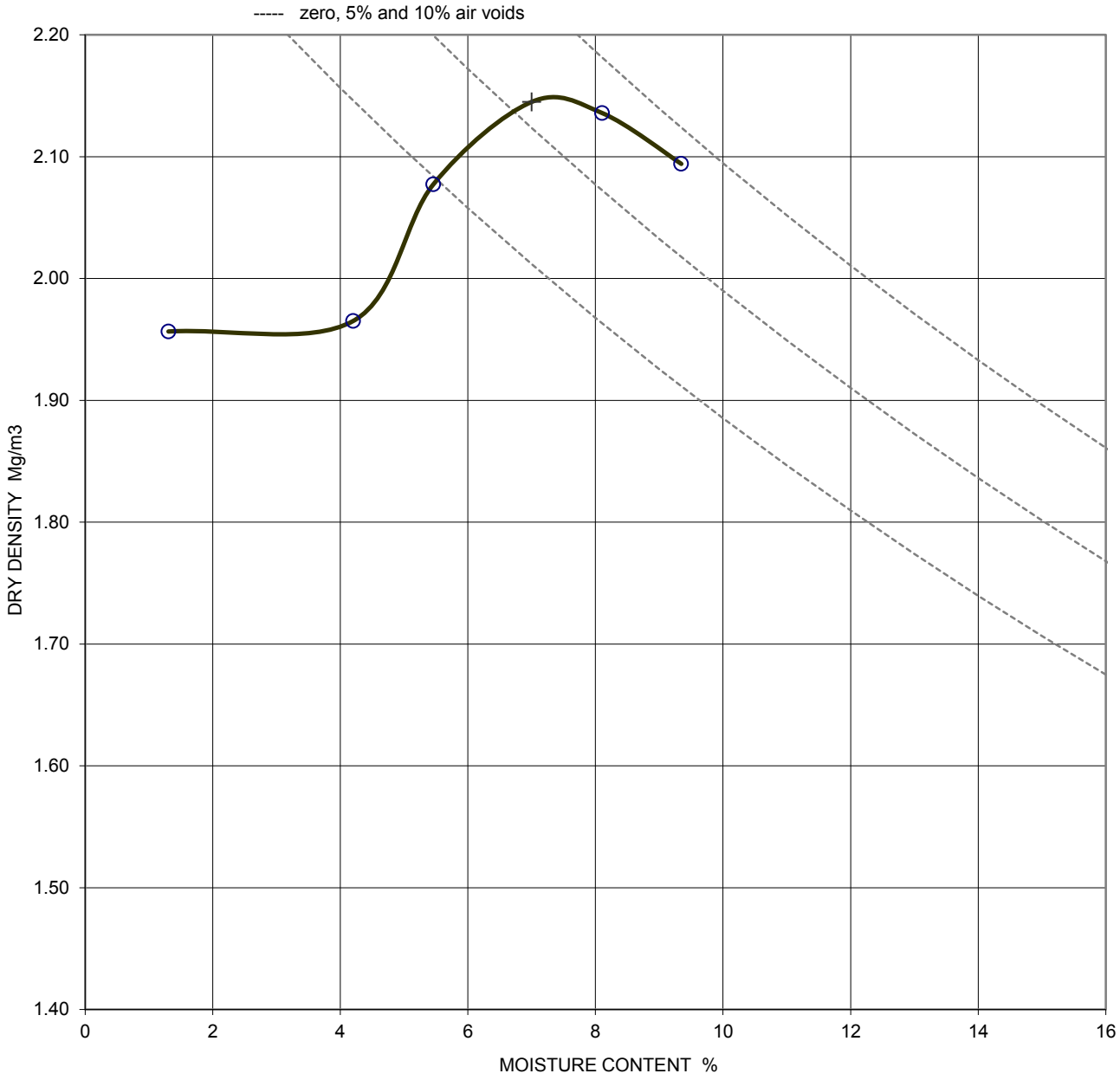
Printed:
23/11/2018
09:22

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP
BS1377 : PART 4 : 1990 : HEAVY COMPACTION, 4.5 kg rammer

Sample Details:	SAMPLE ID:
	HEPTP1020171212011

Hole No	HEP-TP-10
Sample Depth (m BGL)	2
Sample Type and No	LB10
Specimen Ref	



Soil description	Grey sandy silty GRAVEL.		
Test method	BS 1377:part 4:1990: clause 3.6, 4.5 kg rammer in a CBR mould		
Preparation	Original material was natural, single sample tested		
Material > 37.5mm	11	%	
Material < 37.5mm > 20mm	19	%	
Particle density	2.65	assumed	
Remarks			

Derived Parameters +

Maximum dry density, Mg/m3
2.15

Optimum moisture content, %
7

Grading Zone X

QA Ref
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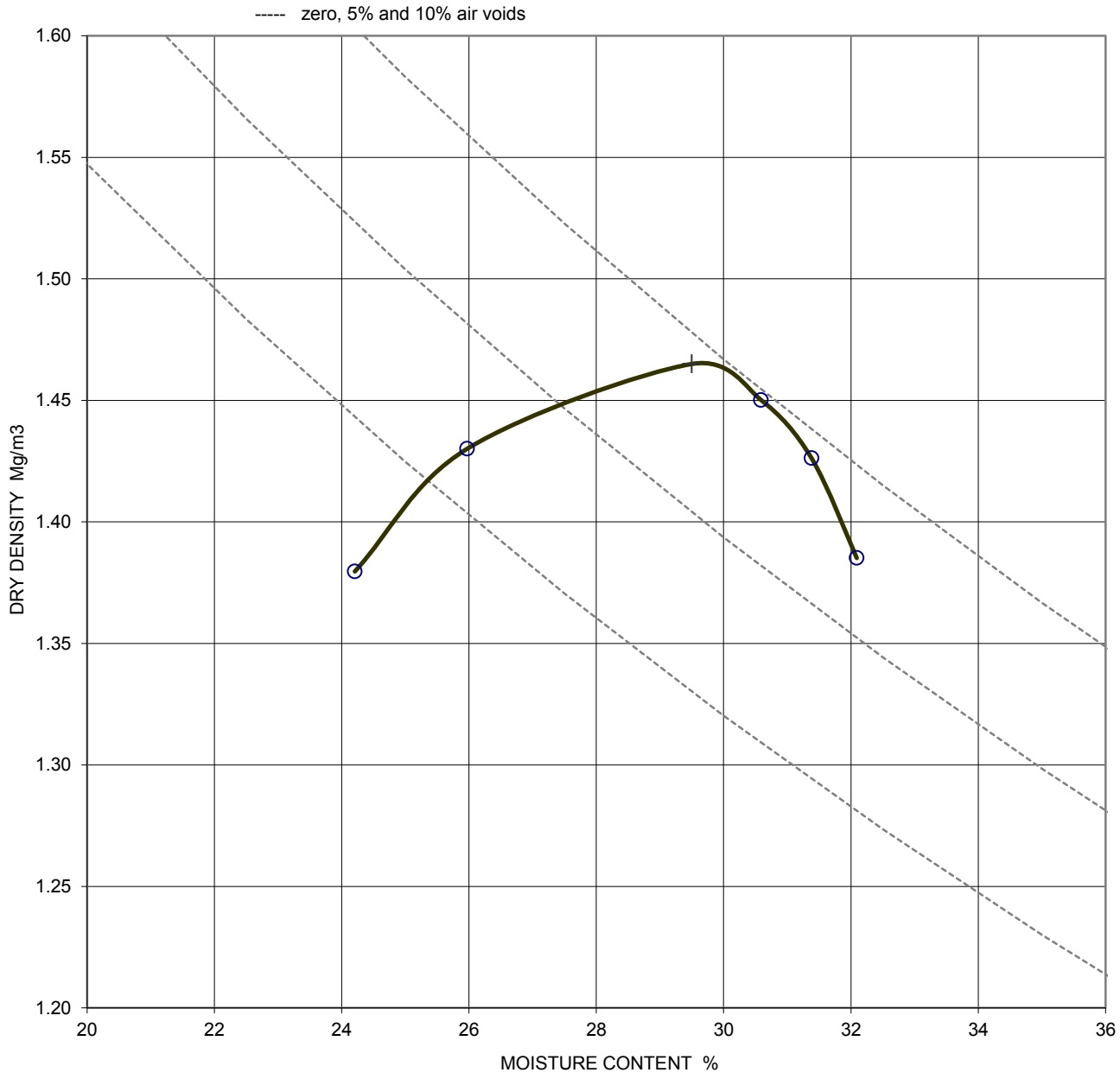
30/10/2018
10:33

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP
BS1377 : PART 4 : 1990 : HEAVY COMPACTION, 4.5 kg rammer

Sample Details:	SAMPLE ID:
	HEPTT620171123008

Hole No	HEP-TT-6
Sample Depth (m BGL)	0.8
Sample Type and No	LB8
Specimen Ref	



Soil description	Brown slightly sandy slightly gravelly silty CLAY.		
Test method	BS 1377:part 4:1990: clause 3.6, 4.5 kg rammer in a CBR mould		
Preparation	Original material was natural, single sample tested		
Material > 37.5mm	9	%	
Material < 37.5mm > 20mm	4	%	
Particle density	2.62	measured - gas jar	
Remarks			

Derived Parameters +

Maximum dry density, Mg/m3 **1.47**

Optimum moisture content, % **30**

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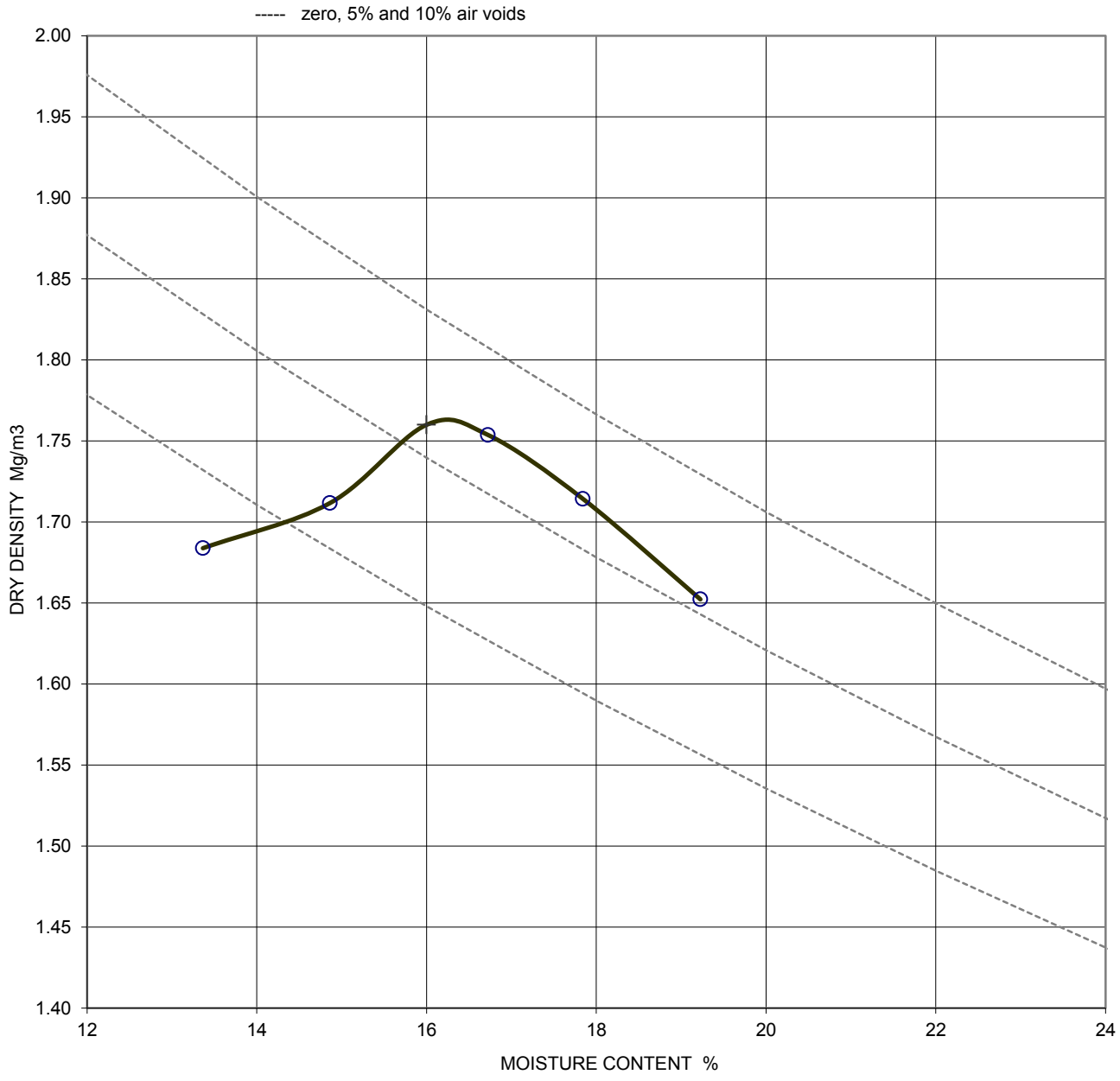
DRY DENSITY / MOISTURE CONTENT RELATIONSHIP
BS1377 : PART 4 : 1990 : HEAVY COMPACTION, 4.5 kg rammer

Sample Details:	SAMPLE ID:
	HEPTT920171123010

Hole No	HEP-TT-9
Sample Depth (m BGL)	1.2
Sample Type and No	B9
Specimen Ref	



Soil description	Greyish brown slightly sandy gravelly CLAY.		
Test method	BS 1377:part 4:1990: clause 3.6, 4.5 kg rammer in a CBR mould		
Preparation	Original material was natural, single sample tested		
Material > 37.5mm	5	%	
Material < 37.5mm > 20mm	11	%	
Particle density	2.59	measured - gas jar	
Remarks			

Derived Parameters +

Maximum dry density, Mg/m3 **1.76**

Optimum moisture content, % **16**

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Project Name Heathrow Airport Limited

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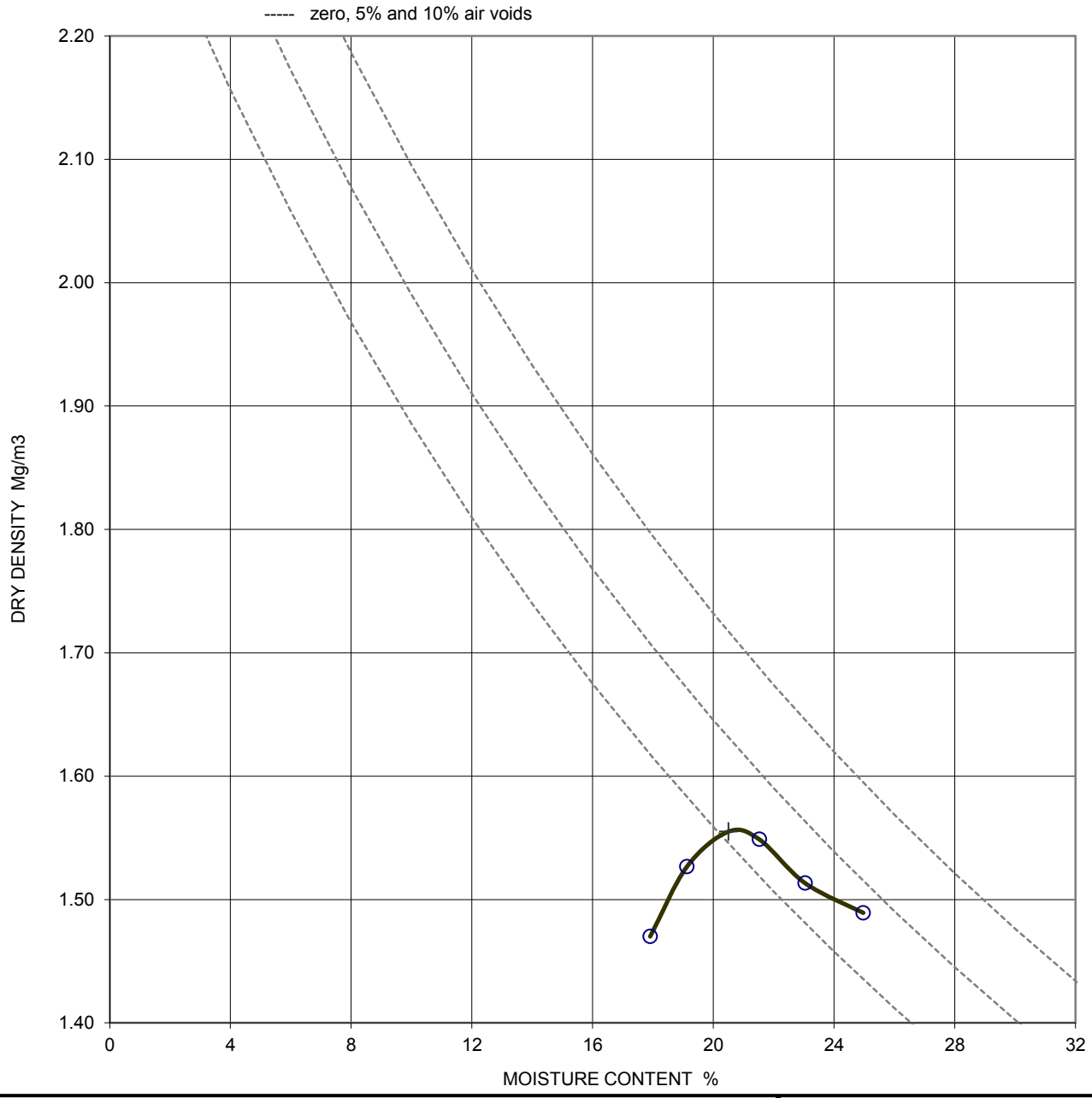
DRY DENSITY / MOISTURE CONTENT RELATIONSHIP
BS1377 : PART 4 : 1990 : LIGHT COMPACTION, 2.5 kg rammer

Sample Details:	SAMPLE ID:
	HEPTT1120171124010

Hole No	HEP-TT-11
Sample Depth (m BGL)	1.3
Sample Type and No	B9
Specimen Ref	



Soil description	Brown slightly sandy slightly gravelly CLAY.		
Test method	BS 1377:part 4:1990: clause 3.6, 2.5 kg rammer in a CBR mould		
Preparation	Original material was natural, single sample tested		
Material > 37.5mm	3	%	
Material < 37.5mm > 20mm	3	%	
Particle density	2.65	measured - gas jar	
Remarks			

Derived Parameters +

Maximum dry density, Mg/m3 **1.56**

Optimum moisture content, % **21**

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Project No	N8135-18
Project Name	Heathrow Airport Limited

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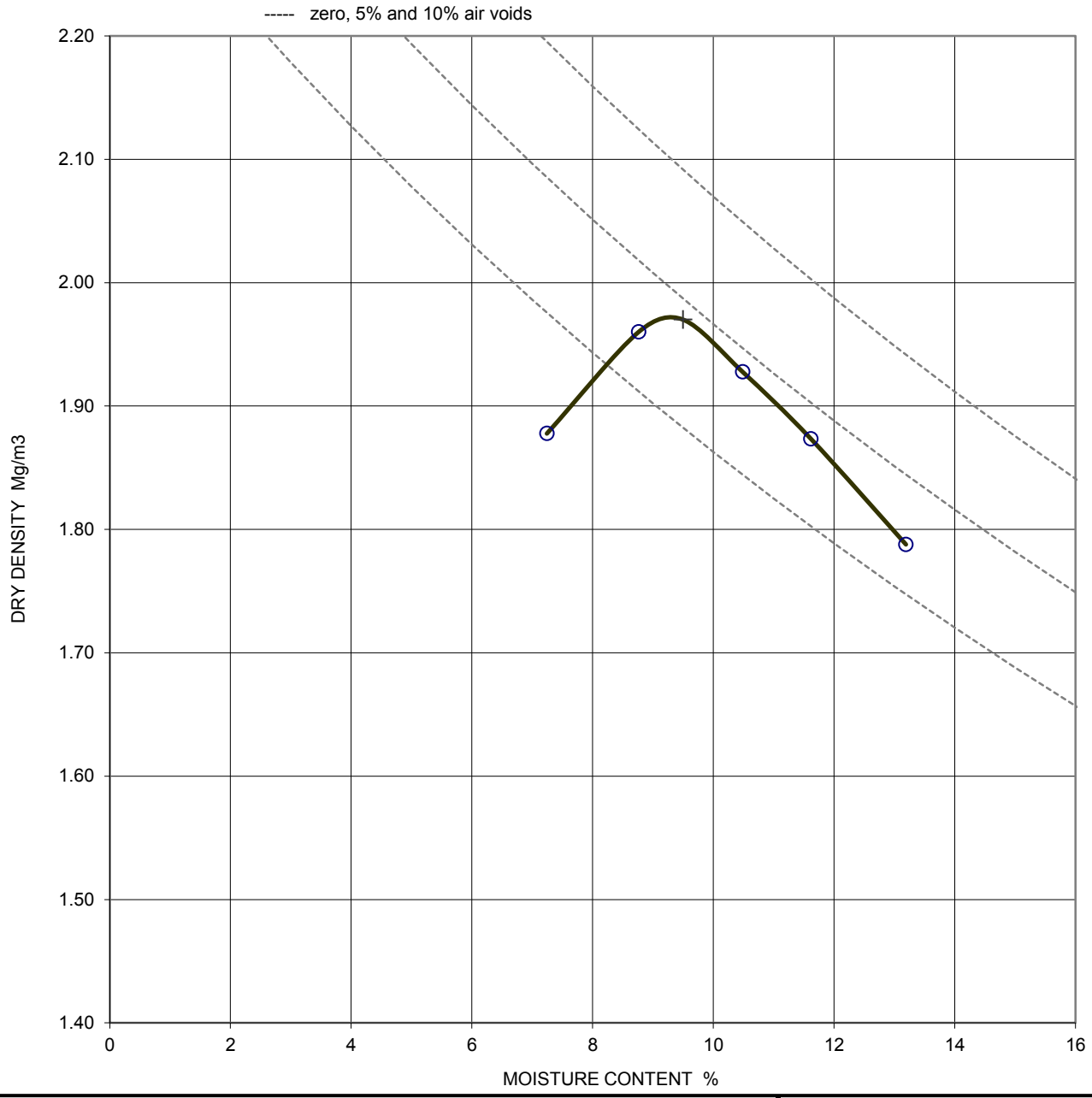
DRY DENSITY / MOISTURE CONTENT RELATIONSHIP
BS1377 : PART 4 : 1990 : LIGHT COMPACTION, 2.5 kg rammer

Sample Details:	SAMPLE ID:
	HEPTT2920171128009

Hole No	HEP-TT-29
Sample Depth (m BGL)	1.8
Sample Type and No	B9
Specimen Ref	



Soil description	Dark brown slightly sandy slightly gravelly CLAY.		
Test method	BS 1377:part 4:1990: clause 3.6, 2.5 kg rammer in a CBR mould		
Preparation	Original material was natural, single sample tested		
Material > 37.5mm	2	%	
Material < 37.5mm > 20mm	15	%	
Particle density	2.61	measured - small pyknometer	
Remarks			

Derived Parameters +

Maximum dry density, Mg/m3 **1.97**

Optimum moisture content, % **9.5**

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Project Name Heathrow Airport Limited

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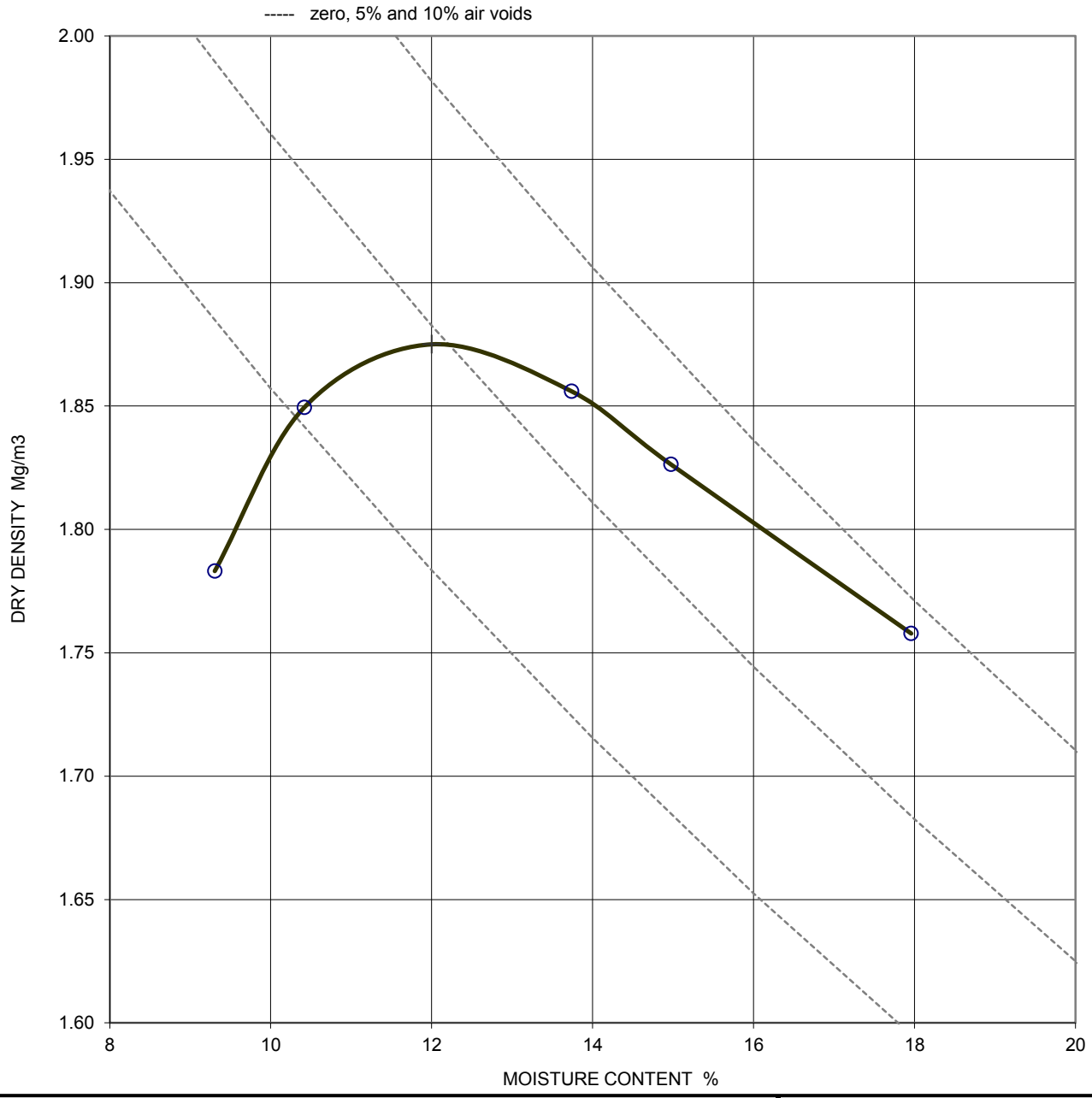
DRY DENSITY / MOISTURE CONTENT RELATIONSHIP
BS1377 : PART 4 : 1990 : LIGHT COMPACTION, 2.5 kg rammer

Sample Details:	SAMPLE ID:
	HEPTT3920171128009

Hole No	HEP-TT-39
Sample Depth (m BGL)	1.8
Sample Type and No	B9
Specimen Ref	



Soil description	Brownish grey slightly sandy gravelly CLAY with one cobble.		
Test method	BS 1377:part 4:1990: clause 3.5, 2.5 kg rammer in a 1 litre mould		
Preparation	Original material was natural, single sample tested		
Material > 37.5mm	19	%	
Material < 37.5mm > 20mm	8	%	
Particle density	2.60	measured - gas jar	
Remarks			

Derived Parameters +

Maximum dry density, Mg/m3 **1.88**

Optimum moisture content, % **12**

Grading Zone X

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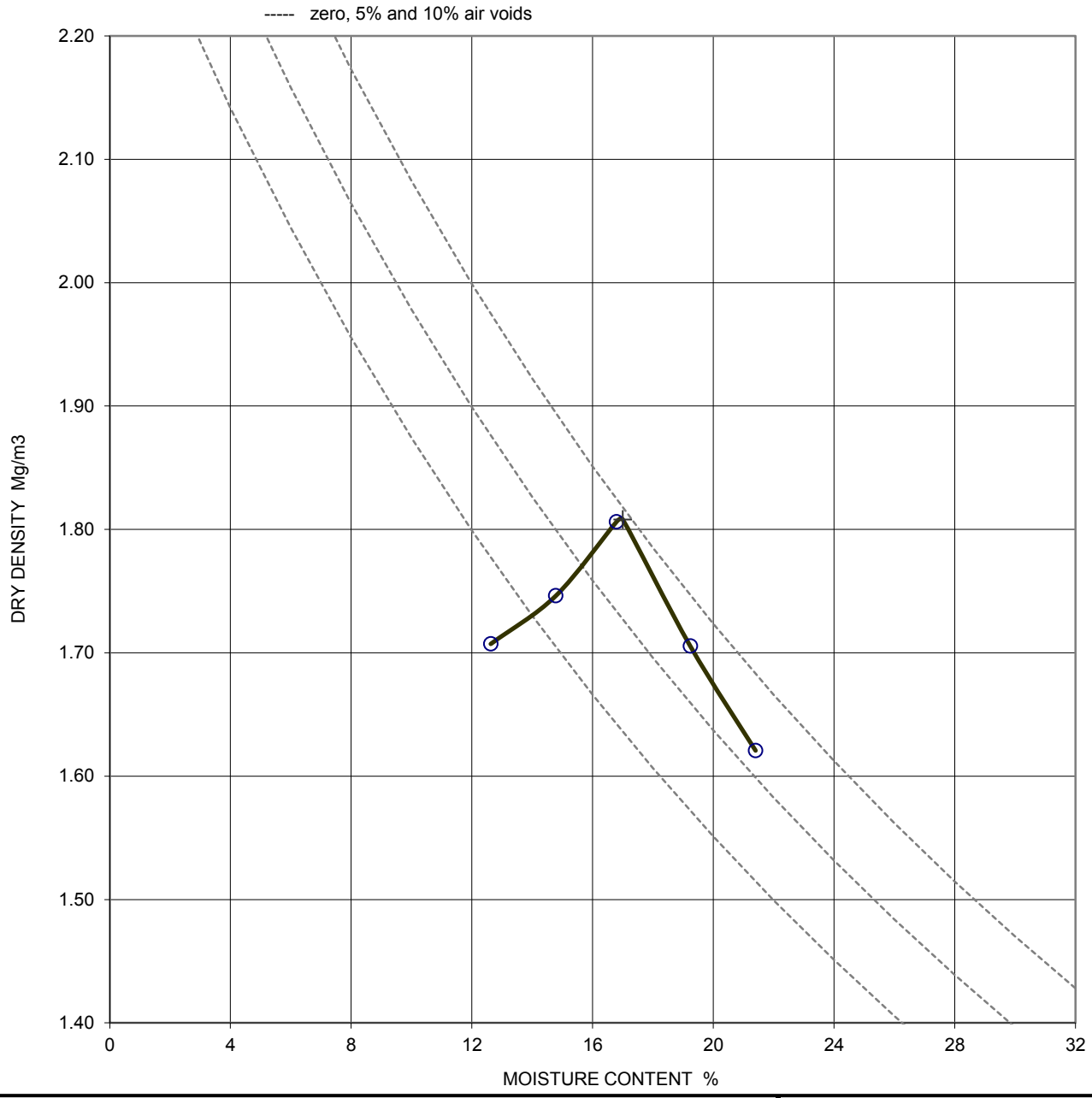
DRY DENSITY / MOISTURE CONTENT RELATIONSHIP
BS1377 : PART 4 : 1990 : LIGHT COMPACTION, 2.5 kg rammer

Sample Details:	SAMPLE ID:
	HEPTT03220171128010

Hole No	HEP-TT-1032
Sample Depth (m BGL)	2.3
Sample Type and No	LB9
Specimen Ref	



Soil description	Brown slightly sandy slightly gravelly silty CLAY.		
Test method	BS 1377:part 4:1990: clause 3.6, 2.5 kg rammer in a CBR mould		
Preparation	Original material was natural, single sample tested		
Material > 37.5mm	1	%	
Material < 37.5mm > 20mm	8	%	
Particle density	2.63	measured - small pyknometer	
Remarks			

Derived Parameters +

Maximum dry density, Mg/m3 **1.81**

Optimum moisture content, % **17**

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MAXIMUM AND MINIMUM DRY DENSITY - SUMMARY OF RESULTS

Hole No.	Sample				Soil Description	Test spec.	Oversize, as appropriate*			*ρdmax*	*ρdmin*	Remarks
	No.	Depth (m)		type			>37.5mm	>6.3mm	>2mm			
		from	to				%	%	%	Mg/m3	Mg/m3	
HEP-BH-1804	14	1.20		B	Dark brown very sandy GRAVEL.	4.3 , 4.5				2.01	1.64	

Key :

Test Spec. BS 1377 : Part 4 : 1990 : clauses :

4.4, 4.2 Maximum, minimum dry density of sandy soil

4.5, 4.3 Maximum, minimum dry density of gravelly soil

*oversize material not replaced by smaller particles unless confirmed in remarks

ρdmax Maximum dry density

ρdmin Minimum dry density

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SUM 4.4
Rev 2.3
Apr 15

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Project Name Heathrow Airport Limited

Figure

RELD

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Moisture Condition Value
Summary of Results

Project Name	Project No.
HAL Airport Expansion	G170029U

Hole No.	Sample			Description	Retained on 20mm sieve %	Moisture Content <20mm %	Moisture Condition Value	Method of Interpretation	Remarks
	Ref	Top	Type						
HEP-BH-45	16	2.10	B	Brown slightly clayey sandy GRAVEL	11.6	8.7	16.6	Steepest straight line	

Method
Tests performed in accordance with BS 1377 : Part 4 : 1990, clause 5.4 unless annotated otherwise

Notes	Date Printed	Figure Number	Sheet Number
	08/09/2018 00:00		

MOISTURE CONDITION VALUE (MCV) TEST

Sample Details:	SAMPLE ID:
	FES1171121019

Hole No	HEP-BH-50
Sample Depth (m BGL)	2.5
Sample Type and No	B19
Specimen Ref	

Soil Description	Brown slightly sandy slightly gravelly CLAY.
Preparation procedure and Remarks	BS1377:Part 1 and Part 4, clause 5.4 at natural moisture content

Test Data

Blows n	Penetration/ protrusion mm	Change in Penetration n to 4n mm
1	126.8	36.1
2	108.9	37.1
3	98.3	30.3
4	90.7	23.1
6	79.2	12.1
8	71.8	4.8
12	68.0	
16	67.6	
24	67.1	
32	67.0	
48		
64		
96		
128		
192		
256		

Equipment

Mould diameter	100	mm
Height of drop	250	mm
Mass of rammer	7	kg

Sample data

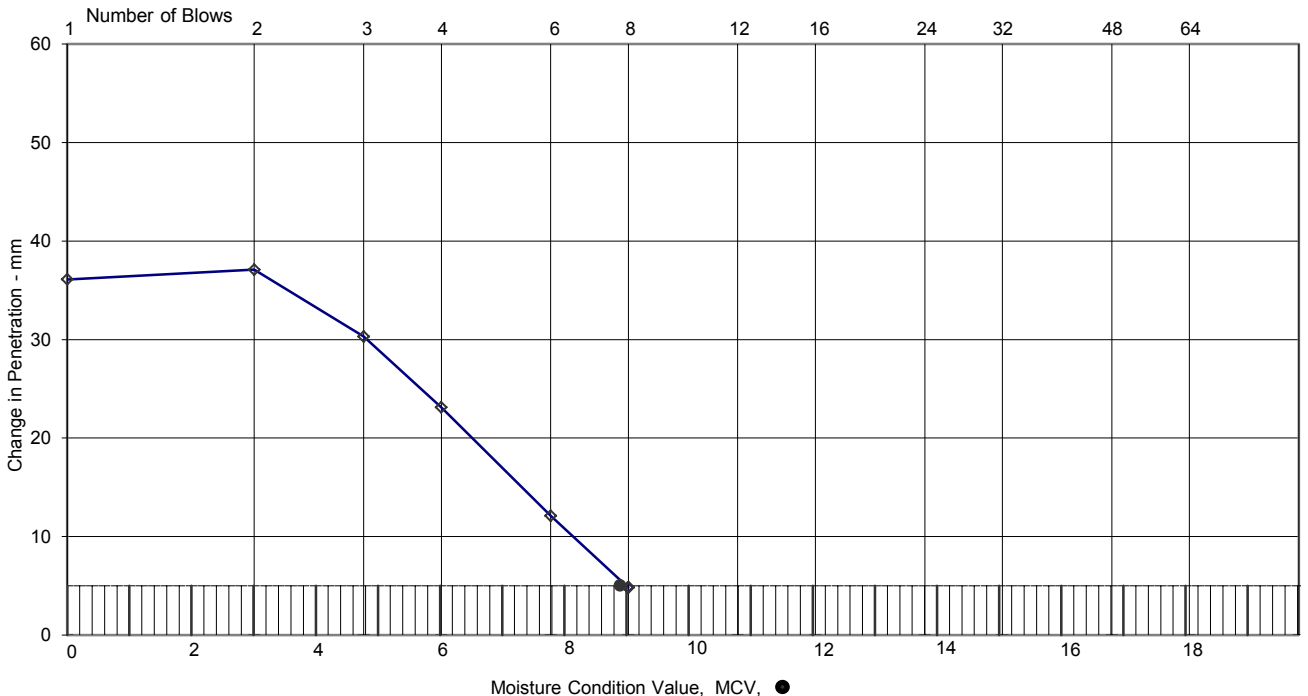
Retained on 20mm sieve, removed	2	%
Mass of specimen used in test	1500	g

Specimen after test

Vane shear strength, if measured		kPa
Bulk density	1.92	Mg/m3
Dry density	1.47	Mg/m3

Moisture Content	**30.0**	%
Moisture Condition Value, MCV	**9.0**	

Method of interpretation Steepest straight line



QA Ref
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Project Name Heathrow Airport Limited

Figure

MCV

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MOISTURE CONDITION VALUE (MCV) TEST

Sample Details:	SAMPLE ID:
	HEPBH6120171120016

Hole No	HEP-BH-61
Sample Depth (m BGL)	0
Sample Type and No	LB4
Specimen Ref	

Soil Description	Brown slightly sandy gravelly silty CLAY.
Preparation procedure and Remarks	BS1377:Part 1 and Part 4, clause 5.4 at natural moisture content

Test Data

Blows n	Penetration/ protrusion mm	Change in Penetration n to 4n mm
1	80.6	13.7
2	71.7	9.3
3	70.1	9.0
4	66.9	9.6
6	64.9	10.9
8	62.4	8.1
12	61.1	7.0
16	57.4	3.4
24	54.0	
32	54.3	
48	54.1	
64	53.9	
96		
128		
192		
256		

Equipment

Mould diameter	100	mm
Height of drop	250	mm
Mass of rammer	7	kg

Sample data

Retained on 20mm sieve, removed	0	%
Mass of specimen used in test	1508	g

Specimen after test

Vane shear strength, if measured		kPa
Bulk density	1.85	Mg/m3
Dry density	1.66	Mg/m3

Moisture Content	**12.0**	%
Moisture Condition Value, MCV	**12.0**	

Method of interpretation Steepest straight line

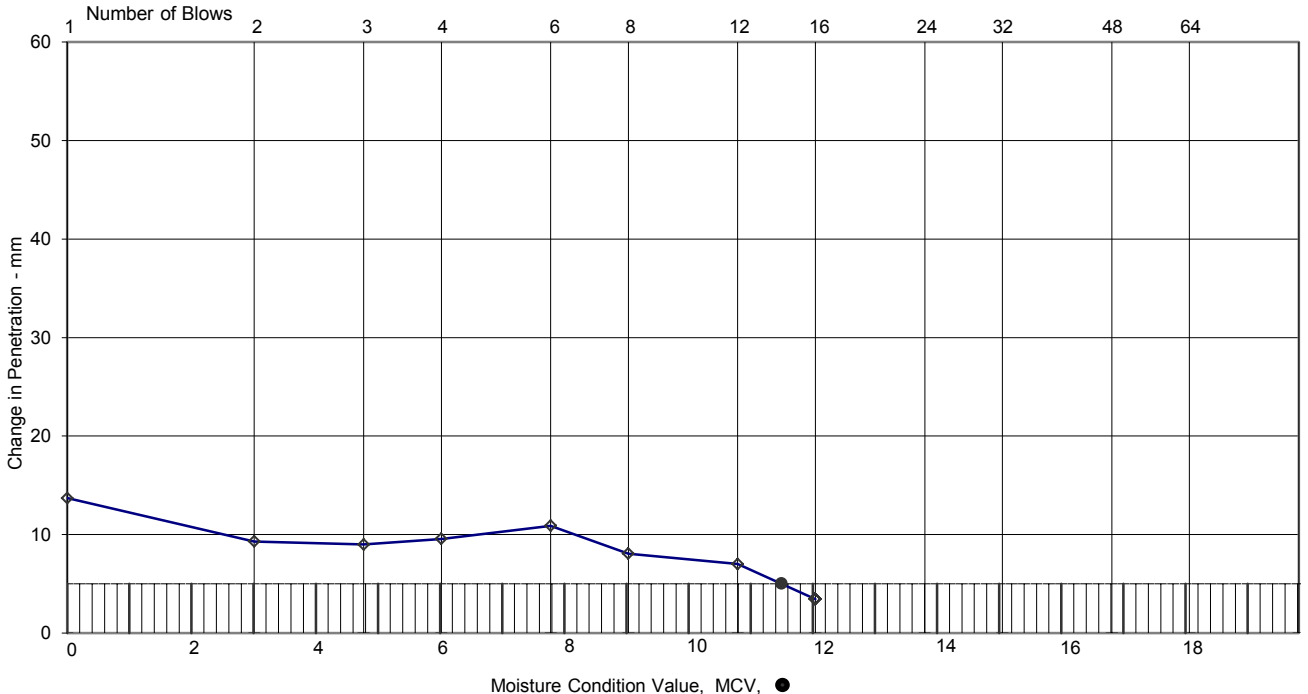

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Figure

MCV

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MOISTURE CONDITION VALUE (MCV) TEST

Sample Details:	SAMPLE ID:
	HEPBH6420180308018

Hole No	HEP-BH-64
Sample Depth (m BGL)	2.45
Sample Type and No	B20
Specimen Ref	

Soil Description	Dark brown slightly sandy slightly gravelly silty CLAY
Preparation procedure and Remarks	BS1377:Part 1 and Part 4, clause 5.4 at natural moisture content

Test Data

Blows n	Penetration/ protrusion mm	Change in Penetration n to 4n mm
1	89.6	19.0
2	82.9	13.7
3	72.4	3.2
4	70.6	
6	70.2	
8	69.2	
12	69.2	
16		
24		
32		
48		
64		
96		
128		
192		
256		

Equipment

Mould diameter	100	mm
Height of drop	250	mm
Mass of rammer	7	kg

Sample data

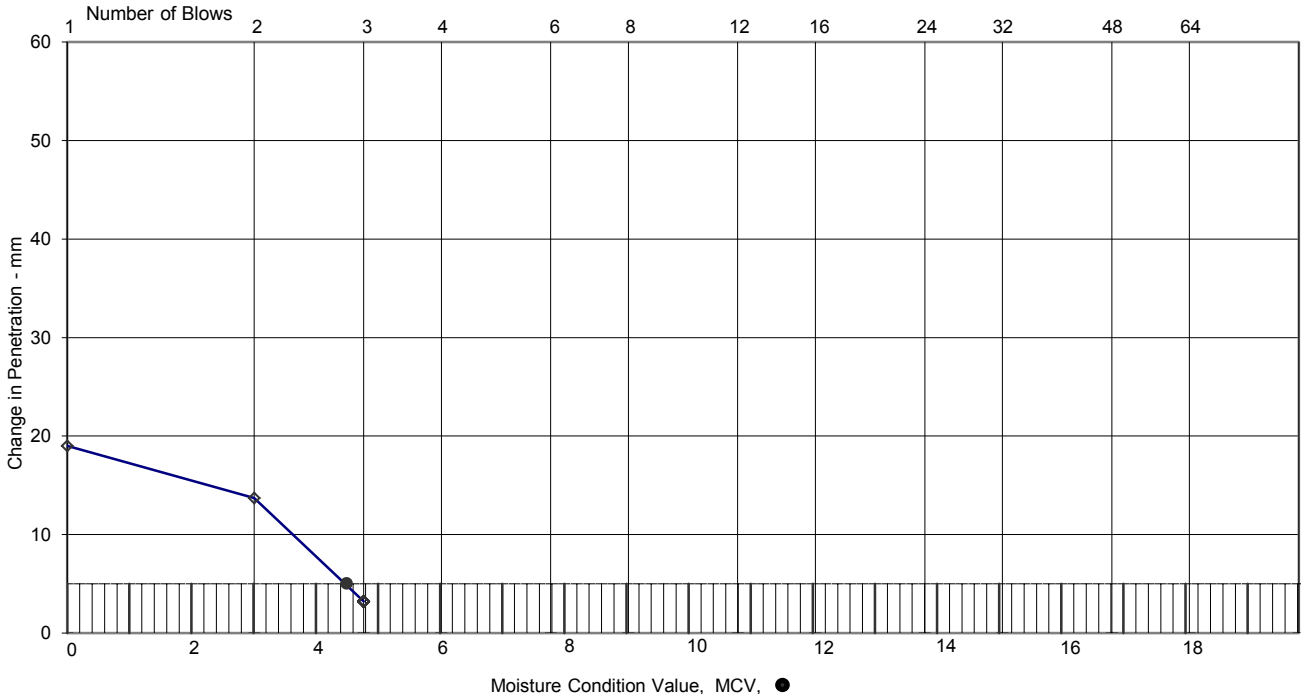
Retained on 20mm sieve, removed	16	%
Mass of specimen used in test	1498	g

Specimen after test

Vane shear strength, if measured		kPa
Bulk density	1.62	Mg/m3
Dry density	1.25	Mg/m3

Moisture Content	**29.0**	%
Moisture Condition Value, MCV	**5.0**	

Method of interpretation Steepest straight line



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MOISTURE CONDITION VALUE (MCV) TEST

Sample Details:	SAMPLE ID:
	FES1180117009

Hole No	HEP-BH-65
Sample Depth (m BGL)	1.35
Sample Type and No	B9
Specimen Ref	

Soil Description	Brownish grey sandy gravelly CLAY.
Preparation procedure and Remarks	BS1377:Part 1 and Part 4, clause 5.4 at natural moisture content

Test Data

Blows n	Penetration/ protrusion mm	Change in Penetration n to 4n mm
1	56.7	9.4
2	50.9	7.6
3	48.8	7.3
4	47.2	7.0
6	44.3	4.9
8	43.3	
12	41.6	
16	40.2	
24	39.4	
32		
48		
64		
96		
128		
192		
256		

Equipment

Mould diameter	100	mm
Height of drop	250	mm
Mass of rammer	7	kg

Sample data

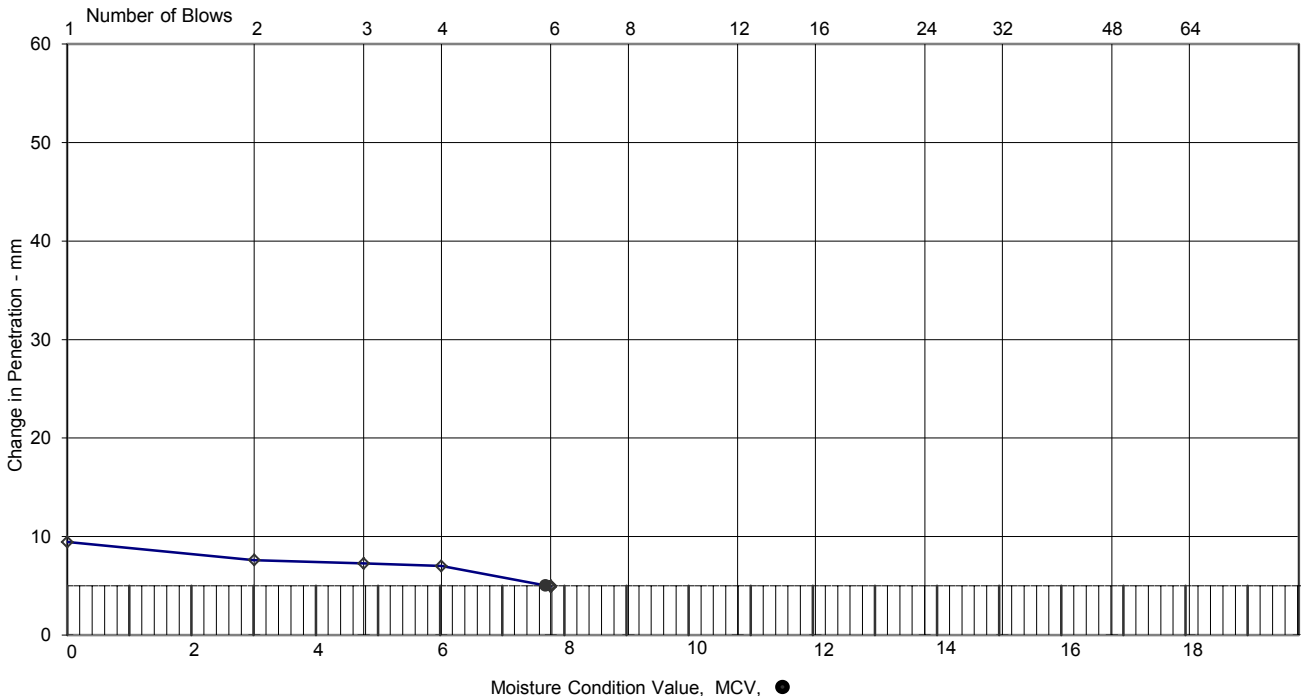
Retained on 20mm sieve, removed	18	%
Mass of specimen used in test	1502	g

Specimen after test

Vane shear strength, if measured		kPa
Bulk density	2.14	Mg/m3
Dry density	1.93	Mg/m3

Moisture Content	**11.0**	%
Moisture Condition Value, MCV	**8.0**	

Method of interpretation Steepest straight line



QA Ref
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Project Name Heathrow Airport Limited

Figure

MCV

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MOISTURE CONDITION VALUE (MCV) TEST

Sample Details:	SAMPLE ID:
	HEPBH82020180306012

Hole No	HEP-BH-820
Sample Depth (m BGL)	0.6
Sample Type and No	B8
Specimen Ref	

Soil Description	Dark brown slightly sandy gravelly clayey SILT.
Preparation procedure and Remarks	BS1377:Part 1 and Part 4, clause 5.4 at natural moisture content

Test Data

Blows n	Penetration/ protrusion mm	Change in Penetration n to 4n mm
1	82.0	26.5
2	68.7	19.6
3	61.2	13.7
4	55.5	7.9
6	53.8	4.8
8	49.1	
12	47.5	
16	47.6	
24	49.1	
32		
48		
64		
96		
128		
192		
256		

Equipment

Mould diameter	100	mm
Height of drop	250	mm
Mass of rammer	7	kg

Sample data

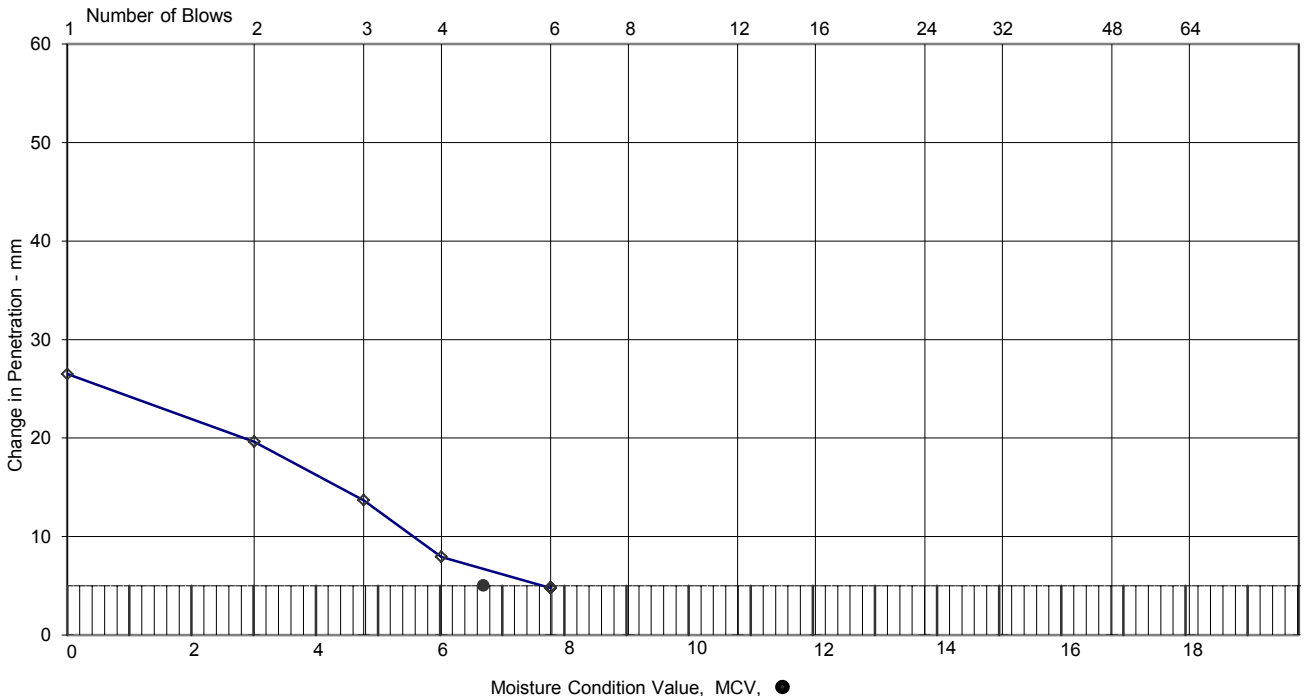
Retained on 20mm sieve, removed	11	%
Mass of specimen used in test	1481	g

Specimen after test

Vane shear strength, if measured		kPa
Bulk density	1.90	Mg/m3
Dry density	1.53	Mg/m3

Moisture Content	**24.0**	%
Moisture Condition Value, MCV	**7.0**	

Method of interpretation Steepest straight line



QA Ref SLR 4, 5.4 Rev 2.4 Feb 17	Project No N8135-18 Project Name Heathrow Airport Limited	**Figure** **MCV**
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MOISTURE CONDITION VALUE (MCV) TEST

Sample Details:	SAMPLE ID:
	FES1180111023

Hole No	HEP-BH-821
Sample Depth (m BGL)	4.2
Sample Type and No	B23
Specimen Ref	

Soil Description	Brown sandy GRAVEL.
Preparation procedure and Remarks	BS1377:Part 1 and Part 4, clause 5.4 at natural moisture content

Test Data

Blows n	Penetration/ protrusion mm	Change in Penetration n to 4n mm
1	65.5	5.7
2	62.4	4.6
3	62.0	
4	59.8	
6	57.5	
8	57.7	
12		
16		
24		
32		
48		
64		
96		
128		
192		
256		

Equipment

Mould diameter	100	mm
Height of drop	250	mm
Mass of rammer	7	kg

Sample data

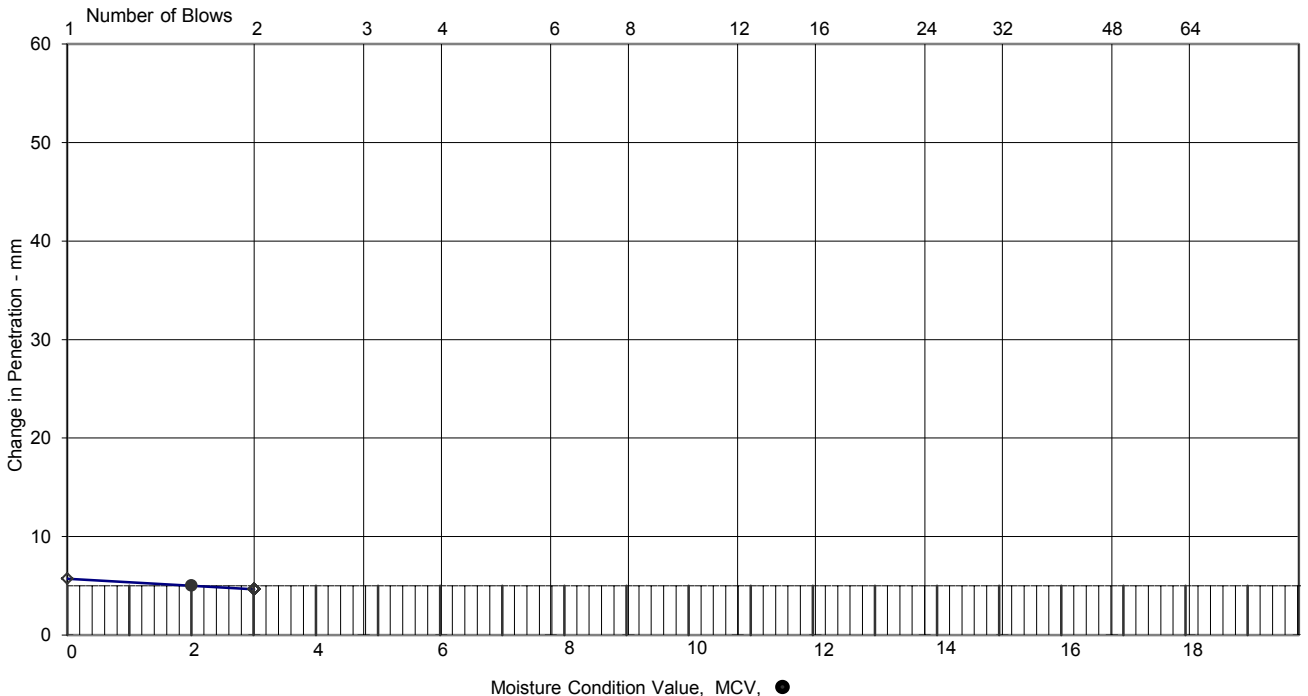
Retained on 20mm sieve, removed	39	%
Mass of specimen used in test	1504	g

Specimen after test

Vane shear strength, if measured		kPa
Bulk density	1.78	Mg/m3
Dry density	1.74	Mg/m3

Moisture Content	**2.2**	%
Moisture Condition Value, MCV	**2.0**	

Method of interpretation Steepest straight line



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MOISTURE CONDITION VALUE (MCV) TEST

Sample Details:	SAMPLE ID:
	FES1171130004

Hole No	HEP-BH-823
Sample Depth (m BGL)	0.7
Sample Type and No	LB4
Specimen Ref	

Soil Description	Brown slightly sandy slightly gravelly CLAY with two cobbles.
Preparation procedure and Remarks	BS1377:Part 1 and Part 4, clause 5.4 at natural moisture content

Test Data

Blows n	Penetration/ protrusion mm	Change in Penetration n to 4n mm
1	75.1	15.8
2	67.5	15.0
3	63.4	13.8
4	59.3	12.0
6	55.5	12.3
8	52.5	10.5
12	49.6	8.1
16	47.3	6.2
24	43.2	2.3
32	42.0	
48	41.5	
64	41.1	
96	40.9	
128		
192		
256		

Equipment

Mould diameter	100	mm
Height of drop	250	mm
Mass of rammer	7	kg

Sample data

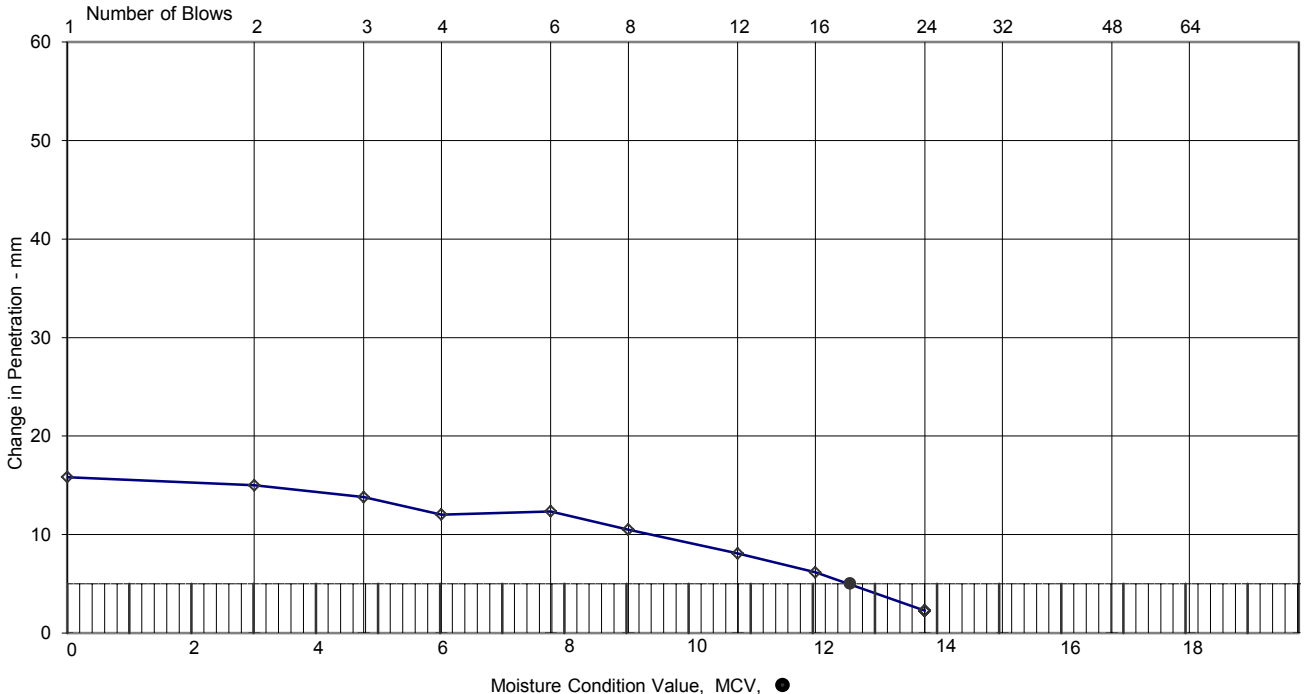
Retained on 20mm sieve, removed	4	%
Mass of specimen used in test	1500	g

Specimen after test

Vane shear strength, if measured		kPa
Bulk density	2.10	Mg/m3
Dry density	1.83	Mg/m3

Moisture Content	**15.0**	%
Moisture Condition Value, MCV	**13.0**	

Method of interpretation Steepest straight line



QA Ref
SLR 4, 5.4
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SOCOTEC

Project No N8135-18

Project Name Heathrow Airport Limited

Figure

MCV

Printed: 29/10/2018 14:19

MOISTURE CONDITION VALUE (MCV) TEST

Sample Details:	SAMPLE ID:
	FES1171124005

Hole No	HEP-BH-826
Sample Depth (m BGL)	1.5
Sample Type and No	B10
Specimen Ref	

Soil Description	Brown slightly sandy slightly gravelly CLAY.
Preparation procedure and Remarks	BS1377:Part 1 and Part 4, clause 5.4 at natural moisture content

Test Data

Blows n	Penetration/ protrusion mm	Change in Penetration n to 4n mm
1	88.6	26.6
2	75.4	26.8
3	67.3	25.4
4	62.0	21.7
6	53.2	14.3
8	48.6	9.7
12	41.9	4.6
16	40.3	
24	38.9	
32	38.9	
48	37.3	
64		
96		
128		
192		
256		

Equipment

Mould diameter	100	mm
Height of drop	250	mm
Mass of rammer	7	kg

Sample data

Retained on 20mm sieve, removed	2	%
Mass of specimen used in test	1493	g

Specimen after test

Vane shear strength, if measured		kPa
Bulk density	2.18	Mg/m3
Dry density	1.91	Mg/m3

Moisture Content	**14.0**	%
Moisture Condition Value, MCV	**10.0**	

Method of interpretation Steepest straight line

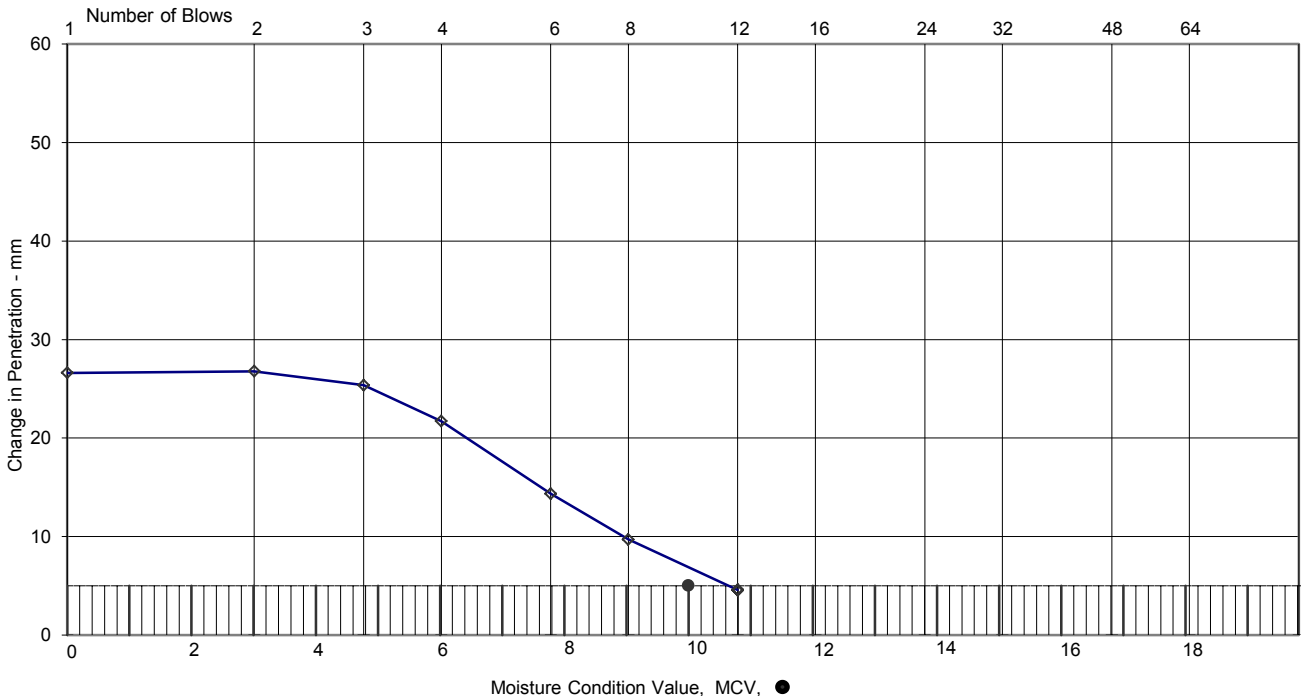

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Figure

MCV

Printed: 29/10/2018 14:19

MOISTURE CONDITION VALUE (MCV) TEST

Sample Details:	SAMPLE ID:
	FES1180318019

Hole No	HEP-BH-1047
Sample Depth (m BGL)	2.7
Sample Type and No	B19
Specimen Ref	

Soil Description	Black sandy GRAVEL.
Preparation procedure and Remarks	BS1377:Part 1 and Part 4, clause 5.4 at natural moisture content

Test Data

Blows n	Penetration/ protrusion mm	Change in Penetration n to 4n mm
1	81.5	11.4
2	75.0	8.8
3	72.2	6.3
4	70.0	4.1
6	67.4	
8	66.1	
12	65.8	
16	66.0	
24		
32		
48		
64		
96		
128		
192		
256		

Equipment

Mould diameter	100	mm
Height of drop	250	mm
Mass of rammer	7	kg

Sample data

Retained on 20mm sieve, removed	31	%
Mass of specimen used in test	1497	g

Specimen after test

Vane shear strength, if measured		kPa
Bulk density	1.64	Mg/m3
Dry density	1.25	Mg/m3

Moisture Content	**31.0**	%
Moisture Condition Value, MCV	**6.0**	

Method of interpretation Steepest straight line

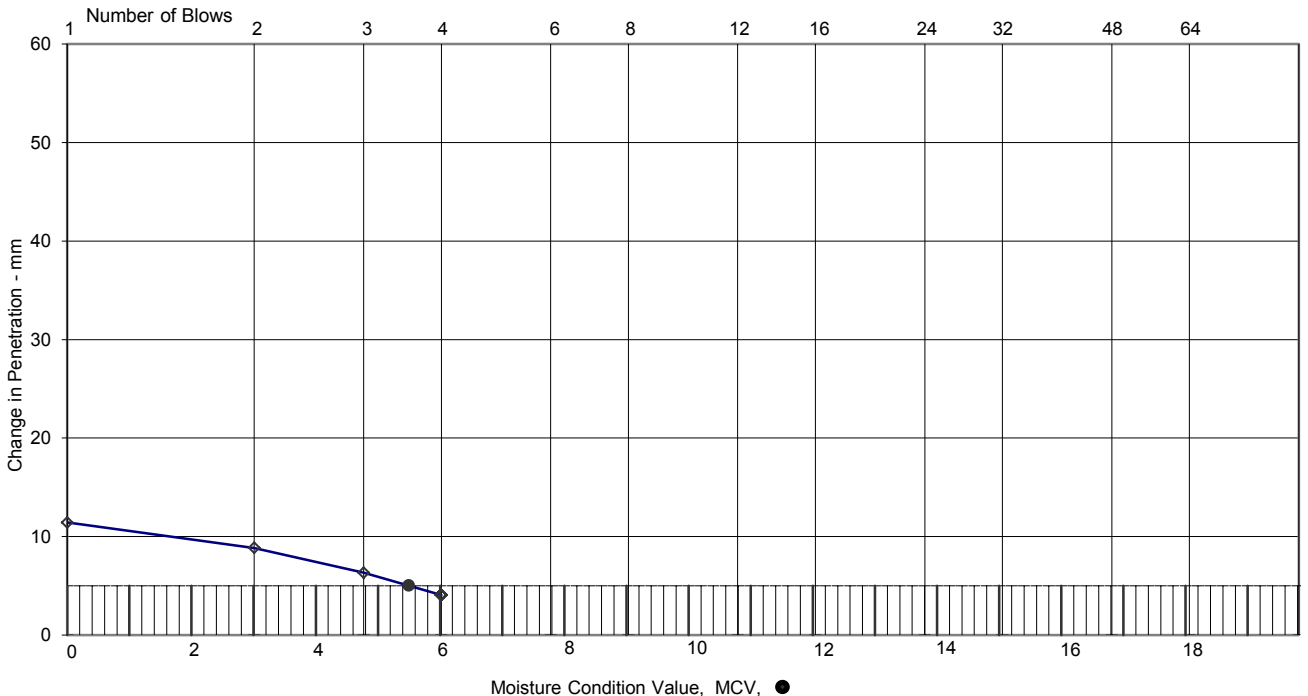

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Figure

MCV

Printed: 29/10/2018 14:19

MOISTURE CONDITION VALUE (MCV) TEST

Sample Details:	SAMPLE ID:
	HEPBH105020180320014

Hole No	HEP-BH-1050
Sample Depth (m BGL)	4
Sample Type and No	B21
Specimen Ref	

Soil Description	Brown sandy GRAVEL.
Preparation procedure and Remarks	BS1377:Part 1 and Part 4, clause 5.4 at natural moisture content

Test Data

Blows n	Penetration/ protrusion mm	Change in Penetration n to 4n mm
1	69.8	5.8
2	66.1	3.7
3	64.8	
4	64.0	
6	62.5	
8	62.4	
12		
16		
24		
32		
48		
64		
96		
128		
192		
256		

Equipment

Mould diameter	100	mm
Height of drop	250	mm
Mass of rammer	7	kg

Sample data

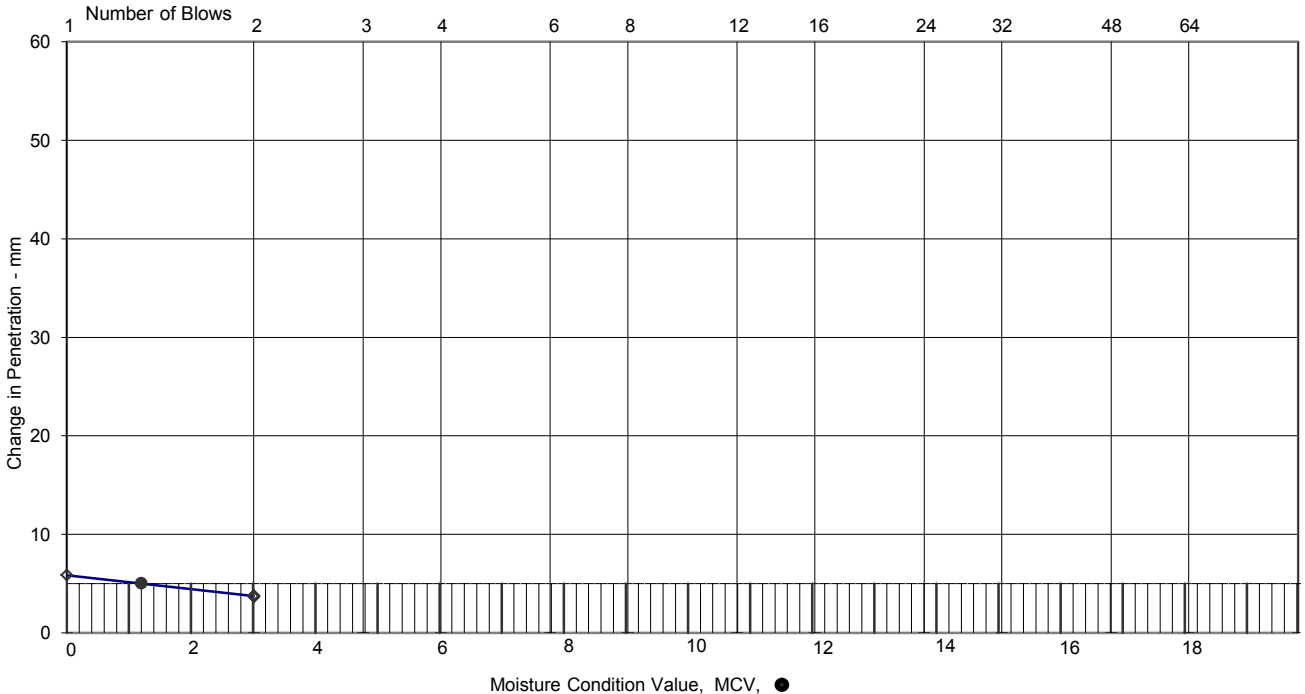
Retained on 20mm sieve, removed	22	%
Mass of specimen used in test	1517	g

Specimen after test

Vane shear strength, if measured		kPa
Bulk density	1.72	Mg/m3
Dry density	1.66	Mg/m3

Moisture Content	**3.9**	%
Moisture Condition Value, MCV	**1.0**	

Method of interpretation Steepest straight line



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Project Name Heathrow Airport Limited

Figure

MCV

Printed: 22/11/2018 10:01

MOISTURE CONDITION VALUE (MCV) TEST

Sample Details:	SAMPLE ID:
	HEPBH180420171206007

Hole No	HEP-BH-1804
Sample Depth (m BGL)	1.2
Sample Type and No	B14
Specimen Ref	

Soil Description	Dark brown very sandy GRAVEL.
Preparation procedure and Remarks	Unsuiable material to be abe to interpret MC Value

Test Data

Blows n	Penetration/ protrusion mm	Change in Penetration n to 4n mm
1	65.5	4.9
2	63.1	5.0
3	61.2	
4	60.6	
6	59.4	
8	58.1	
12		
16		
24		
32		
48		
64		
96		
128		
192		
256		

Equipment

Mould diameter	100	mm
Height of drop	250	mm
Mass of rammer	7	kg

Sample data

Retained on 20mm sieve, removed	32	%
Mass of specimen used in test	1492	g

Specimen after test

Vane shear strength, if measured		kPa
Bulk density	1.76	Mg/m3
Dry density	1.67	Mg/m3

Moisture Content	**5.1**	%
Moisture Condition Value, MCV	**N/A**	

Method of interpretation Steepest straight line

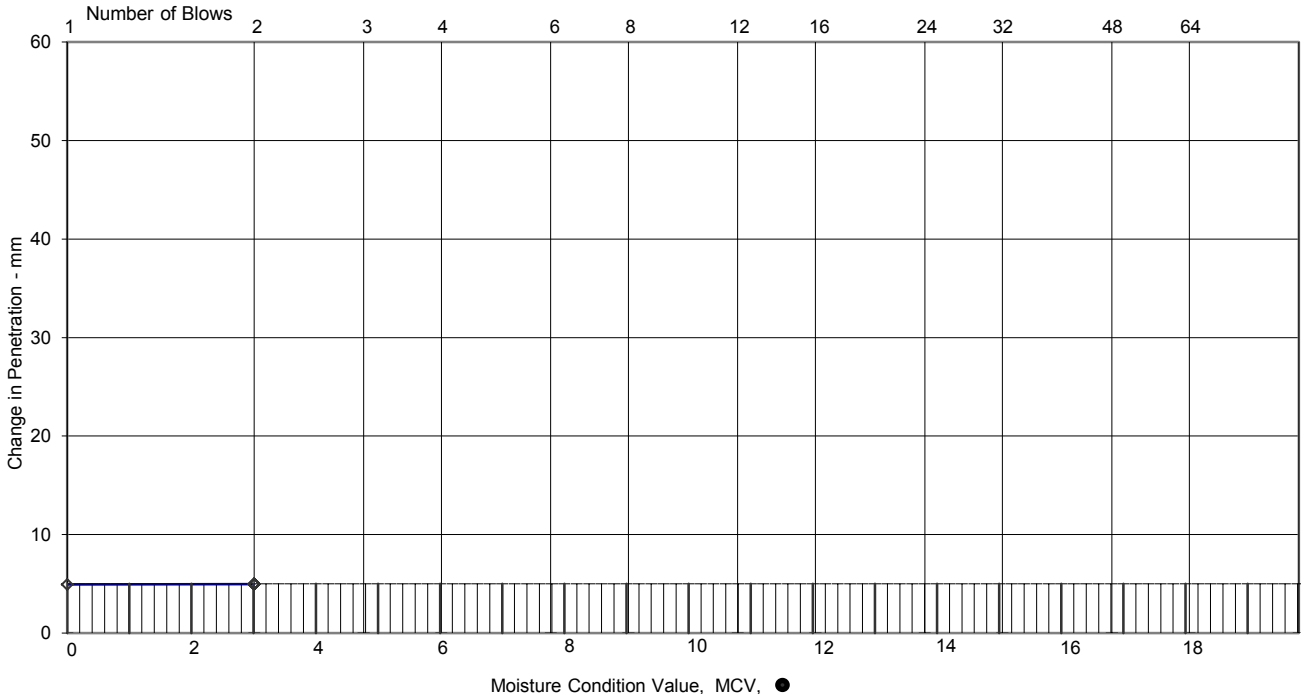

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Figure

MCV

Printed: 29/10/2018 14:19

MOISTURE CONDITION VALUE (MCV) TEST

Sample Details:	SAMPLE ID:
	HEPBH180520170127003

Hole No	HEP-BH-1805
Sample Depth (m BGL)	1.2
Sample Type and No	B8
Specimen Ref	

Soil Description	Brown slightly sandy slightly gravelly CLAY with one cobble.
Preparation procedure and Remarks	BS1377:Part 1 and Part 4, clause 5.4 at natural moisture content

Test Data

Blows n	Penetration/ protrusion mm	Change in Penetration n to 4n mm
1	106.4	27.3
2	92.9	28.7
3	84.1	29.3
4	79.1	30.7
6	70.9	24.3
8	64.2	18.1
12	54.8	8.7
16	48.4	2.6
24	46.6	
32	46.1	
48	46.1	
64	45.8	
96		
128		
192		
256		

Equipment

Mould diameter	100	mm
Height of drop	250	mm
Mass of rammer	7	kg

Sample data

Retained on 20mm sieve, removed	33	%
Mass of specimen used in test	1501	g

Specimen after test

Vane shear strength, if measured		kPa
Bulk density	2.00	Mg/m3
Dry density	1.60	Mg/m3

Moisture Content	**25.0**	%
Moisture Condition Value, MCV	**12.0**	

Method of interpretation Steepest straight line

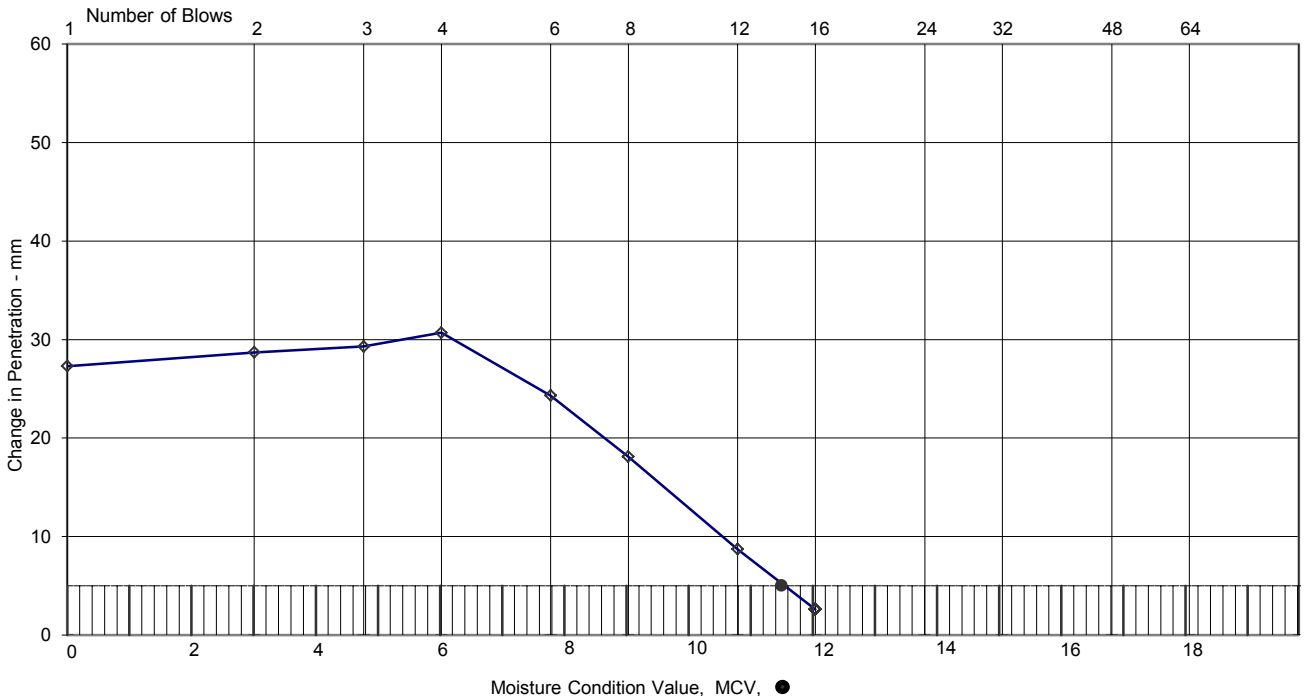

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Figure

MCV

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MOISTURE CONDITION VALUE (MCV) TEST

Sample Details:	SAMPLE ID:
	HEPTP1020171212011

Hole No	HEP-TP-10
Sample Depth (m BGL)	2
Sample Type and No	LB10
Specimen Ref	

Soil Description	Grey sandy silty GRAVEL.
Preparation procedure and Remarks	BS1377:Part 1 and Part 4, clause 5.4 at natural moisture content

Test Data

Blows n	Penetration/ protrusion mm	Change in Penetration n to 4n mm
1	48.0	5.9
2	44.6	4.4
3	42.8	
4	42.1	
6	40.1	
8	40.2	
12		
16		
24		
32		
48		
64		
96		
128		
192		
256		

Equipment

Mould diameter	100	mm
Height of drop	250	mm
Mass of rammer	7	kg

Sample data

Retained on 20mm sieve, removed	30	%
Mass of specimen used in test	1518	g

Specimen after test

Vane shear strength, if measured		kPa
Bulk density	2.13	Mg/m3
Dry density	1.96	Mg/m3

Moisture Content	**8.4**	%
Moisture Condition Value, MCV	**2.0**	

Method of interpretation Steepest straight line

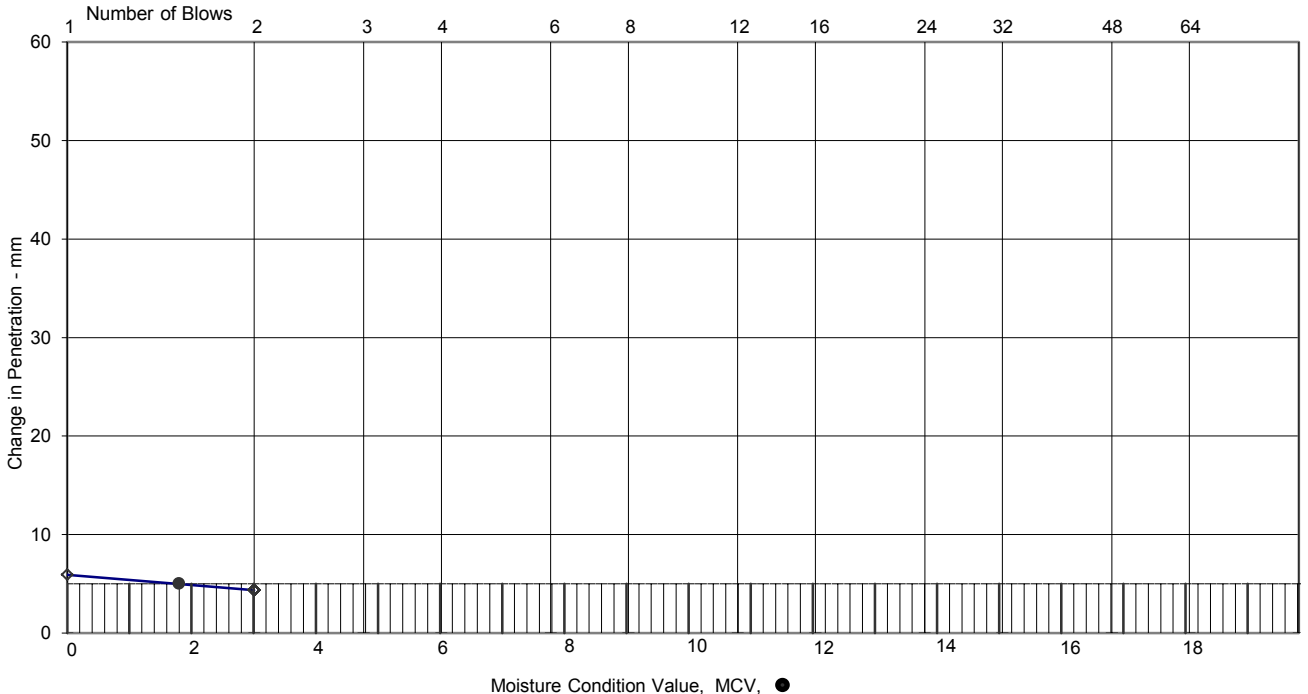

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Figure

MCV

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MOISTURE CONDITION VALUE (MCV) TEST

Sample Details:	SAMPLE ID:
	HEPTT320171122012

Hole No	HEP-TT-3
Sample Depth (m BGL)	1.8
Sample Type and No	B11
Specimen Ref	

Soil Description	Brown slightly sandy gravelly CLAY with four cobbles.
Preparation procedure and Remarks	BS1377:Part 1 and Part 4, clause 5.4 at natural moisture content

Test Data

Blows n	Penetration/ protrusion mm	Change in Penetration n to 4n mm
1	94.8	27.8
2	77.2	10.8
3	68.6	2.3
4	67.0	
6	66.8	
8	66.4	
12	66.3	
16		
24		
32		
48		
64		
96		
128		
192		
256		

Equipment

Mould diameter	100.07	mm
Height of drop	250	mm
Mass of rammer	7	kg

Sample data

Retained on 20mm sieve, removed	23	%
Mass of specimen used in test	1499	g

Specimen after test

Vane shear strength, if measured		kPa
Bulk density	1.94	Mg/m3
Dry density	1.85	Mg/m3

Moisture Content	**25.0**	%
Moisture Condition Value, MCV	**4.0**	

Method of interpretation Steepest straight line

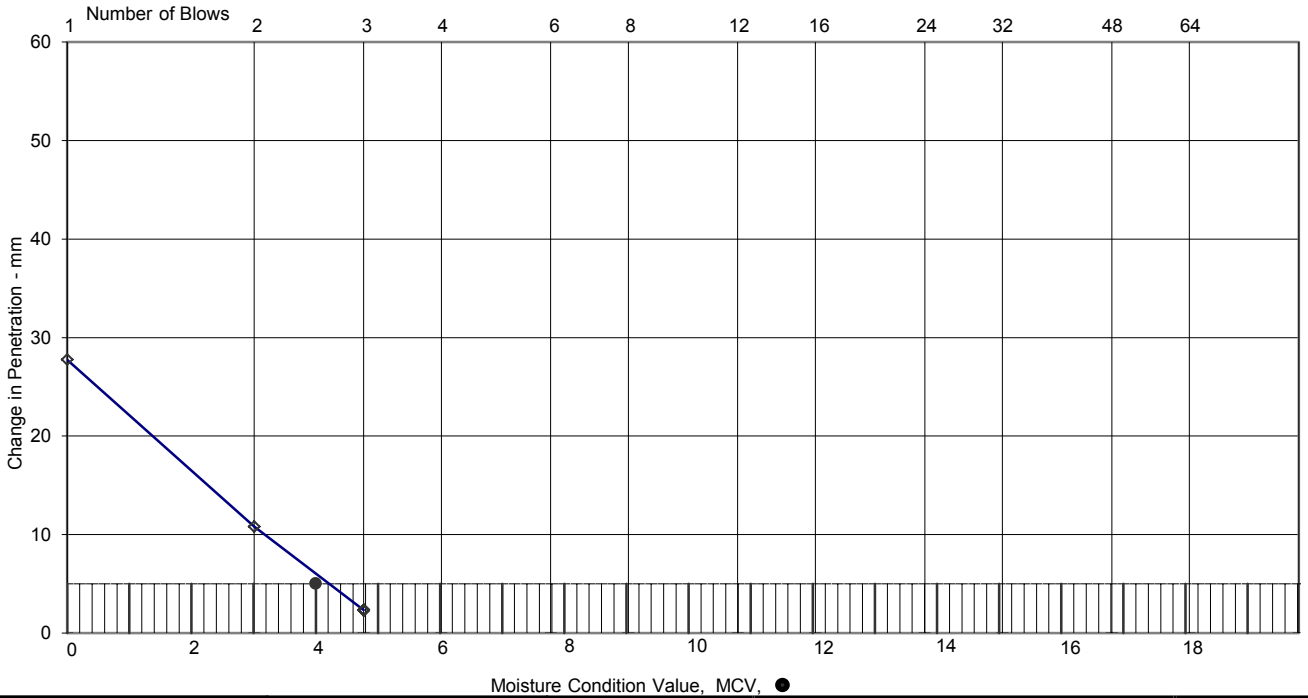

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Figure

MCV

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MOISTURE CONDITION VALUE (MCV) TEST

Sample Details:	SAMPLE ID:
	HEPTT620171123008

Hole No	HEP-TT-6
Sample Depth (m BGL)	0.8
Sample Type and No	LB8
Specimen Ref	

Soil Description	Brown slightly sandy slightly gravelly silty CLAY.
Preparation procedure and Remarks	BS1377:Part 1 and Part 4, clause 5.4 at natural moisture content

Test Data

Blows n	Penetration/ protrusion mm	Change in Penetration n to 4n mm
1	94.8	25.4
2	83.2	27.0
3	74.7	20.9
4	69.4	16.0
6	60.9	7.3
8	56.3	2.1
12	53.8	
16	53.4	
24	53.6	
32	54.1	
48		
64		
96		
128		
192		
256		

Equipment

Mould diameter	100	mm
Height of drop	250	mm
Mass of rammer	7	kg

Sample data

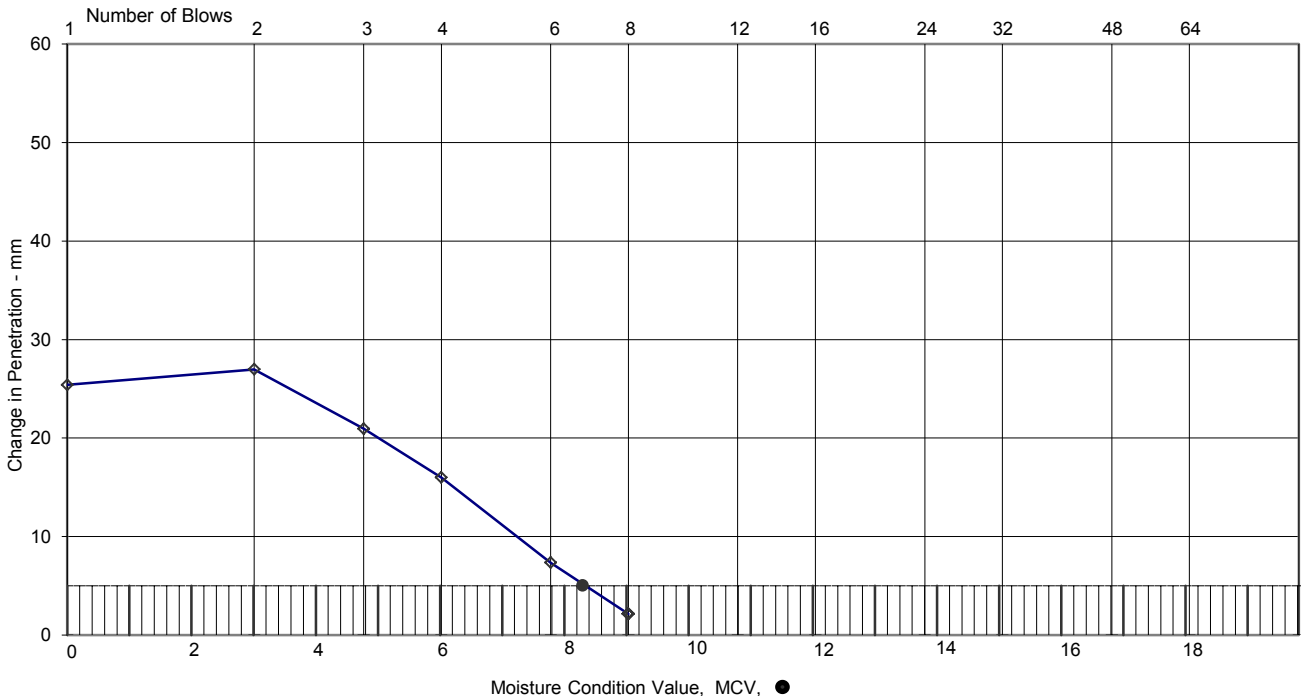
Retained on 20mm sieve, removed	13	%
Mass of specimen used in test	1499	g

Specimen after test

Vane shear strength, if measured		kPa
Bulk density	1.82	Mg/m3
Dry density	1.36	Mg/m3

Moisture Content	**33.0**	%
Moisture Condition Value, MCV	**8.0**	

Method of interpretation Steepest straight line



QA Ref
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Project Name Heathrow Airport Limited

Figure

MCV

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MOISTURE CONDITION VALUE (MCV) TEST

Sample Details:	SAMPLE ID:
	HEPTT920171123010

Hole No	HEP-TT-9
Sample Depth (m BGL)	1.2
Sample Type and No	B9
Specimen Ref	

Soil Description	Greyish brown slightly sandy gravelly silty CLAY.
Preparation procedure and Remarks	BS1377:Part 1 and Part 4, clause 5.4 at natural moisture content

Test Data

Blows n	Penetration/ protrusion mm	Change in Penetration n to 4n mm
1	85.7	18.6
2	76.8	16.7
3	71.3	15.4
4	67.1	14.3
6	62.5	13.0
8	60.1	12.9
12	55.9	11.6
16	52.8	9.7
24	49.4	5.8
32	47.2	4.3
48	44.3	
64	43.1	
96	43.6	
128	42.9	
192		
256		

Equipment

Mould diameter	100	mm
Height of drop	250	mm
Mass of rammer	7	kg

Sample data

Retained on 20mm sieve, removed	17	%
Mass of specimen used in test	1505	g

Specimen after test

Vane shear strength, if measured		kPa
Bulk density	2.04	Mg/m3
Dry density	1.70	Mg/m3

Moisture Content	**20.0**	%
Moisture Condition Value, MCV	**14.0**	

Method of interpretation Steepest straight line

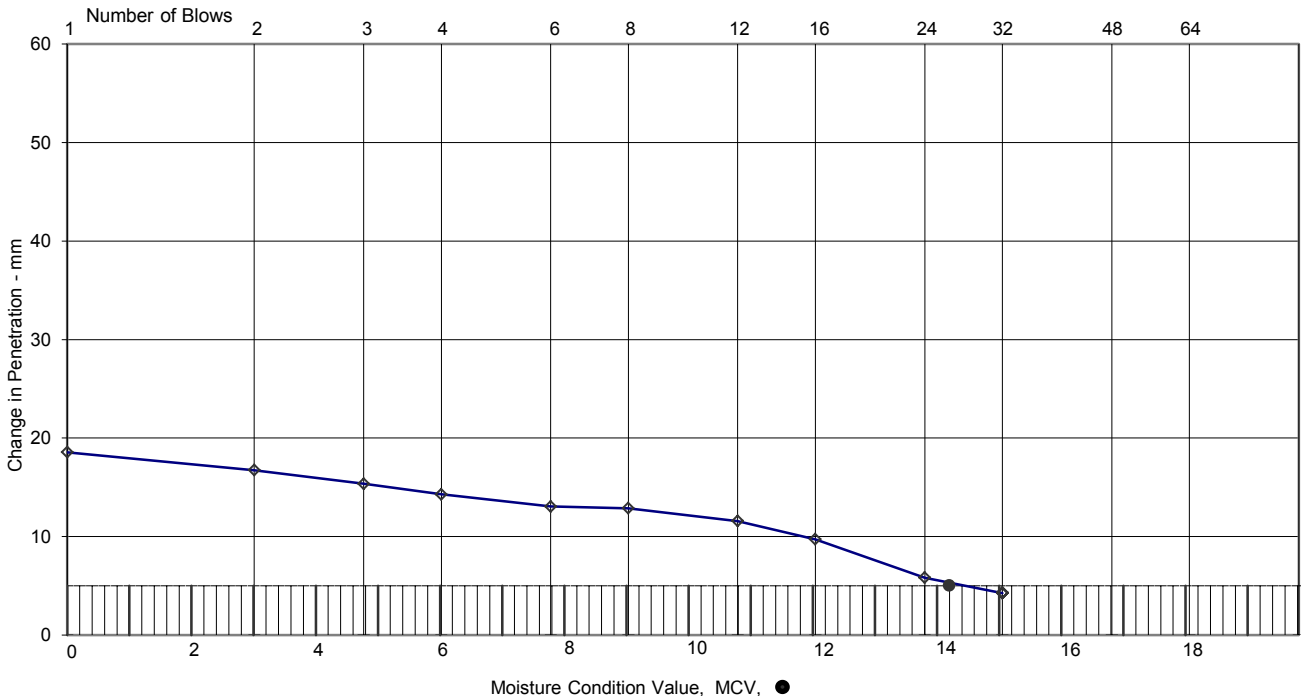

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Figure

MCV

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MOISTURE CONDITION VALUE (MCV) TEST

Sample Details:	SAMPLE ID:
	HEPTT1120171124010

Hole No	HEP-TT-11
Sample Depth (m BGL)	1.3
Sample Type and No	B9
Specimen Ref	

Soil Description	Brown slightly sandy slightly gravelly CLAY.
Preparation procedure and Remarks	BS1377:Part 1 and Part 4, clause 5.4 at natural moisture content

Test Data

Blows n	Penetration/ protrusion mm	Change in Penetration n to 4n mm
1	139.2	34.4
2	123.7	36.2
3	112.5	34.4
4	104.8	33.5
6	94.9	28.6
8	87.6	23.8
12	78.2	15.0
16	71.4	8.8
24	66.3	4.3
32	63.8	
48	63.2	
64	62.6	
96	62.0	
128		
192		
256		

Equipment

Mould diameter	100.07	mm
Height of drop	250	mm
Mass of rammer	7	kg

Sample data

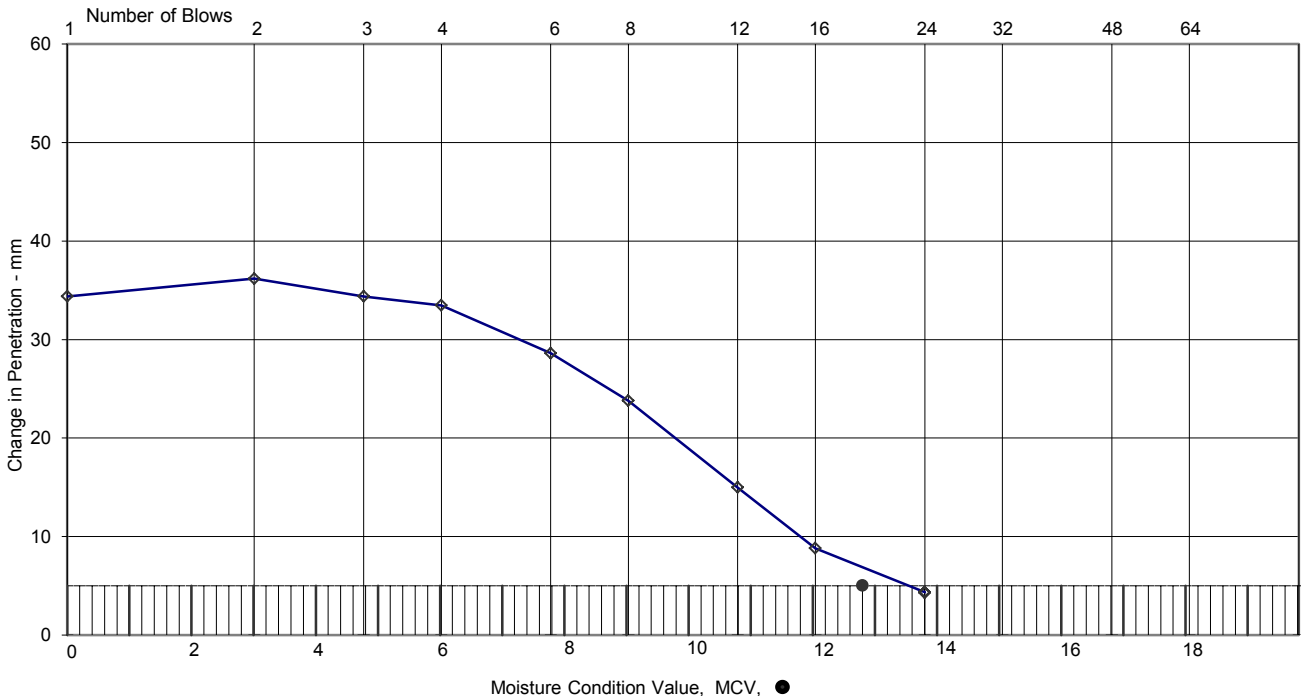
Retained on 20mm sieve, removed	6	%
Mass of specimen used in test	1500	g

Specimen after test

Vane shear strength, if measured		kPa
Bulk density	2.04	Mg/m3
Dry density	1.66	Mg/m3

Moisture Content	**23.0**	%
Moisture Condition Value, MCV	**13.0**	

Method of interpretation Steepest straight line



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Project Name Heathrow Airport Limited

Figure

MCV

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MOISTURE CONDITION VALUE (MCV) TEST

Sample Details:	SAMPLE ID:
	HEPTT2920171128009

Hole No	HEP-TT-29
Sample Depth (m BGL)	1.8
Sample Type and No	B9
Specimen Ref	

Soil Description	Dark brown slightly sandy very gravelly silty CLAY.
Preparation procedure and Remarks	BS1377:Part 1 and Part 4, clause 5.4 at natural moisture content

Test Data

Blows n	Penetration/ protrusion mm	Change in Penetration n to 4n mm
1	84.6	14.9
2	77.4	15.7
3	75.3	17.1
4	69.7	15.4
6	65.5	14.3
8	61.7	11.7
12	58.3	9.3
16	54.3	4.2
24	51.2	
32	50.0	
48	49.0	
64	50.1	
96		
128		
192		
256		

Equipment

Mould diameter	100	mm
Height of drop	250	mm
Mass of rammer	7	kg

Sample data

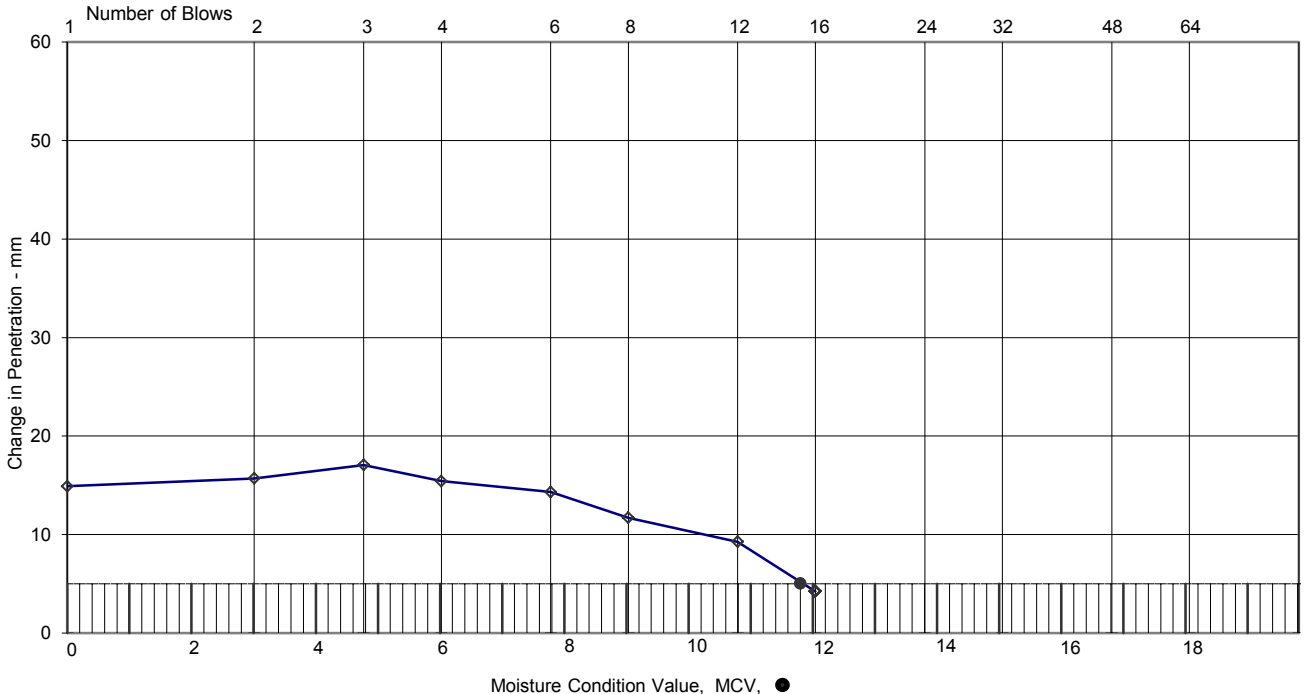
Retained on 20mm sieve, removed	17	%
Mass of specimen used in test	1512	g

Specimen after test

Vane shear strength, if measured		kPa
Bulk density	1.93	Mg/m3
Dry density	1.80	Mg/m3

Moisture Content	**7.5**	%
Moisture Condition Value, MCV	**12.0**	

Method of interpretation Steepest straight line



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Project No N8135-18

Project Name Heathrow Airport Limited

Figure

MCV

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MOISTURE CONDITION VALUE (MCV) TEST

Sample Details:	SAMPLE ID:
	HEPTT3920171128009

Hole No	HEP-TT-39
Sample Depth (m BGL)	1.8
Sample Type and No	B9
Specimen Ref	

Soil Description	Brownish grey slightly sandy gravelly silty CLAY with one cobble.
Preparation procedure and Remarks	BS1377:Part 1 and Part 4, clause 5.4 at natural moisture content

Test Data

Blows n	Penetration/ protrusion mm	Change in Penetration n to 4n mm
1	81.9	20.0
2	71.4	21.1
3	65.1	19.1
4	61.9	17.6
6	54.0	11.7
8	50.3	8.6
12	46.1	4.6
16	44.3	
24	42.3	
32	41.7	
48	41.5	
64		
96		
128		
192		
256		

Equipment

Mould diameter	100	mm
Height of drop	250	mm
Mass of rammer	7	kg

Sample data

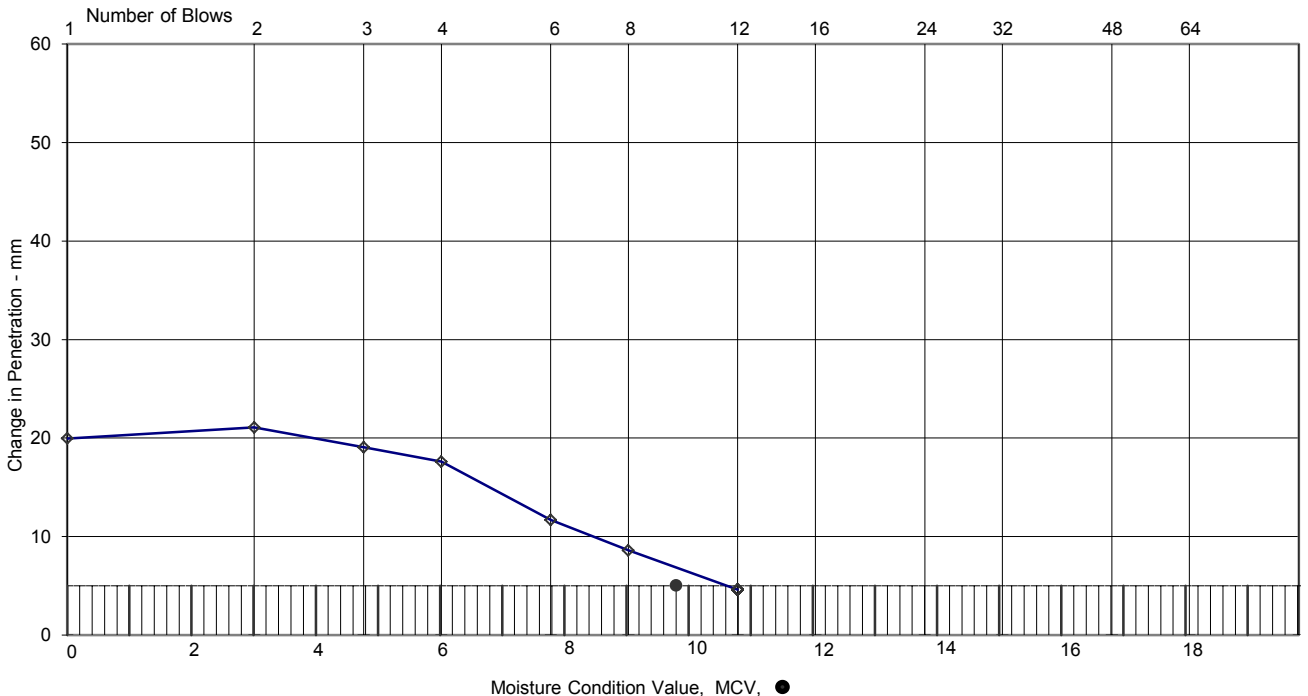
Retained on 20mm sieve, removed	27	%
Mass of specimen used in test	1506	g

Specimen after test

Vane shear strength, if measured		kPa
Bulk density	2.12	Mg/m3
Dry density	1.84	Mg/m3

Moisture Content	**15.0**	%
Moisture Condition Value, MCV	**10.0**	

Method of interpretation Steepest straight line



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Project No N8135-18

Project Name Heathrow Airport Limited

Figure

MCV

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FUGRO	**Moisture Condition Value / Moisture Content Relationship**			Project No.	G170029U
				Hole	HEP-BH-45
				Sample No.	8
Project Name	HAL Airport Expansion			Depth	0.60
Specimen Reference		Specimen Depth	m	Sample Type	B
Description	Brown very clayey very sandy GRAVEL			KeyLAB ID	FES1171208008
Test Method	BS1377:Part4:1990:clause 5.5			Date started	15/05/2018

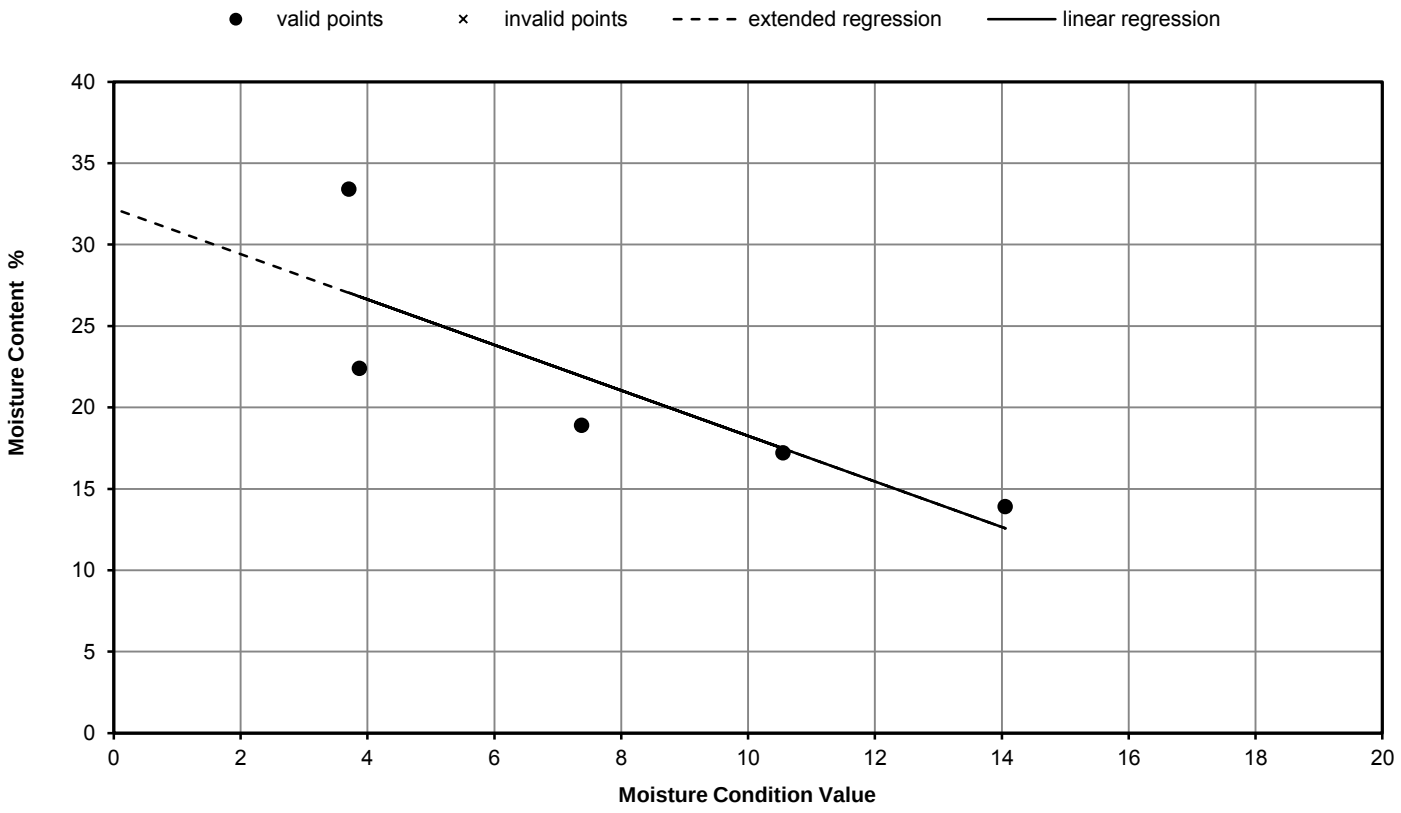
Sample preparation

Amount of material larger than 20mm sieve removed	2.72	%
Initial Water Content of test sample below 20mm		%

General remarks

Table of results

MCV Test Number	1	2	3	4	5
Water Content, %	33.4	17.2	18.9	22.4	13.9
Moisture Condition Value	3.7	10.6	7.4	3.9	14.1
MCV report	3.7	10.6	7.4	3.9	14.1
Effective / Valid data point	YES	YES	YES	YES	YES
Specimen remarks					



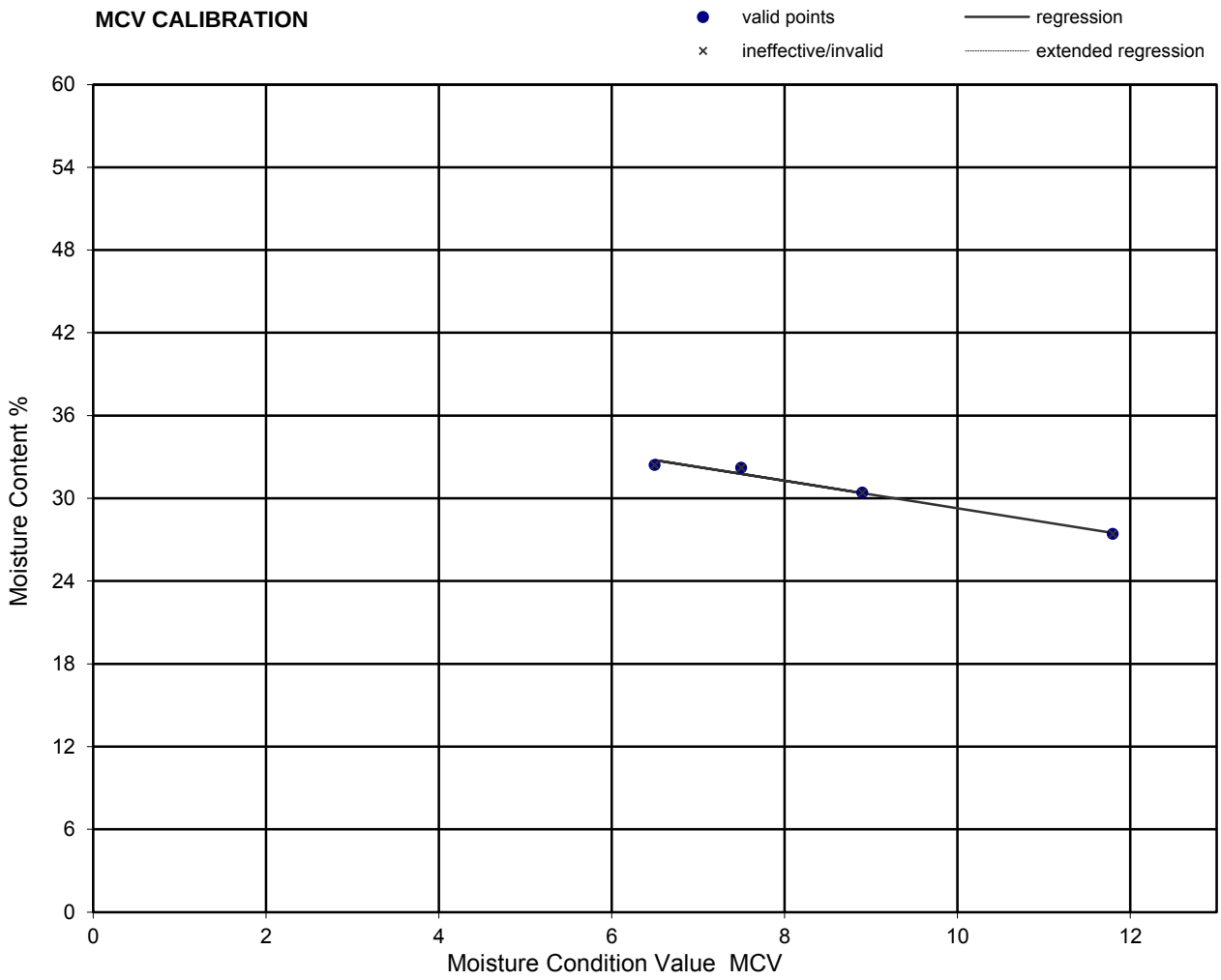
Date printed	Figure Number	Sheet Number
08/09/2018 00:00		

MOISTURE CONDITION VALUE (MCV) / MOISTURE CONTENT

Sample Details:	SAMPLE ID:
	FES1171121019

Hole No	HEP-BH-50
Sample Depth (m BGL)	2.5
Sample Type and No	B19
Specimen Ref	

MCV CALIBRATION



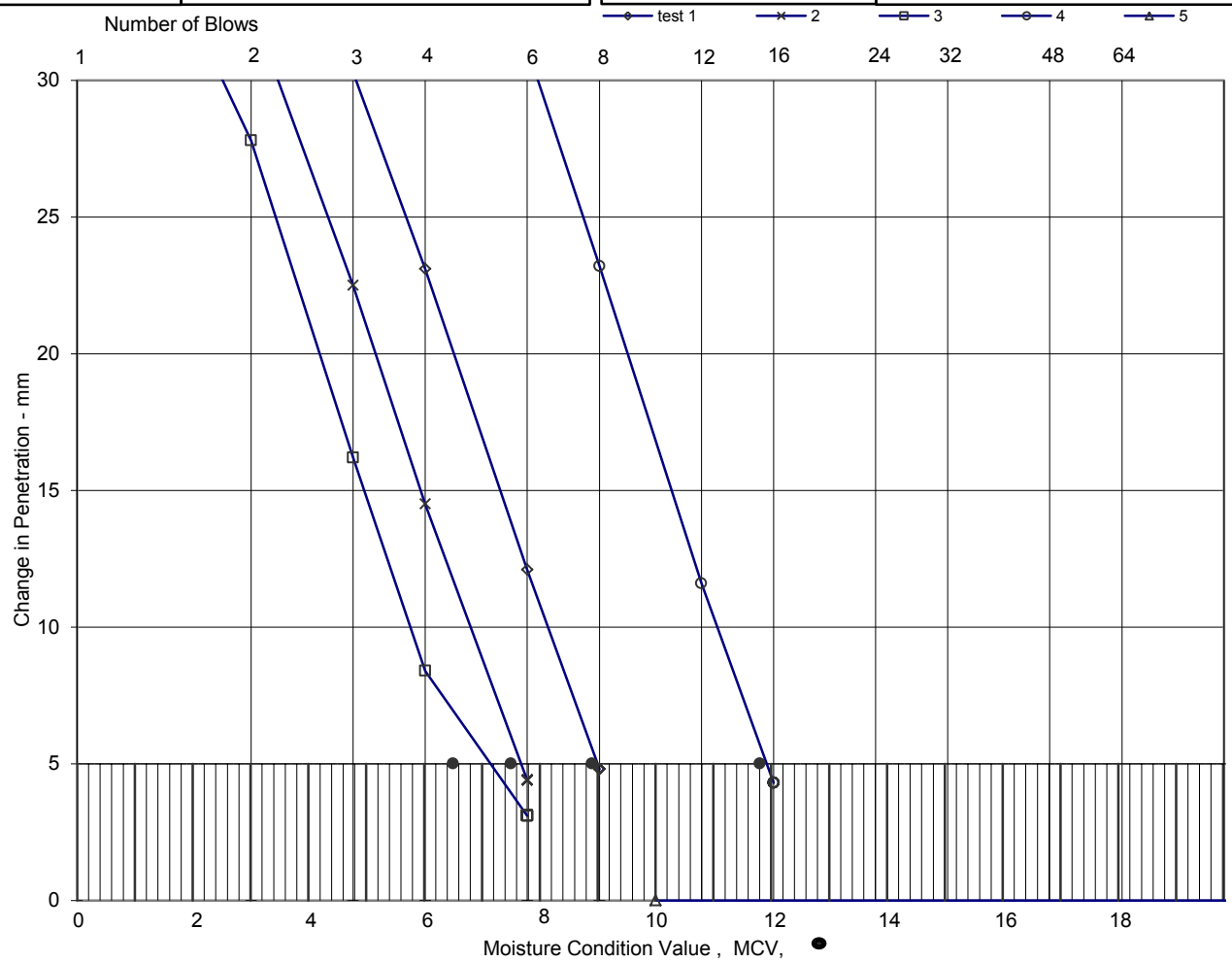
Characteristics of calibration line (determined using linear regression)	
Intercept	39.2
Slope	-0.99
Sensitivity (Change in MCV per 1% moisture content)	1.01
Correlation (proximity of test points to regression line)	-0.99
Method of interpretation of MCV	Steepest straight line

The above characteristics are NOT covered by UKAS accreditation to BS1377

MOISTURE CONDITION VALUE (MCV) / MOISTURE CONTENT

Sample Details:	SAMPLE ID:
	FES1171121019

Hole No	HEP-BH-50
Sample Depth (m BGL)	2.5
Sample Type and No	B19
Specimen Ref	



Test No * ineffective / invalid point		1	2	3	4	*
Moisture Condition Value		8.9	7.5	6.5	11.8	
Moisture Content	%	30.4	32.2	32.4	27.4	
Bulk density after test	Mg/m³	1.92	1.90	1.90	1.99	
Dry density after test	Mg/m³	1.47	1.44	1.44	1.56	

Soil description	Brown slightly sandy slightly gravelly CLAY.
Procedure / Preparation	using single sample
Remarks	

Initial moisture content <20mm	30.4
Material retained on 20mm sieve	2.3

Method of determining MCV
Steepest straight line

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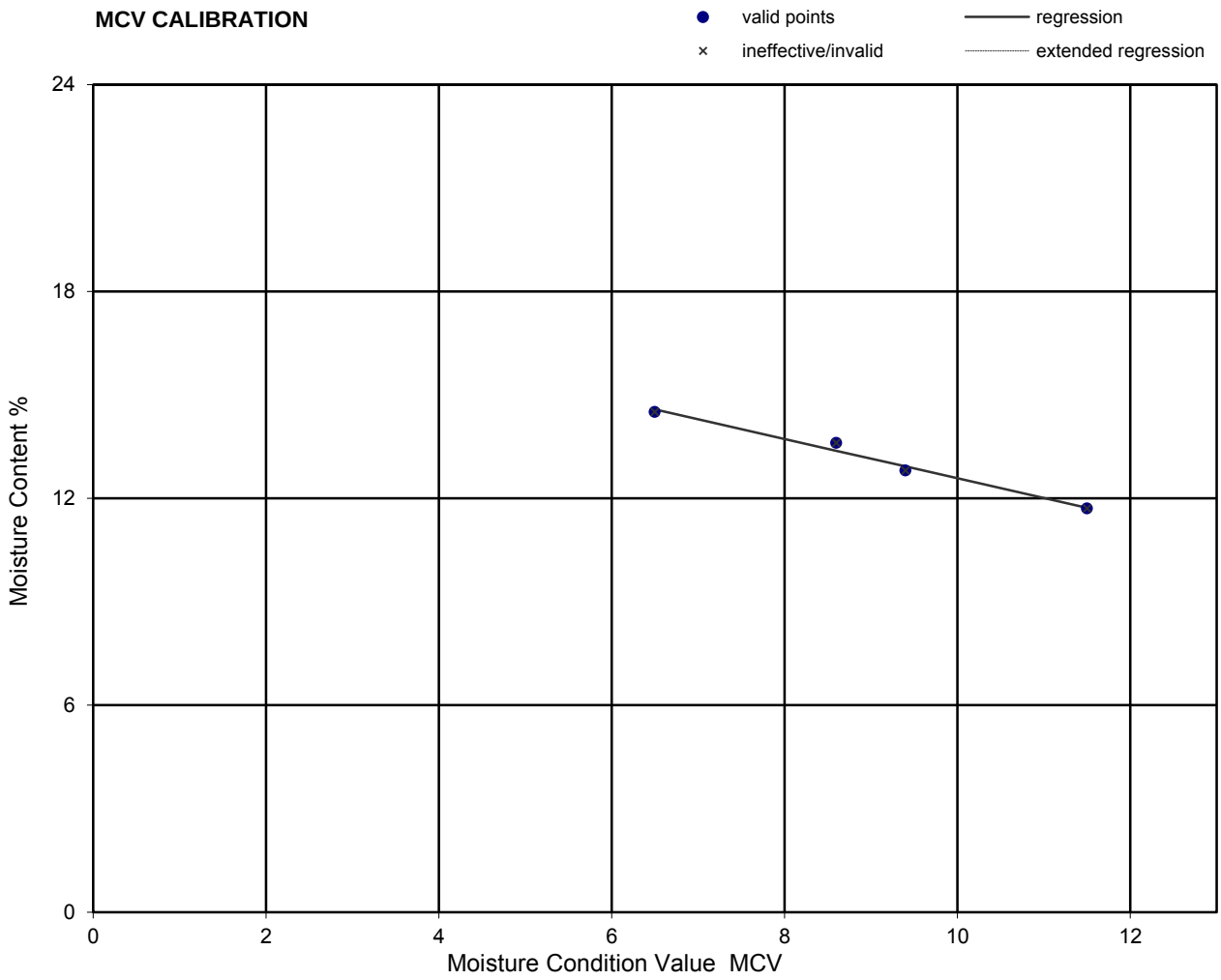
MOISTURE CONDITION VALUE (MCV) / MOISTURE CONTENT

Sample Details:	SAMPLE ID:
	HEPBH6120171120016

Hole No	HEP-BH-61
Sample Depth (m BGL)	0
Sample Type and No	LB4
Specimen Ref	



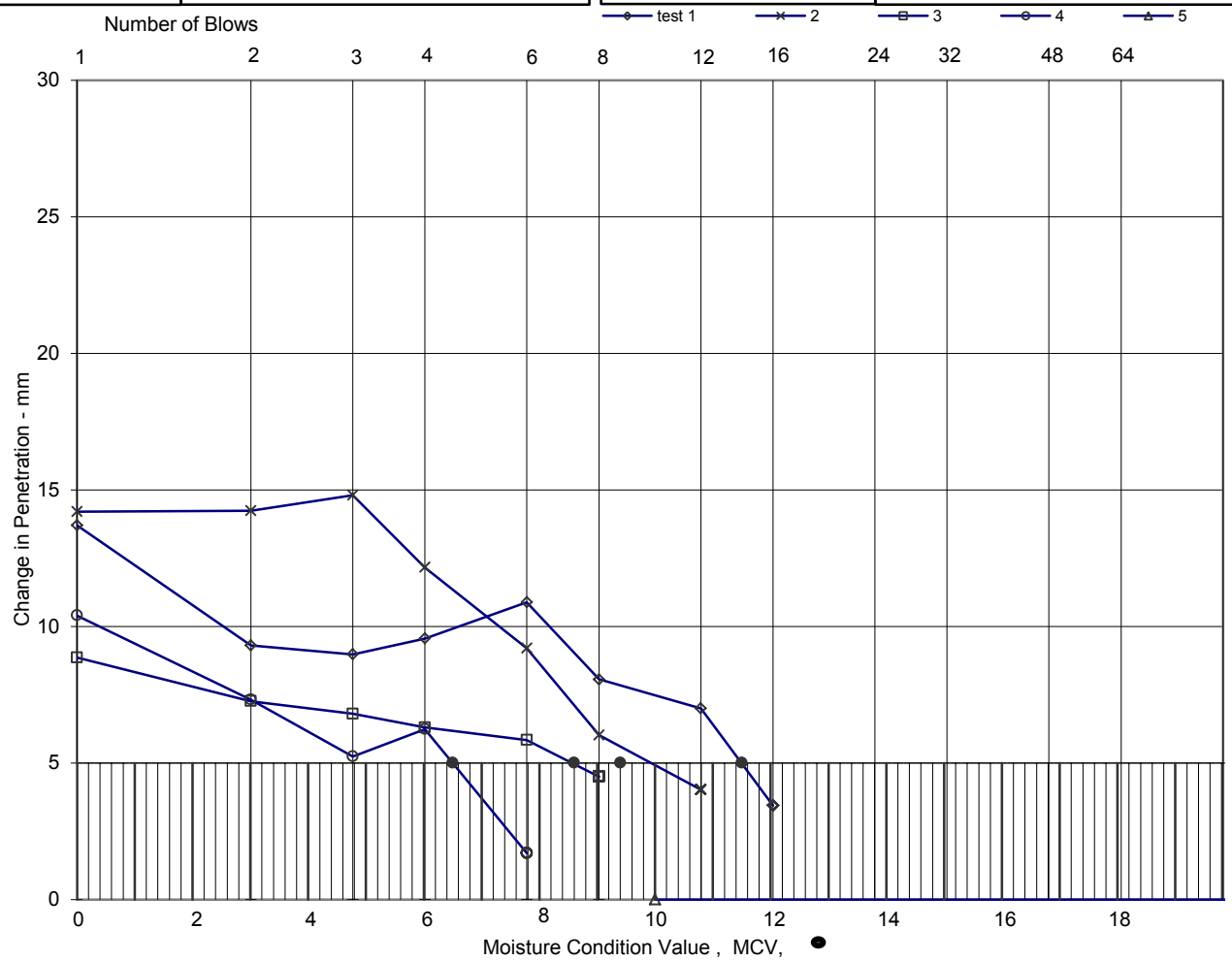
Characteristics of calibration line (determined using linear regression)	
Intercept	18.3
Slope	-0.57
Sensitivity (Change in MCV per 1% moisture content)	1.75
Correlation (proximity of test points to regression line)	-0.99
Method of interpretation of MCV	Steepest straight line

The above characteristics are NOT covered by UKAS accreditation to BS1377

MOISTURE CONDITION VALUE (MCV) / MOISTURE CONTENT

Sample Details:	SAMPLE ID:
	HEPBH6120171120016

Hole No	HEP-BH-61
Sample Depth (m BGL)	0
Sample Type and No	LB4
Specimen Ref	



Test No * ineffective / invalid point		1	2	3	4	*
Moisture Condition Value		11.5	9.4	8.6	6.5	
Moisture Content	%	11.7	12.8	13.6	14.5	
Bulk density after test	Mg/m³	1.85	1.89	1.80	1.85	
Dry density after test	Mg/m³	1.66	1.68	1.58	1.62	

Soil description	Brown slightly sandy gravelly silty CLAY.
Procedure / Preparation	using single sample
Remarks	

Initial moisture content <20mm	12.2
Material retained on 20mm sieve	0

Method of determining MCV
Steepest straight line

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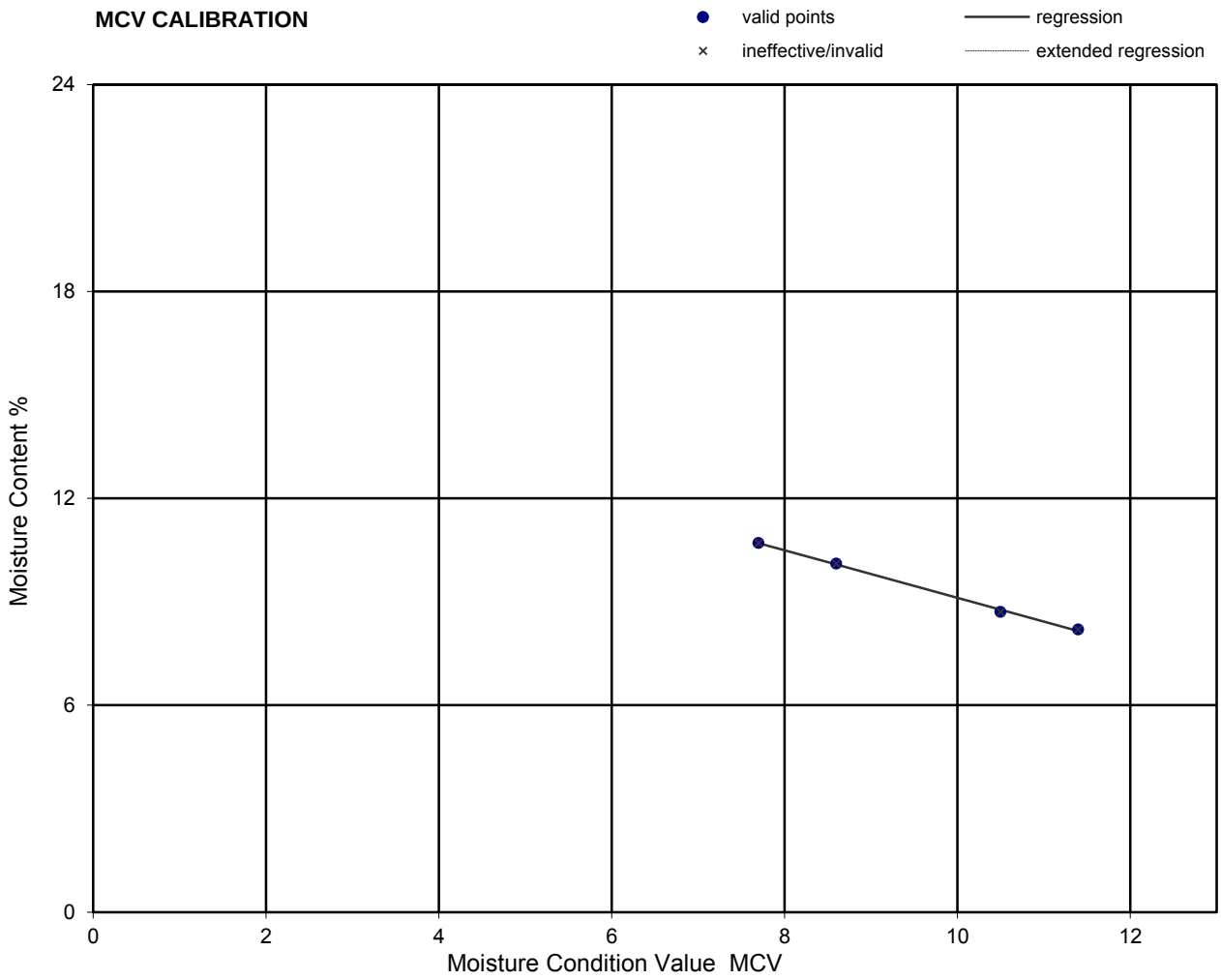
MOISTURE CONDITION VALUE (MCV) / MOISTURE CONTENT

Sample Details:	SAMPLE ID:
	FES1180117009

Hole No	HEP-BH-65
Sample Depth (m BGL)	1.35
Sample Type and No	B9
Specimen Ref	



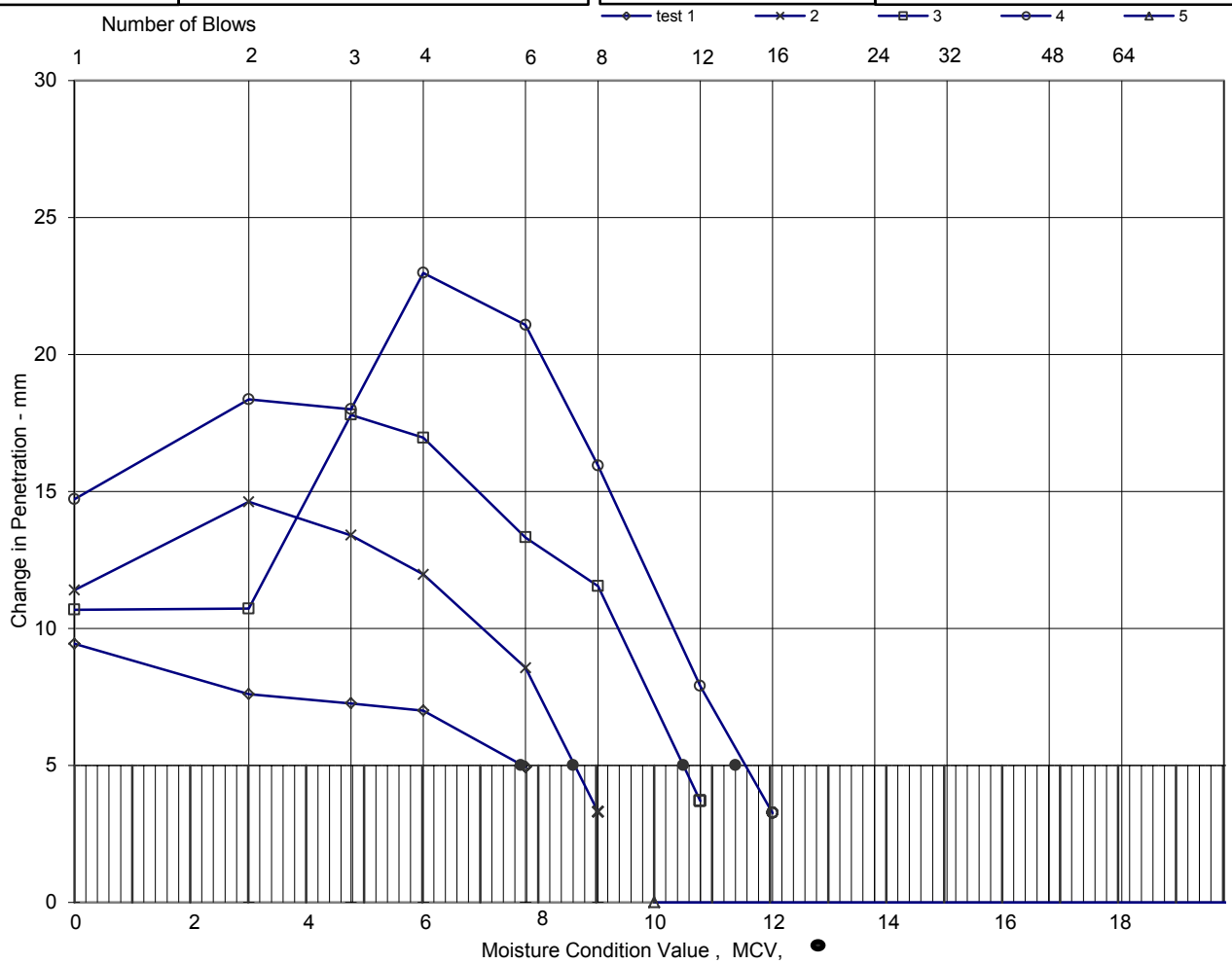
Characteristics of calibration line (determined using linear regression)	
Intercept	16.0
Slope	-0.69
Sensitivity (Change in MCV per 1% moisture content)	1.45
Correlation (proximity of test points to regression line)	-1.00
Method of interpretation of MCV	Steepest straight line

The above characteristics are NOT covered by UKAS accreditation to BS1377

MOISTURE CONDITION VALUE (MCV) / MOISTURE CONTENT

Sample Details:	SAMPLE ID:
	FES1180117009

Hole No	HEP-BH-65
Sample Depth (m BGL)	1.35
Sample Type and No	B9
Specimen Ref	



Test No * ineffective / invalid point		1	2	3	4	*
Moisture Condition Value		7.7	8.6	10.5	11.4	
Moisture Content	%	10.7	10.1	8.7	8.2	
Bulk density after test	Mg/m³	2.14	2.18	2.18	2.32	
Dry density after test	Mg/m³	1.93	1.98	2.01	2.14	

Soil description	Brownish grey sandy gravelly CLAY.
Procedure / Preparation	using single sample
Remarks	

Initial moisture content <20mm	10.8
Material retained on 20mm sieve	18

Method of determining MCV
Steepest straight line

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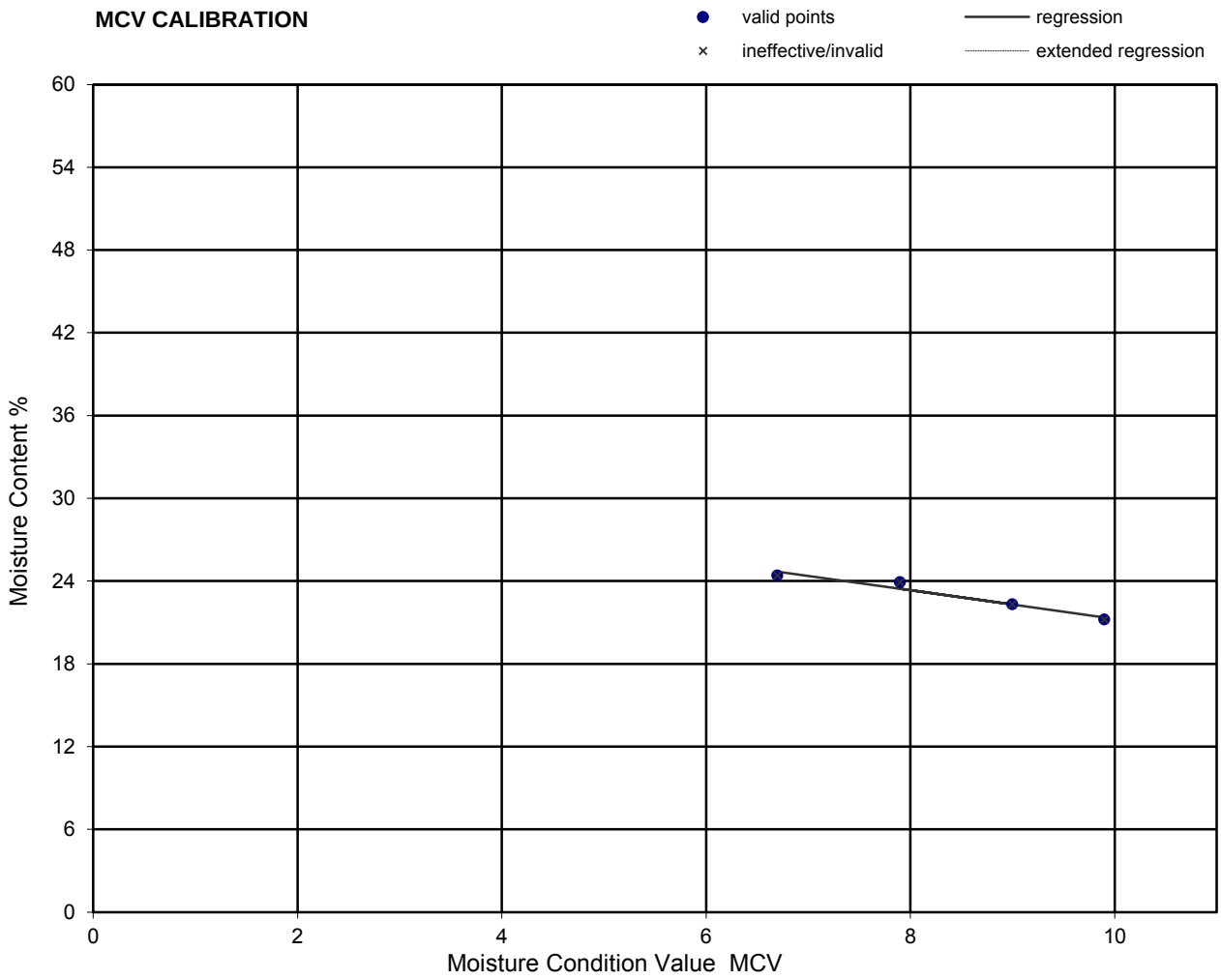
MOISTURE CONDITION VALUE (MCV) / MOISTURE CONTENT

Sample Details:	SAMPLE ID:
	HEPBH82020180306012

Hole No	HEP-BH-820
Sample Depth (m BGL)	0.6
Sample Type and No	B8
Specimen Ref	



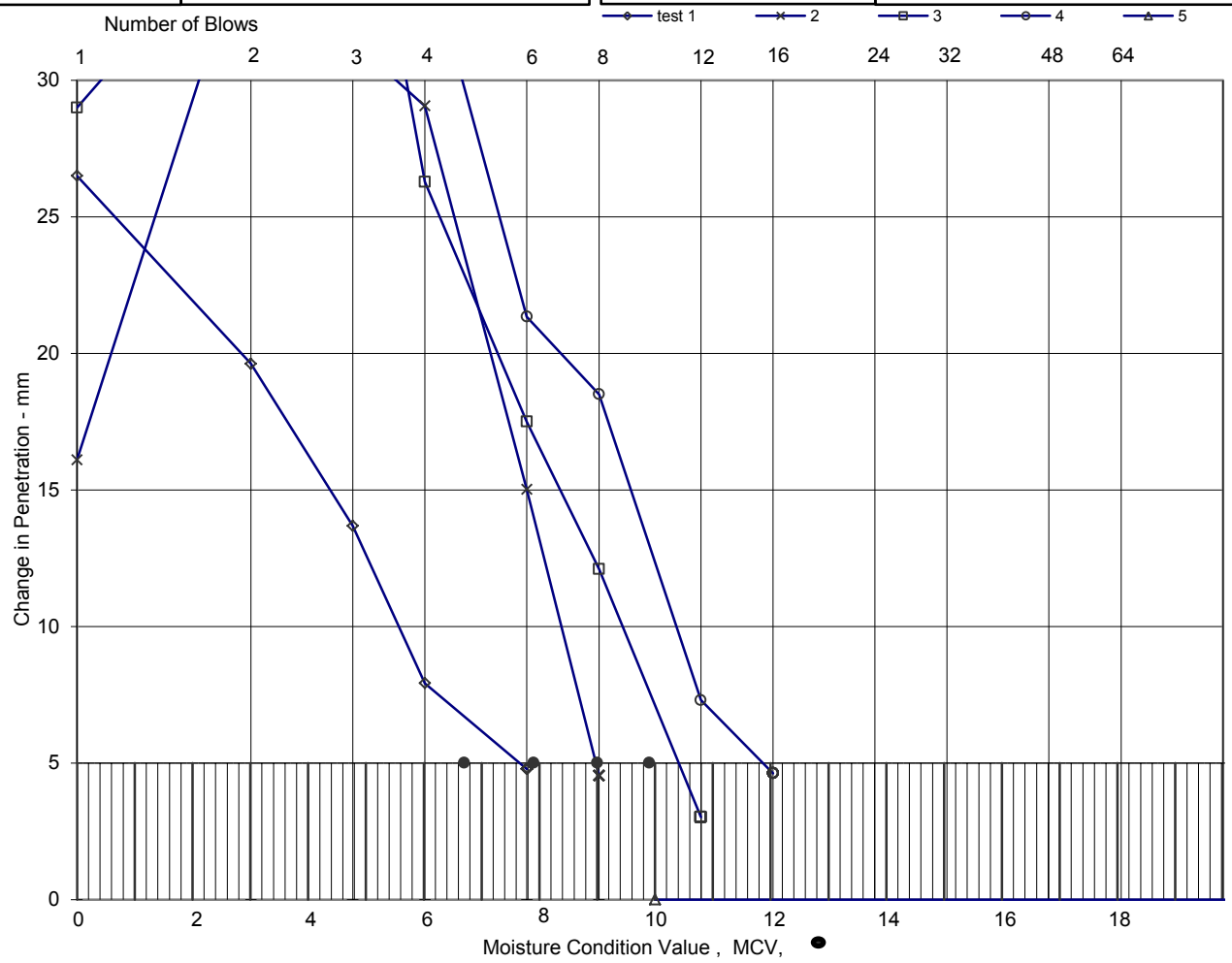
Characteristics of calibration line (determined using linear regression)	
Intercept	31.6
Slope	-1.04
Sensitivity (Change in MCV per 1% moisture content)	0.97
Correlation (proximity of test points to regression line)	-0.98
Method of interpretation of MCV	Steepest straight line

The above characteristics are NOT covered by UKAS accreditation to BS1377

MOISTURE CONDITION VALUE (MCV) / MOISTURE CONTENT

Sample Details:	SAMPLE ID:
	HEPBH82020180306012

Hole No	HEP-BH-820
Sample Depth (m BGL)	0.6
Sample Type and No	B8
Specimen Ref	



Test No * ineffective / invalid point		1	2	3	4	*
Moisture Condition Value		6.7	9.0	7.9	9.9	
Moisture Content	%	24.4	22.3	23.9	21.2	
Bulk density after test	Mg/m³	1.90	2.06	2.00	2.16	
Dry density after test	Mg/m³	1.53	1.68	1.61	1.78	

Soil description	Dark brown slightly sandy gravelly clayey SILT.
Procedure / Preparation	using single sample
Remarks	

Initial moisture content <20mm	25.4
Material retained on 20mm sieve	11

Method of determining MCV
Steepest straight line

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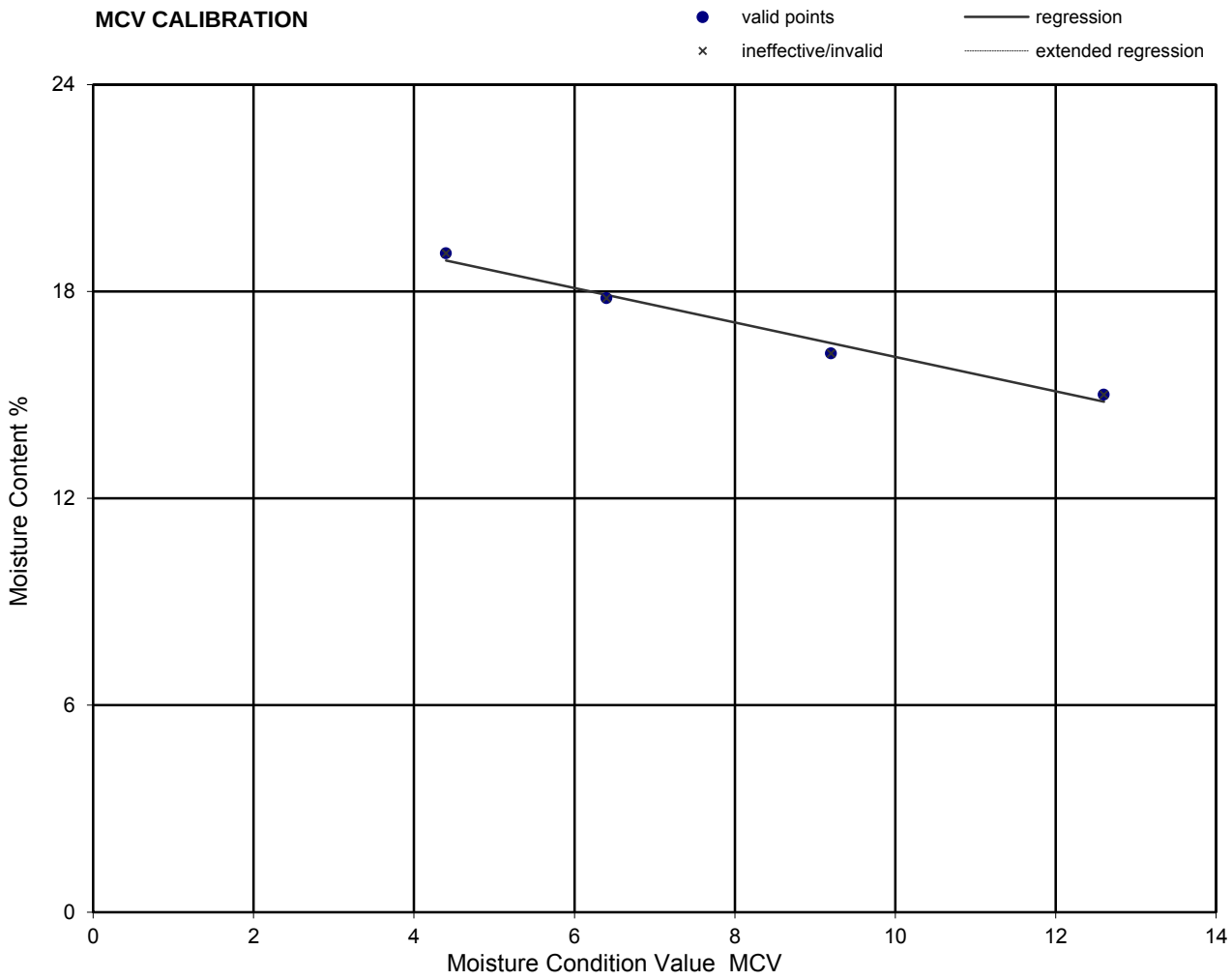
MOISTURE CONDITION VALUE (MCV) / MOISTURE CONTENT

Sample Details:	SAMPLE ID:
	FES1171130004

Hole No	HEP-BH-823
Sample Depth (m BGL)	0.7
Sample Type and No	LB4
Specimen Ref	



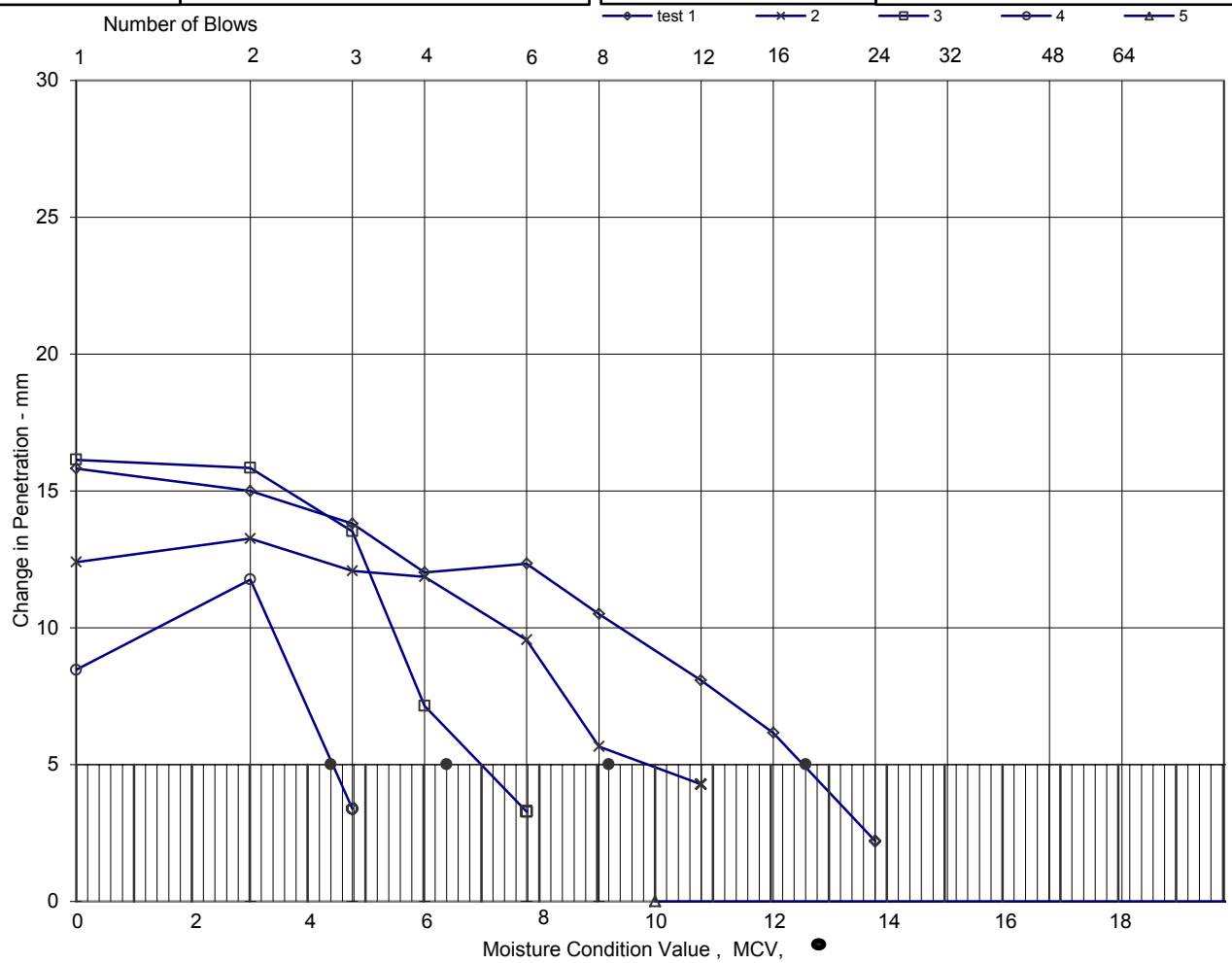
Characteristics of calibration line (determined using linear regression)	
Intercept	21.1
Slope	-0.50
Sensitivity (Change in MCV per 1% moisture content)	2.00
Correlation (proximity of test points to regression line)	-0.99
Method of interpretation of MCV	Steepest straight line

The above characteristics are NOT covered by UKAS accreditation to BS1377

MOISTURE CONDITION VALUE (MCV) / MOISTURE CONTENT

Sample Details:	SAMPLE ID:
	FES1171130004

Hole No	HEP-BH-823
Sample Depth (m BGL)	0.7
Sample Type and No	LB4
Specimen Ref	



Test No * ineffective / invalid point		1	2	3	4	*
Moisture Condition Value		12.6	9.2	6.4	4.4	
Moisture Content	%	15.0	16.2	17.8	19.1	
Bulk density after test	Mg/m³	2.10	2.06	2.02	1.95	
Dry density after test	Mg/m³	1.83	1.77	1.71	1.64	

Soil description	Brown slightly sandy slightly gravelly CLAY with two cobbles.
Procedure / Preparation	0
Remarks	

Initial moisture content <20mm	17.4
Material retained on 20mm sieve	3.8

Method of determining MCV
Steepest straight line

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FUGRO	**Moisture Condition Value / Moisture Content Relationship**			Project No.	G170029U
				Hole	HEP-BH-824
				Sample No.	13
Project Name	HAL Airport Expansion			Depth	1.70
Specimen Reference		Specimen Depth	m	Sample Type	LB
Description	Brown slightly sandy slightly gravelly CLAY			KeyLAB ID	FES2171208022
Test Method	BS1377:Part4:1990:clause 5.5			Date started	30/04/2018

Sample preparation

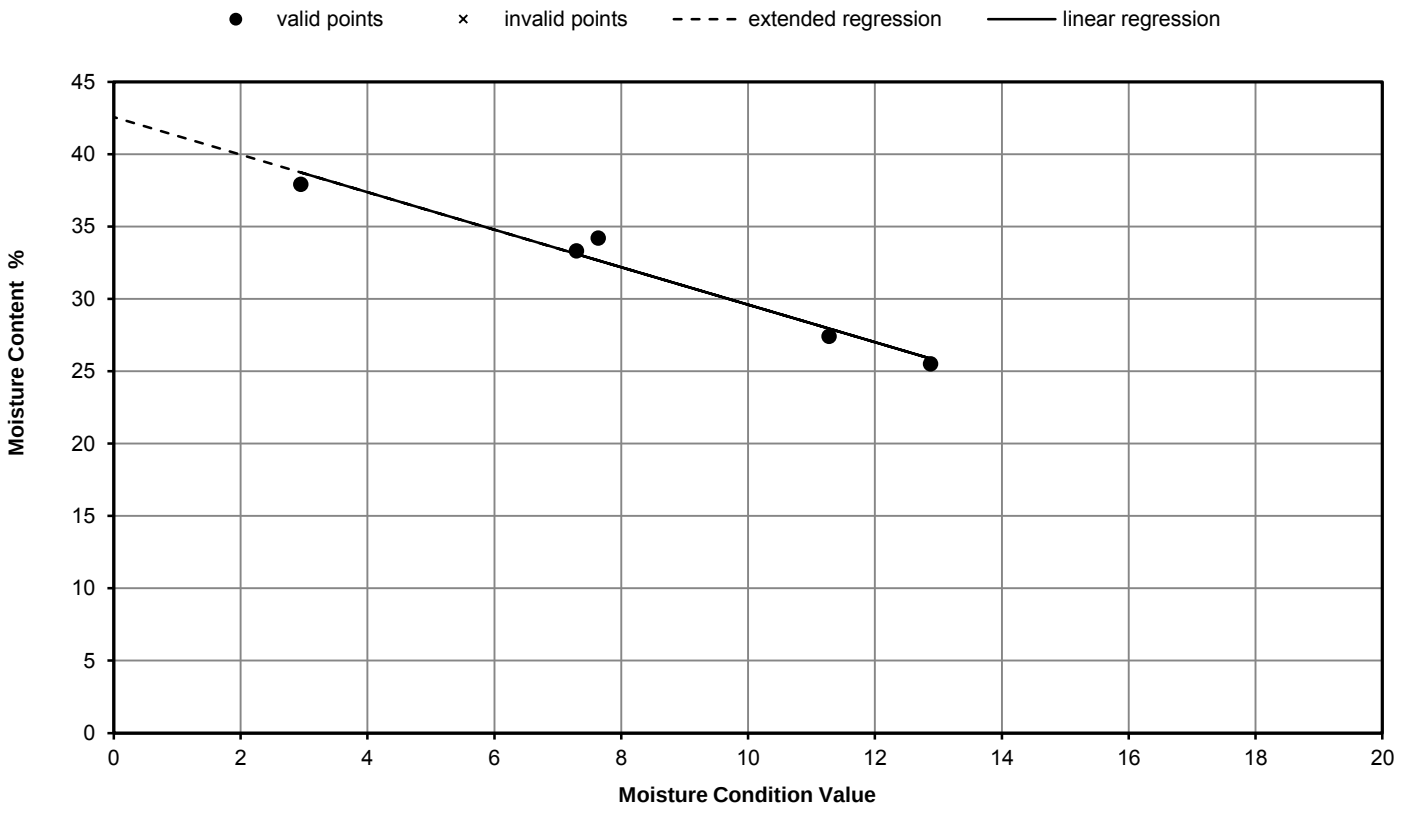
Amount of material larger than 20mm sieve removed	0.00	%
Initial Water Content of test sample below 20mm	37.9	%

Single sample tested

General remarks

Table of results

MCV Test Number	1	2	3	4	5
Water Content, %	37.9	34.2	25.5	27.4	33.3
Moisture Condition Value	3.0	7.6	12.9	11.3	7.3
MCV report	3.0	7.6	12.9	11.3	7.3
Effective / Valid data point	YES	YES	YES	YES	YES
Specimen remarks					



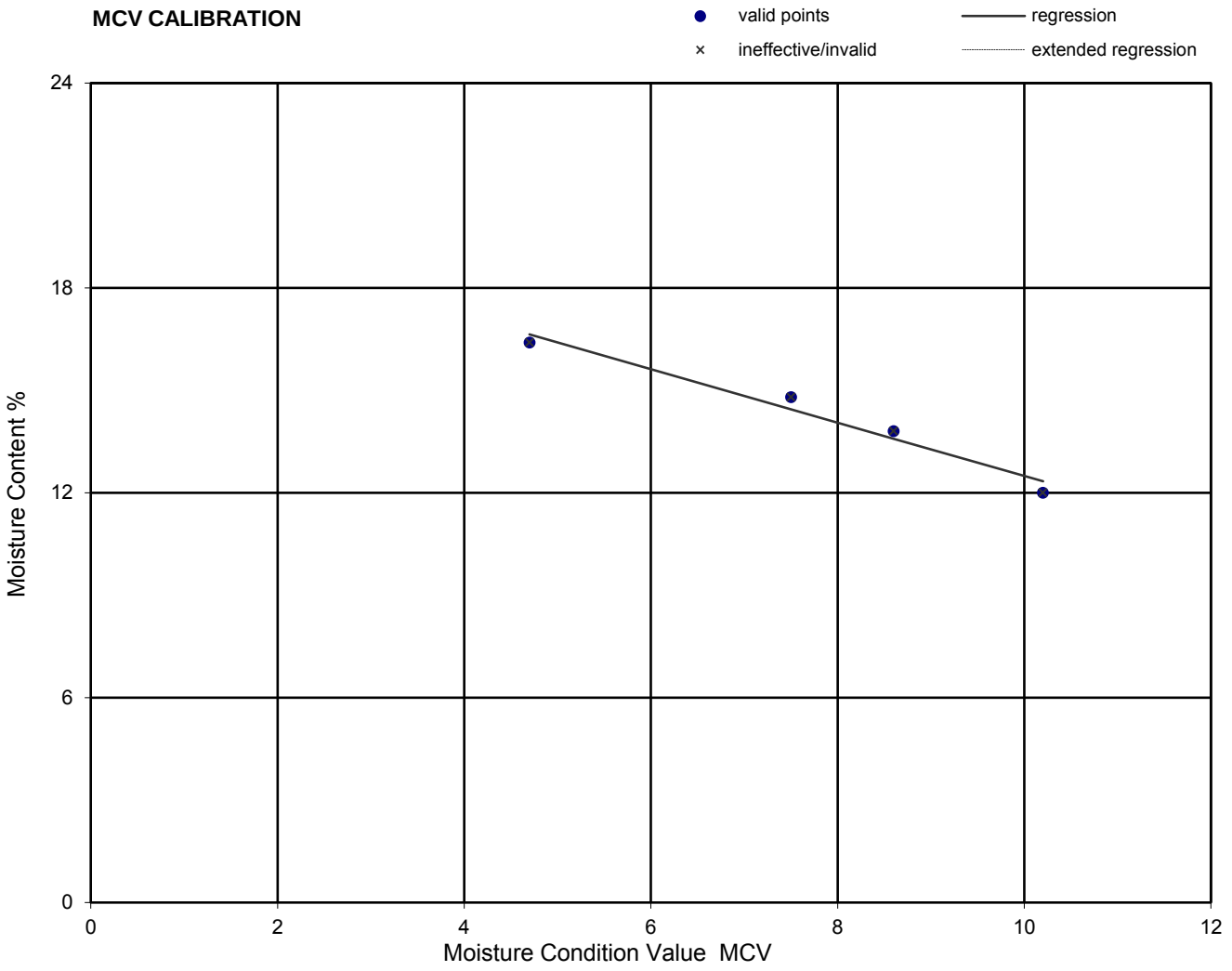
Date printed	Figure Number	Sheet Number
08/09/2018 00:00		

MOISTURE CONDITION VALUE (MCV) / MOISTURE CONTENT

Sample Details:	SAMPLE ID:
	FES1171124005

Hole No	HEP-BH-826
Sample Depth (m BGL)	1.50
Sample Type and No	B10
Specimen Ref	

MCV CALIBRATION



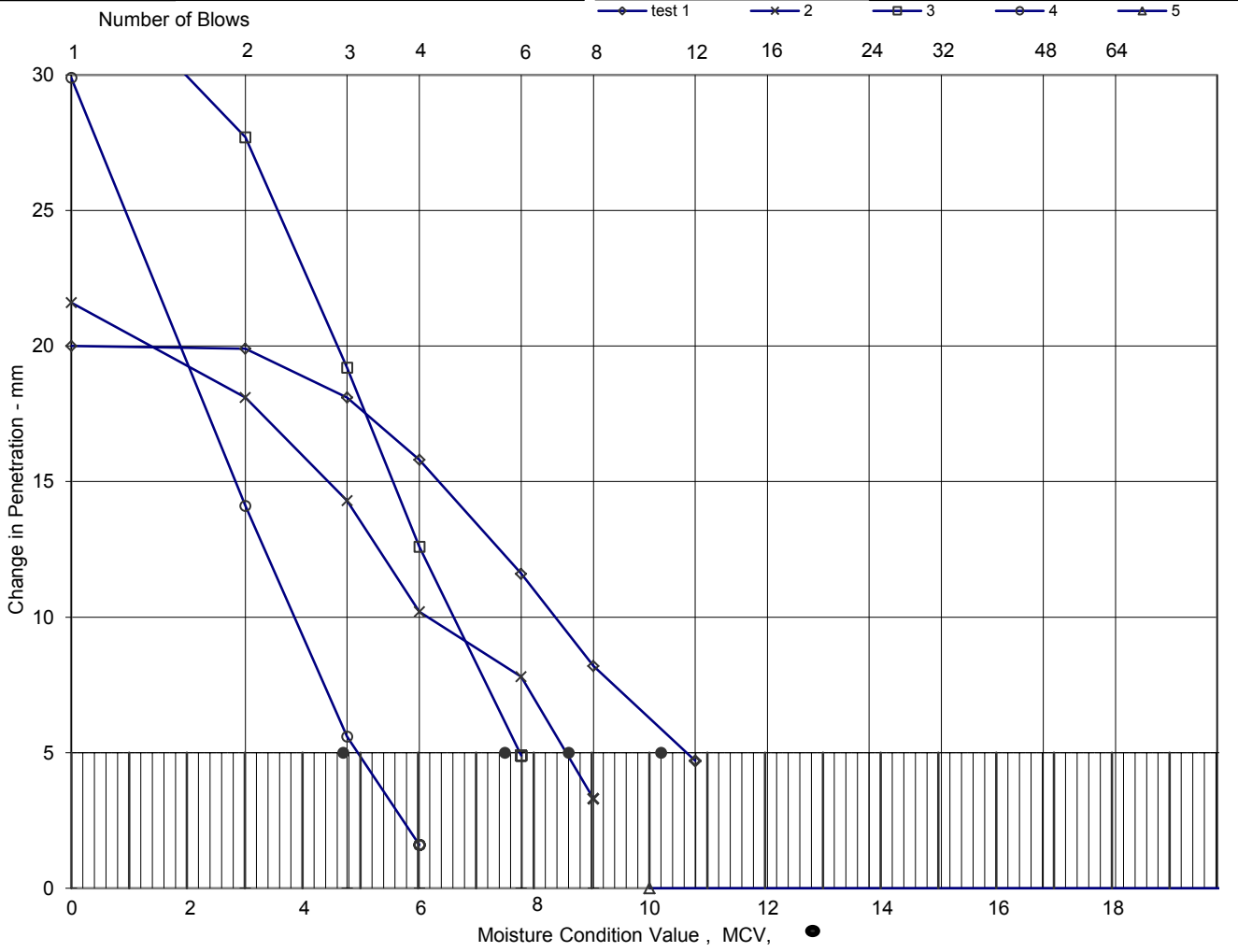
Characteristics of calibration line (determined using linear regression)	
Intercept	20.3
Slope	-0.78
Sensitivity (Change in MCV per 1% moisture content)	1.28
Correlation (proximity of test points to regression line)	-0.98
Method of interpretation of MCV	Steepest straight line

The above characteristics are NOT covered by UKAS accreditation to BS1377

MOISTURE CONDITION VALUE (MCV) / MOISTURE CONTENT

Sample Details:	SAMPLE ID:
	FES1171124005

Hole No	HEP-BH-826
Sample Depth (m BGL)	1.50
Sample Type and No	B10
Specimen Ref	



Test No (* ineffective / invalid point)		1	2	3	4	*
Moisture Condition Value		10.2	8.6	7.5	4.7	
Moisture Content	%	12.0	13.8	14.8	16.4	
Bulk density after test	Mg/m³	1.84	1.80	1.75	1.75	
Dry density after test	Mg/m³	1.64	1.58	1.52	1.50	

Soil description	Brown slightly sandy slightly gravelly CLAY.
Procedure / Preparation	0
Remarks	Sample combined with LB7

Initial moisture content <20mm	12
Material retained on 20mm sieve	0

Method of determining MCV
Steepest straight line

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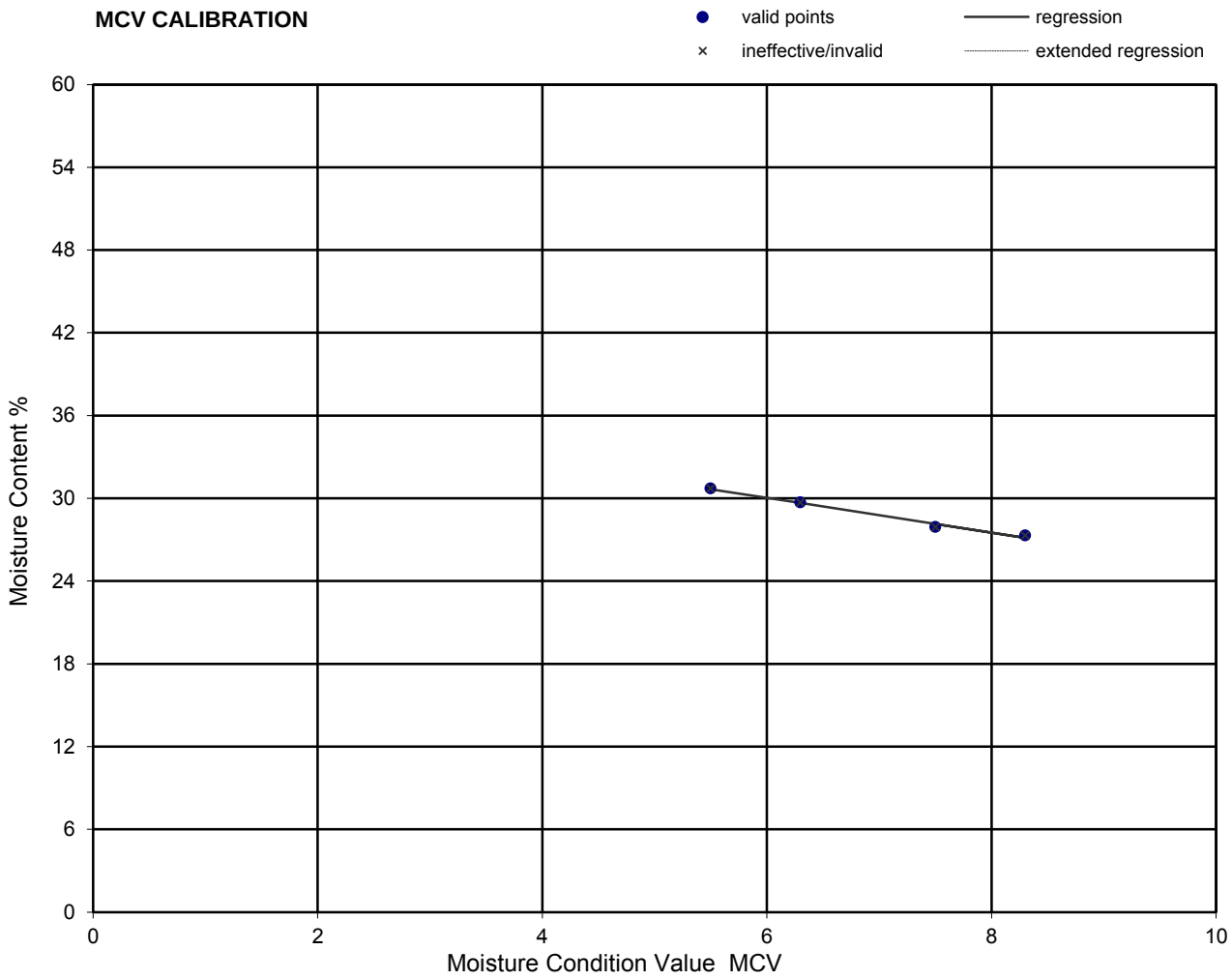
MOISTURE CONDITION VALUE (MCV) / MOISTURE CONTENT

Sample Details:	SAMPLE ID:
	FES1180318019

Hole No	HEP-BH-1047
Sample Depth (m BGL)	2.7
Sample Type and No	B19
Specimen Ref	



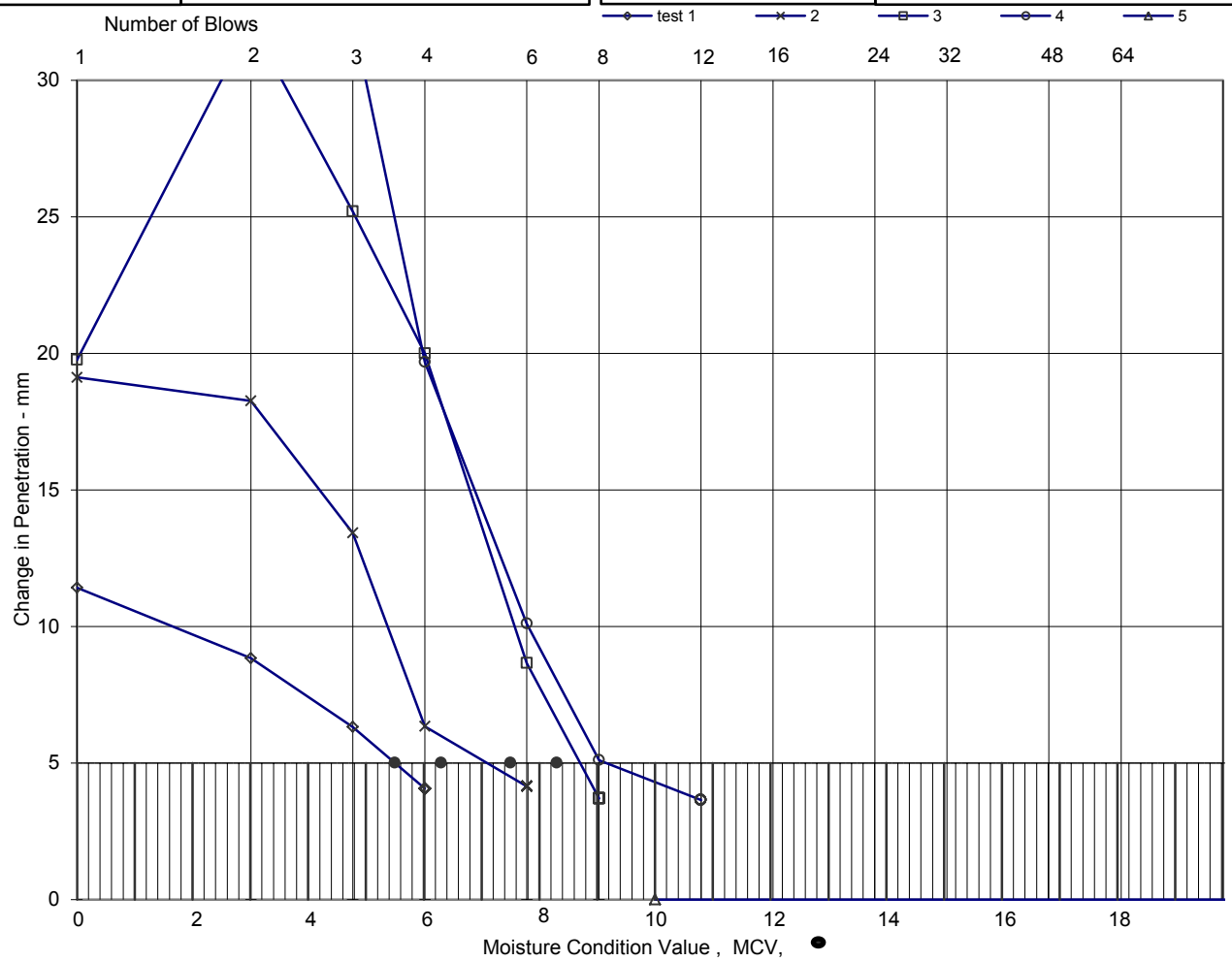
Characteristics of calibration line (determined using linear regression)	
Intercept	37.6
Slope	-1.26
Sensitivity (Change in MCV per 1% moisture content)	0.79
Correlation (proximity of test points to regression line)	-0.99
Method of interpretation of MCV	Steepest straight line

The above characteristics are NOT covered by UKAS accreditation to BS1377

MOISTURE CONDITION VALUE (MCV) / MOISTURE CONTENT

Sample Details:	SAMPLE ID:
	FES1180318019

Hole No	HEP-BH-1047
Sample Depth (m BGL)	2.7
Sample Type and No	B19
Specimen Ref	



Test No * ineffective / invalid point		1	2	3	4	*
Moisture Condition Value		5.5	6.3	8.3	7.5	
Moisture Content	%	30.7	29.7	27.3	27.9	
Bulk density after test	Mg/m³	1.64	1.68	1.78	1.79	
Dry density after test	Mg/m³	1.25	1.30	1.40	1.40	

Soil description	Black sandy GRAVEL.
Procedure / Preparation	using single sample
Remarks	

Initial moisture content <20mm	30.7
Material retained on 20mm sieve	31

Method of determining MCV
Steepest straight line

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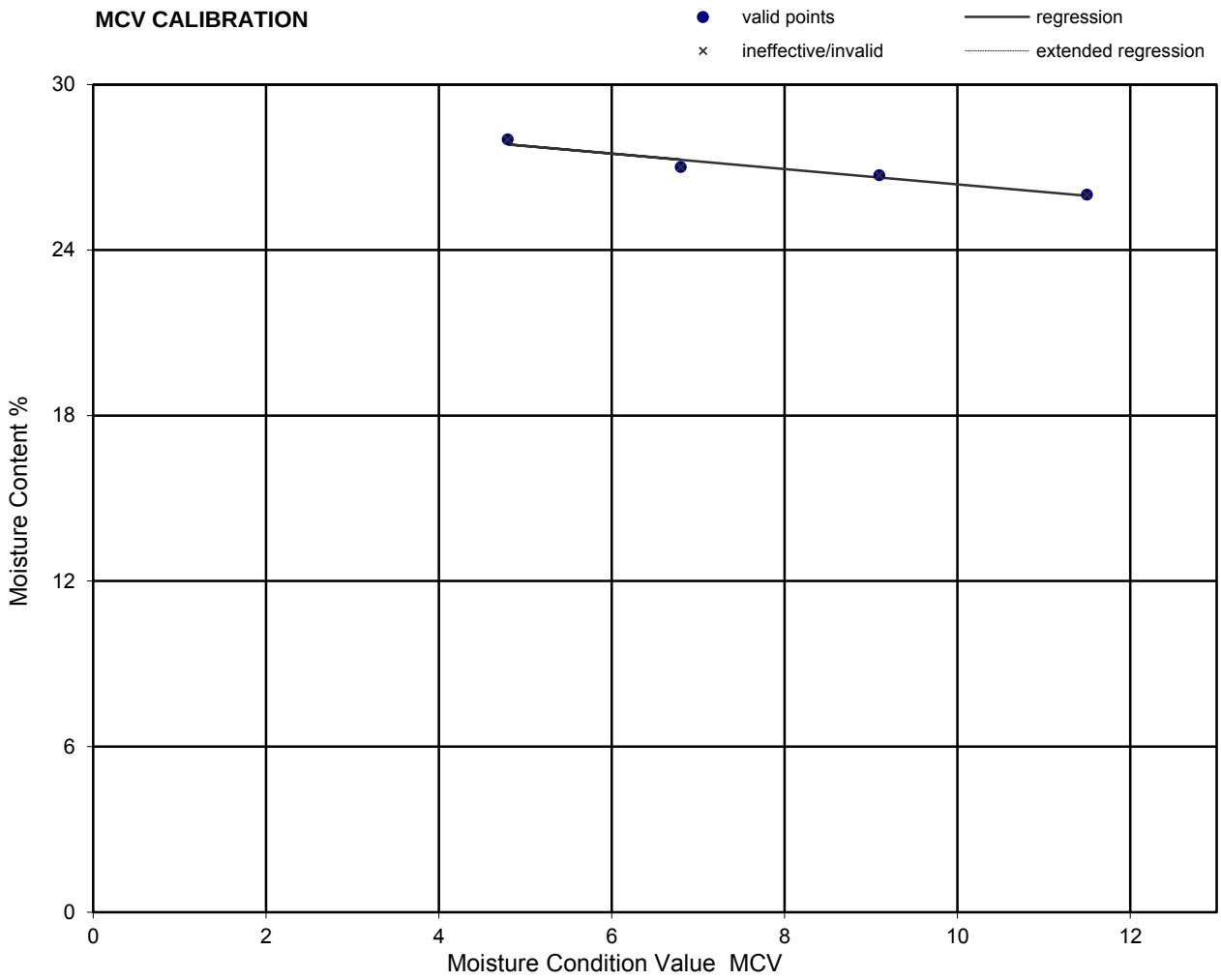
MOISTURE CONDITION VALUE (MCV) / MOISTURE CONTENT

Sample Details:	SAMPLE ID:
	HEPBH180520170127003

Hole No	HEP-BH-1805
Sample Depth (m BGL)	1.2
Sample Type and No	B8
Specimen Ref	



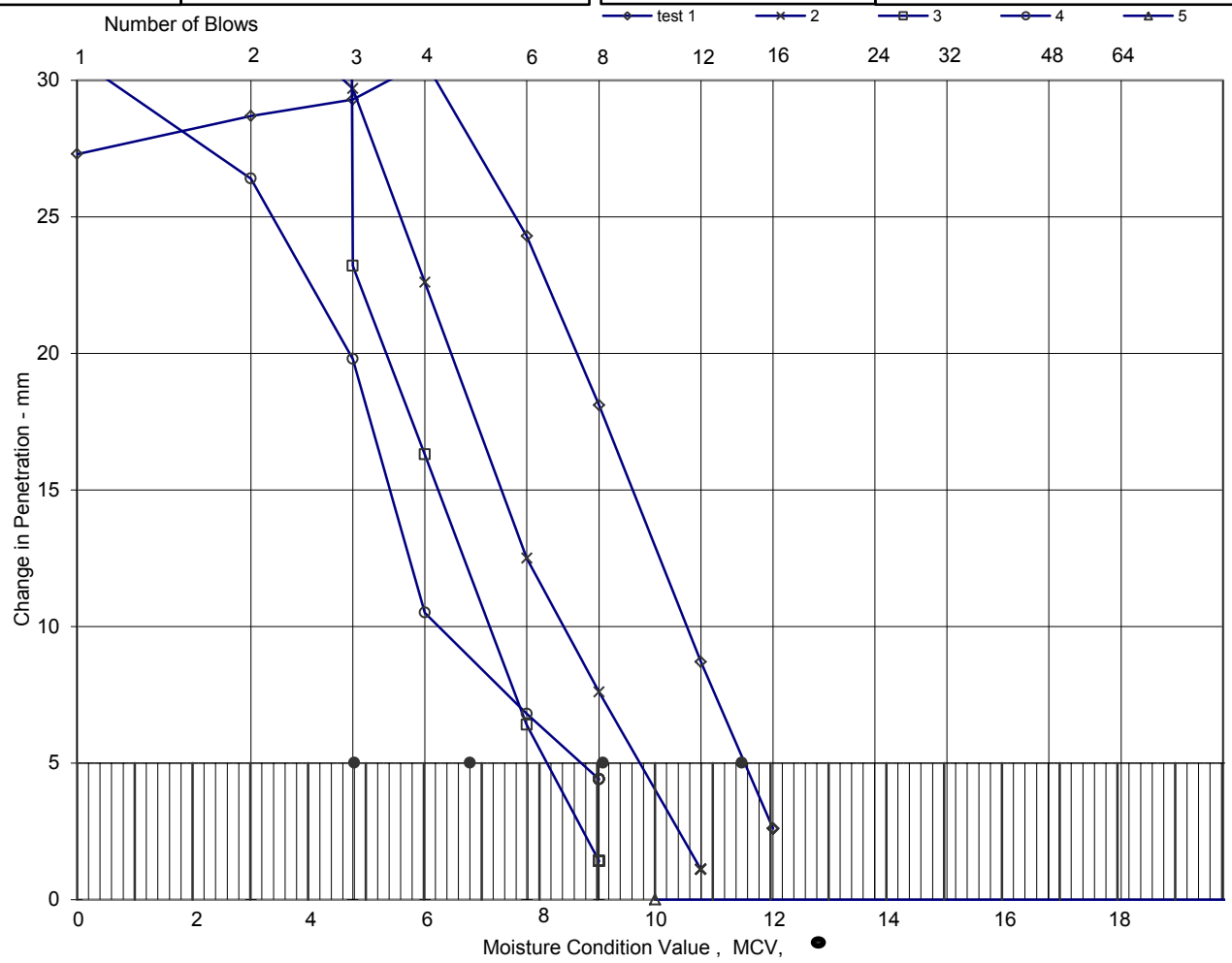
Characteristics of calibration line (determined using linear regression)	
Intercept	29.2
Slope	-0.28
Sensitivity (Change in MCV per 1% moisture content)	3.58
Correlation (proximity of test points to regression line)	-0.97
Method of interpretation of MCV	Steepest straight line

The above characteristics are NOT covered by UKAS accreditation to BS1377

MOISTURE CONDITION VALUE (MCV) / MOISTURE CONTENT

Sample Details:	SAMPLE ID:
	HEPBH180520170127003

Hole No	HEP-BH-1805
Sample Depth (m BGL)	1.2
Sample Type and No	B8
Specimen Ref	



Test No (* ineffective / invalid point)		1	2	3	4	*
Moisture Condition Value		11.5	9.1	4.8	6.8	
Moisture Content	%	26.0	26.7	28.0	27.0	
Bulk density after test	Mg/m³	2.00	2.00	1.95	1.91	
Dry density after test	Mg/m³	1.59	1.58	1.52	1.50	

Soil description	Brown slightly sandy slightly gravelly CLAY with one cobble.
Procedure / Preparation	using single sample
Remarks	

Initial moisture content <20mm	25.5
Material retained on 20mm sieve	32.5

Method of determining MCV
Steepest straight line

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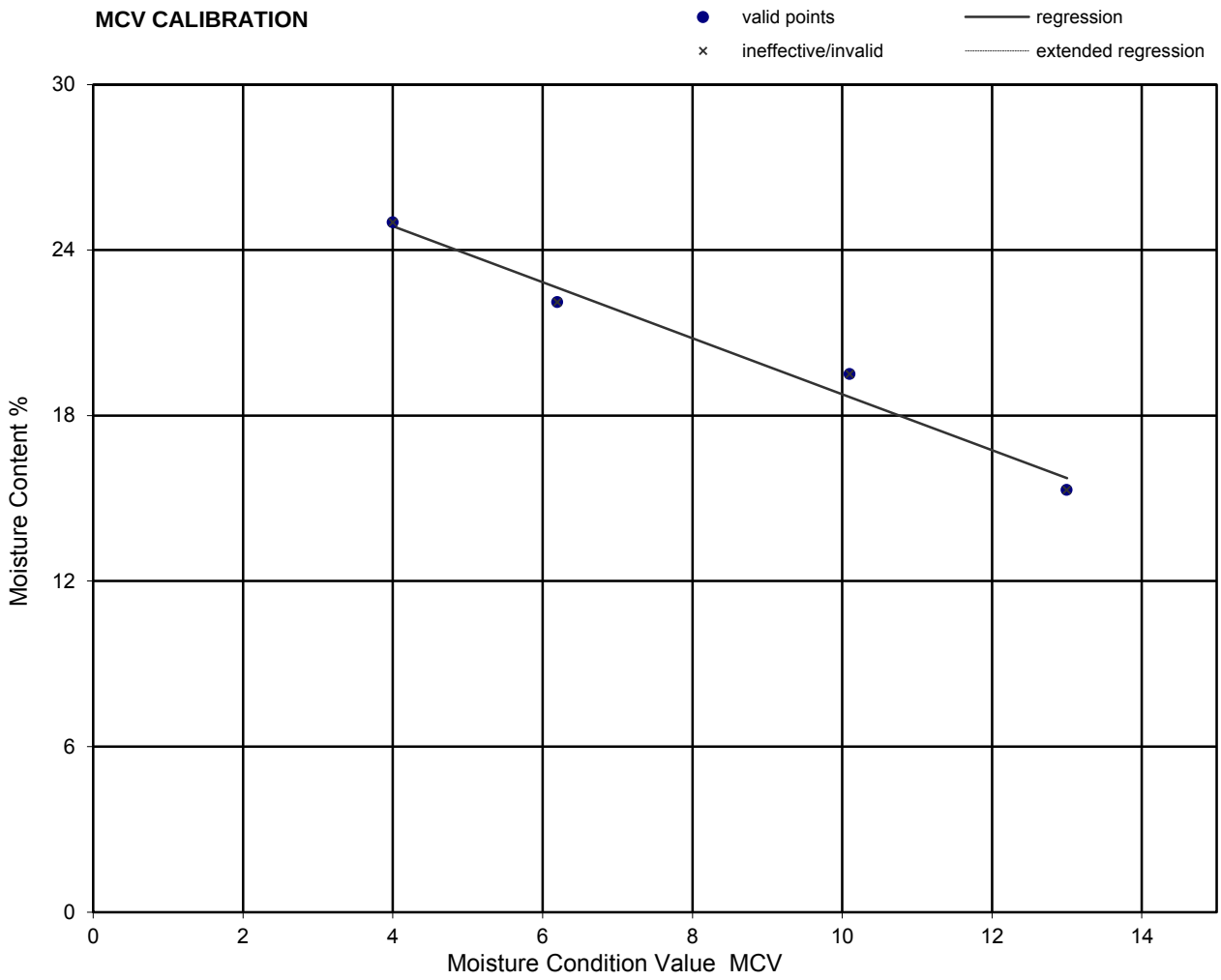
MOISTURE CONDITION VALUE (MCV) / MOISTURE CONTENT

Sample Details:	SAMPLE ID:
	HEPTT320171122012

Hole No	HEP-TT-3
Sample Depth (m BGL)	1.8
Sample Type and No	B11
Specimen Ref	

MCV CALIBRATION



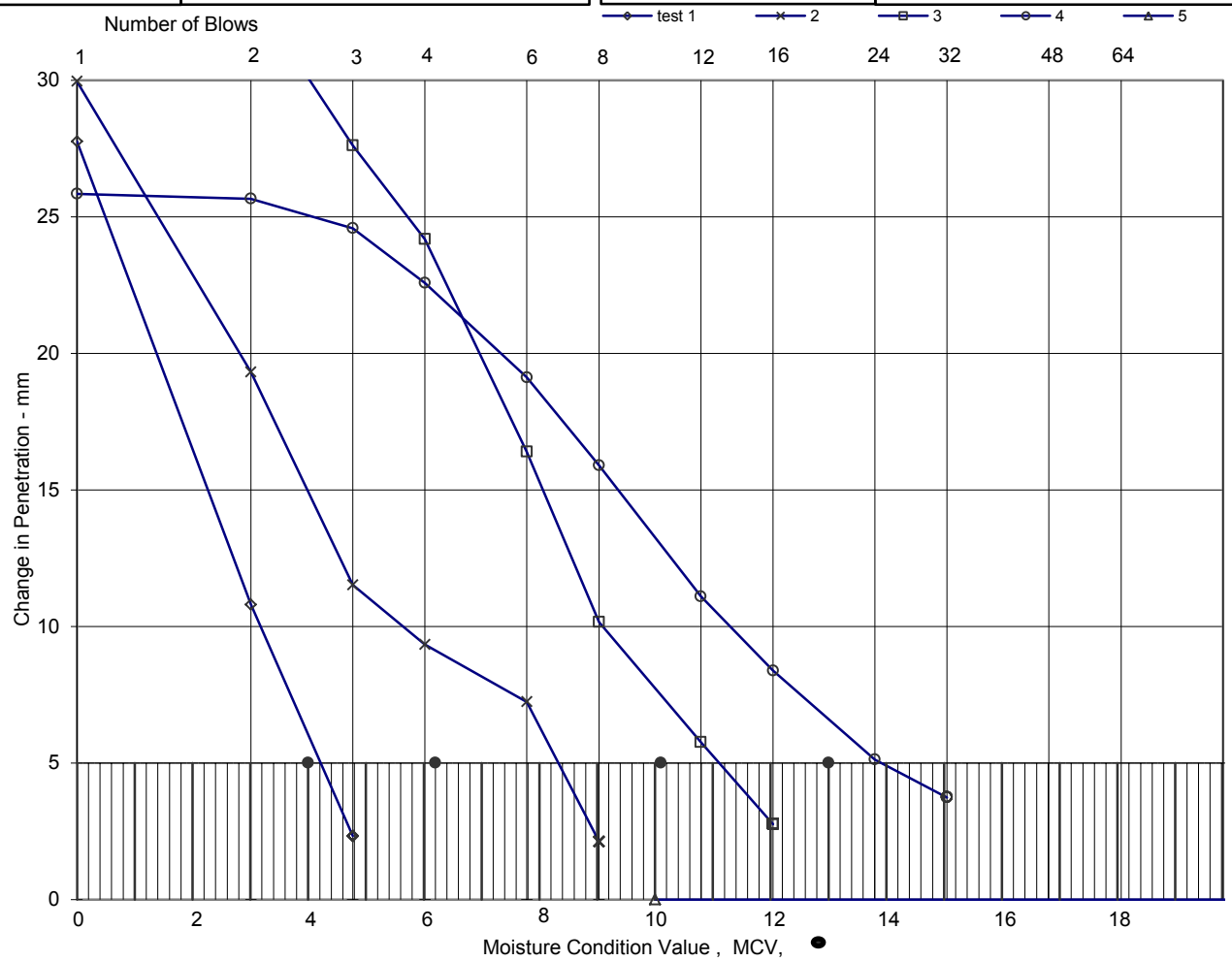
Characteristics of calibration line (determined using linear regression)	
Intercept	28.9
Slope	-1.01
Sensitivity (Change in MCV per 1% moisture content)	0.99
Correlation (proximity of test points to regression line)	-0.99
Method of interpretation of MCV	Steepest straight line

The above characteristics are NOT covered by UKAS accreditation to BS1377

MOISTURE CONDITION VALUE (MCV) / MOISTURE CONTENT

Sample Details:	SAMPLE ID:
	HEPTT320171122012

Hole No	HEP-TT-3
Sample Depth (m BGL)	1.8
Sample Type and No	B11
Specimen Ref	



Test No * ineffective / invalid point		1	2	3	4	*
Moisture Condition Value		4.0	6.2	10.1	13.0	
Moisture Content	%	25.0	22.1	19.5	15.3	
Bulk density after test	Mg/m³	1.94	1.85	2.06	2.11	
Dry density after test	Mg/m³	1.55	1.52	1.72	1.83	

Soil description	Brown slightly sandy gravelly CLAY with four cobbles.
Procedure / Preparation	using separate batches
Remarks	

Initial moisture content <20mm	
Material retained on 20mm sieve	23

Method of determining MCV
Steepest straight line

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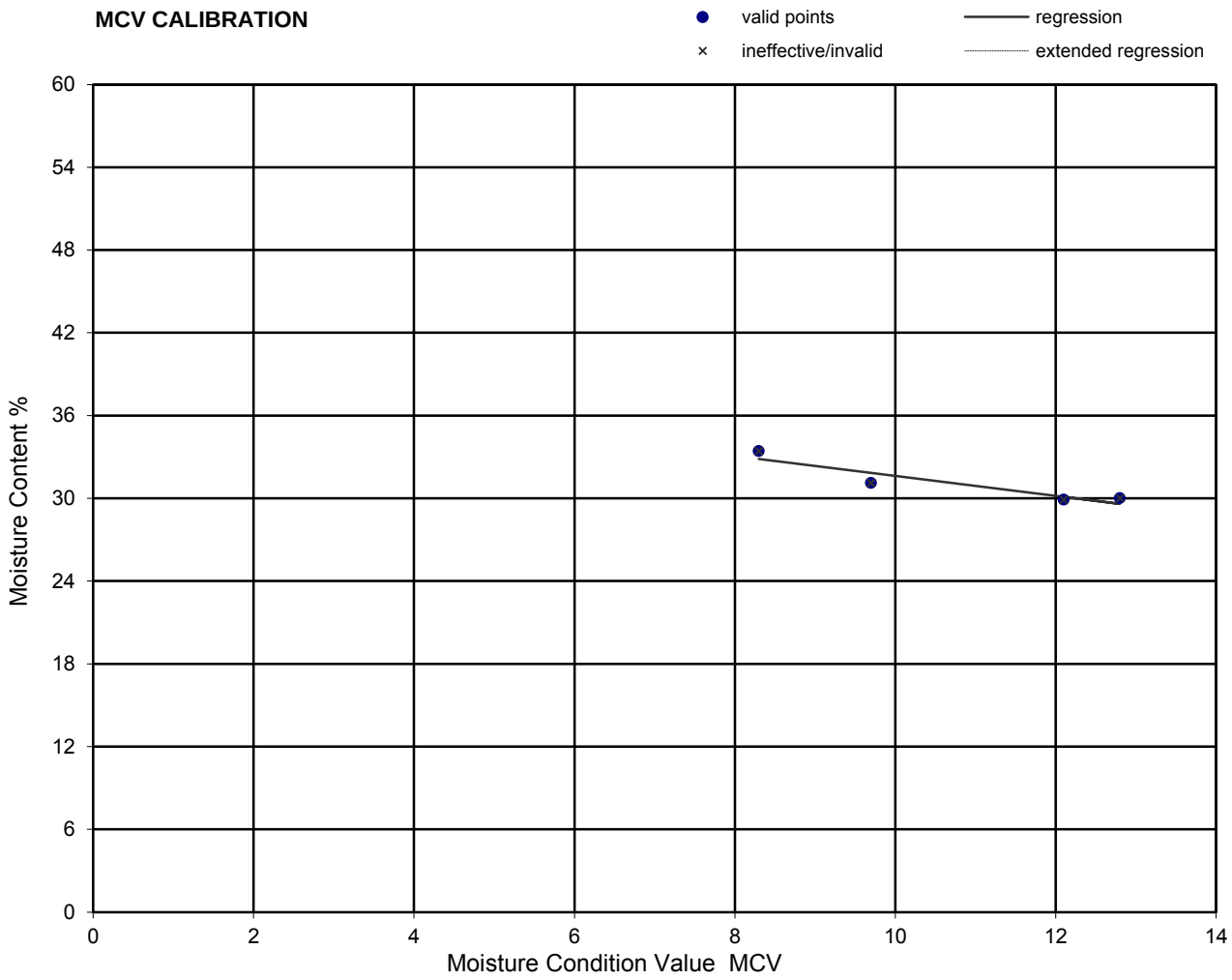
MOISTURE CONDITION VALUE (MCV) / MOISTURE CONTENT

Sample Details:	SAMPLE ID:
	HEPTT620171123008

Hole No	HEP-TT-6
Sample Depth (m BGL)	0.8
Sample Type and No	LB8
Specimen Ref	

MCV CALIBRATION



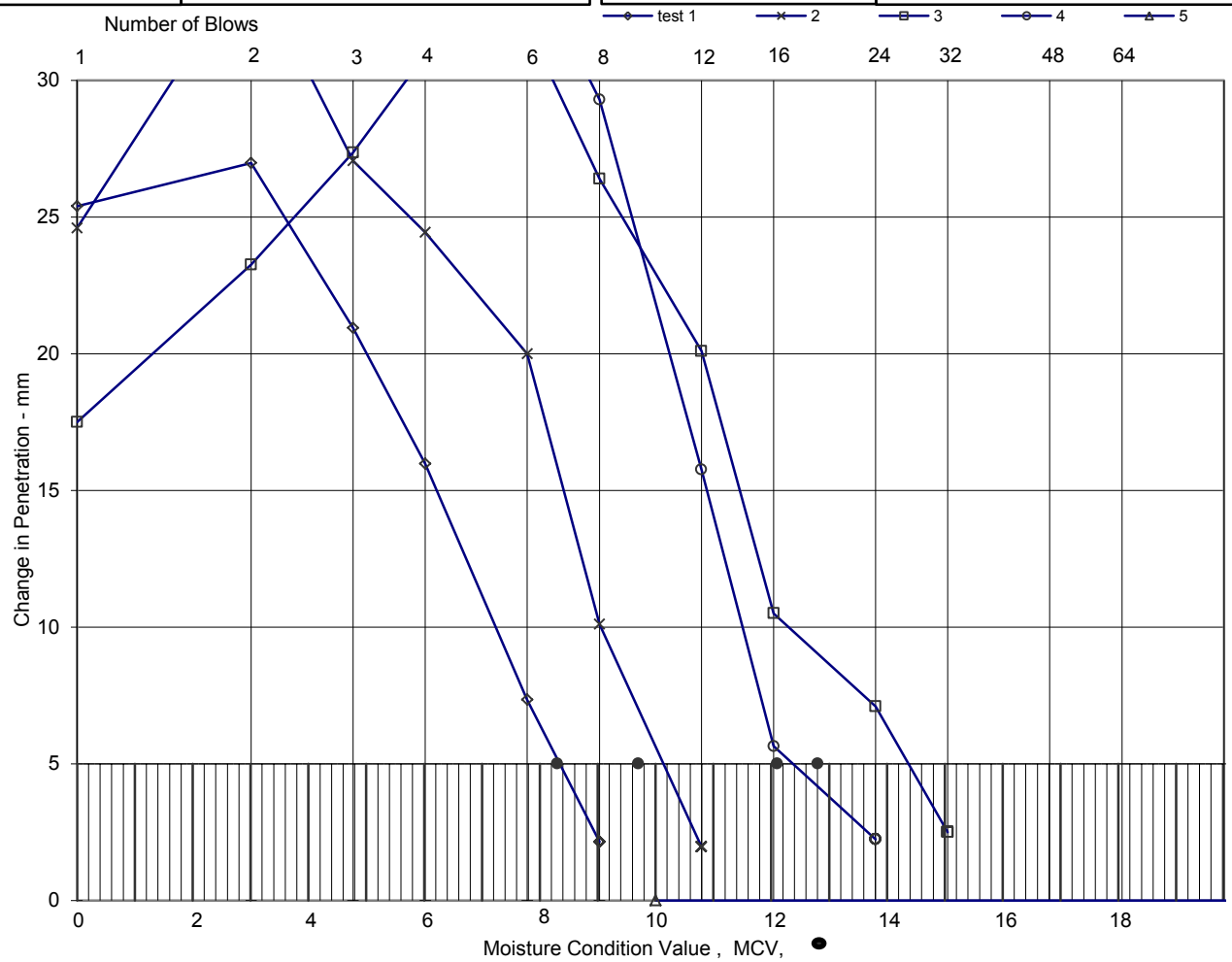
Characteristics of calibration line (determined using linear regression)	
Intercept	38.9
Slope	-0.72
Sensitivity (Change in MCV per 1% moisture content)	1.38
Correlation (proximity of test points to regression line)	-0.93
Method of interpretation of MCV	Steepest straight line

The above characteristics are NOT covered by UKAS accreditation to BS1377

MOISTURE CONDITION VALUE (MCV) / MOISTURE CONTENT

Sample Details:	SAMPLE ID:
	HEPTT620171123008

Hole No	HEP-TT-6
Sample Depth (m BGL)	0.8
Sample Type and No	LB8
Specimen Ref	



Test No (* ineffective / invalid point)		1	2	3	4	*
Moisture Condition Value		8.3	9.7	12.8	12.1	
Moisture Content	%	33.4	31.1	30.0	29.9	
Bulk density after test	Mg/m³	1.82	1.84	1.87	1.96	
Dry density after test	Mg/m³	1.36	1.40	1.44	1.51	

Soil description	Brown slightly sandy slightly gravelly silty CLAY.
Procedure / Preparation	using single sample
Remarks	

Initial moisture content <20mm	33.4
Material retained on 20mm sieve	13

Method of determining MCV
Steepest straight line

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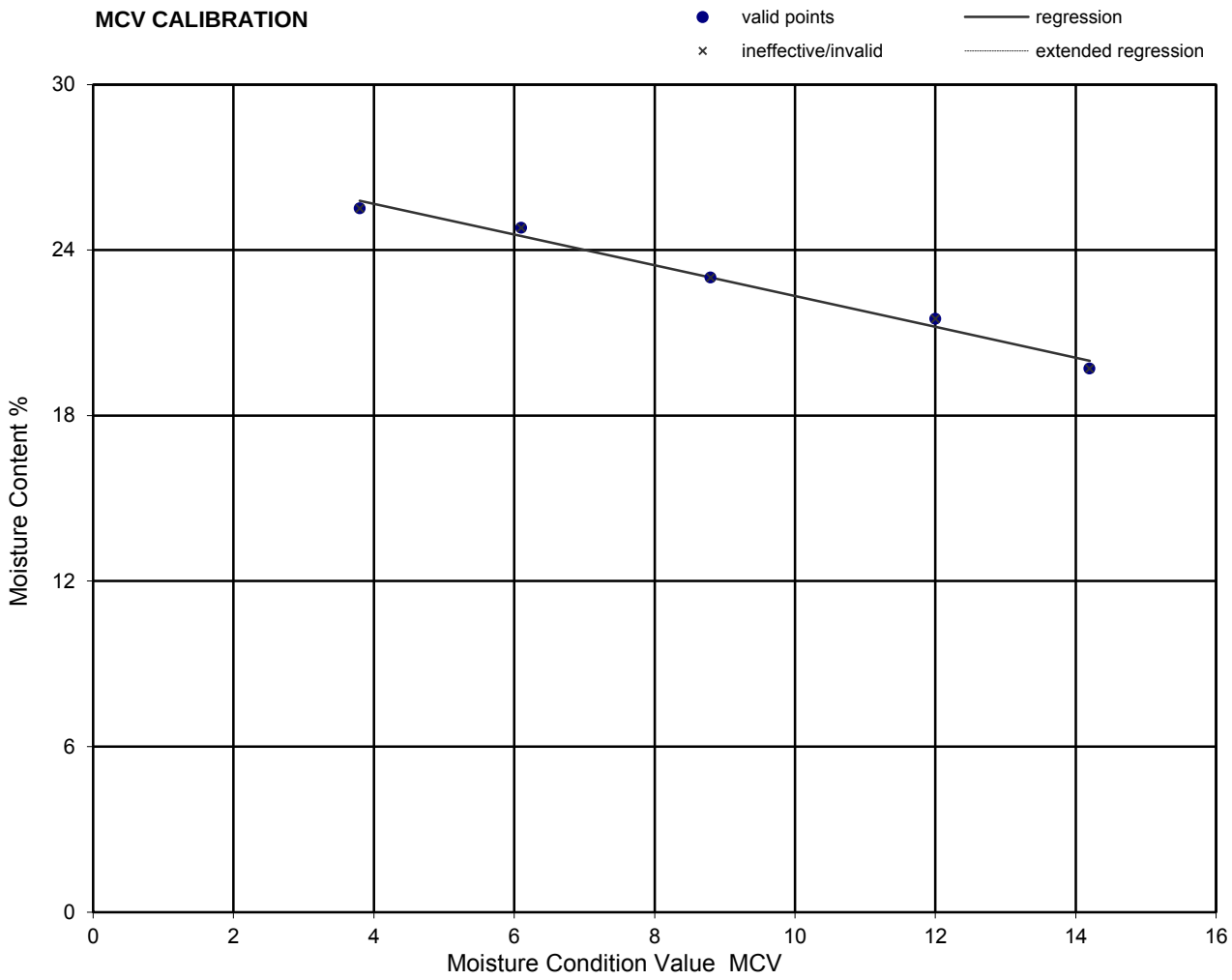
MOISTURE CONDITION VALUE (MCV) / MOISTURE CONTENT

Sample Details:	SAMPLE ID:
	HEPTT920171123010

Hole No	HEP-TT-9
Sample Depth (m BGL)	1.2
Sample Type and No	B9
Specimen Ref	



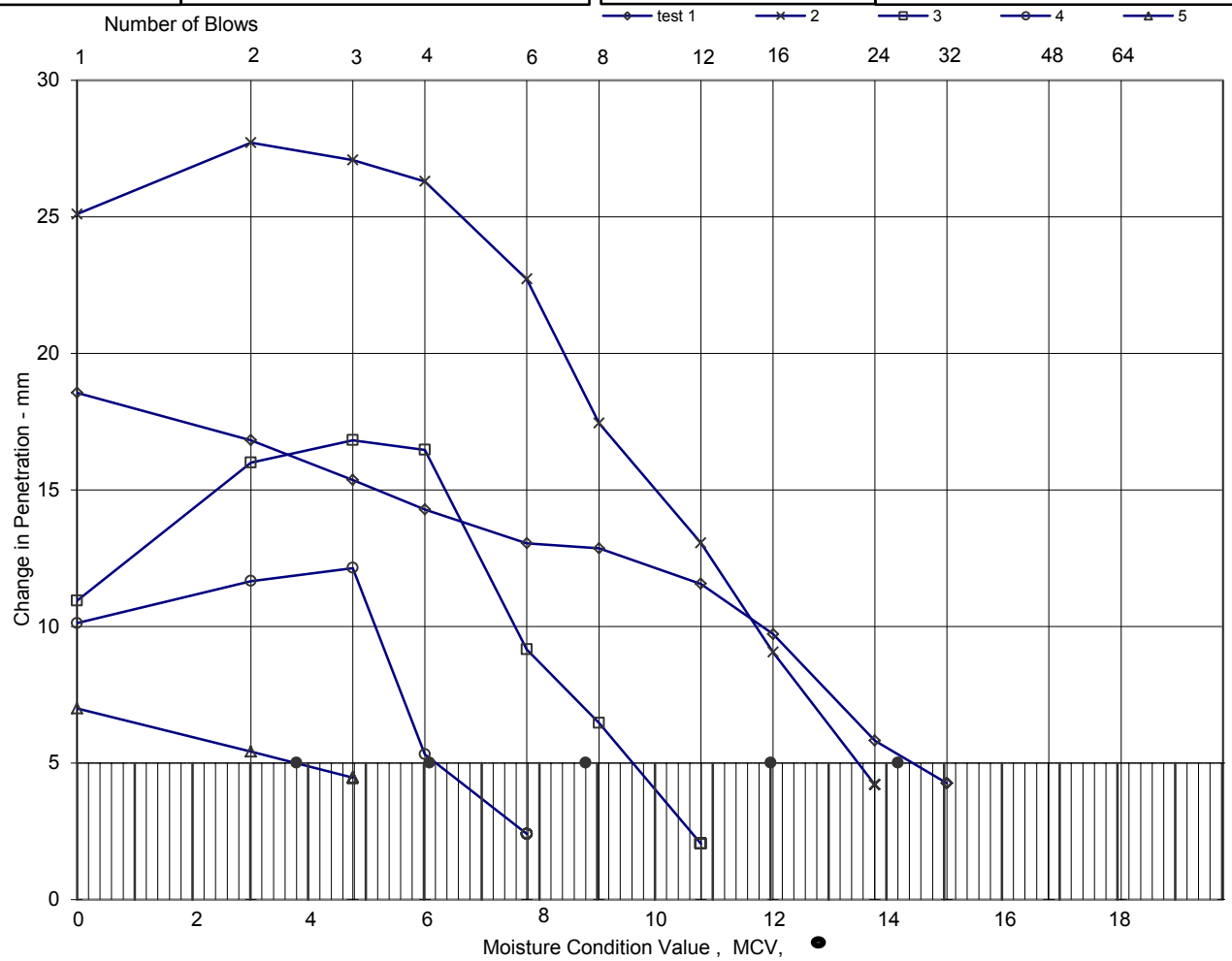
Characteristics of calibration line (determined using linear regression)	
Intercept	27.9
Slope	-0.56
Sensitivity (Change in MCV per 1% moisture content)	1.79
Correlation (proximity of test points to regression line)	-0.99
Method of interpretation of MCV	Steepest straight line

The above characteristics are NOT covered by UKAS accreditation to BS1377

MOISTURE CONDITION VALUE (MCV) / MOISTURE CONTENT

Sample Details:	SAMPLE ID:
	HEPTT920171123010

Hole No	HEP-TT-9
Sample Depth (m BGL)	1.2
Sample Type and No	B9
Specimen Ref	



Test No * ineffective / invalid point		1	2	3	4	5
Moisture Condition Value		14.2	12.0	8.8	6.1	3.8
Moisture Content	%	19.7	21.5	23.0	24.8	25.5
Bulk density after test	Mg/m³	2.04	2.20	1.90	1.79	1.81
Dry density after test	Mg/m³	1.70	1.81	1.54	1.43	1.44

Soil description	Greyish brown slightly sandy gravelly silty CLAY.
Procedure / Preparation	using single sample
Remarks	

Initial moisture content <20mm	19.4
Material retained on 20mm sieve	17

Method of determining MCV
Steepest straight line

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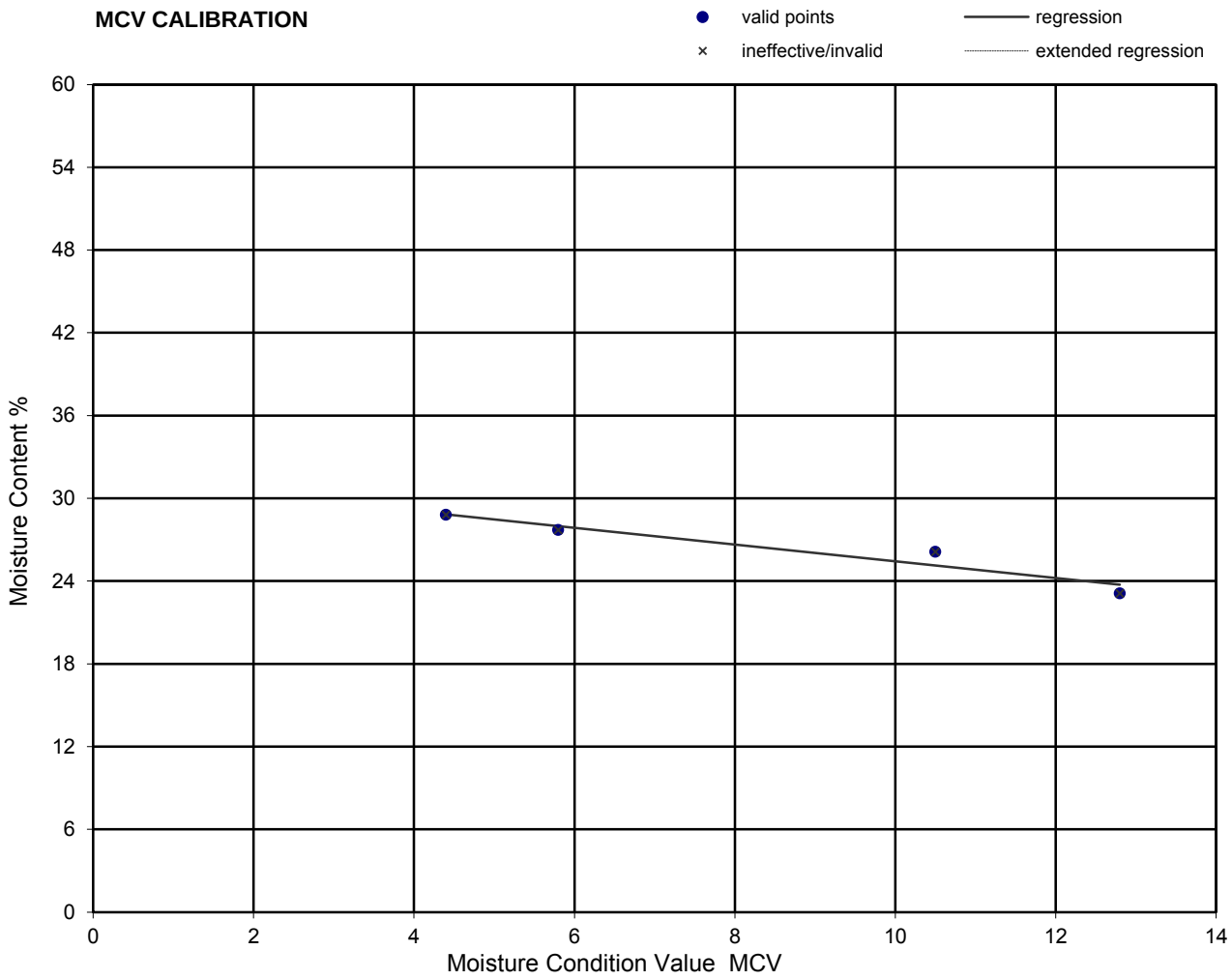
MOISTURE CONDITION VALUE (MCV) / MOISTURE CONTENT

Sample Details:	SAMPLE ID:
	HEPTT1120171124010

Hole No	HEP-TT-11
Sample Depth (m BGL)	1.3
Sample Type and No	B9
Specimen Ref	

MCV CALIBRATION



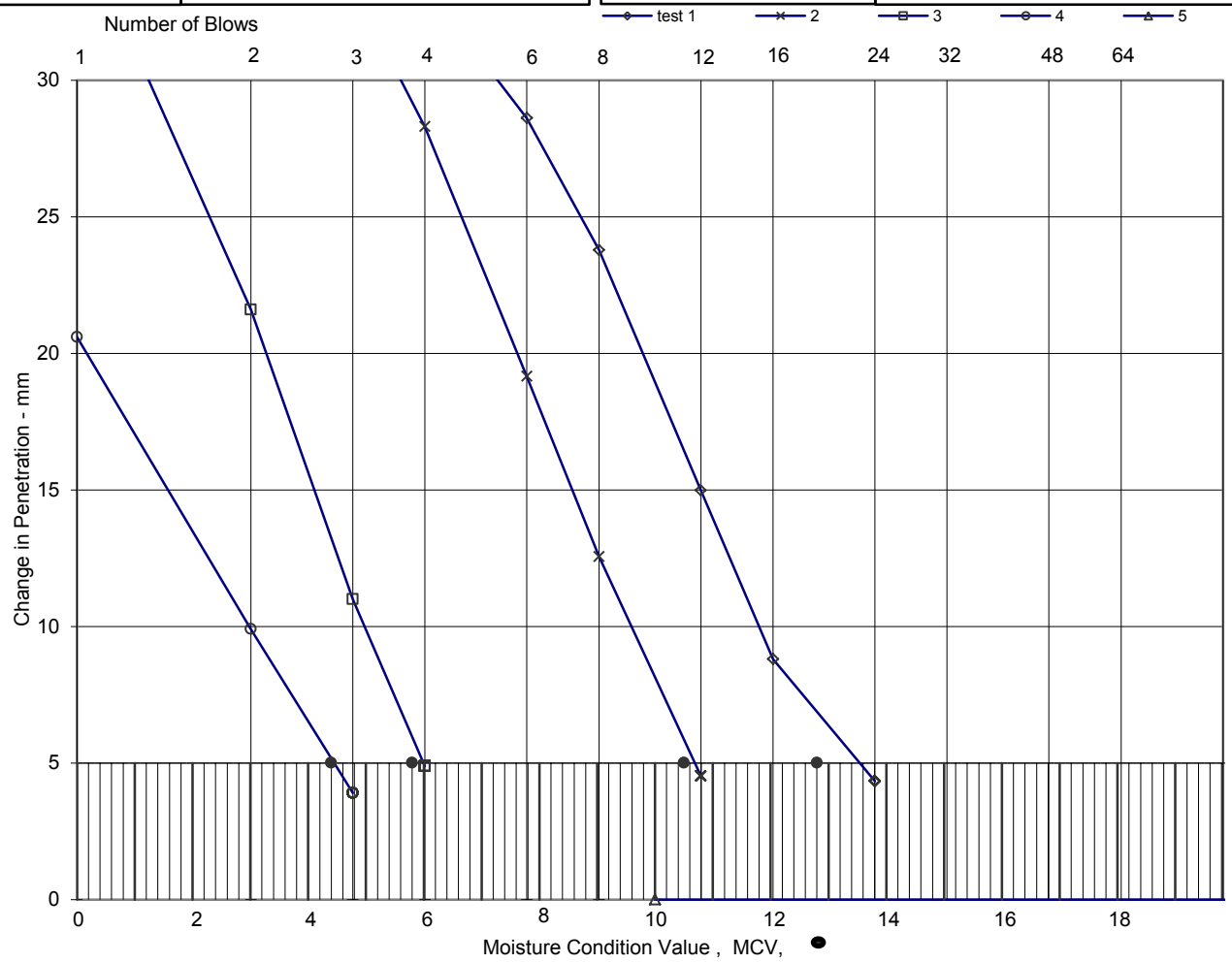
Characteristics of calibration line (determined using linear regression)	
Intercept	31.5
Slope	-0.60
Sensitivity (Change in MCV per 1% moisture content)	1.65
Correlation (proximity of test points to regression line)	-0.96
Method of interpretation of MCV	Steepest straight line

The above characteristics are NOT covered by UKAS accreditation to BS1377

MOISTURE CONDITION VALUE (MCV) / MOISTURE CONTENT

Sample Details:	SAMPLE ID:
	HEPTT1120171124010

Hole No	HEP-TT-11
Sample Depth (m BGL)	1.3
Sample Type and No	B9
Specimen Ref	



Test No * ineffective / invalid point		1	2	3	4	*
Moisture Condition Value		12.8	10.5	5.8	4.4	
Moisture Content	%	23.1	26.1	27.7	28.8	
Bulk density after test	Mg/m³	2.04	1.97	1.92	1.87	
Dry density after test	Mg/m³	1.66	1.56	1.50	1.45	

Soil description	Brown slightly sandy slightly gravelly CLAY.
Procedure / Preparation	using separate batches
Remarks	

Initial moisture content <20mm	23.1
Material retained on 20mm sieve	6

Method of determining MCV
Steepest straight line

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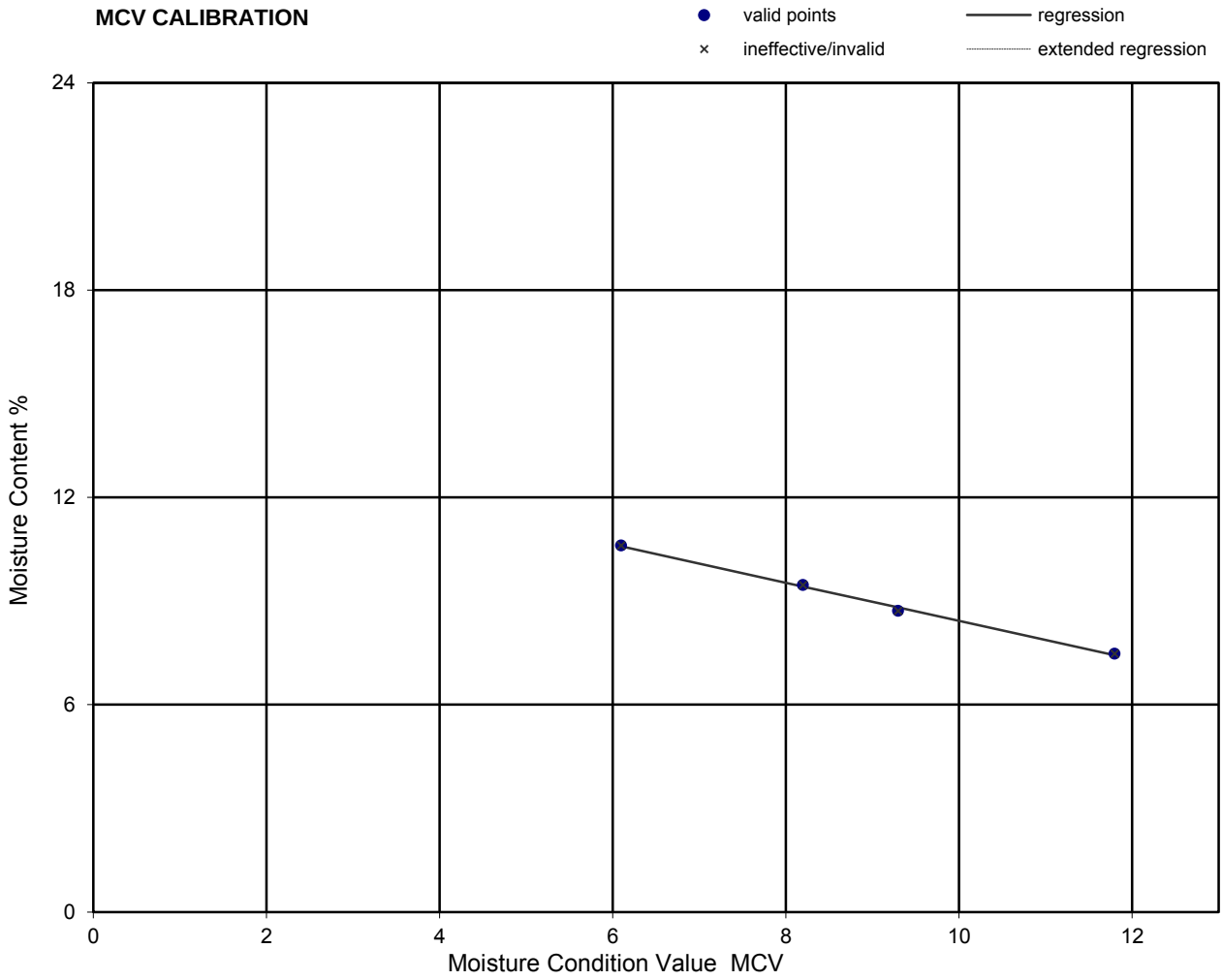
MOISTURE CONDITION VALUE (MCV) / MOISTURE CONTENT

Sample Details:	SAMPLE ID:
	HEPTT2920171128009

Hole No	HEP-TT-29
Sample Depth (m BGL)	1.8
Sample Type and No	B9
Specimen Ref	

MCV CALIBRATION



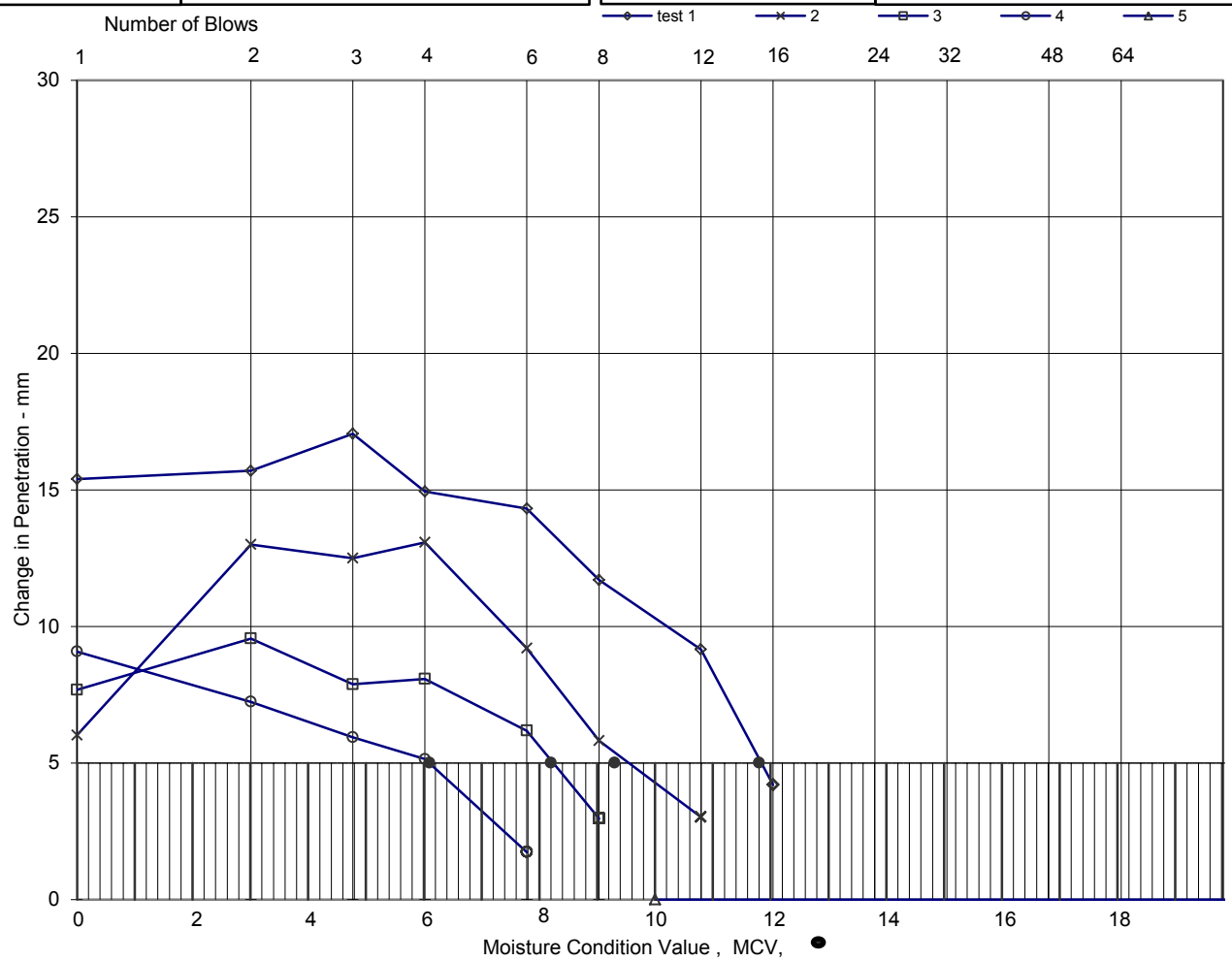
Characteristics of calibration line (determined using linear regression)	
Intercept	14.0
Slope	-0.55
Sensitivity (Change in MCV per 1% moisture content)	1.81
Correlation (proximity of test points to regression line)	-1.00
Method of interpretation of MCV	Steepest straight line

The above characteristics are NOT covered by UKAS accreditation to BS1377

MOISTURE CONDITION VALUE (MCV) / MOISTURE CONTENT

Sample Details:	SAMPLE ID:
	HEPTT2920171128009

Hole No	HEP-TT-29
Sample Depth (m BGL)	1.8
Sample Type and No	B9
Specimen Ref	



Test No * ineffective / invalid point		1	2	3	4	*
Moisture Condition Value		11.8	9.3	8.2	6.1	
Moisture Content	%	7.5	8.7	9.5	10.6	
Bulk density after test	Mg/m³	1.93	1.80	1.80	1.79	
Dry density after test	Mg/m³	1.80	1.66	1.64	1.62	

Soil description	Dark brown slightly sandy very gravelly silty CLAY.
Procedure / Preparation	using single sample
Remarks	

Initial moisture content <20mm	14.8
Material retained on 20mm sieve	17.4

Method of determining MCV
Steepest straight line

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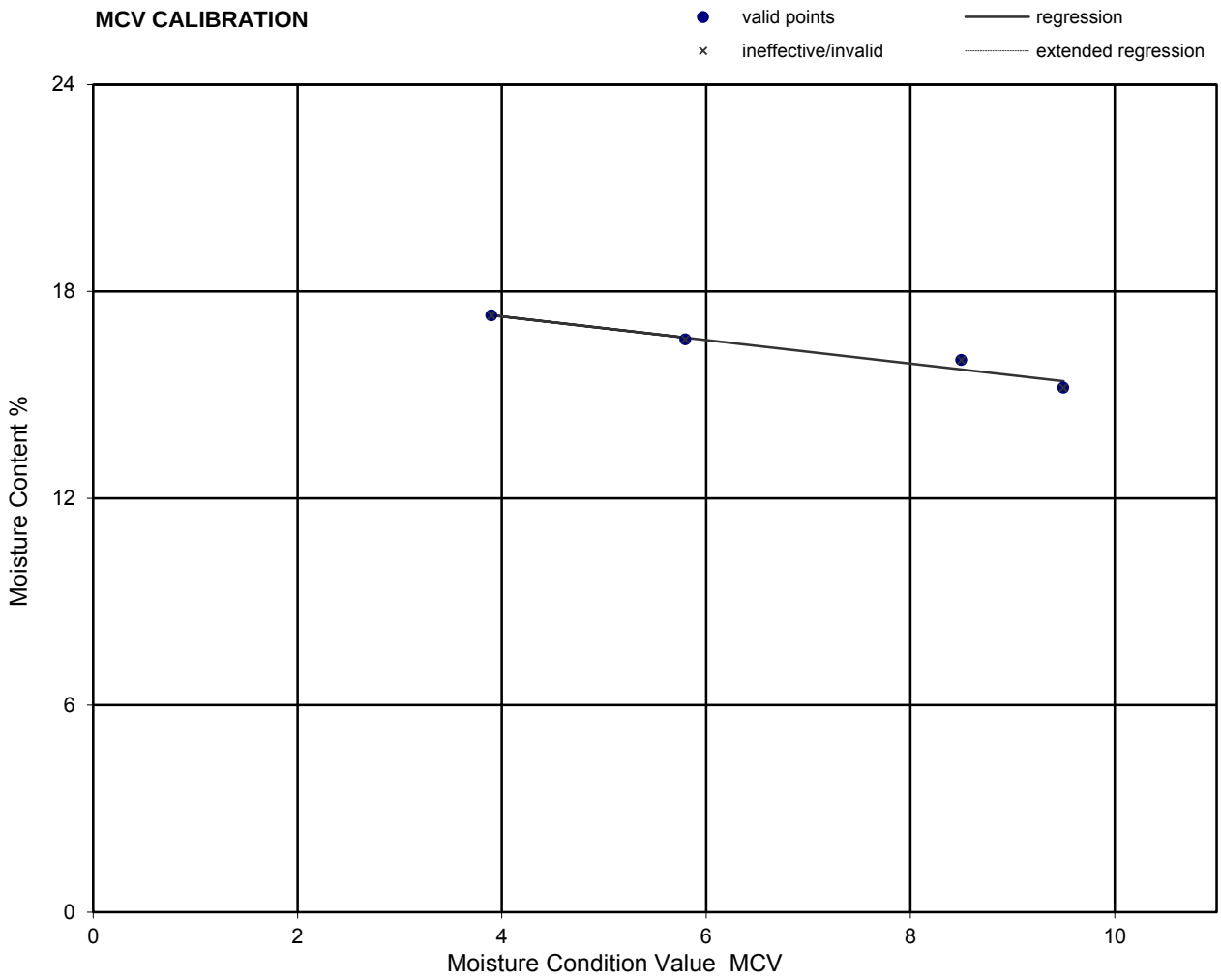
MOISTURE CONDITION VALUE (MCV) / MOISTURE CONTENT

Sample Details:	SAMPLE ID:
	HEPTT3920171128009

Hole No	HEP-TT-39
Sample Depth (m BGL)	1.8
Sample Type and No	B9
Specimen Ref	



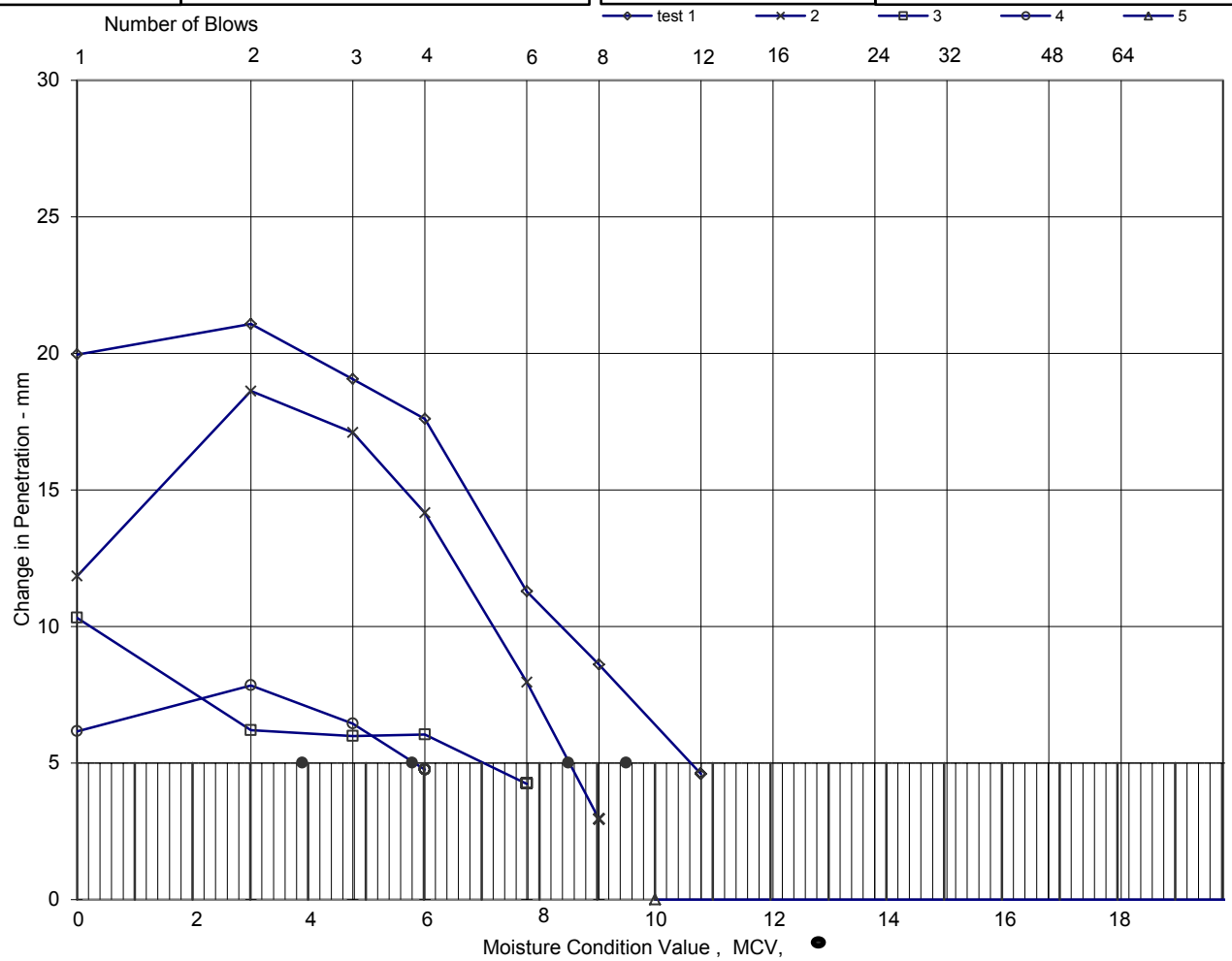
Characteristics of calibration line (determined using linear regression)	
Intercept	18.6
Slope	-0.34
Sensitivity (Change in MCV per 1% moisture content)	2.93
Correlation (proximity of test points to regression line)	-0.98
Method of interpretation of MCV	Steepest straight line

The above characteristics are NOT covered by UKAS accreditation to BS1377

MOISTURE CONDITION VALUE (MCV) / MOISTURE CONTENT

Sample Details:	SAMPLE ID:
	HEPTT3920171128009

Hole No	HEP-TT-39
Sample Depth (m BGL)	1.8
Sample Type and No	B9
Specimen Ref	



Test No * ineffective / invalid point		1	2	3	4	*
Moisture Condition Value		9.5	8.5	3.9	5.8	
Moisture Content	%	15.2	16.0	17.3	16.6	
Bulk density after test	Mg/m³	2.12	1.96	1.90	1.82	
Dry density after test	Mg/m³	1.84	1.69	1.62	1.56	

Soil description	Brownish grey slightly sandy gravelly silty CLAY with one cobble.
Procedure / Preparation	using single sample
Remarks	

Initial moisture content <20mm	14.1
Material retained on 20mm sieve	27

Method of determining MCV
Steepest straight line

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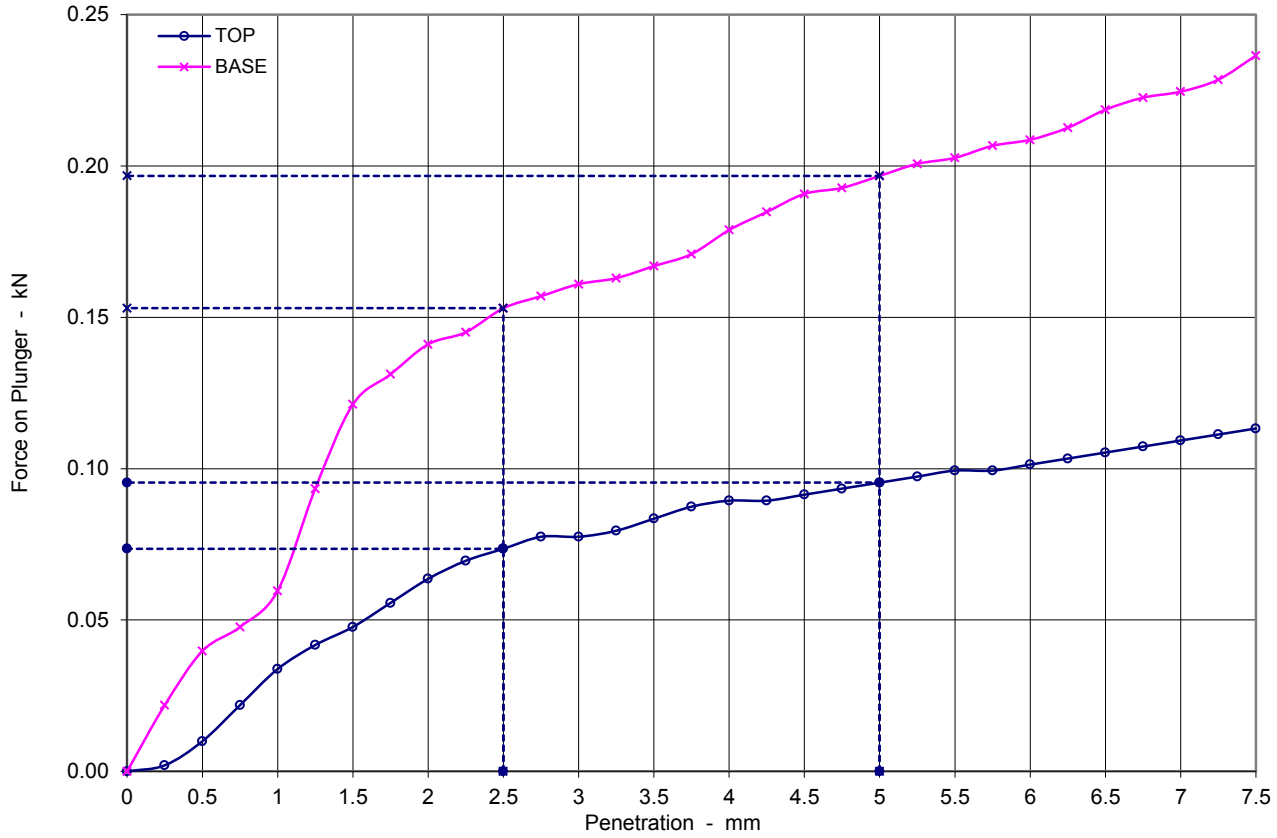
California Bearing Ratio (BS1377:1990:Part 4 , section 7)

Sample Details:	SAMPLE ID:
	FES1171121016

Hole No	HEP-BH-50
Sample Depth (m)	2.3
Sample Type and No	B16
Specimen Ref	1



Soil description	Brown slightly sandy slightly gravelly silty CLAY.

Test Conditions		
Sample Retained on 20 mm sieve	%	0

Preparation	Method of Compaction		
	Recompacted - Rammer compaction with specified effort (4.5kg)		
	Soaked test		YES
	Soaking Period	days	4
	Amount of Swell	mm	1.04

Surcharge applied		
	kg	0
	kPa	0

Notes :

Sample Conditions		
Initial Moisture Content	%	26.0
Bulk Density	Mg/m³	2.00
Dry Density	Mg/m³	1.58
Moisture Content - TOP	%	36.0
Moisture Content - BASE	%	36.0

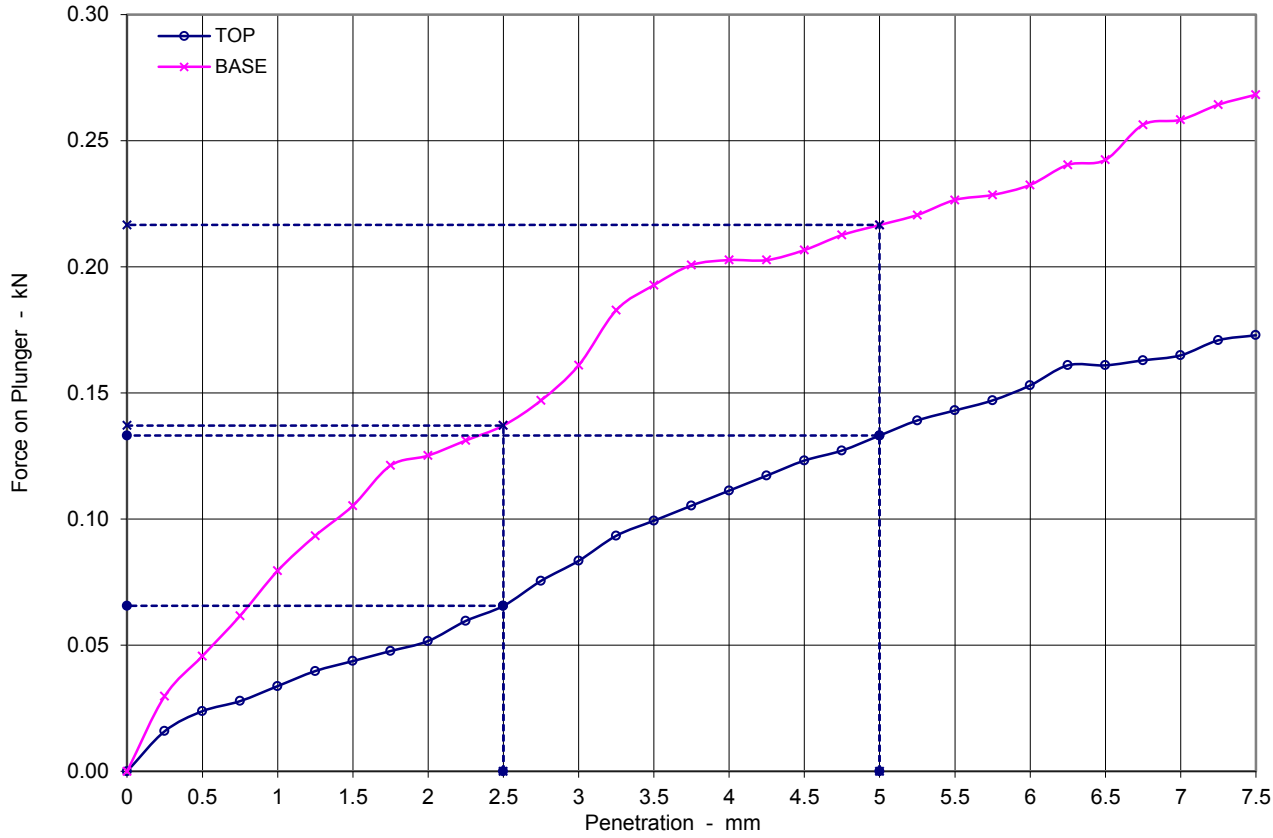
Penetration mm	CBR Values %	
	TOP	BASE
2.5	0.6	1.2
5	0.5	1.0

Accepted CBR %	**0.6**	**1.2**

California Bearing Ratio (BS1377:1990:Part 4 , section 7)

Sample Details:	SAMPLE ID:
	HEPBH6420180308018

Hole No	HEP-BH-64
Sample Depth (m)	2.45
Sample Type and No	B20
Specimen Ref	1



Soil description	Dark brown slightly sandy slightly gravelly silty CLAY

Test Conditions		
Sample Retained on 20 mm sieve	%	16

Preparation	Method of Compaction		
	Recompacted - Rammer compaction with specified effort (2.5kg)		
	Soaked test		NO
	Soaking Period	days	N/A
	Amount of Swell	mm	N/A

Surcharge applied	kg	0
	kPa	0

Notes :

Sample Conditions		
Initial Moisture Content	%	34.0
Bulk Density	Mg/m³	1.86
Dry Density	Mg/m³	1.39
Moisture Content - TOP	%	30.0
Moisture Content - BASE	%	30.0

Penetration mm	CBR Values %	
	TOP	BASE
2.5	0.5	1.0
5	0.7	1.1

Accepted CBR %	**0.7**	**1.1**

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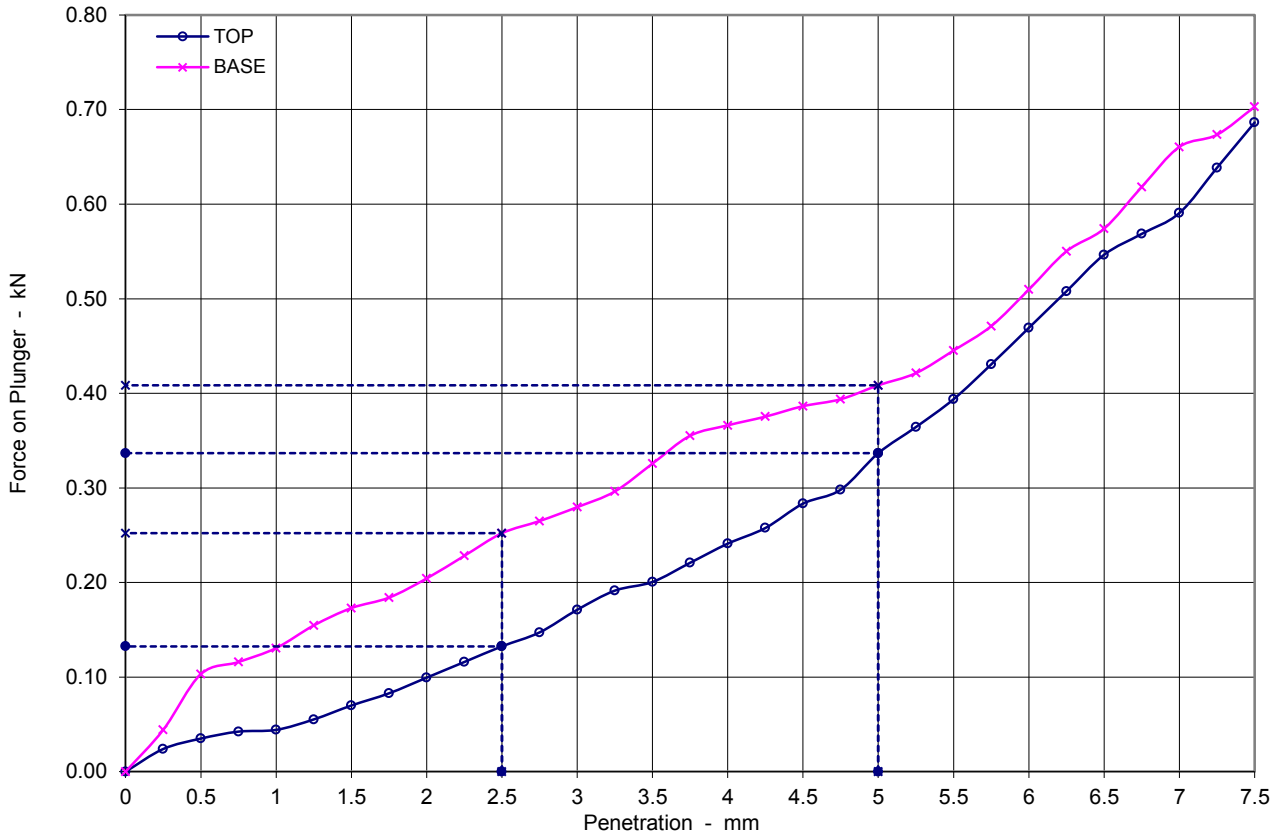
California Bearing Ratio (BS1377:1990:Part 4 , section 7)

Sample Details:	SAMPLE ID:
	FES1180117009

Hole No	HEP-BH-65
Sample Depth (m)	1.35
Sample Type and No	B9
Specimen Ref	1



Soil description	Brownish grey sandy gravelly CLAY.

Test Conditions		
Sample Retained on 20 mm sieve	%	19

Preparation	Method of Compaction		
	Recompacted - Rammer compaction with specified effort (2.5kg)		
	Soaked test		YES
	Soaking Period	days	4
	Amount of Swell	mm	-0.49

Surcharge applied	kg	0
	kPa	0

Notes :

Sample Conditions		
Initial Moisture Content	%	11.0
Bulk Density	Mg/m³	2.24
Dry Density	Mg/m³	2.03
Moisture Content - TOP	%	12.0
Moisture Content - BASE	%	11.0

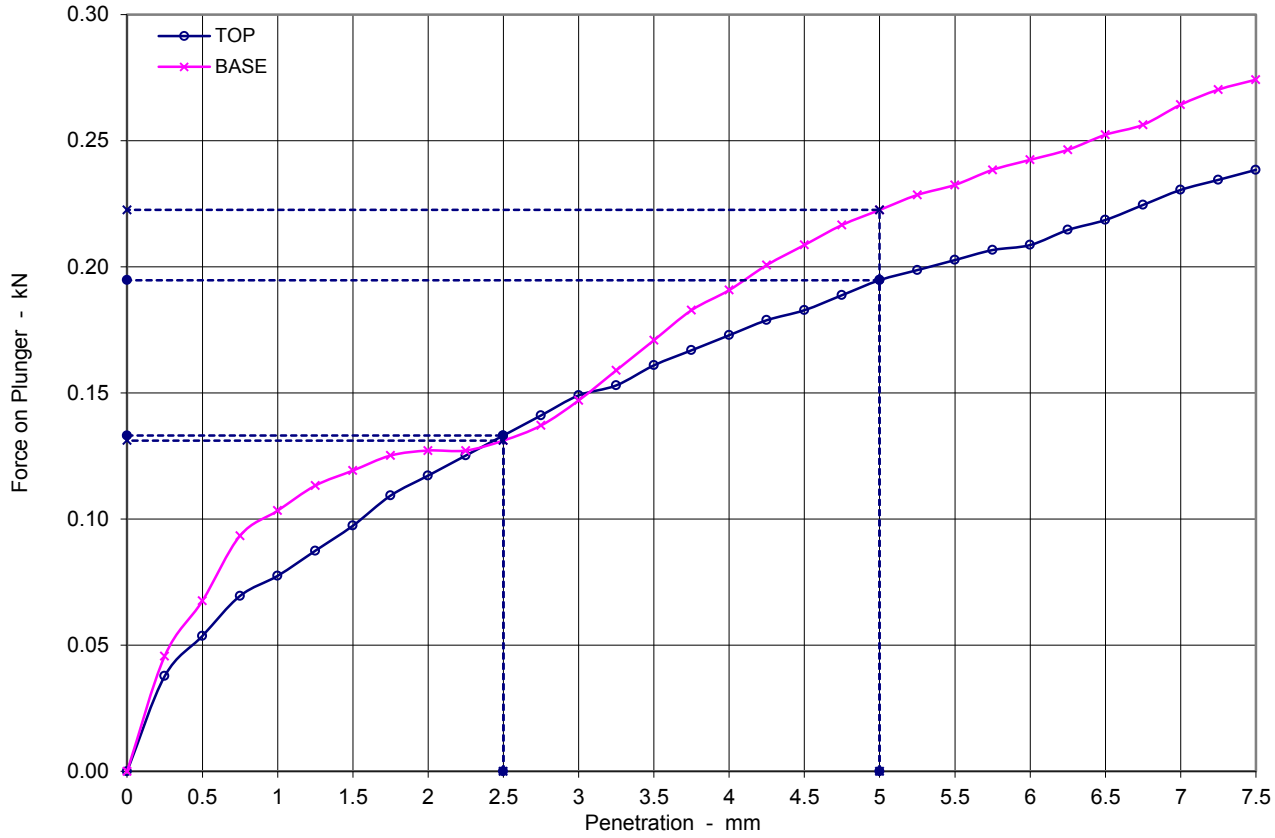
Penetration mm	CBR Values %	
	TOP	BASE
2.5	1.0	1.9
5	1.7	2.0

Accepted CBR %	**1.7**	**2.0**

California Bearing Ratio (BS1377:1990:Part 4 , section 7)

Sample Details:	SAMPLE ID:
	HEPBH82020180306012

Hole No	HEP-BH-820
Sample Depth (m)	0.6
Sample Type and No	B8
Specimen Ref	1



Soil description	Dark brown slightly sandy gravelly clayey SILT.

Test Conditions		
Sample Retained on 20 mm sieve	%	11

Preparation	Method of Compaction		
	Recompacted - Rammer compaction with specified effort (4.5kg)		
	Soaked test		NO
	Soaking Period	days	N/A
	Amount of Swell	mm	N/A

Surcharge applied	kg	0
	kPa	0

Notes :

Sample Conditions		
Initial Moisture Content	%	25.0
Bulk Density	Mg/m³	1.95
Dry Density	Mg/m³	1.56
Moisture Content - TOP	%	23.0
Moisture Content - BASE	%	24.0

Penetration mm	CBR Values %	
	TOP	BASE
2.5	1.0	1.0
5	1.0	1.1

Accepted CBR %	**1.0**	**1.1**

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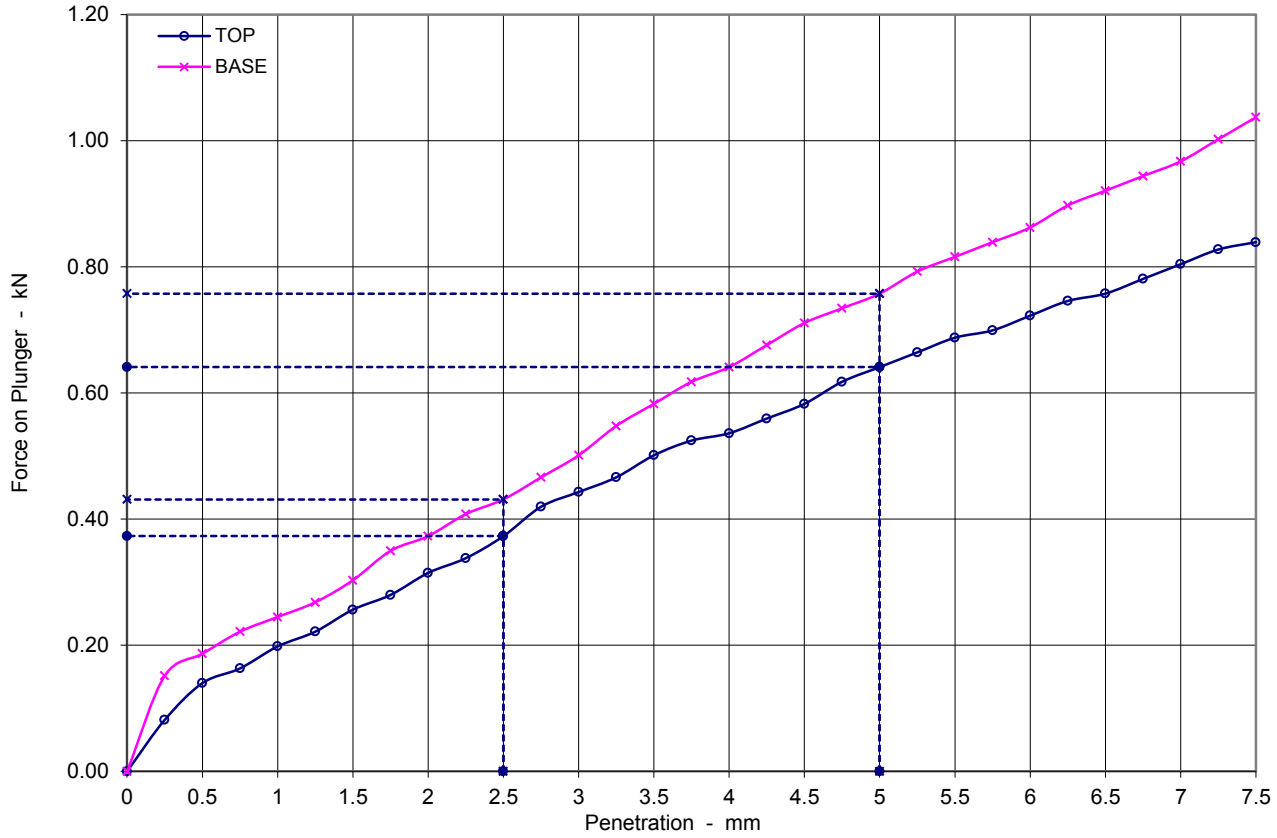
California Bearing Ratio (BS1377:1990:Part 4 , section 7)

Sample Details:	SAMPLE ID:
	FES1171130004

Hole No	HEP-BH-823
Sample Depth (m)	0.7
Sample Type and No	LB4
Specimen Ref	1



Soil description	Brown slightly sandy slightly gravelly CLAY with two cobbles.

Test Conditions		
Sample Retained on 20 mm sieve	%	4

Preparation	Method of Compaction		
	Recompacted - Rammer compaction with specified effort (2.5kg)		
	Soaked test		YES
	Soaking Period	days	4
	Amount of Swell	mm	0.15

Surcharge applied	kg	0
	kPa	0

Notes :

Sample Conditions		
Initial Moisture Content	%	17.0
Bulk Density	Mg/m³	2.06
Dry Density	Mg/m³	1.76
Moisture Content - TOP	%	18.0
Moisture Content - BASE	%	18.0

Penetration mm	CBR Values %	
	TOP	BASE
2.5	2.8	3.3
5	3.2	3.8

Accepted CBR %	**3.2**	**3.8**

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California Bearing Ratio (CBR)

Project No.	G170029U		
Hole	HEP-BH-824		
Sample No.	9		
Project Name	HAL Airport Expansion	Depth	0.70 m
Specimen Ref.		Specimen Depth	m
Sample Type	LB		
Description	Brown slightly sandy CLAY	Keylab ID	FES2171208018
Test Method	BS1377 : Part 4 : 1990, clause 7	CBR Test Number	1

Specimen Preparation

Condition: REMOULDED

Details: Recompacted with specified standard effort using 2.5kg rammer

Material retained on 20mm sieve removed: 0 %

Initial Specimen details:

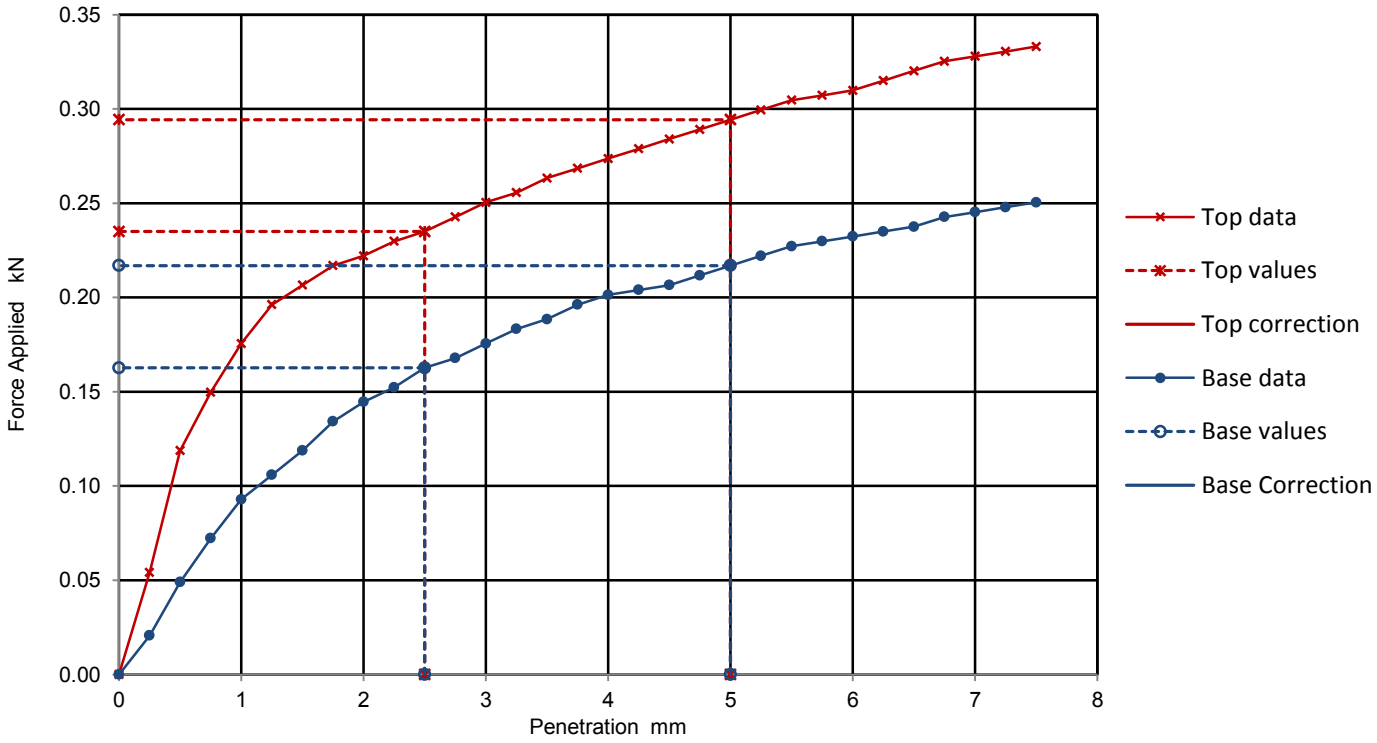
Bulk density	1.86	Mg/m3
Dry density	1.40	Mg/m3
Water content	32.5	%

Soaking details:

Period of soaking	6	days
Time to surface	0	days
Amount of swell recorded	0.67	mm
Dry density after soaking	1.4	Mg/m3

Surcharge applied: 0 kg; 0 kPa

Force v Penetration Plots



Results

	Curve correction applied	CBR Values, %				Moisture Content %
		2.5mm	5mm	Highest	Average	
TOP	No	1.8	1.5	1.8		34.7
BASE	No	1.2	1.1	1.2		35.5

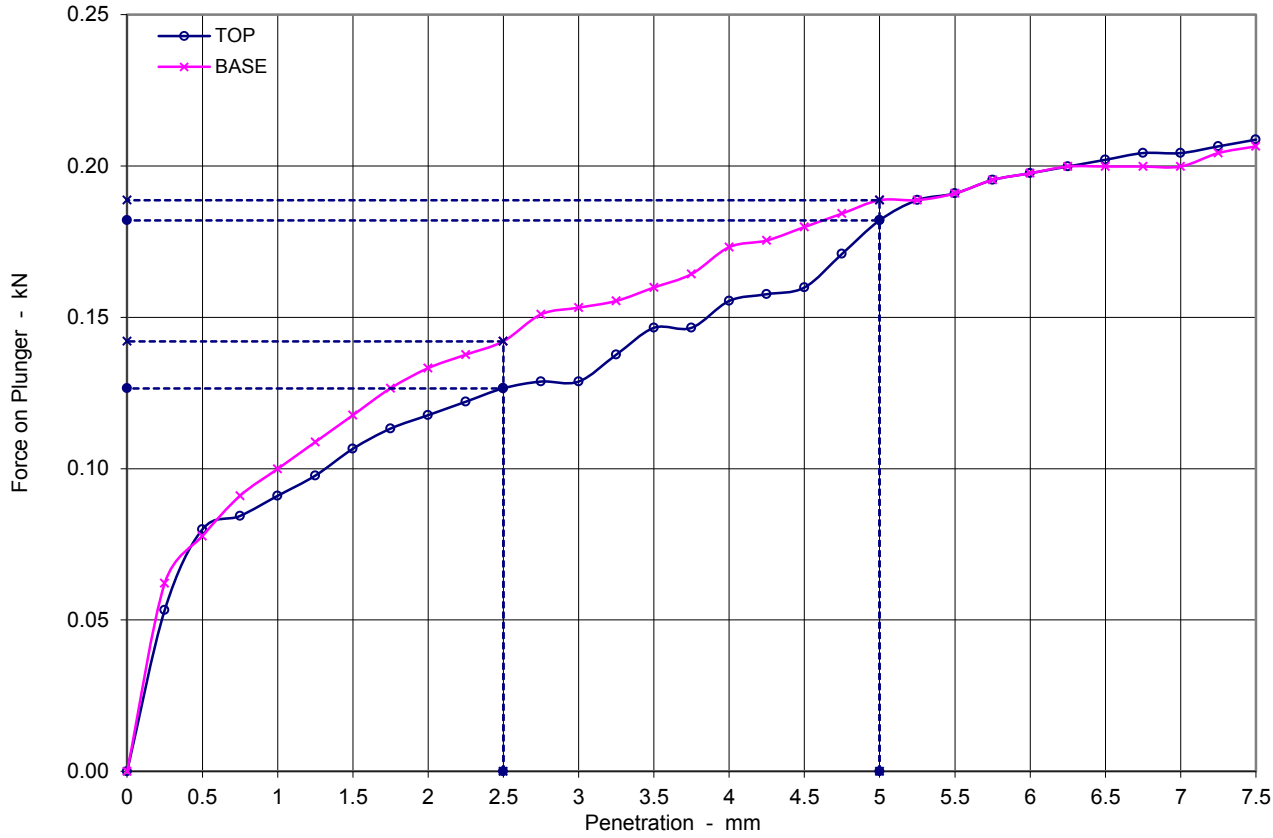
Average value is only displayed if the results from each end of the sample are within ±10% of the mean value

Remarks	Date printed	Figure Number	Sheet Number
	09/08/2018		

California Bearing Ratio (BS1377:1990:Part 4 , section 7)

Sample Details:	SAMPLE ID:
	FES1171124007

Hole No	HEP-BH-826
Sample Depth (m)	2.15
Sample Type and No	LB12
Specimen Ref	1



Soil description	Brown slightly sandy slightly gravelly CLAY with two cobbles.

Test Conditions		
Sample Retained on 20 mm sieve	%	23

Preparation	Method of Compaction		
	Recompacted - Rammer compaction with specified effort (2.5kg)		
	Soaked test		YES
	Soaking Period	days	4
	Amount of Swell	mm	0.75

Surcharge applied		
	kg	0
	kPa	0

Notes :

Sample Conditions		
Initial Moisture Content	%	19.0
Bulk Density	Mg/m³	1.99
Dry Density	Mg/m³	1.68
Moisture Content - TOP	%	25.0
Moisture Content - BASE	%	24.0

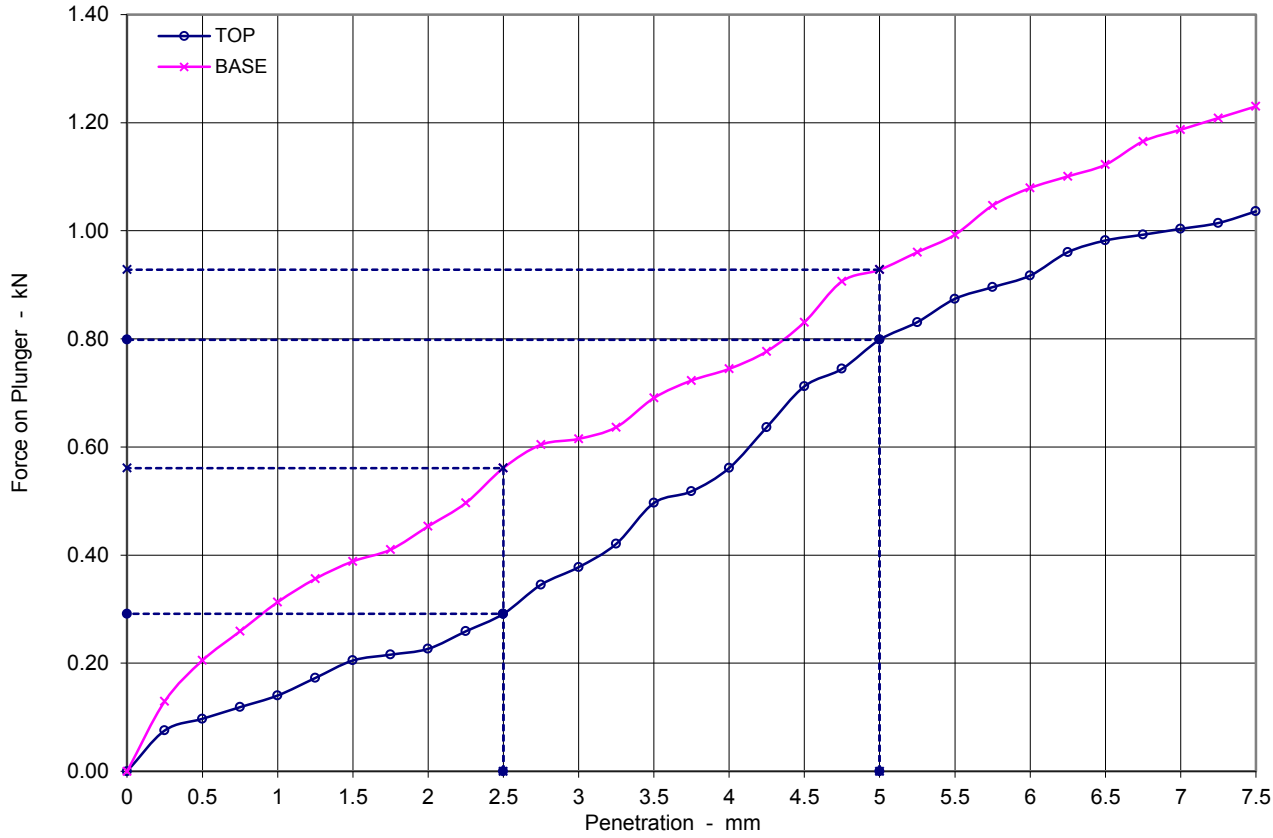
Penetration mm	CBR Values %	
	TOP	BASE
2.5	1.0	1.1
5	0.9	0.9

Accepted CBR %	**1.0**	**1.1**

California Bearing Ratio (BS1377:1990:Part 4 , section 7)

Sample Details:	SAMPLE ID:
	FES1180318019

Hole No	HEP-BH-1047
Sample Depth (m)	2.7
Sample Type and No	B19
Specimen Ref	1



Soil description	Black sandy GRAVEL.

Test Conditions		
Sample Retained on 20 mm sieve	%	31

Preparation	Method of Compaction		
	Recompacted - Rammer compaction with specified effort (4.5kg)		
	Soaked test		YES
	Soaking Period	days	4
	Amount of Swell	mm	0.10

Surcharge applied		
	kg	0
	kPa	0

Notes :

Sample Conditions		
Initial Moisture Content	%	31.0
Bulk Density	Mg/m³	1.88
Dry Density	Mg/m³	1.44
Moisture Content - TOP	%	39.0
Moisture Content - BASE	%	32.0

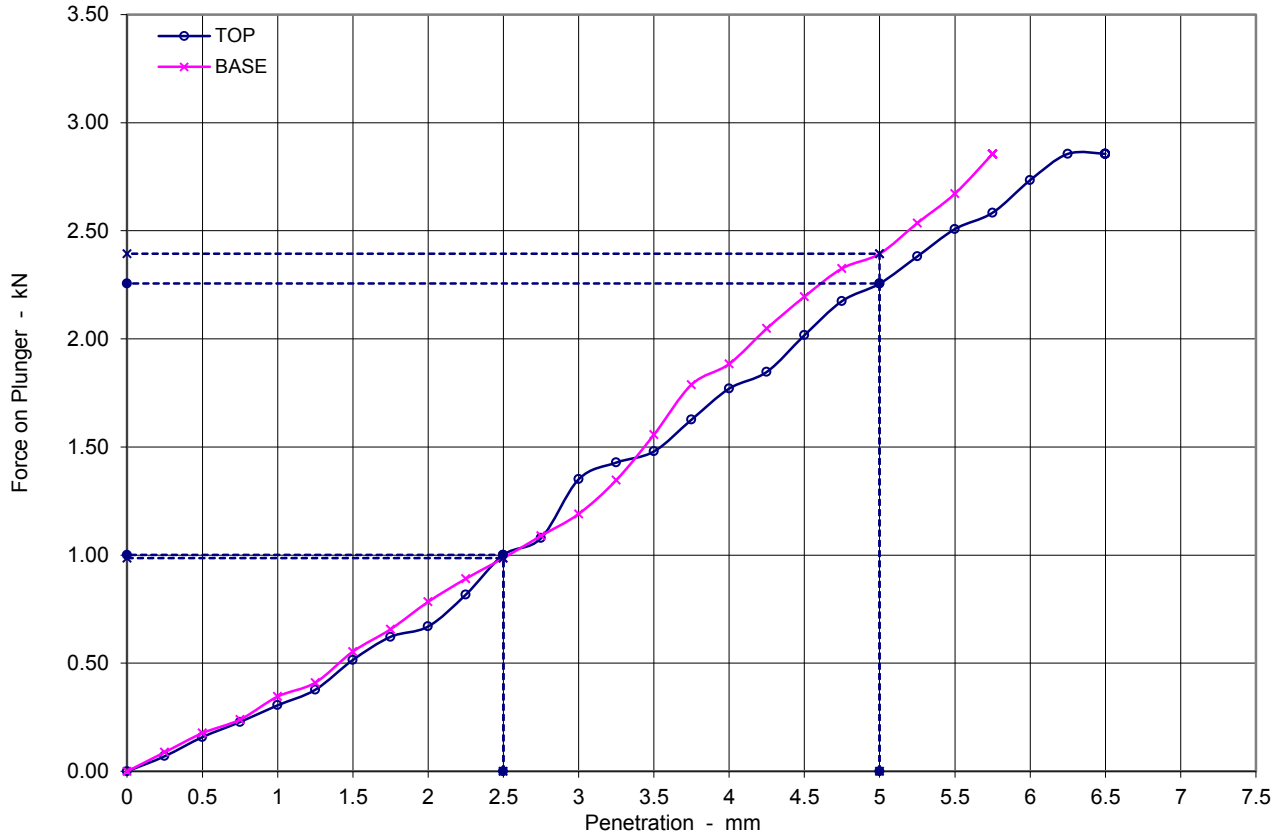
Penetration mm	CBR Values %	
	TOP	BASE
2.5	2.2	4.3
5	4.0	4.6

Accepted CBR %	**4.0**	**4.6**

California Bearing Ratio (BS1377:1990:Part 4 , section 7)

Sample Details:	SAMPLE ID:
	HEPBH105020180320014

Hole No	HEP-BH-1050
Sample Depth (m)	4
Sample Type and No	B21
Specimen Ref	1



Soil description	Brown sandy GRAVEL.

Test Conditions		
Sample Retained on 20 mm sieve	%	22

Preparation	Method of Compaction		
	Recompacted - Rammer compaction with specified effort (4.5kg)		
	Soaked test		YES
	Soaking Period	days	4
	Amount of Swell	mm	-0.08

Surcharge applied	kg	0
	kPa	0

Notes :

Sample Conditions		
Initial Moisture Content	%	4.2
Bulk Density	Mg/m³	1.94
Dry Density	Mg/m³	1.86
Moisture Content - TOP	%	7.7
Moisture Content - BASE	%	9.4

Penetration mm	CBR Values %	
	TOP	BASE
2.5	7.6	7.5
5	11.0	12.0

Accepted CBR %	**11.0**	**12.0**

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Figure

CBR

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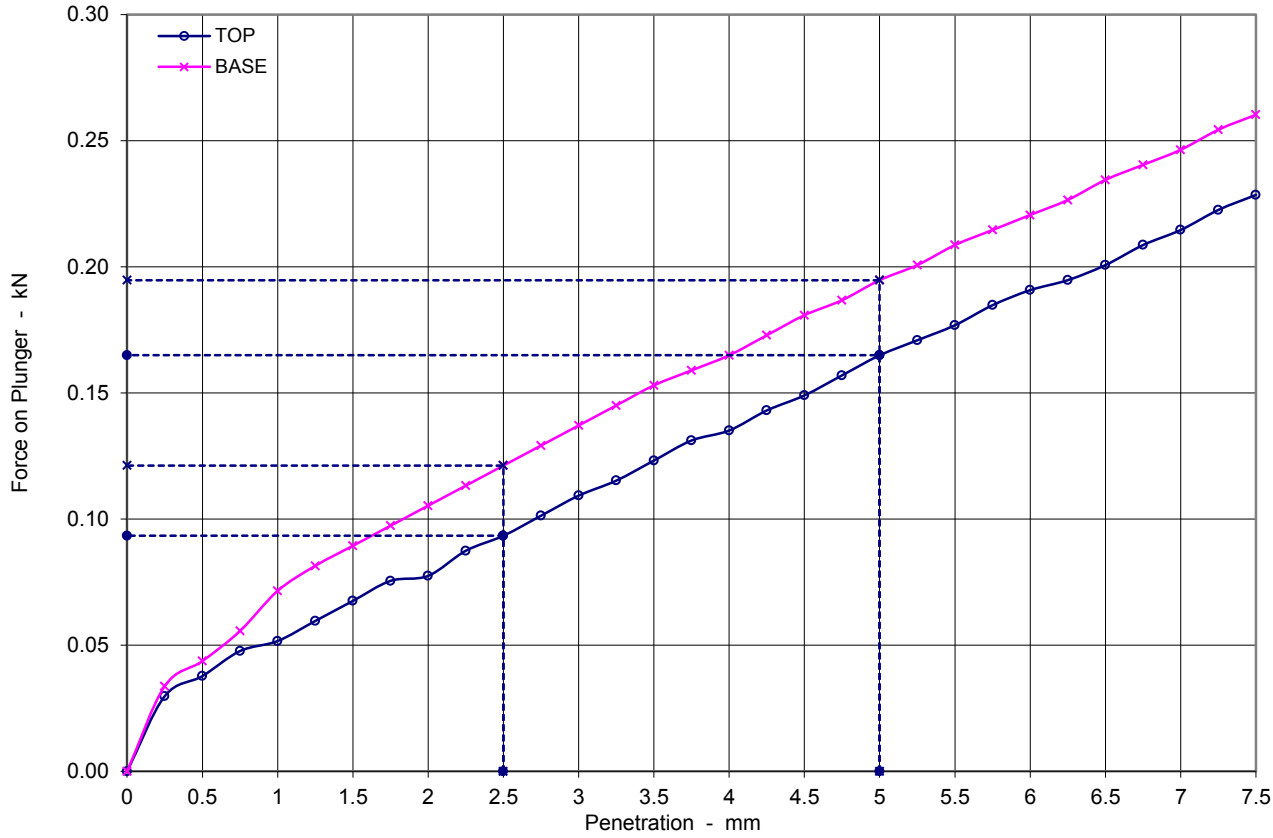
California Bearing Ratio (BS1377:1990:Part 4 , section 7)

Sample Details:	SAMPLE ID:
	HEPTT03220171128010

Hole No	HEP-TT-1032
Sample Depth (m)	2.3
Sample Type and No	LB9
Specimen Ref	1



Soil description	Brown slightly sandy slightly gravelly silty CLAY.

Test Conditions		
Sample Retained on 20 mm sieve	%	9

Preparation	Method of Compaction		
	Recompacted - Rammer compaction with specified effort (2.5kg)		
	Soaked test		NO
	Soaking Period	days	N/A
	Amount of Swell	mm	N/A

Surcharge applied	kg	0
	kPa	0

Notes :

Sample Conditions		
Initial Moisture Content	%	19.0
Bulk Density	Mg/m³	2.14
Dry Density	Mg/m³	1.80
Moisture Content - TOP	%	14.0
Moisture Content - BASE	%	16.0

Penetration mm	CBR Values %	
	TOP	BASE
2.5	0.7	0.9
5	0.8	1.0

Accepted CBR %	**0.8**	**1.0**

QA Ref
SLR 2
Rev 2.7
Apr 15

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Project No N8135-18

Project Name Heathrow Airport Limited

Figure

CBR

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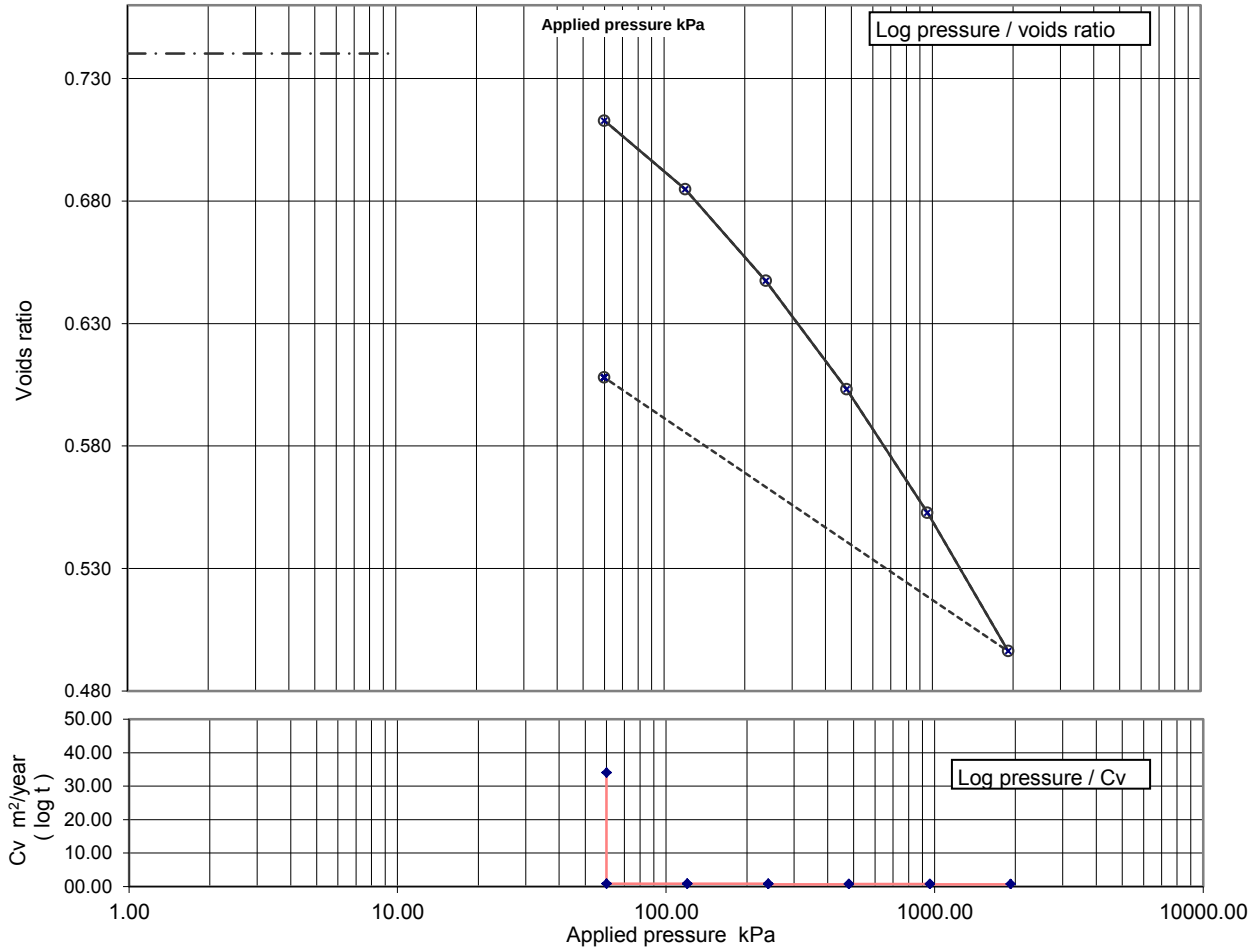
ONE DIMENSIONAL CONSOLIDATION TEST

Sample Details:	SAMPLE ID:
	HEPBH120171211012

Hole No	HEP-BH-1
Sample Depth (m BGL)	6.5
Sample Type and No	UT27
Specimen Ref	



Soil description	Firm grey slightly sandy CLAY.
Preparation	Undisturbed
Index properties	Liquid limit % / Plastic limit %

(if available)

Specimen details	Initial	Final	
Particle density	2.65	assumed	Mg/m3
Diameter	75.23		mm
Height	20.10	18.57	mm
Voids ratio	0.740	0.608	
Moisture content	25	24	%
Bulk density	1.91	2.05	Mg/m3
Dry density	1.52	1.65	Mg/m3
Saturation	90	105	%
Average temperature for test	20		oC

Swelling pressure: not measured kPa

Notes :

Specimen taken 10 mm from base of sample

Applied Pressure kPa	Voids ratio	mv m2/MN	cv (t50, log) m2/year	cv (t90, root) m2/year	
0	0.7402				
60	0.7128	0.263	34	36	
120	0.6848	0.272	0.84	0.89	
240	0.6474	0.185	0.81	0.87	
480	0.6030	0.112	0.69	0.72	
960	0.5527	0.065	0.72	0.75	
1920	0.4962	0.038	0.69	0.74	
60	0.6079	0.040	-	-	

QA Ref
SLR 5.3
Rev 2.16
Nov 16

UKAS TESTING
1157

SOCOTEC

Project No N8135-18

Project Name Heathrow Airport Limited

Figure
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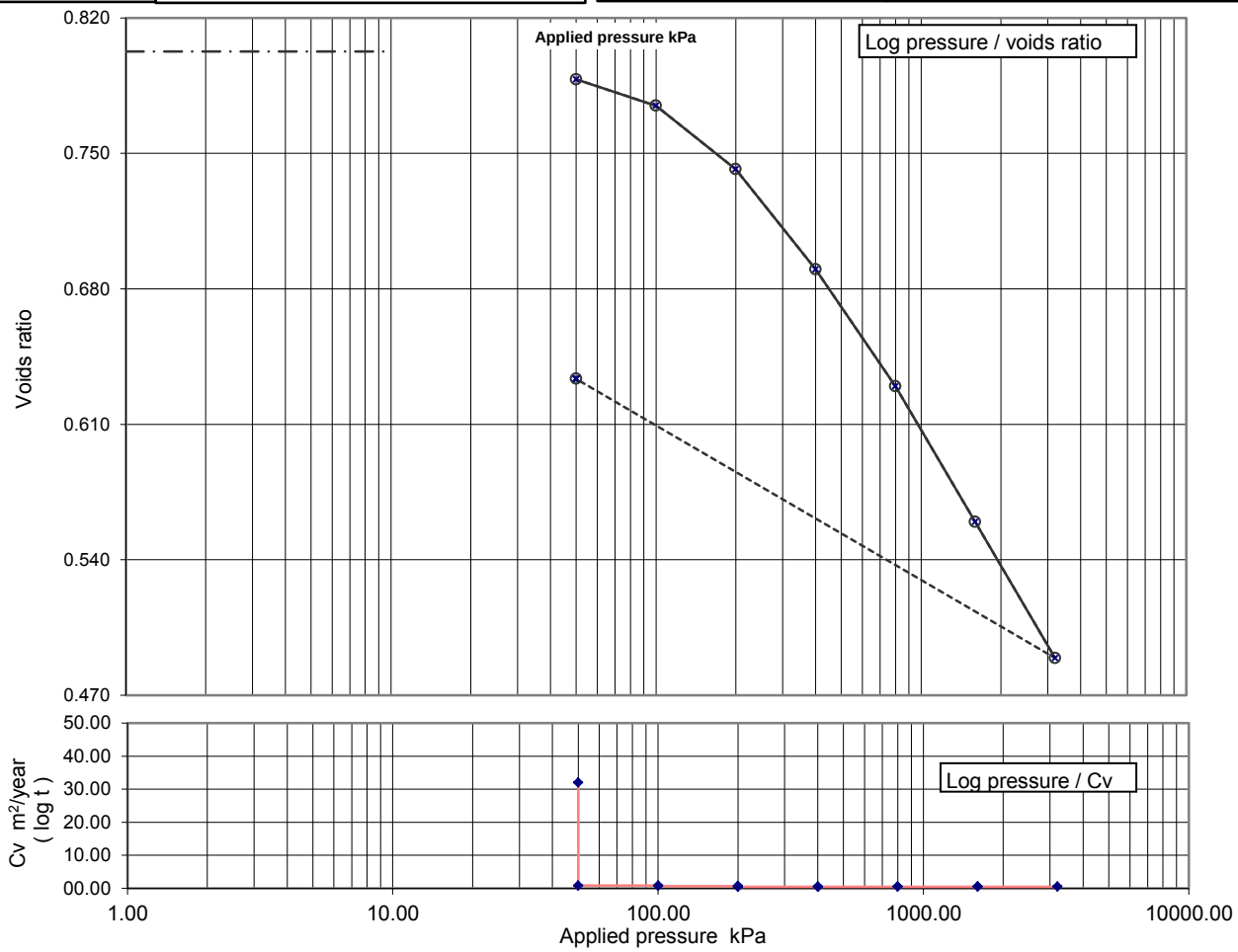
15/10/2018 09:57

ONE DIMENSIONAL CONSOLIDATION TEST

Sample Details:	SAMPLE ID:
	HEPBH1220171130006

Hole No	HEP-BH-12
Sample Depth (m BGL)	5.2
Sample Type and No	UT33
Specimen Ref	



Soil description	Soft to firm brown slightly sandy slightly gravelly CLAY.
Preparation	Undisturbed
Index properties	Liquid limit % / Plastic limit %

(if available)

Specimen details	Initial	Final	
Particle density	2.80	assumed	Mg/m3
Diameter	75.07		mm
Height	18.90	17.13	mm
Voids ratio	0.803	0.634	
Moisture content	29	24	%
Bulk density	2.00	2.12	Mg/m3
Dry density	1.55	1.71	Mg/m3
Saturation	100	105	%
Average temperature for test	19		oC

Swelling pressure: not measured kPa

Notes :

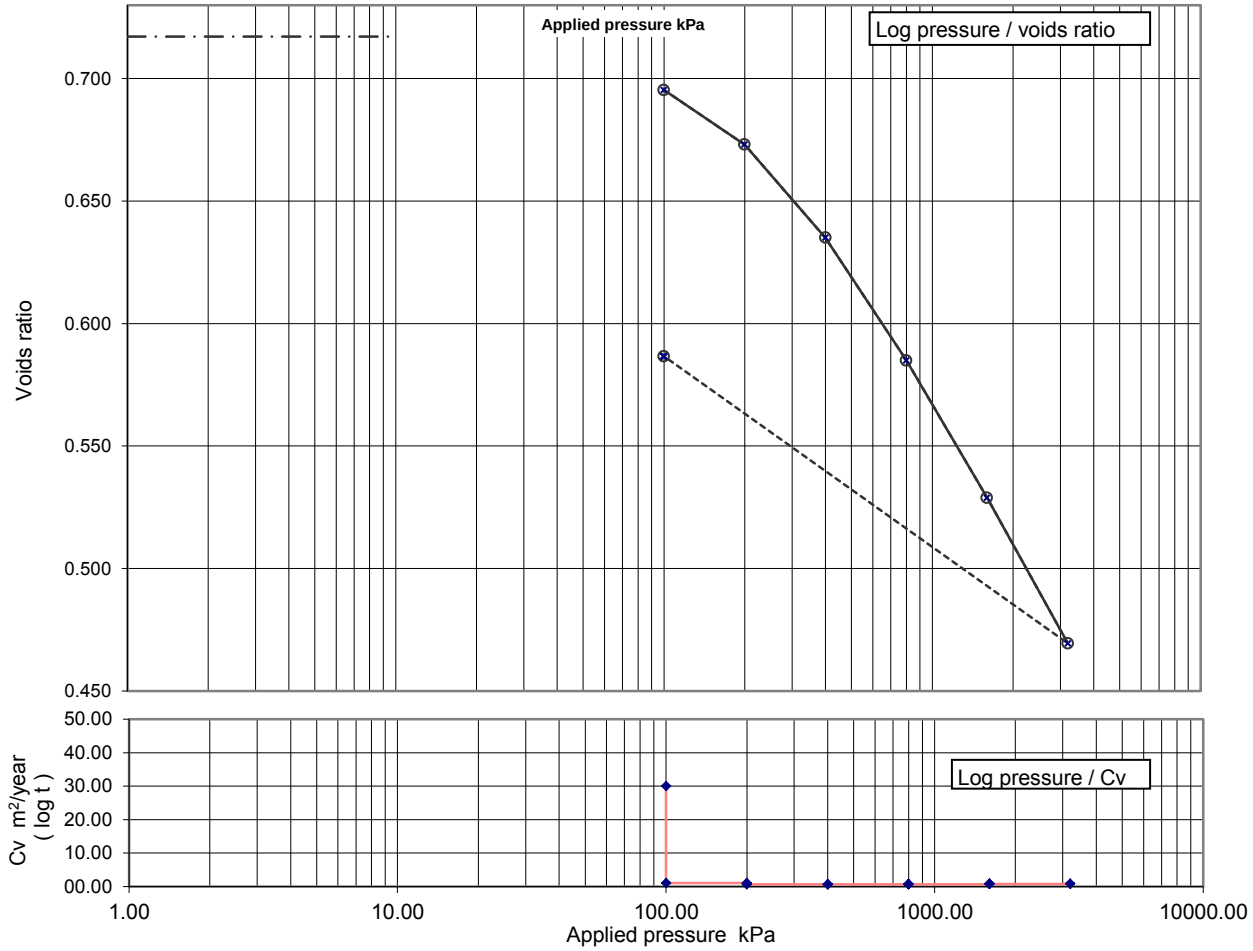
Specimen taken 30 mm from base of sample

Applied Pressure kPa	Voids ratio	mv m2/MN	cv (t50, log) m2/year	cv (t90, root) m2/year	
0	0.8026				
50	0.7882	0.160	32	35	
100	0.7746	0.153	0.85	0.92	
200	0.7418	0.185	0.67	0.73	
400	0.6901	0.148	0.47	0.48	
800	0.6296	0.089	0.52	0.57	
1600	0.5595	0.054	0.51	0.56	
3200	0.4892	0.028	0.49	0.51	
50	0.6335	0.031	-	-	

ONE DIMENSIONAL CONSOLIDATION TEST

Sample Details:	SAMPLE ID:
	HEPBH1220171130013

Hole No	HEP-BH-12
Sample Depth (m BGL)	8.2
Sample Type and No	UT41
Specimen Ref	



Soil description	Stiff to very stiff thinly laminated dark brown slightly sandy CLAY.
Preparation	Undisturbed
Index properties	Liquid limit % 63 Plastic limit % 25

(if available)

Specimen details	Initial	Final	
Particle density	2.75	assumed	Mg/m3
Diameter	75.07		mm
Height	18.82	17.39	mm
Voids ratio	0.717	0.587	
Moisture content	26	22	%
Bulk density	2.02	2.12	Mg/m3
Dry density	1.60	1.73	Mg/m3
Saturation	100	105	%
Average temperature for test	20		oC

Swelling pressure: not measured kPa

Notes :

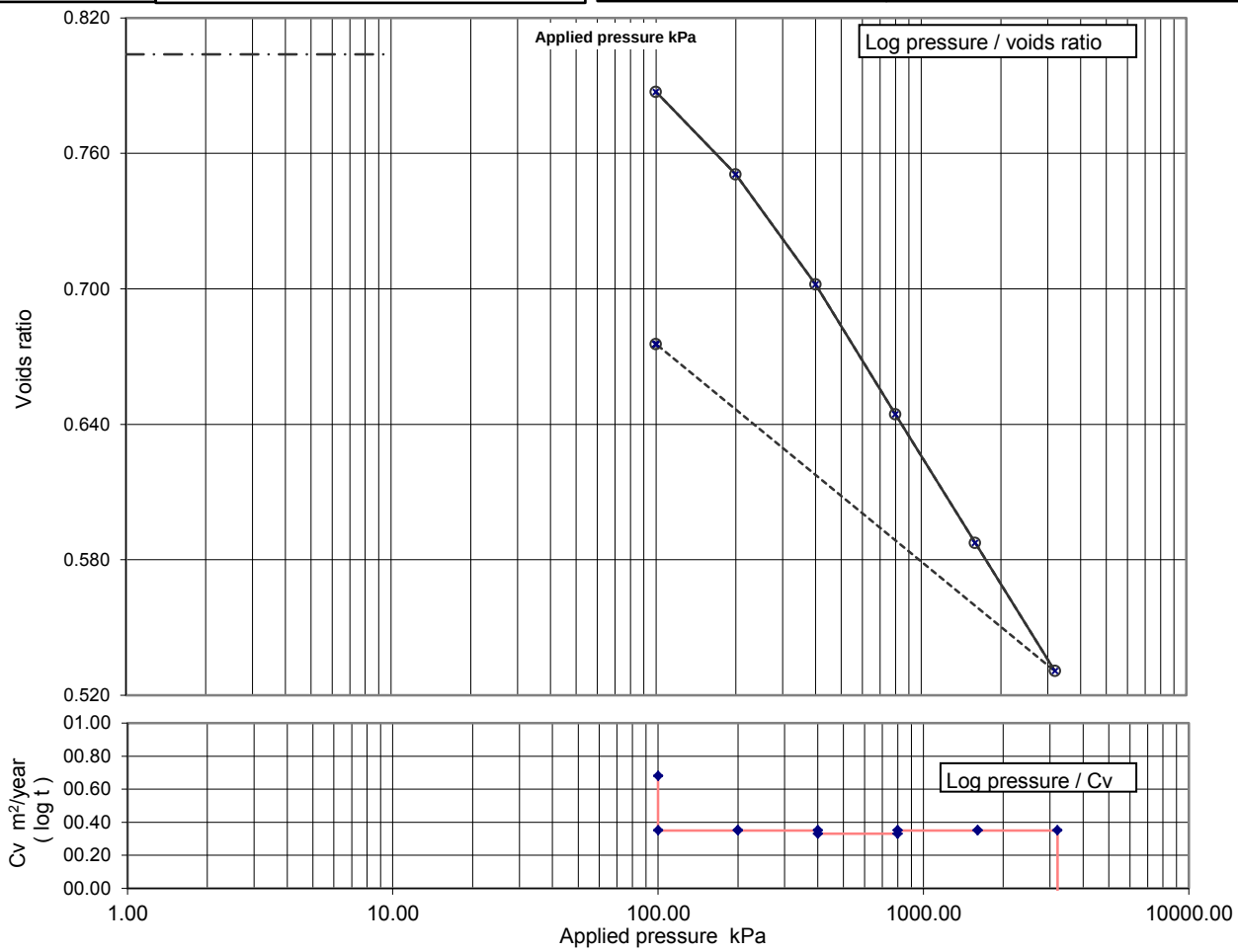
Specimen taken 20 mm from base of sample

Applied Pressure kPa	Voids ratio	mv m2/MN	cv (t50, log) m2/year	cv (t90, root) m2/year	
0	0.7172				
100	0.6953	0.128	30	32	
200	0.6730	0.131	1	1.1	
400	0.6350	0.114	0.66	0.69	
800	0.5849	0.077	0.66	0.7	
1600	0.5289	0.044	0.67	0.71	
3200	0.4694	0.024	0.77	0.83	
100	0.5866	0.026	-	-	

ONE DIMENSIONAL CONSOLIDATION TEST

Sample Details:	SAMPLE ID:
	HEPBH2320171206005

Hole No	HEP-BH-23
Sample Depth (m BGL)	5
Sample Type and No	UT23
Specimen Ref	



Soil description	Firm grey slightly sandy slightly gravelly CLAY.
Preparation	Undisturbed
Index properties	Liquid limit % / Plastic limit %

(if available)

Specimen details	Initial	Final	
Particle density	2.70	assumed	Mg/m3
Diameter	75.18		mm
Height	20.07	18.64	mm
Voids ratio	0.804	0.675	
Moisture content	29	26	%
Bulk density	1.94	2.03	Mg/m3
Dry density	1.50	1.61	Mg/m3
Saturation	99	103	%
Average temperature for test	20		oC

Swelling pressure >50 kPa

Notes :

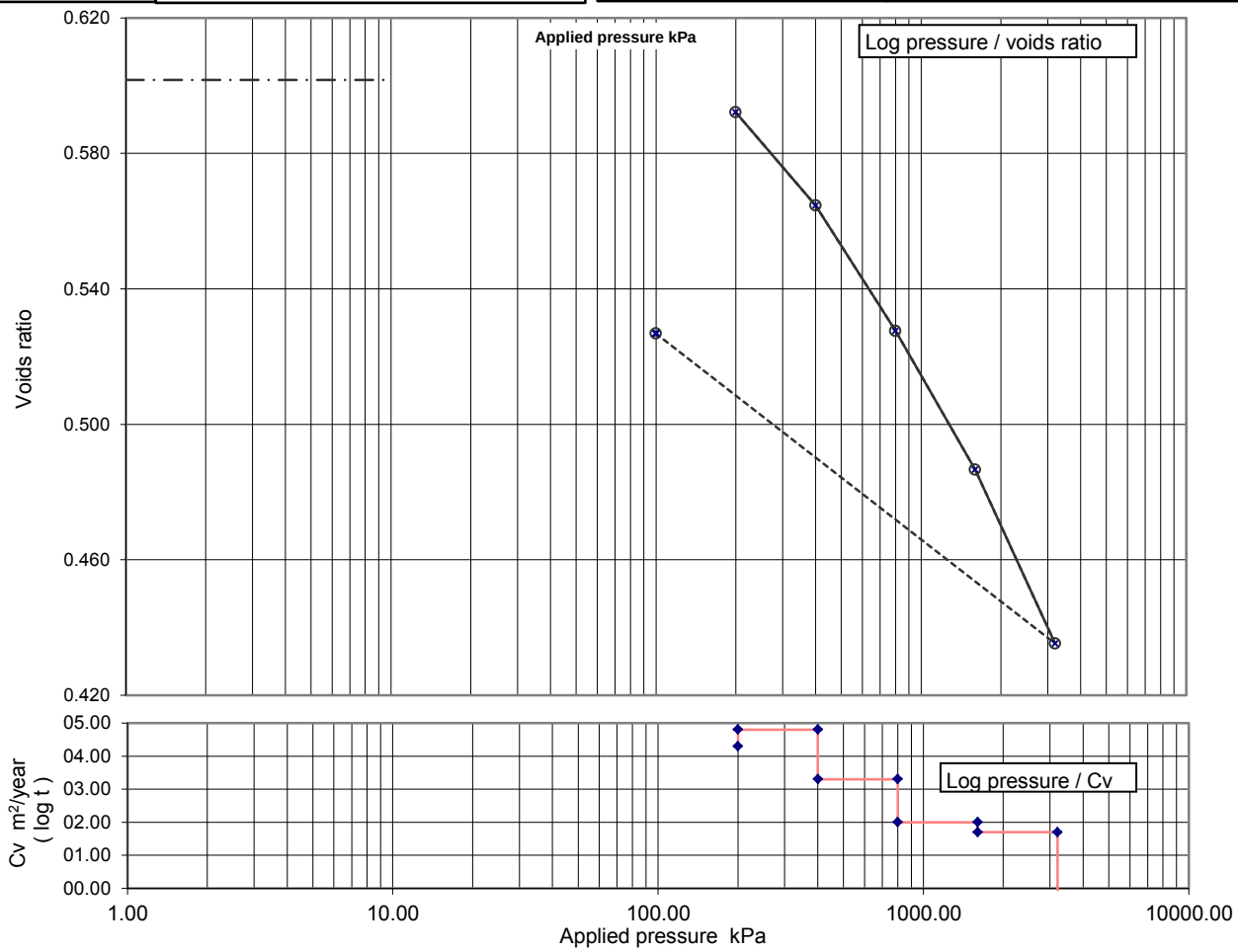
Specimen taken 10 mm from base of sample

Applied Pressure kPa	Voids ratio	mv m2/MN	cv (t50, log) m2/year	cv (t90, root) m2/year	
50	0.8039				
100	0.7872	0.185	0.68	0.75	
200	0.7506	0.205	0.35	0.38	
400	0.7019	0.139	0.35	0.36	
800	0.6443	0.085	0.33	0.35	
1600	0.5874	0.043	0.35	0.38	
3200	0.5307	0.022	0.35	0.37	
100	0.6755	0.031	-	-	

ONE DIMENSIONAL CONSOLIDATION TEST

Sample Details:	SAMPLE ID:
	HEPBH2320171206023

Hole No	HEP-BH-23
Sample Depth (m BGL)	11
Sample Type and No	UT41
Specimen Ref	



Soil description	Firm laminated brown CLAY.
Preparation	Undisturbed
Index properties	Liquid limit % / Plastic limit %

(if available)

Specimen details	Initial	Final	
Particle density	2.65	assumed	Mg/m3
Diameter	75.16		mm
Height	20.15	19.21	mm
Voids ratio	0.602	0.527	
Moisture content	23	21	%
Bulk density	2.03	2.10	Mg/m3
Dry density	1.65	1.74	Mg/m3
Saturation	100	105	%
Average temperature for test	20		oC

Swelling pressure >100 kPa

Notes :

Specimen taken 10 mm from base of sample

Applied Pressure kPa	Voids ratio	mv m2/MN	cv (t50, log) m2/year	cv (t90, root) m2/year	
100	0.6017				
200	0.5921	0.060	4.3	4.6	
400	0.5646	0.086	4.8	5.1	
800	0.5275	0.059	3.3	3.6	
1600	0.4865	0.034	2	2.2	
3200	0.4353	0.022	1.7	1.8	
100	0.5268	0.021	-	-	

QA Ref
SLR 5.3
Rev 2.16
Nov 16

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Project No N8135-18

Project Name Heathrow Airport Limited

Figure

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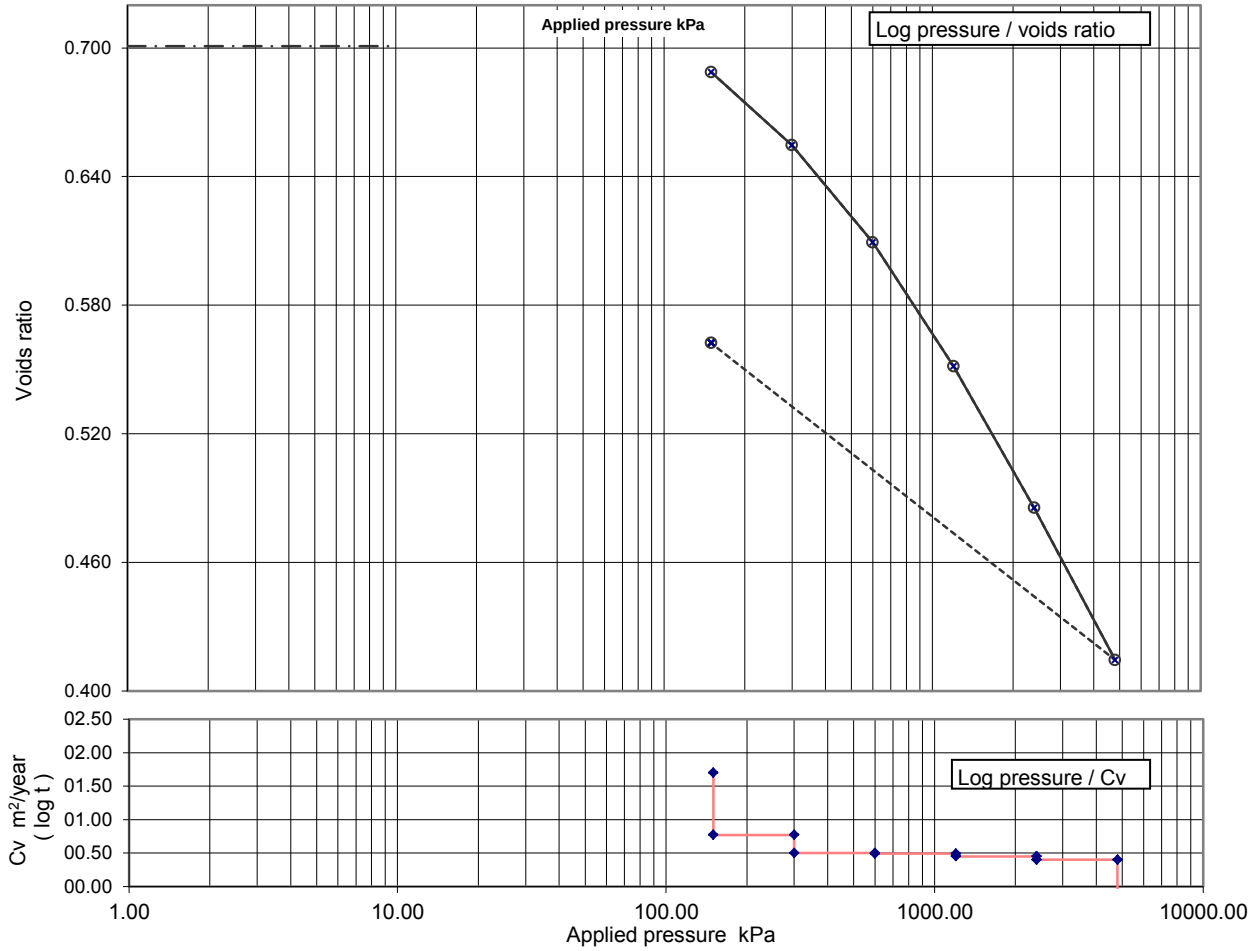
ONE DIMENSIONAL CONSOLIDATION TEST

Sample Details:	SAMPLE ID:
	FES1171215001

Hole No	HEP-BH-25
Sample Depth (m BGL)	7.5
Sample Type and No	UT32
Specimen Ref	



Soil description	Stiff brownsh grey slightly sandy CLAY.
Preparation	Undisturbed
Index properties	Liquid limit % / Plastic limit %

(if available)

Specimen details	Initial	Final	
Particle density	2.72	assumed	Mg/m3
Diameter	74.93		mm
Height	18.72	17.20	mm
Voids ratio	0.701	0.562	
Moisture content	26	22	%
Bulk density	2.01	2.12	Mg/m3
Dry density	1.60	1.74	Mg/m3
Saturation	100	105	%
Average temperature for test	19		oC

Swelling pressure >75 kPa

Notes :

Specimen taken 20 mm from base of sample

Applied Pressure kPa	Voids ratio	mv m2/MN	cv (t50, log) m2/year	cv (t90, root) m2/year	
75	0.7009				
150	0.6887	0.095	1.7	1.8	
300	0.6546	0.135	0.77	0.82	
600	0.6093	0.091	0.5	0.54	
1200	0.5515	0.060	0.49	0.52	
2400	0.4854	0.035	0.45	0.47	
4800	0.4144	0.020	0.4	0.43	
150	0.5623	0.022	-	-	

QA Ref
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Rev 2.16
Nov 16

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Project No N8135-18

Project Name Heathrow Airport Limited

Figure

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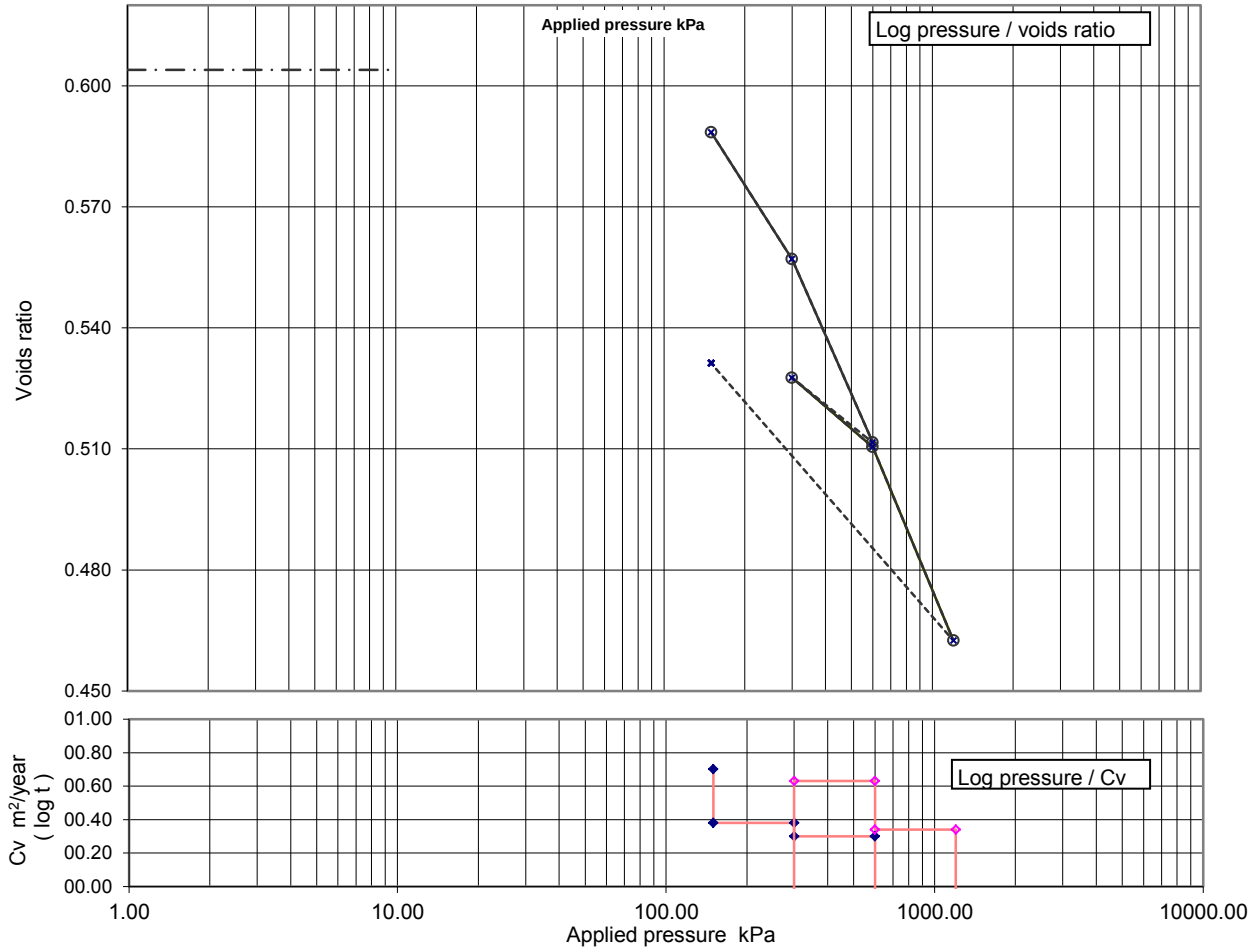
29/10/2018 16:49

ONE DIMENSIONAL CONSOLIDATION TEST

Sample Details:	SAMPLE ID:
	FES1171215018

Hole No	HEP-BH-25
Sample Depth (m BGL)	14.5
Sample Type and No	UT49
Specimen Ref	



Soil description	Stiff greyish brown slightly sandy CLAY.
Preparation	Undisturbed
Index properties	Liquid limit %		Plastic limit %	

(if available)

Specimen details	Initial	Final	
Particle density	2.70	assumed	Mg/m3
Diameter	75.03		mm
Height	18.77	17.92	mm
Voids ratio	0.604	0.531	
Moisture content	22	21	%
Bulk density	2.05	2.13	Mg/m3
Dry density	1.68	1.76	Mg/m3
Saturation	98	105	%
Average temperature for test	19		oC

Swelling pressure	>75	kPa

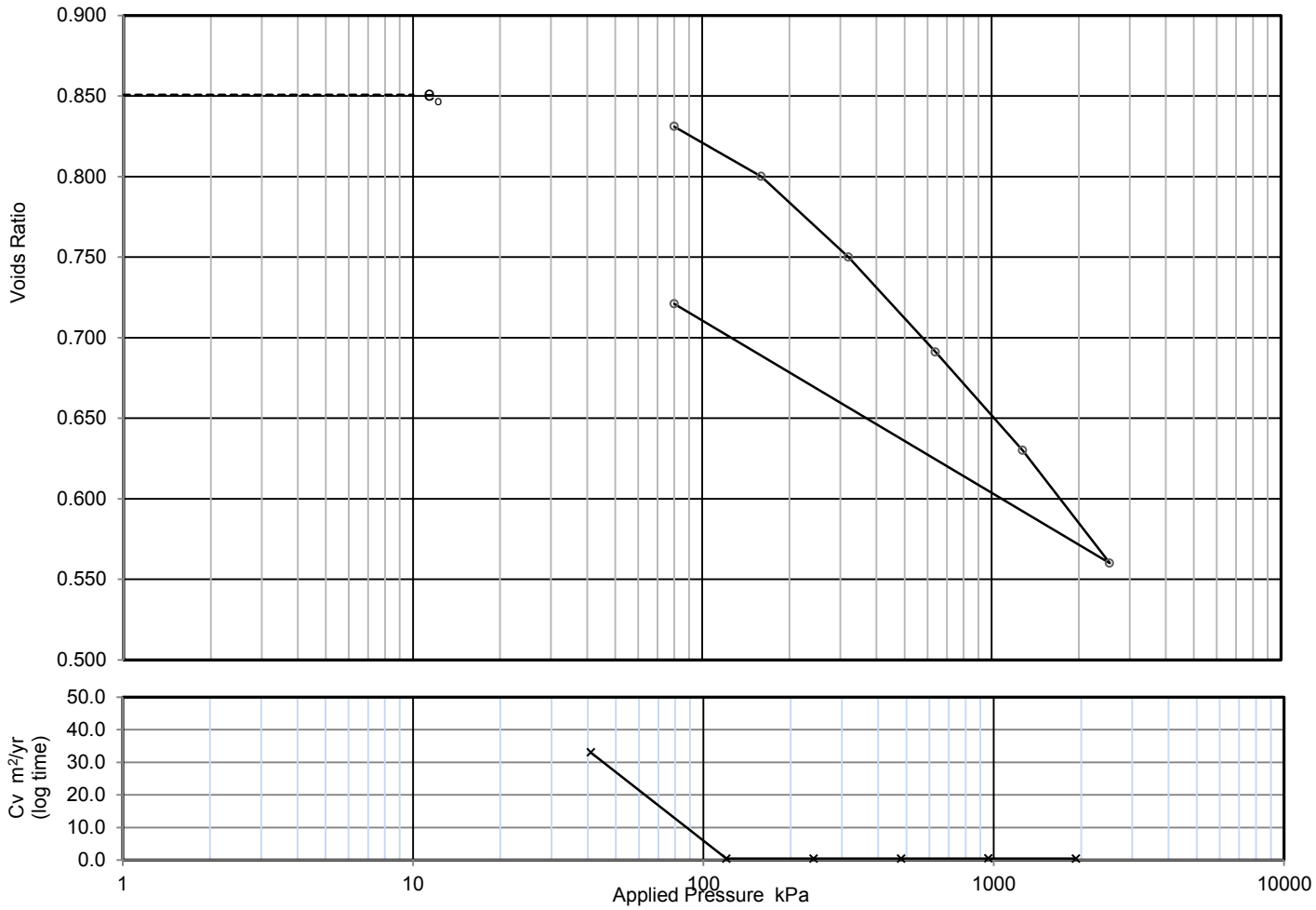
Notes :

Applied Pressure kPa	Voids ratio	mv m2/MN	cv (t50, log) m2/year	cv (t90, root) m2/year	
75	0.6039				
150	0.5885	0.129	0.7	0.75	
300	0.5570	0.132	0.38	0.41	
600	0.5116	0.097	0.3	0.32	
300	0.5276	0.035	-	-	
600	0.5105	0.037	0.63	0.68	
1200	0.4624	0.053	0.34	0.35	
150	0.5312	0.045	-	-	

Specimen taken 20 mm from base of sample

Determination of One-Dimensional Consolidation Properties

				Project No.	G170029U
				Hole	HEP-BH-27
				Sample No.	26
Project Name	HAL Airport Expansion			Depth	7.50
Specimen Reference		Specimen Depth	7.52 m	Sample Type	UT
Specimen Description	Brown slightly gravelly slightly sandy CLAY			KeyLAB ID	FES2171204004
Test Method	BS1377:Part 5:1990, clause 3			Date started	17/07/2018



Applied Pressure kPa	Voids ratio	Mv m²/MN	Cv (t50, log) m²/yr	Cv (t90, root) m²/yr	Csec
2.0	0.850	-	-	-	-
80	0.831	0.13	33	37	*
160	0.800	0.22	0.44	3.6	0.0017
320	0.750	0.17	0.42	0.9	0.0029
640	0.691	0.1	0.42	0.7	0.0029
1,280	0.630	0.056	0.46	0.49	0.0023
2,560	0.560	0.034	0.45	0.43	0.004
80	0.721	0.042			

Preparation: Hand Trimming

Particle density: assumed 2.70 Mg/m³

Specimen details	Initial	Final	
Diameter	74.88	-	mm
Height	18.69	17.38	mm
Water Content	32.6	29.5	%
Bulk density	1.94	2.03	Mg/m³
Dry density	1.46	1.57	Mg/m³
Voids Ratio	0.850	0.721	
Saturation	104	110	%
Average temperature for test	21.0		°C
Swelling Pressure			kPa
Settlement on saturation			%
Remarks			

Final values should be used with caution

Cv plotted at mid point of load increments

Cv corrected to 20°C

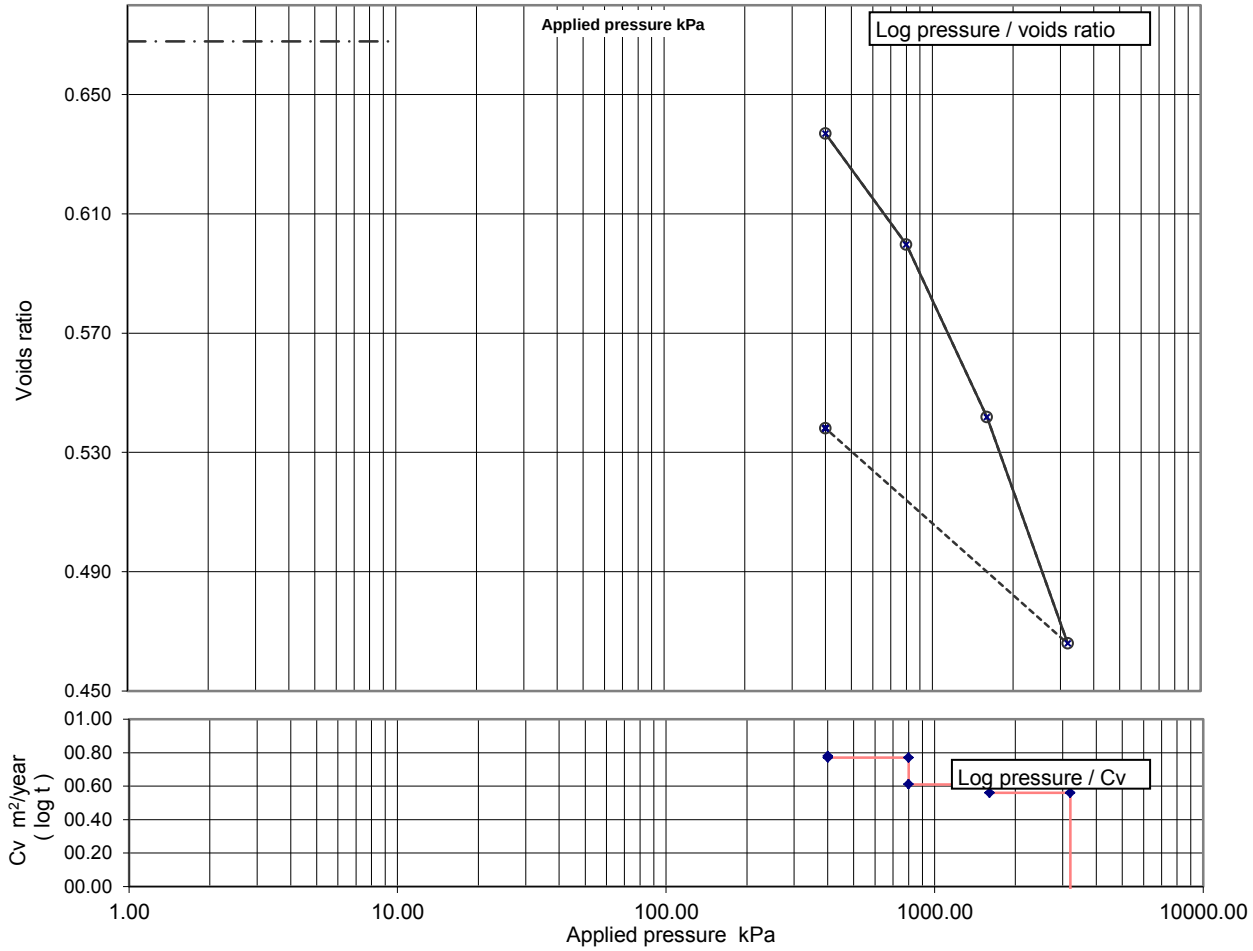
* Negative Csec determination

Date Printed	Figure Number	Sheet Number
09/08/2018		

ONE DIMENSIONAL CONSOLIDATION TEST

Sample Details:	SAMPLE ID:
	FES2171204011

Hole No	HEP-BH-27
Sample Depth (m BGL)	10.5
Sample Type and No	UT33
Specimen Ref	



Soil description	Very stiff thinly laminated greyish brown slightly sandy CLAY.
Preparation	Undisturbed
Index properties	Liquid limit % / Plastic limit %

(if available)

Specimen details	Initial	Final	
Particle density	2.80	assumed	Mg/m3
Diameter	75.11		mm
Height	18.81	17.35	mm
Voids ratio	0.668	0.538	
Moisture content	24	18	%
Bulk density	2.07	2.14	Mg/m3
Dry density	1.68	1.82	Mg/m3
Saturation	99	91	%
Average temperature for test	20		oC

Swelling pressure >160 kPa

Notes :

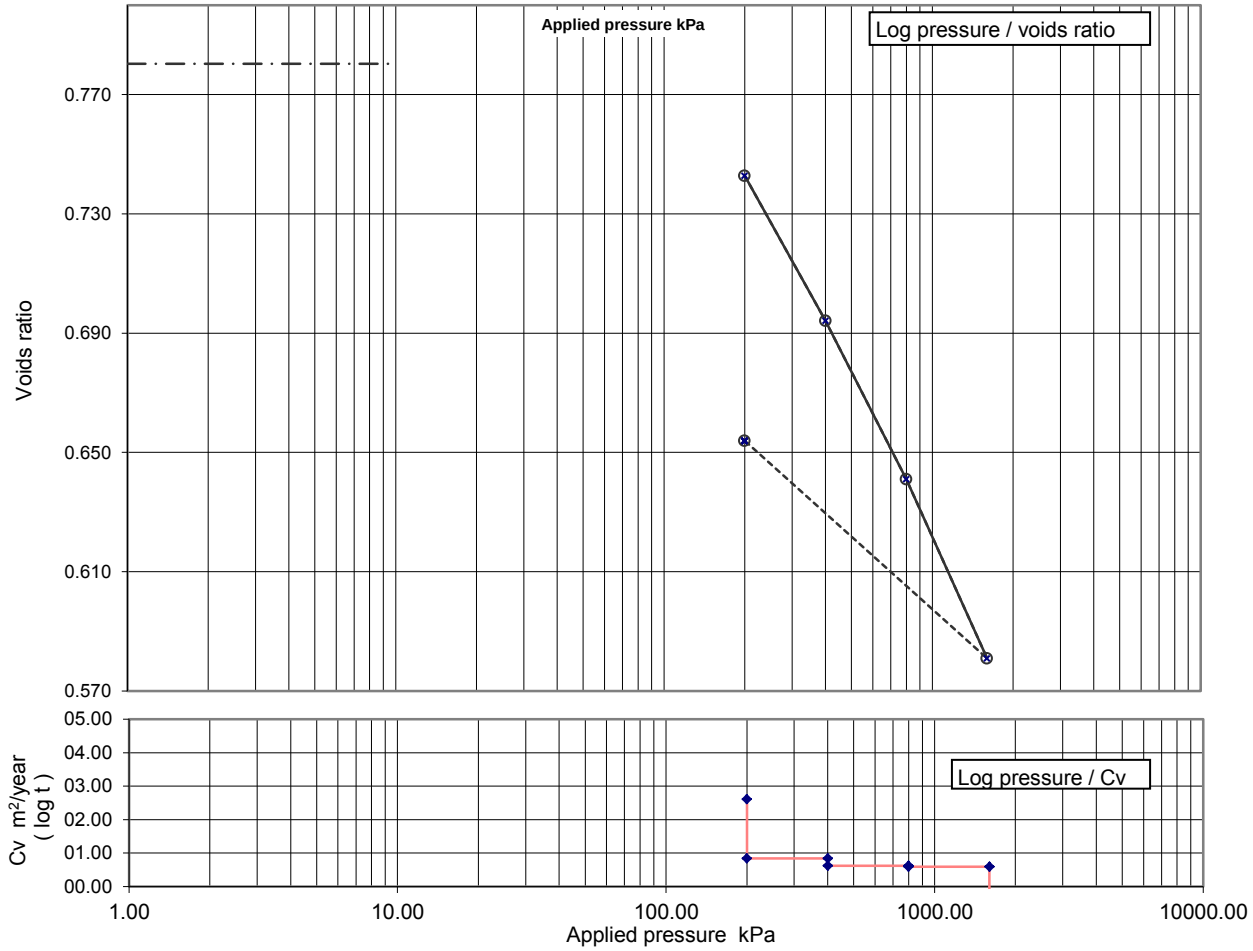
Specimen taken 20 mm from base of sample

Applied Pressure kPa	Voids ratio	mv m2/MN	cv (t50, log) m2/year	cv (t90, root) m2/year	
160	0.6678				
400	0.6369	0.077	0.78	0.84	
800	0.5997	0.057	0.77	1.1	
1600	0.5418	0.045	0.61	0.66	
3200	0.4659	0.031	0.56	0.61	
400	0.5380	0.018	-	-	

ONE DIMENSIONAL CONSOLIDATION TEST

Sample Details:	SAMPLE ID:
	FES4171214023

Hole No	HEP-BH-36
Sample Depth (m BGL)	7.5
Sample Type and No	UT29
Specimen Ref	



Soil description	Firm grey slightly sandy slightly gravelly CLAY.		
Preparation	Undisturbed		
Index properties	Liquid limit %		Plastic limit %

(if available)

Specimen details	Initial	Final	
Particle density	2.65	assumed	Mg/m3
Diameter	75.01		mm
Height	19.01	17.66	mm
Voids ratio	0.780	0.654	
Moisture content	28	26	%
Bulk density	1.90	2.02	Mg/m3
Dry density	1.49	1.60	Mg/m3
Saturation	94	105	%
Average temperature for test	20		oC

Swelling pressure >100 kPa

Notes :

Specimen taken 10 mm from base of sample

Applied Pressure kPa	Voids ratio	mv m2/MN	cv (t50, log) m2/year	cv (t90, root) m2/year	
100	0.7803				
200	0.7428	0.211	2.6	2.7	
400	0.6941	0.139	0.84	0.88	
800	0.6409	0.079	0.62	0.68	
1600	0.5809	0.046	0.59	0.63	
200	0.6539	0.033	-	-	

QA Ref
SLR 5.3
Rev 2.16
Nov 16

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Project No N8135-18

Project Name Heathrow Airport Limited

Figure

OED

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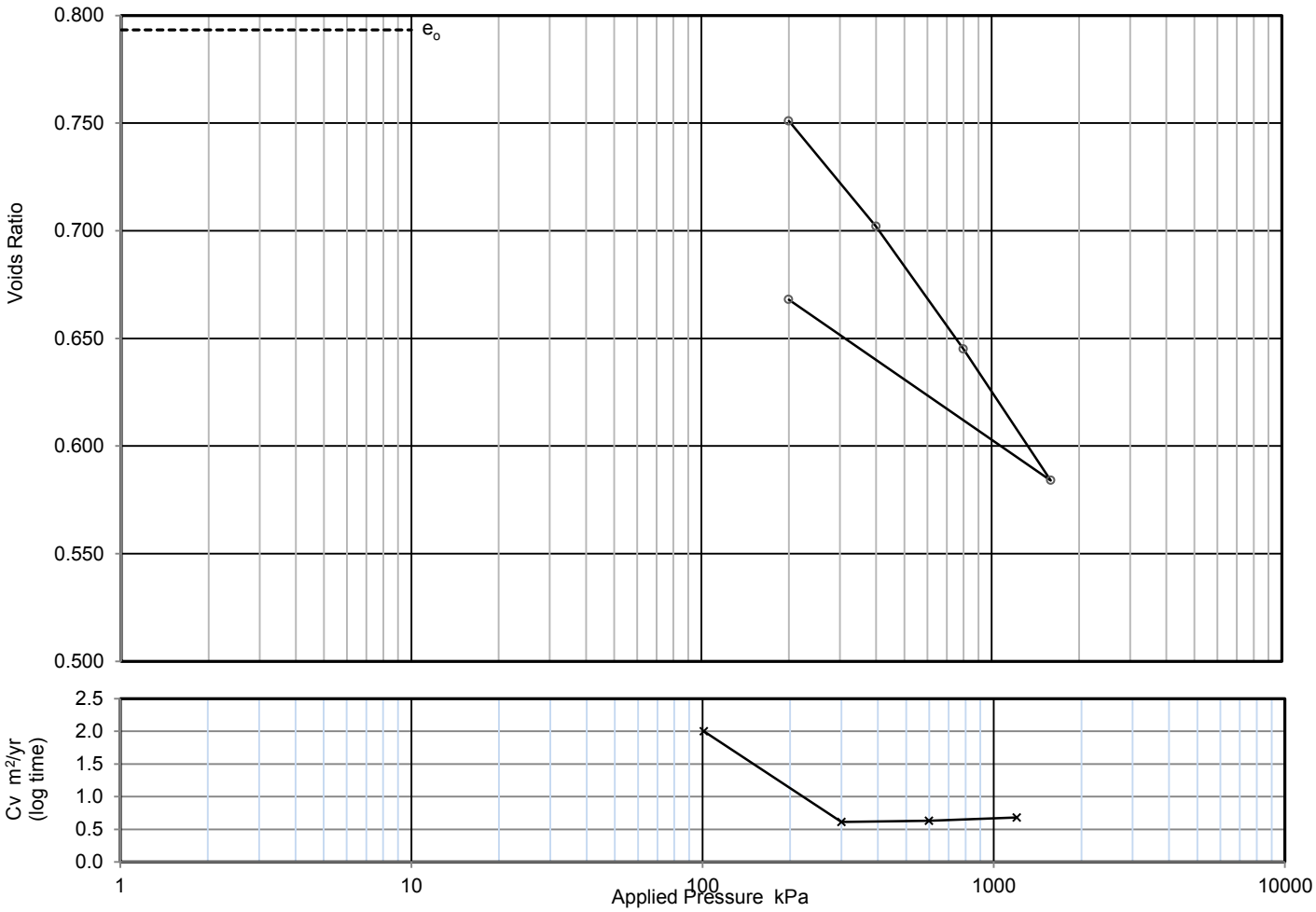
Determination of One-Dimensional Consolidation Properties

				Project No.	G170029U
				Hole	HEP-BH-43
				Sample No.	42
Project Name	HAL Airport Expansion			Depth	11.50
Specimen Reference		Specimen Depth	11.56 m	Sample Type	UT
Specimen Description	Brown slightly sandy CLAY			KeyLAB ID	FES4171220012
Test Method	BS1377:Part 5:1990, clause 3			Date started	12/09/2018



Applied Pressure kPa	Voids ratio	Mv m²/MN	Cv (t50, log) m²/yr	Cv (t90, root) m²/yr	Csec
2.0	0.793	-	-	-	-
200	0.751	0.12	2	16	0.0011
400	0.702	0.14	0.61	4.7	0.0017
800	0.645	0.084	0.63	4.5	0.0022
1,600	0.584	0.046	0.68	3.5	0.0034
200	0.668	0.038			

Preparation: Hand Trimming

Particle density: assumed 2.70 Mg/m³

Specimen details	Initial	Final	
Diameter	74.93	-	mm
Height	18.89	17.57	mm
Water Content	28.6	28.5	%
Bulk density	1.94	2.08	Mg/m³
Dry density	1.51	1.62	Mg/m³
Voids Ratio	0.793	0.668	
Saturation	97	115	%
Average temperature for test	21.0		°C
Swelling Pressure			kPa
Settlement on saturation			%

Remarks

Final values should be used with caution

Cv plotted at mid point of load increments

Cv corrected to 20°C

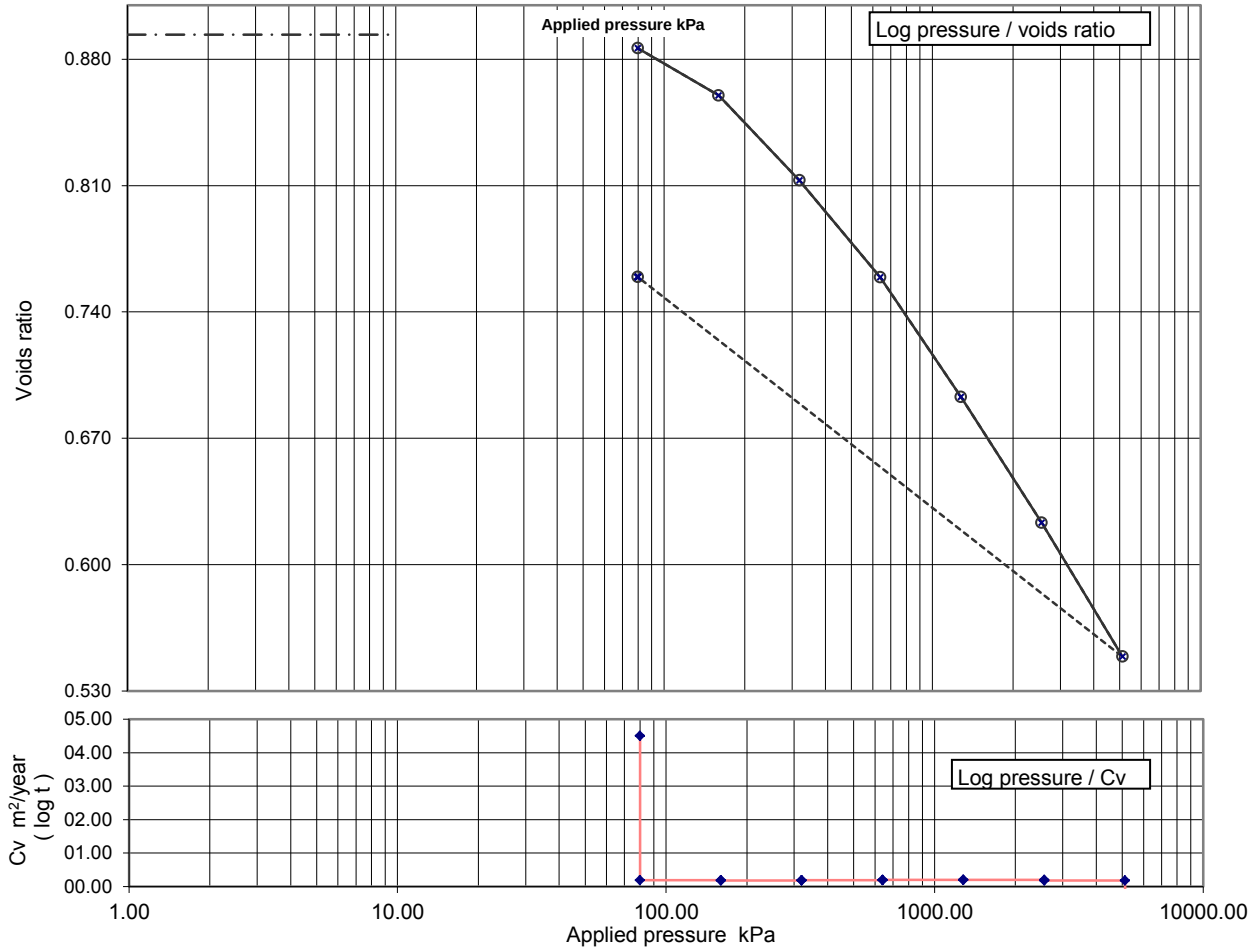
* Negative Csec determination

Date Printed	Figure Number	Sheet Number
04/10/2018		

ONE DIMENSIONAL CONSOLIDATION TEST

Sample Details:	SAMPLE ID:
	FES2180103029

Hole No	HEP-BH-44
Sample Depth (m BGL)	8
Sample Type and No	UT29
Specimen Ref	



Soil description	Stiff brown CLAY.
Preparation	Undisturbed
Index properties	Liquid limit % / Plastic limit %

(if available)

Specimen details	Initial	Final	
Particle density	2.82	assumed	Mg/m3
Diameter	75.10		mm
Height	18.95	17.60	mm
Voids ratio	0.894	0.759	
Moisture content	32	27	%
Bulk density	1.96	2.04	Mg/m3
Dry density	1.49	1.60	Mg/m3
Saturation	100	101	%
Average temperature for test	20		oC

Swelling pressure	not measured	kPa

Notes :

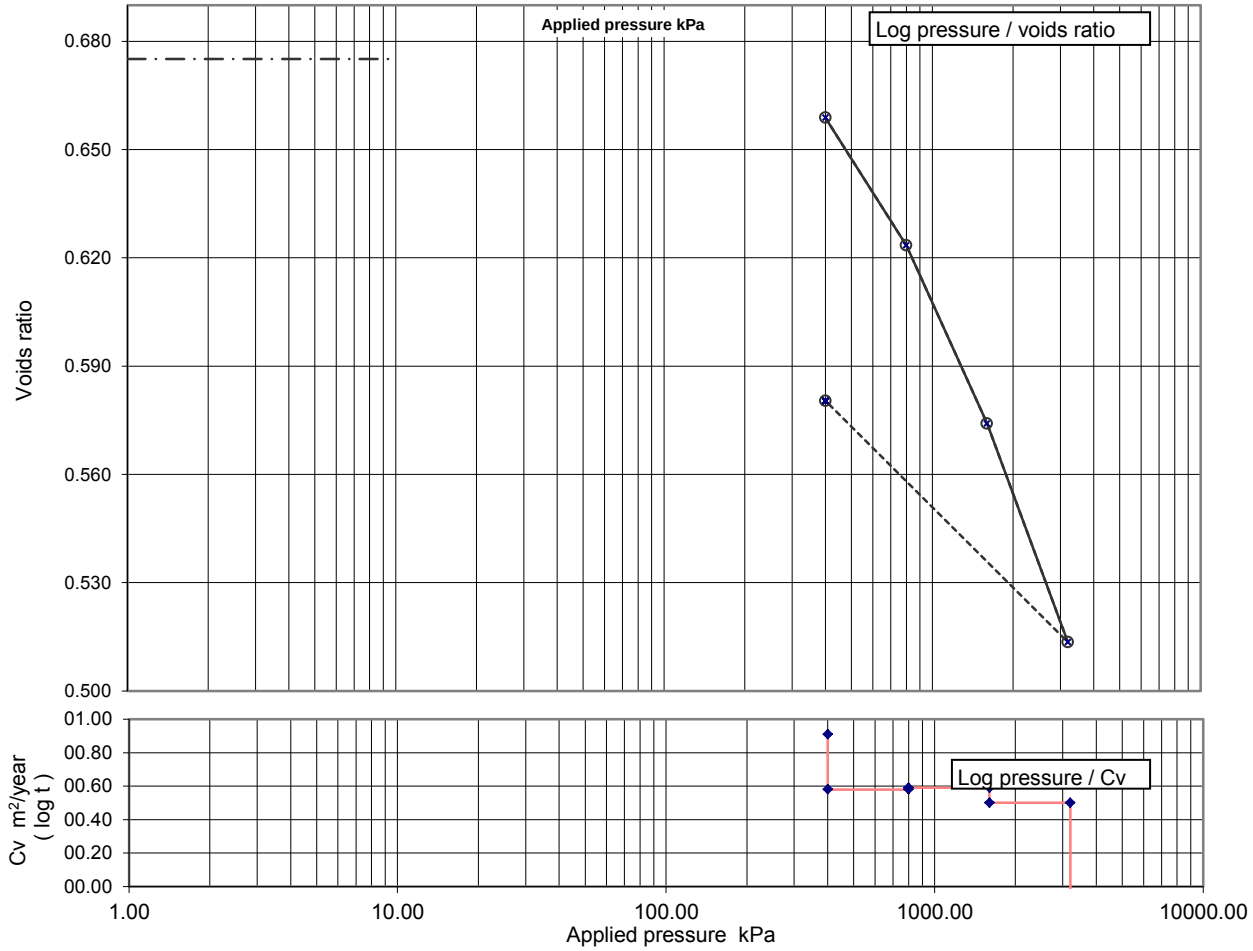
Applied Pressure kPa	Voids ratio	mv m2/MN	cv (t50, log) m2/year	cv (t90, root) m2/year	
0	0.8937				
80	0.8861	0.050	4.5	4.7	
160	0.8599	0.174	0.19	0.21	
320	0.8128	0.158	0.18	0.2	
640	0.7591	0.093	0.19	0.2	
1280	0.6928	0.059	0.2	0.21	
2560	0.6231	0.032	0.2	0.21	
5120	0.5489	0.018	0.18	0.19	
80	0.7592	0.027	-	-	

Specimen taken 20 mm from base of sample

ONE DIMENSIONAL CONSOLIDATION TEST

Sample Details:	SAMPLE ID:
	FES2180103041

Hole No	HEP-BH-44
Sample Depth (m BGL)	15.5
Sample Type and No	UT41
Specimen Ref	



Soil description	Stiff to very stiff laminated greyish brown CLAY.
Preparation	Undisturbed
Index properties	Liquid limit %		Plastic limit %	

(if available)

Specimen details	Initial	Final	
Particle density	2.75	assumed	Mg/m3
Diameter	75.11		mm
Height	18.89	17.82	mm
Voids ratio	0.675	0.580	
Moisture content	25	22	%
Bulk density	2.05	2.13	Mg/m3
Dry density	1.64	1.74	Mg/m3
Saturation	100	105	%
Average temperature for test	19		oC

Swelling pressure	>200	kPa

Notes :

Specimen taken 10 mm from base of sample

Applied Pressure kPa	Voids ratio	mv m2/MN	cv (t50, log) m2/year	cv (t90, root) m2/year	
200	0.6751				
400	0.6588	0.049	0.91	0.97	
800	0.6234	0.053	0.58	0.61	
1600	0.5741	0.038	0.59	0.63	
3200	0.5135	0.024	0.5	0.53	
400	0.5804	0.016	-	-	

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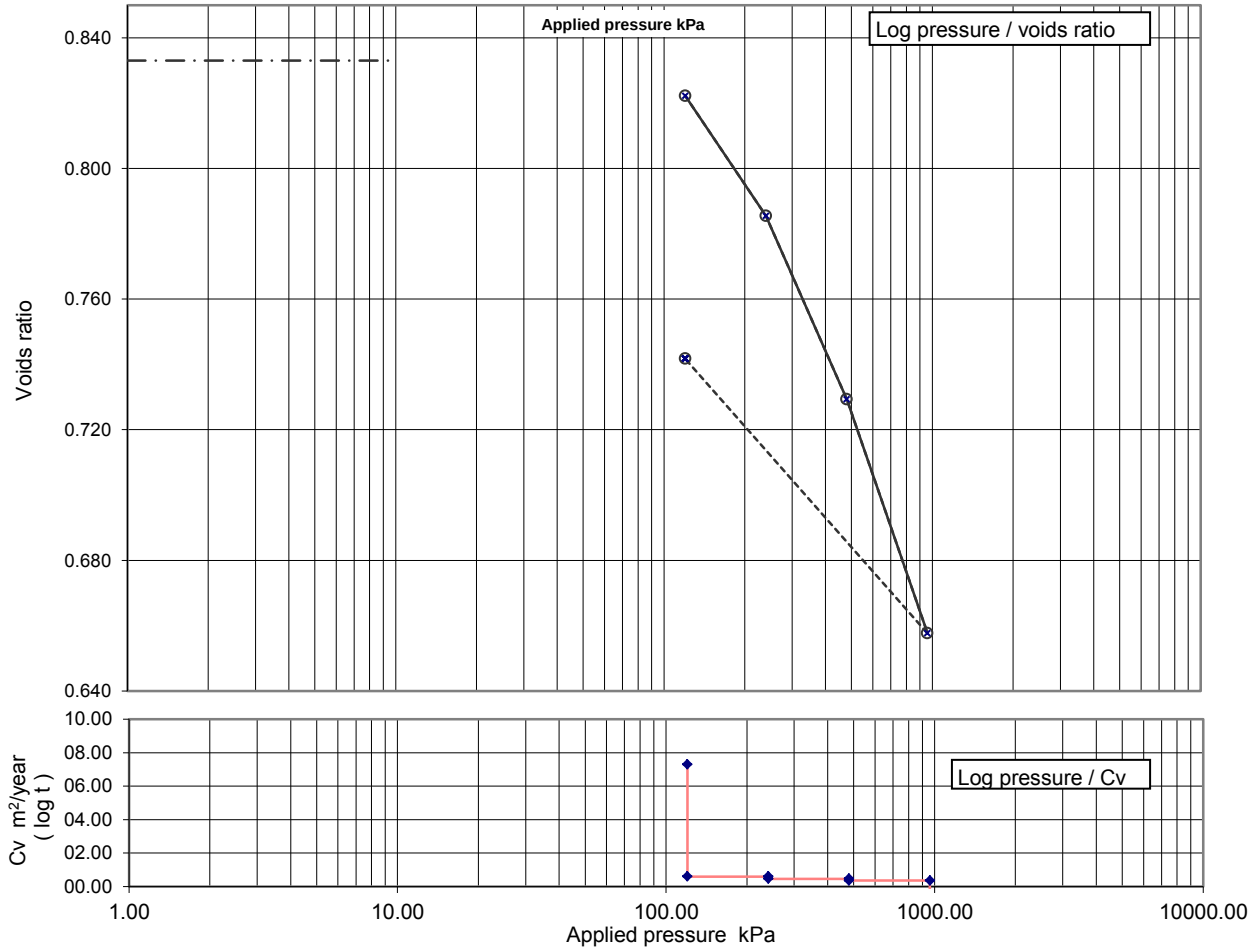
ONE DIMENSIONAL CONSOLIDATION TEST

Sample Details:	SAMPLE ID:
	FES1171208032

Hole No	HEP-BH-45
Sample Depth (m BGL)	6
Sample Type and No	UT32
Specimen Ref	



Soil description	Firm brownish grey slightly sandy CLAY.			
Preparation	Undisturbed			
Index properties	Liquid limit %	79	Plastic limit %	29

(if available)

Specimen details	Initial	Final	
Particle density	2.65	assumed	Mg/m3
Diameter	75.20		mm
Height	20.12	19.11	mm
Voids ratio	0.833	0.742	
Moisture content	32	29	%
Bulk density	1.90	1.97	Mg/m3
Dry density	1.45	1.52	Mg/m3
Saturation	100	105	%
Average temperature for test	20		oC

Swelling pressure >60 kPa

Notes :

Specimen taken 10 mm from base of sample

Applied Pressure kPa	Voids ratio	mv m2/MN	cv (t50, log) m2/year	cv (t90, root) m2/year	
60	0.8330				
120	0.8222	0.099	7.3	8.2	
240	0.7855	0.168	0.6	0.63	
480	0.7292	0.131	0.46	0.49	
960	0.6576	0.086	0.36	0.38	
120	0.7417	0.060	-	-	

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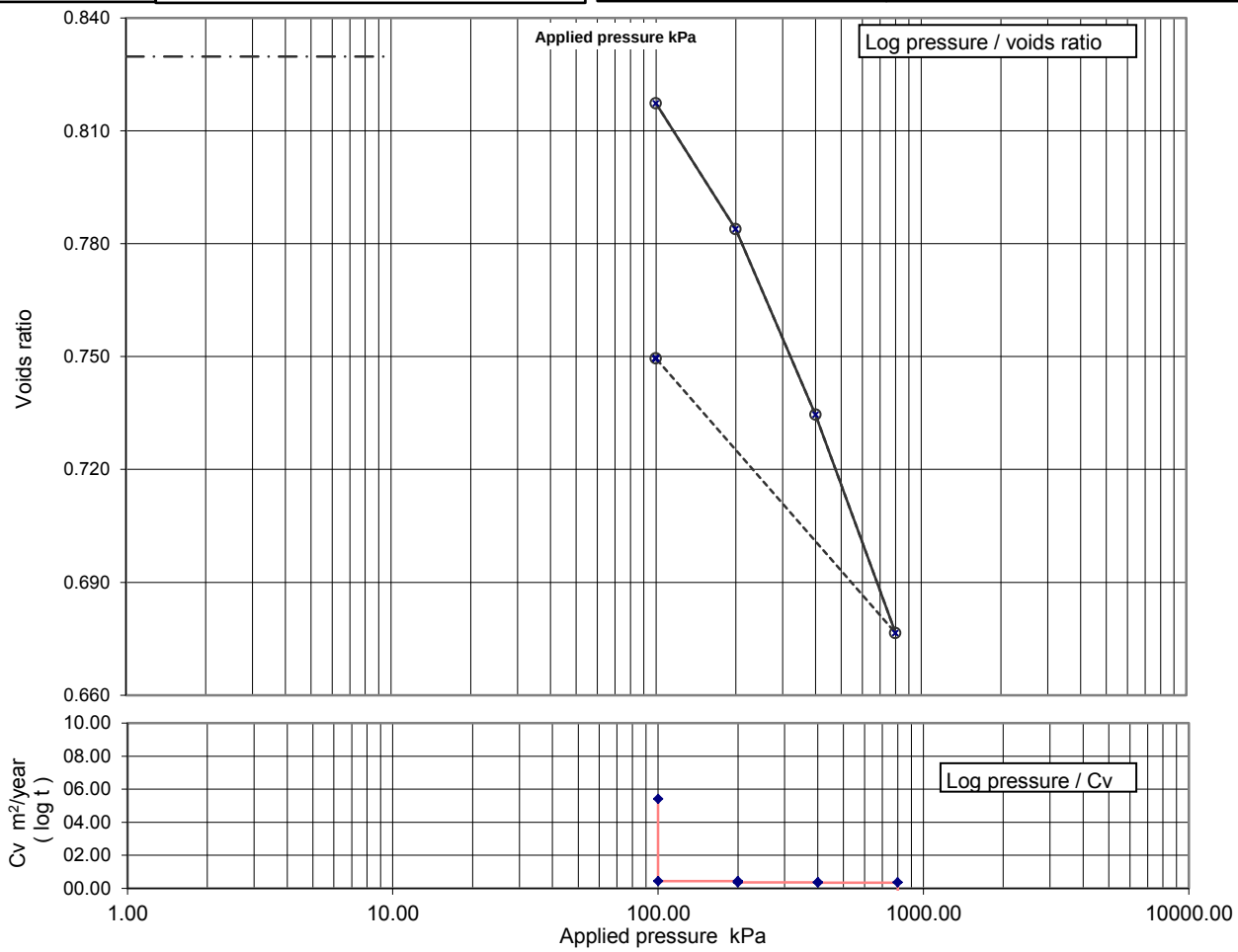
ONE DIMENSIONAL CONSOLIDATION TEST

Sample Details:	SAMPLE ID:
	FES2171205021

Hole No	HEP-BH-47
Sample Depth (m BGL)	5
Sample Type and No	UT21
Specimen Ref	



Soil description	Stiff to very stiff laminated greyish brown slightly sandy CLAY.
Preparation	Undisturbed
Index properties	Liquid limit %		Plastic limit %	

(if available)

Specimen details	Initial	Final	
Particle density	2.65	assumed	Mg/m3
Diameter	75.20		mm
Height	19.11	18.27	mm
Voids ratio	0.830	0.749	
Moisture content	31	29	%
Bulk density	1.89	1.96	Mg/m3
Dry density	1.45	1.51	Mg/m3
Saturation	98	103	%
Average temperature for test	20		oC

Swelling pressure	>50	kPa

Notes :

Specimen taken 0 mm from base of sample

Applied Pressure kPa	Voids ratio	mv m2/MN	cv (t50, log) m2/year	cv (t90, root) m2/year	
50	0.8298				
100	0.8172	0.137	5.4	5.6	
200	0.7838	0.184	0.43	0.48	
400	0.7345	0.138	0.36	0.38	
800	0.6765	0.084	0.35	0.37	
100	0.7494	0.062	-	-	

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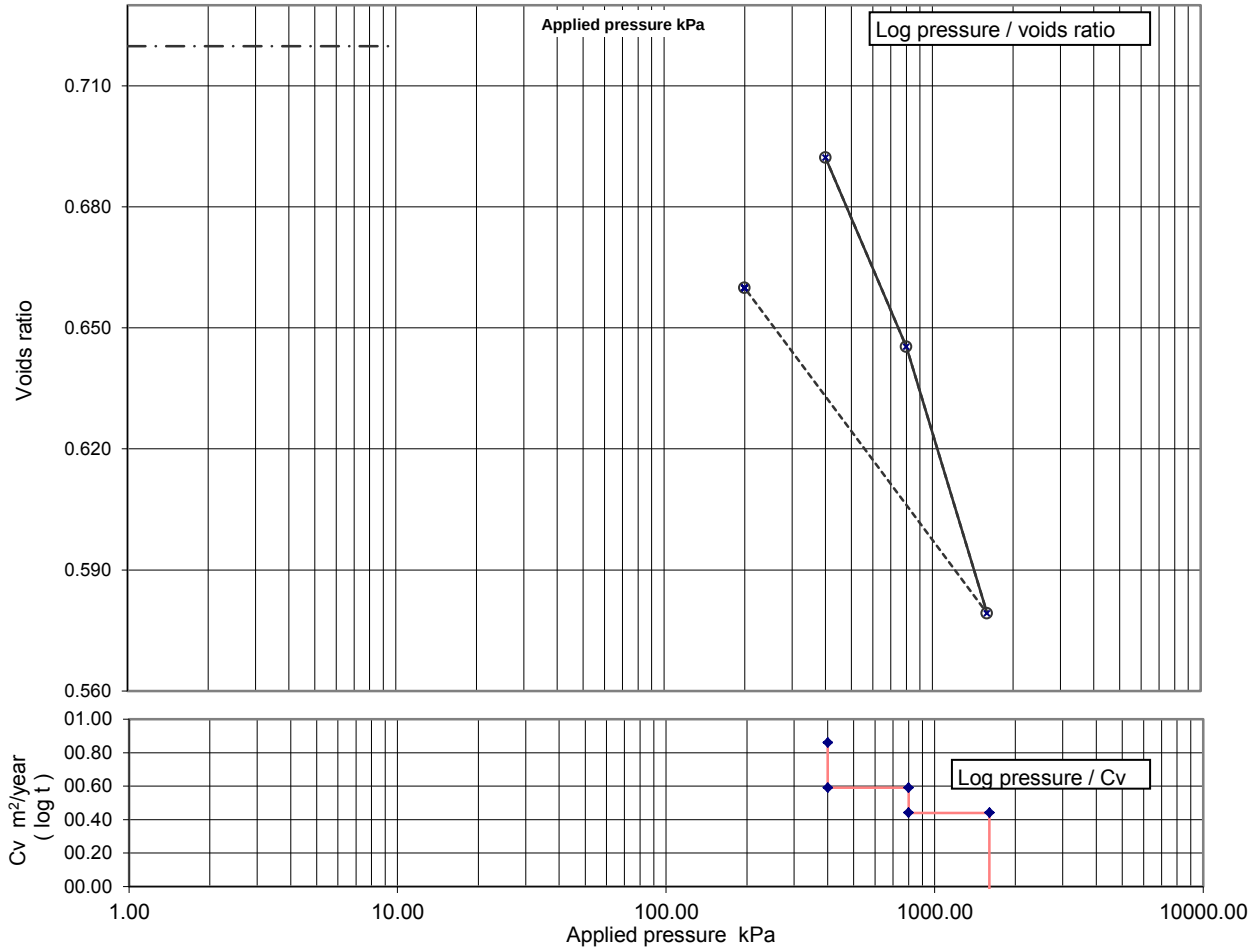
ONE DIMENSIONAL CONSOLIDATION TEST

Sample Details:	SAMPLE ID:
	FES2171206006

Hole No	HEP-BH-47
Sample Depth (m BGL)	11
Sample Type and No	UT35
Specimen Ref	



Soil description	Firm laminated brown CLAY.		
Preparation	Undisturbed		
Index properties	Liquid limit %		Plastic limit %

(if available)

Specimen details	Initial	Final	
Particle density	2.65	assumed	Mg/m3
Diameter	75.09		mm
Height	18.88	18.22	mm
Voids ratio	0.720	0.660	
Moisture content	27	26	%
Bulk density	1.96	2.01	Mg/m3
Dry density	1.54	1.60	Mg/m3
Saturation	100	105	%
Average temperature for test	20		oC

Swelling pressure >200 kPa

Notes :

Specimen taken 10 mm from base of sample

Applied Pressure kPa	Voids ratio	mv m2/MN	cv (t50, log) m2/year	cv (t90, root) m2/year	
200	0.7198				
400	0.6922	0.080	0.86	0.91	
800	0.6453	0.069	0.59	0.61	
1600	0.5792	0.050	0.44	0.47	
200	0.6599	0.036	-	-	

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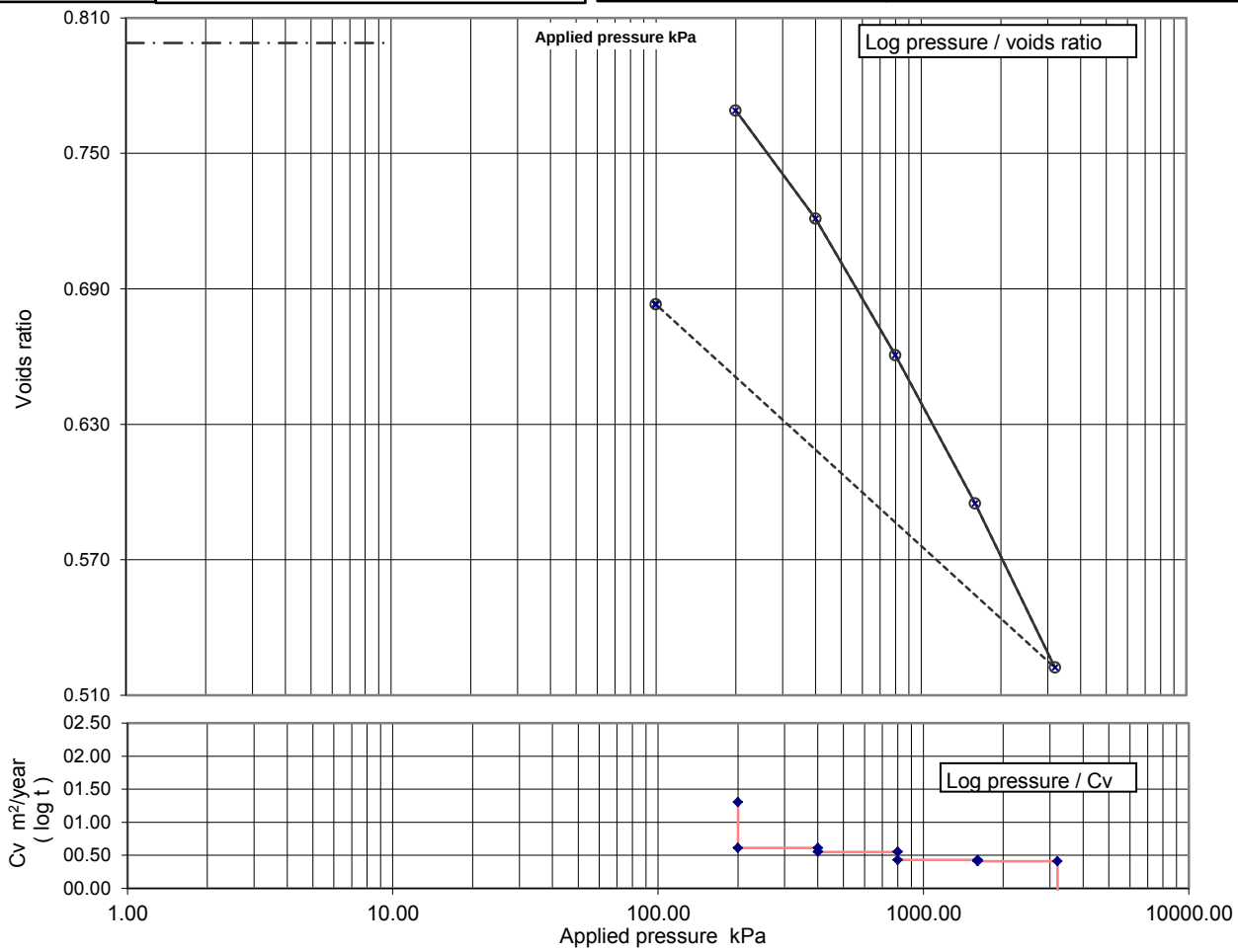
ONE DIMENSIONAL CONSOLIDATION TEST

Sample Details:	SAMPLE ID:
	FES1171121033

Hole No	HEP-BH-50
Sample Depth (m BGL)	6
Sample Type and No	UT33
Specimen Ref	



Soil description	Firm laminated brown slightly sandy CLAY.
Preparation	Undisturbed
Index properties	Liquid limit % / Plastic limit %

(if available)

Specimen details	Initial	Final	
Particle density	2.65	assumed	Mg/m3
Diameter	74.98		mm
Height	18.89	17.67	mm
Voids ratio	0.799	0.683	
Moisture content	29	27	%
Bulk density	1.90	2.00	Mg/m3
Dry density	1.47	1.57	Mg/m3
Saturation	96	105	%
Average temperature for test	20		oC

Swelling pressure >100 kPa

Notes :

Specimen taken 70 mm from base of sample

Applied Pressure kPa	Voids ratio	mv m2/MN	cv (t50, log) m2/year	cv (t90, root) m2/year	
100	0.7989				
200	0.7689	0.167	1.3	1.4	
400	0.7210	0.135	0.61	0.65	
800	0.6605	0.088	0.55	0.59	
1600	0.5948	0.049	0.43	0.45	
3200	0.5222	0.028	0.41	0.44	
100	0.6830	0.034	-	-	

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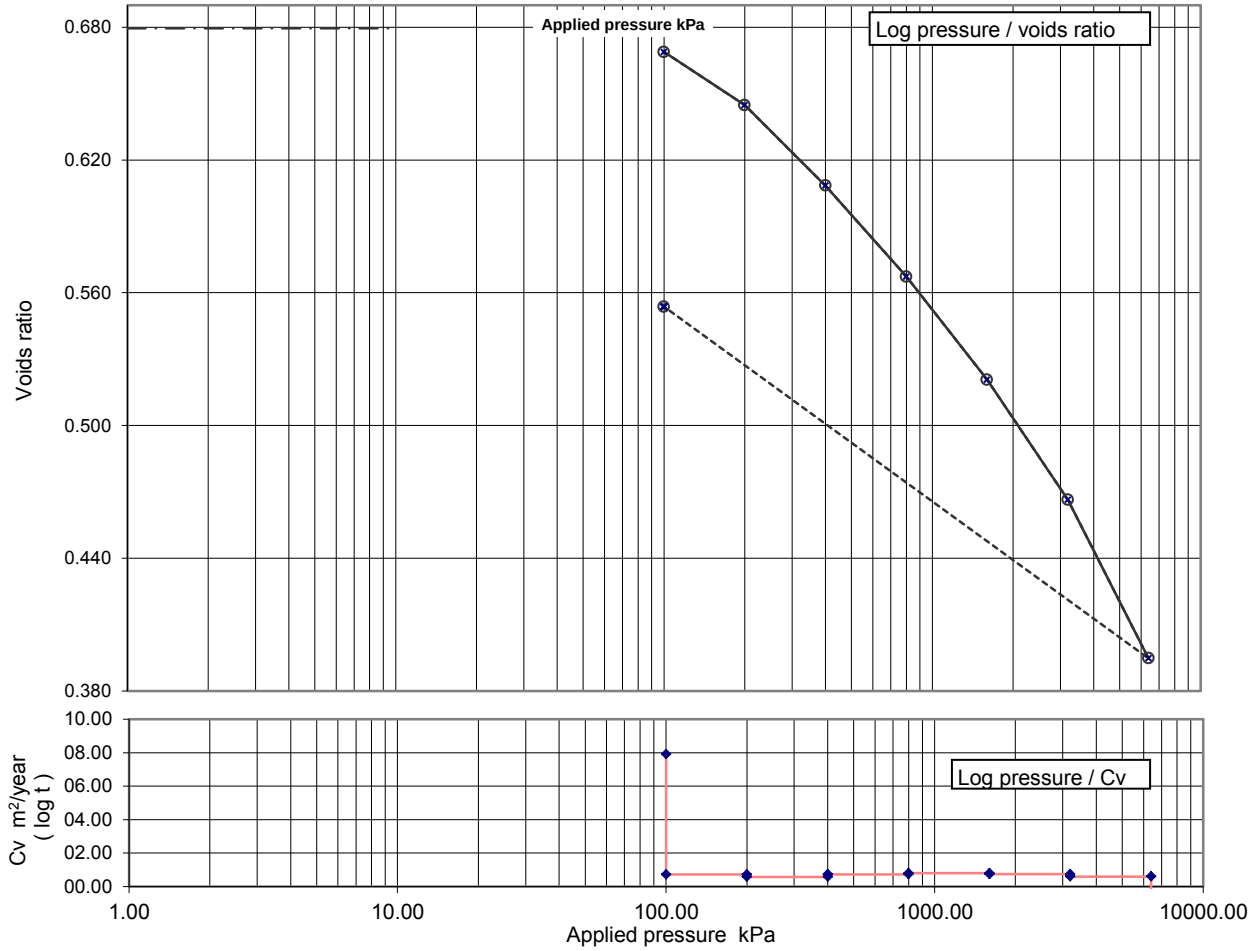
ONE DIMENSIONAL CONSOLIDATION TEST

Sample Details:	SAMPLE ID:
	FES1171121065

Hole No	HEP-BH-50
Sample Depth (m BGL)	15
Sample Type and No	U65
Specimen Ref	



Soil description	Firm to stiff brownish grey slightly sandy CLAY.
Preparation	Undisturbed
Index properties	Liquid limit %		Plastic limit %	

(if available)

Specimen details	Initial	Final	
Particle density	2.65	assumed	Mg/m3
Diameter	74.99		mm
Height	19.02	17.60	mm
Voids ratio	0.680	0.554	
Moisture content	24	22	%
Bulk density	1.96	2.08	Mg/m3
Dry density	1.58	1.71	Mg/m3
Saturation	95	105	%
Average temperature for test	20		oC

Swelling pressure	not measured	kPa

Notes :

Specimen taken 20 mm from base of sample

Applied Pressure kPa	Voids ratio	mv m2/MN	cv (t50, log) m2/year	cv (t90, root) m2/year	
0	0.6796				
100	0.6688	0.064	7.9	8.6	
200	0.6448	0.144	0.72	0.78	
400	0.6084	0.111	0.58	0.63	
800	0.5673	0.064	0.73	0.78	
1600	0.5207	0.037	0.8	0.86	
3200	0.4665	0.022	0.74	0.81	
6400	0.3948	0.015	0.6	0.63	
100	0.5537	0.018	-	-	

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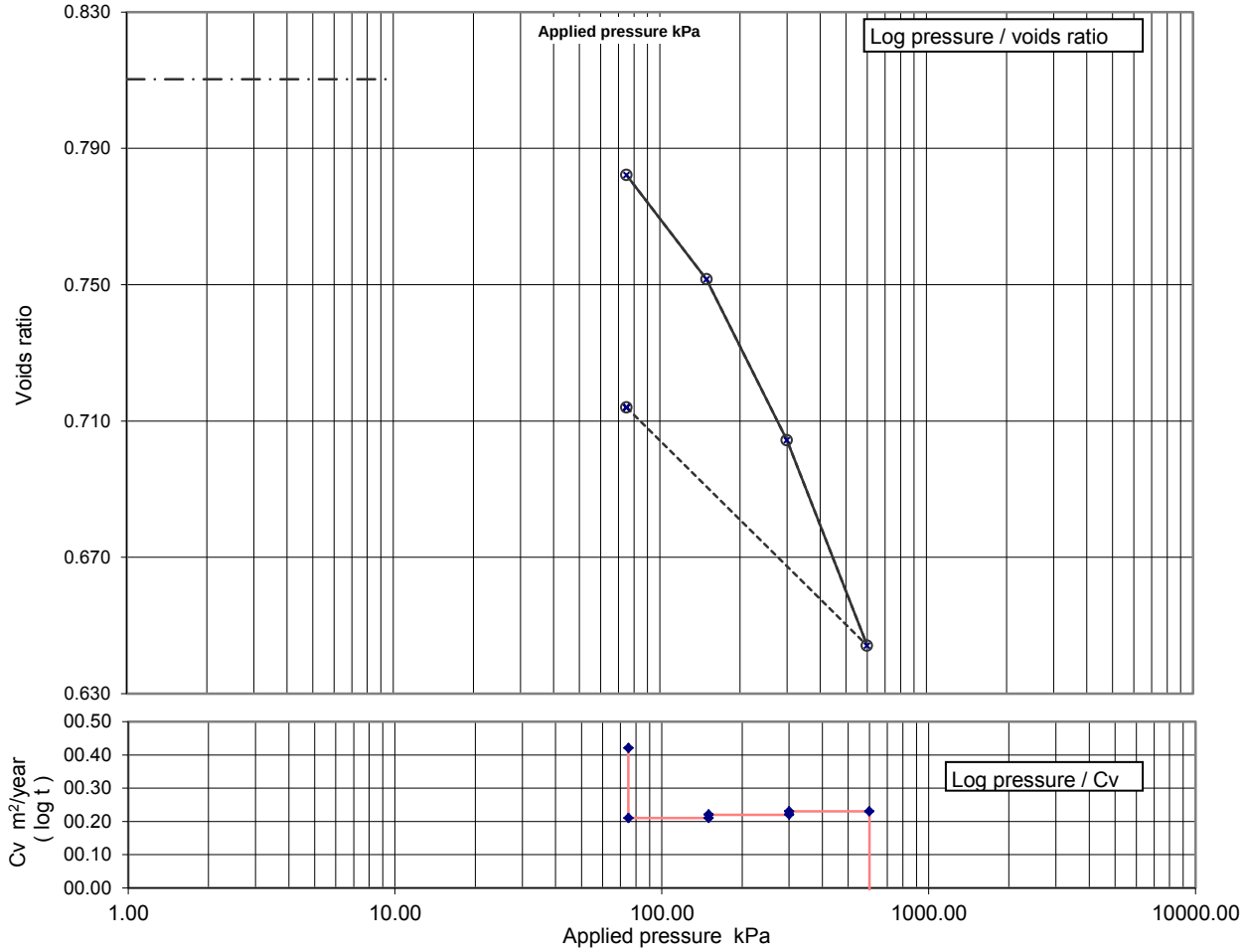
ONE DIMENSIONAL CONSOLIDATION TEST

Sample Details:	SAMPLE ID:
	HEPBH6120171121026

Hole No	HEP-BH-61
Sample Depth (m BGL)	4.7
Sample Type and No	UT23
Specimen Ref	



Soil description	Firm to stiff thinly laminated greyish brown slightly sandy CLAY.
Preparation	Undisturbed
Index properties	Liquid limit % 46 Plastic limit % 20

(if available)

Specimen details	Initial	Final	
Particle density	2.75	assumed	Mg/m3
Diameter	75.10		mm
Height	18.90	17.89	mm
Voids ratio	0.810	0.714	
Moisture content	30	27	%
Bulk density	1.97	2.04	Mg/m3
Dry density	1.52	1.60	Mg/m3
Saturation	100	105	%
Average temperature for test	20		oC

Swelling pressure	not measured	kPa

Notes :

Specimen taken 10 mm from base of sample

Applied Pressure kPa	Voids ratio	mv m2/MN	cv (t50, log) m2/year	cv (t90, root) m2/year	
0	0.8103				
75	0.7822	0.207	0.42	0.48	
150	0.7515	0.229	0.21	0.22	
300	0.7043	0.180	0.22	0.23	
600	0.6440	0.118	0.23	0.24	
75	0.7140	0.081	-	-	

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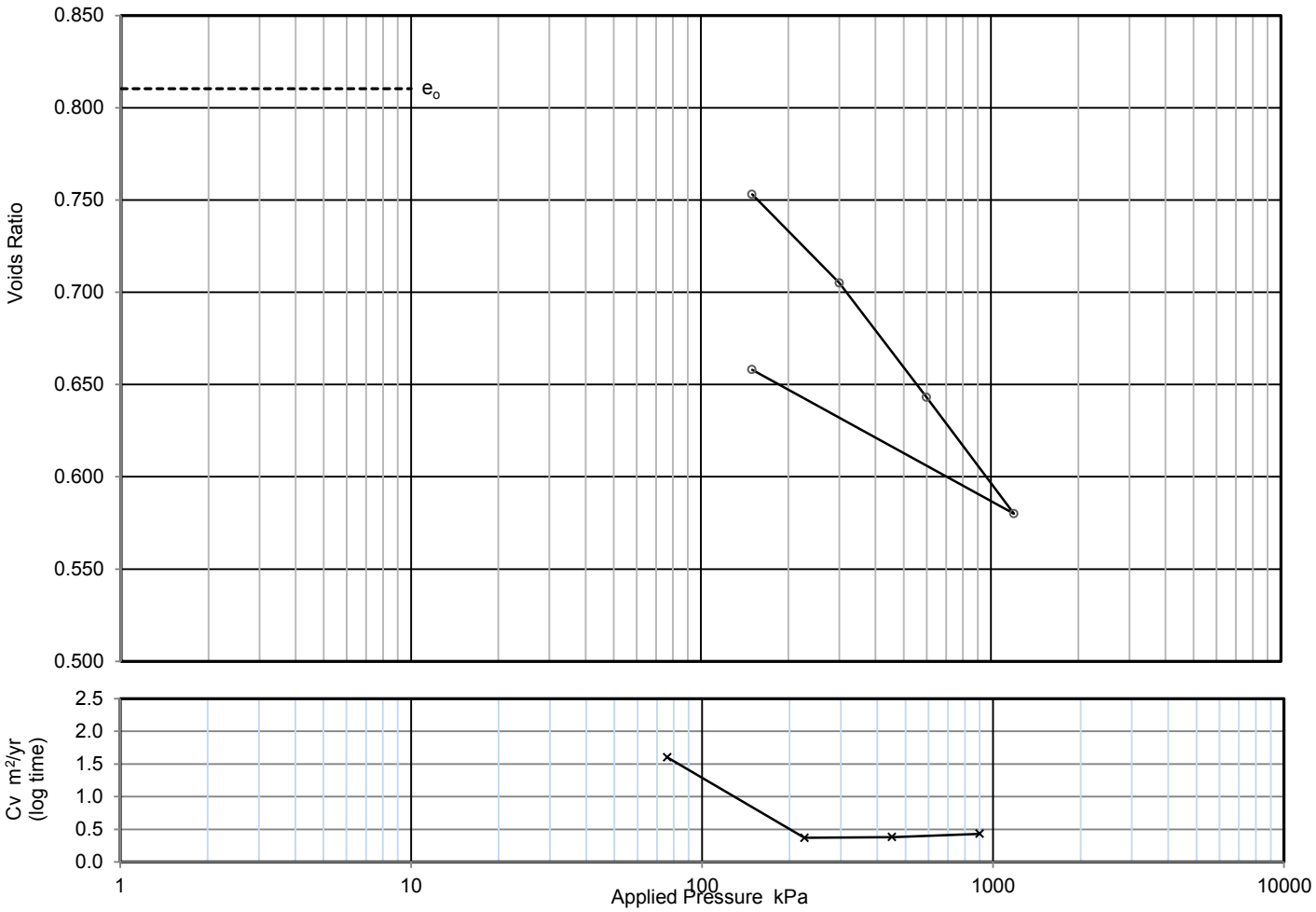
Determination of One-Dimensional Consolidation Properties

				Project No.	G170029U
				Hole	HEP-BH-61
				Sample No.	32
Project Name	HAL Airport Expansion			Depth	7.70
Specimen Reference		Specimen Depth	7.72 m	Sample Type	UT
Specimen Description	Brown slightly sandy CLAY			KeyLAB ID	HEPBH6120171121032
Test Method	BS1377:Part 5:1990, clause 3			Date started	11/07/2018



Applied Pressure kPa	Voids ratio	Mv m²/MN	Cv (t50, log) m²/yr	Cv (t90, root) m²/yr	Csec
2.0	0.810	-	-	-	-
150	0.753	0.22	1.6	14	0.0028
300	0.705	0.18	0.37	1.4	0.0017
600	0.643	0.12	0.38	0.43	0.0034
1,200	0.580	0.064	0.43	0.46	0.0039
150	0.658	0.047			

Preparation: Hand Trimming

Particle density: assumed 2.70 Mg/m³

Specimen details	Initial	Final	
Diameter	74.76	-	mm
Height	18.89	17.30	mm
Water Content	31.3	27.8	%
Bulk density	1.96	2.08	Mg/m³
Dry density	1.49	1.63	Mg/m³
Voids Ratio	0.810	0.658	
Saturation	104	114	%
Average temperature for test	21.0		°C
Swelling Pressure			kPa
Settlement on saturation			%

Remarks

Final values should be used with caution

Cv plotted at mid point of load increments

Cv corrected to 20°C

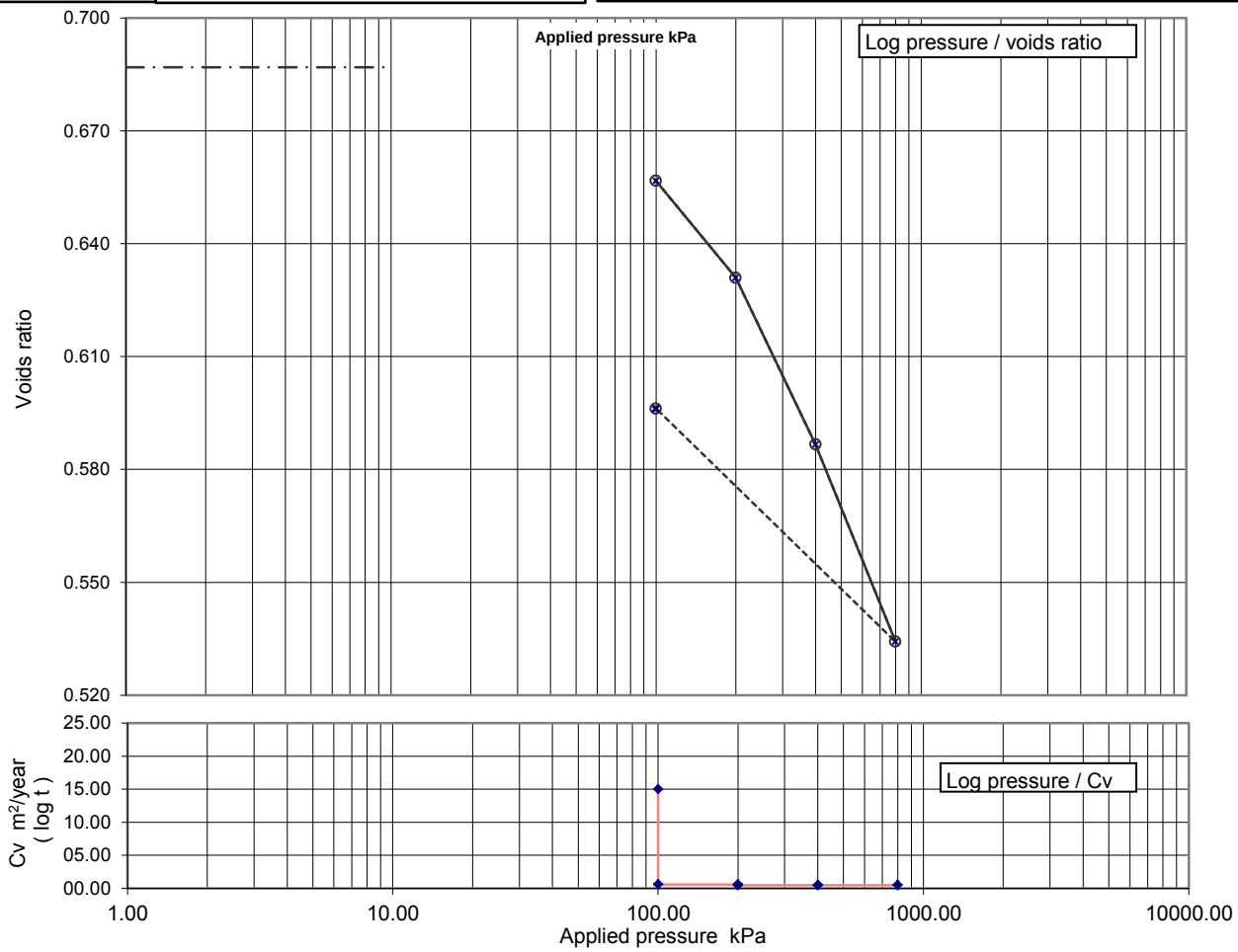
* Negative Csec determination

Date Printed	Figure Number	Sheet Number
09/08/2018		

ONE DIMENSIONAL CONSOLIDATION TEST

Sample Details:	SAMPLE ID:
	FES1180117026

Hole No	HEP-BH-65
Sample Depth (m BGL)	5.5
Sample Type and No	UT26
Specimen Ref	



Soil description	Stiff to very stiff greyish brown slightly sandy CLAY.
Preparation	Undisturbed
Index properties	Liquid limit %		Plastic limit %	

(if available)

Specimen details	Initial	Final	
Particle density	2.75	assumed	Mg/m3
Diameter	75.01		mm
Height	18.76	17.75	mm
Voids ratio	0.687	0.596	
Moisture content	25	23	%
Bulk density	2.03	2.12	Mg/m3
Dry density	1.63	1.72	Mg/m3
Saturation	99	105	%
Average temperature for test	19		oC

Swelling pressure	not measured	kPa

Notes :

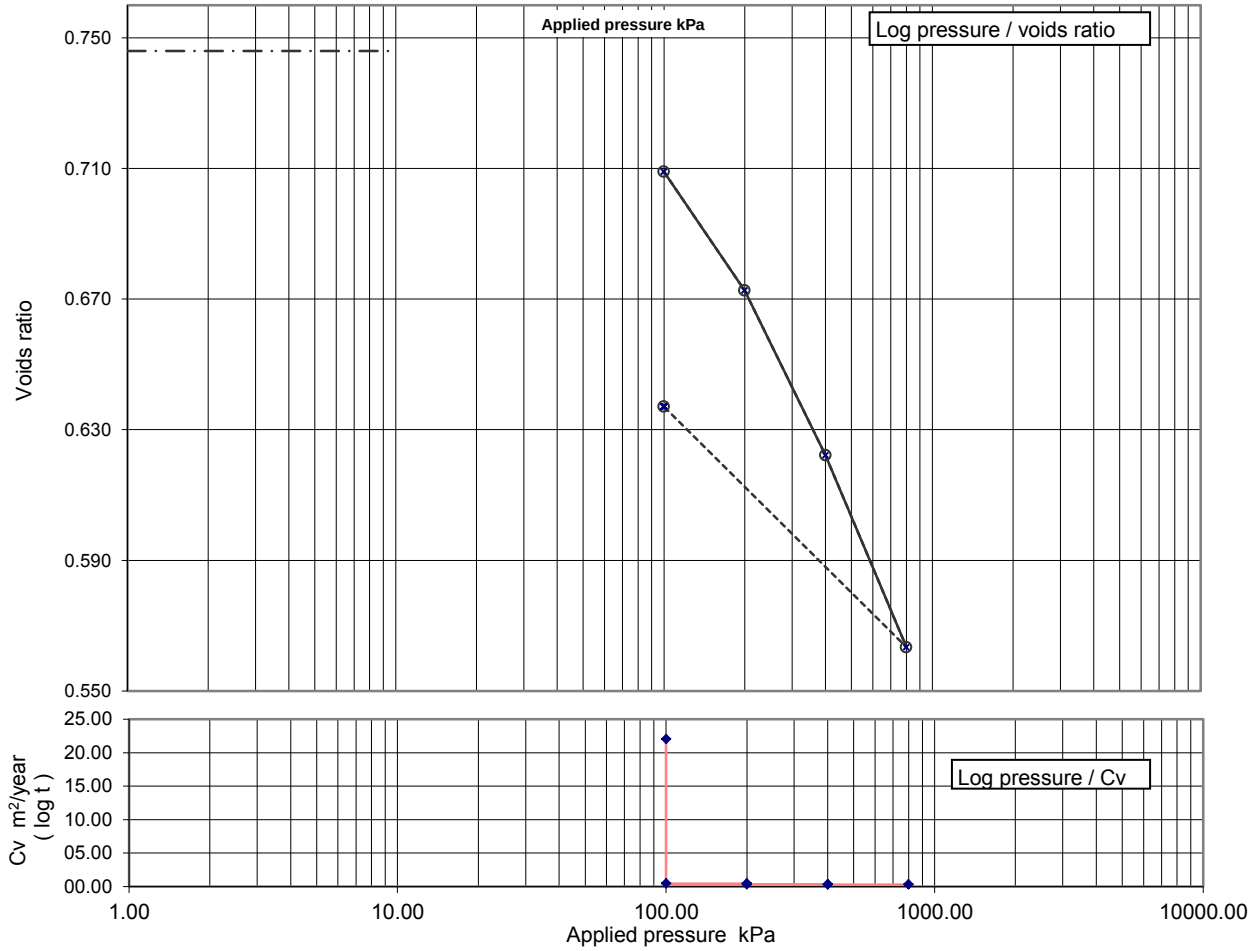
Applied Pressure kPa	Voids ratio	mv m2/MN	cv (t50, log) m2/year	cv (t90, root) m2/year	
0	0.6869				
100	0.6566	0.179	15	16	
200	0.6309	0.155	0.58	0.62	
400	0.5866	0.136	0.47	0.49	
800	0.5342	0.083	0.49	0.53	
100	0.5961	0.058	-	-	

Specimen taken 20 mm from base of sample

ONE DIMENSIONAL CONSOLIDATION TEST

Sample Details:	SAMPLE ID:
	FES1180104030

Hole No	HEP-BH-77
Sample Depth (m BGL)	6
Sample Type and No	UT30
Specimen Ref	



Soil description	Firm brow slightly sandy CLAY with localised softening.
Preparation	Undistubed
Index properties	Liquid limit % [ ] Plastic limit % [ ]

(if available)

Specimen details	Initial	Final	
Particle density	2.65	assumed	Mg/m3
Diameter	75.06		mm
Height	18.90	17.72	mm
Voids ratio	0.746	0.637	
Moisture content	28	25	%
Bulk density	1.94	2.03	Mg/m3
Dry density	1.52	1.62	Mg/m3
Saturation	99	105	%
Average temperature for test	20		oC

Swelling pressure: not measured kPa

Notes :

Specimen taken 10 mm from base of sample

Applied Pressure kPa	Voids ratio	mv m2/MN	cv (t50, log) m2/year	cv (t90, root) m2/year	
0	0.7460				
100	0.7089	0.212	22	24	
200	0.6726	0.213	0.45	0.49	
400	0.6222	0.151	0.32	0.34	
800	0.5634	0.091	0.29	0.31	
100	0.6370	0.067	-	-	

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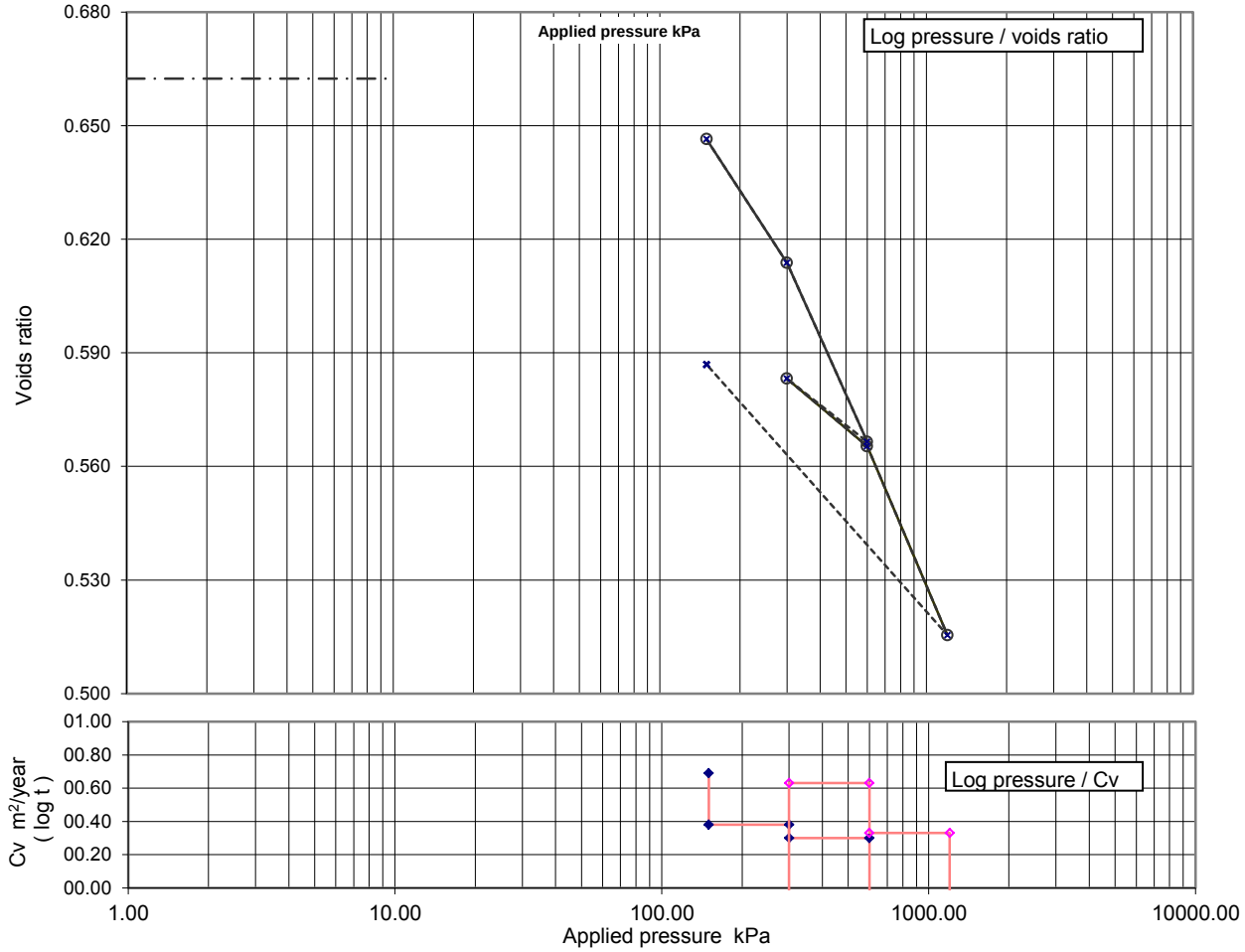
ONE DIMENSIONAL CONSOLIDATION TEST

Sample Details:	SAMPLE ID:
	FES1180111034

Hole No	HEP-BH-821
Sample Depth (m BGL)	7.5
Sample Type and No	UT34
Specimen Ref	



Soil description	Firm grey slightly sandy CLAY.			
Preparation	Undisturbed			
Index properties	Liquid limit %	72	Plastic limit %	26

(if available)

Specimen details	Initial	Final	
Particle density	2.65	assumed	Mg/m3
Diameter	75.04		mm
Height	18.72	17.87	mm
Voids ratio	0.662	0.587	
Moisture content	25	23	%
Bulk density	1.99	2.06	Mg/m3
Dry density	1.59	1.67	Mg/m3
Saturation	100	105	%
Average temperature for test	19		oC

Swelling pressure >75 kPa

Notes :

Specimen taken 20 mm from base of sample

Applied Pressure kPa	Voids ratio	mv m2/MN	cv (t50, log) m2/year	cv (t90, root) m2/year	
75	0.6625				
150	0.6464	0.129	0.69	0.74	
300	0.6137	0.132	0.38	0.4	
600	0.5665	0.098	0.3	0.32	
300	0.5832	0.036	-	-	
600	0.5653	0.038	0.63	0.67	
1200	0.5154	0.053	0.33	0.35	
150	0.5869	0.045	-	-	

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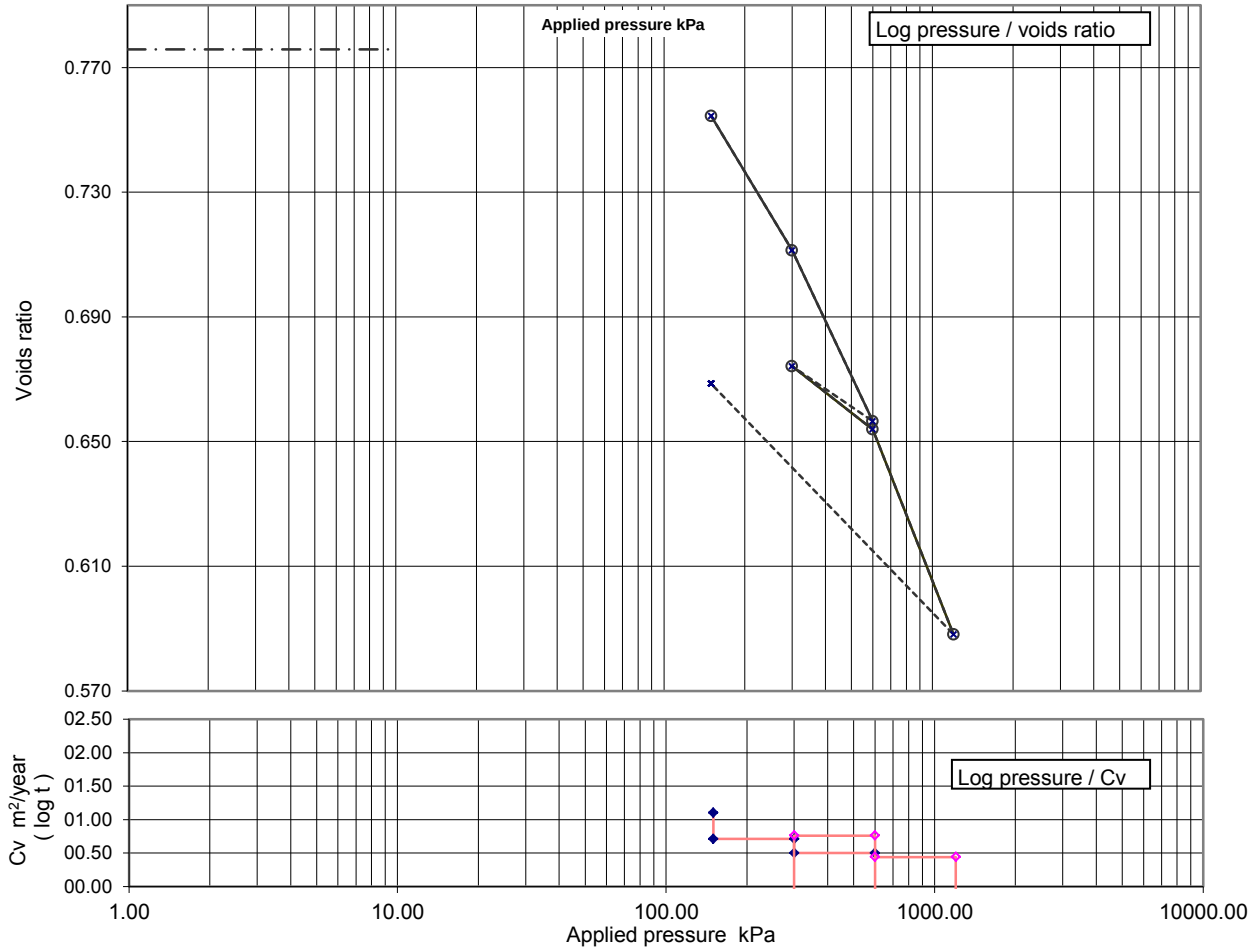
ONE DIMENSIONAL CONSOLIDATION TEST

Sample Details:	SAMPLE ID:
	FES1180111041

Hole No	HEP-BH-821
Sample Depth (m BGL)	11
Sample Type and No	UT41
Specimen Ref	



Soil description	Stiff to very stiff brownish grey slightly sandy silty CLAY.
Preparation	Undisturbed
Index properties	Liquid limit % 72 Plastic limit % 27

(if available)

Specimen details	Initial	Final	
Particle density	2.75	assumed	Mg/m3
Diameter	75.15		mm
Height	18.70	17.57	mm
Voids ratio	0.776	0.669	
Moisture content	28	26	%
Bulk density	1.98	2.07	Mg/m3
Dry density	1.55	1.65	Mg/m3
Saturation	99	105	%
Average temperature for test	19		oC

Swelling pressure >75 kPa

Notes :

Specimen taken 200 mm from base of sample

Applied Pressure kPa	Voids ratio	mv m2/MN	cv (t50, log) m2/year	cv (t90, root) m2/year	
75	0.7758				
150	0.7544	0.160	1.1	1.1	
300	0.7113	0.164	0.71	0.73	
600	0.6565	0.107	0.5	0.52	
300	0.6742	0.036	-	-	
600	0.6538	0.040	0.76	0.81	
1200	0.5881	0.066	0.44	0.46	
150	0.6686	0.048	-	-	

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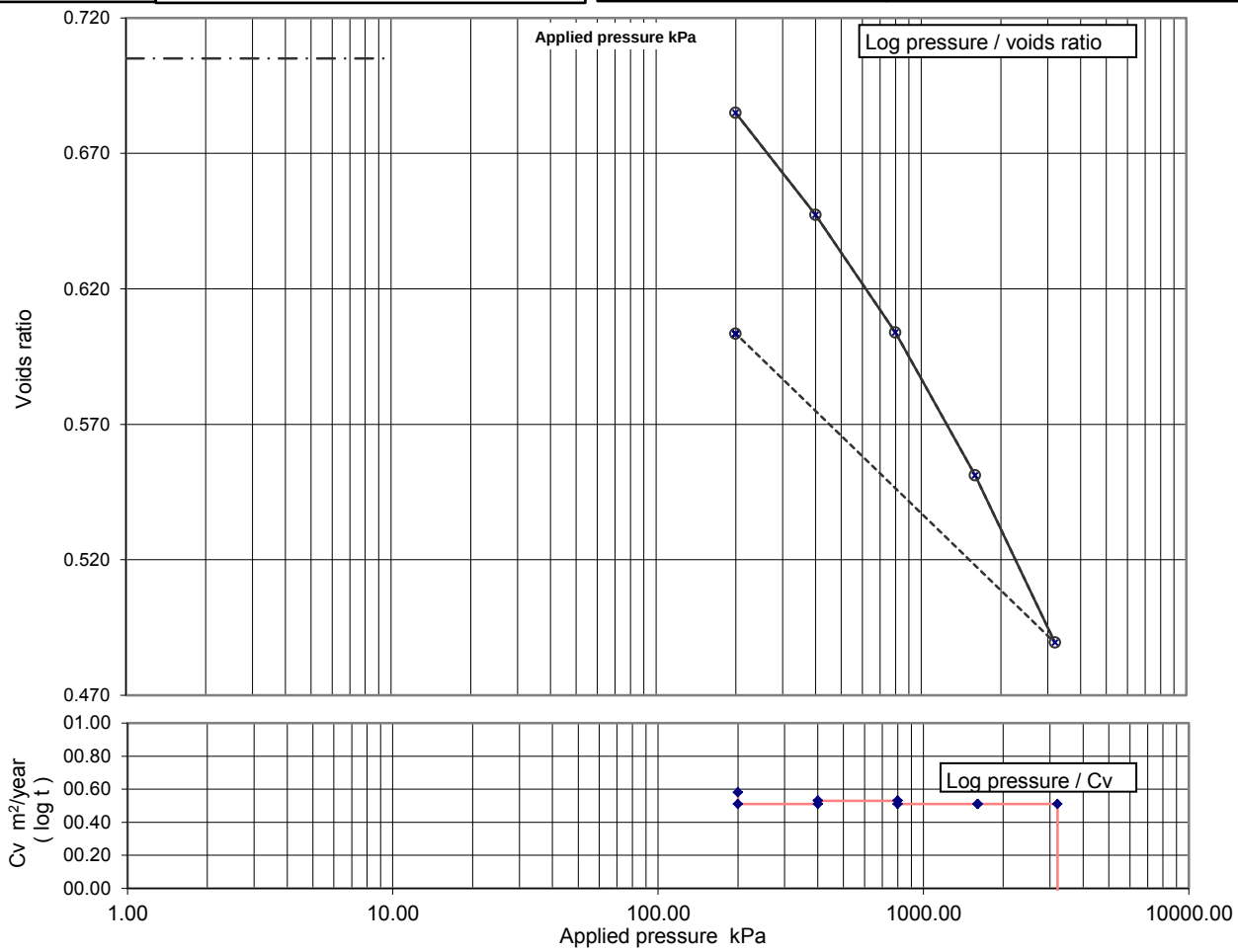
ONE DIMENSIONAL CONSOLIDATION TEST

Sample Details:	SAMPLE ID:
	FES1171130037

Hole No	HEP-BH-823
Sample Depth (m BGL)	9
Sample Type and No	UT37
Specimen Ref	



Soil description	Very stiff thinly laminated greyish brown slightly sandy CLAY.
Preparation	Undisturbed
Index properties	Liquid limit % | Plastic limit %

(if available)

Specimen details	Initial	Final	
Particle density	2.65	assumed	Mg/m3
Diameter	75.23		mm
Height	19.09	17.95	mm
Voids ratio	0.705	0.603	
Moisture content	26	24	%
Bulk density	1.96	2.05	Mg/m3
Dry density	1.55	1.65	Mg/m3
Saturation	99	105	%
Average temperature for test	19		oC

Swelling pressure	>100	kPa

Notes :

Applied Pressure kPa	Voids ratio	mv m2/MN	cv (t50, log) m2/year	cv (t90, root) m2/year	
100	0.7050				
200	0.6849	0.118	0.58	0.64	
400	0.6473	0.112	0.51	0.54	
800	0.6038	0.066	0.53	0.58	
1600	0.5511	0.041	0.51	0.55	
3200	0.4894	0.025	0.51	0.53	
200	0.6034	0.026	-	-	

Specimen taken 50 mm from base of sample

QA Ref
SLR 5.3
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Nov 16

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1157

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Project No N8135-18

Project Name Heathrow Airport Limited

Figure

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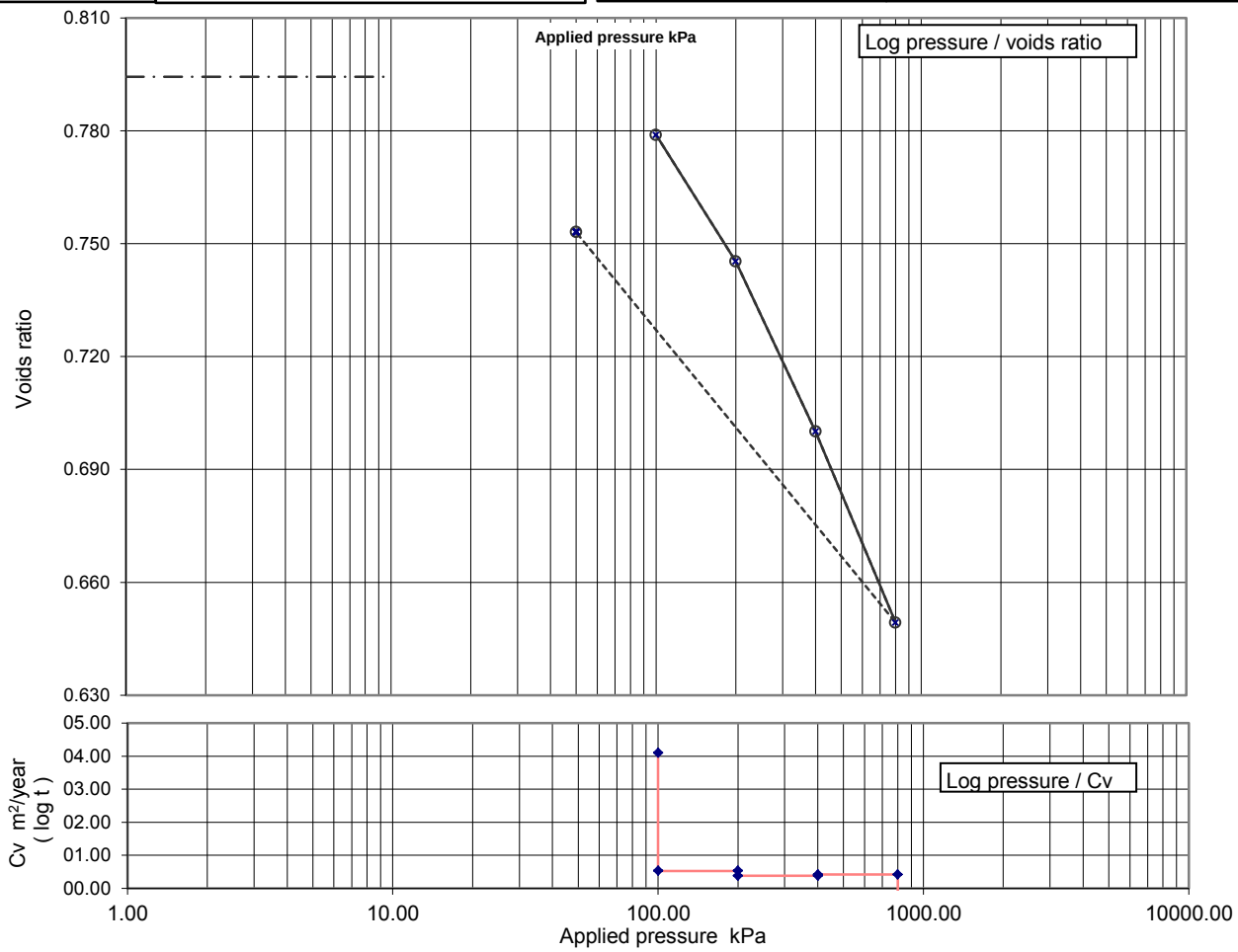
ONE DIMENSIONAL CONSOLIDATION TEST

Sample Details:	SAMPLE ID:
	FES2171208037

Hole No	HEP-BH-824
Sample Depth (m BGL)	5.2
Sample Type and No	UT28
Specimen Ref	



Soil description	Firm brownish grey slightly sandy CLAY.
Preparation	Undisturbed
Index properties	Liquid limit % / Plastic limit %

(if available)

Specimen details	Initial	Final	
Particle density	2.70	assumed	Mg/m3
Diameter	75.12		mm
Height	18.90	18.46	mm
Voids ratio	0.794	0.753	
Moisture content	29	29	%
Bulk density	1.94	1.99	Mg/m3
Dry density	1.50	1.54	Mg/m3
Saturation	99	105	%
Average temperature for test	20		oC

Swelling pressure >50 kPa

Notes :

Specimen taken 10 mm from base of sample

Applied Pressure kPa	Voids ratio	mv m2/MN	cv (t50, log) m2/year	cv (t90, root) m2/year	
50	0.7943				
100	0.7789	0.173	4.1	4.1	
200	0.7453	0.189	0.53	0.55	
400	0.7001	0.129	0.38	0.41	
800	0.6493	0.075	0.42	0.44	
50	0.7530	0.084	-	-	

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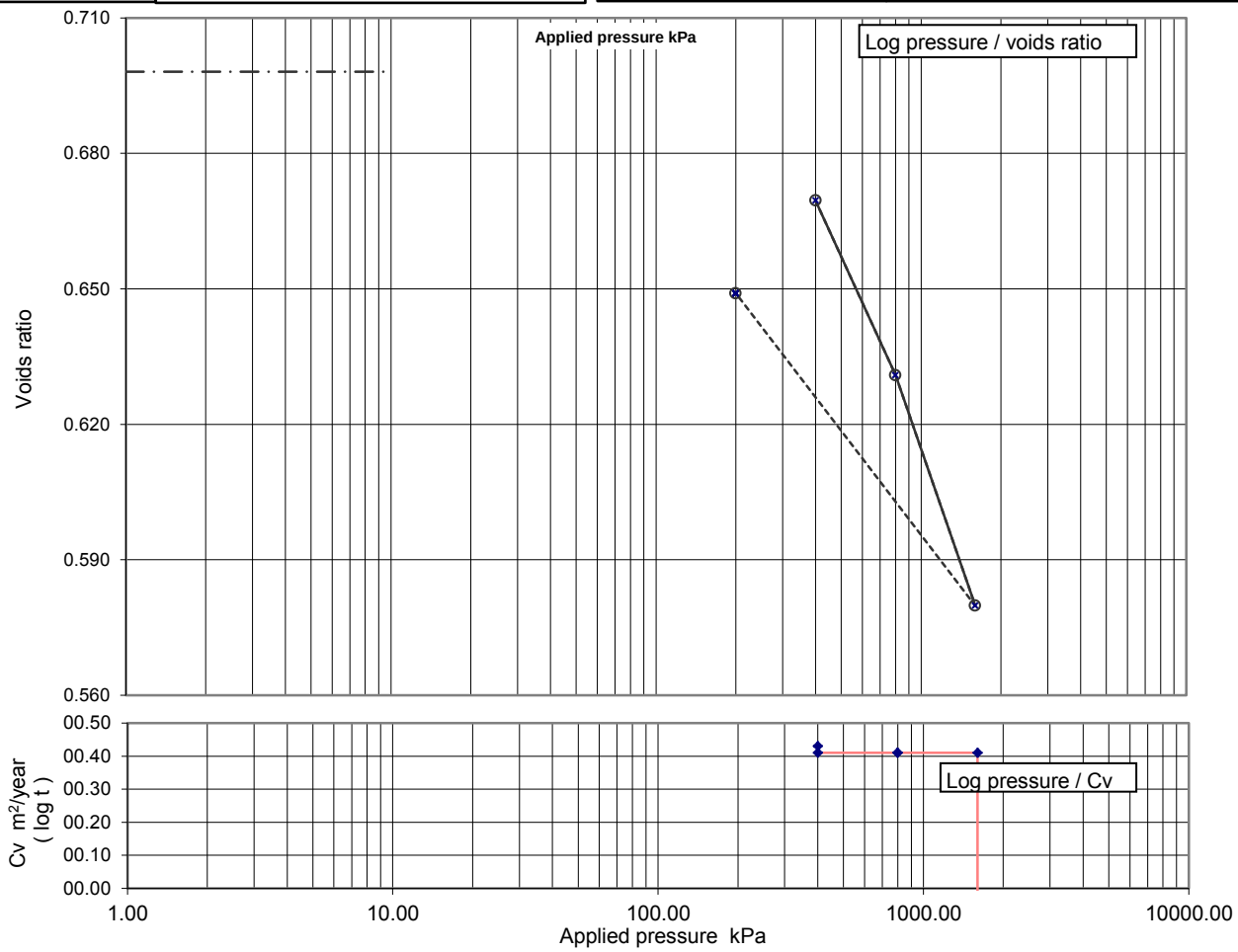
ONE DIMENSIONAL CONSOLIDATION TEST

Sample Details:	SAMPLE ID:
	FES2171209004

Hole No	HEP-BH-824
Sample Depth (m BGL)	12
Sample Type and No	UT41
Specimen Ref	



Soil description	Firm to stiff greyish brown slightly sandy CLAY.
Preparation	Undisturbed
Index properties	Liquid limit % / Plastic limit %

(if available)

Specimen details	Initial	Final	
Particle density	2.65	assumed	Mg/m3
Diameter	75.15		mm
Height	19.09	18.54	mm
Voids ratio	0.698	0.649	
Moisture content	25	24	%
Bulk density	1.95	2.00	Mg/m3
Dry density	1.56	1.61	Mg/m3
Saturation	95	100	%
Average temperature for test	20		oC

Swelling pressure >200 kPa

Notes :

Specimen taken 10 mm from base of sample

Applied Pressure kPa	Voids ratio	mv m2/MN	cv (t50, log) m2/year	cv (t90, root) m2/year	
200	0.6981				
400	0.6696	0.084	0.43	0.46	
800	0.6309	0.058	0.41	0.43	
1600	0.5798	0.039	0.41	0.43	
200	0.6490	0.031	-	-	

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Figure

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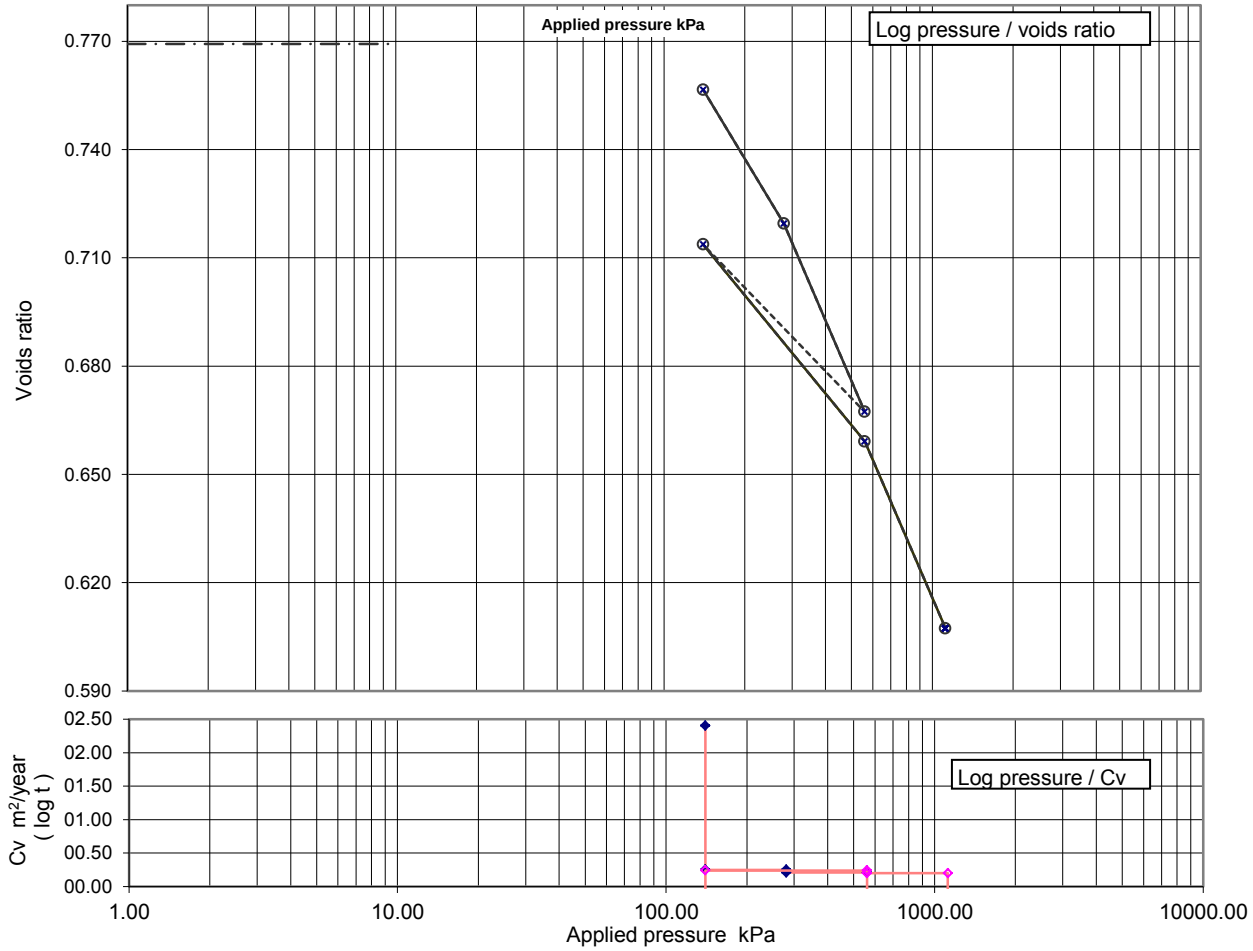
ONE DIMENSIONAL CONSOLIDATION TEST

Sample Details:	SAMPLE ID:
	FES1180318031

Hole No	HEP-BH-1047
Sample Depth (m BGL)	6
Sample Type and No	UT31
Specimen Ref	



Soil description	Firm brown slightly sandy silty CLAY.
Preparation	Undisturbed
Index properties	Liquid limit % 68 Plastic limit % 26

(if available)

Specimen details	Initial	Final	
Particle density	2.65	assumed	Mg/m3
Diameter	75.04		mm
Height	18.85	17.12	mm
Voids ratio	0.769	0.607	
Moisture content	29	24	%
Bulk density	1.93	2.05	Mg/m3
Dry density	1.50	1.65	Mg/m3
Saturation	100	105	%
Average temperature for test	20		oC

Swelling pressure >70 kPa

Notes :

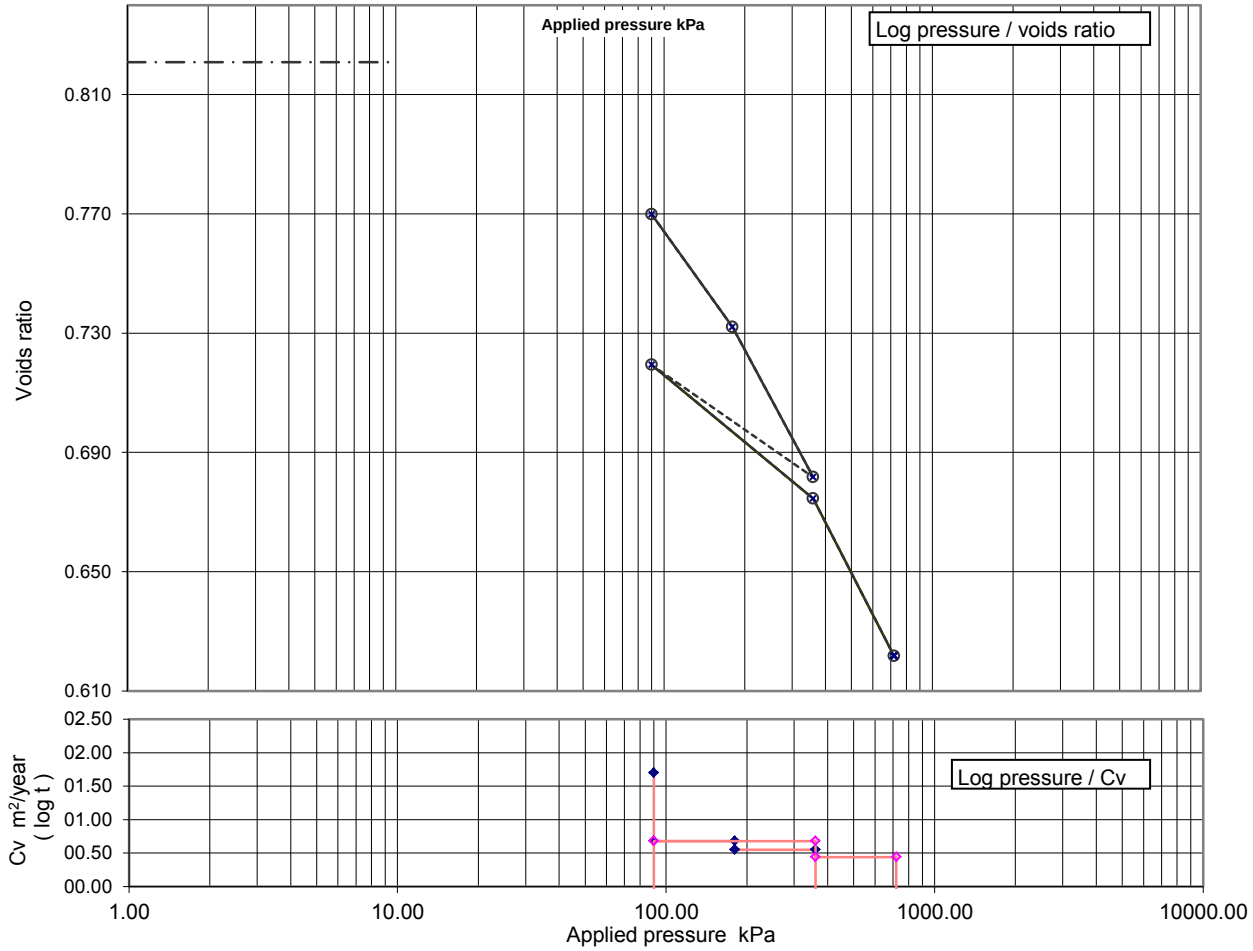
Specimen taken 10 mm from base of sample

Applied Pressure kPa	Voids ratio	mv m2/MN	cv (t50, log) m2/year	cv (t90, root) m2/year	
70	0.7692				
140	0.7566	0.102	2.4	2.6	
280	0.7195	0.151	0.25	0.26	
560	0.6673	0.108	0.21	0.22	
140	0.7137	0.066	-	-	
560	0.6591	0.076	0.24	0.26	
1120	0.6073	0.056	0.2	0.22	

ONE DIMENSIONAL CONSOLIDATION TEST

Sample Details:	SAMPLE ID:
	FES1180318041

Hole No	HEP-BH-1047
Sample Depth (m BGL)	9
Sample Type and No	UT41
Specimen Ref	



Soil description	Firm laminated brown slightly sandy slightly gravelly CLAY.
Preparation	Undisturbed
Index properties	Liquid limit %		Plastic limit %	

(if available)

Specimen details	Initial	Final	
Particle density	2.65	assumed	Mg/m3
Diameter	75.07		mm
Height	18.92	16.85	mm
Voids ratio	0.821	0.622	
Moisture content	30	25	%
Bulk density	1.89	2.04	Mg/m3
Dry density	1.46	1.63	Mg/m3
Saturation	96	105	%
Average temperature for test	20		oC

Swelling pressure	not measured	kPa

Notes :

Applied Pressure kPa	Voids ratio	mv m2/MN	cv (t50, log) m2/year	cv (t90, root) m2/year	
0	0.8209				
90	0.7699	0.311	1.7	1.9	
180	0.7321	0.237	0.68	0.74	
360	0.6817	0.161	0.55	0.56	
90	0.7193	0.083	-	-	
360	0.6745	0.097	0.68	0.74	
720	0.6217	0.088	0.44	0.48	

Specimen taken 10 mm from base of sample

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Project Name Heathrow Airport Limited

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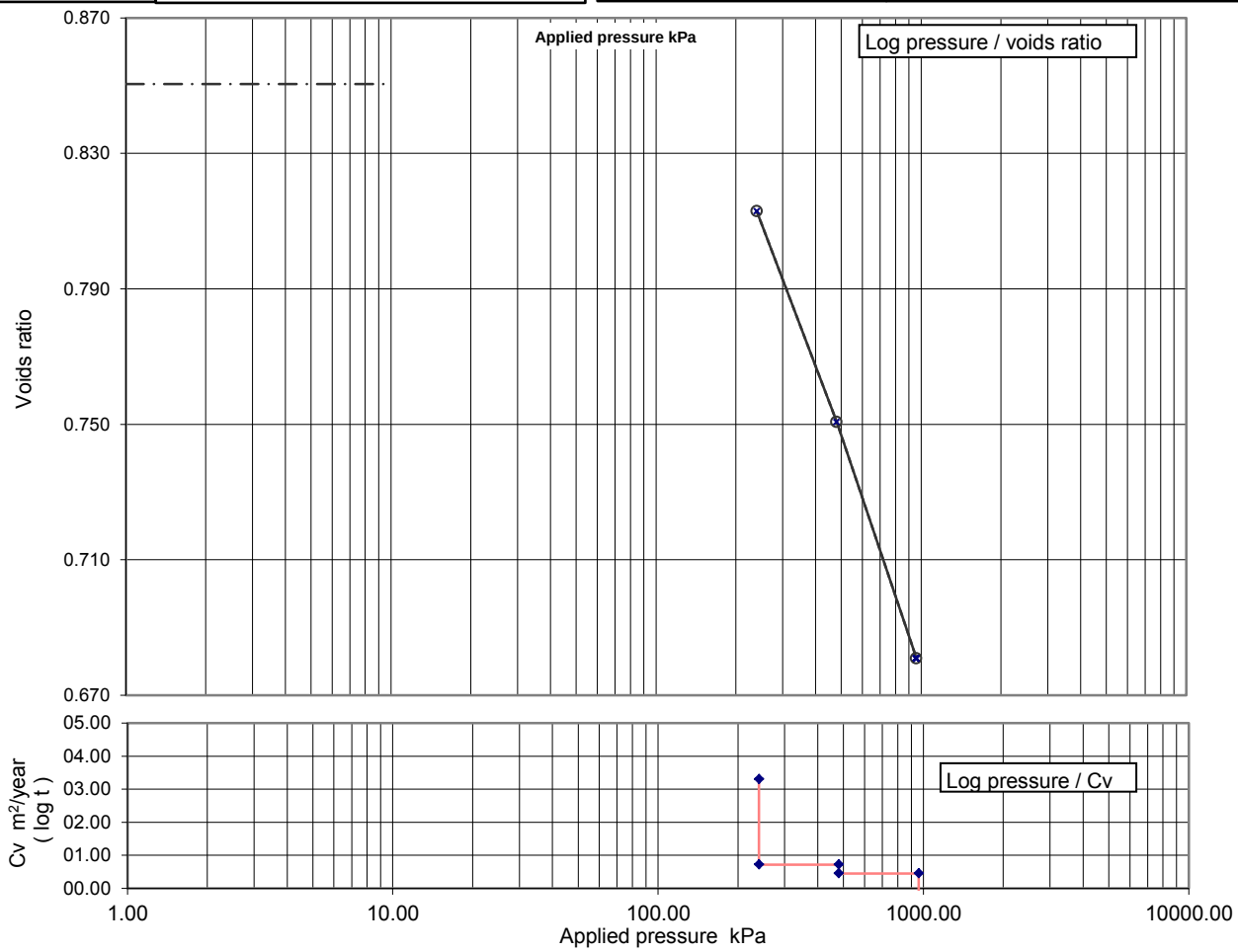
ONE DIMENSIONAL CONSOLIDATION TEST

Sample Details:	SAMPLE ID:
	FES1180318052

Hole No	HEP-BH-1047
Sample Depth (m BGL)	13
Sample Type and No	UT52
Specimen Ref	



Soil description	Firm laminated brown slightly sandy CLAY.			
Preparation	Undisturbed			
Index properties	Liquid limit %	81	Plastic limit %	31

(if available)

Specimen details	Initial	Final	
Particle density	2.65	assumed	Mg/m3
Diameter	75.03		mm
Height	18.91	17.17	mm
Voids ratio	0.850	0.681	
Moisture content	29	27	%
Bulk density	1.85	2.00	Mg/m3
Dry density	1.43	1.58	Mg/m3
Saturation	91	105	%
Average temperature for test	20		oC

Swelling pressure >120 kPa

Notes :

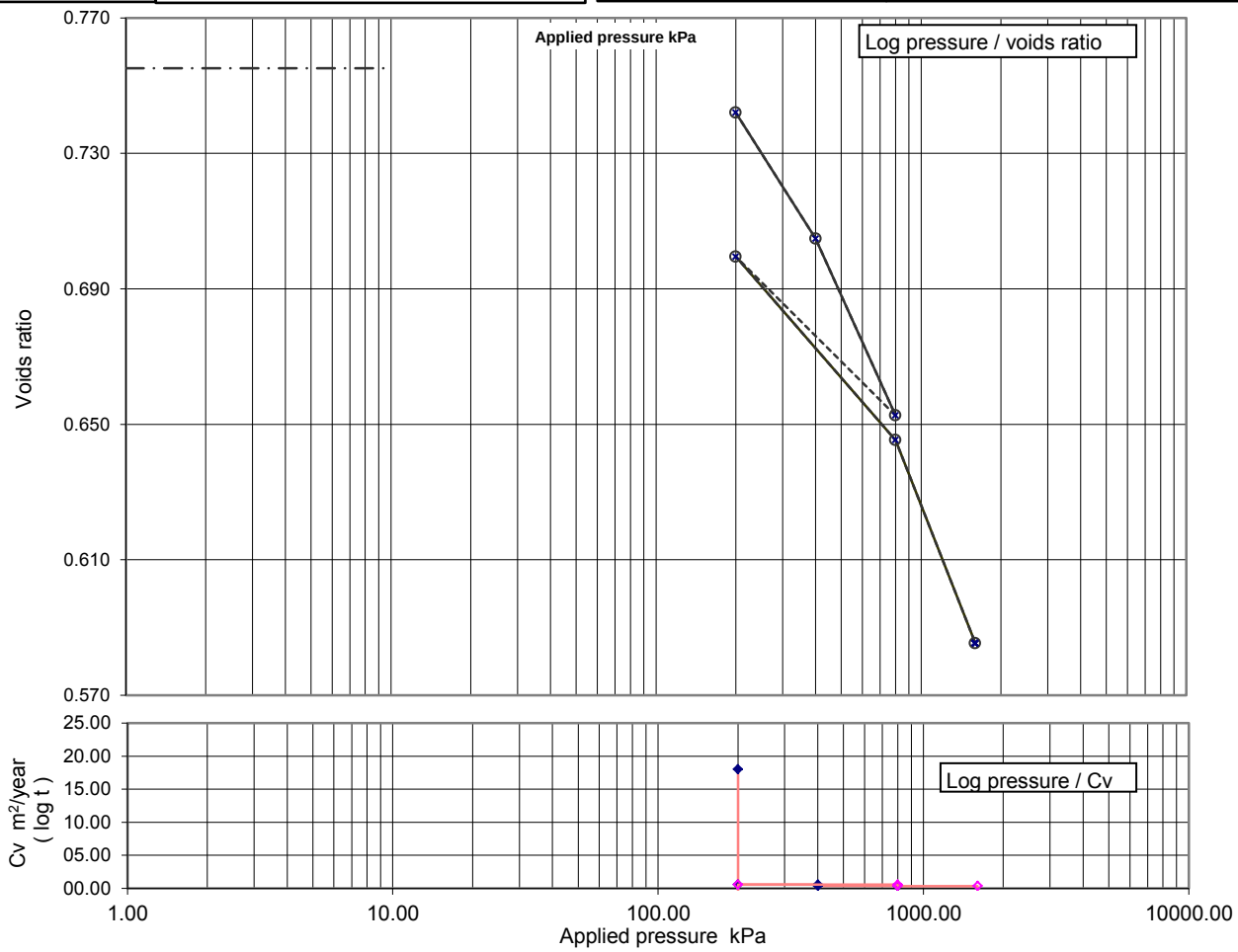
Specimen taken 40 mm from base of sample

Applied Pressure kPa	Voids ratio	mv m2/MN	cv (t50, log) m2/year	cv (t90, root) m2/year	
120	0.8505				
240	0.8129	0.169	3.3	3.6	
480	0.7507	0.143	0.72	0.79	
960	0.6809	0.083	0.45	0.48	

ONE DIMENSIONAL CONSOLIDATION TEST

Sample Details:	SAMPLE ID:
	HEPBH105020180320020

Hole No	HEP-BH-1050
Sample Depth (m BGL)	8
Sample Type and No	UT33
Specimen Ref	



Soil description	Firm laminated brown slightly sandy CLAY.			
Preparation	Undisturbed			
Index properties	Liquid limit %	67	Plastic limit %	25

(if available)

Specimen details	Initial	Final	
Particle density	2.65	assumed	Mg/m3
Diameter	75.11		mm
Height	19.11	17.26	mm
Voids ratio	0.755	0.585	
Moisture content	28	23	%
Bulk density	1.93	2.06	Mg/m3
Dry density	1.51	1.67	Mg/m3
Saturation	99	105	%
Average temperature for test	20		oC

Swelling pressure >100 kPa

Notes :

Specimen taken 10 mm from base of sample

Applied Pressure kPa	Voids ratio	mv m2/MN	cv (t50, log) m2/year	cv (t90, root) m2/year	
100	0.7551				
200	0.7420	0.075	18	19	
400	0.7048	0.107	0.55	0.58	
800	0.6526	0.077	0.37	0.39	
200	0.6995	0.047	-	-	
800	0.6453	0.053	0.56	0.59	
1600	0.5854	0.046	0.34	0.37	

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Project Name Heathrow Airport Limited

Figure

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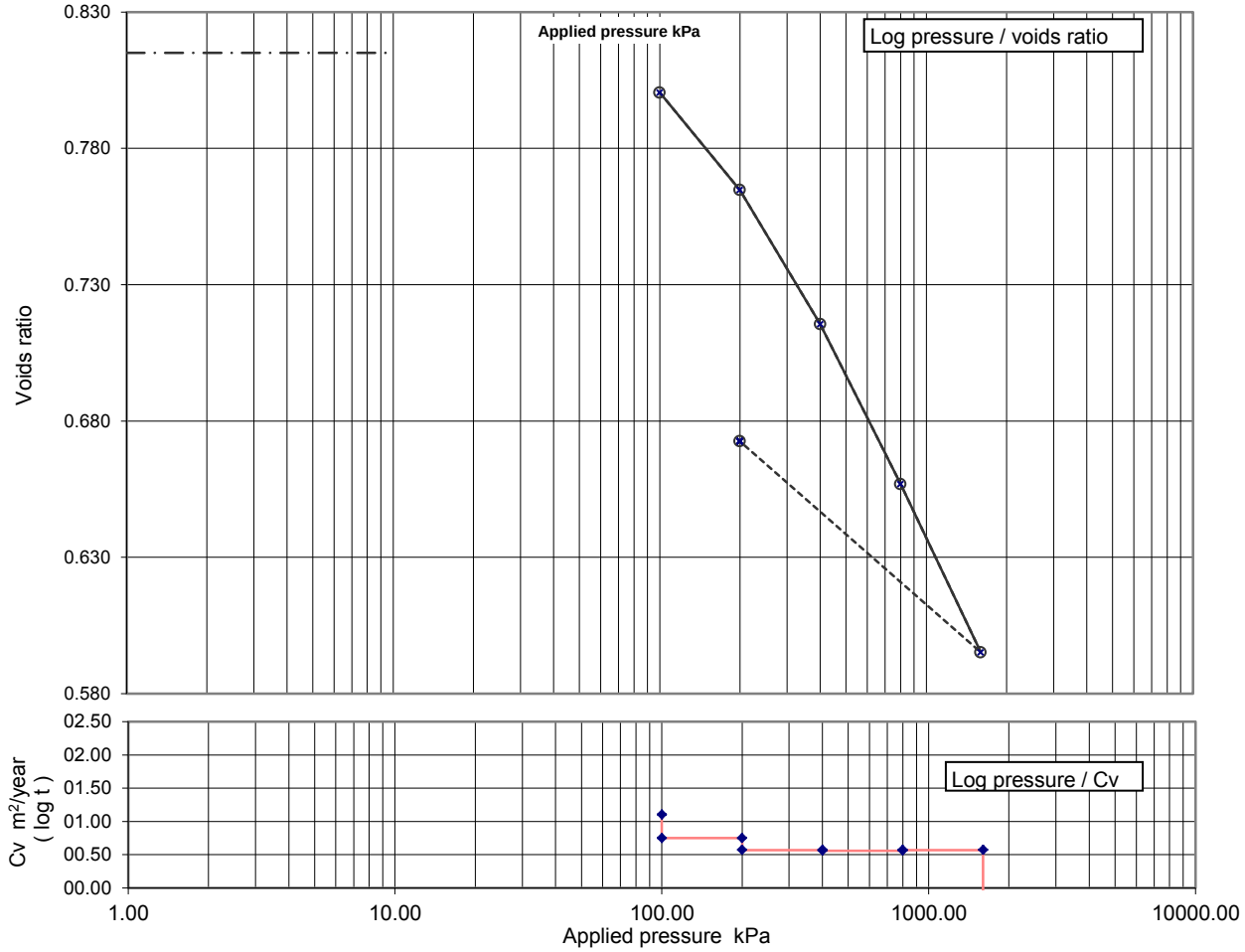
ONE DIMENSIONAL CONSOLIDATION TEST

Sample Details:	SAMPLE ID:
	HEPBH180220171208013

Hole No	HEP-BH-1802
Sample Depth (m BGL)	5
Sample Type and No	UT20
Specimen Ref	



Soil description	Stiff laminated greyish brown slightly sandy CLAY.
Preparation	Undisturbed
Index properties	Liquid limit % [ ] Plastic limit % [ ]

(if available)

Specimen details	Initial	Final	
Particle density	2.70	assumed	Mg/m3
Diameter	75.07		mm
Height	18.91	17.42	mm
Voids ratio	0.815	0.672	
Moisture content	30	26	%
Bulk density	1.94	2.04	Mg/m3
Dry density	1.49	1.61	Mg/m3
Saturation	100	105	%
Average temperature for test	20		oC

Swelling pressure >50 kPa

Notes :

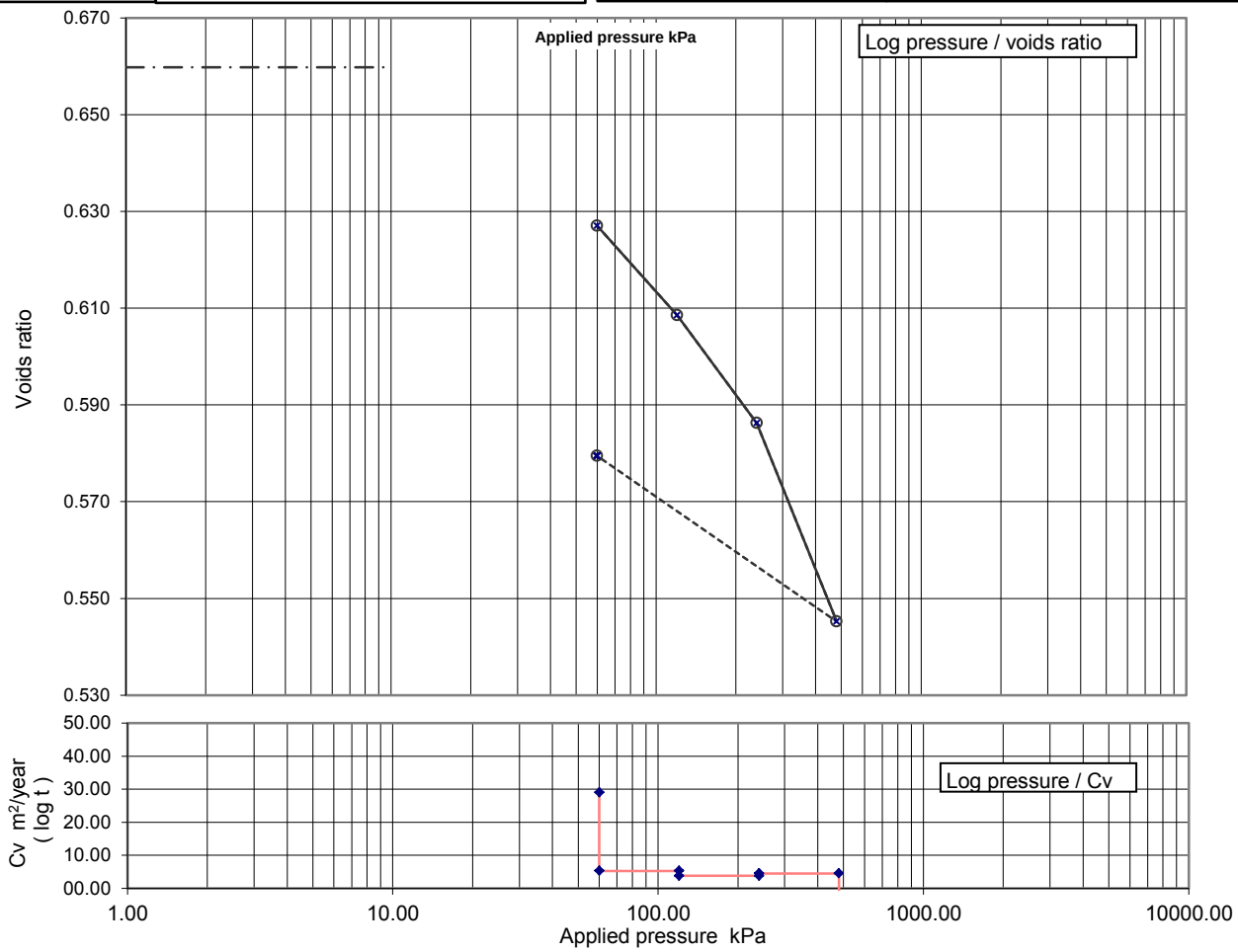
Specimen taken 10 mm from base of sample

Applied Pressure kPa	Voids ratio	mv m2/MN	cv (t50, log) m2/year	cv (t90, root) m2/year	
50	0.8150				
100	0.8004	0.161	1.1	1.2	
200	0.7646	0.199	0.75	0.79	
400	0.7155	0.139	0.57	0.58	
800	0.6568	0.085	0.56	0.6	
1600	0.5951	0.047	0.57	0.61	
200	0.6725	0.035	-	-	

ONE DIMENSIONAL CONSOLIDATION TEST

Sample Details:	SAMPLE ID:
	HEPBH180420171206016

Hole No	HEP-BH-1804
Sample Depth (m BGL)	6.3
Sample Type and No	UT27
Specimen Ref	



Soil description	Firm brown slightly sandy silty CLAY becoming laminated grey slightly sandy silty CLAY towards base.
Preparation	Undisturbed
Index properties	Liquid limit % 55 Plastic limit % 24

(if available)

Specimen details	Initial	Final	
Particle density	2.65	assumed	Mg/m3
Diameter	75.07		mm
Height	18.82	17.90	mm
Voids ratio	0.660	0.579	
Moisture content	25	23	%
Bulk density	1.99	2.06	Mg/m3
Dry density	1.60	1.68	Mg/m3
Saturation	100	105	%
Average temperature for test	20		oC

Swelling pressure	not measured	kPa

Notes :

Applied Pressure kPa	Voids ratio	mv m2/MN	cv (t50, log) m2/year	cv (t90, root) m2/year	
0	0.6598				
60	0.6270	0.330	29	31	
120	0.6086	0.189	5.3	5.7	
240	0.5862	0.116	3.8	3.9	
480	0.5452	0.108	4.5	4.6	
60	0.5794	0.053	-	-	

Specimen taken 10 mm from base of sample

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SLR 5.3
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UKAS TESTING
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SOCOTEC

Project No	N8135-18
Project Name	Heathrow Airport Limited

Figure
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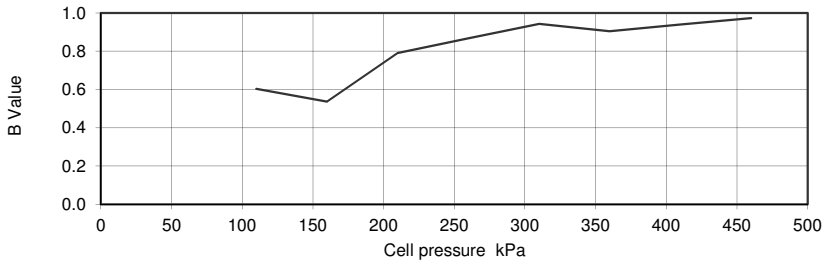
Determination of Permeability in a Triaxial Cell
(BS1377 : Part 6 : 1990, clause 6 - Constant Head test)

Project No	N8135-18	Sample Details:	Hole No.	HEP-BH-1		
Project Name	Heathrow Airport Limited		Depth (m BGL)	6.50		
			Sample No	27	Type	UT
			ID			
			Spec Ref			

Specimen Details

				Initial	Final	
Soil Description	Firm brown slightly sandy slightly gravelly CLAY.					
Specimen Type /Preparation	UNDISTURBED		Bulk Density	2.02	2.01	Mg/m³
			Water Content	25.3	27.2	%
Length	100.9	mm	Dry density	1.61	1.58	Mg/m³
Diameter	103.8	mm	Voids ratio	0.65	0.68	
Particle density	2.65	Mg/m³ Assumed	Degree of saturation	104	106	%

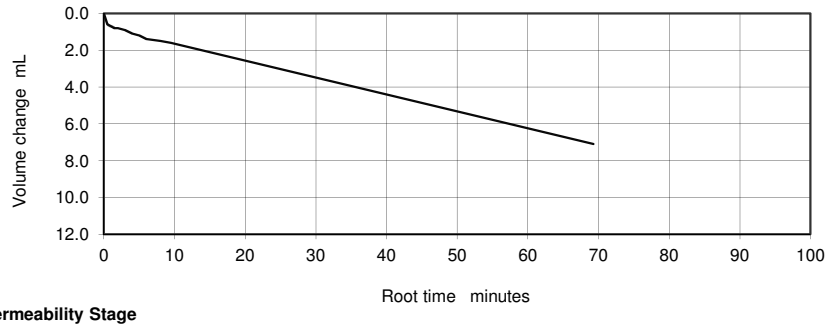
Saturation Stage



Method:
Increments of cell and back pressure

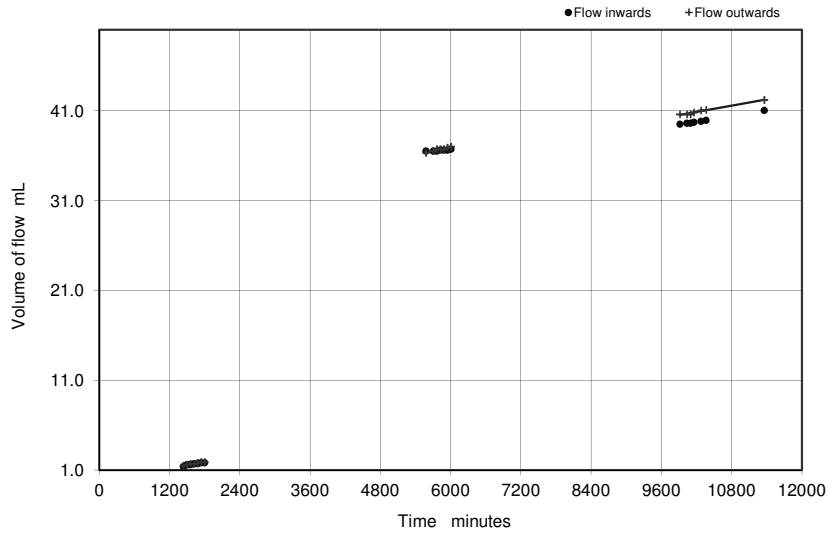
Cell pressure increments	50	kPa
Differential Pressure	10	kPa
Final Cell Pressure	460	kPa
Final pore water pressure	430	kPa
Final B Value	0.97	

Consolidation Stage



Drainage Condition	to one end only	
Cell pressure applied	510	kPa
Back pressure applied	450	kPa
Effective stress	60	kPa

Permeability Stage



Cell Pressure	515	kPa
Top Pressure	450	kPa
Base Pressure	460	kPa
Mean Effective Stress	60	kPa
Differential Pressure	10	kPa
Hydraulic gradient	10	
Mean rate of flow	0.00118	ml/min
Temperature during test	20.2	°C

PERMEABILITY, *kv*

(at 20°C) **2.3×10^{-10}** **m/s**

Notes

Ref			Figure
SLR6.6 Rev 2.0 Feb18	SOCOTEC	Printed:22/11/2018 09:37	**TXLP 1** sheet 1 of 1

UKAS TESTING 1157

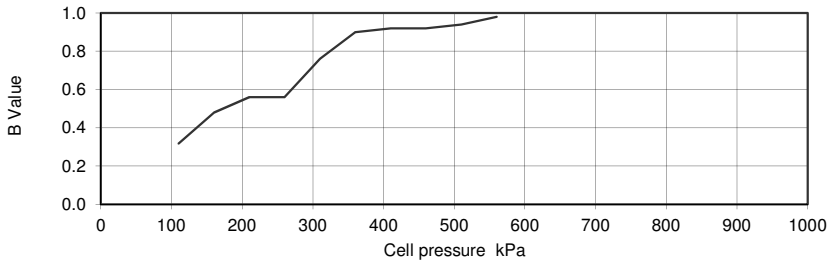
Determination of Permeability in a Triaxial Cell
(BS1377 : Part 6 : 1990, clause 6 - Constant Head test)

Project No	N8135-18	Sample Details:	Hole No.	HEP - BH - 12		
Project Name	HEATHROW AIRPORT LIMITED (3)		Depth (m BGL)	5.20		
			Sample No	33	Type	UT
			ID			
			Spec Ref			

Specimen Details

				Initial	Final	
Soil Description	Firm brown slightly sandy slightly gravelly CLAY					
Specimen Type /Preparation	UNDISTURBED		Bulk Density	1.95	1.95	Mg/m³
			Water Content	27.8	30.6	%
Length	100.8	mm	Dry density	1.53	1.49	Mg/m³
Diameter	104.3	mm	Voids ratio	0.73	0.78	
Particle density	2.65	Mg/m³ Assumed	Degree of saturation	101	104	%

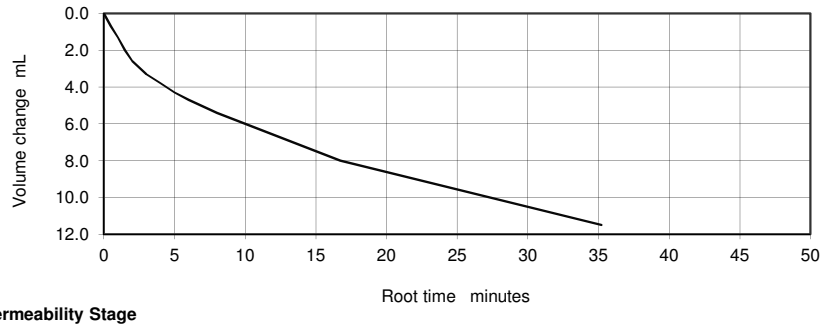
Saturation Stage



Method:
Increments of cell and back pressure

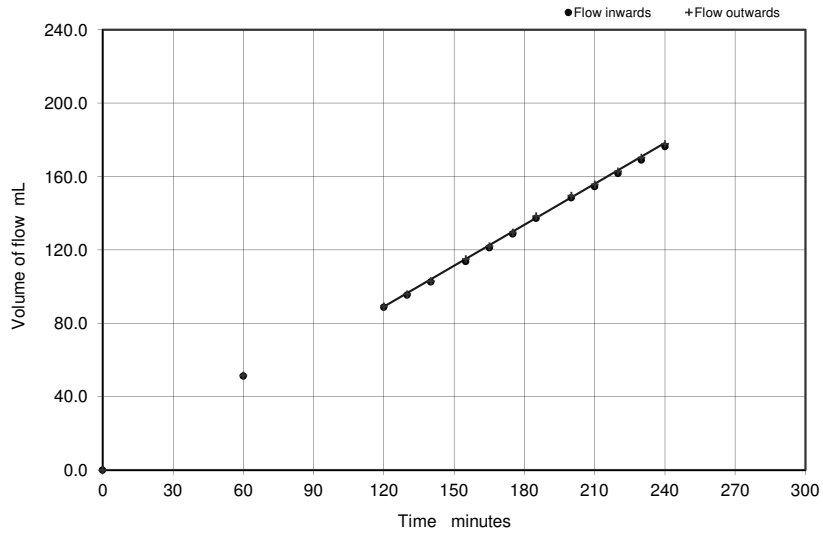
Cell pressure increments	50	kPa
Differential Pressure	10	kPa
Final Cell Pressure	560	kPa
Final pore water pressure	545	kPa
Final B Value	0.98	

Consolidation Stage



Drainage Condition	to one end only	
Cell pressure applied	590	kPa
Back pressure applied	550	kPa
Effective stress	40	kPa

Permeability Stage



Cell Pressure	595	kPa
Top Pressure	550	kPa
Base Pressure	560	kPa
Mean Effective Stress	40	kPa
Differential Pressure	10	kPa
Hydraulic gradient	10	
Mean rate of flow	0.74396	ml/min
Temperature during test	20.1	°C

PERMEABILITY, *kv*

(at 20°C) **1.4×10^{-7}** **m/s**

Notes H.G= 10kPa
2x120 min runs undertaken due to flow speed.

Ref SLR6.6 Rev 2.0 Feb18	SOCOTEC	1157	Printed:22/09/2018 15:12
			Figure **TXLP 1** sheet 1 of 1

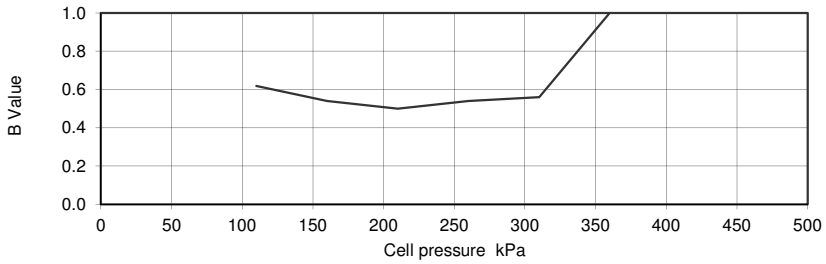
Determination of Permeability in a Triaxial Cell
(BS1377 : Part 6 : 1990, clause 6 - Constant Head test)

Project No	N8135-18	Sample Details:	Hole No.	HEP-BH-12	
Project Name	Heathrow Airport Limited (3)		Depth (m BGL)	8.20 - 8.65	
			Sample No	41	Type UT
			ID		
			Spec Ref		

Specimen Details

				Initial	Final	
Soil Description	Firm brown slightly sandy CLAY					
Specimen Type /Preparation	UNDISTURBED		Bulk Density	2.02	2.02	Mg/m³
			Water Content	25.2	25.8	%
Length	100.7	mm	Dry density	1.61	1.60	Mg/m³
Diameter	104.7	mm	Voids ratio	0.65	0.65	
Particle density	2.65	Mg/m³ Assumed	Degree of saturation	104	105	%

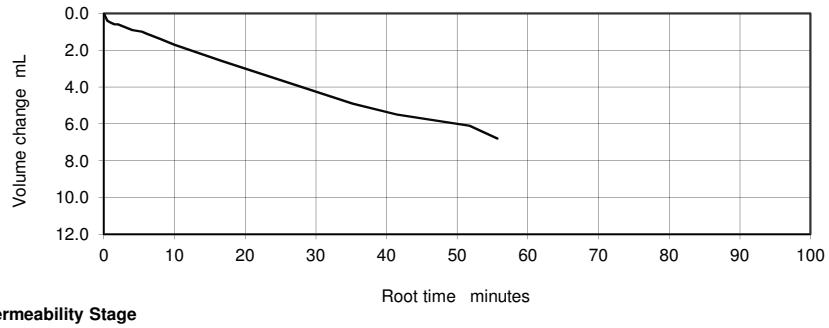
Saturation Stage



Method:
Increments of cell and back pressure

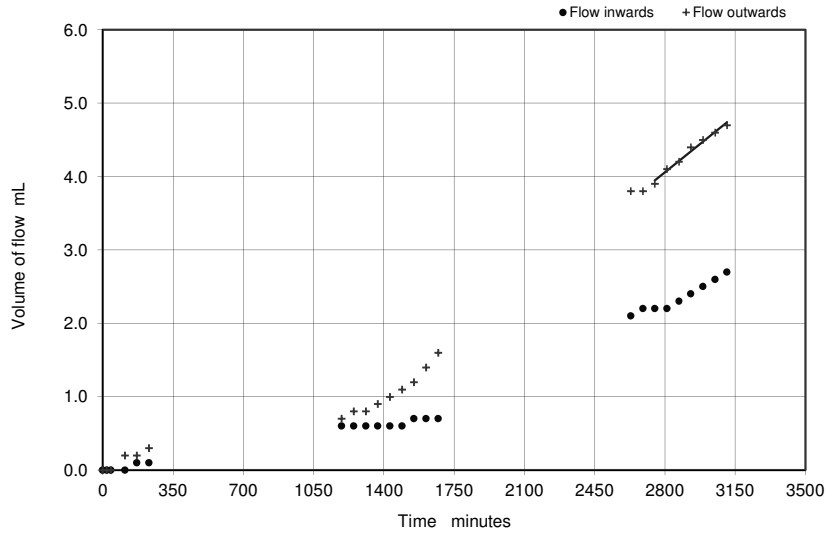
Cell pressure increments	50	kPa
Differential Pressure	10	kPa
Final Cell Pressure	360	kPa
Final pore water pressure	318	kPa
Final B Value	1.00	

Consolidation Stage



Drainage Condition	to one end only	
Cell pressure applied	375	kPa
Back pressure applied	300	kPa
Effective stress	75	kPa

Permeability Stage



Cell Pressure	380	kPa
Top Pressure	300	kPa
Base Pressure	310	kPa
Mean Effective Stress	75	kPa
Differential Pressure	10	kPa
Hydraulic gradient	10	
Mean rate of flow	0.00220	ml/min
Temperature during test	20.1	°C

PERMEABILITY, *kv*

(at 20°C) **4.2×10^{-10}** **m/s**

Notes H.G=10kPa increasing to 60kPa

Ref SLR6.6 Rev 2.0 Feb18	SOCOTEC	Printed:15/11/2018 11:31	**Figure** **TXLP** sheet 1 of 1
	UKAS TESTING 1157		

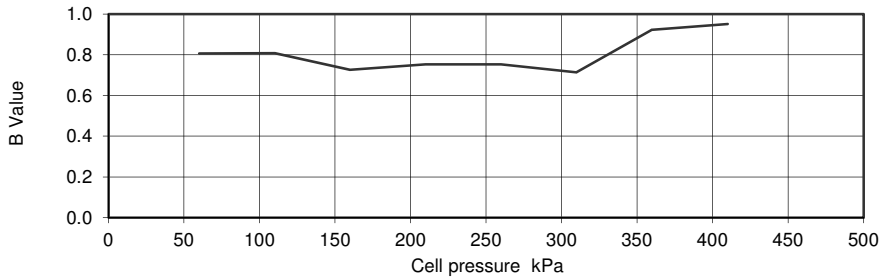
Determination of Permeability in a Triaxial Cell
(BS1377 : Part 6 : 1990, clause 6 - Constant Head test)

Project No	N8135-18	Sample Details:	Hole No.	HEP-BH-23	
Project Name	Heathrow Airport Limited		Depth (m BGL)	5.00	
			Sample No	23	Type UT
			ID		
			Spec Ref		

Specimen Details

				Initial	Final	
Soil Description	Firm brown slightly sandy slightly gravelly CLAY		Bulk Density	1.98	2.01	Mg/m³
Specimen Type /Preparation	UNDISTURBED		Water Content	26.4	27.2	%
Length	100.1	mm	Dry density	1.57	1.58	Mg/m³
Diameter	103.3	mm	Voids ratio	0.69	0.68	
Particle density	2.65	Mg/m³ Assumed	Degree of saturation	102	106	%

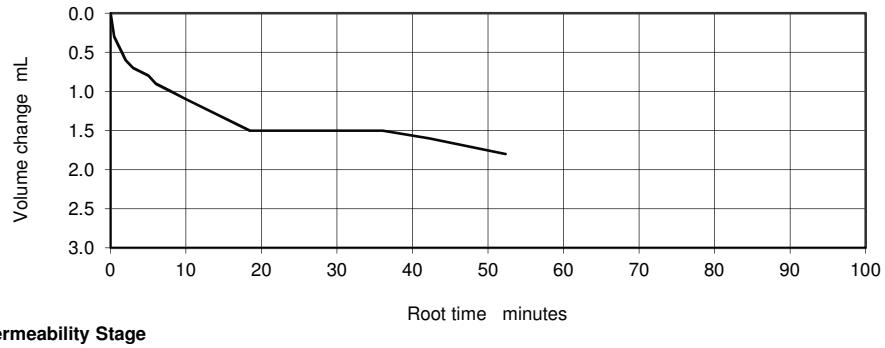
Saturation Stage



Method:
Increments of cell and back pressure

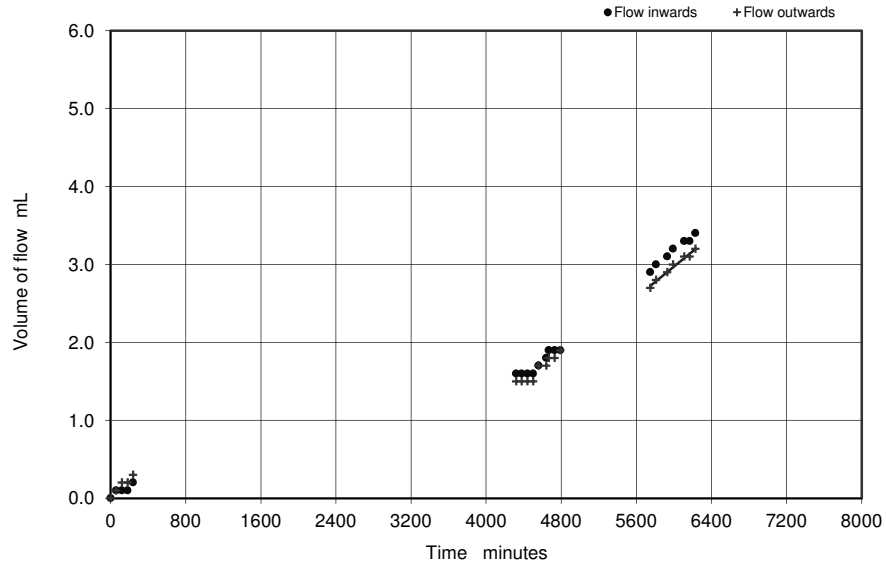
Cell pressure increments	50	kPa
Differential Pressure	10	kPa
Final Cell Pressure	410	kPa
Final pore water pressure	338	kPa
Final B Value	0.95	

Consolidation Stage



Drainage Condition	to one end only	
Cell pressure applied	450	kPa
Back pressure applied	400	kPa
Effective stress	50	kPa

Permeability Stage



Cell Pressure	455	kPa
Top Pressure	400	kPa
Base Pressure	410	kPa
Mean Effective Stress	50	kPa
Differential Pressure	10	kPa
Hydraulic gradient	10	
Mean rate of flow	0.00098	ml/min
Temperature during test	20	°C

PERMEABILITY, *kv*

(at 20°C) **1.9 x 10^{-10} m/s**

Notes H.G 20kPa increasing to 50kPa

Ref SLR6.6 Rev 2.0 Feb18	SOCOTEC	Printed:04/07/2018 14:02	**Figure** **TXLP** sheet 1 of 1
	UKAS TESTING 1157		

Determination of Permeability in a Triaxial Cell
(BS1377 : Part 6 : 1990, clause 6 - Constant Head test)

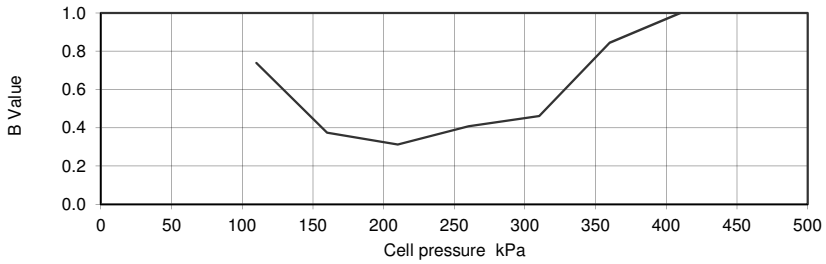
Project No	N8135-18	Sample Details:	Hole No.	HEP-BH-25	
Project Name	Heathrow (2)		Depth (m BGL)	14.50	
			Sample No	49	Type UT
			ID		
			Spec Ref		

Specimen Details

Soil Description: Firm to stiff brown slightly sandy CLAY.

				Initial	Final	
Specimen Type /Preparation	UNDISTURBED		Bulk Density	2.04	1.98	Mg/m³
			Water Content	23.1	25.1	%
Length	99.8	mm	Dry density	1.66	1.59	Mg/m³
Diameter	101.1	mm	Voids ratio	0.60	0.67	
Particle density	2.65	Mg/m³ Assumed	Degree of saturation	103	99	%

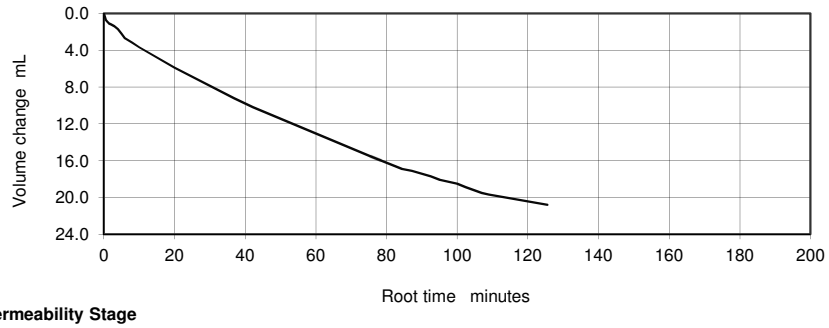
Saturation Stage



Method: Increments of cell and back pressure

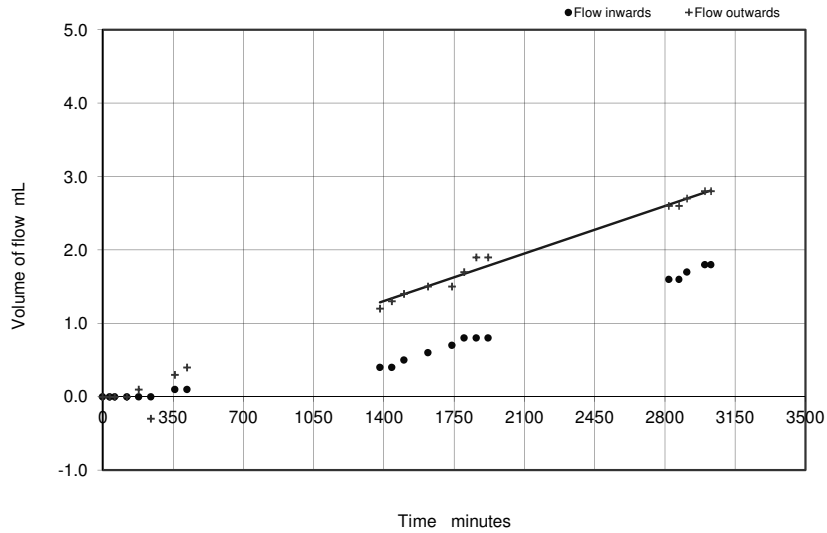
Cell pressure increments	50	kPa
Differential Pressure	10	kPa
Final Cell Pressure	410	kPa
Final pore water pressure	353	kPa
Final B Value	1.00	

Consolidation Stage



Drainage Condition	to one end only	
Cell pressure applied	520	kPa
Back pressure applied	350	kPa
Effective stress	170	kPa

Permeability Stage



Cell Pressure	525	kPa
Top Pressure	350	kPa
Base Pressure	360	kPa
Mean Effective Stress	170	kPa
Differential Pressure	10	kPa
Hydraulic gradient	10	
Mean rate of flow	0.00093	ml/min
Temperature during test	20.2	°C

PERMEABILITY, *kv*

(at 20°C) **1.9 x 10^{-10}** m/s

Notes H.G=10kPa increasing to 70kPa

Ref SLR6.6 Rev 2.0 Feb18	SOCOTEC	Printed:29/10/2018 16:59	**Figure** **TXLP** sheet 1 of 1
	UKAS TESTING 1157		

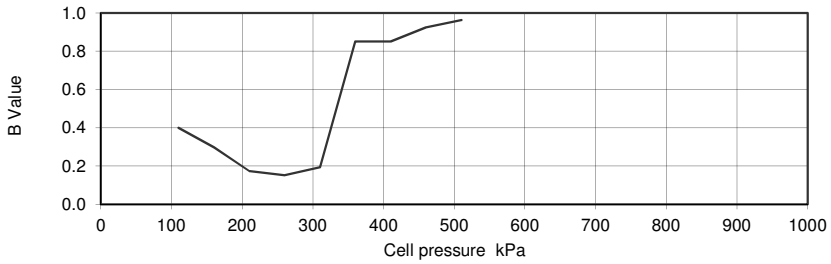
Determination of Permeability in a Triaxial Cell
(BS1377 : Part 6 : 1990, clause 6 - Constant Head test)

Project No	N8135-18	Sample Details:	Hole No.	HEP-BH-44		
Project Name	Heathrow Airport Limited 3		Depth (m BGL)	11.50		
			Sample No	34	Type	UT
			ID			
			Spec Ref			

Specimen Details

				Initial	Final	
Soil Description	Firm brown slightly sandy CLAY.					
Specimen Type /Preparation	UNDISTURBED		Bulk Density	2.02	2.02	Mg/m³
			Water Content	25.6	26.2	%
Length	100.9	mm	Dry density	1.61	1.60	Mg/m³
Diameter	103.1	mm	Voids ratio	0.65	0.66	
Particle density	2.65	Mg/m³ Assumed	Degree of saturation	105	105	%

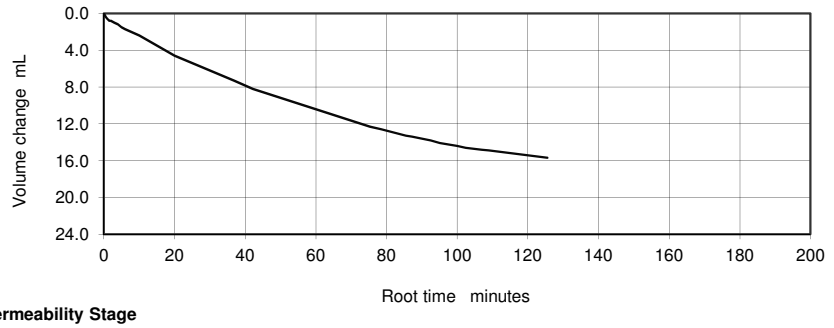
Saturation Stage



Method:
Increments of cell and back pressure

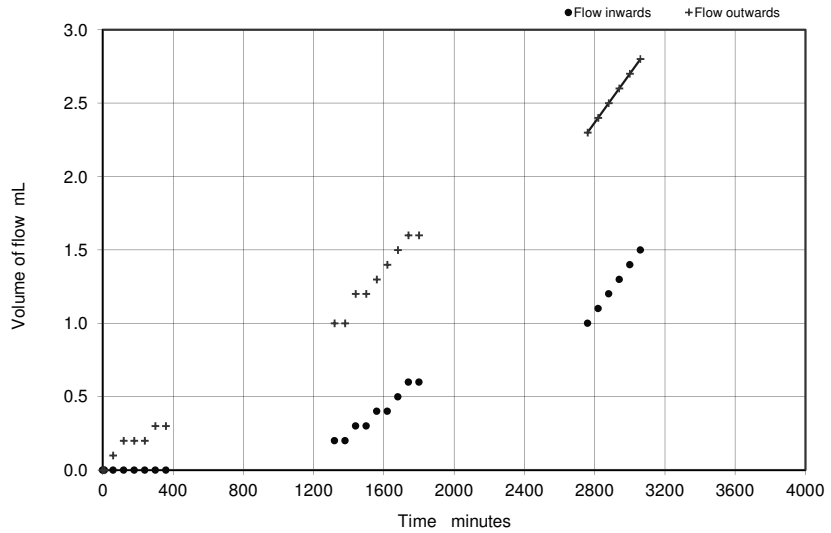
Cell pressure increments	50	kPa
Differential Pressure	10	kPa
Final Cell Pressure	510	kPa
Final pore water pressure	435	kPa
Final B Value	0.96	

Consolidation Stage



Drainage Condition	to one end only	
Cell pressure applied	595	kPa
Back pressure applied	450	kPa
Effective stress	145	kPa

Permeability Stage



Cell Pressure	600	kPa
Top Pressure	450	kPa
Base Pressure	460	kPa
Mean Effective Stress	145	kPa
Differential Pressure	10	kPa
Hydraulic gradient	10	
Mean rate of flow	0.00167	ml/min
Temperature during test	20.1	°C

PERMEABILITY, *kv*

(at 20°C) **3.3 x 10^{-10}** **m/s**

Notes H.G=10kPa increasing to 70kPa

Ref SLR6.6 Rev 2.0 Feb18	SOCOTEC	Printed:22/09/2018 15:06	**Figure** **TXLP 1** sheet 1 of 1
	UKAS TESTING 1157		

Determination of Permeability in a Triaxial Cell
(BS1377 : Part 6 : 1990, clause 6 - Constant Head test)

Project No	N8135-18	Sample Details:	Hole No.	HEP - BH - 44	
Project Name	HEATHROW AIRPORT LIMITED (3)		Depth (m BGL)	19.50	
			Sample No	50	Type UT
			ID		
			Spec Ref		

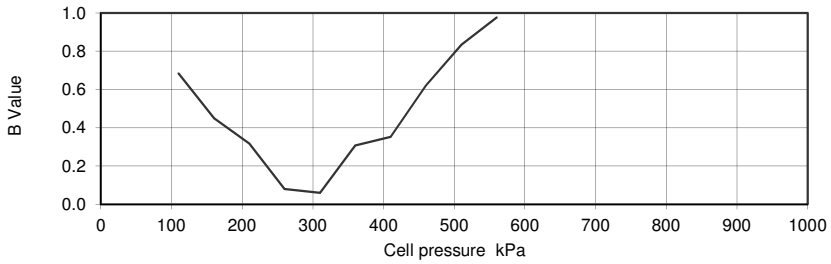
Specimen Details

Soil Description: Firm brownish slightly sandy CLAY.

Specimen Type /Preparation	UNDISTURBED		
Length	100.7	mm	
Diameter	103.7	mm	
Particle density	2.65	Mg/m³	Assumed

	Initial	Final	
Bulk Density	2.01	2.00	Mg/m³
Water Content	25.6	26.8	%
Dry density	1.60	1.58	Mg/m³
Voids ratio	0.65	0.68	
Degree of saturation	104	105	%

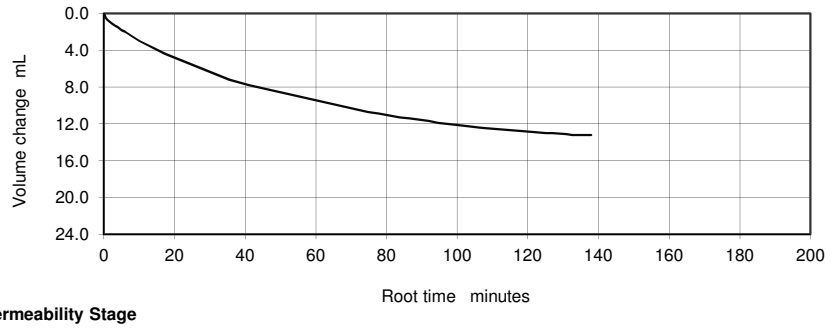
Saturation Stage



Method:
Increments of cell and back pressure

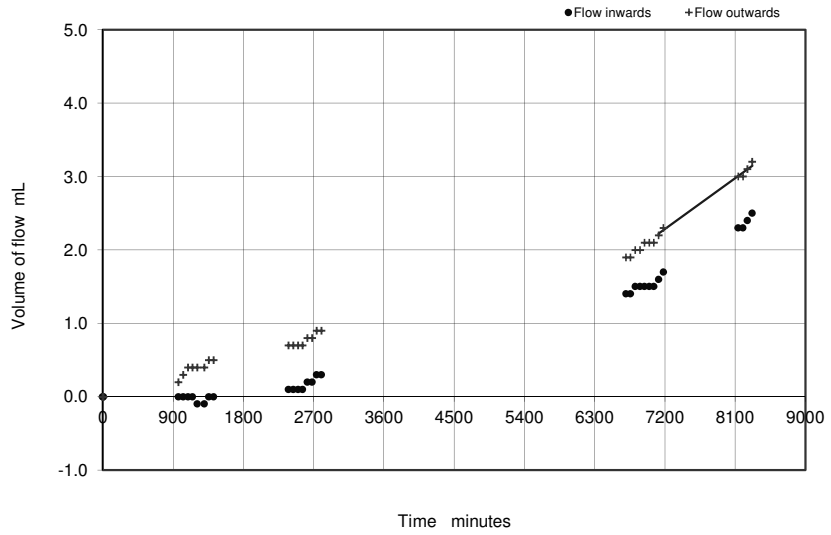
Cell pressure increments	50	kPa
Differential Pressure	10	kPa
Final Cell Pressure	560	kPa
Final pore water pressure	396	kPa
Final B Value	0.98	

Consolidation Stage



Drainage Condition	to one end only	
Cell pressure applied	700	kPa
Back pressure applied	500	kPa
Effective stress	200	kPa

Permeability Stage



Cell Pressure	705	kPa
Top Pressure	500	kPa
Base Pressure	510	kPa
Mean Effective Stress	200	kPa
Differential Pressure	10	kPa
Hydraulic gradient	10	
Mean rate of flow	0.00077	ml/min
Temperature during test	19.5	°C

PERMEABILITY, *kv*

(at 20°C) **1.5×10^{-10}** m/s

Notes H.G=10kPa increasing to 120kPa

Ref SLR6.6 Rev 2.0 Feb18	SOCOTEC	1157	Printed:03/10/2018 13:40
Figure **TXLP** sheet 1 of 1			

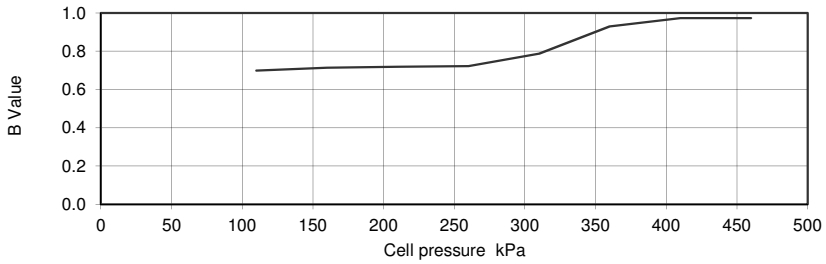
Determination of Permeability in a Triaxial Cell
(BS1377 : Part 6 : 1990, clause 6 - Constant Head test)

Project No	N8135-18	Sample Details:	Hole No.	HEP-BH-47		
Project Name	Heathrow Airport Limited		Depth (m BGL)	8.00		
			Sample No	28	Type	UT
			ID			
			Spec Ref			

Specimen Details

				Initial	Final	
Soil Description	Firm grey slightly sandy laminated CLAY.					
Specimen Type /Preparation	UNDISTURBED		Bulk Density	1.97	1.98	Mg/m³
			Water Content	28.0	29.5	%
Length	100.7	mm	Dry density	1.54	1.53	Mg/m³
Diameter	103.4	mm	Voids ratio	0.72	0.74	
Particle density	2.65	Mg/m³ Assumed	Degree of saturation	103	106	%

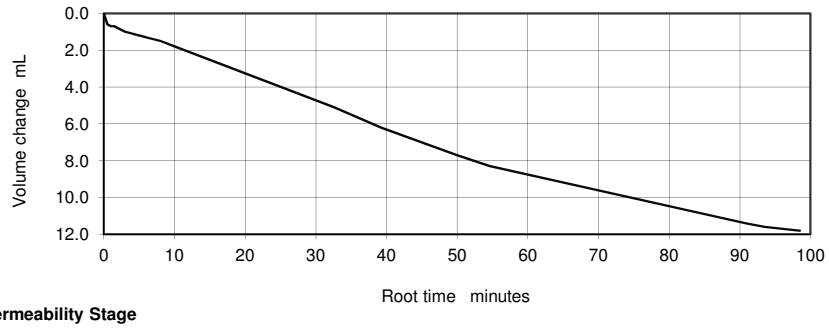
Saturation Stage



Method:
Increments of cell and back pressure

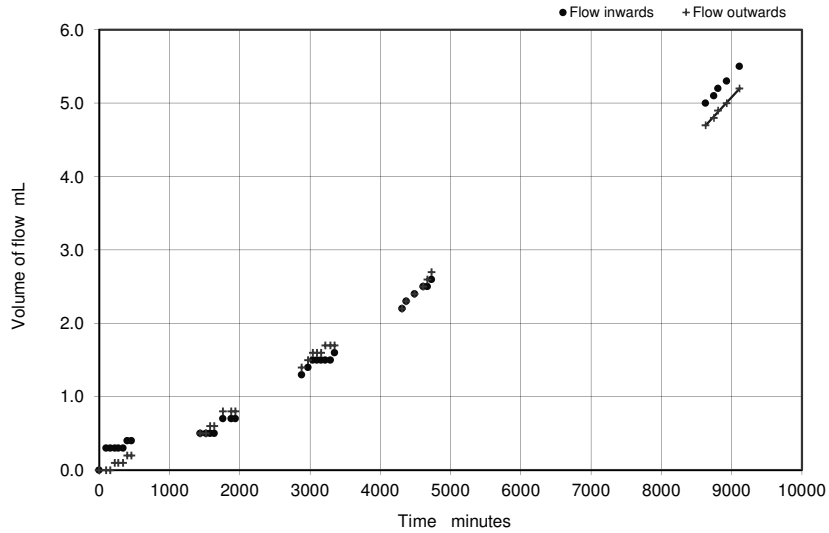
Cell pressure increments	50	kPa
Differential Pressure	10	kPa
Final Cell Pressure	460	kPa
Final pore water pressure	434	kPa
Final B Value	0.97	

Consolidation Stage



Drainage Condition	to one end only	
Cell pressure applied	475	kPa
Back pressure applied	400	kPa
Effective stress	75	kPa

Permeability Stage



Cell Pressure	480	kPa
Top Pressure	400	kPa
Base Pressure	410	kPa
Mean Effective Stress	75	kPa
Differential Pressure	10	kPa
Hydraulic gradient	10	
Mean rate of flow	0.00104	ml/min
Temperature during test	21.2	°C

PERMEABILITY, *kv*

(at 20°C) **2.0 x 10^{-10}** **m/s**

Notes H.G=10kPa increasing to 50kPa

Ref SLR6.6 Rev 2.0 Feb18	SOCOTEC	Printed:22/11/2018 12:55	**Figure** **TXLP 1** sheet 1 of 1
	UKAS TESTING 1157		

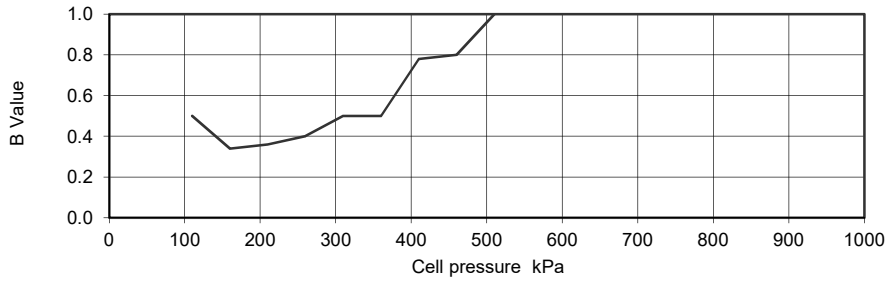
Determination of Permeability in a Triaxial Cell
(BS1377 : Part 6 : 1990, clause 6 - Constant Head test)

Project No	N8135-18	Sample Details:	Hole No.	HEP-BH-50	
Project Name	Heathrow (3)		Depth (m BGL)	9.00	
			Sample No	44	Type UT
			ID		
			Spec Ref		

Specimen Details

				Initial	Final	
Soil Description	Firm to stiff grey slightly sandy CLAY		Bulk Density	1.97	2.00	Mg/m³
Specimen Type /Preparation	UNDISTURBED		Water Content	26.4	27.8	%
Length	100.3	mm	Dry density	1.56	1.56	Mg/m³
Diameter	103.6	mm	Voids ratio	0.70	0.69	
Particle density	2.65	Mg/m³ Assumed	Degree of saturation	100	106	%

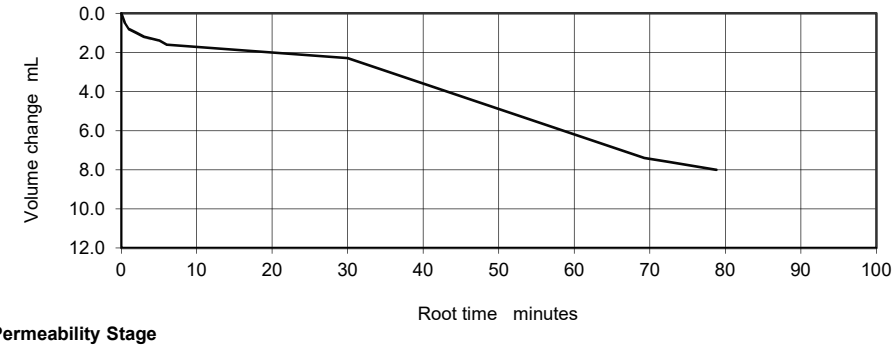
Saturation Stage



Method:
Increments of cell and back pressure

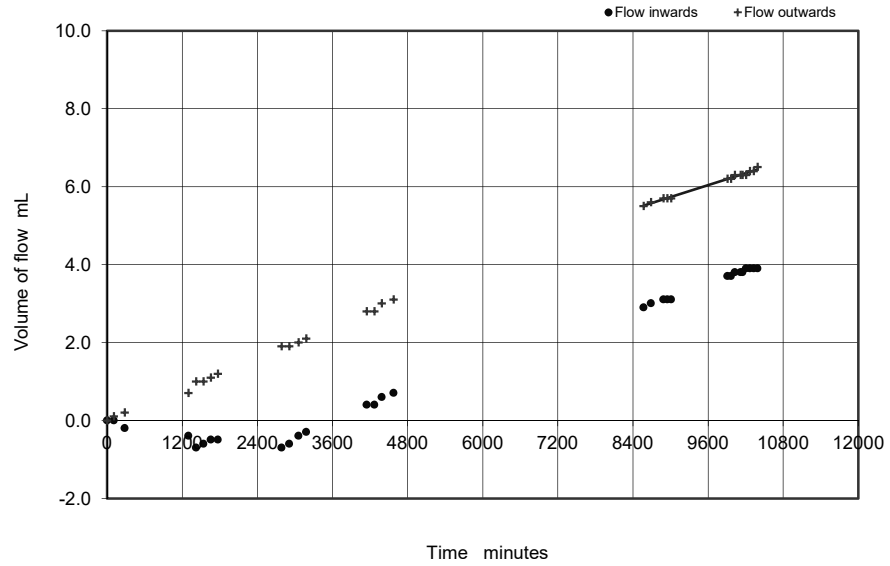
Cell pressure increments	50	kPa
Differential Pressure	10	kPa
Final Cell Pressure	510	kPa
Final pore water pressure	464	kPa
Final B Value	1.00	

Consolidation Stage



Drainage Condition	to one end only	
Cell pressure applied	535	kPa
Back pressure applied	450	kPa
Effective stress	85	kPa

Permeability Stage



Cell Pressure	540	kPa
Top Pressure	450	kPa
Base Pressure	460	kPa
Mean Effective Stress	85	kPa
Differential Pressure	10	kPa
Hydraulic gradient	10	
Mean rate of flow	0.00051	ml/min
Temperature during test	20.5	°C

PERMEABILITY, *kv*

(at 20°C) **9.9 x 10^{-11}** **m/s**

Notes HG=10kPa increasing to 70kPa

Ref SLR6.6 Rev 2.0 Feb18	SOCOTEC	Printed:29/07/2018 19:23	**Figure** **TXLP 1** sheet 1 of 1
	UKAS TESTING 1157		

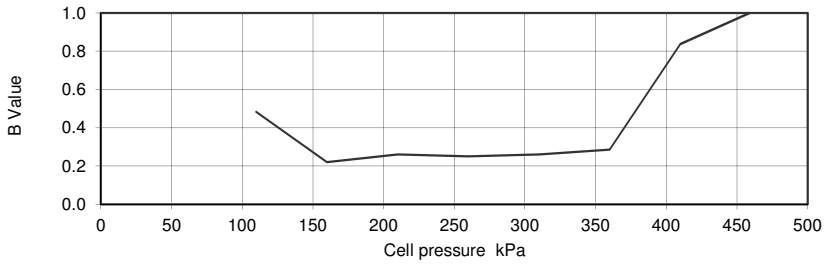
Determination of Permeability in a Triaxial Cell
(BS1377 : Part 6 : 1990, clause 6 - Constant Head test)

Project No	N8135-18	Sample Details:	Hole No.	HEP-BH-821		
Project Name	Heathrow (2)		Depth (m BGL)	11.00		
			Sample No	41	Type	UT
			ID			
			Spec Ref			

Specimen Details

				Initial	Final	
Soil Description	Stiff brown slightly sandy silty CLAY.					
Specimen Type /Preparation	UNDISTURBED		Bulk Density	2.01	2.01	Mg/m³
			Water Content	25.6	26.8	%
Length	100.7	mm	Dry density	1.60	1.58	Mg/m³
Diameter	102.0	mm	Voids ratio	0.66	0.67	
Particle density	2.65	Mg/m³ Assumed	Degree of saturation	103	105	%

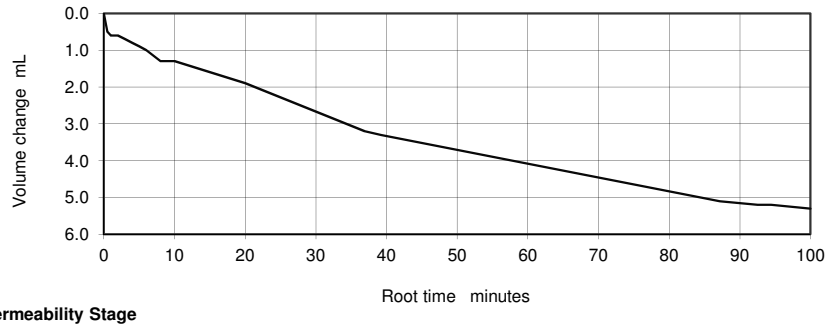
Saturation Stage



Method:
Increments of cell and back pressure

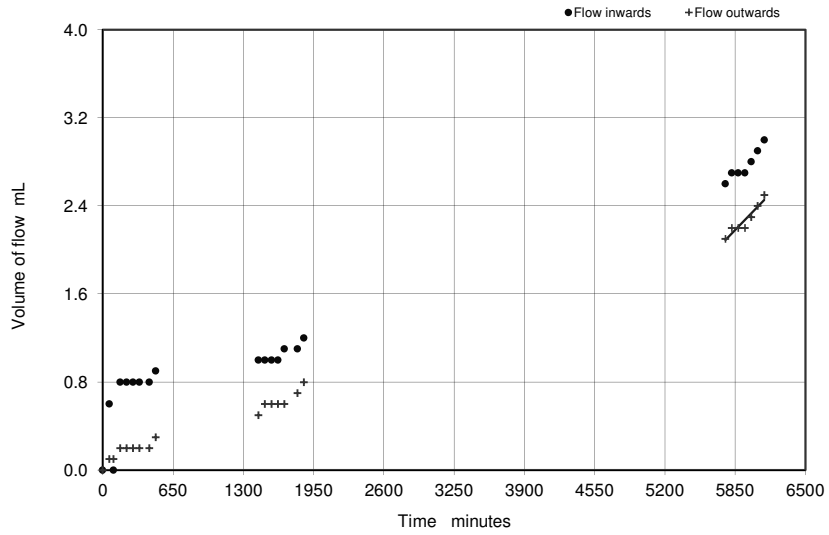
Cell pressure increments	50	kPa
Differential Pressure	10	kPa
Final Cell Pressure	460	kPa
Final pore water pressure	350	kPa
Final B Value	1.00	

Consolidation Stage



Drainage Condition	to one end only	
Cell pressure applied	520	kPa
Back pressure applied	400	kPa
Effective stress	120	kPa

Permeability Stage



Cell Pressure	525	kPa
Top Pressure	400	kPa
Base Pressure	410	kPa
Mean Effective Stress	120	kPa
Differential Pressure	10	kPa
Hydraulic gradient	10	
Mean rate of flow	0.00101	ml/min
Temperature during test	20.1	°C

PERMEABILITY, *kv*

(at 20°C) **2.0×10^{-10}** **m/s**

Notes H.G=10kPa increasing to 70kPa

Ref SLR6.6 Rev 2.0 Feb18	SOCOTEC	Printed:12/09/2018 13:12	**Figure** **TXLP 1** sheet 1 of 1
	UKAS TESTING 1157		

Determination of Permeability in a Triaxial Cell
(BS1377 : Part 6 : 1990, clause 6 - Constant Head test)

Project No	N8135-18	Sample Details:	Hole No.	HEP - BH - 823		
Project Name	HEATHROW AIRPORT LIMITED (3)		Depth (m BGL)	6.00		
			Sample No	27	Type	UT
			ID			
			Spec Ref			

Specimen Details

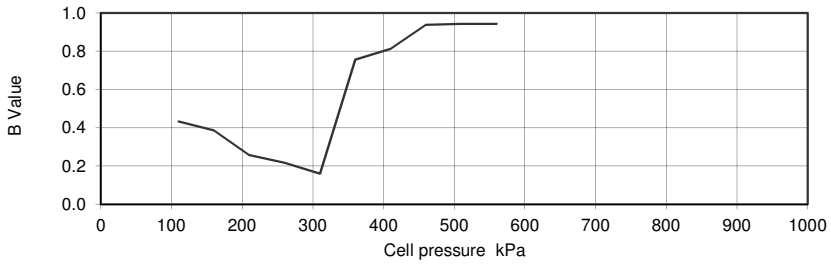
Soil Description: Firm brown slightly sandy CLAY.

Specimen Type /Preparation: UNDISTURBED

Length	100.3	mm	
Diameter	103.2	mm	
Particle density	2.65	Mg/m³	Assumed

	Initial	Final	
Bulk Density	1.97	1.97	Mg/m³
Water Content	27.9	28.5	%
Dry density	1.54	1.53	Mg/m³
Voids ratio	0.72	0.73	
Degree of saturation	102	104	%

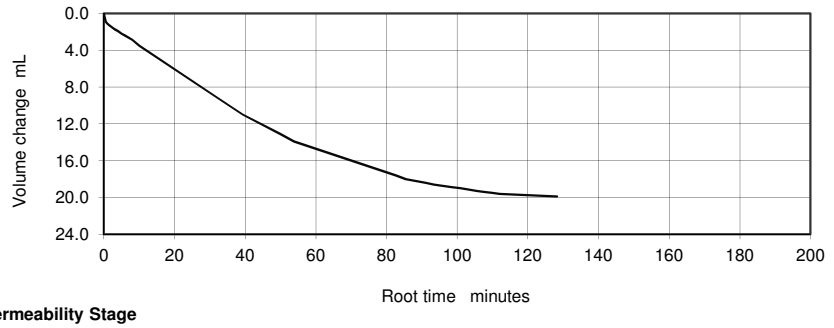
Saturation Stage



Method: Increments of cell and back pressure

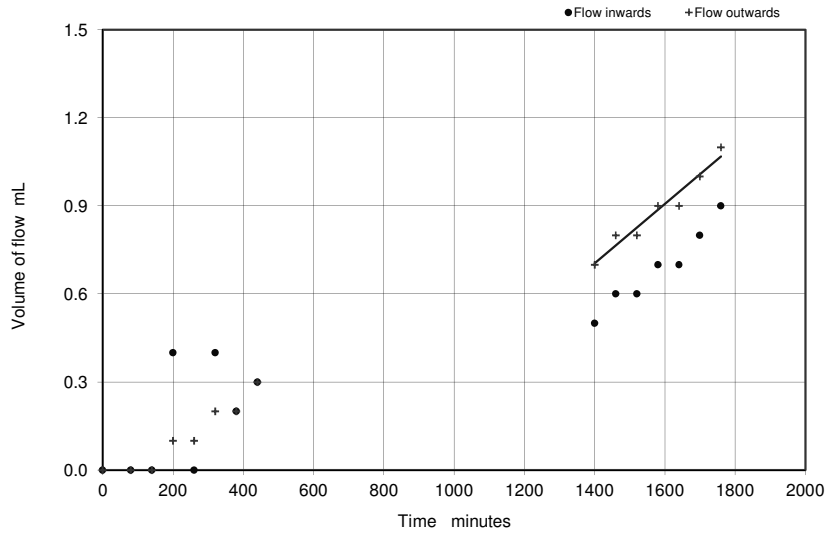
Cell pressure increments	50	kPa
Differential Pressure	10	kPa
Final Cell Pressure	560	kPa
Final pore water pressure	544	kPa
Final B Value	0.94	

Consolidation Stage



Drainage Condition	to one end only	
Cell pressure applied	600	kPa
Back pressure applied	500	kPa
Effective stress	100	kPa

Permeability Stage



Cell Pressure	605	kPa
Top Pressure	500	kPa
Base Pressure	510	kPa
Mean Effective Stress	100	kPa
Differential Pressure	10	kPa
Hydraulic gradient	10	
Mean rate of flow	0.00101	ml/min
Temperature during test	20.1	°C

PERMEABILITY, *kv*

(at 20°C) **2.0×10^{-10} m/s**

Notes H.G=10kPa increasing to 50kPa

Ref SLR6.6 Rev 2.0 Feb18	SOCOTEC	Printed:22/09/2018 15:14	**Figure** **TXLP** sheet 1 of 1
	UKAS TESTING 1157		

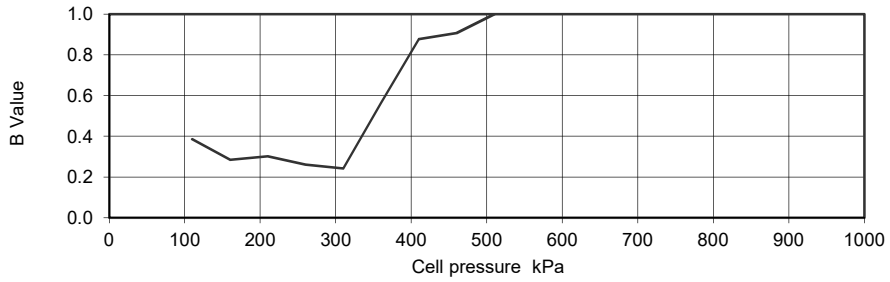
Determination of Permeability in a Triaxial Cell
(BS1377 : Part 6 : 1990, clause 6 - Constant Head test)

Project No	N8135-18	Sample Details:	Hole No.	HEP-BH-824	
Project Name	Heathrow Airport Limited		Depth (m BGL)	16.00	
			Sample No	48	Type UT
			ID		
			Spec Ref		

Specimen Details

				Initial	Final	
Soil Description	Firm grey slightly sandy CLAY.					
Specimen Type /Preparation	UNDISTURBED		Bulk Density	2.05	2.07	Mg/m³
			Water Content	23.0	22.8	%
Length	100.4	mm	Dry density	1.67	1.69	Mg/m³
Diameter	102.7	mm	Voids ratio	0.59	0.57	
Particle density	2.65	Mg/m³ Assumed	Degree of saturation	103	106	%

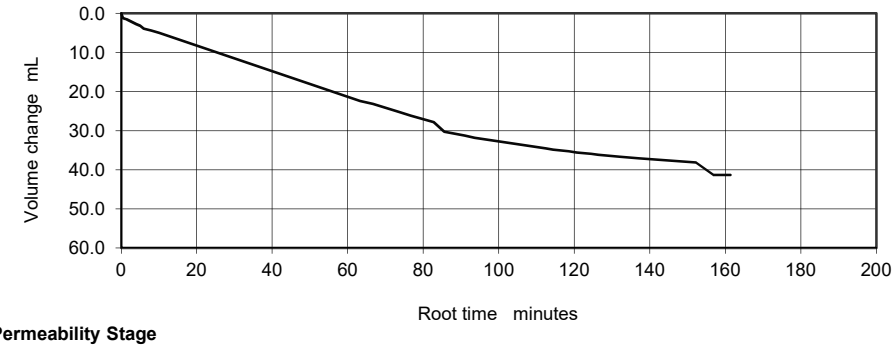
Saturation Stage



Method:
Increments of cell and back pressure

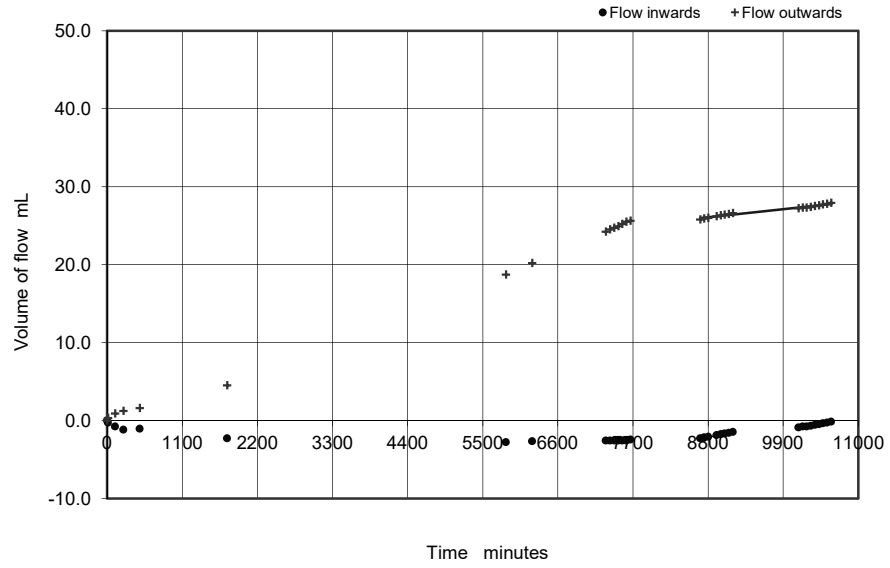
Cell pressure increments	50	kPa
Differential Pressure	10	kPa
Final Cell Pressure	510	kPa
Final pore water pressure	444	kPa
Final B Value	1.00	

Consolidation Stage



Drainage Condition	to one end only	
Cell pressure applied	740	kPa
Back pressure applied	450	kPa
Effective stress	290	kPa

Permeability Stage



Cell Pressure	845	kPa
Top Pressure	450	kPa
Base Pressure	460	kPa
Mean Effective Stress	390	kPa
Differential Pressure	10	kPa
Hydraulic gradient	10	
Mean rate of flow	0.00094	ml/min
Temperature during test	20	°C

PERMEABILITY, *kv*

(at 20°C) **1.9 x 10^{-10} m/s**

Notes H.G=10 increasing to 100kPa

Ref SLR6.6 Rev 2.0 Feb18	SOCOTEC	Printed:12/08/2018 11:59	**Figure** **TXLP 1** sheet 1 of 1
	UKAS TESTING 1157		

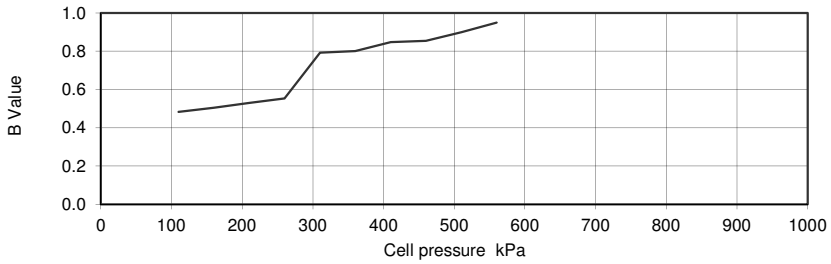
Determination of Permeability in a Triaxial Cell
(BS1377 : Part 6 : 1990, clause 6 - Constant Head test)

Project No	N8135-18	Sample Details:	Hole No.	HEP-BH-1047		
Project Name	Heathrow Airport Limited		Depth (m BGL)	6.00		
			Sample No	31	Type	UT
			ID			
			Spec Ref			

Specimen Details

				Initial	Final	
Soil Description	firm brown slightly sandy slightly gravelly CLAY					
Specimen Type /Preparation	UNDISTURBED		Bulk Density	1.96	1.97	Mg/m³
			Water Content	28.4	30.4	%
Length	100.5	mm	Dry density	1.53	1.51	Mg/m³
Diameter	103.1	mm	Voids ratio	0.73	0.76	
Particle density	2.65	Mg/m³ Assumed	Degree of saturation	103	106	%

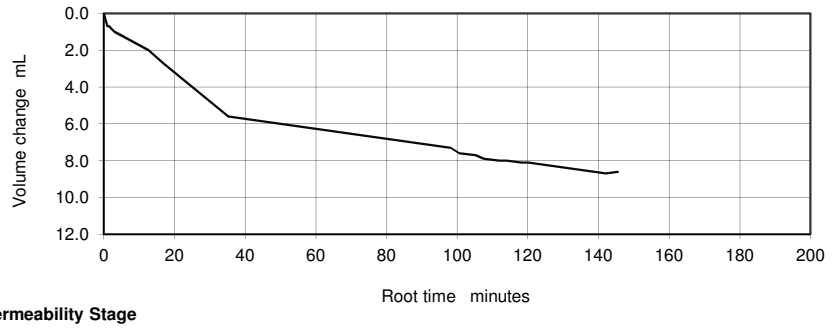
Saturation Stage



Method:
Increments of cell and back pressure

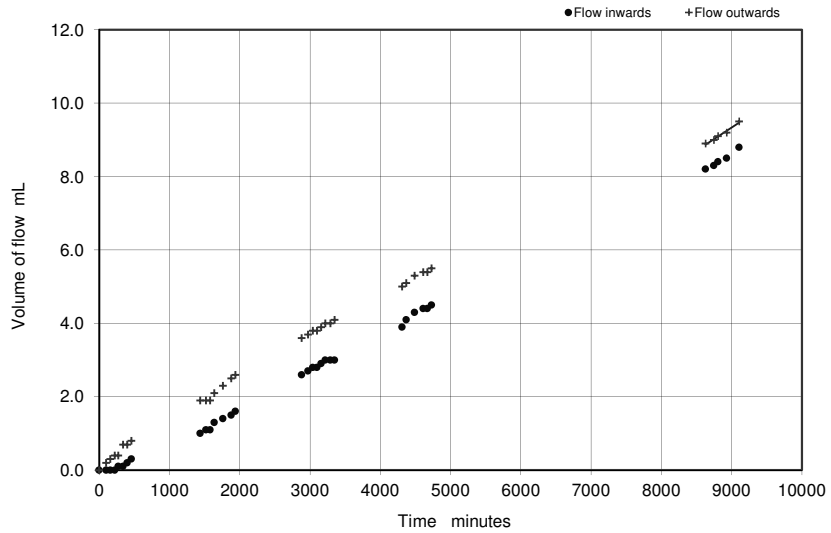
Cell pressure increments	50	kPa
Differential Pressure	10	kPa
Final Cell Pressure	560	kPa
Final pore water pressure	533	kPa
Final B Value	0.95	

Consolidation Stage



Drainage Condition	to one end only	
Cell pressure applied	610	kPa
Back pressure applied	550	kPa
Effective stress	60	kPa

Permeability Stage



Cell Pressure	615	kPa
Top Pressure	550	kPa
Base Pressure	560	kPa
Mean Effective Stress	60	kPa
Differential Pressure	10	kPa
Hydraulic gradient	10	
Mean rate of flow	0.00125	ml/min
Temperature during test	21.2	°C

PERMEABILITY, *kv*

(at 20°C) **2.4 x 10^{-10}** **m/s**

Notes H.G initially 10kPa increasing to 30kPa

Ref SLR6.6 Rev 2.0 Feb18	SOCOTEC	Printed:22/11/2018 09:49	**Figure** **TXLP** sheet 1 of 1
	UKAS TESTING 1157		

Determination of Permeability in a Triaxial Cell
(BS1377 : Part 6 : 1990, clause 6 - Constant Head test)

Project No	N8135-18	Sample Details:	Hole No.	HEP-BH-1805		
Project Name	Heathrow Airport Limited (3)		Depth (m BGL)	4.20		
			Sample No	17	Type	UT
			ID			
			Spec Ref			

Specimen Details

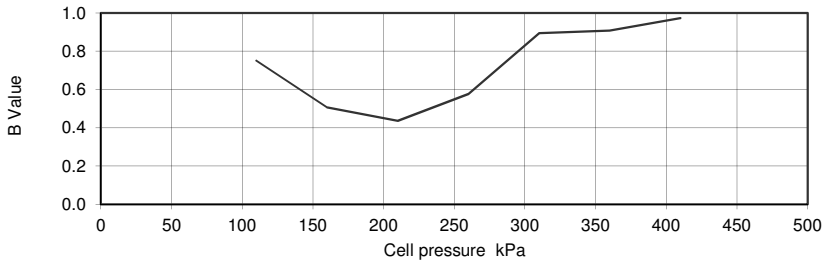
Soil Description: Firm grey slightly sandy slightly gravelly CLAY.

Specimen Type /Preparation: UNDISTURBED

Length	100.0	mm	
Diameter	105.5	mm	
Particle density	2.65	Mg/m³	Assumed

	Initial	Final	
Bulk Density	1.93	1.93	Mg/m³
Water Content	31.8	32.2	%
Dry density	1.46	1.46	Mg/m³
Voids ratio	0.81	0.82	
Degree of saturation	104	105	%

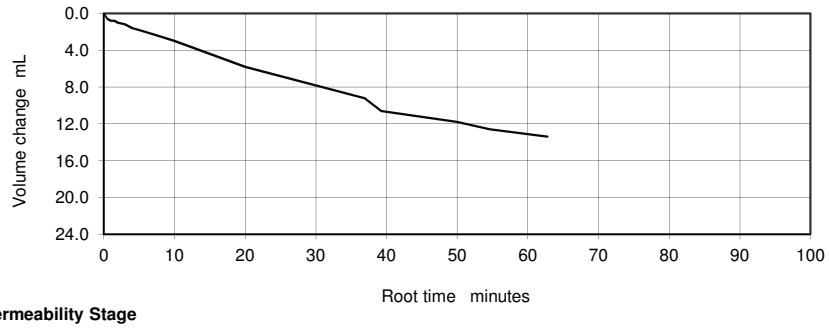
Saturation Stage



Method: Increments of cell and back pressure

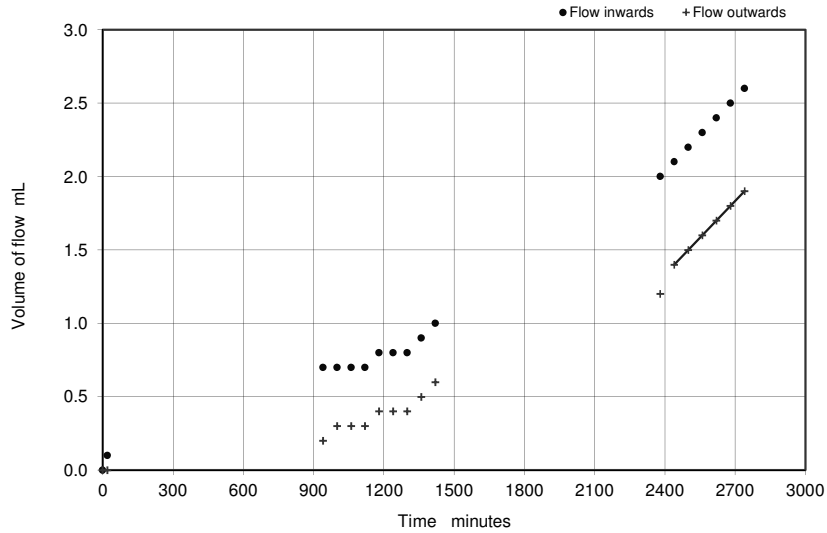
Cell pressure increments	50	kPa
Differential Pressure	10	kPa
Final Cell Pressure	410	kPa
Final pore water pressure	361	kPa
Final B Value	0.97	

Consolidation Stage



Drainage Condition	to one end only	
Cell pressure applied	425	kPa
Back pressure applied	350	kPa
Effective stress	75	kPa

Permeability Stage



Cell Pressure	430	kPa
Top Pressure	350	kPa
Base Pressure	360	kPa
Mean Effective Stress	75	kPa
Differential Pressure	10	kPa
Hydraulic gradient	10	
Mean rate of flow	0.00167	ml/min
Temperature during test	20	°C

PERMEABILITY, *kv*

(at 20°C) **3.1×10^{-10}** m/s

Notes

Ref			Figure
SLR6.6 Rev 2.0 Feb18	SOCOTEC	1157	Printed:15/11/2018 11:30	**TXLP** sheet 1 of 1

Unconsolidated Undrained Triaxial Compression tests without measurement of pore pressure
Summary of Results

Project Name: HAL Airport Expansion

Project No.: G170029U

Hole	Sample Ref	Sample Top	Sample Type	Sample Spec. Depth	Description	Test Type	Density bulk (Mg/m3)	Density dry (Mg/m3)	w (%)	Length (mm)	Dia. (mm)	σ3 (kPa)	At failure: Axial strain (%)	At failure: σ1 - σ3 (kPa)	At failure: cu (kPa)	At failure: Mode	Remarks
HEP-BH-27	26	7.50	UT	7.65	Stiff brown slightly sandy CLAY	UU	1.98	1.53	29.7	196.4	102.1	150	4.2	175	87	B	Laminated
HEP-BH-27	43	14.50	UT	14.63	(Very stiff) brown slightly sandy CLAY	UU	2.04	1.65	23.3	201.5	102.1	290	2.2	281	141	B	Laminated
HEP-BH-50	79	19.00	UT	19.08	Very stiff brown slightly sandy CLAY	UU	2.00	1.59	25.7	198.2	103.2	390	7.4	287	144	B	

Key
- UU - single stage test (single and multiple specimens)
- UUM - Multistage test on a single specimen
- suffix R - remoulded or recompacted
- σ3 Cell pressure
- σ1 - σ3 Maximum corrected deviator stress
- cu Undrained shear strength, ½ (σ1 - σ3)
- Mode of failure ; B - Brittle; P - Plastic; C - Compound

Notes

Tests carried out in accordance with BS1377:Part 7 : 1990 clause 8 or 9 as appropriate to test type.

Date Printed: 09/08/2018

Figure Number:

Sheet Number:

UNCONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TESTS WITHOUT MEASUREMENT OF PORE PRESSURE - SUMMARY OF RESULTS

Hole No.	Sample				Soil Description	Density		*w*	Test type	Dia.	ó3	At failure / end of stage				Membrane Thickness	Remarks
	No.	Depth (m) from	Depth (m) to	type		bulk	dry					Axial strain	ó1 - ó3	*cu*	MODE		
						Mg/m3		%		mm	kPa	%	kPa	kPa		mm	
HEP-BH-65	26	5.50		UT	Stiff to very stiff greyish brown slightly sandy CLAY.	2.03	1.61	26	UU	103.1	100	7.9	201	100	B	0.5	

General notes: Tests carried out in accordance with BS1377: Part 7: 1990, clause 8 for single stage, clause 9 for multistage tests. Specimens nominally 2:1 height diameter ratio and tested at a rate of strain of 2%/minute, unless annotated otherwise. Latex rubber membrane used and membrane correction applied in accordance with BS1377-7 8.5.1.4 unless stated.

Legend						
	UU - single stage test (may be in sets of specimens)	ó3	cell pressure	Mode of failure	P	plastic
	UUM - multistage test on a single specimen	ó1 - ó3	deviator stress		B	brittle
	suffix R - remoulded or recompacted	*cu*	undrained shear strength		C	compound

QA Ref
SLR 2
Rev 2.7
Apr 15

UKAS TESTING
1157

SOCOTEC

Project No N8135-18

Project Name Heathrow Airport Limited

Figure

UUSUM

Printed: 29/10/2018 16:58

UNCONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TESTS WITHOUT MEASUREMENT OF PORE PRESSURE - SUMMARY OF RESULTS

Hole No.	Sample				Soil Description	Density		*w*	Test type	Dia.	ó3	At failure / end of stage				Membrane Thickness	Remarks
	No.	Depth (m) from	Depth (m) to	type		bulk Mg/m3	dry Mg/m3	%		mm	kPa	Axial strain %	ó1 - ó3 kPa	*cu* kPa	MODE	mm	
HEP-BH-12	41	8.20		UT	Stiff to very stiff thinly laminated dark brown slightly sandy CLAY.	2.02	1.61	26	UU	105.1	165	4.2	151	75	B	0.6	
HEP-BH-1802	20	5.00		UT	Stiff laminated greyish brown slightly sandy CLAY.	1.95	1.5	30	UU	102.8	90	7.4	131	65	B	0.4	
HEP-BH-1805	17	4.20		UT	Firm to stiff greyish brown slightly sandy slightly gravelly CLAY.	1.97	1.51	30	UU	105.4	75	7.5	53	27	P	0.6	
HEP-BH-27	33	10.50		UT	Very stiff thinly laminated greyish brown slightly sandy CLAY.	2.05	1.66	24	UU	103	210	5.5	333	167	B	0.5	
HEP-BH-44	34	11.50		UT	Firm brown slightly sandy CLAY.	2.04	1.63	25	UU	103.4	230	7.7	296	148	B	0.5	
HEP-BH-47	21	5.00		UT	Stiff to very stiff laminated greyish brown slightly sandy CLAY.	1.98	1.54	29	UU	103	90	17.8	161	80	B	0.4	
HEP-BH-61	23	4.70		UT	Firm to stiff thinly laminated greyish brown slightly sandy CLAY.	1.94	1.48	31	UU	105.2	75	10.9	88	44	P	0.5	
HEP-BH-823	37	9.00		UT		2	1.56	28	UU	103.5	162	6.7	216	108	B	0.5	
HEP-BH-823	51	17.00		UT	Very stiff laminated greyish brown slightly sandy CLAY.	2.03	1.64	24	UU	103.3	306	5.5	299	150	B	0.5	
HEP-BH-824	48	16.00		UT	Very stiff laminated greyish brown slightly sandy CLAY.	2.04	1.63	25	UU	102.5	290	5.5	298	149	B	0.4	

General notes: Tests carried out in accordance with BS1377: Part 7: 1990, clause 8 for single stage, clause 9 for multistage tests. Specimens nominally 2:1 height diameter ratio and tested at a rate of strain of 2%/minute, unless annotated otherwise. Latex rubber membrane used and membrane correction applied in accordance with BS1377-7 8.5.1.4 unless stated.

Legend

UU - single stage test (may be in sets of specimens)	ó3	cell pressure	Mode of failure	P	plastic
UUM - multistage test on a single specimen	ó1 - ó3	deviator stress		B	brittle
suffix R - remoulded or recompacted	*cu*	undrained shear strength		C	compound

QA Ref
SLR 2
Rev 2.7
Apr 15

SOCOTEC

Project No N8135-18

Project Name Heathrow Airport Limited

Figure

UUSUM

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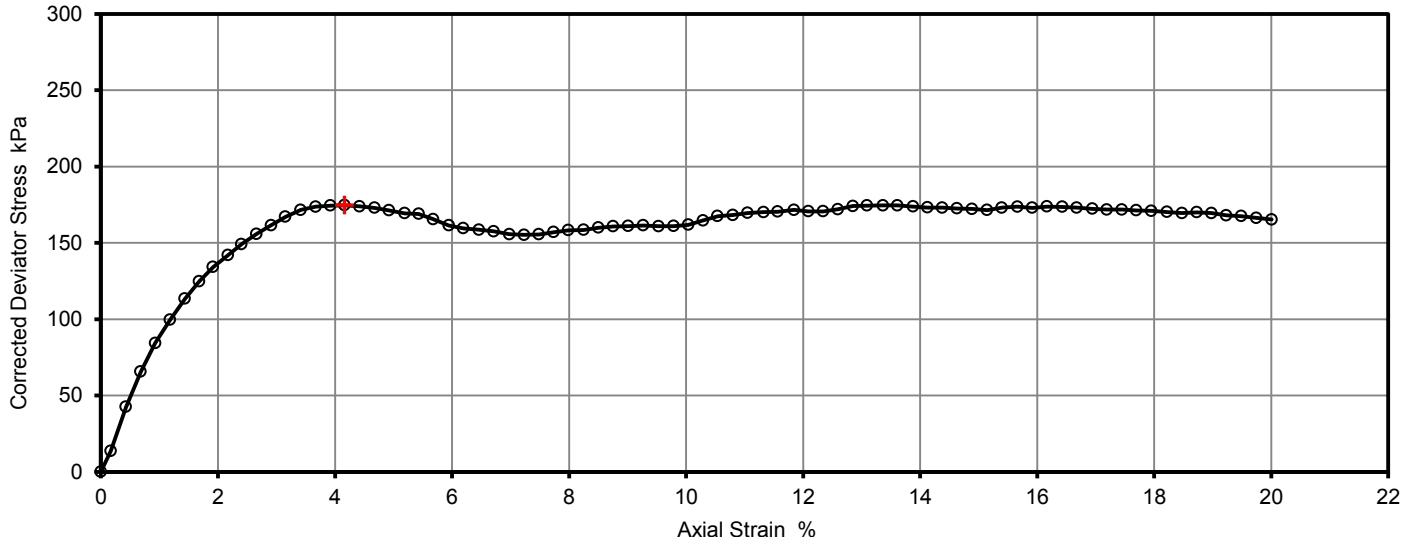
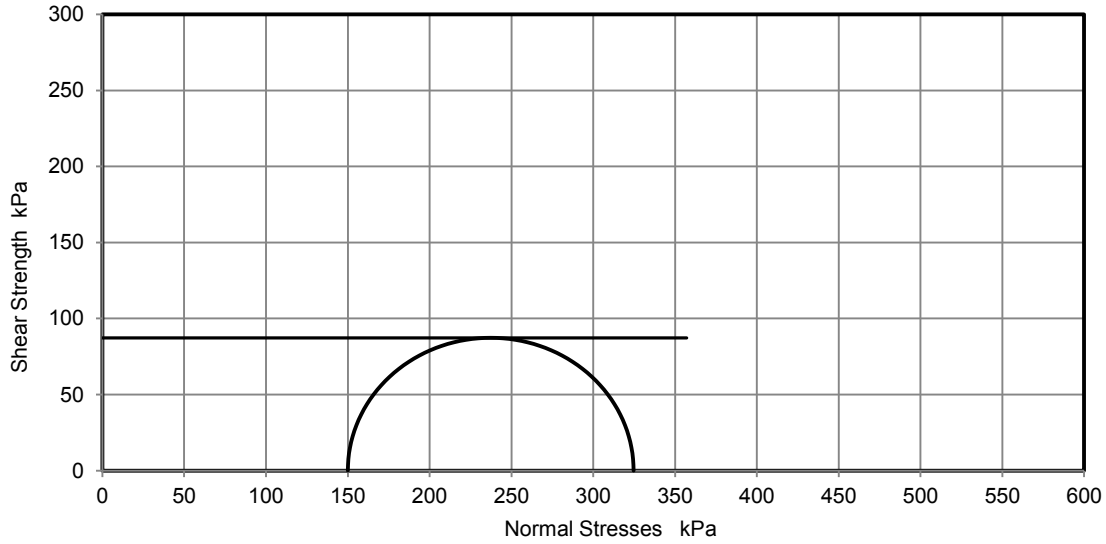
FUGRO	**Unconsolidated Undrained Triaxial Compression without measurement of pore pressure - single specimen**			Project No.	G170029U
				Hole	HEP-BH-27
				Sample No.	26
Project Name	HAL Airport Expansion			Depth	7.50
Specimen Reference		Specimen Depth	7.65 m	Sample Type	UT
Description	Stiff brown slightly sandy CLAY			KeyLAB ID	FES2171204004
Test Method	BS1377 : Part 7 : 1990, clause 8, single specimen			Date of test	29/06/2018

Test Number		1	
Length		196.4	mm
Diameter		102.1	mm
Bulk Density		1.98	Mg/m3
Moisture Content		29.7	%
Dry Density		1.53	Mg/m3
Rate of Strain		1.5	%/min
Cell Pressure		150	kPa
At failure	Axial Strain	4.2	%
	Deviator Stress, (σ1 - σ3)f	175	kPa
	Undrained Shear Strength, cu	87	kPa
	Mode of Failure	Brittle	

Deviator Stress v Axial Strain



Mohr Circles



Deviator stress corrected for area change and membrane effects

Mohr circles and their interpretation is not covered by BS1377.
This is provided for information only.

Remarks

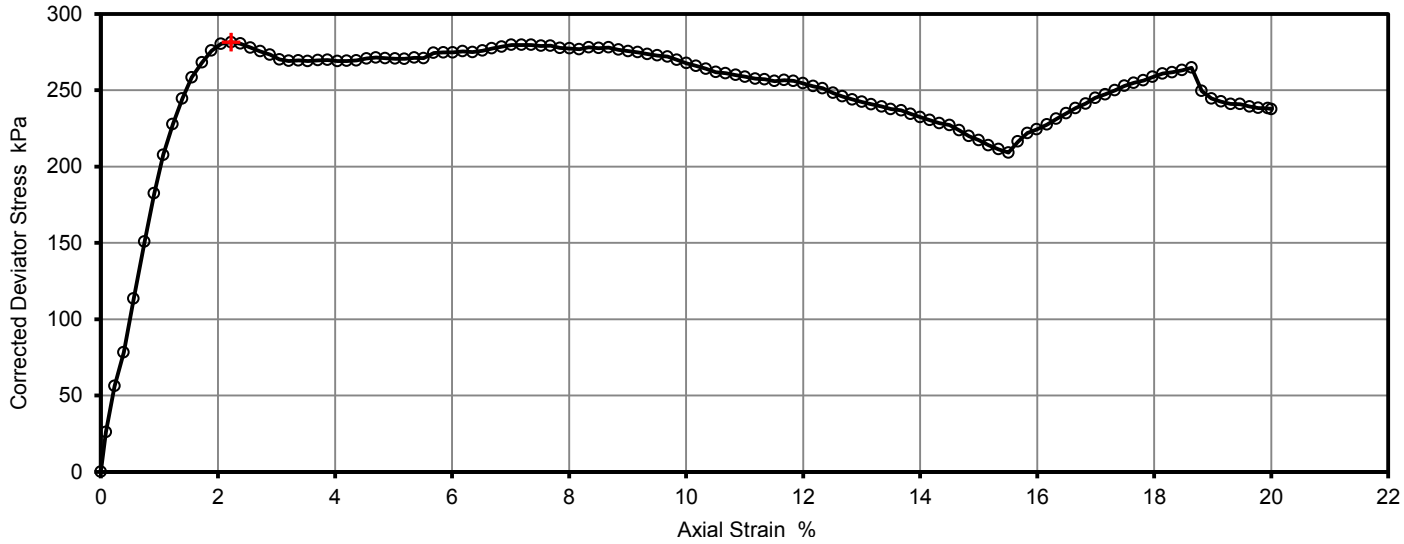
Laminated

Date Printed	Figure Number	Sheet number
09/08/2018		

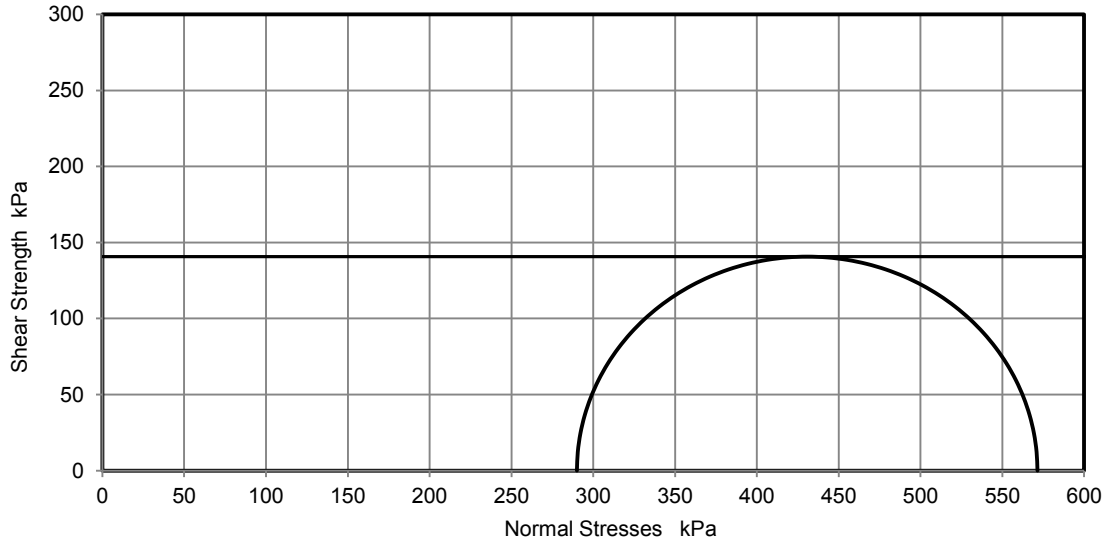
FUGRO	**Unconsolidated Undrained Triaxial Compression without measurement of pore pressure - single specimen**			Project No.	G170029U
				Hole	HEP-BH-27
				Sample No.	43
Project Name	HAL Airport Expansion			Depth	14.50
Specimen Reference		Specimen Depth	14.63 m	Sample Type	UT
Description	(Very stiff) brown slightly sandy CLAY			KeyLAB ID	FES2171204021
Test Method	BS1377 : Part 7 : 1990, clause 8, single specimen			Date of test	29/06/2018

Test Number		1	
Length		201.5	mm
Diameter		102.1	mm
Bulk Density		2.04	Mg/m3
Moisture Content		23.3	%
Dry Density		1.65	Mg/m3
Rate of Strain		1.0	%/min
Cell Pressure		290	kPa
At failure	Axial Strain	2.2	%
	Deviator Stress, (σ1 - σ3)f	281	kPa
	Undrained Shear Strength, cu	141	kPa
	Mode of Failure	Brittle	

Deviator Stress v Axial Strain



Mohr Circles



Deviator stress corrected for area change and membrane effects

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Remarks

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Date Printed	Figure Number	Sheet number
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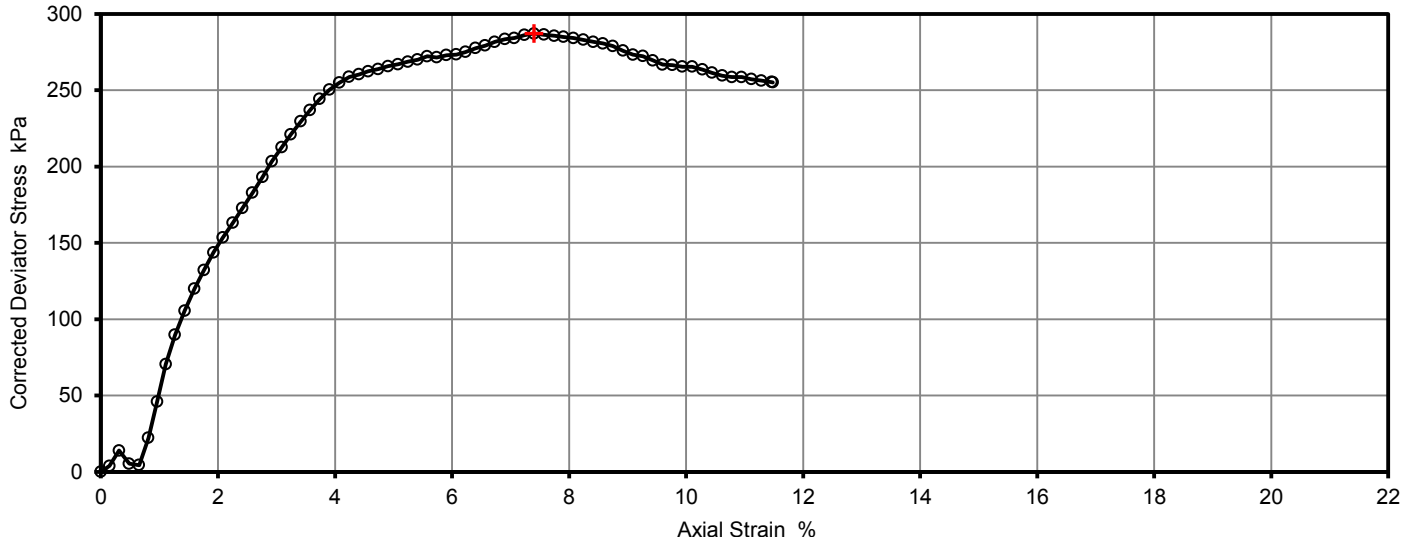
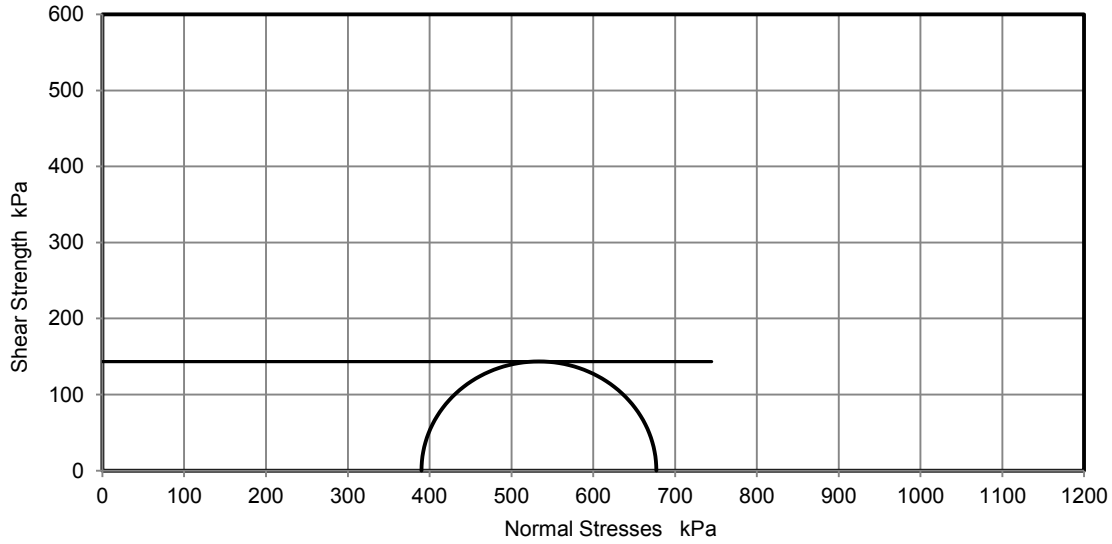
FUGRO	**Unconsolidated Undrained Triaxial Compression without measurement of pore pressure - single specimen**			Project No.	G170029U
				Hole	HEP-BH-50
				Sample No.	79
Project Name	HAL Airport Expansion			Depth	19.00
Specimen Reference		Specimen Depth	19.08 m	Sample Type	UT
Description	Very stiff brown slightly sandy CLAY			KeyLAB ID	FES1171121079
Test Method	BS1377 : Part 7 : 1990, clause 8, single specimen			Date of test	27/04/2018

Test Number		1	
Length		198.2	mm
Diameter		103.2	mm
Bulk Density		2.00	Mg/m3
Moisture Content		25.7	%
Dry Density		1.59	Mg/m3
Rate of Strain		1.0	%/min
Cell Pressure		390	kPa
At failure	Axial Strain	7.4	%
	Deviator Stress, (σ1 - σ3)f	287	kPa
	Undrained Shear Strength, cu	144	kPa
	Mode of Failure	Brittle	

Deviator Stress v Axial Strain



Mohr Circles



Deviator stress corrected for area change and membrane effects

Mohr circles and their interpretation is not covered by BS1377.
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Remarks

Date Printed	Figure Number	Sheet number
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RESULTS OF UNDRAINED SHEAR STRENGTH TESTS IN TRIAXIAL COMPRESSION WITHOUT MEASUREMENT OF POREWATER PRESSURE

BS 1377 Part 7:1990:Test 8 and 9 / BS EN ISO 17892:2014 (see additional Method Sheet for details)

Hole	Sample No.	Sample Type	Sample Depth [Specimen Depth] (m)	Test Type	Bulk Density (Mg/m^3)	Water Content (%)	Dry Density (Mg/m^3)	Diameter (mm)	Preparation	Cell Pressure (kPa)	Failure Strain (%)	Mode of Failure	Undrained Shear Strength c_u (kPa)	Average c_u (kPa)	Description
HEP-BH-43	UT	UT	14.50 [14.58]	UU M	2.04	24.3	1.64	103.2	UD	120 240 480	6.3 8.4 8.8	B	153 175 171	166	Very stiff brown slightly sandy CLAY

Test Type:	UU - Unconsolidated undrained; UUM - Unconsolidated undrained multistage
Sample Preparation:	REM - Remoulded; UD - Undisturbed
Sample Type:	See key sheet
Sample & Specimen Depth:	Metres below exploratory hole datum
Sample Orientation:	Vertical unless stated
Undrained Shear Strength:	Corrected maximum deviator stress at failure divided by two
Mode of Failure:	B - Brittle; C - Compound; P - Plastic
Membrane:	The correction applied to the undrained shear strength (kPa) is between 0.01 - 0.09 kPa per 1% strain for 102mm samples and 0.03 - 0.09 kPa for 38mm samples dependent on the membrane used. A latex membrane was used.
Remarks	

UNDRAINED TRIAXIAL COMPRESSION TEST

BS 1377 : Part 7 : 1990 : Test 9

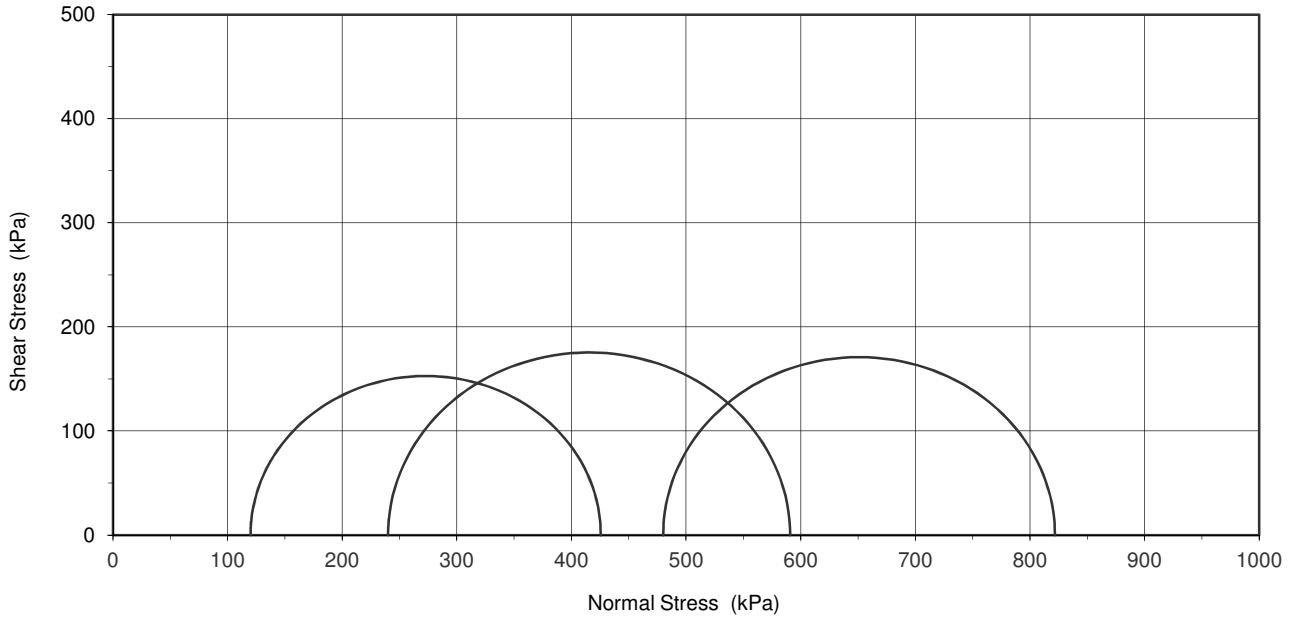
Hole No. : HEP-BH-43 Sample No. : UT Sample Type : UT Depth (m) : 14.50

Specimen Details

Test Date 27/04/2018

Soil Description Very stiff brown slightly sandy CLAY

			Specimen No.		
			1		
Initial Condition	Specimen Depth	mm	80		
	Preparation		Undisturbed		
	Height	mm	210.1		
	Diameter	mm	103.2		
	Moisture Content	%	24		
	Bulk Density	Mg/m³	2.04		
	Dry Density	Mg/m³	1.64		
			Stage No.		
			1	2	3
Compression	Rate of Strain	%/min	1.0		
	Membrane Thickness	mm	0.26		
	Cell Pressure	kPa	120	240	480
	Membrane Correction	kPa	0.4	0.5	0.5
	Maximum Deviator Stress	kPa	306	351	342
	Failure Strain	%	6.3	8.4	8.8
	Mode of Failure		Brittle		
	Cohesion	kPa	153	175	171
	Average Cohesion	kPa	166		



Remarks	

UNDRAINED TRIAXIAL COMPRESSION TEST

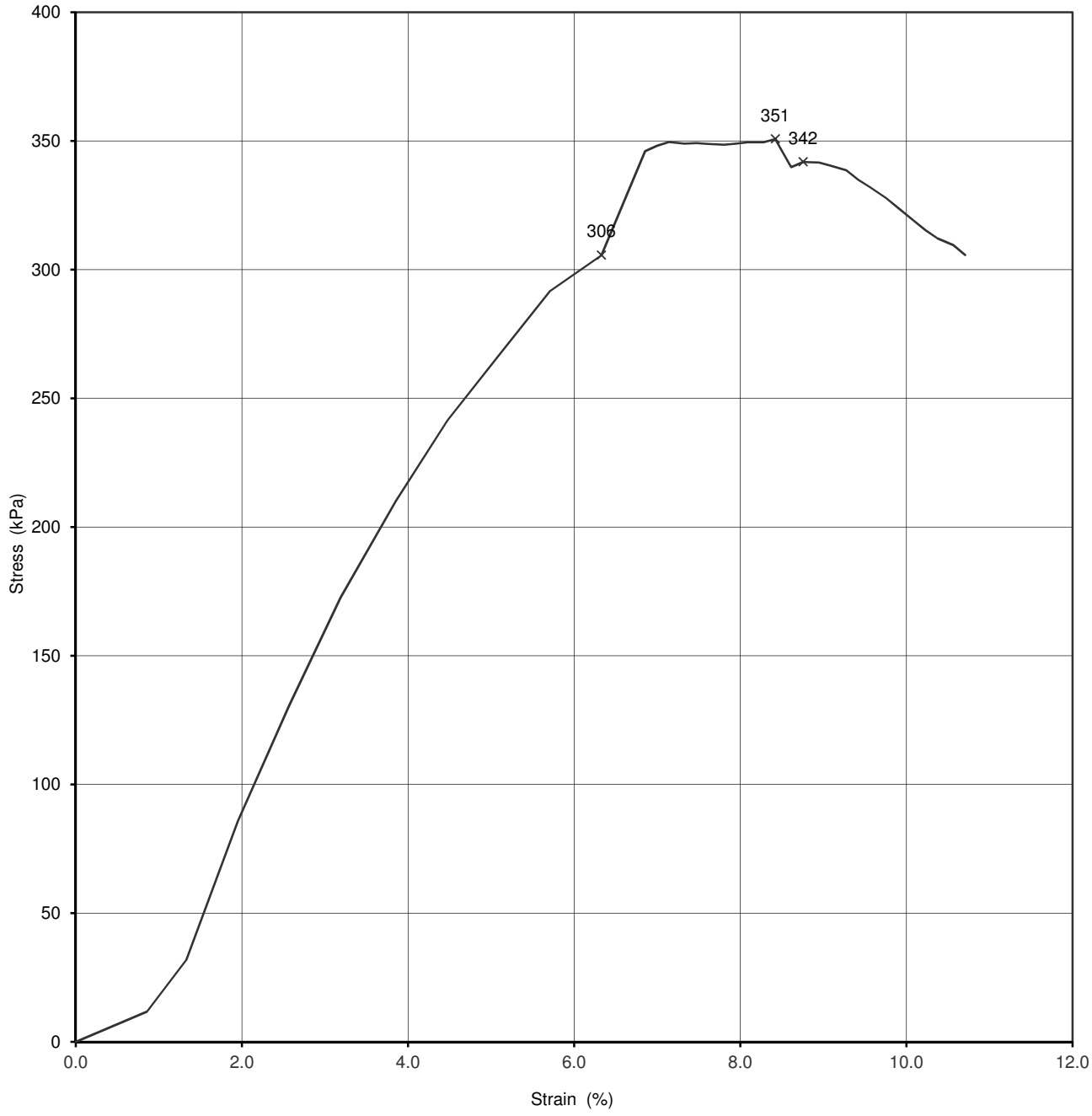
BS 1377 : Part 7 : 1990 : Test 9

Hole No. : HEP-BH-43 Sample No. : UT Sample Type : UT Depth (m) : 14.50

Specimen Details

Test Date 27/04/2018

Soil Description Very stiff brown slightly sandy CLAY



Remarks	

Determination of shear strength by direct shear (Small shearbox apparatus)
(BS1377 : Part 7 : clause 4 : 1990)

Project No	N8135-18	Sample Details:	Hole No.		HEP-BH-2	
Project Name	Heathrow Airport Limited		Depth (m BGL)		14.50	
			Sample No	52	Type	B
			ID			
			Spec Ref			

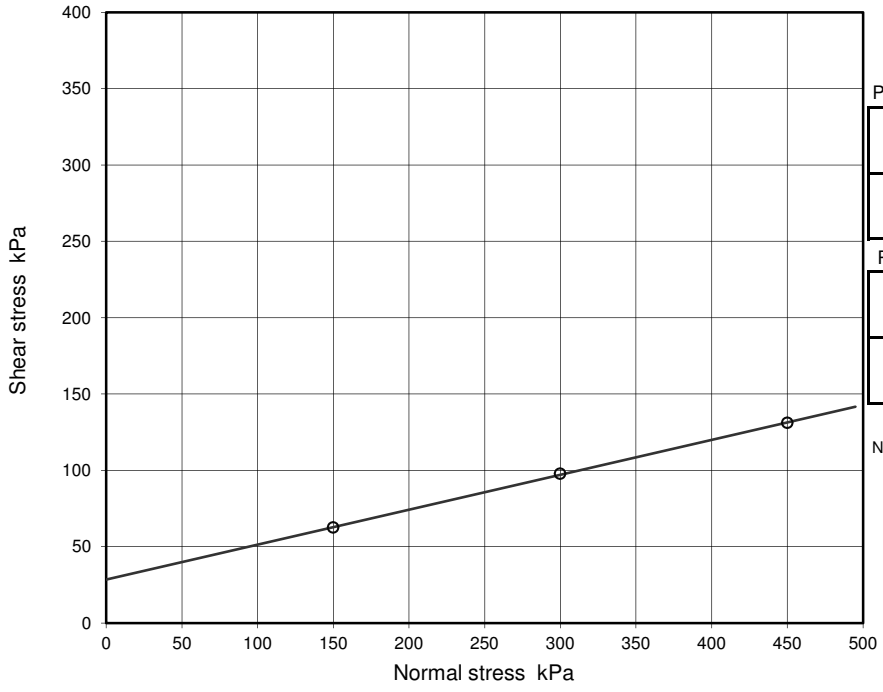
Soil Description	Brownish Grey slightly sandy slightly gravelly CLAY
Specimen Type /Preparation	-2mm material. Recompacted to a bulk density of 2.00 Mg/m3 at as received moisture content.

Specimen(s) nominally 60mm x 60mm square
Test(s) carried out in submerged condition
Particle density, assumed 2.65 Mg/m^3

Specimen Details		No.	1	2	3	4	5	6
Initial	Height	mm	24.0	24.0	24.0			
	Bulk Density	Mg/m^3	2.00	2.00	2.00			
	Water Content	%	28.8	28.2	28.3			
	Dry density	Mg/m^3	1.55	1.56	1.56			
	Voids ratio		0.707	0.698	0.700			
	Degree of Saturation	%	108	107	107			
Consol^n	Consolidation / Normal Stress applied	kPa	**150**	**300**	**450**			
	Change in height during consolidation	mm	-0.868	-1.904	-1.188			
	Voids ratio after consolidation		0.645	0.564	0.616			
Shear see note 1	Voids ratio at end of test		0.637	0.542	0.606			
	Moisture content at end of test	%	24.0	20.4	22.9			
	Saturation at end of test	%	100	100	100			

Shearing stage

Rate of displacement	Peak	mm/min	0.007	0.007	0.007			
	Residual	mm/min						
Peak values, (o)	Relative displacement	mm	1.08	2.20	1.56			
	Shear stress	kPa	62.4	97.8	131.0			
Residual values, (x)	No. of reversals							
	Relative displacement	mm						
	Shear stress	kPa						



Shear Strength Parameters

Peak strength, (o)		Regression	Manual
c '	kPa	28	-
Ø '	degrees	13	-

Residual strength, (x)			
c'_R	kPa	-	-
$Ø'_R$	degrees	-	-

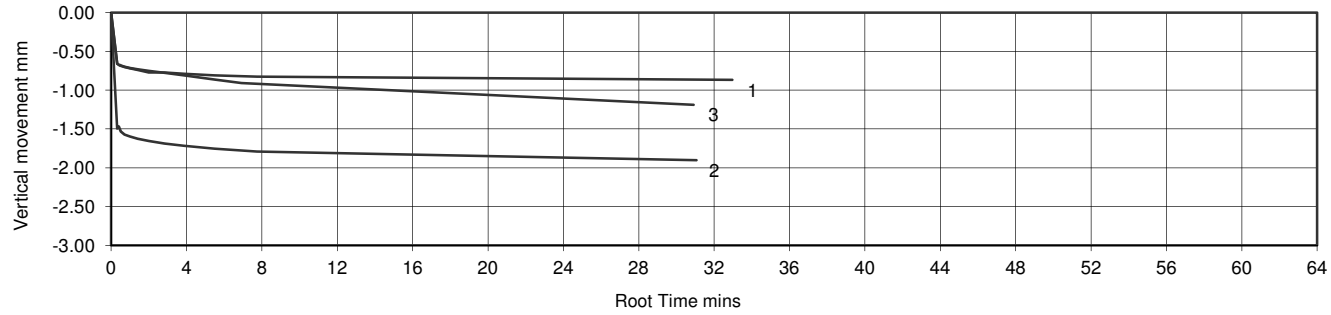
Notes :

1 After shear values based on BS1377. Pt 7 cl. 4.6.1.6 using δH calculated from consolidation and shear stages

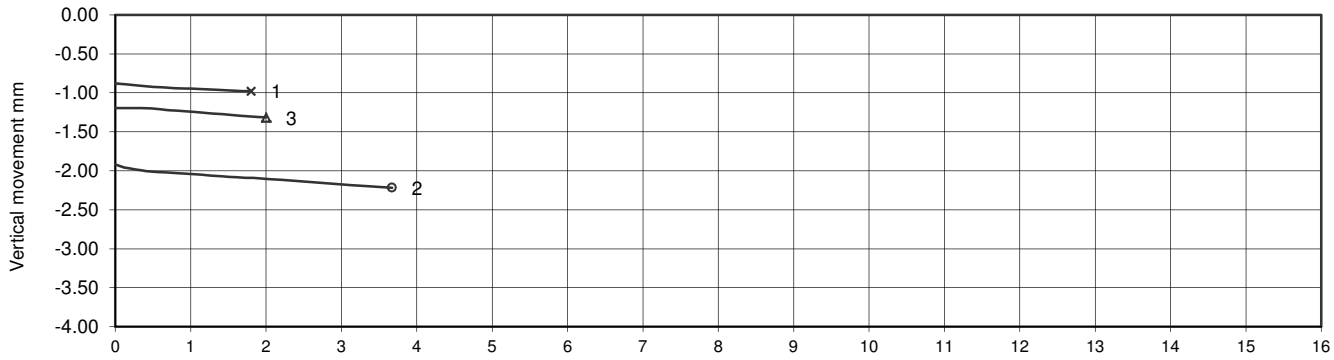
Determination of shear strength by direct shear (Small shearbox apparatus)
(BS1377 : Part 7 : clause 4 : 1990)

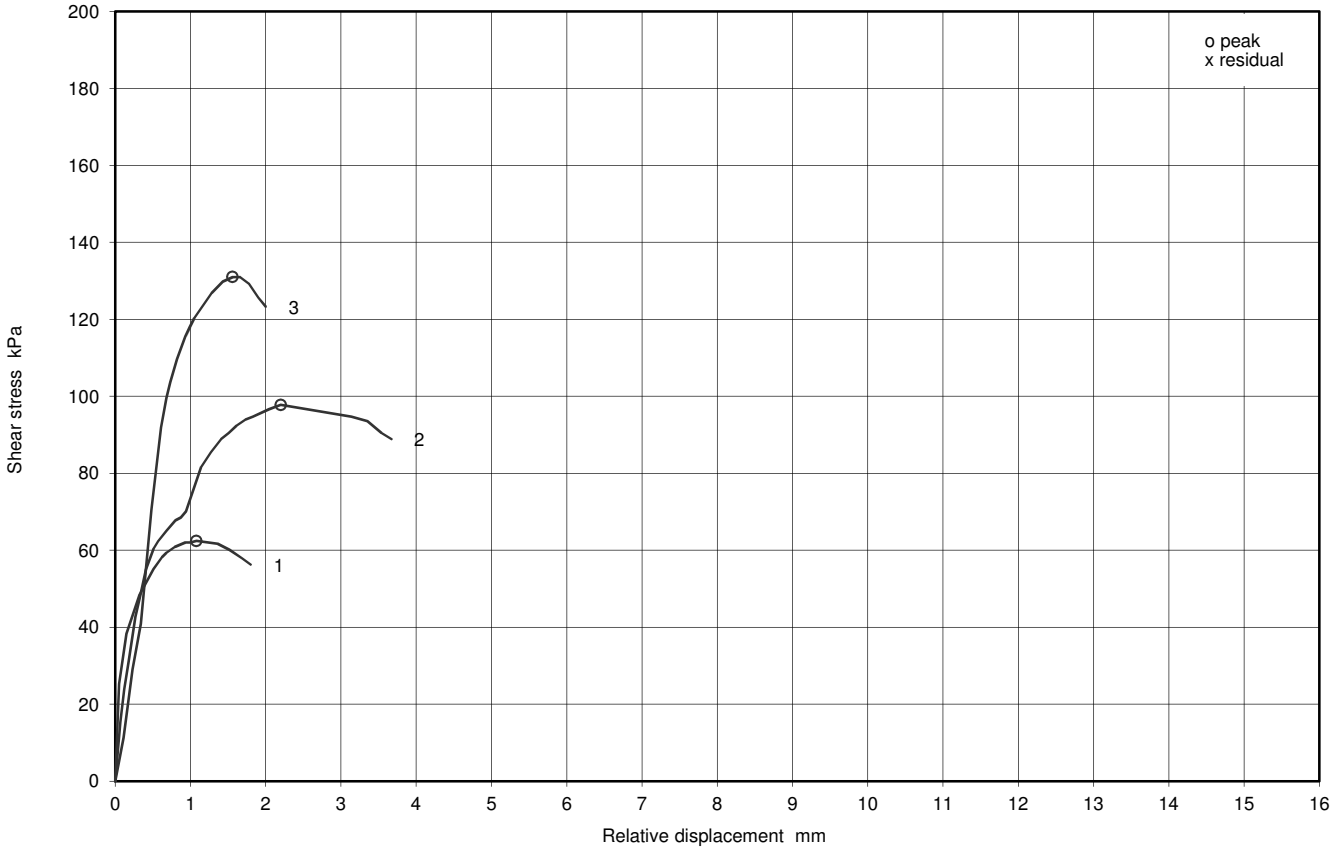
Project No	N8135-18	Sample Details:	Hole No.	HEP-BH-2		
Project Name	Heathrow Airport Limited		Depth (m BGL)	14.50		
			Sample No	52	Type	B
			ID			
			Spec Ref			

Consolidation stage(s)



Shearing stage(s)





Ref			Figure
SLR7.4 Rev 86.0 Feb18	SOCOTEC UKAS TESTING 1157	Printed:27/06/2018 15:11	**SSB** sheet 2 of 2

Determination of shear strength by direct shear (Small shearbox apparatus)
(BS1377 : Part 7 : clause 4 : 1990)

Project No	N8135-18	Sample Details:	Hole No.	HEP-BH-44		
Project Name	Heathrow Airport Limited		Depth (m BGL)	2.20		
			Sample No	11	Type	B
			ID			
			Spec Ref			

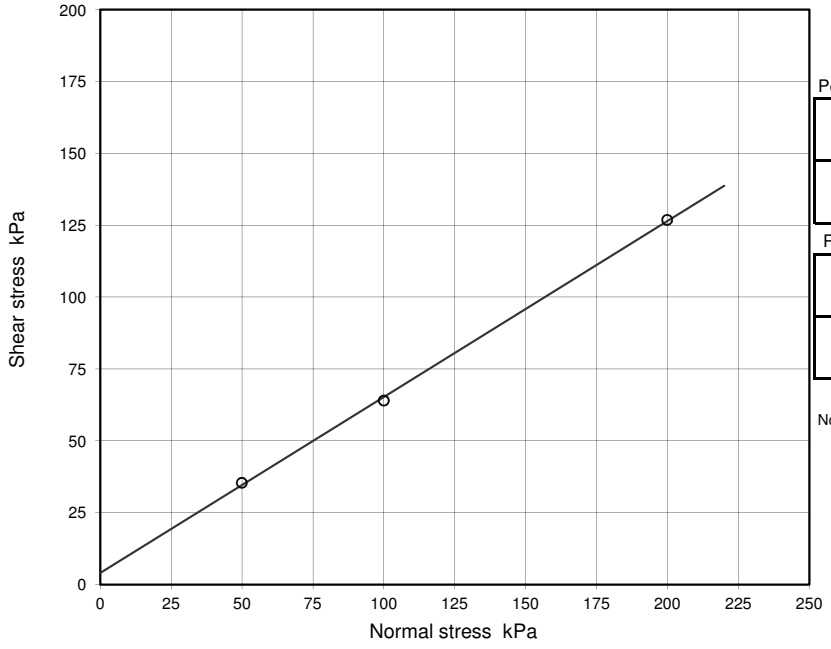
Soil Description	Brown SAND.
Specimen Type /Preparation	-2mm material. Recompacted to a dry density of between 1.70-1.75 Mg/m3 at as received moisture content.

Specimen(s) nominally 60mm x 60mm square
Test(s) carried out in submerged condition
Particle density, assumed 2.65 Mg/m^3

Specimen Details		No.	1	2	3	4	5	6
Initial	Height	mm	25.1	25.1	25.1			
	Bulk Density	Mg/m^3	1.84	1.84	1.84			
	Water Content	%	8.4	8.4	8.4			
	Dry density	Mg/m^3	1.70	1.70	1.70			
	Voids ratio		0.559	0.559	0.559			
	Degree of Saturation	%	40	40	40			
Consol^n	Consolidation / Normal Stress applied	kPa	**50**	**100**	**200**			
	Change in height during consolidation	mm	-0.080	-0.224	-0.452			
	Voids ratio after consolidation		0.554	0.545	0.531			
Shear see note 1	Voids ratio at end of test		0.549	0.535	0.515			
	Moisture content at end of test	%	18.0	17.9	17.2			
	Saturation at end of test	%	87	89	89			

Shearing stage

Rate of displacement	Peak	mm/min	0.600	0.600	0.600			
	Residual	mm/min						
Peak values, (o)	Relative displacement	mm	1.75	8.00	2.25			
	Shear stress	kPa	35.4	63.9	126.8			
Residual values, (x)	No. of reversals							
	Relative displacement	mm						
	Shear stress	kPa						



Shear Strength Parameters

Peak strength, (o)		Regression	Manual
c '	kPa	4.0	-
Ø '	degrees	31½	-

Residual strength, (x)			
c'_R	kPa	-	-
$Ø'_R$	degrees	-	-

Notes :

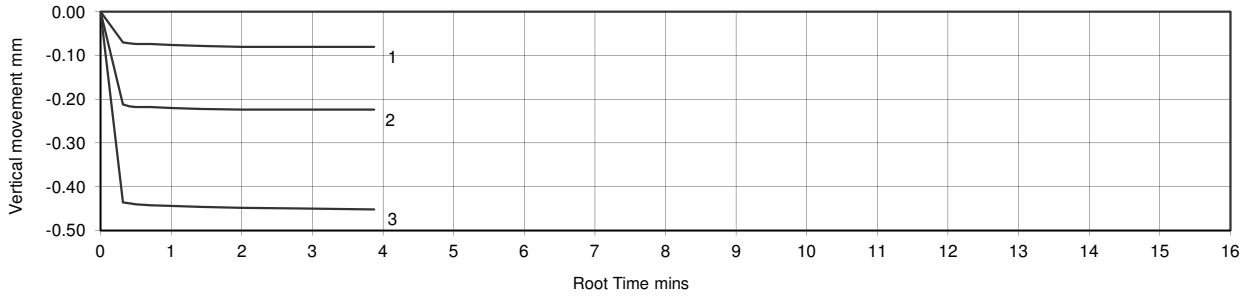
1 After shear values based on BS1377. Pt 7 cl. 4.6.1.6 using δH calculated from consolidation and shear stages

Ref				Figure
SLR7.4 Rev 86.0 Feb18	SOCOTEC	UKAS TESTING 1157	Printed:12/09/2018 12:36	**SSB**
				sheet 1 of 2

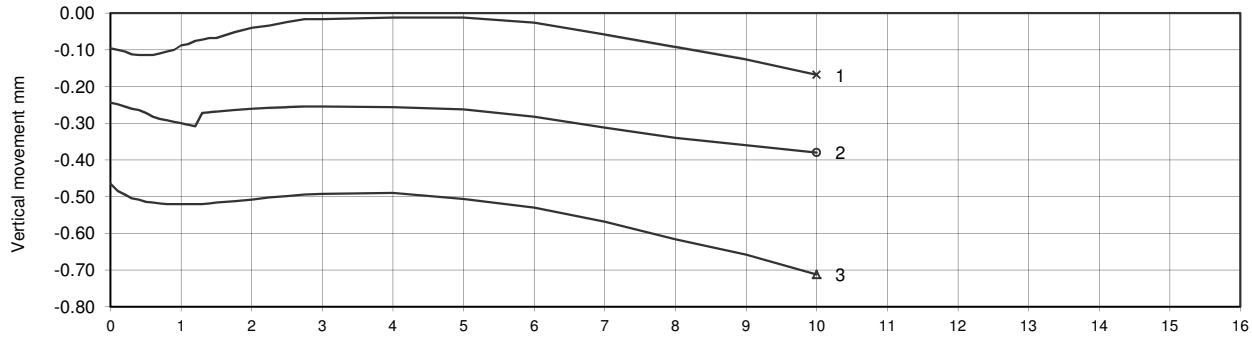
Determination of shear strength by direct shear (Small shearbox apparatus)
(BS1377 : Part 7 : clause 4 : 1990)

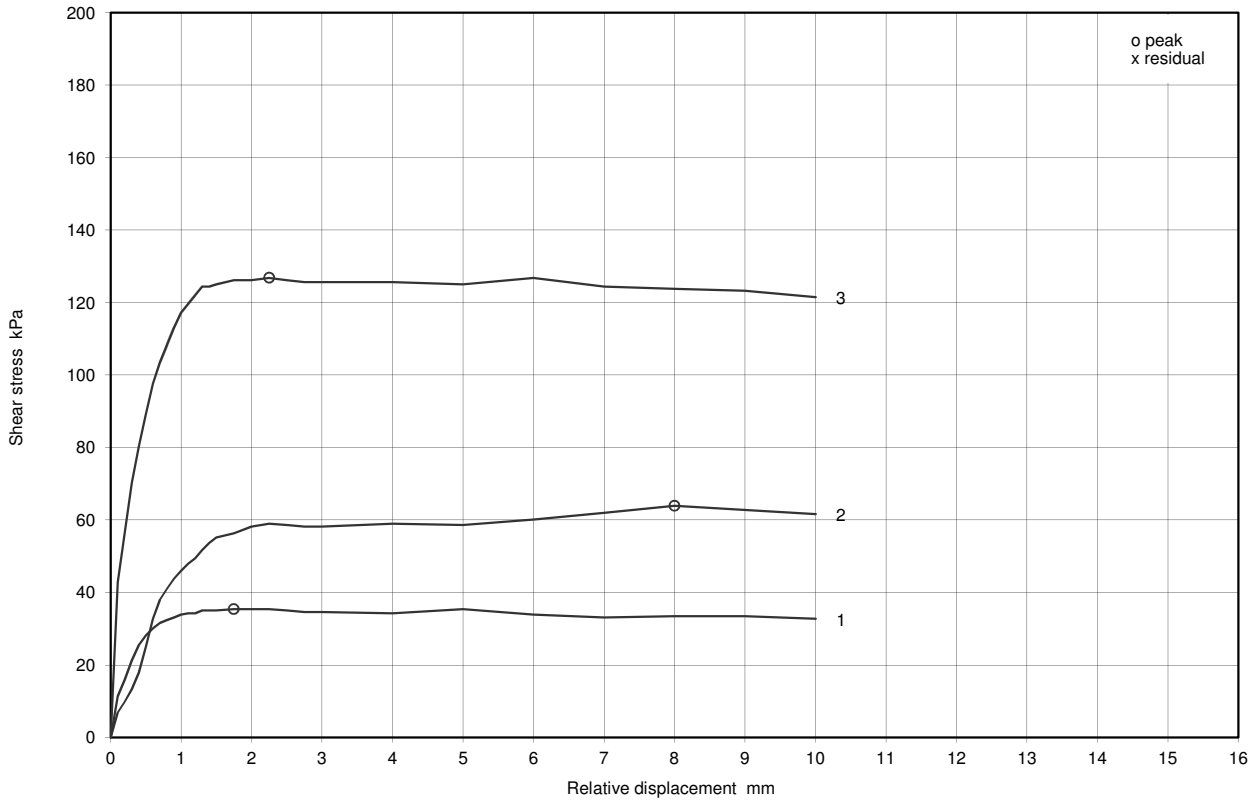
Project No	N8135-18	Sample Details:	Hole No.	HEP-BH-44		
Project Name	Heathrow Airport Limited		Depth (m BGL)	2.20		
			Sample No	11	Type	B
			ID			
			Spec Ref			

Consolidation stage(s)



Shearing stage(s)





Ref			Figure
SLR7.4 Rev 86.0 Feb18	SOCOTEC UKAS TESTING 1157	Printed:12/09/2018 12:36	**SSB** sheet 2 of 2

Determination of shear strength by direct shear (Small shearbox apparatus)
(BS1377 : Part 7 : clause 4 : 1990)

Project No	N8135	Sample Details:	Hole No.	HEP-BH-47		
Project Name	Heathrow Airport Limited		Depth (m BGL)	4.00-4.45		
			Sample No	18	Type	B
			ID			
			Spec Ref			

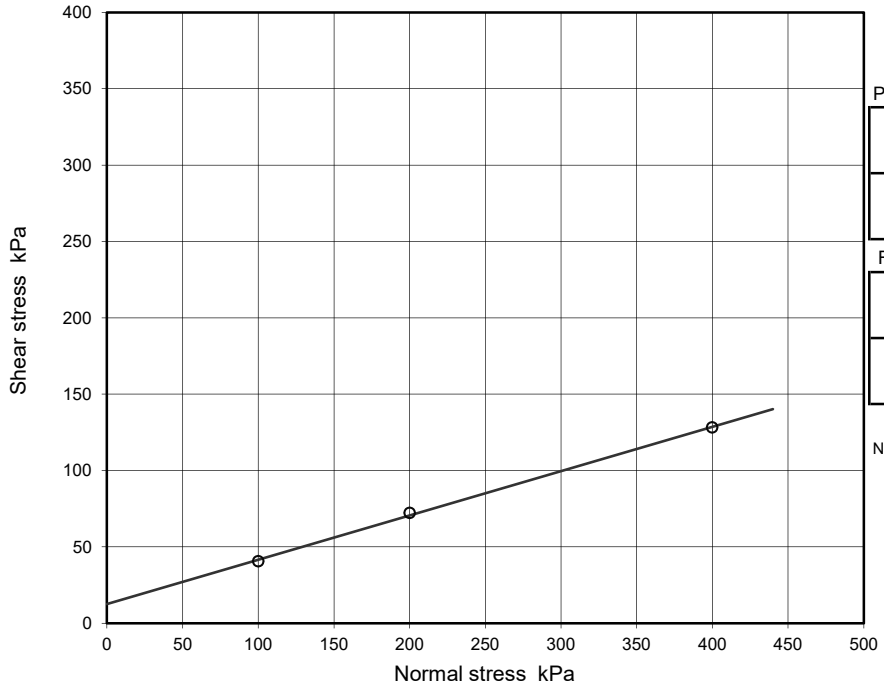
Soil Description	Brown slightly sandy slightly gravelly CLAY.
Specimen Type /Preparation	-2mm material. Recompacted to 90% dry density at as received moisture content using a bulk density of 2.00Mg/m3

8 % >2mm sieve removed prior to test
Specimen(s) nominally 60mm x 60mm square
Test(s) carried out in submerged condition
Particle density, assumed 2.65 Mg/m^3

Specimen Details		No.	1	2	3	4	5	6
Initial	Height	mm	24.0	24.0	24.0			
	Bulk Density	Mg/m^3	1.80	1.80	1.80			
	Water Content	%	28.9	28.9	28.9			
	Dry density	Mg/m^3	1.40	1.40	1.40			
	Voids ratio		0.898	0.898	0.898			
	Degree of Saturation	%	85	85	85			
Consol^n	Consolidation / Normal Stress applied	kPa	**100**	**200**	**400**			
	Change in height during consolidation	mm	-0.856	-2.270	-3.168			
	Voids ratio after consolidation		0.830	0.719	0.648			
Shear see note 1	Voids ratio at end of test		0.790	0.689	0.616			
	Moisture content at end of test	%	29.8	26.0	23.2			
	Saturation at end of test	%	100	100	100			

Shearing stage

Rate of displacement	Peak	mm/min	0.001	0.001	0.001			
	Residual	mm/min						
Peak values, (o)	Relative displacement	mm	2.83	2.41	2.42			
	Shear stress	kPa	40.5	72.1	128.1			
Residual values, (x)	No. of reversals							
	Relative displacement	mm						
	Shear stress	kPa						



Shear Strength Parameters

Peak strength, (o)		Regression	Manual
c '	kPa	12	-
Ø '	degrees	16	-
Residual strength, (x)			
c'_R	kPa	-	-
$Ø'_R$	degrees	-	-

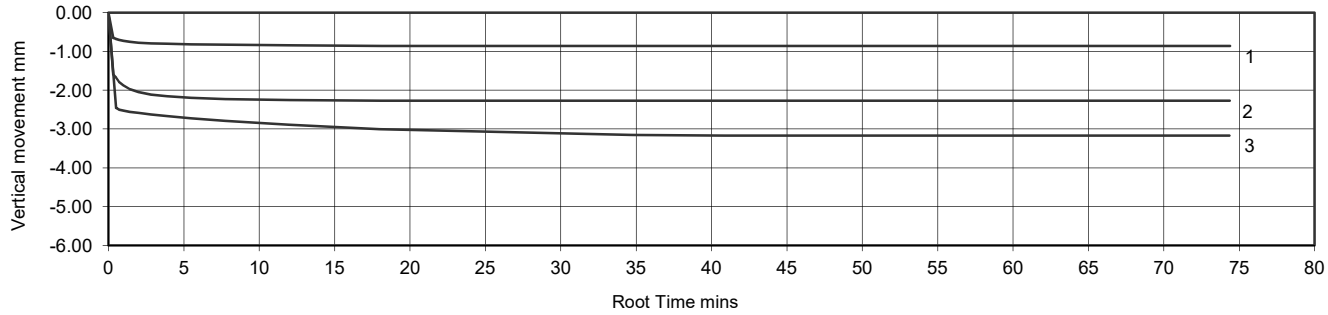
Notes :

1 After shear values based on BS1377. Pt 7 cl. 4.6.1.6 using δH calculated from consolidation and shear stages

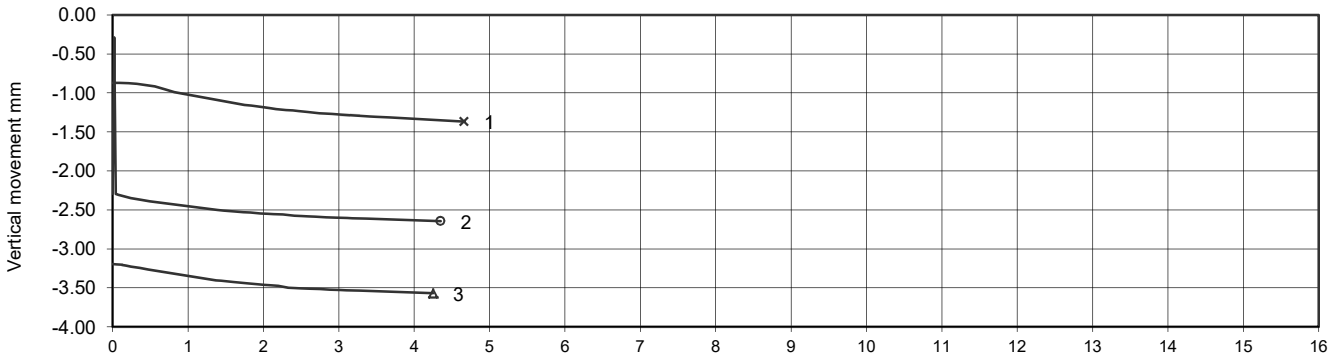
Determination of shear strength by direct shear (Small shearbox apparatus)
(BS1377 : Part 7 : clause 4 : 1990)

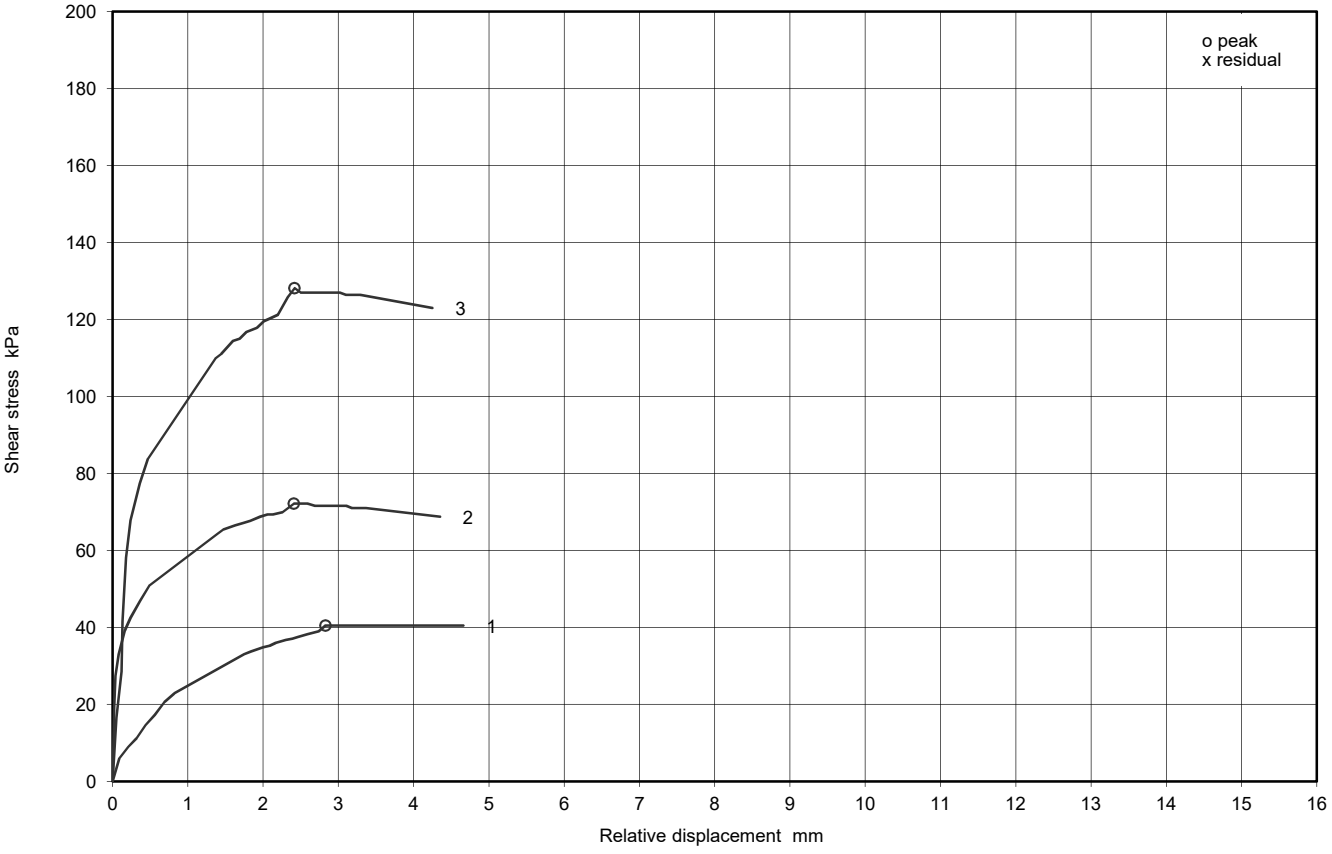
Project No	N8135	Sample Details:	Hole No.	HEP-BH-47		
Project Name	Heathrow Airport Limited		Depth (m BGL)	4.00-4.45		
			Sample No	18	Type	B
			ID			
			Spec Ref			

Consolidation stage(s)



Shearing stage(s)





Ref			Figure
SLR7.4 Rev 86.0 Feb18	SOCOTEC UKAS TESTING 1157	Printed:18/07/2018 08:25	**SSB** sheet 2 of 2

Determination of shear strength by direct shear (Small shearbox apparatus)
(BS1377 : Part 7 : clause 4 : 1990)

Project No	N8135	Sample Details:	Hole No.	HEP-BH-826		
Project Name	Heathrow Airport Limited		Depth (m BGL)	4.5 - 5.0		
			Sample No	25	Type	B
			ID			
			Spec Ref			

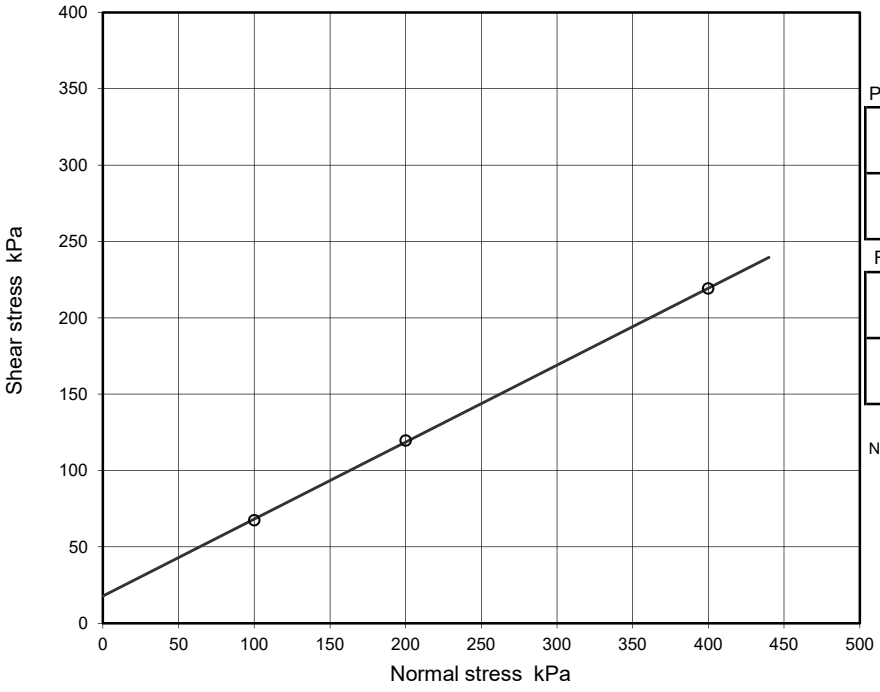
Soil Description	Brown slightly sandy gravelly CLAY.
Specimen Type /Preparation	-2mm material. Recompacted to 90% dry density at as received moisture content using a bulk density of 2.00Mg/m3

48 % >2mm sieve removed prior to test
Specimen(s) nominally 60mm x 60mm square
Test(s) carried out in submerged condition
Particle density, assumed 2.75 Mg/m^3

Specimen Details		No.	1	2	3	4	5	6
Initial	Height	mm	23.2	22.9	24.0			
	Bulk Density	Mg/m^3	2.04	2.07	1.97			
	Water Content	%	26.6	26.6	26.6			
	Dry density	Mg/m^3	1.61	1.63	1.56			
	Voids ratio		0.709	0.684	0.766			
	Degree of Saturation	%	103	107	96			
Consol^n	Consolidation / Normal Stress applied	kPa	**100**	**200**	**400**			
	Change in height during consolidation	mm	-1.864	-3.082	-4.942			
	Voids ratio after consolidation		0.572	0.458	0.402			
Shear see note 1	Voids ratio at end of test		0.526	0.420	0.358			
	Moisture content at end of test	%	19.1	15.3	13.0			
	Saturation at end of test	%	100	100	100			

Shearing stage

Rate of displacement	Peak	mm/min	0.002	0.002	0.002			
	Residual	mm/min						
Peak values, (o)	Relative displacement	mm	4.22	3.90	3.58			
	Shear stress	kPa	67.4	119.6	219.0			
Residual values, (x)	No. of reversals							
	Relative displacement	mm						
	Shear stress	kPa						



Shear Strength Parameters

Peak strength, (o)		Regression	Manual
c '	kPa	18	-
Ø '	degrees	27	-
Residual strength, (x)			
c'_R	kPa	-	-
$Ø'_R$	degrees	-	-

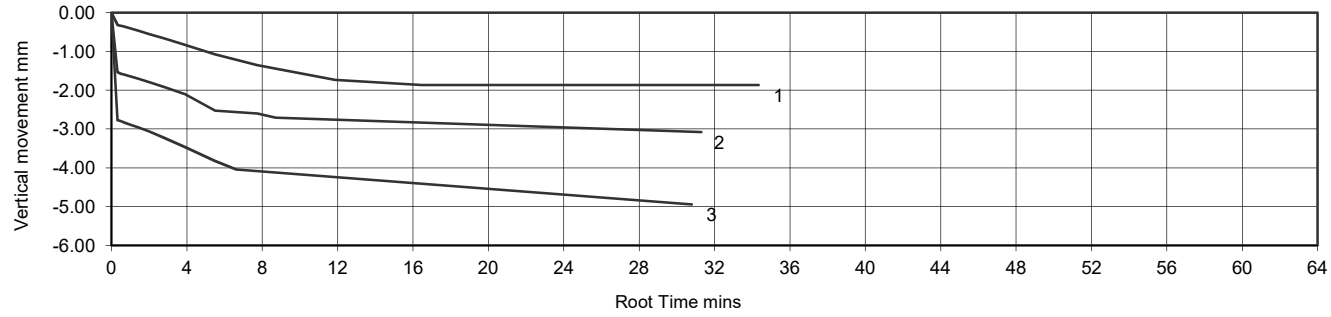
Notes :

1 After shear values based on BS1377. Pt 7 cl. 4.6.1.6 using δH calculated from consolidation and shear stages

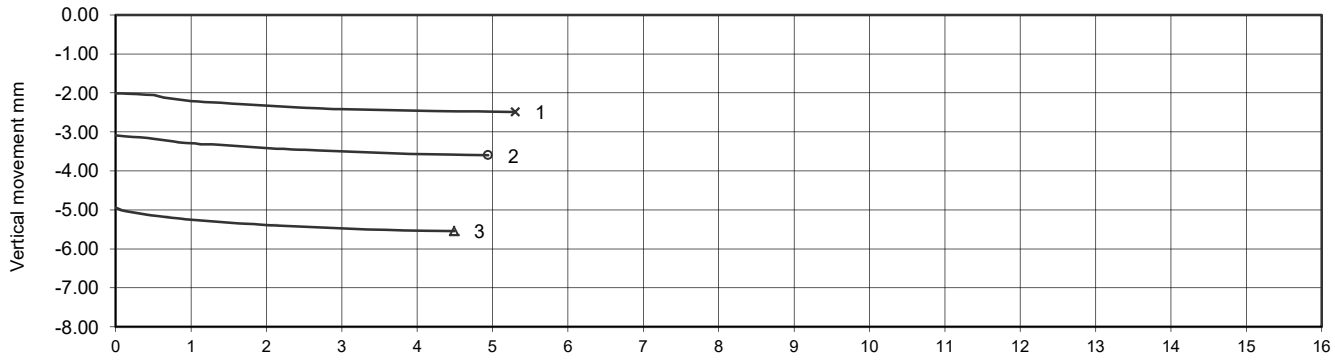
Determination of shear strength by direct shear (Small shearbox apparatus)
(BS1377 : Part 7 : clause 4 : 1990)

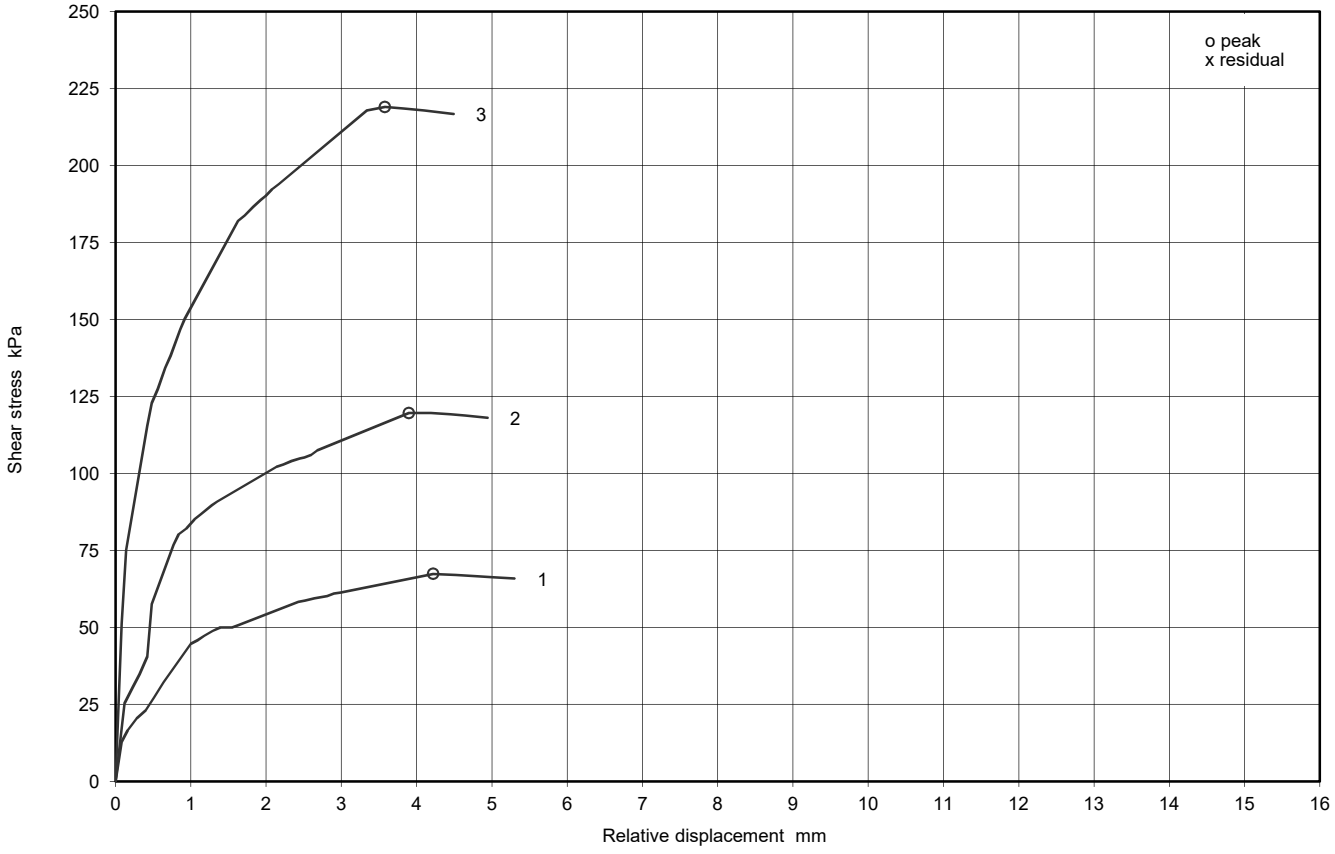
Project No	N8135	Sample Details:	Hole No.	HEP-BH-826		
Project Name	Heathrow Airport Limited		Depth (m BGL)	4.5 - 5.0		
			Sample No	25	Type	B
			ID			
			Spec Ref			

Consolidation stage(s)



Shearing stage(s)





Ref			Figure
SLR7.4 Rev 86.0 Feb18	SOCOTEC UKAS TESTING 1157	Printed:25/07/2018 08:24	**SSB** sheet 2 of 2

Determination of shear strength by direct shear (Small shearbox apparatus)
(BS1377 : Part 7 : clause 4 : 1990)

Project No	N8135	Sample Details:	Hole No.	HEP-BH-1804		
Project Name	Heathrow Airport Limited		Depth (m BGL)	3.0 - 3.5		
			Sample No	20	Type	B
			ID			
			Spec Ref			

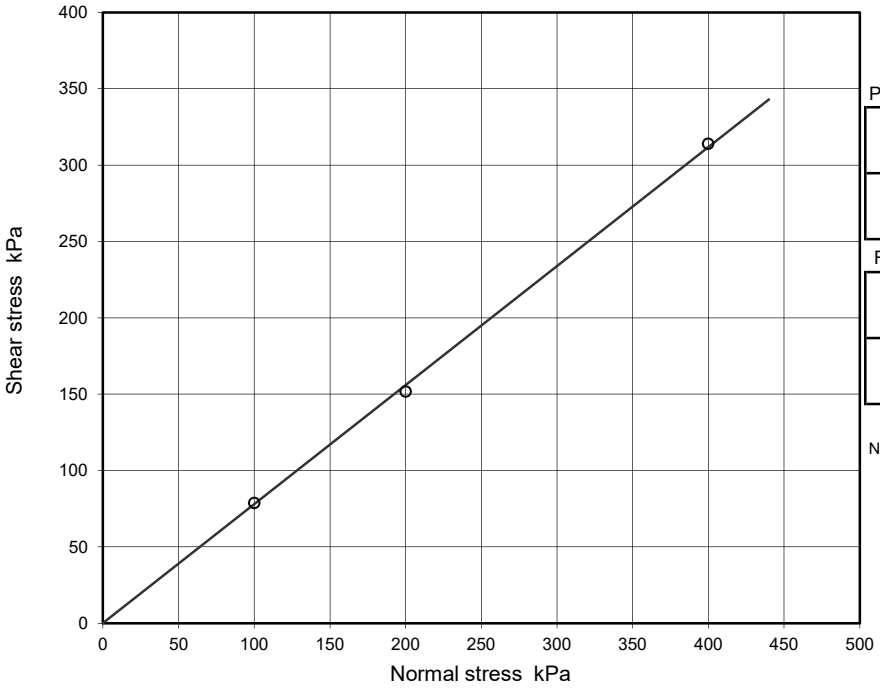
Soil Description	Brown sandy GRAVEL.
Specimen Type /Preparation	-2mm material. Recompacted to 90% dry density at as received moisture content using an assumed bulk density of 2.00Mg/m3.

86 % >2mm sieve removed prior to test
Specimen(s) nominally 60mm x 60mm square
Test(s) carried out in submerged condition
Particle density, assumed 2.65 Mg/m^3

Specimen Details		No.	1	2	3	4	5	6
Initial	Height	mm	21.1	21.1	21.1			
	Bulk Density	Mg/m^3	1.63	1.63	1.63			
	Water Content	%	6.2	6.2	6.2			
	Dry density	Mg/m^3	1.53	1.53	1.54			
	Voids ratio		0.728	0.726	0.726			
	Degree of Saturation	%	23	23	23			
Consol^n	Consolidation / Normal Stress applied	kPa	**100**	**200**	**400**			
	Change in height during consolidation	mm	-0.204	-0.720	-0.746			
	Voids ratio after consolidation		0.711	0.668	0.665			
Shear see note 1	Voids ratio at end of test		0.728	0.676	0.665			
	Moisture content at end of test	%	21.3	20.5	20.2			
	Saturation at end of test	%	78	80	81			

Shearing stage

Rate of displacement	Peak	mm/min	0.600	0.600	0.600			
	Residual	mm/min						
Peak values, (o)	Relative displacement	mm	0.76	3.40	4.00			
	Shear stress	kPa	78.6	151.6	313.8			
Residual values, (x)	No. of reversals							
	Relative displacement	mm						
	Shear stress	kPa						



Shear Strength Parameters

Peak strength, (o)		Regression	Manual
c '	kPa	(-2.6)	0.0
Ø '	degrees	(38)	38

Residual strength, (x)

c'_R	kPa	-	-
$Ø'_R$	degrees	-	-

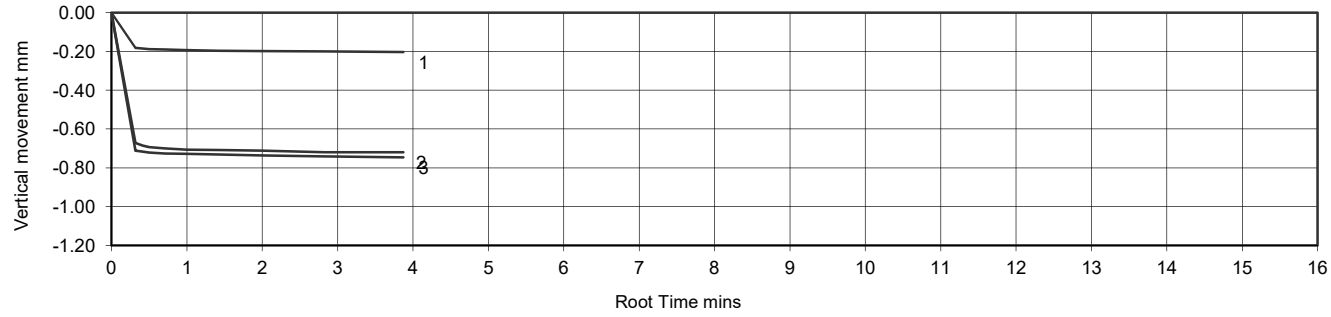
Notes :

1 After shear values based on BS1377. Pt 7 cl. 4.6.1.6 using δH calculated from consolidation and shear stages

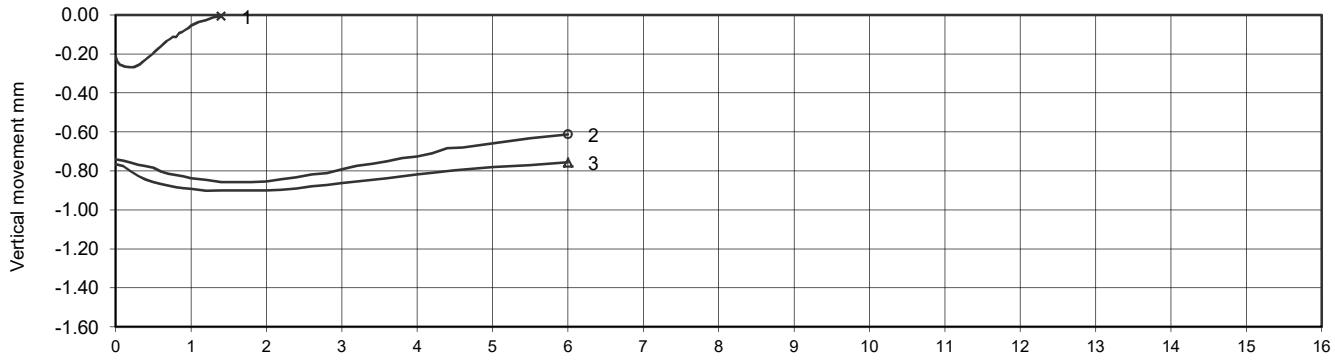
Determination of shear strength by direct shear (Small shearbox apparatus)
(BS1377 : Part 7 : clause 4 : 1990)

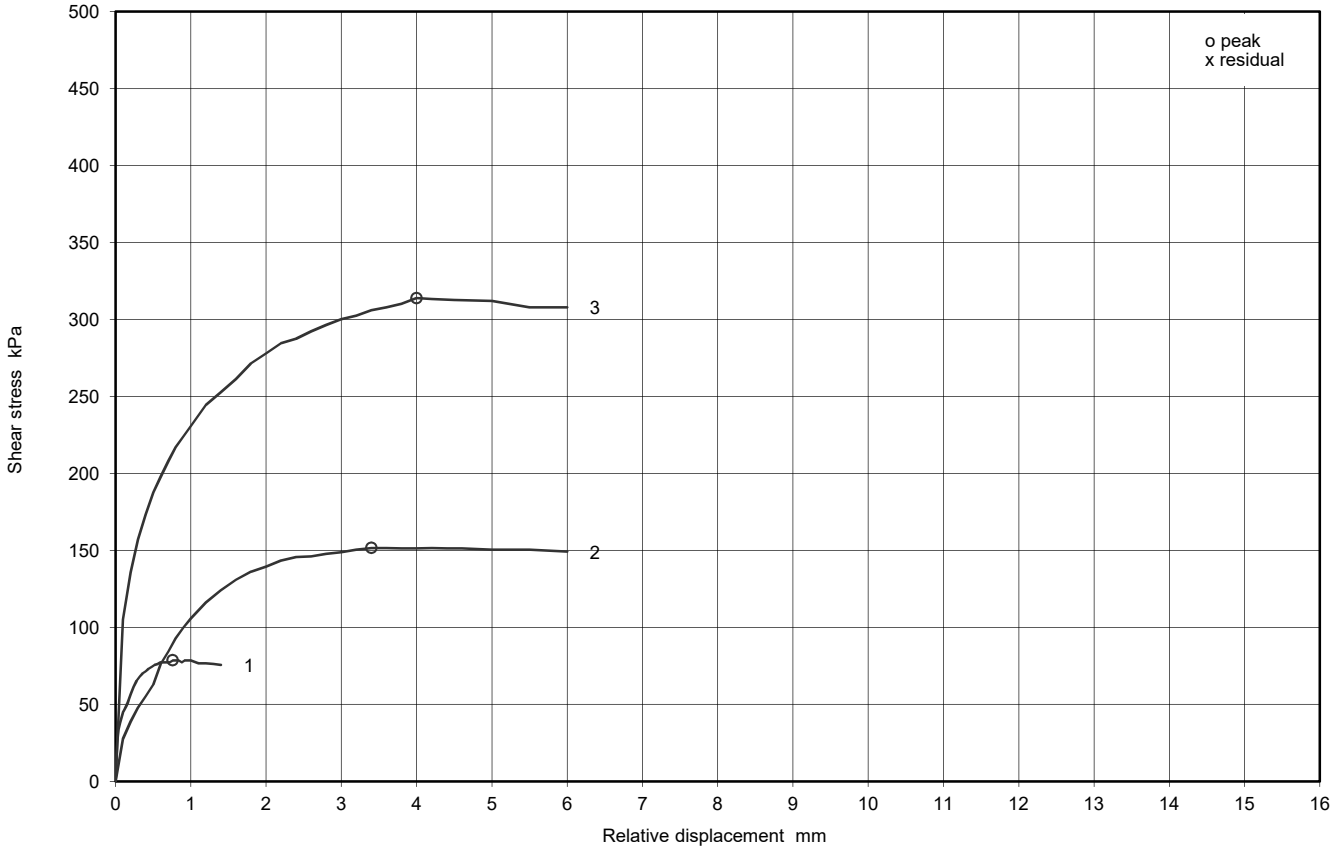
Project No	N8135	Sample Details:	Hole No.	HEP-BH-1804		
Project Name	Heathrow Airport Limited		Depth (m BGL)	3.0 - 3.5		
			Sample No	20	Type	B
			ID			
			Spec Ref			

Consolidation stage(s)



Shearing stage(s)





Ref			Figure
SLR7.4 Rev 86.0 Feb18	SOCOTEC UKAS TESTING 1157	Printed:18/07/2018 08:21	**SSB** sheet 2 of 2

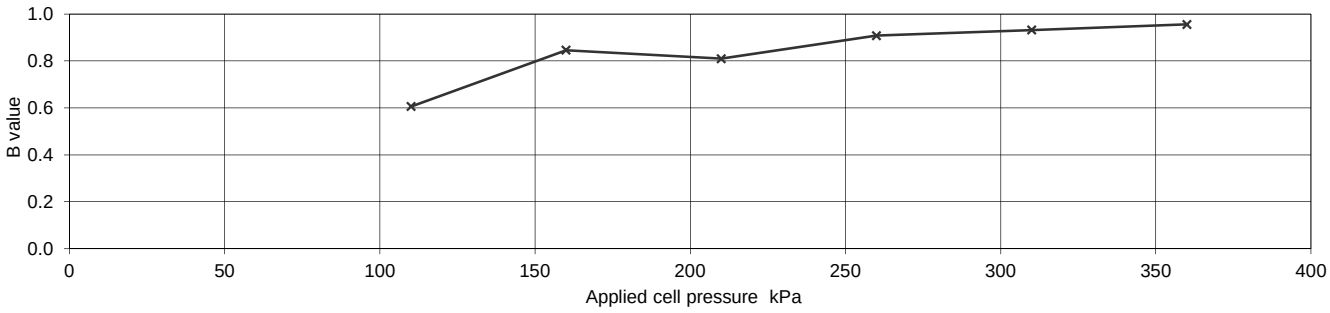
Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	N8135	Sample Details:	Hole No	HEP-BH-1		
Project Name	Heathrow Airport Limited		Depth (m BGL)	6.50		
			No	27	Type	UT
			ID			
			Spec Ref			

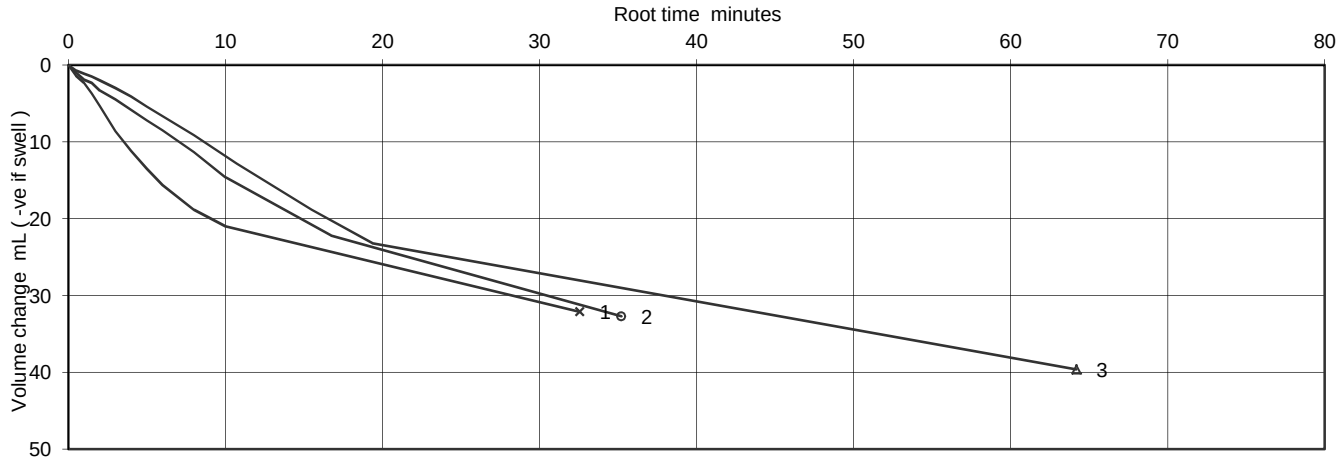
Specimen Details		
Initial		
Length	mm	203.36
Diameter	mm	104.08
Bulk Density	Mg/m³	1.98
Water Content	%	27
Dry density	Mg/m³	1.57
After test		
Bulk Density	Mg/m³	2.00
Water Content	%	25
Dry density	Mg/m³	1.60

Soil Description	Firm laminated grey slightly sandy CLAY
Specimen Type /Preparation	UNDISTURBED

Saturation Details		Method of Saturation
		Increments of cell and back pressure
Cell pressure increments	kPa	50
Differential Pressure	kPa	10
Final Cell Pressure	kPa	360
Final pore water pressure	kPa	335.7
Final B Value		0.96



Consolidation Details	Drainage Conditions		From radial boundary and one end			
	Stage No.		1	2	3	
	Cell Pressure applied		410	470	590	kPa
	Back Pressure applied		350	350	350	kPa
	Effective Pressure		60	120	240	kPa
	Pore pressure at start of consolidation		384	721	497	kPa
	Pore pressure at end of consolidation		351	351	350	kPa
	Pore pressure dissipation at end of consolidation		97	100	100	%
Consolidation parameters (see note to BS1377 : pt 8, clause 6.3.4)	Coefficient of Consolidation	C_{vi}	2.04	0.45	0.24	m^2/year
	Coefficient of Compressibility	M_{vi}	0.55	0.05	0.16	m^2/MN
	Coefficient of Permeability (calculated)	k_{vi}	3.5E-10	7.1E-12	1.1E-11	m/s



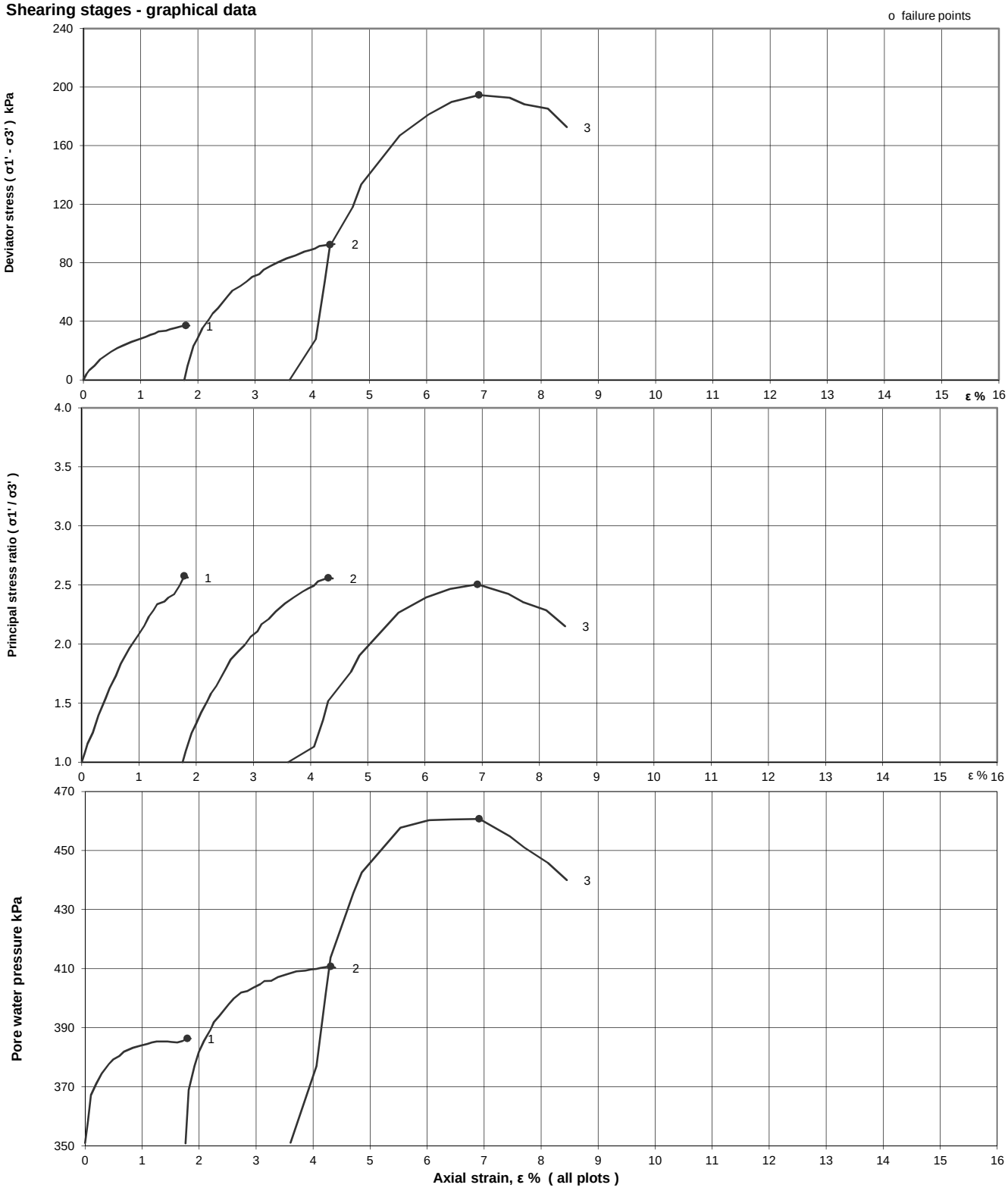
Ref			Figure
SLR8.1 Rev 86.0 Feb18	SOCOTEC	Printed:21/06/2018 08:44	CUM
	UKAS TESTING 1157		sheet 1 of 3

Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	N8135	Sample Details:	Hole No	HEP-BH-1		
Project Name	Heathrow Airport Limited		Depth (m BGL)	6.50		
			No	27	Type	UT
			ID			
			Spec Ref			

Shearing stages - graphical data

o failure points

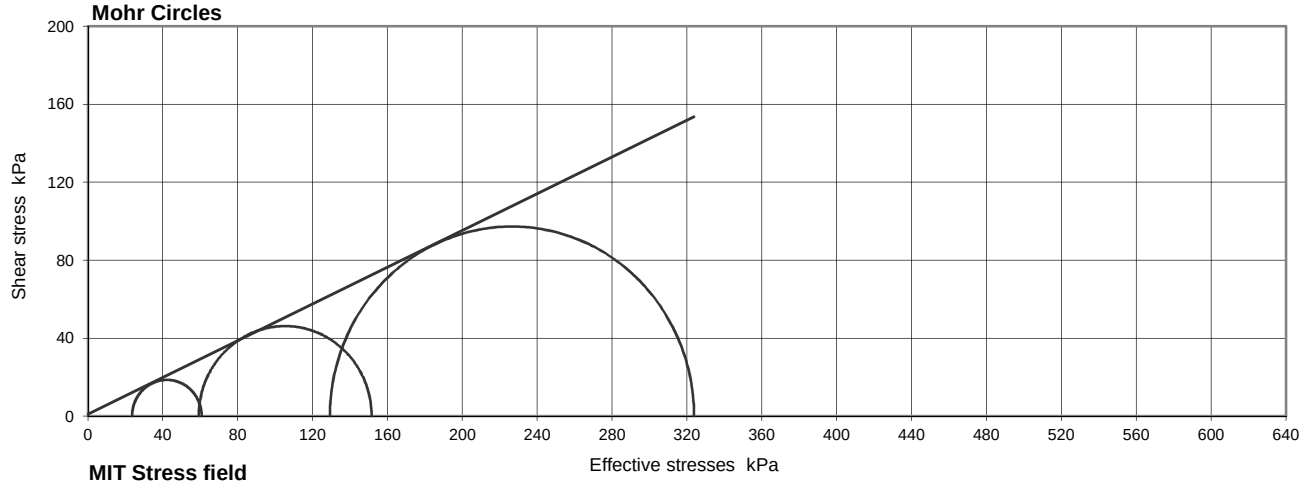


Ref			Figure
SLR8.1 Rev 86.0 Feb18	SOCOTEC UKAS TESTING 1157	Printed:21/06/2018 08:44	**CUM** sheet 2 of 3

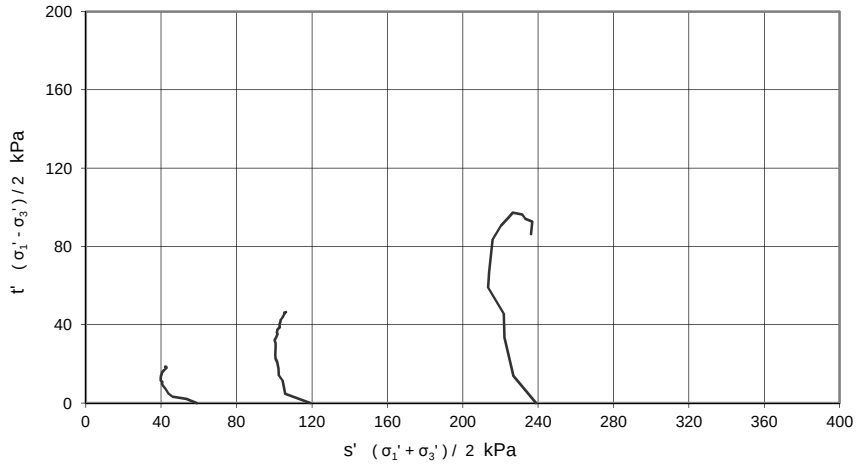
Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	N8135	Sample Details:	Hole No	HEP-BH-1		
Project Name	Heathrow Airport Limited		Depth (m BGL)	6.50		
			No	27	Type	UT
			ID			
			Spec Ref			

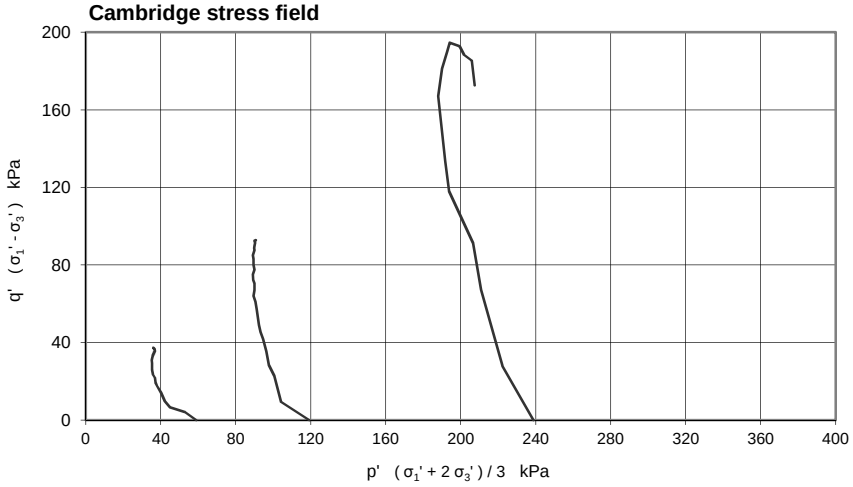
Mohr Circles



MIT Stress field



Cambridge stress field



Compression stages

Stage	1	2	3	
Cell pressure	410	470	590	kPa
Initial pwp	351	351	351	kPa
Initial σ_3'	59	119	239	kPa
Rate of strain	1.43	1.43	1.43	%/hr

Failure conditions

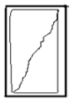
Criterion	Maximum effective principal stress ratio			
Axial strain	1.79	4.31	6.91	%
$(\sigma_1' / \sigma_3')_f$	2.576	2.560	2.505	
$(\sigma_1' - \sigma_3')_f$	37.2	92.4	194.5	kPa
u_f	386	411	461	kPa
$\sigma_3'_f$	24	59	129	kPa
$\sigma_1'_f$	61	152	324	kPa
A_f	0.95	0.65	0.56	
Time to failure	1.3	3.0	4.8	hrs

Shear Strength Parameters

at peak stress ratio

		Linear regression
c '	kPa	1.0
Ø '	degrees	25.2
		Manual re-assessment
c '	kPa	-
Ø '	degrees	-

Mode of failure



Notes : Deviator stresses corrected for area change, vertical side drains and 0.596 mm thick rubber membrane(s)

Ref			Figure
SLR8.1 Rev 86.0 Feb18	SOCOTEC UKAS TESTING 1157	Printed:21/06/2018 08:44	**CUM** sheet 3 of 3

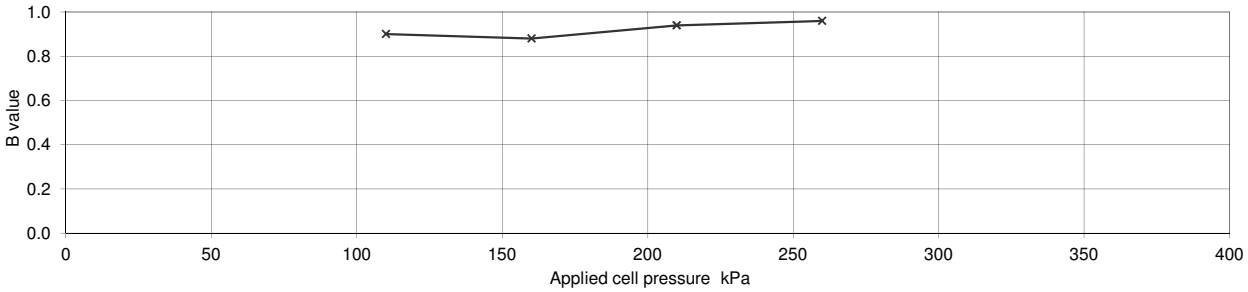
Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	N8135-18	Sample Details:	Hole No	HEP-BH-7		
Project Name	Heathrow Airport Limited		Depth (m BGL)	6.50		
			No	39	Type	UT
			ID			
			Spec Ref			

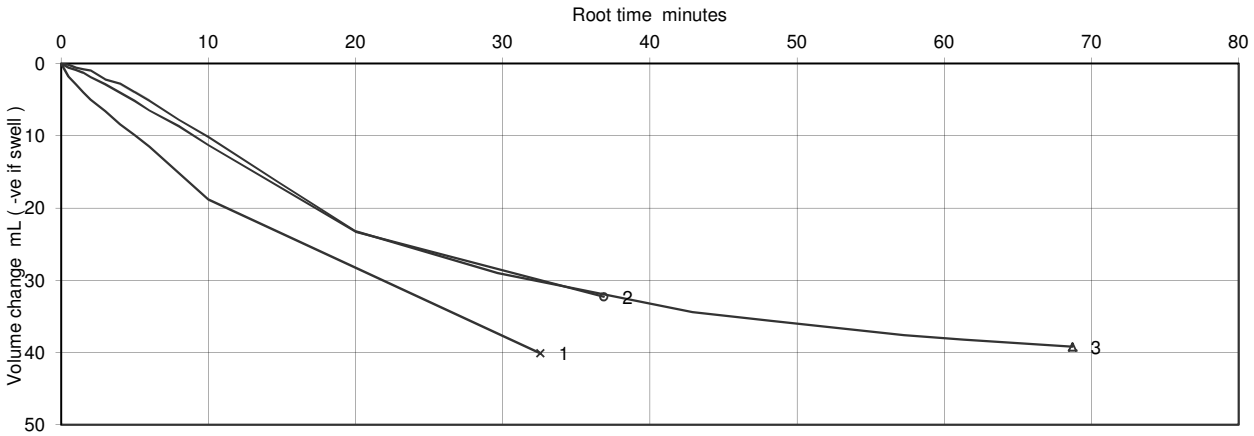
Specimen Details		
Initial		
Length	mm	203.45
Diameter	mm	104.38
Bulk Density	Mg/m³	2.00
Water Content	%	27
Dry density	Mg/m³	1.58
After test		
Bulk Density	Mg/m³	2.03
Water Content	%	25
Dry density	Mg/m³	1.62

Soil Description	Firm greyish brown slightly sandy CLAY
Specimen Type /Preparation	UNDISTURBED

Saturation Details		Method of Saturation
		Increments of cell and back pressure
Cell pressure increments	kPa	50
Differential Pressure	kPa	10
Final Cell Pressure	kPa	260
Final pore water pressure	kPa	243
Final B Value		0.96



Consolidation Details	Drainage Conditions		From radial boundary and one end			
	Stage No.		1	2	3	
	Cell Pressure applied		375	450	600	kPa
	Back Pressure applied		300	300	300	kPa
	Effective Pressure		75	150	300	kPa
	Pore pressure at start of consolidation		357	389	471	kPa
	Pore pressure at end of consolidation		302	302	309	kPa
	Pore pressure dissipation at end of consolidation		96	98	95	%
Consolidation parameters (see note to BS1377 : pt 8, clause 6.3.4)	Coefficient of Consolidation	C_{vi}	0.56	0.31	0.21	m^2/year
	Coefficient of Compressibility	M_{vi}	0.40	0.21	0.14	m^2/MN
	Coefficient of Permeability (calculated)	k_{vi}	7.0E-11	2.0E-11	9.1E-12	m/s



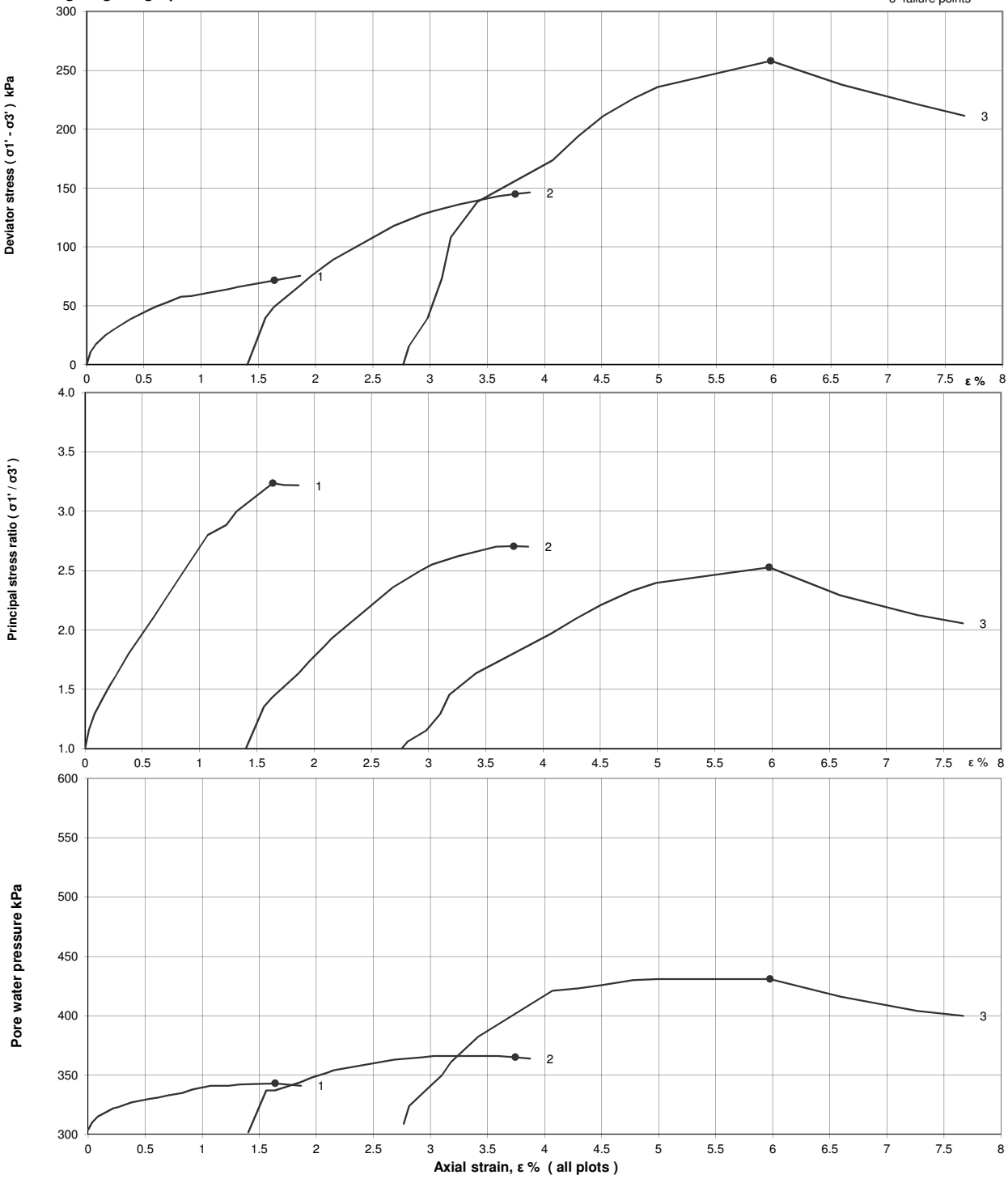
Ref			Figure
SLR8.1 Rev 86.0 Feb18	SOCOTEC	Printed:03/10/2018 13:42	CUM
	UKAS TESTING 1157		sheet 1 of 3

Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	N8135-18	Sample Details:	Hole No	HEP-BH-7		
Project Name	Heathrow Airport Limited		Depth (m BGL)	6.50		
			No	39	Type	UT
			ID			
			Spec Ref			

Shearing stages - graphical data

o failure points

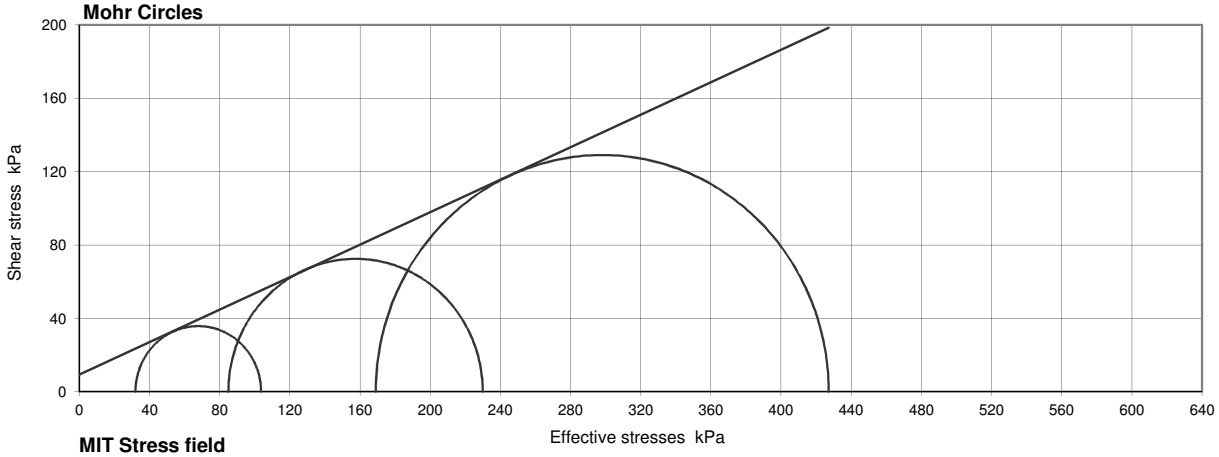


Ref			Figure
SLR8.1 Rev 86.0 Feb18	SOCOTEC UKAS TESTING 1157	Printed:03/10/2018 13:42	**CUM** sheet 2 of 3

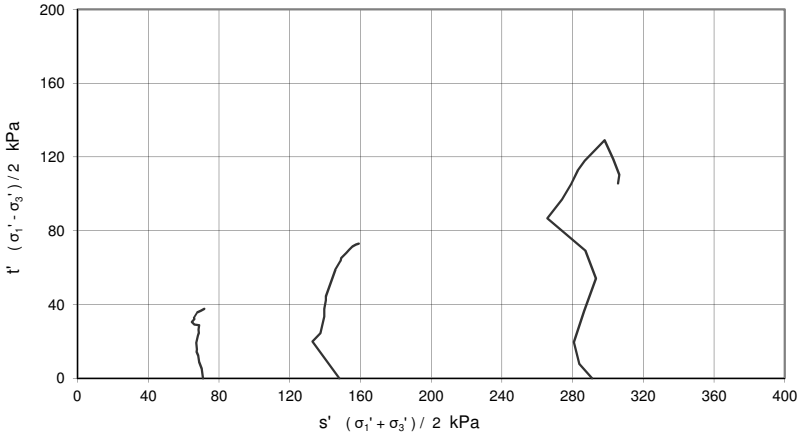
Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	N8135-18	Sample Details:	Hole No	HEP-BH-7		
Project Name	Heathrow Airport Limited		Depth (m BGL)	6.50		
			No	39	Type	UT
			ID			
			Spec Ref			

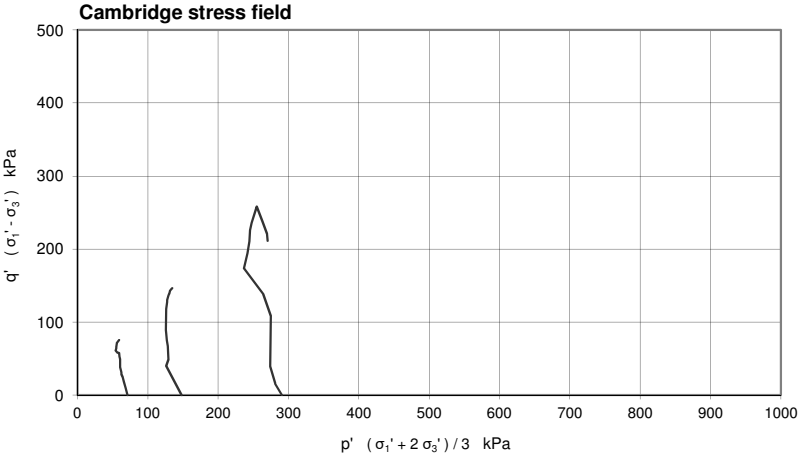
Mohr Circles



MIT Stress field



Cambridge stress field



Compression stages

Stage	1	2	3	
Cell pressure	375	450	600	kPa
Initial pwp	304	302	309	kPa
Initial σ_3'	71	148	291	kPa
Rate of strain	0.39	0.39	0.39	%/hr

Failure conditions

Criterion	Maximum effective principal stress ratio			
Axial strain	1.64	3.74	5.98	%
$(\sigma_1' / \sigma_3')_f$	3.237	2.706	2.528	
$(\sigma_1' - \sigma_3')_f$	71.6	145.0	258.2	kPa
u_f	343	365	431	kPa
$\sigma_3'_f$	32	85	169	kPa
$\sigma_1'_f$	104	230	427	kPa
A_f	0.54	0.43	0.47	
Time to failure	4.2	9.6	15.3	hrs

Shear Strength Parameters

at peak stress ratio

		Linear regression
c '	kPa	9.3
Ø '	degrees	23.9
		Manual re-assessment
c '	kPa	-
Ø '	degrees	-

Mode of failure

Notes : Deviator stresses corrected for area change, vertical side drains and 0.298 mm thick rubber membrane(s)

Ref			Figure
SLR8.1 Rev 86.0 Feb18	SOCOTEC UKAS TESTING 1157	Printed:03/10/2018 13:42	**CUM** sheet 3 of 3

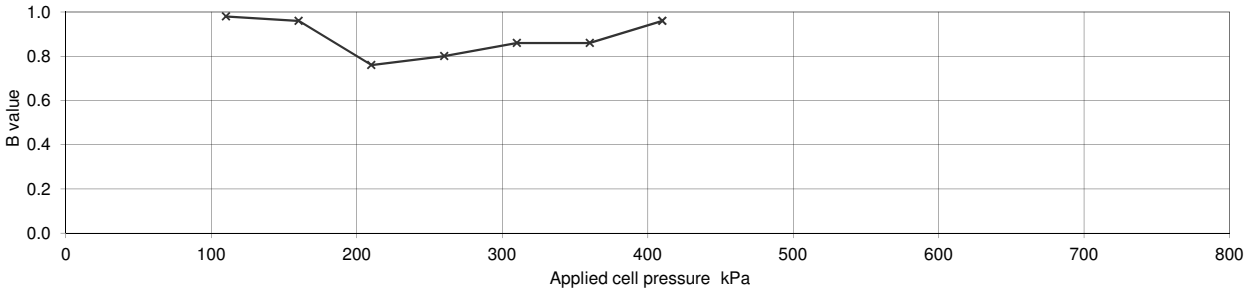
Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	N8135-18	Sample Details:	Hole No	HEP - BH - 12		
Project Name	HEATHROW AIPORT HEATHROW		Depth (m BGL)	5.20		
			No	33	Type	UT
			ID			
			Spec Ref			

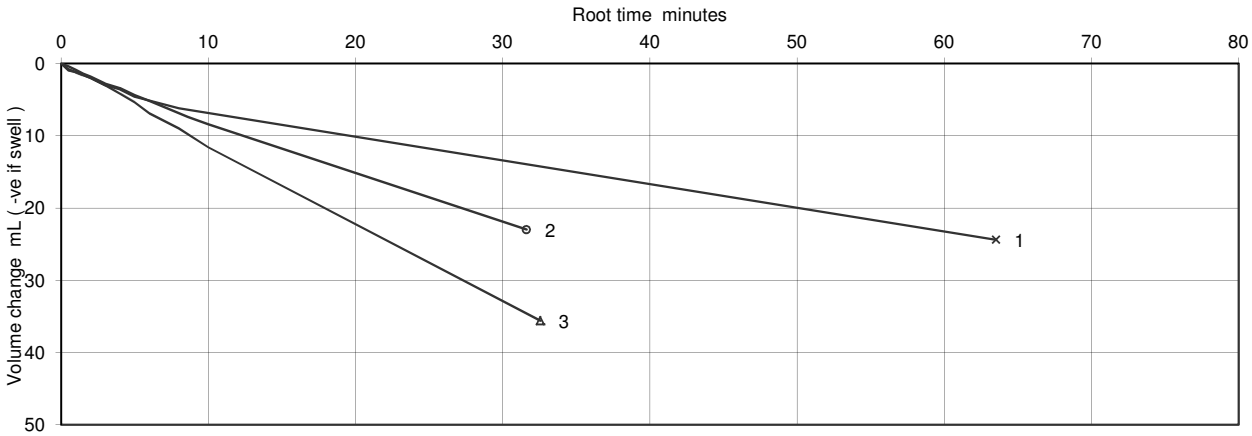
Specimen Details		
Initial		
Length	mm	203.14
Diameter	mm	104.74
Bulk Density	Mg/m³	1.94
Water Content	%	31
Dry density	Mg/m³	1.48
After test		
Bulk Density	Mg/m³	1.96
Water Content	%	29
Dry density	Mg/m³	1.52

Soil Description	Firm brown slightly sandy slightly gravelly CLAY.
Specimen Type /Preparation	UNDISTURBED

Saturation Details		Method of Saturation
		Increments of cell and back pressure
Cell pressure increments	kPa	50
Differential Pressure	kPa	10
Final Cell Pressure	kPa	410
Final pore water pressure	kPa	395
Final B Value		0.98



Consolidation Details	Drainage Conditions		From radial boundary and one end			
	Stage No.		1	2	3	
	Cell Pressure applied		460	520	640	kPa
	Back Pressure applied		400	400	400	kPa
	Effective Pressure		60	120	240	kPa
	Pore pressure at start of consolidation		443	458	538	kPa
	Pore pressure at end of consolidation		400	401	407	kPa
	Pore pressure dissipation at end of consolidation		100	98	95	%
Consolidation parameters (see note to BS1377 : pt 8, clause 6.3.4)	Coefficient of Consolidation	C_{vi}	0.29	0.36	0.28	m^2/year
	Coefficient of Compressibility	M_{vi}	0.32	0.23	0.16	m^2/MN
	Coefficient of Permeability (calculated)	k_{vi}	2.8E-11	2.5E-11	1.4E-11	m/s



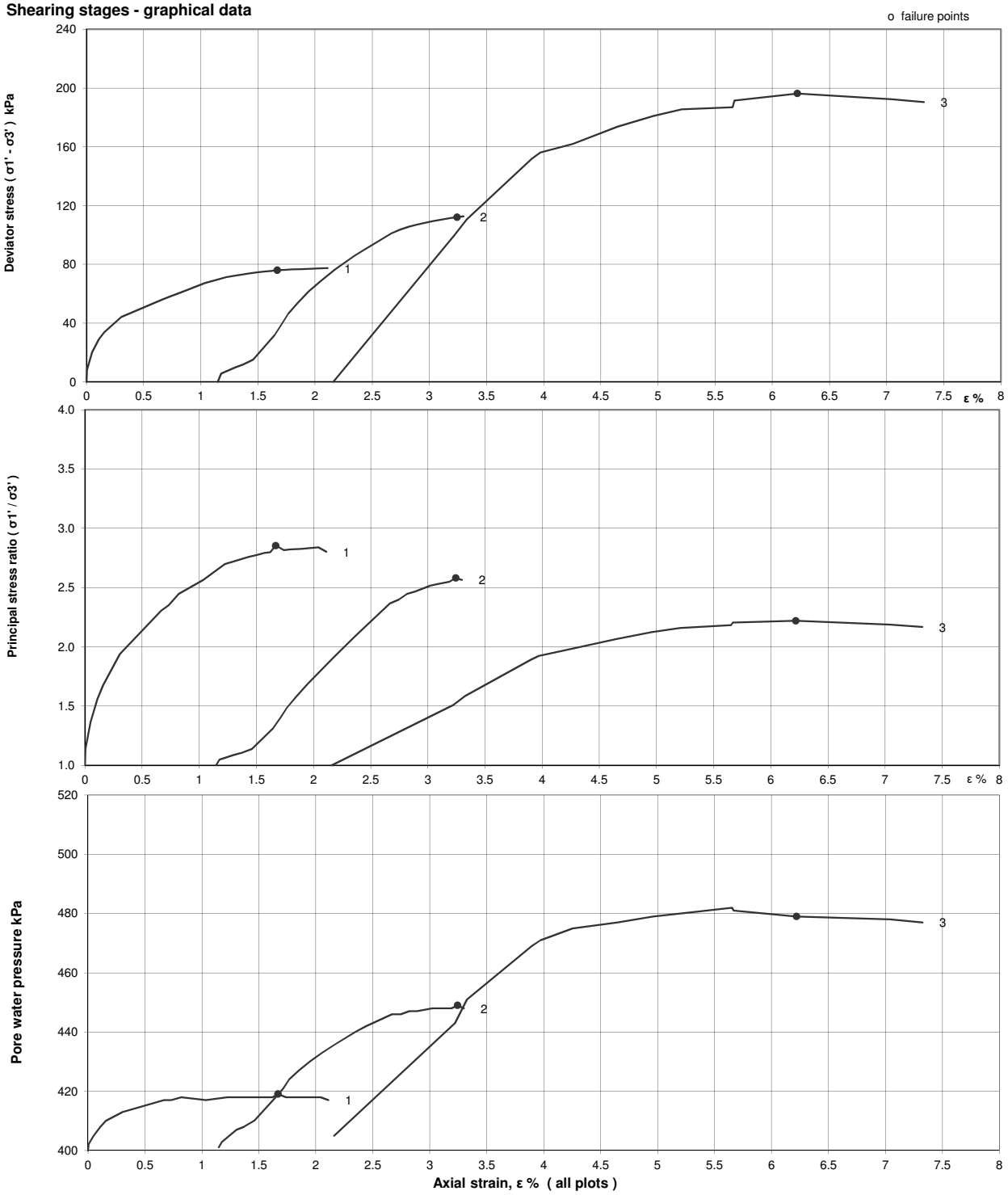
Ref			Figure
SLR8.1 Rev 86.0 Feb18	SOCOTEC	Printed:22/09/2018 15:19	CUM
	UKAS TESTING 1157		sheet 1 of 3

Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	N8135-18	Sample Details:	Hole No	HEP - BH - 12		
Project Name	HEATHROW AIPORT HEATHROW		Depth (m BGL)	5.20		
			No	33	Type	UT
			ID			
			Spec Ref			

Shearing stages - graphical data

o failure points

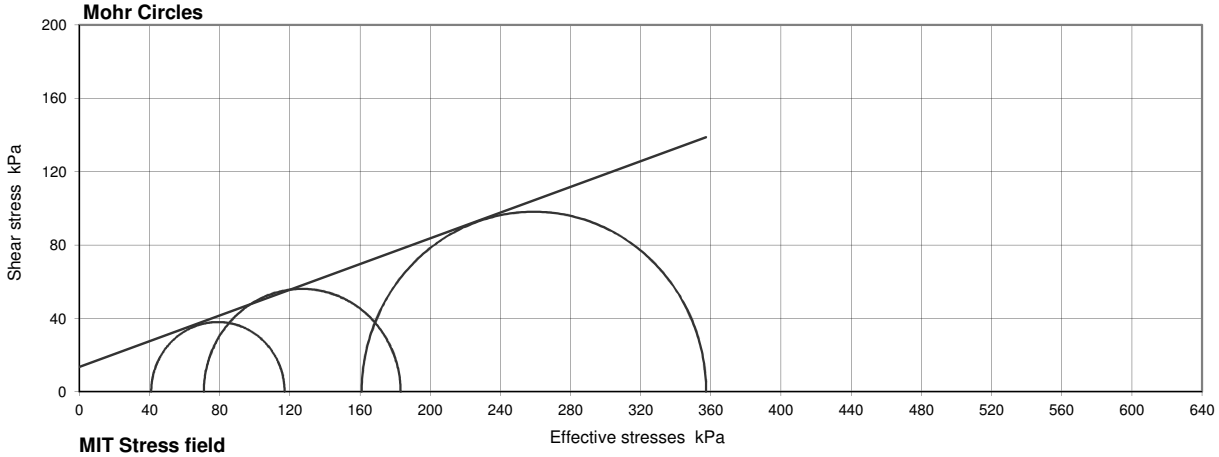


Ref			Figure
SLR8.1 Rev 86.0 Feb18	SOCOTEC UKAS TESTING 1157	Printed:22/09/2018 15:19	**CUM** sheet 2 of 3

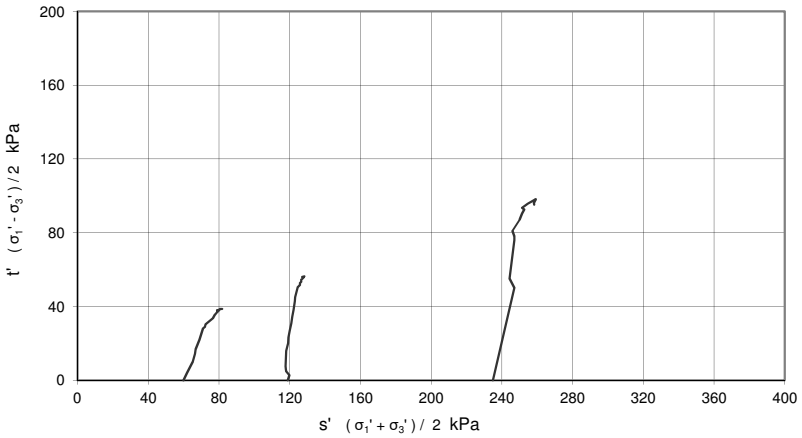
Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	N8135-18	Sample Details:	Hole No	HEP - BH - 12		
Project Name	HEATHROW AIPORT HEATHROW		Depth (m BGL)	5.20		
			No	33	Type	UT
			ID			
			Spec Ref			

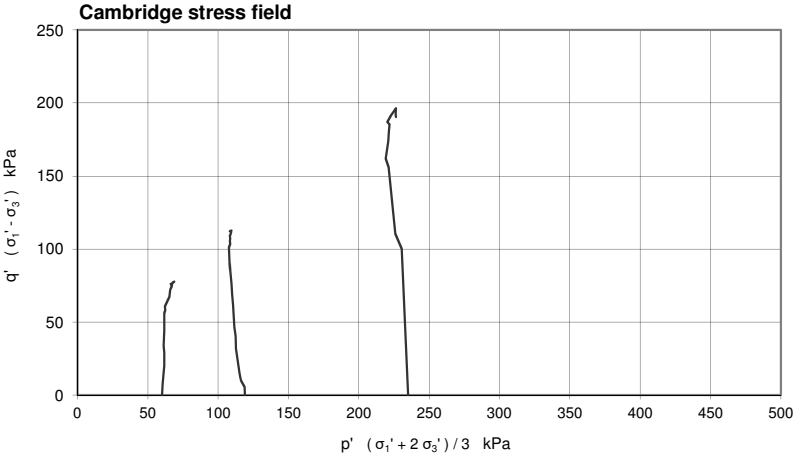
Mohr Circles



MIT Stress field



Cambridge stress field



Compression stages

Stage	1	2	3	
Cell pressure	460	520	640	kPa
Initial pwp	400	401	405	kPa
Initial σ_3'	60	119	235	kPa
Rate of strain	0.20	0.20	0.20	%/hr

Failure conditions

Criterion	Maximum effective principal stress ratio			
Axial strain	1.67	3.24	6.22	%
$(\sigma_1' / \sigma_3')_f$	2.854	2.580	2.219	
$(\sigma_1' - \sigma_3')_f$	76.0	112.2	196.3	kPa
u_f	419	449	479	kPa
$\sigma_3'_f$	41	71	161	kPa
$\sigma_1'_f$	117	183	357	kPa
A_f	0.25	0.43	0.38	
Time to failure	8.3	16.2	31.1	hrs

Shear Strength Parameters

at peak stress ratio

		Linear regression
c '	kPa	13.6
Ø '	degrees	19.3
		Manual re-assessment
c '	kPa	-
Ø '	degrees	-

Mode of failure

Notes : Deviator stresses corrected for area change, vertical side drains and 0.298 mm thick rubber membrane(s)

Ref			Figure
SLR8.1 Rev 86.0 Feb18	SOCOTEC UKAS TESTING 1157	Printed:22/09/2018 15:19	**CUM** sheet 3 of 3

Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure
(BS1377 : Part 8 : 1990)

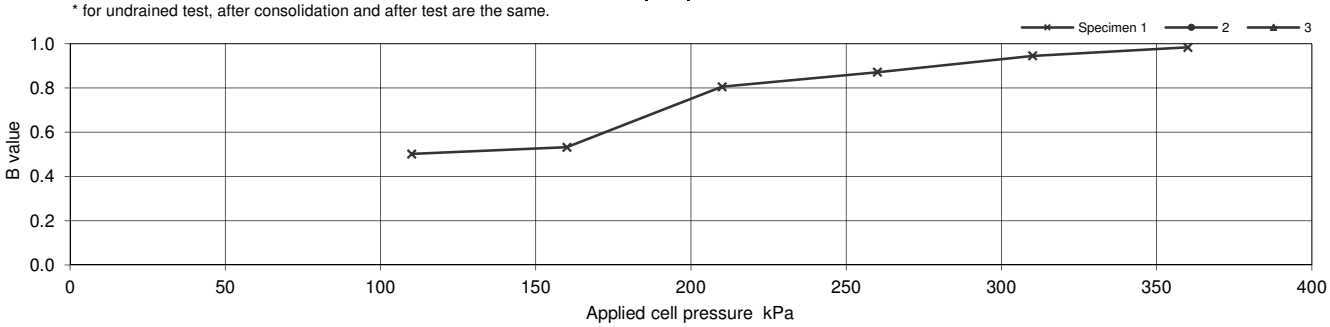
Project No	N8135-18	Sample Details:	Hole No	HEP-BH-23	
Project Name	Heathrow Airport Limited		Depth (m BGL)	5.00	
			No	23	Type UT
			ID		
			Spec Ref		

Specimen Details			1	2	3
Initial	Length	mm	204.26		
	Diameter	mm	103.26		
	Bulk Density	Mg/m³	1.99		
	Water Content	%	26		
	Dry density	Mg/m³	1.58		
After consolidation	Length	mm	204.73		
	Diameter	mm	103.50		
	Bulk Density*	Mg/m³	1.98		
	Water Content*	%	26		
	Dry density*	Mg/m³	1.57		

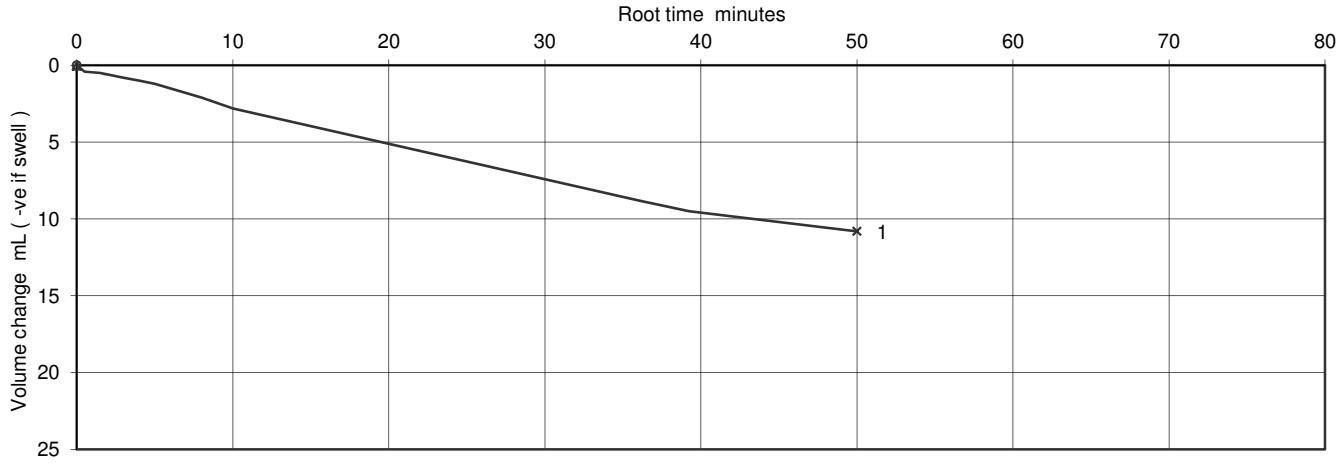
* for undrained test, after consolidation and after test are the same.

Soil Description	Firm brown slightly sandy slightly gravelly CLAY
Specimen Type /Preparation	UNDISTURBED

Saturation Details		Method of Saturation		
		Increments of cell and back pressure		
Cell pressure increments	kPa	50		
Differential Pressure	kPa	10		
Final Cell Pressure	kPa	360		
Final pore water pressure	kPa	321.9		
Final B Value		0.98		



Consolidation Details	Drainage Conditions		From radial boundary and one end			
	Specimen No.		1	2	3	
	Cell Pressure applied		410			kPa
	Back Pressure applied		350			kPa
	Effective Pressure		60			kPa
	Pore pressure at start of consolidation		377			kPa
	Pore pressure at end of consolidation		350			kPa
	Pore pressure dissipation at end of consolidation		100			%
Consolidation parameters (see note to BS1377 : pt 8, clause 6.3.4)	Coefficient of Consolidation	C_{vi}	0.18			m^2/year
	Coefficient of Compressibility	M_{vi}	0.23			m^2/MN
	Coefficient of Permeability (calculated)	k_{vi}	1.3E-11			m/s

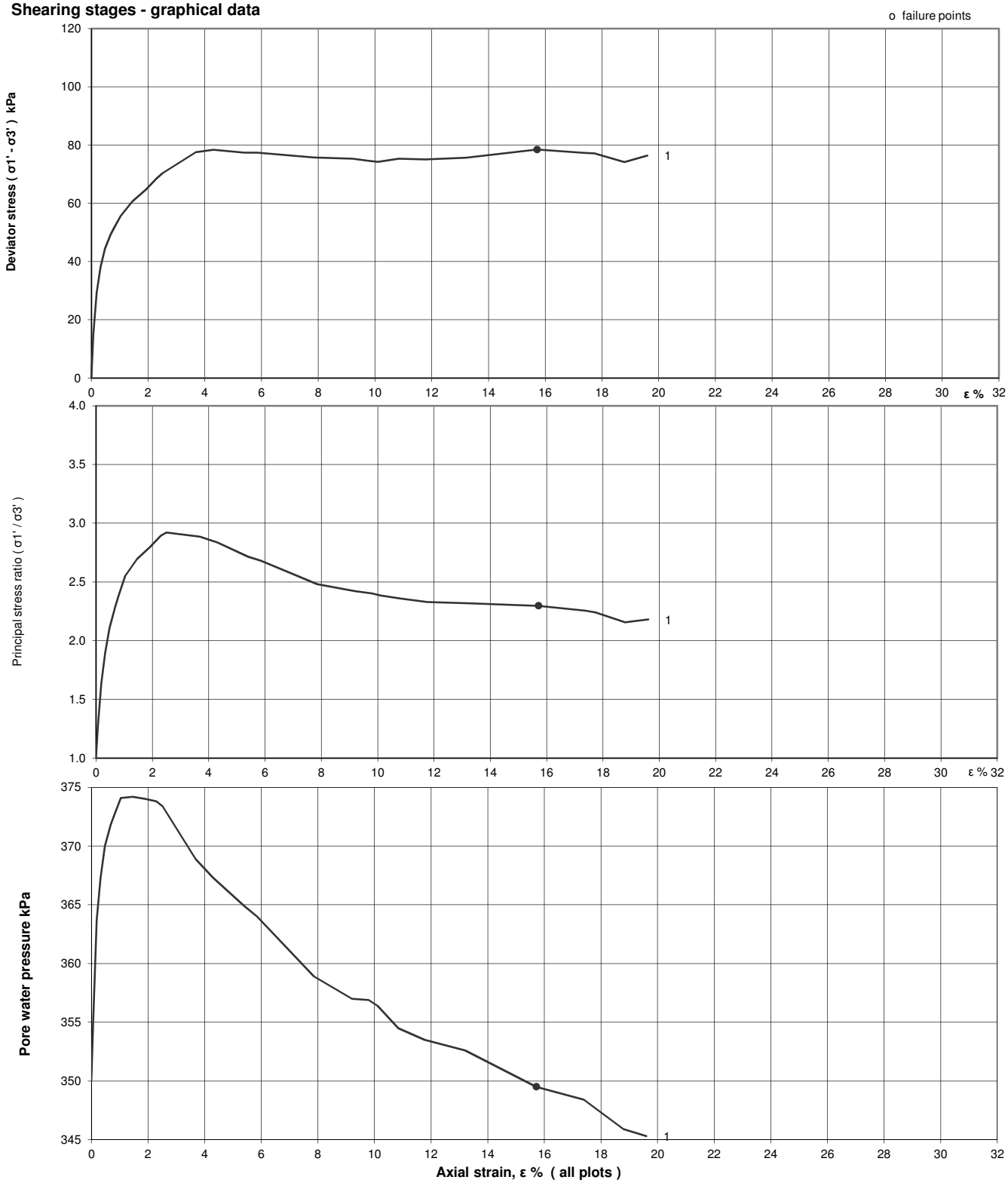


Ref			Figure
SLR8.1 Rev 86.0 Feb18	SOCOTEC	Printed:04/07/2018 13:17	CU
	UKAS TESTING 1157		sheet 1 of 3

Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure
(BS1377 : Part 8 : 1990)

Project No	N8135-18	Sample Details:	Hole No	HEP-BH-23		
Project Name	Heathrow Airport Limited		Depth (m BGL)	5.00		
			No	23	Type	UT
			ID			
			Spec Ref			

Shearing stages - graphical data

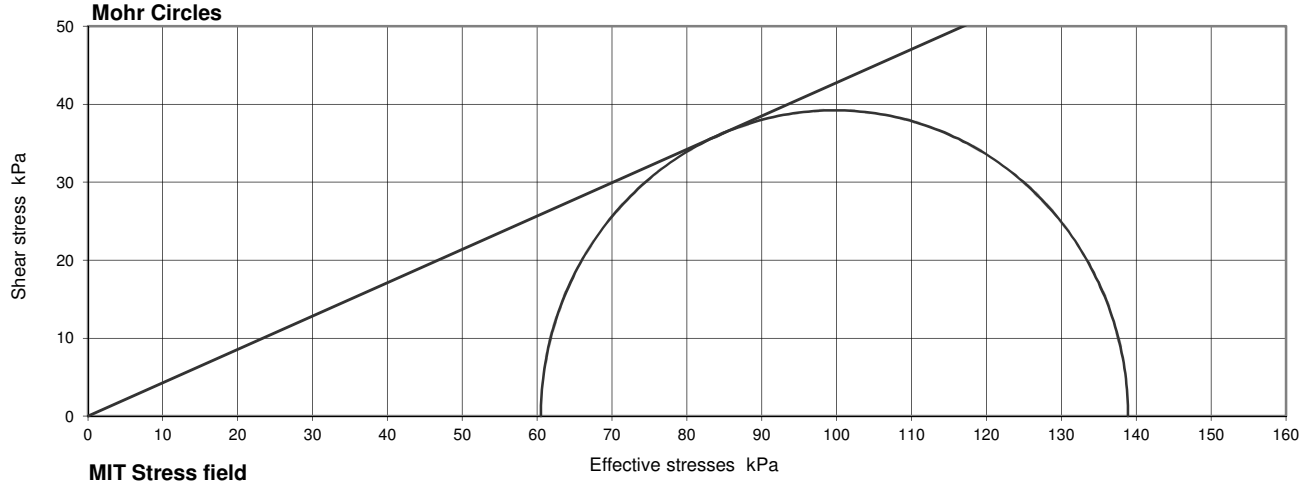


Ref			Figure
SLR8.1 Rev 86.0 Feb18	SOCOTEC	1157	**CU**
		Printed:04/07/2018 13:17	sheet 2 of 3

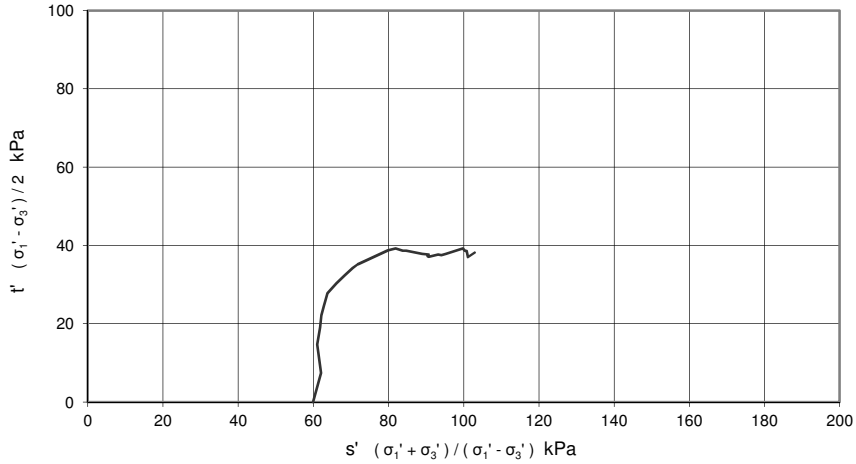
Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure
(BS1377 : Part 8 : 1990)

Project No	N8135-18	Sample Details:	Hole No	HEP-BH-23		
Project Name	Heathrow Airport Limited		Depth (m BGL)	5.00		
			No	23	Type	UT
			ID			
			Spec Ref			

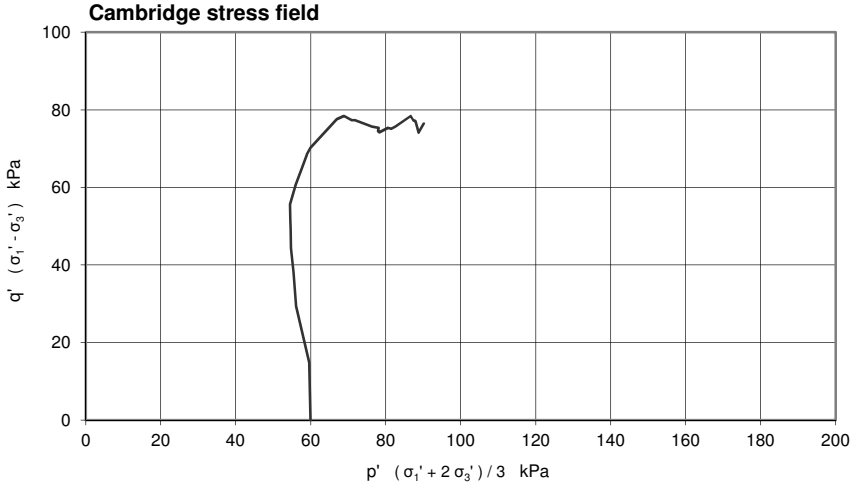
Mohr Circles



MIT Stress field



Cambridge stress field



Compression stages

Specimen	1	2	3	
Cell pressure	410			kPa
Initial pwp	350			kPa
Initial σ_3'	60			kPa
Rate of strain	0.40			%/hr

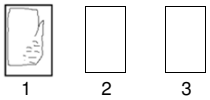
Failure conditions

Criterion	Maximum deviator stress			
Axial strain	15.72			%
$(\sigma_1' / \sigma_3')_f$	2.296			
$(\sigma_1' - \sigma_3')_f$	78.4			kPa
u_f	350			kPa
$\sigma_3'_f$	61			kPa
$\sigma_1'_f$	139			kPa
A_f	-0.01			
Time to failure	39.3			hrs

Shear Strength Parameters

		Linear regression
c '	kPa	0.0
Ø '	degrees	23.2
		Manual re-assessment
c '	kPa	-
Ø '	degrees	-

Mode of failure



Notes : Deviator stresses corrected for area change, vertical side drains and 0.498 mm thick rubber membrane(s)

Unable to achieve saturation by cell only.

Ref			Figure
SLR8.1 Rev 86.0 Feb18	SOCOTEC UKAS TESTING 1157	Printed:04/07/2018 13:17	**CU** sheet 3 of 3

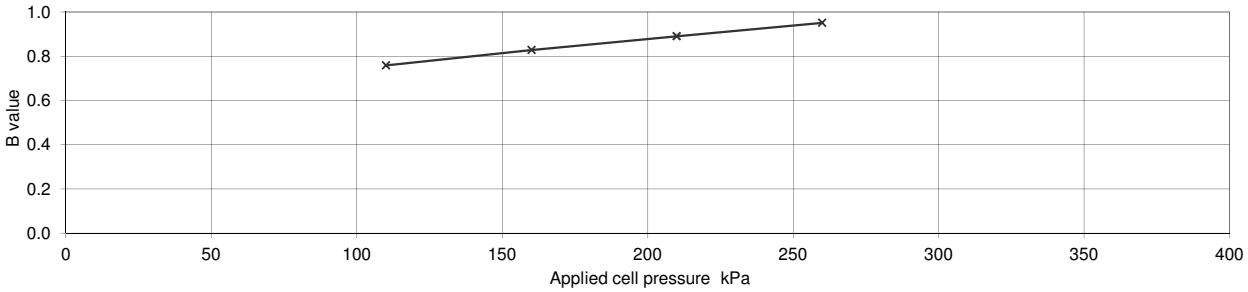
Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	N8135-18	Sample Details:	Hole No	HEP-BH-23		
Project Name	Heathrow Airport Limited		Depth (m BGL)	8.00		
			No	34	Type	U
			ID			
			Spec Ref			

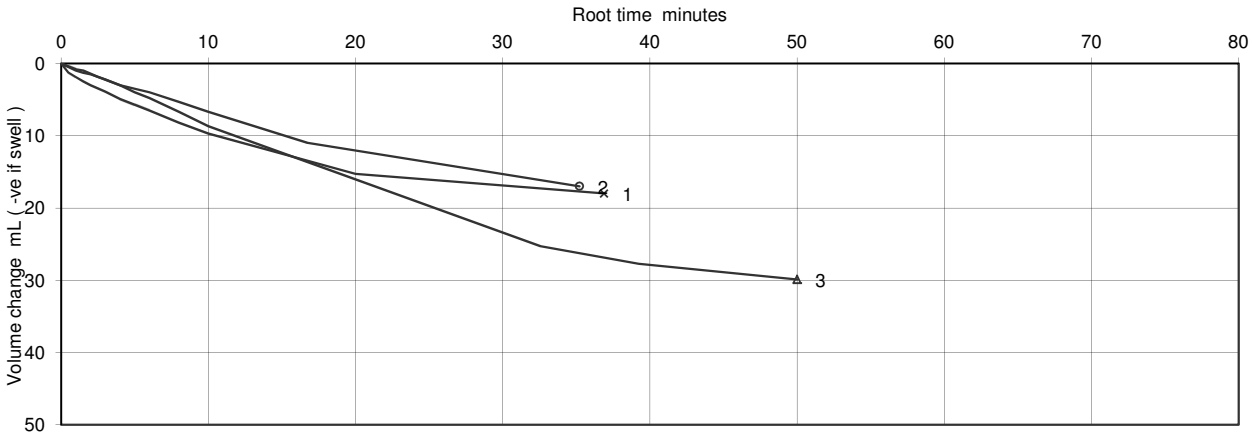
Specimen Details		
Initial		
Length	mm	203.20
Diameter	mm	103.31
Bulk Density	Mg/m³	1.96
Water Content	%	28
Dry density	Mg/m³	1.53
After test		
Bulk Density	Mg/m³	1.97
Water Content	%	28
Dry density	Mg/m³	1.54

Soil Description	Firm greyish brown slightly sandy CLAY
Specimen Type /Preparation	UNDISTURBED

Saturation Details		Method of Saturation
		Increments of cell and back pressure
Cell pressure increments	kPa	50
Differential Pressure	kPa	10
Final Cell Pressure	kPa	260
Final pore water pressure	kPa	242.2
Final B Value		0.95



Consolidation Details	Drainage Conditions		From radial boundary and one end			
	Stage No.		1	2	3	
	Cell Pressure applied		350	400	500	kPa
	Back Pressure applied		300	300	300	kPa
	Effective Pressure		50	100	200	kPa
	Pore pressure at start of consolidation		328	345	401	kPa
	Pore pressure at end of consolidation		300	300	302	kPa
	Pore pressure dissipation at end of consolidation		100	100	98	%
Consolidation parameters (see note to BS1377 : pt 8, clause 6.3.4)	Coefficient of Consolidation	C_{vi}	0.61	0.33	0.20	m^2/year
	Coefficient of Compressibility	M_{vi}	0.37	0.22	0.17	m^2/MN
	Coefficient of Permeability (calculated)	k_{vi}	6.9E-11	2.2E-11	1.1E-11	m/s



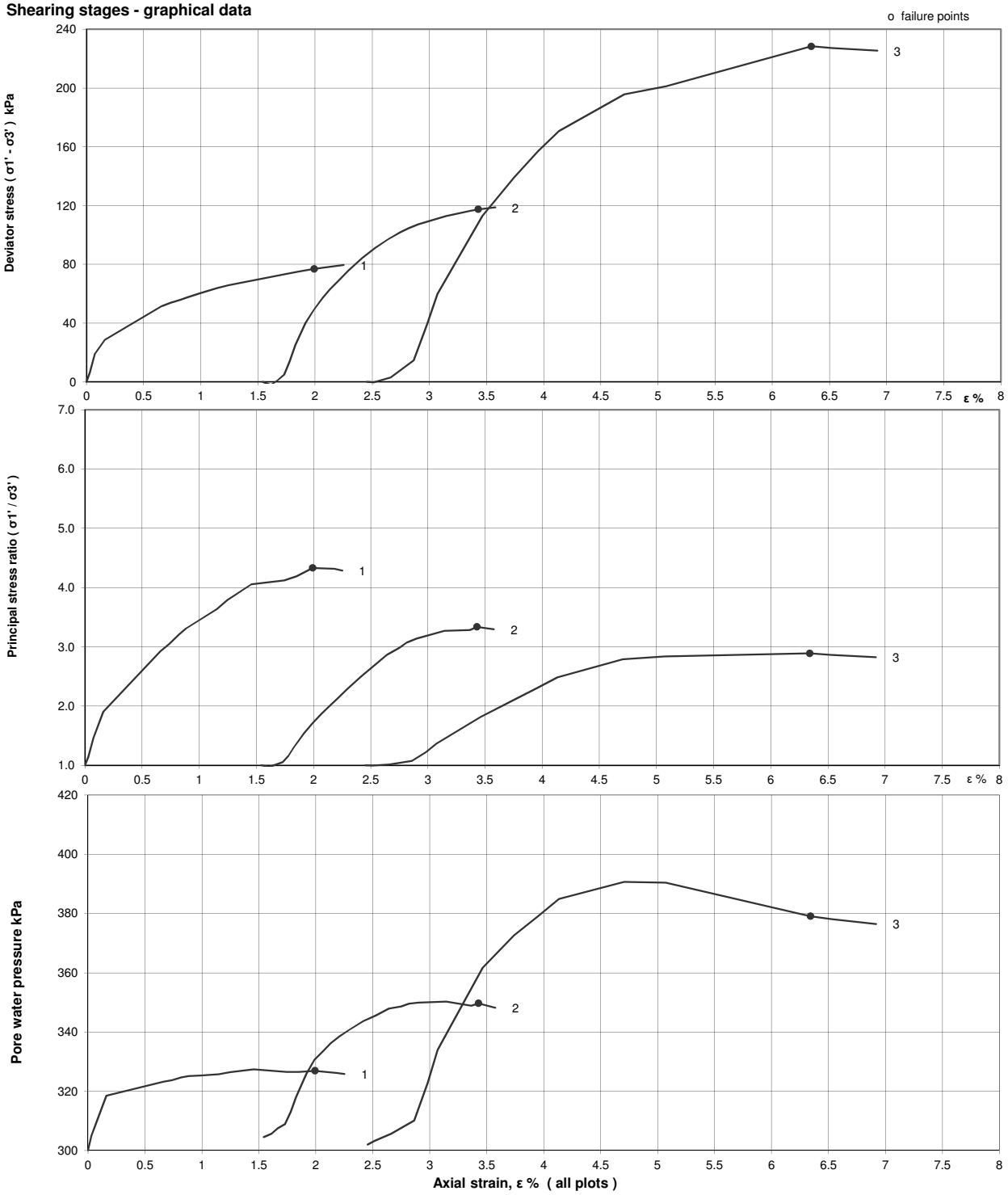
Ref			Figure
SLR8.1 Rev 86.0 Feb18	SOCOTEC	Printed:03/10/2018 13:43	CUM
	UKAS TESTING 1157		sheet 1 of 3

Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	N8135-18	Sample Details:	Hole No	HEP-BH-23		
Project Name	Heathrow Airport Limited		Depth (m BGL)	8.00		
			No	34	Type	U
			ID			
			Spec Ref			

Shearing stages - graphical data

o failure points

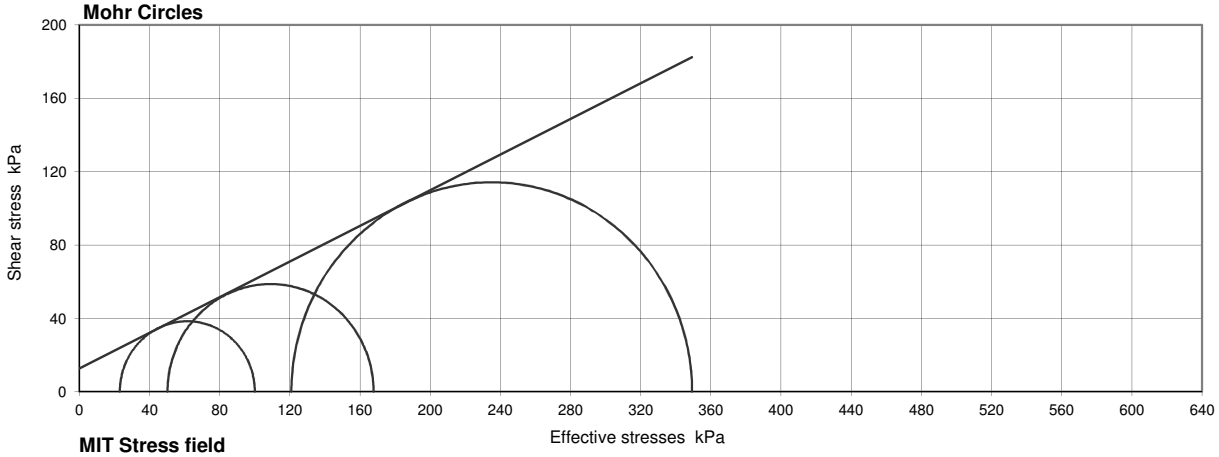


Ref			Figure
SLR8.1 Rev 86.0 Feb18	SOCOTEC UKAS TESTING 1157	Printed:03/10/2018 13:43	**CUM** sheet 2 of 3

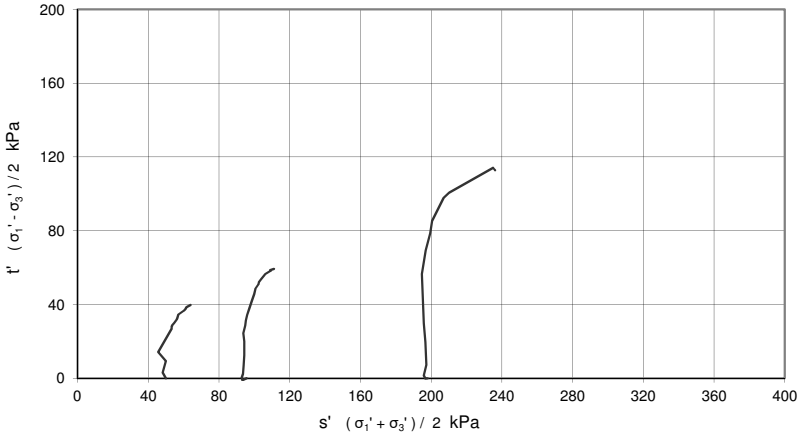
Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	N8135-18	Sample Details:	Hole No	HEP-BH-23		
Project Name	Heathrow Airport Limited		Depth (m BGL)	8.00		
			No	34	Type	U
			ID			
			Spec Ref			

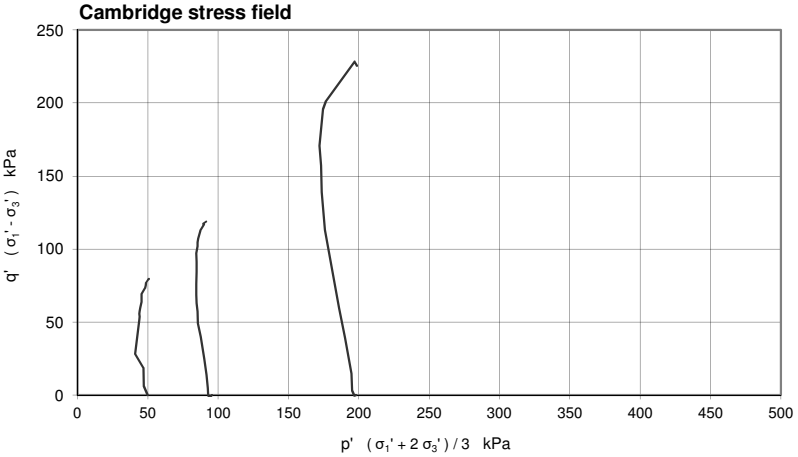
Mohr Circles



MIT Stress field



Cambridge stress field



Compression stages

Stage	1	2	3	
Cell pressure	350	400	500	kPa
Initial pwp	300	305	302	kPa
Initial σ_3'	50	96	198	kPa
Rate of strain	0.44	0.44	0.44	%/hr

Failure conditions

Criterion	Maximum effective principal stress ratio			
Axial strain	1.99	3.43	6.34	%
$(\sigma_1' / \sigma_3')_f$	4.330	3.335	2.889	
$(\sigma_1' - \sigma_3')_f$	76.9	117.4	228.4	kPa
u_f	327	350	379	kPa
$\sigma_3'_f$	23	50	121	kPa
$\sigma_1'_f$	100	168	349	kPa
A_f	0.35	0.38	0.34	
Time to failure	4.5	7.8	14.4	hrs

Shear Strength Parameters

at peak stress ratio

		Linear regression
c '	kPa	12.6
Ø '	degrees	25.9
		Manual re-assessment
c '	kPa	-
Ø '	degrees	-

Mode of failure

Notes : Deviator stresses corrected for area change, vertical side drains and 0.38 mm thick rubber membrane(s)

Ref			Figure
SLR8.1 Rev 86.0 Feb18	SOCOTEC UKAS TESTING 1157	Printed:03/10/2018 13:43	**CUM** sheet 3 of 3

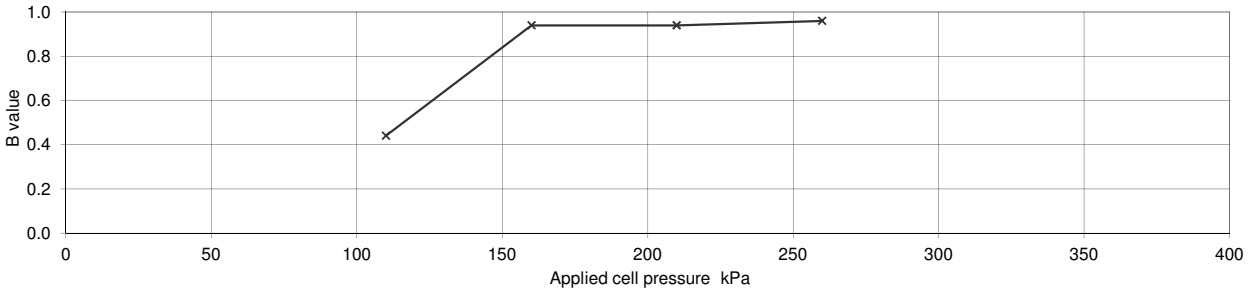
Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	N8135-18	Sample Details:	Hole No	HEP-BH-25		
Project Name	Heathrow Airport Limited		Depth (m BGL)	11.00		
			No	39	Type	UT
			ID			
			Spec Ref			

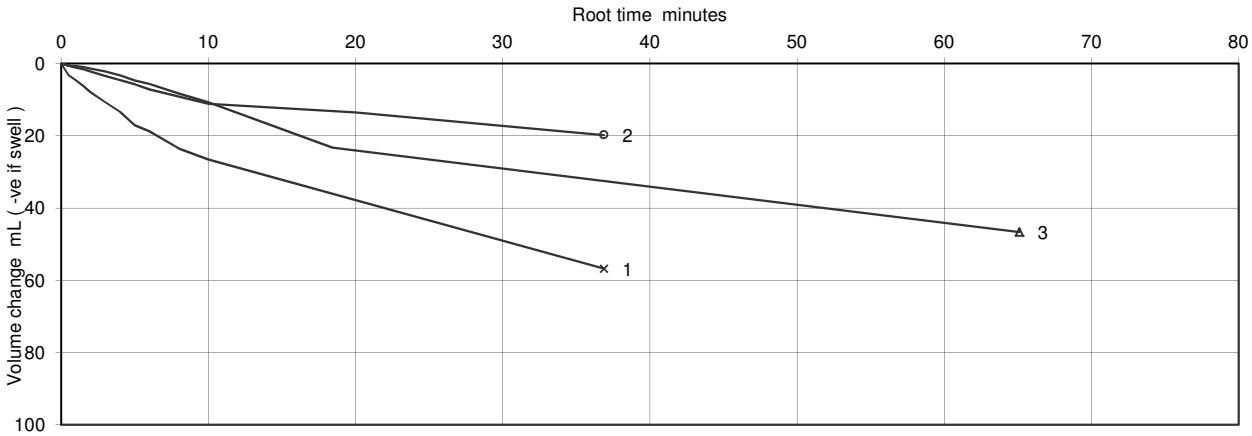
Specimen Details		
Initial		
Length	mm	203.36
Diameter	mm	103.49
Bulk Density	Mg/m³	1.98
Water Content	%	28
Dry density	Mg/m³	1.55
After test		
Bulk Density	Mg/m³	2.02
Water Content	%	24
Dry density	Mg/m³	1.63

Soil Description	Firm brown slightly sandy CLAY
Specimen Type /Preparation	UNDISTURBED

Saturation Details		Method of Saturation
		Increments of cell and back pressure
Cell pressure increments	kPa	50
Differential Pressure	kPa	10
Final Cell Pressure	kPa	260
Final pore water pressure	kPa	240
Final B Value		0.96



Consolidation Details	Drainage Conditions		From radial boundary and one end			
	Stage No.		1	2	3	
	Cell Pressure applied		450	600	900	kPa
	Back Pressure applied		300	300	300	kPa
	Effective Pressure		150	300	600	kPa
	Pore pressure at start of consolidation		424	472	641	kPa
	Pore pressure at end of consolidation		300	302	308	kPa
	Pore pressure dissipation at end of consolidation		100	99	98	%
Consolidation parameters (see note to BS1377 : pt 8, clause 6.3.4)	Coefficient of Consolidation	C_{vi}	0.59	0.77	0.18	m^2/year
	Coefficient of Compressibility	M_{vi}	0.26	0.07	0.08	m^2/MN
	Coefficient of Permeability (calculated)	k_{vi}	4.7E-11	1.6E-11	4.8E-12	m/s



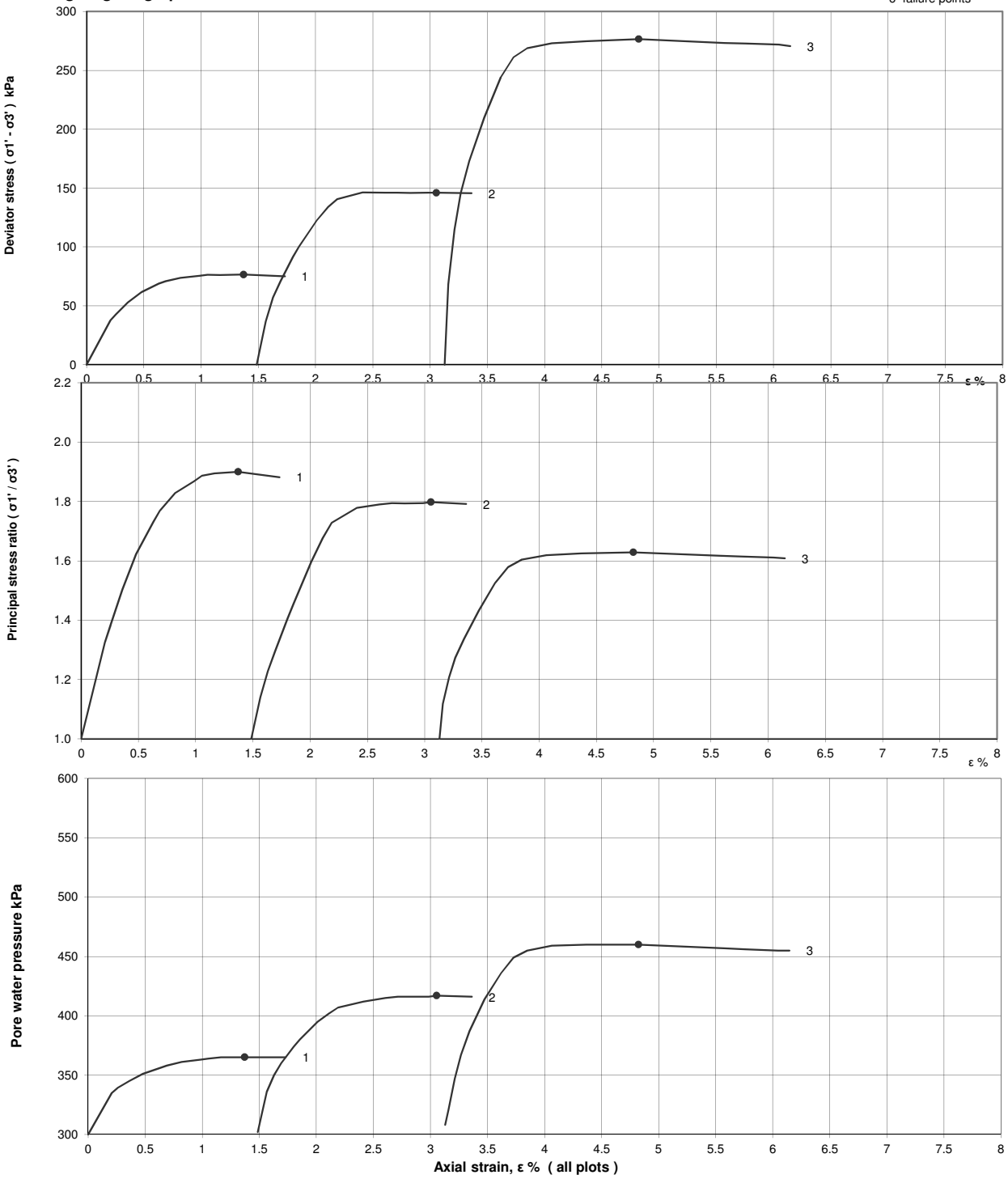
Ref			Figure
SLR8.1 Rev 86.0 Feb18	SOCOTEC	Printed:23/11/2018 11:21	CUM
	UKAS TESTING 1157		sheet 1 of 3

Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	N8135-18	Sample Details:	Hole No	HEP-BH-25		
Project Name	Heathrow Airport Limited		Depth (m BGL)	11.00		
			No	39	Type	UT
			ID			
			Spec Ref			

Shearing stages - graphical data

o failure points



Ref		Figure
SLR8.1 Rev 86.0 Feb18	Printed:23/11/2018 11:21	**CUM** sheet 2 of 3

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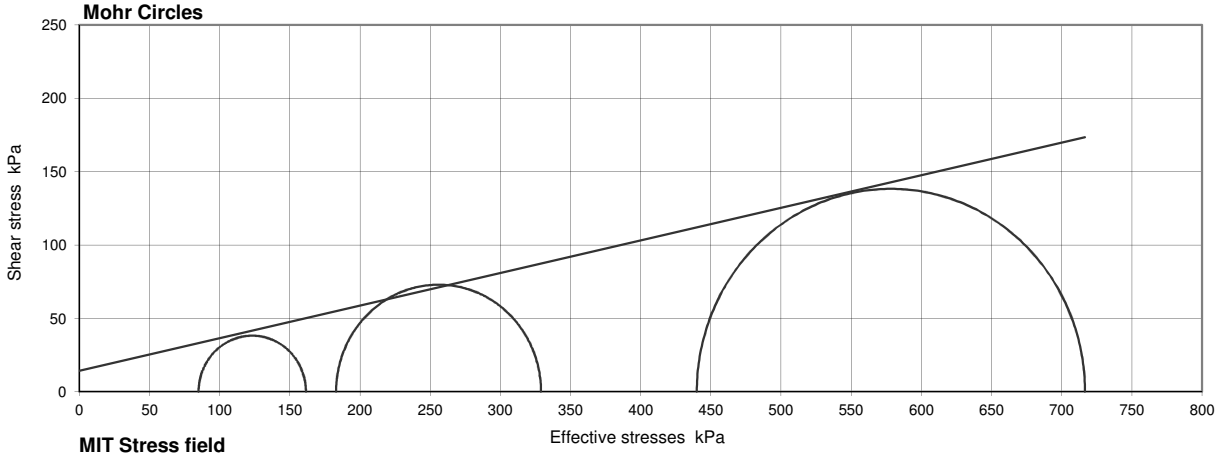
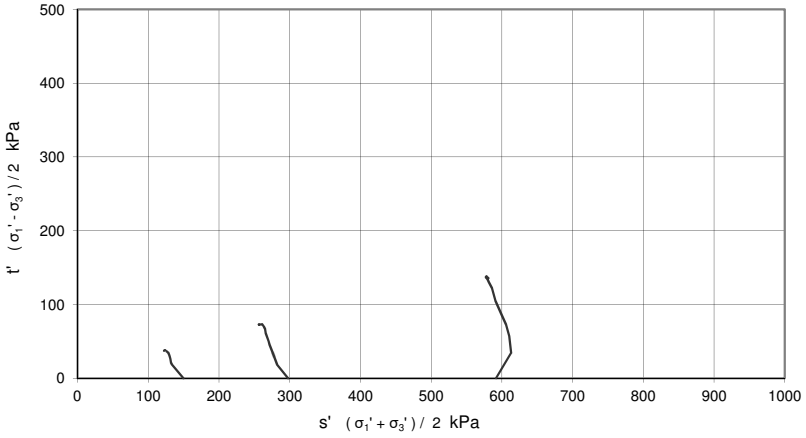
Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	N8135-18	Sample Details:	Hole No	HEP-BH-25		
Project Name	Heathrow Airport Limited		Depth (m BGL)	11.00		
			No	39	Type	UT
			ID			
			Spec Ref			

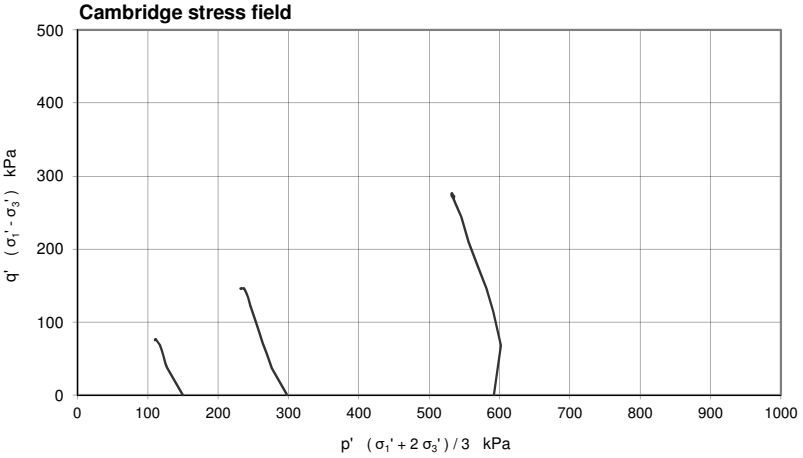
Mohr Circles



MIT Stress field



Cambridge stress field



Compression stages

Stage	1	2	3	
Cell pressure	450	600	900	kPa
Initial pwp	300	302	308	kPa
Initial σ_3'	150	298	592	kPa
Rate of strain	0.42	0.42	0.42	%/hr

Failure conditions

Criterion	Maximum effective principal stress ratio			
Axial strain	1.37	3.06	4.82	%
$(\sigma_1' / \sigma_3')_f$	1.900	1.798	1.629	
$(\sigma_1' - \sigma_3')_f$	76.5	146.0	276.6	kPa
u_f	365	417	460	kPa
$\sigma_3'_f$	85	183	440	kPa
$\sigma_1'_f$	161	329	717	kPa
A_f	0.85	0.79	0.55	
Time to failure	3.3	7.3	11.5	hrs

Shear Strength Parameters

at peak stress ratio

		Linear regression
c '	kPa	14.4
Ø '	degrees	12.5
		Manual re-assessment
c '	kPa	-
Ø '	degrees	-

Mode of failure

Notes : Deviator stresses corrected for area change, vertical side drains and 0.298 mm thick rubber membrane(s)

Ref			Figure
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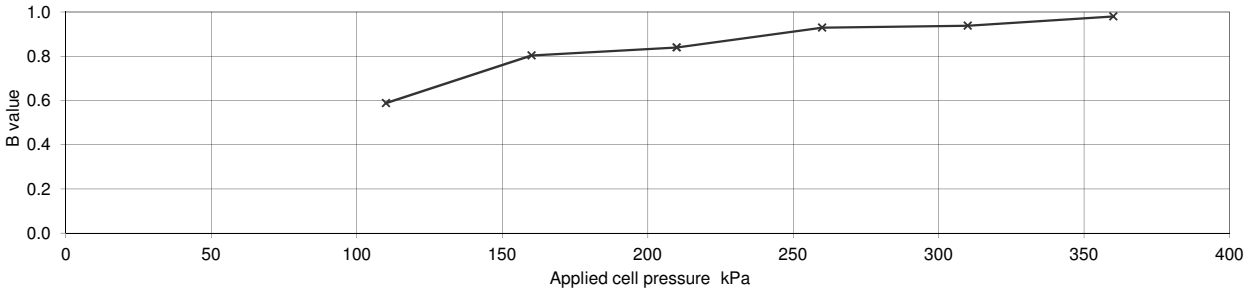
Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	N8135-18	Sample Details:	Hole No	HEP-BH-25		
Project Name	Heathrow		Depth (m BGL)	14.50		
			No	49	Type	UT
			ID			
			Spec Ref			

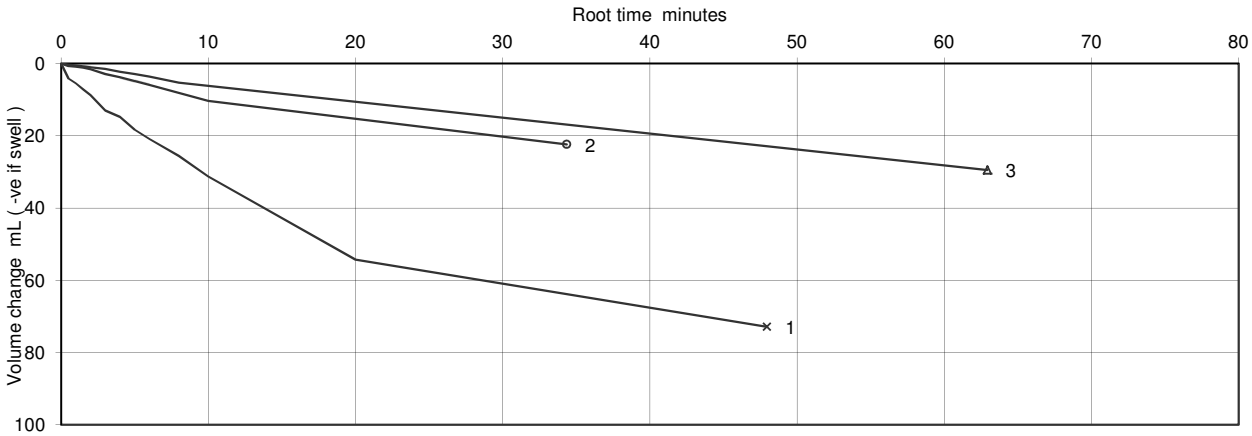
Specimen Details		
Initial		
Length	mm	203.20
Diameter	mm	100.88
Bulk Density	Mg/m³	2.00
Water Content	%	25
Dry density	Mg/m³	1.61
After test		
Bulk Density	Mg/m³	2.04
Water Content	%	23
Dry density	Mg/m³	1.66

Soil Description	Firm grey slightly sandy CLAY
Specimen Type /Preparation	UNDISTURBED

Saturation Details		Method of Saturation
		Increments of cell and back pressure
Cell pressure increments	kPa	50
Differential Pressure	kPa	10
Final Cell Pressure	kPa	360
Final pore water pressure	kPa	335.5
Final B Value		0.98



Consolidation Details	Drainage Conditions		From radial boundary and one end			
	Stage No.		1	2	3	
	Cell Pressure applied		450	600	750	kPa
	Back Pressure applied		300	300	300	kPa
	Effective Pressure		150	300	450	kPa
	Pore pressure at start of consolidation		426	471	500	kPa
	Pore pressure at end of consolidation		300	309	305	kPa
	Pore pressure dissipation at end of consolidation		100	95	98	%
Consolidation parameters (see note to BS1377 : pt 8, clause 6.3.4)	Coefficient of Consolidation	C_{vi}	0.41	0.46	0.13	m^2/year
	Coefficient of Compressibility	M_{vi}	0.34	0.09	0.09	m^2/MN
	Coefficient of Permeability (calculated)	k_{vi}	4.3E-11	1.2E-11	3.7E-12	m/s



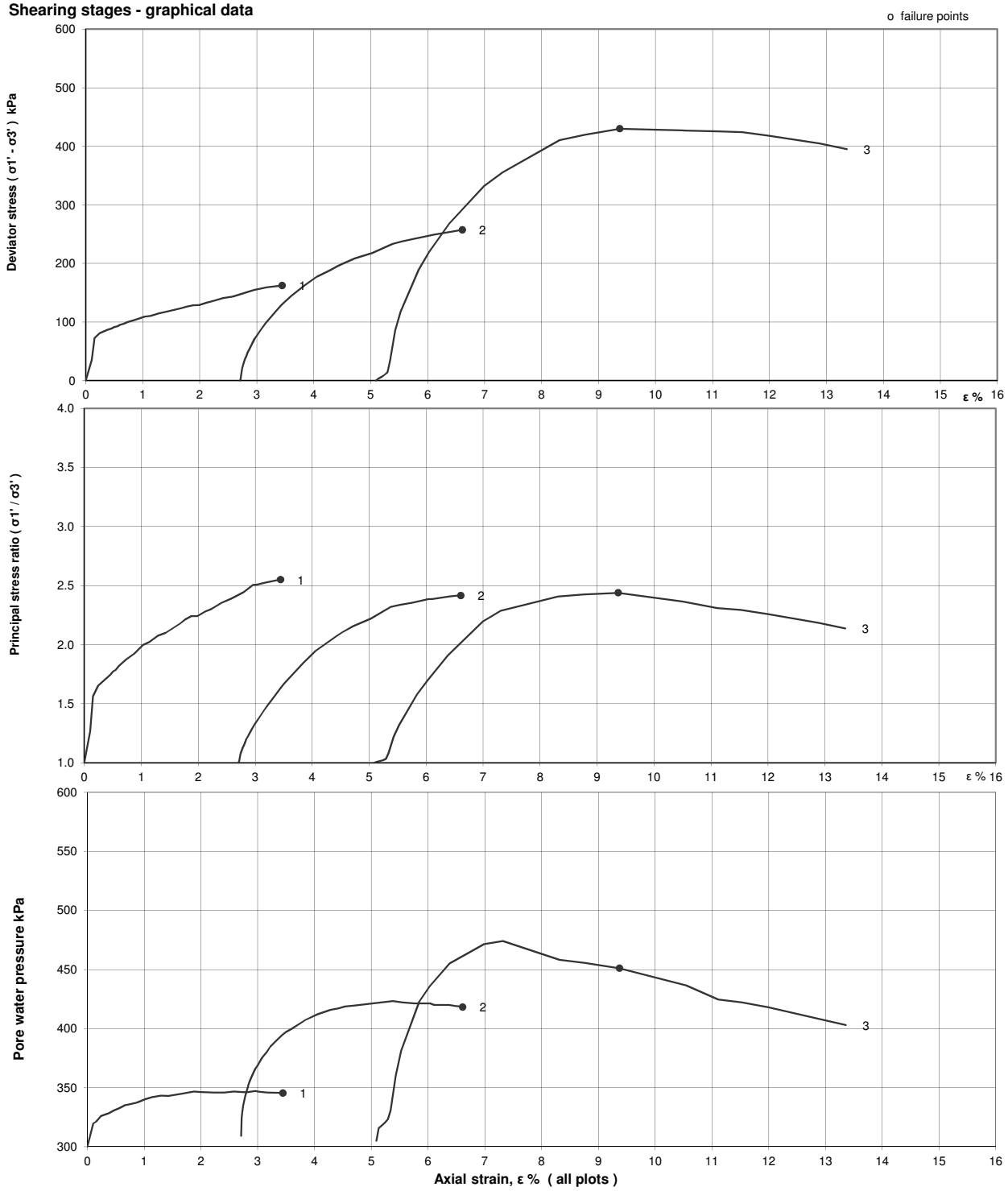
Ref			Figure
SLR8.1 Rev 86.0 Feb18	SOCOTEC	Printed:12/09/2018 13:07	CUM
	UKAS TESTING 1157		sheet 1 of 3

Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	N8135-18	Sample Details:	Hole No	HEP-BH-25		
Project Name	Heathrow		Depth (m BGL)	14.50		
			No	49	Type	UT
			ID			
			Spec Ref			

Shearing stages - graphical data

o failure points

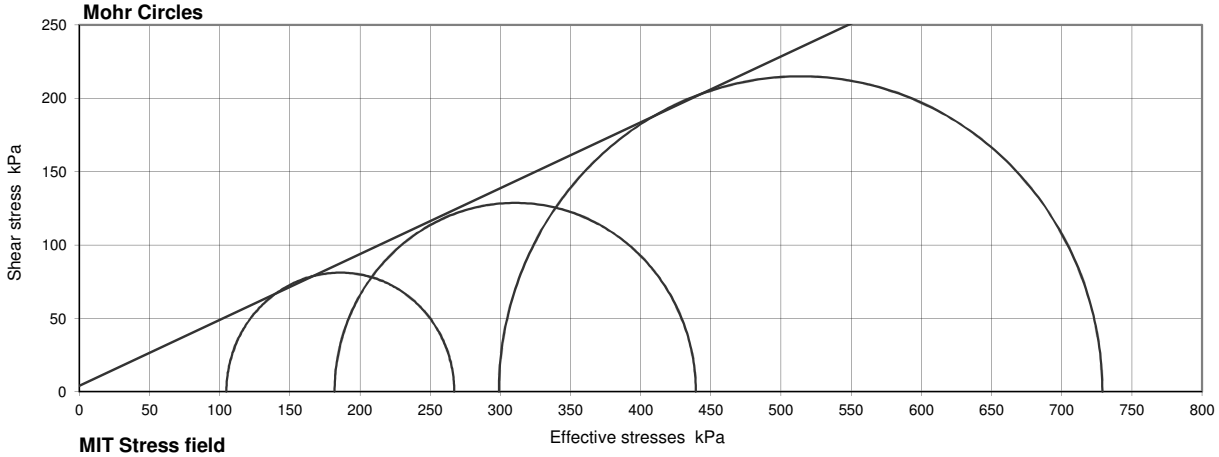


Ref SLR8.1 Rev 86.0 Feb18	SOCOTEC UKAS TESTING 1157	Printed:12/09/2018 13:07	**Figure** **CUM** sheet 2 of 3

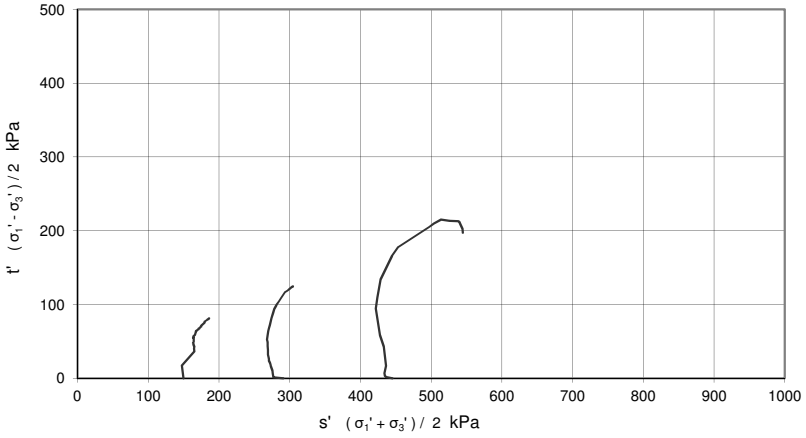
Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	N8135-18	Sample Details:	Hole No	HEP-BH-25		
Project Name	Heathrow		Depth (m BGL)	14.50		
			No	49	Type	UT
			ID			
			Spec Ref			

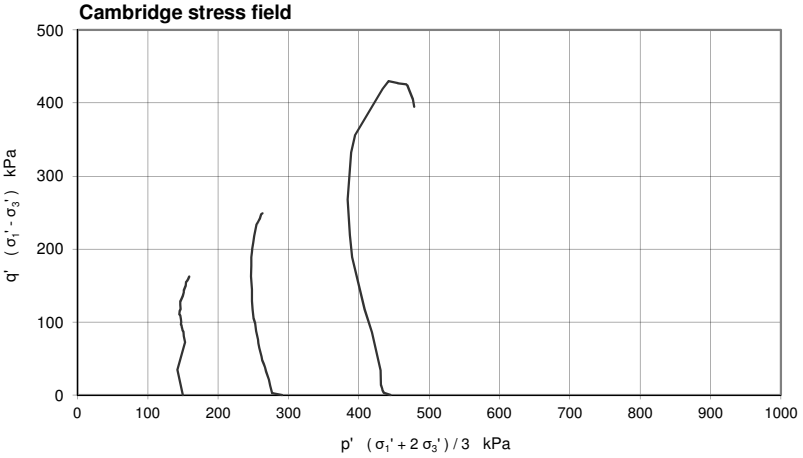
Mohr Circles



MIT Stress field



Cambridge stress field



Compression stages

Stage	1	2	3	
Cell pressure	450	600	750	kPa
Initial pwp	300	309	305	kPa
Initial σ_3'	150	291	445	kPa
Rate of strain	0.32	0.32	0.32	%/hr

Failure conditions

Criterion	Maximum effective principal stress ratio			
Axial strain	3.45	6.61	9.37	%
$(\sigma_1' / \sigma_3')_f$	2.550	2.415	2.438	
$(\sigma_1' - \sigma_3')_f$	162.4	257.4	430.0	kPa
u_f	345	418	451	kPa
$\sigma_3'_f$	105	182	299	kPa
$\sigma_1'_f$	267	439	729	kPa
A_f	0.28	0.42	0.34	
Time to failure	10.8	20.7	29.3	hrs

Shear Strength Parameters

at peak stress ratio

		Linear regression
c '	kPa	4.0
Ø '	degrees	24.2
		Manual re-assessment
c '	kPa	-
Ø '	degrees	-

Mode of failure

Notes : Deviator stresses corrected for area change, vertical side drains and 0.296 mm thick rubber membrane(s)

RED

Ref			Figure
SLR8.1 Rev 86.0 Feb18	SOCOTEC UKAS TESTING 1157	Printed:12/09/2018 13:07	**CUM** sheet 3 of 3

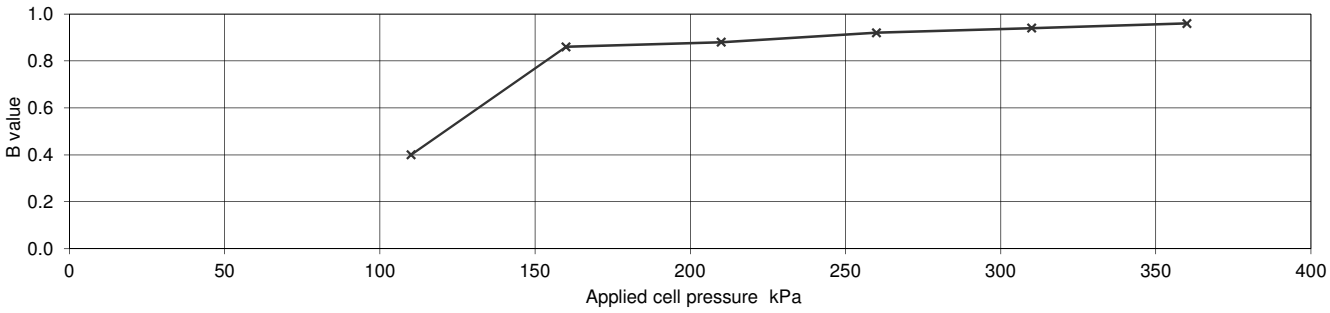
Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	N8135-18	Sample Details:	Hole No	HEP -BH-36		
Project Name	Heathrow Airport Limited		Depth (m BGL)	7.50		
			No	29	Type	UT
			ID			
			Spec Ref			

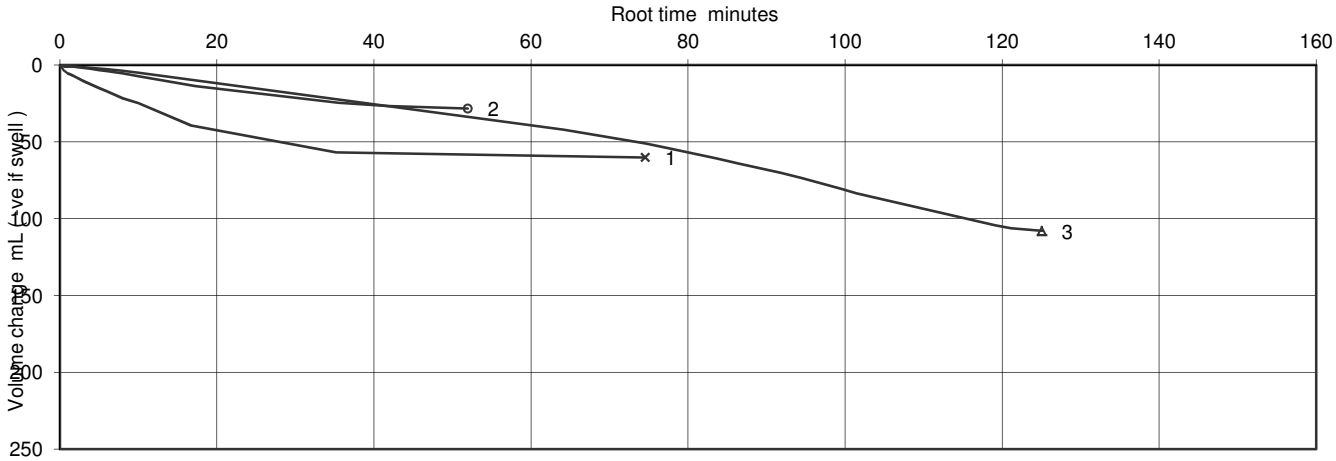
Specimen Details		
Initial		
Length	mm	203.12
Diameter	mm	102.69
Bulk Density	Mg/m³	2.05
Water Content	%	24
Dry density	Mg/m³	1.65
After test		
Bulk Density	Mg/m³	2.09
Water Content	%	22
Dry density	Mg/m³	1.71

Soil Description	Firm grey slightly sandy slightly gravelly CLAY.
Specimen Type /Preparation	UNDISTURBED

Saturation Details		Method of Saturation
		Increments of cell and back pressure
Cell pressure increments	kPa	50
Differential Pressure	kPa	10
Final Cell Pressure	kPa	360
Final pore water pressure	kPa	345
Final B Value		0.96



Consolidation Details	Drainage Conditions		From radial boundary and one end			
	Stage No.		1	2	3	
	Cell Pressure applied		435	570	840	kPa
	Back Pressure applied		300	300	300	kPa
	Effective Pressure		135	270	540	kPa
	Pore pressure at start of consolidation		420	448	626	kPa
	Pore pressure at end of consolidation		300	305	312	kPa
	Pore pressure dissipation at end of consolidation		100	97	96	%
Consolidation parameters (see note to BS1377 : pt 8, clause 6.3.4)	Coefficient of Consolidation	C_{vi}	0.47	0.20	0.02	m^2/year
	Coefficient of Compressibility	M_{vi}	0.27	0.11	0.20	m^2/MN
	Coefficient of Permeability (calculated)	k_{vi}	4.0E-11	7.0E-12	9.4E-13	m/s



Ref		Figure
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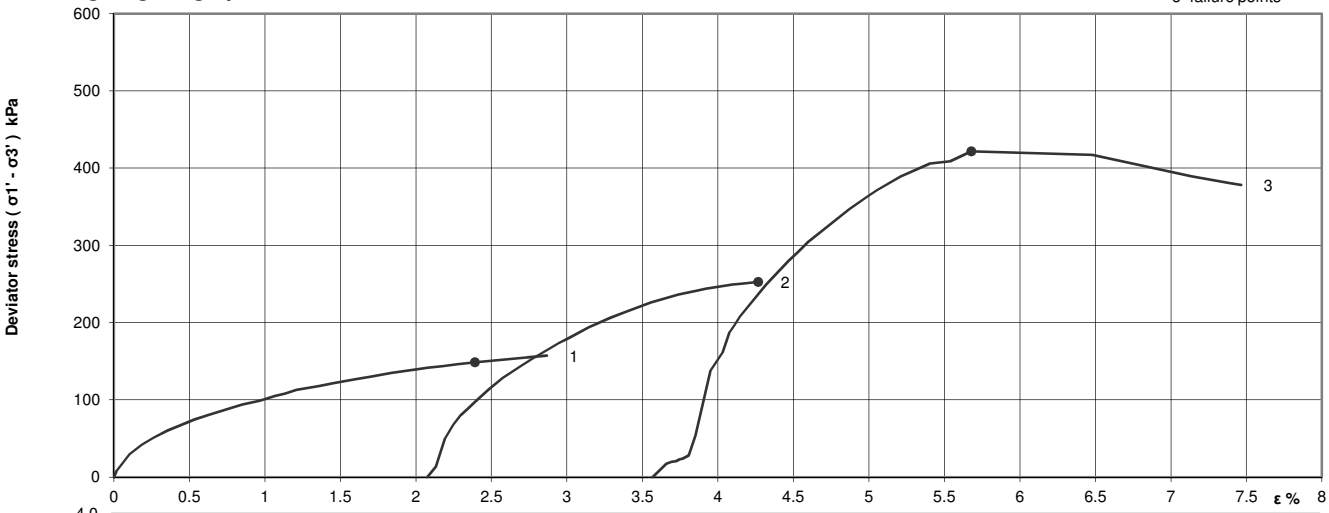
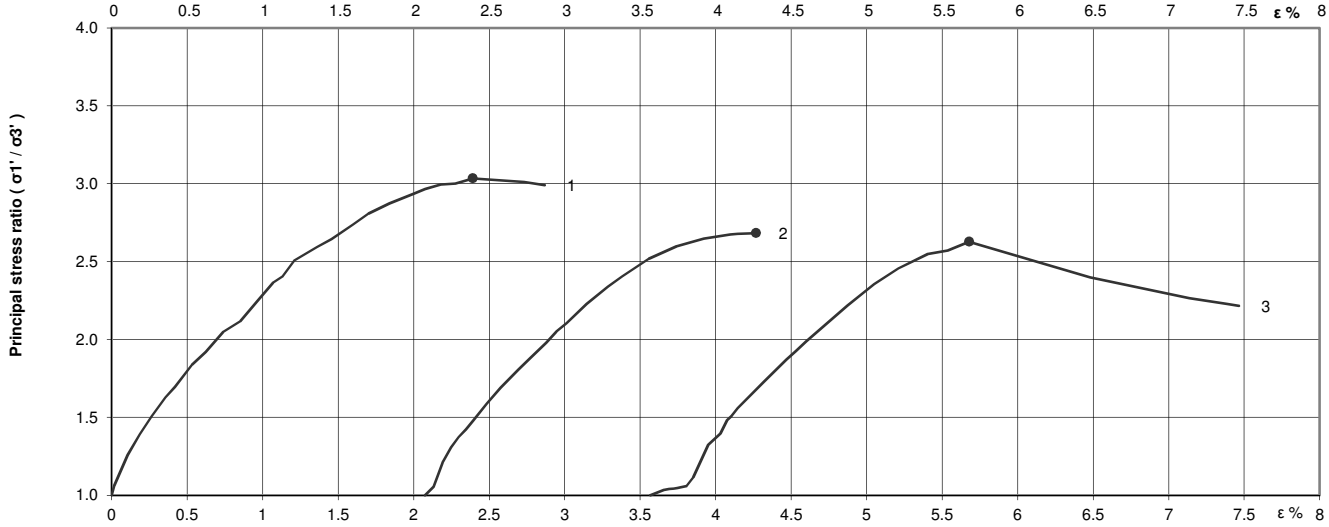
Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

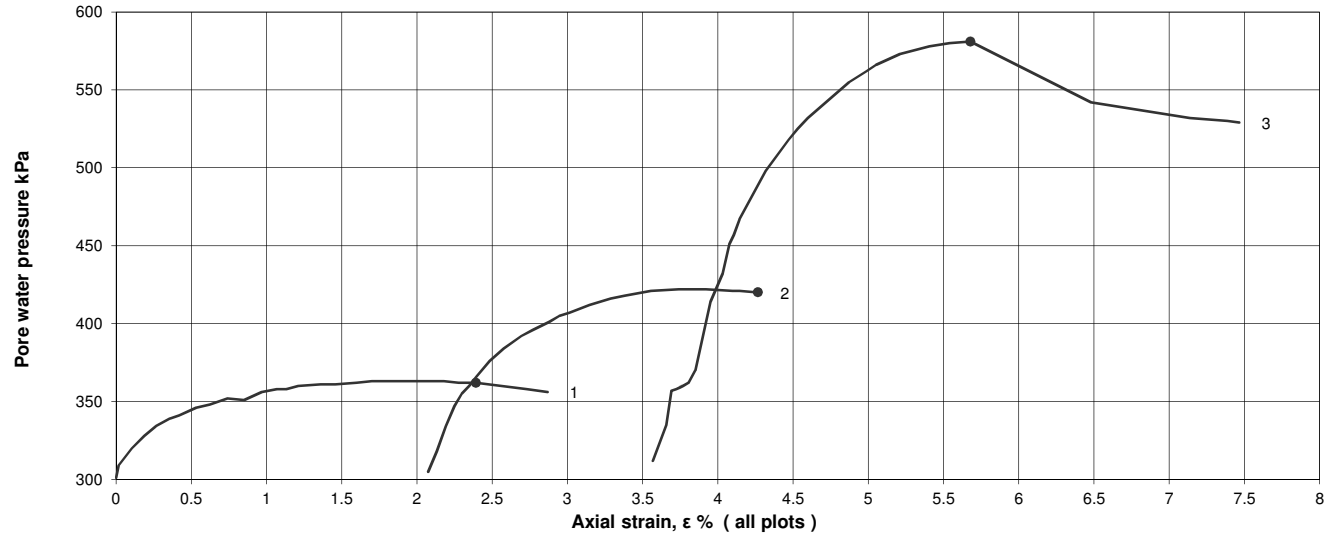
Project No	N8135-18	Sample Details:	Hole No	HEP -BH-36		
Project Name	Heathrow Airport Limited		Depth (m BGL)	7.50		
			No	29	Type	UT
			ID			
			Spec Ref			

Shearing stages - graphical data

o failure points





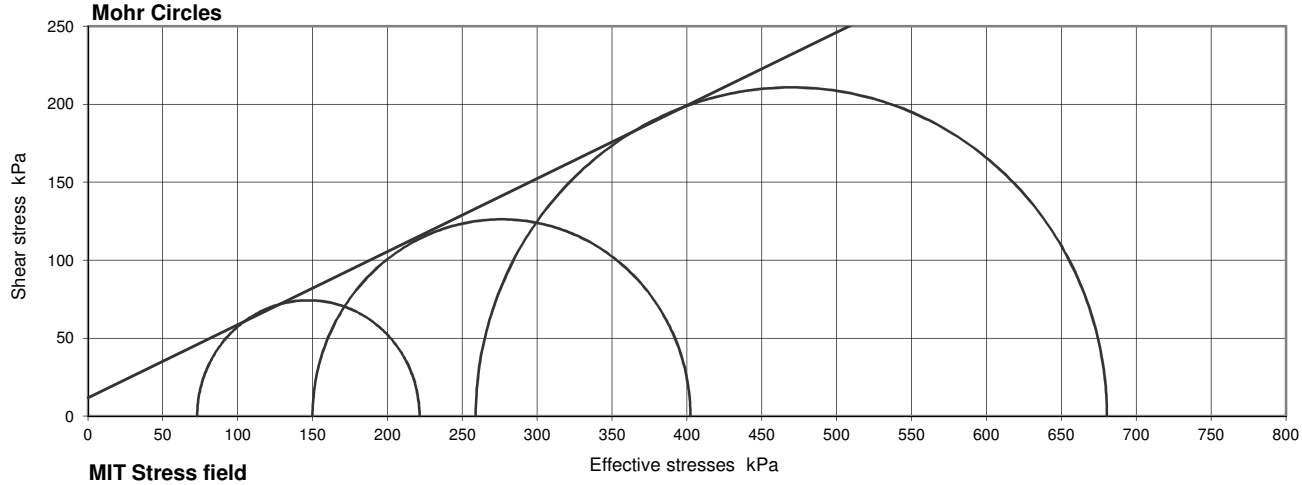


Ref			Figure
SLR8.1 Rev 86.0 Feb18	SOCOTEC UKAS TESTING 1157	Printed:04/07/2018 13:28	**CUM** sheet 2 of 3

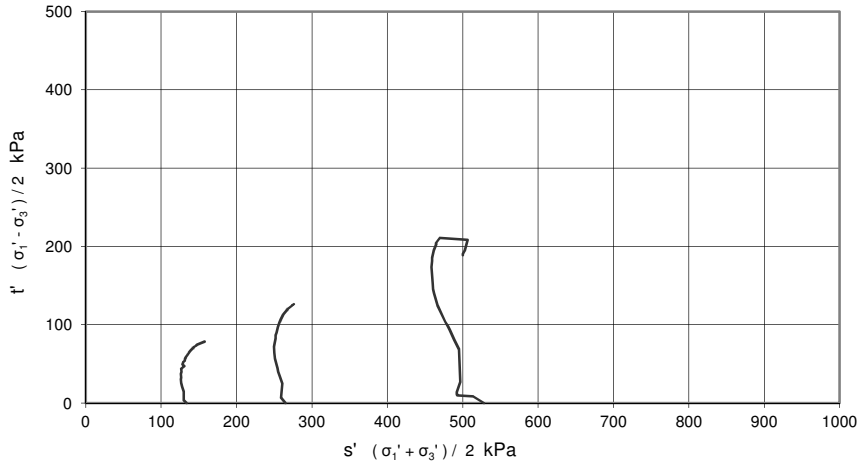
Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	N8135-18	Sample Details:	Hole No	HEP -BH-36		
Project Name	Heathrow Airport Limited		Depth (m BGL)	7.50		
			No	29	Type	UT
			ID			
			Spec Ref			

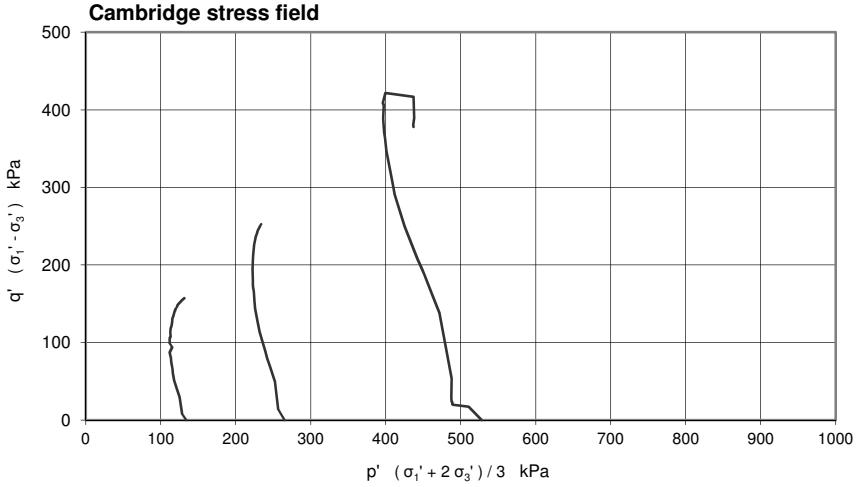
Mohr Circles



MIT Stress field



Cambridge stress field



Compression stages

Stage	1	2	3	
Cell pressure	435	570	840	kPa
Initial pwp	301	305	312	kPa
Initial σ_3'	134	265	528	kPa
Rate of strain	0.33	0.33	0.33	%/hr

Failure conditions

Criterion	Maximum effective principal stress ratio			
Axial strain	2.39	4.27	5.68	%
$(\sigma_1' / \sigma_3')_f$	3.034	2.683	2.627	
$(\sigma_1' - \sigma_3')_f$	148.5	252.4	421.5	kPa
u_f	362	420	581	kPa
$\sigma_3'_f$	73	150	259	kPa
$\sigma_1'_f$	221	402	681	kPa
A_f	0.41	0.46	0.64	
Time to failure	7.2	12.9	17.2	hrs

Shear Strength Parameters

at peak stress ratio

		Linear regression
c '	kPa	11.8
Ø '	degrees	25.1
		Manual re-assessment
c '	kPa	-
Ø '	degrees	-

Mode of failure

Notes : Deviator stresses corrected for area change, vertical side drains and 0.5 mm thick rubber membrane(s)

Ref			Figure
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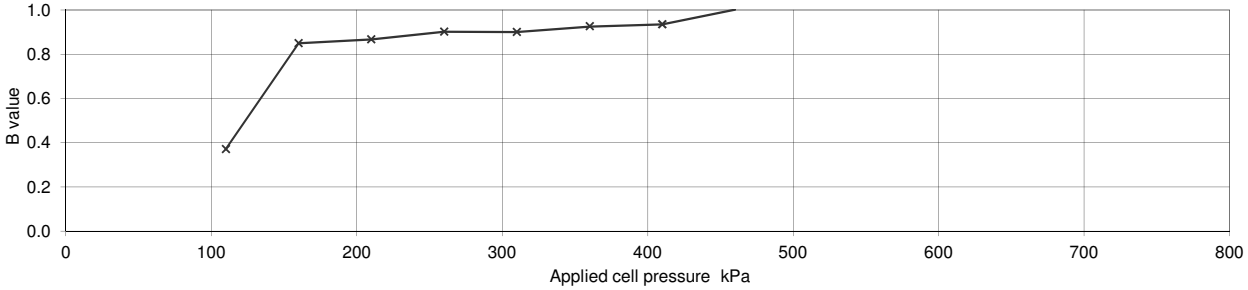
Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	N8135-18	Sample Details:	Hole No	HEP-BH-36		
Project Name	Heathrow		Depth (m BGL)	11.00		
			No	42	Type	UT
			ID			
			Spec Ref			

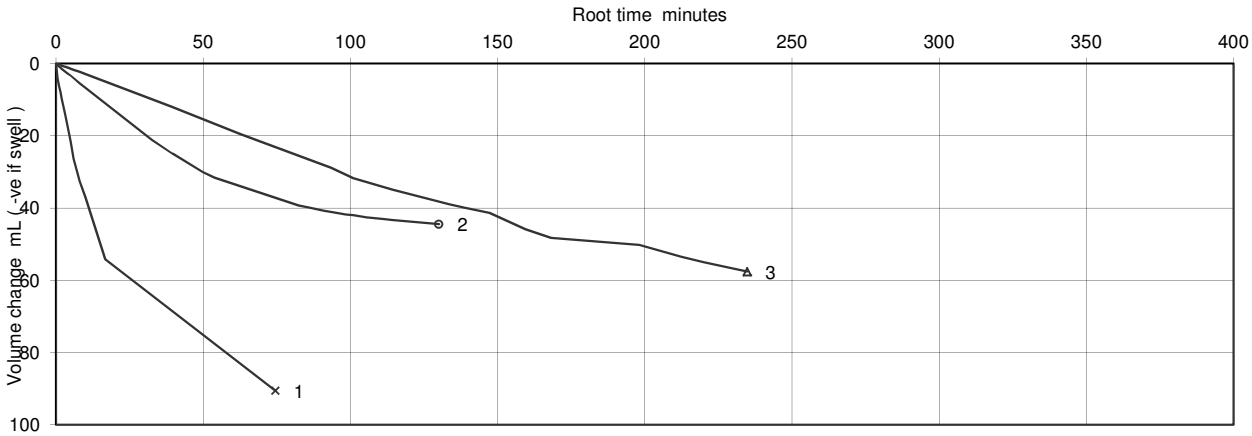
Specimen Details		
Initial		
Length	mm	202.41
Diameter	mm	102.80
Bulk Density	Mg/m³	2.01
Water Content	%	27
Dry density	Mg/m³	1.57
After test		
Bulk Density	Mg/m³	2.07
Water Content	%	24
Dry density	Mg/m³	1.67

Soil Description	Firm to stiff grey slightly sandy CLAY
Specimen Type /Preparation	UNDISTURBED

Saturation Details		Method of Saturation
		Increments of cell and back pressure
Cell pressure increments	kPa	50
Differential Pressure	kPa	10
Final Cell Pressure	kPa	460
Final pore water pressure	kPa	442
Final B Value		1



Consolidation Details	Drainage Conditions		From radial boundary and one end			
	Stage No.		1	2	3	
	Cell Pressure applied		600	800	1200	kPa
	Back Pressure applied		400	400	400	kPa
	Effective Pressure		200	400	800	kPa
	Pore pressure at start of consolidation		582	621	870	kPa
	Pore pressure at end of consolidation		401	406	421	kPa
	Pore pressure dissipation at end of consolidation		100	97	96	%
Consolidation parameters (see note to BS1377 : pt 8, clause 6.3.4)	Coefficient of Consolidation	C_{vi}	0.49	0.05	0.01	m^2/year
	Coefficient of Compressibility	M_{vi}	0.28	0.12	0.08	m^2/MN
	Coefficient of Permeability (calculated)	k_{vi}	4.2E-11	1.8E-12	1.6E-13	m/s



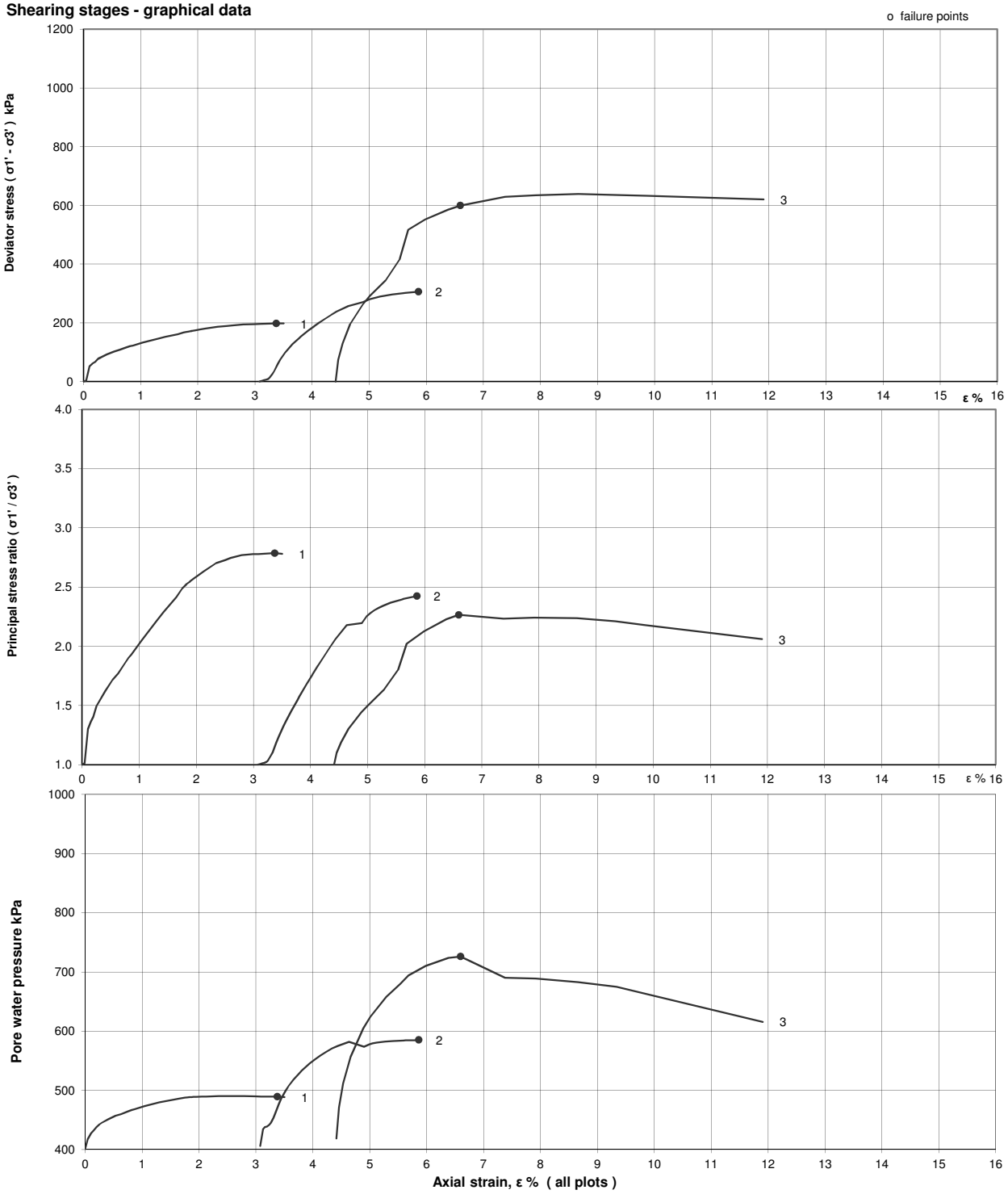
Ref			Figure
SLR8.1 Rev 86.0 Feb18	SOCOTEC	Printed:05/09/2018 10:32	CUM
	UKAS TESTING 1157		sheet 1 of 3

Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	N8135-18	Sample Details:	Hole No	HEP-BH-36		
Project Name	Heathrow		Depth (m BGL)	11.00		
			No	42	Type	UT
			ID			
			Spec Ref			

Shearing stages - graphical data

o failure points

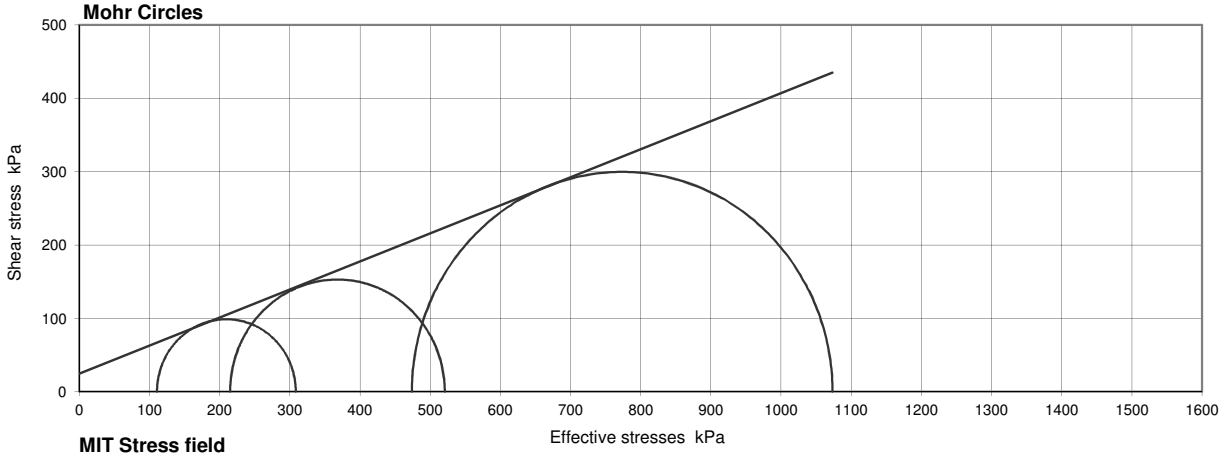


Ref SLR8.1 Rev 86.0 Feb18	SOCOTEC	Printed:05/09/2018 10:32	**Figure** **CUM** sheet 2 of 3
	UKAS TESTING 1157		

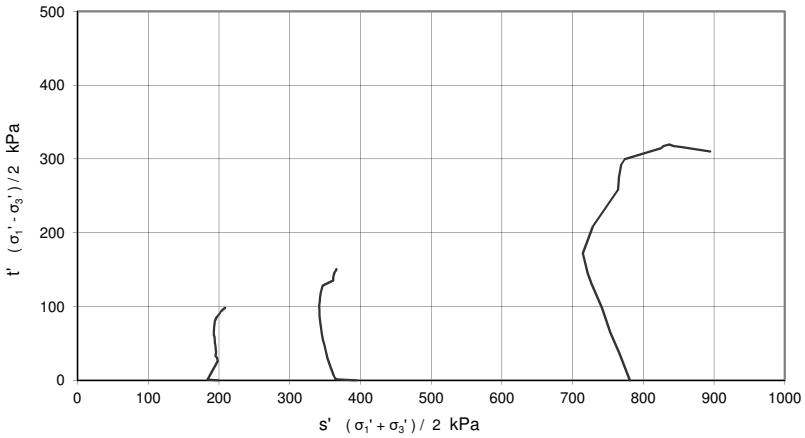
Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	N8135-18	Sample Details:	Hole No	HEP-BH-36		
Project Name	Heathrow		Depth (m BGL)	11.00		
			No	42	Type	UT
			ID			
			Spec Ref			

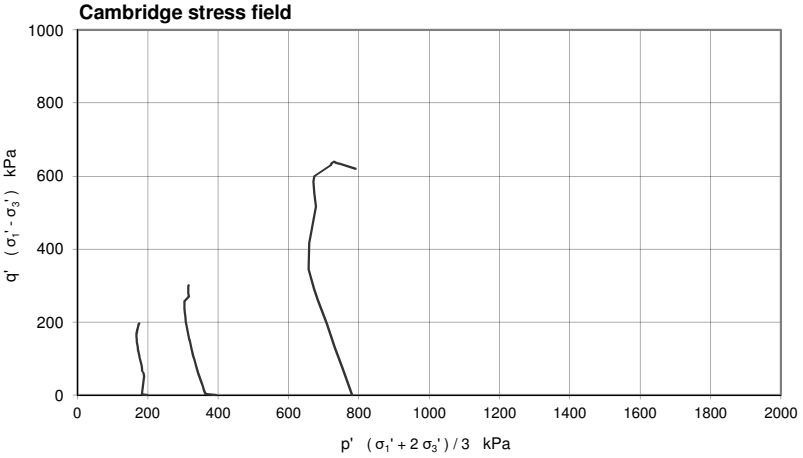
Mohr Circles



MIT Stress field



Cambridge stress field



Compression stages

Stage	1	2	3	
Cell pressure	600	800	1200	kPa
Initial pwp	401	406	419	kPa
Initial σ_3'	199	394	781	kPa
Rate of strain	0.35	0.35	0.35	%/hr

Failure conditions

Criterion	Maximum effective principal stress ratio			
Axial strain	3.38	5.87	6.60	%
$(\sigma_1' / \sigma_3')_f$	2.787	2.424	2.265	
$(\sigma_1' - \sigma_3')_f$	197.8	305.9	599.5	kPa
u_f	489	585	726	kPa
$\sigma_3'_f$	111	215	474	kPa
$\sigma_1'_f$	308	521	1073	kPa
A_f	0.45	0.59	0.51	
Time to failure	9.6	16.8	18.9	hrs

Shear Strength Parameters

at peak stress ratio

		Linear regression
c '	kPa	24.6
Ø '	degrees	20.9
		Manual re-assessment
c '	kPa	-
Ø '	degrees	-

Mode of failure

Notes : Deviator stresses corrected for area change, vertical side drains and 0.595 mm thick rubber membrane(s)

Ref			Figure
SLR8.1 Rev 86.0 Feb18	SOCOTEC UKAS TESTING 1157	Printed:05/09/2018 10:32	**CUM** sheet 3 of 3

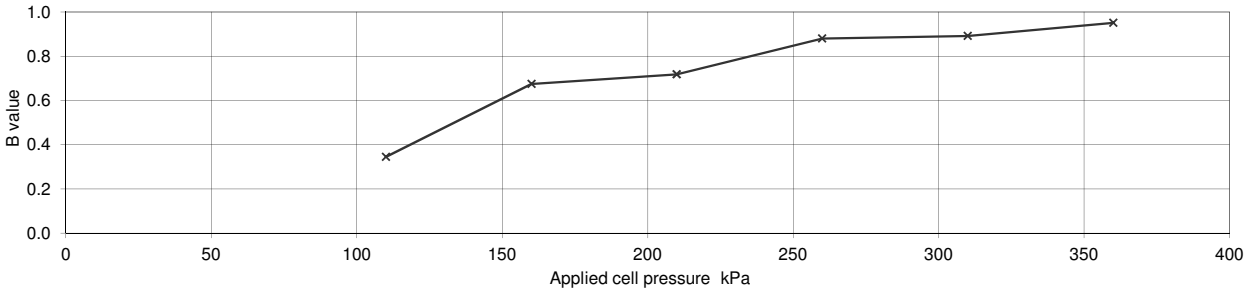
Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	N8135-18	Sample Details:	Hole No	HEP-BH-44		
Project Name	Heathrow Airport, Limited		Depth (m BGL)	15.50-15.95		
			No	41	Type	UT
			ID			
			Spec Ref			

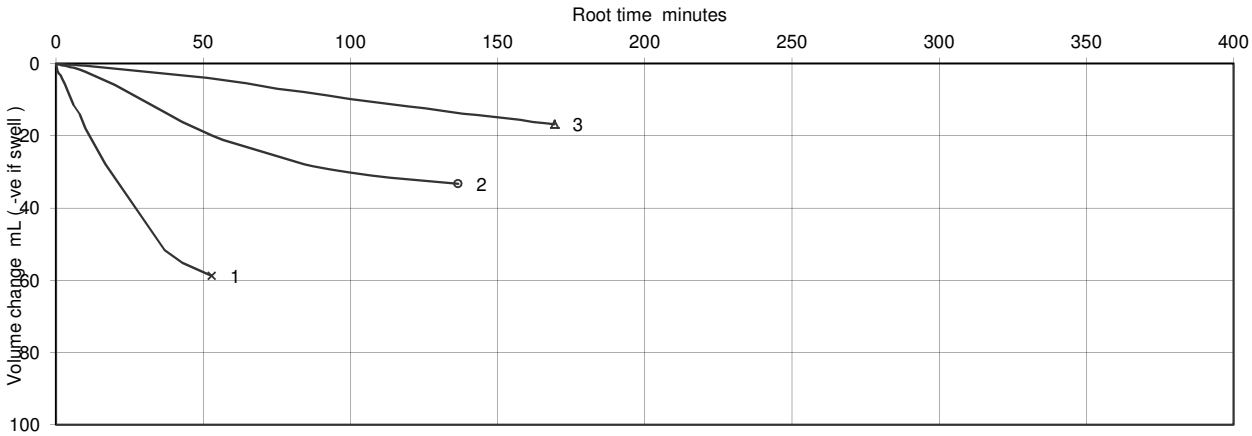
Specimen Details		
Initial		
Length	mm	201.68
Diameter	mm	103.08
Bulk Density	Mg/m³	2.05
Water Content	%	24
Dry density	Mg/m³	1.65
After test		
Bulk Density	Mg/m³	2.06
Water Content	%	24
Dry density	Mg/m³	1.66

Soil Description	Stiff brown laminated slightly sandy CLAY.
Specimen Type /Preparation	UNDISTURBED

Saturation Details		Method of Saturation
		Increments of cell and back pressure
Cell pressure increments	kPa	50
Differential Pressure	kPa	10
Final Cell Pressure	kPa	360
Final pore water pressure	kPa	342.6
Final B Value		0.95



Consolidation Details	Drainage Conditions		From radial boundary and one end			
	Stage No.		1	2	3	
	Cell Pressure applied		460	620	780	kPa
	Back Pressure applied		300	300	300	kPa
	Effective Pressure		160	320	480	kPa
	Pore pressure at start of consolidation		442	469	494	kPa
	Pore pressure at end of consolidation		302	309	310	kPa
	Pore pressure dissipation at end of consolidation		99	95	95	%
Consolidation parameters (see note to BS1377 : pt 8, clause 6.3.4)	Coefficient of Consolidation	C_{vi}	0.19	0.03	0.01	m^2/year
	Coefficient of Compressibility	M_{vi}	0.23	0.12	0.05	m^2/MN
	Coefficient of Permeability (calculated)	k_{vi}	1.4E-11	1.3E-12	1.5E-13	m/s



Ref			Figure
SLR8.1 Rev 86.0 Feb18	SOCOTEC	Printed:29/10/2018 14:11	CUM
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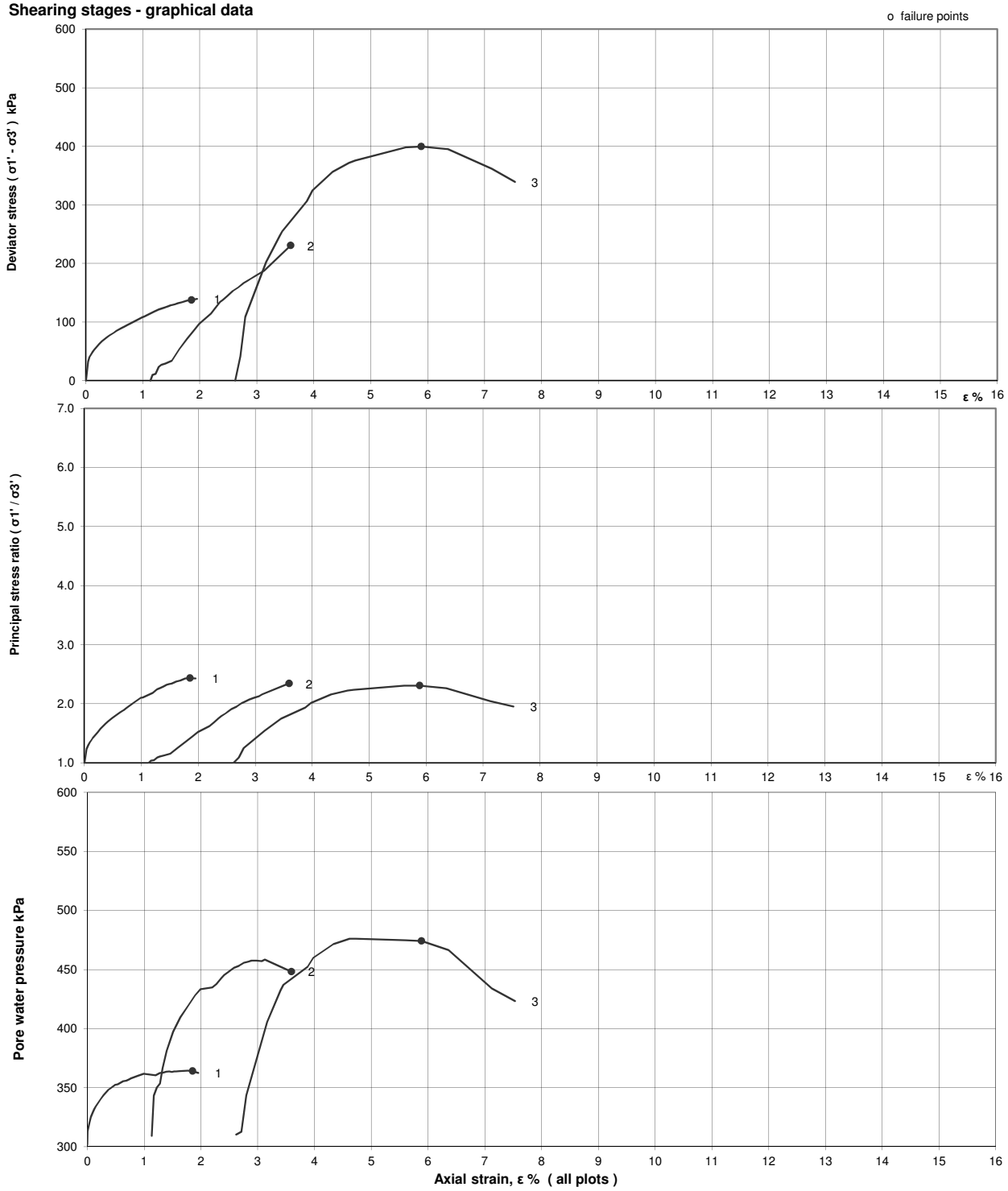
Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	N8135-18	Sample Details:	Hole No	HEP-BH-44		
Project Name	Heathrow Airport, Limited		Depth (m BGL)	15.50-15.95		
			No	41	Type	UT
			ID			
			Spec Ref			

Shearing stages - graphical data



Ref		Figure
SLR8.1 Rev 86.0 Feb18	Printed:29/10/2018 14:11	**CUM** sheet 2 of 3

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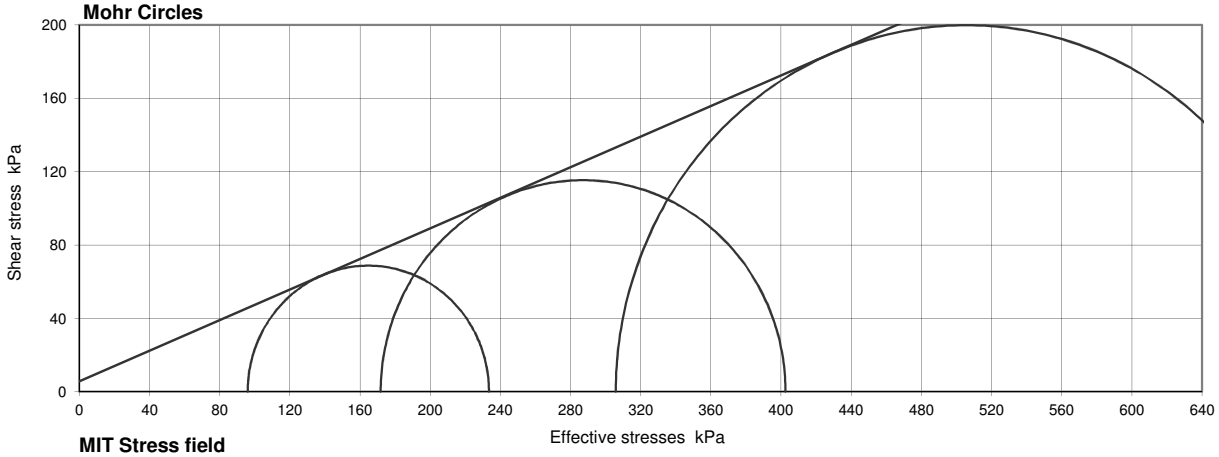
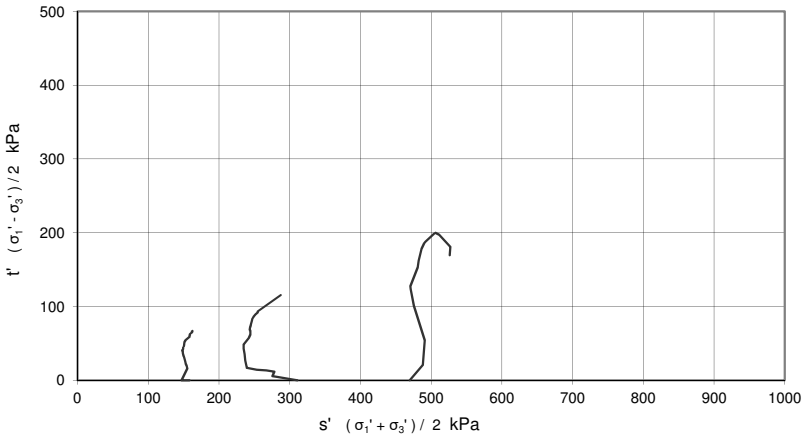
Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	N8135-18	Sample Details:	Hole No	HEP-BH-44		
Project Name	Heathrow Airport, Limited		Depth (m BGL)	15.50-15.95		
			No	41	Type	UT
			ID			
			Spec Ref			

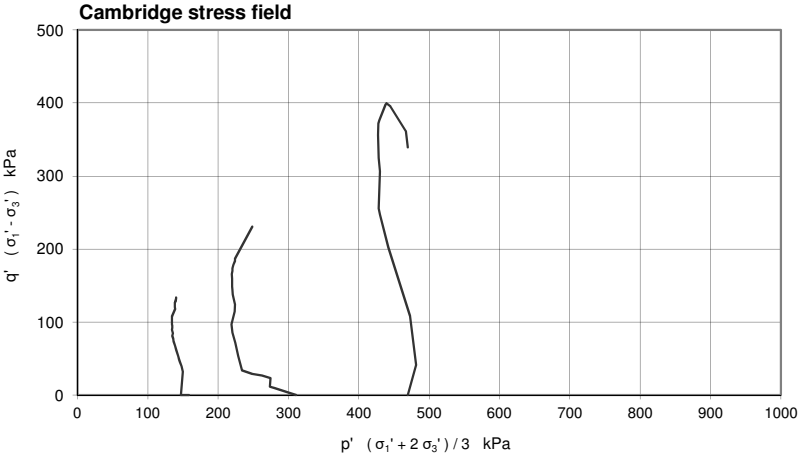
Mohr Circles



MIT Stress field



Cambridge stress field



Compression stages

Stage	1	2	3	
Cell pressure	460	620	780	kPa
Initial pwp	302	309	310	kPa
Initial σ_3'	158	311	470	kPa
Rate of strain	0.13	0.13	0.13	%/hr

Failure conditions

Criterion	Maximum effective principal stress ratio			
Axial strain	1.85	3.59	5.89	%
$(\sigma_1' / \sigma_3')_f$	2.433	2.343	2.307	
$(\sigma_1' - \sigma_3')_f$	137.5	230.8	399.7	kPa
u_f	364	448	474	kPa
$\sigma_3'_f$	96	172	306	kPa
$\sigma_1'_f$	234	403	706	kPa
A_f	0.45	0.60	0.41	
Time to failure	14.3	27.7	45.3	hrs

Shear Strength Parameters

at peak stress ratio

		Linear regression
c '	kPa	5.6
Ø '	degrees	22.6
		Manual re-assessment
c '	kPa	-
Ø '	degrees	-

Mode of failure

Notes : Deviator stresses corrected for area change, vertical side drains and 0.496 mm thick rubber membrane(s)

Ref			Figure
SLR8.1 Rev 86.0 Feb18	SOCOTEC UKAS TESTING 1157	Printed:29/10/2018 14:11	**CUM** sheet 3 of 3

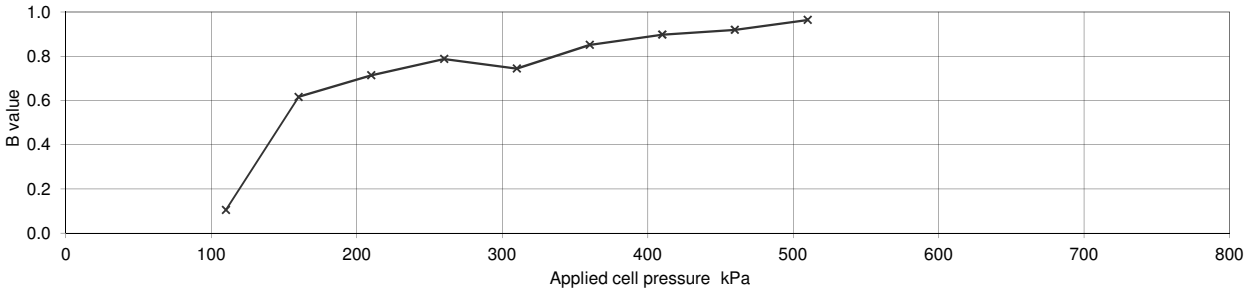
Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	N8135-18	Sample Details:	Hole No	HEP - BH - 44		
Project Name	HEATHROW AIPORT LIMITED		Depth (m BGL)	19.50		
			No	50	Type	UT
			ID			
			Spec Ref			

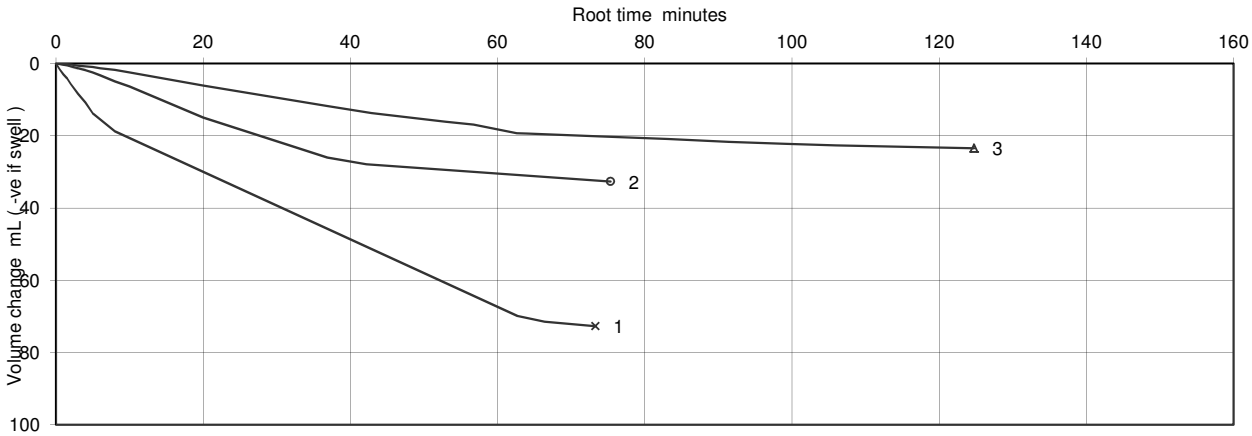
Specimen Details		
Initial		
Length	mm	203.25
Diameter	mm	103.53
Bulk Density	Mg/m³	2.04
Water Content	%	25
Dry density	Mg/m³	1.63
After test		
Bulk Density	Mg/m³	2.05
Water Content	%	25
Dry density	Mg/m³	1.65

Soil Description	Firm to stiff brown slightly sandy CLAY.
Specimen Type /Preparation	UNDISTURBED

Saturation Details		Method of Saturation
		Increments of cell and back pressure
Cell pressure increments	kPa	50
Differential Pressure	kPa	10
Final Cell Pressure	kPa	510
Final pore water pressure	kPa	487.2
Final B Value		0.98



Consolidation Details	Drainage Conditions		From radial boundary and one end			
	Stage No.		1	2	3	
	Cell Pressure applied		650	850	1050	kPa
	Back Pressure applied		450	450	450	kPa
	Effective Pressure		200	400	600	kPa
	Pore pressure at start of consolidation		631	697	687	kPa
	Pore pressure at end of consolidation		450	454	450	kPa
	Pore pressure dissipation at end of consolidation		100	98	100	%
Consolidation parameters (see note to BS1377 : pt 8, clause 6.3.4)	Coefficient of Consolidation	C_{vi}	0.30	0.14	0.05	m^2/year
	Coefficient of Compressibility	M_{vi}	0.22	0.08	0.06	m^2/MN
	Coefficient of Permeability (calculated)	k_{vi}	2.1E-11	3.3E-12	8.1E-13	m/s

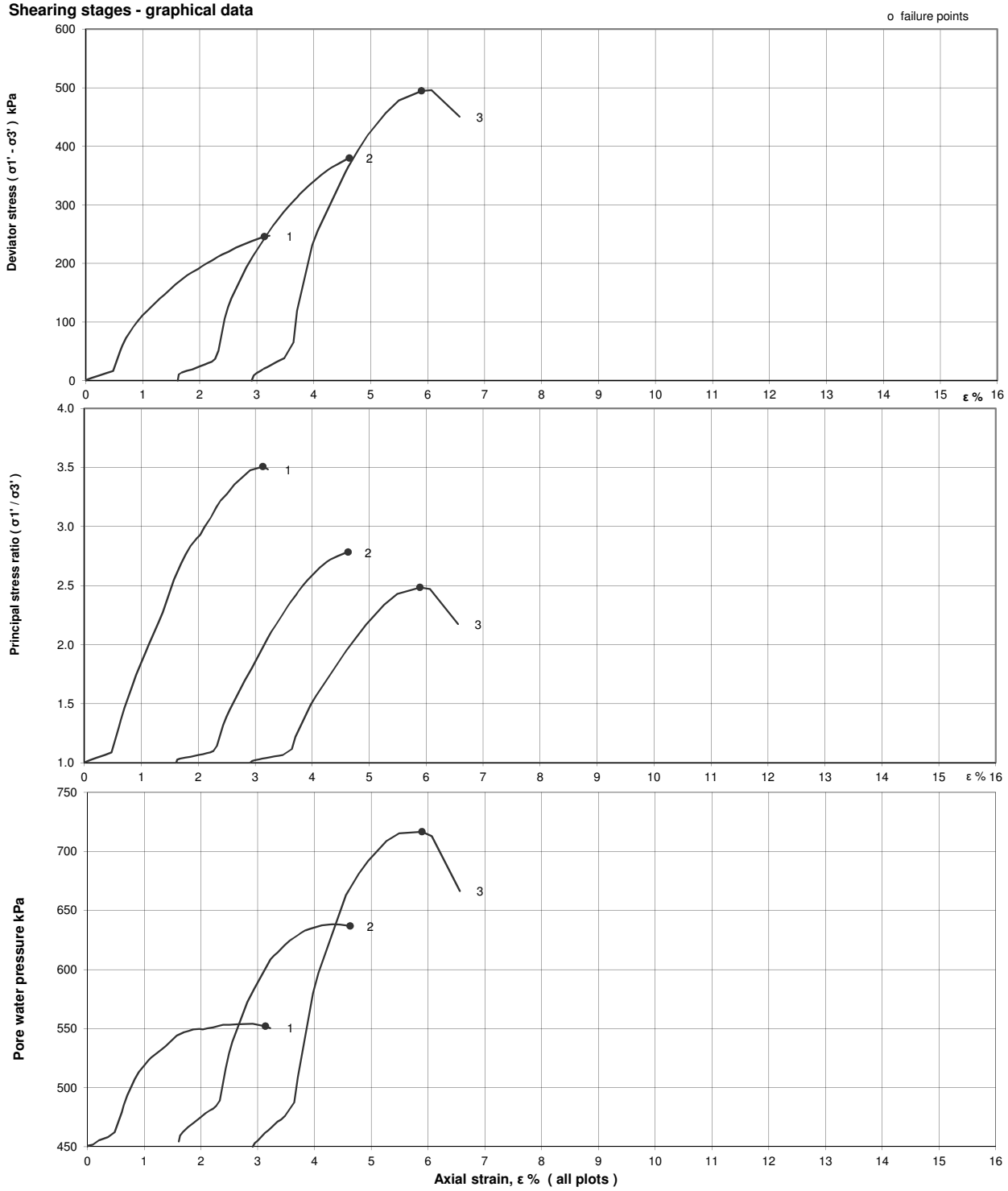


Ref			Figure
SLR8.1 Rev 86.0 Feb18	SOCOTEC	Printed:15/10/2018 09:28	CUM
	UKAS TESTING 1157		sheet 1 of 3

Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	N8135-18	Sample Details:	Hole No	HEP - BH - 44		
Project Name	HEATHROW AIPORT LIMITED		Depth (m BGL)	19.50		
			No	50	Type	UT
			ID			
			Spec Ref			

Shearing stages - graphical data

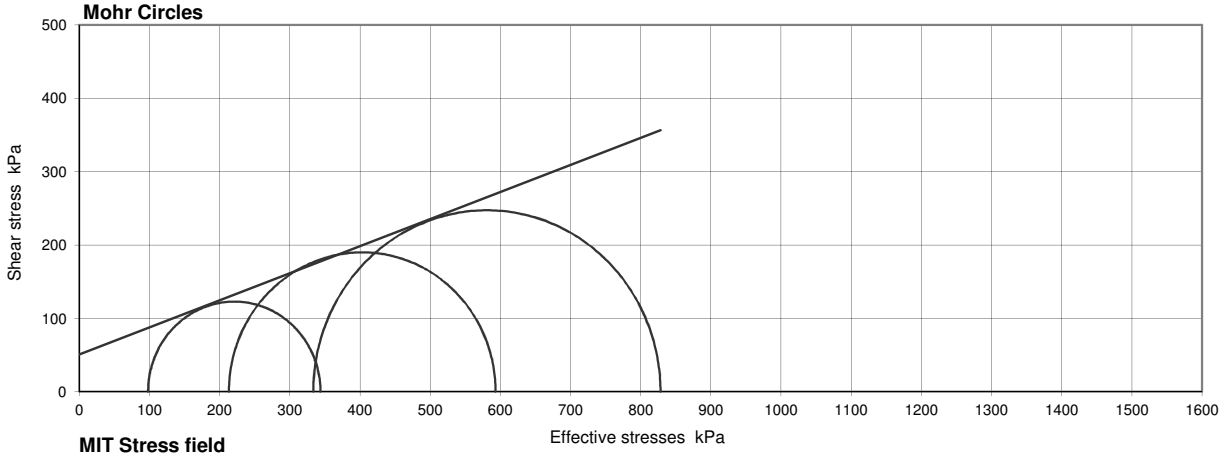


Ref		Figure
SLR8.1 Rev 86.0 Feb18	SOCOTEC UKAS TESTING 1157 Printed:15/10/2018 09:28	**CUM** sheet 2 of 3

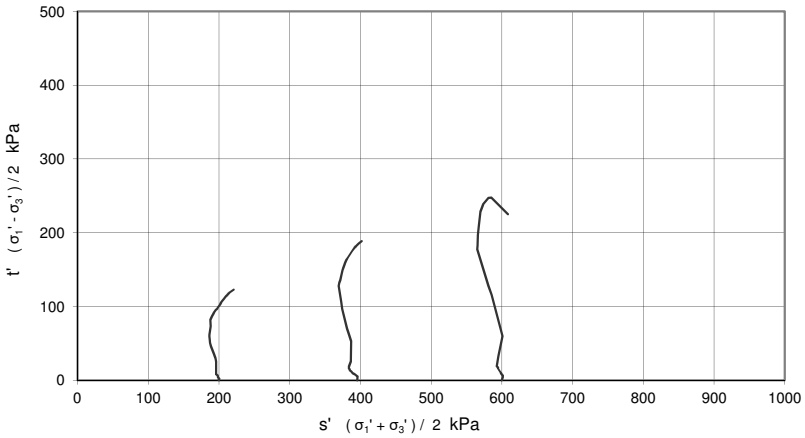
Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	N8135-18	Sample Details:	Hole No	HEP - BH - 44		
Project Name	HEATHROW AIPORT LIMITED		Depth (m BGL)	19.50		
			No	50	Type	UT
			ID			
			Spec Ref			

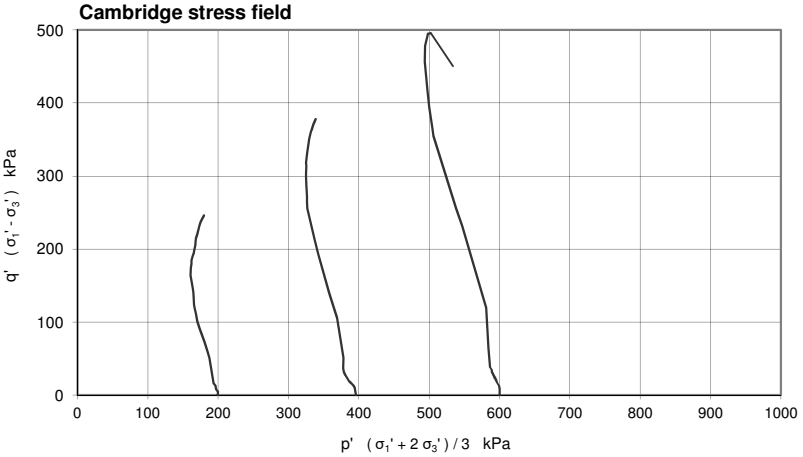
Mohr Circles



MIT Stress field



Cambridge stress field



Compression stages

Stage	1	2	3	
Cell pressure	650	850	1050	kPa
Initial pwp	450	454	450	kPa
Initial σ_3'	200	396	600	kPa
Rate of strain	0.21	0.21	0.21	%/hr

Failure conditions

Criterion	Maximum effective principal stress ratio			
Axial strain	3.13	4.63	5.89	%
$(\sigma_1' / \sigma_3')_f$	3.508	2.783	2.484	
$(\sigma_1' - \sigma_3')_f$	245.8	380.1	494.8	kPa
u_f	552	637	717	kPa
$\sigma_3'_f$	98	213	333	kPa
$\sigma_1'_f$	344	593	828	kPa
A_f	0.42	0.48	0.54	
Time to failure	14.9	22.0	28.1	hrs

Shear Strength Parameters

at peak stress ratio

		Linear regression
c '	kPa	50.9
Ø '	degrees	20.2
		Manual re-assessment
c '	kPa	-
Ø '	degrees	-

Mode of failure

Notes : Deviator stresses corrected for area change, vertical side drains and 0.298 mm thick rubber membrane(s)

Ref			Figure
SLR8.1 Rev 86.0 Feb18	SOCOTEC UKAS TESTING 1157	Printed:15/10/2018 09:28	**CUM** sheet 3 of 3

Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	N8135-18	Sample Details:	Hole No	HEP -BH-45		
Project Name	Heathrow Airport Limited		Depth (m BGL)	6.00		
			Sample No	32	Type	UT
			ID			
			Spec Ref			

			System Number		
			Stage number	3	
Pore pressure transducer number			Nominal effective stress (σ_3')	200	kPa
Load cell / Proving ring number			Cell Pressure	600	kPa
Cell number			Back Pressure	400	kPa
Machine number					
Height at start of shear (L_C)	202.93	mm	Load Cell / Load ring factor	2.230	N/div
Area at start of shear (A_C)	8220.90	mm	Rate of strain	0.540	% per hr
Volume at start of shear (V_C)	1668.23	mm	Machine Speed	0.0183	mm/min

Date	Time	Strain reading 0.01 mm/div	Load Reading divs*	Pore water pressure	New Load factor* N/div	Axial strain %	$Ó_3'$ kPa	$(Ó_1 - Ó_3)'$ kPa	$Ó_1'/ Ó_3'$ kPa	A
		604	18	400		2.98	200.0	0.0	1.00	0.00
		612	35	402.3		3.02	197.7	0.4	1.00	6.43
		631	50.4	405.4		3.11	194.6	4.4	1.02	1.23
		650	87.6	408.1		3.20	191.9	14.1	1.07	0.57
		668	111.1	414.4		3.29	185.6	20.3	1.11	0.71
		688	237.5	432.9	2.164	3.39	167.1	51.7	1.31	0.64
		712	320	445.2		3.51	154.8	72.5	1.47	0.62
		725	348.1	449.6		3.57	150.4	79.6	1.53	0.62
		747	395	456.2		3.68	143.8	91.4	1.64	0.62
		775	436	462.1		3.82	137.9	101.6	1.74	0.61
		806	479.8	467.8		3.97	132.2	112.5	1.85	0.60
		832	512.5	471.6		4.10	128.4	120.6	1.94	0.59
		890	574.5	478.6		4.39	121.4	135.8	2.12	0.58
		915	596	480.3		4.51	119.7	141.0	2.18	0.57
		937	610.8	481.8		4.62	118.2	144.5	2.22	0.57
		982	632.6	483.5		4.84	116.5	149.6	2.28	0.56
		1021	645.5	484.1		5.03	115.9	152.5	2.32	0.55
		1210	680	482.5		5.96	117.5	159.4	2.36	0.52
		1328	662.7	478.2		6.54	121.8	154.1	2.26	0.51
		1444	636	473.8		7.12	126.2	146.5	2.16	0.50
		1514	634.8	472.1		7.46	127.9	145.7	2.14	0.50
		1632	628.8	469.6		8.04	130.4	143.2	2.10	0.49
		1648	625	468.1		8.12	131.9	142.2	2.08	0.48

Ref SLR8.1 Rev 86.0 Feb18	SOCOTEC	Operator		Date	
		Checked		Date	

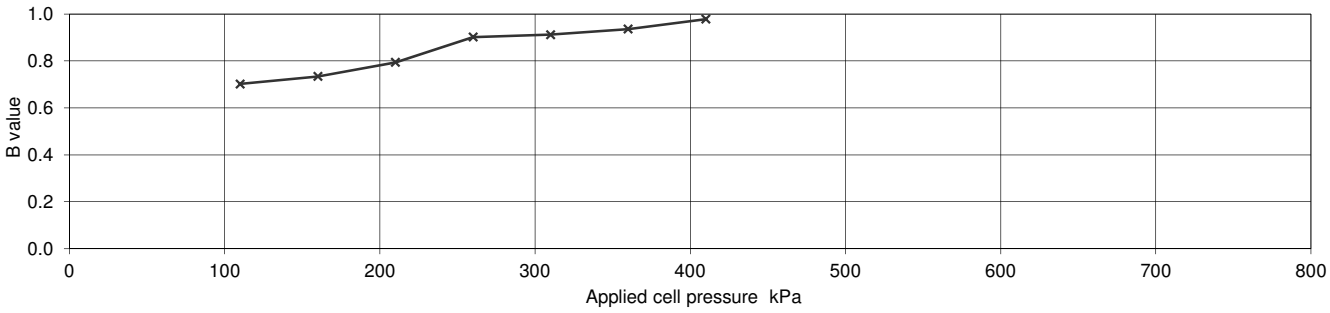
Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	N8135-18	Sample Details:	Hole No	HEP -BH-45		
Project Name	Heathrow Airport Limited		Depth (m BGL)	6.00		
			No	32	Type	UT
			ID			
			Spec Ref			

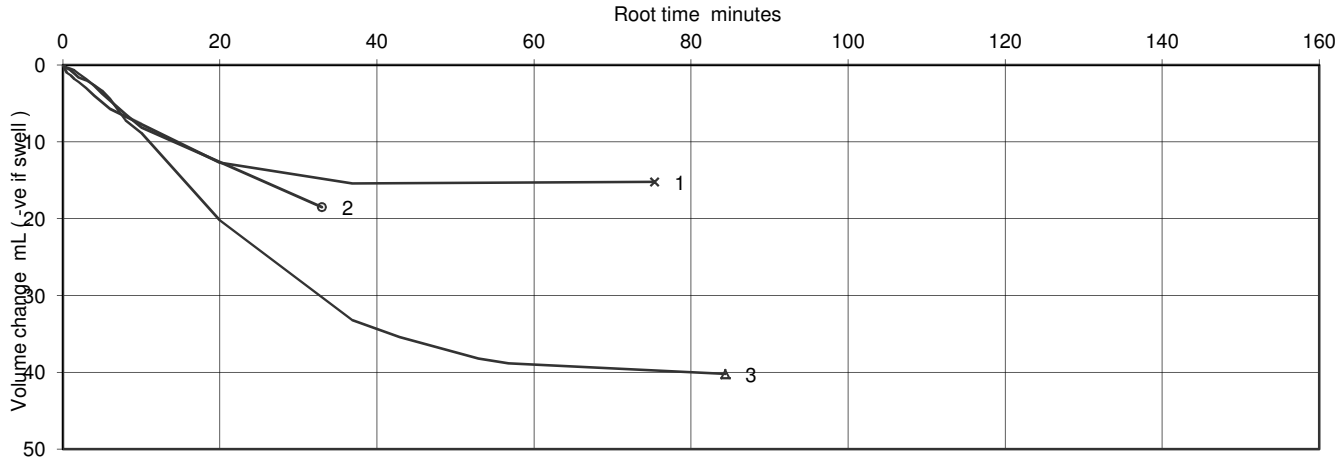
Specimen Details		
Initial		
Length	mm	203.04
Diameter	mm	102.37
Bulk Density	Mg/m³	1.98
Water Content	%	28
Dry density	Mg/m³	1.54
After test		
Bulk Density	Mg/m³	1.98
Water Content	%	29
Dry density	Mg/m³	1.54

Soil Description	Firm brownish grey slightly sandy CLAY
Specimen Type /Preparation	UNDISTURBED

Saturation Details		Method of Saturation
		Increments of cell and back pressure
Cell pressure increments	kPa	50
Differential Pressure	kPa	10
Final Cell Pressure	kPa	410
Final pore water pressure	kPa	399.1
Final B Value		0.98



Consolidation Details	Drainage Conditions		From radial boundary and one end			
	Stage No.		1	2	3	
	Cell Pressure applied		450	500	600	kPa
	Back Pressure applied		400	400	400	kPa
	Effective Pressure		50	100	200	kPa
	Pore pressure at start of consolidation		440	459	525	kPa
	Pore pressure at end of consolidation		400	402	400	kPa
	Pore pressure dissipation at end of consolidation		99	97	100	%
Consolidation parameters (see note to BS1377 : pt 8, clause 6.3.4)	Coefficient of Consolidation	C_{vi}	0.73	0.50	0.15	m^2/year
	Coefficient of Compressibility	M_{vi}	0.22	0.19	0.19	m^2/MN
	Coefficient of Permeability (calculated)	k_{vi}	5.0E-11	2.9E-11	8.5E-12	m/s



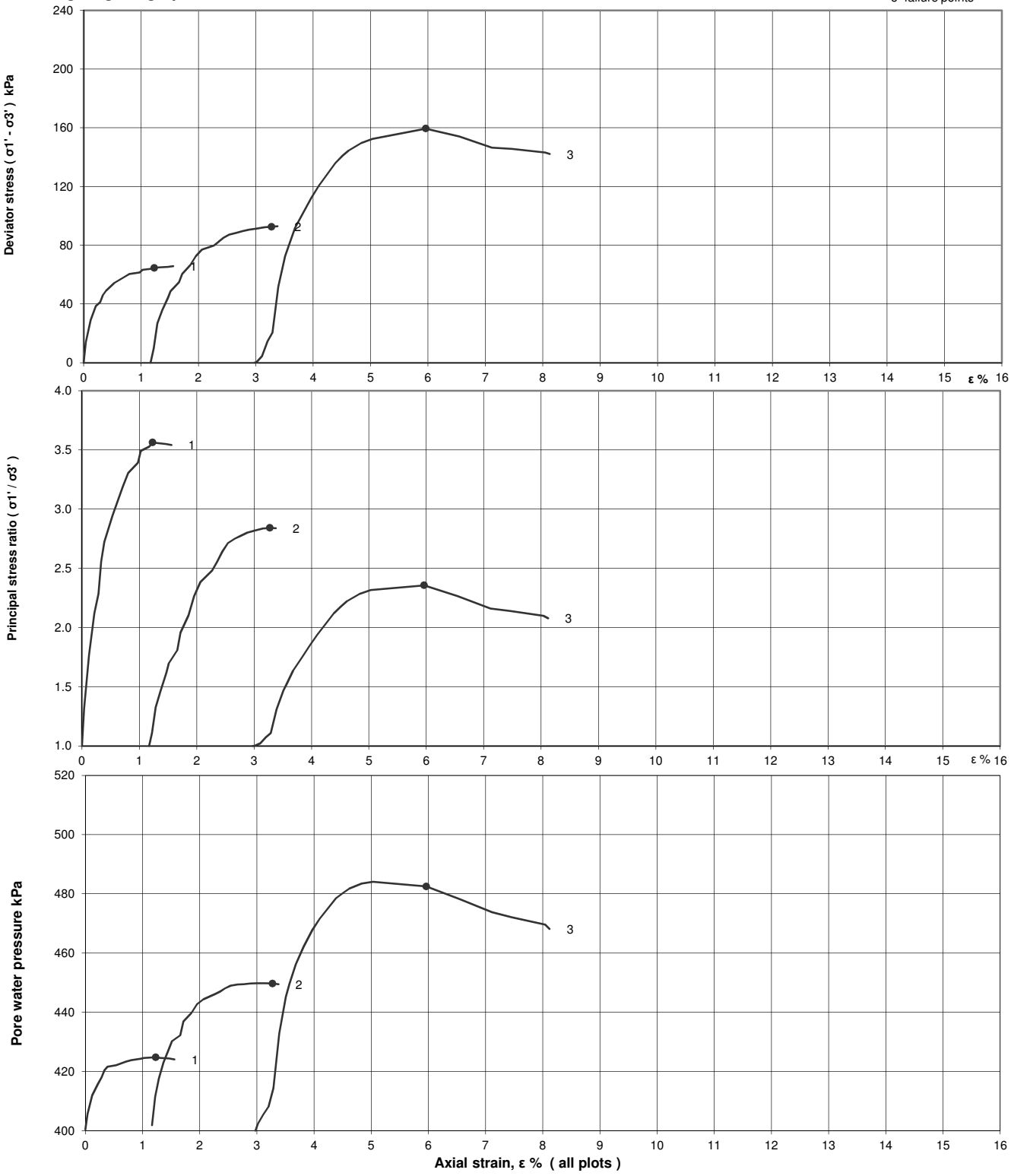
Ref			Figure
SLR8.1 Rev 86.0 Feb18	SOCOTEC	1157	CUM
	Printed:27/06/2018 15:23		sheet 1 of 3

Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	N8135-18	Sample Details:	Hole No	HEP -BH-45		
Project Name	Heathrow Airport Limited		Depth (m BGL)	6.00		
			No	32	Type	UT
			ID			
			Spec Ref			

Shearing stages - graphical data

o failure points

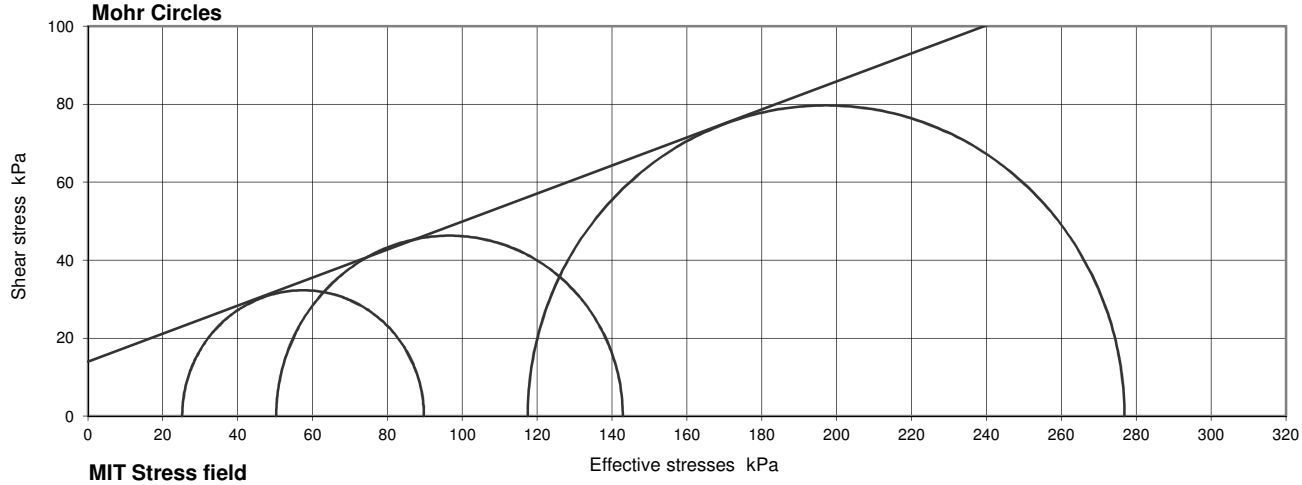


Ref SLR8.1 Rev 86.0 Feb18	SOCOTEC	Printed:27/06/2018 15:23	**Figure** **CUM** sheet 2 of 3
	UKAS TESTING 1157		

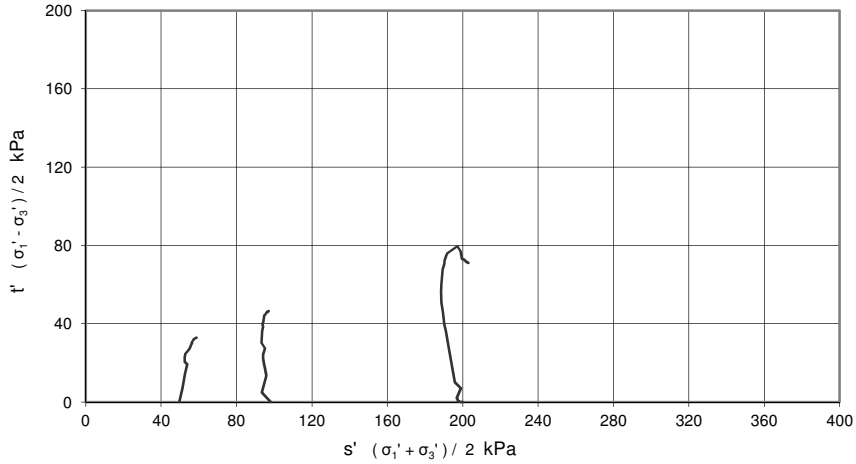
Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	N8135-18	Sample Details:	Hole No	HEP -BH-45		
Project Name	Heathrow Airport Limited		Depth (m BGL)	6.00		
			No	32	Type	UT
			ID			
			Spec Ref			

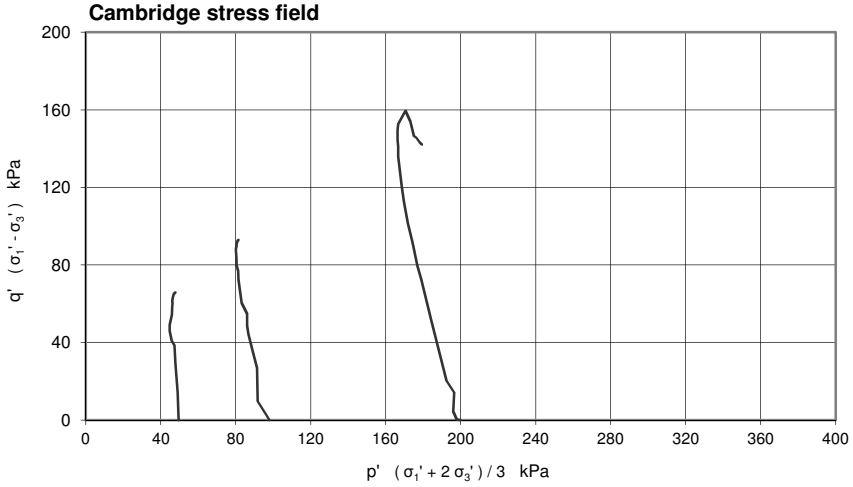
Mohr Circles



MIT Stress field



Cambridge stress field



Compression stages

Stage	1	2	3	
Cell pressure	450	500	600	kPa
Initial pwp	400	402	400	kPa
Initial σ_3'	50	98	200	kPa
Rate of strain	0.54	0.54	0.54	%/hr

Failure conditions

Criterion	Maximum effective principal stress ratio			
Axial strain	1.23	3.28	5.96	%
$(\sigma_1' / \sigma_3')_f$	3.562	2.841	2.357	
$(\sigma_1' - \sigma_3')_f$	64.6	92.6	159.4	kPa
u_f	425	450	483	kPa
$\sigma_3'_f$	25	50	118	kPa
$\sigma_1'_f$	90	143	277	kPa
A_f	0.38	0.52	0.52	
Time to failure	2.3	6.1	11.0	hrs

Shear Strength Parameters

at peak stress ratio

		Linear regression
c '	kPa	14.0
Ø '	degrees	19.7
		Manual re-assessment
c '	kPa	-
Ø '	degrees	-

Mode of failure

Notes : Deviator stresses corrected for area change, vertical side drains and 0.499 mm thick rubber membrane(s)

Ref			Figure
SLR8.1 Rev 86.0 Feb18	SOCOTEC UKAS TESTING 1157	Printed:27/06/2018 15:23	**CUM** sheet 3 of 3

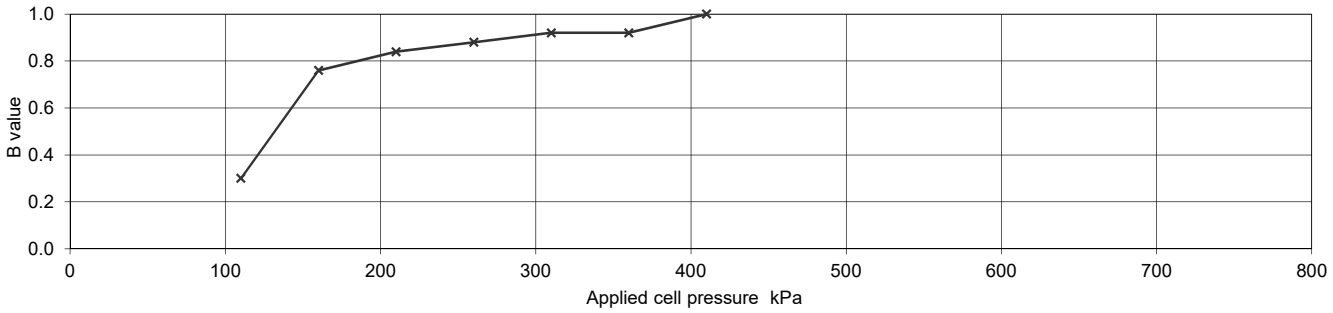
Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	N8135-18	Sample Details:	Hole No	HEP-BH-47		
Project Name	Heathrow Airport Limited		Depth (m BGL)	8.00		
			No	28	Type	UT
			ID			
			Spec Ref			

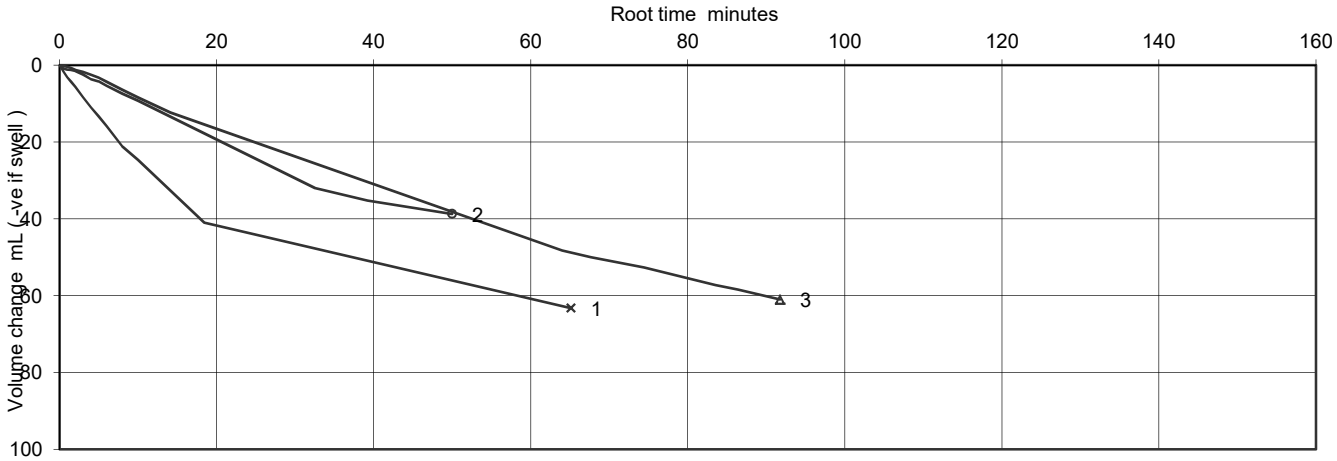
Specimen Details		
Initial		
Length	mm	203.14
Diameter	mm	102.96
Bulk Density	Mg/m³	1.98
Water Content	%	29
Dry density	Mg/m³	1.54
After test		
Bulk Density	Mg/m³	2.02
Water Content	%	27
Dry density	Mg/m³	1.60

Soil Description	Firm grey slightly sandy laminated CLAY
Specimen Type /Preparation	UNDISTURBED

Saturation Details		Method of Saturation
		Increments of cell and back pressure
Cell pressure increments	kPa	50
Differential Pressure	kPa	10
Final Cell Pressure	kPa	410
Final pore water pressure	kPa	393
Final B Value		1



Consolidation Details	Drainage Conditions		From radial boundary and one end			
	Stage No.		1	2	3	
	Cell Pressure applied		475	600	850	kPa
	Back Pressure applied		350	350	350	kPa
	Effective Pressure		125	250	500	kPa
	Pore pressure at start of consolidation		458	494	647	kPa
	Pore pressure at end of consolidation		350	352	363	kPa
	Pore pressure dissipation at end of consolidation		100	99	96	%
Consolidation parameters (see note to BS1377 : pt 8, clause 6.3.4)	Coefficient of Consolidation	C_{vi}	0.38	0.15	0.05	m^2/year
	Coefficient of Compressibility	M_{vi}	0.33	0.16	0.13	m^2/MN
	Coefficient of Permeability (calculated)	k_{vi}	3.8E-11	7.2E-12	2.1E-12	m/s



Ref		Figure
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		sheet 1 of 3

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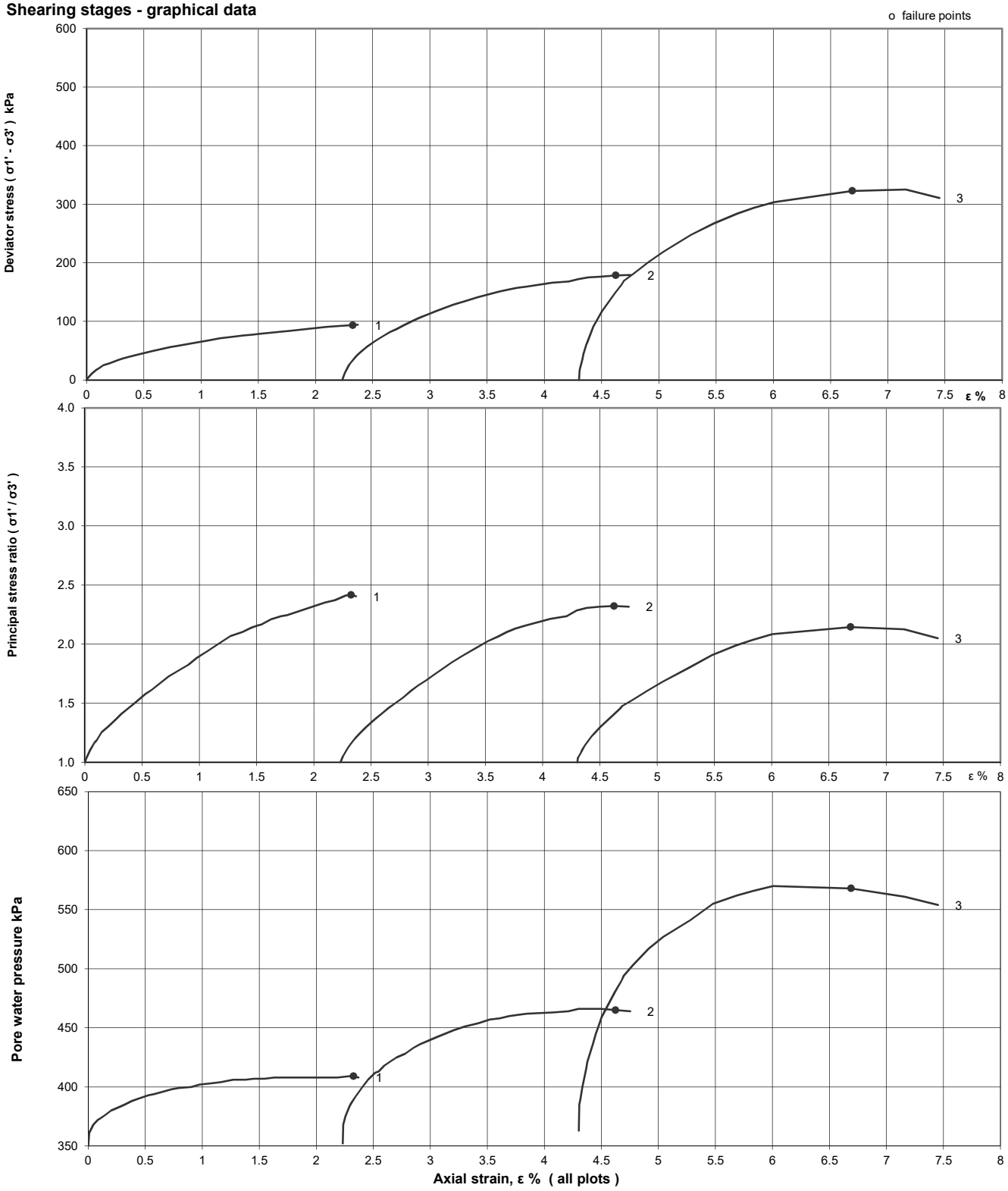
Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	N8135-18	Sample Details:	Hole No	HEP-BH-47		
Project Name	Heathrow Airport Limited		Depth (m BGL)	8.00		
			No	28	Type	UT
			ID			
			Spec Ref			

Shearing stages - graphical data

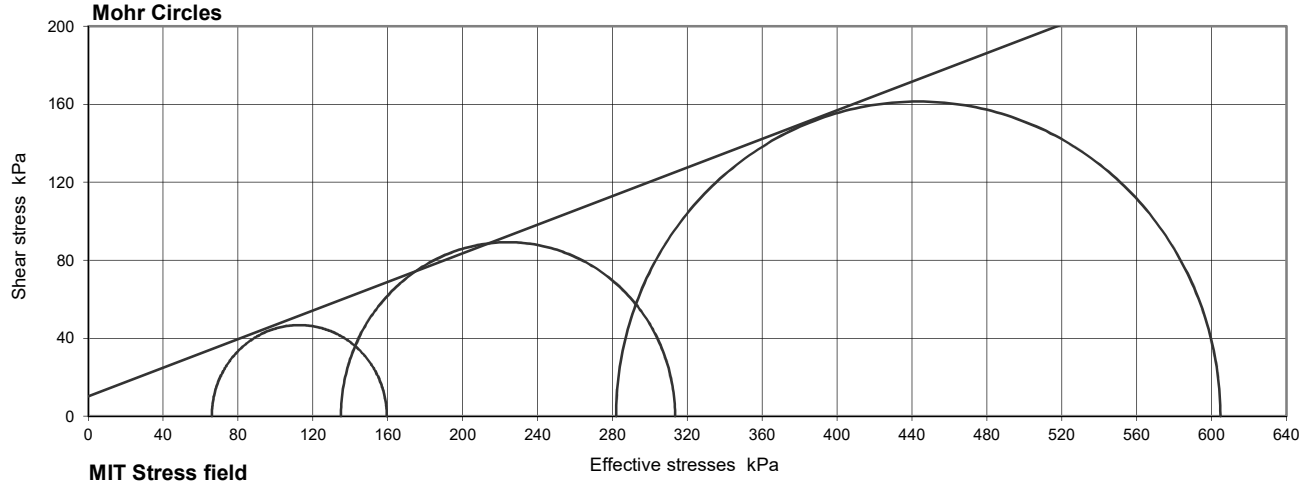


Ref			Figure
SLR8.1 Rev 86.0 Feb18	SOCOTEC UKAS TESTING 1157	Printed:18/07/2018 08:27	**CUM** sheet 2 of 3

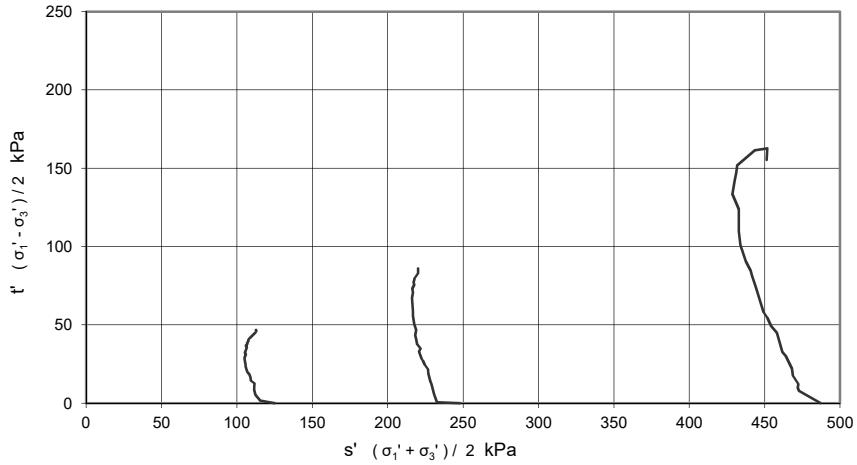
Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure
(BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	N8135-18	Sample Details:	Hole No	HEP-BH-47		
Project Name	Heathrow Airport Limited		Depth (m BGL)	8.00		
			No	28	Type	UT
			ID			
			Spec Ref			

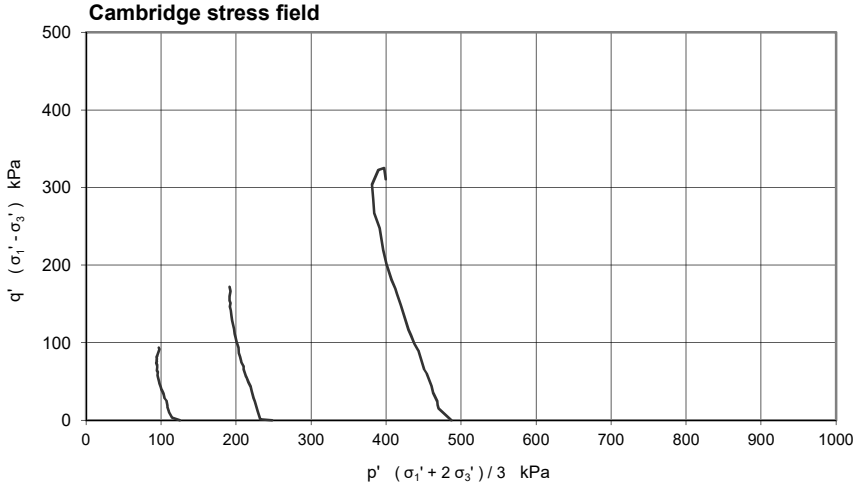
Mohr Circles



MIT Stress field



Cambridge stress field



Compression stages

Stage	1	2	3	
Cell pressure	475	600	850	kPa
Initial pwp	350	352	363	kPa
Initial σ_3'	125	248	487	kPa
Rate of strain	0.27	0.27	0.27	%/hr

Failure conditions

Criterion	Maximum effective principal stress ratio			
Axial strain	2.33	4.62	6.69	%
$(\sigma_1' / \sigma_3')_f$	2.416	2.322	2.145	
$(\sigma_1' - \sigma_3')_f$	93.5	178.5	322.8	kPa
u_f	409	465	568	kPa
$\sigma_3'_f$	66	135	282	kPa
$\sigma_1'_f$	159	313	605	kPa
A_f	0.63	0.63	0.64	
Time to failure	8.6	17.1	24.8	hrs

Shear Strength Parameters

at peak stress ratio

		Linear regression
c '	kPa	10.2
Ø '	degrees	20.1
		Manual re-assessment
c '	kPa	-
Ø '	degrees	-

Mode of failure

Notes : Deviator stresses corrected for area change, vertical side drains and 0.596 mm thick rubber membrane(s)

Ref			Figure
SLR8.1 Rev 86.0 Feb18	SOCOTEC UKAS TESTING 1157	Printed:18/07/2018 08:27	**CUM** sheet 3 of 3

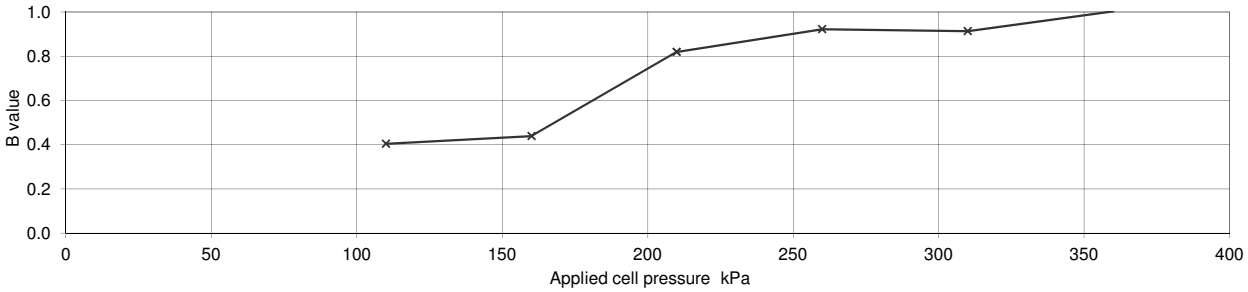
Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	N8135-18	Sample Details:	Hole No	HEP -BH-47		
Project Name	Heathrow Airport Limited		Depth (m BGL)	19.00		
			No	47	Type	UT
			ID			
			Spec Ref			

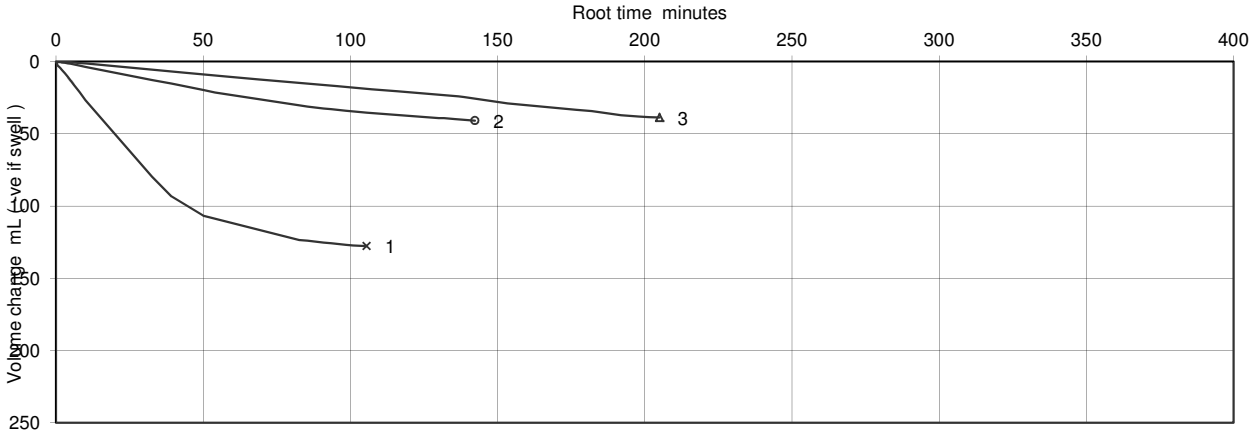
Specimen Details		
Initial		
Length	mm	203.38
Diameter	mm	102.59
Bulk Density	Mg/m³	2.03
Water Content	%	24
Dry density	Mg/m³	1.64
After test		
Bulk Density	Mg/m³	2.07
Water Content	%	22
Dry density	Mg/m³	1.69

Soil Description	Firm to stiff brown slightly sandy CLAY
Specimen Type /Preparation	UNDISTURBED

Saturation Details		Method of Saturation
		Increments of cell and back pressure
Cell pressure increments	kPa	50
Differential Pressure	kPa	10
Final Cell Pressure	kPa	360
Final pore water pressure	kPa	352.3
Final B Value		1



Consolidation Details	Drainage Conditions		From radial boundary and one end			
	Stage No.		1	2	3	
	Cell Pressure applied		600	900	1200	kPa
	Back Pressure applied		300	300	300	kPa
	Effective Pressure		300	600	900	kPa
	Pore pressure at start of consolidation		590	646	787	kPa
	Pore pressure at end of consolidation		305	396	311	kPa
	Pore pressure dissipation at end of consolidation		98	72	98	%
Consolidation parameters (see note to BS1377 : pt 8, clause 6.3.4)	Coefficient of Consolidation	C_{vi}	0.10	0.02	0.01	m^2/year
	Coefficient of Compressibility	M_{vi}	0.24	0.10	0.05	m^2/MN
	Coefficient of Permeability (calculated)	k_{vi}	7.9E-12	6.2E-13	8.5E-14	m/s

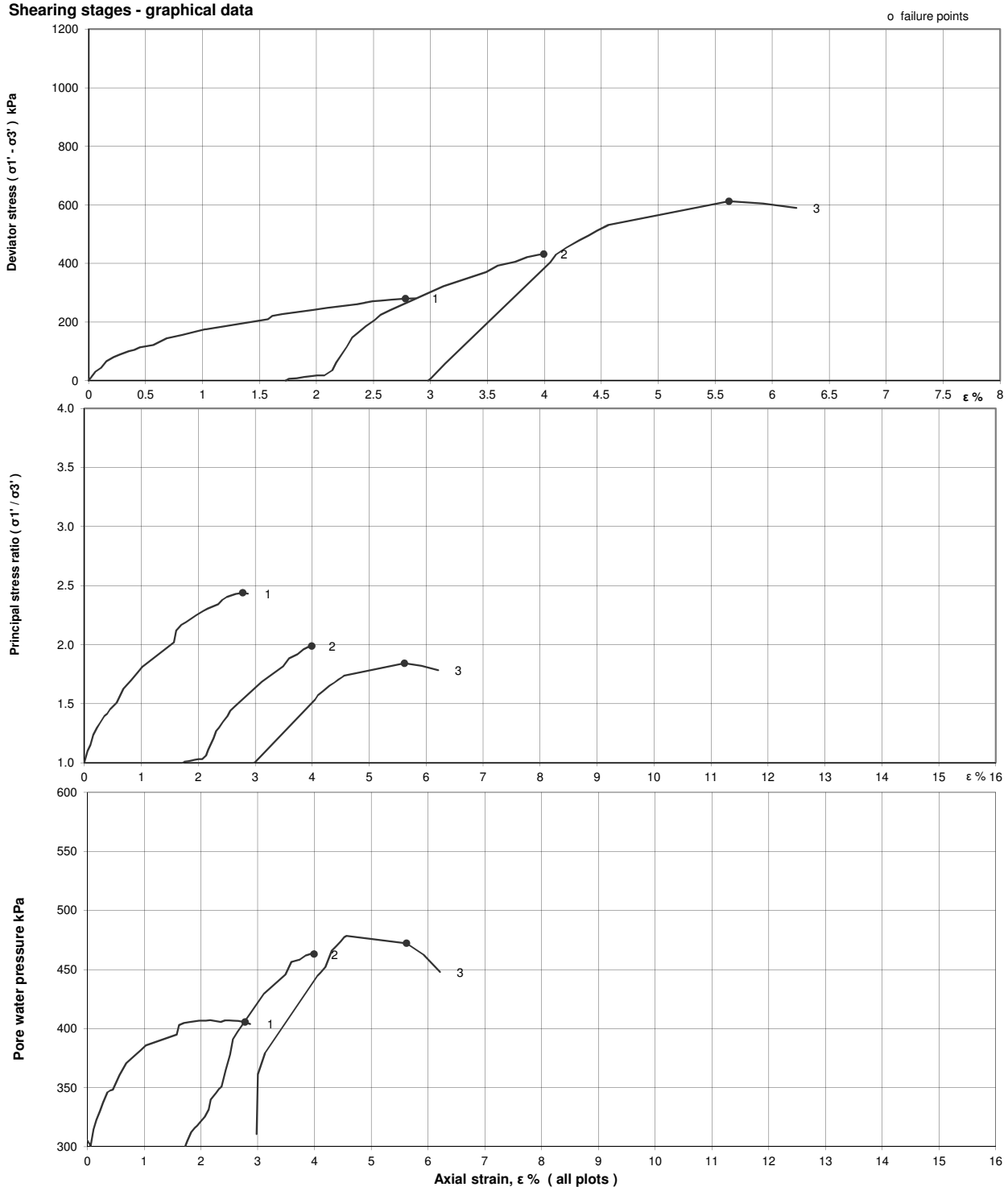


Ref			Figure
SLR8.1 Rev 86.0 Feb18	SOCOTEC	Printed:23/08/2018 15:21	CUM
	UKAS TESTING 1157		sheet 1 of 3

Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	N8135-18	Sample Details:	Hole No	HEP -BH-47		
Project Name	Heathrow Airport Limited		Depth (m BGL)	19.00		
			No	47	Type	UT
			ID			
			Spec Ref			

Shearing stages - graphical data

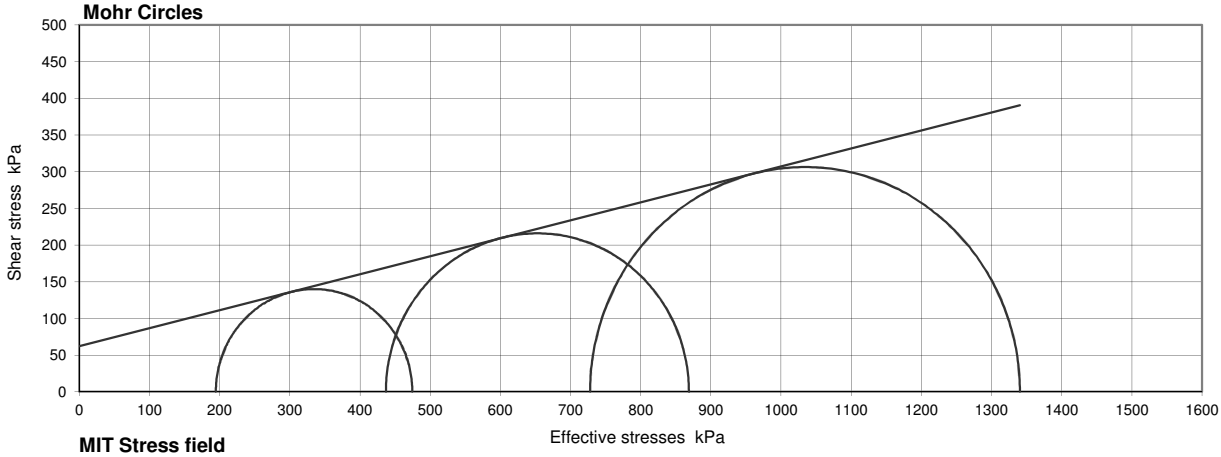


Ref			Figure
SLR8.1 Rev 86.0 Feb18	SOCOTEC UKAS TESTING 1157	Printed:23/08/2018 15:21	**CUM** sheet 2 of 3

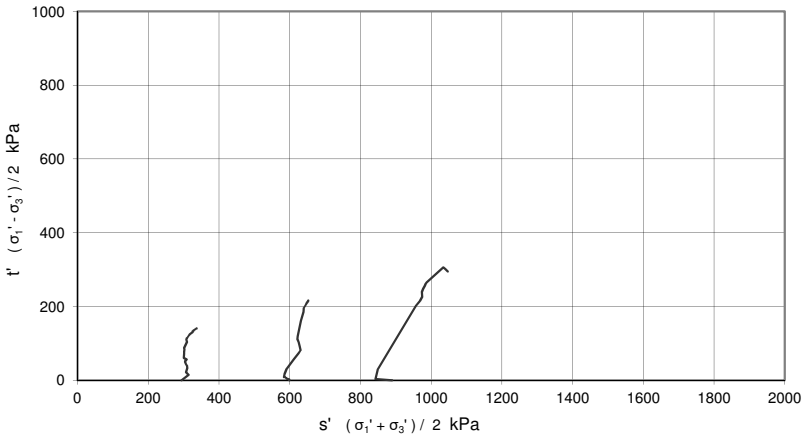
Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	N8135-18	Sample Details:	Hole No	HEP -BH-47		
Project Name	Heathrow Airport Limited		Depth (m BGL)	19.00		
			No	47	Type	UT
			ID			
			Spec Ref			

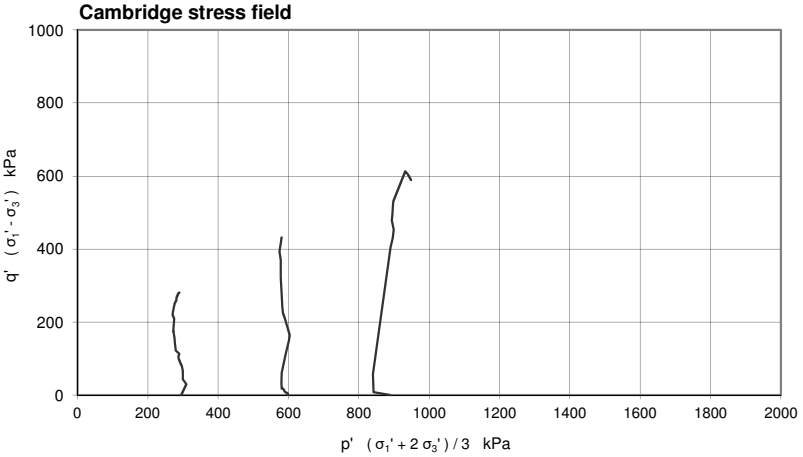
Mohr Circles



MIT Stress field



Cambridge stress field



Compression stages

Stage	1	2	3	
Cell pressure	600	900	1200	kPa
Initial pwp	305	301	311	kPa
Initial σ_3'	295	599	889	kPa
Rate of strain	0.07	0.07	0.07	%/hr

Failure conditions

Criterion	Maximum effective principal stress ratio			
Axial strain	2.78	4.00	5.62	%
$(\sigma_1' / \sigma_3')_f$	2.438	1.988	1.842	
$(\sigma_1' - \sigma_3')_f$	279.9	431.9	612.5	kPa
u_f	405	463	472	kPa
$\sigma_3'_f$	195	437	728	kPa
$\sigma_1'_f$	475	869	1340	kPa
A_f	0.36	0.38	0.26	
Time to failure	37.6	54.0	76.0	hrs

Shear Strength Parameters

at peak stress ratio

		Linear regression
c '	kPa	62.3
Ø '	degrees	13.8
		Manual re-assessment
c '	kPa	-
Ø '	degrees	-

Mode of failure

Notes : Deviator stresses corrected for area change, vertical side drains and 0.498 mm thick rubber membrane(s)

Ref			Figure
SLR8.1 Rev 86.0 Feb18	SOCOTEC UKAS TESTING 1157	Printed:23/08/2018 15:21	**CUM** sheet 3 of 3

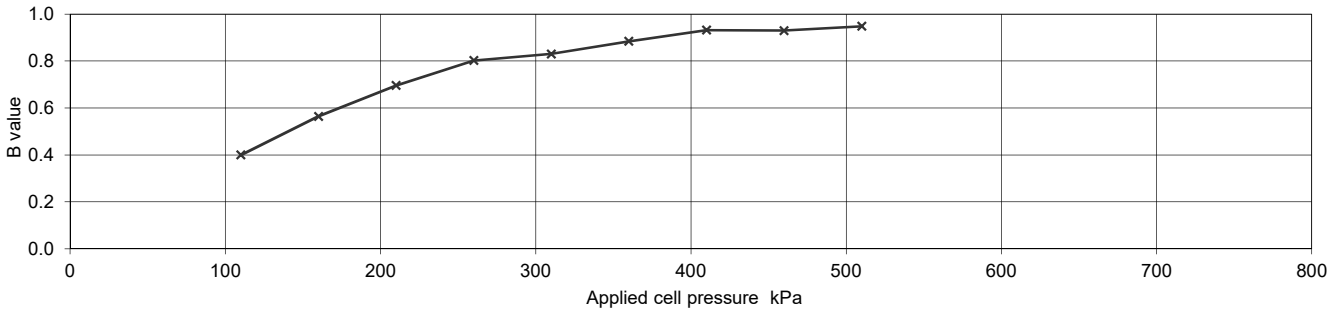
Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	N8135-18	Sample Details:	Hole No	HEP-BH-50		
Project Name	Heathrow Airport Limited		Depth (m BGL)	6.00		
			No	33	Type	UT
			ID			
			Spec Ref			

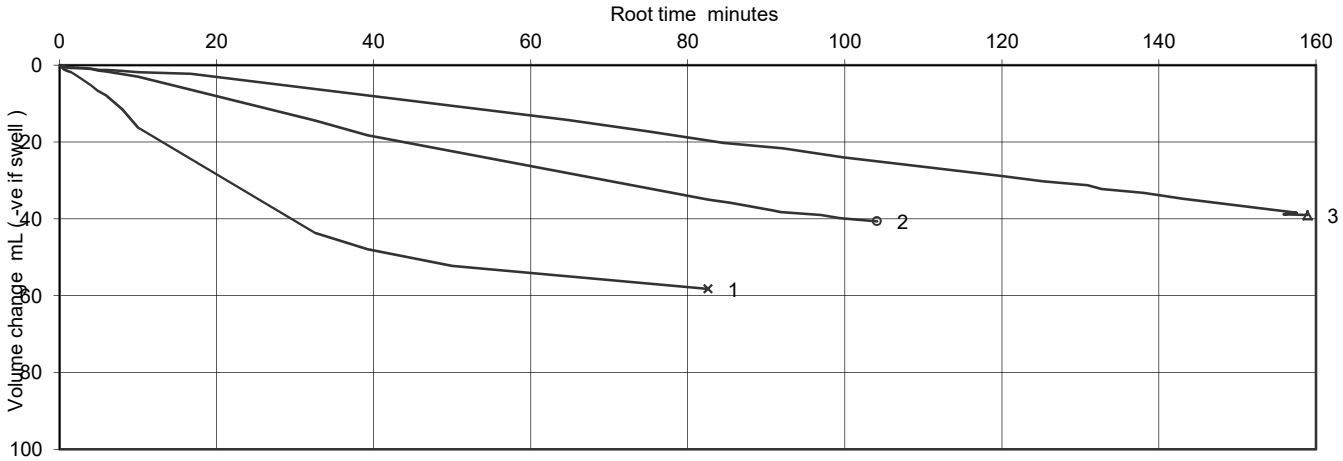
Specimen Details		
Initial		
Length	mm	203.03
Diameter	mm	103.89
Bulk Density	Mg/m³	1.94
Water Content	%	27
Dry density	Mg/m³	1.52
After test		
Bulk Density	Mg/m³	1.97
Water Content	%	26
Dry density	Mg/m³	1.57

Soil Description	firm brown slightly sandy CLAY
Specimen Type /Preparation	UNDISTURBED

Saturation Details		Method of Saturation
		Increments of cell and back pressure
Cell pressure increments	kPa	50
Differential Pressure	kPa	10
Final Cell Pressure	kPa	510
Final pore water pressure	kPa	493.8
Final B Value		0.95



Consolidation Details						
	Drainage Conditions		From radial boundary and one end			
	Stage No.		1	2	3	
	Cell Pressure applied		570	690	810	kPa
	Back Pressure applied		450	450	450	kPa
	Effective Pressure		120	240	360	kPa
	Pore pressure at start of consolidation		553	594	628	kPa
	Pore pressure at end of consolidation		451	458	452	kPa
	Pore pressure dissipation at end of consolidation		99	95	99	%
Consolidation parameters (see note to BS1377 : pt 8, clause 6.3.4)	Coefficient of Consolidation	C_{vi}	0.25	0.03	0.01	m^2/year
	Coefficient of Compressibility	M_{vi}	0.32	0.17	0.13	m^2/MN
	Coefficient of Permeability (calculated)	k_{vi}	2.4E-11	1.8E-12	3.6E-13	m/s



Ref		Figure
SLR8.1 Rev 86.0 Feb18	Printed:12/08/2018 11:55	CUM
		sheet 1 of 3

SOCOTEC

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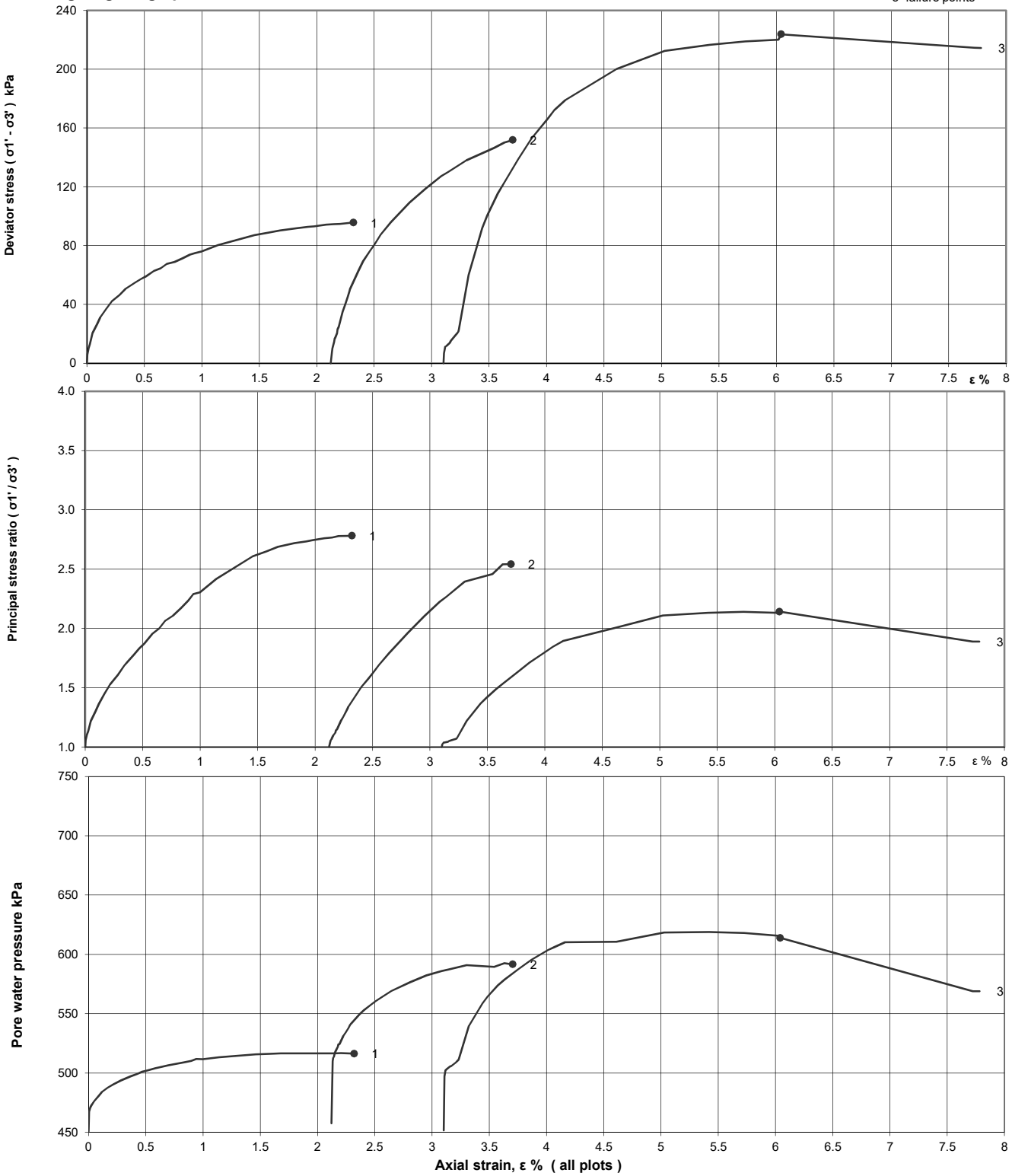
Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	N8135-18	Sample Details:	Hole No	HEP-BH-50		
Project Name	Heathrow Airport Limited		Depth (m BGL)	6.00		
			No	33	Type	UT
			ID			
			Spec Ref			

Shearing stages - graphical data

o failure points

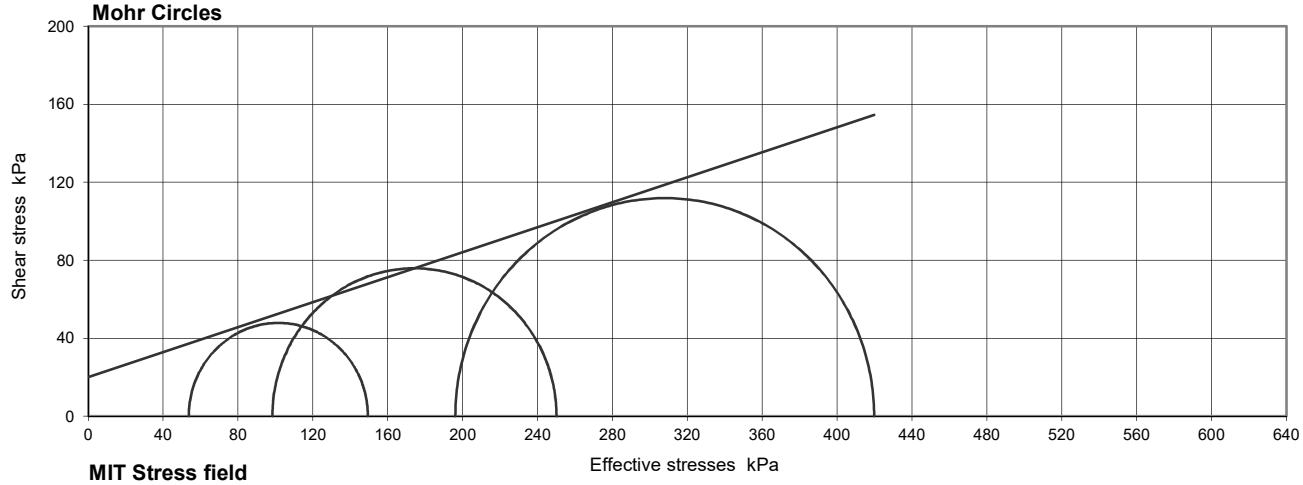


Ref SLR8.1 Rev 86.0 Feb18	SOCOTEC UKAS TESTING 1157	Printed:12/08/2018 11:55	**Figure** **CUM** sheet 2 of 3

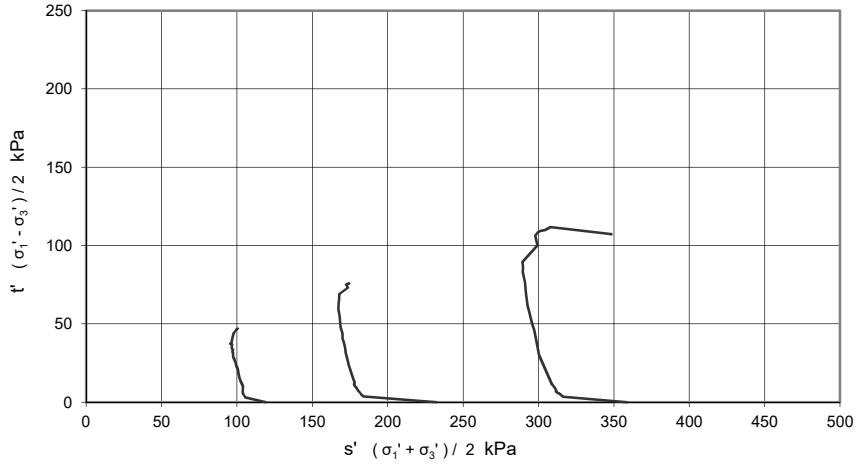
Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	N8135-18	Sample Details:	Hole No	HEP-BH-50		
Project Name	Heathrow Airport Limited		Depth (m BGL)	6.00		
			No	33	Type	UT
			ID			
			Spec Ref			

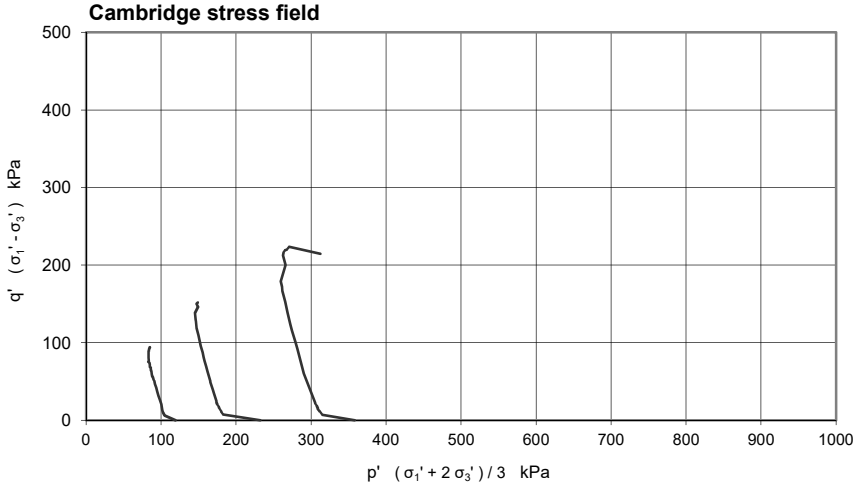
Mohr Circles



MIT Stress field



Cambridge stress field



Compression stages

Stage	1	2	3	
Cell pressure	570	690	810	kPa
Initial pwp	451	458	452	kPa
Initial σ_3'	119	232	358	kPa
Rate of strain	0.17	0.17	0.17	%/hr

Failure conditions

Criterion	Maximum effective principal stress ratio			
Axial strain	2.32	3.71	6.04	%
$(\sigma_1' / \sigma_3')_f$	2.782	2.542	2.141	
$(\sigma_1' - \sigma_3')_f$	95.7	151.8	223.7	kPa
u_f	516	592	614	kPa
$\sigma_3'_f$	54	98	196	kPa
$\sigma_1'_f$	149	250	420	kPa
A_f	0.68	0.88	0.73	
Time to failure	13.7	21.8	35.5	hrs

Shear Strength Parameters

at peak stress ratio

		Linear regression
c '	kPa	20.1
Ø '	degrees	17.8
		Manual re-assessment
c '	kPa	-
Ø '	degrees	-

Mode of failure

Notes : Deviator stresses corrected for area change, vertical side drains and 0.59 mm thick rubber membrane(s)

Ref			Figure
SLR8.1 Rev 86.0 Feb18	SOCOTEC UKAS TESTING 1157	Printed:12/08/2018 11:55	**CUM** sheet 3 of 3

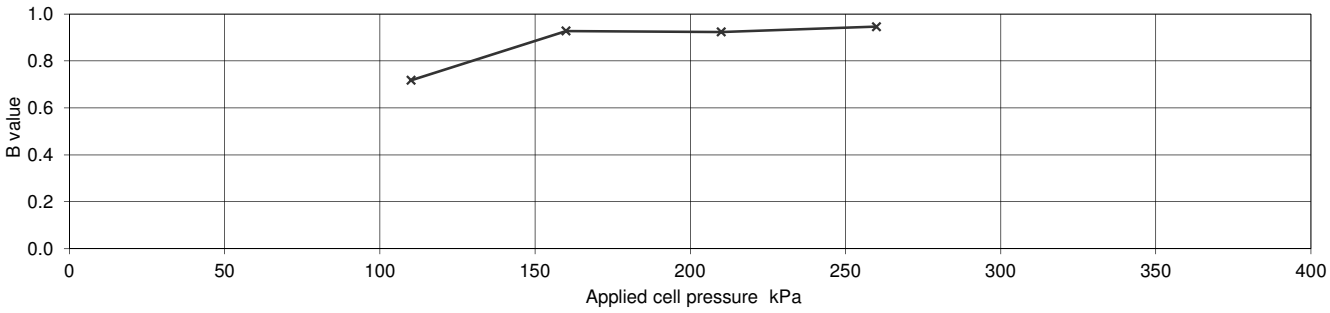
Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	N8135-18	Sample Details:	Hole No	HEP -BH-77		
Project Name	Heathrow Airport Limited		Depth (m BGL)	6.00		
			No	30	Type	UT
			ID			
			Spec Ref			

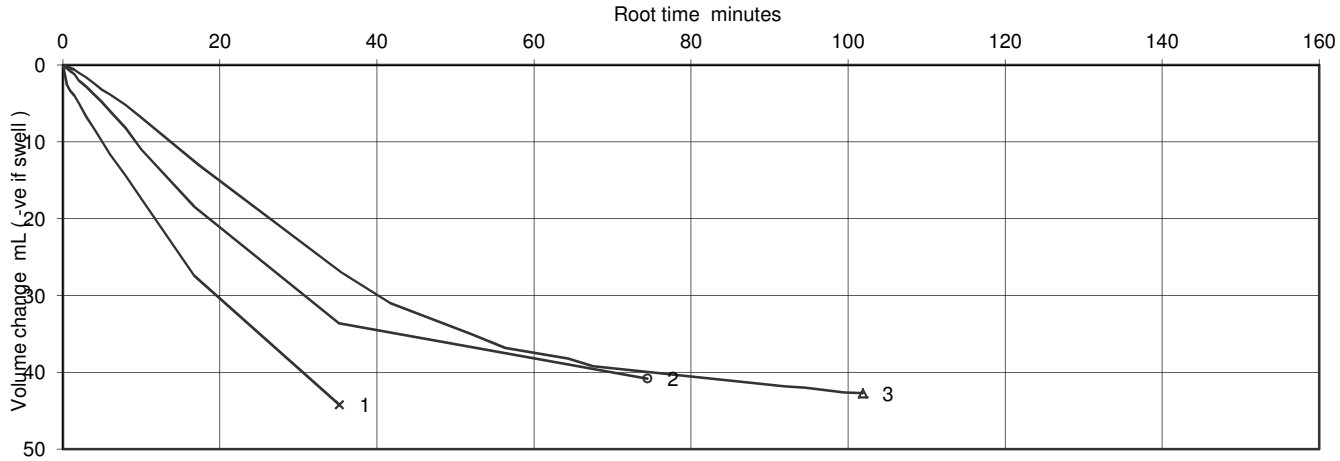
Specimen Details		
Initial		
Length	mm	203.16
Diameter	mm	103.29
Bulk Density	Mg/m³	1.99
Water Content	%	27
Dry density	Mg/m³	1.56
After test		
Bulk Density	Mg/m³	2.05
Water Content	%	24
Dry density	Mg/m³	1.65

Soil Description	Firm brown slightly sandy CLAY with localised softening.
Specimen Type /Preparation	UNDISTURBED

Saturation Details		Method of Saturation
		Increments of cell and back pressure
Cell pressure increments	kPa	50
Differential Pressure	kPa	10
Final Cell Pressure	kPa	260
Final pore water pressure	kPa	240.1
Final B Value		0.95



Consolidation Details	Drainage Conditions		From radial boundary and one end			
	Stage No.		1	2	3	
	Cell Pressure applied		400	500	700	kPa
	Back Pressure applied		300	300	300	kPa
	Effective Pressure		100	200	400	kPa
	Pore pressure at start of consolidation		380	429	529	kPa
	Pore pressure at end of consolidation		300	300	311	kPa
	Pore pressure dissipation at end of consolidation		100	100	95	%
Consolidation parameters (see note to BS1377 : pt 8, clause 6.3.4)	Coefficient of Consolidation	C_{vi}	0.43	0.17	0.07	m^2/year
	Coefficient of Compressibility	M_{vi}	0.32	0.19	0.12	m^2/MN
	Coefficient of Permeability (calculated)	k_{vi}	4.2E-11	9.6E-12	2.6E-12	m/s



Ref		Figure
SLR8.1 Rev 86.0 Feb18	Printed:03/07/2018 11:10	CUM
		sheet 1 of 3

SOCOTEC

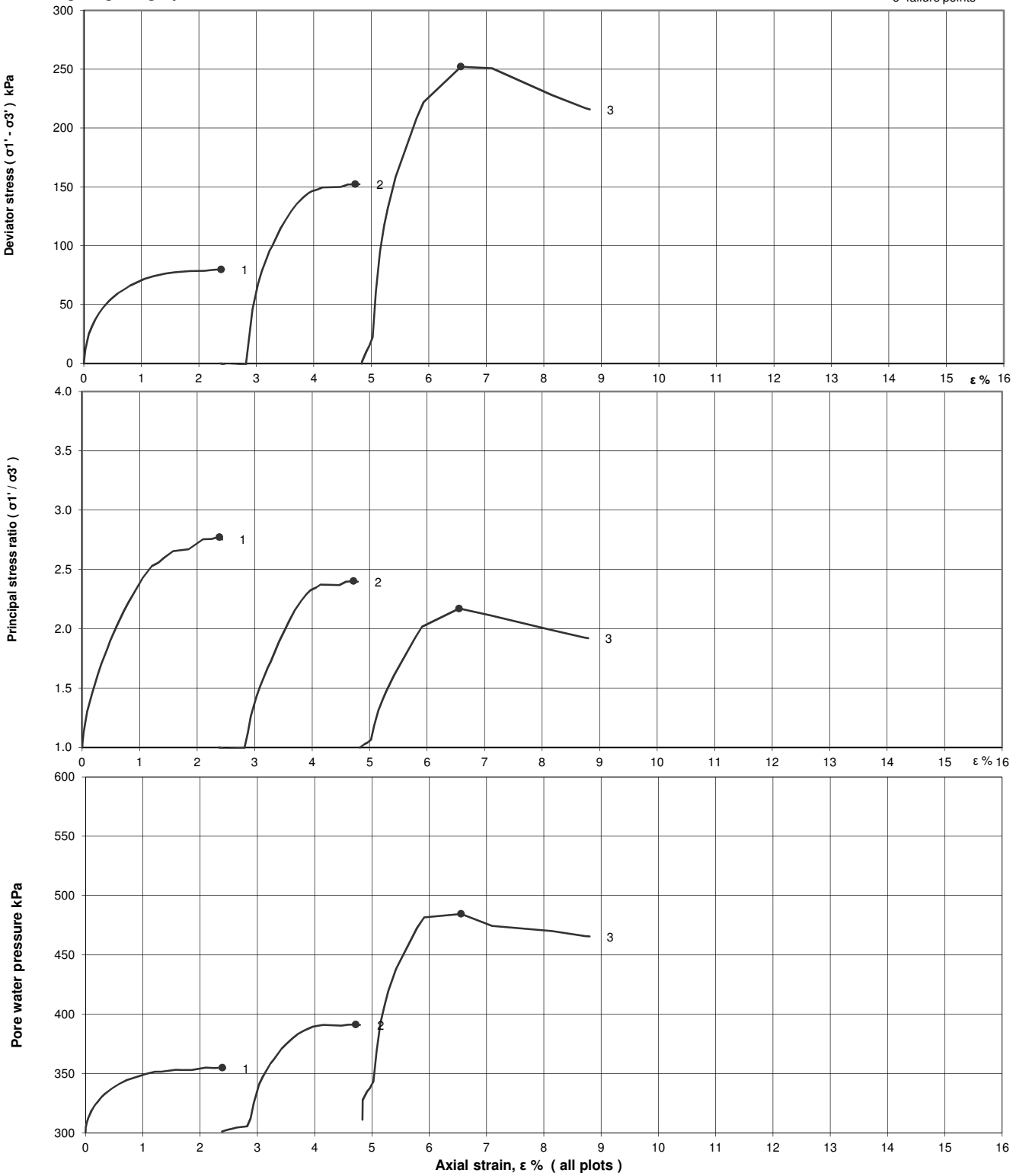
UKAS TESTING 1157

Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	N8135-18	Sample Details:	Hole No	HEP -BH-77		
Project Name	Heathrow Airport Limited		Depth (m BGL)	6.00		
			No	30	Type	UT
			ID			
			Spec Ref			

Shearing stages - graphical data

o failure points

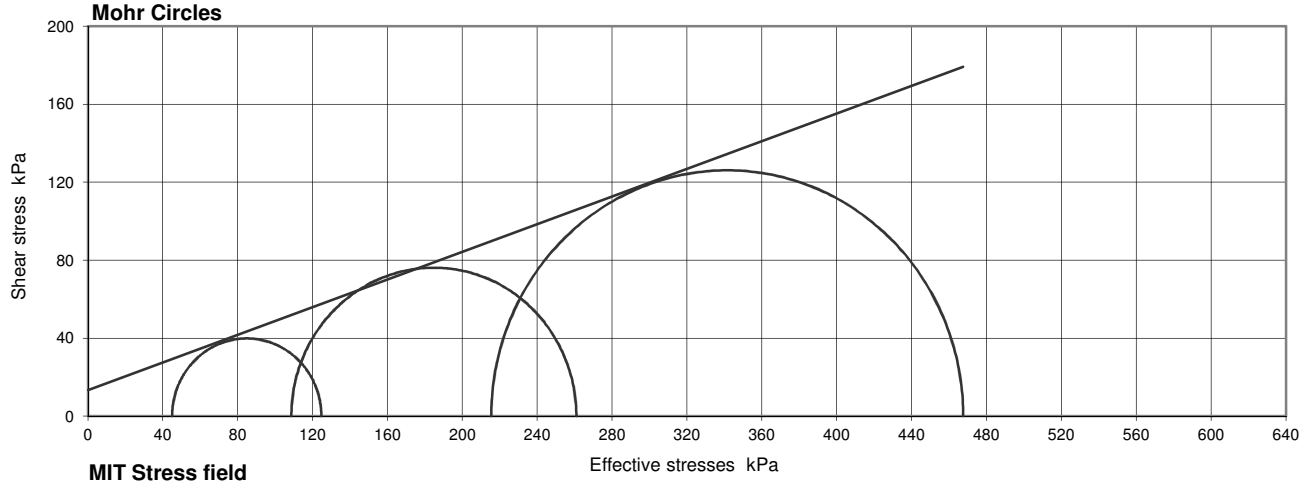


Ref			Figure
SLR8.1 Rev 86.0 Feb18	SOCOTEC 1157	Printed:03/07/2018 11:10	**CUM** sheet 2 of 3

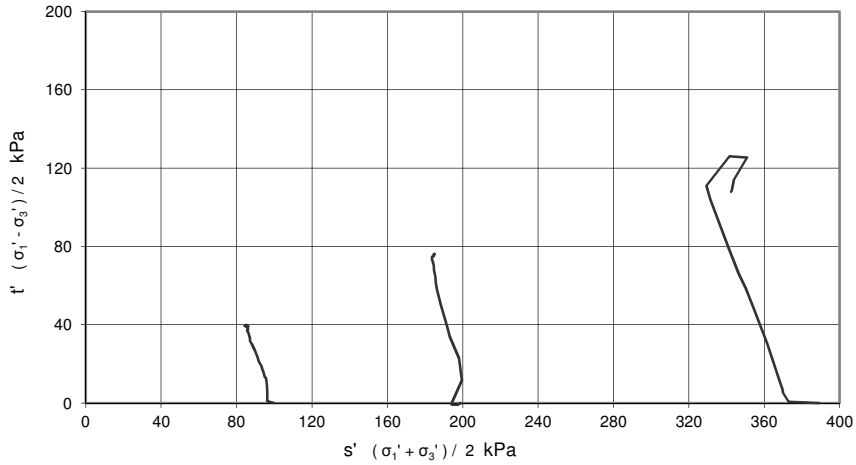
Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	N8135-18	Sample Details:	Hole No	HEP -BH-77		
Project Name	Heathrow Airport Limited		Depth (m BGL)	6.00		
			No	30	Type	UT
			ID			
			Spec Ref			

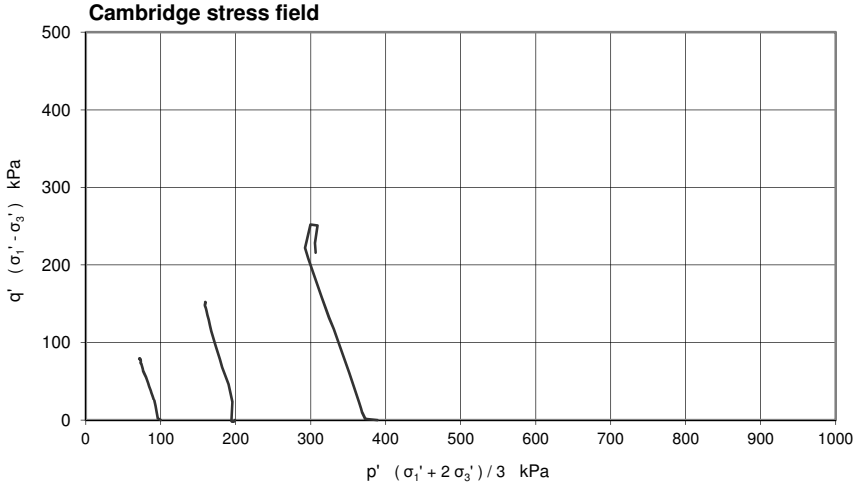
Mohr Circles



MIT Stress field



Cambridge stress field



Compression stages

Stage	1	2	3	
Cell pressure	400	500	700	kPa
Initial pwp	300	301	311	kPa
Initial σ_3'	100	199	389	kPa
Rate of strain	0.31	0.31	0.31	%/hr

Failure conditions

Criterion	Maximum effective principal stress ratio			
Axial strain	2.39	4.72	6.56	%
$(\sigma_1' / \sigma_3')_f$	2.772	2.401	2.170	
$(\sigma_1' - \sigma_3')_f$	79.7	152.3	252.1	kPa
u_f	355	391	485	kPa
$\sigma_3'_f$	45	109	216	kPa
$\sigma_1'_f$	125	261	468	kPa
A_f	0.69	0.59	0.69	
Time to failure	7.7	15.2	21.2	hrs

Shear Strength Parameters

at peak stress ratio

		Linear regression
c '	kPa	13.3
Ø '	degrees	19.5
		Manual re-assessment
c '	kPa	-
Ø '	degrees	-

Mode of failure

Notes : Deviator stresses corrected for area change, vertical side drains and 0.596 mm thick rubber membrane(s)

Ref			Figure
SLR8.1 Rev 86.0 Feb18	SOCOTEC UKAS TESTING 1157	Printed:03/07/2018 11:10	**CUM** sheet 3 of 3

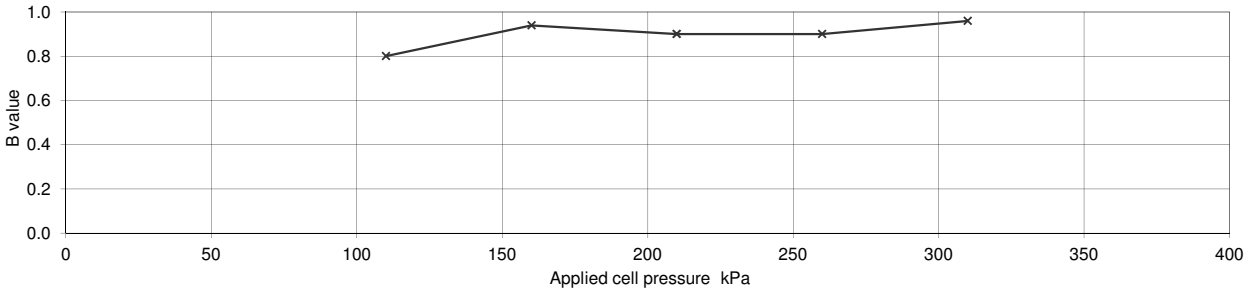
Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	N8135-18	Sample Details:	Hole No	HEP-BH-821		
Project Name	Heathrow Airport		Depth (m BGL)	7.50		
			No	34	Type	UT
			ID			
			Spec Ref			

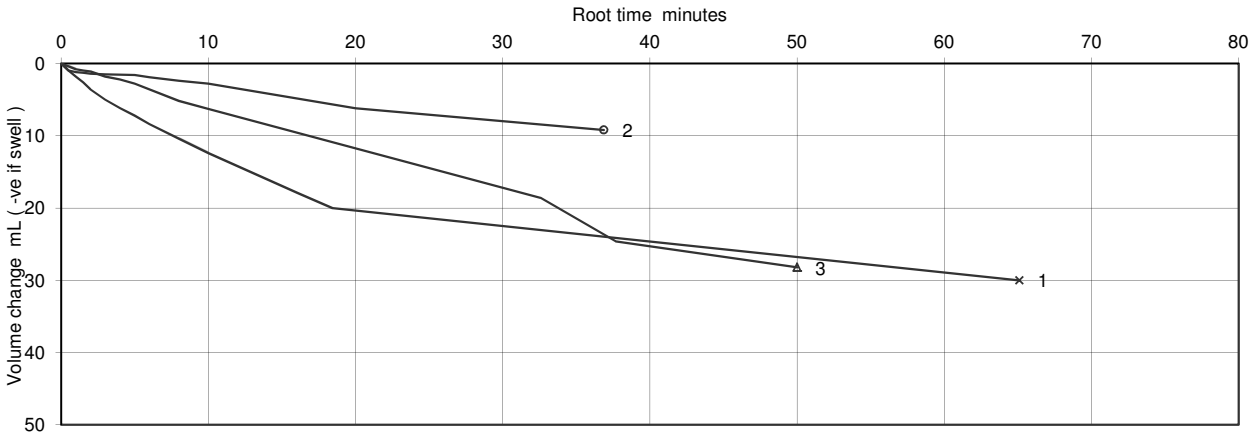
Specimen Details		
Initial		
Length	mm	203.48
Diameter	mm	103.49
Bulk Density	Mg/m³	1.99
Water Content	%	26
Dry density	Mg/m³	1.58
After test		
Bulk Density	Mg/m³	2.01
Water Content	%	25
Dry density	Mg/m³	1.61

Soil Description	Firm grey slightly sandy slightly gravelly CLAY.
Specimen Type /Preparation	UNDISTURBED

Saturation Details		Method of Saturation
		Increments of cell and back pressure
Cell pressure increments	kPa	50
Differential Pressure	kPa	10
Final Cell Pressure	kPa	310
Final pore water pressure	kPa	294
Final B Value		0.96



Consolidation Details	Drainage Conditions		From radial boundary and one end			
	Stage No.		1	2	3	
	Cell Pressure applied		360	420	540	kPa
	Back Pressure applied		300	300	300	kPa
	Effective Pressure		60	120	240	kPa
	Pore pressure at start of consolidation		341	365	408	kPa
	Pore pressure at end of consolidation		300	300	300	kPa
	Pore pressure dissipation at end of consolidation		100	100	100	%
Consolidation parameters (see note to BS1377 : pt 8, clause 6.3.4)	Coefficient of Consolidation	C_{vi}	0.31	0.26	0.12	m^2/year
	Coefficient of Compressibility	M_{vi}	0.42	0.08	0.15	m^2/MN
	Coefficient of Permeability (calculated)	k_{vi}	4.0E-11	6.7E-12	5.8E-12	m/s



Ref			Figure
SLR8.1 Rev 86.0 Feb18	SOCOTEC	Printed:12/09/2018 13:09	CUM
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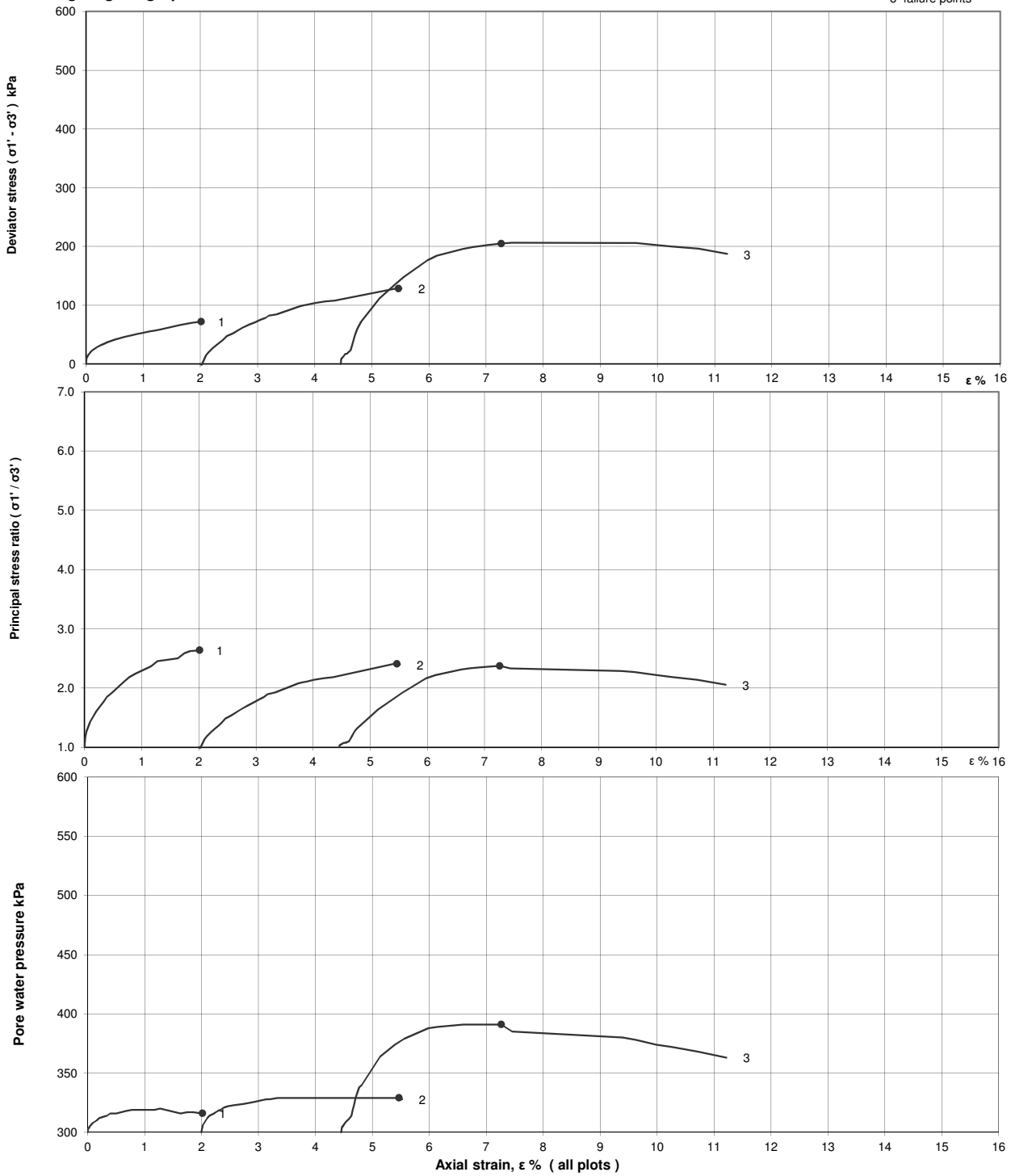
Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	N8135-18	Sample Details:	Hole No	HEP-BH-821		
Project Name	Heathrow Airport		Depth (m BGL)	7.50		
			No	34	Type	UT
			ID			
			Spec Ref			

Shearing stages - graphical data

o failure points

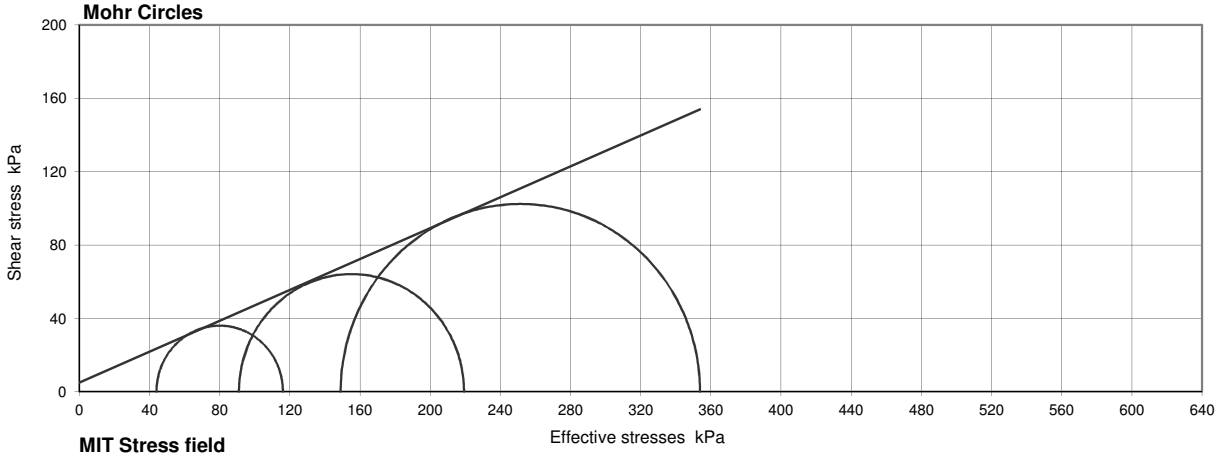


Ref			Figure
SLR8.1 Rev 86.0 Feb18	SOCOTEC UKAS TESTING 1157	Printed:12/09/2018 13:09	**CUM** sheet 2 of 3

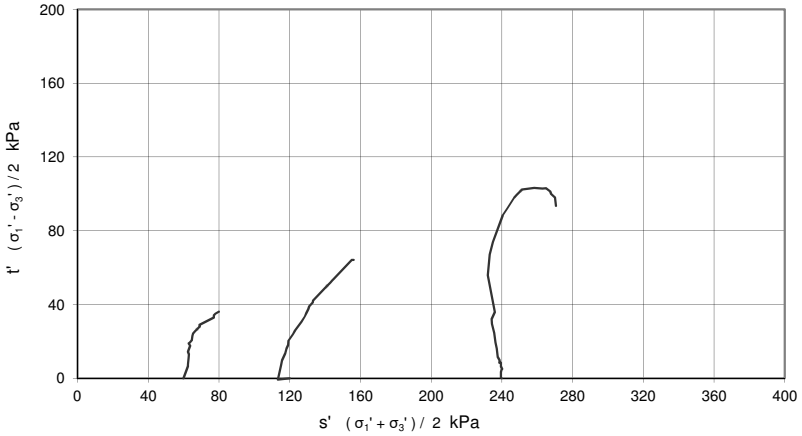
Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	N8135-18	Sample Details:	Hole No	HEP-BH-821		
Project Name	Heathrow Airport		Depth (m BGL)	7.50		
			No	34	Type	UT
			ID			
			Spec Ref			

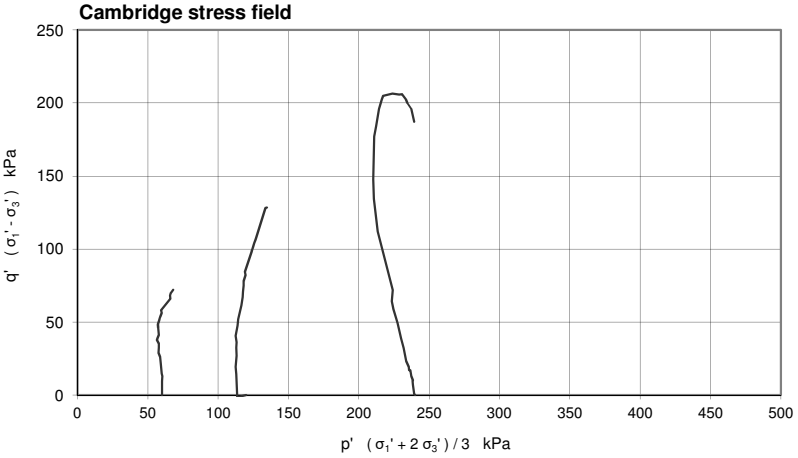
Mohr Circles



MIT Stress field



Cambridge stress field



Compression stages

Stage	1	2	3	
Cell pressure	360	420	540	kPa
Initial pwp	300	300	300	kPa
Initial σ_3'	60	120	240	kPa
Rate of strain	0.23	0.23	0.23	%/hr

Failure conditions

Criterion	Maximum effective principal stress ratio			
Axial strain	2.02	5.47	7.27	%
$(\sigma_1' / \sigma_3')_f$	2.638	2.410	2.375	
$(\sigma_1' - \sigma_3')_f$	72.1	128.3	204.8	kPa
u_f	316	329	391	kPa
$\sigma_3'_f$	44	91	149	kPa
$\sigma_1'_f$	116	219	354	kPa
A_f	0.22	0.23	0.44	
Time to failure	8.8	23.8	31.6	hrs

Shear Strength Parameters

at peak stress ratio

		Linear regression
c '	kPa	5.0
Ø '	degrees	22.8
		Manual re-assessment
c '	kPa	-
Ø '	degrees	-

Mode of failure

Notes : Deviator stresses corrected for area change, vertical side drains and 0.594 mm thick rubber membrane(s)

CELL ONLY SATURATION COULD NOT BE OBTAINED

Ref			Figure
SLR8.1 Rev 86.0 Feb18	SOCOTEC UKAS TESTING 1157	Printed:12/09/2018 13:09	**CUM** sheet 3 of 3

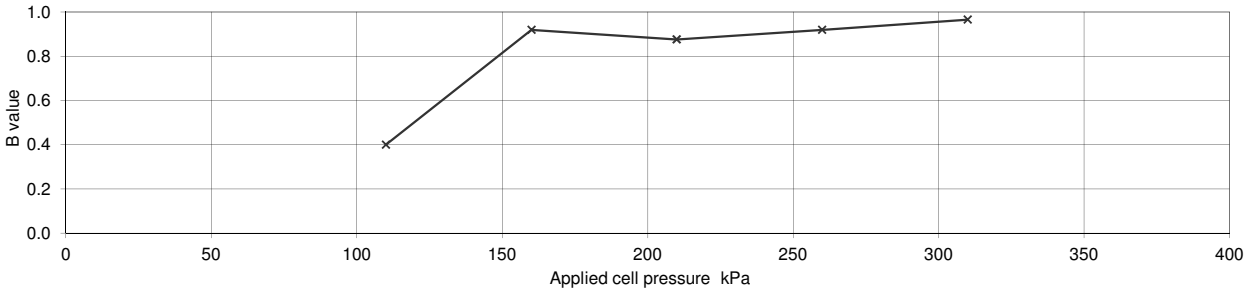
Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	N8135-18	Sample Details:	Hole No	HEP-BH-821		
Project Name	Heathrow		Depth (m BGL)	15.00		
			No	48	Type	UT
			ID			
			Spec Ref			

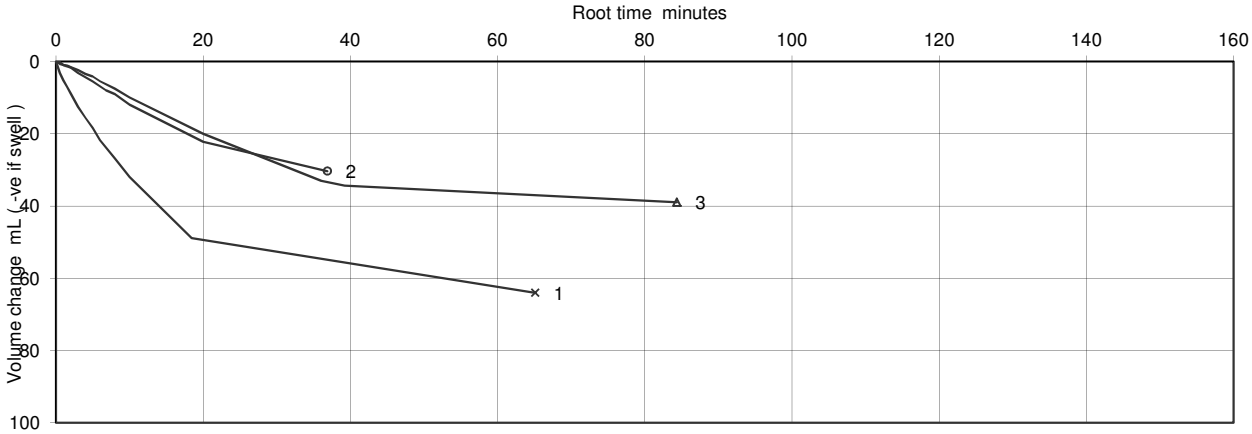
Specimen Details		
Initial		
Length	mm	202.95
Diameter	mm	103.49
Bulk Density	Mg/m³	1.95
Water Content	%	28
Dry density	Mg/m³	1.53
After test		
Bulk Density	Mg/m³	1.97
Water Content	%	26
Dry density	Mg/m³	1.56

Soil Description	Firm grey slightly sandy laminated CLAY.
Specimen Type /Preparation	UNDISTURBED

Saturation Details		Method of Saturation
		Increments of cell and back pressure
Cell pressure increments	kPa	50
Differential Pressure	kPa	10
Final Cell Pressure	kPa	310
Final pore water pressure	kPa	291.5
Final B Value		0.97



Consolidation Details	Drainage Conditions		From radial boundary and one end			
	Stage No.		1	2	3	
	Cell Pressure applied		450	600	900	kPa
	Back Pressure applied		300	300	300	kPa
	Effective Pressure		150	300	600	kPa
	Pore pressure at start of consolidation		434	501	655	kPa
	Pore pressure at end of consolidation		300	301	300	kPa
	Pore pressure dissipation at end of consolidation		100	100	100	%
Consolidation parameters (see note to BS1377 : pt 8, clause 6.3.4)	Coefficient of Consolidation	C_{vi}	0.49	0.39	0.17	m^2/year
	Coefficient of Compressibility	M_{vi}	0.27	0.09	0.06	m^2/MN
	Coefficient of Permeability (calculated)	k_{vi}	4.0E-11	1.0E-11	3.4E-12	m/s



Ref			Figure
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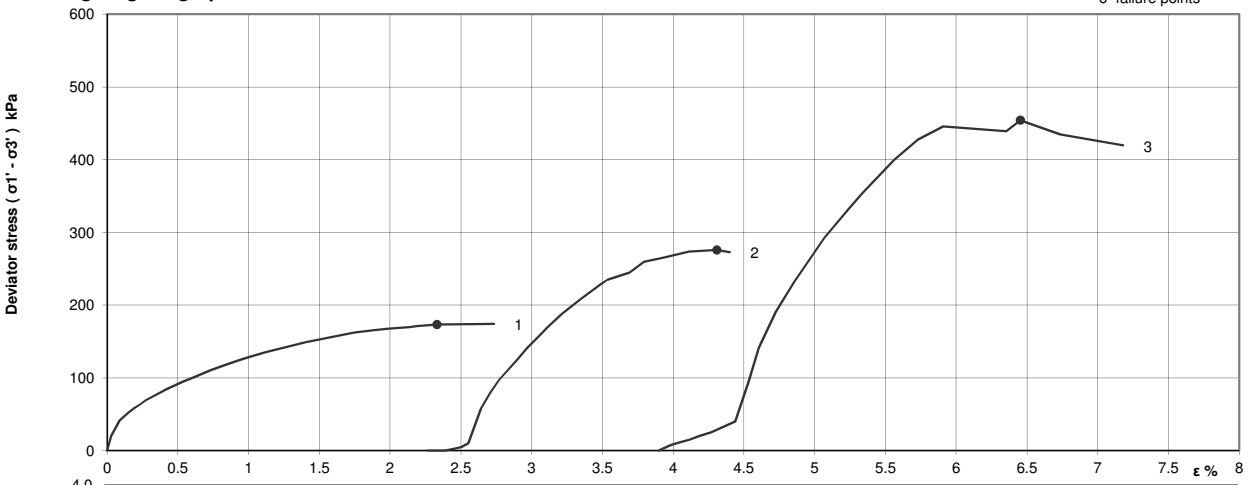
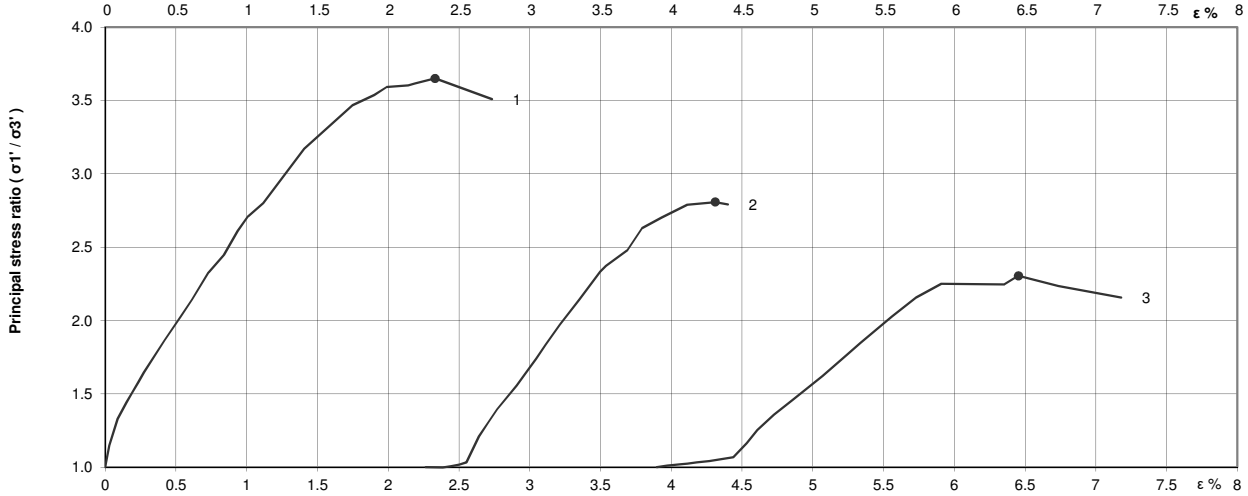
Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

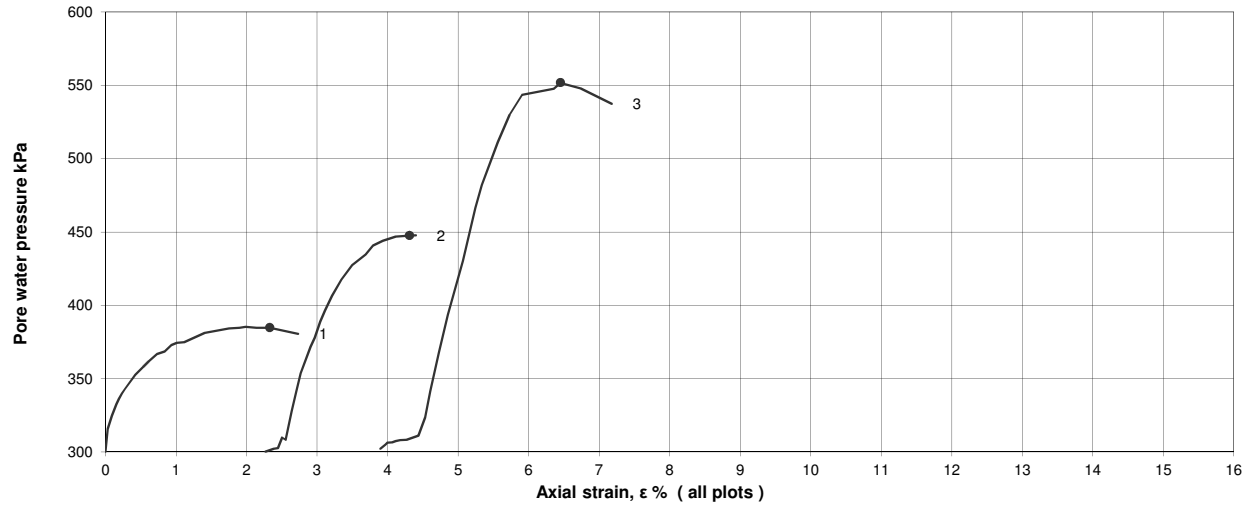
Project No	N8135-18	Sample Details:	Hole No	HEP-BH-821		
Project Name	Heathrow		Depth (m BGL)	15.00		
			No	48	Type	UT
			ID			
			Spec Ref			

Shearing stages - graphical data

o failure points





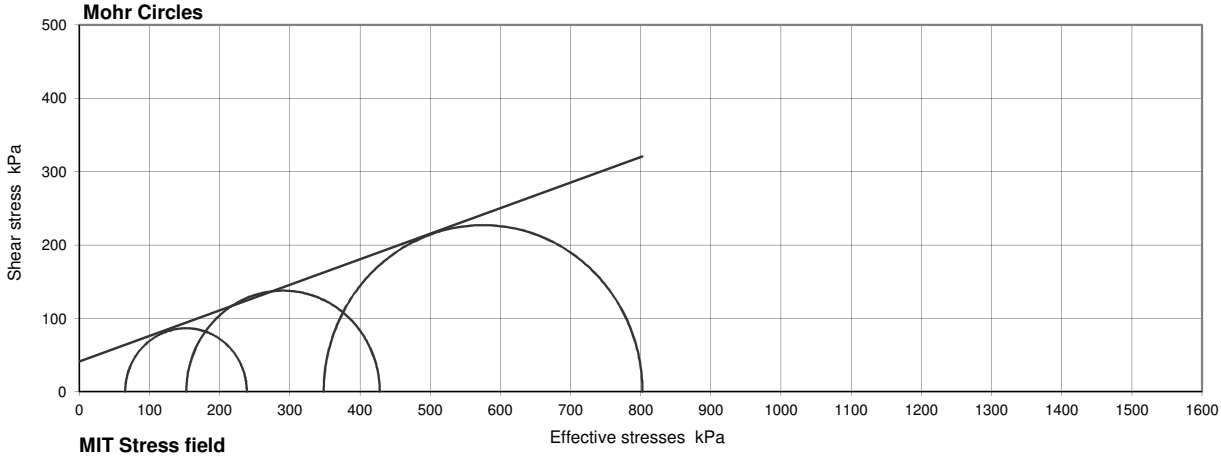


Ref			Figure
SLR8.1 Rev 86.0 Feb18	SOCOTEC UKAS TESTING 1157	Printed:05/09/2018 09:54	**CUM** sheet 2 of 3

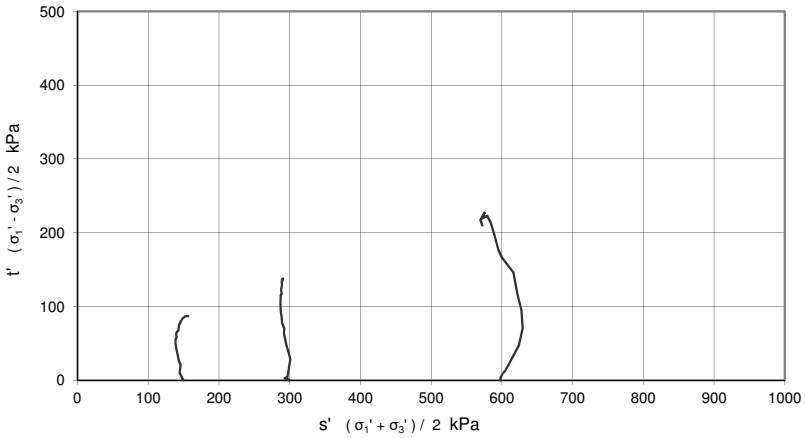
Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	N8135-18	Sample Details:	Hole No	HEP-BH-821		
Project Name	Heathrow		Depth (m BGL)	15.00		
			No	48	Type	UT
			ID			
			Spec Ref			

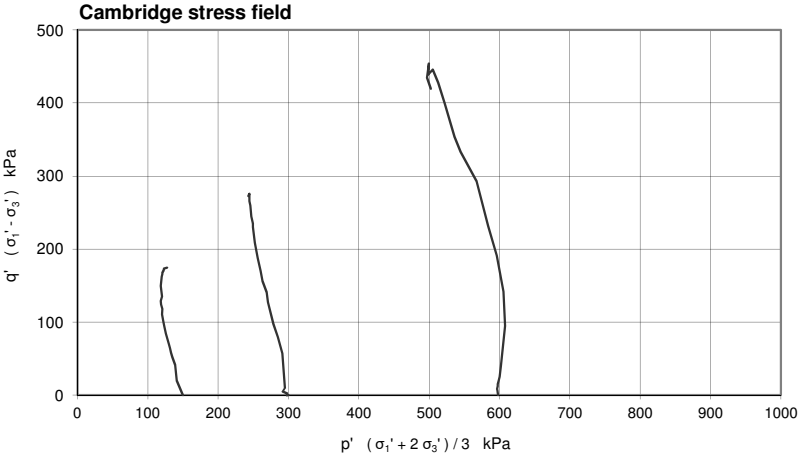
Mohr Circles



MIT Stress field



Cambridge stress field



Compression stages

Stage	1	2	3	
Cell pressure	450	600	900	kPa
Initial pwp	300	300	302	kPa
Initial σ_3'	150	300	598	kPa
Rate of strain	0.35	0.35	0.35	%/hr

Failure conditions

Criterion				
Axial strain	2.33	4.31	6.45	%
$(\sigma_1' / \sigma_3')_f$	3.650	2.808	2.304	
$(\sigma_1' - \sigma_3')_f$	173.3	275.7	454.2	kPa
u_f	385	448	552	kPa
$\sigma_3'_f$	65	153	348	kPa
$\sigma_1'_f$	239	428	803	kPa
A_f	0.49	0.53	0.55	
Time to failure	6.7	12.3	18.4	hrs

Shear Strength Parameters

		Linear regression
c '	kPa	41.2
Ø '	degrees	19.2
		Manual re-assessment
c '	kPa	-
Ø '	degrees	-

Mode of failure

Notes : Deviator stresses corrected for area change, vertical side drains and 0.594 mm thick rubber membrane(s)

RED SAMPLE

Ref			Figure
SLR8.1 Rev 86.0 Feb18	SOCOTEC UKAS TESTING 1157	Printed:05/09/2018 09:54	**CUM** sheet 3 of 3

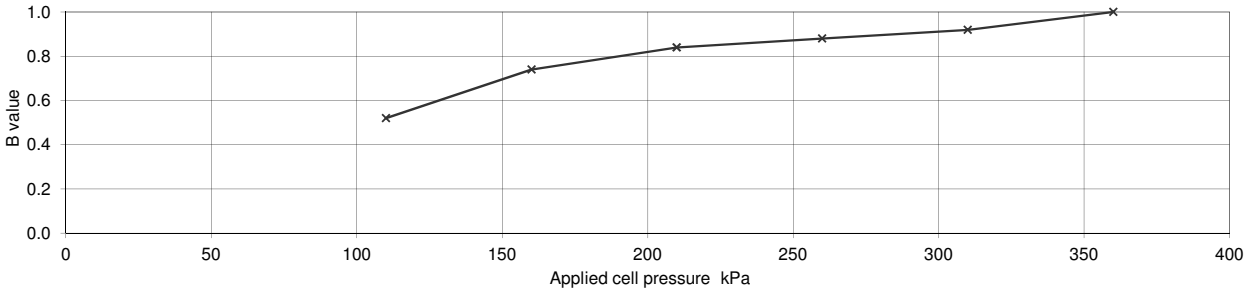
Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	N8135-18	Sample Details:	Hole No	HEP - BH - 823		
Project Name	HEATHROW AIRPORT LIMITED		Depth (m BGL)	6.00		
			No	27	Type	UT
			ID			
			Spec Ref			

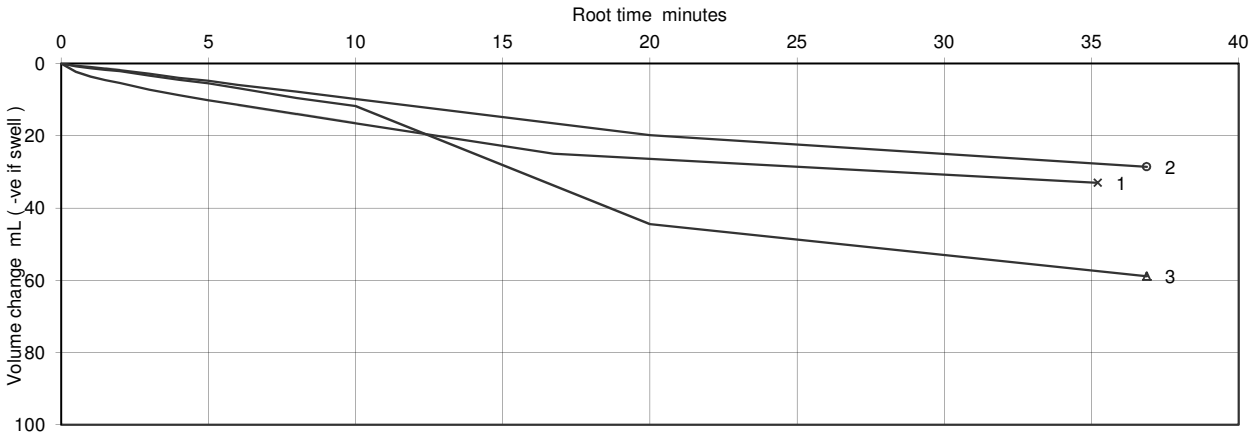
Specimen Details		
Initial		
Length	mm	203.16
Diameter	mm	102.92
Bulk Density	Mg/m³	1.97
Water Content	%	29
Dry density	Mg/m³	1.53
After test		
Bulk Density	Mg/m³	2.01
Water Content	%	27
Dry density	Mg/m³	1.59

Soil Description	Firm brown slightly sandy CLAY.
Specimen Type /Preparation	UNDISTURBED

Saturation Details		Method of Saturation
		Increments of cell and back pressure
Cell pressure increments	kPa	50
Differential Pressure	kPa	10
Final Cell Pressure	kPa	360
Final pore water pressure	kPa	340
Final B Value		1



Consolidation Details	Drainage Conditions		From radial boundary and one end			
	Stage No.		1	2	3	
	Cell Pressure applied		370	440	580	kPa
	Back Pressure applied		300	300	300	kPa
	Effective Pressure		70	140	280	kPa
	Pore pressure at start of consolidation		352	374	459	kPa
	Pore pressure at end of consolidation		300	300	302	kPa
	Pore pressure dissipation at end of consolidation		100	100	99	%
Consolidation parameters (see note to BS1377 : pt 8, clause 6.3.4)	Coefficient of Consolidation	C_{vi}	0.63	0.28	0.37	m^2/year
	Coefficient of Compressibility	M_{vi}	0.33	0.23	0.22	m^2/MN
	Coefficient of Permeability (calculated)	k_{vi}	6.4E-11	1.9E-11	2.6E-11	m/s

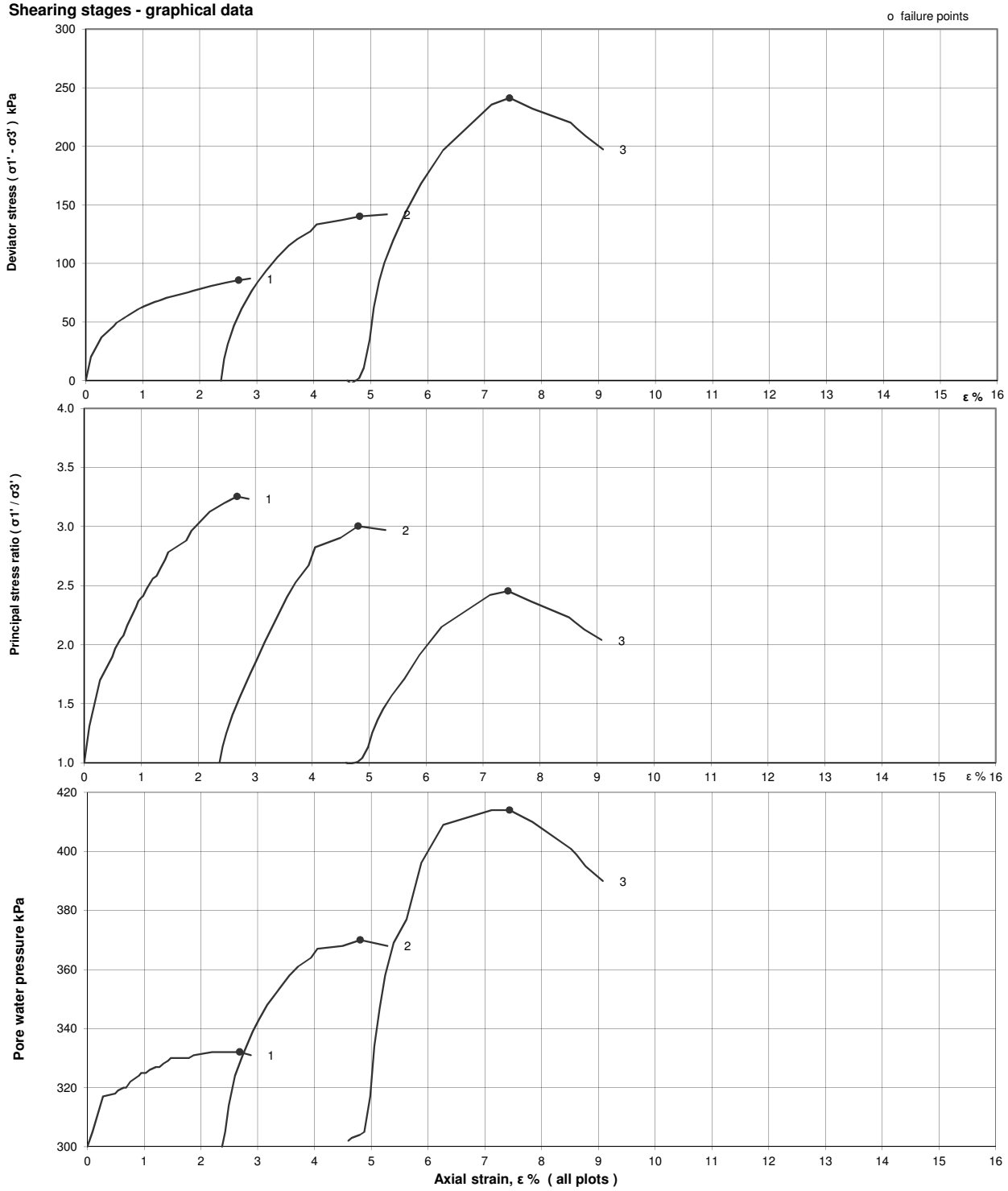


Ref			Figure
SLR8.1 Rev 86.0 Feb18	SOCOTEC	Printed:22/09/2018 15:16	CUM
	UKAS TESTING 1157		sheet 1 of 3

Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	N8135-18	Sample Details:	Hole No	HEP - BH - 823		
Project Name	HEATHROW AIRPORT LIMITED		Depth (m BGL)	6.00		
			No	27	Type	UT
			ID			
			Spec Ref			

Shearing stages - graphical data

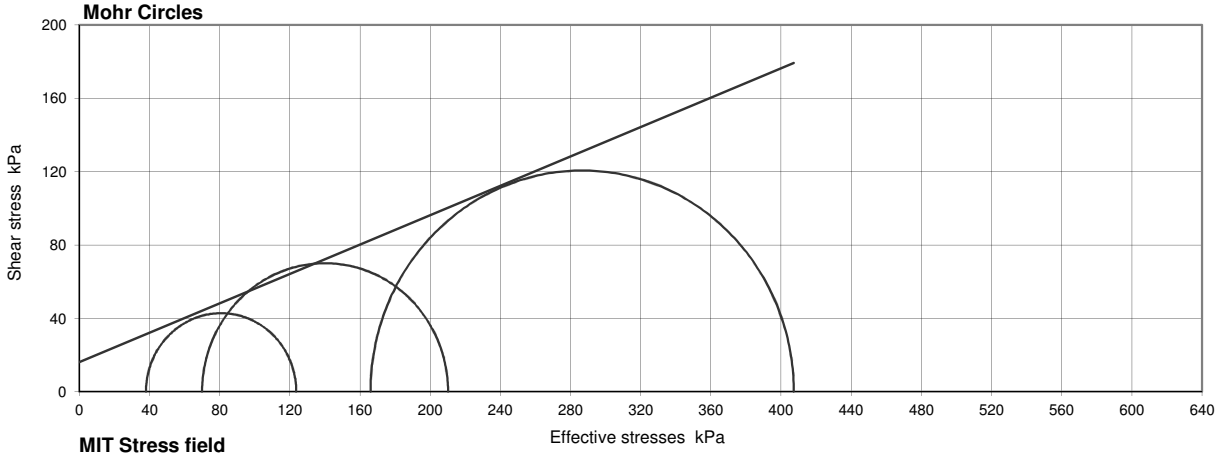


Ref		Figure
SLR8.1 Rev 86.0 Feb18	SOCOTEC UKAS TESTING 1157	Printed:22/09/2018 15:16	**CUM** sheet 2 of 3

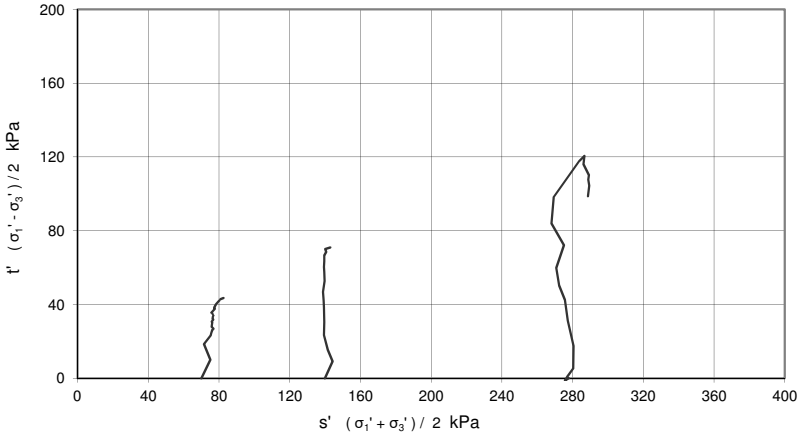
Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	N8135-18	Sample Details:	Hole No	HEP - BH - 823		
Project Name	HEATHROW AIRPORT LIMITED		Depth (m BGL)	6.00		
			No	27	Type	UT
			ID			
			Spec Ref			

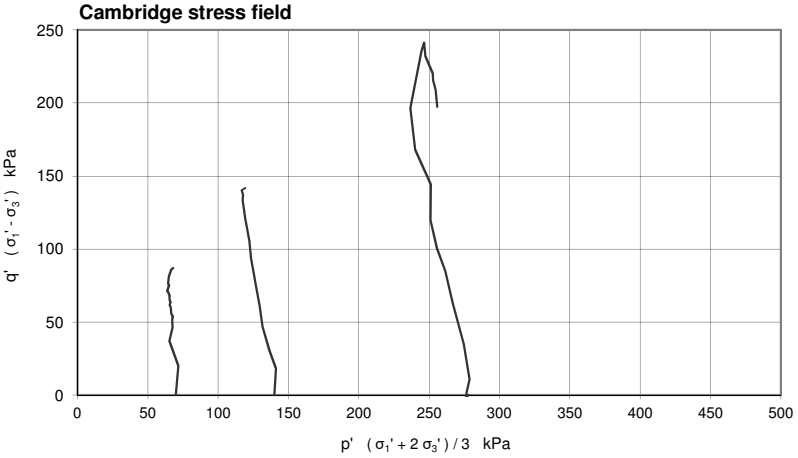
Mohr Circles



MIT Stress field



Cambridge stress field



Compression stages

Stage	1	2	3	
Cell pressure	370	440	580	kPa
Initial pwp	300	300	302	kPa
Initial σ_3'	70	140	278	kPa
Rate of strain	0.46	0.46	0.46	%/hr

Failure conditions

Criterion	Maximum effective principal stress ratio			
Axial strain	2.68	4.81	7.44	%
$(\sigma_1' / \sigma_3')_f$	3.255	3.003	2.453	
$(\sigma_1' - \sigma_3')_f$	85.7	140.2	241.3	kPa
u_f	332	370	414	kPa
$\sigma_3'_f$	38	70	166	kPa
$\sigma_1'_f$	124	210	407	kPa
A_f	0.37	0.50	0.46	
Time to failure	5.8	10.5	16.2	hrs

Shear Strength Parameters

at peak stress ratio

		Linear regression
c '	kPa	16.1
Ø '	degrees	21.8
		Manual re-assessment
c '	kPa	-
Ø '	degrees	-

Mode of failure

Notes : Deviator stresses corrected for area change, vertical side drains and 0.294 mm thick rubber membrane(s)

Ref			Figure
SLR8.1 Rev 86.0 Feb18	SOCOTEC UKAS TESTING 1157	Printed:22/09/2018 15:16	**CUM** sheet 3 of 3

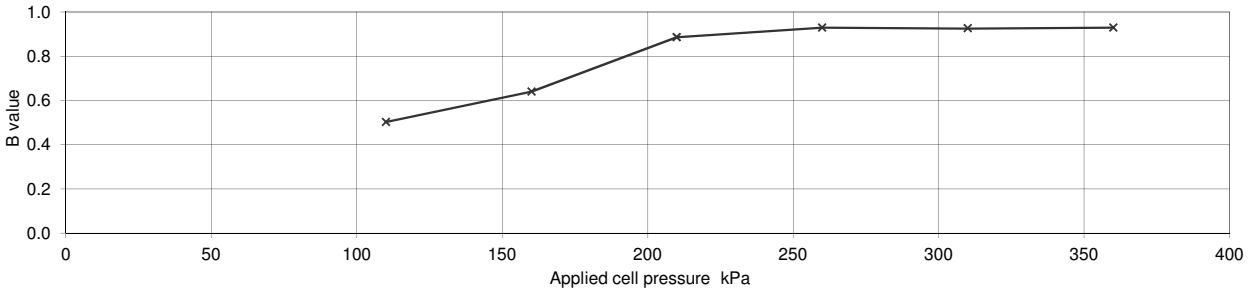
Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	N8135-18	Sample Details:	Hole No	HEP-BH-823		
Project Name	Heathrow		Depth (m BGL)	13.00		
			No	44	Type	UT
			ID			
			Spec Ref			

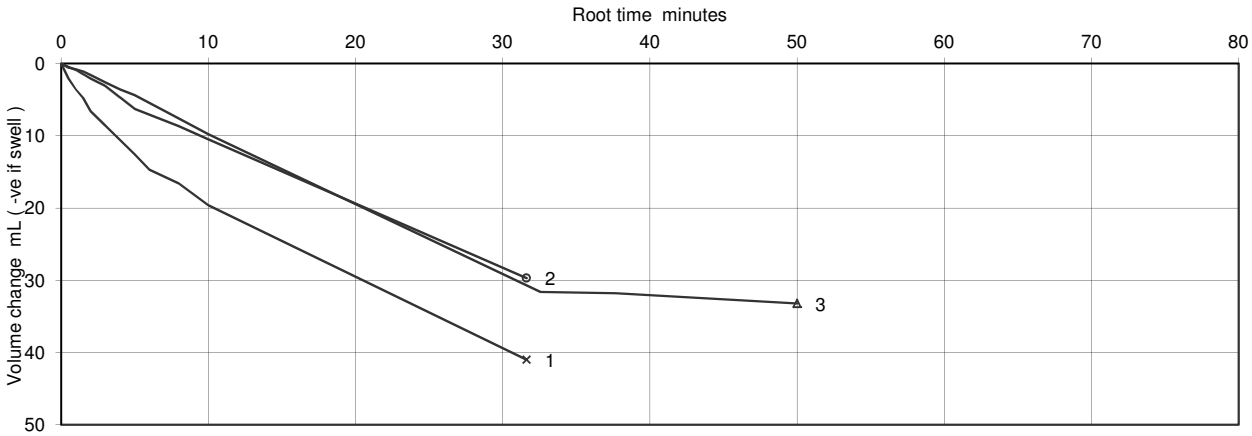
Specimen Details		
Initial		
Length	mm	204.45
Diameter	mm	103.41
Bulk Density	Mg/m³	2.04
Water Content	%	22
Dry density	Mg/m³	1.66
After test		
Bulk Density	Mg/m³	2.06
Water Content	%	21
Dry density	Mg/m³	1.70

Soil Description	Firm grey slightly sandy CLAY
Specimen Type /Preparation	UNDISTURBED

Saturation Details		Method of Saturation
		Increments of cell and back pressure
Cell pressure increments	kPa	50
Differential Pressure	kPa	10
Final Cell Pressure	kPa	360
Final pore water pressure	kPa	341.9
Final B Value		0.93



Consolidation Details	Drainage Conditions		From radial boundary and one end			
	Stage No.		1	2	3	
	Cell Pressure applied		425	550	800	kPa
	Back Pressure applied		300	300	300	kPa
	Effective Pressure		125	250	500	kPa
	Pore pressure at start of consolidation		409	444	586	kPa
	Pore pressure at end of consolidation		300	300	302	kPa
	Pore pressure dissipation at end of consolidation		100	100	99	%
Consolidation parameters (see note to BS1377 : pt 8, clause 6.3.4)	Coefficient of Consolidation	C_{vi}	1.26	0.52	0.20	m^2/year
	Coefficient of Compressibility	M_{vi}	0.21	0.12	0.07	m^2/MN
	Coefficient of Permeability (calculated)	k_{vi}	8.2E-11	1.9E-11	4.2E-12	m/s



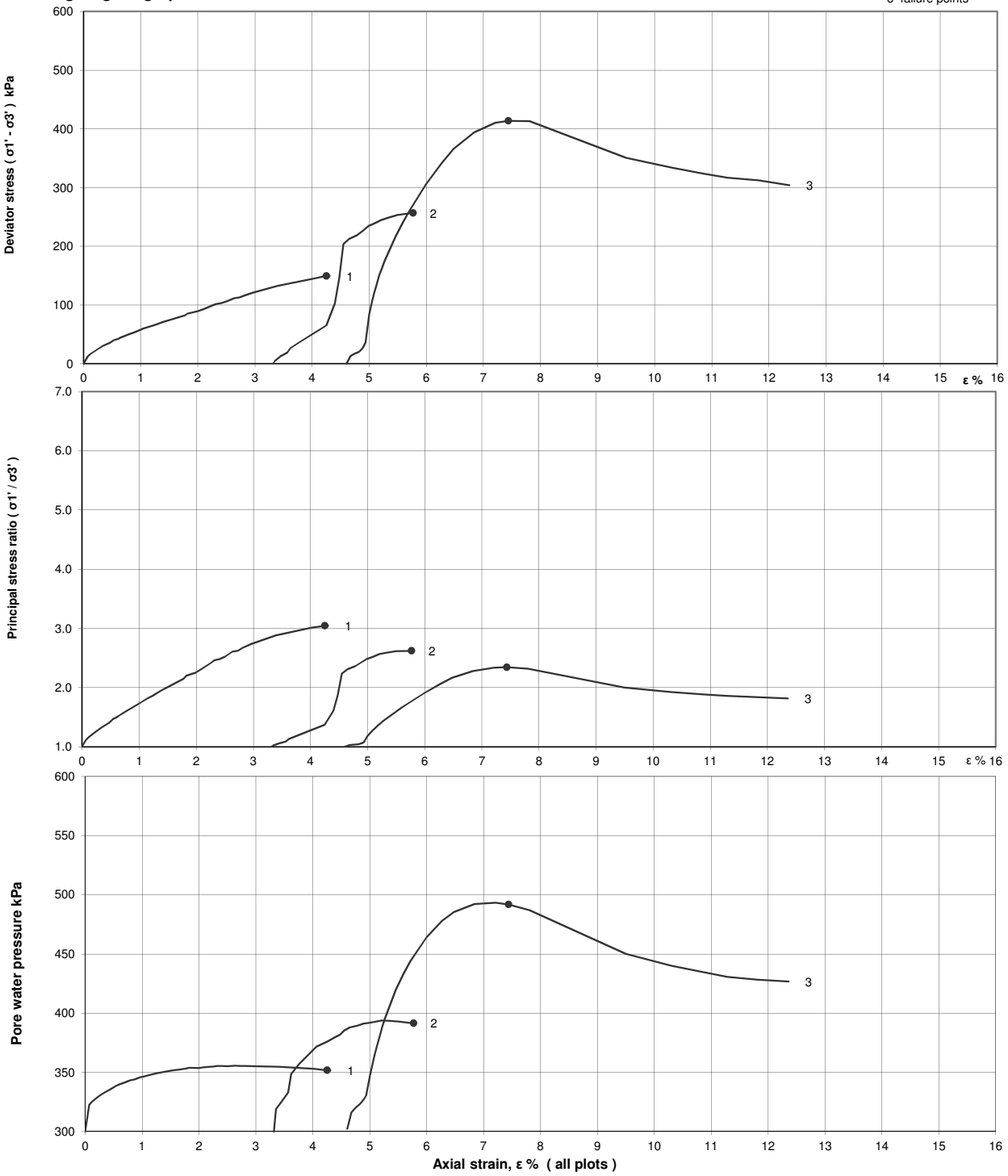
Ref			Figure
SLR8.1 Rev 86.0 Feb18	SOCOTEC	Printed:12/09/2018 12:57	CUM
	UKAS TESTING 1157		sheet 1 of 3

Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	N8135-18	Sample Details:	Hole No	HEP-BH-823		
Project Name	Heathrow		Depth (m BGL)	13.00		
			No	44	Type	UT
			ID			
			Spec Ref			

Shearing stages - graphical data

o failure points

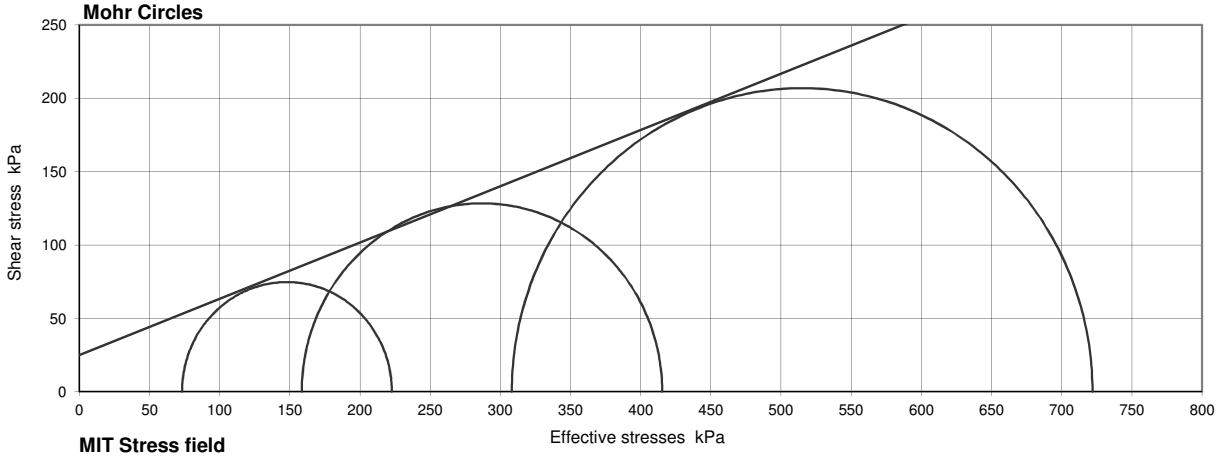


Ref SLR8.1 Rev 86.0 Feb18	SOCOTEC	Printed:12/09/2018 12:57	**Figure** **CUM** sheet 2 of 3
	UKAS TESTING 1157		

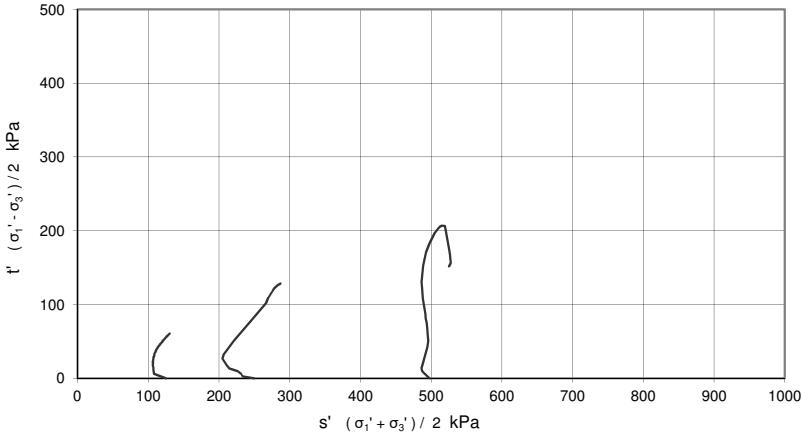
Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	N8135-18	Sample Details:	Hole No	HEP-BH-823		
Project Name	Heathrow		Depth (m BGL)	13.00		
			No	44	Type	UT
			ID			
			Spec Ref			

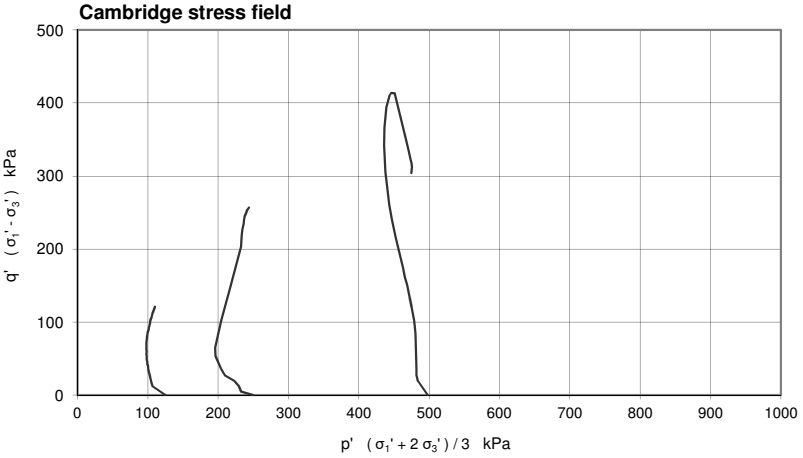
Mohr Circles



MIT Stress field



Cambridge stress field



Compression stages

Stage	1	2	3	
Cell pressure	425	550	800	kPa
Initial pwp	300	300	302	kPa
Initial σ_3'	125	250	498	kPa
Rate of strain	1.10	1.10	1.10	%/hr

Failure conditions

Criterion	Maximum effective principal stress ratio			
Axial strain	4.25	5.77	7.44	%
$(\sigma_1' / \sigma_3')_f$	3.043	2.620	2.343	
$(\sigma_1' - \sigma_3')_f$	149.5	256.8	413.8	kPa
u_f	352	392	492	kPa
$\sigma_3'_f$	73	159	308	kPa
$\sigma_1'_f$	223	415	722	kPa
A_f	0.35	0.36	0.46	
Time to failure	3.9	5.2	6.8	hrs

Shear Strength Parameters

at peak stress ratio

		Linear regression
c '	kPa	24.9
Ø '	degrees	21.0
		Manual re-assessment
c '	kPa	-
Ø '	degrees	-

Mode of failure

Notes : Deviator stresses corrected for area change, vertical side drains and 0.296 mm thick rubber membrane(s)

Ref			Figure
SLR8.1 Rev 86.0 Feb18	SOCOTEC UKAS TESTING 1157	Printed:12/09/2018 12:57	**CUM** sheet 3 of 3

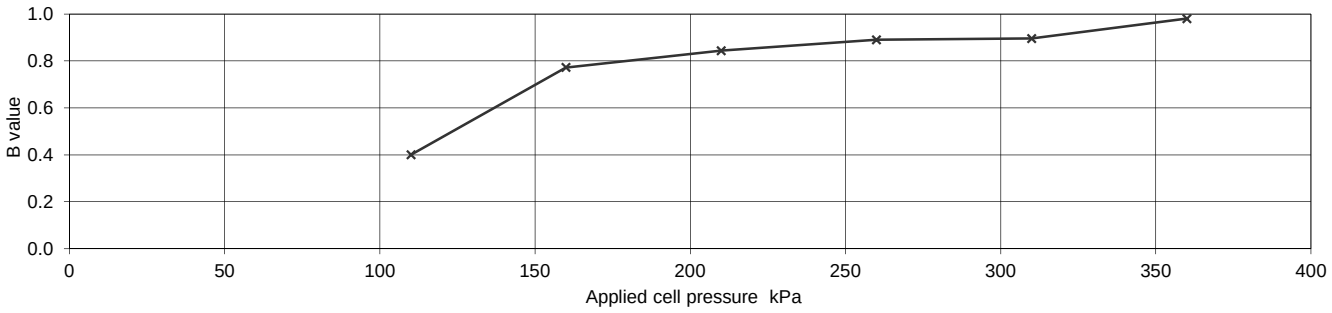
Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	N8135-18	Sample Details:	Hole No	HEP -BH-824		
Project Name	Heathrow Airport Limited		Depth (m BGL)	5.20		
			No	28	Type	UT
			ID			
			Spec Ref			

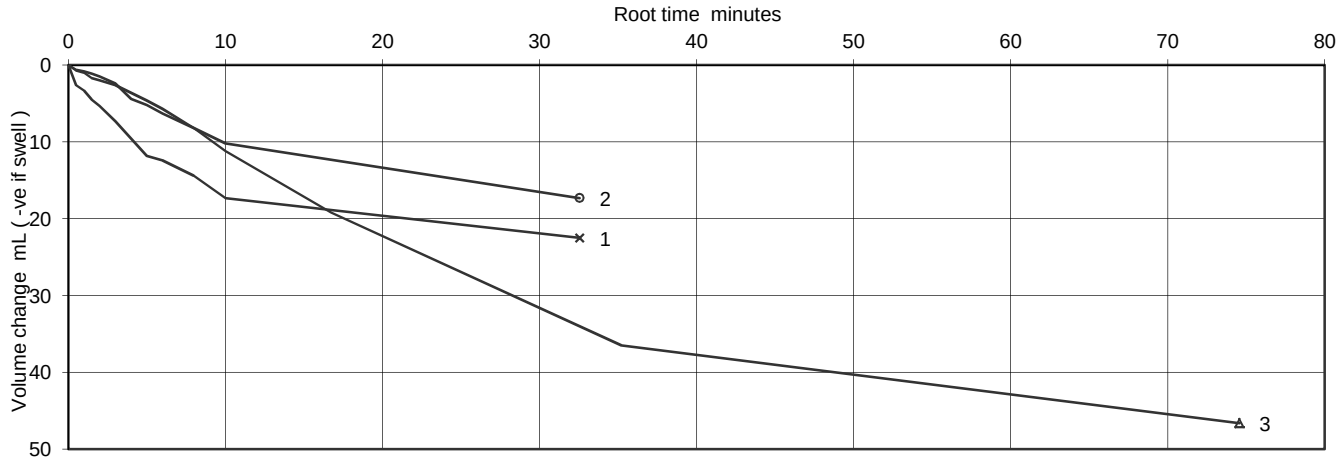
Specimen Details		
Initial		
Length	mm	203.20
Diameter	mm	103.02
Bulk Density	Mg/m³	1.99
Water Content	%	27
Dry density	Mg/m³	1.57
After test		
Bulk Density	Mg/m³	2.01
Water Content	%	26
Dry density	Mg/m³	1.60

Soil Description	Firm brownish grey slightly sandy CLAY.
Specimen Type /Preparation	UNDISTURBED

Saturation Details		Method of Saturation
		Increments of cell and back pressure
Cell pressure increments	kPa	50
Differential Pressure	kPa	10
Final Cell Pressure	kPa	360
Final pore water pressure	kPa	338.6
Final B Value		0.98



Consolidation Details						
	Drainage Conditions		From radial boundary and one end			
	Stage No.		1	2	3	
	Cell Pressure applied		410	470	590	kPa
	Back Pressure applied		350	350	350	kPa
	Effective Pressure		60	120	240	kPa
	Pore pressure at start of consolidation		389	413	486	kPa
	Pore pressure at end of consolidation		351	351	351	kPa
	Pore pressure dissipation at end of consolidation		98	99	99	%
Consolidation parameters (see note to BS1377 : pt 8, clause 6.3.4)	Coefficient of Consolidation	C_{vi}	2.25	1.02	0.15	m^2/year
	Coefficient of Compressibility	M_{vi}	0.33	0.16	0.20	m^2/MN
	Coefficient of Permeability (calculated)	k_{vi}	2.3E-10	5.1E-11	9.7E-12	m/s

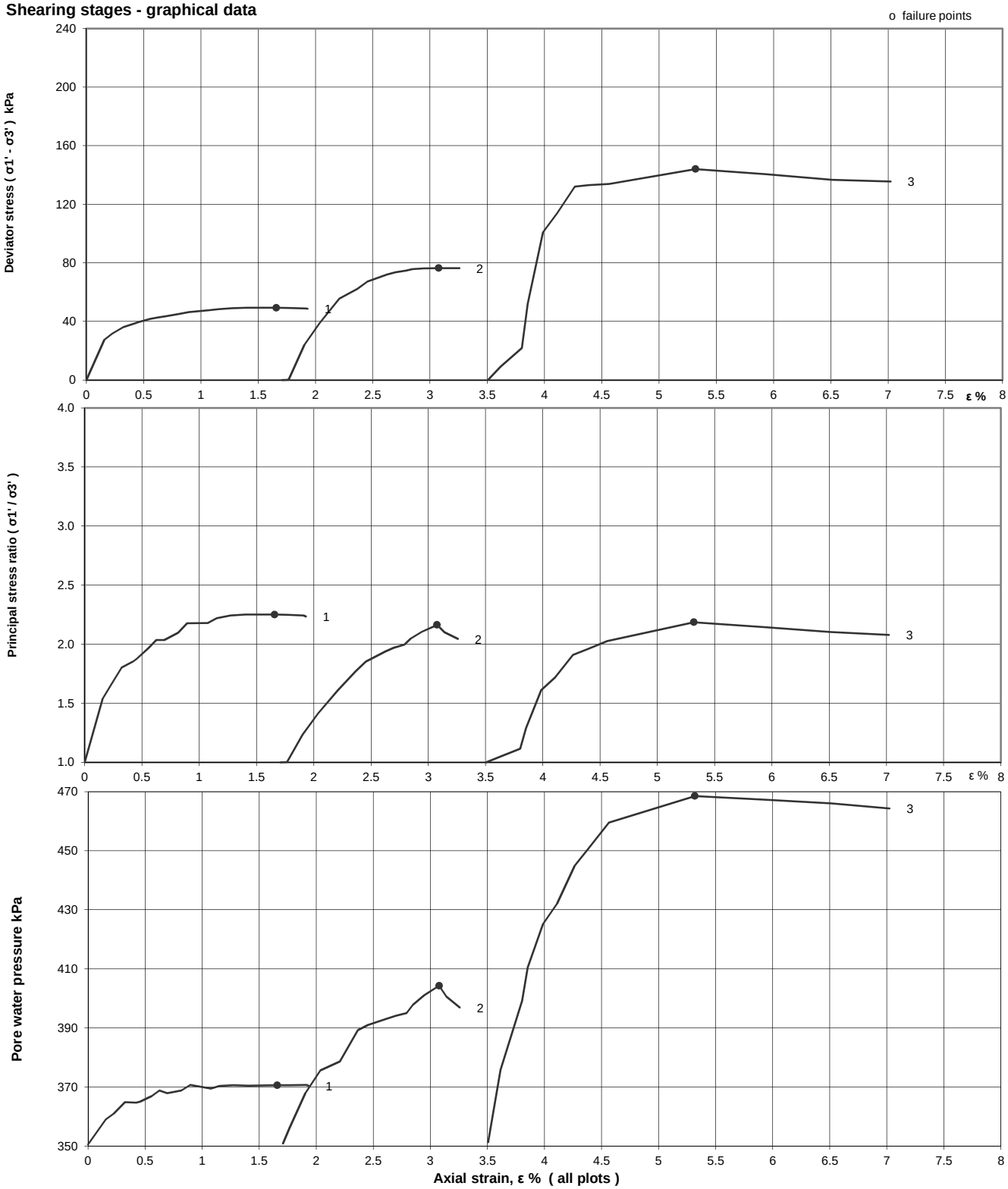


Ref			Figure
SLR8.1 Rev 86.0 Feb18	SOCOTEC	Printed:21/06/2018 08:47	CUM
	UKAS TESTING 1157		sheet 1 of 3

Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	N8135-18	Sample Details:	Hole No	HEP -BH-824		
Project Name	Heathrow Airport Limited		Depth (m BGL)	5.20		
			No	28	Type	UT
			ID			
			Spec Ref			

Shearing stages - graphical data

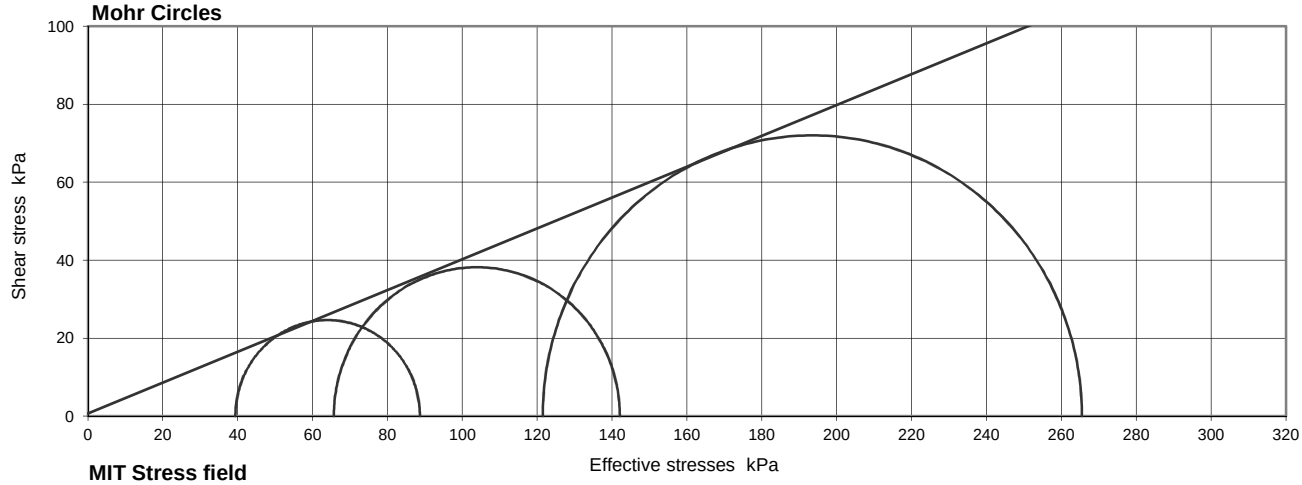


Ref SLR8.1 Rev 86.0 Feb18	SOCOTEC	Printed:21/06/2018 08:47	**Figure** **CUM** sheet 2 of 3
	UKAS TESTING 1157		

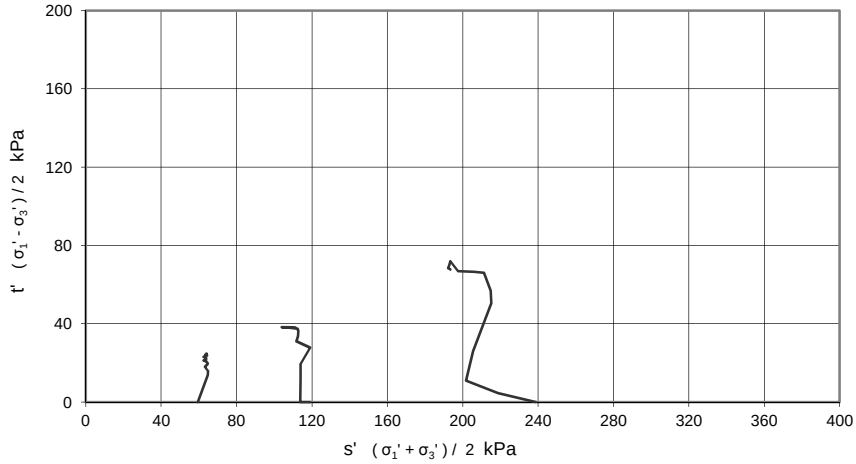
Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure
(BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	N8135-18	Sample Details:	Hole No	HEP -BH-824		
Project Name	Heathrow Airport Limited		Depth (m BGL)	5.20		
			No	28	Type	UT
			ID			
			Spec Ref			

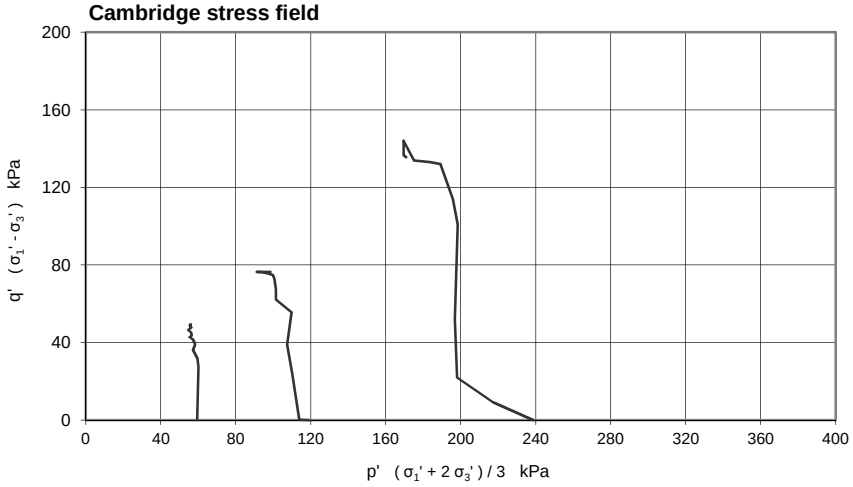
Mohr Circles



MIT Stress field



Cambridge stress field



Compression stages

Stage	1	2	3	
Cell pressure	410	470	590	kPa
Initial pwp	351	351	351	kPa
Initial σ_3'	59	119	239	kPa
Rate of strain	1.64	1.64	1.64	%/hr

Failure conditions

Criterion	Maximum effective principal stress ratio			
Axial strain	1.66	3.08	5.32	%
$(\sigma_1' / \sigma_3')_f$	2.251	2.163	2.185	
$(\sigma_1' - \sigma_3')_f$	49.3	76.4	144.0	kPa
u_f	371	404	469	kPa
$\sigma_3'_f$	39	66	122	kPa
$\sigma_1'_f$	89	142	266	kPa
A_f	0.41	0.70	0.81	
Time to failure	1.0	1.9	3.2	hrs

Shear Strength Parameters

at peak stress ratio

		Linear regression
c '	kPa	0.7
Ø '	degrees	21.6
		Manual re-assessment
c '	kPa	-
Ø '	degrees	-

Mode of failure

Notes : Deviator stresses corrected for area change, vertical side drains and 0.485 mm thick rubber membrane(s)

Ref			Figure
SLR8.1 Rev 86.0 Feb18	SOCOTEC UKAS TESTING 1157	Printed:21/06/2018 08:47	**CUM** sheet 3 of 3

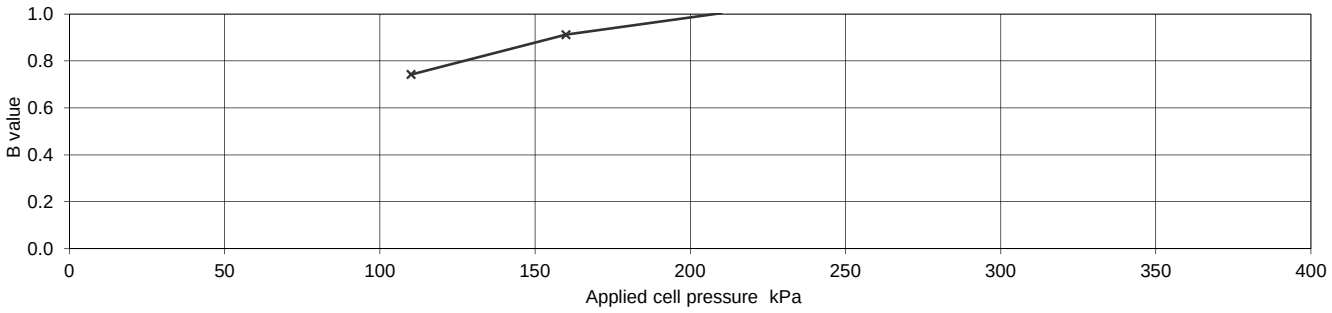
Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	N8135-18	Sample Details:	Hole No	HEP -BH-824		
Project Name	Heathrow Airport Limited		Depth (m BGL)	8.50		
			No	34	Type	UT
			ID			
			Spec Ref			

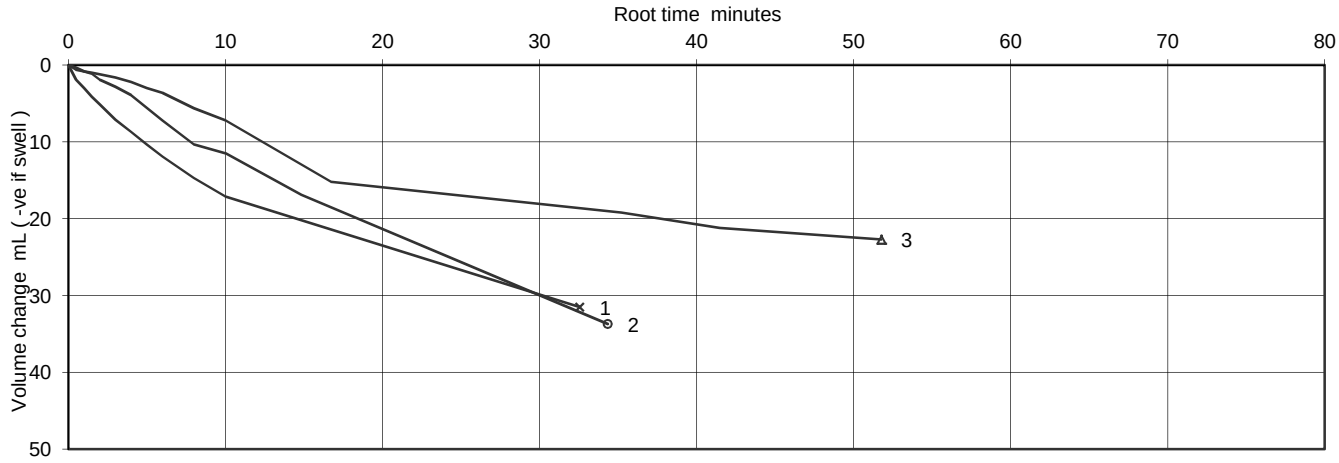
Specimen Details		
Initial		
Length	mm	203.16
Diameter	mm	103.21
Bulk Density	Mg/m³	1.96
Water Content	%	29
Dry density	Mg/m³	1.52
After test		
Bulk Density	Mg/m³	1.98
Water Content	%	28
Dry density	Mg/m³	1.54

Soil Description	Firm grey slightly sandy fissured CLAY
Specimen Type /Preparation	UNDISTURBED

Saturation Details		Method of Saturation
		Increments of cell and back pressure
Cell pressure increments	kPa	50
Differential Pressure	kPa	10
Final Cell Pressure	kPa	210
Final pore water pressure	kPa	190.3
Final B Value		0.99



Consolidation Details	Drainage Conditions		From radial boundary and one end			
	Stage No.		1	2	3	
	Cell Pressure applied		380	460	620	kPa
	Back Pressure applied		300	300	300	kPa
	Effective Pressure		80	160	320	kPa
	Pore pressure at start of consolidation		356	398	473	kPa
	Pore pressure at end of consolidation		302	300	308	kPa
	Pore pressure dissipation at end of consolidation		97	100	95	%
Consolidation parameters (see note to BS1377 : pt 8, clause 6.3.4)	Coefficient of Consolidation	C_{vi}	0.92	0.42	0.39	m^2/year
	Coefficient of Compressibility	M_{vi}	0.33	0.20	0.08	m^2/MN
	Coefficient of Permeability (calculated)	k_{vi}	9.4E-11	2.6E-11	9.8E-12	m/s



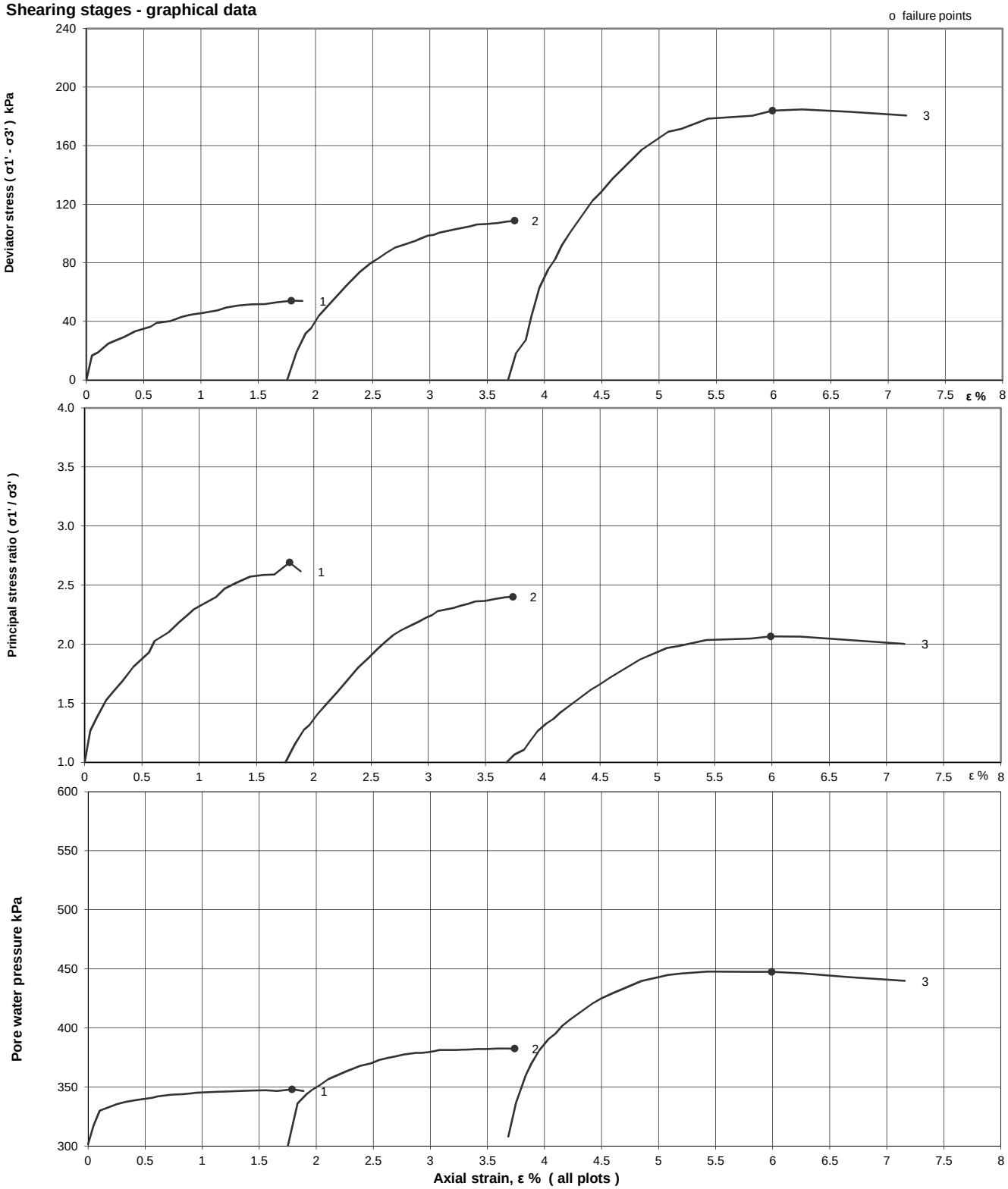
Ref			Figure
SLR8.1 Rev 86.0 Feb18	SOCOTEC	Printed:21/06/2018 08:47	CUM
	UKAS TESTING 1157		sheet 1 of 3

Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	N8135-18	Sample Details:	Hole No	HEP -BH-824		
Project Name	Heathrow Airport Limited		Depth (m BGL)	8.50		
			No	34	Type	UT
			ID			
			Spec Ref			

Shearing stages - graphical data

o failure points

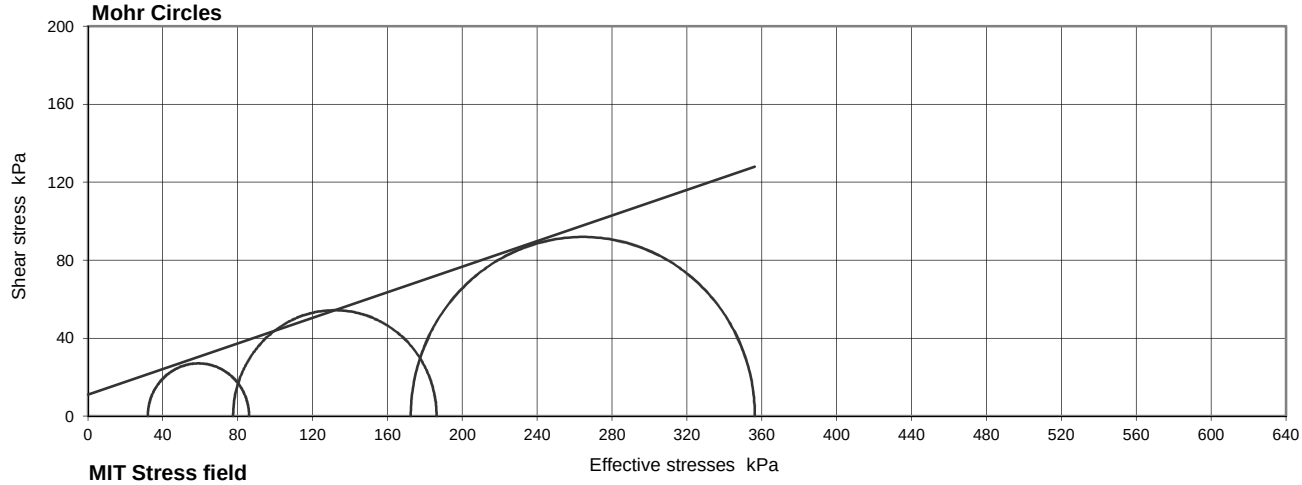


Ref			Figure
SLR8.1 Rev 86.0 Feb18	SOCOTEC UKAS TESTING 1157	Printed:21/06/2018 08:47	**CUM** sheet 2 of 3

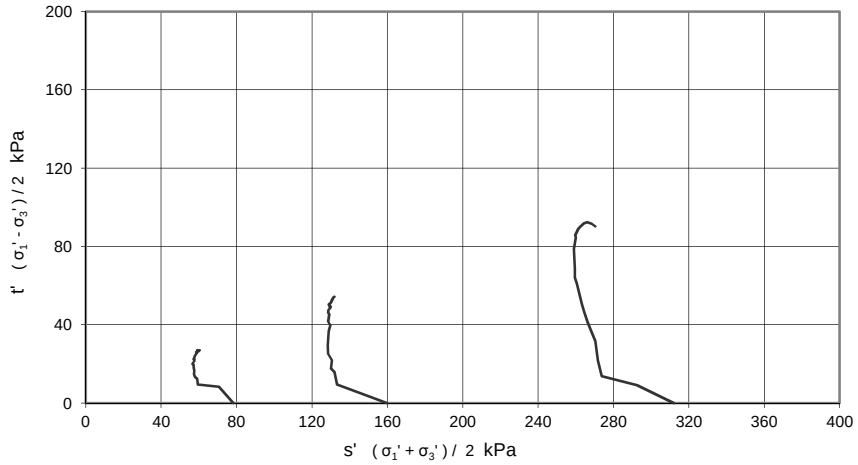
Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	N8135-18	Sample Details:	Hole No	HEP -BH-824		
Project Name	Heathrow Airport Limited		Depth (m BGL)	8.50		
			No	34	Type	UT
			ID			
			Spec Ref			

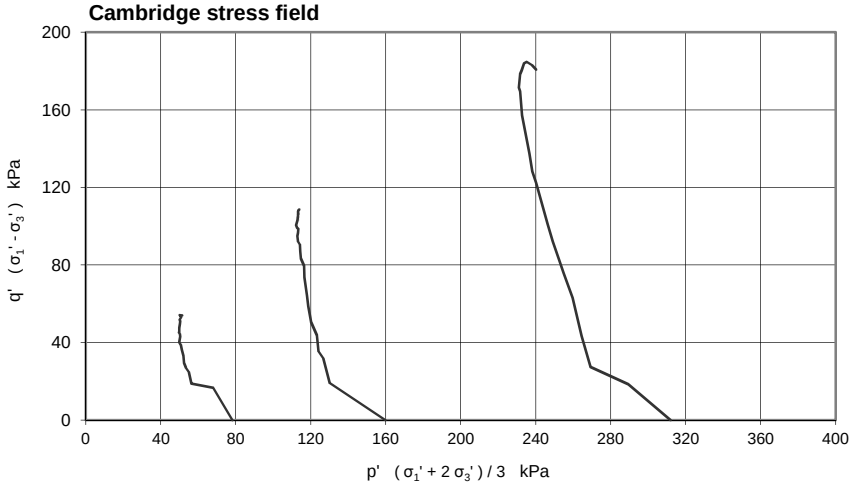
Mohr Circles



MIT Stress field



Cambridge stress field



Compression stages

Stage	1	2	3	
Cell pressure	380	460	620	kPa
Initial pwp	302	300	308	kPa
Initial σ_3'	78	160	312	kPa
Rate of strain	0.67	0.67	0.67	%/hr

Failure conditions

Criterion	Maximum effective principal stress ratio			
Axial strain	1.79	3.74	5.99	%
$(\sigma_1' / \sigma_3')_f$	2.691	2.400	2.066	
$(\sigma_1' - \sigma_3')_f$	54.1	108.7	183.8	kPa
u_f	348	382	448	kPa
$\sigma_3'_f$	32	78	173	kPa
$\sigma_1'_f$	86	186	356	kPa
A_f	0.86	0.76	0.76	
Time to failure	2.7	5.6	8.9	hrs

Shear Strength Parameters

at peak stress ratio

		Linear regression
c '	kPa	11.0
Ø '	degrees	18.2
		Manual re-assessment
c '	kPa	-
Ø '	degrees	-

Mode of failure

Notes : Deviator stresses corrected for area change, vertical side drains and 0.595 mm thick rubber membrane(s)

Ref			Figure
SLR8.1 Rev 86.0 Feb18	SOCOTEC UKAS TESTING 1157	Printed:21/06/2018 08:47	**CUM** sheet 3 of 3

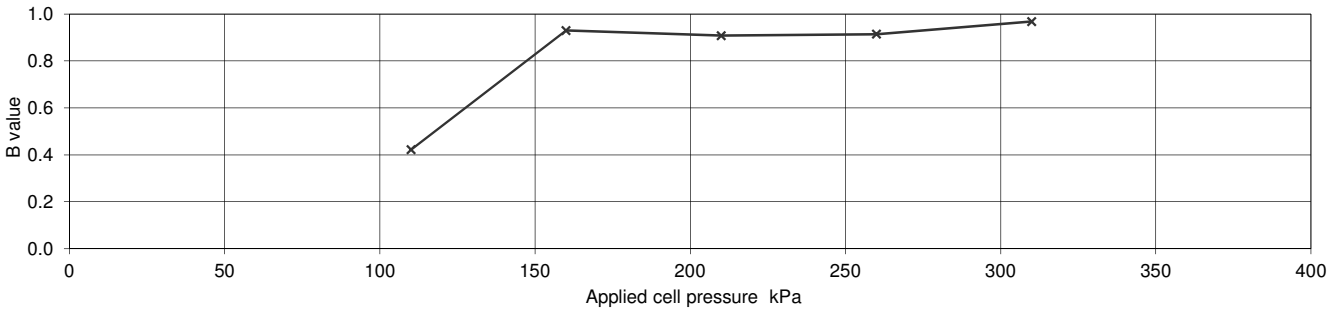
Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	N8135-18	Sample Details:	Hole No	HEP -BH-824		
Project Name	Heathrow Airport Limited		Depth (m BGL)	12.00		
			No	41	Type	UT
			ID			
			Spec Ref			

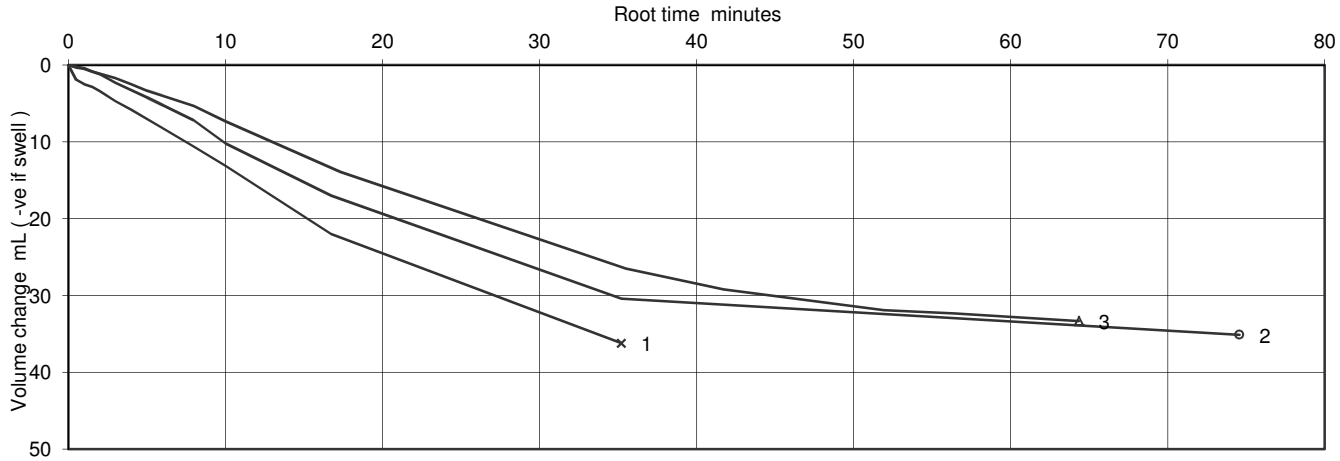
Specimen Details		
Initial		
Length	mm	202.85
Diameter	mm	102.04
Bulk Density	Mg/m³	2.05
Water Content	%	25
Dry density	Mg/m³	1.65
After test		
Bulk Density	Mg/m³	2.07
Water Content	%	24
Dry density	Mg/m³	1.67

Soil Description	Firm to stiff greyish brown slightly sandy CLAY
Specimen Type /Preparation	UNDISTURBED

Saturation Details		Method of Saturation
		Increments of cell and back pressure
Cell pressure increments	kPa	50
Differential Pressure	kPa	10
Final Cell Pressure	kPa	310
Final pore water pressure	kPa	290.6
Final B Value		0.97



Consolidation Details	Drainage Conditions		From radial boundary and one end			
	Stage No.		1	2	3	
	Cell Pressure applied		400	500	700	kPa
	Back Pressure applied		300	300	300	kPa
	Effective Pressure		100	200	400	kPa
	Pore pressure at start of consolidation		383	419	516	kPa
	Pore pressure at end of consolidation		301	301	307	kPa
	Pore pressure dissipation at end of consolidation		99	99	97	%
Consolidation parameters (see note to BS1377 : pt 8, clause 6.3.4)	Coefficient of Consolidation	C_{vi}	0.28	0.21	0.15	m^2/year
	Coefficient of Compressibility	M_{vi}	0.25	0.17	0.10	m^2/MN
	Coefficient of Permeability (calculated)	k_{vi}	2.2E-11	1.1E-11	4.4E-12	m/s



Ref			Figure
SLR8.1 Rev 86.0 Feb18	SOCOTEC	Printed:27/06/2018 15:23	CUM
	UKAS TESTING 1157		sheet 1 of 3

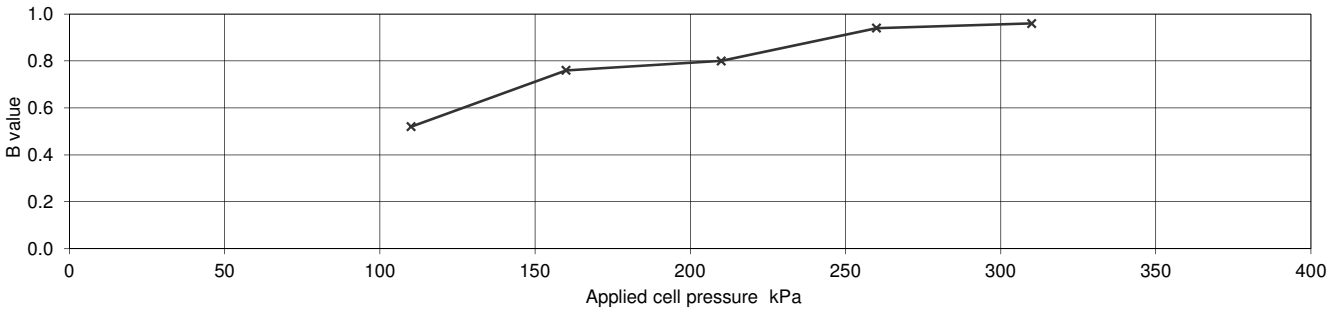
Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	N8135-18	Sample Details:	Hole No	HEP-BH-1047		
Project Name	Heathrow Airport Limited		Depth (m BGL)	9-9.45		
			No	41	Type	UT
			ID			
			Spec Ref			

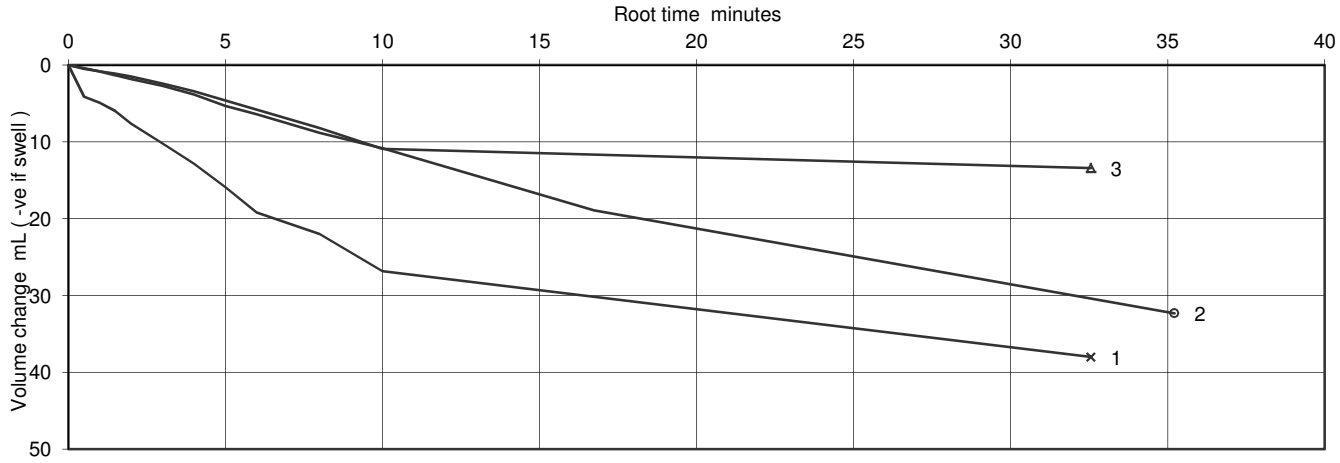
Specimen Details		
Initial		
Length	mm	202.00
Diameter	mm	103.59
Bulk Density	Mg/m³	1.98
Water Content	%	29
Dry density	Mg/m³	1.54
After test		
Bulk Density	Mg/m³	1.99
Water Content	%	28
Dry density	Mg/m³	1.56

Soil Description	Firm brown laminated slightly sandy slightly gravelly CLAY.
Specimen Type /Preparation	UNDISTURBED

Saturation Details		Method of Saturation
		Increments of cell and back pressure
Cell pressure increments	kPa	50
Differential Pressure	kPa	10
Final Cell Pressure	kPa	310
Final pore water pressure	kPa	289
Final B Value		0.96



Consolidation Details	Drainage Conditions		From radial boundary and one end			
	Stage No.		1	2	3	
	Cell Pressure applied		380	460	620	kPa
	Back Pressure applied		300	300	300	kPa
	Effective Pressure		80	160	320	kPa
	Pore pressure at start of consolidation		358	384	478	kPa
	Pore pressure at end of consolidation		300	300	300	kPa
	Pore pressure dissipation at end of consolidation		100	100	100	%
Consolidation parameters (see note to BS1377 : pt 8, clause 6.3.4)	Coefficient of Consolidation	C_{vi}	1.33	0.29	2.29	m^2/year
	Coefficient of Compressibility	M_{vi}	0.37	0.22	0.04	m^2/MN
	Coefficient of Permeability (calculated)	k_{vi}	1.5E-10	2.0E-11	3.2E-11	m/s



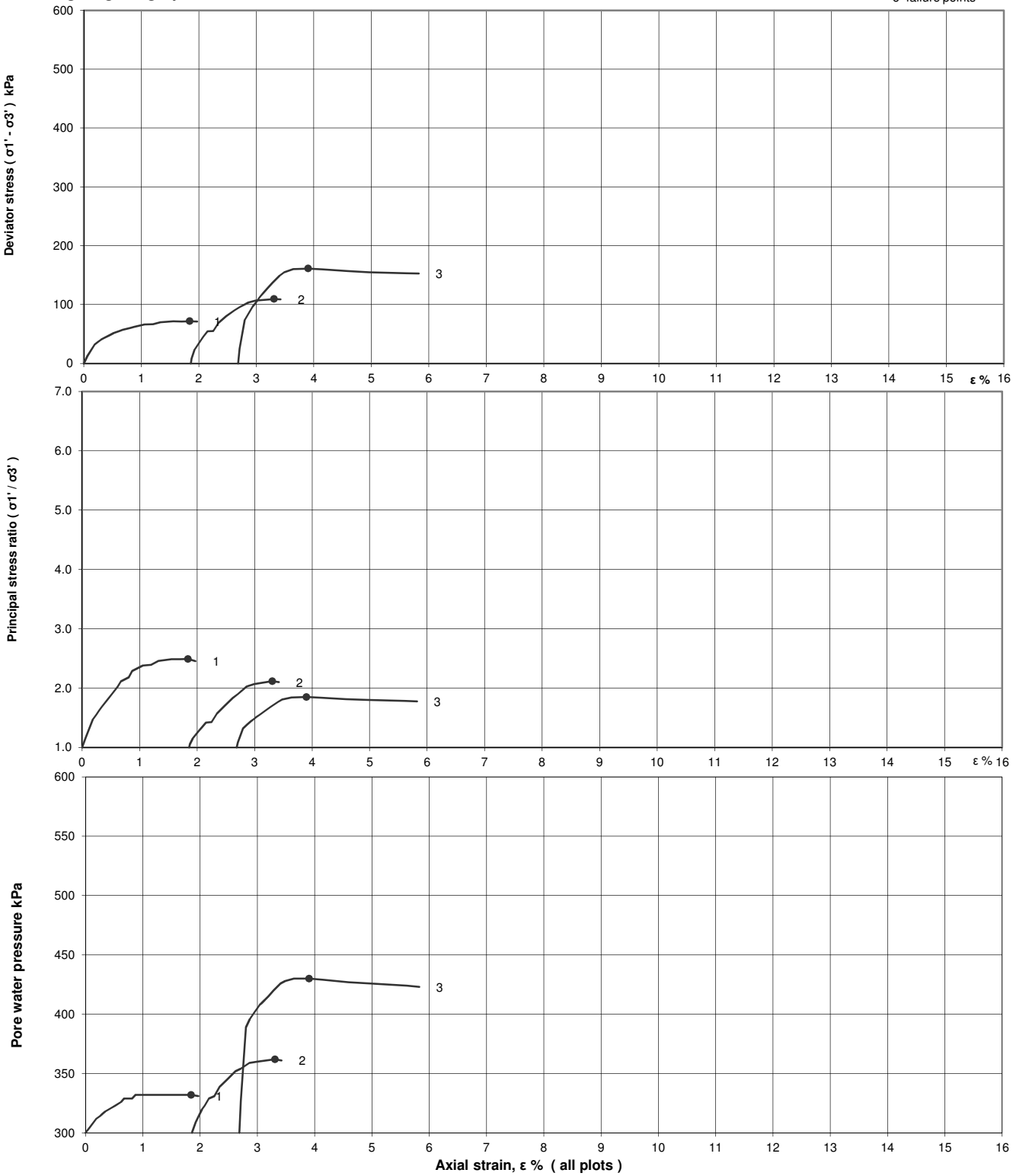
Ref			Figure
SLR8.1 Rev 86.0 Feb18	SOCOTEC	Printed:27/06/2018 15:22	CUM
	UKAS TESTING 1157		sheet 1 of 3

Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	N8135-18	Sample Details:	Hole No	HEP-BH-1047		
Project Name	Heathrow Airport Limited		Depth (m BGL)	9-9.45		
			No	41	Type	UT
			ID			
			Spec Ref			

Shearing stages - graphical data

o failure points

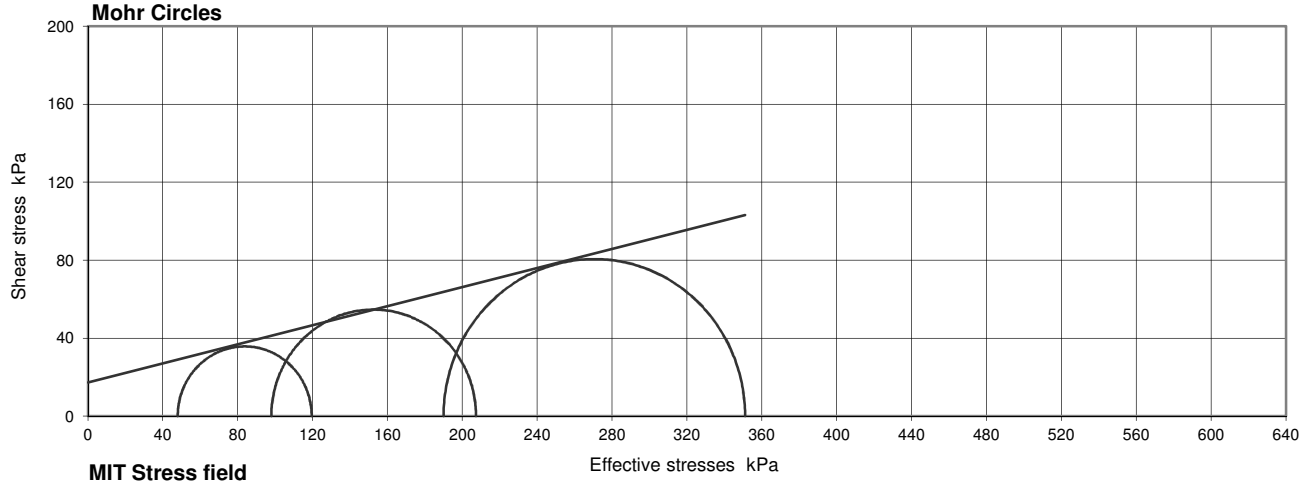


Ref			Figure
SLR8.1 Rev 86.0 Feb18	SOCOTEC 1157	Printed:27/06/2018 15:22	**CUM** sheet 2 of 3

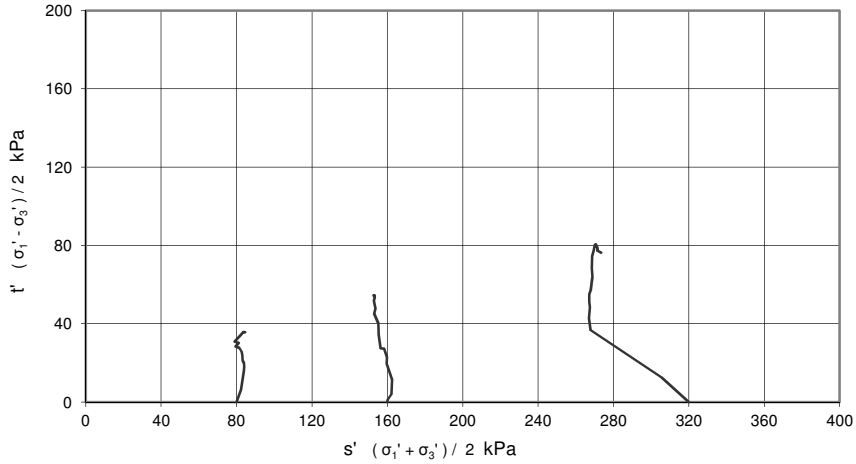
Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	N8135-18	Sample Details:	Hole No	HEP-BH-1047		
Project Name	Heathrow Airport Limited		Depth (m BGL)	9-9.45		
			No	41	Type	UT
			ID			
			Spec Ref			

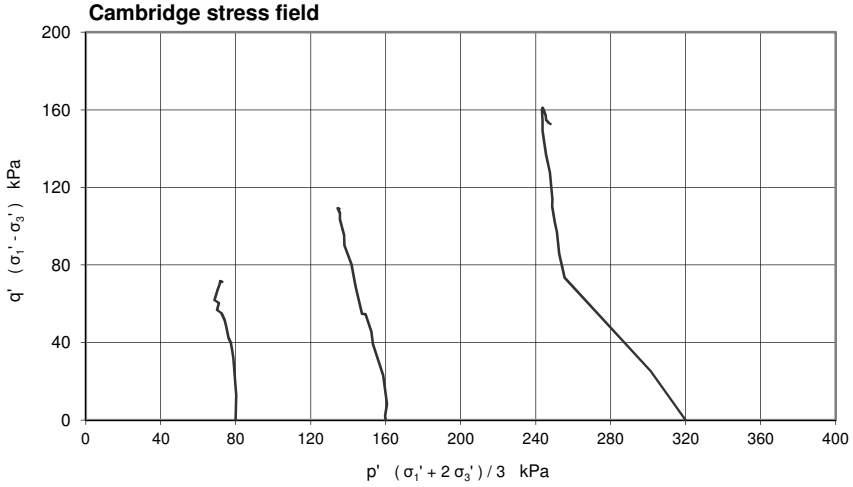
Mohr Circles



MIT Stress field



Cambridge stress field



Compression stages

Stage	1	2	3	
Cell pressure	380	460	620	kPa
Initial pwp	300	300	300	kPa
Initial σ_3'	80	160	320	kPa
Rate of strain	0.94	0.94	0.94	%/hr

Failure conditions

Criterion	Maximum effective principal stress ratio			
Axial strain	1.84	3.31	3.90	%
$(\sigma_1' / \sigma_3')_f$	2.490	2.116	1.848	
$(\sigma_1' - \sigma_3')_f$	71.5	109.3	161.1	kPa
u_f	332	362	430	kPa
$\sigma_3'_f$	48	98	190	kPa
$\sigma_1'_f$	120	207	351	kPa
A_f	0.45	0.57	0.81	
Time to failure	2.0	3.5	4.2	hrs

Shear Strength Parameters

at peak stress ratio

		Linear regression
c '	kPa	17.3
Ø '	degrees	13.7
		Manual re-assessment
c '	kPa	-
Ø '	degrees	-

Mode of failure

Notes : Deviator stresses corrected for area change, vertical side drains and 0.498 mm thick rubber membrane(s)

Ref			Figure
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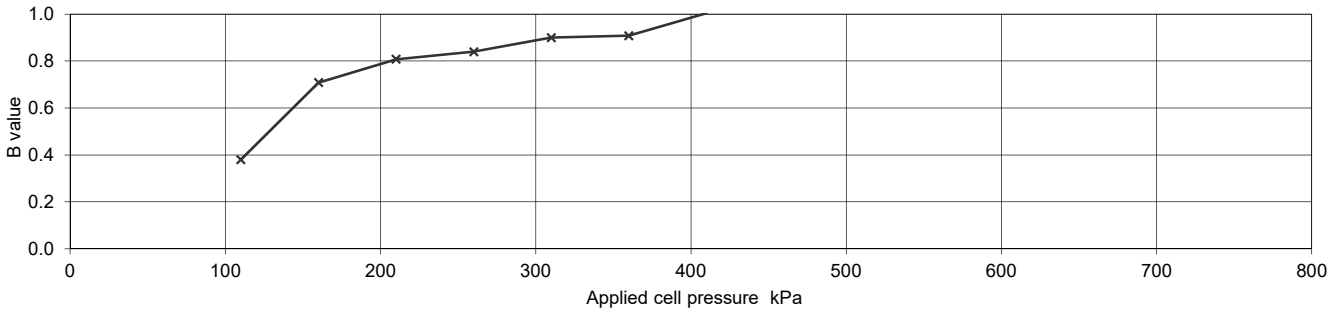
Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	N8135-18	Sample Details:	Hole No	HEP-BH-1050		
Project Name	Heathrow Airport Limited		Depth (m BGL)	8.00		
			No	33	Type	UT
			ID			
			Spec Ref			

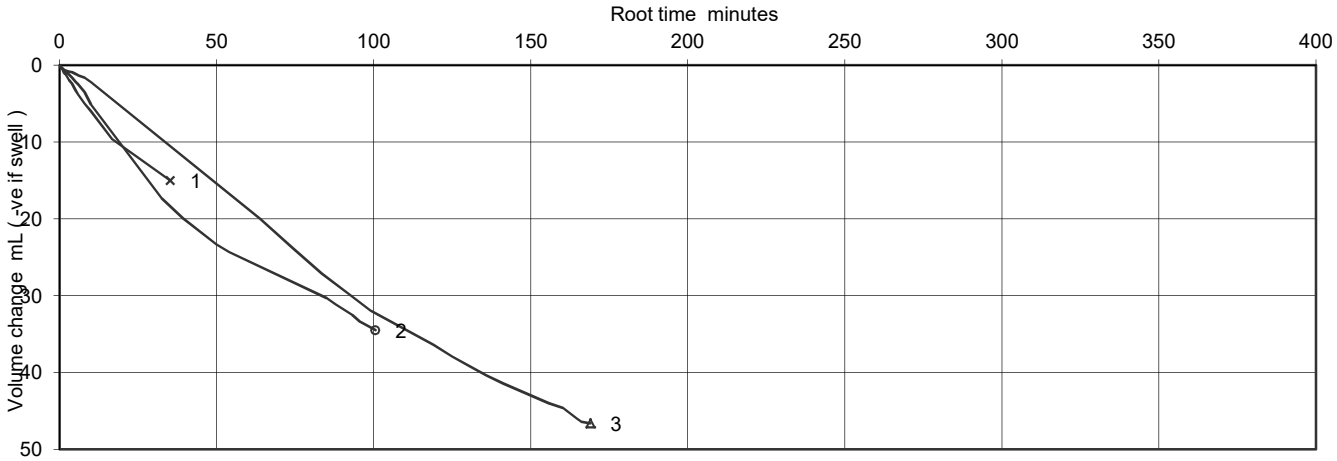
Specimen Details		
Initial		
Length	mm	203.06
Diameter	mm	103.09
Bulk Density	Mg/m³	2.00
Water Content	%	26
Dry density	Mg/m³	1.59
After test		
Bulk Density	Mg/m³	1.99
Water Content	%	27
Dry density	Mg/m³	1.56

Soil Description	Firm brown slightly sandy slightly gravelly CLAY.
Specimen Type /Preparation	UNDISTURBED

Saturation Details		Method of Saturation
		Increments of cell and back pressure
Cell pressure increments	kPa	50
Differential Pressure	kPa	10
Final Cell Pressure	kPa	410
Final pore water pressure	kPa	389.7
Final B Value		1



Consolidation Details						
	Drainage Conditions		From radial boundary and one end			
	Stage No.		1	2	3	
	Cell Pressure applied		450	500	600	kPa
	Back Pressure applied		400	400	400	kPa
	Effective Pressure		50	100	200	kPa
	Pore pressure at start of consolidation		430	458	542	kPa
	Pore pressure at end of consolidation		401	402	405	kPa
	Pore pressure dissipation at end of consolidation		97	96	96	%
Consolidation parameters (see note to BS1377 : pt 8, clause 6.3.4)	Coefficient of Consolidation	C_{vi}	0.44	0.06	0.01	m^2/year
	Coefficient of Compressibility	M_{vi}	0.29	0.34	0.19	m^2/MN
	Coefficient of Permeability (calculated)	k_{vi}	3.9E-11	6.0E-12	6.8E-13	m/s



Ref

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Feb18

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Printed:29/07/2018 19:28

Figure

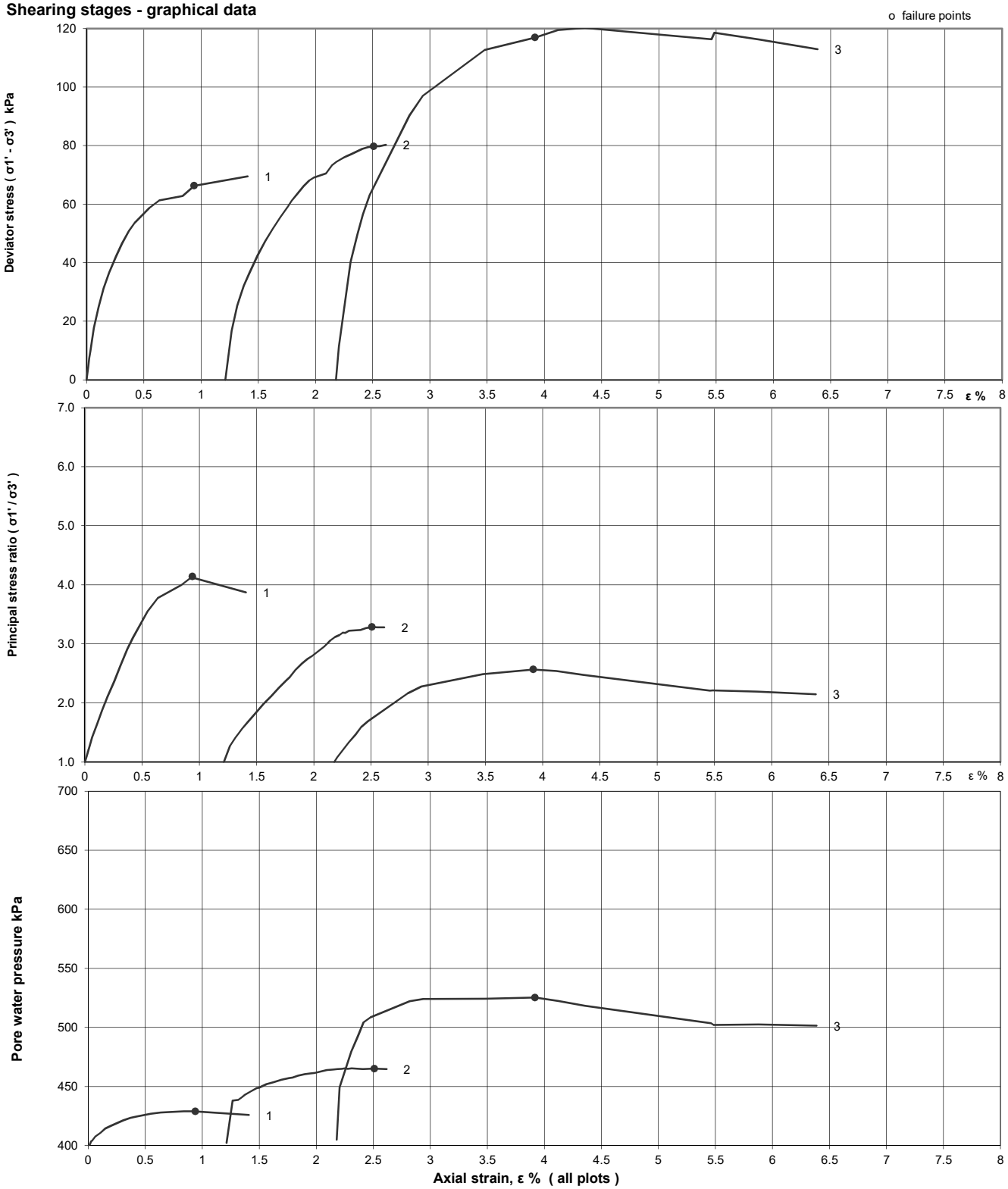
CUM

Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	N8135-18	Sample Details:	Hole No	HEP-BH-1050		
Project Name	Heathrow Airport Limited		Depth (m BGL)	8.00		
			No	33	Type	UT
			ID			
			Spec Ref			

Shearing stages - graphical data

o failure points

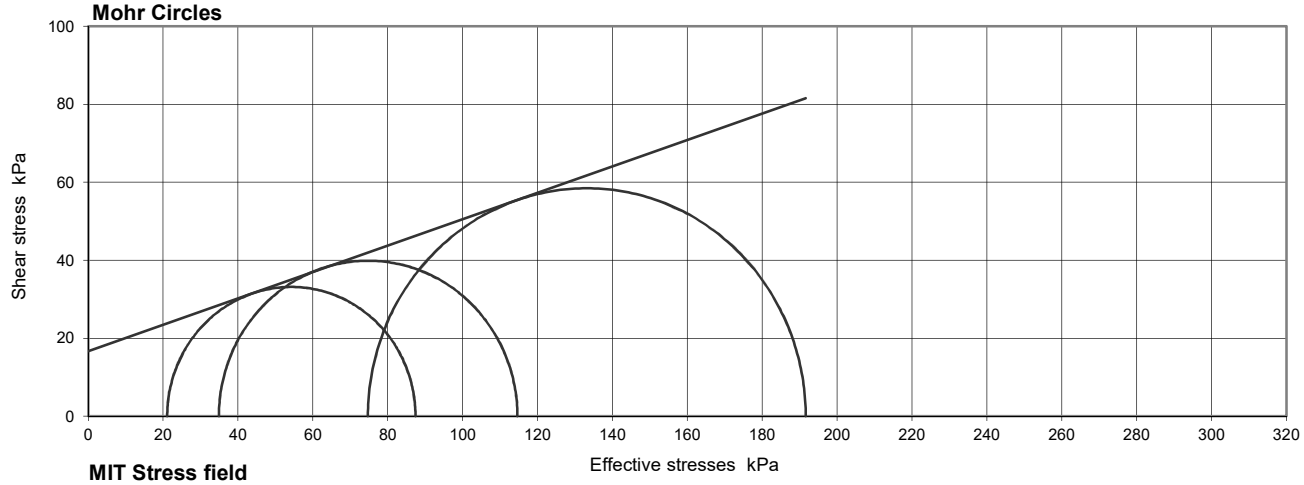


Ref			Figure
SLR8.1 Rev 86.0 Feb18	SOCOTEC UKAS TESTING 1157	Printed:29/07/2018 19:28	**CUM** sheet 2 of 3

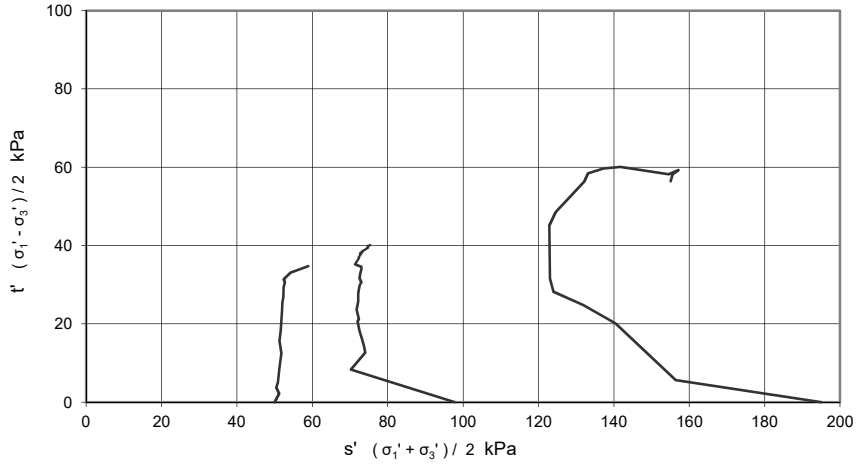
Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure
(BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	N8135-18	Sample Details:	Hole No	HEP-BH-1050		
Project Name	Heathrow Airport Limited		Depth (m BGL)	8.00		
			No	33	Type	UT
			ID			
			Spec Ref			

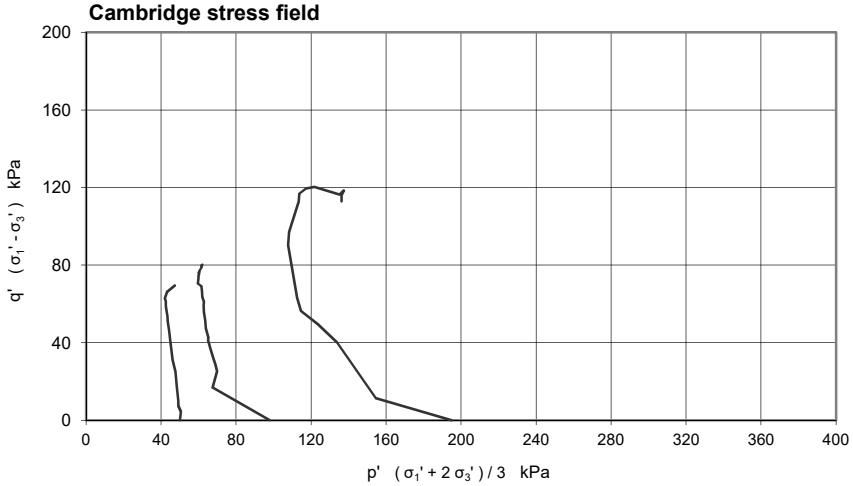
Mohr Circles



MIT Stress field



Cambridge stress field



Compression stages

Stage	1	2	3	
Cell pressure	450	500	600	kPa
Initial pwp	400	402	405	kPa
Initial σ_3'	50	98	195	kPa
Rate of strain	0.31	0.31	0.31	%/hr

Failure conditions

Criterion	Maximum effective principal stress ratio			
Axial strain	0.94	2.51	3.92	%
$(\sigma_1' / \sigma_3')_f$	4.142	3.285	2.565	
$(\sigma_1' - \sigma_3')_f$	66.3	79.7	116.9	kPa
u_f	429	465	525	kPa
$\sigma_3'_f$	21	35	75	kPa
$\sigma_1'_f$	87	115	192	kPa
A_f	0.44	0.79	1.03	
Time to failure	3.0	8.1	12.6	hrs

Shear Strength Parameters

at peak stress ratio

		Linear regression
c '	kPa	16.7
Ø '	degrees	18.7
		Manual re-assessment
c '	kPa	-
Ø '	degrees	-

Mode of failure

Notes : Deviator stresses corrected for area change, vertical side drains and 0.401 mm thick rubber membrane(s)

Ref			Figure
SLR8.1 Rev 86.0 Feb18	SOCOTEC UKAS TESTING 1157	Printed:29/07/2018 19:28	**CUM** sheet 3 of 3

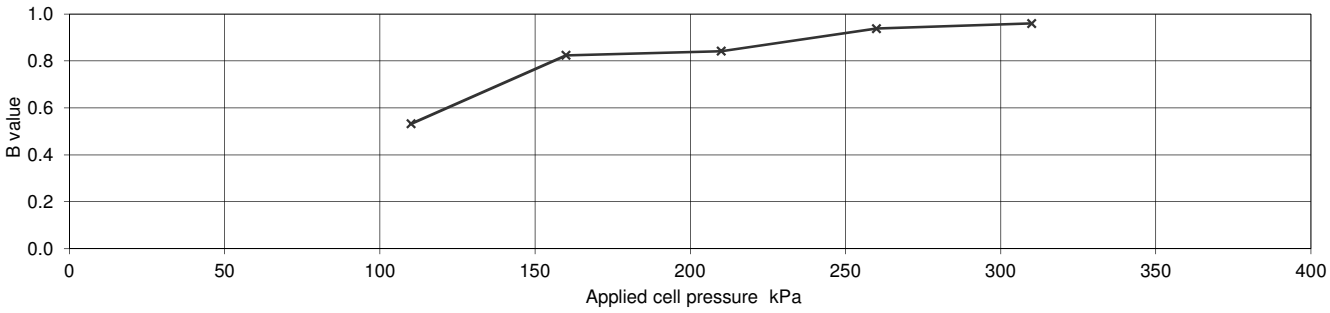
Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	N8135-18	Sample Details:	Hole No	HEP -BH-1804		
Project Name	Heathrow Airport Limited		Depth (m BGL)	6.30		
			No	27	Type	UT
			ID			
			Spec Ref			

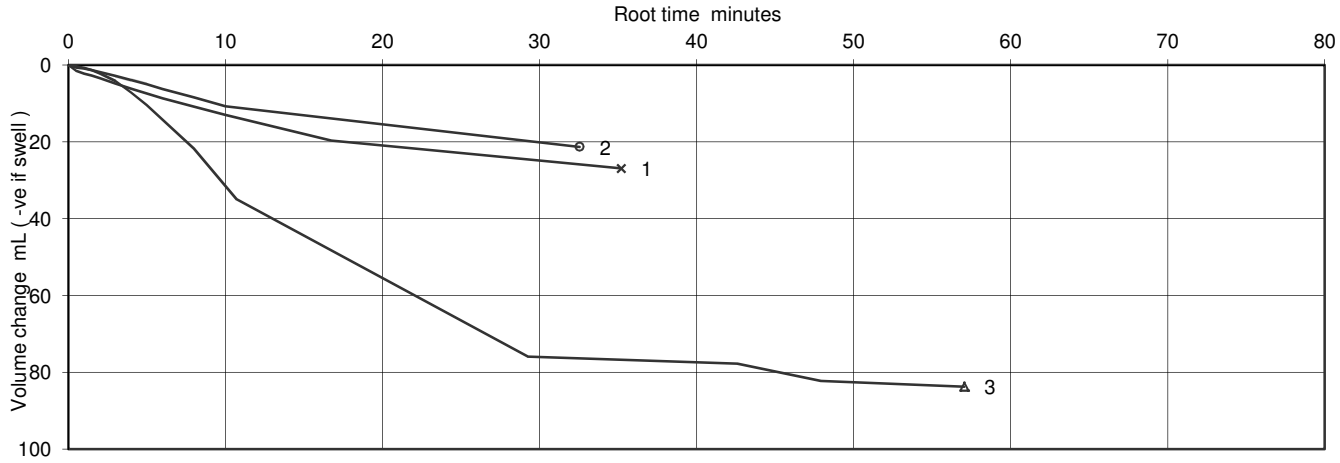
Specimen Details		
Initial		
Length	mm	202.91
Diameter	mm	102.87
Bulk Density	Mg/m³	2.01
Water Content	%	25
Dry density	Mg/m³	1.60
After test		
Bulk Density	Mg/m³	2.02
Water Content	%	26
Dry density	Mg/m³	1.60

Soil Description	Firm brown slightly sandy CLAY
Specimen Type /Preparation	UNDISTURBED

Saturation Details		Method of Saturation
		Increments of cell and back pressure
Cell pressure increments	kPa	50
Differential Pressure	kPa	10
Final Cell Pressure	kPa	310
Final pore water pressure	kPa	293.7
Final B Value		0.96



Consolidation Details	Drainage Conditions		From radial boundary and one end			
	Stage No.		1	2	3	
	Cell Pressure applied		360	420	540	kPa
	Back Pressure applied		300	300	300	kPa
	Effective Pressure		60	120	240	kPa
	Pore pressure at start of consolidation		345	369	441	kPa
	Pore pressure at end of consolidation		300	303	300	kPa
	Pore pressure dissipation at end of consolidation		100	96	100	%
Consolidation parameters (see note to BS1377 : pt 8, clause 6.3.4)	Coefficient of Consolidation	C_{vi}	0.65	0.59	0.45	m^2/year
	Coefficient of Compressibility	M_{vi}	0.33	0.18	0.34	m^2/MN
	Coefficient of Permeability (calculated)	k_{vi}	6.6E-11	3.3E-11	4.7E-11	m/s



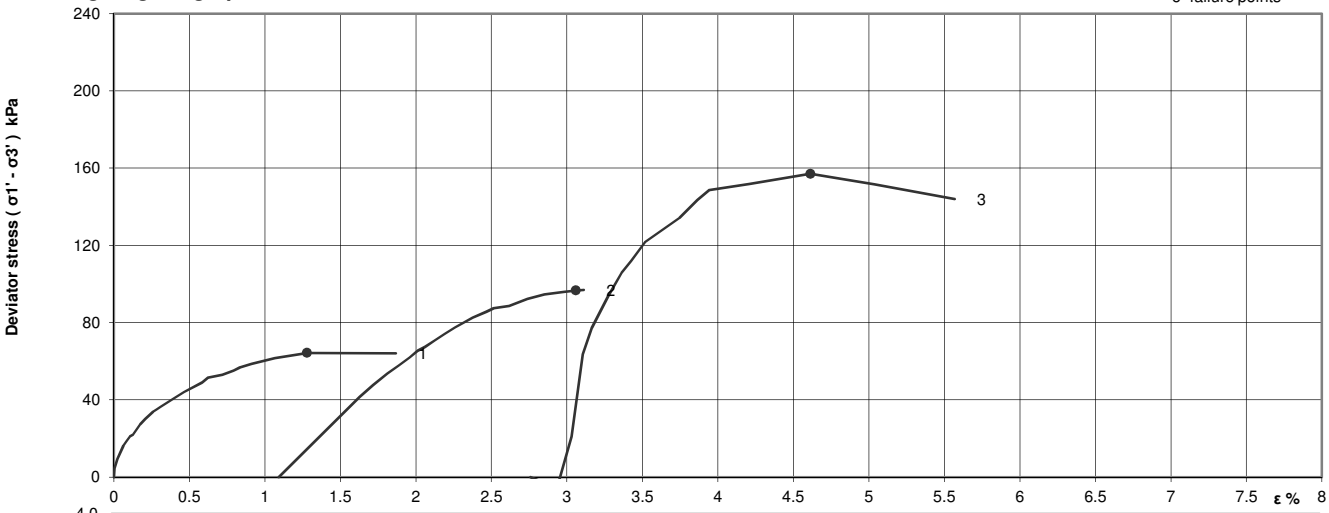
Ref			Figure
SLR8.1 Rev 86.0 Feb18	SOCOTEC	Printed:21/06/2018 08:48	CUM
	UKAS TESTING 1157		sheet 1 of 3

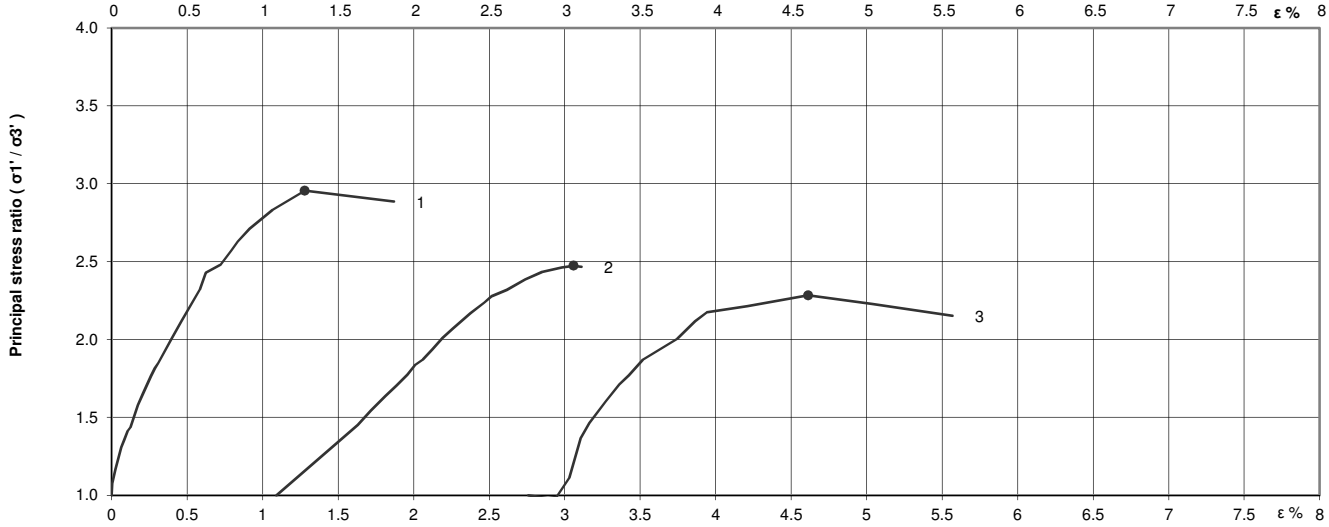
Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

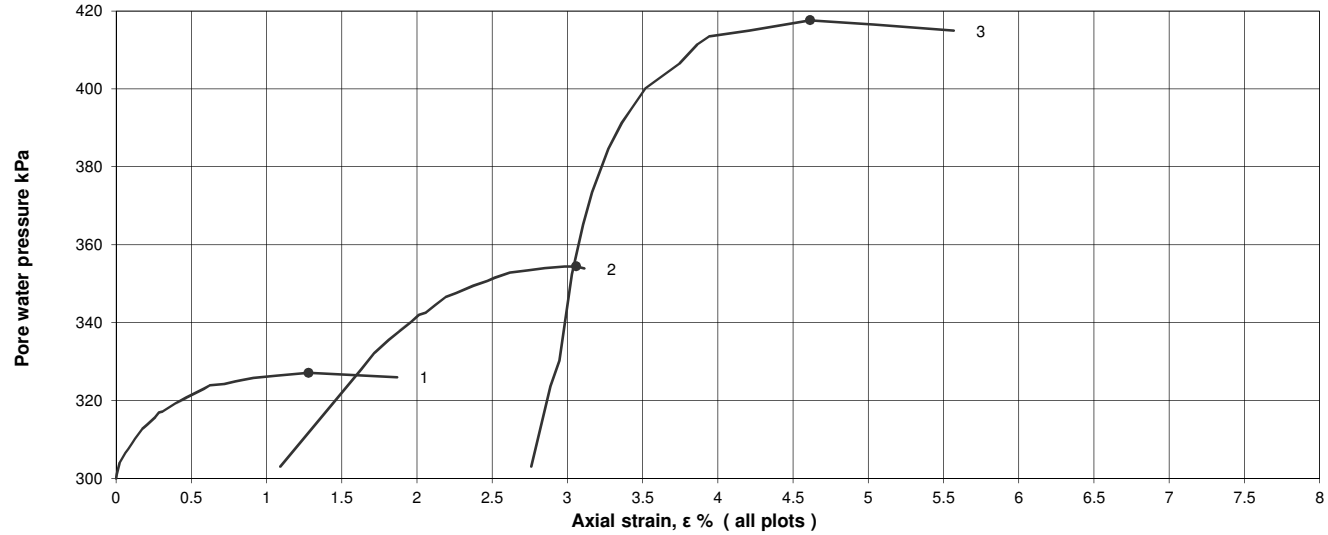
Project No	N8135-18	Sample Details:	Hole No	HEP -BH-1804		
Project Name	Heathrow Airport Limited		Depth (m BGL)	6.30		
			No	27	Type	UT
			ID			
			Spec Ref			

Shearing stages - graphical data

o failure points





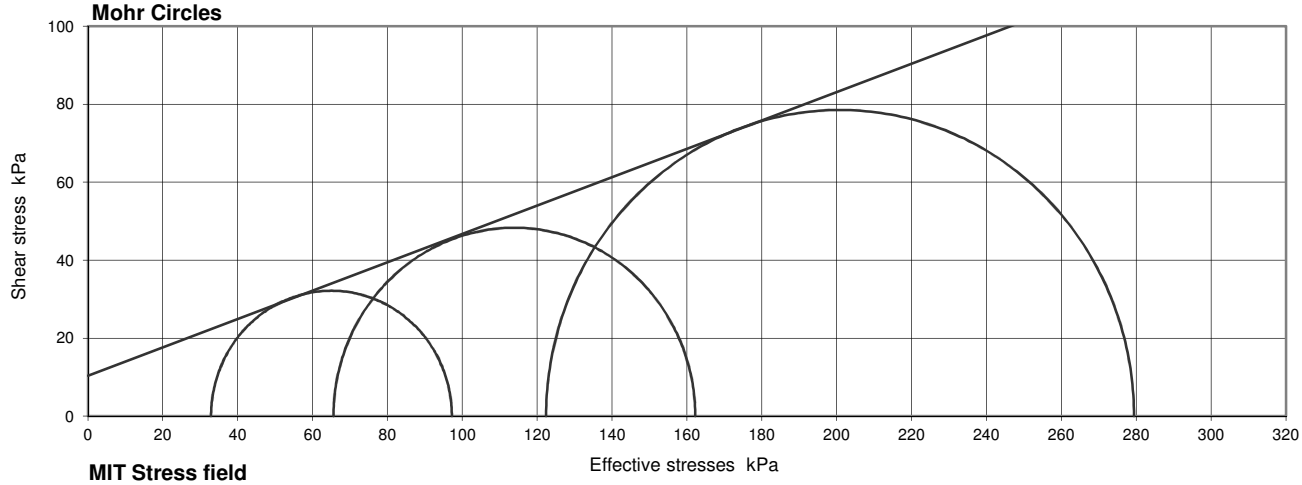


Ref			Figure
SLR8.1 Rev 86.0 Feb18	SOCOTEC UKAS TESTING 1157	Printed:21/06/2018 08:48	**CUM** sheet 2 of 3

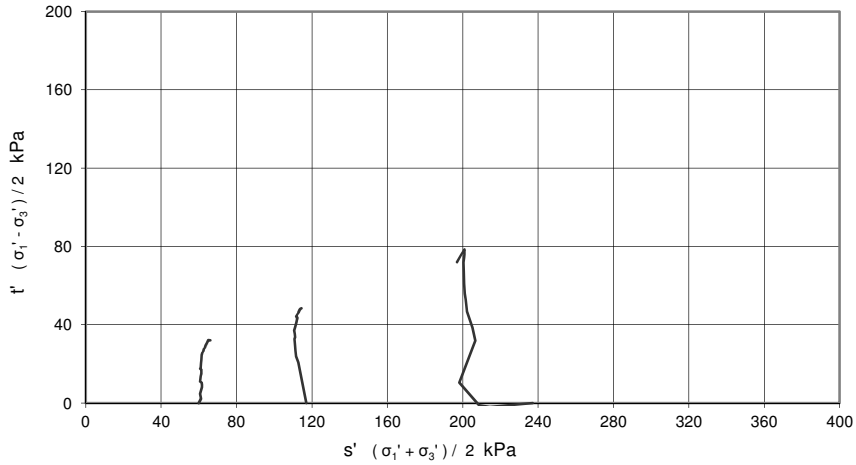
Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	N8135-18	Sample Details:	Hole No	HEP -BH-1804		
Project Name	Heathrow Airport Limited		Depth (m BGL)	6.30		
			No	27	Type	UT
			ID			
			Spec Ref			

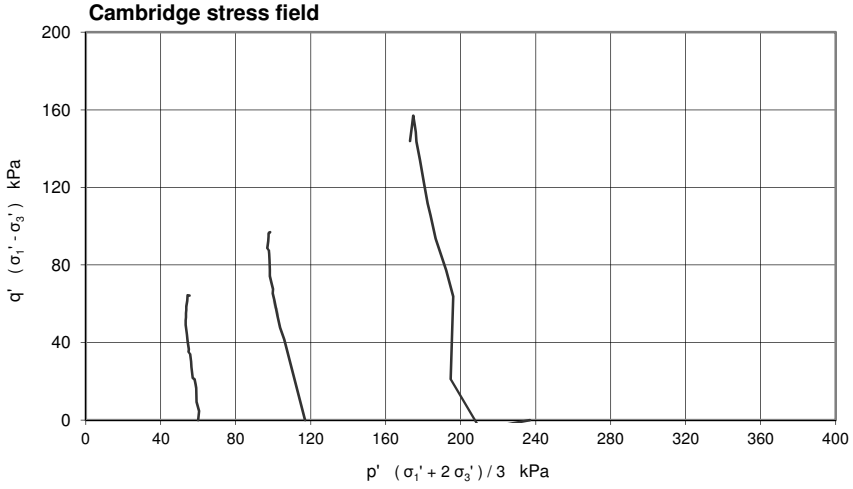
Mohr Circles



MIT Stress field



Cambridge stress field



Compression stages

Stage	1	2	3	
Cell pressure	360	420	540	kPa
Initial pwp	300	303	303	kPa
Initial σ_3'	60	117	237	kPa
Rate of strain	0.46	0.46	0.46	%/hr

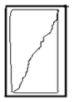
Failure conditions

Criterion				
Axial strain	1.28	3.06	4.61	%
$(\sigma_1' / \sigma_3')_f$	2.955	2.473	2.283	
$(\sigma_1' - \sigma_3')_f$	64.3	96.6	157.0	kPa
u_f	327	354	418	kPa
$\sigma_3'_f$	33	66	122	kPa
$\sigma_1'_f$	97	162	279	kPa
A_f	0.42	0.53	0.73	
Time to failure	2.8	6.6	10.0	hrs

Shear Strength Parameters

		Linear regression
c '	kPa	10.3
Ø '	degrees	20.0
		Manual re-assessment
c '	kPa	-
Ø '	degrees	-

Mode of failure



Notes : Deviator stresses corrected for area change, vertical side drains and 0.596 mm thick rubber membrane(s)

Ref			Figure
SLR8.1 Rev 86.0 Feb18	SOCOTEC UKAS TESTING 1157	Printed:21/06/2018 08:48	**CUM** sheet 3 of 3

MEASUREMENT OF ELECTRIC RESISTIVITY - SUMMARY OF RESULTS

Hole No.	Sample				Soil Description	Preparation	Bulk Density Mg/m3	Moisture Content %	Soil Temp. oC	Resistivity	
	No.	Depth (m) from	Depth (m) to	type						as tested ohm.m	at 20oC ohm.m
HEP-BH-1047	11	1.50		B	Black spongy pseudo fibrous slightly sandy slightly gravelly clayey PEAT.	Recompacted using 2.5kgeffort at as received moisture content	1.47	76	24	5	6
HEP-BH-1050	8	1.10		B	Brown slightly sandy slightly gravelly silty CLAY.	Recompacted using 2.5kgeffort at as received moisture content	2.08	15	24	11	13
HEP-BH-820	8	0.60		B	Dark brown slightly sandy gravelly clayey SILT.	Recompacted using 2.5Kg compactive effort at as received moisture content	1.81	19	20	20	20

Test Method : BS 1377 : Part 3 : 1990 : clause 10.3, Wenner probe method and SM TP 0016B*

ESG Container

	Type	Plastic tube	Probe details :	Type	steel	
	Dia	250.4 mm		Diameter	2.0	mm
	Length*	103.9 mm		Penetration into soil	55	mm
Specimen	Diameter	250.4 mm		Spacing between probes	25	mm
	Length	103.9 mm		Inserted into	side	of specimen

QA Ref
SLR 3.10.3
Rev 2.3
Apr 15

UKAS TESTING
1157

SOCOTEC

Project No N8135-18

Project Name Heathrow Airport Limited

Figure

ERES

Printed: 15/11/2018 14:51

Our Ref: EFS/187038 (Ver. 1)
Your Ref: N8135-18

July 4, 2018

Environmental Chemistry
SOCOTEC UK Limited
Bretby Business Park
Ashby Road
Burton-on-Trent
Staffordshire
DE15 0YZ

Telephone: 01283 554400
Facsimile: 01283 554422

Ryan Clark
SOCOTEC UK Doncaster
Askern Road
Carcroft
Doncaster
South Yorkshire
DN6 8DG

For the attention of Ryan Clark

Dear Ryan Clark

Sample Analysis - N8135-18 Heathrow

Samples from the above site have been analysed in accordance with the schedule supplied.
The sample details and the results of analyses for these samples are given in the appended report.

An invoice for this work will follow under a separate cover.

Where appropriate the samples will be kept until 04/08/18 when they will be discarded. Please call 01283 554649 for an extension of this date.
Please be aware that our policy for the retention of paper based laboratory records and analysis reports is 6 years.

The work was carried out in accordance with SOCOTEC UK Limited (Multi-Sector Services) Standard Terms and Conditions of Contract.

If I can be of any further assistance please do not hesitate to contact me.

Yours sincerely

for SOCOTEC UK Limited

P Williams
Project Co-ordinator
01283 554649

TEST REPORT

1252

Report No. EFS/187038 (Ver. 1)

SOCOTEC UK Doncaster
Askern Road
Carcroft
Doncaster
South Yorkshire
DN6 8DG

Site: N8135-18 Heathrow

The 2 samples described in this report were registered for analysis by SOCOTEC UK Limited on 23-Jun-2018. This report supersedes any versions previously issued by the laboratory.
The analysis was completed by: 04-Jul-2018

Tests where the accreditation is set to N or No, and any individual data items marked with a * are not UKAS accredited.
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

The following tables are contained in this report:

On behalf of
SOCOTEC UK Lim
Tim Barnes Operations Director
Energy & Waste Services

Date of Issue: 04-Jul-2018

Tests marked '^' have been subcontracted to another laboratory.
Where samples have been flagged as deviant on the Analytical and Deviating Sample Overview, for any reason, the data may not be representative of the sample at the point of sampling and the validity of the data may be affected.
SOCOTEC UK Limited accepts no responsibility for any sampling not carried out by our personnel.

Where individual results are flagged see report notes for status.

Units :			mg/kg	mg/l	%	pH Units												
Method Codes :			ICPACIDS	ICPWSS	TSBRE1	WSLM50												
Method Reporting Limits :			20	10	0.005													
UKAS Accredited :			Yes	Yes	No	No												
LAB ID Number CL/	**Client Sample Description**	**Sample Date**	**SO4-- (acid sol)**	**SO4-- (H2O sol) mg/l**	**Total Sulphur.**	**pH (BS1377)**												
1910755	HEP-TT-3 B 11 1.80	**20-Jun-18**	3990	1870	0.248	8.0												
1910756	HEP-BH-476 LB 11 2.20	**20-Jun-18**	1260	585	0.079	9.4												

SOCOTEC

Bretby Business Park, Ashby Road

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Tel +44 (0) 1283 554400

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Client Name	**SOCOTEC UK Doncaster**
Contact	Ryan Clark

N8135-18 Heathrow

Sample Analysis

Date Printed	**04-Jul-2018**
Report Number	**EFS/187038**
Table Number	**1**

Where individual results are flagged see report notes for status.

Analytical and Deviating Sample Overview

Customer SOCOTEC UK Doncaster
Site N8135-18 Heathrow
Report No S187038

Consignment No S75650
Date Logged 23-Jun-2018
In-House Report Due 29-Jun-2018

Please note the results for any subcontracted analysis (identified with a '^') is likely to take up to an additional five working days.

ID Number	Description	MethodID	CustServ	Dep.Opt			ICPACIDS	ICPBRE	ICPWSS	KONECL	KoneNO3	TSBRE1	WSLM50
		Sampled	REPORT A	DO Cl if pH<5.5	DO Mg if SO4(W)>3000	DO NO3 if pH<5.5	SO4-- (acid sol)	Magnesium (BRE)	SO4-- (H2O sol) mg/l	Chloride:(2:1)	Nitrate (BRE 2:1): mg/l	Total Sulphur.	pH (BS1377)
							✓		✓				
CL/1910755	HEP-TT-3 1.80	20/06/18											
CL/1910756	HEP-BH-476 2.20	20/06/18											

Note: We will endeavour to prioritise samples to complete analysis within holding time; however any delay could result in samples becoming deviant whilst being processed in the laboratory.

If sampling dates are missing or matrices unclassified then results will not be ISO 17025 accredited. Please contact us as soon as possible to provide missing information in order to reinstate accreditation.

Deviating Sample Key	
A	The sample was received in an inappropriate container for this analysis
B	The sample was received without the correct preservation for this analysis
C	Headspace present in the sample container
D	The sampling date was not supplied so holding time may be compromised - applicable to all analysis
E	Sample processing did not commence within the appropriate holding time
F	Sample processing did not commence within the appropriate handling time

Requested Analysis Key	
	Analysis Required
	Analysis dependant upon trigger result - **Note: due date may be affected if triggered**
	No analysis scheduled
^	Analysis Subcontracted - **Note: due date may vary**

Where individual results are flagged see report notes for status.

 The integrity of data for samples/analysis that have been categorised as Deviating may be compromised. Data may not be representative of the sample at the time of sampling.

Method Descriptions

Matrix	MethodID	Analysis Basis	Method Description
Soil	ICPACIDS	Oven Dried @ < 35°C	Determination of Total Sulphate in soil samples by Hydrochloric Acid extraction followed by ICPOES detection
Soil	ICPWSS	Oven Dried @ < 35°C	Determination of Water Soluble Sulphate in soil samples by water extraction followed by ICPOES detection
Soil	TSBRE1	Oven Dried @ < 35°C	Determination of Total Carbon and/or Total Sulphur in solid samples by high temperature combustion/infrared detection
Soil	WSLM50	Oven Dried @ < 35°C	Determination of pH of 2.5:1 deionised water to soil extracts using pH probe.

Where individual results are flagged see report notes for status.

Report Notes

Generic Notes

Soil/Solid Analysis

Unless stated otherwise,
- Results expressed as mg/kg have been calculated on the basis indicated in the Method Description table.
  All results on MCERTS reports are reported on a 105ºC dry weight basis with the exception of pH and conductivity.
- Sulphate analysis not conducted in accordance with BS1377
- Water Soluble Sulphate is on a 2:1 water:soil extract

Waters Analysis

Unless stated otherwise results are expressed as mg/l

Nil: Where "Nil" has been entered against Total Alkalinity or Total Acidity this indicates that a measurement was not required due to the inherent pH of the sample.

Oil analysis specific

Unless stated otherwise,
- Results are expressed as mg/kg
- SG is expressed as g/cm^3@ 15^{o}C

Gas (Tedlar bag) Analysis

Unless stated otherwise, results are expressed as ug/l

Asbestos Analysis

CH Denotes Chrysotile **TR** Denotes Tremolite
CR Denotes Crocidolite **AC** Denotes Actinolite
AM Denotes Amosite **AN** Denotes Anthophylite
NAIIS No Asbestos Identified in Sample
NADIS No Asbestos Detected In Sample

Symbol Reference

^ Sub-contracted analysis.
$$ Unable to analyse due to the nature of the sample
¶ Samples submitted for this analyte were not preserved on site in accordance with laboratory protocols. This may have resulted in deterioration of the sample(s) during transit to the laboratory. Consequently the reported data may not represent the concentration of the target analyte present in the sample at the time of sampling
¥ Results for guidance only due to possible interference
& Blank corrected result
I.S Insufficient sample to complete requested analysis
I.S(g) Insufficient sample to re-analyse, results for guidance only
Intf Unable to analyse due to interferences
N.D Not determined **N.Det** Not detected
N.F No Flow
NS Information Not Supplied
Req Analysis requested, see attached sheets for results
Þ Raised detection limit due to nature of the sample
***** All accreditation has been removed by the laboratory for this result
‡ MCERTS accreditation has been removed for this result
§ accreditation has been removed for this result as it is a non-accredited matrix

Note: The Laboratory may only claim that data is accredited when all of the requirements of our Quality System have been met. Where these requirements have not been met the laboratory may elect to include the data in its final report and remove the accreditation from individual data items if it believes that the validity of the data has not been affected. If further details are required of the circumstances which have led to the removal of accreditation then please do not hesitate to contact the laboratory.

Sample Descriptions

Client : SOCOTEC UK Doncaster

Site : N8135-18 Heathrow

Report Number : S18_7038

Note: major constituent in upper case

Lab ID Number	Client ID	Description
CL/1910755	HEP-TT-3 B 11 1.80	MADE GROUND
CL/1910756	HEP-BH-476 LB 11 2.20	CLAY

Our Ref: EFS/187039 (Ver. 1)
Your Ref: N8135-18

July 4, 2018

Environmental Chemistry
SOCOTEC UK Limited
Bretby Business Park
Ashby Road
Burton-on-Trent
Staffordshire
DE15 0YZ

Telephone: 01283 554400
Facsimile: 01283 554422

Ryan Clark
SOCOTEC UK Doncaster
Askern Road
Carcroft
Doncaster
South Yorkshire
DN6 8DG

For the attention of Ryan Clark

Dear Ryan Clark

Sample Analysis - N8135-18 Heathrow

Samples from the above site have been analysed in accordance with the schedule supplied.
The sample details and the results of analyses for these samples are given in the appended report.

An invoice for this work will follow under a separate cover.

Where appropriate the samples will be kept until 04/08/18 when they will be discarded. Please call 01283 554649 for an extension of this date.
Please be aware that our policy for the retention of paper based laboratory records and analysis reports is 6 years.

The work was carried out in accordance with SOCOTEC UK Limited (Multi-Sector Services) Standard Terms and Conditions of Contract.

If I can be of any further assistance please do not hesitate to contact me.

Yours sincerely

for SOCOTEC UK Limited

P Williams
Project Co-ordinator
01283 554649

TEST REPORT

UKAS TESTING
1252

Report No. EFS/187039 (Ver. 1)

SOCOTEC UK Doncaster
Askern Road
Carcroft
Doncaster
South Yorkshire
DN6 8DG

Site: N8135-18 Heathrow

The 19 samples described in this report were registered for analysis by SOCOTEC UK Limited on 23-Jun-2018. This report supersedes any versions previously issued by the laboratory.
The analysis was completed by: 04-Jul-2018

Tests where the accreditation is set to N or No, and any individual data items marked with a * are not UKAS accredited.
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

The following tables are contained in this report:

On behalf of
SOCOTEC UK Lim
Tim Barnes Operations Director
Energy & Waste Services

Date of Issue: 04-Jul-2018

Tests marked '^' have been subcontracted to another laboratory.
Where samples have been flagged as deviant on the Analytical and Deviating Sample Overview, for any reason, the data may not be representative of the sample at the point of sampling and the validity of the data may be affected.
SOCOTEC UK Limited accepts no responsibility for any sampling not carried out by our personnel.

Units :			mg/kg	mg/l	%	%	pH Units											
Method Codes :			ICPACIDS	ICPWSS	ORGMAT	TSBRE1	WSLM50											
Method Reporting Limits :			20	10	0.1	0.005												
UKAS Accredited :			Yes	Yes	No	No	No											
LAB ID Number CL/	**Client Sample Description**	**Sample Date**	**SO4-- (acid sol)**	**SO4-- (H2O sol) mg/l**	**Organic Matter %**	**Total Sulphur.**	**pH (BS1377)**											
1910757	BH-1802 D 8 1.20	20-Jun-18	236	117		0.045	8.2											
1910758	BH-1047 B 11 1.50	20-Jun-18			6.6													
1910759	HEP-TP-1018 D 14 1.85	20-Jun-18	186	82		0.026	8.0											
1910760	HEP-BH-567 B 30 5.65	20-Jun-18	352	179		0.091	7.9											
1910761	TP10 B 10 2.00	20-Jun-18	181	100		0.036	8.3											
1910762	HEP-BH-775 D 35 9.50	20-Jun-18	62 §	36 §		0.024	8.5											
1910763	BH-1050 B 8 1.10	20-Jun-18			1.0													
1910764	HEP-BH502 D 28 5.20	20-Jun-18	250	117		0.032	8.0											
1910765	HEP-TT-1826 LB 6 0.20	20-Jun-18	1320	538		0.144	8.0											
1910766	HEP-BH-775 D 33 7.45	20-Jun-18	1140	557		0.424	7.9											
1910767	HEP-BH-775 D 35 9.50	20-Jun-18	1090	$$		0.294	8.0											
1910768	HEP-BH-45 UT 32 6.00	20-Jun-18	1140	$$		0.642	8.1											
1910769	HEP-TP-1019 D 8 0.45	20-Jun-18	490	231		0.056	8.2											
1910770	HEP-BH-12 B 12 1.00	20-Jun-18	206	66		0.031	8.3											
1910771	HEP-BH-S48 D 16 4.00	20-Jun-18	278 §	120 §		0.052	7.9											
1910772	BH-36 D 7 1.50	20-Jun-18	444	242		0.052	7.9											
1910773	HEP-BH-803 D 15 2.40	20-Jun-18	90 §	65 §		0.027	8.3											
1910774	HEP-TT-11 B 9 1.30	20-Jun-18	6940	991		0.242	7.8											
1910775	HEP-BH-567 LB 3 0.05	20-Jun-18	1060	229		0.060	8.1											

SOCOTEC

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Tel +44 (0) 1283 554400

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Client Name SOCOTEC UK Doncaster

Contact Ryan Clark

N8135-18 Heathrow

Sample Analysis

Date Printed	**04-Jul-2018**
Report Number	**EFS/187039**
Table Number	**1**

Where individual results are flagged see report notes for status.

Analytical and Deviating Sample Overview

Customer SOCOTEC UK Doncaster
Site N8135-18 Heathrow
Report No S187039

Consignment No S75657
Date Logged 23-Jun-2018
In-House Report Due 29-Jun-2018

Please note the results for any subcontracted analysis (identified with a '^') is likely to take up to an additional five working days.

ID Number	Description	MethodID	CustServ	Dep.Opt			ICPACIDS	ICPBRE	ICPWSS	KONECL	KoneNO3	ORGMAT	TSBRE1	WSLM50
		Sampled	REPORT A	DO Cl if pH<5.5	DO Mg if SO4(W)>3000	DO NO3 if pH<5.5	SO4-- (acid sol)	Magnesium (BRE)	SO4-- (H2O sol) mg/l	Chloride:(2:1)	Nitrate (BRE 2:1): mg/l	Organic Matter %	Total Sulphur.	pH (BS1377)
							✓		✓					
CL/1910757	BH-1802 1.20	20/06/18												
CL/1910758	BH-1047 1.50	20/06/18												
CL/1910759	HEP-TP-1018 1.85	20/06/18												
CL/1910760	HEP-BH-567 5.65	20/06/18												
CL/1910761	TP10 2.00	20/06/18												
CL/1910762	HEP-BH-775 9.50	20/06/18												
CL/1910763	BH-1050 1.10	20/06/18												
CL/1910764	HEP-BH502 5.20	20/06/18												
CL/1910765	HEP-TT-1826 0.20	20/06/18												
CL/1910766	HEP-BH-775 7.45	20/06/18												
CL/1910767	HEP-BH-775 9.50	20/06/18												
CL/1910768	HEP-BH-45 6.00	20/06/18												
CL/1910769	HEP-TP-1019 0.45	20/06/18												
CL/1910770	HEP-BH-12 1.00	20/06/18												
CL/1910771	HEP-BH-S48 4.00	20/06/18												

Note: We will endeavour to prioritise samples to complete analysis within holding time; however any delay could result in samples becoming deviant whilst being processed in the laboratory.

If sampling dates are missing or matrices unclassified then results will not be ISO 17025 accredited. Please contact us as soon as possible to provide missing information in order to reinstate accreditation.

Deviating Sample Key	
A	The sample was received in an inappropriate container for this analysis
B	The sample was received without the correct preservation for this analysis
C	Headspace present in the sample container
D	The sampling date was not supplied so holding time may be compromised - applicable to all analysis
E	Sample processing did not commence within the appropriate holding time
F	Sample processing did not commence within the appropriate handling time

Requested Analysis Key	
	Analysis Required
	Analysis dependant upon trigger result - **Note: due date may be affected if triggered**
	No analysis scheduled
^	Analysis Subcontracted - **Note: due date may vary**

Where individual results are flagged see report notes for status.

 The integrity of data for samples/analysis that have been categorised as Deviating may be compromised. Data may not be representative of the sample at the time of sampling.

Analytical and Deviating Sample Overview

Customer SOCOTEC UK Doncaster
Site N8135-18 Heathrow
Report No S187039

Consignment No S75657
Date Logged 23-Jun-2018
In-House Report Due 29-Jun-2018

Please note the results for any subcontracted analysis (identified with a '^') is likely to take up to an additional five working days.

ID Number	Description	MethodID	CustServ	Dep.Opt			ICPACIDS	ICPBRE	ICPWSS	KONECL	KoneNO3	ORGMAT	TSBRE1	WSLM50
		Sampled	REPORT A	DO Cl if pH<5.5	DO Mg if SO4(W)>3000	DO NO3 if pH<5.5	SO4-- (acid sol)	Magnesium (BRE)	SO4-- (H2O sol) mg/l	Chloride:(2:1)	Nitrate (BRE 2:1): mg/l	Organic Matter %	Total Sulphur.	pH (BS1377)
							✓		✓					
CL/1910772	BH-36 1.50	20/06/18												
CL/1910773	HEP-BH-803 2.40	20/06/18												
CL/1910774	HEP-TT-11 1.30	20/06/18												
CL/1910775	HEP-BH-567 0.05	20/06/18												

Note: We will endeavour to prioritise samples to complete analysis within holding time; however any delay could result in samples becoming deviant whilst being processed in the laboratory.

If sampling dates are missing or matrices unclassified then results will not be ISO 17025 accredited. Please contact us as soon as possible to provide missing information in order to reinstate accreditation.

Deviating Sample Key	
A	The sample was received in an inappropriate container for this analysis
B	The sample was received without the correct preservation for this analysis
C	Headspace present in the sample container
D	The sampling date was not supplied so holding time may be compromised - applicable to all analysis
E	Sample processing did not commence within the appropriate holding time
F	Sample processing did not commence within the appropriate handling time

Requested Analysis Key	
	Analysis Required
	Analysis dependant upon trigger result - **Note: due date may be affected if triggered**
	No analysis scheduled
^	Analysis Subcontracted - **Note: due date may vary**

Where individual results are flagged see report notes for status.

 The integrity of data for samples/analysis that have been categorised as Deviating may be compromised. Data may not be representative of the sample at the time of sampling.

Report Number : EFS/187039

Additional Report Notes

Method Code	Sample ID	The following information should be taken into consideration when using the data contained within this report
ICPWSS	CL/1910767 to CL/1910768	An attempt was made to perform extraction for ICPWSS analysis, however due to the nature of the sample, extraction was not possible and therefore the sample is not amenable for ICPWSS

Method Descriptions

Matrix	MethodID	Analysis Basis	Method Description
Soil	ICPACIDS	Oven Dried @ < 35°C	Determination of Total Sulphate in soil samples by Hydrochloric Acid extraction followed by ICPOES detection
Soil	ICPWSS	Oven Dried @ < 35°C	Determination of Water Soluble Sulphate in soil samples by water extraction followed by ICPOES detection
Soil	ORGMAT	Oven Dried @ < 35°C	Acid Dichromate oxidation of the sample followed by colorimetric analysis of the extract
Soil	TSBRE1	Oven Dried @ < 35°C	Determination of Total Carbon and/or Total Sulphur in solid samples by high temperature combustion/infrared detection
Soil	WSLM50	Oven Dried @ < 35°C	Determination of pH of 2.5:1 deionised water to soil extracts using pH probe.

Where individual results are flagged see report notes for status.

Report Notes

Generic Notes

Soil/Solid Analysis

Unless stated otherwise,
- Results expressed as mg/kg have been calculated on the basis indicated in the Method Description table.
  All results on MCERTS reports are reported on a 105ºC dry weight basis with the exception of pH and conductivity.
- Sulphate analysis not conducted in accordance with BS1377
- Water Soluble Sulphate is on a 2:1 water:soil extract

Waters Analysis

Unless stated otherwise results are expressed as mg/l

Nil: Where "Nil" has been entered against Total Alkalinity or Total Acidity this indicates that a measurement was not required due to the inherent pH of the sample.

Oil analysis specific

Unless stated otherwise,
- Results are expressed as mg/kg
- SG is expressed as g/cm^3@ 15^{o}C

Gas (Tedlar bag) Analysis

Unless stated otherwise, results are expressed as ug/l

Asbestos Analysis

CH Denotes Chrysotile **TR** Denotes Tremolite
CR Denotes Crocidolite **AC** Denotes Actinolite
AM Denotes Amosite **AN** Denotes Anthophylite
NAIIS No Asbestos Identified in Sample
NADIS No Asbestos Detected In Sample

Symbol Reference

^ Sub-contracted analysis.
$$ Unable to analyse due to the nature of the sample
¶ Samples submitted for this analyte were not preserved on site in accordance with laboratory protocols. This may have resulted in deterioration of the sample(s) during transit to the laboratory. Consequently the reported data may not represent the concentration of the target analyte present in the sample at the time of sampling
¥ Results for guidance only due to possible interference
& Blank corrected result
I.S Insufficient sample to complete requested analysis
I.S(g) Insufficient sample to re-analyse, results for guidance only
Intf Unable to analyse due to interferences
N.D Not determined **N.Det** Not detected
N.F No Flow
NS Information Not Supplied
Req Analysis requested, see attached sheets for results
Þ Raised detection limit due to nature of the sample
***** All accreditation has been removed by the laboratory for this result
‡ MCERTS accreditation has been removed for this result
§ accreditation has been removed for this result as it is a non-accredited matrix

Note: The Laboratory may only claim that data is accredited when all of the requirements of our Quality System have been met. Where these requirements have not been met the laboratory may elect to include the data in its final report and remove the accreditation from individual data items if it believes that the validity of the data has not been affected. If further details are required of the circumstances which have led to the removal of accreditation then please do not hesitate to contact the laboratory.

Sample Descriptions

Client : SOCOTEC UK Doncaster

Site : N8135-18 Heathrow

Report Number : S18_7039

Note: major constituent in upper case

Lab ID Number	Client ID	Description
CL/1910757	BH-1802 D 8 1.20	SAND
CL/1910758	BH-1047 B 11 1.50	SILT
CL/1910759	HEP-TP-1018 D 14 1.85	SILT
CL/1910760	HEP-BH-567 B 30 5.65	CLAY
CL/1910761	TP10 B 10 2.00	SILT
CL/1910762	HEP-BH-775 D 35 9.50	STONE
CL/1910763	BH-1050 B 8 1.10	SILT
CL/1910764	HEP-BH502 D 28 5.20	SILT
CL/1910765	HEP-TT-1826 LB 6 0.20	MADE GROUND
CL/1910766	HEP-BH-775 D 33 7.45	SILT
CL/1910767	HEP-BH-775 D 35 9.50	SILT
CL/1910768	HEP-BH-45 UT 32 6.00	SILT
CL/1910769	HEP-TP-1019 D 8 0.45	SILT
CL/1910770	HEP-BH-12 B 12 1.00	SILT
CL/1910771	HEP-BH-S48 D 16 4.00	STONE
CL/1910772	BH-36 D 7 1.50	SAND
CL/1910773	HEP-BH-803 D 15 2.40	STONE
CL/1910774	HEP-TT-11 B 9 1.30	MADE GROUND
CL/1910775	HEP-BH-567 LB 3 0.05	SILT

Our Ref: EFS/187040 (Ver. 1)
Your Ref: N8135-18

July 4, 2018

Environmental Chemistry
SOCOTEC UK Limited
Bretby Business Park
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DE15 0YZ

Telephone: 01283 554400
Facsimile: 01283 554422

Ryan Clark
SOCOTEC UK Doncaster
Askern Road
Carcroft
Doncaster
South Yorkshire
DN6 8DG

For the attention of Ryan Clark

Dear Ryan Clark

Sample Analysis - N8135-18 Heathrow

Samples from the above site have been analysed in accordance with the schedule supplied.
The sample details and the results of analyses for these samples are given in the appended report.

An invoice for this work will follow under a separate cover.

Where appropriate the samples will be kept until 04/08/18 when they will be discarded. Please call 01283 554649 for an extension of this date.
Please be aware that our policy for the retention of paper based laboratory records and analysis reports is 6 years.

The work was carried out in accordance with SOCOTEC UK Limited (Multi-Sector Services) Standard Terms and Conditions of Contract.

If I can be of any further assistance please do not hesitate to contact me.

Yours sincerely

for SOCOTEC UK Limited

P Williams
Project Co-ordinator
01283 554649

TEST REPORT

1252

Report No. EFS/187040 (Ver. 1)

SOCOTEC UK Doncaster
Askern Road
Carcroft
Doncaster
South Yorkshire
DN6 8DG

Site: N8135-18 Heathrow

The 1 sample described in this report were registered for analysis by SOCOTEC UK Limited on 23-Jun-2018. This report supersedes any versions previously issued by the laboratory.
The analysis was completed by: 04-Jul-2018

Tests where the accreditation is set to N or No, and any individual data items marked with a * are not UKAS accredited.
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

The following tables are contained in this report:

On behalf of
SOCOTEC UK Lim
Tim Barnes Operations Director
Energy & Waste Services

Date of Issue: 04-Jul-2018

Tests marked '^' have been subcontracted to another laboratory.
Where samples have been flagged as deviant on the Analytical and Deviating Sample Overview, for any reason, the data may not be representative of the sample at the point of sampling and the validity of the data may be affected.
SOCOTEC UK Limited accepts no responsibility for any sampling not carried out by our personnel.

Where individual results are flagged see report notes for status.

Units :			mg/kg	mg/l	%	pH Units												
Method Codes :			ICPACIDS	ICPWSS	TSBRE1	WSLM50												
Method Reporting Limits :			20	10	0.005													
UKAS Accredited :			Yes	Yes	No	No												
LAB ID Number CL/	**Client Sample Description**	**Sample Date**	**SO4-- (acid sol)**	**SO4-- (H2O sol) mg/l**	**Total Sulphur.**	**pH (BS1377)**												
1910776	BH47 D 15 3.00	**20-Jun-18**	1270	$$	0.284	8.1												

SOCOTEC

Bretby Business Park, Ashby Road

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Client Name	**SOCOTEC UK Doncaster**
Contact	Ryan Clark

N8135-18 Heathrow

Sample Analysis

Date Printed	**04-Jul-2018**
Report Number	**EFS/187040**
Table Number	**1**

Analytical and Deviating Sample Overview

Customer SOCOTEC UK Doncaster
Site N8135-18 Heathrow
Report No S187040

Consignment No S75657
Date Logged 23-Jun-2018
In-House Report Due 29-Jun-2018

Please note the results for any subcontracted analysis (identified with a '^') is likely to take up to an additional five working days.

ID Number	Description	MethodID	CustServ	Dep.Opt			ICPACIDS	ICPBRE	ICPWSS	KONECL	KoneNO3	TSBRE1	WSLM50
		Sampled	REPORT A	DO Cl if pH<5.5	DO Mg if SO4(W)>3000	DO NO3 if pH<5.5	SO4-- (acid sol)	Magnesium (BRE)	SO4-- (H2O sol) mg/l	Chloride:(2:1)	Nitrate (BRE 2:1): mg/l	Total Sulphur.	pH (BS1377)
							✓		✓				
CL/1910776	BH47 3.00	20/06/18											

Note: We will endeavour to prioritise samples to complete analysis within holding time; however any delay could result in samples becoming deviant whilst being processed in the laboratory.

If sampling dates are missing or matrices unclassified then results will not be ISO 17025 accredited. Please contact us as soon as possible to provide missing information in order to reinstate accreditation.

Deviating Sample Key	
A	The sample was received in an inappropriate container for this analysis
B	The sample was received without the correct preservation for this analysis
C	Headspace present in the sample container
D	The sampling date was not supplied so holding time may be compromised - applicable to all analysis
E	Sample processing did not commence within the appropriate holding time
F	Sample processing did not commence within the appropriate handling time

Requested Analysis Key	
	Analysis Required
	Analysis dependant upon trigger result - **Note: due date may be affected if triggered**
	No analysis scheduled
^	Analysis Subcontracted - **Note: due date may vary**

Where individual results are flagged see report notes for status.

 The integrity of data for samples/analysis that have been categorised as Deviating may be compromised. Data may not be representative of the sample at the time of sampling.

Report Number : EFS/187040

Additional Report Notes

Method Code	Sample ID	The following information should be taken into consideration when using the data contained within this report
ICPWSS	CL/1910776	An attempt was made to perform extraction for ICPWSS analysis, however due to the nature of the sample, extraction was not possible and therefore the sample is not amenable for ICPWSS

Where individual results are flagged see report notes for status.

Method Descriptions

Matrix	MethodID	Analysis Basis	Method Description
Soil	ICPACIDS	Oven Dried @ < 35°C	Determination of Total Sulphate in soil samples by Hydrochloric Acid extraction followed by ICPOES detection
Soil	ICPWSS	Oven Dried @ < 35°C	Determination of Water Soluble Sulphate in soil samples by water extraction followed by ICPOES detection
Soil	TSBRE1	Oven Dried @ < 35°C	Determination of Total Carbon and/or Total Sulphur in solid samples by high temperature combustion/infrared detection
Soil	WSLM50	Oven Dried @ < 35°C	Determination of pH of 2.5:1 deionised water to soil extracts using pH probe.

Where individual results are flagged see report notes for status.

Report Notes

Generic Notes

Soil/Solid Analysis

Unless stated otherwise,
- Results expressed as mg/kg have been calculated on the basis indicated in the Method Description table.
  All results on MCERTS reports are reported on a 105ºC dry weight basis with the exception of pH and conductivity.
- Sulphate analysis not conducted in accordance with BS1377
- Water Soluble Sulphate is on a 2:1 water:soil extract

Waters Analysis

Unless stated otherwise results are expressed as mg/l

Nil: Where "Nil" has been entered against Total Alkalinity or Total Acidity this indicates that a measurement was not required due to the inherent pH of the sample.

Oil analysis specific

Unless stated otherwise,
- Results are expressed as mg/kg
- SG is expressed as g/cm^3@ 15^{o}C

Gas (Tedlar bag) Analysis

Unless stated otherwise, results are expressed as ug/l

Asbestos Analysis

CH Denotes Chrysotile **TR** Denotes Tremolite
CR Denotes Crocidolite **AC** Denotes Actinolite
AM Denotes Amosite **AN** Denotes Anthophylite
NAIIS No Asbestos Identified in Sample
NADIS No Asbestos Detected In Sample

Symbol Reference

^ Sub-contracted analysis.
$$ Unable to analyse due to the nature of the sample
¶ Samples submitted for this analyte were not preserved on site in accordance with laboratory protocols. This may have resulted in deterioration of the sample(s) during transit to the laboratory. Consequently the reported data may not represent the concentration of the target analyte present in the sample at the time of sampling
¥ Results for guidance only due to possible interference
& Blank corrected result
I.S Insufficient sample to complete requested analysis
I.S(g) Insufficient sample to re-analyse, results for guidance only
Intf Unable to analyse due to interferences
N.D Not determined **N.Det** Not detected
N.F No Flow
NS Information Not Supplied
Req Analysis requested, see attached sheets for results
Þ Raised detection limit due to nature of the sample
***** All accreditation has been removed by the laboratory for this result
‡ MCERTS accreditation has been removed for this result
§ accreditation has been removed for this result as it is a non-accredited matrix

Note: The Laboratory may only claim that data is accredited when all of the requirements of our Quality System have been met. Where these requirements have not been met the laboratory may elect to include the data in its final report and remove the accreditation from individual data items if it believes that the validity of the data has not been affected. If further details are required of the circumstances which have led to the removal of accreditation then please do not hesitate to contact the laboratory.

Sample Descriptions

Client : SOCOTEC UK Doncaster
Site : N8135-18 Heathrow
Report Number : S18_7040

Note: major constituent in upper case

Lab ID Number	Client ID	Description
CL/1910776	BH47 D 15 3.00	CLAY

Our Ref: EFS/187203 (Ver. 1)
Your Ref: N8135-18

July 9, 2018

Environmental Chemistry
SOCOTEC UK Limited
Bretby Business Park
Ashby Road
Burton-on-Trent
Staffordshire
DE15 0YZ

Telephone: 01283 554400
Facsimile: 01283 554422

Ryan Clark
SOCOTEC - Geotechnical Laboratory
Askern Road
Carcroft
Doncaster
South Yorkshire
DN6 8DG

For the attention of Ryan Clark

Dear Ryan Clark

Sample Analysis - N8135-18 Heathrow

Samples from the above site have been analysed in accordance with the schedule supplied.
The sample details and the results of analyses for these samples are given in the appended report.

An invoice for this work will follow under a separate cover.

Where appropriate the samples will be kept until 09/08/18 when they will be discarded. Please call 01283 554649 for an extension of this date.
Please be aware that our policy for the retention of paper based laboratory records and analysis reports is 6 years.

The work was carried out in accordance with SOCOTEC UK Limited (Multi-Sector Services) Standard Terms and Conditions of Contract.

If I can be of any further assistance please do not hesitate to contact me.

Yours sincerely

for SOCOTEC UK Limited

P Williams
Project Co-ordinator
01283 554649

TEST REPORT

1252

Report No. EFS/187203 (Ver. 1)

SOCOTEC - Geotechnical Laboratory
Askern Road
Carcroft
Doncaster
South Yorkshire
DN6 8DG

Site: N8135-18 Heathrow

The 3 samples described in this report were registered for analysis by SOCOTEC UK Limited on 28-Jun-2018. This report supersedes any versions previously issued by the laboratory.
The analysis was completed by: 09-Jul-2018

Tests where the accreditation is set to N or No, and any individual data items marked with a * are not UKAS accredited.
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

The following tables are contained in this report:

On behalf of
SOCOTEC UK Lim
Tim Barnes
Operations Director
Energy & Waste Services

Date of Issue: 09-Jul-2018

Tests marked '^' have been subcontracted to another laboratory.
Where samples have been flagged as deviant on the Analytical and Deviating Sample Overview, for any reason, the data may not be representative of the sample at the point of sampling and the validity of the data may be affected.
SOCOTEC UK Limited accepts no responsibility for any sampling not carried out by our personnel.

Where individual results are flagged see report notes for status.

Units :			mg/kg	mg/l	%	pH Units												
Method Codes :			ICPACIDS	ICPWSS	TSBRE1	WSLM50												
Method Reporting Limits :			20	10	0.005													
UKAS Accredited :			Yes	Yes	No	No												
LAB ID Number CL/	**Client Sample Description**	**Sample Date**	**SO4-- (acid sol)**	**SO4-- (H2O sol) mg/l**	**Total Sulphur.**	**pH (BS1377)**												
1911578	BH513 1.70	25-Jun-18	1660	397	0.112	8.2												
1911579	BH02 0.25	25-Jun-18	784	115	0.051	7.9												
1911580	TP-972 2.55	25-Jun-18	1290	570	0.092	7.9												

SOCOTEC

Bretby Business Park, Ashby Road

Burton-on-Trent, Staffordshire, DE15 0YZ

Tel +44 (0) 1283 554400

Fax +44 (0) 1283 554422

Client Name	**SOCOTEC - Geotechnical Laboratory**
Contact	Ryan Clark

N8135-18 Heathrow

Sample Analysis

Date Printed	**09-Jul-2018**
Report Number	**EFS/187203**
Table Number	**1**

SOCOTEC UK Ltd Environmental Chemistry
Analytical and Deviating Sample Overview

Customer SOCOTEC - Geotechnical Laboratory
Site N8135-18 Heathrow
Report No S187203

Consignment No S75794
Date Logged 28-Jun-2018
In-House Report Due 04-Jul-2018

Please note the results for any subcontracted analysis (identified with a '^') is likely to take up to an additional five working days.

ID Number	Description	MethodID	CustServ	Dep.Opt			ICPACIDS	ICPBRE	ICPWSS	KONECL	KoneNO3	TSBRE1	WSLM50
		Sampled	REPORT A	DO Cl if pH<5.5	DO Mg if SO4(W)>3000	DO NO3 if pH<5.5	SO4-- (acid sol)	Magnesium (BRE)	SO4-- (H2O sol) mg/l	Chloride:(2:1)	Nitrate (BRE 2:1): mg/l	Total Sulphur.	pH (BS1377)
							✓		✓				
CL/1911578	BH513 1.70	25/06/18											
CL/1911579	BH02 0.25	25/06/18											
CL/1911580	TP-972 2.55	25/06/18											

Note: We will endeavour to prioritise samples to complete analysis within holding time; however any delay could result in samples becoming deviant whilst being processed in the laboratory.

If sampling dates are missing or matrices unclassified then results will not be ISO 17025 accredited. Please contact us as soon as possible to provide missing information in order to reinstate accreditation.

Deviating Sample Key	
A	The sample was received in an inappropriate container for this analysis
B	The sample was received without the correct preservation for this analysis
C	Headspace present in the sample container
D	The sampling date was not supplied so holding time may be compromised - applicable to all analysis
E	Sample processing did not commence within the appropriate holding time
F	Sample processing did not commence within the appropriate handling time

Requested Analysis Key	
	Analysis Required
	Analysis dependant upon trigger result - **Note: due date may be affected if triggered**
	No analysis scheduled
^	Analysis Subcontracted - **Note: due date may vary**

Where individual results are flagged see report notes for status.

 The integrity of data for samples/analysis that have been categorised as Deviating may be compromised. Data may not be representative of the sample at the time of sampling.

Method Descriptions

Matrix	MethodID	Analysis Basis	Method Description
Soil	ICPACIDS	Oven Dried @ < 35°C	Determination of Total Sulphate in soil samples by Hydrochloric Acid extraction followed by ICPOES detection
Soil	ICPWSS	Oven Dried @ < 35°C	Determination of Water Soluble Sulphate in soil samples by water extraction followed by ICPOES detection
Soil	TSBRE1	Oven Dried @ < 35°C	Determination of Total Carbon and/or Total Sulphur in solid samples by high temperature combustion/infrared detection
Soil	WSLM50	Oven Dried @ < 35°C	Determination of pH of 2.5:1 deionised water to soil extracts using pH probe.

Where individual results are flagged see report notes for status.

Report Notes

Generic Notes

Soil/Solid Analysis

Unless stated otherwise,
- Results expressed as mg/kg have been calculated on the basis indicated in the Method Description table.
  All results on MCERTS reports are reported on a 105ºC dry weight basis with the exception of pH and conductivity.
- Sulphate analysis not conducted in accordance with BS1377
- Water Soluble Sulphate is on a 2:1 water:soil extract

Waters Analysis

Unless stated otherwise results are expressed as mg/l

Nil: Where "Nil" has been entered against Total Alkalinity or Total Acidity this indicates that a measurement was not required due to the inherent pH of the sample.

Oil analysis specific

Unless stated otherwise,
- Results are expressed as mg/kg
- SG is expressed as g/cm^3@ 15^{o}C

Gas (Tedlar bag) Analysis

Unless stated otherwise, results are expressed as ug/l

Asbestos Analysis

CH Denotes Chrysotile **TR** Denotes Tremolite
CR Denotes Crocidolite **AC** Denotes Actinolite
AM Denotes Amosite **AN** Denotes Anthophylite
NAIIS No Asbestos Identified in Sample
NADIS No Asbestos Detected In Sample

Symbol Reference

^ Sub-contracted analysis.
$$ Unable to analyse due to the nature of the sample
¶ Samples submitted for this analyte were not preserved on site in accordance with laboratory protocols. This may have resulted in deterioration of the sample(s) during transit to the laboratory. Consequently the reported data may not represent the concentration of the target analyte present in the sample at the time of sampling
¥ Results for guidance only due to possible interference
& Blank corrected result
I.S Insufficient sample to complete requested analysis
I.S(g) Insufficient sample to re-analyse, results for guidance only
Intf Unable to analyse due to interferences
N.D Not determined **N.Det** Not detected
N.F No Flow
NS Information Not Supplied
Req Analysis requested, see attached sheets for results
Þ Raised detection limit due to nature of the sample
***** All accreditation has been removed by the laboratory for this result
‡ MCERTS accreditation has been removed for this result
§ accreditation has been removed for this result as it is a non-accredited matrix

Note: The Laboratory may only claim that data is accredited when all of the requirements of our Quality System have been met. Where these requirements have not been met the laboratory may elect to include the data in its final report and remove the accreditation from individual data items if it believes that the validity of the data has not been affected. If further details are required of the circumstances which have led to the removal of accreditation then please do not hesitate to contact the laboratory.

Sample Descriptions

Client : SOCOTEC - Geotechnical Laboratory

Site : N8135-18 Heathrow

Report Number : S18_7203

Note: major constituent in upper case

Lab ID Number	Client ID	Description
CL/1911578	BH513 1.70	MADE GROUND
CL/1911579	BH02 0.25	MADE GROUND
CL/1911580	TP-972 2.55	SILT

Our Ref: EFS/187293 (Ver. 1)
Your Ref: N8135-18

July 12, 2018

Environmental Chemistry
SOCOTEC UK Limited
Bretby Business Park
Ashby Road
Burton-on-Trent
Staffordshire
DE15 0YZ

Telephone: 01283 554400
Facsimile: 01283 554422

Ryan Clark
SOCOTEC UK Doncaster
Askern Road
Carcroft
Doncaster
South Yorkshire
DN6 8DG

For the attention of Ryan Clark

Dear Ryan Clark

Sample Analysis - N8135-18 Heathrow

Samples from the above site have been analysed in accordance with the schedule supplied.
The sample details and the results of analyses for these samples are given in the appended report.

An invoice for this work will follow under a separate cover.

Where appropriate the samples will be kept until 10/08/18 when they will be discarded. Please call 01283 554649 for an extension of this date.
Please be aware that our policy for the retention of paper based laboratory records and analysis reports is 6 years.

The work was carried out in accordance with SOCOTEC UK Limited (Multi-Sector Services) Standard Terms and Conditions of Contract.

If I can be of any further assistance please do not hesitate to contact me.

Yours sincerely

for SOCOTEC UK Limited

P Williams
Project Co-ordinator
01283 554649

TEST REPORT

1252

Report No. EFS/187293 (Ver. 1)

SOCOTEC UK Doncaster
Askern Road
Carcroft
Doncaster
South Yorkshire
DN6 8DG

Site: N8135-18 Heathrow

The 14 samples described in this report were registered for analysis by SOCOTEC UK Limited on 29-Jun-2018. This report supersedes any versions previously issued by the laboratory.

The analysis was completed by: 12-Jul-2018

Tests where the accreditation is set to N or No, and any individual data items marked with a * are not UKAS accredited.
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

The following tables are contained in this report:

On behalf of
SOCOTEC UK Lim
Tim Barnes Operations Director
Energy & Waste Services

Date of Issue: 12-Jul-2018

Tests marked '^' have been subcontracted to another laboratory.

Where samples have been flagged as deviant on the Analytical and Deviating Sample Overview, for any reason, the data may not be representative of the sample at the point of sampling and the validity of the data may be affected. SOCOTEC UK Limited accepts no responsibility for any sampling not carried out by our personnel.

Where individual results are flagged see report notes for status.

Units :			mg/kg	mg/l	%	%	%	pH Units										
Method Codes :			ICPACIDS	ICPWSS	LOI(%MM)	ORGMAT	TSBRE1	WSLM50										
Method Reporting Limits :			20	10	0.2	0.1	0.005											
UKAS Accredited :			Yes	Yes	No	No	No	No										
LAB ID Number CL/	**Client Sample Description**	**Sample Date**	**SO4-- (acid sol)**	**SO4-- (H2O sol) mg/l**	**L.O.I. % @ 450C**	**Organic Matter %**	**Total Sulphur.**	**pH (BS1377)**										
1912000	HEP-BH-521 B 16 3.20	28-Jun-18				3.5												
1912001	BH826 D 6 1.25	28-Jun-18	382	66	2.5	1.4	0.042	8.2										
1912002	BH826 D 34 6.10	28-Jun-18	1830	921			0.475	7.7										
1912003	BH826 D 21 4.00	28-Jun-18	515	163			0.092	8.0										
1912004	BH47 LB 9 1.00	28-Jun-18	692	225			0.068	7.9										
1912005	BH533 D 10 1.20	28-Jun-18				1.5												
1912006	TT557 D 14 2.00	28-Jun-18	700	282			0.047	7.8										
1912007	HEP-TP-489 LB 6 1.10	28-Jun-18	2540	544			0.130	9.1										
1912008	HEP-BH-513 LB 17 3.60	28-Jun-18	6660	1960			0.974	7.5										
1912009	TT511 D 14 3.50	28-Jun-18	996	402			0.116	8.0										
1912010	TT522 D 6 0.25	28-Jun-18	290	40			0.039	7.9										
1912011	TT539 D 5 0.15	28-Jun-18	922	125			0.076	7.8										
1912012	HEP-BH-533 D 26 5.20	28-Jun-18			2.0													
1912013	TT518 D 5 0.80	28-Jun-18	721	134			0.067	7.9										

SOCOTEC

Bretby Business Park, Ashby Road

Burton-on-Trent, Staffordshire, DE15 0YZ

Tel +44 (0) 1283 554400

Fax +44 (0) 1283 554422

Client Name SOCOTEC UK Doncaster

Contact Ryan Clark

N8135-18 Heathrow

Sample Analysis

Date Printed	**12-Jul-2018**
Report Number	**EFS/187293**
Table Number	**1**

Where individual results are flagged see report notes for status.

Analytical and Deviating Sample Overview

Customer SOCOTEC UK Doncaster
Site N8135-18 Heathrow
Report No S187293

Consignment No S75903
Date Logged 29-Jun-2018
In-House Report Due 06-Jul-2018

Please note the results for any subcontracted analysis (identified with a '^') is likely to take up to an additional five working days.

ID Number	Description	Sampled	MethodID	CustServ	Dep.Opt			ICPACIDS	ICPBRE	ICPWSS	KONECL	KoneNO3	LOI(%MM)	ORGMAT	TSBRE1	WSLM50
				REPORT A	DO Cl if pH<5.5	DO Mg if SO4(W)>3000	DO NO3 if pH<5.5	SO4-- (acid sol)	Magnesium (BRE)	SO4-- (H2O sol) mg/l	Chloride:(2:1)	Nitrate (BRE 2:1): mg/l	L.O.I. % @ 450C	Organic Matter %	Total Sulphur.	pH (BS1377)
								✓		✓						
CL/1912000	HEP-BH-521 3.20	28/06/18														
CL/1912001	BH826 1.25	28/06/18														
CL/1912002	BH826 6.10	28/06/18														
CL/1912003	BH826 4.00	28/06/18														
CL/1912004	BH47 1.00	28/06/18														
CL/1912005	BH533 1.20	28/06/18														
CL/1912006	TT557 2.00	28/06/18														
CL/1912007	HEP-TP-489 1.10	28/06/18														
CL/1912008	HEP-BH-513 3.60	28/06/18														
CL/1912009	TT511 3.50	28/06/18														
CL/1912010	TT522 0.25	28/06/18														
CL/1912011	TT539 0.15	28/06/18														
CL/1912012	HEP-BH-533 5.20	28/06/18														
CL/1912013	TT518 0.80	28/06/18														

Note: We will endeavour to prioritise samples to complete analysis within holding time; however any delay could result in samples becoming deviant whilst being processed in the laboratory.

If sampling dates are missing or matrices unclassified then results will not be ISO 17025 accredited. Please contact us as soon as possible to provide missing information in order to reinstate accreditation.

Deviating Sample Key	
A	The sample was received in an inappropriate container for this analysis
B	The sample was received without the correct preservation for this analysis
C	Headspace present in the sample container
D	The sampling date was not supplied so holding time may be compromised - applicable to all analysis
E	Sample processing did not commence within the appropriate holding time
F	Sample processing did not commence within the appropriate handling time

Requested Analysis Key	
	Analysis Required
	Analysis dependant upon trigger result - **Note: due date may be affected if triggered**
	No analysis scheduled
^	Analysis Subcontracted - **Note: due date may vary**

Where individual results are flagged see report notes for status.

 The integrity of data for samples/analysis that have been categorised as Deviating may be compromised. Data may not be representative of the sample at the time of sampling.

Method Descriptions

Matrix	MethodID	Analysis Basis	Method Description
Soil	ICPACIDS	Oven Dried @ < 35°C	Determination of Total Sulphate in soil samples by Hydrochloric Acid extraction followed by ICPOES detection
Soil	ICPWSS	Oven Dried @ < 35°C	Determination of Water Soluble Sulphate in soil samples by water extraction followed by ICPOES detection
Soil	LOI(%MM)	Oven Dried @ < 35°C	Determination of loss on ignition for soil samples at specified temperature by gravimetry
Soil	ORGMAT	Oven Dried @ < 35°C	Acid Dichromate oxidation of the sample followed by colorimetric analysis of the extract
Soil	TSBRE1	Oven Dried @ < 35°C	Determination of Total Carbon and/or Total Sulphur in solid samples by high temperature combustion/infrared detection
Soil	WSLM50	Oven Dried @ < 35°C	Determination of pH of 2.5:1 deionised water to soil extracts using pH probe.

Where individual results are flagged see report notes for status.

Report Notes

Generic Notes

Soil/Solid Analysis

Unless stated otherwise,
- Results expressed as mg/kg have been calculated on the basis indicated in the Method Description table.
  All results on MCERTS reports are reported on a 105ºC dry weight basis with the exception of pH and conductivity.
- Sulphate analysis not conducted in accordance with BS1377
- Water Soluble Sulphate is on a 2:1 water:soil extract

Waters Analysis

Unless stated otherwise results are expressed as mg/l

Nil: Where "Nil" has been entered against Total Alkalinity or Total Acidity this indicates that a measurement was not required due to the inherent pH of the sample.

Oil analysis specific

Unless stated otherwise,
- Results are expressed as mg/kg
- SG is expressed as g/cm^3@ 15^{o}C

Gas (Tedlar bag) Analysis

Unless stated otherwise, results are expressed as ug/l

Asbestos Analysis

CH Denotes Chrysotile **TR** Denotes Tremolite
CR Denotes Crocidolite **AC** Denotes Actinolite
AM Denotes Amosite **AN** Denotes Anthophylite
NAIIS No Asbestos Identified in Sample
NADIS No Asbestos Detected In Sample

Symbol Reference

^ Sub-contracted analysis.
$$ Unable to analyse due to the nature of the sample
¶ Samples submitted for this analyte were not preserved on site in accordance with laboratory protocols. This may have resulted in deterioration of the sample(s) during transit to the laboratory. Consequently the reported data may not represent the concentration of the target analyte present in the sample at the time of sampling
¥ Results for guidance only due to possible interference
& Blank corrected result
I.S Insufficient sample to complete requested analysis
I.S(g) Insufficient sample to re-analyse, results for guidance only
Intf Unable to analyse due to interferences
N.D Not determined **N.Det** Not detected
N.F No Flow
NS Information Not Supplied
Req Analysis requested, see attached sheets for results
Þ Raised detection limit due to nature of the sample
***** All accreditation has been removed by the laboratory for this result
‡ MCERTS accreditation has been removed for this result
§ accreditation has been removed for this result as it is a non-accredited matrix

Note: The Laboratory may only claim that data is accredited when all of the requirements of our Quality System have been met. Where these requirements have not been met the laboratory may elect to include the data in its final report and remove the accreditation from individual data items if it believes that the validity of the data has not been affected. If further details are required of the circumstances which have led to the removal of accreditation then please do not hesitate to contact the laboratory.

Sample Descriptions

Client : SOCOTEC UK Doncaster

Site : N8135-18 Heathrow

Report Number : S18_7293

Note: major constituent in upper case

Lab ID Number	Client ID	Description
CL/1912000	HEP-BH-521 B 16 3.20	SILT
CL/1912001	BH826 D 6 1.25	SILT
CL/1912002	BH826 D 34 6.10	CLAY
CL/1912003	BH826 D 21 4.00	SILT
CL/1912004	BH47 LB 9 1.00	SILT
CL/1912005	BH533 D 10 1.20	CLAY
CL/1912006	TT557 D 14 2.00	SILT
CL/1912007	HEP-TP-489 LB 6 1.10	SILT
CL/1912008	HEP-BH-513 LB 17 3.60	SILT
CL/1912009	TT511 D 14 3.50	SILT
CL/1912010	TT522 D 6 0.25	SILT
CL/1912011	TT539 D 5 0.15	SILT
CL/1912012	HEP-BH-533 D 26 5.20	SILT
CL/1912013	TT518 D 5 0.80	SILT

Our Ref: EFS/187666 (Ver. 1)
Your Ref: N8135-18

July 18, 2018

Environmental Chemistry
SOCOTEC UK Limited
Bretby Business Park
Ashby Road
Burton-on-Trent
Staffordshire
DE15 0YZ

Telephone: 01283 554400
Facsimile: 01283 554422

Ryan Clark
SOCOTEC - Geotechnical Laboratory
Askern Road
Carcroft
Doncaster
South Yorkshire
DN6 8DG

For the attention of Ryan Clark

Dear Ryan Clark

Sample Analysis - N8135-18 Heathrow

Samples from the above site have been analysed in accordance with the schedule supplied.
The sample details and the results of analyses for these samples are given in the appended report.

An invoice for this work will follow under a separate cover.

Where appropriate the samples will be kept until 23/08/18 when they will be discarded. Please call 01283 554649 for an extension of this date.
Please be aware that our policy for the retention of paper based laboratory records and analysis reports is 6 years.

The work was carried out in accordance with SOCOTEC UK Limited (Multi-Sector Services) Standard Terms and Conditions of Contract.

If I can be of any further assistance please do not hesitate to contact me.

Yours sincerely

for SOCOTEC UK Limited

P Williams
Project Co-ordinator
01283 554649

TEST REPORT

1252

Report No. EFS/187666 (Ver. 1)

SOCOTEC - Geotechnical Laboratory
Askern Road
Carcroft
Doncaster
South Yorkshire
DN6 8DG

Site: N8135-18 Heathrow

The 13 samples described in this report were registered for analysis by SOCOTEC UK Limited on 12-Jul-2018. This report supersedes any versions previously issued by the laboratory.

The analysis was completed by: 18-Jul-2018

Tests where the accreditation is set to N or No, and any individual data items marked with a * are not UKAS accredited.
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

The following tables are contained in this report:

On behalf of
SOCOTEC UK Lim
Tim Barnes Operations Director
Energy & Waste Services

Date of Issue: 18-Jul-2018

Tests marked '^' have been subcontracted to another laboratory.

Where samples have been flagged as deviant on the Analytical and Deviating Sample Overview, for any reason, the data may not be representative of the sample at the point of sampling and the validity of the data may be affected. SOCOTEC UK Limited accepts no responsibility for any sampling not carried out by our personnel.

Where individual results are flagged see report notes for status.

Units :			mg/kg	mg/l	%	%	%	pH Units										
Method Codes :			ICPACIDS	ICPWSS	LOI(%MM)	ORGMAT	TSBRE1	WSLM50										
Method Reporting Limits :			20	10	0.2	0.1	0.005											
UKAS Accredited :			Yes	Yes	No	No	No	No										
LAB ID Number CL/	**Client Sample Description**	**Sample Date**	**SO4-- (acid sol)**	**SO4-- (H2O sol) mg/l**	**L.O.I. % @ 450C**	**Organic Matter %**	**Total Sulphur.**	**pH (BS1377)**										
1913742	HEP-BH-77 D 19 3.30	10-Jul-18	505	258			0.041	8.6										
1913743	HEP-BH-556 D 4 0.75	10-Jul-18	505	117			0.079	8.1										
1913744	HEP-BH-515 D 7 0.80	10-Jul-18	1000	221			0.152	7.6										
1913745	HEP-BH-476 LB 8 1.20	10-Jul-18				1.6												
1913746	HEP-BH-1937 D 20 4.10	10-Jul-18	333	157			0.038	6.4										
1913747	HEP-BH-487 D 21 4.20	10-Jul-18	474	169			0.048	9.0										
1913748	HEP-BH-487 D 17 3.55	10-Jul-18				1.6												
1913749	HEP-BH-522 D 12 3.20	10-Jul-18			3.0	1.6												
1913750	HEP-TP-1022 D 2 0.10	10-Jul-18	718	140			0.065	7.4										
1913751	HEP-BH-515 D 26 6.80	10-Jul-18	1930	964			0.462	7.5										
1913752	HEP-BH-530 D 21 4.80	10-Jul-18			2.9	1.2												
1913753	HEP-TT-11 B 9 1.30	10-Jul-18				1.2												
1913754	HEP-BH-1937 D 27 6.45	10-Jul-18	967	442			0.294	7.9										

SOCOTEC

Bretby Business Park, Ashby Road

Burton-on-Trent, Staffordshire, DE15 0YZ

Tel +44 (0) 1283 554400

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Client Name SOCOTEC - Geotechnical Laboratory

Contact Ryan Clark

N8135-18 Heathrow

Sample Analysis

Date Printed	**18-Jul-2018**
Report Number	**EFS/187666**
Table Number	**1**

Where individual results are flagged see report notes for status.

SOCOTEC UK Ltd Environmental Chemistry
Analytical and Deviating Sample Overview

Customer SOCOTEC - Geotechnical Laboratory
Site N8135-18 Heathrow
Report No S187666

Consignment No S76177
Date Logged 12-Jul-2018
In-House Report Due 18-Jul-2018

Please note the results for any subcontracted analysis (identified with a '^') is likely to take up to an additional five working days.

ID Number	Description	MethodID	CustServ	Dep.Opt			ICPACIDS	ICPBRE	ICPWSS	KONECL	KoneNO3	LOI(%MM)	ORGMAT	TSBRE1	WSLM50
		Sampled	REPORT A	DO Cl if pH<5.5	DO Mg if SO4(W)>3000	DO NO3 if pH<5.5	SO4-- (acid sol)	Magnesium (BRE)	SO4-- (H2O sol) mg/l	Chloride:(2:1)	Nitrate (BRE 2:1): mg/l	L.O.I. % @ 450C	Organic Matter %	Total Sulphur.	pH (BS1377)
							✓		✓						
CL/1913742	HEP-BH-77 3.30	10/07/18													
CL/1913743	HEP-BH-556 0.75	10/07/18													
CL/1913744	HEP-BH-515 0.80	10/07/18													
CL/1913745	HEP-BH-476 1.20	10/07/18													
CL/1913746	HEP-BH-1937 4.10	10/07/18													
CL/1913747	HEP-BH-487 4.20	10/07/18													
CL/1913748	HEP-BH-487 3.55	10/07/18													
CL/1913749	HEP-BH-522 3.20	10/07/18													
CL/1913750	HEP-TP-1022 0.10	10/07/18													
CL/1913751	HEP-BH-515 6.80	10/07/18													
CL/1913752	HEP-BH-530 4.80	10/07/18													
CL/1913753	HEP-TT-11 1.30	10/07/18													
CL/1913754	HEP-BH-1937 6.45	10/07/18													

Note: We will endeavour to prioritise samples to complete analysis within holding time; however any delay could result in samples becoming deviant whilst being processed in the laboratory.

If sampling dates are missing or matrices unclassified then results will not be ISO 17025 accredited. Please contact us as soon as possible to provide missing information in order to reinstate accreditation.

Deviating Sample Key	
A	The sample was received in an inappropriate container for this analysis
B	The sample was received without the correct preservation for this analysis
C	Headspace present in the sample container
D	The sampling date was not supplied so holding time may be compromised - applicable to all analysis
E	Sample processing did not commence within the appropriate holding time
F	Sample processing did not commence within the appropriate handling time

Requested Analysis Key	
	Analysis Required
	Analysis dependant upon trigger result - **Note: due date may be affected if triggered**
	No analysis scheduled
^	Analysis Subcontracted - **Note: due date may vary**

Where individual results are flagged see report notes for status.

The integrity of data for samples/analysis that have been categorised as Deviating may be compromised. Data may not be representative of the sample at the time of sampling.

Method Descriptions

Matrix	MethodID	Analysis Basis	Method Description
Soil	ICPACIDS	Oven Dried @ < 35°C	Determination of Total Sulphate in soil samples by Hydrochloric Acid extraction followed by ICPOES detection
Soil	ICPWSS	Oven Dried @ < 35°C	Determination of Water Soluble Sulphate in soil samples by water extraction followed by ICPOES detection
Soil	LOI(%MM)	Oven Dried @ < 35°C	Determination of loss on ignition for soil samples at specified temperature by gravimetry
Soil	ORGMAT	Oven Dried @ < 35°C	Acid Dichromate oxidation of the sample followed by colorimetric analysis of the extract
Soil	TSBRE1	Oven Dried @ < 35°C	Determination of Total Carbon and/or Total Sulphur in solid samples by high temperature combustion/infrared detection
Soil	WSLM50	Oven Dried @ < 35°C	Determination of pH of 2.5:1 deionised water to soil extracts using pH probe.

Where individual results are flagged see report notes for status.

Report Notes

Generic Notes

Soil/Solid Analysis

Unless stated otherwise,
- Results expressed as mg/kg have been calculated on the basis indicated in the Method Description table.
  All results on MCERTS reports are reported on a 105ºC dry weight basis with the exception of pH and conductivity.
- Sulphate analysis not conducted in accordance with BS1377
- Water Soluble Sulphate is on a 2:1 water:soil extract

Waters Analysis

Unless stated otherwise results are expressed as mg/l

Nil: Where "Nil" has been entered against Total Alkalinity or Total Acidity this indicates that a measurement was not required due to the inherent pH of the sample.

Oil analysis specific

Unless stated otherwise,
- Results are expressed as mg/kg
- SG is expressed as g/cm^3@ 15^{o}C

Gas (Tedlar bag) Analysis

Unless stated otherwise, results are expressed as ug/l

Asbestos Analysis

CH Denotes Chrysotile **TR** Denotes Tremolite
CR Denotes Crocidolite **AC** Denotes Actinolite
AM Denotes Amosite **AN** Denotes Anthophylite
NAIIS No Asbestos Identified in Sample
NADIS No Asbestos Detected In Sample

Symbol Reference

^ Sub-contracted analysis.
$$ Unable to analyse due to the nature of the sample
¶ Samples submitted for this analyte were not preserved on site in accordance with laboratory protocols. This may have resulted in deterioration of the sample(s) during transit to the laboratory. Consequently the reported data may not represent the concentration of the target analyte present in the sample at the time of sampling
¥ Results for guidance only due to possible interference
& Blank corrected result
I.S Insufficient sample to complete requested analysis
I.S(g) Insufficient sample to re-analyse, results for guidance only
Intf Unable to analyse due to interferences
N.D Not determined **N.Det** Not detected
N.F No Flow
NS Information Not Supplied
Req Analysis requested, see attached sheets for results
Þ Raised detection limit due to nature of the sample
***** All accreditation has been removed by the laboratory for this result
‡ MCERTS accreditation has been removed for this result
§ accreditation has been removed for this result as it is a non-accredited matrix

Note: The Laboratory may only claim that data is accredited when all of the requirements of our Quality System have been met. Where these requirements have not been met the laboratory may elect to include the data in its final report and remove the accreditation from individual data items if it believes that the validity of the data has not been affected. If further details are required of the circumstances which have led to the removal of accreditation then please do not hesitate to contact the laboratory.

Sample Descriptions

Client : SOCOTEC - Geotechnical Laboratory

Site : N8135-18 Heathrow

Report Number : S18_7666

Note: major constituent in upper case

Lab ID Number	Client ID	Description
CL/1913742	HEP-BH-77 D 19 3.30	Brown Stone SAND
CL/1913743	HEP-BH-556 D 4 0.75	Brown MADE GROUND
CL/1913744	HEP-BH-515 D 7 0.80	Brown CLAY
CL/1913745	HEP-BH-476 LB 8 1.20	Brown Stone SILT
CL/1913746	HEP-BH-1937 D 20 4.10	Brown Stone SILT
CL/1913747	HEP-BH-487 D 21 4.20	Brown Stone SAND
CL/1913748	HEP-BH-487 D 17 3.55	Brown Stone SILT
CL/1913749	HEP-BH-522 D 12 3.20	Brown Stone SILT
CL/1913750	HEP-TP-1022 D 2 0.10	Brown Stone SILT
CL/1913751	HEP-BH-515 D 26 6.80	Brown CLAY
CL/1913752	HEP-BH-530 D 21 4.80	Brown Stone SILT
CL/1913753	HEP-TT-11 B 9 1.30	Brown Stone SILT
CL/1913754	HEP-BH-1937 D 27 6.45	Brown CLAY

Our Ref: EFS/188847 (Ver. 1)
Your Ref: N8135-18

August 20, 2018

Environmental Chemistry
SOCOTEC UK Limited
Bretby Business Park
Ashby Road
Burton-on-Trent
Staffordshire
DE15 0YZ

Telephone: 01283 554400
Facsimile: 01283 554422

Ryan Clark
SOCOTEC UK Doncaster
Askern Road
Carcroft
Doncaster
South Yorkshire
DN6 8DG

For the attention of Ryan Clark

Dear Ryan Clark

Sample Analysis - N8135-18 Heathrow

Samples from the above site have been analysed in accordance with the schedule supplied.
The sample details and the results of analyses for these samples are given in the appended report.

An invoice for this work will follow under a separate cover.

Where appropriate the samples will be kept until 24/09/18 when they will be discarded. Please call 01283 554400 for an extension of this date.
Please be aware that our policy for the retention of paper based laboratory records and analysis reports is 6 years.

The work was carried out in accordance with SOCOTEC UK Limited (Multi-Sector Services) Standard Terms and Conditions of Contract.

If I can be of any further assistance please do not hesitate to contact me.

Yours sincerely

for SOCOTEC UK Limited

L Moore
Project Co-ordinator
01283 554400

TEST REPORT

1252

Report No. EFS/188847 (Ver. 1)

SOCOTEC UK Doncaster
Askern Road
Carcroft
Doncaster
South Yorkshire
DN6 8DG

Site: N8135-18 Heathrow

The 19 samples described in this report were registered for analysis by SOCOTEC UK Limited on 13-Aug-2018. This report supersedes any versions previously issued by the laboratory.

The analysis was completed by: 20-Aug-2018

Tests where the accreditation is set to N or No, and any individual data items marked with a * are not UKAS accredited.
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

The following tables are contained in this report:

On behalf of
SOCOTEC UK Lim
Tim Barnes Operations Director
Energy & Waste Services

Date of Issue: 20-Aug-2018

Tests marked '^' have been subcontracted to another laboratory.

Where samples have been flagged as deviant on the Analytical and Deviating Sample Overview, for any reason, the data may not be representative of the sample at the point of sampling and the validity of the data may be affected. SOCOTEC UK Limited accepts no responsibility for any sampling not carried out by our personnel.

Where individual results are flagged see report notes for status.

Units :			mg/kg	mg/l	%	%	%	pH Units										
Method Codes :			ICPACIDS	ICPWSS	LOI(%MM)	ORGMAT	TSBRE1	WSLM50										
Method Reporting Limits :			20	10	0.2	0.1	0.005											
UKAS Accredited :			Yes	Yes	No	No	No	No										
LAB ID Number CL/	**Client Sample Description**	**Sample Date**	**SO4-- (acid sol)**	**SO4-- (H2O sol) mg/l**	**L.O.I. % @ 450C**	**Organic Matter %**	**Total Sulphur.**	**pH (BS1377)**										
1918476	BH519 B 24 6.50	09-Aug-18			3.8													
1918477	BH562 D 12 2.25	09-Aug-18	185 §	94 §			0.042	8.3										
1918478	BH785 D 4 0.90	09-Aug-18		56			0.034	8.2										
1918479	BH785 D 14 3.00	09-Aug-18		26 §			0.133	8.7										
1918480	BH791 D 10 1.40	09-Aug-18		176			0.095	8.2										
1918481	BH794 D 35 9.50	09-Aug-18		421			0.888	8.0										
1918482	BH795 D 16 4.20	09-Aug-18		36			0.026	8.6										
1918483	BH798 D 40 13.00	09-Aug-18		482			0.289	7.9										
1918484	BH820 B 8 0.60	09-Aug-18		46			0.059	7.8										
1918485	BH820 B 11 1.60	09-Aug-18				0.6												
1918486	BH991 D 11 2.00	09-Aug-18		47 §			0.035	8.1										
1918487	BH991 D 20 4.50	09-Aug-18		475			0.173	7.6										
1918488	BH999 D 11 2.00	09-Aug-18		51 §			0.038	8.2										
1918489	BH999 D 29 8.00	09-Aug-18		694			0.330	7.7										
1918490	BH1002 D 14 1.55	09-Aug-18				2.6												
1918491	BH1002 D 30 6.50	09-Aug-18		620			0.791	7.7										
1918492	BH1009 D 20 5.00	09-Aug-18		850			0.465	7.5										
1918493	BH1012 D 11 2.00	09-Aug-18		32 §			0.040	8.3										
1918494	BH1012 D 26 7.00	09-Aug-18		852			0.530	7.5										

SOCOTEC

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Client Name	**SOCOTEC UK Doncaster**
Contact	Ryan Clark

N8135-18 Heathrow

Sample Analysis

Date Printed	**20-Aug-2018**
Report Number	**EFS/188847**
Table Number	**1**

Where individual results are flagged see report notes for status.

SOCOTEC UK Ltd Environmental Chemistry
Analytical and Deviating Sample Overview

Customer SOCOTEC UK Doncaster
Site N8135-18 Heathrow
Report No S188847

Consignment No S77258
Date Logged 13-Aug-2018
In-House Report Due 20-Aug-2018

Please note the results for any subcontracted analysis (identified with a '^') is likely to take up to an additional five working days.

ID Number	Description	MethodID	CustServ	Dep.Opt			ICPACIDS	ICPBRE	ICPWSS	KONECL	KoneNO3	LOI(%MM)	ORGMAT	TSBRE1	WSLM50
		Sampled	REPORT A	DO Cl if pH<5.5	DO Mg if SO4(W)>3000	DO NO3 if pH<5.5	SO4-- (acid sol)	Magnesium (BRE)	SO4-- (H2O sol) mg/l	Chloride:(2:1)	Nitrate (BRE 2:1): mg/l	L.O.I. % @ 450C	Organic Matter %	Total Sulphur.	pH (BS1377)
							✓		✓						
CL/1918476	BH519 6.50	09/08/18													
CL/1918477	BH562 2.25	09/08/18													
CL/1918478	BH785 0.90	09/08/18													
CL/1918479	BH785 3.00	09/08/18													
CL/1918480	BH791 1.40	09/08/18													
CL/1918481	BH794 9.50	09/08/18													
CL/1918482	BH795 4.20	09/08/18													
CL/1918483	BH798 13.00	09/08/18													
CL/1918484	BH820 0.60	09/08/18													
CL/1918485	BH820 1.60	09/08/18													
CL/1918486	BH991 2.00	09/08/18													
CL/1918487	BH991 4.50	09/08/18													
CL/1918488	BH999 2.00	09/08/18													
CL/1918489	BH999 8.00	09/08/18													
CL/1918490	BH1002 1.55	09/08/18													

Note: We will endeavour to prioritise samples to complete analysis within holding time; however any delay could result in samples becoming deviant whilst being processed in the laboratory.

If sampling dates are missing or matrices unclassified then results will not be ISO 17025 accredited. Please contact us as soon as possible to provide missing information in order to reinstate accreditation.

Deviating Sample Key	
A	The sample was received in an inappropriate container for this analysis
B	The sample was received without the correct preservation for this analysis
C	Headspace present in the sample container
D	The sampling date was not supplied so holding time may be compromised - applicable to all analysis
E	Sample processing did not commence within the appropriate holding time
F	Sample processing did not commence within the appropriate handling time

Requested Analysis Key	
	Analysis Required
	Analysis dependant upon trigger result - **Note: due date may be affected if triggered**
	No analysis scheduled
^	Analysis Subcontracted - **Note: due date may vary**

Where individual results are flagged see report notes for status.

The integrity of data for samples/analysis that have been categorised as Deviating may be compromised. Data may not be representative of the sample at the time of sampling.

SOCOTEC UK Ltd Environmental Chemistry
Analytical and Deviating Sample Overview

Customer SOCOTEC UK Doncaster
Site N8135-18 Heathrow
Report No S188847

Consignment No S77258
Date Logged 13-Aug-2018
In-House Report Due 20-Aug-2018

Please note the results for any subcontracted analysis (identified with a '^') is likely to take up to an additional five working days.

ID Number	Description	MethodID	CustServ	Dep.Opt			ICPACIDS	ICPBRE	ICPWSS	KONECL	KoneNO3	LOI(%MM)	ORGMAT	TSBRE1	WSLM50
		Sampled	REPORT A	DO Cl if pH<5.5	DO Mg if SO4(W)>3000	DO NO3 if pH<5.5	SO4-- (acid sol)	Magnesium (BRE)	SO4-- (H2O sol) mg/l	Chloride:(2:1)	Nitrate (BRE 2:1): mg/l	L.O.I. % @ 450C	Organic Matter %	Total Sulphur.	pH (BS1377)
							•		✓						
CL/1918491	BH1002 6.50	09/08/18													
CL/1918492	BH1009 5.00	09/08/18													
CL/1918493	BH1012 2.00	09/08/18													
CL/1918494	BH1012 7.00	09/08/18													

Note: We will endeavour to prioritise samples to complete analysis within holding time; however any delay could result in samples becoming deviant whilst being processed in the laboratory.

If sampling dates are missing or matrices unclassified then results will not be ISO 17025 accredited. Please contact us as soon as possible to provide missing information in order to reinstate accreditation.

Deviating Sample Key	
A	The sample was received in an inappropriate container for this analysis
B	The sample was received without the correct preservation for this analysis
C	Headspace present in the sample container
D	The sampling date was not supplied so holding time may be compromised - applicable to all analysis
E	Sample processing did not commence within the appropriate holding time
F	Sample processing did not commence within the appropriate handling time

Requested Analysis Key	
	Analysis Required
	Analysis dependant upon trigger result - **Note: due date may be affected if triggered**
	No analysis scheduled
^	Analysis Subcontracted - **Note: due date may vary**

Where individual results are flagged see report notes for status.

The integrity of data for samples/analysis that have been categorised as Deviating may be compromised. Data may not be representative of the sample at the time of sampling.

Method Descriptions

Matrix	MethodID	Analysis Basis	Method Description
Soil	ICPACIDS	Oven Dried @ < 35°C	Determination of Total Sulphate in soil samples by Hydrochloric Acid extraction followed by ICPOES detection
Soil	ICPWSS	Oven Dried @ < 35°C	Determination of Water Soluble Sulphate in soil samples by water extraction followed by ICPOES detection
Soil	LOI(%MM)	Oven Dried @ < 35°C	Determination of loss on ignition for soil samples at specified temperature by gravimetry
Soil	ORGMAT	Oven Dried @ < 35°C	Acid Dichromate oxidation of the sample followed by colorimetric analysis of the extract
Soil	TSBRE1	Oven Dried @ < 35°C	Determination of Total Carbon and/or Total Sulphur in solid samples by high temperature combustion/infrared detection
Soil	WSLM50	Oven Dried @ < 35°C	Determination of pH of 2.5:1 deionised water to soil extracts using pH probe.

Where individual results are flagged see report notes for status.

Report Notes

Generic Notes

Soil/Solid Analysis

Unless stated otherwise,
- Results expressed as mg/kg have been calculated on the basis indicated in the Method Description table.
  All results on MCERTS reports are reported on a 105ºC dry weight basis with the exception of pH and conductivity.
- Sulphate analysis not conducted in accordance with BS1377
- Water Soluble Sulphate is on a 2:1 water:soil extract

Waters Analysis

Unless stated otherwise results are expressed as mg/l

Nil: Where "Nil" has been entered against Total Alkalinity or Total Acidity this indicates that a measurement was not required due to the inherent pH of the sample.

Oil analysis specific

Unless stated otherwise,
- Results are expressed as mg/kg
- SG is expressed as g/cm^3@ 15^{o}C

Gas (Tedlar bag) Analysis

Unless stated otherwise, results are expressed as ug/l

Asbestos Analysis

CH Denotes Chrysotile **TR** Denotes Tremolite
CR Denotes Crocidolite **AC** Denotes Actinolite
AM Denotes Amosite **AN** Denotes Anthophylite
NAIIS No Asbestos Identified in Sample
NADIS No Asbestos Detected In Sample

Symbol Reference

^ Sub-contracted analysis.
$$ Unable to analyse due to the nature of the sample
¶ Samples submitted for this analyte were not preserved on site in accordance with laboratory protocols. This may have resulted in deterioration of the sample(s) during transit to the laboratory. Consequently the reported data may not represent the concentration of the target analyte present in the sample at the time of sampling
¥ Results for guidance only due to possible interference
& Blank corrected result
I.S Insufficient sample to complete requested analysis
I.S(g) Insufficient sample to re-analyse, results for guidance only
Intf Unable to analyse due to interferences
N.D Not determined **N.Det** Not detected
N.F No Flow
NS Information Not Supplied
Req Analysis requested, see attached sheets for results
Þ Raised detection limit due to nature of the sample
***** All accreditation has been removed by the laboratory for this result
‡ MCERTS accreditation has been removed for this result
§ accreditation has been removed for this result as it is a non-accredited matrix

Note: The Laboratory may only claim that data is accredited when all of the requirements of our Quality System have been met. Where these requirements have not been met the laboratory may elect to include the data in its final report and remove the accreditation from individual data items if it believes that the validity of the data has not been affected. If further details are required of the circumstances which have led to the removal of accreditation then please do not hesitate to contact the laboratory.

Sample Descriptions

Client : SOCOTEC UK Doncaster

Site : N8135-18 Heathrow

Report Number : S18_8847

Note: major constituent in upper case

Lab ID Number	Client ID	Description
CL/1918476	BH519 B 24 6.50	Grey CLAY
CL/1918477	BH562 D 12 2.25	Brown Sand GRAVEL
CL/1918478	BH785 D 4 0.90	Brown Gravel SILT Stone
CL/1918479	BH785 D 14 3.00	Brown Sand GRAVEL Stone
CL/1918480	BH791 D 10 1.40	Brown SAND
CL/1918481	BH794 D 35 9.50	Brown CLAY
CL/1918482	BH795 D 16 4.20	Brown Gravel SAND
CL/1918483	BH798 D 40 13.00	Brown CLAY
CL/1918484	BH820 B 8 0.60	Brown Silt CLAY Gravel
CL/1918485	BH820 B 11 1.60	Brown Silt CLAY Gravel
CL/1918486	BH991 D 11 2.00	Brown Sand GRAVEL
CL/1918487	BH991 D 20 4.50	Brown Silt CLAY Gravel
CL/1918488	BH999 D 11 2.00	Brown Sand GRAVEL
CL/1918489	BH999 D 29 8.00	Brown CLAY
CL/1918490	BH1002 D 14 1.55	Brown Clay SILT
CL/1918491	BH1002 D 30 6.50	Brown CLAY
CL/1918492	BH1009 D 20 5.00	Brown CLAY
CL/1918493	BH1012 D 11 2.00	Brown Sand GRAVEL
CL/1918494	BH1012 D 26 7.00	Brown CLAY

Our Ref: EFS/189339 (Ver. 1)
Your Ref: N8135-18

September 3, 2018

Environmental Chemistry
SOCOTEC UK Limited
Bretby Business Park
Ashby Road
Burton-on-Trent
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DE15 0YZ

Telephone: 01283 554400
Facsimile: 01283 554422

Ryan Clark
SOCOTEC UK Doncaster
Askern Road
Carcroft
Doncaster
South Yorkshire
DN6 8DG

For the attention of Ryan Clark

Dear Ryan Clark

Sample Analysis - N8135-18 Heathrow Airport

Samples from the above site have been analysed in accordance with the schedule supplied.
The sample details and the results of analyses for these samples are given in the appended report.

An invoice for this work will follow under a separate cover.

Where appropriate the samples will be kept until 06/10/18 when they will be discarded. Please call 01283 554400 for an extension of this date.
Please be aware that our policy for the retention of paper based laboratory records and analysis reports is 6 years.

The work was carried out in accordance with SOCOTEC UK Limited (Multi-Sector Services) Standard Terms and Conditions of Contract.

If I can be of any further assistance please do not hesitate to contact me.

Yours sincerely

for SOCOTEC UK Limited

L Moore
Project Co-ordinator
01283 554400

TEST REPORT

UKAS TESTING
1252

Report No. EFS/189339 (Ver. 1)

SOCOTEC UK Doncaster
Askern Road
Carcroft
Doncaster
South Yorkshire
DN6 8DG

Site: N8135-18 Heathrow Airport

The 19 samples described in this report were registered for analysis by SOCOTEC UK Limited on 25-Aug-2018. This report supersedes any versions previously issued by the laboratory.
The analysis was completed by: 03-Sep-2018

Tests where the accreditation is set to N or No, and any individual data items marked with a * are not UKAS accredited.
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

The following tables are contained in this report:

On behalf of
SOCOTEC UK Lim
Tim Barnes Operations Director
Energy & Waste Services

Date of Issue: 03-Sep-2018

Tests marked '^' have been subcontracted to another laboratory.
Where samples have been flagged as deviant on the Analytical and Deviating Sample Overview, for any reason, the data may not be representative of the sample at the point of sampling and the validity of the data may be affected.
SOCOTEC UK Limited accepts no responsibility for any sampling not carried out by our personnel.

Where individual results are flagged see report notes for status.

Units :			mg/kg	mg/l	%	%	%	pH Units										
Method Codes :			ICPACIDS	ICPWSS	LOI(%MM)	ORGMAT	TSBRE1	WSLM50										
Method Reporting Limits :			20	10	0.2	0.1	0.005											
UKAS Accredited :			Yes	Yes	No	No	No	No										
LAB ID Number CL/	**Client Sample Description**	**Sample Date**	**SO4-- (acid sol)**	**SO4-- (H2O sol) mg/l**	**L.O.I. % @ 450C**	**Organic Matter %**	**Total Sulphur.**	**pH (BS1377)**										
1919945	HEP-TT-6 LB 8 0.80	22-Aug-18	2080	581			0.205	7.9										
1919946	HEP-TT-9 LB 9 1.20	22-Aug-18	2240	531			0.155	7.7										
1919947	HEP-TT-39 B 9 1.80	22-Aug-18	560	130			0.049	7.9										
1919948	HEP-BH-65 D 11 2.00	22-Aug-18	85	26			0.035	8.3										
1919949	HEP-BH-65 D 28 6.10	22-Aug-18	2200	1030			0.421	7.7										
1919950	BH43 B 12 4.00	22-Aug-18				6.9												
1919951	BH1805 B 11 2.20	22-Aug-18	116	34			0.051	8.2										
1919952	TP1032 B 9 2.30	22-Aug-18	295	76		1.4	0.038	7.2										
1919953	HEP-BH-443 D 29 7.80	22-Aug-18	2050	788			0.452	7.7										
1919954	HEP-BH-476 D 16 4.20	22-Aug-18	875	196			0.085	8.0										
1919955	HEP-BH-542 D 18 4.00	22-Aug-18			3.8	1.7												
1919956	HEP-BH-802 D 35 8.50	22-Aug-18	232	73			0.042	8.1										
1919957	HEP-BH-802 D 30 6.70	22-Aug-18	41	13			0.026	8.4										
1919958	TP-973 D 12 1.70	22-Aug-18	84	17			0.031	8.2										
1919959	TT-524 D 8 1.15	22-Aug-18	2270	749			0.100	7.5										
1919960	TT-531 D 14 3.60	22-Aug-18	5730	1550			0.452	7.6										
1919961	TT-1855 LB 9 0.95	22-Aug-18	524	114			0.045	8.2										
1919962	HEP-BH-540 D 13 2.50	22-Aug-18	403	122			0.057	7.9										
1919963	TP-547 D 11 2.15	22-Aug-18	641	133			0.064	7.4										

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Contact Ryan Clark

N8135-18 Heathrow Airport

Sample Analysis

Date Printed	**03-Sep-2018**
Report Number	**EFS/189339**
Table Number	**1**

Where individual results are flagged see report notes for status.

Analytical and Deviating Sample Overview

Customer SOCOTEC UK Doncaster
Site N8135-18 Heathrow Airport
Report No S189339

Consignment No S77708
Date Logged 25-Aug-2018
In-House Report Due 03-Sep-2018

Please note the results for any subcontracted analysis (identified with a '^') is likely to take up to an additional five working days.

ID Number	Description	Sampled	MethodID	CustServ	Dep.Opt			ICPACIDS	ICPBRE	ICPWSS	KONECL	KoneNO3	LOI(%MM)	ORGMAT	TSBRE1	WSLM50
				REPORT A	DO Cl if pH<5.5	DO Mg if SO4(W)>3000	DO NO3 if pH<5.5	SO4-- (acid sol)	Magnesium (BRE)	SO4-- (H2O sol) mg/l	Chloride:(2:1)	Nitrate (BRE 2:1): mg/l	L.O.I. % @ 450C	Organic Matter %	Total Sulphur.	pH (BS1377)
								✓		✓						
CL/1919945	HEP-TT-6 0.80	22/08/18														
CL/1919946	HEP-TT-9 1.20	22/08/18														
CL/1919947	HEP-TT-39 1.80	22/08/18														
CL/1919948	HEP-BH-65 2.00	22/08/18														
CL/1919949	HEP-BH-65 6.10	22/08/18														
CL/1919950	BH43 4.00	22/08/18														
CL/1919951	BH1805 2.20	22/08/18														
CL/1919952	TP1032 2.30	22/08/18														
CL/1919953	HEP-BH-443 7.80	22/08/18														
CL/1919954	HEP-BH-476 4.20	22/08/18														
CL/1919955	HEP-BH-542 4.00	22/08/18														
CL/1919956	HEP-BH-802 8.50	22/08/18														
CL/1919957	HEP-BH-802 6.70	22/08/18														
CL/1919958	TP-973 1.70	22/08/18														
CL/1919959	TT-524 1.15	22/08/18														

Note: We will endeavour to prioritise samples to complete analysis within holding time; however any delay could result in samples becoming deviant whilst being processed in the laboratory.

If sampling dates are missing or matrices unclassified then results will not be ISO 17025 accredited. Please contact us as soon as possible to provide missing information in order to reinstate accreditation.

Deviating Sample Key	
A	The sample was received in an inappropriate container for this analysis
B	The sample was received without the correct preservation for this analysis
C	Headspace present in the sample container
D	The sampling date was not supplied so holding time may be compromised - applicable to all analysis
E	Sample processing did not commence within the appropriate holding time
F	Sample processing did not commence within the appropriate handling time

Requested Analysis Key	
	Analysis Required
	Analysis dependant upon trigger result - **Note: due date may be affected if triggered**
	No analysis scheduled
^	Analysis Subcontracted - **Note: due date may vary**

Where individual results are flagged see report notes for status.

 The integrity of data for samples/analysis that have been categorised as Deviating may be compromised. Data may not be representative of the sample at the time of sampling.

Analytical and Deviating Sample Overview

Customer SOCOTEC UK Doncaster
Site N8135-18 Heathrow Airport
Report No S189339

Consignment No S77708
Date Logged 25-Aug-2018
In-House Report Due 03-Sep-2018

Please note the results for any subcontracted analysis (identified with a '^') is likely to take up to an additional five working days.

ID Number	Description	MethodID	CustServ	Dep.Opt			ICPACIDS	ICPBRE	ICPWSS	KONECL	KoneNO3	LOI(%MM)	ORGMAT	TSBRE1	WSLM50
		Sampled	REPORT A	DO Cl if pH<5.5	DO Mg if SO4(W)>3000	DO NO3 if pH<5.5	SO4-- (acid sol)	Magnesium (BRE)	SO4-- (H2O sol) mg/l	Chloride:(2:1)	Nitrate (BRE 2:1): mg/l	L.O.I. % @ 450C	Organic Matter %	Total Sulphur.	pH (BS1377)
							✓		✓						
CL/1919960	TT-531 3.60	22/08/18													
CL/1919961	TT-1855 0.95	22/08/18													
CL/1919962	HEP-BH-540 2.50	22/08/18													
CL/1919963	TP-547 2.15	22/08/18													

Note: We will endeavour to prioritise samples to complete analysis within holding time; however any delay could result in samples becoming deviant whilst being processed in the laboratory.

If sampling dates are missing or matrices unclassified then results will not be ISO 17025 accredited. Please contact us as soon as possible to provide missing information in order to reinstate accreditation.

Deviating Sample Key	
A	The sample was received in an inappropriate container for this analysis
B	The sample was received without the correct preservation for this analysis
C	Headspace present in the sample container
D	The sampling date was not supplied so holding time may be compromised - applicable to all analysis
E	Sample processing did not commence within the appropriate holding time
F	Sample processing did not commence within the appropriate handling time

Requested Analysis Key	
	Analysis Required
	Analysis dependant upon trigger result - **Note: due date may be affected if triggered**
	No analysis scheduled
^	Analysis Subcontracted - **Note: due date may vary**

Where individual results are flagged see report notes for status.

 The integrity of data for samples/analysis that have been categorised as Deviating may be compromised. Data may not be representative of the sample at the time of sampling.

Method Descriptions

Matrix	MethodID	Analysis Basis	Method Description
Soil	ICPACIDS	Oven Dried @ < 35°C	Determination of Total Sulphate in soil samples by Hydrochloric Acid extraction followed by ICPOES detection
Soil	ICPWSS	Oven Dried @ < 35°C	Determination of Water Soluble Sulphate in soil samples by water extraction followed by ICPOES detection
Soil	LOI(%MM)	Oven Dried @ < 35°C	Determination of loss on ignition for soil samples at specified temperature by gravimetry
Soil	ORGMAT	Oven Dried @ < 35°C	Acid Dichromate oxidation of the sample followed by colorimetric analysis of the extract
Soil	TSBRE1	Oven Dried @ < 35°C	Determination of Total Carbon and/or Total Sulphur in solid samples by high temperature combustion/infrared detection
Soil	WSLM50	Oven Dried @ < 35°C	Determination of pH of 2.5:1 deionised water to soil extracts using pH probe.

Where individual results are flagged see report notes for status.

Report Notes

Generic Notes

Soil/Solid Analysis

Unless stated otherwise,
- Results expressed as mg/kg have been calculated on the basis indicated in the Method Description table.
  All results on MCERTS reports are reported on a 105ºC dry weight basis with the exception of pH and conductivity.
- Sulphate analysis not conducted in accordance with BS1377
- Water Soluble Sulphate is on a 2:1 water:soil extract

Waters Analysis

Unless stated otherwise results are expressed as mg/l

Nil: Where "Nil" has been entered against Total Alkalinity or Total Acidity this indicates that a measurement was not required due to the inherent pH of the sample.

Oil analysis specific

Unless stated otherwise,
- Results are expressed as mg/kg
- SG is expressed as g/cm^3@ 15^{o}C

Gas (Tedlar bag) Analysis

Unless stated otherwise, results are expressed as ug/l

Asbestos Analysis

CH Denotes Chrysotile **TR** Denotes Tremolite
CR Denotes Crocidolite **AC** Denotes Actinolite
AM Denotes Amosite **AN** Denotes Anthophylite
NAIIS No Asbestos Identified in Sample
NADIS No Asbestos Detected In Sample

Symbol Reference

^ Sub-contracted analysis.
$$ Unable to analyse due to the nature of the sample
¶ Samples submitted for this analyte were not preserved on site in accordance with laboratory protocols. This may have resulted in deterioration of the sample(s) during transit to the laboratory. Consequently the reported data may not represent the concentration of the target analyte present in the sample at the time of sampling
¥ Results for guidance only due to possible interference
& Blank corrected result
I.S Insufficient sample to complete requested analysis
I.S(g) Insufficient sample to re-analyse, results for guidance only
Intf Unable to analyse due to interferences
N.D Not determined **N.Det** Not detected
N.F No Flow
NS Information Not Supplied
Req Analysis requested, see attached sheets for results
Þ Raised detection limit due to nature of the sample
***** All accreditation has been removed by the laboratory for this result
‡ MCERTS accreditation has been removed for this result
§ accreditation has been removed for this result as it is a non-accredited matrix

Note: The Laboratory may only claim that data is accredited when all of the requirements of our Quality System have been met. Where these requirements have not been met the laboratory may elect to include the data in its final report and remove the accreditation from individual data items if it believes that the validity of the data has not been affected. If further details are required of the circumstances which have led to the removal of accreditation then please do not hesitate to contact the laboratory.

Sample Descriptions

Client : SOCOTEC UK Doncaster

Site : N8135-18 Heathrow Airport

Report Number : S18_9339

Note: major constituent in upper case

Lab ID Number	Client ID	Description
CL/1919945	HEP-TT-6 LB 8 0.80	Brown/Grey MADE GROUND
CL/1919946	HEP-TT-9 LB 9 1.20	Brown MADE GROUND
CL/1919947	HEP-TT-39 B 9 1.80	Brown Stone SILT
CL/1919948	HEP-BH-65 D 11 2.00	Brown Stone GRAVEL Sand
CL/1919949	HEP-BH-65 D 28 6.10	Brown CLAY
CL/1919950	BH43 B 12 4.00	Brown Silt CLAY
CL/1919951	BH1805 B 11 2.20	Brown Stone SAND
CL/1919952	TP1032 B 9 2.30	Brown Gravel CLAY
CL/1919953	HEP-BH-443 D 29 7.80	Brown CLAY
CL/1919954	HEP-BH-476 D 16 4.20	Brown MADE GROUND
CL/1919955	HEP-BH-542 D 18 4.00	Brown Gravel CLAY
CL/1919956	HEP-BH-802 D 35 8.50	Brown Gravel CLAY
CL/1919957	HEP-BH-802 D 30 6.70	Brown Stone SAND
CL/1919958	TP-973 D 12 1.70	Brown Stone SAND
CL/1919959	TT-524 D 8 1.15	Brown Stone SILT
CL/1919960	TT-531 D 14 3.60	Brown CLAY
CL/1919961	TT-1855 LB 9 0.95	Brown Clay SILT
CL/1919962	HEP-BH-540 D 13 2.50	Brown/Grey Stone GRAVEL Sand
CL/1919963	TP-547 D 11 2.15	Brown Stone SILT

Summary of Photoionisation Detector Readings

Project Name	Project No.
HAL Airport Expansion	G170029U

Hole	Sample			Photoionisation Detector Reading ppm	Remarks
	Ref	Top (m)	Type		
HEP-BH-1802	9	1.20	B	0	
HEP-BH-1802	17	4.20	D	0	
HEP-BH-1804	4	0.30	B	0	
HEP-BH-1805	1	0.10	B	<50ppm	
HEP-BH-1806	5	0.60	D	<50ppm	
HEP-BH-1864	16	4.20	B	0	
HEP-BH-27	6	1.00	LB	0.3	
HEP-BH-27	13	3.20	B	0.2	
HEP-BH-27	23	6.50	B	0	
HEP-BH-27	26	7.50	UT	<50ppm	
HEP-BH-27	43	14.50	UT	<50ppm	
HEP-BH-27	45	14.50	B	0	
HEP-BH-36	29	7.50	UT	<50ppm	
HEP-BH-36	30	8.00	D	0	
HEP-BH-36	51	13.90	D	<50ppm	

Test Method	Date Printed	Figure Number	Sheet Number
Manufacturer's Guidelines	09/08/2018		

Summary of Photoionisation Detector Readings

Project Name	Project No.
HAL Airport Expansion	G170029U

Hole	Sample			Photoionisation Detector Reading ppm	Remarks
	Ref	Top (m)	Type		
HEP-BH-43	49	14.50	UT	0	
HEP-BH-45	8	0.60	B	0.1	
HEP-BH-45	11	1.25	B	0.2	
HEP-BH-45	16	2.10	B	0	
HEP-BH-45	28	4.50	B	0	
HEP-BH-50	79	19.00	UT	0	
HEP-BH-61	32	7.70	UT	<50ppm	
HEP-BH-61	33	8.10	D	<50ppm	
HEP-BH-61	42	10.70	UT	<50ppm	
HEP-BH-824	6	0.20	LB	<50ppm	
HEP-BH-824	9	0.70	LB	0.1	
HEP-BH-824	13	1.70	LB	<50ppm	
HEP-BH-824	12	1.90	D	<50ppm	
HEP-BH-824	15	2.20	LB	0	
HEP-BH-824	32	7.90	D	<50ppm	

Test Method	Date Printed	Figure Number	Sheet Number
Manufacturer's Guidelines	09/08/2018		

Summary of Photoionisation Detector Readings

Project Name	Project No.
HAL Airport Expansion	G170029U

Hole	Sample			Photoionisation Detector Reading ppm	Remarks
	Ref	Top (m)	Type		
HEP-BH-824	45	14.00	D	<50ppm	

Test Method	Date Printed	Figure Number	Sheet Number
Manufacturer's Guidelines	09/08/2018		

J. GEOENVIRONMENTAL LABORATORY TEST RESULTS

J.1 GUIDANCE NOTES

J.2 SCHEDULES

UKAS Accreditation Schedules

J.3 TEST CERTIFICATES

Concept Life Sciences Certificates of Analysis for testing on soil samples:

- 701280;
- 701280 Sub Suite 1;
- 701280 Sub Suite 3;
- 701803;
- 701803 Sub Suite 1;
- 701835;
- 701835 Sub Suite 1;
- 701887;
- 702829;
- 702809 Sub Suite 1;
- 702844;
- 703830;
- 704623;
- 704623 Sub Suite 1;
- 706211;
- 706211 Sub Suite 1;
- 706211 Sub Suite 6;
- 706245;
- 706245 Sub Suite 1;
- 707108;
- 707552;
- 707552 Sub Suite 1;
- 708032;
- 708032 Sub Suite 1;
- 708032 Sub Suite 3 (Part 1);
- 708032 Sub Suite 3 (Part 2);
- 709003;
- 709003 Sub Suite 3;
- 710090;
- 710090 Sub Suite 3;
- 720766;
- 722427;
- 722990;
- 724097;
- 724097 Sub Suite 3.

NOTES ON CHEMICAL ANALYSIS FOR CONTAMINATED LAND ASSESSMENT

SAMPLING, SAMPLE PRESERVATION, TRANSPORT AND STORAGE

Sampling of soils for environmental chemical analysis is undertaken to the standards set out in BS 10175:2011+A2:2017, sampling of groundwater is undertaken as per BS EN ISO 22475-1:2006 and BS EN ISO 5667-11+A2:2017, sampling of surface waters as per BS EN ISO 5667-1:2006 and BS EN ISO 5667-6:2016, and sampling of ground gases for environmental testing as per CIRIA Guidance C665. Guidance on quality assurance and quality control is undertaken as per BS EN ISO 5667-14:2016.

The sample container types used are dictated by the requirements of chemical testing as set out in the project specification and as provided by the selected environmental testing laboratory. Sample containers are filled as instructed by laboratory guidelines, ensuring minimisation of sample headspace.

Where sample volumes are limited by the sampling technique (e.g. dynamic sampling) certain sample container types may be prioritised to achieve the most comprehensive testing possible.

Samples on site are preserved by control of temperature to between 2 and 4 degrees Celsius unless otherwise stated. Samples are despatched to the analytical laboratory on the day of sampling under Chain of Custody (CoC) in temperature controlled cool-boxes. Sample temperature is measured on receipt at the designated analytical laboratory. Temperature control is maintained at the analytical laboratory prior to receipt of testing instructions, preparation and analysis.

Where testing instructions are to be provided by the Engineer/Client, blank testing schedules are provided as standard within 1 to 2 working days of sampling.

LABORATORY ANALYTICAL METHODOLOGIES AND ACCREDITATION

Analytical laboratories used by Fugro are accredited by UKAS (United Kingdom Accreditation Service). Dependent on Limits of Detection being achievable as requested at the time of scheduling, chemical analyses on soils, waters and gases will, where possible, be accredited by MCERTS (Monitoring Certification Scheme). MCERTS is the Environment Agency's performance standard for laboratories undertaking chemical testing. The accreditation applicable for individual tests is presented on the analytical laboratory test certificates in this report.

A summary of the methodologies used by the analytical laboratory in carrying out the requested analyses is presented on the summary pages of the analytical laboratory test certificates. Further information may be obtained on the test methodologies by contacting the laboratory concerned.

DEVIATING SAMPLES

UKAS is the accreditation body responsible for auditing laboratories to both ISO 17025 and MCERTS in the UK. All UKAS accredited laboratories are required to operate appropriate procedures for the handling of deviating samples.

Deviating (or non-conforming) samples are defined as those which may have been compromised in some way during sampling, transportation, storage or analysis, and which may cause the integrity of the analytical data to be in doubt.

Examples of deviating samples that can occur from sampling, transportation and storage issues include:

- Incorrect sample containers for analyses requested, for example, no separate volatile container supplied or samples for organics analysis supplied in plastic containers;
- Headspace present in containers for volatile compounds or Biological Oxygen Demand (BOD) analyses;
- No sampling date supplied (mandatory for MCERTS);
- No sampling time supplied (applicable for certain water parameters);
- Temperature exceeded;
- Holding time for the analysis exceeded.

Where deviating samples are subsequently analysed, UKAS requires that the competent laboratory "shall include a disclaimer in the report, clearly stating that the sample was deviating and that, as a result, the test result(s) may be invalid". It is also a condition of MCERTS that the whole results certificate is included in reports sent to the Client, including all supporting information, and not just the results sheets. Each analytical report therefore contains a page detailing the deviating samples and the reasons for the non-conformity.

Fugro undertakes to sample, record, transport and store samples in such a way that deviating samples should not occur unless for reasons outside of Fugro's control.

WASTE ACCEPTANCE CRITERIA TESTING

Where samples have been scheduled for Waste Acceptance Criteria (WAC) testing to BS EN 12457-3:2002, analysis is undertaken for one of the Full, Hazardous or Inert WAC suites, as specified and as detailed below.

Full WAC Suite. The solid material from each sample is tested for: total organic carbon (TOC); loss on ignition (LOI); benzene, toluene, ethylbenzene and xylene (BTEX): polychlorinated biphenyls (PCBs); total petroleum hydrocarbons (TPH (C10 – C40)); polycyclic aromatic hydrocarbons (PAHs); pH value; and acid neutralisation capacity. Two leachate specimens for each sample are prepared at liquid to solid ratios of 2:1 and then 8:1 and both are analysed for arsenic, barium, cadmium, chromium, copper, mercury, molybdenum, nickel, lead, antimony, selenium, zinc, chloride, fluoride, sulphate, total dissolved solids, phenol index and dissolved organic carbon.

Hazardous WAC Suite. The solid material from each sample is tested for total organic carbon, loss on ignition and acid neutralisation capacity. Two leachate specimens for each sample are prepared at liquid to solid ratios of 2:1 and then 8:1 and both are analysed for arsenic, barium, cadmium, chromium, copper, mercury, molybdenum, nickel, lead, antimony, selenium, zinc, chloride, fluoride, sulphate, total dissolved solids and dissolved organic carbon.

Inert WAC Suite. The solid material from each sample is tested for total organic carbon, BTEX, PCBs, TPH (C10 – C40) and PAH. Two leachate specimens for each sample are prepared at liquid to solid ratios of 2:1 and then 8:1 and both analysed for arsenic, barium, cadmium, chromium, copper, mercury, molybdenum, nickel, lead, antimony, selenium, zinc, chloride, fluoride, sulphate, total dissolved solids, phenol index and dissolved organic carbon.

Results/calculation. The results of the testing of the 2:1 and 8:1 leachate specimens are then calculated to give a liquid to solid ratio of 10:1 result in mg/kg. These 10:1 results, and the results of the solid determinations, can be compared to the values set out in the guidance produced by the Environment Agency (2005) to assist with appropriate disposal to landfill, under Landfill Directive (1999/31/EC).

CHEMICAL ANALYSIS ON LEACHATES PREPARED FROM SOIL SAMPLES

Where artificially produced leachate specimens are requested from soil samples the leachate preparation technique is in accordance with British Standard BS EN 12457, as detailed on the Schedules.

The following list summarises the different leaching preparations available:

- BS EN 12457-1: one stage test carried out at a liquid to solid ratio of 2:1;
- BS EN 12457-2: one stage test carried out at a liquid to solid ratio of 10:1;
- BS EN 12457-3: two stage test carried out at a liquid to solid ratio of 2:1 followed by 8:1, giving a cumulative liquid to solid ratio of 10:1.

The resultant leachate specimens are then tested for the list of parameters as scheduled.

AGS DATA FOR CHEMISTRY TESTING

Chemical testing results are provided in AGS 4.0.4 format where requested. It should be noted that where laboratory methodologies differ, or determinants tested do not appear on the AGS code list for chemical test names, a new and unique code may be used for an individual test.

REFERENCES

General References

BS 10175:2011+A2:2017 Investigation of potentially contaminated sites. Code of practice. British Standards Institute (BSI), March 2011. ISBN 978 0 580 68198 1.

BS EN ISO 22475-1:2006. Geotechnical investigation and testing – sampling methods and groundwater measurements – Part 1: Technical principles for execution. BSI, Milton Keynes (2006).

BS EN ISO 5667-1:2006. Water quality. Sampling. Guidance on the design of sampling programmes and sampling techniques. BSI, Milton Keynes (2006).

BS EN ISO 5667-6:2016. Water quality. Sampling. Guidance on sampling of rivers and streams. BSI, Milton Keynes (2016).

BS EN ISO 5667-11+A2:2017. Water Quality. Sampling. Guidance on sampling of groundwaters. BSI, Milton Keynes (2017).

BS EN ISO 5667-14:2016. Water Quality. Sampling. Guidance on quality assurance and quality control of environmental water sampling and handling. BSI, Milton Keynes (2016).

CIRIA 665: 2007. Wilson, S. et al. Assessing risks posed by hazardous ground gases to buildings. CIRIA, London.

Council Directive 1999/31/EC of 26 April 1999 on the landfill of waste.

Environment Agency (2005) Guidance on Sampling and Testing of Wastes to meet Landfill Waste Acceptance Procedures., Version 1. April 2005.

Leaching Tests

BS EN 12457-1:2002. Characterisation of waste. Leaching. Compliance test for leaching of granular waste materials and sludges. One stage batch test at a liquid to solid ratio of 2 l/kg for materials with high solid content and with particle size below 4 mm (without or with size reduction). BSI, London (2002).

BS EN 12457-2:2002. Characterisation of waste. Leaching. Compliance test for leaching of granular waste materials and sludges. One stage batch test at a liquid to solid ratio of 10 l/kg for materials with particle size below 4 mm (without or with size reduction). BSI, London (2002).

BS EN 12457-3:2002. Characterisation of waste. Leaching. Compliance test for leaching of granular waste materials and sludges. Two stage batch test at a liquid to solid ratio of 2 l/kg and 8 l/kg for materials with a high solid content and with a particle size below 4 mm (without or with size reduction). BSI, London (2002).

HEATHROW EXPANSION PROJECT CONTAMINATION TESTING SUITES

Primary Soil Suites

Suite A – Made Ground and Soils with Elevated PID Readings

Determinand Group	Determinands	Required LOD	Conditional (see note 2)	Conditional / Analysis Notes
Asbestos	Asbestos screen / ID	n/a	Yes	If asbestos is identified, then undertake asbestos quantification to 0.001%LOD – see below
Metals and Metalloids	Arsenic	1 mg/kg	No	
	Cadmium	1 mg/kg	No	
	Total Chromium	1 mg/kg	No	As majority of Cr exceeded 6 mg/kg this has been added to Suite A rather than as a conditional
	Chromium (III)	1 mg/kg	No	
	Chromium (VI)	1 mg/kg	No	
	Iron	1 mg/kg	No	
	Lead	1 mg/kg	No	
	Manganese	1 mg/kg	No	
	Total Mercury	1 mg/kg	No	Conditional criteria. If Total Hg > 15 mg/kg
	Elemental Mercury	26 mg/kg	Yes	
	Inorganic Mercury	1 mg/kg	Yes	
	Methyl mercury	1 mg/kg	Yes	
	Nickel	1 mg/kg	No	
	Selenium	1 mg/kg	No	
	Copper	1 mg/kg	No	
	Zinc	3 mg/kg	No	
	Boron (water soluble)	1 mg/kg	No	
Inorganic Compounds	Chloride	kg	No	
	Total cyanide	1 mg/kg	No	Conditional criteria. If Total CN > 18 mg/kg
	Easily-liberatable cyanide	1 mg/kg	Yes	
	Complex cyanide	1 mg/kg	Yes	
	Thiocyanate	5 mg/kg	No	

	Nitrate	1 mg/kg	No	
	Nitrite	1 mg/kg	No	
	Sulphate (total)	0.01%	No	
	Sulphide	0.5 mg/kg	No	
Total Phenol	Total Phenol	1mg/kg	No	
Speciated Polycyclic Aromatic Hydrocarbons	US EPA 16	1 µg/kg	No	
Volatile Organic Compounds	Volatile Organic Compounds (US EPA 8260 target list) inc. TICS	1 µg/kg (VOC's) 0.1 mg/kg (BTEX)	Yes	Investigation Supervisor to schedule if required
Semi Volatile Organic Compounds	Semi Volatile Organic Compounds (US EPA 8270 target list) inc. TICs	1 µg/kg	Yes	Investigation Supervisor to schedule if required
TPH CWG	TPH speciated by Aliphatic and Aromatic fractions, reported per Criteria Working Group banding.	4 mg/kg	No	
Misc.	Soil organic matter	0.10%	No	
	pH	0.1 pH Units	No	

2

Suite A – Dependent Options

Determinand Group	Determinands	Required LOD	Conditional (see note 2)	Conditional / Analysis Notes
Asbestos	Asbestos quantification	0.001%	Yes	If asbestos is identified, then undertake asbestos quantification to 0.001%LOD
Metals and Metalloids	Elemental Mercury	26 mg/kg	Yes	If Total Hg > 15 mg/kg
	Inorganic Mercury	1 mg/kg	Yes	
	Methyl mercury	1 mg/kg	Yes	
Inorganic Compounds	Easily-liberatable cyanide	1 mg/kg	Yes	If Total CN > 18 mg/kg
	Complex cyanide	1 mg/kg	Yes	
Volatile Organic Compounds	Volatile Organic Compounds (US EPA 8260 target list) inc. tentatively identified compounds	1 µg/kg (VOC's) 0.1 mg/kg (BTEX)	Yes	Investigation Supervisor to schedule if required
Semi Volatile Organic Compounds	Semi Volatile Organic Compounds (US EPA 8270 Target List) inc. tentatively identified compounds	1 µg/kg	Yes	Investigation Supervisor to schedule if required

3

Suite B – Natural Material

Determinand Group	Determinands	Required LOD	Conditional (see note 2)	Conditional / Analysis Notes
Metals and Metalloids	Arsenic	1 mg/kg	No	
	Cadmium	1 mg/kg	No	
	Total Chromium	1 mg/kg	No	If Total Cr > 6 mg/kg
	Chromium (III)	1 mg/kg	Yes	
	Chromium (VI)	1 mg/kg	Yes	
	Iron	1 mg/kg	No	
	Lead	1 mg/kg	No	
	Manganese	1 mg/kg	No	
	Total Mercury	1 mg/kg	No	
	Elemental Mercury	26mg/kg	Yes	Conditional criteria if Total Hg > 15 mg/kg.
	Inorganic Mercury	1 mg/kg	Yes	Note elemental mercury only to be scheduled if instructed by the Investigation Supervisor.
	Methyl mercury	1 mg/kg	Yes	
	Nickel	1 mg/kg	No	
	Selenium	1 mg/kg	No	
	Copper	1 mg/kg	No	
	Zinc	3 mg/kg	No	
	Boron (water soluble)	1 mg/kg	No	
Organic	Total TPH	10 mg/kg	No	Conditional criteria. If Total TPH > 500 mg/kg do TPH CWG
	Speciated PAH (USEPA16)	Total 10 mg/kg	No	Please specify ind, LODs
	TPH speciated by Aliphatic and Aromatic fractions, reported per Criteria Working Group banding.	4 mg/kg	Yes	If Total TPH > 500 mg/kg
Volatile Organic Compounds	Volatile Organic Compounds (US EPA 8260 target list) inc. TICs	1 µg/kg (VOC's) 0.1 mg/kg (BTEX)	Yes	Investigation Supervisor to schedule if required

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Determinand Group	Determinands	Required LOD	Conditional (see note 2)	Conditional / Analysis Notes
Semi Volatile Organic Compounds	Semi Volatile Organic Compounds (US EPA 8270 Target List) inc. tentatively identified compounds	1 µg/kg	Yes	Investigation Supervisor to schedule if required
Inorganic Compounds	Chloride	1mg/kg	No	
Misc.	Soil organic matter	0.10%	No	
	Fraction organic carbon	0.10%	No	
	pH	0.1 pH Units	No	

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Suite B – Dependent Options

Determinand Group	Determinands	Required LOD	Conditional (see note 2)	Conditional / Analysis Notes
Metals and Metalloids	Chromium (III)	1 mg/kg	Yes	If Total Cr > 6 mg/kg
	Chromium (VI)	1 mg/kg	Yes	
Metals and Metalloids	Elemental Mercury	26 mg/kg	Yes	If Total Hg > 15 mg/kg
	Inorganic Mercury	1 mg/kg	Yes	
	Methyl mercury	1 mg/kg	Yes	
Organic	TPH speciated by Aliphatic and Aromatic fractions, reported per Criteria Working Group banding.	4 mg/kg	Yes	If Total TPH > 500 mg/kg
Volatile Organic Compounds	Volatile Organic Compounds (US EPA 8260 target list) inc. tentatively identified compounds	1 µg/kg (VOC's) 0.1 mg/kg (BTEX)	Yes	Investigation Supervisor to schedule if required
Semi Volatile Organic Compounds	Semi Volatile Organic Compounds (US EPA 8270 Target List) inc. tentatively identified compounds	1 µg/kg	Yes	Investigation Supervisor to schedule if required

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Secondary Soil Suites

Sub Suite 1 – Dioxins, Furans and Dioxin like PCBs

Determinand Group	Determinands	Required LOD	Conditional (see note 2)	Conditional / Analysis Notes
	2,3,7,8-TCDD	Sum of PCDDs, PCDFs and PCBs <0.003 mg/kg	No	
	1,2,3,7,8-PeCDD	Sum of PCDDs, PCDFs and PCBs <0.003 mg/kg	No	
	1,2,3,4,7,8-HxCDD	Sum of PCDDs, PCDFs and PCBs <0.003 mg/kg	No	
	1,2,3,6,7,8-HxCDD	Sum of PCDDs, PCDFs and PCBs <0.003 mg/kg	No	
	1,2,3,7,8,9-HxCDD	Sum of PCDDs, PCDFs and PCBs <0.003 mg/kg	No	
	1,2,3,4,6,7,8-HpCDD	Sum of PCDDs, PCDFs and PCBs <0.003 mg/kg	No	
	OCDD	Sum of PCDDs, PCDFs and PCBs <0.003 mg/kg	No	
	2,3,7,8-TCDF	Sum of PCDDs, PCDFs and PCBs <0.003 mg/kg	No	
	1,2,3,7,8-PeCDF	Sum of PCDDs, PCDFs and PCBs <0.003 mg/kg	No	
	2,3,4,7,8-PeCDF	Sum of PCDDs, PCDFs and PCBs <0.003 mg/kg	No	

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Determinand Group	Determinands	Required LOD	Conditional (see note 2)	Conditional / Analysis Notes
	1,2,3,4,7,8-HxCDF	Sum of PCDDs, PCDFs and PCBs <0.003 mg/kg	No	
	1,2,3,7,8,9-HxCDF	Sum of PCDDs, PCDFs and PCBs <0.003 mg/kg	No	
	1,2,3,6,7,8-HxCDF	Sum of PCDDs, PCDFs and PCBs <0.003 mg/kg	No	
	2,3,4,6,7,8-HxCDF	Sum of PCDDs, PCDFs and PCBs <0.003 mg/kg	No	
	1,2,3,4,6,7,8-HpCDF	Sum of PCDDs, PCDFs and PCBs <0.003 mg/kg	No	
	1,2,3,4,7,8,9-HpCDF	Sum of PCDDs, PCDFs and PCBs <0.003 mg/kg	No	
	OCDF	Sum of PCDDs, PCDFs and PCBs <0.003 mg/kg	No	
	PCB-77	Sum of PCDDs, PCDFs and PCBs <0.003 mg/kg	No	
	PCB-81	Sum of PCDDs, PCDFs and PCBs <0.003 mg/kg	No	
	PCB-126	Sum of PCDDs, PCDFs and PCBs <0.003 mg/kg	No	
	PCB-169	Sum of PCDDs, PCDFs and PCBs <0.003 mg/kg	No	

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Determinand Group	Determinands	Required LOD	Conditional (see note 2)	Conditional / Analysis Notes
	PCB-105	Sum of PCDDs, PCDFs and PCBs <0.003 mg/kg	No	
	PCB-114	Sum of PCDDs, PCDFs and PCBs <0.003 mg/kg	No	
	PCB-118	Sum of PCDDs, PCDFs and PCBs <0.003 mg/kg	No	
	PCB-123	Sum of PCDDs, PCDFs and PCBs <0.003 mg/kg	No	
	PCB-156	Sum of PCDDs, PCDFs and PCBs <0.003 mg/kg	No	
	PCB-157	Sum of PCDDs, PCDFs and PCBs <0.003 mg/kg	No	
	PCB-167	Sum of PCDDs, PCDFs and PCBs <0.003 mg/kg	No	
	PCB-189	Sum of PCDDs, PCDFs and PCBs <0.003 mg/kg	No	

Sub Suite 2 – Pathogens

Determinand Group	Determinands	Required LOD	Conditional (see note 2)	Conditional / Analysis Notes
Pathogens	Salmonella	<1 MPN/g	No	
	E.coli	<1 MPN/g	No	
	Faecal streptococci	<1 MPN/g	No	

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Sub Suite 3 – Radiological

Determinand Group	Determinands	Required LOD	Conditional	Conditional / Analysis Notes
Gamma Spectrometry	Ag-110m	0.0026 Bq/g	No	
	Am-241	0.0017 Bq/g	No	
	Ce-144	0.0097 Bq/g	No	
	Co-58	0.0026 Bq/g	No	
	Co-60	0.0026 Bq/g	No	
	Cs-134	0.0030 Bq/g	No	
	Cs-137	0.0029 Bq/g	No	
	Eu-152	0.0036 Bq/g	No	
	Eu-154	0.0025 Bq/g	No	
	Eu-155	0.0043 Bq/g	No	
	I-129	0.0060 Bq/g	No	
	I-131	0.0024 Bq/g	No	
	I-133	0.0020 Bq/g	No	

Determinand Group	Determinands	Required LOD	Conditional	Conditional / Analysis Notes
	Mn-54	0.0026 Bq/g	No	
	Nb-95	0.0026 Bq/g	No	
	Np-237	0.0066 Bq/g	No	
	Pa-233	0.0047 Bq/g	No	
	Ra-226	0.041 Bq/g	No	
	Ru-106	0.024 Bq/g	No	
	Sb-124	0.0025 Bq/g	No	
	Sb-125	0.0070 Bq/g	No	
	Te-123m	0.0030 Bq/g	No	
	Th-234	0.017 Bq/g	No	
	U-235	0.011 Bq/g	No	
	Zn-65	0.0052 Bq/g	No	
	Total tritium	0.1 Bq/g	No	

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Sub Suite 4 – Pesticides and Herbicides

Determinand Group	Determinands	Required LOD (note 1)	Conditional	Conditional / Analysis Notes
Pesticides & Herbicides	Organochlorine Pesticides	0.05 mg/kg	N	
	Organophosphate Pesticides	0.05 mg/kg	N	
	Organonitrogen pesticides	0.05 mg/kg	N	
	Triazine Herbicides	0.05 mg/kg	N	
	Phenoxy Acidic Herbicides	0.05 mg/kg	N	
	Phenyl Urea Herbicides	0.05 mg/kg	N	

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Sub Suite 5 – Airport Chemicals

Determinand Group	Determinands	Required LOD	Conditional (see note 2)	Conditional / Analysis Notes
Fire Control	PFBA (perfluoro-n-butanoic acid) (CAS-357-22-44)	3 µg/kg		
	PFPA (perfluoro-n-pentanoic acid) (CAS-2706-90-3)	3 µg/kg		
	PFHxA (perfluoro-n-hexanoic acid) (307-24-4)	2 µg/kg		
	PFHpA (perfluoro-n-heptanoic acid) (375-85-9)	1 µg/kg		
	PFOA (perfluoro-n-octanoic acid) (CAS-335-67-1)	1 µg/kg		
	PFNA (perfluoro-n-nonanoic acid) (CAS-375-95-1)	1 µg/kg		
	PFUnA (perfluoro-n-undecanoic acid) (CAS-2508-94-8)	1 µg/kg		
	PFDoA (perfluoro-n-dodecanoic acid) (CAS-307-55-1)	1 µg/kg		
	PFBS (perfluoro-1-butanesulfonate) (CAS-375-73-5)	1 µg/kg		
	PFHxS (perfluoro-1-hexanesulfonate) (CAS-355-46-4)	1 µg/kg		
	PFHpS (perfluoro-1-heptanesulfonate) (CAS-375-92-8)	1 µg/kg		
	Linear PFOS (perfluoro-1-octanesulfonate) (CAS-1763-23-1)	1 µg/kg		
	Branched PFOS (mixture of isomers)	1 µg/kg		
	Total PFOS (sum of linear and branched)	1 µg/kg		
	6:2 FtS (6:2 fluorotelomer sulfonate) (CAS-27619-97-2)	1 µg/kg		
	PFOSA (Perfluoro-octane sulfonamide) (CAS-754-91-6)	1 µg/kg		
	Bromated diphenylethers (congener 28, 47, 99, 100, 153 & 154)	1 µg/kg	No	
	Hexabromocyclododecane (HBCDD)	1 µg/kg	No	
Glycols	1,3-Butylene glycol	Contractor to offer Laboratory LOD	No	

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Determinand Group	Determinands	Required LOD	Conditional (see note 2)	Conditional / Analysis Notes
	1,4-Butylene glycol	Contractor to offer Laboratory LOD	No	
	Diethylene Glycol	Contractor to offer Laboratory LOD	No	
	Ethylene glycol	Contractor to offer Laboratory LOD	No	
	Monoethylene Glycol	Contractor to offer Laboratory LOD	No	
	Propylene glycol (Propanediol (1,2))	Contractor to offer Laboratory LOD	No	
	Propanediol (1,3)	Contractor to offer Laboratory LOD	No	
	Triethylene Glycol	Contractor to offer Laboratory LOD	No	
	Trimethylene glycol	Contractor to offer Laboratory LOD	No	
Non-glycol de-icers / acetates	Acetates	Contractor to offer Laboratory LOD	No	
	Formates	Contractor to offer Laboratory LOD	No	

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Sub Suite 6 – Waste Acceptance Criteria

Determinand Group	Determinands	Required LOD	Conditional Analysis	Conditional / Analysis Notes
WAC	See Suite I – Stable Non Reactive Hazardous Waste in Non Hazardous Landfill, Suite H – Inert Landfill WAC test and Suite J – Hazardous Landfill WAC test (see Schedule 1.20.5 of the	As specified	No	

Soil Analysis Notes

Note 1

Conditional analysis offers a potential cost saving by initially undertaking limited analysis (for example total chromium), if a condition is met (i.e. an exceedance of hexavalent chromium) the laboratory then undertakes hexavalent chromium and chromium III analysis. Over the number of samples to be submitted to the laboratory this could offer a saving by removing the need to undertake the more expensive analysis on each cost. Before undertaking this is should be established with the laboratory that holding times for the compounds would not be exceeded should the second stage of analysis be required.

Note 2

Contractor to provide determinands offered in each of the pesticide and herbicide categories.

Note 3

Contractor is to provide a list of determinands offered within the VOC and SVOC suites.

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United Kingdom Accreditation Service

ACCREDITATION CERTIFICATE

TESTING LABORATORY
No. 1549

Concept Life Sciences Analytical & Development Services Ltd

is accredited in accordance with the recognised International Standard ISO/IEC 17025:2005 - General Requirements for the competence of testing and calibration laboratories.

This accreditation demonstrates technical competence for a defined scope as detailed in and at the locations specified in the schedule to this certificate, and the operation of a laboratory quality management system (refer joint ISO-ILAC-IAF Communiqué dated April 2017).

The schedule to this certificate is an essential accreditation document and from time to time may be revised and reissued by the United Kingdom Accreditation Service. The most recent issue of the schedule of accreditation, which bears the same accreditation number as this certificate, is available from the UKAS website www.ukas.com.

This accreditation is subject to continuing conformity with United Kingdom Accreditation Service requirements. The absence of a schedule on the UKAS website indicates that the accreditation is no longer in force.

Accreditation Manager, United Kingdom Accreditation Service

Initial Accreditation date
10 January 1995

This certificate issued on
31 July 2017

UKAS is appointed as the sole national accreditation body for the UK by The Accreditation Regulations 2009 (SI No 3155/2009) and operates under a Memorandum of Understanding (MoU) with the Department for Business, Energy & Industrial Strategy (BEIS)

SCHEDULE OF GEOENVIRONMENTAL TESTING

Fugro Chain of Custody Reference	Exploratory Position IDs	Concept Life Sciences Certificate of Analysis Number
18492	HEP-BH-61	701280
18506	HEP-TT-11	701280
18507	HEP-TT-9	701280
18511	HEP-BH-1804	701280
18512	HEP-BH-1805	701280
18514	HEP-BH-1806	701280
18516	HEP-BH-1321	701280
18519	HEP-BH-826	701280
18520	HEP-BH-1321	na
18522	HEP-TT-18	701280
18523	HEP-BH-1	701280
18525	HEP-BH-826	na
18532	HEP-BH-1805	701280
18534	HEP-TT-1032	na
18528	HEP-BH-1861	701887
18487	HEP-BH-22	701835
18488	HEP-BH-50	701835
18494	HEP-BH-50	na
18497	HEP-BH-61	na
18498	HEP-BH-22	701835
18502	HEP-BH-61	na
18510	HEP-TT-6	701835
18517	HEP-BH-22	na
18525	HEP-BH-826	Na
18527	HEP-BH-1802	701835
18529	HEP-BH-1805	701835
18530	HEP-BH-24	701835
18538	HEP-BH-823	701835
18541	HEP-BH-823	701835
18543	HEP-BH-23	701835
18546	HEP-BH-12	na
18547	HEP-BH-12	na
18518	HEP-BH-826	701803
18519	HEP-BH-826	701803
18526	HEP-BH-12	701803
18536	HEP-BH-32	701803
18537	HEP-BH-12	701803
18542	HEP-BH-25	701803
18545	HEP-BH-32	701803
18548	HEP-BH-33	701803
18549	HEP-BH-27	701803
18550	HEP-BH-27	na
18504	HEP-TT-3	702829
18533	HEP-TT-39	702829

Fugro Chain of Custody Reference	Exploratory Position IDs	Concept Life Sciences Certificate of Analysis Number
18535	HEP-TT-29	702829
21701	HEP-BH-2	702829
21702	HEP-BH-17	702829
21704	HEP-BH-47	702829
21703	HEP-BH-1806	702844
21705	HEP-BH-47	na
21706	HEP-BH-2	na
21708	HEP-BH-1806	na
21714	HEP-BH-45	703830
21715	HEP-BH-1	703830
21716	HEP-BH-824	703830
21705	HEP-BH-47	na
21707	HEP-BH-1804	704623
21709	HEP-BH-12	na
21710	HEP-BH-23	704623
21711	HEP-BH-5	704623
21712	HEP-BH-33	704623
21713	HEP-BH-23	na
21717	HEP-BH-1802	704623
21718	HEP-BH-13	704623
21719	HEP-BH-1862	na
21720	HEP-BH-45	na
21721	HEP-BH-824	na
21722	HEP-BH-1	na
21723	HEP-BH-1863	704623
21724	HEP-BH-1810	704623
21725	HEP-BH-36	704623
21726	HEP-BH-25	704623
21727	HEP-BH-17	na
21728	HEP-BH-36	704623
21730	HEP-TP-10	704623
21731	HEP-BH-1318	na
21732	HEP-BH-25	na
21733	HEP-TP-1296	706211
21734	HEP-BH-1811	na
21735	HEP-BH-14	706211
21736	HEP-BH-16	na
21737	HEP-BH-43	706211
21738	HEP-BH-39	706211
21739	HEP-BH-36	na
21740	HEP-BH-36	706211
21741	HEP-TT-19	706211
21742	HEP-BH-1795	Na
21743	HEP-BH-13	706211
21745	HEP-BH-16	706211

Fugro Chain of Custody Reference	Exploratory Position IDs	Concept Life Sciences Certificate of Analysis Number
21746	HEP-BH-43	706211
21747	HEP-BH-14	706211
21748	HEP-BH-16	706211
21749	HEP-BH-43	706211
21750	HEP-BH-13	706211
21756	HEP-BH-20	706211
21757	HEP-BH-1797	na
21758	HEP-BH-43	na
21759	HEP-BH-1864	706211
21760	HEP-BH-44	706211
21761	HEP-BH-20	706245
21762	HEP-BH-1319	706245
21763	HEP-BH-1798	706245
21764	HEP-BH-5	706245
21765	HEP-BH-1797	706245
21767	HEP-BH-5	706245
21755	HEP-BH-14	707108
21776	HEP-BH-44	707108
18531	HEP-BH-1861	707552
21788	HEP-BH-77	708032
21791	HEP-BH-1364	na
21796	HEP-BH-85	708032
21798	HEP-BH-85	708032
21810	HEP-BH-821	709003
21817	HEP-BH-821	na
21828	HEP-BH-65	710090
21834	HEP-BH-85	na
21914	HEP-BH-820	720766
22359	HEP-BH-822	720766
21925	HEP-BH-64	722427
21927	HEP-BH-1323	722427
21931	HEP-BH-52	722990
21945	HEP-BH-1050	724097
21946	HEP-BH-1047	724097

Notes:
na not applicable (testing not scheduled)

SCHEDULE OF GEOENVIRONMENTAL LABORATORY TEST CLARIFICATIONS

Concept Life Sciences Certificate of Analysis Number	Deviations		Clarifications (one or more sample/analyte affected within Certificate of Analysis)								Remarks
	Reason for Deviation	Analyses Affected	LOD raised due to dilution of sample	LOD determined by sample aliquot used for analysis	LOD raised due to high moisture content of the sample	LOD raised due to low internal standard recovery	LOD raised due to matrix interference	Results have been blank corrected	LOD raised due to elevated blank	Qualitative result*	
			[9] †	[100] †	[109] †	[110] †	[2] †	[13] †	[3] †	[278] †	
701280	Samples have been analysed exceeding recommended holding times	pH, VOCs	PAHs, TPH	-	-	TPH	-	TPH	-	MRPs	(5) MRPs (Nicotine)
701280 Sub Suite 1	-	-	-	-	-	-	PCBs	-	-	-	
701280 Sub Suite 3	-	-	-	-	-	-	-	-	-	-	Subcontracted to Amec Foster Wheeler (Reference L180008)
701803	Samples have been analysed exceeding recommended holding times	pH	PAHs	-	-	TPH	-	TPH	-	-	“Fill” samples are outside the scope of UKAS accreditation
701803 Sub Suite 1	-	-	-	-	-	-	PCBs	-	-	-	“Fill” samples are outside the scope of UKAS accreditation
701835	Samples have been analysed exceeding recommended holding times	pH	PAHs	-	-	-	-	TPH	-	-	
701835 Sub Suite 1	-	-	-	-	-	-	PCBs	-	-	-	
701887	Samples have been analysed exceeding recommended holding times	pH	PAHs	-	-	-	-	TPH	-	-	
702829	-	-	PAHs, TPH	-	-	-	-	TPH	-	-	“Other” samples are outside the scope of UKAS accreditation
702829 Sub Suite 1	-	-	-	-	-	-	-	-	-	-	“Other” samples are outside the scope of UKAS accreditation
702844	Samples have been analysed exceeding recommended holding times	pH	-	-	-	-	-	TPH	-	-	
703830	Samples have been analysed exceeding recommended holding times	pH	PAHs, TPH	-	-	TPH	-	TPH	-	-	
704623	-	-	PAHs	PAHs, Herbicides	-	TPH	-	TPH	-	MRPs	“Fill” samples are outside the scope of MCERTS accreditation (36) Herbicides, (5) MRPs (Nicotine), (62) MRPs (Nicotine)
704623 Sub Suite 1	-	-	-	PCBs	-	-	PCBs	-	-	-	“Fill” samples are outside the scope of MCERTS accreditation
706211	Samples taken 14/12/17 or earlier have been analysed exceeding recommended holding times	TPH, PCBs, PAHs, phenols, pesticides	PAHs, TPH	PAHs, TPH	-	-	-	TPH	-	MRPs	“Fill” samples are outside the scope of MCERTS accreditation (5) MRPs (Nicotine), (147) MRPs (Pentachlorophenol)
706211 Sub Suite 1	Samples taken 14/12/17 or earlier have been analysed exceeding recommended holding times	PCBs	-	PCBs	-	-	PCBs	-	-	-	
706211 Sub Suite 6	-	-	-	-	-	-	-	-	-	-	
706245	Samples have been analysed exceeding recommended holding times	pH, TPH	PAHs, TPH (Aromatics)	PAHs	-	-	-	TPH	-	-	
706245 Sub Suite 1	-	-	-	PCBs	-	-	-	-	-	-	

Concept Life Sciences Certificate of Analysis Number	Deviations		Clarifications (one or more sample/analyte affected within Certificate of Analysis)								Remarks
	Reason for Deviation	Analyses Affected	LOD raised due to dilution of sample	LOD determined by sample aliquot used for analysis	LOD raised due to high moisture content of the sample	LOD raised due to low internal standard recovery	LOD raised due to matrix interference	Results have been blank corrected	LOD raised due to elevated blank	Qualitative result*	
			[9] †	[100] †	[109] †	[110] †	[2] †	[13] †	[3] †	[278] †	
707108	Samples have been analysed exceeding recommended holding times	pH, TPH, PAHs	-	-	-	-	-	TPH	-	-	“Fill” samples are outside the scope of MCERTS accreditation
707552	-	-	PAHs, TPH	-	-	-	-	TPH	-	-	
707552 Sub Suite 1	-	-	-	-	-	-	-	-	-	-	
708032	-	-	PAHs, TPH	-	-	-	-	TPH	-	MRPs	“Fill” samples are outside the scope of MCERTS accreditation. Sample 6 is asbestos cement and can’t be quantified. (36) Herbicides, (5) MRPs (Nicotine)
708032 Sub Suite 1	-	-	-	PCBs	-	-	-	-	-	-	“Fill” samples are outside the scope of MCERTS accreditation
708032 Sub Suite 3 (Part 1)	-	-	-	-	-	-	-	-	-	-	Subcontracted to SOCOTEC (Reference 18-0045)
708032 Sub Suite 3 (Part 2)	-	-	-	-	-	-	-	-	-	-	Subcontracted to SOCOTEC (Reference 18-0097ADD)
709003	-	-	-	-	-	-	-	TPH	-	-	
709003 Sub Suite 3	-	-	-	-	-	-	-	-	-	-	Subcontracted to SOCOTEC (Reference 18-0124)
710090	Samples have been analysed exceeding recommended holding times	pH	-	-	-	-	-	TPH	-	-	
710090 Sub Suite 3	-	-	-	-	-	-	-	-	-	-	Subcontracted to SOCOTEC (Reference 18-0071)
720766	-	-	-	-	-	-	-	TPH	-	-	“Other” samples are outside the scope of UKAS accreditation
722427	-	-	-	-	-	-	-	TPH	-	-	“Fill” samples are outside the scope of UKAS accreditation Sample 1 is asbestos cement and can’t be quantified
722990	-	--	-	-	TPH	-	-	TPH	-	-	“Fill” samples are outside the scope of UKAS accreditation
724097	-	-	-	-	-	-	-	TPH	-	-	
724097 Sub Suite 3	Samples have been analysed exceeding recommended holding times	Tritium	-	-	-	-	-	-	-	-	Subcontracted to SOCOTEC (Reference 18-0266)

Notes:

Refer to Concept Life Sciences’ Certificates of Analysis for specific samples/analytes affected by deviation/clarification

LOD	Limit of detection		
PAH	Polycyclic aromatic hydrocarbon	CLS	Concept Life Sciences
PCB	Polychlorinated biphenyl	MCERTS	Environment Agency of England and Wales Monitoring Certification Scheme
TPH	Total petroleum hydrocarbons	UKAS	United Kingdom Accreditation Service
VOC	Volatile organic compound		
MRPs	Maillard reacted peptides	†	CLS remark reference

CONCEPT LIFE SCIENCES
DELIVERING SCIENCE

Concept Life Sciences is a trading name of Concept Life Sciences Analytical & Development Services Limited registered in England and Wales (No 2514788)

Concept Life Sciences

Certificate of Analysis

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Report Number: Second Supplemental B 701280-3

Date of Report: 27-Jun-2018

Customer: Fugro GeoServices
Fugro House
Hithercroft Road
Wallingford
Oxfordshire
OX10 9RB

Customer Contact: Ms Karen Blackmore

Customer Job Reference:
Customer Purchase Order: 56642KB-WAL
Customer Site Reference: Heathrow HEP Package 3
Date Job Received at Concept: 20-Nov-2017
Date Analysis Started: 06-Dec-2017
Date Analysis Completed: 22-Feb-2018

The results reported relate to samples received in the laboratory and may not be representative of a whole batch.

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation

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Tests covered by this certificate were conducted in accordance with Concept Life Sciences SOPs

All results have been reviewed in accordance with Section 25 of the Concept Life Sciences, Analytical Services Quality Manual

UKAS TESTING
1549

mCERTS
THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME

Report checked
and authorised by :
Sara Abou-Shakra
Customer Service Manager

Issued by :
David Catterall
Laboratory Manager

Concept Reference: 701280
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

Concept Reference					**701280 001**	**701280 007**	**701280 009**	**701280 010**	**701280 025**
Customer Sample Reference					**HEP-BH-1321**	**HEP-BH-61**	**HEP-BH-61**	**HEP-BH-61**	**HEP-BH-826**
Hole ID					**HEP-BH-1321**	**HEP-BH-61**	**HEP-BH-61**	**HEP-BH-61**	**HEP-BH-826**
Depth					**0.80**	**0.90**	**2.20**	**2.70**	**2.40**
Top Depth					**0.80**	**0.90**	**2.20**	**2.70**	**2.40**
Date Sampled					**23-NOV-2017**	**21-NOV-2017**	**21-NOV-2017**	**21-NOV-2017**	**24-NOV-2017**
Time Sampled					**13:25**	**10:00**	**11:00**	**11:15**	**09:20**
AGS Type					**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID					**HEPBH1321201711230 01**	**HEPBH6120171121001**	**HEPBH6120171121003**	**HEPBH6120171121004**	**FES1171124008**
AGS Sample Reference					**3**	**5**	**13**	**14**	**13**
Matrix Class					**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Moisture @105C	T162	AR	0.1	%	**6.5**	**3.2**	**17**	**30**	**18**
Retained on 10mm sieve	T2	M40	0.1	%	<0.1	<0.1	<0.1	<0.1	<0.1

Concept Reference: 701280
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

Concept Reference					**701280 026**	**701280 027**	**701280 032**	**701280 034**	**701280 035**
Customer Sample Reference					**HEP-BH-826**	**HEP-BH-826**	**HEP-BH-1804**	**HEP-BH-1804**	**HEP-BH-1806**
Hole ID					**HEP-BH-826**	**HEP-BH-826**	**HEP-BH-1804**	**HEP-BH-1804**	**HEP-BH-1806**
Depth					**3.40**	**4.30**	**0.20**	**0.70**	**0.30**
Top Depth					**3.40**	**4.30**	**0.20**	**0.70**	**0.30**
Date Sampled					**24-NOV-2017**	**24-NOV-2017**	**23-NOV-2017**	**23-NOV-2017**	**23-NOV-2017**
Time Sampled					**09:30**	**10:15**	**11:15**	**12:30**	**10:55**
AGS Type					**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID					**FES1171124013**	**FES1171124018**	**HEPBH1804201711230 01**	**HEPBH1804201711230 03**	**HEPBH1806201711230 01**
AGS Sample Reference					**18**	**23**	**3**	**9**	**3**
Matrix Class					**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Moisture @105C	T162	AR	0.1	%	**27**	**13**	**45**	**43**	**15**
Retained on 10mm sieve	T2	M40	0.1	%	<0.1	<0.1	<0.1	<0.1	<0.1

Concept Reference: 701280
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

Concept Reference					**701280 036**	**701280 038**	**701280 039**	**701280 042**	**701280 044**
Customer Sample Reference					**HEP-BH-1806**	**HEP-TT-11**	**HEP-TT-11**	**HEP-TT-18**	**HEP-TT-18**
Hole ID					**HEP-BH-1806**	**HEP-TT-11**	**HEP-TT-11**	**HEP-TT-18**	**HEP-TT-18**
Depth					**0.70**	**0.40**	**1.30**	**0.50**	**1.60**
Top Depth					**0.70**	**0.40**	**1.30**	**0.50**	**1.60**
Date Sampled					**23-NOV-2017**	**24-NOV-2017**	**24-NOV-2017**	**24-NOV-2017**	**24-NOV-2017**
Time Sampled					**11:30**	**00:00**	**00:00**	**00:00**	**00:00**
AGS Type					**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID					**HEPBH1806201711230 02**	**HEPTT1120171124002**	**HEPTT1120171124003**	**HEPTT1820171124002**	**HEPTT1820171124004**
AGS Sample Reference					**6**	**4**	**7**	**4**	**10**
Matrix Class					**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Moisture @105C	T162	AR	0.1	%	**24**	**12**	**22**	**9.8**	**27**
Retained on 10mm sieve	T2	M40	0.1	%	<0.1	<0.1	<0.1	<0.1	<0.1

Concept Reference: 701280
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**701280 046**	**701280 048**	**701280 049**	**701280 050**	**701280 051**
				Customer Sample Reference	**HEP-TT-9**	**HEP-TT-9**	**HEP-BH-1805**	**HEP-BH-1805**	**HEP-BH-1**
				Hole ID	**HEP-TT-9**	**HEP-TT-9**	**HEP-BH-1805**	**HEP-BH-1805**	**HEP-BH-1**
				Depth	**0.50**	**1.80**	**0.30**	**1.10**	**0.30**
				Top Depth	**0.50**	**1.80**	**0.30**	**1.10**	**0.30**
				Date Sampled	**23-NOV-2017**	**23-NOV-2017**	**23-NOV-2017**	**23-NOV-2017**	**23-NOV-2017**
				Time Sampled	**11:40**	**12:45**	**13:35**	**14:05**	**10:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPTT920171123002**	**HEPTT920171123004**	**HEPBH180520171123001**	**HEPBH180520171123002**	**HEPBH120171124001**
				AGS Sample Reference	**4**	**10**	**3**	**6**	**3**
				Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Moisture @105C	T162	AR	0.1	%	**12**	**35**	**23**	**4.4**	**19**
Retained on 10mm sieve	T2	M40	0.1	%	<0.1	<0.1	<0.1	<0.1	<0.1

Concept Reference: 701280
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**701280 052**
				Customer Sample Reference	**HEP-BH-1**
				Hole ID	**HEP-BH-1**
				Depth	**0.50**
				Top Depth	**0.50**
				Date Sampled	**23-NOV-2017**
				Time Sampled	**11:00**
				AGS Type	**ES**
				AGS Sample ID	**HEPBH120171124002**
				AGS Sample Reference	**6**
				Matrix Class	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**	
Moisture @105C	T162	AR	0.1	%	**20**
Retained on 10mm sieve	T2	M40	0.1	%	<0.1

Concept Reference: 701280
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - Inorganics

				Concept Reference	**701280 001**	**701280 007**	**701280 009**	**701280 010**	**701280 025**
				Customer Sample Reference	**HEP-BH-1321**	**HEP-BH-61**	**HEP-BH-61**	**HEP-BH-61**	**HEP-BH-826**
				Hole ID	**HEP-BH-1321**	**HEP-BH-61**	**HEP-BH-61**	**HEP-BH-61**	**HEP-BH-826**
				Depth	**0.80**	**0.90**	**2.20**	**2.70**	**2.40**
				Top Depth	**0.80**	**0.90**	**2.20**	**2.70**	**2.40**
				Date Sampled	**23-NOV-2017**	**21-NOV-2017**	**21-NOV-2017**	**21-NOV-2017**	**24-NOV-2017**
				Time Sampled	**13:25**	**10:00**	**11:00**	**11:15**	**09:20**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH1321201711230 01**	**HEPBH6120171121001**	**HEPBH6120171121003**	**HEPBH6120171121004**	**FES1171124008**
				AGS Sample Reference	**3**	**5**	**13**	**14**	**13**
				Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Chloride	T686	AR	1	mg/kg	**22**	**4**	**7**	**19**	**10**
Cyanide(Total)	T4	AR	1	mg/kg	<1	<1	<1	<1	<1
Thiocyanate	T4	A40	1	mg/kg	<10	<10	<10	<10	<10
Nitrate	T686	AR	1	mg/kg	**230**	**26**	**2**	<1	**4**
Nitrite	T686	AR	1	mg/kg	<1	<1	<1	<1	<1
SO4(Total)	T6	A40	0.01	%	**0.29**	**0.07**	**0.08**	**0.23**	**0.19**
Sulphide	T4	A40	10	mg/kg	<10	<10	**12**	**530**	**20**
Bromate	T11	AR	1	mg/kg	<1	<1	<1	<1	<1

Concept Reference: 701280
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - Inorganics

				Concept Reference	**701280 026**	**701280 027**	**701280 032**	**701280 034**	**701280 035**
				Customer Sample Reference	**HEP-BH-826**	**HEP-BH-826**	**HEP-BH-1804**	**HEP-BH-1804**	**HEP-BH-1806**
				Hole ID	**HEP-BH-826**	**HEP-BH-826**	**HEP-BH-1804**	**HEP-BH-1804**	**HEP-BH-1806**
				Depth	**3.40**	**4.30**	**0.20**	**0.70**	**0.30**
				Top Depth	**3.40**	**4.30**	**0.20**	**0.70**	**0.30**
				Date Sampled	**24-NOV-2017**	**24-NOV-2017**	**23-NOV-2017**	**23-NOV-2017**	**23-NOV-2017**
				Time Sampled	**09:30**	**10:15**	**11:15**	**12:30**	**10:55**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**FES1171124013**	**FES1171124018**	**HEPBH1804201711230 01**	**HEPBH1804201711230 03**	**HEPBH1806201711230 01**
				AGS Sample Reference	**18**	**23**	**3**	**9**	**3**
				Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Chloride	T686	AR	1	mg/kg	**26**	**10**	**9**	**27**	**120**
Cyanide(Total)	T4	AR	1	mg/kg	<1	<1	<1	<1	<1
Thiocyanate	T4	A40	1	mg/kg	<10	<10	<10	<10	<10
Nitrate	T686	AR	1	mg/kg	<1	<1	**120**	<1	<1
Nitrite	T686	AR	1	mg/kg	<1	<1	<1	<1	<1
SO4(Total)	T6	A40	0.01	%	**0.14**	**0.10**	**0.21**	**0.06**	**0.14**
Sulphide	T4	A40	10	mg/kg	**300**	**23**	**15**	**15**	<10
Bromate	T11	AR	1	mg/kg	<1	<1	<1	<1	<1

Concept Reference: 701280
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - Inorganics

				Concept Reference	**701280 036**	**701280 038**	**701280 039**	**701280 042**	**701280 044**
				Customer Sample Reference	**HEP-BH-1806**	**HEP-TT-11**	**HEP-TT-11**	**HEP-TT-18**	**HEP-TT-18**
				Hole ID	**HEP-BH-1806**	**HEP-TT-11**	**HEP-TT-11**	**HEP-TT-18**	**HEP-TT-18**
				Depth	**0.70**	**0.40**	**1.30**	**0.50**	**1.60**
				Top Depth	**0.70**	**0.40**	**1.30**	**0.50**	**1.60**
				Date Sampled	**23-NOV-2017**	**24-NOV-2017**	**24-NOV-2017**	**24-NOV-2017**	**24-NOV-2017**
				Time Sampled	**11:30**	**00:00**	**00:00**	**00:00**	**00:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH180620171123002**	**HEPTT1120171124002**	**HEPTT1120171124003**	**HEPTT1820171124002**	**HEPTT1820171124004**
				AGS Sample Reference	**6**	**4**	**7**	**4**	**10**
				Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Chloride	T686	AR	1	mg/kg	**19**	**4**	**8**	**3**	**9**
Cyanide(Total)	T4	AR	1	mg/kg	<1	<1	<1	<1	**10**
Thiocyanate	T4	A40	1	mg/kg	<10	<10	<10	<1	<10
Nitrate	T686	AR	1	mg/kg	<1	**35**	**30**	**7**	<1
Nitrite	T686	AR	1	mg/kg	<1	<1	<1	<1	<1
SO4(Total)	T6	A40	0.01	%	**0.02**	**0.25**	**0.36**	**0.14**	**0.41**
Sulphide	T4	A40	10	mg/kg	<10	<10	**12**	**14**	**150**
Bromate	T11	AR	1	mg/kg	<1	<1	<1	<1	<1

Concept Reference: 701280
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - Inorganics

				Concept Reference	**701280 046**	**701280 048**	**701280 049**	**701280 050**	**701280 051**
				Customer Sample Reference	**HEP-TT-9**	**HEP-TT-9**	**HEP-BH-1805**	**HEP-BH-1805**	**HEP-BH-1**
				Hole ID	**HEP-TT-9**	**HEP-TT-9**	**HEP-BH-1805**	**HEP-BH-1805**	**HEP-BH-1**
				Depth	**0.50**	**1.80**	**0.30**	**1.10**	**0.30**
				Top Depth	**0.50**	**1.80**	**0.30**	**1.10**	**0.30**
				Date Sampled	**23-NOV-2017**	**23-NOV-2017**	**23-NOV-2017**	**23-NOV-2017**	**23-NOV-2017**
				Time Sampled	**11:40**	**12:45**	**13:35**	**14:05**	**10:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPTT920171123002**	**HEPTT920171123004**	**HEPBH180520171123001**	**HEPBH180520171123002**	**HEPBH120171124001**
				AGS Sample Reference	**4**	**10**	**3**	**6**	**3**
				Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Chloride	T686	AR	1	mg/kg	**4**	**15**	**12**	**19**	**31**
Cyanide(Total)	T4	AR	1	mg/kg	**3**	**4**	<1	<1	<1
Thiocyanate	T4	A40	1	mg/kg	<10	<10	<10	<10	<10
Nitrate	T686	AR	1	mg/kg	**32**	<1	**2**	<1	**35**
Nitrite	T686	AR	1	mg/kg	<1	<1	<1	<1	<1
SO4(Total)	T6	A40	0.01	%	**0.14**	**0.44**	**0.02**	**0.09**	**0.05**
Sulphide	T4	A40	10	mg/kg	**14**	**300**	<10	**19**	<10
Bromate	T11	AR	1	mg/kg	<1	<1	<1	<1	<1

Concept Reference: 701280
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Inorganics

Concept Reference	**701280 052**
Customer Sample Reference	**HEP-BH-1**
Hole ID	**HEP-BH-1**
Depth	**0.50**
Top Depth	**0.50**
Date Sampled	**23-NOV-2017**
Time Sampled	**11:00**
AGS Type	**ES**
AGS Sample ID	**HEPBH120171124002**
AGS Sample Reference	**6**
Matrix Class	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units	
Chloride	T686	AR	1	mg/kg	**20**
Cyanide(Total)	T4	AR	1	mg/kg	<1
Thiocyanate	T4	A40	1	mg/kg	<10
Nitrate	T686	AR	1	mg/kg	**8**
Nitrite	T686	AR	1	mg/kg	<1
SO4(Total)	T6	A40	0.01	%	**0.03**
Sulphide	T4	A40	10	mg/kg	<10
Bromate	T11	AR	1	mg/kg	<1

Concept Reference: 701280
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Misc

Concept Reference	**701280 001**	**701280 007**	**701280 009**	**701280 010**	**701280 025**
Customer Sample Reference	**HEP-BH-1321**	**HEP-BH-61**	**HEP-BH-61**	**HEP-BH-61**	**HEP-BH-826**
Hole ID	**HEP-BH-1321**	**HEP-BH-61**	**HEP-BH-61**	**HEP-BH-61**	**HEP-BH-826**
Depth	**0.80**	**0.90**	**2.20**	**2.70**	**2.40**
Top Depth	**0.80**	**0.90**	**2.20**	**2.70**	**2.40**
Date Sampled	**23-NOV-2017**	**21-NOV-2017**	**21-NOV-2017**	**21-NOV-2017**	**24-NOV-2017**
Time Sampled	**13:25**	**10:00**	**11:00**	**11:15**	**09:20**
AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**HEPBH132120171123001**	**HEPBH6120171121001**	**HEPBH6120171121003**	**HEPBH6120171121004**	**FES1171124008**
AGS Sample Reference	**3**	**5**	**13**	**14**	**13**
Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units					
Soil Organic Matter	T287	A40	0.1	%	**4.8**	**1.9**	**2.2**	**2.1**	**1.5**
pH	T7	A40			**7.8**	**7.9**	**7.3**	**7.3**	**7.8**

Concept Reference: 701280
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Misc

				Concept Reference	**701280 026**	**701280 027**	**701280 032**	**701280 034**	**701280 035**
				Customer Sample Reference	**HEP-BH-826**	**HEP-BH-826**	**HEP-BH-1804**	**HEP-BH-1804**	**HEP-BH-1806**
				Hole ID	**HEP-BH-826**	**HEP-BH-826**	**HEP-BH-1804**	**HEP-BH-1804**	**HEP-BH-1806**
				Depth	**3.40**	**4.30**	**0.20**	**0.70**	**0.30**
				Top Depth	**3.40**	**4.30**	**0.20**	**0.70**	**0.30**
				Date Sampled	**24-NOV-2017**	**24-NOV-2017**	**23-NOV-2017**	**23-NOV-2017**	**23-NOV-2017**
				Time Sampled	**09:30**	**10:15**	**11:15**	**12:30**	**10:55**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**FES1171124013**	**FES1171124018**	**HEPBH180420171123001**	**HEPBH180420171123003**	**HEPBH180620171123001**
				AGS Sample Reference	**18**	**23**	**3**	**9**	**3**
				Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Soil Organic Matter	T287	A40	0.1	%	**0.8**	**2.0**	**11**	**2.3**	**5.7**
pH	T7	A40			**8.3**	**7.8**	**7.7**	**7.4**	**6.8**

Concept Reference: 701280
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Misc

				Concept Reference	**701280 036**	**701280 038**	**701280 039**	**701280 042**	**701280 044**
				Customer Sample Reference	**HEP-BH-1806**	**HEP-TT-11**	**HEP-TT-11**	**HEP-TT-18**	**HEP-TT-18**
				Hole ID	**HEP-BH-1806**	**HEP-TT-11**	**HEP-TT-11**	**HEP-TT-18**	**HEP-TT-18**
				Depth	**0.70**	**0.40**	**1.30**	**0.50**	**1.60**
				Top Depth	**0.70**	**0.40**	**1.30**	**0.50**	**1.60**
				Date Sampled	**23-NOV-2017**	**24-NOV-2017**	**24-NOV-2017**	**24-NOV-2017**	**24-NOV-2017**
				Time Sampled	**11:30**	**00:00**	**00:00**	**00:00**	**00:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH180620171123002**	**HEPTT1120171124002**	**HEPTT1120171124003**	**HEPTT1820171124002**	**HEPTT1820171124004**
				AGS Sample Reference	**6**	**4**	**7**	**4**	**10**
				Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Soil Organic Matter	T287	A40	0.1	%	**0.5**	**5.8**	**4.1**	**4.1**	**6.9**
pH	T7	A40			**7.9**	**7.8**	**8.1**	**8.1**	**8.0**

Concept Reference: 701280
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Misc

				Concept Reference	**701280 046**	**701280 048**	**701280 049**	**701280 050**	**701280 051**
				Customer Sample Reference	**HEP-TT-9**	**HEP-TT-9**	**HEP-BH-1805**	**HEP-BH-1805**	**HEP-BH-1**
				Hole ID	**HEP-TT-9**	**HEP-TT-9**	**HEP-BH-1805**	**HEP-BH-1805**	**HEP-BH-1**
				Depth	**0.50**	**1.80**	**0.30**	**1.10**	**0.30**
				Top Depth	**0.50**	**1.80**	**0.30**	**1.10**	**0.30**
				Date Sampled	**23-NOV-2017**	**23-NOV-2017**	**23-NOV-2017**	**23-NOV-2017**	**23-NOV-2017**
				Time Sampled	**11:40**	**12:45**	**13:35**	**14:05**	**10:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPTT920171123002**	**HEPTT920171123004**	**HEPBH180520171123001**	**HEPBH180520171123002**	**HEPBH120171124001**
				AGS Sample Reference	**4**	**10**	**3**	**6**	**3**
				Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Soil Organic Matter	T287	A40	0.1	%	**6.4**	**3.1**	**0.6**	**1.4**	**2.9**
pH	T7	A40			**7.6**	**7.4**	**7.9**	**8.3**	**6.9**

Concept Reference: 701280
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Misc

Concept Reference	**701280 052**
Customer Sample Reference	**HEP-BH-1**
Hole ID	**HEP-BH-1**
Depth	**0.50**
Top Depth	**0.50**
Date Sampled	**23-NOV-2017**
Time Sampled	**11:00**
AGS Type	**ES**
AGS Sample ID	**HEPBH120171124002**
AGS Sample Reference	**6**
Matrix Class	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units	
Soil Organic Matter	T287	A40	0.1	%	**1.7**
pH	T7	A40			**7.3**

Concept Reference: 701280
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings Metals and Metalloids

Concept Reference	**701280 001**	**701280 007**	**701280 009**	**701280 010**	**701280 025**
Customer Sample Reference	**HEP-BH-1321**	**HEP-BH-61**	**HEP-BH-61**	**HEP-BH-61**	**HEP-BH-826**
Hole ID	**HEP-BH-1321**	**HEP-BH-61**	**HEP-BH-61**	**HEP-BH-61**	**HEP-BH-826**
Depth	**0.80**	**0.90**	**2.20**	**2.70**	**2.40**
Top Depth	**0.80**	**0.90**	**2.20**	**2.70**	**2.40**
Date Sampled	**23-NOV-2017**	**21-NOV-2017**	**21-NOV-2017**	**21-NOV-2017**	**24-NOV-2017**
Time Sampled	**13:25**	**10:00**	**11:00**	**11:15**	**09:20**
AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**HEPBH1321201711230 01**	**HEPBH6120171121001**	**HEPBH6120171121003**	**HEPBH6120171121004**	**FES1171124008**
AGS Sample Reference	**3**	**5**	**13**	**14**	**13**
Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units					
Arsenic	T6	M40	2	mg/kg	**15**	**11**	**10**	**13**	**28**
Cadmium	T6	M40	1	mg/kg	**2**	<1	<1	<1	<1
Chromium	T6	M40	1	mg/kg	**48**	**30**	**26**	**39**	**37**
Iron	T6	A40	1	mg/kg	**29000**	**24000**	**24000**	**34000**	**57000**
Lead	T6	M40	1	mg/kg	**230**	**95**	**82**	**38**	**72**
Manganese	T6	M40	1	mg/kg	**360**	**500**	**360**	**590**	**360**
Mercury	T6	M40	1	mg/kg	<1	<1	<1	<1	<1
Nickel	T6	M40	1	mg/kg	**30**	**19**	**18**	**35**	**34**
Selenium	T6	M40	3	mg/kg	<3	<3	<3	<3	<3
Copper	T6	M40	1	mg/kg	**67**	**88**	**29**	**25**	**33**
Zinc	T6	M40	1	mg/kg	**370**	**88**	**75**	**85**	**86**
Boron (water-soluble)	T6	A40	1	mg/kg	<1	<1	<1	<1	<1

Concept Reference: 701280
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings Metals and Metalloids

				Concept Reference	**701280 026**	**701280 027**	**701280 032**	**701280 034**	**701280 035**
				Customer Sample Reference	**HEP-BH-826**	**HEP-BH-826**	**HEP-BH-1804**	**HEP-BH-1804**	**HEP-BH-1806**
				Hole ID	**HEP-BH-826**	**HEP-BH-826**	**HEP-BH-1804**	**HEP-BH-1804**	**HEP-BH-1806**
				Depth	**3.40**	**4.30**	**0.20**	**0.70**	**0.30**
				Top Depth	**3.40**	**4.30**	**0.20**	**0.70**	**0.30**
				Date Sampled	**24-NOV-2017**	**24-NOV-2017**	**23-NOV-2017**	**23-NOV-2017**	**23-NOV-2017**
				Time Sampled	**09:30**	**10:15**	**11:15**	**12:30**	**10:55**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**FES1171124013**	**FES1171124018**	**HEPBH180420171123001**	**HEPBH180420171123003**	**HEPBH180620171123001**
				AGS Sample Reference	**18**	**23**	**3**	**9**	**3**
				Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Arsenic	T6	M40	2	mg/kg	**16**	**13**	**11**	**7**	**21**
Cadmium	T6	M40	1	mg/kg	<1	<1	**1**	<1	<1
Chromium	T6	M40	1	mg/kg	**40**	**32**	**40**	**7**	**36**
Iron	T6	A40	1	mg/kg	**45000**	**34000**	**26000**	**4400**	**37000**
Lead	T6	M40	1	mg/kg	**260**	**66**	**130**	**6**	**110**
Manganese	T6	M40	1	mg/kg	**330**	**370**	**460**	**110**	**630**
Mercury	T6	M40	1	mg/kg	<1	<1	<1	<1	<1
Nickel	T6	M40	1	mg/kg	**35**	**27**	**29**	**11**	**28**
Selenium	T6	M40	3	mg/kg	<3	<3	<3	<3	<3
Copper	T6	M40	1	mg/kg	**28**	**23**	**50**	**6**	**31**
Zinc	T6	M40	1	mg/kg	**99**	**78**	**140**	**20**	**76**
Boron (water-soluble)	T6	A40	1	mg/kg	<1	<1	<1	<1	<1

Concept Reference: 701280
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings Metals and Metalloids

				Concept Reference	**701280 036**	**701280 038**	**701280 039**	**701280 042**	**701280 044**
				Customer Sample Reference	**HEP-BH-1806**	**HEP-TT-11**	**HEP-TT-11**	**HEP-TT-18**	**HEP-TT-18**
				Hole ID	**HEP-BH-1806**	**HEP-TT-11**	**HEP-TT-11**	**HEP-TT-18**	**HEP-TT-18**
				Depth	**0.70**	**0.40**	**1.30**	**0.50**	**1.60**
				Top Depth	**0.70**	**0.40**	**1.30**	**0.50**	**1.60**
				Date Sampled	**23-NOV-2017**	**24-NOV-2017**	**24-NOV-2017**	**24-NOV-2017**	**24-NOV-2017**
				Time Sampled	**11:30**	**00:00**	**00:00**	**00:00**	**00:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH180620171123002**	**HEPTT1120171124002**	**HEPTT1120171124003**	**HEPTT1820171124002**	**HEPTT1820171124004**
				AGS Sample Reference	**6**	**4**	**7**	**4**	**10**
				Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Arsenic	T6	M40	2	mg/kg	**12**	**16**	**16**	**15**	**16**
Cadmium	T6	M40	1	mg/kg	<1	**10**	**3**	**2**	**11**
Chromium	T6	M40	1	mg/kg	**25**	**110**	**50**	**47**	**140**
Iron	T6	A40	1	mg/kg	**30000**	**31000**	**31000**	**32000**	**30000**
Lead	T6	M40	1	mg/kg	**17**	**260**	**530**	**450**	**450**
Manganese	T6	M40	1	mg/kg	**460**	**400**	**380**	**410**	**310**
Mercury	T6	M40	1	mg/kg	<1	<1	<1	<1	**1**
Nickel	T6	M40	1	mg/kg	**24**	**53**	**34**	**33**	**60**
Selenium	T6	M40	3	mg/kg	<3	<3	<3	<3	<3
Copper	T6	M40	1	mg/kg	**13**	**160**	**83**	**99**	**210**
Zinc	T6	M40	1	mg/kg	**37**	**400**	**280**	**270**	**500**
Boron (water-soluble)	T6	A40	1	mg/kg	<1	<1	<1	<1	<1

Concept Reference: 701280
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings Metals and Metalloids

Concept Reference	**701280 046**	**701280 048**	**701280 049**	**701280 050**	**701280 051**
Customer Sample Reference	**HEP-TT-9**	**HEP-TT-9**	**HEP-BH-1805**	**HEP-BH-1805**	**HEP-BH-1**
Hole ID	**HEP-TT-9**	**HEP-TT-9**	**HEP-BH-1805**	**HEP-BH-1805**	**HEP-BH-1**
Depth	**0.50**	**1.80**	**0.30**	**1.10**	**0.30**
Top Depth	**0.50**	**1.80**	**0.30**	**1.10**	**0.30**
Date Sampled	**23-NOV-2017**	**23-NOV-2017**	**23-NOV-2017**	**23-NOV-2017**	**23-NOV-2017**
Time Sampled	**11:40**	**12:45**	**13:35**	**14:05**	**10:00**
AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**HEPTT920171123002**	**HEPTT920171123004**	**HEPBH180520171123001**	**HEPBH180520171123002**	**HEPBH120171124001**
AGS Sample Reference	**4**	**10**	**3**	**6**	**3**
Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units					
Arsenic	T6	M40	2	mg/kg	**17**	**13**	**10**	**9**	**14**
Cadmium	T6	M40	1	mg/kg	**12**	**3**	<1	<1	<1
Chromium	T6	M40	1	mg/kg	**190**	**46**	**32**	**49**	**30**
Iron	T6	A40	1	mg/kg	**30000**	**31000**	**25000**	**17000**	**26000**
Lead	T6	M40	1	mg/kg	**280**	**490**	**21**	**70**	**43**
Manganese	T6	M40	1	mg/kg	**400**	**310**	**400**	**190**	**340**
Mercury	T6	M40	1	mg/kg	**1**	<1	<1	<1	<1
Nickel	T6	M40	1	mg/kg	**60**	**23**	**30**	**23**	**21**
Selenium	T6	M40	3	mg/kg	<3	<3	<3	<3	<3
Copper	T6	M40	1	mg/kg	**200**	**67**	**17**	**29**	**22**
Zinc	T6	M40	1	mg/kg	**440**	**560**	**68**	**99**	**64**
Boron (water-soluble)	T6	A40	1	mg/kg	<1	<1	<1	<1	<1

Concept Reference: 701280
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings Metals and Metalloids

Concept Reference	**701280 052**
Customer Sample Reference	**HEP-BH-1**
Hole ID	**HEP-BH-1**
Depth	**0.50**
Top Depth	**0.50**
Date Sampled	**23-NOV-2017**
Time Sampled	**11:00**
AGS Type	**ES**
AGS Sample ID	**HEPBH120171124002**
AGS Sample Reference	**6**
Matrix Class	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units	
Arsenic	T6	M40	2	mg/kg	**9**
Cadmium	T6	M40	1	mg/kg	<1
Chromium	T6	M40	1	mg/kg	**33**
Iron	T6	A40	1	mg/kg	**22000**
Lead	T6	M40	1	mg/kg	**21**
Manganese	T6	M40	1	mg/kg	**210**
Mercury	T6	M40	1	mg/kg	<1
Nickel	T6	M40	1	mg/kg	**21**
Selenium	T6	M40	3	mg/kg	<3
Copper	T6	M40	1	mg/kg	**18**
Zinc	T6	M40	1	mg/kg	**54**
Boron (water-soluble)	T6	A40	1	mg/kg	<1

Concept Reference: 701280
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Chromium

Concept Reference					**701280 001**	**701280 007**	**701280 009**	**701280 010**	**701280 025**
Customer Sample Reference					**HEP-BH-1321**	**HEP-BH-61**	**HEP-BH-61**	**HEP-BH-61**	**HEP-BH-826**
Hole ID					**HEP-BH-1321**	**HEP-BH-61**	**HEP-BH-61**	**HEP-BH-61**	**HEP-BH-826**
Depth					**0.80**	**0.90**	**2.20**	**2.70**	**2.40**
Top Depth					**0.80**	**0.90**	**2.20**	**2.70**	**2.40**
Date Sampled					**23-NOV-2017**	**21-NOV-2017**	**21-NOV-2017**	**21-NOV-2017**	**24-NOV-2017**
Time Sampled					**13:25**	**10:00**	**11:00**	**11:15**	**09:20**
AGS Type					**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID					**HEPBH1321201711230 01**	**HEPBH6120171121001**	**HEPBH6120171121003**	**HEPBH6120171121004**	**FES1171124008**
AGS Sample Reference					**3**	**5**	**13**	**14**	**13**
Matrix Class					**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Chromium (trivalent)	T85	AR	2	mg/kg	**48**	**30**	**26**	**39**	**37**
Chromium VI	T6	A40	1	mg/kg	<1	<1	<1	<1	<1

Concept Reference: 701280
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Chromium

Concept Reference					**701280 026**	**701280 027**	**701280 032**	**701280 034**	**701280 035**
Customer Sample Reference					**HEP-BH-826**	**HEP-BH-826**	**HEP-BH-1804**	**HEP-BH-1804**	**HEP-BH-1806**
Hole ID					**HEP-BH-826**	**HEP-BH-826**	**HEP-BH-1804**	**HEP-BH-1804**	**HEP-BH-1806**
Depth					**3.40**	**4.30**	**0.20**	**0.70**	**0.30**
Top Depth					**3.40**	**4.30**	**0.20**	**0.70**	**0.30**
Date Sampled					**24-NOV-2017**	**24-NOV-2017**	**23-NOV-2017**	**23-NOV-2017**	**23-NOV-2017**
Time Sampled					**09:30**	**10:15**	**11:15**	**12:30**	**10:55**
AGS Type					**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID					**FES1171124013**	**FES1171124018**	**HEPBH1804201711230 01**	**HEPBH1804201711230 03**	**HEPBH1806201711230 01**
AGS Sample Reference					**18**	**23**	**3**	**9**	**3**
Matrix Class					**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Chromium (trivalent)	T85	AR	2	mg/kg	**40**	**32**	**40**	**7**	**36**
Chromium VI	T6	A40	1	mg/kg	<1	<1	<1	<1	<1

Concept Reference: 701280
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Chromium

Concept Reference					**701280 036**	**701280 038**	**701280 039**	**701280 042**	**701280 044**
Customer Sample Reference					**HEP-BH-1806**	**HEP-TT-11**	**HEP-TT-11**	**HEP-TT-18**	**HEP-TT-18**
Hole ID					**HEP-BH-1806**	**HEP-TT-11**	**HEP-TT-11**	**HEP-TT-18**	**HEP-TT-18**
Depth					**0.70**	**0.40**	**1.30**	**0.50**	**1.60**
Top Depth					**0.70**	**0.40**	**1.30**	**0.50**	**1.60**
Date Sampled					**23-NOV-2017**	**24-NOV-2017**	**24-NOV-2017**	**24-NOV-2017**	**24-NOV-2017**
Time Sampled					**11:30**	**00:00**	**00:00**	**00:00**	**00:00**
AGS Type					**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID					**HEPBH1806201711230 02**	**HEPTT1120171124002**	**HEPTT1120171124003**	**HEPTT1820171124002**	**HEPTT1820171124004**
AGS Sample Reference					**6**	**4**	**7**	**4**	**10**
Matrix Class					**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Chromium (trivalent)	T85	AR	2	mg/kg	**25**	**110**	**50**	**47**	**140**
Chromium VI	T6	A40	1	mg/kg	<1	<1	<1	<1	<1

Concept Reference: 701280
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Chromium

				Concept Reference	**701280 046**	**701280 048**	**701280 049**	**701280 050**	**701280 051**
				Customer Sample Reference	**HEP-TT-9**	**HEP-TT-9**	**HEP-BH-1805**	**HEP-BH-1805**	**HEP-BH-1**
				Hole ID	**HEP-TT-9**	**HEP-TT-9**	**HEP-BH-1805**	**HEP-BH-1805**	**HEP-BH-1**
				Depth	**0.50**	**1.80**	**0.30**	**1.10**	**0.30**
				Top Depth	**0.50**	**1.80**	**0.30**	**1.10**	**0.30**
				Date Sampled	**23-NOV-2017**	**23-NOV-2017**	**23-NOV-2017**	**23-NOV-2017**	**23-NOV-2017**
				Time Sampled	**11:40**	**12:45**	**13:35**	**14:05**	**10:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPTT920171123002**	**HEPTT920171123004**	**HEPBH180520171123001**	**HEPBH180520171123002**	**HEPBH120171124001**
				AGS Sample Reference	**4**	**10**	**3**	**6**	**3**
				Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Chromium (trivalent)	T85	AR	2	mg/kg	**190**	**46**	**32**	**49**	**30**
Chromium VI	T6	A40	1	mg/kg	<1	<1	<1	<1	<1

Concept Reference: 701280
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Chromium

				Concept Reference	**701280 052**
				Customer Sample Reference	**HEP-BH-1**
				Hole ID	**HEP-BH-1**
				Depth	**0.50**
				Top Depth	**0.50**
				Date Sampled	**23-NOV-2017**
				Time Sampled	**11:00**
				AGS Type	**ES**
				AGS Sample ID	**HEPBH120171124002**
				AGS Sample Reference	**6**
				Matrix Class	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**	
Chromium (trivalent)	T85	AR	2	mg/kg	**33**
Chromium VI	T6	A40	1	mg/kg	<1

Concept Reference: 701280
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Total Phenol

				Concept Reference	**701280 001**	**701280 007**	**701280 009**	**701280 010**	**701280 025**
				Customer Sample Reference	**HEP-BH-1321**	**HEP-BH-61**	**HEP-BH-61**	**HEP-BH-61**	**HEP-BH-826**
				Hole ID	**HEP-BH-1321**	**HEP-BH-61**	**HEP-BH-61**	**HEP-BH-61**	**HEP-BH-826**
				Depth	**0.80**	**0.90**	**2.20**	**2.70**	**2.40**
				Top Depth	**0.80**	**0.90**	**2.20**	**2.70**	**2.40**
				Date Sampled	**23-NOV-2017**	**21-NOV-2017**	**21-NOV-2017**	**21-NOV-2017**	**24-NOV-2017**
				Time Sampled	**13:25**	**10:00**	**11:00**	**11:15**	**09:20**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH132120171123001**	**HEPBH6120171121001**	**HEPBH6120171121003**	**HEPBH6120171121004**	**FES1171124008**
				AGS Sample Reference	**3**	**5**	**13**	**14**	**13**
				Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Phenols(Mono)	T4	AR	0.5	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0

Concept Reference: 701280
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Total Phenol

				Concept Reference	**701280 026**	**701280 027**	**701280 032**	**701280 034**	**701280 035**
				Customer Sample Reference	**HEP-BH-826**	**HEP-BH-826**	**HEP-BH-1804**	**HEP-BH-1804**	**HEP-BH-1806**
				Hole ID	**HEP-BH-826**	**HEP-BH-826**	**HEP-BH-1804**	**HEP-BH-1804**	**HEP-BH-1806**
				Depth	**3.40**	**4.30**	**0.20**	**0.70**	**0.30**
				Top Depth	**3.40**	**4.30**	**0.20**	**0.70**	**0.30**
				Date Sampled	**24-NOV-2017**	**24-NOV-2017**	**23-NOV-2017**	**23-NOV-2017**	**23-NOV-2017**
				Time Sampled	**09:30**	**10:15**	**11:15**	**12:30**	**10:55**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**FES1171124013**	**FES1171124018**	**HEPBH180420171123001**	**HEPBH180420171123003**	**HEPBH180620171123001**
				AGS Sample Reference	**18**	**23**	**3**	**9**	**3**
				Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Phenols(Mono)	T4	AR	0.5	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0

Concept Reference: 701280
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Total Phenol

				Concept Reference	**701280 036**	**701280 038**	**701280 039**	**701280 042**	**701280 044**
				Customer Sample Reference	**HEP-BH-1806**	**HEP-TT-11**	**HEP-TT-11**	**HEP-TT-18**	**HEP-TT-18**
				Hole ID	**HEP-BH-1806**	**HEP-TT-11**	**HEP-TT-11**	**HEP-TT-18**	**HEP-TT-18**
				Depth	**0.70**	**0.40**	**1.30**	**0.50**	**1.60**
				Top Depth	**0.70**	**0.40**	**1.30**	**0.50**	**1.60**
				Date Sampled	**23-NOV-2017**	**24-NOV-2017**	**24-NOV-2017**	**24-NOV-2017**	**24-NOV-2017**
				Time Sampled	**11:30**	**00:00**	**00:00**	**00:00**	**00:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH180620171123002**	**HEPTT1120171124002**	**HEPTT1120171124003**	**HEPTT1820171124002**	**HEPTT1820171124004**
				AGS Sample Reference	**6**	**4**	**7**	**4**	**10**
				Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Phenols(Mono)	T4	AR	0.5	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0

Concept Reference: 701280
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Total Phenol

				Concept Reference	**701280 046**	**701280 048**	**701280 049**	**701280 050**	**701280 051**
				Customer Sample Reference	**HEP-TT-9**	**HEP-TT-9**	**HEP-BH-1805**	**HEP-BH-1805**	**HEP-BH-1**
				Hole ID	**HEP-TT-9**	**HEP-TT-9**	**HEP-BH-1805**	**HEP-BH-1805**	**HEP-BH-1**
				Depth	**0.50**	**1.80**	**0.30**	**1.10**	**0.30**
				Top Depth	**0.50**	**1.80**	**0.30**	**1.10**	**0.30**
				Date Sampled	**23-NOV-2017**	**23-NOV-2017**	**23-NOV-2017**	**23-NOV-2017**	**23-NOV-2017**
				Time Sampled	**11:40**	**12:45**	**13:35**	**14:05**	**10:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPTT920171123002**	**HEPTT920171123004**	**HEPBH180520171123001**	**HEPBH180520171123002**	**HEPBH120171124001**
				AGS Sample Reference	**4**	**10**	**3**	**6**	**3**
				Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Phenols(Mono)	T4	AR	0.5	mg/kg	<1.0	**1.9**	<1.0	<1.0	<1.0

Concept Reference: 701280
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - Total Phenol

Concept Reference	**701280 052**
Customer Sample Reference	**HEP-BH-1**
Hole ID	**HEP-BH-1**
Depth	**0.50**
Top Depth	**0.50**
Date Sampled	**23-NOV-2017**
Time Sampled	**11:00**
AGS Type	**ES**
AGS Sample ID	**HEPBH120171124002**
AGS Sample Reference	**6**
Matrix Class	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units	
Phenols(Mono)	T4	AR	0.5	mg/kg	<1.0

Concept Reference: 701280
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - Asbestos

Concept Reference	**701280 001**	**701280 007**	**701280 009**	**701280 010**	**701280 025**
Customer Sample Reference	**HEP-BH-1321**	**HEP-BH-61**	**HEP-BH-61**	**HEP-BH-61**	**HEP-BH-826**
Hole ID	**HEP-BH-1321**	**HEP-BH-61**	**HEP-BH-61**	**HEP-BH-61**	**HEP-BH-826**
Depth	**0.80**	**0.90**	**2.20**	**2.70**	**2.40**
Top Depth	**0.80**	**0.90**	**2.20**	**2.70**	**2.40**
Date Sampled	**23-NOV-2017**	**21-NOV-2017**	**21-NOV-2017**	**21-NOV-2017**	**24-NOV-2017**
Time Sampled	**13:25**	**10:00**	**11:00**	**11:15**	**09:20**
AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**HEPBH132120171123001**	**HEPBH6120171121001**	**HEPBH6120171121003**	**HEPBH6120171121004**	**FES1171124008**
AGS Sample Reference	**3**	**5**	**13**	**14**	**13**
Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units					
Asbestos ID	T27	AR			N.D.	N.D.	N.D.	N.D.	N.D.

Concept Reference: 701280
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - Asbestos

Concept Reference	**701280 026**	**701280 027**	**701280 032**	**701280 034**	**701280 035**
Customer Sample Reference	**HEP-BH-826**	**HEP-BH-826**	**HEP-BH-1804**	**HEP-BH-1804**	**HEP-BH-1806**
Hole ID	**HEP-BH-826**	**HEP-BH-826**	**HEP-BH-1804**	**HEP-BH-1804**	**HEP-BH-1806**
Depth	**3.40**	**4.30**	**0.20**	**0.70**	**0.30**
Top Depth	**3.40**	**4.30**	**0.20**	**0.70**	**0.30**
Date Sampled	**24-NOV-2017**	**24-NOV-2017**	**23-NOV-2017**	**23-NOV-2017**	**23-NOV-2017**
Time Sampled	**09:30**	**10:15**	**11:15**	**12:30**	**10:55**
AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**FES1171124013**	**FES1171124018**	**HEPBH1804201711230001**	**HEPBH1804201711230003**	**HEPBH1806201711230001**
AGS Sample Reference	**18**	**23**	**3**	**9**	**3**
Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units					
Asbestos ID	T27	AR			N.D.	N.D.	N.D.	N.D.	N.D.

Concept Reference: 701280
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Asbestos

				Concept Reference	**701280 036**	**701280 038**	**701280 039**	**701280 042**	**701280 044**
				Customer Sample Reference	**HEP-BH-1806**	**HEP-TT-11**	**HEP-TT-11**	**HEP-TT-18**	**HEP-TT-18**
				Hole ID	**HEP-BH-1806**	**HEP-TT-11**	**HEP-TT-11**	**HEP-TT-18**	**HEP-TT-18**
				Depth	**0.70**	**0.40**	**1.30**	**0.50**	**1.60**
				Top Depth	**0.70**	**0.40**	**1.30**	**0.50**	**1.60**
				Date Sampled	**23-NOV-2017**	**24-NOV-2017**	**24-NOV-2017**	**24-NOV-2017**	**24-NOV-2017**
				Time Sampled	**11:30**	**00:00**	**00:00**	**00:00**	**00:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH180620171123002**	**HEPTT1120171124002**	**HEPTT1120171124003**	**HEPTT1820171124002**	**HEPTT1820171124004**
				AGS Sample Reference	**6**	**4**	**7**	**4**	**10**
				Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Asbestos ID	T27	AR			N.D.	N.D.	N.D.	N.D.	N.D.

Concept Reference: 701280
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Asbestos

				Concept Reference	**701280 046**	**701280 048**	**701280 049**	**701280 050**	**701280 051**
				Customer Sample Reference	**HEP-TT-9**	**HEP-TT-9**	**HEP-BH-1805**	**HEP-BH-1805**	**HEP-BH-1**
				Hole ID	**HEP-TT-9**	**HEP-TT-9**	**HEP-BH-1805**	**HEP-BH-1805**	**HEP-BH-1**
				Depth	**0.50**	**1.80**	**0.30**	**1.10**	**0.30**
				Top Depth	**0.50**	**1.80**	**0.30**	**1.10**	**0.30**
				Date Sampled	**23-NOV-2017**	**23-NOV-2017**	**23-NOV-2017**	**23-NOV-2017**	**23-NOV-2017**
				Time Sampled	**11:40**	**12:45**	**13:35**	**14:05**	**10:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPTT920171123002**	**HEPTT920171123004**	**HEPBH180520171123001**	**HEPBH180520171123002**	**HEPBH120171124001**
				AGS Sample Reference	**4**	**10**	**3**	**6**	**3**
				Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Asbestos ID	T27	AR			N.D.	N.D.	N.D.	N.D.	N.D.

Concept Reference: 701280
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Asbestos

				Concept Reference	**701280 052**
				Customer Sample Reference	**HEP-BH-1**
				Hole ID	**HEP-BH-1**
				Depth	**0.50**
				Top Depth	**0.50**
				Date Sampled	**23-NOV-2017**
				Time Sampled	**11:00**
				AGS Type	**ES**
				AGS Sample ID	**HEPBH120171124002**
				AGS Sample Reference	**6**
				Matrix Class	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**	
Asbestos ID	T27	AR			N.D.

Concept Reference: 701280
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground Soils with Elevated PID Readings - Organics PAH US EPA 16

Concept Reference	**701280 001**	**701280 007**	**701280 009**	**701280 010**	**701280 025**
Customer Sample Reference	**HEP-BH-1321**	**HEP-BH-61**	**HEP-BH-61**	**HEP-BH-61**	**HEP-BH-826**
Hole ID	**HEP-BH-1321**	**HEP-BH-61**	**HEP-BH-61**	**HEP-BH-61**	**HEP-BH-826**
Depth	**0.80**	**0.90**	**2.20**	**2.70**	**2.40**
Top Depth	**0.80**	**0.90**	**2.20**	**2.70**	**2.40**
Date Sampled	**23-NOV-2017**	**21-NOV-2017**	**21-NOV-2017**	**21-NOV-2017**	**24-NOV-2017**
Time Sampled	**13:25**	**10:00**	**11:00**	**11:15**	**09:20**
AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**HEPBH1321201711230 01**	**HEPBH6120171121001**	**HEPBH6120171121003**	**HEPBH6120171121004**	**FES1171124008**
AGS Sample Reference	**3**	**5**	**13**	**14**	**13**
Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units					
Naphthalene	T207	M105	0.1	mg/kg	(9) <1.0	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	T207	AR	0.1	mg/kg	(9) <1.0	<0.1	<0.1	<0.1	<0.1
Acenaphthene	T207	M105	0.1	mg/kg	(9) <1.0	<0.1	<0.1	<0.1	<0.1
Fluorene	T207	M105	0.1	mg/kg	(9) <1.0	<0.1	<0.1	<0.1	<0.1
Phenanthrene	T207	M105	0.1	mg/kg	**2.4**	**0.1**	<0.1	<0.1	<0.1
Anthracene	T207	AR	0.1	mg/kg	(9) <1.0	<0.1	<0.1	<0.1	<0.1
Fluoranthene	T207	M105	0.1	mg/kg	**5.5**	**0.4**	**0.1**	<0.1	<0.1
Pyrene	T207	M105	0.1	mg/kg	**5.1**	**0.3**	**0.1**	<0.1	<0.1
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	**2.4**	**0.2**	<0.1	<0.1	<0.1
Chrysene	T207	M105	0.1	mg/kg	**2.8**	**0.2**	<0.1	<0.1	<0.1
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	**2.6**	**0.2**	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	**2.2**	**0.2**	<0.1	<0.1	<0.1
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	**2.9**	**0.2**	<0.1	<0.1	<0.1
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	**1.6**	**0.1**	<0.1	<0.1	<0.1
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	(9) <1.0	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	**1.9**	**0.1**	<0.1	<0.1	<0.1
PAH(total)	T207	AR	0.1	mg/kg	**29**	**2.0**	**0.3**	<0.1	<0.1

Concept Reference: 701280
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground Soils with Elevated PID Readings - Organics PAH US EPA 16

Concept Reference	**701280 026**	**701280 027**	**701280 032**	**701280 034**	**701280 035**
Customer Sample Reference	**HEP-BH-826**	**HEP-BH-826**	**HEP-BH-1804**	**HEP-BH-1804**	**HEP-BH-1806**
Hole ID	**HEP-BH-826**	**HEP-BH-826**	**HEP-BH-1804**	**HEP-BH-1804**	**HEP-BH-1806**
Depth	**3.40**	**4.30**	**0.20**	**0.70**	**0.30**
Top Depth	**3.40**	**4.30**	**0.20**	**0.70**	**0.30**
Date Sampled	**24-NOV-2017**	**24-NOV-2017**	**23-NOV-2017**	**23-NOV-2017**	**23-NOV-2017**
Time Sampled	**09:30**	**10:15**	**11:15**	**12:30**	**10:55**
AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**FES1171124013**	**FES1171124018**	**HEPBH1804201711230 01**	**HEPBH1804201711230 03**	**HEPBH1806201711230 01**
AGS Sample Reference	**18**	**23**	**3**	**9**	**3**
Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units					
Naphthalene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	**0.8**	<0.1
Acenaphthylene	T207	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	T207	M105	0.1	mg/kg	<0.1	<0.1	**0.2**	<0.1	<0.1
Anthracene	T207	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	T207	M105	0.1	mg/kg	<0.1	**0.2**	**0.4**	<0.1	<0.1
Pyrene	T207	M105	0.1	mg/kg	<0.1	**0.2**	**0.3**	<0.1	<0.1
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1	**0.2**	<0.1	<0.1
Chrysene	T207	M105	0.1	mg/kg	<0.1	<0.1	**0.2**	<0.1	<0.1
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	<0.1	<0.1	**0.2**	<0.1	<0.1
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	<0.1	<0.1	**0.2**	<0.1	<0.1
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
PAH(total)	T207	AR	0.1	mg/kg	<0.1	**0.4**	**1.6**	**0.8**	<0.1

Concept Reference: 701280
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground Soils with Elevated PID Readings - Organics PAH US EPA 16

Concept Reference	**701280 036**	**701280 038**	**701280 039**	**701280 042**	**701280 044**
Customer Sample Reference	**HEP-BH-1806**	**HEP-TT-11**	**HEP-TT-11**	**HEP-TT-18**	**HEP-TT-18**
Hole ID	**HEP-BH-1806**	**HEP-TT-11**	**HEP-TT-11**	**HEP-TT-18**	**HEP-TT-18**
Depth	**0.70**	**0.40**	**1.30**	**0.50**	**1.60**
Top Depth	**0.70**	**0.40**	**1.30**	**0.50**	**1.60**
Date Sampled	**23-NOV-2017**	**24-NOV-2017**	**24-NOV-2017**	**24-NOV-2017**	**24-NOV-2017**
Time Sampled	**11:30**	**00:00**	**00:00**	**00:00**	**00:00**
AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**HEPBH1806201711230 02**	**HEPTT1120171124002**	**HEPTT1120171124003**	**HEPTT1820171124002**	**HEPTT1820171124004**
AGS Sample Reference	**6**	**4**	**7**	**4**	**10**
Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units					
Naphthalene	T207	M105	0.1	mg/kg	<0.1	(9) <1.0	(9) <1.0	(9) <1.0	(9) <1.0
Acenaphthylene	T207	AR	0.1	mg/kg	<0.1	(9) <1.0	(9) <1.0	(9) <1.0	(9) <1.0
Acenaphthene	T207	M105	0.1	mg/kg	<0.1	(9) <1.0	(9) <1.0	(9) <1.0	(9) <1.0
Fluorene	T207	M105	0.1	mg/kg	<0.1	(9) <1.0	(9) <1.0	(9) <1.0	(9) <1.0
Phenanthrene	T207	M105	0.1	mg/kg	<0.1	**2.7**	**1.3**	(9) <1.0	**2.3**
Anthracene	T207	AR	0.1	mg/kg	<0.1	(9) <1.0	(9) <1.0	(9) <1.0	(9) <1.0
Fluoranthene	T207	M105	0.1	mg/kg	<0.1	**3.9**	**2.0**	**2.3**	**2.2**
Pyrene	T207	M105	0.1	mg/kg	<0.1	**3.4**	**1.8**	**2.1**	**2.0**
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	<0.1	**1.6**	(9) <1.0	**1.1**	(9) <1.0
Chrysene	T207	M105	0.1	mg/kg	<0.1	**2.0**	(9) <1.0	**1.3**	(9) <1.0
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	<0.1	**2.8**	(9) <1.0	**1.2**	(9) <1.0
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	<0.1	**2.2**	**1.1**	**1.6**	(9) <1.0
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	<0.1	**3.0**	(9) <1.0	**1.4**	(9) <1.0
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	<0.1	**1.7**	(9) <1.0	**1.1**	(9) <1.0
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	<0.1	(9) <1.0	(9) <1.0	(9) <1.0	(9) <1.0
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	<0.1	**2.1**	(9) <1.0	**1.1**	(9) <1.0
PAH(total)	T207	AR	0.1	mg/kg	<0.1	**25**	**6.3**	**13**	**6.6**

Concept Reference: 701280
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground Soils with Elevated PID Readings - Organics PAH US EPA 16

Concept Reference	**701280 046**	**701280 048**	**701280 049**	**701280 050**	**701280 051**
Customer Sample Reference	**HEP-TT-9**	**HEP-TT-9**	**HEP-BH-1805**	**HEP-BH-1805**	**HEP-BH-1**
Hole ID	**HEP-TT-9**	**HEP-TT-9**	**HEP-BH-1805**	**HEP-BH-1805**	**HEP-BH-1**
Depth	**0.50**	**1.80**	**0.30**	**1.10**	**0.30**
Top Depth	**0.50**	**1.80**	**0.30**	**1.10**	**0.30**
Date Sampled	**23-NOV-2017**	**23-NOV-2017**	**23-NOV-2017**	**23-NOV-2017**	**23-NOV-2017**
Time Sampled	**11:40**	**12:45**	**13:35**	**14:05**	**10:00**
AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**HEPTT920171123002**	**HEPTT920171123004**	**HEPBH180520171123001**	**HEPBH180520171123002**	**HEPBH120171124001**
AGS Sample Reference	**4**	**10**	**3**	**6**	**3**
Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units					
Naphthalene	T207	M105	0.1	mg/kg	(9) <1.0	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	T207	AR	0.1	mg/kg	(9) <1.0	<0.1	<0.1	<0.1	<0.1
Acenaphthene	T207	M105	0.1	mg/kg	(9) <1.0	<0.1	<0.1	<0.1	<0.1
Fluorene	T207	M105	0.1	mg/kg	(9) <1.0	<0.1	<0.1	<0.1	<0.1
Phenanthrene	T207	M105	0.1	mg/kg	(9) <1.0	<0.1	<0.1	<0.1	<0.1
Anthracene	T207	AR	0.1	mg/kg	(9) <1.0	<0.1	<0.1	<0.1	<0.1
Fluoranthene	T207	M105	0.1	mg/kg	(9) <1.0	<0.1	<0.1	<0.1	<0.1
Pyrene	T207	M105	0.1	mg/kg	(9) <1.0	<0.1	<0.1	<0.1	<0.1
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	(9) <1.0	<0.1	<0.1	<0.1	<0.1
Chrysene	T207	M105	0.1	mg/kg	(9) <1.0	<0.1	<0.1	<0.1	<0.1
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	(9) <1.0	<0.1	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	(9) <1.0	<0.1	<0.1	<0.1	<0.1
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	(9) <1.0	<0.1	<0.1	<0.1	<0.1
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	(9) <1.0	<0.1	<0.1	<0.1	<0.1
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	(9) <1.0	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	(9) <1.0	<0.1	<0.1	<0.1	<0.1
PAH(total)	T207	AR	0.1	mg/kg	<1.0	<0.1	<0.1	<0.1	<0.1

Concept Reference: 701280
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground Soils with Elevated PID Readings - Organics PAH US EPA 16

Concept Reference	**701280 052**
Customer Sample Reference	**HEP-BH-1**
Hole ID	**HEP-BH-1**
Depth	**0.50**
Top Depth	**0.50**
Date Sampled	**23-NOV-2017**
Time Sampled	**11:00**
AGS Type	**ES**
AGS Sample ID	**HEPBH120171124002**
AGS Sample Reference	**6**
Matrix Class	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units	
Naphthalene	T207	M105	0.1	mg/kg	<0.1
Acenaphthylene	T207	AR	0.1	mg/kg	<0.1
Acenaphthene	T207	M105	0.1	mg/kg	<0.1
Fluorene	T207	M105	0.1	mg/kg	<0.1
Phenanthrene	T207	M105	0.1	mg/kg	<0.1
Anthracene	T207	AR	0.1	mg/kg	<0.1
Fluoranthene	T207	M105	0.1	mg/kg	<0.1
Pyrene	T207	M105	0.1	mg/kg	<0.1
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	<0.1
Chrysene	T207	M105	0.1	mg/kg	<0.1
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	<0.1
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	<0.1
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	<0.1
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	<0.1
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	<0.1
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	<0.1
PAH(total)	T207	AR	0.1	mg/kg	<0.1

Concept Reference: 701280
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - TPH (CWG)

				Concept Reference	**701280 001**	**701280 007**	**701280 009**	**701280 010**	**701280 025**
				Customer Sample Reference	**HEP-BH-1321**	**HEP-BH-61**	**HEP-BH-61**	**HEP-BH-61**	**HEP-BH-826**
				Hole ID	**HEP-BH-1321**	**HEP-BH-61**	**HEP-BH-61**	**HEP-BH-61**	**HEP-BH-826**
				Depth	**0.80**	**0.90**	**2.20**	**2.70**	**2.40**
				Top Depth	**0.80**	**0.90**	**2.20**	**2.70**	**2.40**
				Date Sampled	**23-NOV-2017**	**21-NOV-2017**	**21-NOV-2017**	**21-NOV-2017**	**24-NOV-2017**
				Time Sampled	**13:25**	**10:00**	**11:00**	**11:15**	**09:20**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH1321201711230 01**	**HEPBH6120171121001**	**HEPBH6120171121003**	**HEPBH6120171121004**	**FES1171124008**
				AGS Sample Reference	**3**	**5**	**13**	**14**	**13**
				Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
TPH (C5-C6 aliphatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C6-C8 aliphatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C8-C10 aliphatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	**280**
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	(9,13) <10	(13) <1	(13) <1	(13) <1	(13) <1
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	(9,13) <10	(13) <1	(13) <1	(13) <1	(13) <1
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	(9,13) <10	(13) <1	(13) <1	(13) <1	(13) <1
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	(13,9) <10	(13) <2	**(13) 7**	(13) <2	(13) <2
TPH (C6-C7 aromatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C7-C8 aromatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C8-C10 aromatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	(13,9) <10	(13) <2	(13) <2	(13) <2	(13) <2
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	**(13) 21**	(13) <1	(13) <1	(13) <1	(13) <1
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	**(13) 170**	**(13) 2**	**(13) 2**	(13) <1	(13) <1
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	**(13) 290**	**(13) 8**	**(13) 6**	(13) <1	(13) <1

Concept Reference: 701280
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - TPH (CWG)

				Concept Reference	**701280 026**	**701280 027**	**701280 032**	**701280 034**	**701280 035**
				Customer Sample Reference	**HEP-BH-826**	**HEP-BH-826**	**HEP-BH-1804**	**HEP-BH-1804**	**HEP-BH-1806**
				Hole ID	**HEP-BH-826**	**HEP-BH-826**	**HEP-BH-1804**	**HEP-BH-1804**	**HEP-BH-1806**
				Depth	**3.40**	**4.30**	**0.20**	**0.70**	**0.30**
				Top Depth	**3.40**	**4.30**	**0.20**	**0.70**	**0.30**
				Date Sampled	**24-NOV-2017**	**24-NOV-2017**	**23-NOV-2017**	**23-NOV-2017**	**23-NOV-2017**
				Time Sampled	**09:30**	**10:15**	**11:15**	**12:30**	**10:55**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**FES1171124013**	**FES1171124018**	**HEPBH1804201711230 01**	**HEPBH1804201711230 03**	**HEPBH1806201711230 01**
				AGS Sample Reference	**18**	**23**	**3**	**9**	**3**
				Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
TPH (C5-C6 aliphatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C6-C8 aliphatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C8-C10 aliphatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	(13) <1	(13) <1	(13) <1	(13) <1	(13) <1
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	(13) <1	(13) <1	(13) <1	(13) <1	(13) <1
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	(13) <1	(13) <1	(13) <1	(13) <1	(13) <1
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	(13) <2	**(13) 2**	(13) <2	(13) <2	**(13) 9**
TPH (C6-C7 aromatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C7-C8 aromatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C8-C10 aromatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	(13) <2	(13) <2	(13) <2	(13) <2	(13) <2
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	(13) <1	(13) <1	(13) <1	(13) <1	**(13) 13**
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	(13) <1	**(13) 1**	**(13) 1**	(13) <1	**(13) 11**
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	(13) <1	**(13) 3**	**(13) 5**	(13) <1	**(13) 16**

Concept Reference: 701280
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - TPH (CWG)

					Concept Reference	**701280 036**	**701280 038**	**701280 039**	**701280 042**	**701280 044**
					Customer Sample Reference	**HEP-BH-1806**	**HEP-TT-11**	**HEP-TT-11**	**HEP-TT-18**	**HEP-TT-18**
					Hole ID	**HEP-BH-1806**	**HEP-TT-11**	**HEP-TT-11**	**HEP-TT-18**	**HEP-TT-18**
					Depth	**0.70**	**0.40**	**1.30**	**0.50**	**1.60**
					Top Depth	**0.70**	**0.40**	**1.30**	**0.50**	**1.60**
					Date Sampled	**23-NOV-2017**	**24-NOV-2017**	**24-NOV-2017**	**24-NOV-2017**	**24-NOV-2017**
					Time Sampled	**11:30**	**00:00**	**00:00**	**00:00**	**00:00**
					AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
					AGS Sample ID	**HEPBH1806201711230 02**	**HEPTT1120171124002**	**HEPTT1120171124003**	**HEPTT1820171124002**	**HEPTT1820171124004**
					AGS Sample Reference	**6**	**4**	**7**	**4**	**10**
					Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**						
TPH (C5-C6 aliphatic)	T209	AR	100	µg/kg		<100	<100	<100	<100	<100
TPH (C6-C8 aliphatic)	T209	AR	100	µg/kg		<100	<100	<100	<100	<100
TPH (C8-C10 aliphatic)	T209	AR	100	µg/kg		<100	<100	<100	<100	**3100**
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg		(13) <1	(13,9) <10	(13) <1	(13,9) <10	**(13) 19**
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg		(13) <1	(9,13) <10	**(13) 5**	(9,13) <10	**(13) 79**
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg		(13) <1	(9,13) <10	**(13) 13**	(9,13) <10	**(13) 76**
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg		(13) <2	**(13) 84**	**(13) 41**	**(13) 56**	**(13) 310**
TPH (C6-C7 aromatic)	T209	AR	100	µg/kg		<100	<100	<100	<100	<100
TPH (C7-C8 aromatic)	T209	AR	100	µg/kg		<100	<100	<100	<100	<100
TPH (C8-C10 aromatic)	T209	AR	100	µg/kg		<100	<100	<100	<100	<100
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg		(13) <2	(9,13) <10	(13) <2	(13,9) <10	**(13) 6**
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg		(13) <1	(13,9) <10	**(13) 7**	(13,9) <10	**(13) 9**
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg		(13) <1	**(13) 14**	**(13) 18**	**(13) 12**	**(13) 45**
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg		(13) <1	**(13) 43**	**(13) 28**	(13,9) <10	**(13) 18**

Concept Reference: 701280
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - TPH (CWG)

					Concept Reference	**701280 046**	**701280 048**	**701280 049**	**701280 050**	**701280 051**
					Customer Sample Reference	**HEP-TT-9**	**HEP-TT-9**	**HEP-BH-1805**	**HEP-BH-1805**	**HEP-BH-1**
					Hole ID	**HEP-TT-9**	**HEP-TT-9**	**HEP-BH-1805**	**HEP-BH-1805**	**HEP-BH-1**
					Depth	**0.50**	**1.80**	**0.30**	**1.10**	**0.30**
					Top Depth	**0.50**	**1.80**	**0.30**	**1.10**	**0.30**
					Date Sampled	**23-NOV-2017**	**23-NOV-2017**	**23-NOV-2017**	**23-NOV-2017**	**23-NOV-2017**
					Time Sampled	**11:40**	**12:45**	**13:35**	**14:05**	**10:00**
					AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
					AGS Sample ID	**HEPTT920171123002**	**HEPTT920171123004**	**HEPBH1805201711230 01**	**HEPBH1805201711230 02**	**HEPBH120171124001**
					AGS Sample Reference	**4**	**10**	**3**	**6**	**3**
					Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**						
TPH (C5-C6 aliphatic)	T209	AR	100	µg/kg		<100	(110) <200	<100	<100	<100
TPH (C6-C8 aliphatic)	T209	AR	100	µg/kg		<100	(110) <200	<100	<100	<100
TPH (C8-C10 aliphatic)	T209	AR	100	µg/kg		<100	**13000**	<100	<100	<100
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg		(13) <1	**(13) 19**	(13) <1	(13) <1	(13) <1
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg		(13) <1	**(13) 47**	(13) <1	(13) <1	(13) <1
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg		**(13) 12**	**(13) 170**	(13) <1	(13) <1	(13) <1
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg		**(13) 74**	**(13) 910**	(13) <2	(13) <2	(13) <2
TPH (C6-C7 aromatic)	T209	AR	100	µg/kg		<100	(110) <200	<100	<100	<100
TPH (C7-C8 aromatic)	T209	AR	100	µg/kg		<100	(110) <200	<100	<100	<100
TPH (C8-C10 aromatic)	T209	AR	100	µg/kg		<100	(110) <200	<100	<100	<100
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg		(13) <2	**(13) 3**	(13) <2	(13) <2	(13) <2
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg		**(13) 1**	**(13) 6**	(13) <1	(13) <1	(13) <1
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg		**(13) 26**	**(13) 31**	(13) <1	(13) <1	(13) <1
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg		**(13) 17**	**(13) 7**	(13) <1	(13) <1	(13) <1

Concept Reference: 701280
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - TPH (CWG)

Concept Reference	**701280 052**
Customer Sample Reference	**HEP-BH-1**
Hole ID	**HEP-BH-1**
Depth	**0.50**
Top Depth	**0.50**
Date Sampled	**23-NOV-2017**
Time Sampled	**11:00**
AGS Type	**ES**
AGS Sample ID	**HEPBH120171124002**
AGS Sample Reference	**6**
Matrix Class	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units	
TPH (C5-C6 aliphatic)	T209	AR	100	µg/kg	<100
TPH (C6-C8 aliphatic)	T209	AR	100	µg/kg	<100
TPH (C8-C10 aliphatic)	T209	AR	100	µg/kg	<100
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	(13) <1
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	(13) <1
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	(13) <1
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	(13) <2
TPH (C6-C7 aromatic)	T209	AR	100	µg/kg	<100
TPH (C7-C8 aromatic)	T209	AR	100	µg/kg	<100
TPH (C8-C10 aromatic)	T209	AR	100	µg/kg	<100
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	(13) <2
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	(13) <1
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	(13) <1
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	(13) <1

Concept Reference: 701280
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Total Petroleum Hydrocarbons (Aliphatics+Aromatics) Total

Concept Reference		**701280 001**	**701280 007**	**701280 009**	**701280 010**	**701280 025**
Customer Sample Reference		**HEP-BH-1321**	**HEP-BH-61**	**HEP-BH-61**	**HEP-BH-61**	**HEP-BH-826**
Hole ID		**HEP-BH-1321**	**HEP-BH-61**	**HEP-BH-61**	**HEP-BH-61**	**HEP-BH-826**
Depth		**0.80**	**0.90**	**2.20**	**2.70**	**2.40**
Top Depth		**0.80**	**0.90**	**2.20**	**2.70**	**2.40**
Date Sampled		**23-NOV-2017**	**21-NOV-2017**	**21-NOV-2017**	**21-NOV-2017**	**24-NOV-2017**
Time Sampled		**13:25**	**10:00**	**11:00**	**11:15**	**09:20**
AGS Type		**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID		**HEPBH132120171123001**	**HEPBH6120171121001**	**HEPBH6120171121003**	**HEPBH6120171121004**	**FES1171124008**
AGS Sample Reference		**3**	**5**	**13**	**14**	**13**
Matrix Class		**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**		
TPH (Aliphatic) total	T85	M105		mg/kg	(13,9) <10	(13) N.D.	**(13) 7.0**	(13) N.D.	(13) N.D.
TPH (Aromatic) total	T85	M105		mg/kg	**(13) 480**	**(13) 10**	**(13) 8.0**	(13) N.D.	(13) N.D.
TPH (Aliphatic+Aromatic) (sum)	T85	M105		mg/kg	**480**	**10.0**	**15.0**	N.D.	N.D.

Concept Reference: 701280
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Total Petroleum Hydrocarbons (Aliphatics+Aromatics) Total

Concept Reference	**701280 026**	**701280 027**	**701280 032**	**701280 034**	**701280 035**
Customer Sample Reference	**HEP-BH-826**	**HEP-BH-826**	**HEP-BH-1804**	**HEP-BH-1804**	**HEP-BH-1806**
Hole ID	**HEP-BH-826**	**HEP-BH-826**	**HEP-BH-1804**	**HEP-BH-1804**	**HEP-BH-1806**
Depth	**3.40**	**4.30**	**0.20**	**0.70**	**0.30**
Top Depth	**3.40**	**4.30**	**0.20**	**0.70**	**0.30**
Date Sampled	**24-NOV-2017**	**24-NOV-2017**	**23-NOV-2017**	**23-NOV-2017**	**23-NOV-2017**
Time Sampled	**09:30**	**10:15**	**11:15**	**12:30**	**10:55**
AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**FES1171124013**	**FES1171124018**	**HEPBH180420171123001**	**HEPBH180420171123003**	**HEPBH180620171123001**
AGS Sample Reference	**18**	**23**	**3**	**9**	**3**
Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**

Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
TPH (Aliphatic) total	T85	M105		mg/kg	(13) N.D.	**(13) 2.0**	(13) N.D.	(13) N.D.	**(13) 9.0**
TPH (Aromatic) total	T85	M105		mg/kg	(13) N.D.	**(13) 4.0**	**(13) 6.0**	(13) N.D.	**(13) 40**
TPH (Aliphatic+Aromatic) (sum)	T85	M105		mg/kg	N.D.	**6.00**	**6.00**	N.D.	**49.0**

Concept Reference: 701280
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Total Petroleum Hydrocarbons (Aliphatics+Aromatics) Total

Concept Reference	**701280 036**	**701280 038**	**701280 039**	**701280 042**	**701280 044**
Customer Sample Reference	**HEP-BH-1806**	**HEP-TT-11**	**HEP-TT-11**	**HEP-TT-18**	**HEP-TT-18**
Hole ID	**HEP-BH-1806**	**HEP-TT-11**	**HEP-TT-11**	**HEP-TT-18**	**HEP-TT-18**
Depth	**0.70**	**0.40**	**1.30**	**0.50**	**1.60**
Top Depth	**0.70**	**0.40**	**1.30**	**0.50**	**1.60**
Date Sampled	**23-NOV-2017**	**24-NOV-2017**	**24-NOV-2017**	**24-NOV-2017**	**24-NOV-2017**
Time Sampled	**11:30**	**00:00**	**00:00**	**00:00**	**00:00**
AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**HEPBH180620171123002**	**HEPTT112017112400 2**	**HEPTT112017112400 3**	**HEPTT182017112400 2**	**HEPTT182017112400 4**
AGS Sample Reference	**6**	**4**	**7**	**4**	**10**
Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**

Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
TPH (Aliphatic) total	T85	M105		mg/kg	(13) N.D.	**(13) 84**	**(13) 59**	**(13) 56**	**(13) 480**
TPH (Aromatic) total	T85	M105		mg/kg	(13) N.D.	**(13) 57**	**(13) 53**	**(13) 12**	**(13) 78**
TPH (Aliphatic+Aromatic) (sum)	T85	M105		mg/kg	N.D.	**141**	**112**	**68.0**	**558**

Concept Reference: 701280
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Total Petroleum Hydrocarbons (Aliphatics+Aromatics) Total

				Concept Reference	**701280 046**	**701280 048**	**701280 049**	**701280 050**	**701280 051**
				Customer Sample Reference	**HEP-TT-9**	**HEP-TT-9**	**HEP-BH-1805**	**HEP-BH-1805**	**HEP-BH-1**
				Hole ID	**HEP-TT-9**	**HEP-TT-9**	**HEP-BH-1805**	**HEP-BH-1805**	**HEP-BH-1**
				Depth	**0.50**	**1.80**	**0.30**	**1.10**	**0.30**
				Top Depth	**0.50**	**1.80**	**0.30**	**1.10**	**0.30**
				Date Sampled	**23-NOV-2017**	**23-NOV-2017**	**23-NOV-2017**	**23-NOV-2017**	**23-NOV-2017**
				Time Sampled	**11:40**	**12:45**	**13:35**	**14:05**	**10:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPTT920171123002**	**HEPTT920171123004**	**HEPBH180520171123001**	**HEPBH180520171123002**	**HEPBH120171124001**
				AGS Sample Reference	**4**	**10**	**3**	**6**	**3**
				Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
TPH (Aliphatic) total	T85	M105		mg/kg	**(13) 86**	**(13) 1100**	(13) N.D.	(13) N.D.	(13) N.D.
TPH (Aromatic) total	T85	M105		mg/kg	**(13) 45**	**(13) 47**	(13) N.D.	(13) N.D.	(13) N.D.
TPH (Aliphatic+Aromatic) (sum)	T85	M105		mg/kg	**131**	**1150**	N.D.	N.D.	N.D.

Concept Reference: 701280
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Total Petroleum Hydrocarbons (Aliphatics+Aromatics) Total

				Concept Reference	**701280 052**
				Customer Sample Reference	**HEP-BH-1**
				Hole ID	**HEP-BH-1**
				Depth	**0.50**
				Top Depth	**0.50**
				Date Sampled	**23-NOV-2017**
				Time Sampled	**11:00**
				AGS Type	**ES**
				AGS Sample ID	**HEPBH120171124002**
				AGS Sample Reference	**6**
				Matrix Class	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**	
TPH (Aliphatic) total	T85	M105		mg/kg	(13) N.D.
TPH (Aromatic) total	T85	M105		mg/kg	(13) N.D.
TPH (Aliphatic+Aromatic) (sum)	T85	M105		mg/kg	N.D.

Concept Reference: 701280
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Sub Suite 2 - Pathogens

Concept Reference	**701280 034**
Customer Sample Reference	**HEP-BH-1804**
Hole ID	**HEP-BH-1804**
Depth	**0.70**
Top Depth	**0.70**
Date Sampled	**23-NOV-2017**
Time Sampled	**12:30**
AGS Type	**ES**
AGS Sample ID	**HEPBH1804201711230 03**
AGS Sample Reference	**9**
Matrix Class	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units	
Salmonella spp	T34	AR			N.D.
Escherichia coli	T34	AR	1	cfu/in 25g	<1
Intestinal Enterococci	T34	AR	1	cfu/g	<20

Concept Reference: 701280
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Sub Suite 4 - MRPS by GC MS MS

Concept Reference	**701280 035**
Customer Sample Reference	**HEP-BH-1806**
Hole ID	**HEP-BH-1806**
Depth	**0.30**
Top Depth	**0.30**
Date Sampled	**23-NOV-2017**
Time Sampled	**10:55**
AGS Type	**ES**
AGS Sample ID	**HEPBH18062017112 3001**
AGS Sample Reference	**3**
Matrix Class	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units	
2,4,6-Trichlorophenol	T826	AR	0.01	mg/kg	<0.01
2-Methyl-4,6-dinitrophenol	T826	AR	0.01	mg/kg	<0.01
2-Phenylphenol	T826	AR	0.01	mg/kg	<0.01
9,10-Anthraquinone	T826	AR	0.01	mg/kg	**0.02**
Acetochlor	T826	AR	0.01	mg/kg	<0.01
Aclonifen	T826	AR	0.01	mg/kg	<0.01
Acrinathrin	T826	AR	0.01	mg/kg	<0.01
Alachlor	T826	AR	0.01	mg/kg	<0.01
Aldrin	T826	AR	0.01	mg/kg	<0.01
Ametryn	T826	AR	0.01	mg/kg	<0.01
Atraton	T826	AR	0.01	mg/kg	<0.01
Atrazine	T826	AR	0.01	mg/kg	<0.01
Azaconazole	T826	AR	0.01	mg/kg	<0.01
Azobenzene	T826	AR	0.01	mg/kg	<0.01
Azoxystrobin	T826	AR	0.01	mg/kg	<0.01
Benalaxyl	T826	AR	0.01	mg/kg	<0.01
Benfluralin	T826	AR	0.01	mg/kg	<0.01
Bifenox	T826	AR	0.01	mg/kg	<0.01
Bifenthrin	T826	AR	0.01	mg/kg	<0.01
Binapacryl	T826	AR	0.01	mg/kg	<0.01
Biphenyl	T826	AR	0.01	mg/kg	(278) <0.01
Bitertanol	T826	AR	0.01	mg/kg	<0.01
Boscalid	T826	AR	0.01	mg/kg	<0.01
Bromacil	T826	AR	0.01	mg/kg	<0.01
Bromophos	T826	AR	0.01	mg/kg	<0.01
Bromophos-Ethyl	T826	AR	0.01	mg/kg	<0.01
Bromopropylate	T826	AR	0.01	mg/kg	<0.01
Bupirimate	T826	AR	0.01	mg/kg	<0.01
Buprofezine	T826	AR	0.01	mg/kg	<0.01
Butachlor	T826	AR	0.01	mg/kg	<0.01
Cadusafos	T826	AR	0.01	mg/kg	<0.01
Captan	T826	AR	0.01	mg/kg	(278) <0.01
Carbaryl	T826	AR	0.01	mg/kg	<0.01
Carbophenothion	T826	AR	0.01	mg/kg	<0.01
Carboxine	T826	AR	0.01	mg/kg	<0.01
Carfentrazone Ethyl	T826	AR	0.01	mg/kg	<0.01
Chlorbenzilate	T826	AR	0.01	mg/kg	<0.01
Chlorbufam	T826	AR	0.01	mg/kg	<0.01
Chlordane	T826	AR	0.01	mg/kg	<0.01
Chlordimeform	T826	AR	0.01	mg/kg	<0.01
Chlorethoxyfos	T826	AR	0.01	mg/kg	<0.01
Chlorfenapyr	T826	AR	0.01	mg/kg	<0.01
Chlorfenson	T826	AR	0.01	mg/kg	<0.01
Chlorfenvinphos	T826	AR	0.01	mg/kg	<0.01
Chlormephos	T826	AR	0.01	mg/kg	<0.01
Chloropropylate	T826	AR	0.01	mg/kg	<0.01
Chlorothalonil	T826	AR	0.01	mg/kg	<0.01
Chlorpropham	T826	AR	0.01	mg/kg	<0.01
Chlorpyrifos	T826	AR	0.01	mg/kg	<0.01
Chlorpyrifos methyl	T826	AR	0.01	mg/kg	<0.01
Chlorthal Dimethyl	T826	AR	0.01	mg/kg	<0.01

Concept Reference: 701280
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Sub Suite 4 - MRPS by GC MS MS

Concept Reference	**701280 035**
Customer Sample Reference	**HEP-BH-1806**
Hole ID	**HEP-BH-1806**
Depth	**0.30**
Top Depth	**0.30**
Date Sampled	**23-NOV-2017**
Time Sampled	**10:55**
AGS Type	**ES**
AGS Sample ID	**HEPBH18062017112 3001**
AGS Sample Reference	**3**
Matrix Class	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units	
Chlorthion	T826	AR	0.01	mg/kg	<0.01
Chlorthiophos	T826	AR	0.01	mg/kg	<0.01
Chlozolinate	T826	AR	0.01	mg/kg	<0.01
cis-1,2,3,6-Tetrahydrophthalimide	T826	AR	0.01	mg/kg	<0.01
Clodinafop propargy	T826	AR	0.01	mg/kg	<0.01
Clomazone	T826	AR	0.01	mg/kg	<0.01
Cloquintocet mexyl	T826	AR	0.01	mg/kg	<0.01
Coumaphos	T826	AR	0.01	mg/kg	<0.01
Cyflufenamid	T826	AR	0.01	mg/kg	<0.01
Cyfluthrin	T826	AR	0.01	mg/kg	<0.01
Cypermethrin	T826	AR	0.01	mg/kg	<0.01
Cyphenothrin	T826	AR	0.01	mg/kg	<0.01
Cyproconazole	T826	AR	0.01	mg/kg	<0.01
Cyprodinil	T826	AR	0.01	mg/kg	<0.01
DEET	T826	AR	0.01	mg/kg	<0.01
Deltamethrin	T826	AR	0.01	mg/kg	<0.01
Desmetryn	T826	AR	0.01	mg/kg	<0.01
Diafenthiuron	T826	AR	0.01	mg/kg	(278) <0.01
Dialifos	T826	AR	0.01	mg/kg	<0.01
Diazinon	T826	AR	0.01	mg/kg	<0.01
Dichlobenil	T826	AR	0.01	mg/kg	<0.01
Dichlofenthion	T826	AR	0.01	mg/kg	<0.01
Dichlorvos	T826	AR	0.01	mg/kg	<0.01
Diclobutrazol	T826	AR	0.01	mg/kg	<0.01
Dicloran	T826	AR	0.01	mg/kg	<0.01
Dicofol	T826	AR	0.01	mg/kg	<0.01
Dieldrin	T826	AR	0.01	mg/kg	<0.01
Difenoconazole	T826	AR	0.01	mg/kg	<0.01
Diflufenican	T826	AR	0.01	mg/kg	<0.01
Dimethenamid	T826	AR	0.01	mg/kg	<0.01
Dimethomorph	T826	AR	0.01	mg/kg	<0.01
Dimoxystrobin	T826	AR	0.01	mg/kg	<0.01
Dinoterb	T826	AR	0.01	mg/kg	<0.01
Dioxabenzofos	T826	AR	0.01	mg/kg	<0.01
Diphenamid	T826	AR	0.01	mg/kg	<0.01
Diphenylamine	T826	AR	0.01	mg/kg	<0.01
Disulfoton	T826	AR	0.01	mg/kg	<0.01
Ditalimfos	T826	AR	0.01	mg/kg	<0.01
Edifenphos	T826	AR	0.01	mg/kg	<0.01
Endosulphan alpha	T826	AR	0.01	mg/kg	<0.01
Endosulphan beta	T826	AR	0.01	mg/kg	<0.01
Endosulphan sulphate	T826	AR	0.01	mg/kg	<0.01
Endrin	T826	AR	0.01	mg/kg	<0.01
Epn	T826	AR	0.01	mg/kg	<0.01
Epoxiconazole	T826	AR	0.01	mg/kg	<0.01
EPTC	T826	AR	0.01	mg/kg	<0.01
Etaconazole	T826	AR	0.01	mg/kg	<0.01
Ethion	T826	AR	0.01	mg/kg	<0.01
Ethofumesate	T826	AR	0.01	mg/kg	<0.01
Ethoprophos	T826	AR	0.01	mg/kg	<0.01
Ethoxyquin	T826	AR	0.01	mg/kg	(278) <0.01

Concept Reference: 701280
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Sub Suite 4 - MRPS by GC MS MS

Concept Reference	**701280 035**
Customer Sample Reference	**HEP-BH-1806**
Hole ID	**HEP-BH-1806**
Depth	**0.30**
Top Depth	**0.30**
Date Sampled	**23-NOV-2017**
Time Sampled	**10:55**
AGS Type	**ES**
AGS Sample ID	**HEPBH18062017112 3001**
AGS Sample Reference	**3**
Matrix Class	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units	
Etofenprox	T826	AR	0.01	mg/kg	<0.01
Etoxazole	T826	AR	0.01	mg/kg	<0.01
Etridiazole	T826	AR	0.01	mg/kg	<0.01
Etrimfos	T826	AR	0.01	mg/kg	<0.01
Famoxadone	T826	AR	0.01	mg/kg	<0.01
Famphur	T826	AR	0.01	mg/kg	<0.01
Fenamidone	T826	AR	0.01	mg/kg	<0.01
Fenamiphos	T826	AR	0.01	mg/kg	<0.01
Fenarimol	T826	AR	0.01	mg/kg	<0.01
Fenbuconazole	T826	AR	0.01	mg/kg	<0.01
Fenchlorphos	T826	AR	0.01	mg/kg	<0.01
Fenhexamid	T826	AR	0.01	mg/kg	<0.01
Fenitrothion	T826	AR	0.01	mg/kg	<0.01
Fenpiclonil	T826	AR	0.01	mg/kg	<0.01
Fenpropathrin	T826	AR	0.01	mg/kg	<0.01
Fenson	T826	AR	0.01	mg/kg	<0.01
Fensulfothion	T826	AR	0.01	mg/kg	<0.01
Fenthion	T826	AR	0.01	mg/kg	<0.01
Fenvalerate	T826	AR	0.01	mg/kg	<0.01
Fipronil	T826	AR	0.01	mg/kg	<0.01
Fipronil sulphone	T826	AR	0.01	mg/kg	<0.01
Flamprop isopropyl	T826	AR	0.01	mg/kg	<0.01
Fluazifop-P-Butyl	T826	AR	0.01	mg/kg	<0.01
Flucythrinate	T826	AR	0.01	mg/kg	<0.01
Fludioxonil	T826	AR	0.01	mg/kg	<0.01
Flufenacet	T826	AR	0.01	mg/kg	<0.01
Flumetralin	T826	AR	0.01	mg/kg	<0.01
Flumioxazin	T826	AR	0.01	mg/kg	<0.01
Flumorph	T826	AR	0.01	mg/kg	<0.01
Fluopyram	T826	AR	0.01	mg/kg	<0.01
Fluquinconazole	T826	AR	0.01	mg/kg	<0.01
Fluroxypyr-1-methylheptyl ester	T826	AR	0.01	mg/kg	<0.01
Flusilazole	T826	AR	0.01	mg/kg	<0.01
Flutolanil	T826	AR	0.01	mg/kg	<0.01
Fluxapyroxad	T826	AR	0.01	mg/kg	<0.01
Folpet	T826	AR	0.01	mg/kg	<0.01
Fonophos	T826	AR	0.01	mg/kg	<0.01
Formothion	T826	AR	0.01	mg/kg	<0.01
Furalaxyl	T826	AR	0.01	mg/kg	<0.01
Haloxyfop etotyl	T826	AR	0.01	mg/kg	<0.01
Haloxyfop Methyl	T826	AR	0.01	mg/kg	<0.01
Heptachlor	T826	AR	0.01	mg/kg	<0.01
Heptachlor epoxide	T826	AR	0.01	mg/kg	<0.01
Heptachlor exo Epoxide	T826	AR	0.01	mg/kg	<0.01
Heptenophos	T826	AR	0.01	mg/kg	<0.01
Hexachlorobenzene	T826	AR	0.01	mg/kg	<0.01
Hexachlorocyclohexane (alpha)	T826	AR	0.01	mg/kg	<0.01
Hexachlorocyclohexane (beta)	T826	AR	0.01	mg/kg	<0.01
Hexachlorocyclohexane (delta)	T826	AR	0.01	mg/kg	<0.01
Hexaconazole	T826	AR	0.01	mg/kg	<0.01
Hexazinone	T826	AR	0.01	mg/kg	<0.01

Concept Reference: 701280
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Sub Suite 4 - MRPS by GC MS MS

Concept Reference	**701280 035**
Customer Sample Reference	**HEP-BH-1806**
Hole ID	**HEP-BH-1806**
Depth	**0.30**
Top Depth	**0.30**
Date Sampled	**23-NOV-2017**
Time Sampled	**10:55**
AGS Type	**ES**
AGS Sample ID	**HEPBH18062017112 3001**
AGS Sample Reference	**3**
Matrix Class	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units	
Imazalil	T826	AR	0.01	mg/kg	<0.01
Iodofenphos	T826	AR	0.01	mg/kg	<0.01
Iprodione	T826	AR	0.01	mg/kg	<0.01
Isazofos	T826	AR	0.01	mg/kg	<0.01
Isocarbophos	T826	AR	0.01	mg/kg	<0.01
Isodrin	T826	AR	0.01	mg/kg	<0.01
Isofenphos	T826	AR	0.01	mg/kg	<0.01
Isofenphos Methyl	T826	AR	0.01	mg/kg	<0.01
Isomethiozin	T826	AR	0.01	mg/kg	<0.01
Isoprothiolane	T826	AR	0.01	mg/kg	<0.01
Isopyrazam	T826	AR	0.01	mg/kg	<0.01
Isothiazolinone	T826	AR	0.01	mg/kg	<0.01
Kresoxim Methyl	T826	AR	0.01	mg/kg	<0.01
Lambda Cyhalothrin	T826	AR	0.01	mg/kg	<0.01
Lenacil	T826	AR	0.01	mg/kg	<0.01
Leptophos	T826	AR	0.01	mg/kg	<0.01
Lindane	T826	AR	0.01	mg/kg	<0.01
Malathion	T826	AR	0.01	mg/kg	<0.01
MCPA-thioethyl	T826	AR	0.01	mg/kg	<0.01
Mecarbam	T826	AR	0.01	mg/kg	<0.01
Mepanipyrim	T826	AR	0.01	mg/kg	<0.01
Mephosfolan	T826	AR	0.01	mg/kg	<0.01
Mepronil	T826	AR	0.01	mg/kg	<0.01
Metalaxyl	T826	AR	0.01	mg/kg	<0.01
Metazachlor	T826	AR	0.01	mg/kg	<0.01
Methacrifos	T826	AR	0.01	mg/kg	<0.01
Methidathion	T826	AR	0.01	mg/kg	<0.01
Methoxychlor	T826	AR	0.01	mg/kg	<0.01
Methyl Paraoxon	T826	AR	0.01	mg/kg	<0.01
Metolachlor	T826	AR	0.01	mg/kg	<0.01
Metolcarb	T826	AR	0.01	mg/kg	<0.01
Metrafenone	T826	AR	0.01	mg/kg	<0.01
Metribuzin	T826	AR	0.01	mg/kg	<0.01
Mevinphos	T826	AR	0.01	mg/kg	<0.01
Mirex	T826	AR	0.01	mg/kg	<0.01
Molinate	T826	AR	0.01	mg/kg	<0.01
Myclobutanil	T826	AR	0.01	mg/kg	<0.01
Napropamide	T826	AR	0.01	mg/kg	<0.01
Nitrofen	T826	AR	0.01	mg/kg	<0.01
Nitrothal isopropyl	T826	AR	0.01	mg/kg	<0.01
Nuarimol	T826	AR	0.01	mg/kg	<0.01
o,p'-DDT	T826	AR	0.01	mg/kg	<0.01
Octhilinone	T826	AR	0.01	mg/kg	<0.01
Ofurace	T826	AR	0.01	mg/kg	<0.01
Orysastrobin	T826	AR	0.01	mg/kg	<0.01
Oxadiazon	T826	AR	0.01	mg/kg	<0.01
Oxadixyl	T826	AR	0.01	mg/kg	<0.01
Oxyfluorfen	T826	AR	0.01	mg/kg	<0.01
p,p-DDD	T826	AR	0.01	mg/kg	<0.01
p,p-DDE	T826	AR	0.01	mg/kg	<0.01
p,p-DDT	T826	AR	0.01	mg/kg	<0.01

Concept Reference: 701280
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Sub Suite 4 - MRPS by GC MS MS

Concept Reference	**701280 035**
Customer Sample Reference	**HEP-BH-1806**
Hole ID	**HEP-BH-1806**
Depth	**0.30**
Top Depth	**0.30**
Date Sampled	**23-NOV-2017**
Time Sampled	**10:55**
AGS Type	**ES**
AGS Sample ID	**HEPBH18062017112 3001**
AGS Sample Reference	**3**
Matrix Class	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units	
Paclobutrazol	T826	AR	0.01	mg/kg	<0.01
Paraoxon	T826	AR	0.01	mg/kg	<0.01
Parathion	T826	AR	0.01	mg/kg	<0.01
Parathion methyl	T826	AR	0.01	mg/kg	<0.01
Penconazole	T826	AR	0.01	mg/kg	<0.01
Pendimethalin	T826	AR	0.01	mg/kg	<0.01
Pentachloroaniline	T826	AR	0.01	mg/kg	<0.01
Pentachlorophenol	T826	AR	0.01	mg/kg	<0.01
Pentanochlor	T826	AR	0.01	mg/kg	<0.01
Permethrin	T826	AR	0.01	mg/kg	<0.01
Pethoxamid	T826	AR	0.01	mg/kg	<0.01
Phenothrin	T826	AR	0.01	mg/kg	<0.01
Phenthoate	T826	AR	0.01	mg/kg	<0.01
Phorate	T826	AR	0.01	mg/kg	<0.01
Phosalone	T826	AR	0.01	mg/kg	<0.01
Phosfolan	T826	AR	0.01	mg/kg	<0.01
Phosmet	T826	AR	0.01	mg/kg	<0.01
Phthalimide	T826	AR	0.01	mg/kg	(278) <0.01
Picoxystrobin	T826	AR	0.01	mg/kg	<0.01
Piperonyl Butoxide	T826	AR	0.01	mg/kg	<0.01
Pirimicarb	T826	AR	0.01	mg/kg	<0.01
Pirimiphos Ethyl	T826	AR	0.01	mg/kg	<0.01
Pirimiphos methyl	T826	AR	0.01	mg/kg	<0.01
Pretilachlor	T826	AR	0.01	mg/kg	<0.01
Prochloraz	T826	AR	0.01	mg/kg	<0.01
Procymidone	T826	AR	0.01	mg/kg	<0.01
Profenofos	T826	AR	0.01	mg/kg	<0.01
Prometon	T826	AR	0.01	mg/kg	<0.01
Prometryn	T826	AR	0.01	mg/kg	<0.01
Propachlor	T826	AR	0.01	mg/kg	<0.01
Propanil	T826	AR	0.01	mg/kg	<0.01
Propaphos	T826	AR	0.01	mg/kg	<0.01
Propargite	T826	AR	0.01	mg/kg	<0.01
Propazine	T826	AR	0.01	mg/kg	<0.01
Propetamphos	T826	AR	0.01	mg/kg	<0.01
Propham	T826	AR	0.01	mg/kg	<0.01
Propiconazole	T826	AR	0.01	mg/kg	<0.01
Propyzamide	T826	AR	0.01	mg/kg	<0.01
Proquinazid	T826	AR	0.01	mg/kg	<0.01
Prosulfocarb	T826	AR	0.01	mg/kg	<0.01
Prothiofos	T826	AR	0.01	mg/kg	<0.01
Pyraclostrobin	T826	AR	0.01	mg/kg	<0.01
Pyraflufen ethyl	T826	AR	0.01	mg/kg	<0.01
Pyrazophos	T826	AR	0.01	mg/kg	<0.01
Pyridaben	T826	AR	0.01	mg/kg	<0.01
Pyridaphenthion	T826	AR	0.01	mg/kg	<0.01
Pyrimethanil	T826	AR	0.01	mg/kg	<0.01
Pyriproxyfen	T826	AR	0.01	mg/kg	<0.01
Quinalphos	T826	AR	0.01	mg/kg	<0.01
Quinoxyfen	T826	AR	0.01	mg/kg	<0.01
Quintozene	T826	AR	0.01	mg/kg	<0.01

Concept Reference: 701280
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Sub Suite 4 - MRPS by GC MS MS

Concept Reference	**701280 035**
Customer Sample Reference	**HEP-BH-1806**
Hole ID	**HEP-BH-1806**
Depth	**0.30**
Top Depth	**0.30**
Date Sampled	**23-NOV-2017**
Time Sampled	**10:55**
AGS Type	**ES**
AGS Sample ID	**HEPBH18062017112 3001**
AGS Sample Reference	**3**
Matrix Class	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units	
Quizalofop-ethyl	T826	AR	0.01	mg/kg	<0.01
S421	T826	AR	0.01	mg/kg	<0.01
Secbumeton	T826	AR	0.01	mg/kg	<0.01
Silafluofen	T826	AR	0.01	mg/kg	<0.01
Simazine	T826	AR	0.01	mg/kg	<0.01
Simeconazole	T826	AR	0.01	mg/kg	<0.01
Sulfallate	T826	AR	0.01	mg/kg	<0.01
Sulfentrazone	T826	AR	0.01	mg/kg	<0.01
Sulprofos	T826	AR	0.01	mg/kg	<0.01
Tau-Fluvalinate	T826	AR	0.01	mg/kg	<0.01
Tebuconazole	T826	AR	0.01	mg/kg	<0.01
Tebufenpyrad	T826	AR	0.01	mg/kg	<0.01
Tebupirimiphos	T826	AR	0.01	mg/kg	<0.01
Tecnazene	T826	AR	0.01	mg/kg	<0.01
Tefluthrin	T826	AR	0.01	mg/kg	<0.01
Terbacil	T826	AR	0.01	mg/kg	<0.01
Terbufos	T826	AR	0.01	mg/kg	<0.01
Terbumeton	T826	AR	0.01	mg/kg	<0.01
Terbuthylazine	T826	AR	0.01	mg/kg	<0.01
Terbutryn	T826	AR	0.01	mg/kg	<0.01
Tetrachlorvinphos	T826	AR	0.01	mg/kg	<0.01
Tetraconazole	T826	AR	0.01	mg/kg	<0.01
Tetradifon	T826	AR	0.01	mg/kg	<0.01
sulfotep	T826	AR	0.01	mg/kg	<0.01
Tetramethrin	T826	AR	0.01	mg/kg	<0.01
Tetrasul	T826	AR	0.01	mg/kg	<0.01
Thiamethoxam	T826	AR	0.01	mg/kg	<0.01
Thiobencarb	T826	AR	0.01	mg/kg	<0.01
Thiocyclam	T826	AR	0.01	mg/kg	(278) <0.01
Thiometon	T826	AR	0.01	mg/kg	<0.01
Tolclofos-methyl	T826	AR	0.01	mg/kg	<0.01
Triadimefon	T826	AR	0.01	mg/kg	<0.01
Triadimenol	T826	AR	0.01	mg/kg	<0.01
Triallate	T826	AR	0.01	mg/kg	<0.01
Triazamate	T826	AR	0.01	mg/kg	<0.01
Triazophos	T826	AR	0.01	mg/kg	<0.01
Trietazine	T826	AR	0.01	mg/kg	<0.01
Trifloxystrobin	T826	AR	0.01	mg/kg	<0.01
Triflumizole	T826	AR	0.01	mg/kg	(278) <0.01
Trifluralin	T826	AR	0.01	mg/kg	<0.01
Uniconazole	T826	AR	0.01	mg/kg	<0.01
Vinclozolin	T826	AR	0.01	mg/kg	<0.01

Concept Reference: 701280
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Sub Suite 4 - MRPS by LC MS MS

Concept Reference	**701280 035**
Customer Sample Reference	**HEP-BH-1806**
Hole ID	**HEP-BH-1806**
Depth	**0.30**
Top Depth	**0.30**
Date Sampled	**23-NOV-2017**
Time Sampled	**10:55**
AGS Type	**ES**
AGS Sample ID	**HEPBH180620171123001**
AGS Sample Reference	**3**
Matrix Class	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units	
2-(1-Naphthyl)acetamide	T310	AR	0.01	mg/kg	<0.01
3-hydroxycarbofuran	T310	AR	0.01	mg/kg	<0.01
6-Benzyladenine	T310	AR	0.01	mg/kg	<0.01
Abamectin	T310	AR	0.01	mg/kg	<0.01
Acephate	T310	AR	0.01	mg/kg	<0.01
Acetamiprid	T310	AR	0.01	mg/kg	<0.01
Acibenzolar-S-methyl	T310	AR	0.01	mg/kg	<0.01
Aldicarb	T310	AR	0.01	mg/kg	<0.01
Aldicarb sulphone	T310	AR	0.01	mg/kg	<0.01
Aldicarb sulphoxide	T310	AR	0.01	mg/kg	<0.01
Aminocarb	T310	AR	0.01	mg/kg	<0.01
Amitraz	T310	AR	0.01	mg/kg	(278) <0.01
Azinphos ethyl	T310	AR	0.01	mg/kg	<0.01
Azinphos methyl	T310	AR	0.01	mg/kg	<0.01
Azoxystrobin	T310	AR	0.01	mg/kg	<0.01
Bendiocarb	T310	AR	0.01	mg/kg	<0.01
Benfuracarb	T310	AR	0.01	mg/kg	(278) <0.01
Bifenazate	T310	AR	0.01	mg/kg	(278) <0.01
Butoxycarboxim	T310	AR	0.01	mg/kg	(278) <0.01
Butralin	T310	AR	0.01	mg/kg	<0.01
Carbaryl	T310	AR	0.01	mg/kg	<0.01
Carbendazim	T310	AR	0.01	mg/kg	<0.01
Carbetamide	T310	AR	0.01	mg/kg	<0.01
Carbofuran	T310	AR	0.01	mg/kg	<0.01
Carpropamid	T310	AR	0.01	mg/kg	<0.01
Chinomethionat	T310	AR	0.01	mg/kg	(278) <0.01
chlorantraniliprole	T310	AR	0.01	mg/kg	<0.01
Chlorbromuron	T310	AR	0.01	mg/kg	<0.01
Chlorfluazuron	T310	AR	0.01	mg/kg	<0.01
Chloridazon	T310	AR	0.01	mg/kg	<0.01
Chlorotoluron	T310	AR	0.01	mg/kg	<0.01
Chlorpropham	T310	AR	0.01	mg/kg	<0.01
Clofentezine	T310	AR	0.01	mg/kg	<0.01
Clothianidin	T310	AR	0.01	mg/kg	<0.01
Cyanazine	T310	AR	0.01	mg/kg	<0.01
Cyazofamid	T310	AR	0.01	mg/kg	<0.01
Cycluron	T310	AR	0.01	mg/kg	<0.01
Cymoxanil	T310	AR	0.01	mg/kg	<0.01
Cyromazine	T310	AR	0.01	mg/kg	(278) <0.01
Cythioate	T310	AR	0.01	mg/kg	<0.01
Demeton	T310	AR	0.01	mg/kg	<0.01
Demeton-s-methyl sulphone	T310	AR	0.01	mg/kg	<0.01
Desmedipham	T310	AR	0.01	mg/kg	<0.01
Dicrotophos	T310	AR	0.01	mg/kg	<0.01
Diethofencarb	T310	AR	0.01	mg/kg	<0.01
Diflubenzuron	T310	AR	0.01	mg/kg	<0.01
Dimefuron	T310	AR	0.01	mg/kg	<0.01
Dimethoate	T310	AR	0.01	mg/kg	<0.01
Diniconazole	T310	AR	0.01	mg/kg	<0.01
Dinotefuran	T310	AR	0.01	mg/kg	<0.01
Dioxacarb	T310	AR	0.01	mg/kg	<0.01

Concept Reference: 701280
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Sub Suite 4 - MRPS by LC MS MS

Concept Reference	**701280 035**
Customer Sample Reference	**HEP-BH-1806**
Hole ID	**HEP-BH-1806**
Depth	**0.30**
Top Depth	**0.30**
Date Sampled	**23-NOV-2017**
Time Sampled	**10:55**
AGS Type	**ES**
AGS Sample ID	**HEPBH180620171123001**
AGS Sample Reference	**3**
Matrix Class	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units	
Disulfoton sulfoxide	T310	AR	0.01	mg/kg	<0.01
Disulfoton sulphone	T310	AR	0.01	mg/kg	<0.01
Diuron	T310	AR	0.01	mg/kg	<0.01
DMSA	T310	AR	0.01	mg/kg	<0.01
DMST	T310	AR	0.01	mg/kg	<0.01
Dodemorph	T310	AR	0.01	mg/kg	<0.01
Emamectin	T310	AR	0.01	mg/kg	<0.01
Ethidimuron	T310	AR	0.01	mg/kg	<0.01
Ethiofencarb	T310	AR	0.01	mg/kg	<0.01
Ethiofencarb sulfone	T310	AR	0.01	mg/kg	<0.01
Ethiofencarb sulfoxide	T310	AR	0.01	mg/kg	<0.01
Ethiprole	T310	AR	0.01	mg/kg	<0.01
Ethirimol	T310	AR	0.01	mg/kg	(278) <0.01
Fenamiphos sulfone	T310	AR	0.01	mg/kg	<0.01
Fenamiphos sulfoxide	T310	AR	0.01	mg/kg	<0.01
Fenazaquin	T310	AR	0.01	mg/kg	<0.01
Fenchlorphos oxon	T310	AR	0.01	mg/kg	<0.01
Fenhexamid	T310	AR	0.01	mg/kg	<0.01
Fenpropidin	T310	AR	0.01	mg/kg	<0.01
Fenpropimorph	T310	AR	0.01	mg/kg	<0.01
Fenpyroximate	T310	AR	0.01	mg/kg	<0.01
Fenthion Sulphone	T310	AR	0.01	mg/kg	<0.01
Fenthion Sulphoxide	T310	AR	0.01	mg/kg	<0.01
Fenuron	T310	AR	0.01	mg/kg	<0.01
Flonicamid	T310	AR	0.01	mg/kg	<0.01
Fluazinam	T310	AR	0.01	mg/kg	<0.01
Flufenoxuron	T310	AR	0.01	mg/kg	<0.01
Fluometuron	T310	AR	0.01	mg/kg	<0.01
Fluopicolide	T310	AR	0.01	mg/kg	<0.01
Fluorochloridone	T310	AR	0.01	mg/kg	<0.01
Flurtamone	T310	AR	0.01	mg/kg	<0.01
Flutriafol	T310	AR	0.01	mg/kg	<0.01
Forchlorfenuron	T310	AR	0.01	mg/kg	<0.01
Formetanate	T310	AR	0.01	mg/kg	(278) <0.01
Fuberidazole	T310	AR	0.01	mg/kg	<0.01
Furathiocarb	T310	AR	0.01	mg/kg	<0.01
Hexaflumuron	T310	AR	0.01	mg/kg	<0.01
Hexythiazox	T310	AR	0.01	mg/kg	<0.01
Imazalil	T310	AR	0.01	mg/kg	<0.01
Imidacloprid	T310	AR	0.01	mg/kg	<0.01
Indoxacarb	T310	AR	0.01	mg/kg	<0.01
Iprovalicarb	T310	AR	0.01	mg/kg	<0.01
Isoprocarb	T310	AR	0.01	mg/kg	<0.01
Isoproturon	T310	AR	0.01	mg/kg	<0.01
Isoxaben	T310	AR	0.01	mg/kg	<0.01
Karbutylate	T310	AR	0.01	mg/kg	<0.01
Linuron	T310	AR	0.01	mg/kg	<0.01
Lufenuron	T310	AR	0.01	mg/kg	<0.01
Malaoxon	T310	AR	0.01	mg/kg	<0.01
Mandipropamid	T310	AR	0.01	mg/kg	<0.01
Mefenacet	T310	AR	0.01	mg/kg	<0.01

Concept Reference: 701280
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Sub Suite 4 - MRPS by LC MS MS

Concept Reference	**701280 035**
Customer Sample Reference	**HEP-BH-1806**
Hole ID	**HEP-BH-1806**
Depth	**0.30**
Top Depth	**0.30**
Date Sampled	**23-NOV-2017**
Time Sampled	**10:55**
AGS Type	**ES**
AGS Sample ID	**HEPBH180620171123001**
AGS Sample Reference	**3**
Matrix Class	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units	
Metaflumizone	T310	AR	0.01	mg/kg	<0.01
Metamitron	T310	AR	0.01	mg/kg	<0.01
Metconazole	T310	AR	0.01	mg/kg	<0.01
Methabenzthiazuron	T310	AR	0.01	mg/kg	<0.01
Methamidophos	T310	AR	0.01	mg/kg	<0.01
Methiocarb	T310	AR	0.01	mg/kg	<0.01
Methiocarb sulfone	T310	AR	0.01	mg/kg	<0.01
Methiocarb Sulfoxide	T310	AR	0.01	mg/kg	<0.01
Methomyl	T310	AR	0.01	mg/kg	<0.01
Methoxyfenozide	T310	AR	0.01	mg/kg	<0.01
Metobromuron	T310	AR	0.01	mg/kg	<0.01
Monocrotophos	T310	AR	0.01	mg/kg	<0.01
Monolinuron	T310	AR	0.01	mg/kg	<0.01
Monuron	T310	AR	0.01	mg/kg	<0.01
Neburon	T310	AR	0.01	mg/kg	<0.01
Nicotine	T310	AR	0.01	mg/kg	(278,5) <0.01
Nitenpyram	T310	AR	0.01	mg/kg	<0.01
Novaluron	T310	AR	0.01	mg/kg	<0.01
Omethoate	T310	AR	0.01	mg/kg	<0.01
Oxadiargyl	T310	AR	0.01	mg/kg	<0.01
Oxamyl	T310	AR	0.01	mg/kg	<0.01
Oxycarboxin	T310	AR	0.01	mg/kg	<0.01
Pencycuron	T310	AR	0.01	mg/kg	<0.01
Phenmedipham	T310	AR	0.01	mg/kg	<0.01
Phorate sulfone	T310	AR	0.01	mg/kg	<0.01
Phorate sulfoxide	T310	AR	0.01	mg/kg	<0.01
Phosmet	T310	AR	0.01	mg/kg	<0.01
Phosphamidon	T310	AR	0.01	mg/kg	<0.01
Phoxim	T310	AR	0.01	mg/kg	<0.01
Pirimicarb	T310	AR	0.01	mg/kg	<0.01
Pirimicarb desmethyl	T310	AR	0.01	mg/kg	<0.01
Prochloraz	T310	AR	0.01	mg/kg	<0.01
Propamocarb	T310	AR	0.01	mg/kg	<0.01
Propaquizafop	T310	AR	0.01	mg/kg	<0.01
Propargite	T310	AR	0.01	mg/kg	(278) <0.01
Propoxur	T310	AR	0.01	mg/kg	<0.01
Prothioconazole desthio	T310	AR	0.01	mg/kg	<0.01
Pyraclostrobin	T310	AR	0.01	mg/kg	<0.01
Pyrethrin I	T310	AR	0.01	mg/kg	(278) <0.01
Pyrifenox	T310	AR	0.01	mg/kg	<0.01
Resmethrin	T310	AR	0.01	mg/kg	(278) <0.01
Spinetoram	T310	AR	0.01	mg/kg	<0.01
Spinosad	T310	AR	0.01	mg/kg	<0.01
Spirodiclofen	T310	AR	0.01	mg/kg	<0.01
Spiromesifen	T310	AR	0.01	mg/kg	<0.01
Spirotetramat	T310	AR	0.01	mg/kg	<0.01
Spiroxamine	T310	AR	0.01	mg/kg	<0.01
Tebufenozide	T310	AR	0.01	mg/kg	<0.01
Teflubenzuron	T310	AR	0.01	mg/kg	<0.01
Temephos	T310	AR	0.01	mg/kg	<0.01
Terbufos sulfone	T310	AR	0.01	mg/kg	<0.01

Concept Reference: 701280
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Sub Suite 4 - MRPS by LC MS MS

Concept Reference	**701280 035**
Customer Sample Reference	**HEP-BH-1806**
Hole ID	**HEP-BH-1806**
Depth	**0.30**
Top Depth	**0.30**
Date Sampled	**23-NOV-2017**
Time Sampled	**10:55**
AGS Type	**ES**
AGS Sample ID	**HEPBH180620171123001**
AGS Sample Reference	**3**
Matrix Class	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units	
Terbufos sulfoxide	T310	AR	0.01	mg/kg	<0.01
Thiabendazole	T310	AR	0.01	mg/kg	<0.01
Thiacloprid	T310	AR	0.01	mg/kg	<0.01
Thiamethoxam	T310	AR	0.01	mg/kg	<0.01
Thiazafluron	T310	AR	0.01	mg/kg	<0.01
Thidiazuron	T310	AR	0.01	mg/kg	<0.01
Thiodicarb	T310	AR	0.01	mg/kg	<0.01
Thiofanox	T310	AR	0.01	mg/kg	<0.01
Thiophanate Methyl	T310	AR	0.01	mg/kg	<0.01
Tolylfluanid	T310	AR	0.01	mg/kg	(278) <0.01
Tribenuron methyl	T310	AR	0.01	mg/kg	(278) <0.01
Tridemorph	T310	AR	0.01	mg/kg	<0.01
Triflumuron	T310	AR	0.01	mg/kg	<0.01
Triflusulfuron-methyl	T310	AR	0.01	mg/kg	<0.01
Triforine	T310	AR	0.01	mg/kg	<0.01
Triticonazole	T310	AR	0.01	mg/kg	<0.01
Vamidothion	T310	AR	0.01	mg/kg	<0.01
Vernolate	T310	AR	0.01	mg/kg	<0.01
Zoxamide	T310	AR	0.01	mg/kg	<0.01

Concept Reference: 701280
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Sub Suite 3 - Radiological

Concept Reference	**701280 007**
Customer Sample Reference	**HEP-BH-61**
Hole ID	**HEP-BH-61**
Depth	**0.90**
Top Depth	**0.90**
Date Sampled	**21-NOV-2017**
Time Sampled	**10:00**
AGS Type	**ES**
AGS Sample ID	**HEPBH6120171121001**
AGS Sample Reference	**5**
Matrix Class	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units	
High resolution gamma spectrometry	T100	AR	0.1	Bq/g	**0.5**
Tritium	T510	AR	0.1	Bq/g	<40

Concept Reference: 701280
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Sub Suite 4 - Phenoxy Acetic acid herbicides

Concept Reference	**701280 035**
Customer Sample Reference	**HEP-BH-1806**
Hole ID	**HEP-BH-1806**
Depth	**0.30**
Top Depth	**0.30**
Date Sampled	**23-NOV-2017**
Time Sampled	**10:55**
AGS Type	**ES**
AGS Sample ID	**HEPBH18062017112 3001**
AGS Sample Reference	**3**
Matrix Class	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units	
Mecoprop	T16	AR	0.01	mg/kg	<0.01
Phenoxy Acetic acid herbicide: MCPA	T16	AR	0.01	mg/kg	<0.01
Dichlorprop	T16	AR	0.01	mg/kg	<0.01
Phenoxy Acetic acid herbicide: 2,4-D	T16	AR	0.01	mg/kg	<0.01
Fenoprop	T16	AR	0.01	mg/kg	<0.01
Phenoxy Acetic acid herbicide: 2,4,5-T	T16	AR	0.01	mg/kg	<0.01

Index to symbols used in Second Supplemental B 701280-3

Value	Description
A40	Assisted dried < 40C
AR	As Received
M105	Analysis conducted on an "as received" aliquot. Results are reported on a dry weight basis where moisture content was determined by assisted drying of sample at 105C
M40	Analysis conducted on sample assisted dried at no more than 40C. Results are reported on a dry weight basis.
N.D.	Not Detected
278	Data reported is qualitative as recovery is outside the 60 to 140% range
5	Results are Semiquantitative
110	LOD raised due to low internal standard recovery.
9	LOD raised due to dilution of sample
13	Results have been blank corrected.
S	Analysis was subcontracted
M	Analysis is MCERTS accredited
U	Analysis is UKAS accredited
N	Analysis is not UKAS accredited

Notes

Second Supplemental B to report in standard format with TPH totals.
Nitrate and Nitrite transferred to Concept East Kilbride
Microbacterial analysis subcontracted to Concept Moy
High resolution gamma spectrometry was subcontracted to AMEC Foster Wheeler
Bromate testing was subcontracted to RPS Mountain Heath
Asbestos testing was subcontracted to REC Asbestos
MRPS and phenoxyacetic pesticide testing was transferred within group to CLS Cambridge
These samples have been analysed exceeding recommended holding times for pH and VOCs. It is possible therefore that the results provided may be compromised.

Method Index

Value	Description
T16	GC/MS
T100	Gamma Spectrometry
T4	Colorimetry
T686	Discrete Analyser
T27	PLM
T7	Probe
T510	Probe (Sub)

T2	Grav
T34	Micro
T11	IC
T162	Grav (1 Dec) (105 C)
T207	GC/MS (MCERTS)
T209	GC/MS (Head Space)(MCERTS)
T826	SOP611 (GC MSMS)
T287	Calc TOC/0.58
T6	ICP/OES
T85	Calc
T310	LC/MS/MS
T909	GCxGC

Accreditation Summary

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Soil Organic Matter	T287	A40	0.1	%	N	001,007,009-010,025-027,032,034-036,038-039,042,044,046,048-052
pH	T7	A40			M	001,007,009-010,025-027,032,034-036,038-039,042,044,046,048-052
Asbestos ID	T27	AR			SU	001,007,009-010,025-027,032,034-036,038-039,042,044,046,048-052
Phenols(Mono)	T4	AR	0.5	mg/kg	M	001,007,009-010,025-027,032,034-036,038-039,042,044,046,048-052
Chloride	T686	AR	1	mg/kg	N	001,007,009-010,025-027,032,034-036,038-039,042,044,046,048-052
Cyanide(Total)	T4	AR	1	mg/kg	M	001,007,009-010,025-027,032,034-036,038-039,042,044,046,048-052
Thiocyanate	T4	A40	1	mg/kg	N	001,007,009-010,025-027,032,034-036,038-039,042,044,046,048-052
Nitrate	T686	AR	1	mg/kg	N	001,007,009-010,025-027,032,034-036,038-039,042,044,046,048-052
Nitrite	T686	AR	1	mg/kg	N	001,007,009-010,025-027,032,034-036,038-039,042,044,046,048-052
SO4(Total)	T6	A40	0.01	%	U	001,007,009-010,025-027,032,034-036,038-039,042,044,046,048-052
Sulphide	T4	A40	10	mg/kg	N	001,007,009-010,025-027,032,034-036,038-039,042,044,046,048-052
Bromate	T11	AR	1	mg/kg	SN	001,007,009-010,025-027,032,034-036,038-039,042,044,046,048-052
Arsenic	T6	M40	2	mg/kg	M	001,007,009-010,025-027,032,034-036,038-039,042,044,046,048-052
Cadmium	T6	M40	1	mg/kg	M	001,007,009-010,025-027,032,034-036,038-039,042,044,046,048-052
Chromium	T6	M40	1	mg/kg	M	001,007,009-010,025-027,032,034-036,038-039,042,044,046,048-052
Iron	T6	A40	1	mg/kg	U	001,007,009-010,025-027,032,034-036,038-039,042,044,046,048-052
Lead	T6	M40	1	mg/kg	M	001,007,009-010,025-027,032,034-036,038-039,042,044,046,048-052
Manganese	T6	M40	1	mg/kg	M	001,007,009-010,025-027,032,034-036,038-039,042,044,046,048-052
Mercury	T6	M40	1	mg/kg	M	001,007,009-010,025-027,032,034-036,038-039,042,044,046,048-052
Nickel	T6	M40	1	mg/kg	M	001,007,009-010,025-027,032,034-036,038-039,042,044,046,048-052
Selenium	T6	M40	3	mg/kg	M	001,007,009-010,025-027,032,034-036,038-039,042,044,046,048-052
Copper	T6	M40	1	mg/kg	M	001,007,009-010,025-027,032,034-036,038-039,042,044,046,048-052
Zinc	T6	M40	1	mg/kg	M	001,007,009-010,025-027,032,034-036,038-039,042,044,046,048-052
Boron (water-soluble)	T6	A40	1	mg/kg	N	001,007,009-010,025-027,032,034-036,038-039,042,044,046,048-052
Naphthalene	T207	M105	0.1	mg/kg	M	001,007,009-010,025-027,032,034-036,038-039,042,044,046,048-052
Acenaphthylene	T207	AR	0.1	mg/kg	U	001,007,009-010,025-027,032,034-036,038-039,042,044,046,048-052
Acenaphthene	T207	M105	0.1	mg/kg	M	001,007,009-010,025-027,032,034-036,038-039,042,044,046,048-052
Fluorene	T207	M105	0.1	mg/kg	M	001,007,009-010,025-027,032,034-036,038-039,042,044,046,048-052
Phenanthrene	T207	M105	0.1	mg/kg	M	001,007,009-010,025-027,032,034-036,038-039,042,044,046,048-052
Anthracene	T207	AR	0.1	mg/kg	U	001,007,009-010,025-027,032,034-036,038-039,042,044,046,048-052
Fluoranthene	T207	M105	0.1	mg/kg	M	001,007,009-010,025-027,032,034-036,038-039,042,044,046,048-052
Pyrene	T207	M105	0.1	mg/kg	M	001,007,009-010,025-027,032,034-036,038-039,042,044,046,048-052
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	M	001,007,009-010,025-027,032,034-036,038-039,042,044,046,048-052
Chrysene	T207	M105	0.1	mg/kg	M	001,007,009-010,025-027,032,034-036,038-039,042,044,046,048-052
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	M	001,007,009-010,025-027,032,034-036,038-039,042,044,046,048-052
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	M	001,007,009-010,025-027,032,034-036,038-039,042,044,046,048-052
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	M	001,007,009-010,025-027,032,034-036,038-039,042,044,046,048-052
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	M	001,007,009-010,025-027,032,034-036,038-039,042,044,046,048-052
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	M	001,007,009-010,025-027,032,034-036,038-039,042,044,046,048-052
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	M	001,007,009-010,025-027,032,034-036,038-039,042,044,046,048-052
PAH(total)	T207	AR	0.1	mg/kg	U	001,007,009-010,025-027,032,034-036,038-039,042,044,046,048-052
TPH (C5-C6 aliphatic)	T209	AR	100	µg/kg	N	001,007,009-010,025-027,032,034-036,038-039,042,044,046,048-052
TPH (C6-C8 aliphatic)	T209	AR	100	µg/kg	N	001,007,009-010,025-027,032,034-036,038-039,042,044,046,048-052
TPH (C8-C10 aliphatic)	T209	AR	100	µg/kg	N	001,007,009-010,025-027,032,034-036,038-039,042,044,046,048-052
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	M	001,007,009-010,025-027,032,034-036,038-039,042,044,046,048-052
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	M	001,007,009-010,025-027,032,034-036,038-039,042,044,046,048-052
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	M	001,007,009-010,025-027,032,034-036,038-039,042,044,046,048-052
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	M	001,007,009-010,025-027,032,034-036,038-039,042,044,046,048-052
TPH (C6-C7 aromatic)	T209	AR	100	µg/kg	N	001,007,009-010,025-027,032,034-036,038-039,042,044,046,048-052
TPH (C7-C8 aromatic)	T209	AR	100	µg/kg	N	001,007,009-010,025-027,032,034-036,038-039,042,044,046,048-052
TPH (C8-C10 aromatic)	T209	AR	100	µg/kg	N	001,007,009-010,025-027,032,034-036,038-039,042,044,046,048-052
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	M	001,007,009-010,025-027,032,034-036,038-039,042,044,046,048-052
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	M	001,007,009-010,025-027,032,034-036,038-039,042,044,046,048-052
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	M	001,007,009-010,025-027,032,034-036,038-039,042,044,046,048-052

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	M	001,007,009-010,025-027,032,034-036,038-039,042,044,046,048-052
TPH (Aliphatic) total	T85	M105		mg/kg	N	001,007,009-010,025-027,032,034-036,038-039,042,044,046,048-052
TPH (Aromatic) total	T85	M105		mg/kg	N	001,007,009-010,025-027,032,034-036,038-039,042,044,046,048-052
TPH (Aliphatic+Aromatic) (sum)	T85	M105		mg/kg	N	001,007,009-010,025-027,032,034-036,038-039,042,044,046,048-052
Moisture @105C	T162	AR	0.1	%	N	001,007,009-010,025-027,032,034-036,038-039,042,044,046,048-052
Retained on 10mm sieve	T2	M40	0.1	%	N	001,007,009-010,025-027,032,034-036,038-039,042,044,046,048-052
2,4,6-Trichlorophenol	T826	AR	0.01	mg/kg	N	035
2-Methyl-4,6-dinitrophenol	T826	AR	0.01	mg/kg	N	035
2-Phenylphenol	T826	AR	0.01	mg/kg	N	035
9,10-Anthraquinone	T826	AR	0.01	mg/kg	N	035
Acetochlor	T826	AR	0.01	mg/kg	N	035
Aclonifen	T826	AR	0.01	mg/kg	N	035
Acrinathrin	T826	AR	0.01	mg/kg	N	035
Alachlor	T826	AR	0.01	mg/kg	N	035
Aldrin	T826	AR	0.01	mg/kg	N	035
Ametryn	T826	AR	0.01	mg/kg	N	035
Atraton	T826	AR	0.01	mg/kg	N	035
Atrazine	T826	AR	0.01	mg/kg	N	035
Azaconazole	T826	AR	0.01	mg/kg	N	035
Azobenzene	T826	AR	0.01	mg/kg	N	035
Azoxystrobin	T826	AR	0.01	mg/kg	N	035
Benalaxyl	T826	AR	0.01	mg/kg	N	035
Benfluralin	T826	AR	0.01	mg/kg	N	035
Bifenox	T826	AR	0.01	mg/kg	N	035
Bifenthrin	T826	AR	0.01	mg/kg	N	035
Binapacryl	T826	AR	0.01	mg/kg	N	035
Biphenyl	T826	AR	0.01	mg/kg	N	035
Bitertanol	T826	AR	0.01	mg/kg	N	035
Boscalid	T826	AR	0.01	mg/kg	N	035
Bromacil	T826	AR	0.01	mg/kg	N	035
Bromophos	T826	AR	0.01	mg/kg	N	035
Bromophos-Ethyl	T826	AR	0.01	mg/kg	N	035
Bromopropylate	T826	AR	0.01	mg/kg	N	035
Bupirimate	T826	AR	0.01	mg/kg	N	035
Buprofezine	T826	AR	0.01	mg/kg	N	035
Butachlor	T826	AR	0.01	mg/kg	N	035
Cadusafos	T826	AR	0.01	mg/kg	N	035
Captan	T826	AR	0.01	mg/kg	N	035
Carbaryl	T826	AR	0.01	mg/kg	N	035
Carbophenothion	T826	AR	0.01	mg/kg	N	035
Carboxine	T826	AR	0.01	mg/kg	N	035
Carfentrazone Ethyl	T826	AR	0.01	mg/kg	N	035
Chlorbenzilate	T826	AR	0.01	mg/kg	N	035
Chlorbufam	T826	AR	0.01	mg/kg	N	035
Chlordane	T826	AR	0.01	mg/kg	N	035
Chlordimeform	T826	AR	0.01	mg/kg	N	035
Chlorethoxyfos	T826	AR	0.01	mg/kg	N	035
Chlorfenapyr	T826	AR	0.01	mg/kg	N	035
Chlorfenson	T826	AR	0.01	mg/kg	N	035
Chlorfenvinphos	T826	AR	0.01	mg/kg	N	035
Chlormephos	T826	AR	0.01	mg/kg	N	035
Chloropropylate	T826	AR	0.01	mg/kg	N	035
Chlorothalonil	T826	AR	0.01	mg/kg	N	035
Chlorpropham	T826	AR	0.01	mg/kg	N	035
Chlorpyrifos	T826	AR	0.01	mg/kg	N	035
Chlorpyrifos methyl	T826	AR	0.01	mg/kg	N	035
Chlorthal Dimethyl	T826	AR	0.01	mg/kg	N	035
Chlorthion	T826	AR	0.01	mg/kg	N	035
Chlorthiophos	T826	AR	0.01	mg/kg	N	035
Chlozolinate	T826	AR	0.01	mg/kg	N	035
cis-1,2,3,6-Tetrahydrophthalimide	T826	AR	0.01	mg/kg	N	035
Clodinafop propargy	T826	AR	0.01	mg/kg	N	035
Clomazone	T826	AR	0.01	mg/kg	N	035
Cloquintocet mexyl	T826	AR	0.01	mg/kg	N	035
Coumaphos	T826	AR	0.01	mg/kg	N	035
Cyflufenamid	T826	AR	0.01	mg/kg	N	035
Cyfluthrin	T826	AR	0.01	mg/kg	N	035
Cypermethrin	T826	AR	0.01	mg/kg	N	035
Cyphenothrin	T826	AR	0.01	mg/kg	N	035
Cyproconazole	T826	AR	0.01	mg/kg	N	035

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Cyprodinil	T826	AR	0.01	mg/kg	N	035
DEET	T826	AR	0.01	mg/kg	N	035
Deltamethrin	T826	AR	0.01	mg/kg	N	035
Desmetryn	T826	AR	0.01	mg/kg	N	035
Diafenthiuron	T826	AR	0.01	mg/kg	N	035
Dialifos	T826	AR	0.01	mg/kg	N	035
Diazinon	T826	AR	0.01	mg/kg	N	035
Dichlobenil	T826	AR	0.01	mg/kg	N	035
Dichlofenthion	T826	AR	0.01	mg/kg	N	035
Dichlorvos	T826	AR	0.01	mg/kg	N	035
Diclobutrazol	T826	AR	0.01	mg/kg	N	035
Dicloran	T826	AR	0.01	mg/kg	N	035
Dicofol	T826	AR	0.01	mg/kg	N	035
Dieldrin	T826	AR	0.01	mg/kg	N	035
Difenoconazole	T826	AR	0.01	mg/kg	N	035
Diflufenican	T826	AR	0.01	mg/kg	N	035
Dimethenamid	T826	AR	0.01	mg/kg	N	035
Dimethomorph	T826	AR	0.01	mg/kg	N	035
Dimoxystrobin	T826	AR	0.01	mg/kg	N	035
Dinoterb	T826	AR	0.01	mg/kg	N	035
Dioxabenzofos	T826	AR	0.01	mg/kg	N	035
Diphenamid	T826	AR	0.01	mg/kg	N	035
Diphenylamine	T826	AR	0.01	mg/kg	N	035
Disulfoton	T826	AR	0.01	mg/kg	N	035
Ditalimfos	T826	AR	0.01	mg/kg	N	035
Edifenphos	T826	AR	0.01	mg/kg	N	035
Endosulphan alpha	T826	AR	0.01	mg/kg	N	035
Endosulphan beta	T826	AR	0.01	mg/kg	N	035
Endosulphan sulphate	T826	AR	0.01	mg/kg	N	035
Endrin	T826	AR	0.01	mg/kg	N	035
Epn	T826	AR	0.01	mg/kg	N	035
Epoxiconazole	T826	AR	0.01	mg/kg	N	035
EPTC	T826	AR	0.01	mg/kg	N	035
Etaconazole	T826	AR	0.01	mg/kg	N	035
Ethion	T826	AR	0.01	mg/kg	N	035
Ethofumesate	T826	AR	0.01	mg/kg	N	035
Ethoprophos	T826	AR	0.01	mg/kg	N	035
Ethoxyquin	T826	AR	0.01	mg/kg	N	035
Etofenprox	T826	AR	0.01	mg/kg	N	035
Etoxazole	T826	AR	0.01	mg/kg	N	035
Etridiazole	T826	AR	0.01	mg/kg	N	035
Etrimfos	T826	AR	0.01	mg/kg	N	035
Famoxadone	T826	AR	0.01	mg/kg	N	035
Famphur	T826	AR	0.01	mg/kg	N	035
Fenamidone	T826	AR	0.01	mg/kg	N	035
Fenamiphos	T826	AR	0.01	mg/kg	N	035
Fenarimol	T826	AR	0.01	mg/kg	N	035
Fenbuconazole	T826	AR	0.01	mg/kg	N	035
Fenchlorphos	T826	AR	0.01	mg/kg	N	035
Fenhexamid	T826	AR	0.01	mg/kg	N	035
Fenitrothion	T826	AR	0.01	mg/kg	N	035
Fenpiclonil	T826	AR	0.01	mg/kg	N	035
Fenpropathrin	T826	AR	0.01	mg/kg	N	035
Fenson	T826	AR	0.01	mg/kg	N	035
Fensulfothion	T826	AR	0.01	mg/kg	N	035
Fenthion	T826	AR	0.01	mg/kg	N	035
Fenvalerate	T826	AR	0.01	mg/kg	N	035
Fipronil	T826	AR	0.01	mg/kg	N	035
Fipronil sulphone	T826	AR	0.01	mg/kg	N	035
Flamprop isopropyl	T826	AR	0.01	mg/kg	N	035
Fluazifop-P-Butyl	T826	AR	0.01	mg/kg	N	035
Flucythrinate	T826	AR	0.01	mg/kg	N	035
Fludioxonil	T826	AR	0.01	mg/kg	N	035
Flufenacet	T826	AR	0.01	mg/kg	N	035
Flumetralin	T826	AR	0.01	mg/kg	N	035
Flumioxazin	T826	AR	0.01	mg/kg	N	035
Flumorph	T826	AR	0.01	mg/kg	N	035
Fluopyram	T826	AR	0.01	mg/kg	N	035
Fluquinconazole	T826	AR	0.01	mg/kg	N	035
Fluroxypyr-1-methylheptyl ester	T826	AR	0.01	mg/kg	N	035

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Flusilazole	T826	AR	0.01	mg/kg	N	035
Flutolanil	T826	AR	0.01	mg/kg	N	035
Fluxapyroxad	T826	AR	0.01	mg/kg	N	035
Folpet	T826	AR	0.01	mg/kg	N	035
Fonophos	T826	AR	0.01	mg/kg	N	035
Formothion	T826	AR	0.01	mg/kg	N	035
Furalaxyl	T826	AR	0.01	mg/kg	N	035
Haloxyfop etotyl	T826	AR	0.01	mg/kg	N	035
Haloxyfop Methyl	T826	AR	0.01	mg/kg	N	035
Heptachlor	T826	AR	0.01	mg/kg	N	035
Heptachlor epoxide	T826	AR	0.01	mg/kg	N	035
Heptachlor exo Epoxide	T826	AR	0.01	mg/kg	N	035
Heptenophos	T826	AR	0.01	mg/kg	N	035
Hexachlorobenzene	T826	AR	0.01	mg/kg	N	035
Hexachlorocyclohexane (alpha)	T826	AR	0.01	mg/kg	N	035
Hexachlorocyclohexane (beta)	T826	AR	0.01	mg/kg	N	035
Hexachlorocyclohexane (delta)	T826	AR	0.01	mg/kg	N	035
Hexaconazole	T826	AR	0.01	mg/kg	N	035
Hexazinone	T826	AR	0.01	mg/kg	N	035
Imazalil	T826	AR	0.01	mg/kg	N	035
Iodofenphos	T826	AR	0.01	mg/kg	N	035
Iprodione	T826	AR	0.01	mg/kg	N	035
Isazofos	T826	AR	0.01	mg/kg	N	035
Isocarbophos	T826	AR	0.01	mg/kg	N	035
Isodrin	T826	AR	0.01	mg/kg	N	035
Isofenphos	T826	AR	0.01	mg/kg	N	035
Isofenphos Methyl	T826	AR	0.01	mg/kg	N	035
Isomethiozin	T826	AR	0.01	mg/kg	N	035
Isoprothiolane	T826	AR	0.01	mg/kg	N	035
Isopyrazam	T826	AR	0.01	mg/kg	N	035
Isothiazolinone	T826	AR	0.01	mg/kg	N	035
Kresoxim Methyl	T826	AR	0.01	mg/kg	N	035
Lambda Cyhalothrin	T826	AR	0.01	mg/kg	N	035
Lenacil	T826	AR	0.01	mg/kg	N	035
Leptophos	T826	AR	0.01	mg/kg	N	035
Lindane	T826	AR	0.01	mg/kg	N	035
Malathion	T826	AR	0.01	mg/kg	N	035
MCPA-thioethyl	T826	AR	0.01	mg/kg	N	035
Mecarbam	T826	AR	0.01	mg/kg	N	035
Mepanipyrim	T826	AR	0.01	mg/kg	N	035
Mephosfolan	T826	AR	0.01	mg/kg	N	035
Mepronil	T826	AR	0.01	mg/kg	N	035
Metalaxyl	T826	AR	0.01	mg/kg	N	035
Metazachlor	T826	AR	0.01	mg/kg	N	035
Methacrifos	T826	AR	0.01	mg/kg	N	035
Methidathion	T826	AR	0.01	mg/kg	N	035
Methoxychlor	T826	AR	0.01	mg/kg	N	035
Methyl Paraoxon	T826	AR	0.01	mg/kg	N	035
Metolachlor	T826	AR	0.01	mg/kg	N	035
Metolcarb	T826	AR	0.01	mg/kg	N	035
Metrafenone	T826	AR	0.01	mg/kg	N	035
Metribuzin	T826	AR	0.01	mg/kg	N	035
Mevinphos	T826	AR	0.01	mg/kg	N	035
Mirex	T826	AR	0.01	mg/kg	N	035
Molinate	T826	AR	0.01	mg/kg	N	035
Myclobutanil	T826	AR	0.01	mg/kg	N	035
Napropamide	T826	AR	0.01	mg/kg	N	035
Nitrofen	T826	AR	0.01	mg/kg	N	035
Nitrothal isopropyl	T826	AR	0.01	mg/kg	N	035
Nuarimol	T826	AR	0.01	mg/kg	N	035
o,p'-DDT	T826	AR	0.01	mg/kg	N	035
Octhilinone	T826	AR	0.01	mg/kg	N	035
Ofurace	T826	AR	0.01	mg/kg	N	035
Orysastrobin	T826	AR	0.01	mg/kg	N	035
Oxadiazon	T826	AR	0.01	mg/kg	N	035
Oxadixyl	T826	AR	0.01	mg/kg	N	035
Oxyfluorfen	T826	AR	0.01	mg/kg	N	035
p,p-DDD	T826	AR	0.01	mg/kg	N	035
p,p-DDE	T826	AR	0.01	mg/kg	N	035
p,p-DDT	T826	AR	0.01	mg/kg	N	035

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Paclobutrazol	T826	AR	0.01	mg/kg	N	035
Paraoxon	T826	AR	0.01	mg/kg	N	035
Parathion	T826	AR	0.01	mg/kg	N	035
Parathion methyl	T826	AR	0.01	mg/kg	N	035
Penconazole	T826	AR	0.01	mg/kg	N	035
Pendimethalin	T826	AR	0.01	mg/kg	N	035
Pentachloroaniline	T826	AR	0.01	mg/kg	N	035
Pentachlorophenol	T826	AR	0.01	mg/kg	N	035
Pentanochlor	T826	AR	0.01	mg/kg	N	035
Permethrin	T826	AR	0.01	mg/kg	N	035
Pethoxamid	T826	AR	0.01	mg/kg	N	035
Phenothrin	T826	AR	0.01	mg/kg	N	035
Phenthoate	T826	AR	0.01	mg/kg	N	035
Phorate	T826	AR	0.01	mg/kg	N	035
Phosalone	T826	AR	0.01	mg/kg	N	035
Phosfolan	T826	AR	0.01	mg/kg	N	035
Phosmet	T826	AR	0.01	mg/kg	N	035
Phthalimide	T826	AR	0.01	mg/kg	N	035
Picoxystrobin	T826	AR	0.01	mg/kg	N	035
Piperonyl Butoxide	T826	AR	0.01	mg/kg	N	035
Pirimicarb	T826	AR	0.01	mg/kg	N	035
Pirimiphos Ethyl	T826	AR	0.01	mg/kg	N	035
Pirimiphos methyl	T826	AR	0.01	mg/kg	N	035
Pretilachlor	T826	AR	0.01	mg/kg	N	035
Prochloraz	T826	AR	0.01	mg/kg	N	035
Procymidone	T826	AR	0.01	mg/kg	N	035
Profenofos	T826	AR	0.01	mg/kg	N	035
Prometon	T826	AR	0.01	mg/kg	N	035
Prometryn	T826	AR	0.01	mg/kg	N	035
Propachlor	T826	AR	0.01	mg/kg	N	035
Propanil	T826	AR	0.01	mg/kg	N	035
Propaphos	T826	AR	0.01	mg/kg	N	035
Propargite	T826	AR	0.01	mg/kg	N	035
Propazine	T826	AR	0.01	mg/kg	N	035
Propetamphos	T826	AR	0.01	mg/kg	N	035
Propham	T826	AR	0.01	mg/kg	N	035
Propiconazole	T826	AR	0.01	mg/kg	N	035
Propyzamide	T826	AR	0.01	mg/kg	N	035
Proquinazid	T826	AR	0.01	mg/kg	N	035
Prosulfocarb	T826	AR	0.01	mg/kg	N	035
Prothiofos	T826	AR	0.01	mg/kg	N	035
Pyraclostrobin	T826	AR	0.01	mg/kg	N	035
Pyraflufen ethyl	T826	AR	0.01	mg/kg	N	035
Pyrazophos	T826	AR	0.01	mg/kg	N	035
Pyridaben	T826	AR	0.01	mg/kg	N	035
Pyridaphenthion	T826	AR	0.01	mg/kg	N	035
Pyrimethanil	T826	AR	0.01	mg/kg	N	035
Pyriproxyfen	T826	AR	0.01	mg/kg	N	035
Quinalphos	T826	AR	0.01	mg/kg	N	035
Quinoxyfen	T826	AR	0.01	mg/kg	N	035
Quintozene	T826	AR	0.01	mg/kg	N	035
Quizalofop-ethyl	T826	AR	0.01	mg/kg	N	035
S421	T826	AR	0.01	mg/kg	N	035
Secbumeton	T826	AR	0.01	mg/kg	N	035
Silafluofen	T826	AR	0.01	mg/kg	N	035
Simazine	T826	AR	0.01	mg/kg	N	035
Simeconazole	T826	AR	0.01	mg/kg	N	035
Sulfallate	T826	AR	0.01	mg/kg	N	035
Sulfentrazone	T826	AR	0.01	mg/kg	N	035
Sulprofos	T826	AR	0.01	mg/kg	N	035
Tau-Fluvalinate	T826	AR	0.01	mg/kg	N	035
Tebuconazole	T826	AR	0.01	mg/kg	N	035
Tebufenpyrad	T826	AR	0.01	mg/kg	N	035
Tebupirimiphos	T826	AR	0.01	mg/kg	N	035
Tecnazene	T826	AR	0.01	mg/kg	N	035
Tefluthrin	T826	AR	0.01	mg/kg	N	035
Terbacil	T826	AR	0.01	mg/kg	N	035
Terbufos	T826	AR	0.01	mg/kg	N	035
Terbumeton	T826	AR	0.01	mg/kg	N	035
Terbuthylazine	T826	AR	0.01	mg/kg	N	035

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Terbutryn	T826	AR	0.01	mg/kg	N	035
Tetrachlorvinphos	T826	AR	0.01	mg/kg	N	035
Tetraconazole	T826	AR	0.01	mg/kg	N	035
Tetradifon	T826	AR	0.01	mg/kg	N	035
sulfotep	T826	AR	0.01	mg/kg	N	035
Tetramethrin	T826	AR	0.01	mg/kg	N	035
Tetrasul	T826	AR	0.01	mg/kg	N	035
Thiamethoxam	T826	AR	0.01	mg/kg	N	035
Thiobencarb	T826	AR	0.01	mg/kg	N	035
Thiocyclam	T826	AR	0.01	mg/kg	N	035
Thiometon	T826	AR	0.01	mg/kg	N	035
Tolclofos-methyl	T826	AR	0.01	mg/kg	N	035
Triadimefon	T826	AR	0.01	mg/kg	N	035
Triadimenol	T826	AR	0.01	mg/kg	N	035
Triallate	T826	AR	0.01	mg/kg	N	035
Triazamate	T826	AR	0.01	mg/kg	N	035
Triazophos	T826	AR	0.01	mg/kg	N	035
Trietazine	T826	AR	0.01	mg/kg	N	035
Trifloxystrobin	T826	AR	0.01	mg/kg	N	035
Triflumizole	T826	AR	0.01	mg/kg	N	035
Trifluralin	T826	AR	0.01	mg/kg	N	035
Uniconazole	T826	AR	0.01	mg/kg	N	035
Vinclozolin	T826	AR	0.01	mg/kg	N	035
2-(1-Naphthyl)acetamide	T310	AR	0.01	mg/kg	N	035
3-hydroxycarbofuran	T310	AR	0.01	mg/kg	N	035
6-Benzyladenine	T310	AR	0.01	mg/kg	N	035
Abamectin	T310	AR	0.01	mg/kg	N	035
Acephate	T310	AR	0.01	mg/kg	N	035
Acetamiprid	T310	AR	0.01	mg/kg	N	035
Acibenzolar-S-methyl	T310	AR	0.01	mg/kg	N	035
Aldicarb	T310	AR	0.01	mg/kg	N	035
Aldicarb sulphone	T310	AR	0.01	mg/kg	N	035
Aldicarb sulphoxide	T310	AR	0.01	mg/kg	N	035
Aminocarb	T310	AR	0.01	mg/kg	N	035
Amitraz	T310	AR	0.01	mg/kg	N	035
Azinphos ethyl	T310	AR	0.01	mg/kg	N	035
Azinphos methyl	T310	AR	0.01	mg/kg	N	035
Azoxystrobin	T310	AR	0.01	mg/kg	N	035
Bendiocarb	T310	AR	0.01	mg/kg	N	035
Benfuracarb	T310	AR	0.01	mg/kg	N	035
Bifenazate	T310	AR	0.01	mg/kg	N	035
Butoxycarboxim	T310	AR	0.01	mg/kg	N	035
Butralin	T310	AR	0.01	mg/kg	N	035
Carbaryl	T310	AR	0.01	mg/kg	N	035
Carbendazim	T310	AR	0.01	mg/kg	N	035
Carbetamide	T310	AR	0.01	mg/kg	N	035
Carbofuran	T310	AR	0.01	mg/kg	N	035
Carpropamid	T310	AR	0.01	mg/kg	N	035
Chinomethionat	T310	AR	0.01	mg/kg	N	035
chlorantraniliprole	T310	AR	0.01	mg/kg	N	035
Chlorbromuron	T310	AR	0.01	mg/kg	N	035
Chlorfluazuron	T310	AR	0.01	mg/kg	N	035
Chloridazon	T310	AR	0.01	mg/kg	N	035
Chlorotoluron	T310	AR	0.01	mg/kg	N	035
Chlorpropham	T310	AR	0.01	mg/kg	N	035
Clofentezine	T310	AR	0.01	mg/kg	N	035
Clothianidin	T310	AR	0.01	mg/kg	N	035
Cyanazine	T310	AR	0.01	mg/kg	N	035
Cyazofamid	T310	AR	0.01	mg/kg	N	035
Cycluron	T310	AR	0.01	mg/kg	N	035
Cymoxanil	T310	AR	0.01	mg/kg	N	035
Cyromazine	T310	AR	0.01	mg/kg	N	035
Cythioate	T310	AR	0.01	mg/kg	N	035
Demeton	T310	AR	0.01	mg/kg	N	035
Demeton-s-methyl sulphone	T310	AR	0.01	mg/kg	N	035
Desmedipham	T310	AR	0.01	mg/kg	N	035
Dicrotophos	T310	AR	0.01	mg/kg	N	035
Diethofencarb	T310	AR	0.01	mg/kg	N	035
Diflubenzuron	T310	AR	0.01	mg/kg	N	035
Dimefuron	T310	AR	0.01	mg/kg	N	035

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Dimethoate	T310	AR	0.01	mg/kg	N	035
Diniconazole	T310	AR	0.01	mg/kg	N	035
Dinotefuran	T310	AR	0.01	mg/kg	N	035
Dioxacarb	T310	AR	0.01	mg/kg	N	035
Disulfoton sulfoxide	T310	AR	0.01	mg/kg	N	035
Disulfoton sulphone	T310	AR	0.01	mg/kg	N	035
Diuron	T310	AR	0.01	mg/kg	N	035
DMSA	T310	AR	0.01	mg/kg	N	035
DMST	T310	AR	0.01	mg/kg	N	035
Dodemorph	T310	AR	0.01	mg/kg	N	035
Emamectin	T310	AR	0.01	mg/kg	N	035
Ethidimuron	T310	AR	0.01	mg/kg	N	035
Ethiofencarb	T310	AR	0.01	mg/kg	N	035
Ethiofencarb sulfone	T310	AR	0.01	mg/kg	N	035
Ethiofencarb sulfoxide	T310	AR	0.01	mg/kg	N	035
Ethiprole	T310	AR	0.01	mg/kg	N	035
Ethirimol	T310	AR	0.01	mg/kg	N	035
Fenamiphos sulfone	T310	AR	0.01	mg/kg	N	035
Fenamiphos sulfoxide	T310	AR	0.01	mg/kg	N	035
Fenazaquin	T310	AR	0.01	mg/kg	N	035
Fenchlorphos oxon	T310	AR	0.01	mg/kg	N	035
Fenhexamid	T310	AR	0.01	mg/kg	N	035
Fenpropidin	T310	AR	0.01	mg/kg	N	035
Fenpropimorph	T310	AR	0.01	mg/kg	N	035
Fenpyroximate	T310	AR	0.01	mg/kg	N	035
Fenthion Sulphone	T310	AR	0.01	mg/kg	N	035
Fenthion Sulphoxide	T310	AR	0.01	mg/kg	N	035
Fenuron	T310	AR	0.01	mg/kg	N	035
Flonicamid	T310	AR	0.01	mg/kg	N	035
Fluazinam	T310	AR	0.01	mg/kg	N	035
Flufenoxuron	T310	AR	0.01	mg/kg	N	035
Fluometuron	T310	AR	0.01	mg/kg	N	035
Fluopicolide	T310	AR	0.01	mg/kg	N	035
Fluorochloridone	T310	AR	0.01	mg/kg	N	035
Flurtamone	T310	AR	0.01	mg/kg	N	035
Flutriafol	T310	AR	0.01	mg/kg	N	035
Forchlorfenuron	T310	AR	0.01	mg/kg	N	035
Formetanate	T310	AR	0.01	mg/kg	N	035
Fuberidazole	T310	AR	0.01	mg/kg	N	035
Furathiocarb	T310	AR	0.01	mg/kg	N	035
Hexaflumuron	T310	AR	0.01	mg/kg	N	035
Hexythiazox	T310	AR	0.01	mg/kg	N	035
Imazalil	T310	AR	0.01	mg/kg	N	035
Imidacloprid	T310	AR	0.01	mg/kg	N	035
Indoxacarb	T310	AR	0.01	mg/kg	N	035
Iprovalicarb	T310	AR	0.01	mg/kg	N	035
Isoprocarb	T310	AR	0.01	mg/kg	N	035
Isoproturon	T310	AR	0.01	mg/kg	N	035
Isoxaben	T310	AR	0.01	mg/kg	N	035
Karbutylate	T310	AR	0.01	mg/kg	N	035
Linuron	T310	AR	0.01	mg/kg	N	035
Lufenuron	T310	AR	0.01	mg/kg	N	035
Malaoxon	T310	AR	0.01	mg/kg	N	035
Mandipropamid	T310	AR	0.01	mg/kg	N	035
Mefenacet	T310	AR	0.01	mg/kg	N	035
Metaflumizone	T310	AR	0.01	mg/kg	N	035
Metamitron	T310	AR	0.01	mg/kg	N	035
Metconazole	T310	AR	0.01	mg/kg	N	035
Methabenzthiazuron	T310	AR	0.01	mg/kg	N	035
Methamidophos	T310	AR	0.01	mg/kg	N	035
Methiocarb	T310	AR	0.01	mg/kg	N	035
Methiocarb sulfone	T310	AR	0.01	mg/kg	N	035
Methiocarb Sulfoxide	T310	AR	0.01	mg/kg	N	035
Methomyl	T310	AR	0.01	mg/kg	N	035
Methoxyfenozide	T310	AR	0.01	mg/kg	N	035
Metobromuron	T310	AR	0.01	mg/kg	N	035
Monocrotophos	T310	AR	0.01	mg/kg	N	035
Monolinuron	T310	AR	0.01	mg/kg	N	035
Monuron	T310	AR	0.01	mg/kg	N	035
Neburon	T310	AR	0.01	mg/kg	N	035

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Nicotine	T310	AR	0.01	mg/kg	N	035
Nitenpyram	T310	AR	0.01	mg/kg	N	035
Novaluron	T310	AR	0.01	mg/kg	N	035
Omethoate	T310	AR	0.01	mg/kg	N	035
Oxadiargyl	T310	AR	0.01	mg/kg	N	035
Oxamyl	T310	AR	0.01	mg/kg	N	035
Oxycarboxin	T310	AR	0.01	mg/kg	N	035
Pencycuron	T310	AR	0.01	mg/kg	N	035
Phenmedipham	T310	AR	0.01	mg/kg	N	035
Phorate sulfone	T310	AR	0.01	mg/kg	N	035
Phorate sulfoxide	T310	AR	0.01	mg/kg	N	035
Phosmet	T310	AR	0.01	mg/kg	N	035
Phosphamidon	T310	AR	0.01	mg/kg	N	035
Phoxim	T310	AR	0.01	mg/kg	N	035
Pirimicarb	T310	AR	0.01	mg/kg	N	035
Pirimicarb desmethyl	T310	AR	0.01	mg/kg	N	035
Prochloraz	T310	AR	0.01	mg/kg	N	035
Propamocarb	T310	AR	0.01	mg/kg	N	035
Propaquizafop	T310	AR	0.01	mg/kg	N	035
Propargite	T310	AR	0.01	mg/kg	N	035
Propoxur	T310	AR	0.01	mg/kg	N	035
Prothioconazole desthio	T310	AR	0.01	mg/kg	N	035
Pyraclostrobin	T310	AR	0.01	mg/kg	N	035
Pyrethrin I	T310	AR	0.01	mg/kg	N	035
Pyrifenox	T310	AR	0.01	mg/kg	N	035
Resmethrin	T310	AR	0.01	mg/kg	N	035
Spinetoram	T310	AR	0.01	mg/kg	N	035
Spinosad	T310	AR	0.01	mg/kg	N	035
Spirodiclofen	T310	AR	0.01	mg/kg	N	035
Spiromesifen	T310	AR	0.01	mg/kg	N	035
Spirotetramat	T310	AR	0.01	mg/kg	N	035
Spiroxamine	T310	AR	0.01	mg/kg	N	035
Tebufenozide	T310	AR	0.01	mg/kg	N	035
Teflubenzuron	T310	AR	0.01	mg/kg	N	035
Temephos	T310	AR	0.01	mg/kg	N	035
Terbufos sulfone	T310	AR	0.01	mg/kg	N	035
Terbufos sulfoxide	T310	AR	0.01	mg/kg	N	035
Thiabendazole	T310	AR	0.01	mg/kg	N	035
Thiacloprid	T310	AR	0.01	mg/kg	N	035
Thiamethoxam	T310	AR	0.01	mg/kg	N	035
Thiazafluron	T310	AR	0.01	mg/kg	N	035
Thidiazuron	T310	AR	0.01	mg/kg	N	035
Thiodicarb	T310	AR	0.01	mg/kg	N	035
Thiofanox	T310	AR	0.01	mg/kg	N	035
Thiophanate Methyl	T310	AR	0.01	mg/kg	N	035
Tolylfluanid	T310	AR	0.01	mg/kg	N	035
Tribenuron methyl	T310	AR	0.01	mg/kg	N	035
Tridemorph	T310	AR	0.01	mg/kg	N	035
Triflumuron	T310	AR	0.01	mg/kg	N	035
Triflusulfuron-methyl	T310	AR	0.01	mg/kg	N	035
Triforine	T310	AR	0.01	mg/kg	N	035
Triticonazole	T310	AR	0.01	mg/kg	N	035
Vamidothion	T310	AR	0.01	mg/kg	N	035
Vernolate	T310	AR	0.01	mg/kg	N	035
Zoxamide	T310	AR	0.01	mg/kg	N	035
Mecoprop	T16	AR	0.01	mg/kg	N	035
Phenoxy Acetic acid herbicide: MCPA	T16	AR	0.01	mg/kg	N	035
Dichlorprop	T16	AR	0.01	mg/kg	N	035
Phenoxy Acetic acid herbicide: 2,4-D	T16	AR	0.01	mg/kg	N	035
Fenoprop	T16	AR	0.01	mg/kg	N	035
Phenoxy Acetic acid herbicide: 2,4,5-T	T16	AR	0.01	mg/kg	N	035
High resolution gamma spectrometry	T100	AR	0.1	Bq/g	SU	007
Tritium	T510	AR	0.1	Bq/g	SU	007
Chromium (trivalent)	T85	AR	2	mg/kg	N	001,007,009-010,025-027,032,034-036,038-039,042,044,046,048-052
Chromium VI	T6	A40	1	mg/kg	N	001,007,009-010,025-027,032,034-036,038-039,042,044,046,048-052
Salmonella spp	T34	AR			N	034
Escherichia coli	T34	AR	1	cfu/in 25g	U	034
Intestinal Enterococci	T34	AR	1	cfu/g	N	034

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Concept Life Sciences

Certificate of Analysis

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Report Number: Second Supplemental A 701280-3

Date of Report: 22-Jun-2018

Customer: Fugro GeoServices
Fugro House
Hithercroft Road
Wallingford
Oxfordshire
OX10 9RB

Customer Contact: Ms Karen Blackmore

Customer Job Reference:
Customer Purchase Order: 56642KB-WAL
Customer Site Reference: Heathrow HEP Package 3
Date Job Received at Concept: 20-Nov-2017
Date Analysis Started: 06-Dec-2017
Date Analysis Completed: 22-Feb-2018

The results reported relate to samples received in the laboratory and may not be representative of a whole batch.

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation

This report should not be reproduced except in full without the written approval of the laboratory

Tests covered by this certificate were conducted in accordance with Concept Life Sciences SOPs

All results have been reviewed in accordance with Section 25 of the Concept Life Sciences, Analytical Services Quality Manual

UKAS TESTING
1549

Report checked
and authorised by :
Sara Abou-Shakra
Customer Service Manager

Issued by :
Sara Abou-Shakra
Customer Service Manager

Summary Of Results

Soil

Dioxins

Corrected to 0% Moisture

				WHO2005 Toxic Equivalents ng/kg		WHO Toxic Equivalents ng/kg	
Concept Reference	**Customer Sample Reference**	**Analysis**	**Symbol**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**
701280 039	HEP-TT-11	Dioxins and Furans (Based on US EPA 1613)	U	0.76	**3.4**	0.63	**3.4**
		Poly-Chlorinated Biphenyls (WHO 12)	U	0.056	**12**	0.26	**11**
			Sum :	0.81	**16**	0.89	**15**
701280 044	HEP-TT-18	Dioxins and Furans (Based on US EPA 1613)	U	30	**33**	27	**30**
		Poly-Chlorinated Biphenyls (WHO 12)	U	2.9	**12**	11	**21**
			Sum :	33	**45**	39	**51**
701280 048	HEP-TT-9	Dioxins and Furans (Based on US EPA 1613)	U	11	**13**	11	**13**
		Poly-Chlorinated Biphenyls (WHO 12)	U	0.45	**24**	2.0	**24**
			Sum :	11	**37**	13	**38**

Soil

Customer Sample Reference : HEP-TT-11
Our Sample Reference : 701280 039
Moisture Content : 22.3 %
Top Depth : 1.30
Hole ID : HEP-TT-11
Depth : 1.30
Date Sampled : 24-NOV-2017
Time Sampled : 00:00
AGS Type : ES
AGS Sample ID : HEPTT1120171124003
AGS Sample Reference : 7
Matrix Class : Sandy Soil

Dioxins and Furans (Based on US EPA 1613)

Technique : GC/MS (HR)

						WHO2005 Toxic Equivalents ng/kg		WHO Toxic Equivalents ng/kg	
Determinand	**Symbol**	**Result ng/kg As Received @22% Moisture**	**LOD As Received @22% Moisture**	**Lower Bound ng/kg @ 0% Moisture**	**LOD @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**
2,3,7,8-TCDD	U	<0.32	0.32	<0.41	0.41	0.0	**0.41**	0.0	**0.41**
1,2,3,7,8-PeCDD	U	<0.90	0.90	<1.2	1.2	0.0	**1.2**	0.0	**1.2**
1,2,3,4,7,8-HxCDD	U	<0.31	0.31	<0.40	0.40	0.0	**0.040**	0.0	**0.040**
1,2,3,6,7,8-HxCDD	U	<1.5	1.5	<1.9	1.9	0.0	**0.19**	0.0	**0.19**
1,2,3,7,8,9-HxCDD	U	<0.42	0.42	<0.54	0.54	0.0	**0.054**	0.0	**0.054**
1,2,3,4,6,7,8-HpCDD	U	**36**	0.40	47	0.51	0.47	**0.47**	0.47	**0.47**
OCDD	U	**470**	1.3	610	1.7	0.18	**0.18**	0.061	**0.061**
					Dioxins Totals :	0.65	**2.5**	0.53	**2.4**
2,3,7,8-TCDF	U	<1.2	1.2	<1.5	1.5	0.0	**0.15**	0.0	**0.15**
1,2,3,7,8-PeCDF	U	<0.88	0.88	<1.1	1.1	0.0	**0.034**	0.0	**0.057**
2,3,4,7,8-PeCDF	U	<0.41	0.41	<0.52	0.52	0.0	**0.16**	0.0	**0.26**
1,2,3,4,7,8-HxCDF	U	<0.95	0.95	<1.2	1.2	0.0	**0.12**	0.0	**0.12**
1,2,3,6,7,8-HxCDF	U	<0.80	0.80	<1.0	1.0	0.0	**0.10**	0.0	**0.10**
2,3,4,6,7,8-HxCDF	U	<1.0	1.0	<1.3	1.3	0.0	**0.13**	0.0	**0.13**
1,2,3,7,8,9-HxCDF	U	<0.27	0.27	<0.35	0.35	0.0	**0.035**	0.0	**0.035**
1,2,3,4,6,7,8-HpCDF	U	**7.9**	0.35	10	0.45	0.10	**0.10**	0.10	**0.10**
1,2,3,4,7,8,9-HpCDF	U	<0.44	0.44	<0.57	0.57	0.0	**0.0057**	0.0	**0.0057**
OCDF	U	**14**	0.73	18	0.93	0.0054	**0.0054**	0.0018	**0.0018**
					Furans Totals :	0.11	**0.85**	0.10	**0.97**
					Totals :	**0.76**	**3.4**	**0.63**	**3.4**

Poly-Chlorinated Biphenyls (WHO 12)

Technique : GC/MS (HR)

						WHO2005 Toxic Equivalents ng/kg		WHO Toxic Equivalents ng/kg	
Determinand	**Symbol**	**Result ng/kg As Received @22% Moisture**	**LOD As Received @22% Moisture**	**Lower Bound ng/kg @ 0% Moisture**	**LOD @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**
PCB BZ#77	U	**85**	50	110	64	0.011	**0.011**	0.011	**0.011**
PCB BZ#81	U	<50	50	<64	64	0.0	**0.019**	0.0	**0.0064**
PCB BZ#105	U	**350**	50	450	64	0.014	**0.014**	0.045	**0.045**
PCB BZ#114	U	<50	50	<64	64	0.0	**0.0019**	0.0	**0.032**

PCB BZ#118	U	**610**	50	780	64	0.024	**0.024**	0.078	**0.078**
PCB BZ#123	U	(2) <160	160	<210	210	0.0	**0.0062**	0.0	**0.021**
PCB BZ#126	U	(2) <80	80	<100	100	0.0	**10**	0.0	**10**
PCB BZ#156	U	**140**	50	180	64	0.0054	**0.0054**	0.090	**0.090**
PCB BZ#157	U	**59**	50	76	64	0.0023	**0.0023**	0.038	**0.038**
PCB BZ#167	U	(2) <320	320	<410	410	0.0	**0.012**	0.0	**0.0041**
PCB BZ#169	U	<50	50	<64	64	0.0	**1.9**	0.0	**0.64**
PCB BZ#189	U	<50	50	<64	64	0.0	**0.0019**	0.0	**0.0064**
					Totals :	**0.056**	**12**	**0.26**	**11**

Soil

Customer Sample Reference : HEP-TT-18
Our Sample Reference : 701280 044
Moisture Content : 27.0 %
Depth : 1.60
Hole ID : HEP-TT-18
Top Depth : 1.60
Date Sampled : 24-NOV-2017
Time Sampled : 00:00
AGS Type : ES
AGS Sample ID : HEPTT1820171124004
AGS Sample Reference : 10
Matrix Class : Sandy Soil

Dioxins and Furans (Based on US EPA 1613)

Technique : GC/MS (HR)

						WHO2005 Toxic Equivalents ng/kg		WHO Toxic Equivalents ng/kg	
Determinand	**Symbol**	**Result ng/kg As Received @27% Moisture**	**LOD As Received @27% Moisture**	**Lower Bound ng/kg @ 0% Moisture**	**LOD @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**
2,3,7,8-TCDD	U	<0.80	0.80	<1.1	1.1	0.0	**1.1**	0.0	**1.1**
1,2,3,7,8-PeCDD	U	**2.4**	0.54	3.3	0.74	3.3	**3.3**	3.3	**3.3**
1,2,3,4,7,8-HxCDD	U	<2.3	2.3	<3.1	3.1	0.0	**0.31**	0.0	**0.31**
1,2,3,6,7,8-HxCDD	U	**22**	0.77	30	1.0	3.0	**3.0**	3.0	**3.0**
1,2,3,7,8,9-HxCDD	U	<9.0	9.0	<12	12	0.0	**1.2**	0.0	**1.2**
1,2,3,4,6,7,8-HpCDD	U	**850**	1.5	1200	2.1	12	**12**	12	**12**
OCDD	U	**12000**	3.7	17000	5.1	5.1	**5.1**	1.7	**1.7**
					Dioxins Totals :	23	**26**	20	**22**
2,3,7,8-TCDF	U	**5.8**	0.67	7.9	0.92	0.79	**0.79**	0.79	**0.79**
1,2,3,7,8-PeCDF	U	**2.0**	0.51	2.7	0.70	0.082	**0.082**	0.14	**0.14**
2,3,4,7,8-PeCDF	U	**3.6**	0.46	4.9	0.62	1.5	**1.5**	2.4	**2.4**
1,2,3,4,7,8-HxCDF	U	**8.2**	0.40	11	0.54	1.1	**1.1**	1.1	**1.1**
1,2,3,6,7,8-HxCDF	U	**4.7**	0.37	6.4	0.51	0.64	**0.64**	0.64	**0.64**
2,3,4,6,7,8-HxCDF	U	**6.1**	0.49	8.4	0.66	0.84	**0.84**	0.84	**0.84**
1,2,3,7,8,9-HxCDF	U	<1.1	1.1	<1.5	1.5	0.0	**0.15**	0.0	**0.15**
1,2,3,4,6,7,8-HpCDF	U	**120**	0.65	160	0.89	1.6	**1.6**	1.6	**1.6**
1,2,3,4,7,8,9-HpCDF	U	**10**	0.86	14	1.2	0.14	**0.14**	0.14	**0.14**
OCDF	U	**260**	0.98	360	1.3	0.11	**0.11**	0.036	**0.036**
					Furans Totals :	6.8	**6.9**	7.7	**7.9**
					Totals :	**30**	**33**	**27**	**30**

Poly-Chlorinated Biphenyls (WHO 12)

Technique : GC/MS (HR)

						WHO2005 Toxic Equivalents ng/kg		WHO Toxic Equivalents ng/kg	
Determinand	**Symbol**	**Result ng/kg As Received @27% Moisture**	**LOD As Received @27% Moisture**	**Lower Bound ng/kg @ 0% Moisture**	**LOD @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**
PCB BZ#77	U	**4800**	50	6600	68	0.66	**0.66**	0.66	**0.66**
PCB BZ#81	U	<50	50	<68	68	0.0	**0.021**	0.0	**0.0068**
PCB BZ#105	U	**18000**	50	25000	68	0.74	**0.74**	2.5	**2.5**
PCB BZ#114	U	(2) <1700	1700	<2300	2300	0.0	**0.070**	0.0	**1.2**

PCB BZ#118	U	**26000**	50	36000	68	1.1	**1.1**	3.6	**3.6**
PCB BZ#123	U	(2) <4300	4300	<5900	5900	0.0	**0.18**	0.0	**0.59**
PCB BZ#126	U	<50	50	<68	68	0.0	**6.8**	0.0	**6.8**
PCB BZ#156	U	**5500**	50	7500	68	0.23	**0.23**	3.8	**3.8**
PCB BZ#157	U	**1000**	50	1400	68	0.041	**0.041**	0.68	**0.68**
PCB BZ#167	U	**4300**	50	5900	68	0.18	**0.18**	0.059	**0.059**
PCB BZ#169	U	<50	50	<68	68	0.0	**2.1**	0.0	**0.68**
PCB BZ#189	U	**590**	50	810	68	0.024	**0.024**	0.081	**0.081**
					Totals :	**2.9**	**12**	**11**	**21**

Soil

Customer Sample Reference : HEP-TT-9
Our Sample Reference : 701280 048
Moisture Content : 34.8 %
Depth : 1.80
Hole ID : HEP-TT-9
Top Depth : 1.80
Date Sampled : 23-NOV-2017
Time Sampled : 12:45
AGS Type : ES
AGS Sample ID : HEPTT920171123004
AGS Sample Reference : 10
Matrix Class : Sandy Soil

Dioxins and Furans (Based on US EPA 1613)

Technique : GC/MS (HR)

						WHO2005 Toxic Equivalents ng/kg		WHO Toxic Equivalents ng/kg	
Determinand	**Symbol**	**Result ng/kg As Received @35% Moisture**	**LOD As Received @35% Moisture**	**Lower Bound ng/kg @ 0% Moisture**	**LOD @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**
2,3,7,8-TCDD	U	<0.37	0.37	<0.57	0.57	0.0	**0.57**	0.0	**0.57**
1,2,3,7,8-PeCDD	U	<0.60	0.60	<0.92	0.92	0.0	**0.92**	0.0	**0.92**
1,2,3,4,7,8-HxCDD	U	<1.4	1.4	<2.1	2.1	0.0	**0.21**	0.0	**0.21**
1,2,3,6,7,8-HxCDD	U	**13**	0.39	20	0.60	2.0	**2.0**	2.0	**2.0**
1,2,3,7,8,9-HxCDD	U	**3.5**	0.53	5.3	0.81	0.53	**0.53**	0.53	**0.53**
1,2,3,4,6,7,8-HpCDD	U	**180**	0.53	270	0.81	2.7	**2.7**	2.7	**2.7**
OCDD	U	**1800**	0.93	2800	1.4	0.84	**0.84**	0.28	**0.28**
					Dioxins Totals :	6.1	**7.8**	5.5	**7.2**
2,3,7,8-TCDF	U	**2.6**	0.47	3.9	0.73	0.39	**0.39**	0.39	**0.39**
1,2,3,7,8-PeCDF	U	<1.2	1.2	<1.8	1.8	0.0	**0.055**	0.0	**0.092**
2,3,4,7,8-PeCDF	U	**3.2**	0.38	4.8	0.59	1.5	**1.5**	2.4	**2.4**
1,2,3,4,7,8-HxCDF	U	**3.8**	0.26	5.8	0.40	0.58	**0.58**	0.58	**0.58**
1,2,3,6,7,8-HxCDF	U	**3.1**	0.24	4.7	0.37	0.47	**0.47**	0.47	**0.47**
2,3,4,6,7,8-HxCDF	U	**4.0**	0.32	6.2	0.49	0.62	**0.62**	0.62	**0.62**
1,2,3,7,8,9-HxCDF	U	<0.80	0.80	<1.2	1.2	0.0	**0.12**	0.0	**0.12**
1,2,3,4,6,7,8-HpCDF	U	**74**	0.29	110	0.45	1.1	**1.1**	1.1	**1.1**
1,2,3,4,7,8,9-HpCDF	U	**3.2**	0.40	4.9	0.61	0.049	**0.049**	0.049	**0.049**
OCDF	U	**120**	1.1	190	1.7	0.057	**0.057**	0.019	**0.019**
					Furans Totals :	4.8	**4.9**	5.7	**5.9**
					Totals :	**11**	**13**	**11**	**13**

Poly-Chlorinated Biphenyls (WHO 12)

Technique : GC/MS (HR)

						WHO2005 Toxic Equivalents ng/kg		WHO Toxic Equivalents ng/kg	
Determinand	**Symbol**	**Result ng/kg As Received @35% Moisture**	**LOD As Received @35% Moisture**	**Lower Bound ng/kg @ 0% Moisture**	**LOD @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**
PCB BZ#77	U	**560**	50	860	77	0.086	**0.086**	0.086	**0.086**
PCB BZ#81	U	<50	50	<77	77	0.0	**0.023**	0.0	**0.0077**
PCB BZ#105	U	**2000**	50	3100	77	0.092	**0.092**	0.31	**0.31**
PCB BZ#114	U	(2) <210	210	<320	320	0.0	**0.0097**	0.0	**0.16**

PCB BZ#118	U	**3500**	50	5400	77	0.16	**0.16**	0.54	**0.54**
PCB BZ#123	U	(2) <550	550	<840	840	0.0	**0.025**	0.0	**0.084**
PCB BZ#126	U	(2) <140	140	<210	210	0.0	**21**	0.0	**21**
PCB BZ#156	U	**1100**	50	1700	77	0.051	**0.051**	0.84	**0.84**
PCB BZ#157	U	**190**	50	290	77	0.0087	**0.0087**	0.15	**0.15**
PCB BZ#167	U	**860**	50	1300	77	0.040	**0.040**	0.013	**0.013**
PCB BZ#169	U	<50	50	<77	77	0.0	**2.3**	0.0	**0.77**
PCB BZ#189	U	**360**	50	550	77	0.017	**0.017**	0.055	**0.055**
					Totals :	**0.45**	**24**	**2.0**	**24**

Concept Reference: 701280
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**701280 001**	**701280 007**	**701280 009**	**701280 010**	**701280 025**
				Customer Sample Reference	**HEP-BH-1321**	**HEP-BH-61**	**HEP-BH-61**	**HEP-BH-61**	**HEP-BH-826**
				Test Sample	**AR**	**AR**	**AR**	**AR**	**AR**
				Top Depth	**0.80**	**0.90**	**2.20**	**2.70**	**2.40**
				Depth	**0.80**	**0.90**	**2.20**	**2.70**	**2.40**
				Hole ID	**HEP-BH-1321**	**HEP-BH-61**	**HEP-BH-61**	**HEP-BH-61**	**HEP-BH-826**
				Date Sampled	**23-NOV-2017**	**21-NOV-2017**	**21-NOV-2017**	**21-NOV-2017**	**24-NOV-2017**
				Time Sampled	**13:25**	**10:00**	**11:00**	**11:15**	**09:20**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH132120171123001**	**HEPBH6120171121001**	**HEPBH6120171121003**	**HEPBH6120171121004**	**FES1171124008**
				AGS Sample Reference	**3**	**5**	**13**	**14**	**13**
				Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**LOD**	**Units**	**Symbol**					
Moisture @105C	Grav (1 Dec) (105 C)	0.1	%	N	**6.5**	**3.2**	**17**	**30**	**18**

Concept Reference: 701280
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**701280 026**	**701280 027**	**701280 032**	**701280 034**	**701280 035**
				Customer Sample Reference	**HEP-BH-826**	**HEP-BH-826**	**HEP-BH-1804**	**HEP-BH-1804**	**HEP-BH-1806**
				Test Sample	**AR**	**AR**	**AR**	**AR**	**AR**
				Top Depth	**3.40**	**4.30**	**0.20**	**0.70**	**0.30**
				Depth	**3.40**	**4.30**	**0.20**	**0.70**	**0.30**
				Hole ID	**HEP-BH-826**	**HEP-BH-826**	**HEP-BH-1804**	**HEP-BH-1804**	**HEP-BH-1806**
				Date Sampled	**24-NOV-2017**	**24-NOV-2017**	**23-NOV-2017**	**23-NOV-2017**	**23-NOV-2017**
				Time Sampled	**09:30**	**10:15**	**11:15**	**12:30**	**10:55**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**FES1171124013**	**FES1171124018**	**HEPBH180420171123001**	**HEPBH180420171123003**	**HEPBH180620171123001**
				AGS Sample Reference	**18**	**23**	**3**	**9**	**3**
				Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**LOD**	**Units**	**Symbol**					
Moisture @105C	Grav (1 Dec) (105 C)	0.1	%	N	**27**	**13**	**45**	**43**	**15**

Concept Reference: 701280
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**701280 036**	**701280 038**	**701280 039**	**701280 042**	**701280 044**
				Customer Sample Reference	**HEP-BH-1806**	**HEP-TT-11**	**HEP-TT-11**	**HEP-TT-18**	**HEP-TT-18**
				Test Sample	**AR**	**AR**	**AR**	**AR**	**AR**
				Top Depth	**0.70**	**0.40**	**1.30**	**0.50**	**1.60**
				Depth	**0.70**	**0.40**	**1.30**	**0.50**	**1.60**
				Hole ID	**HEP-BH-1806**	**HEP-TT-11**	**HEP-TT-11**	**HEP-TT-18**	**HEP-TT-18**
				Date Sampled	**23-NOV-2017**	**24-NOV-2017**	**24-NOV-2017**	**24-NOV-2017**	**24-NOV-2017**
				Time Sampled	**11:30**	**00:00**	**00:00**	**00:00**	**00:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH180620171123002**	**HEPTT1120171124002**	**HEPTT1120171124003**	**HEPTT1820171124002**	**HEPTT1820171124004**
				AGS Sample Reference	**6**	**4**	**7**	**4**	**10**
				Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**LOD**	**Units**	**Symbol**					
Moisture @105C	Grav (1 Dec) (105 C)	0.1	%	N	**24**	**12**	**22**	**9.8**	**27**

Concept Reference: 701280
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**701280 046**	**701280 048**	**701280 049**	**701280 050**	**701280 051**
				Customer Sample Reference	**HEP-TT-9**	**HEP-TT-9**	**HEP-BH-1805**	**HEP-BH-1805**	**HEP-BH-1**
				Test Sample	**AR**	**AR**	**AR**	**AR**	**AR**
				Top Depth	**0.50**	**1.80**	**0.30**	**1.10**	**0.30**
				Depth	**0.50**	**1.80**	**0.30**	**1.10**	**0.30**
				Hole ID	**HEP-TT-9**	**HEP-TT-9**	**HEP-BH-1805**	**HEP-BH-1805**	**HEP-BH-1**
				Date Sampled	**23-NOV-2017**	**23-NOV-2017**	**23-NOV-2017**	**23-NOV-2017**	**23-NOV-2017**
				Time Sampled	**11:40**	**12:45**	**13:35**	**14:05**	**10:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPTT920171123002**	**HEPTT920171123004**	**HEPBH180520171123001**	**HEPBH180520171123002**	**HEPBH120171124001**
				AGS Sample Reference	**4**	**10**	**3**	**6**	**3**
				Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**LOD**	**Units**	**Symbol**					
Moisture @105C	Grav (1 Dec) (105 C)	0.1	%	N	**12**	**35**	**23**	**4.4**	**19**

Concept Reference: 701280
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**701280 052**
				Customer Sample Reference	**HEP-BH-1**
				Test Sample	**AR**
				Top Depth	**0.50**
				Depth	**0.50**
				Hole ID	**HEP-BH-1**
				Date Sampled	**23-NOV-2017**
				Time Sampled	**11:00**
				AGS Type	**ES**
				AGS Sample ID	**HEPBH120171124002**
				AGS Sample Reference	**6**
				Matrix Class	**Sandy Soil**
Determinand	**Method**	**LOD**	**Units**	**Symbol**	
Moisture @105C	Grav (1 Dec) (105 C)	0.1	%	N	**20**

Concept Reference: 701280
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**701280 001**	**701280 007**	**701280 009**	**701280 010**	**701280 025**
				Customer Sample Reference	**HEP-BH-1321**	**HEP-BH-61**	**HEP-BH-61**	**HEP-BH-61**	**HEP-BH-826**
				Test Sample	**M40**	**M40**	**M40**	**M40**	**M40**
				Top Depth	**0.80**	**0.90**	**2.20**	**2.70**	**2.40**
				Depth	**0.80**	**0.90**	**2.20**	**2.70**	**2.40**
				Hole ID	**HEP-BH-1321**	**HEP-BH-61**	**HEP-BH-61**	**HEP-BH-61**	**HEP-BH-826**
				Date Sampled	**23-NOV-2017**	**21-NOV-2017**	**21-NOV-2017**	**21-NOV-2017**	**24-NOV-2017**
				Time Sampled	**13:25**	**10:00**	**11:00**	**11:15**	**09:20**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH132120171123001**	**HEPBH6120171121001**	**HEPBH6120171121003**	**HEPBH6120171121004**	**FES1171124008**
				AGS Sample Reference	**3**	**5**	**13**	**14**	**13**
				Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**LOD**	**Units**	**Symbol**					
Retained on 10mm sieve	Grav	0.1	%	N	<0.1	<0.1	<0.1	<0.1	<0.1

Concept Reference: 701280
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**701280 026**	**701280 027**	**701280 032**	**701280 034**	**701280 035**
				Customer Sample Reference	**HEP-BH-826**	**HEP-BH-826**	**HEP-BH-1804**	**HEP-BH-1804**	**HEP-BH-1806**
				Test Sample	**M40**	**M40**	**M40**	**M40**	**M40**
				Top Depth	**3.40**	**4.30**	**0.20**	**0.70**	**0.30**
				Depth	**3.40**	**4.30**	**0.20**	**0.70**	**0.30**
				Hole ID	**HEP-BH-826**	**HEP-BH-826**	**HEP-BH-1804**	**HEP-BH-1804**	**HEP-BH-1806**
				Date Sampled	**24-NOV-2017**	**24-NOV-2017**	**23-NOV-2017**	**23-NOV-2017**	**23-NOV-2017**
				Time Sampled	**09:30**	**10:15**	**11:15**	**12:30**	**10:55**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**FES1171124013**	**FES1171124018**	**HEPBH180420171123001**	**HEPBH180420171123003**	**HEPBH180620171123001**
				AGS Sample Reference	**18**	**23**	**3**	**9**	**3**
				Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**LOD**	**Units**	**Symbol**					
Retained on 10mm sieve	Grav	0.1	%	N	<0.1	<0.1	<0.1	<0.1	<0.1

Concept Reference: 701280
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**701280 036**	**701280 038**	**701280 039**	**701280 042**	**701280 044**
				Customer Sample Reference	**HEP-BH-1806**	**HEP-TT-11**	**HEP-TT-11**	**HEP-TT-18**	**HEP-TT-18**
				Test Sample	**M40**	**M40**	**M40**	**M40**	**M40**
				Top Depth	**0.70**	**0.40**	**1.30**	**0.50**	**1.60**
				Depth	**0.70**	**0.40**	**1.30**	**0.50**	**1.60**
				Hole ID	**HEP-BH-1806**	**HEP-TT-11**	**HEP-TT-11**	**HEP-TT-18**	**HEP-TT-18**
				Date Sampled	**23-NOV-2017**	**24-NOV-2017**	**24-NOV-2017**	**24-NOV-2017**	**24-NOV-2017**
				Time Sampled	**11:30**	**00:00**	**00:00**	**00:00**	**00:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH180620171123002**	**HEPTT112017112402**	**HEPTT112017112403**	**HEPTT182017112402**	**HEPTT182017112404**
				AGS Sample Reference	**6**	**4**	**7**	**4**	**10**
				Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**LOD**	**Units**	**Symbol**					
Retained on 10mm sieve	Grav	0.1	%	N	<0.1	<0.1	<0.1	<0.1	<0.1

Concept Reference: 701280
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**701280 046**	**701280 048**	**701280 049**	**701280 050**	**701280 051**
				Customer Sample Reference	**HEP-TT-9**	**HEP-TT-9**	**HEP-BH-1805**	**HEP-BH-1805**	**HEP-BH-1**
				Test Sample	**M40**	**M40**	**M40**	**M40**	**M40**
				Top Depth	**0.50**	**1.80**	**0.30**	**1.10**	**0.30**
				Depth	**0.50**	**1.80**	**0.30**	**1.10**	**0.30**
				Hole ID	**HEP-TT-9**	**HEP-TT-9**	**HEP-BH-1805**	**HEP-BH-1805**	**HEP-BH-1**
				Date Sampled	**23-NOV-2017**	**23-NOV-2017**	**23-NOV-2017**	**23-NOV-2017**	**23-NOV-2017**
				Time Sampled	**11:40**	**12:45**	**13:35**	**14:05**	**10:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPTT920171123002**	**HEPTT920171123004**	**HEPBH180520171123001**	**HEPBH180520171123002**	**HEPBH120171124001**
				AGS Sample Reference	**4**	**10**	**3**	**6**	**3**
				Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**LOD**	**Units**	**Symbol**					
Retained on 10mm sieve	Grav	0.1	%	N	<0.1	<0.1	<0.1	<0.1	<0.1

Concept Reference:	701280
Project Site:	Heathrow HEP Package 3
Customer Reference:	
Soil	Analysed as Soil
MCERTS Preparation	

Concept Reference	**701280 052**
Customer Sample Reference	**HEP-BH-1**
Test Sample	**M40**
Top Depth	**0.50**
Depth	**0.50**
Hole ID	**HEP-BH-1**
Date Sampled	**23-NOV-2017**
Time Sampled	**11:00**
AGS Type	**ES**
AGS Sample ID	**HEPBH120171124002**
AGS Sample Reference	**6**
Matrix Class	**Sandy Soil**

Determinand	Method	LOD	Units	Symbol	
Retained on 10mm sieve	Grav	0.1	%	N	<0.1

Index to symbols used in Second Supplemental A 701280-3

Value	Description
M40	Analysis conducted on sample assisted dried at no more than 40C. Results are reported on a dry weight basis.
AR	As Received
2	LOD Raised Due to Matrix Interference
U	Analysis is UKAS accredited
N	Analysis is not UKAS accredited

Notes

Second Supplemental A to report Dioxins and PCBS only.

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Analytical Report for Concept Life Sciences

Radiometric Analysis of Soil

The applicability of UKAS accreditation to this report is detailed in Section 5.1

Amec Foster Wheeler Reference:	L180008
Issue Number:	01
Issue Date:	30 January 2018

Document Issue Record

Title	Radiometric Analysis of Soil
Laboratory Reference	L180008
Contract or Tender Reference	TRP-2016-5635
Laboratory Details	Analytical Services Amec Foster Wheeler 601 Faraday Street Birchwood Park, Birchwood WARRINGTON, WA3 6GN United Kingdom
Laboratory Contact Details	Nicola Summers, Tel. 01925 675454, Email: nicola.summers@amecfw.com
Customer Details	Aneta Dybek-Echtermeyer Concept Life Sciences Hadfield House Hadfield Street Manchester M16 9FE
Order Number	701280

Issue	Prepared by	QA checked by	Authorised for issue by	Date
01	Nicola Summers Operations Team Leader	Michal Sypula Senior Scientist	Michal Sypula Senior Scientist	30 January 2018

This is the first issue of the Analytical Report.

1 Job Details

1.1 Scope of Work

The work described in this report involved the radiometric analysis of one soil sample (Project ID: 701280). The required analysis was as described in the analytical schedule received with the sample and tender TRP-2016-5635.

1.2 Sample Received

A description of the sample received is provided in Table 1-1.

Table 1-1: Description of the Sample Received

Laboratory Reference	Client Reference	Client Sample Description	Sampling Date
L180008-1	701280-007	SOIL	21/11/2017

1.3 Sample Receipt Date

04 January 2018.

1.4 Details of Subcontractors

None.

2 Sample Preparation

2.1 Sample Preparation

The sample was dried at 30°C and, where necessary, the dried material was ground to pass a 1 mm screen.

The dried and screened material was then submitted for measurement by high-resolution gamma spectrometry.

3 Analytical Methods

3.1 High-resolution Gamma Spectrometry

A known amount of the prepared sample was transferred to an appropriate container to produce a standard counting geometry prior to measurement by high-resolution gamma spectrometry. The high-resolution gamma spectrometry was conducted using high-purity germanium detectors, coupled to computerized multi-channel analysers, with peak search and peak shape functions and validated radionuclide library. System calibration was undertaken for standardized geometries using a nationally traceable “mixed gamma” reference solution, in the energy range 60 keV - 1836 keV.

4 Results

The results are reported on a dry-weight basis.

4.1 High-resolution Gamma Spectrometry

Laboratory Reference	Client Reference	Determinand	Result			Units
L180008-1	701280-007	Ac-228	0.0267	±	0.0043	Bq/g
		Ag-110m		<	0.0011	Bq/g
		Am-241		<	0.0020	Bq/g
		Be-7		<	0.0037	Bq/g
		Bi-212	0.031	±	0.011	Bq/g
		Bi-214	0.0253	±	0.0095	Bq/g
		Ce-144		<	0.0027	Bq/g
		Co-57		<	0.00061	Bq/g
		Co-58		<	0.0015	Bq/g
		Co-60		<	0.00031	Bq/g
		Cs-134		<	0.00077	Bq/g
		Cs-137		<	0.0012	Bq/g
		Eu-152		<	0.0013	Bq/g
		Eu-154		<	0.0012	Bq/g
		Eu-155		<	0.0037	Bq/g
		I-131		<	0.0017	Bq/g
		K-40	0.327	±	0.037	Bq/g
		Mn-54		<	0.0017	Bq/g
		Nb-94		<	0.0010	Bq/g
		Nb-95		<	0.00059	Bq/g
		Np-237		<	0.0035	Bq/g
		Pa-233		<	0.0020	Bq/g
		Pa-234m		<	0.14	Bq/g
		Pb-210	0.024	±	0.017	Bq/g
		Pb-212	0.0231	±	0.0021	Bq/g
		Pb-214	0.0190	±	0.0021	Bq/g
		Ra-226	0.021	±	0.014	Bq/g
		Ru-106		<	0.019	Bq/g
		Sb-125		<	0.0040	Bq/g

Laboratory Reference	Client Reference	Determinand	Result			Units
		Th-234		<	0.033	Bq/g
		Tl-208	0.0092	±	0.0019	Bq/g
		U-235	0.00104	±	0.00068	Bq/g
		Zn-65		<	0.00094	Bq/g
		Zr-95		<	0.00080	Bq/g

Results are referenced to the count date of the sample: 24-Jan-2018

4.2 Moisture Content

Laboratory Reference	Client Reference	Determinand	Result	Units
L180008-1	701280-007	Moisture content	8.9	%

The moisture content result is not based on formal moisture determination but represents the loss on drying at the temperature specified in section 2.1 to a visibly dry material.

5 Quality Assurance

5.1 Quality System and Applicability of UKAS Accreditation

This laboratory is accredited in accordance with the recognised International Standard ISO/IEC 17025. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to the joint ISO-ILAC-IAF communiqué dated April 2017).

The following radiometric analysis described in this report is UKAS accredited for the sample submitted:

- high-resolution gamma spectrometry (Note 1);

All other analyses described in this report are not UKAS accredited.

Note 1: Pb-210 falls outside the UKAS accredited calibration range for high-resolution gamma spectrometry; therefore any results for this nuclide presented in this report are not UKAS accredited.

Any comments, opinions and interpretations expressed in Section 6 of this report are outside the scope of UKAS accreditation.

5.2 Statement of Uncertainties

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor *k*=2, providing a coverage probability of approximately 95%. For UKAS accredited methods, the uncertainty evaluation has been carried out in accordance with UKAS requirements.

6 Comments

The following comments are provided to assist the customer with results interpretation; they are provided in good faith and on the understanding that Amec Foster Wheeler has no legal liability for these comments.

6.1 General

The results reported refer to the sample received at the laboratory and it is assumed that any subsamples analysed are representative of the sample provided.

CONCEPT LIFE SCIENCES
DELIVERING SCIENCE

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Concept Life Sciences

Certificate of Analysis

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Report Number: Fifth Supplemental B 701803-3

Date of Report: 27-Jun-2018

Customer: Fugro GeoServices
Fugro House
Hithercroft Road
Wallingford
Oxfordshire
OX10 9RB

Customer Contact: Ms Karen Blackmore

Customer Job Reference:
Customer Purchase Order: 56642KB-WAL
Customer Site Reference: HEP Package 3 CoC AGS4
Date Job Received at Concept: 29-Nov-2017
Date Analysis Started: 08-Dec-2017
Date Analysis Completed: 29-Jan-2018

The results reported relate to samples received in the laboratory and may not be representative of a whole batch.

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation

This report should not be reproduced except in full without the written approval of the laboratory

Tests covered by this certificate were conducted in accordance with Concept Life Sciences SOPs

All results have been reviewed in accordance with Section 25 of the Concept Life Sciences, Analytical Services Quality Manual

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mCERTS
THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME

Report checked
and authorised by :
Sara Abou-Shakra
Customer Service Manager

Issued by :
David Catterall
Laboratory Manager

Concept Reference: 701803
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**701803 001**	**701803 003**	**701803 007**	**701803 015**	**701803 016**
				Customer Sample Reference	**HEP-BH-12**	**HEP-BH-12**	**HEP-BH-12**	**HEP-BH-25**	**HEP-BH-27**
				Hole ID	**HEP-BH-12**	**HEP-BH-12**	**HEP-BH-12**	**HEP-BH-25**	**HEP-BH-27**
				Depth	**0.05**	**0.80**	**2.30**	**1.00**	**0.20**
				Top Depth	**0.05**	**0.80**	**2.30**	**1.00**	**0.20**
				Date Sampled	**27-NOV-2017**	**27-NOV-2017**	**29-NOV-2017**	**30-NOV-2017**	**01-DEC-2017**
				Time Sampled	**00:00**		**12:30**	**10:00**	**09:30**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH1220171127001**	**HEPBH1220171127003**	**HEPBH1220171129003**	**HEPBH2520171130002**	**FES2171201001**
				AGS Sample Reference	**1**	**7**	**22**	**4**	**1**
				Matrix Class	**Topsoil**	**Sandy Soil**	**Fill**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Moisture @105C	T162	AR	0.1	%	**14**	**29**	**2.6**	**7.2**	**14**
Retained on 10mm sieve	T2	M40	0.1	%	<0.1	<0.1	<0.1	<0.1	<0.1

Concept Reference: 701803
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**701803 017**	**701803 019**	**701803 023**	**701803 025**	**701803 027**
				Customer Sample Reference	**HEP-BH-27**	**HEP-BH-27**	**HEP-BH-32**	**HEP-BH-32**	**HEP-BH-32**
				Hole ID	**HEP-BH-27**	**HEP-BH-27**	**HEP-BH-32**	**HEP-BH-32**	**HEP-BH-32**
				Depth	**1.00**	**2.80**	**0.20**	**2.30**	**4.40**
				Top Depth	**1.00**	**2.80**	**0.20**	**2.30**	**4.40**
				Date Sampled	**01-DEC-2017**	**01-DEC-2017**	**28-NOV-2017**	**29-NOV-2017**	**29-NOV-2017**
				Time Sampled	**10:00**	**12:30**	**15:30**	**09:30**	**10:30**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**FES2171201004**	**FES2171201010**	**HEPBH3220171128001**	**HEPBH3220171129001**	**HEPBH3220171129003**
				AGS Sample Reference	**4**	**10**	**3**	**13**	**19**
				Matrix Class	**Sandy Soil**	**Fill**	**Topsoil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Moisture @105C	T162	AR	0.1	%	**22**	**1.3**	**16**	**20**	**21**
Retained on 10mm sieve	T2	M40	0.1	%	<0.1	<0.1	<0.1	<0.1	<0.1

Concept Reference: 701803
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**701803 028**	**701803 029**	**701803 030**	**701803 034**	**701803 036**
				Customer Sample Reference	**HEP-BH-32**	**HEP-BH-32**	**HEP-BH-32**	**HEP-BH-33**	**HEP-BH-826**
				Hole ID	**HEP-BH-32**	**HEP-BH-32**	**HEP-BH-32**	**HEP-BH-33**	**HEP-BH-826**
				Depth	**5.30**	**6.40**	**7.50**	**0.30**	**0.60**
				Top Depth	**5.30**	**6.40**	**7.50**	**0.30**	**0.60**
				Date Sampled	**29-NOV-2017**	**29-NOV-2017**	**30-NOV-2017**	**01-DEC-2017**	**23-NOV-2017**
				Time Sampled	**11:00**	**13:00**	**14:00**	**12:40**	**16:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH3220171129004**	**HEPBH3220171129005**	**HEPBH3220171130001**	**HEPBH3320171201002**	**FES1171123005**
				AGS Sample Reference	**22**	**26**	**29**	**4**	**5**
				Matrix Class	**Fill**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Moisture @105C	T162	AR	0.1	%	**12**	**22**	**11**	**9.6**	**6.8**
Retained on 10mm sieve	T2	M40	0.1	%	<0.1	<0.1	<0.1	<0.1	<0.1

Concept Reference: 701803
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Inorganics

				Concept Reference	**701803 001**	**701803 003**	**701803 015**	**701803 016**	**701803 017**
				Customer Sample Reference	**HEP-BH-12**	**HEP-BH-12**	**HEP-BH-25**	**HEP-BH-27**	**HEP-BH-27**
				Hole ID	**HEP-BH-12**	**HEP-BH-12**	**HEP-BH-25**	**HEP-BH-27**	**HEP-BH-27**
				Depth	**0.05**	**0.80**	**1.00**	**0.20**	**1.00**
				Top Depth	**0.05**	**0.80**	**1.00**	**0.20**	**1.00**
				Date Sampled	**27-NOV-2017**	**27-NOV-2017**	**30-NOV-2017**	**01-DEC-2017**	**01-DEC-2017**
				Time Sampled	**00:00**		**10:00**	**09:30**	**10:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH1220171127001**	**HEPBH1220171127003**	**HEPBH2520171130002**	**FES2171201001**	**FES2171201004**
				AGS Sample Reference	**1**	**7**	**4**	**1**	**4**
				Matrix Class	**Topsoil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Chloride	T686	AR	1	mg/kg	**39**	**18**	**6**	**6**	**4**
Cyanide(Total)	T4	AR	1	mg/kg	<1	<1	<1	<1	<1
Thiocyanate	T4	A40	1	mg/kg	<1	<1	<1	<1	<1
Nitrate	T686	AR	1	mg/kg	**15**	**2**	<1	**12**	<1
Nitrite	T686	AR	1	mg/kg	<1	<1	<1	<1	<1
SO4(Total)	T6	A40	0.01	%	**0.34**	**0.08**	**0.97**	**0.17**	**0.17**
Sulphide	T4	AR	10	mg/kg	<10	<10	**57**	**28**	<10

Concept Reference: 701803
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Inorganics

				Concept Reference	**701803 019**	**701803 023**	**701803 025**	**701803 027**	**701803 028**
				Customer Sample Reference	**HEP-BH-27**	**HEP-BH-32**	**HEP-BH-32**	**HEP-BH-32**	**HEP-BH-32**
				Hole ID	**HEP-BH-27**	**HEP-BH-32**	**HEP-BH-32**	**HEP-BH-32**	**HEP-BH-32**
				Depth	**2.80**	**0.20**	**2.30**	**4.40**	**5.30**
				Top Depth	**2.80**	**0.20**	**2.30**	**4.40**	**5.30**
				Date Sampled	**01-DEC-2017**	**28-NOV-2017**	**29-NOV-2017**	**29-NOV-2017**	**29-NOV-2017**
				Time Sampled	**12:30**	**15:30**	**09:30**	**10:30**	**11:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**FES2171201010**	**HEPBH3220171128001**	**HEPBH3220171129001**	**HEPBH3220171129003**	**HEPBH3220171129004**
				AGS Sample Reference	**10**	**3**	**13**	**19**	**22**
				Matrix Class	**Fill**	**Topsoil**	**Sandy Soil**	**Sandy Soil**	**Fill**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Chloride	T686	AR	1	mg/kg	**3**	**3**	**3**	**27**	**23**
Cyanide(Total)	T4	AR	1	mg/kg	<1	<1	<1	**1**	<1
Thiocyanate	T4	A40	1	mg/kg	<1	<1	<1	<1	<1
Nitrate	T686	AR	1	mg/kg	<1	**4**	**1**	<1	<1
Nitrite	T686	AR	1	mg/kg	<1	<1	<1	<1	<1
SO4(Total)	T6	A40	0.01	%	**0.06**	**0.14**	**0.03**	**0.13**	**0.13**
Sulphide	T4	AR	10	mg/kg	<10	<10	<10	<10	**120**

Concept Reference: 701803
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Inorganics

	Concept Reference	**701803 029**	**701803 030**	**701803 034**	**701803 036**
	Customer Sample Reference	**HEP-BH-32**	**HEP-BH-32**	**HEP-BH-33**	**HEP-BH-826**
	Hole ID	**HEP-BH-32**	**HEP-BH-32**	**HEP-BH-33**	**HEP-BH-826**
	Depth	**6.40**	**7.50**	**0.30**	**0.60**
	Top Depth	**6.40**	**7.50**	**0.30**	**0.60**
	Date Sampled	**29-NOV-2017**	**30-NOV-2017**	**01-DEC-2017**	**23-NOV-2017**
	Time Sampled	**13:00**	**14:00**	**12:40**	**16:00**
	AGS Type	**ES**	**ES**	**ES**	**ES**
	AGS Sample ID	**HEPBH3220171129005**	**HEPBH3220171130001**	**HEPBH3320171201002**	**FES1171123005**
	AGS Sample Reference	**26**	**29**	**4**	**5**
	Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**	
Chloride	T686	AR	1	mg/kg	**24**	**18**	**6**	**5**
Cyanide(Total)	T4	AR	1	mg/kg	<1	<1	<1	<1
Thiocyanate	T4	A40	1	mg/kg	<1	<1	<1	<1
Nitrate	T686	AR	1	mg/kg	<1	<1	**4**	**4**
Nitrite	T686	AR	1	mg/kg	<1	<1	<1	<1
SO4(Total)	T6	A40	0.01	%	**0.08**	**0.06**	**0.15**	**0.06**
Sulphide	T4	AR	10	mg/kg	**44**	**38**	<10	**10**

Concept Reference: 701803
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Misc

	Concept Reference	**701803 001**	**701803 003**	**701803 015**	**701803 016**	**701803 017**
	Customer Sample Reference	**HEP-BH-12**	**HEP-BH-12**	**HEP-BH-25**	**HEP-BH-27**	**HEP-BH-27**
	Hole ID	**HEP-BH-12**	**HEP-BH-12**	**HEP-BH-25**	**HEP-BH-27**	**HEP-BH-27**
	Depth	**0.05**	**0.80**	**1.00**	**0.20**	**1.00**
	Top Depth	**0.05**	**0.80**	**1.00**	**0.20**	**1.00**
	Date Sampled	**27-NOV-2017**	**27-NOV-2017**	**30-NOV-2017**	**01-DEC-2017**	**01-DEC-2017**
	Time Sampled	**00:00**		**10:00**	**09:30**	**10:00**
	AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
	AGS Sample ID	**HEPBH1220171127001**	**HEPBH1220171127003**	**HEPBH2520171130002**	**FES2171201001**	**FES2171201004**
	AGS Sample Reference	**1**	**7**	**4**	**1**	**4**
	Matrix Class	**Topsoil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**		
Soil Organic Matter	T287	A40	0.1	%	**28**	**3.2**	**3.5**	**4.6**	**2.1**
pH	T7	AR			**7.4**	**7.6**	**7.8**	**7.9**	**8.1**

Concept Reference: 701803
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Misc

				Concept Reference	**701803 019**	**701803 023**	**701803 025**	**701803 027**	**701803 028**
				Customer Sample Reference	**HEP-BH-27**	**HEP-BH-32**	**HEP-BH-32**	**HEP-BH-32**	**HEP-BH-32**
				Hole ID	**HEP-BH-27**	**HEP-BH-32**	**HEP-BH-32**	**HEP-BH-32**	**HEP-BH-32**
				Depth	**2.80**	**0.20**	**2.30**	**4.40**	**5.30**
				Top Depth	**2.80**	**0.20**	**2.30**	**4.40**	**5.30**
				Date Sampled	**01-DEC-2017**	**28-NOV-2017**	**29-NOV-2017**	**29-NOV-2017**	**29-NOV-2017**
				Time Sampled	**12:30**	**15:30**	**09:30**	**10:30**	**11:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**FES2171201010**	**HEPBH3220171128001**	**HEPBH3220171129001**	**HEPBH3220171129003**	**HEPBH3220171129004**
				AGS Sample Reference	**10**	**3**	**13**	**19**	**22**
				Matrix Class	**Fill**	**Topsoil**	**Sandy Soil**	**Sandy Soil**	**Fill**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Soil Organic Matter	T287	A40	0.1	%	**0.7**	**2.7**	**2.0**	**2.6**	**2.6**
pH	T7	AR			**7.9**	**8.0**	**7.9**	**7.6**	**8.1**

Concept Reference: 701803
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Misc

				Concept Reference	**701803 029**	**701803 030**	**701803 034**	**701803 036**
				Customer Sample Reference	**HEP-BH-32**	**HEP-BH-32**	**HEP-BH-33**	**HEP-BH-826**
				Hole ID	**HEP-BH-32**	**HEP-BH-32**	**HEP-BH-33**	**HEP-BH-826**
				Depth	**6.40**	**7.50**	**0.30**	**0.60**
				Top Depth	**6.40**	**7.50**	**0.30**	**0.60**
				Date Sampled	**29-NOV-2017**	**30-NOV-2017**	**01-DEC-2017**	**23-NOV-2017**
				Time Sampled	**13:00**	**14:00**	**12:40**	**16:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH3220171129005**	**HEPBH3220171130001**	**HEPBH3320171201002**	**FES1171123005**
				AGS Sample Reference	**26**	**29**	**4**	**5**
				Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**				
Soil Organic Matter	T287	A40	0.1	%	**2.1**	**0.6**	**4.6**	**2.0**
pH	T7	AR			**8.0**	**7.8**	**8.5**	**8.2**

Concept Reference: 701803
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings Metals and Metalloids

				Concept Reference	**701803 001**	**701803 003**	**701803 015**	**701803 016**	**701803 017**
				Customer Sample Reference	**HEP-BH-12**	**HEP-BH-12**	**HEP-BH-25**	**HEP-BH-27**	**HEP-BH-27**
				Hole ID	**HEP-BH-12**	**HEP-BH-12**	**HEP-BH-25**	**HEP-BH-27**	**HEP-BH-27**
				Depth	**0.05**	**0.80**	**1.00**	**0.20**	**1.00**
				Top Depth	**0.05**	**0.80**	**1.00**	**0.20**	**1.00**
				Date Sampled	**27-NOV-2017**	**27-NOV-2017**	**30-NOV-2017**	**01-DEC-2017**	**01-DEC-2017**
				Time Sampled	**00:00**		**10:00**	**09:30**	**10:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH1220171127001**	**HEPBH1220171127003**	**HEPBH2520171130002**	**FES2171201001**	**FES2171201004**
				AGS Sample Reference	**1**	**7**	**4**	**1**	**4**
				Matrix Class	**Topsoil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Arsenic	T6	M40	2	mg/kg	**15**	**19**	**12**	**16**	**17**
Cadmium	T6	M40	1	mg/kg	**54**	**1**	<1	**4**	<1
Chromium	T6	M40	1	mg/kg	**78**	**54**	**26**	**68**	**39**
Iron	T6	A40	1	mg/kg	**22000**	**48000**	**24000**	**31000**	**36000**
Lead	T6	M40	1	mg/kg	**21000**	**210**	**170**	**270**	**2300**
Manganese	T6	M40	1	mg/kg	**310**	**890**	**310**	**410**	**370**
Mercury	T6	M40	1	mg/kg	<1	<1	<1	<1	<1
Nickel	T6	M40	1	mg/kg	**96**	**46**	**18**	**37**	**33**
Selenium	T6	M40	3	mg/kg	**7**	<3	<3	<3	<3
Copper	T6	M40	1	mg/kg	**60000**	**560**	**70**	**120**	**140**
Zinc	T6	M40	1	mg/kg	**13000**	**220**	**270**	**270**	**170**
Boron (water-soluble)	T6	AR	1	mg/kg	<1	<1	<1	<1	<1

Concept Reference: 701803
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings Metals and Metalloids

				Concept Reference	**701803 019**	**701803 023**	**701803 025**	**701803 027**	**701803 028**
				Customer Sample Reference	**HEP-BH-27**	**HEP-BH-32**	**HEP-BH-32**	**HEP-BH-32**	**HEP-BH-32**
				Hole ID	**HEP-BH-27**	**HEP-BH-32**	**HEP-BH-32**	**HEP-BH-32**	**HEP-BH-32**
				Depth	**2.80**	**0.20**	**2.30**	**4.40**	**5.30**
				Top Depth	**2.80**	**0.20**	**2.30**	**4.40**	**5.30**
				Date Sampled	**01-DEC-2017**	**28-NOV-2017**	**29-NOV-2017**	**29-NOV-2017**	**29-NOV-2017**
				Time Sampled	**12:30**	**15:30**	**09:30**	**10:30**	**11:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**FES2171201010**	**HEPBH3220171128001**	**HEPBH3220171129001**	**HEPBH3220171129003**	**HEPBH3220171129004**
				AGS Sample Reference	**10**	**3**	**13**	**19**	**22**
				Matrix Class	**Fill**	**Topsoil**	**Sandy Soil**	**Sandy Soil**	**Fill**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Arsenic	T6	M40	2	mg/kg	**4.7**	**13**	**17**	**9**	**11**
Cadmium	T6	M40	1	mg/kg	<1	<1	<1	<1	<1
Chromium	T6	M40	1	mg/kg	**54**	**36**	**39**	**18**	**25**
Iron	T6	A40	1	mg/kg	**9400**	**31000**	**36000**	**22000**	**25000**
Lead	T6	M40	1	mg/kg	**440**	**140**	**52**	**22**	**39**
Manganese	T6	M40	1	mg/kg	**140**	**450**	**260**	**360**	**380**
Mercury	T6	M40	1	mg/kg	<1	<1	<1	<1	<1
Nickel	T6	M40	1	mg/kg	**13**	**29**	**42**	**17**	**20**
Selenium	T6	M40	3	mg/kg	<3	<3	<3	<3	<3
Copper	T6	M40	1	mg/kg	**85**	**55**	**31**	**16**	**29**
Zinc	T6	M40	1	mg/kg	**63**	**130**	**90**	**53**	**74**
Boron (water-soluble)	T6	AR	1	mg/kg	<1	<1	<1	<1	<1

Concept Reference: 701803
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings Metals and Metalloids

Concept Reference	**701803 029**	**701803 030**	**701803 034**	**701803 036**
Customer Sample Reference	**HEP-BH-32**	**HEP-BH-32**	**HEP-BH-33**	**HEP-BH-826**
Hole ID	**HEP-BH-32**	**HEP-BH-32**	**HEP-BH-33**	**HEP-BH-826**
Depth	**6.40**	**7.50**	**0.30**	**0.60**
Top Depth	**6.40**	**7.50**	**0.30**	**0.60**
Date Sampled	**29-NOV-2017**	**30-NOV-2017**	**01-DEC-2017**	**23-NOV-2017**
Time Sampled	**13:00**	**14:00**	**12:40**	**16:00**
AGS Type	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**HEPBH3220171129005**	**HEPBH3220171130001**	**HEPBH3320171201002**	**FES1171123005**
AGS Sample Reference	**26**	**29**	**4**	**5**
Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units				
Arsenic	T6	M40	2	mg/kg	**14**	**9**	**15**	**12**
Cadmium	T6	M40	1	mg/kg	<1	<1	**1**	<1
Chromium	T6	M40	1	mg/kg	**28**	**18**	**35**	**29**
Iron	T6	A40	1	mg/kg	**32000**	**20000**	**26000**	**22000**
Lead	T6	M40	1	mg/kg	**48**	**21**	**360**	**82**
Manganese	T6	M40	1	mg/kg	**470**	**330**	**370**	**590**
Mercury	T6	M40	1	mg/kg	<1	<1	**1**	<1
Nickel	T6	M40	1	mg/kg	**23**	**15**	**27**	**22**
Selenium	T6	M40	3	mg/kg	<3	<3	<3	<3
Copper	T6	M40	1	mg/kg	**26**	**13**	**100**	**38**
Zinc	T6	M40	1	mg/kg	**78**	**48**	**200**	**99**
Boron (water-soluble)	T6	AR	1	mg/kg	<1	<1	<1	<1

Concept Reference: 701803
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil
Suite A - Chromium

Concept Reference	**701803 001**	**701803 003**	**701803 015**	**701803 016**	**701803 017**
Customer Sample Reference	**HEP-BH-12**	**HEP-BH-12**	**HEP-BH-25**	**HEP-BH-27**	**HEP-BH-27**
Hole ID	**HEP-BH-12**	**HEP-BH-12**	**HEP-BH-25**	**HEP-BH-27**	**HEP-BH-27**
Depth	**0.05**	**0.80**	**1.00**	**0.20**	**1.00**
Top Depth	**0.05**	**0.80**	**1.00**	**0.20**	**1.00**
Date Sampled	**27-NOV-2017**	**27-NOV-2017**	**30-NOV-2017**	**01-DEC-2017**	**01-DEC-2017**
Time Sampled	**00:00**		**10:00**	**09:30**	**10:00**
AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**HEPBH1220171127001**	**HEPBH1220171127003**	**HEPBH2520171130002**	**FES2171201001**	**FES2171201004**
AGS Sample Reference	**1**	**7**	**4**	**1**	**4**
Matrix Class	**Topsoil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units					
Chromium (trivalent)	T85	AR	2	mg/kg	**78**	**54**	**26**	**68**	**39**
Chromium VI	T6	AR	1	mg/kg	<1	<1	<1	<1	<1

Concept Reference: 701803
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil
Suite A - Chromium

				Concept Reference	**701803 019**	**701803 023**	**701803 025**	**701803 027**	**701803 028**
				Customer Sample Reference	**HEP-BH-27**	**HEP-BH-32**	**HEP-BH-32**	**HEP-BH-32**	**HEP-BH-32**
				Hole ID	**HEP-BH-27**	**HEP-BH-32**	**HEP-BH-32**	**HEP-BH-32**	**HEP-BH-32**
				Depth	**2.80**	**0.20**	**2.30**	**4.40**	**5.30**
				Top Depth	**2.80**	**0.20**	**2.30**	**4.40**	**5.30**
				Date Sampled	**01-DEC-2017**	**28-NOV-2017**	**29-NOV-2017**	**29-NOV-2017**	**29-NOV-2017**
				Time Sampled	**12:30**	**15:30**	**09:30**	**10:30**	**11:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**FES2171201010**	**HEPBH3220171128001**	**HEPBH3220171129001**	**HEPBH3220171129003**	**HEPBH3220171129004**
				AGS Sample Reference	**10**	**3**	**13**	**19**	**22**
				Matrix Class	**Fill**	**Topsoil**	**Sandy Soil**	**Sandy Soil**	**Fill**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Chromium (trivalent)	T85	AR	2	mg/kg	**54**	**36**	**39**	**18**	**25**
Chromium VI	T6	AR	1	mg/kg	<1	<1	<1	<1	<1

Concept Reference: 701803
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil
Suite A - Chromium

				Concept Reference	**701803 029**	**701803 030**	**701803 034**	**701803 036**
				Customer Sample Reference	**HEP-BH-32**	**HEP-BH-32**	**HEP-BH-33**	**HEP-BH-826**
				Hole ID	**HEP-BH-32**	**HEP-BH-32**	**HEP-BH-33**	**HEP-BH-826**
				Depth	**6.40**	**7.50**	**0.30**	**0.60**
				Top Depth	**6.40**	**7.50**	**0.30**	**0.60**
				Date Sampled	**29-NOV-2017**	**30-NOV-2017**	**01-DEC-2017**	**23-NOV-2017**
				Time Sampled	**13:00**	**14:00**	**12:40**	**16:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH3220171129005**	**HEPBH3220171130001**	**HEPBH3320171201002**	**FES1171123005**
				AGS Sample Reference	**26**	**29**	**4**	**5**
				Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**				
Chromium (trivalent)	T85	AR	2	mg/kg	**28**	**18**	**35**	**29**
Chromium VI	T6	AR	1	mg/kg	<1	<1	<1	<1

Concept Reference: 701803
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Total Phenol

				Concept Reference	**701803 001**	**701803 003**	**701803 015**	**701803 016**	**701803 017**
				Customer Sample Reference	**HEP-BH-12**	**HEP-BH-12**	**HEP-BH-25**	**HEP-BH-27**	**HEP-BH-27**
				Hole ID	**HEP-BH-12**	**HEP-BH-12**	**HEP-BH-25**	**HEP-BH-27**	**HEP-BH-27**
				Depth	**0.05**	**0.80**	**1.00**	**0.20**	**1.00**
				Top Depth	**0.05**	**0.80**	**1.00**	**0.20**	**1.00**
				Date Sampled	**27-NOV-2017**	**27-NOV-2017**	**30-NOV-2017**	**01-DEC-2017**	**01-DEC-2017**
				Time Sampled	**00:00**		**10:00**	**09:30**	**10:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH1220171127001**	**HEPBH1220171127003**	**HEPBH2520171130002**	**FES2171201001**	**FES2171201004**
				AGS Sample Reference	**1**	**7**	**4**	**1**	**4**
				Matrix Class	**Topsoil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Phenols(Mono)	T4	AR	0.5	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0

Concept Reference: 701803
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - Total Phenol

				Concept Reference	**701803 019**	**701803 023**	**701803 025**	**701803 027**	**701803 028**
				Customer Sample Reference	**HEP-BH-27**	**HEP-BH-32**	**HEP-BH-32**	**HEP-BH-32**	**HEP-BH-32**
				Hole ID	**HEP-BH-27**	**HEP-BH-32**	**HEP-BH-32**	**HEP-BH-32**	**HEP-BH-32**
				Depth	**2.80**	**0.20**	**2.30**	**4.40**	**5.30**
				Top Depth	**2.80**	**0.20**	**2.30**	**4.40**	**5.30**
				Date Sampled	**01-DEC-2017**	**28-NOV-2017**	**29-NOV-2017**	**29-NOV-2017**	**29-NOV-2017**
				Time Sampled	**12:30**	**15:30**	**09:30**	**10:30**	**11:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**FES2171201010**	**HEPBH3220171128001**	**HEPBH3220171129001**	**HEPBH3220171129003**	**HEPBH3220171129004**
				AGS Sample Reference	**10**	**3**	**13**	**19**	**22**
				Matrix Class	**Fill**	**Topsoil**	**Sandy Soil**	**Sandy Soil**	**Fill**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Phenols(Mono)	T4	AR	0.5	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0

Concept Reference: 701803
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - Total Phenol

				Concept Reference	**701803 029**	**701803 030**	**701803 034**	**701803 036**
				Customer Sample Reference	**HEP-BH-32**	**HEP-BH-32**	**HEP-BH-33**	**HEP-BH-826**
				Hole ID	**HEP-BH-32**	**HEP-BH-32**	**HEP-BH-33**	**HEP-BH-826**
				Depth	**6.40**	**7.50**	**0.30**	**0.60**
				Top Depth	**6.40**	**7.50**	**0.30**	**0.60**
				Date Sampled	**29-NOV-2017**	**30-NOV-2017**	**01-DEC-2017**	**23-NOV-2017**
				Time Sampled	**13:00**	**14:00**	**12:40**	**16:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH3220171129005**	**HEPBH3220171130001**	**HEPBH3320171201002**	**FES1171123005**
				AGS Sample Reference	**26**	**29**	**4**	**5**
				Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**				
Phenols(Mono)	T4	AR	0.5	mg/kg	<1.0	<1.0	<1.0	<1.0

Concept Reference: 701803
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - Asbestos

				Concept Reference	**701803 001**	**701803 003**	**701803 015**	**701803 016**	**701803 017**
				Customer Sample Reference	**HEP-BH-12**	**HEP-BH-12**	**HEP-BH-25**	**HEP-BH-27**	**HEP-BH-27**
				Hole ID	**HEP-BH-12**	**HEP-BH-12**	**HEP-BH-25**	**HEP-BH-27**	**HEP-BH-27**
				Depth	**0.05**	**0.80**	**1.00**	**0.20**	**1.00**
				Top Depth	**0.05**	**0.80**	**1.00**	**0.20**	**1.00**
				Date Sampled	**27-NOV-2017**	**27-NOV-2017**	**30-NOV-2017**	**01-DEC-2017**	**01-DEC-2017**
				Time Sampled	**00:00**		**10:00**	**09:30**	**10:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH1220171127001**	**HEPBH1220171127003**	**HEPBH2520171130002**	**FES2171201001**	**FES2171201004**
				AGS Sample Reference	**1**	**7**	**4**	**1**	**4**
				Matrix Class	**Topsoil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Asbestos ID	T27	AR			N.D.	N.D.	N.D.	Chrysotile Detected	N.D.

Concept Reference: 701803
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Asbestos

				Concept Reference	**701803 019**	**701803 023**	**701803 025**	**701803 027**	**701803 028**
				Customer Sample Reference	**HEP-BH-27**	**HEP-BH-32**	**HEP-BH-32**	**HEP-BH-32**	**HEP-BH-32**
				Hole ID	**HEP-BH-27**	**HEP-BH-32**	**HEP-BH-32**	**HEP-BH-32**	**HEP-BH-32**
				Depth	**2.80**	**0.20**	**2.30**	**4.40**	**5.30**
				Top Depth	**2.80**	**0.20**	**2.30**	**4.40**	**5.30**
				Date Sampled	**01-DEC-2017**	**28-NOV-2017**	**29-NOV-2017**	**29-NOV-2017**	**29-NOV-2017**
				Time Sampled	**12:30**	**15:30**	**09:30**	**10:30**	**11:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**FES2171201010**	**HEPBH3220171128001**	**HEPBH3220171129001**	**HEPBH3220171129003**	**HEPBH3220171129004**
				AGS Sample Reference	**10**	**3**	**13**	**19**	**22**
				Matrix Class	**Fill**	**Topsoil**	**Sandy Soil**	**Sandy Soil**	**Fill**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Asbestos ID	T27	AR			N.D.	N.D.	N.D.	N.D.	N.D.

Concept Reference: 701803
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Asbestos

				Concept Reference	**701803 029**	**701803 030**	**701803 034**	**701803 036**
				Customer Sample Reference	**HEP-BH-32**	**HEP-BH-32**	**HEP-BH-33**	**HEP-BH-826**
				Hole ID	**HEP-BH-32**	**HEP-BH-32**	**HEP-BH-33**	**HEP-BH-826**
				Depth	**6.40**	**7.50**	**0.30**	**0.60**
				Top Depth	**6.40**	**7.50**	**0.30**	**0.60**
				Date Sampled	**29-NOV-2017**	**30-NOV-2017**	**01-DEC-2017**	**23-NOV-2017**
				Time Sampled	**13:00**	**14:00**	**12:40**	**16:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH3220171129005**	**HEPBH3220171130001**	**HEPBH3320171201002**	**FES1171123005**
				AGS Sample Reference	**26**	**29**	**4**	**5**
				Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**				
Asbestos ID	T27	AR			N.D.	N.D.	N.D.	N.D.

Concept Reference: 701803
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil
Suite A - Asbestos Quantification

				Concept Reference	**701803 016**	
				Customer Sample Reference	**HEP-BH-27**	
				Hole ID	**HEP-BH-27**	
				Depth	**0.20**	
				Top Depth	**0.20**	
				Date Sampled	**01-DEC-2017**	
				Time Sampled	**09:30**	
				AGS Type	**ES**	
				AGS Sample ID	**FES2171201001**	
				AGS Sample Reference	**1**	
				Matrix Class	**Sandy Soil**	
Determinand	**Method**	**Test Sample**	**LOD**	**Units**		
Asbestos Quantification Stage 2	T413	AR	0.001	%		
Asbestos Quantification Stage 3	T413	AR	0.001	%	**0.45**	
					Chrysotile Detected	

Concept Reference: 701803
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground Soils with Elevated PID Readings - Organics PAH US EPA 16

Concept Reference	**701803 001**	**701803 003**	**701803 015**	**701803 016**	**701803 017**
Customer Sample Reference	**HEP-BH-12**	**HEP-BH-12**	**HEP-BH-25**	**HEP-BH-27**	**HEP-BH-27**
Hole ID	**HEP-BH-12**	**HEP-BH-12**	**HEP-BH-25**	**HEP-BH-27**	**HEP-BH-27**
Depth	**0.05**	**0.80**	**1.00**	**0.20**	**1.00**
Top Depth	**0.05**	**0.80**	**1.00**	**0.20**	**1.00**
Date Sampled	**27-NOV-2017**	**27-NOV-2017**	**30-NOV-2017**	**01-DEC-2017**	**01-DEC-2017**
Time Sampled	**00:00**		**10:00**	**09:30**	**10:00**
AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**HEPBH1220171127001**	**HEPBH1220171127003**	**HEPBH2520171130002**	**FES2171201001**	**FES2171201004**
AGS Sample Reference	**1**	**7**	**4**	**1**	**4**
Matrix Class	**Topsoil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**

Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Naphthalene	T207	M105	0.1	mg/kg	(9) <1.0	<0.1	(9) <1.0	(9) <1.0	<0.1
Acenaphthylene	T207	M105	0.1	mg/kg	(9) <1.0	<0.1	(9) <1.0	(9) <1.0	<0.1
Acenaphthene	T207	M105	0.1	mg/kg	(9) <1.0	<0.1	(9) <1.0	(9) <1.0	<0.1
Fluorene	T207	M105	0.1	mg/kg	(9) <1.0	<0.1	(9) <1.0	(9) <1.0	<0.1
Phenanthrene	T207	M105	0.1	mg/kg	(9) <1.0	<0.1	**3.2**	(9) <1.0	**0.6**
Anthracene	T207	M105	0.1	mg/kg	(9) <1.0	<0.1	(9) <1.0	(9) <1.0	**0.2**
Fluoranthene	T207	M105	0.1	mg/kg	(9) <1.0	<0.1	**6.6**	**2.7**	**1.6**
Pyrene	T207	M105	0.1	mg/kg	(9) <1.0	<0.1	**6.6**	**4.3**	**1.5**
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	(9) <1.0	<0.1	**2.9**	**2.2**	**0.9**
Chrysene	T207	M105	0.1	mg/kg	(9) <1.0	<0.1	**3.1**	**2.6**	**0.9**
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	(9) <1.0	<0.1	**3.4**	**1.6**	**0.9**
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	(9) <1.0	<0.1	**3.4**	**2.2**	**0.8**
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	(9) <1.0	<0.1	**4.3**	**2.1**	**0.9**
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	(9) <1.0	<0.1	**3.0**	**1.3**	**0.6**
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	(9) <1.0	<0.1	(9) <1.0	(9) <1.0	**0.2**
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	(9) <1.0	<0.1	**3.4**	**1.7**	**0.6**
PAH(total)	T207	M105	0.1	mg/kg	<1.0	<0.1	**40**	**21**	**9.6**

Concept Reference: 701803
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground Soils with Elevated PID Readings - Organics PAH US EPA 16

Concept Reference	**701803 019**	**701803 023**	**701803 025**	**701803 027**	**701803 028**
Customer Sample Reference	**HEP-BH-27**	**HEP-BH-32**	**HEP-BH-32**	**HEP-BH-32**	**HEP-BH-32**
Hole ID	**HEP-BH-27**	**HEP-BH-32**	**HEP-BH-32**	**HEP-BH-32**	**HEP-BH-32**
Depth	**2.80**	**0.20**	**2.30**	**4.40**	**5.30**
Top Depth	**2.80**	**0.20**	**2.30**	**4.40**	**5.30**
Date Sampled	**01-DEC-2017**	**28-NOV-2017**	**29-NOV-2017**	**29-NOV-2017**	**29-NOV-2017**
Time Sampled	**12:30**	**15:30**	**09:30**	**10:30**	**11:00**
AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**FES2171201010**	**HEPBH3220171128001**	**HEPBH3220171129001**	**HEPBH3220171129003**	**HEPBH3220171129004**
AGS Sample Reference	**10**	**3**	**13**	**19**	**22**
Matrix Class	**Fill**	**Topsoil**	**Sandy Soil**	**Sandy Soil**	**Fill**

Determinand	Method	Test Sample	LOD	Units					
Naphthalene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	T207	M105	0.1	mg/kg	<0.1	<0.1	**0.8**	<0.1	<0.1
Fluorene	T207	M105	0.1	mg/kg	<0.1	<0.1	**0.4**	<0.1	<0.1
Phenanthrene	T207	M105	0.1	mg/kg	<0.1	**0.5**	**3.7**	**0.1**	**0.3**
Anthracene	T207	M105	0.1	mg/kg	<0.1	**0.1**	**1.2**	<0.1	<0.1
Fluoranthene	T207	M105	0.1	mg/kg	**0.1**	**1.4**	**4.5**	**0.2**	**0.3**
Pyrene	T207	M105	0.1	mg/kg	**0.1**	**1.3**	**4.2**	**0.2**	**0.2**
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	<0.1	**0.8**	**1.7**	<0.1	<0.1
Chrysene	T207	M105	0.1	mg/kg	<0.1	**0.8**	**1.6**	<0.1	<0.1
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	<0.1	**0.8**	**1.4**	<0.1	<0.1
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	<0.1	**0.8**	**1.0**	<0.1	<0.1
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	<0.1	**0.8**	**1.3**	<0.1	<0.1
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	<0.1	**0.5**	**0.7**	<0.1	<0.1
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	<0.1	**0.2**	**0.2**	<0.1	<0.1
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	<0.1	**0.6**	**0.8**	<0.1	<0.1
PAH(total)	T207	M105	0.1	mg/kg	**0.2**	**8.6**	**24**	**0.4**	**0.7**

Concept Reference: 701803
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground Soils with Elevated PID Readings - Organics PAH US EPA 16

				Concept Reference	**701803 029**	**701803 030**	**701803 034**	**701803 036**
				Customer Sample Reference	**HEP-BH-32**	**HEP-BH-32**	**HEP-BH-33**	**HEP-BH-826**
				Hole ID	**HEP-BH-32**	**HEP-BH-32**	**HEP-BH-33**	**HEP-BH-826**
				Depth	**6.40**	**7.50**	**0.30**	**0.60**
				Top Depth	**6.40**	**7.50**	**0.30**	**0.60**
				Date Sampled	**29-NOV-2017**	**30-NOV-2017**	**01-DEC-2017**	**23-NOV-2017**
				Time Sampled	**13:00**	**14:00**	**12:40**	**16:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH3220171129005**	**HEPBH3220171130001**	**HEPBH3320171201002**	**FES1171123005**
				AGS Sample Reference	**26**	**29**	**4**	**5**
				Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**				
Naphthalene	T207	M105	0.1	mg/kg	<0.1	<0.1	**0.1**	<0.1
Acenaphthylene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1
Acenaphthene	T207	M105	0.1	mg/kg	**0.3**	<0.1	<0.1	<0.1
Fluorene	T207	M105	0.1	mg/kg	**0.4**	**0.1**	<0.1	<0.1
Phenanthrene	T207	M105	0.1	mg/kg	**2.0**	**0.8**	**1.0**	**0.3**
Anthracene	T207	M105	0.1	mg/kg	**0.6**	**0.2**	**0.3**	<0.1
Fluoranthene	T207	M105	0.1	mg/kg	**1.9**	**0.9**	**1.9**	**0.7**
Pyrene	T207	M105	0.1	mg/kg	**1.6**	**0.7**	**1.7**	**0.6**
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	**0.7**	**0.3**	**1.0**	**0.4**
Chrysene	T207	M105	0.1	mg/kg	**0.6**	**0.3**	**1.0**	**0.3**
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	**0.5**	**0.2**	**1.2**	**0.3**
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	**0.5**	**0.2**	**0.8**	**0.3**
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	**0.6**	**0.3**	**1.0**	**0.3**
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	**0.3**	**0.1**	**0.6**	**0.2**
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1	**0.2**	<0.1
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	**0.3**	**0.1**	**0.6**	**0.2**
PAH(total)	T207	M105	0.1	mg/kg	**10**	**4.3**	**12**	**3.7**

Concept Reference: 701803
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - TPH (CWG)

				Concept Reference	**701803 001**	**701803 003**	**701803 015**	**701803 016**	**701803 017**
				Customer Sample Reference	**HEP-BH-12**	**HEP-BH-12**	**HEP-BH-25**	**HEP-BH-27**	**HEP-BH-27**
				Hole ID	**HEP-BH-12**	**HEP-BH-12**	**HEP-BH-25**	**HEP-BH-27**	**HEP-BH-27**
				Depth	**0.05**	**0.80**	**1.00**	**0.20**	**1.00**
				Top Depth	**0.05**	**0.80**	**1.00**	**0.20**	**1.00**
				Date Sampled	**27-NOV-2017**	**27-NOV-2017**	**30-NOV-2017**	**01-DEC-2017**	**01-DEC-2017**
				Time Sampled	**00:00**		**10:00**	**09:30**	**10:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH1220171127001**	**HEPBH1220171127003**	**HEPBH2520171130002**	**FES2171201001**	**FES2171201004**
				AGS Sample Reference	**1**	**7**	**4**	**1**	**4**
				Matrix Class	**Topsoil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
TPH (C5-C6 aliphatic)	T209	AR	100	µg/kg	(110) <200	<100	<100	<100	<100
TPH (C6-C8 aliphatic)	T209	AR	100	µg/kg	(110) <200	<100	<100	<100	<100
TPH (C8-C10 aliphatic)	T209	AR	100	µg/kg	(110) <200	<100	<100	<100	<100
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	(13) <1	**(13) 1**	(13) <1	(13) <1	(13) <1
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	(13) <1	(13) <1	(13) <1	(13) <1	(13) <1
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	(13) <1	(13) <1	(13) <1	(13) <1	(13) <1
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	**(13) 44**	(13) <2	**(13) 32**	**(13) 14**	(13) <2
TPH (C6-C7 aromatic)	T209	AR	100	µg/kg	(110) <200	<100	<100	<100	<100
TPH (C7-C8 aromatic)	T209	AR	100	µg/kg	(110) <200	<100	<100	<100	<100
TPH (C8-C10 aromatic)	T209	AR	100	µg/kg	(110) <200	<100	<100	<100	<100
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	(13) <2	(13) <2	(13) <2	(13) <2	(13) <2
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	**(13) 18**	(13) <1	**(13) 25**	**(13) 4**	(13) <1
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	**(13) 37**	(13) <1	**(13) 80**	**(13) 61**	**(13) 2**
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	**(13) 94**	(13) <1	**(13) 230**	**(13) 250**	**(13) 17**

Concept Reference: 701803
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - TPH (CWG)

				Concept Reference	**701803 019**	**701803 023**	**701803 025**	**701803 027**	**701803 028**
				Customer Sample Reference	**HEP-BH-27**	**HEP-BH-32**	**HEP-BH-32**	**HEP-BH-32**	**HEP-BH-32**
				Hole ID	**HEP-BH-27**	**HEP-BH-32**	**HEP-BH-32**	**HEP-BH-32**	**HEP-BH-32**
				Depth	**2.80**	**0.20**	**2.30**	**4.40**	**5.30**
				Top Depth	**2.80**	**0.20**	**2.30**	**4.40**	**5.30**
				Date Sampled	**01-DEC-2017**	**28-NOV-2017**	**29-NOV-2017**	**29-NOV-2017**	**29-NOV-2017**
				Time Sampled	**12:30**	**15:30**	**09:30**	**10:30**	**11:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**FES2171201010**	**HEPBH3220171128001**	**HEPBH3220171129001**	**HEPBH3220171129003**	**HEPBH3220171129004**
				AGS Sample Reference	**10**	**3**	**13**	**19**	**22**
				Matrix Class	**Fill**	**Topsoil**	**Sandy Soil**	**Sandy Soil**	**Fill**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
TPH (C5-C6 aliphatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C6-C8 aliphatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C8-C10 aliphatic)	T209	AR	100	µg/kg	<100	<100	<100	**330**	**720**
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	(13) <1	(13) <1	(13) <1	(13) <1	(13) <1
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	(13) <1	(13) <1	(13) <1	**(13) 2**	(13) <1
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	(13) <1	(13) <1	(13) <1	(13) <1	(13) <1
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	**(13) 6**	**(13) 2**	(13) <2	**(13) 3**	(13) <2
TPH (C6-C7 aromatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C7-C8 aromatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C8-C10 aromatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	(13) <2	(13) <2	(13) <2	(13) <2	(13) <2
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	(13) <1	**(13) 3**	(13) <1	(13) <1	(13) <1
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	(13) <1	**(13) 18**	(13) <1	**(13) 1**	(13) <1
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	**(13) 1**	**(13) 40**	(13) <1	(13) <1	**(13) 1**

Concept Reference: 701803
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - TPH (CWG)

				Concept Reference	**701803 029**	**701803 030**	**701803 034**	**701803 036**
				Customer Sample Reference	**HEP-BH-32**	**HEP-BH-32**	**HEP-BH-33**	**HEP-BH-826**
				Hole ID	**HEP-BH-32**	**HEP-BH-32**	**HEP-BH-33**	**HEP-BH-826**
				Depth	**6.40**	**7.50**	**0.30**	**0.60**
				Top Depth	**6.40**	**7.50**	**0.30**	**0.60**
				Date Sampled	**29-NOV-2017**	**30-NOV-2017**	**01-DEC-2017**	**23-NOV-2017**
				Time Sampled	**13:00**	**14:00**	**12:40**	**16:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH3220171129005**	**HEPBH3220171130001**	**HEPBH3320171201002**	**FES1171123005**
				AGS Sample Reference	**26**	**29**	**4**	**5**
				Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**				
TPH (C5-C6 aliphatic)	T209	AR	100	µg/kg	<100	<100	<100	<100
TPH (C6-C8 aliphatic)	T209	AR	100	µg/kg	<100	<100	<100	<100
TPH (C8-C10 aliphatic)	T209	AR	100	µg/kg	<100	<100	<100	<100
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	(13) <1	(13) <1	(13) <1	**(13) 2**
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	**(13) 1**	(13) <1	(13) <1	**(13) 1**
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	(13) <1	(13) <1	(13) <1	(13) <1
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	**(13) 2**	**(13) 3**	**(13) 18**	**(13) 7**
TPH (C6-C7 aromatic)	T209	AR	100	µg/kg	<100	<100	<100	<100
TPH (C7-C8 aromatic)	T209	AR	100	µg/kg	<100	<100	<100	<100
TPH (C8-C10 aromatic)	T209	AR	100	µg/kg	<100	<100	<100	<100
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	(13) <2	(13) <2	(13) <2	(13) <2
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	**(13) 6**	**(13) 7**	**(13) 3**	**(13) 7**
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	**(13) 20**	**(13) 30**	**(13) 28**	**(13) 9**
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	**(13) 27**	**(13) 37**	**(13) 64**	**(13) 23**

Concept Reference: 701803
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil
Total Petroleum Hydrocarbons (Aliphatics+Aromatics) Total

Concept Reference				**701803 001**	**701803 003**	**701803 015**	**701803 016**	**701803 017**
Customer Sample Reference				**HEP-BH-12**	**HEP-BH-12**	**HEP-BH-25**	**HEP-BH-27**	**HEP-BH-27**
Hole ID				**HEP-BH-12**	**HEP-BH-12**	**HEP-BH-25**	**HEP-BH-27**	**HEP-BH-27**
Depth				**0.05**	**0.80**	**1.00**	**0.20**	**1.00**
Top Depth				**0.05**	**0.80**	**1.00**	**0.20**	**1.00**
Date Sampled				**27-NOV-2017**	**27-NOV-2017**	**30-NOV-2017**	**01-DEC-2017**	**01-DEC-2017**
Time Sampled				**00:00**		**10:00**	**09:30**	**10:00**
AGS Type				**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID				**HEPBH122017112700 1**	**HEPBH122017112700 3**	**HEPBH252017113000 2**	**FES2171201001**	**FES2171201004**
AGS Sample Reference				**1**	**7**	**4**	**1**	**4**
Matrix Class				**Topsoil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**				
TPH (Aliphatic) total	T85	M105		mg/kg	**(13) 44**	**(13) 1.0**	**(13) 32**	**(13) 14**	(13) N.D.
TPH (Aromatic) total	T85	M105		mg/kg	**(13) 150**	(13) N.D.	**(13) 340**	**(13) 320**	**(13) 19**
TPH (Aliphatic+Aromatic) (sum)	T85	M105		mg/kg	**194**	**1.00**	**372**	**334**	**19.0**

Concept Reference: 701803
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil
Total Petroleum Hydrocarbons (Aliphatics+Aromatics) Total

Concept Reference				**701803 019**	**701803 023**	**701803 025**	**701803 027**	**701803 028**
Customer Sample Reference				**HEP-BH-27**	**HEP-BH-32**	**HEP-BH-32**	**HEP-BH-32**	**HEP-BH-32**
Hole ID				**HEP-BH-27**	**HEP-BH-32**	**HEP-BH-32**	**HEP-BH-32**	**HEP-BH-32**
Depth				**2.80**	**0.20**	**2.30**	**4.40**	**5.30**
Top Depth				**2.80**	**0.20**	**2.30**	**4.40**	**5.30**
Date Sampled				**01-DEC-2017**	**28-NOV-2017**	**29-NOV-2017**	**29-NOV-2017**	**29-NOV-2017**
Time Sampled				**12:30**	**15:30**	**09:30**	**10:30**	**11:00**
AGS Type				**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID				**FES2171201010**	**HEPBH322017112800 1**	**HEPBH322017112900 1**	**HEPBH322017112900 3**	**HEPBH322017112900 4**
AGS Sample Reference				**10**	**3**	**13**	**19**	**22**
Matrix Class				**Fill**	**Topsoil**	**Sandy Soil**	**Sandy Soil**	**Fill**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**				
TPH (Aliphatic) total	T85	M105		mg/kg	**(13) 6.0**	**(13) 2.0**	(13) N.D.	**(13) 5.0**	(13) N.D.
TPH (Aromatic) total	T85	M105		mg/kg	**(13) 1.0**	**(13) 61**	(13) N.D.	**(13) 1.0**	**(13) 1.0**
TPH (Aliphatic+Aromatic) (sum)	T85	M105		mg/kg	**7.00**	**63.0**	N.D.	**6.00**	**1.00**

Concept Reference: 701803
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil
Total Petroleum Hydrocarbons (Aliphatics+Aromatics) Total

Concept Reference	**701803 029**	**701803 030**	**701803 034**	**701803 036**
Customer Sample Reference	**HEP-BH-32**	**HEP-BH-32**	**HEP-BH-33**	**HEP-BH-826**
Hole ID	**HEP-BH-32**	**HEP-BH-32**	**HEP-BH-33**	**HEP-BH-826**
Depth	**6.40**	**7.50**	**0.30**	**0.60**
Top Depth	**6.40**	**7.50**	**0.30**	**0.60**
Date Sampled	**29-NOV-2017**	**30-NOV-2017**	**01-DEC-2017**	**23-NOV-2017**
Time Sampled	**13:00**	**14:00**	**12:40**	**16:00**
AGS Type	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**HEPBH3220171129005**	**HEPBH3220171130001**	**HEPBH3320171201002**	**FES1171123005**
AGS Sample Reference	**26**	**29**	**4**	**5**
Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units				
TPH (Aliphatic) total	T85	M105		mg/kg	(13) **2.0**	(13) **3.0**	(13) **18**	(13) **10**
TPH (Aromatic) total	T85	M105		mg/kg	(13) **53**	(13) **74**	(13) **95**	(13) **39**
TPH (Aliphatic+Aromatic) (sum)	T85	M105		mg/kg	**55.0**	**77.0**	**113**	**49.0**

Concept Reference: 701803
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil
Suite B - Inorganics

Concept Reference	**701803 007**
Customer Sample Reference	**HEP-BH-12**
Hole ID	**HEP-BH-12**
Depth	**2.30**
Top Depth	**2.30**
Date Sampled	**29-NOV-2017**
Time Sampled	**12:30**
AGS Type	**ES**
AGS Sample ID	**HEPBH1220171129003**
AGS Sample Reference	**22**
Matrix Class	**Fill**

Determinand	Method	Test Sample	LOD	Units	
Chloride	T686	AR	1	mg/kg	**6**

Concept Reference: 701803
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil
Suite B - Natural Ground - Misc

Concept Reference	**701803 007**
Customer Sample Reference	**HEP-BH-12**
Hole ID	**HEP-BH-12**
Depth	**2.30**
Top Depth	**2.30**
Date Sampled	**29-NOV-2017**
Time Sampled	**12:30**
AGS Type	**ES**
AGS Sample ID	**HEPBH1220171129003**
AGS Sample Reference	**22**
Matrix Class	**Fill**

Determinand	Method	Test Sample	LOD	Units	
Fraction Organic Carbon - F(oc)	T21	AR	1	%	**55**
Soil Organic Matter	T287	A40	0.1	%	**0.3**
pH	T7	AR			**8.3**
TPH C10-C40 (sum)	T85	M105	1	mg/kg	(13) <1

Concept Reference: 701803
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil
Suite B - Natural Ground - Metals and Metalloids

Concept Reference	**701803 007**
Customer Sample Reference	**HEP-BH-12**
Hole ID	**HEP-BH-12**
Depth	**2.30**
Top Depth	**2.30**
Date Sampled	**29-NOV-2017**
Time Sampled	**12:30**
AGS Type	**ES**
AGS Sample ID	**HEPBH1220171129003**
AGS Sample Reference	**22**
Matrix Class	**Fill**

Determinand	Method	Test Sample	LOD	Units	
Arsenic	T6	M40	2.0	mg/kg	**3.5**
Cadmium	T6	M40	1	mg/kg	<1
Chromium	T6	M40	1	mg/kg	**88**
Iron	T6	A40	1	mg/kg	**8800**
Lead	T6	M40	1	mg/kg	**74**
Manganese	T6	M40	1	mg/kg	**120**
Mercury	T6	M40	1	mg/kg	<1
Nickel	T6	M40	1	mg/kg	**53**
Selenium	T6	M40	3	mg/kg	<3
Copper	T6	M40	1	mg/kg	**140**
Zinc	T6	M40	1	mg/kg	**59**
Boron (water-soluble)	T6	AR	1	mg/kg	<1

Concept Reference: 701803
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil
Suite B - Chromium

Concept Reference	**701803 007**
Customer Sample Reference	**HEP-BH-12**
Hole ID	**HEP-BH-12**
Depth	**2.30**
Top Depth	**2.30**
Date Sampled	**29-NOV-2017**
Time Sampled	**12:30**
AGS Type	**ES**
AGS Sample ID	**HEPBH1220171129003**
AGS Sample Reference	**22**
Matrix Class	**Fill**

Determinand	Method	Test Sample	LOD	Units	
Chromium (trivalent)	T85	AR	2	mg/kg	**88**
Chromium VI	T6	AR	1	mg/kg	<1

Concept Reference: 701803
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil
Suite B - Natural Material - Organic - PAHs

Concept Reference	**701803 007**
Customer Sample Reference	**HEP-BH-12**
Hole ID	**HEP-BH-12**
Depth	**2.30**
Top Depth	**2.30**
Date Sampled	**29-NOV-2017**
Time Sampled	**12:30**
AGS Type	**ES**
AGS Sample ID	**HEPBH1220171129003**
AGS Sample Reference	**22**
Matrix Class	**Fill**

Determinand	Method	Test Sample	LOD	Units	
Naphthalene	T207	M105	0.1	mg/kg	<0.1
Acenaphthylene	T207	M105	0.1	mg/kg	<0.1
Acenaphthene	T207	M105	0.1	mg/kg	<0.1
Fluorene	T207	M105	0.1	mg/kg	<0.1
Phenanthrene	T207	M105	0.1	mg/kg	<0.1
Anthracene	T207	M105	0.1	mg/kg	<0.1
Fluoranthene	T207	M105	0.1	mg/kg	**0.2**
Pyrene	T207	M105	0.1	mg/kg	**0.1**
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	**0.1**
Chrysene	T207	M105	0.1	mg/kg	**0.1**
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	**0.1**
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	**0.1**
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	**0.1**
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	<0.1
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	<0.1
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	**0.1**
PAH(total)	T207	M105	0.1	mg/kg	**1.0**

Concept Reference: 701803
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil
Suite B - Natural Material - Organic - TPH

Concept Reference	**701803 007**
Customer Sample Reference	**HEP-BH-12**
Hole ID	**HEP-BH-12**
Depth	**2.30**
Top Depth	**2.30**
Date Sampled	**29-NOV-2017**
Time Sampled	**12:30**
AGS Type	**ES**
AGS Sample ID	**HEPBH1220171129003**
AGS Sample Reference	**22**
Matrix Class	**Fill**

Determinand	Method	Test Sample	LOD	Units	
Bromate	T11	AR	1	mg/kg	
TPH (C10-C35)	T8	M105	1	mg/kg	(13) <1
TPH (C35-C40)	T8	M105	1	mg/kg	(13) <1

Index to symbols used in Fifth Supplemental B 701803-3

Value	Description
AR	As Received
A40	Assisted dried < 40C
M40	Analysis conducted on sample assisted dried at no more than 40C. Results are reported on a dry weight basis.

M105	Analysis conducted on an "as received" aliquot. Results are reported on a dry weight basis where moisture content was determined by assisted drying of sample at 105C
N.D.	Not Detected
110	LOD raised due to low internal standard recovery.
13	Results have been blank corrected.
9	LOD raised due to dilution of sample
S	Analysis was subcontracted
M	Analysis is MCERTS accredited
U	Analysis is UKAS accredited
N	Analysis is not UKAS accredited

Notes

Asbestos subcontracted to REC Asbestos
These samples have been analysed exceeding recommended holding times for pH. It is possible therefore that the results provided may be compromised.
"Fill" samples are outside the scope of our MCERTS accreditation. Results are UKAS only
Nitrate and Nitrite transferred to Concept East Kilbride
Fifth Supplemental B to report in standard format with TPH totals.

Method Index

Value	Description
T8	GC/FID
T413	PLM/Grav
T27	PLM
T85	Calc
T21	OX/IR
T7	Probe
T6	ICP/OES
T207	GC/MS (MCERTS)
T287	Calc TOC/0.58
T11	IC
T162	Grav (1 Dec) (105 C)
T209	GC/MS (Head Space)(MCERTS)
T909	GCxGC
T4	Colorimetry
T2	Grav
T686	Discrete Analyser

Accreditation Summary

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Moisture @105C	T162	AR	0.1	%	N	001,003,007,015-017,019,023,025,027-030,034,036
Retained on 10mm sieve	T2	M40	0.1	%	N	001,003,007,015-017,019,023,025,027-030,034,036
Fraction Organic Carbon - F(oc)	T21	AR	1	%	N	007
pH	T7	AR			U	007,019,028
TPH C10-C40 (sum)	T85	M105	1	mg/kg	N	007
Bromate	T11	AR	1	mg/kg	N	007
TPH (C10-C35)	T8	M105	1	mg/kg	U	007
TPH (C35-C40)	T8	M105	1	mg/kg	N	007
Arsenic	T6	M40	2.0	mg/kg	U	007,019,028
Cadmium	T6	M40	1	mg/kg	U	007,019,028
Chromium	T6	M40	1	mg/kg	U	007,019,028
Lead	T6	M40	1	mg/kg	U	007,019,028
Manganese	T6	M40	1	mg/kg	U	007,019,028
Mercury	T6	M40	1	mg/kg	U	007,019,028
Nickel	T6	M40	1	mg/kg	U	007,019,028
Selenium	T6	M40	3	mg/kg	U	007,019,028
Copper	T6	M40	1	mg/kg	U	007,019,028
Zinc	T6	M40	1	mg/kg	U	007,019,028
Naphthalene	T207	M105	0.1	mg/kg	U	007,019,028
Acenaphthene	T207	M105	0.1	mg/kg	U	007,019,028
Fluorene	T207	M105	0.1	mg/kg	U	007,019,028
Phenanthrene	T207	M105	0.1	mg/kg	U	007,019,028
Fluoranthene	T207	M105	0.1	mg/kg	U	007,019,028
Pyrene	T207	M105	0.1	mg/kg	U	007,019,028
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	U	007,019,028

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Chrysene	T207	M105	0.1	mg/kg	U	007,019,028
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	U	007,019,028
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	U	007,019,028
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	U	007,019,028
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	U	007,019,028
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	U	007,019,028
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	U	007,019,028
Soil Organic Matter	T287	A40	0.1	%	N	001,003,007,015-017,019,023,025,027-030,034,036
pH	T7	AR			M	001,003,015-017,023,025,027,029-030,034,036
Asbestos ID	T27	AR			SU	001,003,015-017,019,023,025,027-030,034,036
Phenols(Mono)	T4	AR	0.5	mg/kg	M	001,003,015-017,023,025,027,029-030,034,036
Phenols(Mono)	T4	AR	0.5	mg/kg	U	019,028
Chloride	T686	AR	1	mg/kg	N	001,003,007,015-017,019,023,025,027-030,034,036
Cyanide(Total)	T4	AR	1	mg/kg	M	001,003,015-017,023,025,027,029-030,034,036
Cyanide(Total)	T4	AR	1	mg/kg	U	019,028
Thiocyanate	T4	A40	1	mg/kg	N	001,003,015-017,019,023,025,027-030,034,036
Nitrate	T686	AR	1	mg/kg	N	001,003,015-017,019,023,025,027-030,034,036
Nitrite	T686	AR	1	mg/kg	N	001,003,015-017,019,023,025,027-030,034,036
SO4(Total)	T6	A40	0.01	%	U	001,003,015-017,019,023,025,027-030,034,036
Sulphide	T4	AR	10	mg/kg	N	001,003,015-017,019,023,025,027-030,034,036
Arsenic	T6	M40	2	mg/kg	M	001,003,015-017,023,025,027,029-030,034,036
Cadmium	T6	M40	1	mg/kg	M	001,003,015-017,023,025,027,029-030,034,036
Chromium	T6	M40	1	mg/kg	M	001,003,015-017,023,025,027,029-030,034,036
Iron	T6	A40	1	mg/kg	U	001,003,007,015-017,019,023,025,027-030,034,036
Lead	T6	M40	1	mg/kg	M	001,003,015-017,023,025,027,029-030,034,036
Manganese	T6	M40	1	mg/kg	M	001,003,015-017,023,025,027,029-030,034,036
Mercury	T6	M40	1	mg/kg	M	001,003,015-017,023,025,027,029-030,034,036
Nickel	T6	M40	1	mg/kg	M	001,003,015-017,023,025,027,029-030,034,036
Selenium	T6	M40	3	mg/kg	M	001,003,015-017,023,025,027,029-030,034,036
Copper	T6	M40	1	mg/kg	M	001,003,015-017,023,025,027,029-030,034,036
Zinc	T6	M40	1	mg/kg	M	001,003,015-017,023,025,027,029-030,034,036
Boron (water-soluble)	T6	AR	1	mg/kg	N	001,003,007,015-017,019,023,025,027-030,034,036
Naphthalene	T207	M105	0.1	mg/kg	M	001,003,015-017,023,025,027,029-030,034,036
Acenaphthylene	T207	M105	0.1	mg/kg	U	001,003,007,015-017,019,023,025,027-030,034,036
Acenaphthene	T207	M105	0.1	mg/kg	M	001,003,015-017,023,025,027,029-030,034,036
Fluorene	T207	M105	0.1	mg/kg	M	001,003,015-017,023,025,027,029-030,034,036
Phenanthrene	T207	M105	0.1	mg/kg	M	001,003,015-017,023,025,027,029-030,034,036
Anthracene	T207	M105	0.1	mg/kg	U	001,003,007,015-017,019,023,025,027-030,034,036
Fluoranthene	T207	M105	0.1	mg/kg	M	001,003,015-017,023,025,027,029-030,034,036
Pyrene	T207	M105	0.1	mg/kg	M	001,003,015-017,023,025,027,029-030,034,036
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	M	001,003,015-017,023,025,027,029-030,034,036
Chrysene	T207	M105	0.1	mg/kg	M	001,003,015-017,023,025,027,029-030,034,036
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	M	001,003,015-017,023,025,027,029-030,034,036
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	M	001,003,015-017,023,025,027,029-030,034,036
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	M	001,003,015-017,023,025,027,029-030,034,036
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	M	001,003,015-017,023,025,027,029-030,034,036
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	M	001,003,015-017,023,025,027,029-030,034,036
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	M	001,003,015-017,023,025,027,029-030,034,036
PAH(total)	T207	M105	0.1	mg/kg	U	001,003,007,015-017,019,023,025,027-030,034,036
TPH (C5-C6 aliphatic)	T209	AR	100	µg/kg	N	001,003,015-017,019,023,025,027-030,034,036
TPH (C6-C8 aliphatic)	T209	AR	100	µg/kg	N	001,003,015-017,019,023,025,027-030,034,036
TPH (C8-C10 aliphatic)	T209	AR	100	µg/kg	N	001,003,015-017,019,023,025,027-030,034,036
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	M	001,003,015-017,023,025,027,029-030,034,036
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	U	019,028
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	M	001,003,015-017,023,025,027,029-030,034,036
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	U	019,028
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	M	001,003,015-017,023,025,027,029-030,034,036
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	U	019,028
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	M	001,003,015-017,023,025,027,029-030,034,036
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	U	019,028
TPH (C6-C7 aromatic)	T209	AR	100	µg/kg	N	001,003,015-017,019,023,025,027-030,034,036
TPH (C7-C8 aromatic)	T209	AR	100	µg/kg	N	001,003,015-017,019,023,025,027-030,034,036
TPH (C8-C10 aromatic)	T209	AR	100	µg/kg	N	001,003,015-017,019,023,025,027-030,034,036
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	M	001,003,015-017,023,025,027,029-030,034,036
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	U	019,028
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	M	001,003,015-017,023,025,027,029-030,034,036
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	U	019,028
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	M	001,003,015-017,023,025,027,029-030,034,036
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	U	019,028
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	M	001,003,015-017,023,025,027,029-030,034,036

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	U	019,028
TPH (Aliphatic) total	T85	M105		mg/kg	N	001,003,015-017,019,023,025,027-030,034,036
TPH (Aromatic) total	T85	M105		mg/kg	N	001,003,015-017,019,023,025,027-030,034,036
TPH (Aliphatic+Aromatic) (sum)	T85	M105		mg/kg	N	001,003,015-017,019,023,025,027-030,034,036
Chromium (trivalent)	T85	AR	2	mg/kg	N	001,003,007,015-017,019,023,025,027-030,034,036
Chromium VI	T6	AR	1	mg/kg	N	001,003,007,015-017,019,023,025,027-030,034,036
Asbestos Quantification Stage 2	T413	AR	0.001	%	SU	016
Asbestos Quantification Stage 3	T413	AR	0.001	%	SU	016

CONCEPT LIFE SCIENCES
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Concept Life Sciences

Certificate of Analysis

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Report Number: Fifth Supplemental A 701803-3

Date of Report: 22-Jun-2018

Customer: Fugro GeoServices
Fugro House
Hithercroft Road
Wallingford
Oxfordshire
OX10 9RB

Customer Contact: Ms Karen Blackmore

Customer Job Reference:
Customer Purchase Order: 56642KB-WAL
Customer Site Reference: HEP Package 3 CoC AGS4
Date Job Received at Concept: 29-Nov-2017
Date Analysis Started: 08-Dec-2017
Date Analysis Completed: 29-Jan-2018

The results reported relate to samples received in the laboratory and may not be representative of a whole batch.

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation

This report should not be reproduced except in full without the written approval of the laboratory

Tests covered by this certificate were conducted in accordance with Concept Life Sciences SOPs

All results have been reviewed in accordance with Section 25 of the Concept Life Sciences, Analytical Services Quality Manual

UKAS TESTING
1549

Report checked
and authorised by :
Sara Abou-Shakra
Customer Service Manager

Issued by :
Sara Abou-Shakra
Customer Service Manager

Summary Of Results

Soil

Dioxins

Corrected to 0% Moisture

				WHO2005 Toxic Equivalents ng/kg		WHO Toxic Equivalents ng/kg	
Concept Reference	**Customer Sample Reference**	**Analysis**	**Symbol**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**
701803 025	HEP-BH-32	Dioxins and Furans (Based on US EPA 1613)	U	0.17	**1.3**	0.16	**1.4**
		Poly-Chlorinated Biphenyls (WHO 12)	U	0.012	**8.1**	0.041	**7.0**
			Sum :	0.19	**9.4**	0.20	**8.4**

Soil

Customer Sample Reference : HEP-BH-32
Our Sample Reference : 701803 025
Moisture Content : 19.6 %
Hole ID : HEP-BH-32
Depth : 2.30
Top Depth : 2.30
Date Sampled : 29-NOV-2017
Time Sampled : 09:30
AGS Type : ES
AGS Sample ID : HEPBH3220171129001
AGS Sample Reference : 13
Matrix Class : Sandy Soil

Dioxins and Furans (Based on US EPA 1613)

Technique : GC/MS (HR)

						WHO2005 Toxic Equivalents ng/kg		WHO Toxic Equivalents ng/kg	
Determinand	**Symbol**	**Result ng/kg As Received @20% Moisture**	**LOD As Received @20% Moisture**	**Lower Bound ng/kg @ 0% Moisture**	**LOD @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**
2,3,7,8-TCDD	U	<0.20	0.20	<0.25	0.25	0.0	**0.25**	0.0	**0.25**
1,2,3,7,8-PeCDD	U	<0.20	0.20	<0.25	0.25	0.0	**0.25**	0.0	**0.25**
1,2,3,4,7,8-HxCDD	U	<0.20	0.20	<0.25	0.25	0.0	**0.025**	0.0	**0.025**
1,2,3,6,7,8-HxCDD	U	<0.22	0.22	<0.27	0.27	0.0	**0.027**	0.0	**0.027**
1,2,3,7,8,9-HxCDD	U	<0.29	0.29	<0.36	0.36	0.0	**0.036**	0.0	**0.036**
1,2,3,4,6,7,8-HpCDD	U	**8.0**	0.22	10	0.27	0.10	**0.10**	0.10	**0.10**
OCDD	U	**67**	0.39	83	0.48	0.025	**0.025**	0.0083	**0.0083**
					Dioxins Totals :	0.13	**0.71**	0.11	**0.69**
2,3,7,8-TCDF	U	<0.45	0.45	<0.56	0.56	0.0	**0.056**	0.0	**0.056**
1,2,3,7,8-PeCDF	U	<0.20	0.20	<0.25	0.25	0.0	**0.0075**	0.0	**0.012**
2,3,4,7,8-PeCDF	U	<0.58	0.58	<0.72	0.72	0.0	**0.22**	0.0	**0.36**
1,2,3,4,7,8-HxCDF	U	<0.50	0.50	<0.62	0.62	0.0	**0.062**	0.0	**0.062**
1,2,3,6,7,8-HxCDF	U	<0.50	0.50	<0.62	0.62	0.0	**0.062**	0.0	**0.062**
2,3,4,6,7,8-HxCDF	U	<0.65	0.65	<0.81	0.81	0.0	**0.081**	0.0	**0.081**
1,2,3,7,8,9-HxCDF	U	<0.20	0.20	<0.25	0.25	0.0	**0.025**	0.0	**0.025**
1,2,3,4,6,7,8-HpCDF	U	**3.9**	0.10	4.8	0.12	0.048	**0.048**	0.048	**0.048**
1,2,3,4,7,8,9-HpCDF	U	<0.20	0.20	<0.25	0.25	0.0	**0.0025**	0.0	**0.0025**
OCDF	U	**3.0**	0.27	3.7	0.34	0.0011	**0.0011**	0.00037	**0.00037**
					Furans Totals :	0.050	**0.56**	0.049	**0.71**
					Totals :	**0.17**	**1.3**	**0.16**	**1.4**

Poly-Chlorinated Biphenyls (WHO 12)

Technique : GC/MS (HR)

						WHO2005 Toxic Equivalents ng/kg		WHO Toxic Equivalents ng/kg	
Determinand	**Symbol**	**Result ng/kg As Received @20% Moisture**	**LOD As Received @20% Moisture**	**Lower Bound ng/kg @ 0% Moisture**	**LOD @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**
PCB BZ#77	U	<50	50	<62	62	0.0	**0.0062**	0.0	**0.0062**
PCB BZ#81	U	<50	50	<62	62	0.0	**0.019**	0.0	**0.0062**
PCB BZ#105	U	**120**	50	150	62	0.0045	**0.0045**	0.015	**0.015**
PCB BZ#114	U	<50	50	<62	62	0.0	**0.0019**	0.0	**0.031**

PCB BZ#118	U	**210**	50	260	62	0.0078	**0.0078**	0.026	**0.026**
PCB BZ#123	U	(2) <70	70	<87	87	0.0	**0.0026**	0.0	**0.0087**
PCB BZ#126	U	<50	50	<62	62	0.0	**6.2**	0.0	**6.2**
PCB BZ#156	U	<50	50	<62	62	0.0	**0.0019**	0.0	**0.031**
PCB BZ#157	U	<50	50	<62	62	0.0	**0.0019**	0.0	**0.031**
PCB BZ#167	U	(2) <130	130	<160	160	0.0	**0.0049**	0.0	**0.0016**
PCB BZ#169	U	<50	50	<62	62	0.0	**1.9**	0.0	**0.62**
PCB BZ#189	U	<50	50	<62	62	0.0	**0.0019**	0.0	**0.0062**
					Totals :	**0.012**	**8.1**	**0.041**	**7.0**

Concept Reference: 701803
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**701803 001**	**701803 003**	**701803 007**	**701803 015**	**701803 016**
				Customer Sample Reference	**HEP-BH-12**	**HEP-BH-12**	**HEP-BH-12**	**HEP-BH-25**	**HEP-BH-27**
				Test Sample	**AR**	**AR**	**AR**	**AR**	**AR**
				Hole ID	**HEP-BH-12**	**HEP-BH-12**	**HEP-BH-12**	**HEP-BH-25**	**HEP-BH-27**
				Top Depth	**0.05**	**0.80**	**2.30**	**1.00**	**0.20**
				Depth	**0.05**	**0.80**	**2.30**	**1.00**	**0.20**
				Date Sampled	**27-NOV-2017**	**27-NOV-2017**	**29-NOV-2017**	**30-NOV-2017**	**01-DEC-2017**
				Time Sampled	**00:00**		**12:30**	**10:00**	**09:30**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH122017112 7001**	**HEPBH122017112 7003**	**HEPBH122017112 9003**	**HEPBH252017113 0002**	**FES2171201001**
				AGS Sample Reference	**1**	**7**	**22**	**4**	**1**
				Matrix Class	**Topsoil**	**Sandy Soil**	**Fill**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**LOD**	**Units**	**Symbol**					
Moisture @105C	Grav (1 Dec) (105 C)	0.1	%	N	**14**	**29**	**2.6**	**7.2**	**14**

Concept Reference: 701803
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**701803 017**	**701803 019**	**701803 023**	**701803 025**	**701803 027**
				Customer Sample Reference	**HEP-BH-27**	**HEP-BH-27**	**HEP-BH-32**	**HEP-BH-32**	**HEP-BH-32**
				Test Sample	**AR**	**AR**	**AR**	**AR**	**AR**
				Hole ID	**HEP-BH-27**	**HEP-BH-27**	**HEP-BH-32**	**HEP-BH-32**	**HEP-BH-32**
				Top Depth	**1.00**	**2.80**	**0.20**	**2.30**	**4.40**
				Depth	**1.00**	**2.80**	**0.20**	**2.30**	**4.40**
				Date Sampled	**01-DEC-2017**	**01-DEC-2017**	**28-NOV-2017**	**29-NOV-2017**	**29-NOV-2017**
				Time Sampled	**10:00**	**12:30**	**15:30**	**09:30**	**10:30**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**FES2171201004**	**FES2171201010**	**HEPBH322017112 8001**	**HEPBH322017112 9001**	**HEPBH322017112 9003**
				AGS Sample Reference	**4**	**10**	**3**	**13**	**19**
				Matrix Class	**Sandy Soil**	**Fill**	**Topsoil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**LOD**	**Units**	**Symbol**					
Moisture @105C	Grav (1 Dec) (105 C)	0.1	%	N	**22**	**1.3**	**16**	**20**	**21**

Concept Reference: 701803
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**701803 028**	**701803 029**	**701803 030**	**701803 034**	**701803 036**
				Customer Sample Reference	**HEP-BH-32**	**HEP-BH-32**	**HEP-BH-32**	**HEP-BH-33**	**HEP-BH-826**
				Test Sample	**AR**	**AR**	**AR**	**AR**	**AR**
				Hole ID	**HEP-BH-32**	**HEP-BH-32**	**HEP-BH-32**	**HEP-BH-33**	**HEP-BH-826**
				Top Depth	**5.30**	**6.40**	**7.50**	**0.30**	**0.60**
				Depth	**5.30**	**6.40**	**7.50**	**0.30**	**0.60**
				Date Sampled	**29-NOV-2017**	**29-NOV-2017**	**30-NOV-2017**	**01-DEC-2017**	**23-NOV-2017**
				Time Sampled	**11:00**	**13:00**	**14:00**	**12:40**	**16:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH322017112 9004**	**HEPBH322017112 9005**	**HEPBH322017113 0001**	**HEPBH332017120 1002**	**FES1171123005**
				AGS Sample Reference	**22**	**26**	**29**	**4**	**5**
				Matrix Class	**Fill**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**LOD**	**Units**	**Symbol**					
Moisture @105C	Grav (1 Dec) (105 C)	0.1	%	N	**12**	**22**	**11**	**9.6**	**6.8**

Concept Reference: 701803
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**701803 001**	**701803 003**	**701803 007**	**701803 015**	**701803 016**
				Customer Sample Reference	**HEP-BH-12**	**HEP-BH-12**	**HEP-BH-12**	**HEP-BH-25**	**HEP-BH-27**
				Test Sample	**M40**	**M40**	**M40**	**M40**	**M40**
				Hole ID	**HEP-BH-12**	**HEP-BH-12**	**HEP-BH-12**	**HEP-BH-25**	**HEP-BH-27**
				Top Depth	**0.05**	**0.80**	**2.30**	**1.00**	**0.20**
				Depth	**0.05**	**0.80**	**2.30**	**1.00**	**0.20**
				Date Sampled	**27-NOV-2017**	**27-NOV-2017**	**29-NOV-2017**	**30-NOV-2017**	**01-DEC-2017**
				Time Sampled	**00:00**		**12:30**	**10:00**	**09:30**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH12201711270 01**	**HEPBH12201711270 03**	**HEPBH12201711290 03**	**HEPBH25201711300 02**	**FES2171201001**
				AGS Sample Reference	**1**	**7**	**22**	**4**	**1**
				Matrix Class	**Topsoil**	**Sandy Soil**	**Fill**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**LOD**	**Units**	**Symbol**					
Retained on 10mm sieve	Grav	0.1	%	N	<0.1	<0.1	<0.1	<0.1	<0.1

Concept Reference: 701803
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**701803 017**	**701803 019**	**701803 023**	**701803 025**	**701803 027**
				Customer Sample Reference	**HEP-BH-27**	**HEP-BH-27**	**HEP-BH-32**	**HEP-BH-32**	**HEP-BH-32**
				Test Sample	**M40**	**M40**	**M40**	**M40**	**M40**
				Hole ID	**HEP-BH-27**	**HEP-BH-27**	**HEP-BH-32**	**HEP-BH-32**	**HEP-BH-32**
				Top Depth	**1.00**	**2.80**	**0.20**	**2.30**	**4.40**
				Depth	**1.00**	**2.80**	**0.20**	**2.30**	**4.40**
				Date Sampled	**01-DEC-2017**	**01-DEC-2017**	**28-NOV-2017**	**29-NOV-2017**	**29-NOV-2017**
				Time Sampled	**10:00**	**12:30**	**15:30**	**09:30**	**10:30**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**FES2171201004**	**FES2171201010**	**HEPBH32201711280 01**	**HEPBH32201711290 01**	**HEPBH32201711290 03**
				AGS Sample Reference	**4**	**10**	**3**	**13**	**19**
				Matrix Class	**Sandy Soil**	**Fill**	**Topsoil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**LOD**	**Units**	**Symbol**					
Retained on 10mm sieve	Grav	0.1	%	N	<0.1	<0.1	<0.1	<0.1	<0.1

Concept Reference: 701803
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**701803 028**	**701803 029**	**701803 030**	**701803 034**	**701803 036**
				Customer Sample Reference	**HEP-BH-32**	**HEP-BH-32**	**HEP-BH-32**	**HEP-BH-33**	**HEP-BH-826**
				Test Sample	**M40**	**M40**	**M40**	**M40**	**M40**
				Hole ID	**HEP-BH-32**	**HEP-BH-32**	**HEP-BH-32**	**HEP-BH-33**	**HEP-BH-826**
				Top Depth	**5.30**	**6.40**	**7.50**	**0.30**	**0.60**
				Depth	**5.30**	**6.40**	**7.50**	**0.30**	**0.60**
				Date Sampled	**29-NOV-2017**	**29-NOV-2017**	**30-NOV-2017**	**01-DEC-2017**	**23-NOV-2017**
				Time Sampled	**11:00**	**13:00**	**14:00**	**12:40**	**16:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH32201711290 04**	**HEPBH32201711290 05**	**HEPBH32201711300 01**	**HEPBH33201712010 02**	**FES1171123005**
				AGS Sample Reference	**22**	**26**	**29**	**4**	**5**
				Matrix Class	**Fill**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**LOD**	**Units**	**Symbol**					
Retained on 10mm sieve	Grav	0.1	%	N	<0.1	<0.1	<0.1	<0.1	<0.1

Index to symbols used in Fifth Supplemental A 701803-3

Value	Description
AR	As Received
M40	Analysis conducted on sample assisted dried at no more than 40C. Results are reported on a dry weight basis.
2	LOD Raised Due to Matrix Interference
U	Analysis is UKAS accredited
N	Analysis is not UKAS accredited

Notes

"Fill" samples are outside the scope of our MCERTS accreditation. Results are UKAS only
Fifth Supplemental A to report Dioxins and PCBS only

CONCEPT LIFE SCIENCES
DELIVERING SCIENCE

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Concept Life Sciences

Certificate of Analysis

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M16 9FE
Tel : 0161 874 2400
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Report Number: Third Supplemental B 701835-2

Date of Report: 27-Jun-2018

Customer: Fugro GeoServices
Fugro House
Hithercroft Road
Wallingford
Oxfordshire
OX10 9RB

Customer Contact: Ms Karen Blackmore

Customer Job Reference:
Customer Purchase Order: 56642KB-WAL
Customer Site Reference: Heathrow HEP Package 3
Date Job Received at Concept: 22-Nov-2017
Date Analysis Started: 07-Dec-2017
Date Analysis Completed: 23-Jan-2018

The results reported relate to samples received in the laboratory and may not be representative of a whole batch.

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation

This report should not be reproduced except in full without the written approval of the laboratory

Tests covered by this certificate were conducted in accordance with Concept Life Sciences SOPs

All results have been reviewed in accordance with Section 25 of the Concept Life Sciences, Analytical Services Quality Manual

UKAS TESTING
1549

mCERTS
THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME

Report checked
and authorised by :
Sara Abou-Shakra
Customer Service Manager

Issued by :
David Catterall
Laboratory Manager

Concept Reference: 701835
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**701835 004**	**701835 006**	**701835 008**	**701835 009**	**701835 010**
				Customer Sample Reference	**HEP-BH-22**	**HEP-BH-22**	**HEP-BH-22**	**HEP-BH-22**	**HEP-BH-22**
				Top Depth	**0.20**	**2.30**	**4.20**	**5.20**	**6.60**
				Hole ID	**HEP-BH-22**	**HEP-BH-22**	**HEP-BH-22**	**HEP-BH-22**	**HEP-BH-22**
				Depth	**0.20**	**2.30**	**4.20**	**5.20**	**6.60**
				Date Sampled	**21-NOV-2017**	**22-NOV-2017**	**22-NOV-2017**	**22-NOV-2017**	**22-NOV-2017**
				Time Sampled	**14:28**	**10:45**	**11:35**	**13:35**	**15:25**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**FES4171121002**	**FES4171122004**	**FES4171122011**	**FES4171122014**	**FES4171122016**
				AGS Sample Reference	**2**	**9**	**14**	**17**	**19**
				Matrix Class	**Topsoil**	**Clay**	**Clay**	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Moisture @105C	T162	AR	0.1	%	**11**	**24**	**21**	**25**	**28**
Retained on 10mm sieve	T2	M40	0.1	%	<0.1	<0.1	<0.1	<0.1	<0.1

Concept Reference: 701835
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**701835 012**	**701835 014**	**701835 016**	**701835 017**	**701835 019**
				Customer Sample Reference	**HEP-BH-23**	**HEP-BH-24**	**HEP-BH-50**	**HEP-BH-50**	**HEP-BH-50**
				Top Depth	**1.00**	**1.00**	**0.40**	**1.15**	**2.40**
				Hole ID	**HEP-BH-23**	**HEP-BH-24**	**HEP-BH-50**	**HEP-BH-50**	**HEP-BH-50**
				Depth	**1.00**	**1.00**	**0.40**	**1.15**	**2.40**
				Date Sampled	**30-NOV-2017**	**27-NOV-2017**	**21-NOV-2017**	**21-NOV-2017**	**21-NOV-2017**
				Time Sampled	**14:10**	**09:30**	**14:43**	**15:00**	**15:50**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH2320171130002**	**FES2171127004**	**FES1171121006**	**FES1171121009**	**FES1171121017**
				AGS Sample Reference	**4**	**4**	**6**	**9**	**17**
				Matrix Class	**Topsoil**	**Topsoil**	**Topsoil**	**Topsoil**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Moisture @105C	T162	AR	0.1	%	**11**	**6.6**	**5.1**	**5.6**	**23**
Retained on 10mm sieve	T2	M40	0.1	%	<0.1	<0.1	<0.1	<0.1	<0.1

Concept Reference: 701835
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**701835 023**	**701835 024**	**701835 025**	**701835 036**	**701835 037**
				Customer Sample Reference	**HEP-BH-1802**	**HEP-BH-1802**	**HEP-BH-1805**	**HEP-BH-823**	**HEP-BH-823**
				Top Depth	**0.30**	**0.80**	**2.00**	**0.40**	**1.00**
				Hole ID	**HEP-BH-1802**	**HEP-BH-1802**	**HEP-BH-1805**	**HEP-BH-823**	**HEP-BH-823**
				Depth	**0.30**	**0.80**	**2.00**	**0.40**	**1.00**
				Date Sampled	**27-NOV-2017**	**27-NOV-2017**	**27-NOV-2017**	**30-NOV-2017**	**30-NOV-2017**
				Time Sampled	**11:30**	**11:40**	**13:15**	**13:00**	**14:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH1802201711270 02**	**HEPBH1802201711270 03**	**HEPBH1805201711270 01**	**FES1171130003**	**FES1171130006**
				AGS Sample Reference	**4**	**7**	**9**	**3**	**6**
				Matrix Class	**Clay**	**Topsoil**	**Sandy Soil**	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Moisture @105C	T162	AR	0.1	%	**42**	**21**	**2.2**	**13**	**13**
Retained on 10mm sieve	T2	M40	0.1	%	<0.1	<0.1	<0.1	<0.1	<0.1

Concept Reference: 701835
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

Concept Reference	**701835 039**	**701835 040**	**701835 041**	**701835 048**	**701835 050**
Customer Sample Reference	**HEP-BH-823**	**HEP-BH-823**	**HEP-BH-823**	**HEP-TT-6**	**HEP-TT-6**
Top Depth	**3.00**	**4.20**	**4.40**	**0.00**	**0.80**
Hole ID	**HEP-BH-823**	**HEP-BH-823**	**HEP-BH-823**	**HEP-TT-6**	**HEP-TT-6**
Depth	**3.00**	**4.20**	**4.40**	**0.00**	**0.80**
Date Sampled	**30-NOV-2017**	**30-NOV-2017**	**30-NOV-2017**	**23-NOV-2017**	**23-NOV-2017**
Time Sampled	**15:00**	**09:10**	**09:20**	**09:10**	**10:30**
AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**FES1171130013**	**FES1171130019**	**FES1171130022**	**HEPTT620171123001**	**HEPTT620171123003**
AGS Sample Reference	**13**	**19**	**22**	**1**	**7**
Matrix Class	**Clay**	**Clay**	**Topsoil**	**Topsoil**	**Clay**

Determinand	Method	Test Sample	LOD	Units					
Moisture @105C	T162	AR	0.1	%	**16**	**18**	**14**	**31**	**28**
Retained on 10mm sieve	T2	M40	0.1	%	<0.1	<0.1	<0.1	<0.1	<0.1

Concept Reference: 701835
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Inorganics

Concept Reference	**701835 004**	**701835 006**	**701835 008**	**701835 009**	**701835 010**
Customer Sample Reference	**HEP-BH-22**	**HEP-BH-22**	**HEP-BH-22**	**HEP-BH-22**	**HEP-BH-22**
Top Depth	**0.20**	**2.30**	**4.20**	**5.20**	**6.60**
Hole ID	**HEP-BH-22**	**HEP-BH-22**	**HEP-BH-22**	**HEP-BH-22**	**HEP-BH-22**
Depth	**0.20**	**2.30**	**4.20**	**5.20**	**6.60**
Date Sampled	**21-NOV-2017**	**22-NOV-2017**	**22-NOV-2017**	**22-NOV-2017**	**22-NOV-2017**
Time Sampled	**14:28**	**10:45**	**11:35**	**13:35**	**15:25**
AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**FES4171121002**	**FES4171122004**	**FES4171122011**	**FES4171122014**	**FES4171122016**
AGS Sample Reference	**2**	**9**	**14**	**17**	**19**
Matrix Class	**Topsoil**	**Clay**	**Clay**	**Clay**	**Clay**

Determinand	Method	Test Sample	LOD	Units					
Chloride	T686	AR	1	mg/kg	**14**	**160**	**17**	**61**	**43**
Cyanide(Total)	T4	AR	1	mg/kg	<1	<1	<1	<1	<1
Thiocyanate	T4	A40	1	mg/kg	<1	<1	<1	<1	<1
Nitrate	T686	AR	1	mg/kg	**37**	<1	<1	<1	<1
Nitrite	T686	AR	1	mg/kg	<1	<1	<1	<1	<1
SO4(Total)	T6	A40	0.01	%	**2.3**	**1.0**	**0.69**	**0.22**	**0.28**
Sulphide	T4	AR	10	mg/kg	<10	**96**	**20**	**44**	**34**

Concept Reference: 701835
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - Inorganics

				Concept Reference	**701835 012**	**701835 014**	**701835 023**	**701835 024**	**701835 025**
				Customer Sample Reference	**HEP-BH-23**	**HEP-BH-24**	**HEP-BH-1802**	**HEP-BH-1802**	**HEP-BH-1805**
				Top Depth	**1.00**	**1.00**	**0.30**	**0.80**	**2.00**
				Hole ID	**HEP-BH-23**	**HEP-BH-24**	**HEP-BH-1802**	**HEP-BH-1802**	**HEP-BH-1805**
				Depth	**1.00**	**1.00**	**0.30**	**0.80**	**2.00**
				Date Sampled	**30-NOV-2017**	**27-NOV-2017**	**27-NOV-2017**	**27-NOV-2017**	**27-NOV-2017**
				Time Sampled	**14:10**	**09:30**	**11:30**	**11:40**	**13:15**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH2320171130002**	**FES2171127004**	**HEPBH1802201711270 02**	**HEPBH1802201711270 03**	**HEPBH1805201711270 01**
				AGS Sample Reference	**4**	**4**	**4**	**7**	**9**
				Matrix Class	**Topsoil**	**Topsoil**	**Clay**	**Topsoil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Chloride	T686	AR	1	mg/kg	**5**	**44**	**18**	**17**	**5**
Cyanide(Total)	T4	AR	1	mg/kg	<1	<1	<1	<1	<1
Thiocyanate	T4	A40	1	mg/kg	<1	<1	<1	<1	<1
Nitrate	T686	AR	1	mg/kg	**7**	**1**	<1	<1	<1
Nitrite	T686	AR	1	mg/kg	<1	**1**	<1	<1	<1
SO4(Total)	T6	A40	0.01	%	**0.16**	**0.71**	**0.15**	**0.10**	**0.03**
Sulphide	T4	AR	10	mg/kg	<10	**20**	<10	<10	<10

Concept Reference: 701835
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - Inorganics

				Concept Reference	**701835 036**	**701835 037**	**701835 039**	**701835 040**	**701835 041**
				Customer Sample Reference	**HEP-BH-823**	**HEP-BH-823**	**HEP-BH-823**	**HEP-BH-823**	**HEP-BH-823**
				Top Depth	**0.40**	**1.00**	**3.00**	**4.20**	**4.40**
				Hole ID	**HEP-BH-823**	**HEP-BH-823**	**HEP-BH-823**	**HEP-BH-823**	**HEP-BH-823**
				Depth	**0.40**	**1.00**	**3.00**	**4.20**	**4.40**
				Date Sampled	**30-NOV-2017**	**30-NOV-2017**	**30-NOV-2017**	**30-NOV-2017**	**30-NOV-2017**
				Time Sampled	**13:00**	**14:00**	**15:00**	**09:10**	**09:20**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**FES1171130003**	**FES1171130006**	**FES1171130013**	**FES1171130019**	**FES1171130022**
				AGS Sample Reference	**3**	**6**	**13**	**19**	**22**
				Matrix Class	**Clay**	**Clay**	**Clay**	**Clay**	**Topsoil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Chloride	T686	AR	1	mg/kg	**6**	**15**	**17**	**18**	**23**
Cyanide(Total)	T4	AR	1	mg/kg	<1	<1	<1	<1	<1
Thiocyanate	T4	A40	1	mg/kg	<1	<1	<1	<1	<1
Nitrate	T686	AR	1	mg/kg	**47**	<1	**3**	<1	<1
Nitrite	T686	AR	1	mg/kg	<1	<1	<1	<1	<1
SO4(Total)	T6	A40	0.01	%	**0.36**	**0.10**	**0.04**	**0.05**	**0.04**
Sulphide	T4	AR	10	mg/kg	**16**	**69**	**20**	**300**	<10

Concept Reference: 701835
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Inorganics

				Concept Reference	**701835 048**	**701835 050**
				Customer Sample Reference	**HEP-TT-6**	**HEP-TT-6**
				Top Depth	**0.00**	**0.80**
				Hole ID	**HEP-TT-6**	**HEP-TT-6**
				Depth	**0.00**	**0.80**
				Date Sampled	**23-NOV-2017**	**23-NOV-2017**
				Time Sampled	**09:10**	**10:30**
				AGS Type	**ES**	**ES**
				AGS Sample ID	**HEPTT620171123001**	**HEPTT620171123003**
				AGS Sample Reference	**1**	**7**
				Matrix Class	**Topsoil**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**		
Chloride	T686	AR	1	mg/kg	**34**	**24**
Cyanide(Total)	T4	AR	1	mg/kg	<1	<1
Thiocyanate	T4	A40	1	mg/kg	<1	<1
Nitrate	T686	AR	1	mg/kg	**16**	**3**
Nitrite	T686	AR	1	mg/kg	<1	<1
SO4(Total)	T6	A40	0.01	%	**0.16**	**0.32**
Sulphide	T4	AR	10	mg/kg	**16**	**100**

Concept Reference: 701835
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Misc

				Concept Reference	**701835 004**	**701835 006**	**701835 008**	**701835 009**	**701835 010**
				Customer Sample Reference	**HEP-BH-22**	**HEP-BH-22**	**HEP-BH-22**	**HEP-BH-22**	**HEP-BH-22**
				Top Depth	**0.20**	**2.30**	**4.20**	**5.20**	**6.60**
				Hole ID	**HEP-BH-22**	**HEP-BH-22**	**HEP-BH-22**	**HEP-BH-22**	**HEP-BH-22**
				Depth	**0.20**	**2.30**	**4.20**	**5.20**	**6.60**
				Date Sampled	**21-NOV-2017**	**22-NOV-2017**	**22-NOV-2017**	**22-NOV-2017**	**22-NOV-2017**
				Time Sampled	**14:28**	**10:45**	**11:35**	**13:35**	**15:25**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**FES4171121002**	**FES4171122004**	**FES4171122011**	**FES4171122014**	**FES4171122016**
				AGS Sample Reference	**2**	**9**	**14**	**17**	**19**
				Matrix Class	**Topsoil**	**Clay**	**Clay**	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Soil Organic Matter	T287	A40	0.1	%	**3.9**	**1.1**	**1.7**	**1.1**	**2.3**
pH	T7	AR			**7.4**	**9.5**	**8.3**	**9.8**	**9.3**

Concept Reference: 701835
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Misc

				Concept Reference	**701835 012**	**701835 014**	**701835 023**	**701835 024**	**701835 025**
				Customer Sample Reference	**HEP-BH-23**	**HEP-BH-24**	**HEP-BH-1802**	**HEP-BH-1802**	**HEP-BH-1805**
				Top Depth	**1.00**	**1.00**	**0.30**	**0.80**	**2.00**
				Hole ID	**HEP-BH-23**	**HEP-BH-24**	**HEP-BH-1802**	**HEP-BH-1802**	**HEP-BH-1805**
				Depth	**1.00**	**1.00**	**0.30**	**0.80**	**2.00**
				Date Sampled	**30-NOV-2017**	**27-NOV-2017**	**27-NOV-2017**	**27-NOV-2017**	**27-NOV-2017**
				Time Sampled	**14:10**	**09:30**	**11:30**	**11:40**	**13:15**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH2320171130002**	**FES2171127004**	**HEPBH1802201711270 02**	**HEPBH1802201711270 03**	**HEPBH1805201711270 01**
				AGS Sample Reference	**4**	**4**	**4**	**7**	**9**
				Matrix Class	**Topsoil**	**Topsoil**	**Clay**	**Topsoil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Soil Organic Matter	T287	A40	0.1	%	**19**	**3.3**	**3.7**	**2.6**	**0.3**
pH	T7	AR			**8.1**	**9.5**	**7.9**	**7.7**	**8.0**

Concept Reference: 701835
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Misc

				Concept Reference	**701835 036**	**701835 037**	**701835 039**	**701835 040**	**701835 041**
				Customer Sample Reference	**HEP-BH-823**	**HEP-BH-823**	**HEP-BH-823**	**HEP-BH-823**	**HEP-BH-823**
				Top Depth	**0.40**	**1.00**	**3.00**	**4.20**	**4.40**
				Hole ID	**HEP-BH-823**	**HEP-BH-823**	**HEP-BH-823**	**HEP-BH-823**	**HEP-BH-823**
				Depth	**0.40**	**1.00**	**3.00**	**4.20**	**4.40**
				Date Sampled	**30-NOV-2017**	**30-NOV-2017**	**30-NOV-2017**	**30-NOV-2017**	**30-NOV-2017**
				Time Sampled	**13:00**	**14:00**	**15:00**	**09:10**	**09:20**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**FES1171130003**	**FES1171130006**	**FES1171130013**	**FES1171130019**	**FES1171130022**
				AGS Sample Reference	**3**	**6**	**13**	**19**	**22**
				Matrix Class	**Clay**	**Clay**	**Clay**	**Clay**	**Topsoil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Soil Organic Matter	T287	A40	0.1	%	**3.9**	**1.7**	**13**	**0.5**	**0.9**
pH	T7	AR			**7.7**	**8.0**	**7.8**	**7.9**	**8.0**

Concept Reference: 701835
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Misc

				Concept Reference	**701835 048**	**701835 050**
				Customer Sample Reference	**HEP-TT-6**	**HEP-TT-6**
				Top Depth	**0.00**	**0.80**
				Hole ID	**HEP-TT-6**	**HEP-TT-6**
				Depth	**0.00**	**0.80**
				Date Sampled	**23-NOV-2017**	**23-NOV-2017**
				Time Sampled	**09:10**	**10:30**
				AGS Type	**ES**	**ES**
				AGS Sample ID	**HEPTT620171123001**	**HEPTT620171123003**
				AGS Sample Reference	**1**	**7**
				Matrix Class	**Topsoil**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**		
Soil Organic Matter	T287	A40	0.1	%	**0.5**	**1.3**
pH	T7	AR			**7.6**	**7.6**

Concept Reference: 701835
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings Metals and Metalloids

				Concept Reference	**701835 004**	**701835 006**	**701835 008**	**701835 009**	**701835 010**
				Customer Sample Reference	**HEP-BH-22**	**HEP-BH-22**	**HEP-BH-22**	**HEP-BH-22**	**HEP-BH-22**
				Top Depth	**0.20**	**2.30**	**4.20**	**5.20**	**6.60**
				Hole ID	**HEP-BH-22**	**HEP-BH-22**	**HEP-BH-22**	**HEP-BH-22**	**HEP-BH-22**
				Depth	**0.20**	**2.30**	**4.20**	**5.20**	**6.60**
				Date Sampled	**21-NOV-2017**	**22-NOV-2017**	**22-NOV-2017**	**22-NOV-2017**	**22-NOV-2017**
				Time Sampled	**14:28**	**10:45**	**11:35**	**13:35**	**15:25**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**FES4171121002**	**FES4171122004**	**FES4171122011**	**FES4171122014**	**FES4171122016**
				AGS Sample Reference	**2**	**9**	**14**	**17**	**19**
				Matrix Class	**Topsoil**	**Clay**	**Clay**	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Arsenic	T6	M40	2	mg/kg	**11**	**15**	**18**	**22**	**22**
Cadmium	T6	M40	1	mg/kg	<1	<1	<1	<1	<1
Chromium	T6	M40	1	mg/kg	**31**	**40**	**35**	**32**	**35**
Iron	T6	A40	1	mg/kg	**21000**	**30000**	**31000**	**30000**	**35000**
Lead	T6	M40	1	mg/kg	**120**	**260**	**420**	**110**	**150**
Manganese	T6	M40	1	mg/kg	**280**	**300**	**350**	**360**	**400**
Mercury	T6	M40	1	mg/kg	<1	<1	<1	<1	<1
Nickel	T6	M40	1	mg/kg	**23**	**29**	**30**	**30**	**34**
Selenium	T6	M40	3	mg/kg	<3	<3	<3	<3	<3
Copper	T6	M40	1	mg/kg	**50**	**61**	**200**	**47**	**56**
Zinc	T6	M40	1	mg/kg	**160**	**250**	**430**	**180**	**160**
Boron (water-soluble)	T6	AR	1	mg/kg	<1	<1	<1	<1	<1

Concept Reference: 701835
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings Metals and Metalloids

				Concept Reference	**701835 012**	**701835 014**	**701835 023**	**701835 024**	**701835 025**
				Customer Sample Reference	**HEP-BH-23**	**HEP-BH-24**	**HEP-BH-1802**	**HEP-BH-1802**	**HEP-BH-1805**
				Top Depth	**1.00**	**1.00**	**0.30**	**0.80**	**2.00**
				Hole ID	**HEP-BH-23**	**HEP-BH-24**	**HEP-BH-1802**	**HEP-BH-1802**	**HEP-BH-1805**
				Depth	**1.00**	**1.00**	**0.30**	**0.80**	**2.00**
				Date Sampled	**30-NOV-2017**	**27-NOV-2017**	**27-NOV-2017**	**27-NOV-2017**	**27-NOV-2017**
				Time Sampled	**14:10**	**09:30**	**11:30**	**11:40**	**13:15**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH2320171130002**	**FES2171127004**	**HEPBH1802201711270 02**	**HEPBH1802201711270 03**	**HEPBH1805201711270 01**
				AGS Sample Reference	**4**	**4**	**4**	**7**	**9**
				Matrix Class	**Topsoil**	**Topsoil**	**Clay**	**Topsoil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Arsenic	T6	M40	2	mg/kg	**33**	**23**	**13**	**12**	**5**
Cadmium	T6	M40	1	mg/kg	**1**	<1	<1	<1	<1
Chromium	T6	M40	1	mg/kg	**71**	**44**	**44**	**22**	**18**
Iron	T6	A40	1	mg/kg	**40000**	**37000**	**32000**	**8200**	**7700**
Lead	T6	M40	1	mg/kg	**580**	**420**	**60**	**16**	**19**
Manganese	T6	M40	1	mg/kg	**530**	**360**	**250**	**65**	**90**
Mercury	T6	M40	1	mg/kg	**3**	<1	<1	<1	<1
Nickel	T6	M40	1	mg/kg	**69**	**32**	**34**	**17**	**12**
Selenium	T6	M40	3	mg/kg	<3	<3	<3	<3	<3
Copper	T6	M40	1	mg/kg	**190**	**150**	**34**	**10**	**9**
Zinc	T6	M40	1	mg/kg	**560**	**370**	**100**	**45**	**27**
Boron (water-soluble)	T6	AR	1	mg/kg	<1	<1	<1	<1	<1

Concept Reference: 701835
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings Metals and Metalloids

Concept Reference					**701835 036**	**701835 037**	**701835 039**	**701835 040**	**701835 041**
Customer Sample Reference					**HEP-BH-823**	**HEP-BH-823**	**HEP-BH-823**	**HEP-BH-823**	**HEP-BH-823**
Top Depth					**0.40**	**1.00**	**3.00**	**4.20**	**4.40**
Hole ID					**HEP-BH-823**	**HEP-BH-823**	**HEP-BH-823**	**HEP-BH-823**	**HEP-BH-823**
Depth					**0.40**	**1.00**	**3.00**	**4.20**	**4.40**
Date Sampled					**30-NOV-2017**	**30-NOV-2017**	**30-NOV-2017**	**30-NOV-2017**	**30-NOV-2017**
Time Sampled					**13:00**	**14:00**	**15:00**	**09:10**	**09:20**
AGS Type					**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID					**FES1171130003**	**FES1171130006**	**FES1171130013**	**FES1171130019**	**FES1171130022**
AGS Sample Reference					**3**	**6**	**13**	**19**	**22**
Matrix Class					**Clay**	**Clay**	**Clay**	**Clay**	**Topsoil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Arsenic	T6	M40	2	mg/kg	**12**	**12**	**12**	**9**	**7**
Cadmium	T6	M40	1	mg/kg	**1**	<1	<1	<1	<1
Chromium	T6	M40	1	mg/kg	**55**	**30**	**28**	**28**	**24**
Iron	T6	A40	1	mg/kg	**22000**	**24000**	**31000**	**22000**	**17000**
Lead	T6	M40	1	mg/kg	**180**	**160**	**63**	**27**	**16**
Manganese	T6	M40	1	mg/kg	**330**	**350**	**590**	**310**	**240**
Mercury	T6	M40	1	mg/kg	<1	<1	<1	<1	<1
Nickel	T6	M40	1	mg/kg	**22**	**22**	**23**	**22**	**20**
Selenium	T6	M40	3	mg/kg	<3	<3	<3	<3	<3
Copper	T6	M40	1	mg/kg	**77**	**49**	**29**	**16**	**12**
Zinc	T6	M40	1	mg/kg	**260**	**150**	**72**	**57**	**44**
Boron (water-soluble)	T6	AR	1	mg/kg	<1	<1	<1	<1	<1

Concept Reference: 701835
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings Metals and Metalloids

Concept Reference					**701835 048**	**701835 050**
Customer Sample Reference					**HEP-TT-6**	**HEP-TT-6**
Top Depth					**0.00**	**0.80**
Hole ID					**HEP-TT-6**	**HEP-TT-6**
Depth					**0.00**	**0.80**
Date Sampled					**23-NOV-2017**	**23-NOV-2017**
Time Sampled					**09:10**	**10:30**
AGS Type					**ES**	**ES**
AGS Sample ID					**HEPTT620171123001**	**HEPTT620171123003**
AGS Sample Reference					**1**	**7**
Matrix Class					**Topsoil**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**		
Arsenic	T6	M40	2	mg/kg	**13**	**15**
Cadmium	T6	M40	1	mg/kg	**3**	<1
Chromium	T6	M40	1	mg/kg	**55**	**30**
Iron	T6	A40	1	mg/kg	**24000**	**27000**
Lead	T6	M40	1	mg/kg	**170**	**150**
Manganese	T6	M40	1	mg/kg	**320**	**230**
Mercury	T6	M40	1	mg/kg	<1	<1
Nickel	T6	M40	1	mg/kg	**30**	**29**
Selenium	T6	M40	3	mg/kg	<3	<3
Copper	T6	M40	1	mg/kg	**67**	**81**
Zinc	T6	M40	1	mg/kg	**200**	**180**
Boron (water-soluble)	T6	AR	1	mg/kg	<1	**1**

Concept Reference: 701835
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Chromium

				Concept Reference	**701835 004**	**701835 006**	**701835 008**	**701835 009**	**701835 010**
				Customer Sample Reference	**HEP-BH-22**	**HEP-BH-22**	**HEP-BH-22**	**HEP-BH-22**	**HEP-BH-22**
				Top Depth	**0.20**	**2.30**	**4.20**	**5.20**	**6.60**
				Hole ID	**HEP-BH-22**	**HEP-BH-22**	**HEP-BH-22**	**HEP-BH-22**	**HEP-BH-22**
				Depth	**0.20**	**2.30**	**4.20**	**5.20**	**6.60**
				Date Sampled	**21-NOV-2017**	**22-NOV-2017**	**22-NOV-2017**	**22-NOV-2017**	**22-NOV-2017**
				Time Sampled	**14:28**	**10:45**	**11:35**	**13:35**	**15:25**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**FES4171121002**	**FES4171122004**	**FES4171122011**	**FES4171122014**	**FES4171122016**
				AGS Sample Reference	**2**	**9**	**14**	**17**	**19**
				Matrix Class	**Topsoil**	**Clay**	**Clay**	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Chromium (trivalent)	T85	AR	2	mg/kg	**31**	**40**	**35**	**32**	**35**
Chromium VI	T6	AR	1	mg/kg	<1	<1	<1	<1	<1

Concept Reference: 701835
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Chromium

				Concept Reference	**701835 012**	**701835 014**	**701835 016**	**701835 017**	**701835 019**
				Customer Sample Reference	**HEP-BH-23**	**HEP-BH-24**	**HEP-BH-50**	**HEP-BH-50**	**HEP-BH-50**
				Top Depth	**1.00**	**1.00**	**0.40**	**1.15**	**2.40**
				Hole ID	**HEP-BH-23**	**HEP-BH-24**	**HEP-BH-50**	**HEP-BH-50**	**HEP-BH-50**
				Depth	**1.00**	**1.00**	**0.40**	**1.15**	**2.40**
				Date Sampled	**30-NOV-2017**	**27-NOV-2017**	**21-NOV-2017**	**21-NOV-2017**	**21-NOV-2017**
				Time Sampled	**14:10**	**09:30**	**14:43**	**15:00**	**15:50**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH2320171130002**	**FES2171127004**	**FES1171121006**	**FES1171121009**	**FES1171121017**
				AGS Sample Reference	**4**	**4**	**6**	**9**	**17**
				Matrix Class	**Topsoil**	**Topsoil**	**Topsoil**	**Topsoil**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Chromium (trivalent)	T85	AR	2	mg/kg	**71**	**44**	**29**	**21**	**39**
Chromium VI	T6	AR	1	mg/kg	<1	<1	<1	<1	<1

Concept Reference: 701835
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Chromium

				Concept Reference	**701835 023**	**701835 024**	**701835 025**	**701835 036**	**701835 037**
				Customer Sample Reference	**HEP-BH-1802**	**HEP-BH-1802**	**HEP-BH-1805**	**HEP-BH-823**	**HEP-BH-823**
				Top Depth	**0.30**	**0.80**	**2.00**	**0.40**	**1.00**
				Hole ID	**HEP-BH-1802**	**HEP-BH-1802**	**HEP-BH-1805**	**HEP-BH-823**	**HEP-BH-823**
				Depth	**0.30**	**0.80**	**2.00**	**0.40**	**1.00**
				Date Sampled	**27-NOV-2017**	**27-NOV-2017**	**27-NOV-2017**	**30-NOV-2017**	**30-NOV-2017**
				Time Sampled	**11:30**	**11:40**	**13:15**	**13:00**	**14:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH1802201711270 02**	**HEPBH1802201711270 03**	**HEPBH1805201711270 01**	**FES1171130003**	**FES1171130006**
				AGS Sample Reference	**4**	**7**	**9**	**3**	**6**
				Matrix Class	**Clay**	**Topsoil**	**Sandy Soil**	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Chromium (trivalent)	T85	AR	2	mg/kg	**44**	**22**	**18**	**55**	**30**
Chromium VI	T6	AR	1	mg/kg	<1	<1	<1	<1	<1

Concept Reference: 701835
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Chromium

				Concept Reference	**701835 039**	**701835 040**	**701835 041**	**701835 048**	**701835 050**
				Customer Sample Reference	**HEP-BH-823**	**HEP-BH-823**	**HEP-BH-823**	**HEP-TT-6**	**HEP-TT-6**
				Top Depth	**3.00**	**4.20**	**4.40**	**0.00**	**0.80**
				Hole ID	**HEP-BH-823**	**HEP-BH-823**	**HEP-BH-823**	**HEP-TT-6**	**HEP-TT-6**
				Depth	**3.00**	**4.20**	**4.40**	**0.00**	**0.80**
				Date Sampled	**30-NOV-2017**	**30-NOV-2017**	**30-NOV-2017**	**23-NOV-2017**	**23-NOV-2017**
				Time Sampled	**15:00**	**09:10**	**09:20**	**09:10**	**10:30**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**FES1171130013**	**FES1171130019**	**FES1171130022**	**HEPTT620171123001**	**HEPTT620171123003**
				AGS Sample Reference	**13**	**19**	**22**	**1**	**7**
				Matrix Class	**Clay**	**Clay**	**Topsoil**	**Topsoil**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Chromium (trivalent)	T85	AR	2	mg/kg	**28**	**28**	**24**	**55**	**30**
Chromium VI	T6	AR	1	mg/kg	<1	<1	<1	<1	<1

Concept Reference: 701835
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Total Phenol

				Concept Reference	**701835 004**	**701835 006**	**701835 008**	**701835 009**	**701835 010**
				Customer Sample Reference	**HEP-BH-22**	**HEP-BH-22**	**HEP-BH-22**	**HEP-BH-22**	**HEP-BH-22**
				Top Depth	**0.20**	**2.30**	**4.20**	**5.20**	**6.60**
				Hole ID	**HEP-BH-22**	**HEP-BH-22**	**HEP-BH-22**	**HEP-BH-22**	**HEP-BH-22**
				Depth	**0.20**	**2.30**	**4.20**	**5.20**	**6.60**
				Date Sampled	**21-NOV-2017**	**22-NOV-2017**	**22-NOV-2017**	**22-NOV-2017**	**22-NOV-2017**
				Time Sampled	**14:28**	**10:45**	**11:35**	**13:35**	**15:25**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**FES4171121002**	**FES4171122004**	**FES4171122011**	**FES4171122014**	**FES4171122016**
				AGS Sample Reference	**2**	**9**	**14**	**17**	**19**
				Matrix Class	**Topsoil**	**Clay**	**Clay**	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Phenols(Mono)	T4	AR	0.5	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0

Concept Reference: 701835
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Total Phenol

				Concept Reference	**701835 012**	**701835 014**	**701835 023**	**701835 024**	**701835 025**
				Customer Sample Reference	**HEP-BH-23**	**HEP-BH-24**	**HEP-BH-1802**	**HEP-BH-1802**	**HEP-BH-1805**
				Top Depth	**1.00**	**1.00**	**0.30**	**0.80**	**2.00**
				Hole ID	**HEP-BH-23**	**HEP-BH-24**	**HEP-BH-1802**	**HEP-BH-1802**	**HEP-BH-1805**
				Depth	**1.00**	**1.00**	**0.30**	**0.80**	**2.00**
				Date Sampled	**30-NOV-2017**	**27-NOV-2017**	**27-NOV-2017**	**27-NOV-2017**	**27-NOV-2017**
				Time Sampled	**14:10**	**09:30**	**11:30**	**11:40**	**13:15**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH2320171130002**	**FES2171127004**	**HEPBH1802201711270 02**	**HEPBH1802201711270 03**	**HEPBH1805201711270 01**
				AGS Sample Reference	**4**	**4**	**4**	**7**	**9**
				Matrix Class	**Topsoil**	**Topsoil**	**Clay**	**Topsoil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Phenols(Mono)	T4	AR	0.5	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0

Concept Reference: 701835
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - Total Phenol

Concept Reference					**701835 036**	**701835 037**	**701835 039**	**701835 040**	**701835 041**
Customer Sample Reference					**HEP-BH-823**	**HEP-BH-823**	**HEP-BH-823**	**HEP-BH-823**	**HEP-BH-823**
Top Depth					**0.40**	**1.00**	**3.00**	**4.20**	**4.40**
Hole ID					**HEP-BH-823**	**HEP-BH-823**	**HEP-BH-823**	**HEP-BH-823**	**HEP-BH-823**
Depth					**0.40**	**1.00**	**3.00**	**4.20**	**4.40**
Date Sampled					**30-NOV-2017**	**30-NOV-2017**	**30-NOV-2017**	**30-NOV-2017**	**30-NOV-2017**
Time Sampled					**13:00**	**14:00**	**15:00**	**09:10**	**09:20**
AGS Type					**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID					**FES1171130003**	**FES1171130006**	**FES1171130013**	**FES1171130019**	**FES1171130022**
AGS Sample Reference					**3**	**6**	**13**	**19**	**22**
Matrix Class					**Clay**	**Clay**	**Clay**	**Clay**	**Topsoil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Phenols(Mono)	T4	AR	0.5	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0

Concept Reference: 701835
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - Total Phenol

Concept Reference					**701835 048**	**701835 050**
Customer Sample Reference					**HEP-TT-6**	**HEP-TT-6**
Top Depth					**0.00**	**0.80**
Hole ID					**HEP-TT-6**	**HEP-TT-6**
Depth					**0.00**	**0.80**
Date Sampled					**23-NOV-2017**	**23-NOV-2017**
Time Sampled					**09:10**	**10:30**
AGS Type					**ES**	**ES**
AGS Sample ID					**HEPTT620171123001**	**HEPTT620171123003**
AGS Sample Reference					**1**	**7**
Matrix Class					**Topsoil**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**		
Phenols(Mono)	T4	AR	0.5	mg/kg	<1.0	<1.0

Concept Reference: 701835
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - Asbestos

Concept Reference					**701835 004**	**701835 006**	**701835 008**	**701835 009**	**701835 010**
Customer Sample Reference					**HEP-BH-22**	**HEP-BH-22**	**HEP-BH-22**	**HEP-BH-22**	**HEP-BH-22**
Top Depth					**0.20**	**2.30**	**4.20**	**5.20**	**6.60**
Hole ID					**HEP-BH-22**	**HEP-BH-22**	**HEP-BH-22**	**HEP-BH-22**	**HEP-BH-22**
Depth					**0.20**	**2.30**	**4.20**	**5.20**	**6.60**
Date Sampled					**21-NOV-2017**	**22-NOV-2017**	**22-NOV-2017**	**22-NOV-2017**	**22-NOV-2017**
Time Sampled					**14:28**	**10:45**	**11:35**	**13:35**	**15:25**
AGS Type					**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID					**FES4171121002**	**FES4171122004**	**FES4171122011**	**FES4171122014**	**FES4171122016**
AGS Sample Reference					**2**	**9**	**14**	**17**	**19**
Matrix Class					**Topsoil**	**Clay**	**Clay**	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Asbestos ID	T27	AR			N.D.	N.D.	N.D.	N.D.	N.D.

Concept Reference: 701835
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Asbestos

				Concept Reference	**701835 012**	**701835 014**	**701835 023**	**701835 024**	**701835 025**
				Customer Sample Reference	**HEP-BH-23**	**HEP-BH-24**	**HEP-BH-1802**	**HEP-BH-1802**	**HEP-BH-1805**
				Top Depth	**1.00**	**1.00**	**0.30**	**0.80**	**2.00**
				Hole ID	**HEP-BH-23**	**HEP-BH-24**	**HEP-BH-1802**	**HEP-BH-1802**	**HEP-BH-1805**
				Depth	**1.00**	**1.00**	**0.30**	**0.80**	**2.00**
				Date Sampled	**30-NOV-2017**	**27-NOV-2017**	**27-NOV-2017**	**27-NOV-2017**	**27-NOV-2017**
				Time Sampled	**14:10**	**09:30**	**11:30**	**11:40**	**13:15**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH2320171130002**	**FES2171127004**	**HEPBH1802201711270 02**	**HEPBH1802201711270 03**	**HEPBH1805201711270 01**
				AGS Sample Reference	**4**	**4**	**4**	**7**	**9**
				Matrix Class	**Topsoil**	**Topsoil**	**Clay**	**Topsoil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Asbestos ID	T27	AR			N.D.	N.D.	N.D.	N.D.	N.D.

Concept Reference: 701835
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Asbestos

				Concept Reference	**701835 036**	**701835 037**	**701835 039**	**701835 040**	**701835 041**
				Customer Sample Reference	**HEP-BH-823**	**HEP-BH-823**	**HEP-BH-823**	**HEP-BH-823**	**HEP-BH-823**
				Top Depth	**0.40**	**1.00**	**3.00**	**4.20**	**4.40**
				Hole ID	**HEP-BH-823**	**HEP-BH-823**	**HEP-BH-823**	**HEP-BH-823**	**HEP-BH-823**
				Depth	**0.40**	**1.00**	**3.00**	**4.20**	**4.40**
				Date Sampled	**30-NOV-2017**	**30-NOV-2017**	**30-NOV-2017**	**30-NOV-2017**	**30-NOV-2017**
				Time Sampled	**13:00**	**14:00**	**15:00**	**09:10**	**09:20**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**FES1171130003**	**FES1171130006**	**FES1171130013**	**FES1171130019**	**FES1171130022**
				AGS Sample Reference	**3**	**6**	**13**	**19**	**22**
				Matrix Class	**Clay**	**Clay**	**Clay**	**Clay**	**Topsoil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Asbestos ID	T27	AR			N.D.	N.D.	N.D.	N.D.	N.D.

Concept Reference: 701835
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Asbestos

				Concept Reference	**701835 048**	**701835 050**
				Customer Sample Reference	**HEP-TT-6**	**HEP-TT-6**
				Top Depth	**0.00**	**0.80**
				Hole ID	**HEP-TT-6**	**HEP-TT-6**
				Depth	**0.00**	**0.80**
				Date Sampled	**23-NOV-2017**	**23-NOV-2017**
				Time Sampled	**09:10**	**10:30**
				AGS Type	**ES**	**ES**
				AGS Sample ID	**HEPTT620171123001**	**HEPTT620171123003**
				AGS Sample Reference	**1**	**7**
				Matrix Class	**Topsoil**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**		
Asbestos ID	T27	AR			N.D.	N.D.

Concept Reference: 701835
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground Soils with Elevated PID Readings - Organics PAH US EPA 16

Concept Reference	**701835 004**	**701835 006**	**701835 008**	**701835 009**	**701835 010**
Customer Sample Reference	**HEP-BH-22**	**HEP-BH-22**	**HEP-BH-22**	**HEP-BH-22**	**HEP-BH-22**
Top Depth	**0.20**	**2.30**	**4.20**	**5.20**	**6.60**
Hole ID	**HEP-BH-22**	**HEP-BH-22**	**HEP-BH-22**	**HEP-BH-22**	**HEP-BH-22**
Depth	**0.20**	**2.30**	**4.20**	**5.20**	**6.60**
Date Sampled	**21-NOV-2017**	**22-NOV-2017**	**22-NOV-2017**	**22-NOV-2017**	**22-NOV-2017**
Time Sampled	**14:28**	**10:45**	**11:35**	**13:35**	**15:25**
AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**FES4171121002**	**FES4171122004**	**FES4171122011**	**FES4171122014**	**FES4171122016**
AGS Sample Reference	**2**	**9**	**14**	**17**	**19**
Matrix Class	**Topsoil**	**Clay**	**Clay**	**Clay**	**Clay**

Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Naphthalene	T207	M105	0.1	mg/kg	<0.1	**1.5**	<0.1	**0.2**	**0.2**
Acenaphthylene	T207	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	T207	M105	0.1	mg/kg	<0.1	**2.7**	<0.1	<0.1	**0.1**
Fluorene	T207	M105	0.1	mg/kg	<0.1	**1.8**	<0.1	<0.1	<0.1
Phenanthrene	T207	M105	0.1	mg/kg	**0.4**	**13**	**0.6**	**0.4**	**0.3**
Anthracene	T207	AR	0.1	mg/kg	<0.1	**2.9**	**0.2**	<0.1	<0.1
Fluoranthene	T207	M105	0.1	mg/kg	**1.3**	**12**	**1.2**	**0.6**	**0.3**
Pyrene	T207	M105	0.1	mg/kg	**1.3**	**10**	**1.1**	**0.5**	**0.3**
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	**0.7**	**5.5**	**0.8**	**0.3**	<0.1
Chrysene	T207	M105	0.1	mg/kg	**0.7**	**5.3**	**0.9**	**0.2**	<0.1
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	**0.6**	**4.2**	**0.5**	**0.2**	<0.1
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	**0.8**	**4.0**	**0.6**	**0.2**	<0.1
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	**0.8**	**4.6**	**0.5**	**0.2**	<0.1
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	**0.5**	**2.5**	**0.3**	<0.1	<0.1
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	**0.2**	**0.9**	<0.1	<0.1	<0.1
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	**0.6**	**2.6**	**0.3**	<0.1	<0.1
PAH(total)	T207	AR	0.1	mg/kg	**7.9**	**74**	**6.9**	**2.8**	**1.2**

Concept Reference: 701835
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground Soils with Elevated PID Readings - Organics PAH US EPA 16

Concept Reference	**701835 012**	**701835 014**	**701835 023**	**701835 024**	**701835 025**
Customer Sample Reference	**HEP-BH-23**	**HEP-BH-24**	**HEP-BH-1802**	**HEP-BH-1802**	**HEP-BH-1805**
Top Depth	**1.00**	**1.00**	**0.30**	**0.80**	**2.00**
Hole ID	**HEP-BH-23**	**HEP-BH-24**	**HEP-BH-1802**	**HEP-BH-1802**	**HEP-BH-1805**
Depth	**1.00**	**1.00**	**0.30**	**0.80**	**2.00**
Date Sampled	**30-NOV-2017**	**27-NOV-2017**	**27-NOV-2017**	**27-NOV-2017**	**27-NOV-2017**
Time Sampled	**14:10**	**09:30**	**11:30**	**11:40**	**13:15**
AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**HEPBH2320171130002**	**FES2171127004**	**HEPBH1802201711270 02**	**HEPBH1802201711270 03**	**HEPBH1805201711270 01**
AGS Sample Reference	**4**	**4**	**4**	**7**	**9**
Matrix Class	**Topsoil**	**Topsoil**	**Clay**	**Topsoil**	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units					
Naphthalene	T207	M105	0.1	mg/kg	**1.3**	(9) <1.0	<0.1	<0.1	<0.1
Acenaphthylene	T207	AR	0.1	mg/kg	(9) <1.0	(9) <1.0	<0.1	<0.1	<0.1
Acenaphthene	T207	M105	0.1	mg/kg	(9) <1.0	(9) <1.0	<0.1	<0.1	<0.1
Fluorene	T207	M105	0.1	mg/kg	(9) <1.0	(9) <1.0	<0.1	<0.1	<0.1
Phenanthrene	T207	M105	0.1	mg/kg	**5.4**	**2.2**	<0.1	<0.1	<0.1
Anthracene	T207	AR	0.1	mg/kg	**1.0**	(9) <1.0	<0.1	<0.1	<0.1
Fluoranthene	T207	M105	0.1	mg/kg	**7.6**	**3.9**	<0.1	<0.1	<0.1
Pyrene	T207	M105	0.1	mg/kg	**6.4**	**3.5**	<0.1	<0.1	<0.1
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	**3.4**	**1.6**	<0.1	<0.1	<0.1
Chrysene	T207	M105	0.1	mg/kg	**3.5**	**2.0**	<0.1	<0.1	<0.1
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	**2.3**	**1.8**	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	**3.5**	**1.5**	<0.1	<0.1	<0.1
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	**3.2**	**1.9**	<0.1	<0.1	<0.1
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	**1.9**	**1.3**	<0.1	<0.1	<0.1
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	(9) <1.0	(9) <1.0	<0.1	<0.1	<0.1
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	**2.3**	**1.7**	<0.1	<0.1	<0.1
PAH(total)	T207	AR	0.1	mg/kg	**42**	**21**	<0.1	<0.1	<0.1

Concept Reference: 701835
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground Soils with Elevated PID Readings - Organics PAH US EPA 16

Concept Reference		**701835 036**	**701835 037**	**701835 039**	**701835 040**	**701835 041**
Customer Sample Reference		**HEP-BH-823**	**HEP-BH-823**	**HEP-BH-823**	**HEP-BH-823**	**HEP-BH-823**
Top Depth		**0.40**	**1.00**	**3.00**	**4.20**	**4.40**
Hole ID		**HEP-BH-823**	**HEP-BH-823**	**HEP-BH-823**	**HEP-BH-823**	**HEP-BH-823**
Depth		**0.40**	**1.00**	**3.00**	**4.20**	**4.40**
Date Sampled		**30-NOV-2017**	**30-NOV-2017**	**30-NOV-2017**	**30-NOV-2017**	**30-NOV-2017**
Time Sampled		**13:00**	**14:00**	**15:00**	**09:10**	**09:20**
AGS Type		**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID		**FES1171130003**	**FES1171130006**	**FES1171130013**	**FES1171130019**	**FES1171130022**
AGS Sample Reference		**3**	**6**	**13**	**19**	**22**
Matrix Class		**Clay**	**Clay**	**Clay**	**Clay**	**Topsoil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**		
Naphthalene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	**0.6**	**53**
Acenaphthylene	T207	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	**7.8**
Acenaphthene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	**0.2**	**21**
Fluorene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	**0.2**	**39**
Phenanthrene	T207	M105	0.1	mg/kg	**0.4**	<0.1	<0.1	**1.0**	**170**
Anthracene	T207	AR	0.1	mg/kg	**0.1**	<0.1	<0.1	**0.2**	**43**
Fluoranthene	T207	M105	0.1	mg/kg	**0.8**	**0.2**	**0.1**	**1.0**	**140**
Pyrene	T207	M105	0.1	mg/kg	**0.7**	**0.2**	**0.1**	**0.7**	**110**
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	**0.4**	**0.1**	<0.1	**0.3**	**42**
Chrysene	T207	M105	0.1	mg/kg	**0.4**	**0.1**	<0.1	**0.3**	**39**
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	**0.3**	<0.1	<0.1	**0.2**	**36**
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	**0.4**	<0.1	<0.1	**0.2**	**21**
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	**0.4**	**0.1**	<0.1	**0.2**	**32**
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	**0.2**	<0.1	<0.1	**0.1**	**16**
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	**5.4**
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	**0.3**	<0.1	<0.1	**0.1**	**18**
PAH(total)	T207	AR	0.1	mg/kg	**4.5**	**0.7**	**0.3**	**5.2**	**780**

Concept Reference: 701835
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground Soils with Elevated PID Readings - Organics PAH US EPA 16

				Concept Reference	**701835 048**	**701835 050**
				Customer Sample Reference	**HEP-TT-6**	**HEP-TT-6**
				Top Depth	**0.00**	**0.80**
				Hole ID	**HEP-TT-6**	**HEP-TT-6**
				Depth	**0.00**	**0.80**
				Date Sampled	**23-NOV-2017**	**23-NOV-2017**
				Time Sampled	**09:10**	**10:30**
				AGS Type	**ES**	**ES**
				AGS Sample ID	**HEPTT620171123001**	**HEPTT620171123003**
				AGS Sample Reference	**1**	**7**
				Matrix Class	**Topsoil**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**		
Naphthalene	T207	M105	0.1	mg/kg	<0.1	<0.1
Acenaphthylene	T207	AR	0.1	mg/kg	<0.1	<0.1
Acenaphthene	T207	M105	0.1	mg/kg	<0.1	<0.1
Fluorene	T207	M105	0.1	mg/kg	<0.1	<0.1
Phenanthrene	T207	M105	0.1	mg/kg	**0.2**	**0.7**
Anthracene	T207	AR	0.1	mg/kg	<0.1	**0.2**
Fluoranthene	T207	M105	0.1	mg/kg	**0.5**	**0.9**
Pyrene	T207	M105	0.1	mg/kg	**0.5**	**0.7**
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	**0.3**	**0.4**
Chrysene	T207	M105	0.1	mg/kg	**0.3**	**0.4**
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	**0.4**	**0.3**
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	**0.3**	**0.3**
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	**0.4**	**0.3**
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	**0.2**	**0.2**
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	**0.3**	**0.2**
PAH(total)	T207	AR	0.1	mg/kg	**3.3**	**4.6**

Concept Reference: 701835
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - TPH (CWG)

				Concept Reference	**701835 004**	**701835 006**	**701835 008**	**701835 009**	**701835 010**
				Customer Sample Reference	**HEP-BH-22**	**HEP-BH-22**	**HEP-BH-22**	**HEP-BH-22**	**HEP-BH-22**
				Top Depth	**0.20**	**2.30**	**4.20**	**5.20**	**6.60**
				Hole ID	**HEP-BH-22**	**HEP-BH-22**	**HEP-BH-22**	**HEP-BH-22**	**HEP-BH-22**
				Depth	**0.20**	**2.30**	**4.20**	**5.20**	**6.60**
				Date Sampled	**21-NOV-2017**	**22-NOV-2017**	**22-NOV-2017**	**22-NOV-2017**	**22-NOV-2017**
				Time Sampled	**14:28**	**10:45**	**11:35**	**13:35**	**15:25**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**FES4171121002**	**FES4171122004**	**FES4171122011**	**FES4171122014**	**FES4171122016**
				AGS Sample Reference	**2**	**9**	**14**	**17**	**19**
				Matrix Class	**Topsoil**	**Clay**	**Clay**	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
TPH (C5-C6 aliphatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C6-C8 aliphatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C8-C10 aliphatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	**(13) 3**	**(13) 4**	**(13) 1**	(13) <1	**(13) 3**
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	**(13) 4**	**(13) 6**	**(13) 3**	**(13) 5**	**(13) 7**
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	**(13) 6**	**(13) 9**	**(13) 6**	**(13) 8**	**(13) 11**
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	**(13) 12**	**(13) 76**	**(13) 26**	**(13) 21**	**(13) 41**
TPH (C6-C7 aromatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C7-C8 aromatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C8-C10 aromatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	(13) <2	(13) <2	(13) <2	(13) <2	(13) <2
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	**(13) 7**	**(13) 20**	**(13) 5**	**(13) 5**	**(13) 6**
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	**(13) 25**	**(13) 50**	**(13) 16**	**(13) 8**	**(13) 11**
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	**(13) 67**	**(13) 78**	**(13) 25**	**(13) 8**	**(13) 11**

Concept Reference: 701835
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - TPH (CWG)

				Concept Reference	**701835 012**	**701835 014**	**701835 023**	**701835 024**	**701835 025**
				Customer Sample Reference	**HEP-BH-23**	**HEP-BH-24**	**HEP-BH-1802**	**HEP-BH-1802**	**HEP-BH-1805**
				Top Depth	**1.00**	**1.00**	**0.30**	**0.80**	**2.00**
				Hole ID	**HEP-BH-23**	**HEP-BH-24**	**HEP-BH-1802**	**HEP-BH-1802**	**HEP-BH-1805**
				Depth	**1.00**	**1.00**	**0.30**	**0.80**	**2.00**
				Date Sampled	**30-NOV-2017**	**27-NOV-2017**	**27-NOV-2017**	**27-NOV-2017**	**27-NOV-2017**
				Time Sampled	**14:10**	**09:30**	**11:30**	**11:40**	**13:15**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH2320171130002**	**FES2171127004**	**HEPBH1802201711270002**	**HEPBH1802201711270003**	**HEPBH1805201711270001**
				AGS Sample Reference	**4**	**4**	**4**	**7**	**9**
				Matrix Class	**Topsoil**	**Topsoil**	**Clay**	**Topsoil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
TPH (C5-C6 aliphatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C6-C8 aliphatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C8-C10 aliphatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	(13) **25**	(13) **20**	(13) **2**	(13) **1**	(13) **2**
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	(13) **28**	(13) **18**	(13) **3**	(13) **3**	(13) **2**
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	(13) **41**	(13) **36**	(13) **5**	(13) **4**	(13) **3**
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	(13) **78**	(13) **91**	(13) **6**	(13) **4**	(13) **3**
TPH (C6-C7 aromatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C7-C8 aromatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C8-C10 aromatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	(13) **12**	(9,13) <10	(13) <2	(13) <2	(13) <2
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	(13) **53**	(13) **41**	(13) **2**	(13) **2**	(13) **2**
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	(13) **110**	(13) **88**	(13) <1	(13) <1	(13) <1
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	(13) **69**	(13) **110**	(13) <1	(13) <1	(13) <1

Concept Reference: 701835
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - TPH (CWG)

				Concept Reference	**701835 036**	**701835 037**	**701835 039**	**701835 040**	**701835 041**
				Customer Sample Reference	**HEP-BH-823**	**HEP-BH-823**	**HEP-BH-823**	**HEP-BH-823**	**HEP-BH-823**
				Top Depth	**0.40**	**1.00**	**3.00**	**4.20**	**4.40**
				Hole ID	**HEP-BH-823**	**HEP-BH-823**	**HEP-BH-823**	**HEP-BH-823**	**HEP-BH-823**
				Depth	**0.40**	**1.00**	**3.00**	**4.20**	**4.40**
				Date Sampled	**30-NOV-2017**	**30-NOV-2017**	**30-NOV-2017**	**30-NOV-2017**	**30-NOV-2017**
				Time Sampled	**13:00**	**14:00**	**15:00**	**09:10**	**09:20**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**FES1171130003**	**FES1171130006**	**FES1171130013**	**FES1171130019**	**FES1171130022**
				AGS Sample Reference	**3**	**6**	**13**	**19**	**22**
				Matrix Class	**Clay**	**Clay**	**Clay**	**Clay**	**Topsoil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
TPH (C5-C6 aliphatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C6-C8 aliphatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C8-C10 aliphatic)	T209	AR	100	µg/kg	<100	<100	**470**	<100	<100
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	(13) **2**	(13) **2**	(13) **1**	(13) **3**	(13) **2**
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	(13) **3**	(13) **4**	(13) **3**	(13) **4**	(13) **3**
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	(13) **6**	(13) **6**	(13) **3**	(13) **6**	(13) **4**
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	(13) **16**	(13) **7**	(13) **5**	(13) **8**	(13) **5**
TPH (C6-C7 aromatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C7-C8 aromatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C8-C10 aromatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	(13) <2	(13) <2	(13) <2	(13) **5**	(13) **4**
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	(13) **3**	(13) **2**	(13) **2**	(13) **23**	(13) **15**
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	(13) **6**	(13) **4**	(13) **2**	(13) **54**	(13) **28**
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	(13) **25**	(13) **7**	(13) **2**	(13) **58**	(13) **31**

Concept Reference: 701835
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - TPH (CWG)

Concept Reference	**701835 048**	**701835 050**
Customer Sample Reference	**HEP-TT-6**	**HEP-TT-6**
Top Depth	**0.00**	**0.80**
Hole ID	**HEP-TT-6**	**HEP-TT-6**
Depth	**0.00**	**0.80**
Date Sampled	**23-NOV-2017**	**23-NOV-2017**
Time Sampled	**09:10**	**10:30**
AGS Type	**ES**	**ES**
AGS Sample ID	**HEPTT620171123001**	**HEPTT620171123003**
AGS Sample Reference	**1**	**7**
Matrix Class	**Topsoil**	**Clay**

Determinand	Method	Test Sample	LOD	Units		
TPH (C5-C6 aliphatic)	T209	AR	100	µg/kg	<100	<100
TPH (C6-C8 aliphatic)	T209	AR	100	µg/kg	<100	<100
TPH (C8-C10 aliphatic)	T209	AR	100	µg/kg	<100	<100
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	(13) **3**	(13) **3**
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	(13) **4**	(13) **5**
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	(13) **6**	(13) **7**
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	(13) **11**	(13) **12**
TPH (C6-C7 aromatic)	T209	AR	100	µg/kg	<100	<100
TPH (C7-C8 aromatic)	T209	AR	100	µg/kg	<100	<100
TPH (C8-C10 aromatic)	T209	AR	100	µg/kg	<100	<100
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	(13) <2	(13) <2
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	(13) **4**	(13) **3**
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	(13) **8**	(13) **9**
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	(13) **19**	(13) **14**

Concept Reference: 701835
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Total Petroleum Hydrocarbons (Aliphatics+Aromatics) Total

Concept Reference	**701835 004**	**701835 006**	**701835 008**	**701835 009**	**701835 010**
Customer Sample Reference	**HEP-BH-22**	**HEP-BH-22**	**HEP-BH-22**	**HEP-BH-22**	**HEP-BH-22**
Top Depth	**0.20**	**2.30**	**4.20**	**5.20**	**6.60**
Hole ID	**HEP-BH-22**	**HEP-BH-22**	**HEP-BH-22**	**HEP-BH-22**	**HEP-BH-22**
Depth	**0.20**	**2.30**	**4.20**	**5.20**	**6.60**
Date Sampled	**21-NOV-2017**	**22-NOV-2017**	**22-NOV-2017**	**22-NOV-2017**	**22-NOV-2017**
Time Sampled	**14:28**	**10:45**	**11:35**	**13:35**	**15:25**
AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**FES4171121002**	**FES4171122004**	**FES4171122011**	**FES4171122014**	**FES4171122016**
AGS Sample Reference	**2**	**9**	**14**	**17**	**19**
Matrix Class	**Topsoil**	**Clay**	**Clay**	**Clay**	**Clay**

Determinand	Method	Test Sample	LOD	Units					
TPH (Aliphatic) total	T85	M105		mg/kg	(13) **25**	(13) **95**	(13) **36**	(13) **34**	(13) **62**
TPH (Aromatic) total	T85	M105		mg/kg	(13) **99**	(13) **150**	(13) **46**	(13) **21**	(13) **28**
TPH (Aliphatic+Aromatic) (sum)	T85	M105		mg/kg	**124**	**245**	**82.0**	**55.0**	**90.0**

Concept Reference: 701835
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Total Petroleum Hydrocarbons (Aliphatics+Aromatics) Total

Concept Reference	**701835 012**	**701835 014**	**701835 023**	**701835 024**	**701835 025**
Customer Sample Reference	**HEP-BH-23**	**HEP-BH-24**	**HEP-BH-1802**	**HEP-BH-1802**	**HEP-BH-1805**
Top Depth	**1.00**	**1.00**	**0.30**	**0.80**	**2.00**
Hole ID	**HEP-BH-23**	**HEP-BH-24**	**HEP-BH-1802**	**HEP-BH-1802**	**HEP-BH-1805**
Depth	**1.00**	**1.00**	**0.30**	**0.80**	**2.00**
Date Sampled	**30-NOV-2017**	**27-NOV-2017**	**27-NOV-2017**	**27-NOV-2017**	**27-NOV-2017**
Time Sampled	**14:10**	**09:30**	**11:30**	**11:40**	**13:15**
AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**HEPBH2320171130002**	**FES2171127004**	**HEPBH180220171127002**	**HEPBH180220171127003**	**HEPBH180520171127001**
AGS Sample Reference	**4**	**4**	**4**	**7**	**9**
Matrix Class	**Topsoil**	**Topsoil**	**Clay**	**Topsoil**	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units					
TPH (Aliphatic) total	T85	M105		mg/kg	(13) 170	(13) 170	(13) 16	(13) 12	(13) 10
TPH (Aromatic) total	T85	M105		mg/kg	(13) 240	(13) 240	(13) 2.0	(13) 2.0	(13) 2.0
TPH (Aliphatic+Aromatic) (sum)	T85	M105		mg/kg	410	410	18.0	14.0	12.0

Concept Reference: 701835
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Total Petroleum Hydrocarbons (Aliphatics+Aromatics) Total

Concept Reference	**701835 036**	**701835 037**	**701835 039**	**701835 040**	**701835 041**
Customer Sample Reference	**HEP-BH-823**	**HEP-BH-823**	**HEP-BH-823**	**HEP-BH-823**	**HEP-BH-823**
Top Depth	**0.40**	**1.00**	**3.00**	**4.20**	**4.40**
Hole ID	**HEP-BH-823**	**HEP-BH-823**	**HEP-BH-823**	**HEP-BH-823**	**HEP-BH-823**
Depth	**0.40**	**1.00**	**3.00**	**4.20**	**4.40**
Date Sampled	**30-NOV-2017**	**30-NOV-2017**	**30-NOV-2017**	**30-NOV-2017**	**30-NOV-2017**
Time Sampled	**13:00**	**14:00**	**15:00**	**09:10**	**09:20**
AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**FES1171130003**	**FES1171130006**	**FES1171130013**	**FES1171130019**	**FES1171130022**
AGS Sample Reference	**3**	**6**	**13**	**19**	**22**
Matrix Class	**Clay**	**Clay**	**Clay**	**Clay**	**Topsoil**

Determinand	Method	Test Sample	LOD	Units					
TPH (Aliphatic) total	T85	M105		mg/kg	(13) 27	(13) 19	(13) 12	(13) 21	(13) 14
TPH (Aromatic) total	T85	M105		mg/kg	(13) 34	(13) 13	(13) 6.0	(13) 140	(13) 78
TPH (Aliphatic+Aromatic) (sum)	T85	M105		mg/kg	61.0	32.0	18.0	161	92.0

Concept Reference: 701835
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Total Petroleum Hydrocarbons (Aliphatics+Aromatics) Total

Concept Reference	**701835 048**	**701835 050**
Customer Sample Reference	**HEP-TT-6**	**HEP-TT-6**
Top Depth	**0.00**	**0.80**
Hole ID	**HEP-TT-6**	**HEP-TT-6**
Depth	**0.00**	**0.80**
Date Sampled	**23-NOV-2017**	**23-NOV-2017**
Time Sampled	**09:10**	**10:30**
AGS Type	**ES**	**ES**
AGS Sample ID	**HEPTT620171123001**	**HEPTT620171123003**
AGS Sample Reference	**1**	**7**
Matrix Class	**Topsoil**	**Clay**

Determinand	Method	Test Sample	LOD	Units		
TPH (Aliphatic) total	T85	M105		mg/kg	(13) 24	(13) 27
TPH (Aromatic) total	T85	M105		mg/kg	(13) 31	(13) 26
TPH (Aliphatic+Aromatic) (sum)	T85	M105		mg/kg	55.0	53.0

Concept Reference: 701835
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite B - Natural Ground - Misc

Concept Reference	**701835 016**	**701835 017**	**701835 019**
Customer Sample Reference	**HEP-BH-50**	**HEP-BH-50**	**HEP-BH-50**
Top Depth	**0.40**	**1.15**	**2.40**
Hole ID	**HEP-BH-50**	**HEP-BH-50**	**HEP-BH-50**
Depth	**0.40**	**1.15**	**2.40**
Date Sampled	**21-NOV-2017**	**21-NOV-2017**	**21-NOV-2017**
Time Sampled	**14:43**	**15:00**	**15:50**
AGS Type	**ES**	**ES**	**ES**
AGS Sample ID	**FES1171121006**	**FES1171121009**	**FES1171121017**
AGS Sample Reference	**6**	**9**	**17**
Matrix Class	**Topsoil**	**Topsoil**	**Clay**

Determinand	**Method**	**Test Sample**	**LOD**	**Units**			
Fraction Organic Carbon - F(oc)	T21	AR	1	%	**2**	**5**	**2**
Soil Organic Matter	T287	A40	0.1	%	**1.8**	**2.2**	**0.4**
pH	T7	AR			**8.1**	**8.2**	**7.7**
TPH C10-C40 (sum)	T85	M105	1	mg/kg	(13) **29**	(13) **170**	(13) **5**

Concept Reference: 701835
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite B - Inorganics

Concept Reference	**701835 016**	**701835 017**	**701835 019**
Customer Sample Reference	**HEP-BH-50**	**HEP-BH-50**	**HEP-BH-50**
Top Depth	**0.40**	**1.15**	**2.40**
Hole ID	**HEP-BH-50**	**HEP-BH-50**	**HEP-BH-50**
Depth	**0.40**	**1.15**	**2.40**
Date Sampled	**21-NOV-2017**	**21-NOV-2017**	**21-NOV-2017**
Time Sampled	**14:43**	**15:00**	**15:50**
AGS Type	**ES**	**ES**	**ES**
AGS Sample ID	**FES1171121006**	**FES1171121009**	**FES1171121017**
AGS Sample Reference	**6**	**9**	**17**
Matrix Class	**Topsoil**	**Topsoil**	**Clay**

Determinand	**Method**	**Test Sample**	**LOD**	**Units**			
Chloride	T686	AR	1	mg/kg	**8**	**15**	**83**

Concept Reference: 701835
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite B - Natural Ground - Metals and Metalloids

Concept Reference	**701835 016**	**701835 017**	**701835 019**
Customer Sample Reference	**HEP-BH-50**	**HEP-BH-50**	**HEP-BH-50**
Top Depth	**0.40**	**1.15**	**2.40**
Hole ID	**HEP-BH-50**	**HEP-BH-50**	**HEP-BH-50**
Depth	**0.40**	**1.15**	**2.40**
Date Sampled	**21-NOV-2017**	**21-NOV-2017**	**21-NOV-2017**
Time Sampled	**14:43**	**15:00**	**15:50**
AGS Type	**ES**	**ES**	**ES**
AGS Sample ID	**FES1171121006**	**FES1171121009**	**FES1171121017**
AGS Sample Reference	**6**	**9**	**17**
Matrix Class	**Topsoil**	**Topsoil**	**Clay**

Determinand	Method	Test Sample	LOD	Units			
Arsenic	T6	M40	2	mg/kg	**16**	**11**	**16**
Cadmium	T6	M40	1	mg/kg	<1	<1	<1
Chromium	T6	M40	1	mg/kg	**29**	**21**	**39**
Iron	T6	A40	1	mg/kg	**26000**	**20000**	**41000**
Lead	T6	M40	1	mg/kg	**120**	**77**	**19**
Manganese	T6	M40	1	mg/kg	**520**	**380**	**360**
Mercury	T6	M40	1	mg/kg	<1	<1	<1
Nickel	T6	M40	1	mg/kg	**27**	**26**	**42**
Selenium	T6	M40	3	mg/kg	<3	<3	<3
Copper	T6	M40	1	mg/kg	**84**	**42**	**29**
Zinc	T6	M40	1	mg/kg	**110**	**110**	**84**
Boron (water-soluble)	T6	AR	1	mg/kg	<1	<1	<1

Concept Reference: 701835
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite B - Natural Material - Organic - PAHs

Concept Reference	**701835 016**	**701835 017**	**701835 019**
Customer Sample Reference	**HEP-BH-50**	**HEP-BH-50**	**HEP-BH-50**
Top Depth	**0.40**	**1.15**	**2.40**
Hole ID	**HEP-BH-50**	**HEP-BH-50**	**HEP-BH-50**
Depth	**0.40**	**1.15**	**2.40**
Date Sampled	**21-NOV-2017**	**21-NOV-2017**	**21-NOV-2017**
Time Sampled	**14:43**	**15:00**	**15:50**
AGS Type	**ES**	**ES**	**ES**
AGS Sample ID	**FES1171121006**	**FES1171121009**	**FES1171121017**
AGS Sample Reference	**6**	**9**	**17**
Matrix Class	**Topsoil**	**Topsoil**	**Clay**

Determinand	Method	Test Sample	LOD	Units			
Naphthalene	T207	M105	0.1	mg/kg	<0.1	(9) <1.0	<0.1
Acenaphthylene	T207	AR	0.1	mg/kg	<0.1	(9) <1.0	<0.1
Acenaphthene	T207	M105	0.1	mg/kg	**0.1**	(9) <1.0	<0.1
Fluorene	T207	M105	0.1	mg/kg	<0.1	(9) <1.0	<0.1
Phenanthrene	T207	M105	0.1	mg/kg	**1.2**	(9) <1.0	<0.1
Anthracene	T207	AR	0.1	mg/kg	**0.3**	(9) <1.0	<0.1
Fluoranthene	T207	M105	0.1	mg/kg	**2.4**	**2.3**	<0.1
Pyrene	T207	M105	0.1	mg/kg	**2.0**	**2.2**	<0.1
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	**1.2**	(9) <1.0	<0.1
Chrysene	T207	M105	0.1	mg/kg	**1.1**	**1.2**	<0.1
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	**1.0**	**1.2**	<0.1
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	**1.0**	**1.2**	<0.1
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	**1.1**	**1.3**	<0.1
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	**0.7**	(9) <1.0	<0.1
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	**0.2**	(9) <1.0	<0.1
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	**0.8**	**1.0**	<0.1
PAH(total)	T207	AR	0.1	mg/kg	**13**	**10**	<0.1

Concept Reference: 701835
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite B - Natural Material - Organic - TPH

Concept Reference	**701835 016**	**701835 017**	**701835 019**
Customer Sample Reference	**HEP-BH-50**	**HEP-BH-50**	**HEP-BH-50**
Top Depth	**0.40**	**1.15**	**2.40**
Hole ID	**HEP-BH-50**	**HEP-BH-50**	**HEP-BH-50**
Depth	**0.40**	**1.15**	**2.40**
Date Sampled	**21-NOV-2017**	**21-NOV-2017**	**21-NOV-2017**
Time Sampled	**14:43**	**15:00**	**15:50**
AGS Type	**ES**	**ES**	**ES**
AGS Sample ID	**FES1171121006**	**FES1171121009**	**FES1171121017**
AGS Sample Reference	**6**	**9**	**17**
Matrix Class	**Topsoil**	**Topsoil**	**Clay**

Determinand	Method	Test Sample	LOD	Units			
TPH (C10-C35)	T8	M105	1	mg/kg	(13) **23**	(13) **92**	(13) **3**
TPH (C35-C40)	T8	M105	1	mg/kg	(13) **6**	(13) **77**	(13) **2**

Concept Reference: 701835
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Sub Suite 2 - Pathogens

Concept Reference	**701835 024**
Customer Sample Reference	**HEP-BH-1802**
Top Depth	**0.80**
Hole ID	**HEP-BH-1802**
Depth	**0.80**
Date Sampled	**27-NOV-2017**
Time Sampled	**11:40**
AGS Type	**ES**
AGS Sample ID	**HEPBH1802201711270 03**
AGS Sample Reference	**7**
Matrix Class	**Topsoil**

Determinand	Method	Test Sample	LOD	Units	
Salmonella spp	T34	AR			N.D.
Escherichia coli	T34	AR	1	cfu/in 25g	<1
Intestinal Enterococci	T34	AR	1	cfu/g	<1

Index to symbols used in Third Supplemental B 701835-2

Value	Description
M105	Analysis conducted on an "as received" aliquot. Results are reported on a dry weight basis where moisture content was determined by assisted drying of sample at 105C
AR	As Received
A40	Assisted dried < 40C
M40	Analysis conducted on sample assisted dried at no more than 40C. Results are reported on a dry weight basis.
N.D.	Not Detected
9	LOD raised due to dilution of sample
13	Results have been blank corrected.
S	Analysis was subcontracted
M	Analysis is MCERTS accredited
U	Analysis is UKAS accredited
N	Analysis is not UKAS accredited

Notes

Third Supplemental B to report in standard format with TPH totals.
Pathogens transferred to Concept Moy
Asbestos subcontracted to REC Asbestos
Nitrate and Nitrite transferred to Concept East Kilbride
These samples have been analysed exceeding recommended holding times for pH. It is possible therefore that the results provided may be compromised.

Method Index

Value	Description
T2	Grav
T4	Colorimetry
T85	Calc
T207	GC/MS (MCERTS)
T8	GC/FID
T34	Micro
T909	GCxGC
T287	Calc TOC/0.58
T6	ICP/OES
T21	OX/IR
T209	GC/MS (Head Space)(MCERTS)
T686	Discrete Analyser
T7	Probe
T162	Grav (1 Dec) (105 C)
T27	PLM

Accreditation Summary

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Moisture @105C	T162	AR	0.1	%	N	004,006,008-010,012,014,016-017,019,023-025,036-037,039-041,048,050
Retained on 10mm sieve	T2	M40	0.1	%	N	004,006,008-010,012,014,016-017,019,023-025,036-037,039-041,048,050
Fraction Organic Carbon - F(oc)	T21	AR	1	%	N	016-017,019
TPH C10-C40 (sum)	T85	M105	1	mg/kg	N	016-017,019
TPH (C10-C35)	T8	M105	1	mg/kg	M	016-017,019
TPH (C35-C40)	T8	M105	1	mg/kg	N	016-017,019
Soil Organic Matter	T287	A40	0.1	%	N	004,006,008-010,012,014,016-017,019,023-025,036-037,039-041,048,050
pH	T7	AR			M	004,006,008-010,012,014,016-017,019,023-025,036-037,039-041,048,050
Asbestos ID	T27	AR			SU	004,006,008-010,012,014,023-025,036-037,039-041,048,050
Phenols(Mono)	T4	AR	0.5	mg/kg	M	004,006,008-010,012,014,023-025,036-037,039-041,048,050
Chloride	T686	AR	1	mg/kg	N	004,006,008-010,012,014,016-017,019,023-025,036-037,039-041,048,050
Cyanide(Total)	T4	AR	1	mg/kg	M	004,006,008-010,012,014,023-025,036-037,039-041,048,050
Thiocyanate	T4	A40	1	mg/kg	N	004,006,008-010,012,014,023-025,036-037,039-041,048,050
Nitrate	T686	AR	1	mg/kg	N	004,006,008-010,012,014,023-025,036-037,039-041,048,050
Nitrite	T686	AR	1	mg/kg	N	004,006,008-010,012,014,023-025,036-037,039-041,048,050
SO4(Total)	T6	A40	0.01	%	U	004,006,008-010,012,014,023-025,036-037,039-041,048,050
Sulphide	T4	AR	10	mg/kg	N	004,006,008-010,012,014,023-025,036-037,039-041,048,050
Arsenic	T6	M40	2	mg/kg	M	004,006,008-010,012,014,016-017,019,023-025,036-037,039-041,048,050
Cadmium	T6	M40	1	mg/kg	M	004,006,008-010,012,014,016-017,019,023-025,036-037,039-041,048,050
Chromium	T6	M40	1	mg/kg	M	004,006,008-010,012,014,016-017,019,023-025,036-037,039-041,048,050
Iron	T6	A40	1	mg/kg	U	004,006,008-010,012,014,016-017,019,023-025,036-037,039-041,048,050
Lead	T6	M40	1	mg/kg	M	004,006,008-010,012,014,016-017,019,023-025,036-037,039-041,048,050
Manganese	T6	M40	1	mg/kg	M	004,006,008-010,012,014,016-017,019,023-025,036-037,039-041,048,050
Mercury	T6	M40	1	mg/kg	M	004,006,008-010,012,014,016-017,019,023-025,036-037,039-041,048,050
Nickel	T6	M40	1	mg/kg	M	004,006,008-010,012,014,016-017,019,023-025,036-037,039-041,048,050
Selenium	T6	M40	3	mg/kg	M	004,006,008-010,012,014,016-017,019,023-025,036-037,039-041,048,050
Copper	T6	M40	1	mg/kg	M	004,006,008-010,012,014,016-017,019,023-025,036-037,039-041,048,050
Zinc	T6	M40	1	mg/kg	M	004,006,008-010,012,014,016-017,019,023-025,036-037,039-041,048,050
Boron (water-soluble)	T6	AR	1	mg/kg	N	004,006,008-010,012,014,016-017,019,023-025,036-037,039-041,048,050
Naphthalene	T207	M105	0.1	mg/kg	M	004,006,008-010,012,014,016-017,019,023-025,036-037,039-041,048,050
Acenaphthylene	T207	AR	0.1	mg/kg	U	004,006,008-010,012,014,016-017,019,023-025,036-037,039-041,048,050
Acenaphthene	T207	M105	0.1	mg/kg	M	004,006,008-010,012,014,016-017,019,023-025,036-037,039-041,048,050
Fluorene	T207	M105	0.1	mg/kg	M	004,006,008-010,012,014,016-017,019,023-025,036-037,039-041,048,050
Phenanthrene	T207	M105	0.1	mg/kg	M	004,006,008-010,012,014,016-017,019,023-025,036-037,039-041,048,050
Anthracene	T207	AR	0.1	mg/kg	U	004,006,008-010,012,014,016-017,019,023-025,036-037,039-041,048,050
Fluoranthene	T207	M105	0.1	mg/kg	M	004,006,008-010,012,014,016-017,019,023-025,036-037,039-041,048,050
Pyrene	T207	M105	0.1	mg/kg	M	004,006,008-010,012,014,016-017,019,023-025,036-037,039-041,048,050
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	M	004,006,008-010,012,014,016-017,019,023-025,036-037,039-041,048,050
Chrysene	T207	M105	0.1	mg/kg	M	004,006,008-010,012,014,016-017,019,023-025,036-037,039-041,048,050
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	M	004,006,008-010,012,014,016-017,019,023-025,036-037,039-041,048,050
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	M	004,006,008-010,012,014,016-017,019,023-025,036-037,039-041,048,050

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	M	004,006,008-010,012,014,016-017,019,023-025,036-037,039-041,048,050
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	M	004,006,008-010,012,014,016-017,019,023-025,036-037,039-041,048,050
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	M	004,006,008-010,012,014,016-017,019,023-025,036-037,039-041,048,050
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	M	004,006,008-010,012,014,016-017,019,023-025,036-037,039-041,048,050
PAH(total)	T207	AR	0.1	mg/kg	U	004,006,008-010,012,014,016-017,019,023-025,036-037,039-041,048,050
TPH (C5-C6 aliphatic)	T209	AR	100	µg/kg	N	004,006,008-010,012,014,023-025,036-037,039-041,048,050
TPH (C6-C8 aliphatic)	T209	AR	100	µg/kg	N	004,006,008-010,012,014,023-025,036-037,039-041,048,050
TPH (C8-C10 aliphatic)	T209	AR	100	µg/kg	N	004,006,008-010,012,014,023-025,036-037,039-041,048,050
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	M	004,006,008-010,012,014,023-025,036-037,039-041,048,050
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	M	004,006,008-010,012,014,023-025,036-037,039-041,048,050
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	M	004,006,008-010,012,014,023-025,036-037,039-041,048,050
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	M	004,006,008-010,012,014,023-025,036-037,039-041,048,050
TPH (C6-C7 aromatic)	T209	AR	100	µg/kg	N	004,006,008-010,012,014,023-025,036-037,039-041,048,050
TPH (C7-C8 aromatic)	T209	AR	100	µg/kg	N	004,006,008-010,012,014,023-025,036-037,039-041,048,050
TPH (C8-C10 aromatic)	T209	AR	100	µg/kg	N	004,006,008-010,012,014,023-025,036-037,039-041,048,050
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	M	004,006,008-010,012,014,023-025,036-037,039-041,048,050
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	M	004,006,008-010,012,014,023-025,036-037,039-041,048,050
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	M	004,006,008-010,012,014,023-025,036-037,039-041,048,050
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	M	004,006,008-010,012,014,023-025,036-037,039-041,048,050
TPH (Aliphatic) total	T85	M105		mg/kg	N	004,006,008-010,012,014,023-025,036-037,039-041,048,050
TPH (Aromatic) total	T85	M105		mg/kg	N	004,006,008-010,012,014,023-025,036-037,039-041,048,050
TPH (Aliphatic+Aromatic) (sum)	T85	M105		mg/kg	N	004,006,008-010,012,014,023-025,036-037,039-041,048,050
Chromium (trivalent)	T85	AR	2	mg/kg	N	004,006,008-010,012,014,016-017,019,023-025,036-037,039-041,048,050
Chromium VI	T6	AR	1	mg/kg	N	004,006,008-010,012,014,016-017,019,023-025,036-037,039-041,048,050
Salmonella spp	T34	AR			N	024
Escherichia coli	T34	AR	1	cfu/in 25g	U	024
Intestinal Enterococci	T34	AR	1	cfu/g	SN	024

CONCEPT LIFE SCIENCES
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Concept Life Sciences

Certificate of Analysis

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Report Number: Third Supplemental A 701835-2

Date of Report: 22-Jun-2018

Customer: Fugro GeoServices
Fugro House
Hithercroft Road
Wallingford
Oxfordshire
OX10 9RB

Customer Contact: Ms Karen Blackmore

Customer Job Reference:
Customer Purchase Order: 56642KB-WAL
Customer Site Reference: Heathrow HEP Package 3
Date Job Received at Concept: 22-Nov-2017
Date Analysis Started: 07-Dec-2017
Date Analysis Completed: 23-Jan-2018

The results reported relate to samples received in the laboratory and may not be representative of a whole batch.

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation

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Tests covered by this certificate were conducted in accordance with Concept Life Sciences SOPs

All results have been reviewed in accordance with Section 25 of the Concept Life Sciences, Analytical Services Quality Manual

UKAS TESTING
1549

Report checked
and authorised by :
Sara Abou-Shakra
Customer Service Manager

Issued by :
Sara Abou-Shakra
Customer Service Manager

Summary Of Results

Soil

Dioxins

Corrected to 0% Moisture

				WHO2005 Toxic Equivalents ng/kg		WHO Toxic Equivalents ng/kg	
Concept Reference	**Customer Sample Reference**	**Analysis**	**Symbol**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**
701835 006	HEP-BH-22	Dioxins and Furans (Based on US EPA 1613)	U	0.93	**4.0**	0.76	**3.9**
		Poly-Chlorinated Biphenyls (WHO 12)	U	0.26	**8.8**	0.87	**8.3**
			Sum :	1.2	**13**	1.6	**12**
701835 050	HEP-TT-6	Dioxins and Furans (Based on US EPA 1613)	U	0.26	**3.2**	0.21	**3.2**
		Poly-Chlorinated Biphenyls (WHO 12)	U	0.41	**16**	1.9	**17**
			Sum :	0.67	**20**	2.1	**20**

Soil

Customer Sample Reference : HEP-BH-22
Our Sample Reference : 701835 006
Moisture Content : 23.7 %
Top Depth : 2.30
Hole ID : HEP-BH-22
Depth : 2.30
Date Sampled : 22-NOV-2017
Time Sampled : 10:45
AGS Type : ES
AGS Sample ID : FES4171122004
AGS Sample Reference : 9
Matrix Class : Clay

Dioxins and Furans (Based on US EPA 1613)

Technique : GC/MS (HR)

						WHO2005 Toxic Equivalents ng/kg		WHO Toxic Equivalents ng/kg	
Determinand	**Symbol**	**Result ng/kg As Received @24% Moisture**	**LOD As Received @24% Moisture**	**Lower Bound ng/kg @ 0% Moisture**	**LOD @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**
2,3,7,8-TCDD	U	<0.50	0.50	<0.66	0.66	0.0	**0.66**	0.0	**0.66**
1,2,3,7,8-PeCDD	U	<0.50	0.50	<0.66	0.66	0.0	**0.66**	0.0	**0.66**
1,2,3,4,7,8-HxCDD	U	<1.0	1.0	<1.3	1.3	0.0	**0.13**	0.0	**0.13**
1,2,3,6,7,8-HxCDD	U	<2.0	2.0	<2.6	2.6	0.0	**0.26**	0.0	**0.26**
1,2,3,7,8,9-HxCDD	U	<0.80	0.80	<1.0	1.0	0.0	**0.10**	0.0	**0.10**
1,2,3,4,6,7,8-HpCDD	U	**52**	0.44	68	0.58	0.68	**0.68**	0.68	**0.68**
OCDD	U	**630**	0.71	830	0.93	0.25	**0.25**	0.083	**0.083**
					Dioxins Totals :	0.93	**2.7**	0.76	**2.6**
2,3,7,8-TCDF	U	<1.5	1.5	<2.0	2.0	0.0	**0.20**	0.0	**0.20**
1,2,3,7,8-PeCDF	U	<0.50	0.50	<0.66	0.66	0.0	**0.020**	0.0	**0.033**
2,3,4,7,8-PeCDF	U	<0.50	0.50	<0.66	0.66	0.0	**0.20**	0.0	**0.33**
1,2,3,4,7,8-HxCDF	U	<1.0	1.0	<1.3	1.3	0.0	**0.13**	0.0	**0.13**
1,2,3,6,7,8-HxCDF	U	<1.0	1.0	<1.3	1.3	0.0	**0.13**	0.0	**0.13**
2,3,4,6,7,8-HxCDF	U	<1.0	1.0	<1.3	1.3	0.0	**0.13**	0.0	**0.13**
1,2,3,7,8,9-HxCDF	U	<1.0	1.0	<1.3	1.3	0.0	**0.13**	0.0	**0.13**
1,2,3,4,6,7,8-HpCDF	U	<20	20	<26	26	0.0	**0.26**	0.0	**0.26**
1,2,3,4,7,8,9-HpCDF	U	<1.0	1.0	<1.3	1.3	0.0	**0.013**	0.0	**0.013**
OCDF	U	<30	30	<39	39	0.0	**0.012**	0.0	**0.0039**
					Furans Totals :	0.0	**1.2**	0.0	**1.4**
					Totals :	**0.93**	**4.0**	**0.76**	**3.9**

Poly-Chlorinated Biphenyls (WHO 12)

Technique : GC/MS (HR)

						WHO2005 Toxic Equivalents ng/kg		WHO Toxic Equivalents ng/kg	
Determinand	**Symbol**	**Result ng/kg As Received @24% Moisture**	**LOD As Received @24% Moisture**	**Lower Bound ng/kg @ 0% Moisture**	**LOD @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**
PCB BZ#77	U	**560**	50	730	66	0.073	**0.073**	0.073	**0.073**
PCB BZ#81	U	<50	50	<66	66	0.0	**0.020**	0.0	**0.0066**
PCB BZ#105	U	**1400**	50	1800	66	0.055	**0.055**	0.18	**0.18**
PCB BZ#114	U	(2) <140	140	<180	180	0.0	**0.0055**	0.0	**0.092**

PCB BZ#118	U	**2500**	50	3300	66	0.098	**0.098**	0.33	**0.33**
PCB BZ#123	U	(2) <500	500	<660	660	0.0	**0.020**	0.0	**0.066**
PCB BZ#126	U	(2) <50	50	<66	66	0.0	**6.6**	0.0	**6.6**
PCB BZ#156	U	**330**	50	430	66	0.013	**0.013**	0.22	**0.22**
PCB BZ#157	U	**95**	50	120	66	0.0037	**0.0037**	0.062	**0.062**
PCB BZ#167	U	**470**	50	620	66	0.018	**0.018**	0.0062	**0.0062**
PCB BZ#169	U	<50	50	<66	66	0.0	**2.0**	0.0	**0.66**
PCB BZ#189	U	<50	50	<66	66	0.0	**0.0020**	0.0	**0.0066**
					Totals :	**0.26**	**8.8**	**0.87**	**8.3**

Soil

Customer Sample Reference : HEP-TT-6
Our Sample Reference : 701835 050
Moisture Content : 27.7 %
Depth : 0.80
Top Depth : 0.80
Hole ID : HEP-TT-6
Date Sampled : 23-NOV-2017
Time Sampled : 10:30
AGS Type : ES
AGS Sample ID : HEPTT620171123003
AGS Sample Reference : 7
Matrix Class : Clay

Dioxins and Furans (Based on US EPA 1613)

Technique : GC/MS (HR)

						WHO2005 Toxic Equivalents ng/kg		WHO Toxic Equivalents ng/kg	
Determinand	**Symbol**	**Result ng/kg As Received @28% Moisture**	**LOD As Received @28% Moisture**	**Lower Bound ng/kg @ 0% Moisture**	**LOD @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**
2,3,7,8-TCDD	U	<0.60	0.60	<0.83	0.83	0.0	**0.83**	0.0	**0.83**
1,2,3,7,8-PeCDD	U	<0.60	0.60	<0.83	0.83	0.0	**0.83**	0.0	**0.83**
1,2,3,4,7,8-HxCDD	U	<1.0	1.0	<1.4	1.4	0.0	**0.14**	0.0	**0.14**
1,2,3,6,7,8-HxCDD	U	<1.0	1.0	<1.4	1.4	0.0	**0.14**	0.0	**0.14**
1,2,3,7,8,9-HxCDD	U	<1.0	1.0	<1.4	1.4	0.0	**0.14**	0.0	**0.14**
1,2,3,4,6,7,8-HpCDD	U	**9.3**	0.32	13	0.44	0.13	**0.13**	0.13	**0.13**
OCDD	U	**170**	0.53	240	0.73	0.071	**0.071**	0.024	**0.024**
					Dioxins Totals :	0.20	**2.3**	0.15	**2.2**
2,3,7,8-TCDF	U	<0.55	0.55	<0.76	0.76	0.0	**0.076**	0.0	**0.076**
1,2,3,7,8-PeCDF	U	<0.40	0.40	<0.55	0.55	0.0	**0.017**	0.0	**0.028**
2,3,4,7,8-PeCDF	U	<0.40	0.40	<0.55	0.55	0.0	**0.17**	0.0	**0.28**
1,2,3,4,7,8-HxCDF	U	<1.0	1.0	<1.4	1.4	0.0	**0.14**	0.0	**0.14**
1,2,3,6,7,8-HxCDF	U	<1.0	1.0	<1.4	1.4	0.0	**0.14**	0.0	**0.14**
2,3,4,6,7,8-HxCDF	U	<1.0	1.0	<1.4	1.4	0.0	**0.14**	0.0	**0.14**
1,2,3,7,8,9-HxCDF	U	<1.0	1.0	<1.4	1.4	0.0	**0.14**	0.0	**0.14**
1,2,3,4,6,7,8-HpCDF	U	**4.1**	0.46	5.7	0.64	0.057	**0.057**	0.057	**0.057**
1,2,3,4,7,8,9-HpCDF	U	<1.0	1.0	<1.4	1.4	0.0	**0.014**	0.0	**0.014**
OCDF	U	<6.5	6.5	<9.0	9.0	0.0	**0.0027**	0.0	**0.00090**
					Furans Totals :	0.057	**0.88**	0.057	**1.0**
					Totals :	**0.26**	**3.2**	**0.21**	**3.2**

Poly-Chlorinated Biphenyls (WHO 12)

Technique : GC/MS (HR)

						WHO2005 Toxic Equivalents ng/kg		WHO Toxic Equivalents ng/kg	
Determinand	**Symbol**	**Result ng/kg As Received @28% Moisture**	**LOD As Received @28% Moisture**	**Lower Bound ng/kg @ 0% Moisture**	**LOD @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**
PCB BZ#77	U	<50	50	<69	69	0.0	**0.0069**	0.0	**0.0069**
PCB BZ#81	U	<50	50	<69	69	0.0	**0.021**	0.0	**0.0069**
PCB BZ#105	U	**2700**	50	3700	69	0.11	**0.11**	0.37	**0.37**
PCB BZ#114	U	(2) <240	240	<330	330	0.0	**0.010**	0.0	**0.17**

PCB BZ#118	U	**5100**	50	7100	69	0.21	**0.21**	0.71	**0.71**
PCB BZ#123	U	(2) <680	680	<940	940	0.0	**0.028**	0.0	**0.094**
PCB BZ#126	U	(2) <100	100	<140	140	0.0	**14**	0.0	**14**
PCB BZ#156	U	**1000**	50	1400	69	0.041	**0.041**	0.69	**0.69**
PCB BZ#157	U	**210**	50	290	69	0.0087	**0.0087**	0.15	**0.15**
PCB BZ#167	U	**900**	50	1200	69	0.037	**0.037**	0.012	**0.012**
PCB BZ#169	U	<50	50	<69	69	0.0	**2.1**	0.0	**0.69**
PCB BZ#189	U	**67**	50	93	69	0.0028	**0.0028**	0.0093	**0.0093**
					Totals :	**0.41**	**16**	**1.9**	**17**

Concept Reference: 701835
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**701835 004**	**701835 006**	**701835 008**	**701835 009**	**701835 010**
				Customer Sample Reference	**HEP-BH-22**	**HEP-BH-22**	**HEP-BH-22**	**HEP-BH-22**	**HEP-BH-22**
				Test Sample	**AR**	**AR**	**AR**	**AR**	**AR**
				Top Depth	**0.20**	**2.30**	**4.20**	**5.20**	**6.60**
				Hole ID	**HEP-BH-22**	**HEP-BH-22**	**HEP-BH-22**	**HEP-BH-22**	**HEP-BH-22**
				Depth	**0.20**	**2.30**	**4.20**	**5.20**	**6.60**
				Date Sampled	**21-NOV-2017**	**22-NOV-2017**	**22-NOV-2017**	**22-NOV-2017**	**22-NOV-2017**
				Time Sampled	**14:28**	**10:45**	**11:35**	**13:35**	**15:25**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**FES4171121002**	**FES4171122004**	**FES4171122011**	**FES4171122014**	**FES4171122016**
				AGS Sample Reference	**2**	**9**	**14**	**17**	**19**
				Matrix Class	**Topsoil**	**Clay**	**Clay**	**Clay**	**Clay**
Determinand	**Method**	**LOD**	**Units**	**Symbol**					
Moisture @105C	Grav (1 Dec) (105 C)	0.1	%	N	**11**	**24**	**21**	**25**	**28**

Concept Reference: 701835
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**701835 012**	**701835 014**	**701835 016**	**701835 017**	**701835 019**
				Customer Sample Reference	**HEP-BH-23**	**HEP-BH-24**	**HEP-BH-50**	**HEP-BH-50**	**HEP-BH-50**
				Test Sample	**AR**	**AR**	**AR**	**AR**	**AR**
				Top Depth	**1.00**	**1.00**	**0.40**	**1.15**	**2.40**
				Hole ID	**HEP-BH-23**	**HEP-BH-24**	**HEP-BH-50**	**HEP-BH-50**	**HEP-BH-50**
				Depth	**1.00**	**1.00**	**0.40**	**1.15**	**2.40**
				Date Sampled	**30-NOV-2017**	**27-NOV-2017**	**21-NOV-2017**	**21-NOV-2017**	**21-NOV-2017**
				Time Sampled	**14:10**	**09:30**	**14:43**	**15:00**	**15:50**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH232017113 0002**	**FES2171127004**	**FES1171121006**	**FES1171121009**	**FES1171121017**
				AGS Sample Reference	**4**	**4**	**6**	**9**	**17**
				Matrix Class	**Topsoil**	**Topsoil**	**Topsoil**	**Topsoil**	**Clay**
Determinand	**Method**	**LOD**	**Units**	**Symbol**					
Moisture @105C	Grav (1 Dec) (105 C)	0.1	%	N	**11**	**6.6**	**5.1**	**5.6**	**23**

Concept Reference: 701835
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**701835 023**	**701835 024**	**701835 025**	**701835 036**	**701835 037**
				Customer Sample Reference	**HEP-BH-1802**	**HEP-BH-1802**	**HEP-BH-1805**	**HEP-BH-823**	**HEP-BH-823**
				Test Sample	**AR**	**AR**	**AR**	**AR**	**AR**
				Top Depth	**0.30**	**0.80**	**2.00**	**0.40**	**1.00**
				Hole ID	**HEP-BH-1802**	**HEP-BH-1802**	**HEP-BH-1805**	**HEP-BH-823**	**HEP-BH-823**
				Depth	**0.30**	**0.80**	**2.00**	**0.40**	**1.00**
				Date Sampled	**27-NOV-2017**	**27-NOV-2017**	**27-NOV-2017**	**30-NOV-2017**	**30-NOV-2017**
				Time Sampled	**11:30**	**11:40**	**13:15**	**13:00**	**14:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH180220171 127002**	**HEPBH180220171 127003**	**HEPBH180520171 127001**	**FES1171130003**	**FES1171130006**
				AGS Sample Reference	**4**	**7**	**9**	**3**	**6**
				Matrix Class	**Clay**	**Topsoil**	**Sandy Soil**	**Clay**	**Clay**
Determinand	**Method**	**LOD**	**Units**	**Symbol**					
Moisture @105C	Grav (1 Dec) (105 C)	0.1	%	N	**42**	**21**	**2.2**	**13**	**13**

Concept Reference: 701835
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**701835 039**	**701835 040**	**701835 041**	**701835 048**	**701835 050**
				Customer Sample Reference	**HEP-BH-823**	**HEP-BH-823**	**HEP-BH-823**	**HEP-TT-6**	**HEP-TT-6**
				Test Sample	**AR**	**AR**	**AR**	**AR**	**AR**
				Top Depth	**3.00**	**4.20**	**4.40**	**0.00**	**0.80**
				Hole ID	**HEP-BH-823**	**HEP-BH-823**	**HEP-BH-823**	**HEP-TT-6**	**HEP-TT-6**
				Depth	**3.00**	**4.20**	**4.40**	**0.00**	**0.80**
				Date Sampled	**30-NOV-2017**	**30-NOV-2017**	**30-NOV-2017**	**23-NOV-2017**	**23-NOV-2017**
				Time Sampled	**15:00**	**09:10**	**09:20**	**09:10**	**10:30**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**FES1171130013**	**FES1171130019**	**FES1171130022**	**HEPTT620171123001**	**HEPTT620171123003**
				AGS Sample Reference	**13**	**19**	**22**	**1**	**7**
				Matrix Class	**Clay**	**Clay**	**Topsoil**	**Topsoil**	**Clay**
Determinand	**Method**	**LOD**	**Units**	**Symbol**					
Moisture @105C	Grav (1 Dec) (105 C)	0.1	%	N	**16**	**18**	**14**	**31**	**28**

Concept Reference: 701835
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**701835 004**	**701835 006**	**701835 008**	**701835 009**	**701835 010**
				Customer Sample Reference	**HEP-BH-22**	**HEP-BH-22**	**HEP-BH-22**	**HEP-BH-22**	**HEP-BH-22**
				Test Sample	**M40**	**M40**	**M40**	**M40**	**M40**
				Top Depth	**0.20**	**2.30**	**4.20**	**5.20**	**6.60**
				Hole ID	**HEP-BH-22**	**HEP-BH-22**	**HEP-BH-22**	**HEP-BH-22**	**HEP-BH-22**
				Depth	**0.20**	**2.30**	**4.20**	**5.20**	**6.60**
				Date Sampled	**21-NOV-2017**	**22-NOV-2017**	**22-NOV-2017**	**22-NOV-2017**	**22-NOV-2017**
				Time Sampled	**14:28**	**10:45**	**11:35**	**13:35**	**15:25**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**FES4171121002**	**FES4171122004**	**FES4171122011**	**FES4171122014**	**FES4171122016**
				AGS Sample Reference	**2**	**9**	**14**	**17**	**19**
				Matrix Class	**Topsoil**	**Clay**	**Clay**	**Clay**	**Clay**
Determinand	**Method**	**LOD**	**Units**	**Symbol**					
Retained on 10mm sieve	Grav	0.1	%	N	<0.1	<0.1	<0.1	<0.1	<0.1

Concept Reference: 701835
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**701835 012**	**701835 014**	**701835 016**	**701835 017**	**701835 019**
				Customer Sample Reference	**HEP-BH-23**	**HEP-BH-24**	**HEP-BH-50**	**HEP-BH-50**	**HEP-BH-50**
				Test Sample	**M40**	**M40**	**M40**	**M40**	**M40**
				Top Depth	**1.00**	**1.00**	**0.40**	**1.15**	**2.40**
				Hole ID	**HEP-BH-23**	**HEP-BH-24**	**HEP-BH-50**	**HEP-BH-50**	**HEP-BH-50**
				Depth	**1.00**	**1.00**	**0.40**	**1.15**	**2.40**
				Date Sampled	**30-NOV-2017**	**27-NOV-2017**	**21-NOV-2017**	**21-NOV-2017**	**21-NOV-2017**
				Time Sampled	**14:10**	**09:30**	**14:43**	**15:00**	**15:50**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH232017113000202**	**FES2171127004**	**FES1171121006**	**FES1171121009**	**FES1171121017**
				AGS Sample Reference	**4**	**4**	**6**	**9**	**17**
				Matrix Class	**Topsoil**	**Topsoil**	**Topsoil**	**Topsoil**	**Clay**
Determinand	**Method**	**LOD**	**Units**	**Symbol**					
Retained on 10mm sieve	Grav	0.1	%	N	<0.1	<0.1	<0.1	<0.1	<0.1

Concept Reference: 701835
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**701835 023**	**701835 024**	**701835 025**	**701835 036**	**701835 037**
				Customer Sample Reference	**HEP-BH-1802**	**HEP-BH-1802**	**HEP-BH-1805**	**HEP-BH-823**	**HEP-BH-823**
				Test Sample	**M40**	**M40**	**M40**	**M40**	**M40**
				Top Depth	**0.30**	**0.80**	**2.00**	**0.40**	**1.00**
				Hole ID	**HEP-BH-1802**	**HEP-BH-1802**	**HEP-BH-1805**	**HEP-BH-823**	**HEP-BH-823**
				Depth	**0.30**	**0.80**	**2.00**	**0.40**	**1.00**
				Date Sampled	**27-NOV-2017**	**27-NOV-2017**	**27-NOV-2017**	**30-NOV-2017**	**30-NOV-2017**
				Time Sampled	**11:30**	**11:40**	**13:15**	**13:00**	**14:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH180220171127002**	**HEPBH180220171127003**	**HEPBH180520171127001**	**FES1171130003**	**FES1171130006**
				AGS Sample Reference	**4**	**7**	**9**	**3**	**6**
				Matrix Class	**Clay**	**Topsoil**	**Sandy Soil**	**Clay**	**Clay**
Determinand	**Method**	**LOD**	**Units**	**Symbol**					
Retained on 10mm sieve	Grav	0.1	%	N	<0.1	<0.1	<0.1	<0.1	<0.1

Concept Reference: 701835
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**701835 039**	**701835 040**	**701835 041**	**701835 048**	**701835 050**
				Customer Sample Reference	**HEP-BH-823**	**HEP-BH-823**	**HEP-BH-823**	**HEP-TT-6**	**HEP-TT-6**
				Test Sample	**M40**	**M40**	**M40**	**M40**	**M40**
				Top Depth	**3.00**	**4.20**	**4.40**	**0.00**	**0.80**
				Hole ID	**HEP-BH-823**	**HEP-BH-823**	**HEP-BH-823**	**HEP-TT-6**	**HEP-TT-6**
				Depth	**3.00**	**4.20**	**4.40**	**0.00**	**0.80**
				Date Sampled	**30-NOV-2017**	**30-NOV-2017**	**30-NOV-2017**	**23-NOV-2017**	**23-NOV-2017**
				Time Sampled	**15:00**	**09:10**	**09:20**	**09:10**	**10:30**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**FES1171130013**	**FES1171130019**	**FES1171130022**	**HEPTT620171123001**	**HEPTT620171123003**
				AGS Sample Reference	**13**	**19**	**22**	**1**	**7**
				Matrix Class	**Clay**	**Clay**	**Topsoil**	**Topsoil**	**Clay**
Determinand	**Method**	**LOD**	**Units**	**Symbol**					
Retained on 10mm sieve	Grav	0.1	%	N	<0.1	<0.1	<0.1	<0.1	<0.1

Index to symbols used in Third Supplemental A 701835-2

Value	Description
M40	Analysis conducted on sample assisted dried at no more than 40C. Results are reported on a dry weight basis.
AR	As Received
2	LOD Raised Due to Matrix Interference
U	Analysis is UKAS accredited
N	Analysis is not UKAS accredited

Notes

Third Supplemental A to report Dioxins and PCBS only.

CONCEPT LIFE SCIENCES
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Concept Life Sciences

Certificate of Analysis

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Tel : 0161 874 2400
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Report Number: Supplemental 701887-2

Date of Report: 27-Jun-2018

Customer: Fugro GeoServices
Fugro House
Hithercroft Road
Wallingford
Oxfordshire
OX10 9RB

Customer Contact: Ms Karen Blackmore

Customer Job Reference:
Customer Purchase Order: 56642KB-WAL
Customer Site Reference: HEP Package 3 CoC AGS4
Date Job Received at Concept: 06-Dec-2017
Date Analysis Started: 07-Dec-2017
Date Analysis Completed: 27-Dec-2017

The results reported relate to samples received in the laboratory and may not be representative of a whole batch.

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation

This report should not be reproduced except in full without the written approval of the laboratory

Tests covered by this certificate were conducted in accordance with Concept Life Sciences SOPs

All results have been reviewed in accordance with Section 25 of the Concept Life Sciences, Analytical Services Quality Manual

UKAS TESTING
1549

mCERTS
THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME

Report checked
and authorised by :
Sara Abou-Shakra
Customer Service Manager

Issued by :
Sara Abou-Shakra
Customer Service Manager

Concept Reference: 701887
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

Concept Reference	**701887 002**
Customer Sample Reference	**HEP-BH-1861**
Hole ID	**HEP-BH-1861**
Depth	**1.00**
Top Depth	**1.00**
Date Sampled	**27-NOV-2017**
Time Sampled	**15:00**
AGS Type	**ES**
AGS Sample ID	**FES2171127011**
AGS Sample Reference	**4**
Matrix Class	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units	
Moisture @105C	T162	AR	0.1	%	**9.8**
Retained on 10mm sieve	T2	M40	0.1	%	<0.1

Concept Reference: 701887
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Inorganics

Concept Reference	**701887 002**
Customer Sample Reference	**HEP-BH-1861**
Hole ID	**HEP-BH-1861**
Depth	**1.00**
Top Depth	**1.00**
Date Sampled	**27-NOV-2017**
Time Sampled	**15:00**
AGS Type	**ES**
AGS Sample ID	**FES2171127011**
AGS Sample Reference	**4**
Matrix Class	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units	
Chloride	T686	AR	1	mg/kg	**7**
Cyanide(Total)	T4	AR	1	mg/kg	<1
Thiocyanate	T4	A40	1	mg/kg	<1
Nitrate	T686	AR	1	mg/kg	**1**
Nitrite	T686	AR	1	mg/kg	<1
SO4(Total)	T6	A40	0.01	%	**0.23**
Sulphide	T4	AR	10	mg/kg	**13**

Concept Reference: 701887
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - Misc

Concept Reference	**701887 002**
Customer Sample Reference	**HEP-BH-1861**
Hole ID	**HEP-BH-1861**
Depth	**1.00**
Top Depth	**1.00**
Date Sampled	**27-NOV-2017**
Time Sampled	**15:00**
AGS Type	**ES**
AGS Sample ID	**FES2171127011**
AGS Sample Reference	**4**
Matrix Class	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units	
Soil Organic Matter	T287	A40	0.1	%	**1.1**
pH	T7	AR			**10.0**

Concept Reference: 701887
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings Metals and Metalloids

Concept Reference	**701887 002**
Customer Sample Reference	**HEP-BH-1861**
Hole ID	**HEP-BH-1861**
Depth	**1.00**
Top Depth	**1.00**
Date Sampled	**27-NOV-2017**
Time Sampled	**15:00**
AGS Type	**ES**
AGS Sample ID	**FES2171127011**
AGS Sample Reference	**4**
Matrix Class	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units	
Arsenic	T6	M40	2	mg/kg	**20**
Cadmium	T6	M40	1	mg/kg	<1
Chromium	T6	M40	1	mg/kg	**24**
Chromium VI	T6	AR	1	mg/kg	<1
Chromium (trivalent)	T85	AR	2	mg/kg	**24**
Iron	T6	A40	1	mg/kg	**23000**
Lead	T6	M40	1	mg/kg	**320**
Manganese	T6	M40	1	mg/kg	**310**
Mercury	T6	M40	1	mg/kg	<1
Nickel	T6	M40	1	mg/kg	**22**
Selenium	T6	M40	3	mg/kg	<3
Copper	T6	M40	1	mg/kg	**310**
Zinc	T6	M40	1	mg/kg	**350**
Boron (water-soluble)	T6	AR	1	mg/kg	<1

Concept Reference: 701887
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil
Suite B - Chromium

Concept Reference	**701887 002**
Customer Sample Reference	**HEP-BH-1861**
Hole ID	**HEP-BH-1861**
Depth	**1.00**
Top Depth	**1.00**
Date Sampled	**27-NOV-2017**
Time Sampled	**15:00**
AGS Type	**ES**
AGS Sample ID	**FES2171127011**
AGS Sample Reference	**4**
Matrix Class	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units	
Chromium (trivalent)	T85	AR	2	mg/kg	**24**
Chromium VI	T6	AR	1	mg/kg	<1

Concept Reference: 701887
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Total Phenol

Concept Reference	**701887 002**
Customer Sample Reference	**HEP-BH-1861**
Hole ID	**HEP-BH-1861**
Depth	**1.00**
Top Depth	**1.00**
Date Sampled	**27-NOV-2017**
Time Sampled	**15:00**
AGS Type	**ES**
AGS Sample ID	**FES2171127011**
AGS Sample Reference	**4**
Matrix Class	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units	
Phenols(Mono)	T4	AR	0.5	mg/kg	<1.0

Concept Reference: 701887
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Asbestos

Concept Reference	**701887 002**
Customer Sample Reference	**HEP-BH-1861**
Hole ID	**HEP-BH-1861**
Depth	**1.00**
Top Depth	**1.00**
Date Sampled	**27-NOV-2017**
Time Sampled	**15:00**
AGS Type	**ES**
AGS Sample ID	**FES2171127011**
AGS Sample Reference	**4**
Matrix Class	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units	
Asbestos ID	T27	AR			N.D.

Concept Reference: 701887
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground Soils with Elevated PID Readings - Organics PAH US EPA 16

Concept Reference	**701887 002**
Customer Sample Reference	**HEP-BH-1861**
Hole ID	**HEP-BH-1861**
Depth	**1.00**
Top Depth	**1.00**
Date Sampled	**27-NOV-2017**
Time Sampled	**15:00**
AGS Type	**ES**
AGS Sample ID	**FES2171127011**
AGS Sample Reference	**4**
Matrix Class	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units	
Naphthalene	T207	M105	0.1	mg/kg	(9) <1.0
Acenaphthylene	T207	AR	0.1	mg/kg	(9) <1.0
Acenaphthene	T207	M105	0.1	mg/kg	(9) <1.0
Fluorene	T207	M105	0.1	mg/kg	(9) <1.0
Phenanthrene	T207	M105	0.1	mg/kg	**1.0**
Anthracene	T207	AR	0.1	mg/kg	(9) <1.0
Fluoranthene	T207	M105	0.1	mg/kg	**2.3**
Pyrene	T207	M105	0.1	mg/kg	**2.1**
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	**1.0**
Chrysene	T207	M105	0.1	mg/kg	**1.2**
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	**1.2**
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	**1.0**
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	**1.2**
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	(9) <1.0
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	(9) <1.0
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	**1.1**
PAH(total)	T207	AR	0.1	mg/kg	**12**

Concept Reference: 701887
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - TPH (CWG)

Concept Reference	**701887 002**
Customer Sample Reference	**HEP-BH-1861**
Hole ID	**HEP-BH-1861**
Depth	**1.00**
Top Depth	**1.00**
Date Sampled	**27-NOV-2017**
Time Sampled	**15:00**
AGS Type	**ES**
AGS Sample ID	**FES2171127011**
AGS Sample Reference	**4**
Matrix Class	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units	
TPH (C5-C6 aliphatic)	T209	AR	100	µg/kg	<100
TPH (C6-C8 aliphatic)	T209	AR	100	µg/kg	<100
TPH (C8-C10 aliphatic)	T209	AR	100	µg/kg	<100
TPH (C10-C12 aliphatic)	T909	AR	1	mg/kg	(13) <1
TPH (C12-C16 aliphatic)	T909	AR	1	mg/kg	**(13) 2**
TPH (C16-C21 aliphatic)	T909	AR	1	mg/kg	**(13) 12**
TPH (C21-C35 aliphatic)	T909	AR	2	mg/kg	**(13) 63**
TPH (C6-C7 aromatic)	T209	AR	100	µg/kg	<100
TPH (C7-C8 aromatic)	T209	AR	100	µg/kg	<100
TPH (C8-C10 aromatic)	T209	AR	100	µg/kg	<100
TPH (C10-C12 aromatic)	T909	AR	2	mg/kg	(13) <2
TPH (C12-C16 aromatic)	T909	AR	1	mg/kg	**(13) 4**
TPH (C16-C21 aromatic)	T909	AR	1	mg/kg	**(13) 19**
TPH (C21-C35 aromatic)	T909	AR	1	mg/kg	**(13) 36**

Concept Reference: 701887
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil

Total Petroleum Hydrocarbons (Aliphatics+Aromatics) Total

Concept Reference	**701887 002**
Customer Sample Reference	**HEP-BH-1861**
Hole ID	**HEP-BH-1861**
Depth	**1.00**
Top Depth	**1.00**
Date Sampled	**27-NOV-2017**
Time Sampled	**15:00**
AGS Type	**ES**
AGS Sample ID	**FES2171127011**
AGS Sample Reference	**4**
Matrix Class	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units	
TPH (Aliphatic) total	T85	AR		mg/kg	(13) **77**
TPH (Aromatic) total	T85	AR		mg/kg	(13) **59**
TPH (Aliphatic+Aromatic) (sum)	T85	AR		mg/kg	**136**

Index to symbols used in Supplemental 701887-2

Value	Description
A40	Assisted dried < 40C
M40	Analysis conducted on sample assisted dried at no more than 40C. Results are reported on a dry weight basis.
AR	As Received
M105	Analysis conducted on an "as received" aliquot. Results are reported on a dry weight basis where moisture content was determined by assisted drying of sample at 105C
N.D.	Not Detected
9	LOD raised due to dilution of sample
13	Results have been blank corrected.
S	Analysis was subcontracted
M	Analysis is MCERTS accredited
U	Analysis is UKAS accredited
N	Analysis is not UKAS accredited

Notes

Supplemental to report TPH totals.
These samples have been analysed exceeding recommended holding times of 5 days for pH. It is possible therefore that the results provided may be compromised.
Asbestos was subcontracted to REC Asbestos.
Nitrate and Nitrite analysis is transferred within group to East Kilbride.

Method Index

Value	Description
T7	Probe
T162	Grav (1 Dec) (105 C)
T209	GC/MS (Head Space)(MCERTS)
T4	Colorimetry
T207	GC/MS (MCERTS)
T2	Grav
T6	ICP/OES
T909	GCxGC
T287	Calc TOC/0.58
T27	PLM
T85	Calc
T686	Discrete Analyser

Accreditation Summary

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Soil Organic Matter	T287	A40	0.1	%	N	002
pH	T7	AR			M	002
Asbestos ID	T27	AR			SU	002
Phenols(Mono)	T4	AR	0.5	mg/kg	M	002
Chloride	T686	AR	1	mg/kg	N	002
Cyanide(Total)	T4	AR	1	mg/kg	M	002
Thiocyanate	T4	A40	1	mg/kg	N	002
Nitrate	T686	AR	1	mg/kg	N	002
Nitrite	T686	AR	1	mg/kg	N	002
SO4(Total)	T6	A40	0.01	%	U	002
Sulphide	T4	AR	10	mg/kg	N	002
Arsenic	T6	M40	2	mg/kg	M	002
Cadmium	T6	M40	1	mg/kg	M	002
Chromium	T6	M40	1	mg/kg	M	002
Iron	T6	A40	1	mg/kg	U	002
Lead	T6	M40	1	mg/kg	M	002
Manganese	T6	M40	1	mg/kg	M	002
Mercury	T6	M40	1	mg/kg	M	002
Nickel	T6	M40	1	mg/kg	M	002
Selenium	T6	M40	3	mg/kg	M	002
Copper	T6	M40	1	mg/kg	M	002
Zinc	T6	M40	1	mg/kg	M	002
Boron (water-soluble)	T6	AR	1	mg/kg	N	002
Naphthalene	T207	M105	0.1	mg/kg	M	002
Acenaphthylene	T207	AR	0.1	mg/kg	U	002
Acenaphthene	T207	M105	0.1	mg/kg	M	002
Fluorene	T207	M105	0.1	mg/kg	M	002
Phenanthrene	T207	M105	0.1	mg/kg	M	002
Anthracene	T207	AR	0.1	mg/kg	U	002
Fluoranthene	T207	M105	0.1	mg/kg	M	002
Pyrene	T207	M105	0.1	mg/kg	M	002
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	M	002
Chrysene	T207	M105	0.1	mg/kg	M	002
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	M	002
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	M	002
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	M	002
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	M	002
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	M	002
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	M	002
PAH(total)	T207	AR	0.1	mg/kg	U	002
TPH (C5-C6 aliphatic)	T209	AR	100	µg/kg	N	002
TPH (C6-C8 aliphatic)	T209	AR	100	µg/kg	N	002
TPH (C8-C10 aliphatic)	T209	AR	100	µg/kg	N	002
TPH (C10-C12 aliphatic)	T909	AR	1	mg/kg	M	002
TPH (C12-C16 aliphatic)	T909	AR	1	mg/kg	M	002
TPH (C16-C21 aliphatic)	T909	AR	1	mg/kg	M	002
TPH (C21-C35 aliphatic)	T909	AR	2	mg/kg	M	002
TPH (C6-C7 aromatic)	T209	AR	100	µg/kg	N	002
TPH (C7-C8 aromatic)	T209	AR	100	µg/kg	N	002
TPH (C8-C10 aromatic)	T209	AR	100	µg/kg	N	002
TPH (C10-C12 aromatic)	T909	AR	2	mg/kg	M	002
TPH (C12-C16 aromatic)	T909	AR	1	mg/kg	M	002
TPH (C16-C21 aromatic)	T909	AR	1	mg/kg	M	002
TPH (C21-C35 aromatic)	T909	AR	1	mg/kg	M	002
TPH (Aliphatic) total	T85	AR		mg/kg	N	002
TPH (Aromatic) total	T85	AR		mg/kg	N	002
TPH (Aliphatic+Aromatic) (sum)	T85	AR		mg/kg	N	002
Chromium (trivalent)	T85	AR	2	mg/kg	N	002
Chromium VI	T6	AR	1	mg/kg	N	002
Moisture @105C	T162	AR	0.1	%	N	002
Retained on 10mm sieve	T2	M40	0.1	%	N	002

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Concept Life Sciences

Certificate of Analysis

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Report Number: Supplemental B 702829-2

Date of Report: 27-Jun-2018

Customer: Fugro GeoServices
Fugro House
Hithercroft Road
Wallingford
Oxfordshire
OX10 9RB

Customer Contact: Ms Karen Blackmore

Customer Job Reference:
Customer Purchase Order: 56642KB-WAL
Customer Site Reference: Heathrow HEP Package 3
Date Job Received at Concept: 07-Dec-2017
Date Analysis Started: 11-Dec-2017
Date Analysis Completed: 03-Jan-2018

The results reported relate to samples received in the laboratory and may not be representative of a whole batch.

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation

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Tests covered by this certificate were conducted in accordance with Concept Life Sciences SOPs

All results have been reviewed in accordance with Section 25 of the Concept Life Sciences, Analytical Services Quality Manual

UKAS TESTING
1549

mCERTS
THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME

Report checked
and authorised by :
Sara Abou-Shakra
Customer Service Manager

Issued by :
Sara Abou-Shakra
Customer Service Manager

Concept Reference: 702829
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**702829 002**	**702829 003**	**702829 005**	**702829 006**	**702829 008**
				Customer Sample Reference	**HEP-BH-17**	**HEP-BH-17**	**HEP-BH-2**	**HEP-BH-2**	**HEP-BH-2**
				Top Depth	**0.35**	**0.6**	**0.50**	**1.10**	**2.40**
				Hole ID	**HEP-BH-17**	**HEP-BH-17**	**HEP-BH-2**	**HEP-BH-2**	**HEP-BH-2**
				Depth	**0.35**	**0.6**	**0.50**	**1.10**	**2.40**
				Date Sampled	**05-DEC-2017**	**05-DEC-2017**	**05-DEC-2017**	**05-DEC-2017**	**05-DEC-2017**
				Time Sampled	**14:00**	**15:00**	**11:50**	**12:15**	**14:45**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH1720171205002**	**HEPBH1720171205003**	**FES1171205006**	**FES1171205009**	**FES1171205017**
				AGS Sample Reference	**6**	**9**	**6**	**9**	**17**
				Matrix Class	**Other**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Other**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Moisture @105C	T162	AR	0.1	%	**18**	**19**	**7.1**	**14**	**1.5**
Retained on 10mm sieve	T2	M40	0.1	%	<0.1	<0.1	<0.1	<0.1	<0.1

Concept Reference: 702829
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**702829 012**	**702829 013**	**702829 014**	**702829 015**	**702829 019**
				Customer Sample Reference	**HEP-BH-47**	**HEP-BH-47**	**HEP-BH-47**	**HEP-BH-47**	**HEP-TT-29**
				Top Depth	**0.40**	**1.00**	**2.10**	**3.00**	**0.50**
				Hole ID	**HEP-BH-47**	**HEP-BH-47**	**HEP-BH-47**	**HEP-BH-47**	**HEP-TT-29**
				Depth	**0.40**	**1.00**	**2.10**	**3.00**	**0.50**
				Date Sampled	**05-DEC-2017**	**05-DEC-2017**	**05-DEC-2017**	**05-DEC-2017**	**28-NOV-2017**
				Time Sampled	**13:30**	**14:00**	**14:30**	**15:00**	**10:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**FES2171205004**	**FES2171205007**	**FES2171205012**	**FES2171205016**	**HEPTT2920171128002**
				AGS Sample Reference	**4**	**7**	**12**	**16**	**4**
				Matrix Class	**Sandy Soil**	**Clay**	**Clay**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Moisture @105C	T162	AR	0.1	%	**4.9**	**7.5**	**23**	**2.2**	**13**
Retained on 10mm sieve	T2	M40	0.1	%	<0.1	<0.1	<0.1	<0.1	<0.1

Concept Reference: 702829
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**702829 020**	**702829 022**	**702829 023**	**702829 025**	**702829 027**
				Customer Sample Reference	**HEP-TT-29**	**HEP-TT-39**	**HEP-TT-39**	**HEP-TT-3**	**HEP-TT-3**
				Top Depth	**1.50**	**0.50**	**1.50**	**0.40**	**1.80**
				Hole ID	**HEP-TT-29**	**HEP-TT-39**	**HEP-TT-39**	**HEP-TT-3**	**HEP-TT-3**
				Depth	**1.50**	**0.50**	**1.50**	**0.40**	**1.80**
				Date Sampled	**28-NOV-2017**	**28-NOV-2017**	**28-NOV-2017**	**22-NOV-2017**	**22-NOV-2017**
				Time Sampled	**10:20**	**11:30**	**12:00**	**15:15**	**16:15**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPTT2920171128003**	**HEPTT3920171128002**	**HEPTT3920171128003**	**HEPTT320171122002**	**HEPTT320171122004**
				AGS Sample Reference	**7**	**4**	**7**	**6**	**12**
				Matrix Class	**Sandy Soil**	**Topsoil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Moisture @105C	T162	AR	0.1	%	**4.0**	**13**	**15**	**9.1**	**16**
Retained on 10mm sieve	T2	M40	0.1	%	<0.1	<0.1	<0.1	<0.1	<0.1

Concept Reference: 702829
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Inorganics

Concept Reference	**702829 002**	**702829 003**	**702829 005**	**702829 006**	**702829 008**
Customer Sample Reference	**HEP-BH-17**	**HEP-BH-17**	**HEP-BH-2**	**HEP-BH-2**	**HEP-BH-2**
Top Depth	**0.35**	**0.6**	**0.50**	**1.10**	**2.40**
Hole ID	**HEP-BH-17**	**HEP-BH-17**	**HEP-BH-2**	**HEP-BH-2**	**HEP-BH-2**
Depth	**0.35**	**0.6**	**0.50**	**1.10**	**2.40**
Date Sampled	**05-DEC-2017**	**05-DEC-2017**	**05-DEC-2017**	**05-DEC-2017**	**05-DEC-2017**
Time Sampled	**14:00**	**15:00**	**11:50**	**12:15**	**14:45**
AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**HEPBH1720171205002**	**HEPBH1720171205003**	**FES1171205006**	**FES1171205009**	**FES1171205017**
AGS Sample Reference	**6**	**9**	**6**	**9**	**17**
Matrix Class	**Other**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Other**

Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Chloride	T686	AR	1	mg/kg	**2**	**3**	**19**	**26**	**2**
Cyanide(Total)	T4	AR	1.0	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0
Thiocyanate	T4	A40	1	mg/kg	<10	<10	<10	<10	<10
Nitrate	T686	AR	1	mg/kg	**3**	**11**	**8**	**2**	<1
Nitrite	T686	AR	1	mg/kg	<1	<1	<1	<1	<1
SO4(Total)	T6	A40	0.01	%	**0.09**	**2.7**	**0.15**	**0.14**	**0.07**
Sulphide	T4	AR	10	mg/kg	<10	**39**	<10	**21**	<10

Concept Reference: 702829
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Inorganics

Concept Reference	**702829 012**	**702829 013**	**702829 014**	**702829 015**	**702829 019**
Customer Sample Reference	**HEP-BH-47**	**HEP-BH-47**	**HEP-BH-47**	**HEP-BH-47**	**HEP-TT-29**
Top Depth	**0.40**	**1.00**	**2.10**	**3.00**	**0.50**
Hole ID	**HEP-BH-47**	**HEP-BH-47**	**HEP-BH-47**	**HEP-BH-47**	**HEP-TT-29**
Depth	**0.40**	**1.00**	**2.10**	**3.00**	**0.50**
Date Sampled	**05-DEC-2017**	**05-DEC-2017**	**05-DEC-2017**	**05-DEC-2017**	**28-NOV-2017**
Time Sampled	**13:30**	**14:00**	**14:30**	**15:00**	**10:00**
AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**FES2171205004**	**FES2171205007**	**FES2171205012**	**FES2171205016**	**HEPTT2920171128002**
AGS Sample Reference	**4**	**7**	**12**	**16**	**4**
Matrix Class	**Sandy Soil**	**Clay**	**Clay**	**Sandy Soil**	**Sandy Soil**

Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Chloride	T686	AR	1	mg/kg	**4**	**8**	**24**	**8**	**2**
Cyanide(Total)	T4	AR	1.0	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0
Thiocyanate	T4	A40	1	mg/kg	<10	<10	<10	<10	<10
Nitrate	T686	AR	1	mg/kg	**15**	**9**	<1	<1	**6**
Nitrite	T686	AR	1	mg/kg	<1	<1	<1	<1	<1
SO4(Total)	T6	A40	0.01	%	**0.11**	**0.11**	**0.06**	**0.16**	**0.06**
Sulphide	T4	AR	10	mg/kg	<10	<10	**12**	**17**	<10

Concept Reference: 702829
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - Inorganics

		Concept Reference	**702829 020**	**702829 022**	**702829 023**	**702829 025**	**702829 027**
		Customer Sample Reference	**HEP-TT-29**	**HEP-TT-39**	**HEP-TT-39**	**HEP-TT-3**	**HEP-TT-3**
		Top Depth	**1.50**	**0.50**	**1.50**	**0.40**	**1.80**
		Hole ID	**HEP-TT-29**	**HEP-TT-39**	**HEP-TT-39**	**HEP-TT-3**	**HEP-TT-3**
		Depth	**1.50**	**0.50**	**1.50**	**0.40**	**1.80**
		Date Sampled	**28-NOV-2017**	**28-NOV-2017**	**28-NOV-2017**	**22-NOV-2017**	**22-NOV-2017**
		Time Sampled	**10:20**	**11:30**	**12:00**	**15:15**	**16:15**
		AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
		AGS Sample ID	**HEPTT2920171128003**	**HEPTT3920171128002**	**HEPTT3920171128003**	**HEPTT320171122002**	**HEPTT320171122004**
		AGS Sample Reference	**7**	**4**	**7**	**6**	**12**
		Matrix Class	**Sandy Soil**	**Topsoil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Chloride	T686	AR	1	mg/kg	**3**	**3**	**5**	**6**	**13**
Cyanide(Total)	T4	AR	1.0	mg/kg	<1.0	**2**	<1.0	<1.0	<1.0
Thiocyanate	T4	A40	1	mg/kg	<10	<10	<10	<10	<10
Nitrate	T686	AR	1	mg/kg	**2**	**35**	**30**	**11**	<1
Nitrite	T686	AR	1	mg/kg	<1	<1	<1	<1	<1
SO4(Total)	T6	A40	0.01	%	**0.20**	**0.15**	**0.62**	**0.08**	**0.38**
Sulphide	T4	AR	10	mg/kg	**26**	<10	**11**	<10	**560**

Concept Reference: 702829
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - Misc

		Concept Reference	**702829 002**	**702829 003**	**702829 005**	**702829 006**	**702829 008**
		Customer Sample Reference	**HEP-BH-17**	**HEP-BH-17**	**HEP-BH-2**	**HEP-BH-2**	**HEP-BH-2**
		Top Depth	**0.35**	**0.6**	**0.50**	**1.10**	**2.40**
		Hole ID	**HEP-BH-17**	**HEP-BH-17**	**HEP-BH-2**	**HEP-BH-2**	**HEP-BH-2**
		Depth	**0.35**	**0.6**	**0.50**	**1.10**	**2.40**
		Date Sampled	**05-DEC-2017**	**05-DEC-2017**	**05-DEC-2017**	**05-DEC-2017**	**05-DEC-2017**
		Time Sampled	**14:00**	**15:00**	**11:50**	**12:15**	**14:45**
		AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
		AGS Sample ID	**HEPBH1720171205002**	**HEPBH1720171205003**	**FES1171205006**	**FES1171205009**	**FES1171205017**
		AGS Sample Reference	**6**	**9**	**6**	**9**	**17**
		Matrix Class	**Other**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Other**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Soil Organic Matter	T287	A40	0.1	%	**3.2**	**4.8**	**4.1**	**4.6**	**0.5**
pH	T7	AR			**8.0**	**7.7**	**8.2**	**8.0**	**7.7**

Concept Reference: 702829
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Misc

				Concept Reference	**702829 012**	**702829 013**	**702829 014**	**702829 015**	**702829 019**
				Customer Sample Reference	**HEP-BH-47**	**HEP-BH-47**	**HEP-BH-47**	**HEP-BH-47**	**HEP-TT-29**
				Top Depth	**0.40**	**1.00**	**2.10**	**3.00**	**0.50**
				Hole ID	**HEP-BH-47**	**HEP-BH-47**	**HEP-BH-47**	**HEP-BH-47**	**HEP-TT-29**
				Depth	**0.40**	**1.00**	**2.10**	**3.00**	**0.50**
				Date Sampled	**05-DEC-2017**	**05-DEC-2017**	**05-DEC-2017**	**05-DEC-2017**	**28-NOV-2017**
				Time Sampled	**13:30**	**14:00**	**14:30**	**15:00**	**10:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**FES2171205004**	**FES2171205007**	**FES2171205012**	**FES2171205016**	**HEPTT2920171128002**
				AGS Sample Reference	**4**	**7**	**12**	**16**	**4**
				Matrix Class	**Sandy Soil**	**Clay**	**Clay**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Soil Organic Matter	T287	A40	0.1	%	**1.1**	**3.5**	**1.1**	**2.0**	**1.7**
pH	T7	AR			**8.3**	**8.0**	**7.9**	**8.4**	**8.1**

Concept Reference: 702829
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Misc

				Concept Reference	**702829 020**	**702829 022**	**702829 023**	**702829 025**	**702829 027**
				Customer Sample Reference	**HEP-TT-29**	**HEP-TT-39**	**HEP-TT-39**	**HEP-TT-3**	**HEP-TT-3**
				Top Depth	**1.50**	**0.50**	**1.50**	**0.40**	**1.80**
				Hole ID	**HEP-TT-29**	**HEP-TT-39**	**HEP-TT-39**	**HEP-TT-3**	**HEP-TT-3**
				Depth	**1.50**	**0.50**	**1.50**	**0.40**	**1.80**
				Date Sampled	**28-NOV-2017**	**28-NOV-2017**	**28-NOV-2017**	**22-NOV-2017**	**22-NOV-2017**
				Time Sampled	**10:20**	**11:30**	**12:00**	**15:15**	**16:15**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPTT2920171128003**	**HEPTT3920171128002**	**HEPTT3920171128003**	**HEPTT320171122002**	**HEPTT320171122004**
				AGS Sample Reference	**7**	**4**	**7**	**6**	**12**
				Matrix Class	**Sandy Soil**	**Topsoil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Soil Organic Matter	T287	A40	0.1	%	**1.7**	**6.2**	**3.8**	**5.8**	**2.8**
pH	T7	AR			**7.2**	**7.6**	**7.3**	**8.0**	**7.9**

Concept Reference: 702829
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings Metals and Metalloids

				Concept Reference	**702829 002**	**702829 003**	**702829 005**	**702829 006**	**702829 008**
				Customer Sample Reference	**HEP-BH-17**	**HEP-BH-17**	**HEP-BH-2**	**HEP-BH-2**	**HEP-BH-2**
				Top Depth	**0.35**	**0.6**	**0.50**	**1.10**	**2.40**
				Hole ID	**HEP-BH-17**	**HEP-BH-17**	**HEP-BH-2**	**HEP-BH-2**	**HEP-BH-2**
				Depth	**0.35**	**0.6**	**0.50**	**1.10**	**2.40**
				Date Sampled	**05-DEC-2017**	**05-DEC-2017**	**05-DEC-2017**	**05-DEC-2017**	**05-DEC-2017**
				Time Sampled	**14:00**	**15:00**	**11:50**	**12:15**	**14:45**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH1720171205002**	**HEPBH1720171205003**	**FES1171205006**	**FES1171205009**	**FES1171205017**
				AGS Sample Reference	**6**	**9**	**6**	**9**	**17**
				Matrix Class	**Other**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Other**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Arsenic	T6	M40	2.0	mg/kg	**15**	**12**	**15**	**18**	**4.3**
Cadmium	T6	M40	1.0	mg/kg	<1.0	**2**	<1.0	<1.0	<1.0
Chromium	T6	M40	1	mg/kg	**36**	**27**	**28**	**30**	**32**
Chromium VI	T6	AR	1	mg/kg	<1	<1	<1	<1	<1
Chromium (trivalent)	T85	AR	2	mg/kg	**36**	**27**	**28**	**30**	**32**
Iron	T6	A40	1	mg/kg	**32000**	**19000**	**25000**	**31000**	**9700**
Lead	T6	M40	1	mg/kg	**190**	**790**	**370**	**340**	**40**
Manganese	T6	M40	1	mg/kg	**370**	**280**	**420**	**430**	**130**
Mercury	T6	M40	1	mg/kg	<1	<1	<1	<1	<1
Nickel	T6	M40	1	mg/kg	**32**	**18**	**23**	**27**	**10**
Selenium	T6	M40	3	mg/kg	<3	<3	<3	<3	<3
Copper	T6	M40	1	mg/kg	**72**	**83**	**110**	**230**	**21**
Zinc	T6	M40	1	mg/kg	**190**	**950**	**190**	**380**	**44**
Boron (water-soluble)	T6	AR	1	mg/kg	<1	<1	<1	<1	<1

Concept Reference: 702829
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings Metals and Metalloids

				Concept Reference	**702829 012**	**702829 013**	**702829 014**	**702829 015**	**702829 019**
				Customer Sample Reference	**HEP-BH-47**	**HEP-BH-47**	**HEP-BH-47**	**HEP-BH-47**	**HEP-TT-29**
				Top Depth	**0.40**	**1.00**	**2.10**	**3.00**	**0.50**
				Hole ID	**HEP-BH-47**	**HEP-BH-47**	**HEP-BH-47**	**HEP-BH-47**	**HEP-TT-29**
				Depth	**0.40**	**1.00**	**2.10**	**3.00**	**0.50**
				Date Sampled	**05-DEC-2017**	**05-DEC-2017**	**05-DEC-2017**	**05-DEC-2017**	**28-NOV-2017**
				Time Sampled	**13:30**	**14:00**	**14:30**	**15:00**	**10:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**FES2171205004**	**FES2171205007**	**FES2171205012**	**FES2171205016**	**HEPTT2920171128002**
				AGS Sample Reference	**4**	**7**	**12**	**16**	**4**
				Matrix Class	**Sandy Soil**	**Clay**	**Clay**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Arsenic	T6	M40	2.0	mg/kg	**11**	**7**	**8**	**12**	**15**
Cadmium	T6	M40	1.0	mg/kg	<1.0	<1.0	<1.0	<1.0	**2**
Chromium	T6	M40	1	mg/kg	**21**	**32**	**30**	**39**	**47**
Chromium VI	T6	AR	1	mg/kg	<1	<1	<1	<1	<1
Chromium (trivalent)	T85	AR	2	mg/kg	**21**	**32**	**30**	**39**	**47**
Iron	T6	A40	1	mg/kg	**21000**	**17000**	**10000**	**31000**	**29000**
Lead	T6	M40	1	mg/kg	**43**	**22**	**23**	**24**	**72**
Manganese	T6	M40	1	mg/kg	**350**	**170**	**110**	**250**	**330**
Mercury	T6	M40	1	mg/kg	<1	<1	<1	<1	<1
Nickel	T6	M40	1	mg/kg	**16**	**21**	**13**	**33**	**27**
Selenium	T6	M40	3	mg/kg	<3	<3	<3	<3	<3
Copper	T6	M40	1	mg/kg	**13**	**21**	**12**	**26**	**46**
Zinc	T6	M40	1	mg/kg	**65**	**46**	**30**	**75**	**120**
Boron (water-soluble)	T6	AR	1	mg/kg	<1	<1	<1	<1	<1

Concept Reference: 702829
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings Metals and Metalloids

		Concept Reference	**702829 020**	**702829 022**	**702829 023**	**702829 025**	**702829 027**
		Customer Sample Reference	**HEP-TT-29**	**HEP-TT-39**	**HEP-TT-39**	**HEP-TT-3**	**HEP-TT-3**
		Top Depth	**1.50**	**0.50**	**1.50**	**0.40**	**1.80**
		Hole ID	**HEP-TT-29**	**HEP-TT-39**	**HEP-TT-39**	**HEP-TT-3**	**HEP-TT-3**
		Depth	**1.50**	**0.50**	**1.50**	**0.40**	**1.80**
		Date Sampled	**28-NOV-2017**	**28-NOV-2017**	**28-NOV-2017**	**22-NOV-2017**	**22-NOV-2017**
		Time Sampled	**10:20**	**11:30**	**12:00**	**15:15**	**16:15**
		AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
		AGS Sample ID	**HEPTT2920171128003**	**HEPTT3920171128002**	**HEPTT3920171128003**	**HEPTT320171122002**	**HEPTT320171122004**
		AGS Sample Reference	**7**	**4**	**7**	**6**	**12**
		Matrix Class	**Sandy Soil**	**Topsoil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Arsenic	T6	M40	2.0	mg/kg	**11**	**11**	**11**	**13**	**15**
Cadmium	T6	M40	1.0	mg/kg	<1.0	**13**	<1.0	**1**	**1**
Chromium	T6	M40	1	mg/kg	**35**	**160**	**30**	**41**	**33**
Chromium VI	T6	AR	1	mg/kg	<1	<1	<1	<1	<1
Chromium (trivalent)	T85	AR	2	mg/kg	**35**	**160**	**30**	**41**	**33**
Iron	T6	A40	1	mg/kg	**28000**	**21000**	**21000**	**28000**	**32000**
Lead	T6	M40	1	mg/kg	**24**	**180**	**41**	**200**	**550**
Manganese	T6	M40	1	mg/kg	**180**	**360**	**450**	**360**	**360**
Mercury	T6	M40	1	mg/kg	<1	**1**	<1	<1	<1
Nickel	T6	M40	1	mg/kg	**22**	**49**	**24**	**28**	**27**
Selenium	T6	M40	3	mg/kg	<3	<3	<3	<3	<3
Copper	T6	M40	1	mg/kg	**24**	**210**	**24**	**58**	**63**
Zinc	T6	M40	1	mg/kg	**72**	**400**	**71**	**200**	**300**
Boron (water-soluble)	T6	AR	1	mg/kg	<1	<1	<1	<1	<1

Concept Reference: 702829
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - Total Phenol

		Concept Reference	**702829 002**	**702829 003**	**702829 005**	**702829 006**	**702829 008**
		Customer Sample Reference	**HEP-BH-17**	**HEP-BH-17**	**HEP-BH-2**	**HEP-BH-2**	**HEP-BH-2**
		Top Depth	**0.35**	**0.6**	**0.50**	**1.10**	**2.40**
		Hole ID	**HEP-BH-17**	**HEP-BH-17**	**HEP-BH-2**	**HEP-BH-2**	**HEP-BH-2**
		Depth	**0.35**	**0.6**	**0.50**	**1.10**	**2.40**
		Date Sampled	**05-DEC-2017**	**05-DEC-2017**	**05-DEC-2017**	**05-DEC-2017**	**05-DEC-2017**
		Time Sampled	**14:00**	**15:00**	**11:50**	**12:15**	**14:45**
		AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
		AGS Sample ID	**HEPBH1720171205002**	**HEPBH1720171205003**	**FES1171205006**	**FES1171205009**	**FES1171205017**
		AGS Sample Reference	**6**	**9**	**6**	**9**	**17**
		Matrix Class	**Other**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Other**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Phenols(Mono)	T4	AR	0.5	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0

Concept Reference: 702829
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - Total Phenol

				Concept Reference	**702829 012**	**702829 013**	**702829 014**	**702829 015**	**702829 019**
				Customer Sample Reference	**HEP-BH-47**	**HEP-BH-47**	**HEP-BH-47**	**HEP-BH-47**	**HEP-TT-29**
				Top Depth	**0.40**	**1.00**	**2.10**	**3.00**	**0.50**
				Hole ID	**HEP-BH-47**	**HEP-BH-47**	**HEP-BH-47**	**HEP-BH-47**	**HEP-TT-29**
				Depth	**0.40**	**1.00**	**2.10**	**3.00**	**0.50**
				Date Sampled	**05-DEC-2017**	**05-DEC-2017**	**05-DEC-2017**	**05-DEC-2017**	**28-NOV-2017**
				Time Sampled	**13:30**	**14:00**	**14:30**	**15:00**	**10:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**FES2171205004**	**FES2171205007**	**FES2171205012**	**FES2171205016**	**HEPTT2920171128002**
				AGS Sample Reference	**4**	**7**	**12**	**16**	**4**
				Matrix Class	**Sandy Soil**	**Clay**	**Clay**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Phenols(Mono)	T4	AR	0.5	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0

Concept Reference: 702829
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - Total Phenol

				Concept Reference	**702829 020**	**702829 022**	**702829 023**	**702829 025**	**702829 027**
				Customer Sample Reference	**HEP-TT-29**	**HEP-TT-39**	**HEP-TT-39**	**HEP-TT-3**	**HEP-TT-3**
				Top Depth	**1.50**	**0.50**	**1.50**	**0.40**	**1.80**
				Hole ID	**HEP-TT-29**	**HEP-TT-39**	**HEP-TT-39**	**HEP-TT-3**	**HEP-TT-3**
				Depth	**1.50**	**0.50**	**1.50**	**0.40**	**1.80**
				Date Sampled	**28-NOV-2017**	**28-NOV-2017**	**28-NOV-2017**	**22-NOV-2017**	**22-NOV-2017**
				Time Sampled	**10:20**	**11:30**	**12:00**	**15:15**	**16:15**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPTT2920171128003**	**HEPTT3920171128002**	**HEPTT3920171128003**	**HEPTT320171122002**	**HEPTT320171122004**
				AGS Sample Reference	**7**	**4**	**7**	**6**	**12**
				Matrix Class	**Sandy Soil**	**Topsoil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Phenols(Mono)	T4	AR	0.5	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0

Concept Reference: 702829
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - Asbestos

				Concept Reference	**702829 002**	**702829 003**	**702829 005**	**702829 006**	**702829 008**
				Customer Sample Reference	**HEP-BH-17**	**HEP-BH-17**	**HEP-BH-2**	**HEP-BH-2**	**HEP-BH-2**
				Top Depth	**0.35**	**0.6**	**0.50**	**1.10**	**2.40**
				Hole ID	**HEP-BH-17**	**HEP-BH-17**	**HEP-BH-2**	**HEP-BH-2**	**HEP-BH-2**
				Depth	**0.35**	**0.6**	**0.50**	**1.10**	**2.40**
				Date Sampled	**05-DEC-2017**	**05-DEC-2017**	**05-DEC-2017**	**05-DEC-2017**	**05-DEC-2017**
				Time Sampled	**14:00**	**15:00**	**11:50**	**12:15**	**14:45**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH1720171205002**	**HEPBH1720171205003**	**FES1171205006**	**FES1171205009**	**FES1171205017**
				AGS Sample Reference	**6**	**9**	**6**	**9**	**17**
				Matrix Class	**Other**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Other**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Asbestos ID	T27	AR			N.D.	N.D.	N.D.	N.D.	N.D.

Concept Reference: 702829
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - Asbestos

				Concept Reference	**702829 012**	**702829 013**	**702829 014**	**702829 015**	**702829 019**
				Customer Sample Reference	**HEP-BH-47**	**HEP-BH-47**	**HEP-BH-47**	**HEP-BH-47**	**HEP-TT-29**
				Top Depth	**0.40**	**1.00**	**2.10**	**3.00**	**0.50**
				Hole ID	**HEP-BH-47**	**HEP-BH-47**	**HEP-BH-47**	**HEP-BH-47**	**HEP-TT-29**
				Depth	**0.40**	**1.00**	**2.10**	**3.00**	**0.50**
				Date Sampled	**05-DEC-2017**	**05-DEC-2017**	**05-DEC-2017**	**05-DEC-2017**	**28-NOV-2017**
				Time Sampled	**13:30**	**14:00**	**14:30**	**15:00**	**10:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**FES2171205004**	**FES2171205007**	**FES2171205012**	**FES2171205016**	**HEPTT2920171128002**
				AGS Sample Reference	**4**	**7**	**12**	**16**	**4**
				Matrix Class	**Sandy Soil**	**Clay**	**Clay**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Asbestos ID	T27	AR			N.D.	N.D.	N.D.	N.D.	N.D.

Concept Reference: 702829
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - Asbestos

				Concept Reference	**702829 020**	**702829 022**	**702829 023**	**702829 025**	**702829 027**
				Customer Sample Reference	**HEP-TT-29**	**HEP-TT-39**	**HEP-TT-39**	**HEP-TT-3**	**HEP-TT-3**
				Top Depth	**1.50**	**0.50**	**1.50**	**0.40**	**1.80**
				Hole ID	**HEP-TT-29**	**HEP-TT-39**	**HEP-TT-39**	**HEP-TT-3**	**HEP-TT-3**
				Depth	**1.50**	**0.50**	**1.50**	**0.40**	**1.80**
				Date Sampled	**28-NOV-2017**	**28-NOV-2017**	**28-NOV-2017**	**22-NOV-2017**	**22-NOV-2017**
				Time Sampled	**10:20**	**11:30**	**12:00**	**15:15**	**16:15**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPTT2920171128003**	**HEPTT3920171128002**	**HEPTT3920171128003**	**HEPTT320171122002**	**HEPTT320171122004**
				AGS Sample Reference	**7**	**4**	**7**	**6**	**12**
				Matrix Class	**Sandy Soil**	**Topsoil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Asbestos ID	T27	AR			N.D.	N.D.	N.D.	N.D.	N.D.

Concept Reference: 702829
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground Soils with Elevated PID Readings - Organics PAH US EPA 16

Concept Reference	**702829 002**	**702829 003**	**702829 005**	**702829 006**	**702829 008**
Customer Sample Reference	**HEP-BH-17**	**HEP-BH-17**	**HEP-BH-2**	**HEP-BH-2**	**HEP-BH-2**
Top Depth	**0.35**	**0.6**	**0.50**	**1.10**	**2.40**
Hole ID	**HEP-BH-17**	**HEP-BH-17**	**HEP-BH-2**	**HEP-BH-2**	**HEP-BH-2**
Depth	**0.35**	**0.6**	**0.50**	**1.10**	**2.40**
Date Sampled	**05-DEC-2017**	**05-DEC-2017**	**05-DEC-2017**	**05-DEC-2017**	**05-DEC-2017**
Time Sampled	**14:00**	**15:00**	**11:50**	**12:15**	**14:45**
AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**HEPBH1720171205002**	**HEPBH1720171205003**	**FES1171205006**	**FES1171205009**	**FES1171205017**
AGS Sample Reference	**6**	**9**	**6**	**9**	**17**
Matrix Class	**Other**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Other**

Determinand	Method	Test Sample	LOD	Units					
Naphthalene	T207	M105	0.1	mg/kg	<0.1	(9) <1.0	(9) <1.0	<0.1	<0.1
Acenaphthylene	T207	M105	0.1	mg/kg	<0.1	(9) <1.0	(9) <1.0	<0.1	<0.1
Acenaphthene	T207	M105	0.1	mg/kg	<0.1	(9) <1.0	(9) <1.0	<0.1	<0.1
Fluorene	T207	M105	0.1	mg/kg	<0.1	(9) <1.0	(9) <1.0	<0.1	<0.1
Phenanthrene	T207	M105	0.1	mg/kg	**0.7**	**1.7**	(9) <1.0	**0.7**	**0.5**
Anthracene	T207	M105	0.1	mg/kg	**0.1**	(9) <1.0	(9) <1.0	**0.2**	**0.1**
Fluoranthene	T207	M105	0.1	mg/kg	**2.0**	**3.9**	**1.6**	**1.2**	**0.7**
Pyrene	T207	M105	0.1	mg/kg	**1.9**	**3.5**	**1.4**	**1.0**	**0.5**
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	**1.0**	**2.0**	(9) <1.0	**0.6**	**0.3**
Chrysene	T207	M105	0.1	mg/kg	**1.2**	**2.2**	(9) <1.0	**0.6**	**0.2**
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	**1.1**	**2.2**	(9) <1.0	**0.7**	**0.2**
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	**1.1**	**2.1**	(9) <1.0	**0.5**	**0.2**
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	**1.2**	**2.5**	(9) <1.0	**0.6**	**0.2**
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	**0.9**	**1.8**	(9) <1.0	**0.3**	<0.1
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	**0.4**	(9) <1.0	(9) <1.0	**0.2**	<0.1
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	**1.2**	**1.8**	(9) <1.0	**0.3**	<0.1
PAH(total)	T207	M105	0.1	mg/kg	**13**	**24**	**3.0**	**6.9**	**2.9**

Concept Reference: 702829
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground Soils with Elevated PID Readings - Organics PAH US EPA 16

Concept Reference	**702829 012**	**702829 013**	**702829 014**	**702829 015**	**702829 019**
Customer Sample Reference	**HEP-BH-47**	**HEP-BH-47**	**HEP-BH-47**	**HEP-BH-47**	**HEP-TT-29**
Top Depth	**0.40**	**1.00**	**2.10**	**3.00**	**0.50**
Hole ID	**HEP-BH-47**	**HEP-BH-47**	**HEP-BH-47**	**HEP-BH-47**	**HEP-TT-29**
Depth	**0.40**	**1.00**	**2.10**	**3.00**	**0.50**
Date Sampled	**05-DEC-2017**	**05-DEC-2017**	**05-DEC-2017**	**05-DEC-2017**	**28-NOV-2017**
Time Sampled	**13:30**	**14:00**	**14:30**	**15:00**	**10:00**
AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**FES2171205004**	**FES2171205007**	**FES2171205012**	**FES2171205016**	**HEPTT2920171128002**
AGS Sample Reference	**4**	**7**	**12**	**16**	**4**
Matrix Class	**Sandy Soil**	**Clay**	**Clay**	**Sandy Soil**	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units					
Naphthalene	T207	M105	0.1	mg/kg	**0.2**	**0.8**	<0.1	<0.1	(9) <1.0
Acenaphthylene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	(9) <1.0
Acenaphthene	T207	M105	0.1	mg/kg	**0.1**	**0.9**	<0.1	<0.1	(9) <1.0
Fluorene	T207	M105	0.1	mg/kg	<0.1	**1.1**	<0.1	<0.1	(9) <1.0
Phenanthrene	T207	M105	0.1	mg/kg	**0.8**	**4.4**	<0.1	<0.1	(9) <1.0
Anthracene	T207	M105	0.1	mg/kg	**0.2**	**1.6**	<0.1	<0.1	(9) <1.0
Fluoranthene	T207	M105	0.1	mg/kg	**1.3**	**4.2**	<0.1	<0.1	(9) <1.0
Pyrene	T207	M105	0.1	mg/kg	**1.2**	**3.5**	<0.1	<0.1	(9) <1.0
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	**0.6**	**1.7**	<0.1	<0.1	(9) <1.0
Chrysene	T207	M105	0.1	mg/kg	**0.5**	**1.5**	<0.1	<0.1	(9) <1.0
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	**0.5**	**1.4**	<0.1	<0.1	(9) <1.0
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	**0.6**	**1.3**	<0.1	<0.1	(9) <1.0
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	**0.6**	**1.4**	<0.1	<0.1	(9) <1.0
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	**0.3**	**0.7**	<0.1	<0.1	(9) <1.0
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	**0.1**	**0.2**	<0.1	<0.1	(9) <1.0
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	**0.3**	**0.6**	<0.1	<0.1	(9) <1.0
PAH(total)	T207	M105	0.1	mg/kg	**7.5**	**25**	<0.1	<0.1	<1.0

Concept Reference: 702829
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground Soils with Elevated PID Readings - Organics PAH US EPA 16

				Concept Reference	**702829 020**	**702829 022**	**702829 023**	**702829 025**	**702829 027**
				Customer Sample Reference	**HEP-TT-29**	**HEP-TT-39**	**HEP-TT-39**	**HEP-TT-3**	**HEP-TT-3**
				Top Depth	**1.50**	**0.50**	**1.50**	**0.40**	**1.80**
				Hole ID	**HEP-TT-29**	**HEP-TT-39**	**HEP-TT-39**	**HEP-TT-3**	**HEP-TT-3**
				Depth	**1.50**	**0.50**	**1.50**	**0.40**	**1.80**
				Date Sampled	**28-NOV-2017**	**28-NOV-2017**	**28-NOV-2017**	**22-NOV-2017**	**22-NOV-2017**
				Time Sampled	**10:20**	**11:30**	**12:00**	**15:15**	**16:15**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPTT2920171128003**	**HEPTT3920171128002**	**HEPTT3920171128003**	**HEPTT320171122002**	**HEPTT320171122004**
				AGS Sample Reference	**7**	**4**	**7**	**6**	**12**
				Matrix Class	**Sandy Soil**	**Topsoil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Naphthalene	T207	M105	0.1	mg/kg	<0.1	(9) <1.0	<0.1	**0.2**	**0.4**
Acenaphthylene	T207	M105	0.1	mg/kg	<0.1	(9) <1.0	<0.1	<0.1	<0.1
Acenaphthene	T207	M105	0.1	mg/kg	<0.1	(9) <1.0	<0.1	<0.1	**0.3**
Fluorene	T207	M105	0.1	mg/kg	<0.1	(9) <1.0	<0.1	**0.1**	**0.3**
Phenanthrene	T207	M105	0.1	mg/kg	<0.1	(9) <1.0	**0.1**	**1.4**	**2.4**
Anthracene	T207	M105	0.1	mg/kg	<0.1	(9) <1.0	<0.1	**0.5**	**0.4**
Fluoranthene	T207	M105	0.1	mg/kg	<0.1	**1.5**	**0.4**	**2.5**	**3.1**
Pyrene	T207	M105	0.1	mg/kg	<0.1	**1.3**	**0.4**	**2.1**	**2.5**
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	<0.1	(9) <1.0	**0.2**	**1.5**	**1.0**
Chrysene	T207	M105	0.1	mg/kg	<0.1	(9) <1.0	**0.2**	**1.6**	**1.1**
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	<0.1	(9) <1.0	**0.2**	**1.9**	**1.2**
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	<0.1	**1.1**	**0.2**	**1.6**	**1.0**
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	<0.1	(9) <1.0	**0.2**	**1.6**	**1.0**
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	<0.1	(9) <1.0	**0.1**	**1.0**	**0.5**
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	<0.1	(9) <1.0	<0.1	**0.4**	**0.2**
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	<0.1	(9) <1.0	**0.1**	**0.9**	**0.4**
PAH(total)	T207	M105	0.1	mg/kg	<0.1	**3.9**	**2.1**	**17**	**16**

Concept Reference: 702829
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - TPH (CWG)

				Concept Reference	**702829 002**	**702829 003**	**702829 005**	**702829 006**	**702829 008**
				Customer Sample Reference	**HEP-BH-17**	**HEP-BH-17**	**HEP-BH-2**	**HEP-BH-2**	**HEP-BH-2**
				Top Depth	**0.35**	**0.6**	**0.50**	**1.10**	**2.40**
				Hole ID	**HEP-BH-17**	**HEP-BH-17**	**HEP-BH-2**	**HEP-BH-2**	**HEP-BH-2**
				Depth	**0.35**	**0.6**	**0.50**	**1.10**	**2.40**
				Date Sampled	**05-DEC-2017**	**05-DEC-2017**	**05-DEC-2017**	**05-DEC-2017**	**05-DEC-2017**
				Time Sampled	**14:00**	**15:00**	**11:50**	**12:15**	**14:45**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH1720171205002**	**HEPBH1720171205003**	**FES1171205006**	**FES1171205009**	**FES1171205017**
				AGS Sample Reference	**6**	**9**	**6**	**9**	**17**
				Matrix Class	**Other**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Other**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
TPH (C5-C6 aliphatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C6-C8 aliphatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C8-C10 aliphatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	(9,13) <10	(13,9) <10	(13) <1	(13) <1	(13) <1
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	(13,9) <10	(13,9) <10	(13) <1	**(13) 2**	(13) <1
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	(13,9) <10	(9,13) <10	(13) <1	**(13) 2**	(13) <1
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	**(13) 21**	**(13) 30**	(13) <2	**(13) 7**	(13) <2
TPH (C6-C7 aromatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C7-C8 aromatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C8-C10 aromatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	(13,9) <10	(13,9) <10	(13) <2	(13) <2	(13) <2
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	(13,9) <10	(9,13) <10	(13) <1	(13) <1	(13) <1
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	**(13) 25**	**(13) 50**	**(13) 5**	**(13) 8**	(13) <1
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	**(13) 24**	**(13) 110**	**(13) 18**	**(13) 23**	(13) <1

Concept Reference: 702829
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - TPH (CWG)

				Concept Reference	**702829 012**	**702829 013**	**702829 014**	**702829 015**	**702829 019**
				Customer Sample Reference	**HEP-BH-47**	**HEP-BH-47**	**HEP-BH-47**	**HEP-BH-47**	**HEP-TT-29**
				Top Depth	**0.40**	**1.00**	**2.10**	**3.00**	**0.50**
				Hole ID	**HEP-BH-47**	**HEP-BH-47**	**HEP-BH-47**	**HEP-BH-47**	**HEP-TT-29**
				Depth	**0.40**	**1.00**	**2.10**	**3.00**	**0.50**
				Date Sampled	**05-DEC-2017**	**05-DEC-2017**	**05-DEC-2017**	**05-DEC-2017**	**28-NOV-2017**
				Time Sampled	**13:30**	**14:00**	**14:30**	**15:00**	**10:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**FES2171205004**	**FES2171205007**	**FES2171205012**	**FES2171205016**	**HEPTT2920171128002**
				AGS Sample Reference	**4**	**7**	**12**	**16**	**4**
				Matrix Class	**Sandy Soil**	**Clay**	**Clay**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
TPH (C5-C6 aliphatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C6-C8 aliphatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C8-C10 aliphatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	(13) <1	(13,9) <10	(13) <1	(13) <1	(13,9) <10
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	(13) <1	(13,9) <10	(13) <1	(13) <1	(9,13) <10
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	(13) <1	(9,13) <10	(13) <1	(13) <1	(9,13) <10
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	(13) <2	(9,13) <10	(13) <2	(13) <2	(9,13) <10
TPH (C6-C7 aromatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C7-C8 aromatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C8-C10 aromatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	(13) <2	(13,9) <10	(13) <2	(13) <2	(13,9) <10
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	(13) <1	**(13) 22**	(13) <1	(13) <1	(13,9) <10
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	(13) <1	**(13) 80**	(13) <1	(13) <1	(9,13) <10
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	(13) <1	**(13) 140**	(13) <1	(13) <1	(9,13) <10

Concept Reference: 702829
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - TPH (CWG)

				Concept Reference	**702829 020**	**702829 022**	**702829 023**	**702829 025**	**702829 027**
				Customer Sample Reference	**HEP-TT-29**	**HEP-TT-39**	**HEP-TT-39**	**HEP-TT-3**	**HEP-TT-3**
				Top Depth	**1.50**	**0.50**	**1.50**	**0.40**	**1.80**
				Hole ID	**HEP-TT-29**	**HEP-TT-39**	**HEP-TT-39**	**HEP-TT-3**	**HEP-TT-3**
				Depth	**1.50**	**0.50**	**1.50**	**0.40**	**1.80**
				Date Sampled	**28-NOV-2017**	**28-NOV-2017**	**28-NOV-2017**	**22-NOV-2017**	**22-NOV-2017**
				Time Sampled	**10:20**	**11:30**	**12:00**	**15:15**	**16:15**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPTT2920171128003**	**HEPTT3920171128002**	**HEPTT3920171128003**	**HEPTT320171122002**	**HEPTT320171122004**
				AGS Sample Reference	**7**	**4**	**7**	**6**	**12**
				Matrix Class	**Sandy Soil**	**Topsoil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
TPH (C5-C6 aliphatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C6-C8 aliphatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C8-C10 aliphatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	(13) <1	(9,13) <10	(13) <1	(9,13) <10	**(13) 3**
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	(13) <1	(9,13) <10	(13) <1	(13,9) <10	**(13) 6**
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	(13) <1	**(13) 65**	**(13) 2**	(13,9) <10	**(13) 6**
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	**(13) 3**	**(13) 970**	**(13) 17**	**(13) 11**	**(13) 37**
TPH (C6-C7 aromatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C7-C8 aromatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C8-C10 aromatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	**150**
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	(13) <2	(9,13) <10	(13) <2	(13,9) <10	(13) <2
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	(13) <1	(9,13) <10	(13) <1	(9,13) <10	**(13) 9**
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	(13) <1	**(13) 230**	**(13) 2**	**(13) 12**	**(13) 51**
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	(13) <1	**(13) 360**	**(13) 3**	**(13) 70**	**(13) 70**

Concept Reference: 702829
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Total Petroleum Hydrocarbons (Aliphatics+Aromatics) Total

Concept Reference	**702829 002**	**702829 003**	**702829 005**	**702829 006**	**702829 008**
Customer Sample Reference	**HEP-BH-17**	**HEP-BH-17**	**HEP-BH-2**	**HEP-BH-2**	**HEP-BH-2**
Top Depth	**0.35**	**0.6**	**0.50**	**1.10**	**2.40**
Hole ID	**HEP-BH-17**	**HEP-BH-17**	**HEP-BH-2**	**HEP-BH-2**	**HEP-BH-2**
Depth	**0.35**	**0.6**	**0.50**	**1.10**	**2.40**
Date Sampled	**05-DEC-2017**	**05-DEC-2017**	**05-DEC-2017**	**05-DEC-2017**	**05-DEC-2017**
Time Sampled	**14:00**	**15:00**	**11:50**	**12:15**	**14:45**
AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**HEPBH1720171205002**	**HEPBH1720171205003**	**FES1171205006**	**FES1171205009**	**FES1171205017**
AGS Sample Reference	**6**	**9**	**6**	**9**	**17**
Matrix Class	**Other**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Other**

Determinand	Method	Test Sample	LOD	Units					
TPH (Aliphatic) total	T85	M105		mg/kg	**(13) 21**	**(13) 30**	(13) N.D.	**(13) 11**	(13) N.D.
TPH (Aromatic) total	T85	M105		mg/kg	**(13) 49**	**(13) 160**	**(13) 23**	**(13) 31**	(13) N.D.
TPH (Aliphatic+Aromatic) (sum)	T85	M105		mg/kg	**70.0**	**190**	**23.0**	**42.0**	N.D.

Concept Reference: 702829
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Total Petroleum Hydrocarbons (Aliphatics+Aromatics) Total

Concept Reference	**702829 012**	**702829 013**	**702829 014**	**702829 015**	**702829 019**
Customer Sample Reference	**HEP-BH-47**	**HEP-BH-47**	**HEP-BH-47**	**HEP-BH-47**	**HEP-TT-29**
Top Depth	**0.40**	**1.00**	**2.10**	**3.00**	**0.50**
Hole ID	**HEP-BH-47**	**HEP-BH-47**	**HEP-BH-47**	**HEP-BH-47**	**HEP-TT-29**
Depth	**0.40**	**1.00**	**2.10**	**3.00**	**0.50**
Date Sampled	**05-DEC-2017**	**05-DEC-2017**	**05-DEC-2017**	**05-DEC-2017**	**28-NOV-2017**
Time Sampled	**13:30**	**14:00**	**14:30**	**15:00**	**10:00**
AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**FES2171205004**	**FES2171205007**	**FES2171205012**	**FES2171205016**	**HEPTT2920171128002**
AGS Sample Reference	**4**	**7**	**12**	**16**	**4**
Matrix Class	**Sandy Soil**	**Clay**	**Clay**	**Sandy Soil**	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units					
TPH (Aliphatic) total	T85	M105		mg/kg	(13) N.D.	(13,9) <10	(13) N.D.	(13) N.D.	(9,13) <10
TPH (Aromatic) total	T85	M105		mg/kg	(13) N.D.	**(13) 240**	(13) N.D.	(13) N.D.	(9,13) <10
TPH (Aliphatic+Aromatic) (sum)	T85	M105		mg/kg	N.D.	**240**	N.D.	N.D.	(9) <10.0

Concept Reference: 702829
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Total Petroleum Hydrocarbons (Aliphatics+Aromatics) Total

Concept Reference				**702829 020**	**702829 022**	**702829 023**	**702829 025**	**702829 027**
Customer Sample Reference				**HEP-TT-29**	**HEP-TT-39**	**HEP-TT-39**	**HEP-TT-3**	**HEP-TT-3**
Top Depth				**1.50**	**0.50**	**1.50**	**0.40**	**1.80**
Hole ID				**HEP-TT-29**	**HEP-TT-39**	**HEP-TT-39**	**HEP-TT-3**	**HEP-TT-3**
Depth				**1.50**	**0.50**	**1.50**	**0.40**	**1.80**
Date Sampled				**28-NOV-2017**	**28-NOV-2017**	**28-NOV-2017**	**22-NOV-2017**	**22-NOV-2017**
Time Sampled				**10:20**	**11:30**	**12:00**	**15:15**	**16:15**
AGS Type				**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID				**HEPTT2920171128003**	**HEPTT3920171128002**	**HEPTT3920171128003**	**HEPTT320171122002**	**HEPTT320171122004**
AGS Sample Reference				**7**	**4**	**7**	**6**	**12**
Matrix Class				**Sandy Soil**	**Topsoil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**				
TPH (Aliphatic) total	T85	M105		mg/kg	(13) **3.0**	(13) **1000**	(13) **19**	(13) **11**	(13) **52**
TPH (Aromatic) total	T85	M105		mg/kg	(13) N.D.	(13) **590**	(13) **5.0**	(13) **82**	(13) **130**
TPH (Aliphatic+Aromatic) (sum)	T85	M105		mg/kg	**3.00**	**1590**	**24.0**	**93.0**	**182**

Index to symbols used in Supplemental B 702829-2

Value	Description
M40	Analysis conducted on sample assisted dried at no more than 40C. Results are reported on a dry weight basis.
A40	Assisted dried < 40C
M105	Analysis conducted on an "as received" aliquot. Results are reported on a dry weight basis where moisture content was determined by assisted drying of sample at 105C
AR	As Received
N.D.	Not Detected
13	Results have been blank corrected.
9	LOD raised due to dilution of sample
S	Analysis was subcontracted
M	Analysis is MCERTS accredited
U	Analysis is UKAS accredited
N	Analysis is not UKAS accredited

Notes

Supplemental B to report in standard format with TPH totals.
Asbestos subcontracted to REC Asbestos.
Nitrate and Nitrite transferred to Concept East Kilbride.
"Other" samples are outside the scope of our accreditation.

Method Index

Value	Description
T27	PLM
T85	Calc
T7	Probe
T209	GC/MS (Head Space)(MCERTS)
T4	Colorimetry
T6	ICP/OES
T287	Calc TOC/0.58
T207	GC/MS (MCERTS)
T909	GCxGC
T2	Grav
T162	Grav (1 Dec) (105 C)
T686	Discrete Analyser

Accreditation Summary

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Soil Organic Matter	T287	A40	0.1	%	N	002-003,005-006,008,012-015,019-020,022-023,025,027
pH	T7	AR			N	002,008
pH	T7	AR			M	003,005-006,012-015,019-020,022-023,025,027
Asbestos ID	T27	AR			SN	002,008
Asbestos ID	T27	AR			SU	003,005-006,012-015,019-020,022-023,025,027
Phenols(Mono)	T4	AR	0.5	mg/kg	N	002,008
Phenols(Mono)	T4	AR	0.5	mg/kg	M	003,005-006,012-015,019-020,022-023,025,027
Chloride	T686	AR	1	mg/kg	N	002-003,005-006,008,012-015,019-020,022-023,025,027
Cyanide(Total)	T4	AR	1.0	mg/kg	N	002,008
Cyanide(Total)	T4	AR	1	mg/kg	M	003,005-006,012-015,019-020,022-023,025,027
Thiocyanate	T4	A40	1	mg/kg	N	002-003,005-006,008,012-015,019-020,022-023,025,027
Nitrate	T686	AR	1	mg/kg	N	002-003,005-006,008,012-015,019-020,022-023,025,027
Nitrite	T686	AR	1	mg/kg	N	002-003,005-006,008,012-015,019-020,022-023,025,027
SO4(Total)	T6	A40	0.01	%	N	002,008
SO4(Total)	T6	A40	0.01	%	U	003,005-006,012-015,019-020,022-023,025,027
Sulphide	T4	AR	10	mg/kg	N	002-003,005-006,008,012-015,019-020,022-023,025,027
Arsenic	T6	M40	2.0	mg/kg	N	002,008
Arsenic	T6	M40	2	mg/kg	M	003,005-006,012-015,019-020,022-023,025,027
Cadmium	T6	M40	1.0	mg/kg	N	002,008
Cadmium	T6	M40	1	mg/kg	M	003,005-006,012-015,019-020,022-023,025,027
Chromium	T6	M40	1	mg/kg	N	002,008
Chromium	T6	M40	1	mg/kg	M	003,005-006,012-015,019-020,022-023,025,027
Chromium VI	T6	AR	1	mg/kg	N	002-003,005-006,008,012-015,019-020,022-023,025,027
Chromium (trivalent)	T85	AR	2	mg/kg	N	002-003,005-006,008,012-015,019-020,022-023,025,027
Iron	T6	A40	1	mg/kg	N	002,008
Iron	T6	A40	1	mg/kg	U	003,005-006,012-015,019-020,022-023,025,027
Lead	T6	M40	1	mg/kg	N	002,008
Lead	T6	M40	1	mg/kg	M	003,005-006,012-015,019-020,022-023,025,027
Manganese	T6	M40	1	mg/kg	N	002,008
Manganese	T6	M40	1	mg/kg	M	003,005-006,012-015,019-020,022-023,025,027
Mercury	T6	M40	1	mg/kg	N	002,008
Mercury	T6	M40	1	mg/kg	M	003,005-006,012-015,019-020,022-023,025,027
Nickel	T6	M40	1	mg/kg	N	002,008
Nickel	T6	M40	1	mg/kg	M	003,005-006,012-015,019-020,022-023,025,027
Selenium	T6	M40	3	mg/kg	N	002,008
Selenium	T6	M40	3	mg/kg	M	003,005-006,012-015,019-020,022-023,025,027
Copper	T6	M40	1	mg/kg	N	002,008
Copper	T6	M40	1	mg/kg	M	003,005-006,012-015,019-020,022-023,025,027
Zinc	T6	M40	1	mg/kg	N	002,008
Zinc	T6	M40	1	mg/kg	M	003,005-006,012-015,019-020,022-023,025,027
Boron (water-soluble)	T6	AR	1	mg/kg	N	002-003,005-006,008,012-015,019-020,022-023,025,027
Naphthalene	T207	M105	0.1	mg/kg	N	002,008
Naphthalene	T207	M105	0.1	mg/kg	M	003,005-006,012-015,019-020,022-023,025,027
Acenaphthylene	T207	M105	0.1	mg/kg	N	002,008
Acenaphthylene	T207	M105	0.1	mg/kg	U	003,005-006,012-015,019-020,022-023,025,027
Acenaphthene	T207	M105	0.1	mg/kg	N	002,008
Acenaphthene	T207	M105	0.1	mg/kg	M	003,005-006,012-015,019-020,022-023,025,027
Fluorene	T207	M105	0.1	mg/kg	N	002,008
Fluorene	T207	M105	0.1	mg/kg	M	003,005-006,012-015,019-020,022-023,025,027
Phenanthrene	T207	M105	0.1	mg/kg	N	002,008
Phenanthrene	T207	M105	0.1	mg/kg	M	003,005-006,012-015,019-020,022-023,025,027
Anthracene	T207	M105	0.1	mg/kg	N	002,008
Anthracene	T207	M105	0.1	mg/kg	U	003,005-006,012-015,019-020,022-023,025,027
Fluoranthene	T207	M105	0.1	mg/kg	N	002,008
Fluoranthene	T207	M105	0.1	mg/kg	M	003,005-006,012-015,019-020,022-023,025,027
Pyrene	T207	M105	0.1	mg/kg	N	002,008
Pyrene	T207	M105	0.1	mg/kg	M	003,005-006,012-015,019-020,022-023,025,027
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	N	002,008
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	M	003,005-006,012-015,019-020,022-023,025,027
Chrysene	T207	M105	0.1	mg/kg	N	002,008
Chrysene	T207	M105	0.1	mg/kg	M	003,005-006,012-015,019-020,022-023,025,027
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	N	002,008
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	M	003,005-006,012-015,019-020,022-023,025,027
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	N	002,008
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	M	003,005-006,012-015,019-020,022-023,025,027
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	N	002,008
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	M	003,005-006,012-015,019-020,022-023,025,027

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	N	002,008
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	M	003,005-006,012-015,019-020,022-023,025,027
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	N	002,008
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	M	003,005-006,012-015,019-020,022-023,025,027
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	N	002,008
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	M	003,005-006,012-015,019-020,022-023,025,027
PAH(total)	T207	M105	0.1	mg/kg	N	002,008
PAH(total)	T207	M105	0.1	mg/kg	U	003,005-006,012-015,019-020,022-023,025,027
TPH (C5-C6 aliphatic)	T209	AR	100	µg/kg	N	002-003,005-006,008,012-015,019-020,022-023,025,027
TPH (C6-C8 aliphatic)	T209	AR	100	µg/kg	N	002-003,005-006,008,012-015,019-020,022-023,025,027
TPH (C8-C10 aliphatic)	T209	AR	100	µg/kg	N	002-003,005-006,008,012-015,019-020,022-023,025,027
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	N	002,008
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	M	003,005-006,012-015,019-020,022-023,025,027
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	N	002,008
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	M	003,005-006,012-015,019-020,022-023,025,027
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	N	002,008
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	M	003,005-006,012-015,019-020,022-023,025,027
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	N	002,008
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	M	003,005-006,012-015,019-020,022-023,025,027
TPH (C6-C7 aromatic)	T209	AR	100	µg/kg	N	002-003,005-006,008,012-015,019-020,022-023,025,027
TPH (C7-C8 aromatic)	T209	AR	100	µg/kg	N	002-003,005-006,008,012-015,019-020,022-023,025,027
TPH (C8-C10 aromatic)	T209	AR	100	µg/kg	N	002-003,005-006,008,012-015,019-020,022-023,025,027
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	N	002,008
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	M	003,005-006,012-015,019-020,022-023,025,027
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	N	002,008
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	M	003,005-006,012-015,019-020,022-023,025,027
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	N	002,008
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	M	003,005-006,012-015,019-020,022-023,025,027
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	N	002,008
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	M	003,005-006,012-015,019-020,022-023,025,027
TPH (Aliphatic) total	T85	M105		mg/kg	N	002-003,005-006,008,012-015,019-020,022-023,025,027
TPH (Aromatic) total	T85	M105		mg/kg	N	002-003,005-006,008,012-015,019-020,022-023,025,027
TPH (Aliphatic+Aromatic) (sum)	T85	M105		mg/kg	N	002-003,005-006,008,012-015,019-020,022-023,025,027
Moisture @105C	T162	AR	0.1	%	N	002-003,005-006,008,012-015,019-020,022-023,025,027
Retained on 10mm sieve	T2	M40	0.1	%	N	002-003,005-006,008,012-015,019-020,022-023,025,027

CONCEPT LIFE SCIENCES
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Concept Life Sciences

Certificate of Analysis

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Report Number: Supplemental A 702829-2

Date of Report: 22-Jun-2018

Customer: Fugro GeoServices
Fugro House
Hithercroft Road
Wallingford
Oxfordshire
OX10 9RB

Customer Contact: Ms Karen Blackmore

Customer Job Reference:
Customer Purchase Order: 56642KB-WAL
Customer Site Reference: Heathrow HEP Package 3
Date Job Received at Concept: 07-Dec-2017
Date Analysis Started: 11-Dec-2017
Date Analysis Completed: 03-Jan-2018

The results reported relate to samples received in the laboratory and may not be representative of a whole batch.

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation

This report should not be reproduced except in full without the written approval of the laboratory

Tests covered by this certificate were conducted in accordance with Concept Life Sciences SOPs

All results have been reviewed in accordance with Section 25 of the Concept Life Sciences, Analytical Services Quality Manual

UKAS TESTING
1549

Report checked
and authorised by :
Sara Abou-Shakra
Customer Service Manager

Issued by :
Sara Abou-Shakra
Customer Service Manager

Summary Of Results

Soil

Dioxins

Corrected to 0% Moisture

				WHO2005 Toxic Equivalents ng/kg		WHO Toxic Equivalents ng/kg	
Concept Reference	**Customer Sample Reference**	**Analysis**	**Symbol**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**
702829 020	HEP-TT-29	Dioxins and Furans (Based on US EPA 1613)	U	0.0034	**2.7**	0.0011	**2.9**
		Poly-Chlorinated Biphenyls (WHO 12)	U	0.0	**6.8**	0.0	**5.8**
			Sum :	0.0034	**9.5**	0.0011	**8.7**
702829 022	HEP-TT-39	Dioxins and Furans (Based on US EPA 1613)	U	46	**52**	46	**52**
		Poly-Chlorinated Biphenyls (WHO 12)	U	4.7	**87**	19	**100**
			Sum :	50	**140**	64	**150**
702829 027	HEP-TT-3	Dioxins and Furans (Based on US EPA 1613)	U	8.6	**11**	8.0	**11**
		Poly-Chlorinated Biphenyls (WHO 12)	U	0.31	**37**	1.0	**36**
			Sum :	8.9	**48**	9.0	**47**

Soil

Customer Sample Reference : HEP-TT-29
Our Sample Reference : 702829 020
Moisture Content : 3.98 %
Top Depth : 1.50
Hole ID : HEP-TT-29
Depth : 1.50
Date Sampled : 28-NOV-2017
Time Sampled : 10:20
AGS Type : ES
AGS Sample ID : HEPTT2920171128003
AGS Sample Reference : 7
Matrix Class : Sandy Soil

Dioxins and Furans (Based on US EPA 1613)

Technique : GC/MS (HR)

						WHO2005 Toxic Equivalents ng/kg		WHO Toxic Equivalents ng/kg	
Determinand	**Symbol**	**Result ng/kg As Received @4.0% Moisture**	**LOD As Received @4.0% Moisture**	**Lower Bound ng/kg @ 0% Moisture**	**LOD @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**
2,3,7,8-TCDD	U	<0.68	0.68	<0.71	0.71	0.0	**0.71**	0.0	**0.71**
1,2,3,7,8-PeCDD	U	<0.90	0.90	<0.94	0.94	0.0	**0.94**	0.0	**0.94**
1,2,3,4,7,8-HxCDD	U	<1.0	1.0	<1.0	1.0	0.0	**0.10**	0.0	**0.10**
1,2,3,6,7,8-HxCDD	U	<1.0	1.0	<1.0	1.0	0.0	**0.10**	0.0	**0.10**
1,2,3,7,8,9-HxCDD	U	<1.0	1.0	<1.0	1.0	0.0	**0.10**	0.0	**0.10**
1,2,3,4,6,7,8-HpCDD	U	<1.0	1.0	<1.0	1.0	0.0	**0.010**	0.0	**0.010**
OCDD	U	**11**	0.68	11	0.71	0.0034	**0.0034**	0.0011	**0.0011**
					Dioxins Totals :	0.0034	**2.0**	0.0011	**2.0**
2,3,7,8-TCDF	U	<0.40	0.40	<0.42	0.42	0.0	**0.042**	0.0	**0.042**
1,2,3,7,8-PeCDF	U	<0.80	0.80	<0.83	0.83	0.0	**0.025**	0.0	**0.042**
2,3,4,7,8-PeCDF	U	<0.80	0.80	<0.83	0.83	0.0	**0.25**	0.0	**0.42**
1,2,3,4,7,8-HxCDF	U	<1.0	1.0	<1.0	1.0	0.0	**0.10**	0.0	**0.10**
1,2,3,6,7,8-HxCDF	U	<1.0	1.0	<1.0	1.0	0.0	**0.10**	0.0	**0.10**
2,3,4,6,7,8-HxCDF	U	<1.0	1.0	<1.0	1.0	0.0	**0.10**	0.0	**0.10**
1,2,3,7,8,9-HxCDF	U	<1.0	1.0	<1.0	1.0	0.0	**0.10**	0.0	**0.10**
1,2,3,4,6,7,8-HpCDF	U	<1.0	1.0	<1.0	1.0	0.0	**0.010**	0.0	**0.010**
1,2,3,4,7,8,9-HpCDF	U	<1.0	1.0	<1.0	1.0	0.0	**0.010**	0.0	**0.010**
OCDF	U	<1.0	1.0	<1.0	1.0	0.0	**0.00031**	0.0	**0.00010**
					Furans Totals :	0.0	**0.75**	0.0	**0.94**
					Totals :	**0.0034**	**2.7**	**0.0011**	**2.9**

Poly-Chlorinated Biphenyls (WHO 12)

Technique : GC/MS (HR)

						WHO2005 Toxic Equivalents ng/kg		WHO Toxic Equivalents ng/kg	
Determinand	**Symbol**	**Result ng/kg As Received @4.0% Moisture**	**LOD As Received @4.0% Moisture**	**Lower Bound ng/kg @ 0% Moisture**	**LOD @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**
PCB BZ#77	U	<50	50	<52	52	0.0	**0.0052**	0.0	**0.0052**
PCB BZ#81	U	<50	50	<52	52	0.0	**0.016**	0.0	**0.0052**
PCB BZ#105	U	<50	50	<52	52	0.0	**0.0016**	0.0	**0.0052**
PCB BZ#114	U	<50	50	<52	52	0.0	**0.0016**	0.0	**0.026**

PCB BZ#118	U	<50	50	<52	52	0.0	**0.0016**	0.0	**0.0052**
PCB BZ#123	U	<50	50	<52	52	0.0	**0.0016**	0.0	**0.0052**
PCB BZ#126	U	<50	50	<52	52	0.0	**5.2**	0.0	**5.2**
PCB BZ#156	U	<50	50	<52	52	0.0	**0.0016**	0.0	**0.026**
PCB BZ#157	U	<50	50	<52	52	0.0	**0.0016**	0.0	**0.026**
PCB BZ#167	U	<50	50	<52	52	0.0	**0.0016**	0.0	**0.00052**
PCB BZ#169	U	<50	50	<52	52	0.0	**1.6**	0.0	**0.52**
PCB BZ#189	U	<50	50	<52	52	0.0	**0.0016**	0.0	**0.0052**
					Totals :	**0.0**	**6.8**	**0.0**	**5.8**

Soil

Customer Sample Reference : HEP-TT-39
Our Sample Reference : 702829 022
Moisture Content : 12.8 %
Top Depth : 0.50
Hole ID : HEP-TT-39
Depth : 0.50
Date Sampled : 28-NOV-2017
Time Sampled : 11:30
AGS Type : ES
AGS Sample ID : HEPTT3920171128002
AGS Sample Reference : 4
Matrix Class : Topsoil

Dioxins and Furans (Based on US EPA 1613)

Technique : GC/MS (HR)

						WHO2005 Toxic Equivalents ng/kg		WHO Toxic Equivalents ng/kg	
Determinand	**Symbol**	**Result ng/kg As Received @13% Moisture**	**LOD As Received @13% Moisture**	**Lower Bound ng/kg @ 0% Moisture**	**LOD @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**
2,3,7,8-TCDD	U	<0.70	0.70	<0.80	0.80	0.0	**0.80**	0.0	**0.80**
1,2,3,7,8-PeCDD	U	<4.2	4.2	<4.8	4.8	0.0	**4.8**	0.0	**4.8**
1,2,3,4,7,8-HxCDD	U	**14**	0.23	16	0.26	1.6	**1.6**	1.6	**1.6**
1,2,3,6,7,8-HxCDD	U	**55**	0.25	63	0.29	6.3	**6.3**	6.3	**6.3**
1,2,3,7,8,9-HxCDD	U	**30**	0.25	34	0.29	3.4	**3.4**	3.4	**3.4**
1,2,3,4,6,7,8-HpCDD	U	**1500**	0.46	1700	0.53	17	**17**	17	**17**
OCDD	U	**12000**	0.50	14000	0.57	4.1	**4.1**	1.4	**1.4**
					Dioxins Totals :	33	**38**	30	**36**
2,3,7,8-TCDF	U	**16**	0.21	18	0.24	1.8	**1.8**	1.8	**1.8**
1,2,3,7,8-PeCDF	U	**4.5**	0.22	5.2	0.25	0.15	**0.15**	0.26	**0.26**
2,3,4,7,8-PeCDF	U	**13**	0.21	15	0.24	4.5	**4.5**	7.5	**7.5**
1,2,3,4,7,8-HxCDF	U	**15**	0.23	17	0.26	1.7	**1.7**	1.7	**1.7**
1,2,3,6,7,8-HxCDF	U	**6.7**	0.24	7.7	0.28	0.77	**0.77**	0.77	**0.77**
2,3,4,6,7,8-HxCDF	U	**12**	0.26	14	0.30	1.4	**1.4**	1.4	**1.4**
1,2,3,7,8,9-HxCDF	U	<5.0	5.0	<5.7	5.7	0.0	**0.57**	0.0	**0.57**
1,2,3,4,6,7,8-HpCDF	U	**200**	0.40	230	0.46	2.3	**2.3**	2.3	**2.3**
1,2,3,4,7,8,9-HpCDF	U	**14**	0.52	16	0.60	0.16	**0.16**	0.16	**0.16**
OCDF	U	**630**	0.65	720	0.75	0.22	**0.22**	0.072	**0.072**
					Furans Totals :	13	**14**	16	**17**
					Totals :	**46**	**52**	**46**	**52**

Poly-Chlorinated Biphenyls (WHO 12)

Technique : GC/MS (HR)

						WHO2005 Toxic Equivalents ng/kg		WHO Toxic Equivalents ng/kg	
Determinand	**Symbol**	**Result ng/kg As Received @13% Moisture**	**LOD As Received @13% Moisture**	**Lower Bound ng/kg @ 0% Moisture**	**LOD @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**
PCB BZ#77	U	**9600**	50	11000	57	1.1	**1.1**	1.1	**1.1**
PCB BZ#81	U	<260	260	<300	300	0.0	**0.089**	0.0	**0.030**
PCB BZ#105	U	**27000**	50	31000	57	0.93	**0.93**	3.1	**3.1**
PCB BZ#114	U	<1800	1800	<2100	2100	0.0	**0.062**	0.0	**1.0**

PCB BZ#118	U	**49000**	50	56000	57	1.7	**1.7**	5.6	**5.6**
PCB BZ#123	U	<4700	4700	<5400	5400	0.0	**0.16**	0.0	**0.54**
PCB BZ#126	U	<700	700	<800	800	0.0	**80**	0.0	**80**
PCB BZ#156	U	**11000**	50	13000	57	0.38	**0.38**	6.3	**6.3**
PCB BZ#157	U	**3700**	50	4200	57	0.13	**0.13**	2.1	**2.1**
PCB BZ#167	U	**12000**	50	14000	57	0.41	**0.41**	0.14	**0.14**
PCB BZ#169	U	<50	50	<57	57	0.0	**1.7**	0.0	**0.57**
PCB BZ#189	U	**1900**	50	2200	57	0.065	**0.065**	0.22	**0.22**
					Totals :	**4.7**	**87**	**19**	**100**

Soil

Customer Sample Reference : HEP-TT-3
Our Sample Reference : 702829 027
Moisture Content : 16.2 %
Hole ID : HEP-TT-3
Top Depth : 1.80
Depth : 1.80
Date Sampled : 22-NOV-2017
Time Sampled : 16:15
AGS Type : ES
AGS Sample ID : HEPTT320171122004
AGS Sample Reference : 12
Matrix Class : Sandy Soil

Dioxins and Furans (Based on US EPA 1613)

Technique : GC/MS (HR)

						WHO2005 Toxic Equivalents ng/kg		WHO Toxic Equivalents ng/kg	
Determinand	**Symbol**	**Result ng/kg As Received @16% Moisture**	**LOD As Received @16% Moisture**	**Lower Bound ng/kg @ 0% Moisture**	**LOD @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**
2,3,7,8-TCDD	U	<0.70	0.70	<0.84	0.84	0.0	**0.84**	0.0	**0.84**
1,2,3,7,8-PeCDD	U	<0.75	0.75	<0.90	0.90	0.0	**0.90**	0.0	**0.90**
1,2,3,4,7,8-HxCDD	U	<3.0	3.0	<3.6	3.6	0.0	**0.36**	0.0	**0.36**
1,2,3,6,7,8-HxCDD	U	**6.2**	0.21	7.4	0.25	0.74	**0.74**	0.74	**0.74**
1,2,3,7,8,9-HxCDD	U	**3.1**	0.21	3.7	0.25	0.37	**0.37**	0.37	**0.37**
1,2,3,4,6,7,8-HpCDD	U	**310**	0.35	370	0.42	3.7	**3.7**	3.7	**3.7**
OCDD	U	**5000**	0.51	6000	0.61	1.8	**1.8**	0.60	**0.60**
					Dioxins Totals :	6.6	**8.7**	5.4	**7.5**
2,3,7,8-TCDF	U	**2.3**	0.21	2.7	0.25	0.27	**0.27**	0.27	**0.27**
1,2,3,7,8-PeCDF	U	<2.0	2.0	<2.4	2.4	0.0	**0.072**	0.0	**0.12**
2,3,4,7,8-PeCDF	U	**2.6**	0.24	3.1	0.29	0.93	**0.93**	1.6	**1.6**
1,2,3,4,7,8-HxCDF	U	**2.3**	0.25	2.7	0.30	0.27	**0.27**	0.27	**0.27**
1,2,3,6,7,8-HxCDF	U	**1.5**	0.24	1.8	0.29	0.18	**0.18**	0.18	**0.18**
2,3,4,6,7,8-HxCDF	U	<1.5	1.5	<1.8	1.8	0.0	**0.18**	0.0	**0.18**
1,2,3,7,8,9-HxCDF	U	<1.0	1.0	<1.2	1.2	0.0	**0.12**	0.0	**0.12**
1,2,3,4,6,7,8-HpCDF	U	**24**	0.45	29	0.54	0.29	**0.29**	0.29	**0.29**
1,2,3,4,7,8,9-HpCDF	U	**1.7**	0.44	2.0	0.53	0.020	**0.020**	0.020	**0.020**
OCDF	U	**66**	0.54	79	0.64	0.024	**0.024**	0.0079	**0.0079**
					Furans Totals :	2.0	**2.4**	2.6	**3.0**
					Totals :	**8.6**	**11**	**8.0**	**11**

Poly-Chlorinated Biphenyls (WHO 12)

Technique : GC/MS (HR)

						WHO2005 Toxic Equivalents ng/kg		WHO Toxic Equivalents ng/kg	
Determinand	**Symbol**	**Result ng/kg As Received @16% Moisture**	**LOD As Received @16% Moisture**	**Lower Bound ng/kg @ 0% Moisture**	**LOD @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**
PCB BZ#77	U	**860**	50	1000	60	0.10	**0.10**	0.10	**0.10**
PCB BZ#81	U	<50	50	<60	60	0.0	**0.018**	0.0	**0.0060**
PCB BZ#105	U	**1600**	50	1900	60	0.057	**0.057**	0.19	**0.19**
PCB BZ#114	U	<150	150	<180	180	0.0	**0.0054**	0.0	**0.090**

PCB BZ#118	U	**3000**	50	3600	60	0.11	**0.11**	0.36	**0.36**
PCB BZ#123	U	<350	350	<420	420	0.0	**0.013**	0.0	**0.042**
PCB BZ#126	U	<290	290	<350	350	0.0	**35**	0.0	**35**
PCB BZ#156	U	**490**	50	590	60	0.018	**0.018**	0.29	**0.29**
PCB BZ#157	U	**74**	50	88	60	0.0027	**0.0027**	0.044	**0.044**
PCB BZ#167	U	**470**	50	560	60	0.017	**0.017**	0.0056	**0.0056**
PCB BZ#169	U	<50	50	<60	60	0.0	**1.8**	0.0	**0.60**
PCB BZ#189	U	**68**	50	81	60	0.0024	**0.0024**	0.0081	**0.0081**
					Totals :	**0.31**	**37**	**1.0**	**36**

Concept Reference: 702829
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**702829 002**	**702829 003**	**702829 005**	**702829 006**	**702829 008**
				Customer Sample Reference	**HEP-BH-17**	**HEP-BH-17**	**HEP-BH-2**	**HEP-BH-2**	**HEP-BH-2**
				Test Sample	**AR**	**AR**	**AR**	**AR**	**AR**
				Hole ID	**HEP-BH-17**	**HEP-BH-17**	**HEP-BH-2**	**HEP-BH-2**	**HEP-BH-2**
				Depth	**0.35**	**0.6**	**0.50**	**1.10**	**2.40**
				Top Depth	**0.35**	**0.6**	**0.50**	**1.10**	**2.40**
				Date Sampled	**05-DEC-2017**	**05-DEC-2017**	**05-DEC-2017**	**05-DEC-2017**	**05-DEC-2017**
				Time Sampled	**14:00**	**15:00**	**11:50**	**12:15**	**14:45**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH1720171205002**	**HEPBH1720171205003**	**FES1171205006**	**FES1171205009**	**FES1171205017**
				AGS Sample Reference	**6**	**9**	**6**	**9**	**17**
				Matrix Class	**Other**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Other**
Determinand	**Method**	**LOD**	**Units**	**Symbol**					
Moisture @105C	Grav (1 Dec) (105 C)	0.1	%	N	**18**	**19**	**7.1**	**14**	**1.5**

Concept Reference: 702829
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**702829 012**	**702829 013**	**702829 014**	**702829 015**	**702829 019**
				Customer Sample Reference	**HEP-BH-47**	**HEP-BH-47**	**HEP-BH-47**	**HEP-BH-47**	**HEP-TT-29**
				Test Sample	**AR**	**AR**	**AR**	**AR**	**AR**
				Hole ID	**HEP-BH-47**	**HEP-BH-47**	**HEP-BH-47**	**HEP-BH-47**	**HEP-TT-29**
				Depth	**0.40**	**1.00**	**2.10**	**3.00**	**0.50**
				Top Depth	**0.40**	**1.00**	**2.10**	**3.00**	**0.50**
				Date Sampled	**05-DEC-2017**	**05-DEC-2017**	**05-DEC-2017**	**05-DEC-2017**	**28-NOV-2017**
				Time Sampled	**13:30**	**14:00**	**14:30**	**15:00**	**10:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**FES2171205004**	**FES2171205007**	**FES2171205012**	**FES2171205016**	**HEPTT2920171128002**
				AGS Sample Reference	**4**	**7**	**12**	**16**	**4**
				Matrix Class	**Sandy Soil**	**Clay**	**Clay**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**LOD**	**Units**	**Symbol**					
Moisture @105C	Grav (1 Dec) (105 C)	0.1	%	N	**4.9**	**7.5**	**23**	**2.2**	**13**

Concept Reference: 702829
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**702829 020**	**702829 022**	**702829 023**	**702829 025**	**702829 027**
				Customer Sample Reference	**HEP-TT-29**	**HEP-TT-39**	**HEP-TT-39**	**HEP-TT-3**	**HEP-TT-3**
				Test Sample	**AR**	**AR**	**AR**	**AR**	**AR**
				Hole ID	**HEP-TT-29**	**HEP-TT-39**	**HEP-TT-39**	**HEP-TT-3**	**HEP-TT-3**
				Depth	**1.50**	**0.50**	**1.50**	**0.40**	**1.80**
				Top Depth	**1.50**	**0.50**	**1.50**	**0.40**	**1.80**
				Date Sampled	**28-NOV-2017**	**28-NOV-2017**	**28-NOV-2017**	**22-NOV-2017**	**22-NOV-2017**
				Time Sampled	**10:20**	**11:30**	**12:00**	**15:15**	**16:15**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPTT2920171128003**	**HEPTT3920171128002**	**HEPTT3920171128003**	**HEPTT3201711220002**	**HEPTT3201711220004**
				AGS Sample Reference	**7**	**4**	**7**	**6**	**12**
				Matrix Class	**Sandy Soil**	**Topsoil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**LOD**	**Units**	**Symbol**					
Moisture @105C	Grav (1 Dec) (105 C)	0.1	%	N	**4.0**	**13**	**15**	**9.1**	**16**

Concept Reference: 702829
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**702829 002**	**702829 003**	**702829 005**	**702829 006**	**702829 008**
				Customer Sample Reference	**HEP-BH-17**	**HEP-BH-17**	**HEP-BH-2**	**HEP-BH-2**	**HEP-BH-2**
				Test Sample	**M40**	**M40**	**M40**	**M40**	**M40**
				Hole ID	**HEP-BH-17**	**HEP-BH-17**	**HEP-BH-2**	**HEP-BH-2**	**HEP-BH-2**
				Depth	**0.35**	**0.6**	**0.50**	**1.10**	**2.40**
				Top Depth	**0.35**	**0.6**	**0.50**	**1.10**	**2.40**
				Date Sampled	**05-DEC-2017**	**05-DEC-2017**	**05-DEC-2017**	**05-DEC-2017**	**05-DEC-2017**
				Time Sampled	**14:00**	**15:00**	**11:50**	**12:15**	**14:45**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH1720171205002**	**HEPBH1720171205003**	**FES1171205006**	**FES1171205009**	**FES1171205017**
				AGS Sample Reference	**6**	**9**	**6**	**9**	**17**
				Matrix Class	**Other**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Other**
Determinand	**Method**	**LOD**	**Units**	**Symbol**					
Retained on 10mm sieve	Grav	0.1	%	N	<0.1	<0.1	<0.1	<0.1	<0.1

Concept Reference: 702829
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**702829 012**	**702829 013**	**702829 014**	**702829 015**	**702829 019**
				Customer Sample Reference	**HEP-BH-47**	**HEP-BH-47**	**HEP-BH-47**	**HEP-BH-47**	**HEP-TT-29**
				Test Sample	**M40**	**M40**	**M40**	**M40**	**M40**
				Hole ID	**HEP-BH-47**	**HEP-BH-47**	**HEP-BH-47**	**HEP-BH-47**	**HEP-TT-29**
				Depth	**0.40**	**1.00**	**2.10**	**3.00**	**0.50**
				Top Depth	**0.40**	**1.00**	**2.10**	**3.00**	**0.50**
				Date Sampled	**05-DEC-2017**	**05-DEC-2017**	**05-DEC-2017**	**05-DEC-2017**	**28-NOV-2017**
				Time Sampled	**13:30**	**14:00**	**14:30**	**15:00**	**10:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**FES2171205004**	**FES2171205007**	**FES2171205012**	**FES2171205016**	**HEPTT2920171128002**
				AGS Sample Reference	**4**	**7**	**12**	**16**	**4**
				Matrix Class	**Sandy Soil**	**Clay**	**Clay**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**LOD**	**Units**	**Symbol**					
Retained on 10mm sieve	Grav	0.1	%	N	<0.1	<0.1	<0.1	<0.1	<0.1

Concept Reference: 702829
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**702829 020**	**702829 022**	**702829 023**	**702829 025**	**702829 027**
				Customer Sample Reference	**HEP-TT-29**	**HEP-TT-39**	**HEP-TT-39**	**HEP-TT-3**	**HEP-TT-3**
				Test Sample	**M40**	**M40**	**M40**	**M40**	**M40**
				Hole ID	**HEP-TT-29**	**HEP-TT-39**	**HEP-TT-39**	**HEP-TT-3**	**HEP-TT-3**
				Depth	**1.50**	**0.50**	**1.50**	**0.40**	**1.80**
				Top Depth	**1.50**	**0.50**	**1.50**	**0.40**	**1.80**
				Date Sampled	**28-NOV-2017**	**28-NOV-2017**	**28-NOV-2017**	**22-NOV-2017**	**22-NOV-2017**
				Time Sampled	**10:20**	**11:30**	**12:00**	**15:15**	**16:15**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPTT2920171128003**	**HEPTT3920171128002**	**HEPTT3920171128003**	**HEPTT3201711220002**	**HEPTT3201711220004**
				AGS Sample Reference	**7**	**4**	**7**	**6**	**12**
				Matrix Class	**Sandy Soil**	**Topsoil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**LOD**	**Units**	**Symbol**					
Retained on 10mm sieve	Grav	0.1	%	N	<0.1	<0.1	<0.1	<0.1	<0.1

Index to symbols used in Supplemental A 702829-2

Value	Description
M40	Analysis conducted on sample assisted dried at no more than 40C. Results are reported on a dry weight basis.
AR	As Received
U	Analysis is UKAS accredited
N	Analysis is not UKAS accredited

Notes

"Other" samples are outside the scope of our accreditation.
Supplemental A to report Dioxins and PCBS only.

CONCEPT LIFE SCIENCES
DELIVERING SCIENCE

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Concept Life Sciences

Certificate of Analysis

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M16 9FE
Tel : 0161 874 2400
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Report Number: Supplemental 702844-1

Date of Report: 27-Jun-2018

Customer: Fugro GeoServices
Fugro House
Hithercroft Road
Wallingford
Oxfordshire
OX10 9RB

Customer Contact: Ms Karen Blackmore

Customer Job Reference:
Customer Purchase Order: 56642KB-WAL
Customer Site Reference: HEP Package 3
Date Job Received at Concept: 08-Dec-2017
Date Analysis Started: 14-Dec-2017
Date Analysis Completed: 27-Dec-2017

The results reported relate to samples received in the laboratory and may not be representative of a whole batch.

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation

This report should not be reproduced except in full without the written approval of the laboratory

Tests covered by this certificate were conducted in accordance with Concept Life Sciences SOPs

All results have been reviewed in accordance with Section 25 of the Concept Life Sciences, Analytical Services Quality Manual

UKAS TESTING
1549

mCERTS
THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME

Report checked
and authorised by :
Sara Abou-Shakra
Customer Service Manager

Issued by :
Sara Abou-Shakra
Customer Service Manager

Concept Reference: 702844
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

Concept Reference	**702844 002**	**702844 003**
Customer Sample Reference	**HEP-BH-1806**	**HEP-BH-1806**
Hole ID	**HEP-BH-1806**	**HEP-BH-1806**
Top Depth	**1.20**	**2.10**
Depth	**1.20**	**2.10**
Date Sampled	**05-DEC-2017**	**05-DEC-2017**
Time Sampled	**11:18**	**14:40**
AGS Type	**ES**	**ES**
AGS Sample ID	**HEPBH1806201712050 01**	**HEPBH1806201712050 02**
AGS Sample Reference	**7**	**11**
Matrix Class	**Clay**	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units		
Moisture @105C	T162	AR	0.1	%	**21**	**8.8**
Retained on 10mm sieve	T2	M40	0.1	%	<0.1	<0.1

Concept Reference: 702844
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Inorganics

Concept Reference	**702844 002**	**702844 003**
Customer Sample Reference	**HEP-BH-1806**	**HEP-BH-1806**
Hole ID	**HEP-BH-1806**	**HEP-BH-1806**
Top Depth	**1.20**	**2.10**
Depth	**1.20**	**2.10**
Date Sampled	**05-DEC-2017**	**05-DEC-2017**
Time Sampled	**11:18**	**14:40**
AGS Type	**ES**	**ES**
AGS Sample ID	**HEPBH1806201712050 01**	**HEPBH1806201712050 02**
AGS Sample Reference	**7**	**11**
Matrix Class	**Clay**	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units		
Chloride	T686	AR	1	mg/kg	**53**	**20**
Cyanide(Total)	T4	AR	1	mg/kg	<1	<1
Thiocyanate	T4	A40	1	mg/kg	<10	<10
Nitrate	T686	AR	1	mg/kg	<1	<1
Nitrite	T686	AR	1	mg/kg	<1	<1
SO4(Total)	T6	A40	0.01	%	**0.05**	<0.01
Sulphide	T4	AR	10	mg/kg	<10	<10

Concept Reference: 702844
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - Misc

Concept Reference	**702844 002**	**702844 003**
Customer Sample Reference	**HEP-BH-1806**	**HEP-BH-1806**
Hole ID	**HEP-BH-1806**	**HEP-BH-1806**
Top Depth	**1.20**	**2.10**
Depth	**1.20**	**2.10**
Date Sampled	**05-DEC-2017**	**05-DEC-2017**
Time Sampled	**11:18**	**14:40**
AGS Type	**ES**	**ES**
AGS Sample ID	**HEPBH1806201712050 01**	**HEPBH1806201712050 02**
AGS Sample Reference	**7**	**11**
Matrix Class	**Clay**	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units		
Soil Organic Matter	T287	A40	0.1	%	**1.2**	**0.4**
pH	T7	AR			**7.7**	**8.0**

Concept Reference: 702844
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings Metals and Metalloids

Concept Reference	**702844 002**	**702844 003**
Customer Sample Reference	**HEP-BH-1806**	**HEP-BH-1806**
Hole ID	**HEP-BH-1806**	**HEP-BH-1806**
Top Depth	**1.20**	**2.10**
Depth	**1.20**	**2.10**
Date Sampled	**05-DEC-2017**	**05-DEC-2017**
Time Sampled	**11:18**	**14:40**
AGS Type	**ES**	**ES**
AGS Sample ID	**HEPBH1806201712050 01**	**HEPBH1806201712050 02**
AGS Sample Reference	**7**	**11**
Matrix Class	**Clay**	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units		
Arsenic	T6	M40	2	mg/kg	**11**	**5**
Cadmium	T6	M40	1	mg/kg	<1	<1
Chromium	T6	M40	1	mg/kg	**25**	**90**
Chromium VI	T6	AR	1	mg/kg	<1	<1
Chromium (trivalent)	T85	AR	2	mg/kg	**25**	**90**
Iron	T6	A40	1	mg/kg	**41000**	**10000**
Lead	T6	M40	1	mg/kg	**250**	**220**
Manganese	T6	M40	1	mg/kg	**890**	**190**
Mercury	T6	M40	1	mg/kg	<1	<1
Nickel	T6	M40	1	mg/kg	**27**	**60**
Selenium	T6	M40	3	mg/kg	<3	<3
Copper	T6	M40	1	mg/kg	**23**	**200**
Zinc	T6	M40	1	mg/kg	**52**	**48**
Boron (water-soluble)	T6	AR	1	mg/kg	<1	<1

Concept Reference: 702844
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - Total Phenol

Concept Reference	**702844 002**	**702844 003**
Customer Sample Reference	**HEP-BH-1806**	**HEP-BH-1806**
Hole ID	**HEP-BH-1806**	**HEP-BH-1806**
Top Depth	**1.20**	**2.10**
Depth	**1.20**	**2.10**
Date Sampled	**05-DEC-2017**	**05-DEC-2017**
Time Sampled	**11:18**	**14:40**
AGS Type	**ES**	**ES**
AGS Sample ID	**HEPBH1806201712050 01**	**HEPBH1806201712050 02**
AGS Sample Reference	**7**	**11**
Matrix Class	**Clay**	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units		
Phenols(Mono)	T4	AR	0.5	mg/kg	<1.0	<1.0

Concept Reference: 702844
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - Asbestos

Concept Reference	**702844 002**	**702844 003**
Customer Sample Reference	**HEP-BH-1806**	**HEP-BH-1806**
Hole ID	**HEP-BH-1806**	**HEP-BH-1806**
Top Depth	**1.20**	**2.10**
Depth	**1.20**	**2.10**
Date Sampled	**05-DEC-2017**	**05-DEC-2017**
Time Sampled	**11:18**	**14:40**
AGS Type	**ES**	**ES**
AGS Sample ID	**HEPBH1806201712050 01**	**HEPBH1806201712050 02**
AGS Sample Reference	**7**	**11**
Matrix Class	**Clay**	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units		
Asbestos ID	T27	AR			N.D.	N.D.

Concept Reference: 702844
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground Soils with Elevated PID Readings - Organics PAH US EPA 16

Concept Reference	**702844 002**	**702844 003**
Customer Sample Reference	**HEP-BH-1806**	**HEP-BH-1806**
Hole ID	**HEP-BH-1806**	**HEP-BH-1806**
Top Depth	**1.20**	**2.10**
Depth	**1.20**	**2.10**
Date Sampled	**05-DEC-2017**	**05-DEC-2017**
Time Sampled	**11:18**	**14:40**
AGS Type	**ES**	**ES**
AGS Sample ID	**HEPBH1806201712050 01**	**HEPBH1806201712050 02**
AGS Sample Reference	**7**	**11**
Matrix Class	**Clay**	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units		
Naphthalene	T207	M105	0.1	mg/kg	<0.1	<0.1
Acenaphthylene	T207	M105	0.1	mg/kg	<0.1	<0.1
Acenaphthene	T207	M105	0.1	mg/kg	<0.1	<0.1
Fluorene	T207	M105	0.1	mg/kg	<0.1	<0.1
Phenanthrene	T207	M105	0.1	mg/kg	<0.1	<0.1
Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1
Fluoranthene	T207	M105	0.1	mg/kg	<0.1	<0.1
Pyrene	T207	M105	0.1	mg/kg	<0.1	<0.1
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1
Chrysene	T207	M105	0.1	mg/kg	<0.1	<0.1
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	<0.1	<0.1
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	<0.1	<0.1
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	<0.1	<0.1
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	<0.1	<0.1
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	<0.1	<0.1
PAH(total)	T207	M105	0.1	mg/kg	<0.1	<0.1

Concept Reference: 702844
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - TPH (CWG)

Concept Reference	**702844 002**	**702844 003**
Customer Sample Reference	**HEP-BH-1806**	**HEP-BH-1806**
Hole ID	**HEP-BH-1806**	**HEP-BH-1806**
Top Depth	**1.20**	**2.10**
Depth	**1.20**	**2.10**
Date Sampled	**05-DEC-2017**	**05-DEC-2017**
Time Sampled	**11:18**	**14:40**
AGS Type	**ES**	**ES**
AGS Sample ID	**HEPBH180620171205001**	**HEPBH180620171205002**
AGS Sample Reference	**7**	**11**
Matrix Class	**Clay**	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units		
TPH (C5-C6 aliphatic)	T209	M105	100	µg/kg	<100	<100
TPH (C6-C8 aliphatic)	T209	M105	100	µg/kg	<100	<100
TPH (C8-C10 aliphatic)	T209	M105	100	µg/kg	<100	<100
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	(13) <1	(13) <1
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	(13) <1	(13) <1
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	(13) <1	(13) <1
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	(13) <2	(13) <2
TPH (C6-C7 aromatic)	T209	M105	100	µg/kg	<100	<100
TPH (C7-C8 aromatic)	T209	M105	100	µg/kg	<100	<100
TPH (C8-C10 aromatic)	T209	M105	100	µg/kg	<100	<100
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	(13) <2	(13) <2
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	**(13) 1**	(13) <1
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	**(13) 1**	(13) <1
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	**(13) 2**	(13) <1

Concept Reference: 702844
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil

Total Petroleum Hydrocarbons (Aliphatics+Aromatics) Total

Concept Reference	**702844 002**	**702844 003**
Customer Sample Reference	**HEP-BH-1806**	**HEP-BH-1806**
Hole ID	**HEP-BH-1806**	**HEP-BH-1806**
Top Depth	**1.20**	**2.10**
Depth	**1.20**	**2.10**
Date Sampled	**05-DEC-2017**	**05-DEC-2017**
Time Sampled	**11:18**	**14:40**
AGS Type	**ES**	**ES**
AGS Sample ID	**HEPBH180620171205001**	**HEPBH180620171205002**
AGS Sample Reference	**7**	**11**
Matrix Class	**Clay**	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units		
TPH (Aliphatic) total	T85	M105		mg/kg	(13) N.D.	(13) N.D.
TPH (Aromatic) total	T85	M105		mg/kg	**(13) 4.0**	(13) N.D.
TPH (Aliphatic+Aromatic) (sum)	T85	M105		mg/kg	**4.00**	N.D.

Index to symbols used in Supplemental 702844-1

Value	Description
AR	As Received
M105	Analysis conducted on an "as received" aliquot. Results are reported on a dry weight basis where moisture content was determined by assisted drying of sample at 105C
A40	Assisted dried < 40C

M40	Analysis conducted on sample assisted dried at no more than 40C. Results are reported on a dry weight basis.
N.D.	Not Detected
13	Results have been blank corrected.
S	Analysis was subcontracted
M	Analysis is MCERTS accredited
U	Analysis is UKAS accredited
N	Analysis is not UKAS accredited

Notes

Supplemental to report TPH totals.
Nitrate and Nitrite analysis is transferred within group to East Kilbride.
These samples have been analysed exceeding recommended holding times of 5 days for pH. It is possible therefore that the results provided may be compromised.
Asbestos subcontracted to REC Asbestos

Method Index

Value	Description
T287	Calc TOC/0.58
T207	GC/MS (MCERTS)
T85	Calc
T909	GCxGC
T4	Colorimetry
T2	Grav
T686	Discrete Analyser
T27	PLM
T6	ICP/OES
T7	Probe
T162	Grav (1 Dec) (105 C)
T209	GC/MS (Head Space)(MCERTS)

Accreditation Summary

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Soil Organic Matter	T287	A40	0.1	%	N	002-003
pH	T7	AR			M	002-003
Asbestos ID	T27	AR			SU	002-003
Phenols(Mono)	T4	AR	0.5	mg/kg	M	002-003
Chloride	T686	AR	1	mg/kg	N	002-003
Cyanide(Total)	T4	AR	1	mg/kg	M	002-003
Thiocyanate	T4	A40	1	mg/kg	N	002-003
Nitrate	T686	AR	1	mg/kg	N	002-003
Nitrite	T686	AR	1	mg/kg	N	002-003
SO4(Total)	T6	A40	0.01	%	U	002-003
Sulphide	T4	AR	10	mg/kg	N	002-003
Arsenic	T6	M40	2	mg/kg	M	002-003
Cadmium	T6	M40	1	mg/kg	M	002-003
Chromium	T6	M40	1	mg/kg	M	002-003
Chromium VI	T6	AR	1	mg/kg	N	002-003
Chromium (trivalent)	T85	AR	2	mg/kg	N	002-003
Iron	T6	A40	1	mg/kg	U	002-003
Lead	T6	M40	1	mg/kg	M	002-003
Manganese	T6	M40	1	mg/kg	M	002-003
Mercury	T6	M40	1	mg/kg	M	002-003
Nickel	T6	M40	1	mg/kg	M	002-003
Selenium	T6	M40	3	mg/kg	M	002-003
Copper	T6	M40	1	mg/kg	M	002-003
Zinc	T6	M40	1	mg/kg	M	002-003
Boron (water-soluble)	T6	AR	1	mg/kg	N	002-003
Naphthalene	T207	M105	0.1	mg/kg	M	002-003
Acenaphthylene	T207	M105	0.1	mg/kg	U	002-003
Acenaphthene	T207	M105	0.1	mg/kg	M	002-003
Fluorene	T207	M105	0.1	mg/kg	M	002-003
Phenanthrene	T207	M105	0.1	mg/kg	M	002-003
Anthracene	T207	M105	0.1	mg/kg	U	002-003
Fluoranthene	T207	M105	0.1	mg/kg	M	002-003
Pyrene	T207	M105	0.1	mg/kg	M	002-003

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	M	002-003
Chrysene	T207	M105	0.1	mg/kg	M	002-003
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	M	002-003
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	M	002-003
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	M	002-003
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	M	002-003
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	M	002-003
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	M	002-003
PAH(total)	T207	M105	0.1	mg/kg	U	002-003
TPH (C5-C6 aliphatic)	T209	M105	100	µg/kg	N	002-003
TPH (C6-C8 aliphatic)	T209	M105	100	µg/kg	N	002-003
TPH (C8-C10 aliphatic)	T209	M105	100	µg/kg	N	002-003
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	M	002-003
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	M	002-003
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	M	002-003
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	M	002-003
TPH (C6-C7 aromatic)	T209	M105	100	µg/kg	N	002-003
TPH (C7-C8 aromatic)	T209	M105	100	µg/kg	N	002-003
TPH (C8-C10 aromatic)	T209	M105	100	µg/kg	N	002-003
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	M	002-003
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	M	002-003
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	M	002-003
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	M	002-003
TPH (Aliphatic) total	T85	M105		mg/kg	N	002-003
TPH (Aromatic) total	T85	M105		mg/kg	N	002-003
TPH (Aliphatic+Aromatic) (sum)	T85	M105		mg/kg	N	002-003
Moisture @105C	T162	AR	0.1	%	N	002-003
Retained on 10mm sieve	T2	M40	0.1	%	N	002-003

CONCEPT LIFE SCIENCES
DELIVERING SCIENCE

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Concept Life Sciences

Certificate of Analysis

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Report Number: Third Supplemental 703830-3

Date of Report: 27-Jun-2018

Customer: Fugro GeoServices
Fugro House
Hithercroft Road
Wallingford
Oxfordshire
OX10 9RB

Customer Contact: Ms Karen Blackmore

Customer Job Reference:
Customer Purchase Order: 56642KB-WAL
Customer Site Reference: HEP Package 3
Date Job Received at Concept: 14-Dec-2017
Date Analysis Started: 15-Dec-2017
Date Analysis Completed: 09-Jan-2018

The results reported relate to samples received in the laboratory and may not be representative of a whole batch.

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation

This report should not be reproduced except in full without the written approval of the laboratory

Tests covered by this certificate were conducted in accordance with Concept Life Sciences SOPs

All results have been reviewed in accordance with Section 25 of the Concept Life Sciences, Analytical Services Quality Manual

UKAS TESTING
1549

mCERTS
THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME

Report checked
and authorised by :
Sara Abou-Shakra
Customer Service Manager

Issued by :
Sara Abou-Shakra
Customer Service Manager

Concept Reference: 703830
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**703830 001**	**703830 003**	**703830 005**	**703830 006**	**703830 017**
				Customer Sample Reference	**HEP-BH-1**	**HEP-BH-45**	**HEP-BH-45**	**HEP-BH-45**	**HEP-BH-824**
				Depth	**2.1**	**0.3**	**1.00**	**1.4**	**0.2**
				Top Depth	**2.1**	**0.3**	**1.00**	**1.4**	**0.2**
				Hole ID	**HEP-BH-1**	**HEP-BH-45**	**HEP-BH-45**	**HEP-BH-45**	**HEP-BH-824**
				Date Sampled	**07-DEC-2017**	**08-DEC-2017**	**08-DEC-2017**	**08-DEC-2017**	**08-DEC-2017**
				Time Sampled	**09:15**	**9:10**	**09:45**	**11:00**	**11:55**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH120171208001**	**FES1171208003**	**FES1171208009**	**FES1171208012**	**FES2171208004**
				AGS Sample Reference	**12**	**3**	**9**	**12**	**4**
				Matrix Class	**Sandy Soil**	**Sandy Soil**	**Clay**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Moisture @105C	T162	AR	0.1	%	**2.8**	**7.0**	**25**	**58**	**11**
Retained on 10mm sieve	T2	M40	0.1	%	<0.1	<0.1	<0.1	<0.1	<0.1

Concept Reference: 703830
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**703830 018**	**703830 019**	**703830 020**
				Customer Sample Reference	**HEP-BH-824**	**HEP-BH-824**	**HEP-BH-824**
				Depth	**0.7**	**1.7**	**2.7**
				Top Depth	**0.7**	**1.7**	**2.7**
				Hole ID	**HEP-BH-824**	**HEP-BH-824**	**HEP-BH-824**
				Date Sampled	**08-DEC-2017**	**08-DEC-2017**	**08-DEC-2017**
				Time Sampled	**12:15**	**13:47**	**14:15**
				AGS Type	**ES**	**ES**	**ES**
				AGS Sample ID	**FES2171208016**	**FES2171208020**	**FES2171208025**
				AGS Sample Reference	**7**	**11**	**16**
				Matrix Class	**Clay**	**Clay**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**			
Moisture @105C	T162	AR	0.1	%	**26**	**30**	**22**
Retained on 10mm sieve	T2	M40	0.1	%	<0.1	<0.1	<0.1

Concept Reference: 703830
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - Inorganics

	Concept Reference	**703830 001**	**703830 003**	**703830 005**	**703830 017**	**703830 018**
	Customer Sample Reference	**HEP-BH-1**	**HEP-BH-45**	**HEP-BH-45**	**HEP-BH-824**	**HEP-BH-824**
	Depth	**2.1**	**0.3**	**1.00**	**0.2**	**0.7**
	Top Depth	**2.1**	**0.3**	**1.00**	**0.2**	**0.7**
	Hole ID	**HEP-BH-1**	**HEP-BH-45**	**HEP-BH-45**	**HEP-BH-824**	**HEP-BH-824**
	Date Sampled	**07-DEC-2017**	**08-DEC-2017**	**08-DEC-2017**	**08-DEC-2017**	**08-DEC-2017**
	Time Sampled	**09:15**	**9:10**	**09:45**	**11:55**	**12:15**
	AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
	AGS Sample ID	**HEPBH120171208001**	**FES1171208003**	**FES1171208009**	**FES2171208004**	**FES2171208016**
	AGS Sample Reference	**12**	**3**	**9**	**4**	**7**
	Matrix Class	**Sandy Soil**	**Sandy Soil**	**Clay**	**Sandy Soil**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**		
Chloride	T686	AR	1	mg/kg	**4**	**9**	**8**	**5**	**10**
Cyanide(Total)	T4	AR	1	mg/kg	<1	<1	<1	<1	<1
Thiocyanate	T4	A40	1	mg/kg	<10	<10	<10	<10	<10
Nitrate	T686	AR	1	mg/kg	**3**	**6**	**3**	**4**	**2**
Nitrite	T686	AR	1	mg/kg	<1	<1	<1	<1	<1
SO4(Total)	T6	A40	0.01	%	**0.08**	**0.17**	**0.15**	**0.41**	**0.29**
Sulphide	T4	AR	10	mg/kg	<10	**15**	**18**	**15**	**16**

Concept Reference: 703830
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - Misc

	Concept Reference	**703830 001**	**703830 003**	**703830 005**	**703830 017**	**703830 018**
	Customer Sample Reference	**HEP-BH-1**	**HEP-BH-45**	**HEP-BH-45**	**HEP-BH-824**	**HEP-BH-824**
	Depth	**2.1**	**0.3**	**1.00**	**0.2**	**0.7**
	Top Depth	**2.1**	**0.3**	**1.00**	**0.2**	**0.7**
	Hole ID	**HEP-BH-1**	**HEP-BH-45**	**HEP-BH-45**	**HEP-BH-824**	**HEP-BH-824**
	Date Sampled	**07-DEC-2017**	**08-DEC-2017**	**08-DEC-2017**	**08-DEC-2017**	**08-DEC-2017**
	Time Sampled	**09:15**	**9:10**	**09:45**	**11:55**	**12:15**
	AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
	AGS Sample ID	**HEPBH120171208001**	**FES1171208003**	**FES1171208009**	**FES2171208004**	**FES2171208016**
	AGS Sample Reference	**12**	**3**	**9**	**4**	**7**
	Matrix Class	**Sandy Soil**	**Sandy Soil**	**Clay**	**Sandy Soil**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**		
Soil Organic Matter	T287	A40	0.1	%	**1.7**	**1.3**	**6.4**	**1.6**	**1.0**
pH	T7	AR			**7.8**	**10.6**	**8.2**	**7.6**	**10.8**

Concept Reference: 703830
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings Metals and Metalloids

Concept Reference				**703830 001**	**703830 003**	**703830 005**	**703830 017**	**703830 018**
Customer Sample Reference				**HEP-BH-1**	**HEP-BH-45**	**HEP-BH-45**	**HEP-BH-824**	**HEP-BH-824**
Depth				**2.1**	**0.3**	**1.00**	**0.2**	**0.7**
Top Depth				**2.1**	**0.3**	**1.00**	**0.2**	**0.7**
Hole ID				**HEP-BH-1**	**HEP-BH-45**	**HEP-BH-45**	**HEP-BH-824**	**HEP-BH-824**
Date Sampled				**07-DEC-2017**	**08-DEC-2017**	**08-DEC-2017**	**08-DEC-2017**	**08-DEC-2017**
Time Sampled				**09:15**	**9:10**	**09:45**	**11:55**	**12:15**
AGS Type				**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID				**HEPBH120171208001**	**FES1171208003**	**FES1171208009**	**FES2171208004**	**FES2171208016**
AGS Sample Reference				**12**	**3**	**9**	**4**	**7**
Matrix Class				**Sandy Soil**	**Sandy Soil**	**Clay**	**Sandy Soil**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**				
Arsenic	T6	M40	2	mg/kg	**12**	**11**	**10**	**10**	**11**
Cadmium	T6	M40	1	mg/kg	<1	<1	<1	<1	<1
Chromium	T6	M40	1	mg/kg	**43**	**21**	**35**	**19**	**32**
Chromium VI	T6	AR	1	mg/kg	<1	<1	<1	<1	<1
Chromium (trivalent)	T85	AR	2	mg/kg	**43**	**21**	**35**	**19**	**32**
Iron	T6	A40	1	mg/kg	**18000**	**20000**	**21000**	**20000**	**34000**
Lead	T6	M40	1	mg/kg	**35**	**48**	**51**	**100**	**18**
Manganese	T6	M40	1	mg/kg	**210**	**340**	**240**	**320**	**260**
Mercury	T6	M40	1	mg/kg	<1	<1	<1	<1	<1
Nickel	T6	M40	1	mg/kg	**21**	**14**	**26**	**14**	**33**
Selenium	T6	M40	3	mg/kg	<3	<3	<3	<3	<3
Copper	T6	M40	1	mg/kg	**30**	**18**	**32**	**31**	**24**
Zinc	T6	M40	1	mg/kg	**74**	**93**	**72**	**110**	**71**
Boron (water-soluble)	T6	AR	1	mg/kg	<1	<1	<1	<1	<1

Concept Reference: 703830
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - Total Phenol

Concept Reference				**703830 001**	**703830 003**	**703830 005**	**703830 017**	**703830 018**
Customer Sample Reference				**HEP-BH-1**	**HEP-BH-45**	**HEP-BH-45**	**HEP-BH-824**	**HEP-BH-824**
Depth				**2.1**	**0.3**	**1.00**	**0.2**	**0.7**
Top Depth				**2.1**	**0.3**	**1.00**	**0.2**	**0.7**
Hole ID				**HEP-BH-1**	**HEP-BH-45**	**HEP-BH-45**	**HEP-BH-824**	**HEP-BH-824**
Date Sampled				**07-DEC-2017**	**08-DEC-2017**	**08-DEC-2017**	**08-DEC-2017**	**08-DEC-2017**
Time Sampled				**09:15**	**9:10**	**09:45**	**11:55**	**12:15**
AGS Type				**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID				**HEPBH120171208001**	**FES1171208003**	**FES1171208009**	**FES2171208004**	**FES2171208016**
AGS Sample Reference				**12**	**3**	**9**	**4**	**7**
Matrix Class				**Sandy Soil**	**Sandy Soil**	**Clay**	**Sandy Soil**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**				
Phenols(Mono)	T4	AR	0.5	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0

Concept Reference: 703830
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - Asbestos

	Concept Reference	**703830 001**	**703830 003**	**703830 005**	**703830 017**	**703830 018**
	Customer Sample Reference	**HEP-BH-1**	**HEP-BH-45**	**HEP-BH-45**	**HEP-BH-824**	**HEP-BH-824**
	Depth	**2.1**	**0.3**	**1.00**	**0.2**	**0.7**
	Top Depth	**2.1**	**0.3**	**1.00**	**0.2**	**0.7**
	Hole ID	**HEP-BH-1**	**HEP-BH-45**	**HEP-BH-45**	**HEP-BH-824**	**HEP-BH-824**
	Date Sampled	**07-DEC-2017**	**08-DEC-2017**	**08-DEC-2017**	**08-DEC-2017**	**08-DEC-2017**
	Time Sampled	**09:15**	**9:10**	**09:45**	**11:55**	**12:15**
	AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
	AGS Sample ID	**HEPBH120171208001**	**FES1171208003**	**FES1171208009**	**FES2171208004**	**FES2171208016**
	AGS Sample Reference	**12**	**3**	**9**	**4**	**7**
	Matrix Class	**Sandy Soil**	**Sandy Soil**	**Clay**	**Sandy Soil**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**		
Asbestos ID	T27	AR			N.D.	N.D.	N.D.	N.D.	N.D.

Concept Reference: 703830
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground Soils with Elevated PID Readings - Organics PAH US EPA 16

	Concept Reference	**703830 001**	**703830 003**	**703830 005**	**703830 017**	**703830 018**
	Customer Sample Reference	**HEP-BH-1**	**HEP-BH-45**	**HEP-BH-45**	**HEP-BH-824**	**HEP-BH-824**
	Depth	**2.1**	**0.3**	**1.00**	**0.2**	**0.7**
	Top Depth	**2.1**	**0.3**	**1.00**	**0.2**	**0.7**
	Hole ID	**HEP-BH-1**	**HEP-BH-45**	**HEP-BH-45**	**HEP-BH-824**	**HEP-BH-824**
	Date Sampled	**07-DEC-2017**	**08-DEC-2017**	**08-DEC-2017**	**08-DEC-2017**	**08-DEC-2017**
	Time Sampled	**09:15**	**9:10**	**09:45**	**11:55**	**12:15**
	AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
	AGS Sample ID	**HEPBH120171208001**	**FES1171208003**	**FES1171208009**	**FES2171208004**	**FES2171208016**
	AGS Sample Reference	**12**	**3**	**9**	**4**	**7**
	Matrix Class	**Sandy Soil**	**Sandy Soil**	**Clay**	**Sandy Soil**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**		
Naphthalene	T207	M105	0.1	mg/kg	<0.1	(9) <1.0	<0.1	**1.6**	<0.1
Acenaphthylene	T207	M105	0.1	mg/kg	<0.1	(9) <1.0	<0.1	(9) <1.0	<0.1
Acenaphthene	T207	M105	0.1	mg/kg	<0.1	(9) <1.0	<0.1	**1.1**	<0.1
Fluorene	T207	M105	0.1	mg/kg	<0.1	(9) <1.0	<0.1	**1.2**	<0.1
Phenanthrene	T207	M105	0.1	mg/kg	<0.1	**7.6**	**0.1**	**6.1**	<0.1
Anthracene	T207	M105	0.1	mg/kg	<0.1	**1.6**	<0.1	**1.1**	<0.1
Fluoranthene	T207	M105	0.1	mg/kg	<0.1	**9.7**	**0.3**	**4.8**	<0.1
Pyrene	T207	M105	0.1	mg/kg	<0.1	**7.9**	**0.3**	**3.9**	<0.1
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	<0.1	**2.8**	**0.2**	**1.2**	<0.1
Chrysene	T207	M105	0.1	mg/kg	<0.1	**2.9**	**0.2**	**1.3**	<0.1
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	<0.1	**2.0**	<0.1	**1.1**	<0.1
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	<0.1	**1.8**	**0.1**	(9) <1.0	<0.1
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	<0.1	**2.1**	**0.2**	(9) <1.0	<0.1
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	<0.1	**1.2**	<0.1	(9) <1.0	<0.1
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	<0.1	(9) <1.0	<0.1	(9) <1.0	<0.1
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	<0.1	**1.5**	<0.1	(9) <1.0	<0.1
PAH(total)	T207	M105	0.1	mg/kg	<0.1	**41**	**1.5**	**23**	<0.1

Concept Reference: 703830
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - TPH (CWG)

Concept Reference	**703830 001**	**703830 003**	**703830 005**	**703830 017**	**703830 018**
Customer Sample Reference	**HEP-BH-1**	**HEP-BH-45**	**HEP-BH-45**	**HEP-BH-824**	**HEP-BH-824**
Depth	**2.1**	**0.3**	**1.00**	**0.2**	**0.7**
Top Depth	**2.1**	**0.3**	**1.00**	**0.2**	**0.7**
Hole ID	**HEP-BH-1**	**HEP-BH-45**	**HEP-BH-45**	**HEP-BH-824**	**HEP-BH-824**
Date Sampled	**07-DEC-2017**	**08-DEC-2017**	**08-DEC-2017**	**08-DEC-2017**	**08-DEC-2017**
Time Sampled	**09:15**	**9:10**	**09:45**	**11:55**	**12:15**
AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**HEPBH120171208001**	**FES1171208003**	**FES1171208009**	**FES2171208004**	**FES2171208016**
AGS Sample Reference	**12**	**3**	**9**	**4**	**7**
Matrix Class	**Sandy Soil**	**Sandy Soil**	**Clay**	**Sandy Soil**	**Clay**

Determinand	Method	Test Sample	LOD	Units					
TPH (C5-C6 aliphatic)	T209	M105	100	µg/kg	<100	(110) <200	<100	<100	<100
TPH (C6-C8 aliphatic)	T209	M105	100	µg/kg	<100	(110) <200	<100	<100	<100
TPH (C8-C10 aliphatic)	T209	M105	100	µg/kg	<100	(110) <200	<100	<100	<100
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	(13) <1	(13) <1	(9,13) <10	(13,9) <10	(13) <1
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	(13) <1	(13) <1	(13,9) <10	**(13) 28**	(13) <1
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	(13) <1	**(13) 2**	(13,9) <10	**(13) 29**	(13) <1
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	(13) <2	**(13) 3**	(9,13) <10	(13,9) <10	(13) <2
TPH (C6-C7 aromatic)	T209	M105	100	µg/kg	<100	(110) <200	<100	<100	<100
TPH (C7-C8 aromatic)	T209	M105	100	µg/kg	<100	(110) <200	<100	<100	<100
TPH (C8-C10 aromatic)	T209	M105	100	µg/kg	<100	(110) <200	<100	<100	<100
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	(13) <2	(13) <2	(13,9) <10	**(13) 20**	(13) <2
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	(13) <1	**(13) 1**	(13,9) <10	**(13) 740**	(13) <1
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	(13) <1	**(13) 3**	(13,9) <10	**(13) 820**	(13) <1
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	(13) <1	(13) <1	(13,9) <10	**(13) 140**	(13) <1

Concept Reference: 703830
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil

Total Petroleum Hydrocarbons (Aliphatics+Aromatics) Total

Concept Reference	**703830 001**	**703830 003**	**703830 005**	**703830 017**	**703830 018**
Customer Sample Reference	**HEP-BH-1**	**HEP-BH-45**	**HEP-BH-45**	**HEP-BH-824**	**HEP-BH-824**
Depth	**2.1**	**0.3**	**1.00**	**0.2**	**0.7**
Top Depth	**2.1**	**0.3**	**1.00**	**0.2**	**0.7**
Hole ID	**HEP-BH-1**	**HEP-BH-45**	**HEP-BH-45**	**HEP-BH-824**	**HEP-BH-824**
Date Sampled	**07-DEC-2017**	**08-DEC-2017**	**08-DEC-2017**	**08-DEC-2017**	**08-DEC-2017**
Time Sampled	**09:15**	**9:10**	**09:45**	**11:55**	**12:15**
AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**HEPBH120171208001**	**FES1171208003**	**FES1171208009**	**FES2171208004**	**FES2171208016**
AGS Sample Reference	**12**	**3**	**9**	**4**	**7**
Matrix Class	**Sandy Soil**	**Sandy Soil**	**Clay**	**Sandy Soil**	**Clay**

Determinand	Method	Test Sample	LOD	Units					
TPH (Aliphatic) total	T85	M105		mg/kg	N.D.	**5.0**	(9) <10	**57**	N.D.
TPH (Aromatic) total	T85	M105		mg/kg	N.D.	**4.0**	(9) <10	**1700**	N.D.
TPH (Aliphatic+Aromatic) (sum)	T85	M105		mg/kg	N.D.	**9.00**	(9) <10.0	**1760**	N.D.

Concept Reference: 703830
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite B - Inorganics

Concept Reference	**703830 006**	**703830 019**	**703830 020**
Customer Sample Reference	**HEP-BH-45**	**HEP-BH-824**	**HEP-BH-824**
Depth	**1.4**	**1.7**	**2.7**
Top Depth	**1.4**	**1.7**	**2.7**
Hole ID	**HEP-BH-45**	**HEP-BH-824**	**HEP-BH-824**
Date Sampled	**08-DEC-2017**	**08-DEC-2017**	**08-DEC-2017**
Time Sampled	**11:00**	**13:47**	**14:15**
AGS Type	**ES**	**ES**	**ES**
AGS Sample ID	**FES1171208012**	**FES2171208020**	**FES2171208025**
AGS Sample Reference	**12**	**11**	**16**
Matrix Class	**Sandy Soil**	**Clay**	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units			
Chloride	T686	AR	1	mg/kg	**10**	**12**	**14**

Concept Reference: 703830
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite B - Natural Ground - Misc

Concept Reference	**703830 006**	**703830 019**	**703830 020**
Customer Sample Reference	**HEP-BH-45**	**HEP-BH-824**	**HEP-BH-824**
Depth	**1.4**	**1.7**	**2.7**
Top Depth	**1.4**	**1.7**	**2.7**
Hole ID	**HEP-BH-45**	**HEP-BH-824**	**HEP-BH-824**
Date Sampled	**08-DEC-2017**	**08-DEC-2017**	**08-DEC-2017**
Time Sampled	**11:00**	**13:47**	**14:15**
AGS Type	**ES**	**ES**	**ES**
AGS Sample ID	**FES1171208012**	**FES2171208020**	**FES2171208025**
AGS Sample Reference	**12**	**11**	**16**
Matrix Class	**Sandy Soil**	**Clay**	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units			
Fraction Organic Carbon - F(oc)	T21	AR	1	%	**39**	**45**	**59**
Soil Organic Matter	T287	A40	0.1	%	**6.6**	**1.2**	**4.1**
pH	T7	AR			**7.7**	**7.9**	**7.0**
TPH C10-C40 (sum)	T85	M105	1	mg/kg	**(13) 2**	**(13) 3**	**(13) 45**

Concept Reference: 703830
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite B - Natural Ground - Metals and Metalloids

Concept Reference	**703830 006**	**703830 019**	**703830 020**
Customer Sample Reference	**HEP-BH-45**	**HEP-BH-824**	**HEP-BH-824**
Depth	**1.4**	**1.7**	**2.7**
Top Depth	**1.4**	**1.7**	**2.7**
Hole ID	**HEP-BH-45**	**HEP-BH-824**	**HEP-BH-824**
Date Sampled	**08-DEC-2017**	**08-DEC-2017**	**08-DEC-2017**
Time Sampled	**11:00**	**13:47**	**14:15**
AGS Type	**ES**	**ES**	**ES**
AGS Sample ID	**FES1171208012**	**FES2171208020**	**FES2171208025**
AGS Sample Reference	**12**	**11**	**16**
Matrix Class	**Sandy Soil**	**Clay**	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units			
Arsenic	T6	M40	2	mg/kg	**5**	**19**	**13**
Cadmium	T6	M40	1	mg/kg	<1	<1	<1
Chromium	T6	M40	1	mg/kg	**11**	**40**	**32**
Iron	T6	A40	1	mg/kg	**7200**	**41000**	**22000**
Lead	T6	M40	1	mg/kg	**25**	**22**	**40**
Manganese	T6	M40	1	mg/kg	**170**	**300**	**220**
Mercury	T6	M40	1	mg/kg	<1	<1	<1
Nickel	T6	M40	1	mg/kg	**12**	**44**	**29**
Selenium	T6	M40	3	mg/kg	<3	<3	<3
Copper	T6	M40	1	mg/kg	**13**	**32**	**26**
Zinc	T6	M40	1	mg/kg	**29**	**89**	**94**
Boron (water-soluble)	T6	AR	1	mg/kg	<1	<1	<1

Concept Reference: 703830
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite B - Chromium

Concept Reference	**703830 006**	**703830 019**	**703830 020**
Customer Sample Reference	**HEP-BH-45**	**HEP-BH-824**	**HEP-BH-824**
Depth	**1.4**	**1.7**	**2.7**
Top Depth	**1.4**	**1.7**	**2.7**
Hole ID	**HEP-BH-45**	**HEP-BH-824**	**HEP-BH-824**
Date Sampled	**08-DEC-2017**	**08-DEC-2017**	**08-DEC-2017**
Time Sampled	**11:00**	**13:47**	**14:15**
AGS Type	**ES**	**ES**	**ES**
AGS Sample ID	**FES1171208012**	**FES2171208020**	**FES2171208025**
AGS Sample Reference	**12**	**11**	**16**
Matrix Class	**Sandy Soil**	**Clay**	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units			
Chromium (trivalent)	T85	AR	2	mg/kg	**11**	**40**	**32**
Chromium VI	T6	AR	1	mg/kg	<1	<1	<1

Concept Reference: 703830
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite B - Natural Material - Organic - PAHs

Concept Reference	**703830 006**	**703830 019**	**703830 020**
Customer Sample Reference	**HEP-BH-45**	**HEP-BH-824**	**HEP-BH-824**
Depth	**1.4**	**1.7**	**2.7**
Top Depth	**1.4**	**1.7**	**2.7**
Hole ID	**HEP-BH-45**	**HEP-BH-824**	**HEP-BH-824**
Date Sampled	**08-DEC-2017**	**08-DEC-2017**	**08-DEC-2017**
Time Sampled	**11:00**	**13:47**	**14:15**
AGS Type	**ES**	**ES**	**ES**
AGS Sample ID	**FES1171208012**	**FES2171208020**	**FES2171208025**
AGS Sample Reference	**12**	**11**	**16**
Matrix Class	**Sandy Soil**	**Clay**	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units			
Naphthalene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1
Acenaphthylene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1
Acenaphthene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1
Fluorene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1
Phenanthrene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1
Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1
Fluoranthene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1
Pyrene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1
Chrysene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1
PAH(total)	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1

Concept Reference: 703830
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite B - Natural Material - Organic - TPH

Concept Reference	**703830 006**	**703830 019**	**703830 020**
Customer Sample Reference	**HEP-BH-45**	**HEP-BH-824**	**HEP-BH-824**
Depth	**1.4**	**1.7**	**2.7**
Top Depth	**1.4**	**1.7**	**2.7**
Hole ID	**HEP-BH-45**	**HEP-BH-824**	**HEP-BH-824**
Date Sampled	**08-DEC-2017**	**08-DEC-2017**	**08-DEC-2017**
Time Sampled	**11:00**	**13:47**	**14:15**
AGS Type	**ES**	**ES**	**ES**
AGS Sample ID	**FES1171208012**	**FES2171208020**	**FES2171208025**
AGS Sample Reference	**12**	**11**	**16**
Matrix Class	**Sandy Soil**	**Clay**	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units			
TPH (C10-C35)	T8	M105	1	mg/kg	**(13) 2**	**(13) 3**	**(13) 39**
TPH (C35-C40)	T8	M105	1	mg/kg	(13) <1	(13) <1	**(13) 6**

Index to symbols used in Third Supplemental 703830-3

Value	Description
M40	Analysis conducted on sample assisted dried at no more than 40C. Results are reported on a dry weight basis.
A40	Assisted dried < 40C
M105	Analysis conducted on an "as received" aliquot. Results are reported on a dry weight basis where moisture content was determined by assisted drying of sample at 105C

AR	As Received
N.D.	Not Detected
9	LOD raised due to dilution of sample
13	Results have been blank corrected.
110	LOD raised due to low internal standard recovery.
S	Analysis was subcontracted
M	Analysis is MCERTS accredited
U	Analysis is UKAS accredited
N	Analysis is not UKAS accredited

Notes

Third Supplemental to report TPH totals.
Asbestos subcontracted to REC Asbestos
Nitrate and Nitrite transferred to Concept East Kilbride
Samples 1-10 and 17-20 have been analysed exceeding recommended holding time for pH. It is possible therefore that the results provided may be compromised.

Method Index

Value	Description
T2	Grav
T85	Calc
T207	GC/MS (MCERTS)
T6	ICP/OES
T162	Grav (1 Dec) (105 C)
T8	GC/FID
T909	GCxGC
T21	OX/IR
T27	PLM
T4	Colorimetry
T209	GC/MS (Head Space)(MCERTS)
T686	Discrete Analyser
T287	Calc TOC/0.58
T7	Probe

Accreditation Summary

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Soil Organic Matter	T287	A40	0.1	%	N	001,003,005-006,017-020
pH	T7	AR			M	001,003,005-006,017-020
Asbestos ID	T27	AR			SU	001,003,005,017-018
Phenols(Mono)	T4	AR	0.5	mg/kg	M	001,003,005,017-018
Chloride	T686	AR	1	mg/kg	N	001,003,005-006,017-020
Cyanide(Total)	T4	AR	1	mg/kg	M	001,003,005,017-018
Thiocyanate	T4	A40	1	mg/kg	N	001,003,005,017-018
Nitrate	T686	AR	1	mg/kg	N	001,003,005,017-018
Nitrite	T686	AR	1	mg/kg	N	001,003,005,017-018
SO4(Total)	T6	A40	0.01	%	U	001,003,005,017-018
Sulphide	T4	AR	10	mg/kg	N	001,003,005,017-018
Arsenic	T6	M40	2	mg/kg	M	001,003,005-006,017-020
Cadmium	T6	M40	1	mg/kg	M	001,003,005-006,017-020
Chromium	T6	M40	1	mg/kg	M	001,003,005-006,017-020
Chromium VI	T6	AR	1	mg/kg	N	001,003,005-006,017-020
Chromium (trivalent)	T85	AR	2	mg/kg	N	001,003,005-006,017-020
Iron	T6	A40	1	mg/kg	U	001,003,005-006,017-020
Lead	T6	M40	1	mg/kg	M	001,003,005-006,017-020
Manganese	T6	M40	1	mg/kg	M	001,003,005-006,017-020
Mercury	T6	M40	1	mg/kg	M	001,003,005-006,017-020
Nickel	T6	M40	1	mg/kg	M	001,003,005-006,017-020
Selenium	T6	M40	3	mg/kg	M	001,003,005-006,017-020
Copper	T6	M40	1	mg/kg	M	001,003,005-006,017-020
Zinc	T6	M40	1	mg/kg	M	001,003,005-006,017-020
Boron (water-soluble)	T6	AR	1	mg/kg	N	001,003,005-006,017-020
Naphthalene	T207	M105	0.1	mg/kg	M	001,003,005-006,017-020
Acenaphthylene	T207	M105	0.1	mg/kg	U	001,003,005-006,017-020
Acenaphthene	T207	M105	0.1	mg/kg	M	001,003,005-006,017-020
Fluorene	T207	M105	0.1	mg/kg	M	001,003,005-006,017-020
Phenanthrene	T207	M105	0.1	mg/kg	M	001,003,005-006,017-020

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Anthracene	T207	M105	0.1	mg/kg	U	001,003,005-006,017-020
Fluoranthene	T207	M105	0.1	mg/kg	M	001,003,005-006,017-020
Pyrene	T207	M105	0.1	mg/kg	M	001,003,005-006,017-020
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	M	001,003,005-006,017-020
Chrysene	T207	M105	0.1	mg/kg	M	001,003,005-006,017-020
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	M	001,003,005-006,017-020
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	M	001,003,005-006,017-020
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	M	001,003,005-006,017-020
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	M	001,003,005-006,017-020
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	M	001,003,005-006,017-020
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	M	001,003,005-006,017-020
PAH(total)	T207	M105	0.1	mg/kg	U	001,003,005-006,017-020
TPH (C5-C6 aliphatic)	T209	M105	100	µg/kg	N	001,003,005,017-018
TPH (C6-C8 aliphatic)	T209	M105	100	µg/kg	N	001,003,005,017-018
TPH (C8-C10 aliphatic)	T209	M105	100	µg/kg	N	001,003,005,017-018
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	M	001,003,005,017-018
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	M	001,003,005,017-018
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	M	001,003,005,017-018
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	M	001,003,005,017-018
TPH (C6-C7 aromatic)	T209	M105	100	µg/kg	N	001,003,005,017-018
TPH (C7-C8 aromatic)	T209	M105	100	µg/kg	N	001,003,005,017-018
TPH (C8-C10 aromatic)	T209	M105	100	µg/kg	N	001,003,005,017-018
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	M	001,003,005,017-018
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	M	001,003,005,017-018
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	M	001,003,005,017-018
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	M	001,003,005,017-018
TPH (Aliphatic) total	T85	M105		mg/kg	N	001,003,005,017-018
TPH (Aromatic) total	T85	M105		mg/kg	N	001,003,005,017-018
TPH (Aliphatic+Aromatic) (sum)	T85	M105		mg/kg	N	001,003,005,017-018
Moisture @105C	T162	AR	0.1	%	N	001,003,005-006,017-020
Retained on 10mm sieve	T2	M40	0.1	%	N	001,003,005-006,017-020
Fraction Organic Carbon - F(oc)	T21	AR	1	%	N	006,019-020
TPH C10-C40 (sum)	T85	M105	1	mg/kg	N	006,019-020
TPH (C10-C35)	T8	M105	1	mg/kg	M	006,019-020
TPH (C35-C40)	T8	M105	1	mg/kg	N	006,019-020

CONCEPT LIFE SCIENCES
DELIVERING SCIENCE

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Concept Life Sciences

Certificate of Analysis

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Report Number: Third Supplemental B 704623-3

Date of Report: 27-Jun-2018

Customer: Fugro GeoServices
Fugro House
Hithercroft Road
Wallingford
Oxfordshire
OX10 9RB

Customer Contact: Ms Karen Blackmore

Customer Job Reference:
Customer Purchase Order: 56642KB-WAL
Customer Site Reference: Heathrow HEP Package 3
Date Job Received at Concept: 18-Dec-2017
Date Analysis Started: 20-Dec-2017
Date Analysis Completed: 29-Jan-2018

The results reported relate to samples received in the laboratory and may not be representative of a whole batch.

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation

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Tests covered by this certificate were conducted in accordance with Concept Life Sciences SOPs

All results have been reviewed in accordance with Section 25 of the Concept Life Sciences, Analytical Services Quality Manual

UKAS TESTING
1549

mCERTS
THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME

Report checked
and authorised by :
Sara Abou-Shakra
Customer Service Manager

Issued by :
Sara Abou-Shakra
Customer Service Manager

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**704623 002**	**704623 003**	**704623 004**	**704623 008**	**704623 010**
				Customer Sample Reference	**HEP-BH-13**	**HEP-BH-17**	**HEP-BH-17**	**HEP-BH-23**	**HEP-BH-23**
				Hole ID	**HEP-BH-13**	**HEP-BH-17**	**HEP-BH-17**	**HEP-BH-23**	**HEP-BH-23**
				Top Depth	**0.30**	**1.20**	**1.70**	**2.00**	**3.80**
				Depth	**0.30**	**1.20**	**1.70**	**2.00**	**3.80**
				Date Sampled	**08-DEC-2017**	**12-DEC-2017**	**12-DEC-2017**	**05-DEC-2017**	**05-DEC-2017**
				Time Sampled	**12:00**	**09:52**	**10:17**	**13:00**	**15:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH1320171208002**	**HEPBH1720171212001**	**HEPBH1720171212002**	**HEPBH2320171205001**	**HEPBH2320171205003**
				AGS Sample Reference	**4**	**10**	**13**	**9**	**19**
				Matrix Class	**Topsoil**	**Sandy Soil**	**Clay**	**Sandy Soil**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Moisture @105C	T162	AR	0.1	%	**13**	**16**	**26**	**12**	**4.2**
Retained on 10mm sieve	T2	M40	0.1	%	<0.1	<0.1	<0.1	<0.1	<0.1

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**704623 016**	**704623 017**	**704623 021**	**704623 022**	**704623 023**
				Customer Sample Reference	**HEP-BH-25**	**HEP-BH-25**	**HEP-BH-33**	**HEP-BH-33**	**HEP-BH-33**
				Hole ID	**HEP-BH-25**	**HEP-BH-25**	**HEP-BH-33**	**HEP-BH-33**	**HEP-BH-33**
				Top Depth	**2.30**	**3.40**	**1.20**	**1.50**	**2.50**
				Depth	**2.30**	**3.40**	**1.20**	**1.50**	**2.50**
				Date Sampled	**12-DEC-2017**	**12-DEC-2017**	**07-DEC-2017**	**07-DEC-2017**	**07-DEC-2017**
				Time Sampled	**11:00**	**13:35**	**11:20**	**11:47**	**12:05**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**FES1171212008**	**FES1171212013**	**HEPBH3320171207001**	**HEPBH3320171207002**	**HEPBH3320171207003**
				AGS Sample Reference	**14**	**19**	**7**	**10**	**13**
				Matrix Class	**Clay**	**Fill**	**Sandy Soil**	**Topsoil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Moisture @105C	T162	AR	0.1	%	**12**	**1.6**	**15**	**33**	**30**
Retained on 10mm sieve	T2	M40	0.1	%	<0.1	<0.1	<0.1	<0.1	<0.1

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**704623 024**	**704623 026**	**704623 027**	**704623 028**	**704623 030**
				Customer Sample Reference	**HEP-BH-33**	**HEP-BH-36**	**HEP-BH-36**	**HEP-BH-36**	**HEP-BH-5**
				Hole ID	**HEP-BH-33**	**HEP-BH-36**	**HEP-BH-36**	**HEP-BH-36**	**HEP-BH-5**
				Top Depth	**3.20**	**0.40**	**1.00**	**2.00**	**0.45**
				Depth	**3.20**	**0.40**	**1.00**	**2.00**	**0.45**
				Date Sampled	**07-DEC-2017**	**11-DEC-2017**	**11-DEC-2017**	**11-DEC-2017**	**07-DEC-2017**
				Time Sampled	**14:20**	**12:00**	**13:00**	**14:00**	**13:50**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH3320171207004**	**FES4171212006**	**FES4171212010**	**FES4171212013**	**HEPBH520171207002**
				AGS Sample Reference	**16**	**6**	**10**	**13**	**4**
				Matrix Class	**Clay**	**Sandy Soil**	**Clay**	**Fill**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Moisture @105C	T162	AR	0.1	%	**25**	**9.7**	**24**	**7.2**	**14**
Retained on 10mm sieve	T2	M40	0.1	%	<0.1	<0.1	<0.1	<0.1	<0.1

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

Concept Reference					**704623 031**	**704623 032**	**704623 033**	**704623 037**	**704623 039**
Customer Sample Reference					**HEP-BH-5**	**HEP-BH-1802**	**HEP-BH-1802**	**HEP-BH-1804**	**HEP-BH-1804**
Hole ID					**HEP-BH-5**	**HEP-BH-1802**	**HEP-BH-1802**	**HEP-BH-1804**	**HEP-BH-1804**
Top Depth					**0.80**	**1.20**	**2.00**	**1.20**	**3.00**
Depth					**0.80**	**1.20**	**2.00**	**1.20**	**3.00**
Date Sampled					**07-DEC-2017**	**08-DEC-2017**	**08-DEC-2017**	**06-DEC-2017**	**06-DEC-2017**
Time Sampled					**16:30**	**10:00**	**11:00**	**12:00**	**13:20**
AGS Type					**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID					**HEPBH520171207003**	**HEPBH180220171208001**	**HEPBH180220171208002**	**HEPBH180420171206001**	**HEPBH180420171206003**
AGS Sample Reference					**7**	**10**	**13**	**12**	**19**
Matrix Class					**Clay**	**Fill**	**Fill**	**Fill**	**Fill**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Moisture @105C	T162	AR	0.1	%	**17**	**1.1**	**3.2**	**6.9**	**14**
Retained on 10mm sieve	T2	M40	0.1	%	<0.1	<0.1	<0.1	<0.1	<0.1

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

Concept Reference					**704623 043**	**704623 045**	**704623 046**	**704623 048**	**704623 050**
Customer Sample Reference					**HEP-BH-1810**	**HEP-BH-1810**	**HEP-BH-1810**	**HEP-BH-1810**	**HEP-BH-1810**
Hole ID					**HEP-BH-1810**	**HEP-BH-1810**	**HEP-BH-1810**	**HEP-BH-1810**	**HEP-BH-1810**
Top Depth					**0.50**	**1.80**	**2.80**	**4.80**	**7.20**
Depth					**0.50**	**1.80**	**2.80**	**4.80**	**7.20**
Date Sampled					**11-DEC-2017**	**11-DEC-2017**	**11-DEC-2017**	**11-DEC-2017**	**11-DEC-2017**
Time Sampled					**10:00**	**12:00**	**13:00**	**14:30**	**16:00**
AGS Type					**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID					**FES2171211005**	**FES2171211012**	**FES2171211015**	**FES2171211021**	**FES2171211030**
AGS Sample Reference					**5**	**12**	**15**	**21**	**30**
Matrix Class					**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Moisture @105C	T162	AR	0.1	%	**6.1**	**24**	**23**	**26**	**27**
Retained on 10mm sieve	T2	M40	0.1	%	<0.1	<0.1	<0.1	<0.1	<0.1

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

Concept Reference					**704623 054**	**704623 055**	**704623 060**	**704623 064**	**704623 066**
Customer Sample Reference					**HEP-BH-1863**	**HEP-BH-1863**	**HEP-BH-36**	**HEP-TP-10**	**HEP-TP-10**
Hole ID					**HEP-BH-1863**	**HEP-BH-1863**	**HEP-BH-36**	**HEP-TP-10**	**HEP-TP-10**
Top Depth					**0.30**	**0.85**	**6.90**	**0.20**	**1.30**
Depth					**0.30**	**0.85**	**6.90**	**0.20**	**1.30**
Date Sampled					**11-DEC-2017**	**11-DEC-2017**	**12-DEC-2017**	**12-DEC-2017**	**12-DEC-2017**
Time Sampled					**13:30**	**14:40**	**13:00**	**11:00**	**13:00**
AGS Type					**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID					**HEPBH186320171211002**	**HEPBH186320171211003**	**HEPBH3620171212005**	**HEPTP1020171212001**	**HEPTP1020171212003**
AGS Sample Reference					**4**	**7**	**28**	**3**	**9**
Matrix Class					**Sandy Soil**	**Sandy Soil**	**Fill**	**Sandy Soil**	**Topsoil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Moisture @105C	T162	AR	0.1	%	**19**	**7.5**	**24**	**13**	**4.0**
Retained on 10mm sieve	T2	M40	0.1	%	<0.1	<0.1	<0.1	<0.1	<0.1

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

Concept Reference	**704623 067**
Customer Sample Reference	**HEP-TP-10**
Hole ID	**HEP-TP-10**
Top Depth	**2.00**
Depth	**2.00**
Date Sampled	**12-DEC-2017**
Time Sampled	**14:00**
AGS Type	**ES**
AGS Sample ID	**HEPTP1020171212004**
AGS Sample Reference	**12**
Matrix Class	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units	
Moisture @105C	T162	AR	0.1	%	**4.1**
Retained on 10mm sieve	T2	M40	0.1	%	<0.1

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Inorganics

Concept Reference	**704623 002**	**704623 003**	**704623 004**	**704623 016**	**704623 017**
Customer Sample Reference	**HEP-BH-13**	**HEP-BH-17**	**HEP-BH-17**	**HEP-BH-25**	**HEP-BH-25**
Hole ID	**HEP-BH-13**	**HEP-BH-17**	**HEP-BH-17**	**HEP-BH-25**	**HEP-BH-25**
Top Depth	**0.30**	**1.20**	**1.70**	**2.30**	**3.40**
Depth	**0.30**	**1.20**	**1.70**	**2.30**	**3.40**
Date Sampled	**08-DEC-2017**	**12-DEC-2017**	**12-DEC-2017**	**12-DEC-2017**	**12-DEC-2017**
Time Sampled	**12:00**	**09:52**	**10:17**	**11:00**	**13:35**
AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**HEPBH1320171208002**	**HEPBH1720171212001**	**HEPBH1720171212002**	**FES1171212008**	**FES1171212013**
AGS Sample Reference	**4**	**10**	**13**	**14**	**19**
Matrix Class	**Topsoil**	**Sandy Soil**	**Clay**	**Clay**	**Fill**

Determinand	Method	Test Sample	LOD	Units					
Chloride	T686	AR	1	mg/kg	**2**	**18**	**21**	**20**	**8**
Cyanide(Total)	T4	AR	1	mg/kg	<1	<1	<1	**29**	<1
Thiocyanate	T4	A40	1	mg/kg	<10	<10	<10	<10	<10
Nitrate	T686	AR	1	mg/kg	**16**	**4**	**2**	**2**	**2**
Nitrite	T686	AR	1	mg/kg	<1	<1	<1	<1	<1
SO4(Total)	T6	A40	0.01	%	**0.12**	**6.8**	**0.97**	**0.18**	**1.3**
Sulphide	T4	AR	10	mg/kg	<10	<10	**180**	**130**	**13**

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Inorganics

				Concept Reference	**704623 021**	**704623 022**	**704623 023**	**704623 024**	**704623 026**
				Customer Sample Reference	**HEP-BH-33**	**HEP-BH-33**	**HEP-BH-33**	**HEP-BH-33**	**HEP-BH-36**
				Hole ID	**HEP-BH-33**	**HEP-BH-33**	**HEP-BH-33**	**HEP-BH-33**	**HEP-BH-36**
				Top Depth	**1.20**	**1.50**	**2.50**	**3.20**	**0.40**
				Depth	**1.20**	**1.50**	**2.50**	**3.20**	**0.40**
				Date Sampled	**07-DEC-2017**	**07-DEC-2017**	**07-DEC-2017**	**07-DEC-2017**	**11-DEC-2017**
				Time Sampled	**11:20**	**11:47**	**12:05**	**14:20**	**12:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH3320171207001**	**HEPBH3320171207002**	**HEPBH3320171207003**	**HEPBH3320171207004**	**FES4171212006**
				AGS Sample Reference	**7**	**10**	**13**	**16**	**6**
				Matrix Class	**Sandy Soil**	**Topsoil**	**Sandy Soil**	**Clay**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Chloride	T686	AR	1	mg/kg	**16**	**10**	**3**	**4**	**43**
Cyanide(Total)	T4	AR	1	mg/kg	<1	**14**	<1	<1	<1
Thiocyanate	T4	A40	1	mg/kg	<10	<10	<10	<10	<10
Nitrate	T686	AR	1	mg/kg	**2**	**36**	**5**	**2**	**21**
Nitrite	T686	AR	1	mg/kg	<1	<1	<1	<1	<1
SO4(Total)	T6	A40	0.01	%	**0.21**	**0.10**	**0.69**	**0.22**	**0.25**
Sulphide	T4	AR	10	mg/kg	<10	**11**	**11**	<10	<10

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Inorganics

				Concept Reference	**704623 027**	**704623 028**	**704623 030**	**704623 031**	**704623 032**
				Customer Sample Reference	**HEP-BH-36**	**HEP-BH-36**	**HEP-BH-5**	**HEP-BH-5**	**HEP-BH-1802**
				Hole ID	**HEP-BH-36**	**HEP-BH-36**	**HEP-BH-5**	**HEP-BH-5**	**HEP-BH-1802**
				Top Depth	**1.00**	**2.00**	**0.45**	**0.80**	**1.20**
				Depth	**1.00**	**2.00**	**0.45**	**0.80**	**1.20**
				Date Sampled	**11-DEC-2017**	**11-DEC-2017**	**07-DEC-2017**	**07-DEC-2017**	**08-DEC-2017**
				Time Sampled	**13:00**	**14:00**	**13:50**	**16:30**	**10:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**FES4171212010**	**FES4171212013**	**HEPBH520171207002**	**HEPBH520171207003**	**HEPBH180220171208001**
				AGS Sample Reference	**10**	**13**	**4**	**7**	**10**
				Matrix Class	**Clay**	**Fill**	**Sandy Soil**	**Clay**	**Fill**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Chloride	T686	AR	1	mg/kg	**120**	**7**	**3**	**3**	**11**
Cyanide(Total)	T4	AR	1	mg/kg	<1	<1	<1	<1	<1
Thiocyanate	T4	A40	1	mg/kg	<10	<10	<10	<10	<10
Nitrate	T686	AR	1	mg/kg	**25**	**2**	**16**	**4**	**2**
Nitrite	T686	AR	1	mg/kg	<1	<1	<1	<1	<1
SO4(Total)	T6	A40	0.01	%	**0.10**	**0.04**	**0.21**	**0.30**	**0.16**
Sulphide	T4	AR	10	mg/kg	<10	<10	**19**	**150**	<10

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - Inorganics

Concept Reference					**704623 033**	**704623 043**	**704623 045**	**704623 046**	**704623 048**
Customer Sample Reference					**HEP-BH-1802**	**HEP-BH-1810**	**HEP-BH-1810**	**HEP-BH-1810**	**HEP-BH-1810**
Hole ID					**HEP-BH-1802**	**HEP-BH-1810**	**HEP-BH-1810**	**HEP-BH-1810**	**HEP-BH-1810**
Top Depth					**2.00**	**0.50**	**1.80**	**2.80**	**4.80**
Depth					**2.00**	**0.50**	**1.80**	**2.80**	**4.80**
Date Sampled					**08-DEC-2017**	**11-DEC-2017**	**11-DEC-2017**	**11-DEC-2017**	**11-DEC-2017**
Time Sampled					**11:00**	**10:00**	**12:00**	**13:00**	**14:30**
AGS Type					**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID					**HEPBH18022017120800 2**	**FES2171211005**	**FES2171211012**	**FES2171211015**	**FES2171211021**
AGS Sample Reference					**13**	**5**	**12**	**15**	**21**
Matrix Class					**Fill**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Chloride	T686	AR	1	mg/kg	**6**	**32**	**66**	**66**	**100**
Cyanide(Total)	T4	AR	1	mg/kg	<1	**1**	<1	<1	<1
Thiocyanate	T4	A40	1	mg/kg	<10	<10	<10	<10	<10
Nitrate	T686	AR	1	mg/kg	**2**	**42**	**7**	**2**	**3**
Nitrite	T686	AR	1	mg/kg	<1	**1**	**4**	<1	<1
SO4(Total)	T6	A40	0.01	%	**0.03**	**0.50**	**0.59**	**0.20**	**0.15**
Sulphide	T4	AR	10	mg/kg	<10	**13**	**39**	**120**	**68**

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
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Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - Inorganics

Concept Reference					**704623 050**	**704623 054**	**704623 055**	**704623 064**	**704623 066**
Customer Sample Reference					**HEP-BH-1810**	**HEP-BH-1863**	**HEP-BH-1863**	**HEP-TP-10**	**HEP-TP-10**
Hole ID					**HEP-BH-1810**	**HEP-BH-1863**	**HEP-BH-1863**	**HEP-TP-10**	**HEP-TP-10**
Top Depth					**7.20**	**0.30**	**0.85**	**0.20**	**1.30**
Depth					**7.20**	**0.30**	**0.85**	**0.20**	**1.30**
Date Sampled					**11-DEC-2017**	**11-DEC-2017**	**11-DEC-2017**	**12-DEC-2017**	**12-DEC-2017**
Time Sampled					**16:00**	**13:30**	**14:40**	**11:00**	**13:00**
AGS Type					**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID					**FES2171211030**	**HEPBH18632017121100 2**	**HEPBH18632017 1211003**	**HEPTP1020171212001**	**HEPTP1020171212003**
AGS Sample Reference					**30**	**4**	**7**	**3**	**9**
Matrix Class					**Clay**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Topsoil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Chloride	T686	AR	1	mg/kg	**78**	**3**	**2**	**2**	**2**
Cyanide(Total)	T4	AR	1	mg/kg	<1	<1	<1	<1	**2**
Thiocyanate	T4	A40	1	mg/kg	<10	<10	<10	<10	<10
Nitrate	T686	AR	1	mg/kg	**3**	**12**	**15**	**5**	**7**
Nitrite	T686	AR	1	mg/kg	<1	<1	<1	<1	<1
SO4(Total)	T6	A40	0.01	%	**0.08**	**0.09**	**0.12**	**0.06**	**0.19**
Sulphide	T4	AR	10	mg/kg	**48**	<10	**12**	<10	<10

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - Inorganics

Concept Reference	**704623 067**
Customer Sample Reference	**HEP-TP-10**
Hole ID	**HEP-TP-10**
Top Depth	**2.00**
Depth	**2.00**
Date Sampled	**12-DEC-2017**
Time Sampled	**14:00**
AGS Type	**ES**
AGS Sample ID	**HEPTP1020171212004**
AGS Sample Reference	**12**
Matrix Class	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units	
Chloride	T686	AR	1	mg/kg	**6**
Cyanide(Total)	T4	AR	1	mg/kg	<1
Thiocyanate	T4	A40	1	mg/kg	<10
Nitrate	T686	AR	1	mg/kg	**3**
Nitrite	T686	AR	1	mg/kg	<1
SO4(Total)	T6	A40	0.01	%	**0.04**
Sulphide	T4	AR	10	mg/kg	<10

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - Misc

Concept Reference	**704623 002**	**704623 003**	**704623 004**	**704623 016**	**704623 017**
Customer Sample Reference	**HEP-BH-13**	**HEP-BH-17**	**HEP-BH-17**	**HEP-BH-25**	**HEP-BH-25**
Hole ID	**HEP-BH-13**	**HEP-BH-17**	**HEP-BH-17**	**HEP-BH-25**	**HEP-BH-25**
Top Depth	**0.30**	**1.20**	**1.70**	**2.30**	**3.40**
Depth	**0.30**	**1.20**	**1.70**	**2.30**	**3.40**
Date Sampled	**08-DEC-2017**	**12-DEC-2017**	**12-DEC-2017**	**12-DEC-2017**	**12-DEC-2017**
Time Sampled	**12:00**	**09:52**	**10:17**	**11:00**	**13:35**
AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**HEPBH1320171208002**	**HEPBH1720171212001**	**HEPBH1720171212002**	**FES1171212008**	**FES1171212013**
AGS Sample Reference	**4**	**10**	**13**	**14**	**19**
Matrix Class	**Topsoil**	**Sandy Soil**	**Clay**	**Clay**	**Fill**

Determinand	Method	Test Sample	LOD	Units					
Soil Organic Matter	T287	A40	0.1	%	**4.2**	**4.0**	**5.2**	**2.0**	**5.6**
pH	T7	AR			**7.8**	**8.9**	**8.4**	**7.6**	**8.1**

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Misc

				Concept Reference	**704623 021**	**704623 022**	**704623 023**	**704623 024**	**704623 026**
				Customer Sample Reference	**HEP-BH-33**	**HEP-BH-33**	**HEP-BH-33**	**HEP-BH-33**	**HEP-BH-36**
				Hole ID	**HEP-BH-33**	**HEP-BH-33**	**HEP-BH-33**	**HEP-BH-33**	**HEP-BH-36**
				Top Depth	**1.20**	**1.50**	**2.50**	**3.20**	**0.40**
				Depth	**1.20**	**1.50**	**2.50**	**3.20**	**0.40**
				Date Sampled	**07-DEC-2017**	**07-DEC-2017**	**07-DEC-2017**	**07-DEC-2017**	**11-DEC-2017**
				Time Sampled	**11:20**	**11:47**	**12:05**	**14:20**	**12:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH3320171207001**	**HEPBH3320171207002**	**HEPBH3320171207003**	**HEPBH3320171207004**	**FES4171212006**
				AGS Sample Reference	**7**	**10**	**13**	**16**	**6**
				Matrix Class	**Sandy Soil**	**Topsoil**	**Sandy Soil**	**Clay**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Soil Organic Matter	T287	A40	0.1	%	**1.3**	**13**	**3.9**	**1.4**	**2.1**
pH	T7	AR			**7.1**	**7.8**	**7.6**	**7.8**	**7.7**

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Misc

				Concept Reference	**704623 027**	**704623 028**	**704623 030**	**704623 031**	**704623 032**
				Customer Sample Reference	**HEP-BH-36**	**HEP-BH-36**	**HEP-BH-5**	**HEP-BH-5**	**HEP-BH-1802**
				Hole ID	**HEP-BH-36**	**HEP-BH-36**	**HEP-BH-5**	**HEP-BH-5**	**HEP-BH-1802**
				Top Depth	**1.00**	**2.00**	**0.45**	**0.80**	**1.20**
				Depth	**1.00**	**2.00**	**0.45**	**0.80**	**1.20**
				Date Sampled	**11-DEC-2017**	**11-DEC-2017**	**07-DEC-2017**	**07-DEC-2017**	**08-DEC-2017**
				Time Sampled	**13:00**	**14:00**	**13:50**	**16:30**	**10:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**FES4171212010**	**FES4171212013**	**HEPBH520171207002**	**HEPBH520171207003**	**HEPBH180220171208001**
				AGS Sample Reference	**10**	**13**	**4**	**7**	**10**
				Matrix Class	**Clay**	**Fill**	**Sandy Soil**	**Clay**	**Fill**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Soil Organic Matter	T287	A40	0.1	%	**2.6**	**0.2**	**6.5**	**4.0**	**3.2**
pH	T7	AR			**7.9**	**7.8**	**8.1**	**7.9**	**8.1**

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Misc

				Concept Reference	**704623 033**	**704623 043**	**704623 045**	**704623 046**	**704623 048**
				Customer Sample Reference	**HEP-BH-1802**	**HEP-BH-1810**	**HEP-BH-1810**	**HEP-BH-1810**	**HEP-BH-1810**
				Hole ID	**HEP-BH-1802**	**HEP-BH-1810**	**HEP-BH-1810**	**HEP-BH-1810**	**HEP-BH-1810**
				Top Depth	**2.00**	**0.50**	**1.80**	**2.80**	**4.80**
				Depth	**2.00**	**0.50**	**1.80**	**2.80**	**4.80**
				Date Sampled	**08-DEC-2017**	**11-DEC-2017**	**11-DEC-2017**	**11-DEC-2017**	**11-DEC-2017**
				Time Sampled	**11:00**	**10:00**	**12:00**	**13:00**	**14:30**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH180220171208002**	**FES2171211005**	**FES2171211012**	**FES2171211015**	**FES2171211021**
				AGS Sample Reference	**13**	**5**	**12**	**15**	**21**
				Matrix Class	**Fill**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Soil Organic Matter	T287	A40	0.1	%	**1.3**	**0.2**	**1.7**	**4.0**	**3.4**
pH	T7	AR			**7.9**	**11.7**	**8.8**	**8.9**	**8.3**

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Misc

				Concept Reference	**704623 050**	**704623 054**	**704623 055**	**704623 064**	**704623 066**
				Customer Sample Reference	**HEP-BH-1810**	**HEP-BH-1863**	**HEP-BH-1863**	**HEP-TP-10**	**HEP-TP-10**
				Hole ID	**HEP-BH-1810**	**HEP-BH-1863**	**HEP-BH-1863**	**HEP-TP-10**	**HEP-TP-10**
				Top Depth	**7.20**	**0.30**	**0.85**	**0.20**	**1.30**
				Depth	**7.20**	**0.30**	**0.85**	**0.20**	**1.30**
				Date Sampled	**11-DEC-2017**	**11-DEC-2017**	**11-DEC-2017**	**12-DEC-2017**	**12-DEC-2017**
				Time Sampled	**16:00**	**13:30**	**14:40**	**11:00**	**13:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**FES2171211030**	**HEPBH1863201712110 02**	**HEPBH18632017 1211003**	**HEPTP1020171212001**	**HEPTP1020171212003**
				AGS Sample Reference	**30**	**4**	**7**	**3**	**9**
				Matrix Class	**Clay**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Topsoil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Soil Organic Matter	T287	A40	0.1	%	**1.5**	**1.1**	**4.1**	**3.0**	**3.9**
pH	T7	AR			**8.1**	**8.4**	**8.4**	**8.0**	**8.1**

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Misc

				Concept Reference	**704623 067**
				Customer Sample Reference	**HEP-TP-10**
				Hole ID	**HEP-TP-10**
				Top Depth	**2.00**
				Depth	**2.00**
				Date Sampled	**12-DEC-2017**
				Time Sampled	**14:00**
				AGS Type	**ES**
				AGS Sample ID	**HEPTP1020171212004**
				AGS Sample Reference	**12**
				Matrix Class	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**	
Soil Organic Matter	T287	A40	0.1	%	**16**
pH	T7	AR			**7.9**

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings Metals and Metalloids

				Concept Reference	**704623 002**	**704623 003**	**704623 004**	**704623 016**	**704623 017**
				Customer Sample Reference	**HEP-BH-13**	**HEP-BH-17**	**HEP-BH-17**	**HEP-BH-25**	**HEP-BH-25**
				Hole ID	**HEP-BH-13**	**HEP-BH-17**	**HEP-BH-17**	**HEP-BH-25**	**HEP-BH-25**
				Top Depth	**0.30**	**1.20**	**1.70**	**2.30**	**3.40**
				Depth	**0.30**	**1.20**	**1.70**	**2.30**	**3.40**
				Date Sampled	**08-DEC-2017**	**12-DEC-2017**	**12-DEC-2017**	**12-DEC-2017**	**12-DEC-2017**
				Time Sampled	**12:00**	**09:52**	**10:17**	**11:00**	**13:35**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH1320171208002**	**HEPBH1720171212001**	**HEPBH1720171212002**	**FES1171212008**	**FES1171212013**
				AGS Sample Reference	**4**	**10**	**13**	**14**	**19**
				Matrix Class	**Topsoil**	**Sandy Soil**	**Clay**	**Clay**	**Fill**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Arsenic	T6	M40	2	mg/kg	**13**	**14**	**24**	**12**	**14**
Cadmium	T6	M40	1	mg/kg	<1	**1**	<1	<1	**2**
Chromium	T6	M40	1	mg/kg	**29**	**29**	**27**	**31**	**51**
Chromium VI	T6	AR	1	mg/kg	<1	<1	<1	<1	<1
Chromium (trivalent)	T85	AR	2	mg/kg	**29**	**29**	**27**	**31**	**51**
Iron	T6	A40	1	mg/kg	**23000**	**23000**	**25000**	**23000**	**46000**
Lead	T6	M40	1	mg/kg	**130**	**320**	**420**	**110**	**1800**
Manganese	T6	M40	1	mg/kg	**280**	**330**	**340**	**320**	**510**
Mercury	T6	M40	1	mg/kg	**1**	<1	**1**	<1	<1
Nickel	T6	M40	1	mg/kg	**24**	**24**	**25**	**21**	**30**
Selenium	T6	M40	3	mg/kg	<3	<3	<3	<3	<3
Copper	T6	M40	1	mg/kg	**62**	**87**	**71**	**46**	**110**
Zinc	T6	M40	1	mg/kg	**110**	**460**	**190**	**120**	**510**
Boron (water-soluble)	T6	AR	1	mg/kg	<1	<1	<1	<1	<1

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings Metals and Metalloids

				Concept Reference	**704623 021**	**704623 022**	**704623 023**	**704623 024**	**704623 026**
				Customer Sample Reference	**HEP-BH-33**	**HEP-BH-33**	**HEP-BH-33**	**HEP-BH-33**	**HEP-BH-36**
				Hole ID	**HEP-BH-33**	**HEP-BH-33**	**HEP-BH-33**	**HEP-BH-33**	**HEP-BH-36**
				Top Depth	**1.20**	**1.50**	**2.50**	**3.20**	**0.40**
				Depth	**1.20**	**1.50**	**2.50**	**3.20**	**0.40**
				Date Sampled	**07-DEC-2017**	**07-DEC-2017**	**07-DEC-2017**	**07-DEC-2017**	**11-DEC-2017**
				Time Sampled	**11:20**	**11:47**	**12:05**	**14:20**	**12:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH3320171207001**	**HEPBH3320171207002**	**HEPBH3320171207003**	**HEPBH3320171207004**	**FES4171212006**
				AGS Sample Reference	**7**	**10**	**13**	**16**	**6**
				Matrix Class	**Sandy Soil**	**Topsoil**	**Sandy Soil**	**Clay**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Arsenic	T6	M40	2	mg/kg	**10**	**15**	**13**	**12**	**7**
Cadmium	T6	M40	1	mg/kg	<1	**2**	**4**	<1	<1
Chromium	T6	M40	1	mg/kg	**28**	**54**	**54**	**40**	**18**
Chromium VI	T6	AR	1	mg/kg	<1	<1	<1	<1	<1
Chromium (trivalent)	T85	AR	2	mg/kg	**28**	**54**	**54**	**40**	**18**
Iron	T6	A40	1	mg/kg	**20000**	**29000**	**28000**	**34000**	**9600**
Lead	T6	M40	1	mg/kg	**400**	**200**	**1800**	**130**	**67**
Manganese	T6	M40	1	mg/kg	**390**	**410**	**470**	**470**	**200**
Mercury	T6	M40	1	mg/kg	<1	**1**	<1	<1	<1
Nickel	T6	M40	1	mg/kg	**18**	**35**	**28**	**36**	**16**
Selenium	T6	M40	3	mg/kg	<3	<3	<3	<3	<3
Copper	T6	M40	1	mg/kg	**33**	**94**	**130**	**32**	**25**
Zinc	T6	M40	1	mg/kg	**120**	**210**	**230**	**90**	**61**
Boron (water-soluble)	T6	AR	1	mg/kg	<1	<1	<1	<1	<1

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings Metals and Metalloids

Concept Reference	**704623 027**	**704623 028**	**704623 030**	**704623 031**	**704623 032**
Customer Sample Reference	**HEP-BH-36**	**HEP-BH-36**	**HEP-BH-5**	**HEP-BH-5**	**HEP-BH-1802**
Hole ID	**HEP-BH-36**	**HEP-BH-36**	**HEP-BH-5**	**HEP-BH-5**	**HEP-BH-1802**
Top Depth	**1.00**	**2.00**	**0.45**	**0.80**	**1.20**
Depth	**1.00**	**2.00**	**0.45**	**0.80**	**1.20**
Date Sampled	**11-DEC-2017**	**11-DEC-2017**	**07-DEC-2017**	**07-DEC-2017**	**08-DEC-2017**
Time Sampled	**13:00**	**14:00**	**13:50**	**16:30**	**10:00**
AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**FES4171212010**	**FES4171212013**	**HEPBH520171207002**	**HEPBH520171207003**	**HEPBH180220171208001**
AGS Sample Reference	**10**	**13**	**4**	**7**	**10**
Matrix Class	**Clay**	**Fill**	**Sandy Soil**	**Clay**	**Fill**

Determinand	Method	Test Sample	LOD	Units					
Arsenic	T6	M40	2	mg/kg	**8**	**3.6**	**16**	**18**	**9.3**
Cadmium	T6	M40	1	mg/kg	<1	<1	**1**	<1	<1
Chromium	T6	M40	1	mg/kg	**24**	**11**	**30**	**37**	**32**
Chromium VI	T6	AR	1	mg/kg	<1	<1	<1	<1	<1
Chromium (trivalent)	T85	AR	2	mg/kg	**24**	**11**	**30**	**37**	**32**
Iron	T6	A40	1	mg/kg	**19000**	**7100**	**28000**	**29000**	**10000**
Lead	T6	M40	1	mg/kg	**26**	**13**	**830**	**560**	**160**
Manganese	T6	M40	1	mg/kg	**380**	**72**	**290**	**300**	**140**
Mercury	T6	M40	1	mg/kg	<1	<1	<1	<1	<1
Nickel	T6	M40	1	mg/kg	**19**	**11**	**28**	**26**	**12**
Selenium	T6	M40	3	mg/kg	<3	<3	<3	<3	<3
Copper	T6	M40	1	mg/kg	**14**	**8**	**110**	**64**	**26**
Zinc	T6	M40	1	mg/kg	**50**	**22**	**660**	**430**	**84**
Boron (water-soluble)	T6	AR	1	mg/kg	<1	<1	<1	<1	<1

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings Metals and Metalloids

Concept Reference	**704623 033**	**704623 043**	**704623 045**	**704623 046**	**704623 048**
Customer Sample Reference	**HEP-BH-1802**	**HEP-BH-1810**	**HEP-BH-1810**	**HEP-BH-1810**	**HEP-BH-1810**
Hole ID	**HEP-BH-1802**	**HEP-BH-1810**	**HEP-BH-1810**	**HEP-BH-1810**	**HEP-BH-1810**
Top Depth	**2.00**	**0.50**	**1.80**	**2.80**	**4.80**
Depth	**2.00**	**0.50**	**1.80**	**2.80**	**4.80**
Date Sampled	**08-DEC-2017**	**11-DEC-2017**	**11-DEC-2017**	**11-DEC-2017**	**11-DEC-2017**
Time Sampled	**11:00**	**10:00**	**12:00**	**13:00**	**14:30**
AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**HEPBH180220171208002**	**FES2171211005**	**FES2171211012**	**FES2171211015**	**FES2171211021**
AGS Sample Reference	**13**	**5**	**12**	**15**	**21**
Matrix Class	**Fill**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Clay**

Determinand	Method	Test Sample	LOD	Units					
Arsenic	T6	M40	2	mg/kg	**6.0**	**15**	**20**	**21**	**15**
Cadmium	T6	M40	1	mg/kg	<1	**3**	**1**	**1**	**1**
Chromium	T6	M40	1	mg/kg	**8**	**45**	**45**	**35**	**37**
Chromium VI	T6	AR	1	mg/kg	<1	<1	<1	<1	<1
Chromium (trivalent)	T85	AR	2	mg/kg	**8**	**45**	**45**	**35**	**37**
Iron	T6	A40	1	mg/kg	**3700**	**16000**	**32000**	**31000**	**31000**
Lead	T6	M40	1	mg/kg	**7**	**160**	**400**	**620**	**470**
Manganese	T6	M40	1	mg/kg	**29**	**230**	**530**	**380**	**310**
Mercury	T6	M40	1	mg/kg	<1	<1	<1	<1	<1
Nickel	T6	M40	1	mg/kg	**11**	**25**	**36**	**31**	**31**
Selenium	T6	M40	3	mg/kg	<3	<3	<3	<3	<3
Copper	T6	M40	1	mg/kg	**3**	**64**	**180**	**110**	**49**
Zinc	T6	M40	1	mg/kg	**20**	**170**	**330**	**430**	**370**
Boron (water-soluble)	T6	AR	1	mg/kg	<1	<1	<1	**6**	**2**

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings Metals and Metalloids

Concept Reference	**704623 050**	**704623 054**	**704623 055**	**704623 064**	**704623 066**
Customer Sample Reference	**HEP-BH-1810**	**HEP-BH-1863**	**HEP-BH-1863**	**HEP-TP-10**	**HEP-TP-10**
Hole ID	**HEP-BH-1810**	**HEP-BH-1863**	**HEP-BH-1863**	**HEP-TP-10**	**HEP-TP-10**
Top Depth	**7.20**	**0.30**	**0.85**	**0.20**	**1.30**
Depth	**7.20**	**0.30**	**0.85**	**0.20**	**1.30**
Date Sampled	**11-DEC-2017**	**11-DEC-2017**	**11-DEC-2017**	**12-DEC-2017**	**12-DEC-2017**
Time Sampled	**16:00**	**13:30**	**14:40**	**11:00**	**13:00**
AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**FES2171211030**	**HEPBH1863201712110 02**	**HEPBH18632017 1211003**	**HEPTP1020171212001**	**HEPTP1020171212003**
AGS Sample Reference	**30**	**4**	**7**	**3**	**9**
Matrix Class	**Clay**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Topsoil**

Determinand	Method	Test Sample	LOD	Units					
Arsenic	T6	M40	2	mg/kg	**14**	**9**	**11**	**20**	**43**
Cadmium	T6	M40	1	mg/kg	<1	<1	<1	**3**	**1**
Chromium	T6	M40	1	mg/kg	**29**	**21**	**23**	**52**	**34**
Chromium VI	T6	AR	1	mg/kg	<1	<1	<1	<1	<1
Chromium (trivalent)	T85	AR	2	mg/kg	**29**	**21**	**23**	**52**	**34**
Iron	T6	A40	1	mg/kg	**49000**	**17000**	**18000**	**35000**	**65000**
Lead	T6	M40	1	mg/kg	**37**	**130**	**210**	**130**	**650**
Manganese	T6	M40	1	mg/kg	**500**	**220**	**200**	**600**	**740**
Mercury	T6	M40	1	mg/kg	<1	**1**	<1	<1	**4**
Nickel	T6	M40	1	mg/kg	**29**	**17**	**20**	**32**	**44**
Selenium	T6	M40	3	mg/kg	<3	<3	<3	<3	<3
Copper	T6	M40	1	mg/kg	**23**	**59**	**48**	**80**	**400**
Zinc	T6	M40	1	mg/kg	**100**	**98**	**180**	**220**	**400**
Boron (water-soluble)	T6	AR	1	mg/kg	<1	<1	<1	<1	<1

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings Metals and Metalloids

Concept Reference	**704623 067**
Customer Sample Reference	**HEP-TP-10**
Hole ID	**HEP-TP-10**
Top Depth	**2.00**
Depth	**2.00**
Date Sampled	**12-DEC-2017**
Time Sampled	**14:00**
AGS Type	**ES**
AGS Sample ID	**HEPTP1020171212004**
AGS Sample Reference	**12**
Matrix Class	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units	
Arsenic	T6	M40	2	mg/kg	**5**
Cadmium	T6	M40	1	mg/kg	<1
Chromium	T6	M40	1	mg/kg	**25**
Chromium VI	T6	AR	1	mg/kg	<1
Chromium (trivalent)	T85	AR	2	mg/kg	**25**
Iron	T6	A40	1	mg/kg	**16000**
Lead	T6	M40	1	mg/kg	**45**
Manganese	T6	M40	1	mg/kg	**180**
Mercury	T6	M40	1	mg/kg	<1
Nickel	T6	M40	1	mg/kg	**24**
Selenium	T6	M40	3	mg/kg	<3
Copper	T6	M40	1	mg/kg	**26**
Zinc	T6	M40	1	mg/kg	**62**
Boron (water-soluble)	T6	AR	1	mg/kg	<1

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Asbestos

				Concept Reference	**704623 002**	**704623 003**	**704623 004**	**704623 016**	**704623 017**
				Customer Sample Reference	**HEP-BH-13**	**HEP-BH-17**	**HEP-BH-17**	**HEP-BH-25**	**HEP-BH-25**
				Hole ID	**HEP-BH-13**	**HEP-BH-17**	**HEP-BH-17**	**HEP-BH-25**	**HEP-BH-25**
				Top Depth	**0.30**	**1.20**	**1.70**	**2.30**	**3.40**
				Depth	**0.30**	**1.20**	**1.70**	**2.30**	**3.40**
				Date Sampled	**08-DEC-2017**	**12-DEC-2017**	**12-DEC-2017**	**12-DEC-2017**	**12-DEC-2017**
				Time Sampled	**12:00**	**09:52**	**10:17**	**11:00**	**13:35**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH1320171208002**	**HEPBH1720171212001**	**HEPBH1720171212002**	**FES1171212008**	**FES1171212013**
				AGS Sample Reference	**4**	**10**	**13**	**14**	**19**
				Matrix Class	**Topsoil**	**Sandy Soil**	**Clay**	**Clay**	**Fill**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Asbestos ID	T27	AR			N.D.	N.D.	N.D.	N.D.	N.D.

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Asbestos

				Concept Reference	**704623 021**	**704623 022**	**704623 023**	**704623 024**	**704623 026**
				Customer Sample Reference	**HEP-BH-33**	**HEP-BH-33**	**HEP-BH-33**	**HEP-BH-33**	**HEP-BH-36**
				Hole ID	**HEP-BH-33**	**HEP-BH-33**	**HEP-BH-33**	**HEP-BH-33**	**HEP-BH-36**
				Top Depth	**1.20**	**1.50**	**2.50**	**3.20**	**0.40**
				Depth	**1.20**	**1.50**	**2.50**	**3.20**	**0.40**
				Date Sampled	**07-DEC-2017**	**07-DEC-2017**	**07-DEC-2017**	**07-DEC-2017**	**11-DEC-2017**
				Time Sampled	**11:20**	**11:47**	**12:05**	**14:20**	**12:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH3320171207001**	**HEPBH3320171207002**	**HEPBH3320171207003**	**HEPBH3320171207004**	**FES4171212006**
				AGS Sample Reference	**7**	**10**	**13**	**16**	**6**
				Matrix Class	**Sandy Soil**	**Topsoil**	**Sandy Soil**	**Clay**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Asbestos ID	T27	AR			N.D.	N.D.	N.D.	N.D.	N.D.

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Asbestos

				Concept Reference	**704623 027**	**704623 028**	**704623 030**	**704623 031**	**704623 032**
				Customer Sample Reference	**HEP-BH-36**	**HEP-BH-36**	**HEP-BH-5**	**HEP-BH-5**	**HEP-BH-1802**
				Hole ID	**HEP-BH-36**	**HEP-BH-36**	**HEP-BH-5**	**HEP-BH-5**	**HEP-BH-1802**
				Top Depth	**1.00**	**2.00**	**0.45**	**0.80**	**1.20**
				Depth	**1.00**	**2.00**	**0.45**	**0.80**	**1.20**
				Date Sampled	**11-DEC-2017**	**11-DEC-2017**	**07-DEC-2017**	**07-DEC-2017**	**08-DEC-2017**
				Time Sampled	**13:00**	**14:00**	**13:50**	**16:30**	**10:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**FES4171212010**	**FES4171212013**	**HEPBH520171207002**	**HEPBH520171207003**	**HEPBH180220171208001**
				AGS Sample Reference	**10**	**13**	**4**	**7**	**10**
				Matrix Class	**Clay**	**Fill**	**Sandy Soil**	**Clay**	**Fill**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Asbestos ID	T27	AR			N.D.	N.D.	N.D.	N.D.	N.D.

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Asbestos

				Concept Reference	**704623 033**	**704623 043**	**704623 045**	**704623 046**	**704623 048**
				Customer Sample Reference	**HEP-BH-1802**	**HEP-BH-1810**	**HEP-BH-1810**	**HEP-BH-1810**	**HEP-BH-1810**
				Hole ID	**HEP-BH-1802**	**HEP-BH-1810**	**HEP-BH-1810**	**HEP-BH-1810**	**HEP-BH-1810**
				Top Depth	**2.00**	**0.50**	**1.80**	**2.80**	**4.80**
				Depth	**2.00**	**0.50**	**1.80**	**2.80**	**4.80**
				Date Sampled	**08-DEC-2017**	**11-DEC-2017**	**11-DEC-2017**	**11-DEC-2017**	**11-DEC-2017**
				Time Sampled	**11:00**	**10:00**	**12:00**	**13:00**	**14:30**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH18022017120800 2**	**FES2171211005**	**FES2171211012**	**FES2171211015**	**FES2171211021**
				AGS Sample Reference	**13**	**5**	**12**	**15**	**21**
				Matrix Class	**Fill**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Asbestos ID	T27	AR			N.D.	N.D.	N.D.	N.D.	N.D.

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Asbestos

				Concept Reference	**704623 050**	**704623 054**	**704623 055**	**704623 064**	**704623 066**
				Customer Sample Reference	**HEP-BH-1810**	**HEP-BH-1863**	**HEP-BH-1863**	**HEP-TP-10**	**HEP-TP-10**
				Hole ID	**HEP-BH-1810**	**HEP-BH-1863**	**HEP-BH-1863**	**HEP-TP-10**	**HEP-TP-10**
				Top Depth	**7.20**	**0.30**	**0.85**	**0.20**	**1.30**
				Depth	**7.20**	**0.30**	**0.85**	**0.20**	**1.30**
				Date Sampled	**11-DEC-2017**	**11-DEC-2017**	**11-DEC-2017**	**12-DEC-2017**	**12-DEC-2017**
				Time Sampled	**16:00**	**13:30**	**14:40**	**11:00**	**13:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**FES2171211030**	**HEPBH18632017121100 2**	**HEPBH18632017 1211003**	**HEPTP1020171212001**	**HEPTP1020171212003**
				AGS Sample Reference	**30**	**4**	**7**	**3**	**9**
				Matrix Class	**Clay**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Topsoil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Asbestos ID	T27	AR			N.D.	N.D.	N.D.	N.D.	N.D.

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Asbestos

				Concept Reference	**704623 067**
				Customer Sample Reference	**HEP-TP-10**
				Hole ID	**HEP-TP-10**
				Top Depth	**2.00**
				Depth	**2.00**
				Date Sampled	**12-DEC-2017**
				Time Sampled	**14:00**
				AGS Type	**ES**
				AGS Sample ID	**HEPTP1020171212004**
				AGS Sample Reference	**12**
				Matrix Class	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**	
Asbestos ID	T27	AR			N.D.

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Total Phenol

				Concept Reference	**704623 002**	**704623 003**	**704623 004**	**704623 016**	**704623 017**
				Customer Sample Reference	**HEP-BH-13**	**HEP-BH-17**	**HEP-BH-17**	**HEP-BH-25**	**HEP-BH-25**
				Hole ID	**HEP-BH-13**	**HEP-BH-17**	**HEP-BH-17**	**HEP-BH-25**	**HEP-BH-25**
				Top Depth	**0.30**	**1.20**	**1.70**	**2.30**	**3.40**
				Depth	**0.30**	**1.20**	**1.70**	**2.30**	**3.40**
				Date Sampled	**08-DEC-2017**	**12-DEC-2017**	**12-DEC-2017**	**12-DEC-2017**	**12-DEC-2017**
				Time Sampled	**12:00**	**09:52**	**10:17**	**11:00**	**13:35**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH1320171208002**	**HEPBH1720171212001**	**HEPBH1720171212002**	**FES1171212008**	**FES1171212013**
				AGS Sample Reference	**4**	**10**	**13**	**14**	**19**
				Matrix Class	**Topsoil**	**Sandy Soil**	**Clay**	**Clay**	**Fill**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Phenols(Mono)	T4	AR	0.5	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Total Phenol

				Concept Reference	**704623 021**	**704623 022**	**704623 023**	**704623 024**	**704623 026**
				Customer Sample Reference	**HEP-BH-33**	**HEP-BH-33**	**HEP-BH-33**	**HEP-BH-33**	**HEP-BH-36**
				Hole ID	**HEP-BH-33**	**HEP-BH-33**	**HEP-BH-33**	**HEP-BH-33**	**HEP-BH-36**
				Top Depth	**1.20**	**1.50**	**2.50**	**3.20**	**0.40**
				Depth	**1.20**	**1.50**	**2.50**	**3.20**	**0.40**
				Date Sampled	**07-DEC-2017**	**07-DEC-2017**	**07-DEC-2017**	**07-DEC-2017**	**11-DEC-2017**
				Time Sampled	**11:20**	**11:47**	**12:05**	**14:20**	**12:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH3320171207001**	**HEPBH3320171207002**	**HEPBH3320171207003**	**HEPBH3320171207004**	**FES4171212006**
				AGS Sample Reference	**7**	**10**	**13**	**16**	**6**
				Matrix Class	**Sandy Soil**	**Topsoil**	**Sandy Soil**	**Clay**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Phenols(Mono)	T4	AR	0.5	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Total Phenol

				Concept Reference	**704623 027**	**704623 028**	**704623 030**	**704623 031**	**704623 032**
				Customer Sample Reference	**HEP-BH-36**	**HEP-BH-36**	**HEP-BH-5**	**HEP-BH-5**	**HEP-BH-1802**
				Hole ID	**HEP-BH-36**	**HEP-BH-36**	**HEP-BH-5**	**HEP-BH-5**	**HEP-BH-1802**
				Top Depth	**1.00**	**2.00**	**0.45**	**0.80**	**1.20**
				Depth	**1.00**	**2.00**	**0.45**	**0.80**	**1.20**
				Date Sampled	**11-DEC-2017**	**11-DEC-2017**	**07-DEC-2017**	**07-DEC-2017**	**08-DEC-2017**
				Time Sampled	**13:00**	**14:00**	**13:50**	**16:30**	**10:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**FES4171212010**	**FES4171212013**	**HEPBH520171207002**	**HEPBH520171207003**	**HEPBH180220171208001**
				AGS Sample Reference	**10**	**13**	**4**	**7**	**10**
				Matrix Class	**Clay**	**Fill**	**Sandy Soil**	**Clay**	**Fill**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Phenols(Mono)	T4	AR	0.5	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Total Phenol

				Concept Reference	**704623 033**	**704623 043**	**704623 045**	**704623 046**	**704623 048**
				Customer Sample Reference	**HEP-BH-1802**	**HEP-BH-1810**	**HEP-BH-1810**	**HEP-BH-1810**	**HEP-BH-1810**
				Hole ID	**HEP-BH-1802**	**HEP-BH-1810**	**HEP-BH-1810**	**HEP-BH-1810**	**HEP-BH-1810**
				Top Depth	**2.00**	**0.50**	**1.80**	**2.80**	**4.80**
				Depth	**2.00**	**0.50**	**1.80**	**2.80**	**4.80**
				Date Sampled	**08-DEC-2017**	**11-DEC-2017**	**11-DEC-2017**	**11-DEC-2017**	**11-DEC-2017**
				Time Sampled	**11:00**	**10:00**	**12:00**	**13:00**	**14:30**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH18022017120800 2**	**FES2171211005**	**FES2171211012**	**FES2171211015**	**FES2171211021**
				AGS Sample Reference	**13**	**5**	**12**	**15**	**21**
				Matrix Class	**Fill**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Phenols(Mono)	T4	AR	0.5	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Total Phenol

				Concept Reference	**704623 050**	**704623 054**	**704623 055**	**704623 064**	**704623 066**
				Customer Sample Reference	**HEP-BH-1810**	**HEP-BH-1863**	**HEP-BH-1863**	**HEP-TP-10**	**HEP-TP-10**
				Hole ID	**HEP-BH-1810**	**HEP-BH-1863**	**HEP-BH-1863**	**HEP-TP-10**	**HEP-TP-10**
				Top Depth	**7.20**	**0.30**	**0.85**	**0.20**	**1.30**
				Depth	**7.20**	**0.30**	**0.85**	**0.20**	**1.30**
				Date Sampled	**11-DEC-2017**	**11-DEC-2017**	**11-DEC-2017**	**12-DEC-2017**	**12-DEC-2017**
				Time Sampled	**16:00**	**13:30**	**14:40**	**11:00**	**13:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**FES2171211030**	**HEPBH18632017121100 2**	**HEPBH18632017 1211003**	**HEPTP1020171212001**	**HEPTP1020171212003**
				AGS Sample Reference	**30**	**4**	**7**	**3**	**9**
				Matrix Class	**Clay**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Topsoil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Phenols(Mono)	T4	AR	0.5	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Total Phenol

				Concept Reference	**704623 067**
				Customer Sample Reference	**HEP-TP-10**
				Hole ID	**HEP-TP-10**
				Top Depth	**2.00**
				Depth	**2.00**
				Date Sampled	**12-DEC-2017**
				Time Sampled	**14:00**
				AGS Type	**ES**
				AGS Sample ID	**HEPTP1020171212004**
				AGS Sample Reference	**12**
				Matrix Class	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**	
Phenols(Mono)	T4	AR	0.5	mg/kg	<1.0

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground Soils with Elevated PID Readings - Organics PAH US EPA 16

Concept Reference		**704623 002**	**704623 003**	**704623 004**	**704623 016**	**704623 017**
Customer Sample Reference		**HEP-BH-13**	**HEP-BH-17**	**HEP-BH-17**	**HEP-BH-25**	**HEP-BH-25**
Hole ID		**HEP-BH-13**	**HEP-BH-17**	**HEP-BH-17**	**HEP-BH-25**	**HEP-BH-25**
Top Depth		**0.30**	**1.20**	**1.70**	**2.30**	**3.40**
Depth		**0.30**	**1.20**	**1.70**	**2.30**	**3.40**
Date Sampled		**08-DEC-2017**	**12-DEC-2017**	**12-DEC-2017**	**12-DEC-2017**	**12-DEC-2017**
Time Sampled		**12:00**	**09:52**	**10:17**	**11:00**	**13:35**
AGS Type		**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID		**HEPBH1320171208002**	**HEPBH1720171212001**	**HEPBH1720171212002**	**FES1171212008**	**FES1171212013**
AGS Sample Reference		**4**	**10**	**13**	**14**	**19**
Matrix Class		**Topsoil**	**Sandy Soil**	**Clay**	**Clay**	**Fill**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**		
Naphthalene	T207	M105	0.1	mg/kg	<0.1	(9) <1.0	<0.1	<0.1	<0.1
Acenaphthylene	T207	AR	0.1	mg/kg	<0.1	(9) <1.0	<0.1	<0.1	<0.1
Acenaphthene	T207	M105	0.1	mg/kg	<0.1	(9) <1.0	<0.1	<0.1	<0.1
Fluorene	T207	M105	0.1	mg/kg	<0.1	(9) <1.0	<0.1	<0.1	<0.1
Phenanthrene	T207	M105	0.1	mg/kg	**0.3**	**1.7**	**0.2**	**0.2**	**0.2**
Anthracene	T207	AR	0.1	mg/kg	**0.1**	(9) <1.0	<0.1	<0.1	<0.1
Fluoranthene	T207	M105	0.1	mg/kg	**0.9**	**3.1**	**0.6**	**0.6**	**0.2**
Pyrene	T207	M105	0.1	mg/kg	**0.8**	**2.8**	**0.5**	**0.5**	**0.2**
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	**0.5**	**1.3**	**0.2**	**0.3**	<0.1
Chrysene	T207	M105	0.1	mg/kg	**0.5**	**1.3**	**0.2**	**0.3**	<0.1
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	**0.5**	**1.2**	**0.2**	**0.3**	<0.1
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	**0.4**	**1.3**	<0.1	**0.2**	<0.1
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	**0.5**	**1.3**	**0.1**	**0.3**	<0.1
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	**0.4**	(9) <1.0	<0.1	**0.2**	<0.1
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	**0.1**	(9) <1.0	<0.1	<0.1	<0.1
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	**0.4**	**1.1**	**0.2**	**0.2**	<0.1
PAH(total)	T207	AR	0.1	mg/kg	**5.6**	**15**	**2.1**	**2.9**	**0.6**

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground Soils with Elevated PID Readings - Organics PAH US EPA 16

Concept Reference		**704623 021**	**704623 022**	**704623 023**	**704623 024**	**704623 026**
Customer Sample Reference		**HEP-BH-33**	**HEP-BH-33**	**HEP-BH-33**	**HEP-BH-33**	**HEP-BH-36**
Hole ID		**HEP-BH-33**	**HEP-BH-33**	**HEP-BH-33**	**HEP-BH-33**	**HEP-BH-36**
Top Depth		**1.20**	**1.50**	**2.50**	**3.20**	**0.40**
Depth		**1.20**	**1.50**	**2.50**	**3.20**	**0.40**
Date Sampled		**07-DEC-2017**	**07-DEC-2017**	**07-DEC-2017**	**07-DEC-2017**	**11-DEC-2017**
Time Sampled		**11:20**	**11:47**	**12:05**	**14:20**	**12:00**
AGS Type		**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID		**HEPBH3320171207001**	**HEPBH3320171207002**	**HEPBH3320171207003**	**HEPBH3320171207004**	**FES4171212006**
AGS Sample Reference		**7**	**10**	**13**	**16**	**6**
Matrix Class		**Sandy Soil**	**Topsoil**	**Sandy Soil**	**Clay**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**		
Naphthalene	T207	M105	0.1	mg/kg	(9) <1.0	(100) <1.0	<0.1	<0.1	<0.1
Acenaphthylene	T207	AR	0.1	mg/kg	(9) <1.0	(100) <1.0	<0.1	<0.1	<0.1
Acenaphthene	T207	M105	0.1	mg/kg	(9) <1.0	(100) <1.0	<0.1	<0.1	<0.1
Fluorene	T207	M105	0.1	mg/kg	(9) <1.0	(100) <1.0	<0.1	<0.1	<0.1
Phenanthrene	T207	M105	0.1	mg/kg	(9) <1.0	(100) <1.0	**0.1**	<0.1	<0.1
Anthracene	T207	AR	0.1	mg/kg	(9) <1.0	(100) <1.0	<0.1	<0.1	<0.1
Fluoranthene	T207	M105	0.1	mg/kg	(9) <1.0	(100) <1.0	**0.4**	<0.1	<0.1
Pyrene	T207	M105	0.1	mg/kg	(9) <1.0	(100) <1.0	**0.4**	<0.1	<0.1
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	(9) <1.0	(100) <1.0	**0.2**	<0.1	<0.1
Chrysene	T207	M105	0.1	mg/kg	(9) <1.0	(100) <1.0	**0.2**	<0.1	<0.1
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	(9) <1.0	(100) <1.0	**0.2**	<0.1	<0.1
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	(9) <1.0	(100) <1.0	**0.2**	<0.1	<0.1
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	(9) <1.0	(100) <1.0	**0.2**	<0.1	<0.1
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	(9) <1.0	(100) <1.0	**0.1**	<0.1	<0.1
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	(9) <1.0	(100) <1.0	<0.1	<0.1	<0.1
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	(9) <1.0	(100) <1.0	**0.2**	<0.1	<0.1
PAH(total)	T207	AR	0.1	mg/kg	(9) <1.0	(100) <1.0	**2.4**	<0.1	<0.1

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground Soils with Elevated PID Readings - Organics PAH US EPA 16

Concept Reference	**704623 027**	**704623 028**	**704623 030**	**704623 031**	**704623 032**
Customer Sample Reference	**HEP-BH-36**	**HEP-BH-36**	**HEP-BH-5**	**HEP-BH-5**	**HEP-BH-1802**
Hole ID	**HEP-BH-36**	**HEP-BH-36**	**HEP-BH-5**	**HEP-BH-5**	**HEP-BH-1802**
Top Depth	**1.00**	**2.00**	**0.45**	**0.80**	**1.20**
Depth	**1.00**	**2.00**	**0.45**	**0.80**	**1.20**
Date Sampled	**11-DEC-2017**	**11-DEC-2017**	**07-DEC-2017**	**07-DEC-2017**	**08-DEC-2017**
Time Sampled	**13:00**	**14:00**	**13:50**	**16:30**	**10:00**
AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**FES4171212010**	**FES4171212013**	**HEPBH520171207002**	**HEPBH520171207003**	**HEPBH1802201712080 01**
AGS Sample Reference	**10**	**13**	**4**	**7**	**10**
Matrix Class	**Clay**	**Fill**	**Sandy Soil**	**Clay**	**Fill**

Determinand	Method	Test Sample	LOD	Units					
Naphthalene	T207	M105	0.1	mg/kg	<0.1	<0.1	(9) <1.0	<0.1	<0.1
Acenaphthylene	T207	AR	0.1	mg/kg	<0.1	<0.1	(9) <1.0	<0.1	<0.1
Acenaphthene	T207	M105	0.1	mg/kg	<0.1	<0.1	(9) <1.0	<0.1	<0.1
Fluorene	T207	M105	0.1	mg/kg	<0.1	<0.1	(9) <1.0	<0.1	<0.1
Phenanthrene	T207	M105	0.1	mg/kg	<0.1	<0.1	**5.5**	**0.5**	<0.1
Anthracene	T207	AR	0.1	mg/kg	<0.1	<0.1	(9) <1.0	**0.1**	<0.1
Fluoranthene	T207	M105	0.1	mg/kg	<0.1	<0.1	**9.5**	**1.1**	<0.1
Pyrene	T207	M105	0.1	mg/kg	<0.1	<0.1	**8.0**	**1.0**	<0.1
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1	**3.6**	**0.5**	<0.1
Chrysene	T207	M105	0.1	mg/kg	<0.1	<0.1	**4.2**	**0.6**	<0.1
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	<0.1	<0.1	**3.7**	**0.6**	<0.1
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	<0.1	<0.1	**3.9**	**0.5**	<0.1
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	<0.1	<0.1	**4.5**	**0.6**	<0.1
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	<0.1	<0.1	**2.7**	**0.4**	<0.1
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1	(9) <1.0	**0.1**	<0.1
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	<0.1	<0.1	**3.2**	**0.4**	<0.1
PAH(total)	T207	AR	0.1	mg/kg	<0.1	<0.1	**49**	**6.5**	<0.1

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground Soils with Elevated PID Readings - Organics PAH US EPA 16

Concept Reference	**704623 033**	**704623 043**	**704623 045**	**704623 046**	**704623 048**
Customer Sample Reference	**HEP-BH-1802**	**HEP-BH-1810**	**HEP-BH-1810**	**HEP-BH-1810**	**HEP-BH-1810**
Hole ID	**HEP-BH-1802**	**HEP-BH-1810**	**HEP-BH-1810**	**HEP-BH-1810**	**HEP-BH-1810**
Top Depth	**2.00**	**0.50**	**1.80**	**2.80**	**4.80**
Depth	**2.00**	**0.50**	**1.80**	**2.80**	**4.80**
Date Sampled	**08-DEC-2017**	**11-DEC-2017**	**11-DEC-2017**	**11-DEC-2017**	**11-DEC-2017**
Time Sampled	**11:00**	**10:00**	**12:00**	**13:00**	**14:30**
AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**HEPBH1802201712080 02**	**FES2171211005**	**FES2171211012**	**FES2171211015**	**FES2171211021**
AGS Sample Reference	**13**	**5**	**12**	**15**	**21**
Matrix Class	**Fill**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Clay**

Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Naphthalene	T207	M105	0.1	mg/kg	<0.1	(9) <1.0	(9) <1.0	**0.2**	**0.4**
Acenaphthylene	T207	AR	0.1	mg/kg	<0.1	(9) <1.0	(9) <1.0	<0.1	<0.1
Acenaphthene	T207	M105	0.1	mg/kg	<0.1	(9) <1.0	(9) <1.0	**0.4**	**0.5**
Fluorene	T207	M105	0.1	mg/kg	<0.1	(9) <1.0	(9) <1.0	**0.4**	**0.4**
Phenanthrene	T207	M105	0.1	mg/kg	<0.1	(9) <1.0	**2.9**	**2.5**	**3.2**
Anthracene	T207	AR	0.1	mg/kg	<0.1	(9) <1.0	(9) <1.0	**0.7**	**1.2**
Fluoranthene	T207	M105	0.1	mg/kg	<0.1	**1.0**	**3.9**	**4.8**	**4.9**
Pyrene	T207	M105	0.1	mg/kg	<0.1	(9) <1.0	**3.2**	**3.6**	**3.6**
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	<0.1	(9) <1.0	**1.5**	**1.9**	**2.2**
Chrysene	T207	M105	0.1	mg/kg	<0.1	(9) <1.0	**1.6**	**1.5**	**2.0**
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	<0.1	(9) <1.0	**1.3**	**1.6**	**1.6**
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	<0.1	(9) <1.0	**1.2**	**1.1**	**1.5**
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	<0.1	(9) <1.0	**1.4**	**1.4**	**1.7**
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	<0.1	(9) <1.0	(9) <1.0	**0.8**	**0.8**
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	<0.1	(9) <1.0	(9) <1.0	**0.3**	**0.3**
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	<0.1	(9) <1.0	**1.0**	**0.9**	**0.9**
PAH(total)	T207	AR	0.1	mg/kg	<0.1	(9) <1.0	**18**	**22**	**25**

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground Soils with Elevated PID Readings - Organics PAH US EPA 16

Concept Reference	**704623 050**	**704623 054**	**704623 055**	**704623 064**	**704623 066**
Customer Sample Reference	**HEP-BH-1810**	**HEP-BH-1863**	**HEP-BH-1863**	**HEP-TP-10**	**HEP-TP-10**
Hole ID	**HEP-BH-1810**	**HEP-BH-1863**	**HEP-BH-1863**	**HEP-TP-10**	**HEP-TP-10**
Top Depth	**7.20**	**0.30**	**0.85**	**0.20**	**1.30**
Depth	**7.20**	**0.30**	**0.85**	**0.20**	**1.30**
Date Sampled	**11-DEC-2017**	**11-DEC-2017**	**11-DEC-2017**	**12-DEC-2017**	**12-DEC-2017**
Time Sampled	**16:00**	**13:30**	**14:40**	**11:00**	**13:00**
AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**FES2171211030**	**HEPBH1863201712110 02**	**HEPBH18632017 1211003**	**HEPTP1020171212001**	**HEPTP1020171212003**
AGS Sample Reference	**30**	**4**	**7**	**3**	**9**
Matrix Class	**Clay**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Topsoil**

Determinand	Method	Test Sample	LOD	Units					
Naphthalene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	**0.7**
Acenaphthylene	T207	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	**0.2**
Acenaphthene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	T207	M105	0.1	mg/kg	<0.1	**0.3**	**0.3**	<0.1	**1.4**
Anthracene	T207	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	**0.4**
Fluoranthene	T207	M105	0.1	mg/kg	<0.1	**1.1**	**1.0**	**0.2**	**2.9**
Pyrene	T207	M105	0.1	mg/kg	<0.1	**0.9**	**0.9**	**0.2**	**2.5**
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	<0.1	**0.5**	**0.6**	**0.1**	**1.4**
Chrysene	T207	M105	0.1	mg/kg	<0.1	**0.5**	**0.6**	**0.1**	**1.5**
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	<0.1	**0.6**	**0.8**	**0.2**	**1.9**
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	<0.1	**0.4**	**0.5**	<0.1	**1.2**
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	<0.1	**0.6**	**0.7**	**0.1**	**1.6**
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	<0.1	**0.4**	**0.5**	<0.1	**1.0**
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	<0.1	**0.1**	**0.2**	<0.1	**0.4**
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	<0.1	**0.5**	**0.6**	**0.1**	**1.2**
PAH(total)	T207	AR	0.1	mg/kg	<0.1	**6.0**	**6.7**	**1.1**	**18**

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground Soils with Elevated PID Readings - Organics PAH US EPA 16

Concept Reference	**704623 067**
Customer Sample Reference	**HEP-TP-10**
Hole ID	**HEP-TP-10**
Top Depth	**2.00**
Depth	**2.00**
Date Sampled	**12-DEC-2017**
Time Sampled	**14:00**
AGS Type	**ES**
AGS Sample ID	**HEPTP1020171212004**
AGS Sample Reference	**12**
Matrix Class	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units	
Naphthalene	T207	M105	0.1	mg/kg	<0.1
Acenaphthylene	T207	AR	0.1	mg/kg	<0.1
Acenaphthene	T207	M105	0.1	mg/kg	<0.1
Fluorene	T207	M105	0.1	mg/kg	<0.1
Phenanthrene	T207	M105	0.1	mg/kg	**0.3**
Anthracene	T207	AR	0.1	mg/kg	<0.1
Fluoranthene	T207	M105	0.1	mg/kg	**0.2**
Pyrene	T207	M105	0.1	mg/kg	**0.1**
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	<0.1
Chrysene	T207	M105	0.1	mg/kg	<0.1
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	<0.1
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	<0.1
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	<0.1
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	<0.1
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	<0.1
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	<0.1
PAH(total)	T207	AR	0.1	mg/kg	**0.6**

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - TPH (CWG)

Concept Reference					**704623 002**	**704623 003**	**704623 004**	**704623 016**	**704623 017**
Customer Sample Reference					**HEP-BH-13**	**HEP-BH-17**	**HEP-BH-17**	**HEP-BH-25**	**HEP-BH-25**
Hole ID					**HEP-BH-13**	**HEP-BH-17**	**HEP-BH-17**	**HEP-BH-25**	**HEP-BH-25**
Top Depth					**0.30**	**1.20**	**1.70**	**2.30**	**3.40**
Depth					**0.30**	**1.20**	**1.70**	**2.30**	**3.40**
Date Sampled					**08-DEC-2017**	**12-DEC-2017**	**12-DEC-2017**	**12-DEC-2017**	**12-DEC-2017**
Time Sampled					**12:00**	**09:52**	**10:17**	**11:00**	**13:35**
AGS Type					**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID					**HEPBH1320171208002**	**HEPBH1720171212001**	**HEPBH1720171212002**	**FES1171212008**	**FES1171212013**
AGS Sample Reference					**4**	**10**	**13**	**14**	**19**
Matrix Class					**Topsoil**	**Sandy Soil**	**Clay**	**Clay**	**Fill**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
TPH (C5-C6 aliphatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C6-C8 aliphatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C8-C10 aliphatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	(13) **2**	(13) **5**	(13) **11**	(13) <1	(13) <1
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	(13) **2**	(13) **5**	(13) **9**	(13) <1	(13) **1**
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	(13) **1**	(13) **41**	(13) **70**	(13) **1**	(13) <1
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	(13) **18**	(13) **960**	(13) **1100**	(13) **6**	(13) **2**
TPH (C6-C7 aromatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C7-C8 aromatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C8-C10 aromatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	(13) <2	(13) <2	(13) <2	(13) <2	(13) <2
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	(13) **3**	(13) **12**	(13) **24**	(13) <1	(13) <1
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	(13) **14**	(13) **54**	(13) **160**	(13) **3**	(13) <1
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	(13) <1	(13) **7**	(13) <1	(13) <1	(13) **1**

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - TPH (CWG)

				Concept Reference	**704623 021**	**704623 022**	**704623 023**	**704623 024**	**704623 026**
				Customer Sample Reference	**HEP-BH-33**	**HEP-BH-33**	**HEP-BH-33**	**HEP-BH-33**	**HEP-BH-36**
				Hole ID	**HEP-BH-33**	**HEP-BH-33**	**HEP-BH-33**	**HEP-BH-33**	**HEP-BH-36**
				Top Depth	**1.20**	**1.50**	**2.50**	**3.20**	**0.40**
				Depth	**1.20**	**1.50**	**2.50**	**3.20**	**0.40**
				Date Sampled	**07-DEC-2017**	**07-DEC-2017**	**07-DEC-2017**	**07-DEC-2017**	**11-DEC-2017**
				Time Sampled	**11:20**	**11:47**	**12:05**	**14:20**	**12:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH3320171207001**	**HEPBH3320171207002**	**HEPBH3320171207003**	**HEPBH3320171207004**	**FES4171212006**
				AGS Sample Reference	**7**	**10**	**13**	**16**	**6**
				Matrix Class	**Sandy Soil**	**Topsoil**	**Sandy Soil**	**Clay**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
TPH (C5-C6 aliphatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C6-C8 aliphatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C8-C10 aliphatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	(13) **3**	(13) **4**	(13) **2**	(13) **3**	(13) **3**
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	(13) **14**	(13) **2**	(13) **3**	(13) **1**	(13) **2**
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	(13) <1	(13) **25**	(13) **78**	(13) **4**	(13) **6**
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	(13) **89**	(13) **95**	(13) **1300**	(13) **9**	(13) **9**
TPH (C6-C7 aromatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C7-C8 aromatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C8-C10 aromatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	(13) <2	(13) <2	(13) <2	(13) <2	(13) <2
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	(13) **5**	(13) **3**	(13) **4**	(13) <1	(13) <1
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	(13) **20**	(13) **34**	(13) **38**	(13) **2**	(13) **1**
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	(13) **8**	(13) <1	(13) <1	(13) **3**	(13) <1

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - TPH (CWG)

				Concept Reference	**704623 027**	**704623 028**	**704623 030**	**704623 031**	**704623 032**
				Customer Sample Reference	**HEP-BH-36**	**HEP-BH-36**	**HEP-BH-5**	**HEP-BH-5**	**HEP-BH-1802**
				Hole ID	**HEP-BH-36**	**HEP-BH-36**	**HEP-BH-5**	**HEP-BH-5**	**HEP-BH-1802**
				Top Depth	**1.00**	**2.00**	**0.45**	**0.80**	**1.20**
				Depth	**1.00**	**2.00**	**0.45**	**0.80**	**1.20**
				Date Sampled	**11-DEC-2017**	**11-DEC-2017**	**07-DEC-2017**	**07-DEC-2017**	**08-DEC-2017**
				Time Sampled	**13:00**	**14:00**	**13:50**	**16:30**	**10:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**FES4171212010**	**FES4171212013**	**HEPBH520171207002**	**HEPBH520171207003**	**HEPBH180220171208001**
				AGS Sample Reference	**10**	**13**	**4**	**7**	**10**
				Matrix Class	**Clay**	**Fill**	**Sandy Soil**	**Clay**	**Fill**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
TPH (C5-C6 aliphatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C6-C8 aliphatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C8-C10 aliphatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	(13) **3**	(13) **2**	(13) **3**	(13) **5**	(13) **2**
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	(13) **2**	(13) **1**	(13) **4**	(13) **10**	(13) **1**
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	(13) **2**	(13) **3**	(13) **13**	(13) **17**	(13) **3**
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	(13) **7**	(13) **10**	(13) **69**	(13) **130**	(13) **6**
TPH (C6-C7 aromatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C7-C8 aromatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C8-C10 aromatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	(13) <2	(13) <2	(13) <2	(13) <2	(13) <2
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	(13) <1	(13) <1	(13) **8**	(13) **14**	(13) <1
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	(13) <1	(13) <1	(13) **32**	(13) **38**	(13) **3**
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	(13) <1	(13) <1	(13) **95**	(13) **37**	(13) **2**

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - TPH (CWG)

Concept Reference					**704623 033**	**704623 043**	**704623 045**	**704623 046**	**704623 048**
Customer Sample Reference					**HEP-BH-1802**	**HEP-BH-1810**	**HEP-BH-1810**	**HEP-BH-1810**	**HEP-BH-1810**
Hole ID					**HEP-BH-1802**	**HEP-BH-1810**	**HEP-BH-1810**	**HEP-BH-1810**	**HEP-BH-1810**
Top Depth					**2.00**	**0.50**	**1.80**	**2.80**	**4.80**
Depth					**2.00**	**0.50**	**1.80**	**2.80**	**4.80**
Date Sampled					**08-DEC-2017**	**11-DEC-2017**	**11-DEC-2017**	**11-DEC-2017**	**11-DEC-2017**
Time Sampled					**11:00**	**10:00**	**12:00**	**13:00**	**14:30**
AGS Type					**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID					**HEPBH1802201712080 02**	**FES2171211005**	**FES2171211012**	**FES2171211015**	**FES2171211021**
AGS Sample Reference					**13**	**5**	**12**	**15**	**21**
Matrix Class					**Fill**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
TPH (C5-C6 aliphatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C6-C8 aliphatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C8-C10 aliphatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	**1300**
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	**(13) 3**	**(13) 26**	**(13) 10**	**(13) 5**	**(13) 33**
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	**(13) 1**	**(13) 13**	**(13) 12**	**(13) 6**	**(13) 150**
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	**(13) 3**	**(13) 2**	**(13) 10**	**(13) 9**	**(13) 180**
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	**(13) 8**	**(13) 58**	**(13) 97**	**(13) 37**	**(13) 270**
TPH (C6-C7 aromatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C7-C8 aromatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C8-C10 aromatic)	T209	AR	100	µg/kg	<100	**160**	<100	<100	**1000**
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	(13) <2	**(13) 17**	**(13) 4**	(13) <2	**(13) 16**
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	(13) <1	**(13) 9**	**(13) 11**	**(13) 13**	**(13) 55**
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	(13) <1	**(13) 10**	**(13) 31**	**(13) 23**	**(13) 110**
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	(13) <1	**(13) 17**	**(13) 35**	**(13) 20**	**(13) 46**

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - TPH (CWG)

Concept Reference					**704623 050**	**704623 054**	**704623 055**	**704623 064**	**704623 066**
Customer Sample Reference					**HEP-BH-1810**	**HEP-BH-1863**	**HEP-BH-1863**	**HEP-TP-10**	**HEP-TP-10**
Hole ID					**HEP-BH-1810**	**HEP-BH-1863**	**HEP-BH-1863**	**HEP-TP-10**	**HEP-TP-10**
Top Depth					**7.20**	**0.30**	**0.85**	**0.20**	**1.30**
Depth					**7.20**	**0.30**	**0.85**	**0.20**	**1.30**
Date Sampled					**11-DEC-2017**	**11-DEC-2017**	**11-DEC-2017**	**12-DEC-2017**	**12-DEC-2017**
Time Sampled					**16:00**	**13:30**	**14:40**	**11:00**	**13:00**
AGS Type					**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID					**FES2171211030**	**HEPBH1863201712110 02**	**HEPBH18632017 1211003**	**HEPTP1020171212001**	**HEPTP1020171212003**
AGS Sample Reference					**30**	**4**	**7**	**3**	**9**
Matrix Class					**Clay**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Topsoil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
TPH (C5-C6 aliphatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	(110) <200
TPH (C6-C8 aliphatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	(110) <200
TPH (C8-C10 aliphatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	(110) <200
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	**(13) 2**	**(13) 3**	**(13) 4**	**(13) 2**	**(13) 4**
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	**(13) 2**	**(13) 2**	**(13) 3**	**(13) 1**	**(13) 8**
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	(13) <1	**(13) 2**	**(13) 3**	**(13) 3**	**(13) 19**
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	**(13) 13**	**(13) 18**	**(13) 26**	**(13) 20**	**(13) 15**
TPH (C6-C7 aromatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	(110) <200
TPH (C7-C8 aromatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	(110) <200
TPH (C8-C10 aromatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	(110) <200
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	(13) <2	(13) <2	(13) <2	(13) <2	**(13) 3**
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	**(13) 1**	**(13) 2**	**(13) 5**	**(13) 2**	**(13) 16**
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	(13) <1	**(13) 6**	**(13) 15**	**(13) 7**	**(13) 36**
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	(13) <1	**(13) 10**	**(13) 19**	(13) <1	(13) <1

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - TPH (CWG)

Concept Reference	**704623 067**
Customer Sample Reference	**HEP-TP-10**
Hole ID	**HEP-TP-10**
Top Depth	**2.00**
Depth	**2.00**
Date Sampled	**12-DEC-2017**
Time Sampled	**14:00**
AGS Type	**ES**
AGS Sample ID	**HEPTP1020171212004**
AGS Sample Reference	**12**
Matrix Class	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units	
TPH (C5-C6 aliphatic)	T209	AR	100	µg/kg	<100
TPH (C6-C8 aliphatic)	T209	AR	100	µg/kg	<100
TPH (C8-C10 aliphatic)	T209	AR	100	µg/kg	<100
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	(13) **2**
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	(13) **1**
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	(13) **3**
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	(13) **5**
TPH (C6-C7 aromatic)	T209	AR	100	µg/kg	<100
TPH (C7-C8 aromatic)	T209	AR	100	µg/kg	<100
TPH (C8-C10 aromatic)	T209	AR	100	µg/kg	<100
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	(13) <2
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	(13) **1**
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	(13) **2**
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	(13) <1

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil

Total Petroleum Hydrocarbons (Aliphatics+Aromatics) Total

Concept Reference	**704623 002**	**704623 003**	**704623 004**	**704623 016**	**704623 017**
Customer Sample Reference	**HEP-BH-13**	**HEP-BH-17**	**HEP-BH-17**	**HEP-BH-25**	**HEP-BH-25**
Hole ID	**HEP-BH-13**	**HEP-BH-17**	**HEP-BH-17**	**HEP-BH-25**	**HEP-BH-25**
Top Depth	**0.30**	**1.20**	**1.70**	**2.30**	**3.40**
Depth	**0.30**	**1.20**	**1.70**	**2.30**	**3.40**
Date Sampled	**08-DEC-2017**	**12-DEC-2017**	**12-DEC-2017**	**12-DEC-2017**	**12-DEC-2017**
Time Sampled	**12:00**	**09:52**	**10:17**	**11:00**	**13:35**
AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**HEPBH1320171208002**	**HEPBH1720171212001**	**HEPBH1720171212002**	**FES1171212008**	**FES1171212013**
AGS Sample Reference	**4**	**10**	**13**	**14**	**19**
Matrix Class	**Topsoil**	**Sandy Soil**	**Clay**	**Clay**	**Fill**

Determinand	Method	Test Sample	LOD	Units					
TPH (Aliphatic) total	T85	M105		mg/kg	(13) **23**	(13) **1000**	(13) **1200**	(13) **7.0**	(13) **3.0**
TPH (Aromatic) total	T85	M105		mg/kg	(13) **17**	(13) **73**	(13) **180**	(13) **3.0**	(13) **1.0**
TPH (Aliphatic+Aromatic) (sum)	T85	M105		mg/kg	**40.0**	**1070**	**1380**	**10.0**	**4.00**

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Total Petroleum Hydrocarbons (Aliphatics+Aromatics) Total

Concept Reference				**704623 021**	**704623 022**	**704623 023**	**704623 024**	**704623 026**
Customer Sample Reference				**HEP-BH-33**	**HEP-BH-33**	**HEP-BH-33**	**HEP-BH-33**	**HEP-BH-36**
Hole ID				**HEP-BH-33**	**HEP-BH-33**	**HEP-BH-33**	**HEP-BH-33**	**HEP-BH-36**
Top Depth				**1.20**	**1.50**	**2.50**	**3.20**	**0.40**
Depth				**1.20**	**1.50**	**2.50**	**3.20**	**0.40**
Date Sampled				**07-DEC-2017**	**07-DEC-2017**	**07-DEC-2017**	**07-DEC-2017**	**11-DEC-2017**
Time Sampled				**11:20**	**11:47**	**12:05**	**14:20**	**12:00**
AGS Type				**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID				**HEPBH3320171207001**	**HEPBH3320171207002**	**HEPBH3320171207003**	**HEPBH3320171207004**	**FES4171212006**
AGS Sample Reference				**7**	**10**	**13**	**16**	**6**
Matrix Class				**Sandy Soil**	**Topsoil**	**Sandy Soil**	**Clay**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**				
TPH (Aliphatic) total	T85	M105		mg/kg	(13) **110**	(13) **130**	(13) **1400**	(13) **17**	(13) **20**
TPH (Aromatic) total	T85	M105		mg/kg	(13) **33**	(13) **37**	(13) **42**	(13) **5.0**	(13) **1.0**
TPH (Aliphatic+Aromatic) (sum)	T85	M105		mg/kg	**143**	**167**	**1440**	**22.0**	**21.0**

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Total Petroleum Hydrocarbons (Aliphatics+Aromatics) Total

Concept Reference				**704623 027**	**704623 028**	**704623 030**	**704623 031**	**704623 032**
Customer Sample Reference				**HEP-BH-36**	**HEP-BH-36**	**HEP-BH-5**	**HEP-BH-5**	**HEP-BH-1802**
Hole ID				**HEP-BH-36**	**HEP-BH-36**	**HEP-BH-5**	**HEP-BH-5**	**HEP-BH-1802**
Top Depth				**1.00**	**2.00**	**0.45**	**0.80**	**1.20**
Depth				**1.00**	**2.00**	**0.45**	**0.80**	**1.20**
Date Sampled				**11-DEC-2017**	**11-DEC-2017**	**07-DEC-2017**	**07-DEC-2017**	**08-DEC-2017**
Time Sampled				**13:00**	**14:00**	**13:50**	**16:30**	**10:00**
AGS Type				**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID				**FES4171212010**	**FES4171212013**	**HEPBH520171207002**	**HEPBH520171207003**	**HEPBH180220171208001**
AGS Sample Reference				**10**	**13**	**4**	**7**	**10**
Matrix Class				**Clay**	**Fill**	**Sandy Soil**	**Clay**	**Fill**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**				
TPH (Aliphatic) total	T85	M105		mg/kg	(13) **14**	(13) **16**	(13) **89**	(13) **160**	(13) **12**
TPH (Aromatic) total	T85	M105		mg/kg	(13) N.D.	(13) N.D.	(13) **140**	(13) **89**	(13) **5.0**
TPH (Aliphatic+Aromatic) (sum)	T85	M105		mg/kg	**14.0**	**16.0**	**229**	**249**	**17.0**

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Total Petroleum Hydrocarbons (Aliphatics+Aromatics) Total

Concept Reference	**704623 033**	**704623 043**	**704623 045**	**704623 046**	**704623 048**
Customer Sample Reference	**HEP-BH-1802**	**HEP-BH-1810**	**HEP-BH-1810**	**HEP-BH-1810**	**HEP-BH-1810**
Hole ID	**HEP-BH-1802**	**HEP-BH-1810**	**HEP-BH-1810**	**HEP-BH-1810**	**HEP-BH-1810**
Top Depth	**2.00**	**0.50**	**1.80**	**2.80**	**4.80**
Depth	**2.00**	**0.50**	**1.80**	**2.80**	**4.80**
Date Sampled	**08-DEC-2017**	**11-DEC-2017**	**11-DEC-2017**	**11-DEC-2017**	**11-DEC-2017**
Time Sampled	**11:00**	**10:00**	**12:00**	**13:00**	**14:30**
AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**HEPBH180220171208002**	**FES2171211005**	**FES2171211012**	**FES2171211015**	**FES2171211021**
AGS Sample Reference	**13**	**5**	**12**	**15**	**21**
Matrix Class	**Fill**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Clay**

Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
TPH (Aliphatic) total	T85	M105		mg/kg	(13) **15**	(13) **99**	(13) **130**	(13) **57**	(13) **630**
TPH (Aromatic) total	T85	M105		mg/kg	(13) N.D.	(13) **53**	(13) **81**	(13) **56**	(13) **230**
TPH (Aliphatic+Aromatic) (sum)	T85	M105		mg/kg	**15.0**	**152**	**211**	**113**	**860**

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Total Petroleum Hydrocarbons (Aliphatics+Aromatics) Total

Concept Reference	**704623 050**	**704623 054**	**704623 055**	**704623 064**	**704623 066**
Customer Sample Reference	**HEP-BH-1810**	**HEP-BH-1863**	**HEP-BH-1863**	**HEP-TP-10**	**HEP-TP-10**
Hole ID	**HEP-BH-1810**	**HEP-BH-1863**	**HEP-BH-1863**	**HEP-TP-10**	**HEP-TP-10**
Top Depth	**7.20**	**0.30**	**0.85**	**0.20**	**1.30**
Depth	**7.20**	**0.30**	**0.85**	**0.20**	**1.30**
Date Sampled	**11-DEC-2017**	**11-DEC-2017**	**11-DEC-2017**	**12-DEC-2017**	**12-DEC-2017**
Time Sampled	**16:00**	**13:30**	**14:40**	**11:00**	**13:00**
AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**FES2171211030**	**HEPBH186320171211002**	**HEPBH186320171211003**	**HEPTP1020171212001**	**HEPTP1020171212003**
AGS Sample Reference	**30**	**4**	**7**	**3**	**9**
Matrix Class	**Clay**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Topsoil**

Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
TPH (Aliphatic) total	T85	M105		mg/kg	(13) **17**	(13) **25**	(13) **26**	(13) **26**	(13) **46**
TPH (Aromatic) total	T85	M105		mg/kg	(13) **1.0**	(13) **18**	(13) **39**	(13) **9.0**	(13) **55**
TPH (Aliphatic+Aromatic) (sum)	T85	M105		mg/kg	**18.0**	**43.0**	**65.0**	**35.0**	**101**

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Total Petroleum Hydrocarbons (Aliphatics+Aromatics) Total

Concept Reference	**704623 067**
Customer Sample Reference	**HEP-TP-10**
Hole ID	**HEP-TP-10**
Top Depth	**2.00**
Depth	**2.00**
Date Sampled	**12-DEC-2017**
Time Sampled	**14:00**
AGS Type	**ES**
AGS Sample ID	**HEPTP102017121200 4**
AGS Sample Reference	**12**
Matrix Class	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units	
TPH (Aliphatic) total	T85	M105		mg/kg	(13) **11**
TPH (Aromatic) total	T85	M105		mg/kg	(13) **3.0**
TPH (Aliphatic+Aromatic) (sum)	T85	M105		mg/kg	**14.0**

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite B - Inorganics

Concept Reference		**704623 008**	**704623 010**	**704623 037**	**704623 039**	**704623 060**
Customer Sample Reference		**HEP-BH-23**	**HEP-BH-23**	**HEP-BH-1804**	**HEP-BH-1804**	**HEP-BH-36**
Hole ID		**HEP-BH-23**	**HEP-BH-23**	**HEP-BH-1804**	**HEP-BH-1804**	**HEP-BH-36**
Top Depth		**2.00**	**3.80**	**1.20**	**3.00**	**6.90**
Depth		**2.00**	**3.80**	**1.20**	**3.00**	**6.90**
Date Sampled		**05-DEC-2017**	**05-DEC-2017**	**06-DEC-2017**	**06-DEC-2017**	**12-DEC-2017**
Time Sampled		**13:00**	**15:00**	**12:00**	**13:20**	**13:00**
AGS Type		**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID		**HEPBH2320171205001**	**HEPBH2320171205003**	**HEPBH1804201712060 01**	**HEPBH1804201712060 03**	**HEPBH3620171212005**
AGS Sample Reference		**9**	**19**	**12**	**19**	**28**
Matrix Class		**Sandy Soil**	**Clay**	**Fill**	**Fill**	**Fill**

Determinand	Method	Test Sample	LOD	Units					
Chloride	T686	AR	1	mg/kg	**18**	**3**	**14**	**17**	**22**

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite B - Natural Ground - Misc

Concept Reference		**704623 008**	**704623 010**	**704623 037**	**704623 039**	**704623 060**
Customer Sample Reference		**HEP-BH-23**	**HEP-BH-23**	**HEP-BH-1804**	**HEP-BH-1804**	**HEP-BH-36**
Hole ID		**HEP-BH-23**	**HEP-BH-23**	**HEP-BH-1804**	**HEP-BH-1804**	**HEP-BH-36**
Top Depth		**2.00**	**3.80**	**1.20**	**3.00**	**6.90**
Depth		**2.00**	**3.80**	**1.20**	**3.00**	**6.90**
Date Sampled		**05-DEC-2017**	**05-DEC-2017**	**06-DEC-2017**	**06-DEC-2017**	**12-DEC-2017**
Time Sampled		**13:00**	**15:00**	**12:00**	**13:20**	**13:00**
AGS Type		**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID		**HEPBH2320171205001**	**HEPBH2320171205003**	**HEPBH1804201712060 01**	**HEPBH1804201712060 03**	**HEPBH3620171212005**
AGS Sample Reference		**9**	**19**	**12**	**19**	**28**
Matrix Class		**Sandy Soil**	**Clay**	**Fill**	**Fill**	**Fill**

Determinand	Method	Test Sample	LOD	Units					
Fraction Organic Carbon - F(oc)	T21	AR	1	%	**45**	**57**	**53**	**53**	**61**
Soil Organic Matter	T287	A40	0.1	%	**0.3**	**0.4**	**0.3**	**0.4**	**0.8**
pH	T7	AR			**8.6**	**7.5**	**8.1**	**8.1**	**7.9**
TPH C10-C40 (sum)	T85	M105	1	mg/kg	(13) **16**	(13) <1	(13) <1	(13) <1	(13) **1**

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite B - Natural Ground - Metals and Metalloids

Concept Reference	**704623 008**	**704623 010**	**704623 037**	**704623 039**	**704623 060**
Customer Sample Reference	**HEP-BH-23**	**HEP-BH-23**	**HEP-BH-1804**	**HEP-BH-1804**	**HEP-BH-36**
Hole ID	**HEP-BH-23**	**HEP-BH-23**	**HEP-BH-1804**	**HEP-BH-1804**	**HEP-BH-36**
Top Depth	**2.00**	**3.80**	**1.20**	**3.00**	**6.90**
Depth	**2.00**	**3.80**	**1.20**	**3.00**	**6.90**
Date Sampled	**05-DEC-2017**	**05-DEC-2017**	**06-DEC-2017**	**06-DEC-2017**	**12-DEC-2017**
Time Sampled	**13:00**	**15:00**	**12:00**	**13:20**	**13:00**
AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**HEPBH2320171205001**	**HEPBH2320171205003**	**HEPBH180420171206001**	**HEPBH180420171206003**	**HEPBH362017121200 5**
AGS Sample Reference	**9**	**19**	**12**	**19**	**28**
Matrix Class	**Sandy Soil**	**Clay**	**Fill**	**Fill**	**Fill**

Determinand	Method	Test Sample	LOD	Units					
Arsenic	T6	M40	2	mg/kg	**4**	**4**	**3.8**	**4.5**	**17**
Cadmium	T6	M40	1	mg/kg	<1	<1	<1	<1	<1
Chromium	T6	M40	1	mg/kg	**11**	**10**	**9**	**10**	**37**
Iron	T6	A40	1	mg/kg	**6300**	**5400**	**6100**	**6400**	**42000**
Lead	T6	M40	1	mg/kg	**15**	**15**	**14**	**14**	**19**
Manganese	T6	M40	1	mg/kg	**73**	**64**	**63**	**66**	**400**
Mercury	T6	M40	1	mg/kg	<1	<1	<1	<1	<1
Nickel	T6	M40	1	mg/kg	**12**	**9**	**10**	**11**	**48**
Selenium	T6	M40	3	mg/kg	<3	<3	<3	<3	<3
Copper	T6	M40	1	mg/kg	**29**	**10**	**11**	**10**	**30**
Zinc	T6	M40	1	mg/kg	**37**	**35**	**32**	**36**	**130**
Boron (water-soluble)	T6	AR	1	mg/kg	<1	<1	<1	<1	<1

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite B - Chromium

Concept Reference	**704623 008**	**704623 010**	**704623 037**	**704623 039**	**704623 060**
Customer Sample Reference	**HEP-BH-23**	**HEP-BH-23**	**HEP-BH-1804**	**HEP-BH-1804**	**HEP-BH-36**
Hole ID	**HEP-BH-23**	**HEP-BH-23**	**HEP-BH-1804**	**HEP-BH-1804**	**HEP-BH-36**
Top Depth	**2.00**	**3.80**	**1.20**	**3.00**	**6.90**
Depth	**2.00**	**3.80**	**1.20**	**3.00**	**6.90**
Date Sampled	**05-DEC-2017**	**05-DEC-2017**	**06-DEC-2017**	**06-DEC-2017**	**12-DEC-2017**
Time Sampled	**13:00**	**15:00**	**12:00**	**13:20**	**13:00**
AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**HEPBH2320171205001**	**HEPBH2320171205003**	**HEPBH180420171206001**	**HEPBH180420171206003**	**HEPBH362017121200 5**
AGS Sample Reference	**9**	**19**	**12**	**19**	**28**
Matrix Class	**Sandy Soil**	**Clay**	**Fill**	**Fill**	**Fill**

Determinand	Method	Test Sample	LOD	Units					
Chromium (trivalent)	T85	AR	2	mg/kg	**11**	**10**	**9**	**10**	**37**
Chromium VI	T6	AR	1	mg/kg	<1	<1	<1	<1	<1

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite B - Natural Material - Organic - PAHs

Concept Reference	**704623 008**	**704623 010**	**704623 037**	**704623 039**	**704623 060**
Customer Sample Reference	**HEP-BH-23**	**HEP-BH-23**	**HEP-BH-1804**	**HEP-BH-1804**	**HEP-BH-36**
Hole ID	**HEP-BH-23**	**HEP-BH-23**	**HEP-BH-1804**	**HEP-BH-1804**	**HEP-BH-36**
Top Depth	**2.00**	**3.80**	**1.20**	**3.00**	**6.90**
Depth	**2.00**	**3.80**	**1.20**	**3.00**	**6.90**
Date Sampled	**05-DEC-2017**	**05-DEC-2017**	**06-DEC-2017**	**06-DEC-2017**	**12-DEC-2017**
Time Sampled	**13:00**	**15:00**	**12:00**	**13:20**	**13:00**
AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**HEPBH2320171205001**	**HEPBH2320171205003**	**HEPBH180420171206001**	**HEPBH180420171206003**	**HEPBH362017121200 5**
AGS Sample Reference	**9**	**19**	**12**	**19**	**28**
Matrix Class	**Sandy Soil**	**Clay**	**Fill**	**Fill**	**Fill**

Determinand	Method	Test Sample	LOD	Units					
Naphthalene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	T207	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	T207	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
PAH(total)	T207	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite B - Natural Material - Organic - TPH

Concept Reference	**704623 008**	**704623 010**	**704623 037**	**704623 039**	**704623 060**
Customer Sample Reference	**HEP-BH-23**	**HEP-BH-23**	**HEP-BH-1804**	**HEP-BH-1804**	**HEP-BH-36**
Hole ID	**HEP-BH-23**	**HEP-BH-23**	**HEP-BH-1804**	**HEP-BH-1804**	**HEP-BH-36**
Top Depth	**2.00**	**3.80**	**1.20**	**3.00**	**6.90**
Depth	**2.00**	**3.80**	**1.20**	**3.00**	**6.90**
Date Sampled	**05-DEC-2017**	**05-DEC-2017**	**06-DEC-2017**	**06-DEC-2017**	**12-DEC-2017**
Time Sampled	**13:00**	**15:00**	**12:00**	**13:20**	**13:00**
AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**HEPBH2320171205001**	**HEPBH2320171205003**	**HEPBH180420171206001**	**HEPBH180420171206003**	**HEPBH362017121200 5**
AGS Sample Reference	**9**	**19**	**12**	**19**	**28**
Matrix Class	**Sandy Soil**	**Clay**	**Fill**	**Fill**	**Fill**

Determinand	Method	Test Sample	LOD	Units					
TPH (C10-C35)	T8	M105	1	mg/kg	**(13) 13**	(13) <1	(13) <1	(13) <1	**(13) 1**
TPH (C35-C40)	T8	M105	1	mg/kg	**(13) 3**	(13) <1	(13) <1	(13) <1	(13) <1

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Sub Suite 2 - Pathogens

Concept Reference	**704623 008**
Customer Sample Reference	**HEP-BH-23**
Hole ID	**HEP-BH-23**
Top Depth	**2.00**
Depth	**2.00**
Date Sampled	**05-DEC-2017**
Time Sampled	**13:00**
AGS Type	**ES**
AGS Sample ID	**HEPBH2320171205001**
AGS Sample Reference	**9**
Matrix Class	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units	
Salmonella spp	T34	AR			N.D.
Escherichia coli	T34	AR	1	cfu/in 25g	<10
Intestinal Enterococci	T34	AR	1	cfu/g	<20

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
MRPS by GC (CSOPP611)

Concept Reference	**704623 032**
Customer Sample Reference	**HEP-BH-1802**
Hole ID	**HEP-BH-1802**
Top Depth	**1.20**
Depth	**1.20**
Date Sampled	**08-DEC-2017**
Time Sampled	**10:00**
AGS Type	**ES**
AGS Sample ID	**HEPBH18022017120 8001**
AGS Sample Reference	**10**
Matrix Class	**Fill**

Determinand	Method	Test Sample	LOD	Units	
2,4,6-Trichlorophenol	T826	AR	0.01	mg/kg	<0.01
2-Methyl-4,6-dinitrophenol	T826	AR	0.01	mg/kg	(278) <0.01
2-Phenylphenol	T826	AR	0.01	mg/kg	<0.01
9,10-Anthraquinone	T826	AR	0.01	mg/kg	<0.01
Acetochlor	T826	AR	0.01	mg/kg	<0.01
Aclonifen	T826	AR	0.01	mg/kg	<0.01
Acrinathrin	T826	AR	0.01	mg/kg	<0.01
Alachlor	T826	AR	0.01	mg/kg	<0.01
Aldrin	T826	AR	0.01	mg/kg	<0.01
Ametryn	T826	AR	0.01	mg/kg	<0.01
Atraton	T826	AR	0.01	mg/kg	<0.01
Atrazine	T826	AR	0.01	mg/kg	<0.01
Azaconazole	T826	AR	0.01	mg/kg	<0.01
Azobenzene	T826	AR	0.01	mg/kg	<0.01
Azoxystrobin	T826	AR	0.01	mg/kg	<0.01
Benalaxyl	T826	AR	0.01	mg/kg	<0.01
Benfluralin	T826	AR	0.01	mg/kg	<0.01
Bifenox	T826	AR	0.01	mg/kg	<0.01
Bifenthrin	T826	AR	0.01	mg/kg	<0.01
Binapacryl	T826	AR	0.01	mg/kg	(278) <0.01
Biphenyl	T826	AR	0.01	mg/kg	<0.01
Bitertanol	T826	AR	0.01	mg/kg	<0.01
Boscalid	T826	AR	0.01	mg/kg	<0.01
Bromacil	T826	AR	0.01	mg/kg	<0.01
Bromophos	T826	AR	0.01	mg/kg	<0.01
Bromophos-Ethyl	T826	AR	0.01	mg/kg	<0.01
Bromopropylate	T826	AR	0.01	mg/kg	<0.01
Bupirimate	T826	AR	0.01	mg/kg	<0.01
Buprofezine	T826	AR	0.01	mg/kg	<0.01
Butachlor	T826	AR	0.01	mg/kg	<0.01
Cadusafos	T826	AR	0.01	mg/kg	<0.01
Captan	T826	AR	0.01	mg/kg	(278) <0.01
Carbaryl	T826	AR	0.01	mg/kg	<0.01
Carbophenothion	T826	AR	0.01	mg/kg	<0.01
Carboxine	T826	AR	0.01	mg/kg	<0.01
Carfentrazone Ethyl	T826	AR	0.01	mg/kg	<0.01
Chlorbenzilate	T826	AR	0.01	mg/kg	<0.01
Chlorbufam	T826	AR	0.01	mg/kg	<0.01
Chlordane	T826	AR	0.01	mg/kg	<0.01
Chlordimeform	T826	AR	0.01	mg/kg	(278) <0.01
Chlorethoxyfos	T826	AR	0.01	mg/kg	<0.01
Chlorfenapyr	T826	AR	0.01	mg/kg	<0.01
Chlorfenson	T826	AR	0.01	mg/kg	<0.01
Chlorfenvinphos	T826	AR	0.01	mg/kg	<0.01
Chlormephos	T826	AR	0.01	mg/kg	<0.01
Chloropropylate	T826	AR	0.01	mg/kg	<0.01
Chlorothalonil	T826	AR	0.01	mg/kg	<0.01
Chlorpropham	T826	AR	0.01	mg/kg	<0.01
Chlorpyrifos	T826	AR	0.01	mg/kg	<0.01
Chlorpyrifos methyl	T826	AR	0.01	mg/kg	<0.01
Chlorthal Dimethyl	T826	AR	0.01	mg/kg	<0.01

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
MRPS by GC (CSOPP611)

Concept Reference	**704623 032**
Customer Sample Reference	**HEP-BH-1802**
Hole ID	**HEP-BH-1802**
Top Depth	**1.20**
Depth	**1.20**
Date Sampled	**08-DEC-2017**
Time Sampled	**10:00**
AGS Type	**ES**
AGS Sample ID	**HEPBH18022017120 8001**
AGS Sample Reference	**10**
Matrix Class	**Fill**

Determinand	Method	Test Sample	LOD	Units	
Chlorthion	T826	AR	0.01	mg/kg	<0.01
Chlorthiophos	T826	AR	0.01	mg/kg	<0.01
Chlozolinate	T826	AR	0.01	mg/kg	<0.01
cis-1,2,3,6-Tetrahydrophthalimide	T826	AR	0.01	mg/kg	<0.01
Clodinafop propargy	T826	AR	0.01	mg/kg	<0.01
Clomazone	T826	AR	0.01	mg/kg	<0.01
Cloquintocet mexyl	T826	AR	0.01	mg/kg	<0.01
Coumaphos	T826	AR	0.01	mg/kg	<0.01
Cyflufenamid	T826	AR	0.01	mg/kg	<0.01
Cyfluthrin	T826	AR	0.01	mg/kg	<0.01
Cypermethrin	T826	AR	0.01	mg/kg	<0.01
Cyphenothrin	T826	AR	0.01	mg/kg	<0.01
Cyproconazole	T826	AR	0.01	mg/kg	<0.01
Cyprodinil	T826	AR	0.01	mg/kg	<0.01
DEET	T826	AR	0.01	mg/kg	<0.01
Deltamethrin	T826	AR	0.01	mg/kg	<0.01
Desmetryn	T826	AR	0.01	mg/kg	<0.01
Diafenthiuron	T826	AR	0.01	mg/kg	(278) <0.01
Dialifos	T826	AR	0.01	mg/kg	<0.01
Diazinon	T826	AR	0.01	mg/kg	<0.01
Dichlobenil	T826	AR	0.01	mg/kg	<0.01
Dichlofenthion	T826	AR	0.01	mg/kg	<0.01
Dichlorvos	T826	AR	0.01	mg/kg	<0.01
Diclobutrazol	T826	AR	0.01	mg/kg	<0.01
Dicloran	T826	AR	0.01	mg/kg	<0.01
Dicofol	T826	AR	0.01	mg/kg	<0.01
Dieldrin	T826	AR	0.01	mg/kg	<0.01
Difenoconazole	T826	AR	0.01	mg/kg	<0.01
Diflufenican	T826	AR	0.01	mg/kg	<0.01
Dimethenamid	T826	AR	0.01	mg/kg	<0.01
Dimethomorph	T826	AR	0.01	mg/kg	<0.01
Dimoxystrobin	T826	AR	0.01	mg/kg	<0.01
Dinoterb	T826	AR	0.01	mg/kg	<0.01
Dioxabenzofos	T826	AR	0.01	mg/kg	(278) <0.01
Diphenamid	T826	AR	0.01	mg/kg	<0.01
Diphenylamine	T826	AR	0.01	mg/kg	<0.01
Disulfoton	T826	AR	0.01	mg/kg	<0.01
Ditalimfos	T826	AR	0.01	mg/kg	<0.01
Edifenphos	T826	AR	0.01	mg/kg	<0.01
Endosulphan alpha	T826	AR	0.01	mg/kg	<0.01
Endosulphan beta	T826	AR	0.01	mg/kg	<0.01
Endosulphan sulphate	T826	AR	0.01	mg/kg	<0.01
Endrin	T826	AR	0.01	mg/kg	<0.01
Epn	T826	AR	0.01	mg/kg	<0.01
Epoxiconazole	T826	AR	0.01	mg/kg	<0.01
EPTC	T826	AR	0.01	mg/kg	<0.01
Etaconazole	T826	AR	0.01	mg/kg	<0.01
Ethion	T826	AR	0.01	mg/kg	<0.01
Ethofumesate	T826	AR	0.01	mg/kg	<0.01
Ethoprophos	T826	AR	0.01	mg/kg	<0.01
Ethoxyquin	T826	AR	0.01	mg/kg	<0.01

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
MRPS by GC (CSOPP611)

Concept Reference	**704623 032**
Customer Sample Reference	**HEP-BH-1802**
Hole ID	**HEP-BH-1802**
Top Depth	**1.20**
Depth	**1.20**
Date Sampled	**08-DEC-2017**
Time Sampled	**10:00**
AGS Type	**ES**
AGS Sample ID	**HEPBH18022017120 8001**
AGS Sample Reference	**10**
Matrix Class	**Fill**

Determinand	Method	Test Sample	LOD	Units	
Etofenprox	T826	AR	0.01	mg/kg	<0.01
Etoxazole	T826	AR	0.01	mg/kg	<0.01
Etridiazole	T826	AR	0.01	mg/kg	<0.01
Etrimfos	T826	AR	0.01	mg/kg	<0.01
Famoxadone	T826	AR	0.01	mg/kg	<0.01
Famphur	T826	AR	0.01	mg/kg	<0.01
Fenamidone	T826	AR	0.01	mg/kg	<0.01
Fenamiphos	T826	AR	0.01	mg/kg	<0.01
Fenarimol	T826	AR	0.01	mg/kg	<0.01
Fenbuconazole	T826	AR	0.01	mg/kg	<0.01
Fenchlorphos	T826	AR	0.01	mg/kg	<0.01
Fenhexamid	T826	AR	0.01	mg/kg	<0.01
Fenitrothion	T826	AR	0.01	mg/kg	<0.01
Fenpiclonil	T826	AR	0.01	mg/kg	<0.01
Fenpropathrin	T826	AR	0.01	mg/kg	<0.01
Fenson	T826	AR	0.01	mg/kg	<0.01
Fensulfothion	T826	AR	0.01	mg/kg	<0.01
Fenthion	T826	AR	0.01	mg/kg	<0.01
Fenvalerate	T826	AR	0.01	mg/kg	<0.01
Fipronil	T826	AR	0.01	mg/kg	<0.01
Fipronil sulphone	T826	AR	0.01	mg/kg	<0.01
Flamprop isopropyl	T826	AR	0.01	mg/kg	<0.01
Fluazifop-P-Butyl	T826	AR	0.01	mg/kg	<0.01
Flucythrinate	T826	AR	0.01	mg/kg	<0.01
Fludioxonil	T826	AR	0.01	mg/kg	<0.01
Flufenacet	T826	AR	0.01	mg/kg	<0.01
Flumetralin	T826	AR	0.01	mg/kg	<0.01
Flumioxazin	T826	AR	0.01	mg/kg	<0.01
Flumorph	T826	AR	0.01	mg/kg	<0.01
Fluopyram	T826	AR	0.01	mg/kg	<0.01
Fluquinconazole	T826	AR	0.01	mg/kg	<0.01
Fluroxypyr-1-methylheptyl ester	T826	AR	0.01	mg/kg	<0.01
Flusilazole	T826	AR	0.01	mg/kg	<0.01
Flutolanil	T826	AR	0.01	mg/kg	<0.01
Fluxapyroxad	T826	AR	0.01	mg/kg	<0.01
Folpet	T826	AR	0.01	mg/kg	<0.01
Fonophos	T826	AR	0.01	mg/kg	<0.01
Formothion	T826	AR	0.01	mg/kg	<0.01
Furalaxyl	T826	AR	0.01	mg/kg	<0.01
Haloxyfop etotyl	T826	AR	0.01	mg/kg	<0.01
Haloxyfop Methyl	T826	AR	0.01	mg/kg	<0.01
Heptachlor	T826	AR	0.01	mg/kg	<0.01
Heptachlor epoxide	T826	AR	0.01	mg/kg	<0.01
Heptachlor exo Epoxide	T826	AR	0.01	mg/kg	<0.01
Heptenophos	T826	AR	0.01	mg/kg	<0.01
Hexachlorobenzene	T826	AR	0.01	mg/kg	<0.01
Hexachlorocyclohexane (alpha)	T826	AR	0.01	mg/kg	<0.01
Hexachlorocyclohexane (beta)	T826	AR	0.01	mg/kg	<0.01
Hexachlorocyclohexane (delta)	T826	AR	0.01	mg/kg	<0.01
Hexaconazole	T826	AR	0.01	mg/kg	<0.01
Hexazinone	T826	AR	0.01	mg/kg	<0.01

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
MRPS by GC (CSOPP611)

Concept Reference	**704623 032**
Customer Sample Reference	**HEP-BH-1802**
Hole ID	**HEP-BH-1802**
Top Depth	**1.20**
Depth	**1.20**
Date Sampled	**08-DEC-2017**
Time Sampled	**10:00**
AGS Type	**ES**
AGS Sample ID	**HEPBH18022017120 8001**
AGS Sample Reference	**10**
Matrix Class	**Fill**

Determinand	Method	Test Sample	LOD	Units	
Imazalil	T826	AR	0.01	mg/kg	<0.01
Iodofenphos	T826	AR	0.01	mg/kg	<0.01
Iprodione	T826	AR	0.01	mg/kg	<0.01
Isazofos	T826	AR	0.01	mg/kg	<0.01
Isocarbophos	T826	AR	0.01	mg/kg	<0.01
Isodrin	T826	AR	0.01	mg/kg	<0.01
Isofenphos	T826	AR	0.01	mg/kg	<0.01
Isofenphos Methyl	T826	AR	0.01	mg/kg	<0.01
Isomethiozin	T826	AR	0.01	mg/kg	<0.01
Isoprothiolane	T826	AR	0.01	mg/kg	<0.01
Isopyrazam	T826	AR	0.01	mg/kg	<0.01
Isothiazolinone	T826	AR	0.01	mg/kg	<0.01
Kresoxim Methyl	T826	AR	0.01	mg/kg	<0.01
Lambda Cyhalothrin	T826	AR	0.01	mg/kg	<0.01
Lenacil	T826	AR	0.01	mg/kg	<0.01
Leptophos	T826	AR	0.01	mg/kg	<0.01
Lindane	T826	AR	0.01	mg/kg	<0.01
Malathion	T826	AR	0.01	mg/kg	<0.01
MCPA-thioethyl	T826	AR	0.01	mg/kg	<0.01
Mecarbam	T826	AR	0.01	mg/kg	<0.01
Mepanipyrim	T826	AR	0.01	mg/kg	<0.01
Mephosfolan	T826	AR	0.01	mg/kg	<0.01
Mepronil	T826	AR	0.01	mg/kg	<0.01
Metalaxyl	T826	AR	0.01	mg/kg	<0.01
Metazachlor	T826	AR	0.01	mg/kg	<0.01
Methacrifos	T826	AR	0.01	mg/kg	<0.01
Methidathion	T826	AR	0.01	mg/kg	<0.01
Methoxychlor	T826	AR	0.01	mg/kg	<0.01
Methyl Paraoxon	T826	AR	0.01	mg/kg	<0.01
Metolachlor	T826	AR	0.01	mg/kg	<0.01
Metolcarb	T826	AR	0.01	mg/kg	<0.01
Metrafenone	T826	AR	0.01	mg/kg	<0.01
Metribuzin	T826	AR	0.01	mg/kg	<0.01
Mevinphos	T826	AR	0.01	mg/kg	<0.01
Mirex	T826	AR	0.01	mg/kg	<0.01
Molinate	T826	AR	0.01	mg/kg	<0.01
Myclobutanil	T826	AR	0.01	mg/kg	<0.01
Napropamide	T826	AR	0.01	mg/kg	<0.01
Nitrofen	T826	AR	0.01	mg/kg	<0.01
Nitrothal isopropyl	T826	AR	0.01	mg/kg	<0.01
Nuarimol	T826	AR	0.01	mg/kg	<0.01
o,p'-DDT	T826	AR	0.01	mg/kg	<0.01
Octhilinone	T826	AR	0.01	mg/kg	<0.01
Ofurace	T826	AR	0.01	mg/kg	<0.01
Orysastrobin	T826	AR	0.01	mg/kg	<0.01
Oxadiazon	T826	AR	0.01	mg/kg	<0.01
Oxadixyl	T826	AR	0.01	mg/kg	<0.01
Oxyfluorfen	T826	AR	0.01	mg/kg	<0.01
p,p-DDD	T826	AR	0.01	mg/kg	<0.01
p,p-DDE	T826	AR	0.01	mg/kg	<0.01
p,p-DDT	T826	AR	0.01	mg/kg	<0.01

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
MRPS by GC (CSOPP611)

Concept Reference	**704623 032**
Customer Sample Reference	**HEP-BH-1802**
Hole ID	**HEP-BH-1802**
Top Depth	**1.20**
Depth	**1.20**
Date Sampled	**08-DEC-2017**
Time Sampled	**10:00**
AGS Type	**ES**
AGS Sample ID	**HEPBH18022017120 8001**
AGS Sample Reference	**10**
Matrix Class	**Fill**

Determinand	Method	Test Sample	LOD	Units	
Paclobutrazol	T826	AR	0.01	mg/kg	<0.01
Paraoxon	T826	AR	0.01	mg/kg	<0.01
Parathion	T826	AR	0.01	mg/kg	<0.01
Parathion methyl	T826	AR	0.01	mg/kg	<0.01
Penconazole	T826	AR	0.01	mg/kg	<0.01
Pendimethalin	T826	AR	0.01	mg/kg	<0.01
Pentachloroaniline	T826	AR	0.01	mg/kg	<0.01
Pentachlorophenol	T826	AR	0.01	mg/kg	(278) <0.01
Pentanochlor	T826	AR	0.01	mg/kg	<0.01
Permethrin	T826	AR	0.01	mg/kg	<0.01
Pethoxamid	T826	AR	0.01	mg/kg	<0.01
Phenothrin	T826	AR	0.01	mg/kg	<0.01
Phenthoate	T826	AR	0.01	mg/kg	<0.01
Phorate	T826	AR	0.01	mg/kg	<0.01
Phosalone	T826	AR	0.01	mg/kg	<0.01
Phosfolan	T826	AR	0.01	mg/kg	<0.01
Phosmet	T826	AR	0.01	mg/kg	<0.01
Phthalimide	T826	AR	0.01	mg/kg	<0.01
Picoxystrobin	T826	AR	0.01	mg/kg	<0.01
Piperonyl Butoxide	T826	AR	0.01	mg/kg	<0.01
Pirimicarb	T826	AR	0.01	mg/kg	<0.01
Pirimiphos Ethyl	T826	AR	0.01	mg/kg	<0.01
Pirimiphos methyl	T826	AR	0.01	mg/kg	<0.01
Pretilachlor	T826	AR	0.01	mg/kg	<0.01
Prochloraz	T826	AR	0.01	mg/kg	<0.01
Procymidone	T826	AR	0.01	mg/kg	<0.01
Profenofos	T826	AR	0.01	mg/kg	<0.01
Prometon	T826	AR	0.01	mg/kg	<0.01
Prometryn	T826	AR	0.01	mg/kg	<0.01
Propachlor	T826	AR	0.01	mg/kg	<0.01
Propanil	T826	AR	0.01	mg/kg	<0.01
Propaphos	T826	AR	0.01	mg/kg	<0.01
Propargite	T826	AR	0.01	mg/kg	<0.01
Propazine	T826	AR	0.01	mg/kg	<0.01
Propetamphos	T826	AR	0.01	mg/kg	<0.01
Propham	T826	AR	0.01	mg/kg	<0.01
Propiconazole	T826	AR	0.01	mg/kg	<0.01
Propyzamide	T826	AR	0.01	mg/kg	<0.01
Proquinazid	T826	AR	0.01	mg/kg	<0.01
Prosulfocarb	T826	AR	0.01	mg/kg	<0.01
Prothiofos	T826	AR	0.01	mg/kg	<0.01
Pyraclostrobin	T826	AR	0.01	mg/kg	<0.01
Pyraflufen ethyl	T826	AR	0.01	mg/kg	<0.01
Pyrazophos	T826	AR	0.01	mg/kg	<0.01
Pyridaben	T826	AR	0.01	mg/kg	<0.01
Pyridaphenthion	T826	AR	0.01	mg/kg	<0.01
Pyrimethanil	T826	AR	0.01	mg/kg	<0.01
Pyriproxyfen	T826	AR	0.01	mg/kg	<0.01
Quinalphos	T826	AR	0.01	mg/kg	<0.01
Quinoxyfen	T826	AR	0.01	mg/kg	<0.01
Quintozene	T826	AR	0.01	mg/kg	<0.01

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
MRPS by GC (CSOPP611)

Concept Reference	**704623 032**
Customer Sample Reference	**HEP-BH-1802**
Hole ID	**HEP-BH-1802**
Top Depth	**1.20**
Depth	**1.20**
Date Sampled	**08-DEC-2017**
Time Sampled	**10:00**
AGS Type	**ES**
AGS Sample ID	**HEPBH18022017120 8001**
AGS Sample Reference	**10**
Matrix Class	**Fill**

Determinand	Method	Test Sample	LOD	Units	
Quizalofop-ethyl	T826	AR	0.01	mg/kg	<0.01
S421	T826	AR	0.01	mg/kg	<0.01
Secbumeton	T826	AR	0.01	mg/kg	<0.01
Silafluofen	T826	AR	0.01	mg/kg	<0.01
Simazine	T826	AR	0.01	mg/kg	<0.01
Simeconazole	T826	AR	0.01	mg/kg	<0.01
Sulfallate	T826	AR	0.01	mg/kg	<0.01
Sulfentrazone	T826	AR	0.01	mg/kg	<0.01
Sulprofos	T826	AR	0.01	mg/kg	<0.01
Tau-Fluvalinate	T826	AR	0.01	mg/kg	<0.01
Tebuconazole	T826	AR	0.01	mg/kg	<0.01
Tebufenpyrad	T826	AR	0.01	mg/kg	<0.01
Tebupirimiphos	T826	AR	0.01	mg/kg	<0.01
Tecnazene	T826	AR	0.01	mg/kg	<0.01
Tefluthrin	T826	AR	0.01	mg/kg	<0.01
Terbacil	T826	AR	0.01	mg/kg	<0.01
Terbufos	T826	AR	0.01	mg/kg	<0.01
Terbumeton	T826	AR	0.01	mg/kg	<0.01
Terbuthylazine	T826	AR	0.01	mg/kg	<0.01
Terbutryn	T826	AR	0.01	mg/kg	<0.01
Tetrachlorvinphos	T826	AR	0.01	mg/kg	<0.01
Tetraconazole	T826	AR	0.01	mg/kg	<0.01
Tetradifon	T826	AR	0.01	mg/kg	<0.01
sulfotep	T826	AR	0.01	mg/kg	<0.01
Tetramethrin	T826	AR	0.01	mg/kg	<0.01
Tetrasul	T826	AR	0.01	mg/kg	<0.01
Thiamethoxam	T826	AR	0.01	mg/kg	<0.01
Thiobencarb	T826	AR	0.01	mg/kg	<0.01
Thiocyclam	T826	AR	0.01	mg/kg	(278) <0.01
Thiometon	T826	AR	0.01	mg/kg	<0.01
Tolclofos-methyl	T826	AR	0.01	mg/kg	<0.01
Triadimefon	T826	AR	0.01	mg/kg	<0.01
Triadimenol	T826	AR	0.01	mg/kg	<0.01
Triallate	T826	AR	0.01	mg/kg	<0.01
Triazamate	T826	AR	0.01	mg/kg	<0.01
Triazophos	T826	AR	0.01	mg/kg	<0.01
Trietazine	T826	AR	0.01	mg/kg	<0.01
Trifloxystrobin	T826	AR	0.01	mg/kg	<0.01
Triflumizole	T826	AR	0.01	mg/kg	(278) <0.01
Trifluralin	T826	AR	0.01	mg/kg	<0.01
Uniconazole	T826	AR	0.01	mg/kg	<0.01
Vinclozolin	T826	AR	0.01	mg/kg	<0.01

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
MRPS by LC (CSOPP603)

Concept Reference	**704623 032**
Customer Sample Reference	**HEP-BH-1802**
Hole ID	**HEP-BH-1802**
Top Depth	**1.20**
Depth	**1.20**
Date Sampled	**08-DEC-2017**
Time Sampled	**10:00**
AGS Type	**ES**
AGS Sample ID	**HEPBH180220171208001**
AGS Sample Reference	**10**
Matrix Class	**Fill**

Determinand	Method	Test Sample	LOD	Units	
2-(1-Naphthyl)acetamide	T310	AR	0.01	mg/kg	<0.01
3-hydroxycarbofuran	T310	AR	0.01	mg/kg	<0.01
6-Benzyladenine	T310	AR	0.01	mg/kg	(278) <0.01
Abamectin	T310	AR	0.01	mg/kg	<0.01
Acephate	T310	AR	0.01	mg/kg	(278) <0.01
Acetamiprid	T310	AR	0.01	mg/kg	<0.01
Acibenzolar-S-methyl	T310	AR	0.01	mg/kg	<0.01
Aldicarb	T310	AR	0.01	mg/kg	<0.01
Aldicarb sulphone	T310	AR	0.01	mg/kg	<0.01
Aldicarb sulphoxide	T310	AR	0.01	mg/kg	<0.01
Aminocarb	T310	AR	0.01	mg/kg	<0.01
Amitraz	T310	AR	0.01	mg/kg	(278) <0.01
Azinphos ethyl	T310	AR	0.01	mg/kg	<0.01
Azinphos methyl	T310	AR	0.01	mg/kg	<0.01
Azoxystrobin	T310	AR	0.01	mg/kg	<0.01
Bendiocarb	T310	AR	0.01	mg/kg	<0.01
Benfuracarb	T310	AR	0.01	mg/kg	(278) <0.01
Bifenazate	T310	AR	0.01	mg/kg	<0.01
Butoxycarboxim	T310	AR	0.01	mg/kg	<0.01
Butralin	T310	AR	0.01	mg/kg	<0.01
Carbaryl	T310	AR	0.01	mg/kg	<0.01
Carbendazim	T310	AR	0.01	mg/kg	<0.01
Carbetamide	T310	AR	0.01	mg/kg	<0.01
Carbofuran	T310	AR	0.01	mg/kg	<0.01
Carpropamid	T310	AR	0.01	mg/kg	<0.01
Chinomethionat	T310	AR	0.01	mg/kg	(278) <0.01
chlorantraniliprole	T310	AR	0.01	mg/kg	<0.01
Chlorbromuron	T310	AR	0.01	mg/kg	<0.01
Chlorfluazuron	T310	AR	0.01	mg/kg	<0.01
Chloridazon	T310	AR	0.01	mg/kg	<0.01
Chlorotoluron	T310	AR	0.01	mg/kg	<0.01
Chlorpropham	T310	AR	0.01	mg/kg	<0.01
Clofentezine	T310	AR	0.01	mg/kg	<0.01
Clothianidin	T310	AR	0.01	mg/kg	<0.01
Cyanazine	T310	AR	0.01	mg/kg	<0.01
Cyazofamid	T310	AR	0.01	mg/kg	<0.01
Cycluron	T310	AR	0.01	mg/kg	<0.01
Cymoxanil	T310	AR	0.01	mg/kg	<0.01
Cyromazine	T310	AR	0.01	mg/kg	(278) <0.01
Cythioate	T310	AR	0.01	mg/kg	<0.01
Demeton	T310	AR	0.01	mg/kg	<0.01
Demeton-s-methyl sulphone	T310	AR	0.01	mg/kg	<0.01
Desmedipham	T310	AR	0.01	mg/kg	<0.01
Dicrotophos	T310	AR	0.01	mg/kg	<0.01
Diethofencarb	T310	AR	0.01	mg/kg	<0.01
Diflubenzuron	T310	AR	0.01	mg/kg	<0.01
Dimefuron	T310	AR	0.01	mg/kg	<0.01
Dimethoate	T310	AR	0.01	mg/kg	<0.01
Diniconazole	T310	AR	0.01	mg/kg	<0.01
Dinotefuran	T310	AR	0.01	mg/kg	<0.01
Dioxacarb	T310	AR	0.01	mg/kg	<0.01

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
MRPS by LC (CSOPP603)

Concept Reference	**704623 032**
Customer Sample Reference	**HEP-BH-1802**
Hole ID	**HEP-BH-1802**
Top Depth	**1.20**
Depth	**1.20**
Date Sampled	**08-DEC-2017**
Time Sampled	**10:00**
AGS Type	**ES**
AGS Sample ID	**HEPBH180220171208001**
AGS Sample Reference	**10**
Matrix Class	**Fill**

Determinand	Method	Test Sample	LOD	Units	
Disulfoton sulfoxide	T310	AR	0.01	mg/kg	<0.01
Disulfoton sulphone	T310	AR	0.01	mg/kg	<0.01
Diuron	T310	AR	0.01	mg/kg	<0.01
DMSA	T310	AR	0.01	mg/kg	<0.01
DMST	T310	AR	0.01	mg/kg	<0.01
Dodemorph	T310	AR	0.01	mg/kg	<0.01
Emamectin	T310	AR	0.01	mg/kg	<0.01
Ethidimuron	T310	AR	0.01	mg/kg	<0.01
Ethiofencarb	T310	AR	0.01	mg/kg	<0.01
Ethiofencarb sulfone	T310	AR	0.01	mg/kg	<0.01
Ethiofencarb sulfoxide	T310	AR	0.01	mg/kg	<0.01
Ethiprole	T310	AR	0.01	mg/kg	<0.01
Ethirimol	T310	AR	0.01	mg/kg	(278) <0.01
Fenamiphos sulfone	T310	AR	0.01	mg/kg	<0.01
Fenamiphos sulfoxide	T310	AR	0.01	mg/kg	<0.01
Fenazaquin	T310	AR	0.01	mg/kg	<0.01
Fenchlorphos oxon	T310	AR	0.01	mg/kg	<0.01
Fenhexamid	T310	AR	0.01	mg/kg	(278) <0.01
Fenpropidin	T310	AR	0.01	mg/kg	<0.01
Fenpropimorph	T310	AR	0.01	mg/kg	<0.01
Fenpyroximate	T310	AR	0.01	mg/kg	<0.01
Fenthion Sulphone	T310	AR	0.01	mg/kg	<0.01
Fenthion Sulphoxide	T310	AR	0.01	mg/kg	<0.01
Fenuron	T310	AR	0.01	mg/kg	<0.01
Flonicamid	T310	AR	0.01	mg/kg	<0.01
Fluazinam	T310	AR	0.01	mg/kg	<0.01
Flufenoxuron	T310	AR	0.01	mg/kg	<0.01
Fluometuron	T310	AR	0.01	mg/kg	<0.01
Fluopicolide	T310	AR	0.01	mg/kg	<0.01
Fluorochloridone	T310	AR	0.01	mg/kg	<0.01
Flurtamone	T310	AR	0.01	mg/kg	<0.01
Flutriafol	T310	AR	0.01	mg/kg	<0.01
Forchlorfenuron	T310	AR	0.01	mg/kg	(278) <0.01
Formetanate	T310	AR	0.01	mg/kg	(278) <0.01
Fuberidazole	T310	AR	0.01	mg/kg	<0.01
Furathiocarb	T310	AR	0.01	mg/kg	<0.01
Hexaflumuron	T310	AR	0.01	mg/kg	<0.01
Hexythiazox	T310	AR	0.01	mg/kg	<0.01
Imazalil	T310	AR	0.01	mg/kg	<0.01
Imidacloprid	T310	AR	0.01	mg/kg	<0.01
Indoxacarb	T310	AR	0.01	mg/kg	<0.01
Iprovalicarb	T310	AR	0.01	mg/kg	<0.01
Isoprocarb	T310	AR	0.01	mg/kg	<0.01
Isoproturon	T310	AR	0.01	mg/kg	<0.01
Isoxaben	T310	AR	0.01	mg/kg	<0.01
Karbutylate	T310	AR	0.01	mg/kg	<0.01
Linuron	T310	AR	0.01	mg/kg	<0.01
Lufenuron	T310	AR	0.01	mg/kg	<0.01
Malaoxon	T310	AR	0.01	mg/kg	<0.01
Mandipropamid	T310	AR	0.01	mg/kg	<0.01
Mefenacet	T310	AR	0.01	mg/kg	<0.01

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
MRPS by LC (CSOPP603)

Concept Reference	**704623 032**
Customer Sample Reference	**HEP-BH-1802**
Hole ID	**HEP-BH-1802**
Top Depth	**1.20**
Depth	**1.20**
Date Sampled	**08-DEC-2017**
Time Sampled	**10:00**
AGS Type	**ES**
AGS Sample ID	**HEPBH180220171208001**
AGS Sample Reference	**10**
Matrix Class	**Fill**

Determinand	Method	Test Sample	LOD	Units	
Metaflumizone	T310	AR	0.01	mg/kg	<0.01
Metamitron	T310	AR	0.01	mg/kg	<0.01
Metconazole	T310	AR	0.01	mg/kg	<0.01
Methabenzthiazuron	T310	AR	0.01	mg/kg	<0.01
Methamidophos	T310	AR	0.01	mg/kg	(278) <0.01
Methiocarb	T310	AR	0.01	mg/kg	<0.01
Methiocarb sulfone	T310	AR	0.01	mg/kg	(278) <0.01
Methiocarb Sulfoxide	T310	AR	0.01	mg/kg	<0.01
Methomyl	T310	AR	0.01	mg/kg	<0.01
Methoxyfenozide	T310	AR	0.01	mg/kg	<0.01
Metobromuron	T310	AR	0.01	mg/kg	<0.01
Monocrotophos	T310	AR	0.01	mg/kg	<0.01
Monolinuron	T310	AR	0.01	mg/kg	<0.01
Monuron	T310	AR	0.01	mg/kg	<0.01
Neburon	T310	AR	0.01	mg/kg	<0.01
Nicotine	T310	AR	0.01	mg/kg	(278,5,62) <0.10
Nitenpyram	T310	AR	0.01	mg/kg	<0.01
Novaluron	T310	AR	0.01	mg/kg	<0.01
Omethoate	T310	AR	0.01	mg/kg	<0.01
Oxadiargyl	T310	AR	0.01	mg/kg	<0.01
Oxamyl	T310	AR	0.01	mg/kg	<0.01
Oxycarboxin	T310	AR	0.01	mg/kg	(278) <0.01
Pencycuron	T310	AR	0.01	mg/kg	<0.01
Phenmedipham	T310	AR	0.01	mg/kg	<0.01
Phorate sulfone	T310	AR	0.01	mg/kg	<0.01
Phorate sulfoxide	T310	AR	0.01	mg/kg	<0.01
Phosmet	T310	AR	0.01	mg/kg	<0.01
Phosphamidon	T310	AR	0.01	mg/kg	<0.01
Phoxim	T310	AR	0.01	mg/kg	<0.01
Pirimicarb	T310	AR	0.01	mg/kg	<0.01
Pirimicarb desmethyl	T310	AR	0.01	mg/kg	<0.01
Prochloraz	T310	AR	0.01	mg/kg	<0.01
Propamocarb	T310	AR	0.01	mg/kg	<0.01
Propaquizafop	T310	AR	0.01	mg/kg	<0.01
Propargite	T310	AR	0.01	mg/kg	<0.01
Propoxur	T310	AR	0.01	mg/kg	<0.01
Prothioconazole desthio	T310	AR	0.01	mg/kg	<0.01
Pyraclostrobin	T310	AR	0.01	mg/kg	<0.01
Pyrethrin I	T310	AR	0.01	mg/kg	(278) <0.01
Pyrifenox	T310	AR	0.01	mg/kg	<0.01
Resmethrin	T310	AR	0.01	mg/kg	<0.01
Spinetoram	T310	AR	0.01	mg/kg	<0.01
Spinosad	T310	AR	0.01	mg/kg	<0.01
Spirodiclofen	T310	AR	0.01	mg/kg	(278) <0.01
Spiromesifen	T310	AR	0.01	mg/kg	(278) <0.01
Spirotetramat	T310	AR	0.01	mg/kg	(278) <0.01
Spiroxamine	T310	AR	0.01	mg/kg	<0.01
Tebufenozide	T310	AR	0.01	mg/kg	<0.01
Teflubenzuron	T310	AR	0.01	mg/kg	<0.01
Temephos	T310	AR	0.01	mg/kg	<0.01
Terbufos sulfone	T310	AR	0.01	mg/kg	<0.01

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
MRPS by LC (CSOPP603)

Concept Reference	**704623 032**
Customer Sample Reference	**HEP-BH-1802**
Hole ID	**HEP-BH-1802**
Top Depth	**1.20**
Depth	**1.20**
Date Sampled	**08-DEC-2017**
Time Sampled	**10:00**
AGS Type	**ES**
AGS Sample ID	**HEPBH180220171208001**
AGS Sample Reference	**10**
Matrix Class	**Fill**

Determinand	Method	Test Sample	LOD	Units	
Terbufos sulfoxide	T310	AR	0.01	mg/kg	<0.01
Thiabendazole	T310	AR	0.01	mg/kg	<0.01
Thiacloprid	T310	AR	0.01	mg/kg	<0.01
Thiamethoxam	T310	AR	0.01	mg/kg	<0.01
Thiazafluron	T310	AR	0.01	mg/kg	<0.01
Thidiazuron	T310	AR	0.01	mg/kg	(278) <0.01
Thiodicarb	T310	AR	0.01	mg/kg	<0.01
Thiofanox	T310	AR	0.01	mg/kg	<0.01
Thiophanate Methyl	T310	AR	0.01	mg/kg	<0.01
Tolylfluanid	T310	AR	0.01	mg/kg	(278) <0.01
Tribenuron methyl	T310	AR	0.01	mg/kg	(278) <0.01
Tridemorph	T310	AR	0.01	mg/kg	<0.01
Triflumuron	T310	AR	0.01	mg/kg	<0.01
Triflusulfuron-methyl	T310	AR	0.01	mg/kg	(278) <0.01
Triforine	T310	AR	0.01	mg/kg	<0.01
Triticonazole	T310	AR	0.01	mg/kg	<0.01
Vamidothion	T310	AR	0.01	mg/kg	<0.01
Vernolate	T310	AR	0.01	mg/kg	<0.01
Zoxamide	T310	AR	0.01	mg/kg	<0.01

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
Sub Suite 4 - Phenoxy Acetic acid herbicides

Concept Reference	**704623 032**
Customer Sample Reference	**HEP-BH-1802**
Hole ID	**HEP-BH-1802**
Top Depth	**1.20**
Depth	**1.20**
Date Sampled	**08-DEC-2017**
Time Sampled	**10:00**
AGS Type	**ES**
AGS Sample ID	**HEPBH180220171208001**
AGS Sample Reference	**10**
Matrix Class	**Fill**

Determinand	Method	Test Sample	LOD	Units	
Mecoprop	T16	AR	0.01	mg/kg	(100,36) <0.20
Phenoxy Acetic acid herbicide: MCPA	T16	AR	0.01	mg/kg	(100) <0.10
Dichlorprop	T16	AR	0.01	mg/kg	(100,36) <0.30
Phenoxy Acetic acid herbicide: 2,4-D	T16	AR	0.01	mg/kg	(100) <0.10
Fenoprop	T16	AR	0.01	mg/kg	(100,36) <0.20
Phenoxy Acetic acid herbicide: 2,4,5-T	T16	AR	0.01	mg/kg	(100) <0.10

Index to symbols used in Third Supplemental B 704623-3

Value	Description
M105	Analysis conducted on an "as received" aliquot. Results are reported on a dry weight basis where moisture content was determined by assisted drying of sample at 105C
A40	Assisted dried < 40C
M40	Analysis conducted on sample assisted dried at no more than 40C. Results are reported on a dry weight basis.
AR	As Received
N.D.	Not Detected
278	Data reported is qualitative as recovery is outside the 60 to 140% range
100	LOD determined by sample aliquot used for analysis
36	LOD Raised due to low Matrix spike recovery
9	LOD raised due to dilution of sample
5	Results are Semiquantitative
62	LOD was raised due to the method performance of the analytical procedure used
13	Results have been blank corrected.
110	LOD raised due to low internal standard recovery.
S	Analysis was subcontracted
M	Analysis is MCERTS accredited
U	Analysis is UKAS accredited
N	Analysis is not UKAS accredited

Notes

Third Supplemental B to report in standard format with TPH totals.
Nitrate and Nitrite transferred to Concept East Kilbride
Pathogens transferred to Concept Moy
"Fill" samples are outside the scope of our MCERTS accreditation. Results are UKAS only
Asbestos subcontracted to REC Asbestos
MRPS testing transferred within group to CLS Cambridge
Third Supplemental B to report in standard format with TPH totals.

Method Index

Value	Description
T287	Calc TOC/0.58
T7	Probe
T85	Calc
T207	GC/MS (MCERTS)
T686	Discrete Analyser
T2	Grav
T27	PLM
T909	GCxGC
T6	ICP/OES
T310	LC/MS/MS
T4	Colorimetry
T8	GC/FID
T16	GC/MS
T21	OX/IR
T209	GC/MS (Head Space)(MCERTS)
T826	SOP611 (GC MSMS)
T34	Micro
T162	Grav (1 Dec) (105 C)

Accreditation Summary

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Soil Organic Matter	T287	A40	0.1	%	N	002-004,008,010,016-017,021-024,026-028,030-033,037,039,043,045-046,048,050,054-055,060,064,066-067
pH	T7	AR			M	002-004,008,010,016,021-024,026-027,030-031,043,045-046,048,050,054-055,064,066-067
pH	T7	AR			U	017,028,032-033,037,039,060
Asbestos ID	T27	AR			SU	002-004,016-017,021-024,026-028,030-033,043,045-046,048,050,054-055,064,066-067
Phenols(Mono)	T4	AR	0.5	mg/kg	M	002-004,016,021-024,026-027,030-031,043,045-046,048,050,054-055,064,066-067
Phenols(Mono)	T4	AR	0.5	mg/kg	U	017,028,032-033
Chloride	T686	AR	1	mg/kg	N	002-004,008,010,016-017,021-024,026-028,030-033,037,039,043,045-046,048,050,054-055,060,064,066-067
Cyanide(Total)	T4	AR	1	mg/kg	M	002-004,016,021-024,026-027,030-031,043,045-046,048,050,054-055,064,066-067

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Cyanide(Total)	T4	AR	1	mg/kg	U	017,028,032-033
Thiocyanate	T4	A40	1	mg/kg	N	002-004,016-017,021-024,026-028,030-033,043,045-046,048,050,054-055,064,066-067
Nitrate	T686	AR	1	mg/kg	N	002-004,016-017,021-024,026-028,030-033,043,045-046,048,050,054-055,064,066-067
Nitrite	T686	AR	1	mg/kg	N	002-004,016-017,021-024,026-028,030-033,043,045-046,048,050,054-055,064,066-067
SO4(Total)	T6	A40	0.01	%	U	002-004,016-017,021-024,026-028,030-033,043,045-046,048,050,054-055,064,066-067
Sulphide	T4	AR	10	mg/kg	N	002-004,016-017,021-024,026-028,030-033,043,045-046,048,050,054-055,064,066-067
Arsenic	T6	M40	2	mg/kg	M	002-004,008,010,016,021-024,026-027,030-031,043,045-046,048,050,054-055,064,066-067
Arsenic	T6	M40	2.0	mg/kg	U	017,028,032-033,037,039,060
Cadmium	T6	M40	1	mg/kg	M	002-004,008,010,016,021-024,026-027,030-031,043,045-046,048,050,054-055,064,066-067
Cadmium	T6	M40	1	mg/kg	U	017,028,032-033,037,039,060
Chromium	T6	M40	1	mg/kg	M	002-004,008,010,016,021-024,026-027,030-031,043,045-046,048,050,054-055,064,066-067
Chromium	T6	M40	1	mg/kg	U	017,028,032-033,037,039,060
Chromium VI	T6	AR	1	mg/kg	N	002-004,008,010,016-017,021-024,026-028,030-033,037,039,043,045-046,048,050,054-055,060,064,066-067
Chromium (trivalent)	T85	AR	2	mg/kg	N	002-004,008,010,016-017,021-024,026-028,030-033,037,039,043,045-046,048,050,054-055,060,064,066-067
Iron	T6	A40	1	mg/kg	U	002-004,008,010,016-017,021-024,026-028,030-033,037,039,043,045-046,048,050,054-055,060,064,066-067
Lead	T6	M40	1	mg/kg	M	002-004,008,010,016,021-024,026-027,030-031,043,045-046,048,050,054-055,064,066-067
Lead	T6	M40	1	mg/kg	U	017,028,032-033,037,039,060
Manganese	T6	M40	1	mg/kg	M	002-004,008,010,016,021-024,026-027,030-031,043,045-046,048,050,054-055,064,066-067
Manganese	T6	M40	1	mg/kg	U	017,028,032-033,037,039,060
Mercury	T6	M40	1	mg/kg	M	002-004,008,010,016,021-024,026-027,030-031,043,045-046,048,050,054-055,064,066-067
Mercury	T6	M40	1	mg/kg	U	017,028,032-033,037,039,060
Nickel	T6	M40	1	mg/kg	M	002-004,008,010,016,021-024,026-027,030-031,043,045-046,048,050,054-055,064,066-067
Nickel	T6	M40	1	mg/kg	U	017,028,032-033,037,039,060
Selenium	T6	M40	3	mg/kg	M	002-004,008,010,016,021-024,026-027,030-031,043,045-046,048,050,054-055,064,066-067
Selenium	T6	M40	3	mg/kg	U	017,028,032-033,037,039,060
Copper	T6	M40	1	mg/kg	M	002-004,008,010,016,021-024,026-027,030-031,043,045-046,048,050,054-055,064,066-067
Copper	T6	M40	1	mg/kg	U	017,028,032-033,037,039,060
Zinc	T6	M40	1	mg/kg	M	002-004,008,010,016,021-024,026-027,030-031,043,045-046,048,050,054-055,064,066-067
Zinc	T6	M40	1	mg/kg	U	017,028,032-033,037,039,060
Boron (water-soluble)	T6	AR	1	mg/kg	N	002-004,008,010,016-017,021-024,026-028,030-033,037,039,043,045-046,048,050,054-055,060,064,066-067
Naphthalene	T207	M105	0.1	mg/kg	M	002-004,008,010,016,021-024,026-027,030-031,043,045-046,048,050,054-055,064,066-067
Naphthalene	T207	M105	0.1	mg/kg	U	017,028,032-033,037,039,060
Acenaphthylene	T207	AR	0.1	mg/kg	U	002-004,008,010,016-017,021-024,026-028,030-033,037,039,043,045-046,048,050,054-055,060,064,066-067
Acenaphthene	T207	M105	0.1	mg/kg	M	002-004,008,010,016,021-024,026-027,030-031,043,045-046,048,050,054-055,064,066-067
Acenaphthene	T207	M105	0.1	mg/kg	U	017,028,032-033,037,039,060
Fluorene	T207	M105	0.1	mg/kg	M	002-004,008,010,016,021-024,026-027,030-031,043,045-046,048,050,054-055,064,066-067
Fluorene	T207	M105	0.1	mg/kg	U	017,028,032-033,037,039,060
Phenanthrene	T207	M105	0.1	mg/kg	M	002-004,008,010,016,021-024,026-027,030-031,043,045-046,048,050,054-055,064,066-067
Phenanthrene	T207	M105	0.1	mg/kg	U	017,028,032-033,037,039,060
Anthracene	T207	AR	0.1	mg/kg	U	002-004,008,010,016-017,021-024,026-028,030-033,037,039,043,045-046,048,050,054-055,060,064,066-067
Fluoranthene	T207	M105	0.1	mg/kg	M	002-004,008,010,016,021-024,026-027,030-031,043,045-046,048,050,054-055,064,066-067
Fluoranthene	T207	M105	0.1	mg/kg	U	017,028,032-033,037,039,060
Pyrene	T207	M105	0.1	mg/kg	M	002-004,008,010,016,021-024,026-027,030-031,043,045-046,048,050,054-055,064,066-067
Pyrene	T207	M105	0.1	mg/kg	U	017,028,032-033,037,039,060
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	M	002-004,008,010,016,021-024,026-027,030-031,043,045-046,048,050,054-055,064,066-067
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	U	017,028,032-033,037,039,060
Chrysene	T207	M105	0.1	mg/kg	M	002-004,008,010,016,021-024,026-027,030-031,043,045-046,048,050,054-055,064,066-067
Chrysene	T207	M105	0.1	mg/kg	U	017,028,032-033,037,039,060
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	M	002-004,008,010,016,021-024,026-027,030-031,043,045-046,048,050,054-055,064,066-067
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	U	017,028,032-033,037,039,060
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	M	002-004,008,010,016,021-024,026-027,030-031,043,045-046,048,050,054-055,064,066-067
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	U	017,028,032-033,037,039,060
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	M	002-004,008,010,016,021-024,026-027,030-031,043,045-046,048,050,054-055,064,066-067

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	U	017,028,032-033,037,039,060
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	M	002-004,008,010,016,021-024,026-027,030-031,043,045-046,048,050,054-055,064,066-067
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	U	017,028,032-033,037,039,060
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	M	002-004,008,010,016,021-024,026-027,030-031,043,045-046,048,050,054-055,064,066-067
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	U	017,028,032-033,037,039,060
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	M	002-004,008,010,016,021-024,026-027,030-031,043,045-046,048,050,054-055,064,066-067
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	U	017,028,032-033,037,039,060
PAH(total)	T207	AR	0.1	mg/kg	U	002-004,008,010,016-017,021-024,026-028,030-033,037,039,043,045-046,048,050,054-055,060,064,066-067
TPH (C5-C6 aliphatic)	T209	AR	100	µg/kg	N	002-004,016-017,021-024,026-028,030-033,043,045-046,048,050,054-055,064,066-067
TPH (C6-C8 aliphatic)	T209	AR	100	µg/kg	N	002-004,016-017,021-024,026-028,030-033,043,045-046,048,050,054-055,064,066-067
TPH (C8-C10 aliphatic)	T209	AR	100	µg/kg	N	002-004,016-017,021-024,026-028,030-033,043,045-046,048,050,054-055,064,066-067
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	M	002-004,016,021-024,026-027,030-031,043,045-046,048,050,054-055,064,066-067
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	U	017,028,032-033
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	M	002-004,016,021-024,026-027,030-031,043,045-046,048,050,054-055,064,066-067
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	U	017,028,032-033
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	M	002-004,016,021-024,026-027,030-031,043,045-046,048,050,054-055,064,066-067
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	U	017,028,032-033
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	M	002-004,016,021-024,026-027,030-031,043,045-046,048,050,054-055,064,066-067
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	U	017,028,032-033
TPH (C6-C7 aromatic)	T209	AR	100	µg/kg	N	002-004,016-017,021-024,026-028,030-033,043,045-046,048,050,054-055,064,066-067
TPH (C7-C8 aromatic)	T209	AR	100	µg/kg	N	002-004,016-017,021-024,026-028,030-033,043,045-046,048,050,054-055,064,066-067
TPH (C8-C10 aromatic)	T209	AR	100	µg/kg	N	002-004,016-017,021-024,026-028,030-033,043,045-046,048,050,054-055,064,066-067
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	M	002-004,016,021-024,026-027,030-031,043,045-046,048,050,054-055,064,066-067
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	U	017,028,032-033
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	M	002-004,016,021-024,026-027,030-031,043,045-046,048,050,054-055,064,066-067
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	U	017,028,032-033
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	M	002-004,016,021-024,026-027,030-031,043,045-046,048,050,054-055,064,066-067
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	U	017,028,032-033
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	M	002-004,016,021-024,026-027,030-031,043,045-046,048,050,054-055,064,066-067
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	U	017,028,032-033
TPH (Aliphatic) total	T85	M105		mg/kg	N	002-004,016-017,021-024,026-028,030-033,043,045-046,048,050,054-055,064,066-067
TPH (Aromatic) total	T85	M105		mg/kg	N	002-004,016-017,021-024,026-028,030-033,043,045-046,048,050,054-055,064,066-067
TPH (Aliphatic+Aromatic) (sum)	T85	M105		mg/kg	N	002-004,016-017,021-024,026-028,030-033,043,045-046,048,050,054-055,064,066-067
Moisture @105C	T162	AR	0.1	%	N	002-004,008,010,016-017,021-024,026-028,030-033,037,039,043,045-046,048,050,054-055,060,064,066-067
Retained on 10mm sieve	T2	M40	0.1	%	N	002-004,008,010,016-017,021-024,026-028,030-033,037,039,043,045-046,048,050,054-055,060,064,066-067
Salmonella spp	T34	AR			N	008
Escherichia coli	T34	AR	1	cfu/in 25g	U	008
Intestinal Enterococci	T34	AR	1	cfu/g	SN	008
Mecoprop	T16	AR	0.01	mg/kg	N	032
Phenoxy Acetic acid herbicide: MCPA	T16	AR	0.01	mg/kg	N	032
Dichlorprop	T16	AR	0.01	mg/kg	N	032
Phenoxy Acetic acid herbicide: 2,4-D	T16	AR	0.01	mg/kg	N	032
Fenoprop	T16	AR	0.01	mg/kg	N	032
Phenoxy Acetic acid herbicide: 2,4,5-T	T16	AR	0.01	mg/kg	N	032
2,4,6-Trichlorophenol	T826	AR	0.01	mg/kg	N	032
2-Methyl-4,6-dinitrophenol	T826	AR	0.01	mg/kg	N	032
2-Phenylphenol	T826	AR	0.01	mg/kg	N	032
9,10-Anthraquinone	T826	AR	0.01	mg/kg	N	032
Acetochlor	T826	AR	0.01	mg/kg	N	032
Aclonifen	T826	AR	0.01	mg/kg	N	032
Acrinathrin	T826	AR	0.01	mg/kg	N	032
Alachlor	T826	AR	0.01	mg/kg	N	032
Aldrin	T826	AR	0.01	mg/kg	N	032
Ametryn	T826	AR	0.01	mg/kg	N	032
Atraton	T826	AR	0.01	mg/kg	N	032
Atrazine	T826	AR	0.01	mg/kg	N	032
Azaconazole	T826	AR	0.01	mg/kg	N	032
Azobenzene	T826	AR	0.01	mg/kg	N	032
Azoxystrobin	T826	AR	0.01	mg/kg	N	032
Benalaxyl	T826	AR	0.01	mg/kg	N	032
Benfluralin	T826	AR	0.01	mg/kg	N	032
Bifenox	T826	AR	0.01	mg/kg	N	032
Bifenthrin	T826	AR	0.01	mg/kg	N	032
Binapacryl	T826	AR	0.01	mg/kg	N	032
Biphenyl	T826	AR	0.01	mg/kg	N	032
Bitertanol	T826	AR	0.01	mg/kg	N	032

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Boscalid	T826	AR	0.01	mg/kg	N	032
Bromacil	T826	AR	0.01	mg/kg	N	032
Bromophos	T826	AR	0.01	mg/kg	N	032
Bromophos-Ethyl	T826	AR	0.01	mg/kg	N	032
Bromopropylate	T826	AR	0.01	mg/kg	N	032
Bupirimate	T826	AR	0.01	mg/kg	N	032
Buprofezine	T826	AR	0.01	mg/kg	N	032
Butachlor	T826	AR	0.01	mg/kg	N	032
Cadusafos	T826	AR	0.01	mg/kg	N	032
Captan	T826	AR	0.01	mg/kg	N	032
Carbaryl	T826	AR	0.01	mg/kg	N	032
Carbophenothion	T826	AR	0.01	mg/kg	N	032
Carboxine	T826	AR	0.01	mg/kg	N	032
Carfentrazone Ethyl	T826	AR	0.01	mg/kg	N	032
Chlorbenzilate	T826	AR	0.01	mg/kg	N	032
Chlorbufam	T826	AR	0.01	mg/kg	N	032
Chlordane	T826	AR	0.01	mg/kg	N	032
Chlordimeform	T826	AR	0.01	mg/kg	N	032
Chlorethoxyfos	T826	AR	0.01	mg/kg	N	032
Chlorfenapyr	T826	AR	0.01	mg/kg	N	032
Chlorfenson	T826	AR	0.01	mg/kg	N	032
Chlorfenvinphos	T826	AR	0.01	mg/kg	N	032
Chlormephos	T826	AR	0.01	mg/kg	N	032
Chloropropylate	T826	AR	0.01	mg/kg	N	032
Chlorothalonil	T826	AR	0.01	mg/kg	N	032
Chlorpropham	T826	AR	0.01	mg/kg	N	032
Chlorpyrifos	T826	AR	0.01	mg/kg	N	032
Chlorpyrifos methyl	T826	AR	0.01	mg/kg	N	032
Chlorthal Dimethyl	T826	AR	0.01	mg/kg	N	032
Chlorthion	T826	AR	0.01	mg/kg	N	032
Chlorthiophos	T826	AR	0.01	mg/kg	N	032
Chlozolinate	T826	AR	0.01	mg/kg	N	032
cis-1,2,3,6-Tetrahydrophthalimide	T826	AR	0.01	mg/kg	N	032
Clodinafop propargy	T826	AR	0.01	mg/kg	N	032
Clomazone	T826	AR	0.01	mg/kg	N	032
Cloquintocet mexyl	T826	AR	0.01	mg/kg	N	032
Coumaphos	T826	AR	0.01	mg/kg	N	032
Cyflufenamid	T826	AR	0.01	mg/kg	N	032
Cyfluthrin	T826	AR	0.01	mg/kg	N	032
Cypermethrin	T826	AR	0.01	mg/kg	N	032
Cyphenothrin	T826	AR	0.01	mg/kg	N	032
Cyproconazole	T826	AR	0.01	mg/kg	N	032
Cyprodinil	T826	AR	0.01	mg/kg	N	032
DEET	T826	AR	0.01	mg/kg	N	032
Deltamethrin	T826	AR	0.01	mg/kg	N	032
Desmetryn	T826	AR	0.01	mg/kg	N	032
Diafenthiuron	T826	AR	0.01	mg/kg	N	032
Dialifos	T826	AR	0.01	mg/kg	N	032
Diazinon	T826	AR	0.01	mg/kg	N	032
Dichlobenil	T826	AR	0.01	mg/kg	N	032
Dichlofenthion	T826	AR	0.01	mg/kg	N	032
Dichlorvos	T826	AR	0.01	mg/kg	N	032
Diclobutrazol	T826	AR	0.01	mg/kg	N	032
Dicloran	T826	AR	0.01	mg/kg	N	032
Dicofol	T826	AR	0.01	mg/kg	N	032
Dieldrin	T826	AR	0.01	mg/kg	N	032
Difenoconazole	T826	AR	0.01	mg/kg	N	032
Diflufenican	T826	AR	0.01	mg/kg	N	032
Dimethenamid	T826	AR	0.01	mg/kg	N	032
Dimethomorph	T826	AR	0.01	mg/kg	N	032
Dimoxystrobin	T826	AR	0.01	mg/kg	N	032
Dinoterb	T826	AR	0.01	mg/kg	N	032
Dioxabenzofos	T826	AR	0.01	mg/kg	N	032
Diphenamid	T826	AR	0.01	mg/kg	N	032
Diphenylamine	T826	AR	0.01	mg/kg	N	032
Disulfoton	T826	AR	0.01	mg/kg	N	032
Ditalimfos	T826	AR	0.01	mg/kg	N	032
Edifenphos	T826	AR	0.01	mg/kg	N	032
Endosulphan alpha	T826	AR	0.01	mg/kg	N	032
Endosulphan beta	T826	AR	0.01	mg/kg	N	032

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Endosulphan sulphate	T826	AR	0.01	mg/kg	N	032
Endrin	T826	AR	0.01	mg/kg	N	032
Epn	T826	AR	0.01	mg/kg	N	032
Epoxiconazole	T826	AR	0.01	mg/kg	N	032
EPTC	T826	AR	0.01	mg/kg	N	032
Etaconazole	T826	AR	0.01	mg/kg	N	032
Ethion	T826	AR	0.01	mg/kg	N	032
Ethofumesate	T826	AR	0.01	mg/kg	N	032
Ethoprophos	T826	AR	0.01	mg/kg	N	032
Ethoxyquin	T826	AR	0.01	mg/kg	N	032
Etofenprox	T826	AR	0.01	mg/kg	N	032
Etoxazole	T826	AR	0.01	mg/kg	N	032
Etridiazole	T826	AR	0.01	mg/kg	N	032
Etrimfos	T826	AR	0.01	mg/kg	N	032
Famoxadone	T826	AR	0.01	mg/kg	N	032
Famphur	T826	AR	0.01	mg/kg	N	032
Fenamidone	T826	AR	0.01	mg/kg	N	032
Fenamiphos	T826	AR	0.01	mg/kg	N	032
Fenarimol	T826	AR	0.01	mg/kg	N	032
Fenbuconazole	T826	AR	0.01	mg/kg	N	032
Fenchlorphos	T826	AR	0.01	mg/kg	N	032
Fenhexamid	T826	AR	0.01	mg/kg	N	032
Fenitrothion	T826	AR	0.01	mg/kg	N	032
Fenpiclonil	T826	AR	0.01	mg/kg	N	032
Fenpropathrin	T826	AR	0.01	mg/kg	N	032
Fenson	T826	AR	0.01	mg/kg	N	032
Fensulfothion	T826	AR	0.01	mg/kg	N	032
Fenthion	T826	AR	0.01	mg/kg	N	032
Fenvalerate	T826	AR	0.01	mg/kg	N	032
Fipronil	T826	AR	0.01	mg/kg	N	032
Fipronil sulphone	T826	AR	0.01	mg/kg	N	032
Flamprop isopropyl	T826	AR	0.01	mg/kg	N	032
Fluazifop-P-Butyl	T826	AR	0.01	mg/kg	N	032
Flucythrinate	T826	AR	0.01	mg/kg	N	032
Fludioxonil	T826	AR	0.01	mg/kg	N	032
Flufenacet	T826	AR	0.01	mg/kg	N	032
Flumetralin	T826	AR	0.01	mg/kg	N	032
Flumioxazin	T826	AR	0.01	mg/kg	N	032
Flumorph	T826	AR	0.01	mg/kg	N	032
Fluopyram	T826	AR	0.01	mg/kg	N	032
Fluquinconazole	T826	AR	0.01	mg/kg	N	032
Fluroxypyr-1-methylheptyl ester	T826	AR	0.01	mg/kg	N	032
Flusilazole	T826	AR	0.01	mg/kg	N	032
Flutolanil	T826	AR	0.01	mg/kg	N	032
Fluxapyroxad	T826	AR	0.01	mg/kg	N	032
Folpet	T826	AR	0.01	mg/kg	N	032
Fonophos	T826	AR	0.01	mg/kg	N	032
Formothion	T826	AR	0.01	mg/kg	N	032
Furalaxyl	T826	AR	0.01	mg/kg	N	032
Haloxyfop etotyl	T826	AR	0.01	mg/kg	N	032
Haloxyfop Methyl	T826	AR	0.01	mg/kg	N	032
Heptachlor	T826	AR	0.01	mg/kg	N	032
Heptachlor epoxide	T826	AR	0.01	mg/kg	N	032
Heptachlor exo Epoxide	T826	AR	0.01	mg/kg	N	032
Heptenophos	T826	AR	0.01	mg/kg	N	032
Hexachlorobenzene	T826	AR	0.01	mg/kg	N	032
Hexachlorocyclohexane (alpha)	T826	AR	0.01	mg/kg	N	032
Hexachlorocyclohexane (beta)	T826	AR	0.01	mg/kg	N	032
Hexachlorocyclohexane (delta)	T826	AR	0.01	mg/kg	N	032
Hexaconazole	T826	AR	0.01	mg/kg	N	032
Hexazinone	T826	AR	0.01	mg/kg	N	032
Imazalil	T826	AR	0.01	mg/kg	N	032
Iodofenphos	T826	AR	0.01	mg/kg	N	032
Iprodione	T826	AR	0.01	mg/kg	N	032
Isazofos	T826	AR	0.01	mg/kg	N	032
Isocarbophos	T826	AR	0.01	mg/kg	N	032
Isodrin	T826	AR	0.01	mg/kg	N	032
Isofenphos	T826	AR	0.01	mg/kg	N	032
Isofenphos Methyl	T826	AR	0.01	mg/kg	N	032
Isomethiozin	T826	AR	0.01	mg/kg	N	032

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Isoprothiolane	T826	AR	0.01	mg/kg	N	032
Isopyrazam	T826	AR	0.01	mg/kg	N	032
Isothiazolinone	T826	AR	0.01	mg/kg	N	032
Kresoxim Methyl	T826	AR	0.01	mg/kg	N	032
Lambda Cyhalothrin	T826	AR	0.01	mg/kg	N	032
Lenacil	T826	AR	0.01	mg/kg	N	032
Leptophos	T826	AR	0.01	mg/kg	N	032
Lindane	T826	AR	0.01	mg/kg	N	032
Malathion	T826	AR	0.01	mg/kg	N	032
MCPA-thioethyl	T826	AR	0.01	mg/kg	N	032
Mecarbam	T826	AR	0.01	mg/kg	N	032
Mepanipyrim	T826	AR	0.01	mg/kg	N	032
Mephosfolan	T826	AR	0.01	mg/kg	N	032
Mepronil	T826	AR	0.01	mg/kg	N	032
Metalaxyl	T826	AR	0.01	mg/kg	N	032
Metazachlor	T826	AR	0.01	mg/kg	N	032
Methacrifos	T826	AR	0.01	mg/kg	N	032
Methidathion	T826	AR	0.01	mg/kg	N	032
Methoxychlor	T826	AR	0.01	mg/kg	N	032
Methyl Paraoxon	T826	AR	0.01	mg/kg	N	032
Metolachlor	T826	AR	0.01	mg/kg	N	032
Metolcarb	T826	AR	0.01	mg/kg	N	032
Metrafenone	T826	AR	0.01	mg/kg	N	032
Metribuzin	T826	AR	0.01	mg/kg	N	032
Mevinphos	T826	AR	0.01	mg/kg	N	032
Mirex	T826	AR	0.01	mg/kg	N	032
Molinate	T826	AR	0.01	mg/kg	N	032
Myclobutanil	T826	AR	0.01	mg/kg	N	032
Napropamide	T826	AR	0.01	mg/kg	N	032
Nitrofen	T826	AR	0.01	mg/kg	N	032
Nitrothal isopropyl	T826	AR	0.01	mg/kg	N	032
Nuarimol	T826	AR	0.01	mg/kg	N	032
o,p'-DDT	T826	AR	0.01	mg/kg	N	032
Octhilinone	T826	AR	0.01	mg/kg	N	032
Ofurace	T826	AR	0.01	mg/kg	N	032
Orysastrobin	T826	AR	0.01	mg/kg	N	032
Oxadiazon	T826	AR	0.01	mg/kg	N	032
Oxadixyl	T826	AR	0.01	mg/kg	N	032
Oxyfluorfen	T826	AR	0.01	mg/kg	N	032
p,p-DDD	T826	AR	0.01	mg/kg	N	032
p,p-DDE	T826	AR	0.01	mg/kg	N	032
p,p-DDT	T826	AR	0.01	mg/kg	N	032
Paclobutrazol	T826	AR	0.01	mg/kg	N	032
Paraoxon	T826	AR	0.01	mg/kg	N	032
Parathion	T826	AR	0.01	mg/kg	N	032
Parathion methyl	T826	AR	0.01	mg/kg	N	032
Penconazole	T826	AR	0.01	mg/kg	N	032
Pendimethalin	T826	AR	0.01	mg/kg	N	032
Pentachloroaniline	T826	AR	0.01	mg/kg	N	032
Pentachlorophenol	T826	AR	0.01	mg/kg	N	032
Pentanochlor	T826	AR	0.01	mg/kg	N	032
Permethrin	T826	AR	0.01	mg/kg	N	032
Pethoxamid	T826	AR	0.01	mg/kg	N	032
Phenothrin	T826	AR	0.01	mg/kg	N	032
Phenthoate	T826	AR	0.01	mg/kg	N	032
Phorate	T826	AR	0.01	mg/kg	N	032
Phosalone	T826	AR	0.01	mg/kg	N	032
Phosfolan	T826	AR	0.01	mg/kg	N	032
Phosmet	T826	AR	0.01	mg/kg	N	032
Phthalimide	T826	AR	0.01	mg/kg	N	032
Picoxystrobin	T826	AR	0.01	mg/kg	N	032
Piperonyl Butoxide	T826	AR	0.01	mg/kg	N	032
Pirimicarb	T826	AR	0.01	mg/kg	N	032
Pirimiphos Ethyl	T826	AR	0.01	mg/kg	N	032
Pirimiphos methyl	T826	AR	0.01	mg/kg	N	032
Pretilachlor	T826	AR	0.01	mg/kg	N	032
Prochloraz	T826	AR	0.01	mg/kg	N	032
Procymidone	T826	AR	0.01	mg/kg	N	032
Profenofos	T826	AR	0.01	mg/kg	N	032
Prometon	T826	AR	0.01	mg/kg	N	032

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Prometryn	T826	AR	0.01	mg/kg	N	032
Propachlor	T826	AR	0.01	mg/kg	N	032
Propanil	T826	AR	0.01	mg/kg	N	032
Propaphos	T826	AR	0.01	mg/kg	N	032
Propargite	T826	AR	0.01	mg/kg	N	032
Propazine	T826	AR	0.01	mg/kg	N	032
Propetamphos	T826	AR	0.01	mg/kg	N	032
Propham	T826	AR	0.01	mg/kg	N	032
Propiconazole	T826	AR	0.01	mg/kg	N	032
Propyzamide	T826	AR	0.01	mg/kg	N	032
Proquinazid	T826	AR	0.01	mg/kg	N	032
Prosulfocarb	T826	AR	0.01	mg/kg	N	032
Prothiofos	T826	AR	0.01	mg/kg	N	032
Pyraclostrobin	T826	AR	0.01	mg/kg	N	032
Pyraflufen ethyl	T826	AR	0.01	mg/kg	N	032
Pyrazophos	T826	AR	0.01	mg/kg	N	032
Pyridaben	T826	AR	0.01	mg/kg	N	032
Pyridaphenthion	T826	AR	0.01	mg/kg	N	032
Pyrimethanil	T826	AR	0.01	mg/kg	N	032
Pyriproxyfen	T826	AR	0.01	mg/kg	N	032
Quinalphos	T826	AR	0.01	mg/kg	N	032
Quinoxyfen	T826	AR	0.01	mg/kg	N	032
Quintozene	T826	AR	0.01	mg/kg	N	032
Quizalofop-ethyl	T826	AR	0.01	mg/kg	N	032
S421	T826	AR	0.01	mg/kg	N	032
Secbumeton	T826	AR	0.01	mg/kg	N	032
Silafluofen	T826	AR	0.01	mg/kg	N	032
Simazine	T826	AR	0.01	mg/kg	N	032
Simeconazole	T826	AR	0.01	mg/kg	N	032
Sulfallate	T826	AR	0.01	mg/kg	N	032
Sulfentrazone	T826	AR	0.01	mg/kg	N	032
Sulprofos	T826	AR	0.01	mg/kg	N	032
Tau-Fluvalinate	T826	AR	0.01	mg/kg	N	032
Tebuconazole	T826	AR	0.01	mg/kg	N	032
Tebufenpyrad	T826	AR	0.01	mg/kg	N	032
Tebupirimiphos	T826	AR	0.01	mg/kg	N	032
Tecnazene	T826	AR	0.01	mg/kg	N	032
Tefluthrin	T826	AR	0.01	mg/kg	N	032
Terbacil	T826	AR	0.01	mg/kg	N	032
Terbufos	T826	AR	0.01	mg/kg	N	032
Terbumeton	T826	AR	0.01	mg/kg	N	032
Terbuthylazine	T826	AR	0.01	mg/kg	N	032
Terbutryn	T826	AR	0.01	mg/kg	N	032
Tetrachlorvinphos	T826	AR	0.01	mg/kg	N	032
Tetraconazole	T826	AR	0.01	mg/kg	N	032
Tetradifon	T826	AR	0.01	mg/kg	N	032
sulfotep	T826	AR	0.01	mg/kg	N	032
Tetramethrin	T826	AR	0.01	mg/kg	N	032
Tetrasul	T826	AR	0.01	mg/kg	N	032
Thiamethoxam	T826	AR	0.01	mg/kg	N	032
Thiobencarb	T826	AR	0.01	mg/kg	N	032
Thiocyclam	T826	AR	0.01	mg/kg	N	032
Thiometon	T826	AR	0.01	mg/kg	N	032
Tolclofos-methyl	T826	AR	0.01	mg/kg	N	032
Triadimefon	T826	AR	0.01	mg/kg	N	032
Triadimenol	T826	AR	0.01	mg/kg	N	032
Triallate	T826	AR	0.01	mg/kg	N	032
Triazamate	T826	AR	0.01	mg/kg	N	032
Triazophos	T826	AR	0.01	mg/kg	N	032
Trietazine	T826	AR	0.01	mg/kg	N	032
Trifloxystrobin	T826	AR	0.01	mg/kg	N	032
Triflumizole	T826	AR	0.01	mg/kg	N	032
Trifluralin	T826	AR	0.01	mg/kg	N	032
Uniconazole	T826	AR	0.01	mg/kg	N	032
Vinclozolin	T826	AR	0.01	mg/kg	N	032
2-(1-Naphthyl)acetamide	T310	AR	0.01	mg/kg	N	032
3-hydroxycarbofuran	T310	AR	0.01	mg/kg	N	032
6-Benzyladenine	T310	AR	0.01	mg/kg	N	032
Abamectin	T310	AR	0.01	mg/kg	N	032
Acephate	T310	AR	0.01	mg/kg	N	032

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Acetamiprid	T310	AR	0.01	mg/kg	N	032
Acibenzolar-S-methyl	T310	AR	0.01	mg/kg	N	032
Aldicarb	T310	AR	0.01	mg/kg	N	032
Aldicarb sulphone	T310	AR	0.01	mg/kg	N	032
Aldicarb sulphoxide	T310	AR	0.01	mg/kg	N	032
Aminocarb	T310	AR	0.01	mg/kg	N	032
Amitraz	T310	AR	0.01	mg/kg	N	032
Azinphos ethyl	T310	AR	0.01	mg/kg	N	032
Azinphos methyl	T310	AR	0.01	mg/kg	N	032
Azoxystrobin	T310	AR	0.01	mg/kg	N	032
Bendiocarb	T310	AR	0.01	mg/kg	N	032
Benfuracarb	T310	AR	0.01	mg/kg	N	032
Bifenazate	T310	AR	0.01	mg/kg	N	032
Butoxycarboxim	T310	AR	0.01	mg/kg	N	032
Butralin	T310	AR	0.01	mg/kg	N	032
Carbaryl	T310	AR	0.01	mg/kg	N	032
Carbendazim	T310	AR	0.01	mg/kg	N	032
Carbetamide	T310	AR	0.01	mg/kg	N	032
Carbofuran	T310	AR	0.01	mg/kg	N	032
Carpropamid	T310	AR	0.01	mg/kg	N	032
Chinomethionat	T310	AR	0.01	mg/kg	N	032
chlorantraniliprole	T310	AR	0.01	mg/kg	N	032
Chlorbromuron	T310	AR	0.01	mg/kg	N	032
Chlorfluazuron	T310	AR	0.01	mg/kg	N	032
Chloridazon	T310	AR	0.01	mg/kg	N	032
Chlorotoluron	T310	AR	0.01	mg/kg	N	032
Chlorpropham	T310	AR	0.01	mg/kg	N	032
Clofentezine	T310	AR	0.01	mg/kg	N	032
Clothianidin	T310	AR	0.01	mg/kg	N	032
Cyanazine	T310	AR	0.01	mg/kg	N	032
Cyazofamid	T310	AR	0.01	mg/kg	N	032
Cycluron	T310	AR	0.01	mg/kg	N	032
Cymoxanil	T310	AR	0.01	mg/kg	N	032
Cyromazine	T310	AR	0.01	mg/kg	N	032
Cythioate	T310	AR	0.01	mg/kg	N	032
Demeton	T310	AR	0.01	mg/kg	N	032
Demeton-s-methyl sulphone	T310	AR	0.01	mg/kg	N	032
Desmedipham	T310	AR	0.01	mg/kg	N	032
Dicrotophos	T310	AR	0.01	mg/kg	N	032
Diethofencarb	T310	AR	0.01	mg/kg	N	032
Diflubenzuron	T310	AR	0.01	mg/kg	N	032
Dimefuron	T310	AR	0.01	mg/kg	N	032
Dimethoate	T310	AR	0.01	mg/kg	N	032
Diniconazole	T310	AR	0.01	mg/kg	N	032
Dinotefuran	T310	AR	0.01	mg/kg	N	032
Dioxacarb	T310	AR	0.01	mg/kg	N	032
Disulfoton sulfoxide	T310	AR	0.01	mg/kg	N	032
Disulfoton sulphone	T310	AR	0.01	mg/kg	N	032
Diuron	T310	AR	0.01	mg/kg	N	032
DMSA	T310	AR	0.01	mg/kg	N	032
DMST	T310	AR	0.01	mg/kg	N	032
Dodemorph	T310	AR	0.01	mg/kg	N	032
Emamectin	T310	AR	0.01	mg/kg	N	032
Ethidimuron	T310	AR	0.01	mg/kg	N	032
Ethiofencarb	T310	AR	0.01	mg/kg	N	032
Ethiofencarb sulfone	T310	AR	0.01	mg/kg	N	032
Ethiofencarb sulfoxide	T310	AR	0.01	mg/kg	N	032
Ethiprole	T310	AR	0.01	mg/kg	N	032
Ethirimol	T310	AR	0.01	mg/kg	N	032
Fenamiphos sulfone	T310	AR	0.01	mg/kg	N	032
Fenamiphos sulfoxide	T310	AR	0.01	mg/kg	N	032
Fenazaquin	T310	AR	0.01	mg/kg	N	032
Fenchlorphos oxon	T310	AR	0.01	mg/kg	N	032
Fenhexamid	T310	AR	0.01	mg/kg	N	032
Fenpropidin	T310	AR	0.01	mg/kg	N	032
Fenpropimorph	T310	AR	0.01	mg/kg	N	032
Fenpyroximate	T310	AR	0.01	mg/kg	N	032
Fenthion Sulphone	T310	AR	0.01	mg/kg	N	032
Fenthion Sulphoxide	T310	AR	0.01	mg/kg	N	032
Fenuron	T310	AR	0.01	mg/kg	N	032

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Flonicamid	T310	AR	0.01	mg/kg	N	032
Fluazinam	T310	AR	0.01	mg/kg	N	032
Flufenoxuron	T310	AR	0.01	mg/kg	N	032
Fluometuron	T310	AR	0.01	mg/kg	N	032
Fluopicolide	T310	AR	0.01	mg/kg	N	032
Fluorochloridone	T310	AR	0.01	mg/kg	N	032
Flurtamone	T310	AR	0.01	mg/kg	N	032
Flutriafol	T310	AR	0.01	mg/kg	N	032
Forchlorfenuron	T310	AR	0.01	mg/kg	N	032
Formetanate	T310	AR	0.01	mg/kg	N	032
Fuberidazole	T310	AR	0.01	mg/kg	N	032
Furathiocarb	T310	AR	0.01	mg/kg	N	032
Hexaflumuron	T310	AR	0.01	mg/kg	N	032
Hexythiazox	T310	AR	0.01	mg/kg	N	032
Imazalil	T310	AR	0.01	mg/kg	N	032
Imidacloprid	T310	AR	0.01	mg/kg	N	032
Indoxacarb	T310	AR	0.01	mg/kg	N	032
Iprovalicarb	T310	AR	0.01	mg/kg	N	032
Isoprocarb	T310	AR	0.01	mg/kg	N	032
Isoproturon	T310	AR	0.01	mg/kg	N	032
Isoxaben	T310	AR	0.01	mg/kg	N	032
Karbutylate	T310	AR	0.01	mg/kg	N	032
Linuron	T310	AR	0.01	mg/kg	N	032
Lufenuron	T310	AR	0.01	mg/kg	N	032
Malaoxon	T310	AR	0.01	mg/kg	N	032
Mandipropamid	T310	AR	0.01	mg/kg	N	032
Mefenacet	T310	AR	0.01	mg/kg	N	032
Metaflumizone	T310	AR	0.01	mg/kg	N	032
Metamitron	T310	AR	0.01	mg/kg	N	032
Metconazole	T310	AR	0.01	mg/kg	N	032
Methabenzthiazuron	T310	AR	0.01	mg/kg	N	032
Methamidophos	T310	AR	0.01	mg/kg	N	032
Methiocarb	T310	AR	0.01	mg/kg	N	032
Methiocarb sulfone	T310	AR	0.01	mg/kg	N	032
Methiocarb Sulfoxide	T310	AR	0.01	mg/kg	N	032
Methomyl	T310	AR	0.01	mg/kg	N	032
Methoxyfenozide	T310	AR	0.01	mg/kg	N	032
Metobromuron	T310	AR	0.01	mg/kg	N	032
Monocrotophos	T310	AR	0.01	mg/kg	N	032
Monolinuron	T310	AR	0.01	mg/kg	N	032
Monuron	T310	AR	0.01	mg/kg	N	032
Neburon	T310	AR	0.01	mg/kg	N	032
Nicotine	T310	AR	0.01	mg/kg	N	032
Nitenpyram	T310	AR	0.01	mg/kg	N	032
Novaluron	T310	AR	0.01	mg/kg	N	032
Omethoate	T310	AR	0.01	mg/kg	N	032
Oxadiargyl	T310	AR	0.01	mg/kg	N	032
Oxamyl	T310	AR	0.01	mg/kg	N	032
Oxycarboxin	T310	AR	0.01	mg/kg	N	032
Pencycuron	T310	AR	0.01	mg/kg	N	032
Phenmedipham	T310	AR	0.01	mg/kg	N	032
Phorate sulfone	T310	AR	0.01	mg/kg	N	032
Phorate sulfoxide	T310	AR	0.01	mg/kg	N	032
Phosmet	T310	AR	0.01	mg/kg	N	032
Phosphamidon	T310	AR	0.01	mg/kg	N	032
Phoxim	T310	AR	0.01	mg/kg	N	032
Pirimicarb	T310	AR	0.01	mg/kg	N	032
Pirimicarb desmethyl	T310	AR	0.01	mg/kg	N	032
Prochloraz	T310	AR	0.01	mg/kg	N	032
Propamocarb	T310	AR	0.01	mg/kg	N	032
Propaquizafop	T310	AR	0.01	mg/kg	N	032
Propargite	T310	AR	0.01	mg/kg	N	032
Propoxur	T310	AR	0.01	mg/kg	N	032
Prothioconazole desthio	T310	AR	0.01	mg/kg	N	032
Pyraclostrobin	T310	AR	0.01	mg/kg	N	032
Pyrethrin I	T310	AR	0.01	mg/kg	N	032
Pyrifenox	T310	AR	0.01	mg/kg	N	032
Resmethrin	T310	AR	0.01	mg/kg	N	032
Spinetoram	T310	AR	0.01	mg/kg	N	032
Spinosad	T310	AR	0.01	mg/kg	N	032

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Spirodiclofen	T310	AR	0.01	mg/kg	N	032
Spiromesifen	T310	AR	0.01	mg/kg	N	032
Spirotetramat	T310	AR	0.01	mg/kg	N	032
Spiroxamine	T310	AR	0.01	mg/kg	N	032
Tebufenozide	T310	AR	0.01	mg/kg	N	032
Teflubenzuron	T310	AR	0.01	mg/kg	N	032
Temephos	T310	AR	0.01	mg/kg	N	032
Terbufos sulfone	T310	AR	0.01	mg/kg	N	032
Terbufos sulfoxide	T310	AR	0.01	mg/kg	N	032
Thiabendazole	T310	AR	0.01	mg/kg	N	032
Thiacloprid	T310	AR	0.01	mg/kg	N	032
Thiamethoxam	T310	AR	0.01	mg/kg	N	032
Thiazafluron	T310	AR	0.01	mg/kg	N	032
Thidiazuron	T310	AR	0.01	mg/kg	N	032
Thiodicarb	T310	AR	0.01	mg/kg	N	032
Thiofanox	T310	AR	0.01	mg/kg	N	032
Thiophanate Methyl	T310	AR	0.01	mg/kg	N	032
Tolylfluanid	T310	AR	0.01	mg/kg	N	032
Tribenuron methyl	T310	AR	0.01	mg/kg	N	032
Tridemorph	T310	AR	0.01	mg/kg	N	032
Triflumuron	T310	AR	0.01	mg/kg	N	032
Triflusulfuron-methyl	T310	AR	0.01	mg/kg	N	032
Triforine	T310	AR	0.01	mg/kg	N	032
Triticonazole	T310	AR	0.01	mg/kg	N	032
Vamidothion	T310	AR	0.01	mg/kg	N	032
Vernolate	T310	AR	0.01	mg/kg	N	032
Zoxamide	T310	AR	0.01	mg/kg	N	032
Fraction Organic Carbon - F(oc)	T21	AR	1	%	N	008,010,037,039,060
TPH C10-C40 (sum)	T85	M105	1	mg/kg	N	008,010,037,039,060
TPH (C10-C35)	T8	M105	1	mg/kg	M	008,010
TPH (C10-C35)	T8	M105	1	mg/kg	U	037,039,060
TPH (C35-C40)	T8	M105	1	mg/kg	N	008,010,037,039,060

CONCEPT LIFE SCIENCES
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Concept Life Sciences

Certificate of Analysis

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Report Number: Third Supplemental A 704623-3

Date of Report: 22-Jun-2018

Customer: Fugro GeoServices
Fugro House
Hithercroft Road
Wallingford
Oxfordshire
OX10 9RB

Customer Contact: Ms Karen Blackmore

Customer Job Reference:
Customer Purchase Order: 56642KB-WAL
Customer Site Reference: Heathrow HEP Package 3
Date Job Received at Concept: 18-Dec-2017
Date Analysis Started: 20-Dec-2017
Date Analysis Completed: 29-Jan-2018

The results reported relate to samples received in the laboratory and may not be representative of a whole batch.

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation

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Tests covered by this certificate were conducted in accordance with Concept Life Sciences SOPs

All results have been reviewed in accordance with Section 25 of the Concept Life Sciences, Analytical Services Quality Manual

UKAS TESTING
1549

Report checked
and authorised by :
Sara Abou-Shakra
Customer Service Manager

Issued by :
Sara Abou-Shakra
Customer Service Manager

Summary Of Results

Soil

Dioxins

Corrected to 0% Moisture

				WHO2005 Toxic Equivalents ng/kg		WHO Toxic Equivalents ng/kg	
Concept Reference	**Customer Sample Reference**	**Analysis**	**Symbol**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**
704623 023	HEP-BH-33	Dioxins and Furans (Based on US EPA 1613)	U	7.6	**19**	7.0	**19**
		Poly-Chlorinated Biphenyls (WHO 12)	U	0.75	**200**	2.7	**180**
			Sum :	8.4	**210**	9.7	**200**
704623 031	HEP-BH-5	Dioxins and Furans (Based on US EPA 1613)	U	12	**23**	13	**24**
		Poly-Chlorinated Biphenyls (WHO 12)	U	0.26	**430**	1.1	**420**
			Sum :	13	**450**	14	**440**
704623 045	HEP-BH-1810	Dioxins and Furans (Based on US EPA 1613)	U	7.7	**24**	7.1	**26**
		Poly-Chlorinated Biphenyls (WHO 12)	U	0.11	**85**	0.37	**74**
			Sum :	7.8	**110**	7.5	**99**

Soil

Customer Sample Reference : HEP-BH-33
Our Sample Reference : 704623 023
Moisture Content : 30.4 %
Hole ID : HEP-BH-33
Top Depth : 2.50
Depth : 2.50
Date Sampled : 07-DEC-2017
Time Sampled : 12:05
AGS Type : ES
AGS Sample ID : HEPBH3320171207003
AGS Sample Reference : 13
Matrix Class : Sandy Soil

Dioxins and Furans (Based on US EPA 1613)

Technique : GC/MS (HR)

						WHO2005 Toxic Equivalents ng/kg		WHO Toxic Equivalents ng/kg	
Determinand	**Symbol**	**Result ng/kg As Received @30% Moisture**	**LOD As Received @30% Moisture**	**Lower Bound ng/kg @ 0% Moisture**	**LOD @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**
2,3,7,8-TCDD	U	<2.0	2.0	<2.9	2.9	0.0	**2.9**	0.0	**2.9**
1,2,3,7,8-PeCDD	U	<2.0	2.0	<2.9	2.9	0.0	**2.9**	0.0	**2.9**
1,2,3,4,7,8-HxCDD	U	<8.0	8.0	<11	11	0.0	**1.1**	0.0	**1.1**
1,2,3,6,7,8-HxCDD	U	**9.0**	8.0	13	11	1.3	**1.3**	1.3	**1.3**
1,2,3,7,8,9-HxCDD	U	<8.0	8.0	<11	11	0.0	**1.1**	0.0	**1.1**
1,2,3,4,6,7,8-HpCDD	U	**200**	1.2	290	1.7	2.9	**2.9**	2.9	**2.9**
OCDD	U	**2300**	2.1	3300	3.0	0.99	**0.99**	0.33	**0.33**
					Dioxins Totals :	5.2	**13**	4.5	**13**
2,3,7,8-TCDF	U	<3.0	3.0	<4.3	4.3	0.0	**0.43**	0.0	**0.43**
1,2,3,7,8-PeCDF	U	<3.3	3.3	<4.7	4.7	0.0	**0.14**	0.0	**0.24**
2,3,4,7,8-PeCDF	U	<3.3	3.3	<4.7	4.7	0.0	**1.4**	0.0	**2.4**
1,2,3,4,7,8-HxCDF	U	**7.8**	0.77	11	1.1	1.1	**1.1**	1.1	**1.1**
1,2,3,6,7,8-HxCDF	U	**5.0**	0.87	7.2	1.2	0.72	**0.72**	0.72	**0.72**
2,3,4,6,7,8-HxCDF	U	<5.0	5.0	<7.2	7.2	0.0	**0.72**	0.0	**0.72**
1,2,3,7,8,9-HxCDF	U	<4.0	4.0	<5.7	5.7	0.0	**0.57**	0.0	**0.57**
1,2,3,4,6,7,8-HpCDF	U	**42**	1.8	60	2.6	0.60	**0.60**	0.60	**0.60**
1,2,3,4,7,8,9-HpCDF	U	<6.0	6.0	<8.6	8.6	0.0	**0.086**	0.0	**0.086**
OCDF	U	**83**	1.6	120	2.3	0.036	**0.036**	0.012	**0.012**
					Furans Totals :	2.5	**5.9**	2.5	**6.9**
					Totals :	**7.6**	**19**	**7.0**	**19**

Poly-Chlorinated Biphenyls (WHO 12)

Technique : GC/MS (HR)

						WHO2005 Toxic Equivalents ng/kg		WHO Toxic Equivalents ng/kg	
Determinand	**Symbol**	**Result ng/kg As Received @30% Moisture**	**LOD As Received @30% Moisture**	**Lower Bound ng/kg @ 0% Moisture**	**LOD @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**
PCB BZ#77	U	**1200**	500	1700	720	0.17	**0.17**	0.17	**0.17**
PCB BZ#81	U	(100) <500	500	<720	720	0.0	**0.22**	0.0	**0.072**
PCB BZ#105	U	**3000**	500	4300	720	0.13	**0.13**	0.43	**0.43**
PCB BZ#114	U	(100) <500	500	<720	720	0.0	**0.022**	0.0	**0.36**

PCB BZ#118	U	**6400**	500	9200	720	0.28	**0.28**	0.92	**0.92**
PCB BZ#123	U	(100, 2) <1600	1600	<2300	2300	0.0	**0.069**	0.0	**0.23**
PCB BZ#126	U	(100, 2) <1200	1200	<1700	1700	0.0	**170**	0.0	**170**
PCB BZ#156	U	**1600**	500	2300	720	0.069	**0.069**	1.1	**1.1**
PCB BZ#157	U	(100) <500	500	<720	720	0.0	**0.022**	0.0	**0.36**
PCB BZ#167	U	**2400**	500	3400	720	0.10	**0.10**	0.034	**0.034**
PCB BZ#169	U	(100) <500	500	<720	720	0.0	**22**	0.0	**7.2**
PCB BZ#189	U	(100) <500	500	<720	720	0.0	**0.022**	0.0	**0.072**
					Totals :	**0.75**	**200**	**2.7**	**180**

Soil

Customer Sample Reference : HEP-BH-5
Our Sample Reference : 704623 031
Moisture Content : 16.8 %
Top Depth : 0.80
Hole ID : HEP-BH-5
Depth : 0.80
Date Sampled : 07-DEC-2017
Time Sampled : 16:30
AGS Type : ES
AGS Sample ID : HEPBH520171207003
AGS Sample Reference : 7
Matrix Class : Clay

Dioxins and Furans (Based on US EPA 1613)

Technique : GC/MS (HR)

						WHO2005 Toxic Equivalents ng/kg		WHO Toxic Equivalents ng/kg	
Determinand	**Symbol**	**Result ng/kg As Received @17% Moisture**	**LOD As Received @17% Moisture**	**Lower Bound ng/kg @ 0% Moisture**	**LOD @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**
2,3,7,8-TCDD	U	<2.0	2.0	<2.4	2.4	0.0	**2.4**	0.0	**2.4**
1,2,3,7,8-PeCDD	U	<2.1	2.1	<2.5	2.5	0.0	**2.5**	0.0	**2.5**
1,2,3,4,7,8-HxCDD	U	<6.0	6.0	<7.2	7.2	0.0	**0.72**	0.0	**0.72**
1,2,3,6,7,8-HxCDD	U	**11**	0.80	13	0.96	1.3	**1.3**	1.3	**1.3**
1,2,3,7,8,9-HxCDD	U	**7.5**	0.80	9.0	0.96	0.90	**0.90**	0.90	**0.90**
1,2,3,4,6,7,8-HpCDD	U	**350**	1.1	420	1.3	4.2	**4.2**	4.2	**4.2**
OCDD	U	**5200**	2.3	6300	2.8	1.9	**1.9**	0.63	**0.63**
					Dioxins Totals :	8.3	**14**	7.1	**13**
2,3,7,8-TCDF	U	<6.1	6.1	<7.3	7.3	0.0	**0.73**	0.0	**0.73**
1,2,3,7,8-PeCDF	U	<4.5	4.5	<5.4	5.4	0.0	**0.16**	0.0	**0.27**
2,3,4,7,8-PeCDF	U	**8.3**	1.0	10	1.2	3.0	**3.0**	5.0	**5.0**
1,2,3,4,7,8-HxCDF	U	<12	12	<14	14	0.0	**1.4**	0.0	**1.4**
1,2,3,6,7,8-HxCDF	U	<10	10	<12	12	0.0	**1.2**	0.0	**1.2**
2,3,4,6,7,8-HxCDF	U	<8.0	8.0	<9.6	9.6	0.0	**0.96**	0.0	**0.96**
1,2,3,7,8,9-HxCDF	U	<6.0	6.0	<7.2	7.2	0.0	**0.72**	0.0	**0.72**
1,2,3,4,6,7,8-HpCDF	U	**83**	1.6	100	1.9	1.0	**1.0**	1.0	**1.0**
1,2,3,4,7,8,9-HpCDF	U	<10	10	<12	12	0.0	**0.12**	0.0	**0.12**
OCDF	U	**180**	1.5	220	1.8	0.065	**0.065**	0.022	**0.022**
					Furans Totals :	4.1	**9.4**	6.0	**11**
					Totals :	**12**	**23**	**13**	**24**

Poly-Chlorinated Biphenyls (WHO 12)

Technique : GC/MS (HR)

						WHO2005 Toxic Equivalents ng/kg		WHO Toxic Equivalents ng/kg	
Determinand	**Symbol**	**Result ng/kg As Received @17% Moisture**	**LOD As Received @17% Moisture**	**Lower Bound ng/kg @ 0% Moisture**	**LOD @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**
PCB BZ#77	U	(100) <500	500	<600	600	0.0	**0.060**	0.0	**0.060**
PCB BZ#81	U	(100) <500	500	<600	600	0.0	**0.18**	0.0	**0.060**
PCB BZ#105	U	**2200**	500	2600	600	0.079	**0.079**	0.26	**0.26**
PCB BZ#114	U	(100) <500	500	<600	600	0.0	**0.018**	0.0	**0.30**

PCB BZ#118	U	**3700**	500	4400	600	0.13	**0.13**	0.44	**0.44**
PCB BZ#123	U	(100, 2) <880	880	<1100	1100	0.0	**0.032**	0.0	**0.11**
PCB BZ#126	U	(100, 2) <3400	3400	<4100	4100	0.0	**410**	0.0	**410**
PCB BZ#156	U	**690**	500	830	600	0.025	**0.025**	0.41	**0.41**
PCB BZ#157	U	(100) <500	500	<600	600	0.0	**0.018**	0.0	**0.30**
PCB BZ#167	U	**730**	500	880	600	0.026	**0.026**	0.0088	**0.0088**
PCB BZ#169	U	(100) <500	500	<600	600	0.0	**18**	0.0	**6.0**
PCB BZ#189	U	(100) <500	500	<600	600	0.0	**0.018**	0.0	**0.060**
					Totals :	**0.26**	**430**	**1.1**	**420**

Soil

Customer Sample Reference : HEP-BH-1810
Our Sample Reference : 704623 045
Moisture Content : 23.5 %
Hole ID : HEP-BH-1810
Depth : 1.80
Top Depth : 1.80
Date Sampled : 11-DEC-2017
Time Sampled : 12:00
AGS Type : ES
AGS Sample ID : FES2171211012
AGS Sample Reference : 12
Matrix Class : Sandy Soil

Dioxins and Furans (Based on US EPA 1613)

Technique : GC/MS (HR)

						WHO2005 Toxic Equivalents ng/kg		WHO Toxic Equivalents ng/kg	
Determinand	**Symbol**	**Result ng/kg As Received @24% Moisture**	**LOD As Received @24% Moisture**	**Lower Bound ng/kg @ 0% Moisture**	**LOD @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**
2,3,7,8-TCDD	U	<2.0	2.0	<2.6	2.6	0.0	**2.6**	0.0	**2.6**
1,2,3,7,8-PeCDD	U	<3.1	3.1	<4.1	4.1	0.0	**4.1**	0.0	**4.1**
1,2,3,4,7,8-HxCDD	U	<8.0	8.0	<10	10	0.0	**1.0**	0.0	**1.0**
1,2,3,6,7,8-HxCDD	U	<8.0	8.0	<10	10	0.0	**1.0**	0.0	**1.0**
1,2,3,7,8,9-HxCDD	U	<8.0	8.0	<10	10	0.0	**1.0**	0.0	**1.0**
1,2,3,4,6,7,8-HpCDD	U	**200**	1.5	260	2.0	2.6	**2.6**	2.6	**2.6**
OCDD	U	**2100**	1.8	2700	2.4	0.82	**0.82**	0.27	**0.27**
					Dioxins Totals :	3.4	**13**	2.9	**13**
2,3,7,8-TCDF	U	<9.3	9.3	<12	12	0.0	**1.2**	0.0	**1.2**
1,2,3,7,8-PeCDF	U	<9.0	9.0	<12	12	0.0	**0.35**	0.0	**0.59**
2,3,4,7,8-PeCDF	U	<9.4	9.4	<12	12	0.0	**3.7**	0.0	**6.1**
1,2,3,4,7,8-HxCDF	U	**12**	0.84	16	1.1	1.6	**1.6**	1.6	**1.6**
1,2,3,6,7,8-HxCDF	U	**5.5**	0.96	7.2	1.3	0.72	**0.72**	0.72	**0.72**
2,3,4,6,7,8-HxCDF	U	**8.1**	0.89	11	1.2	1.1	**1.1**	1.1	**1.1**
1,2,3,7,8,9-HxCDF	U	<6.0	6.0	<7.8	7.8	0.0	**0.78**	0.0	**0.78**
1,2,3,4,6,7,8-HpCDF	U	**67**	1.7	88	2.2	0.88	**0.88**	0.88	**0.88**
1,2,3,4,7,8,9-HpCDF	U	<10	10	<13	13	0.0	**0.13**	0.0	**0.13**
OCDF	U	**130**	1.7	170	2.2	0.051	**0.051**	0.017	**0.017**
					Furans Totals :	4.3	**10**	4.2	**13**
					Totals :	**7.7**	**24**	**7.1**	**26**

Poly-Chlorinated Biphenyls (WHO 12)

Technique : GC/MS (HR)

						WHO2005 Toxic Equivalents ng/kg		WHO Toxic Equivalents ng/kg	
Determinand	**Symbol**	**Result ng/kg As Received @24% Moisture**	**LOD As Received @24% Moisture**	**Lower Bound ng/kg @ 0% Moisture**	**LOD @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**
PCB BZ#77	U	(100) <500	500	<650	650	0.0	**0.065**	0.0	**0.065**
PCB BZ#81	U	(100) <500	500	<650	650	0.0	**0.20**	0.0	**0.065**
PCB BZ#105	U	**1000**	500	1300	650	0.039	**0.039**	0.13	**0.13**
PCB BZ#114	U	(100) <500	500	<650	650	0.0	**0.020**	0.0	**0.33**

PCB BZ#118	U	**1800**	500	2400	650	0.071	**0.071**	0.24	**0.24**
PCB BZ#123	U	(100) <500	500	<650	650	0.0	**0.020**	0.0	**0.065**
PCB BZ#126	U	(100) <500	500	<650	650	0.0	**65**	0.0	**65**
PCB BZ#156	U	(100) <500	500	<650	650	0.0	**0.020**	0.0	**0.33**
PCB BZ#157	U	(100) <500	500	<650	650	0.0	**0.020**	0.0	**0.33**
PCB BZ#167	U	(2, 100) <590	590	<770	770	0.0	**0.023**	0.0	**0.0077**
PCB BZ#169	U	(100) <500	500	<650	650	0.0	**20**	0.0	**6.5**
PCB BZ#189	U	(100) <500	500	<650	650	0.0	**0.020**	0.0	**0.065**
					Totals :	**0.11**	**85**	**0.37**	**74**

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**704623 002**	**704623 003**	**704623 004**	**704623 008**	**704623 010**
				Customer Sample Reference	**HEP-BH-13**	**HEP-BH-17**	**HEP-BH-17**	**HEP-BH-23**	**HEP-BH-23**
				Test Sample	**AR**	**AR**	**AR**	**AR**	**AR**
				Depth	**0.30**	**1.20**	**1.70**	**2.00**	**3.80**
				Hole ID	**HEP-BH-13**	**HEP-BH-17**	**HEP-BH-17**	**HEP-BH-23**	**HEP-BH-23**
				Top Depth	**0.30**	**1.20**	**1.70**	**2.00**	**3.80**
				Date Sampled	**08-DEC-2017**	**12-DEC-2017**	**12-DEC-2017**	**05-DEC-2017**	**05-DEC-2017**
				Time Sampled	**12:00**	**09:52**	**10:17**	**13:00**	**15:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH132017120 8002**	**HEPBH172017121 2001**	**HEPBH172017121 2002**	**HEPBH232017120 5001**	**HEPBH232017120 5003**
				AGS Sample Reference	**4**	**10**	**13**	**9**	**19**
				Matrix Class	**Topsoil**	**Sandy Soil**	**Clay**	**Sandy Soil**	**Clay**
Determinand	**Method**	**LOD**	**Units**	**Symbol**					
Moisture @105C	Grav (1 Dec) (105 C)	0.1	%	N	**13**	**16**	**26**	**12**	**4.2**

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**704623 016**	**704623 017**	**704623 021**	**704623 022**	**704623 023**
				Customer Sample Reference	**HEP-BH-25**	**HEP-BH-25**	**HEP-BH-33**	**HEP-BH-33**	**HEP-BH-33**
				Test Sample	**AR**	**AR**	**AR**	**AR**	**AR**
				Depth	**2.30**	**3.40**	**1.20**	**1.50**	**2.50**
				Hole ID	**HEP-BH-25**	**HEP-BH-25**	**HEP-BH-33**	**HEP-BH-33**	**HEP-BH-33**
				Top Depth	**2.30**	**3.40**	**1.20**	**1.50**	**2.50**
				Date Sampled	**12-DEC-2017**	**12-DEC-2017**	**07-DEC-2017**	**07-DEC-2017**	**07-DEC-2017**
				Time Sampled	**11:00**	**13:35**	**11:20**	**11:47**	**12:05**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**FES1171212008**	**FES1171212013**	**HEPBH332017120 7001**	**HEPBH332017120 7002**	**HEPBH332017120 7003**
				AGS Sample Reference	**14**	**19**	**7**	**10**	**13**
				Matrix Class	**Clay**	**Fill**	**Sandy Soil**	**Topsoil**	**Sandy Soil**
Determinand	**Method**	**LOD**	**Units**	**Symbol**					
Moisture @105C	Grav (1 Dec) (105 C)	0.1	%	N	**12**	**1.6**	**15**	**33**	**30**

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**704623 024**	**704623 026**	**704623 027**	**704623 028**	**704623 030**
				Customer Sample Reference	**HEP-BH-33**	**HEP-BH-36**	**HEP-BH-36**	**HEP-BH-36**	**HEP-BH-5**
				Test Sample	**AR**	**AR**	**AR**	**AR**	**AR**
				Depth	**3.20**	**0.40**	**1.00**	**2.00**	**0.45**
				Hole ID	**HEP-BH-33**	**HEP-BH-36**	**HEP-BH-36**	**HEP-BH-36**	**HEP-BH-5**
				Top Depth	**3.20**	**0.40**	**1.00**	**2.00**	**0.45**
				Date Sampled	**07-DEC-2017**	**11-DEC-2017**	**11-DEC-2017**	**11-DEC-2017**	**07-DEC-2017**
				Time Sampled	**14:20**	**12:00**	**13:00**	**14:00**	**13:50**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH332017120 7004**	**FES4171212006**	**FES4171212010**	**FES4171212013**	**HEPBH520171207 002**
				AGS Sample Reference	**16**	**6**	**10**	**13**	**4**
				Matrix Class	**Clay**	**Sandy Soil**	**Clay**	**Fill**	**Sandy Soil**
Determinand	**Method**	**LOD**	**Units**	**Symbol**					
Moisture @105C	Grav (1 Dec) (105 C)	0.1	%	N	**25**	**9.7**	**24**	**7.2**	**14**

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**704623 031**	**704623 032**	**704623 033**	**704623 037**	**704623 039**
				Customer Sample Reference	**HEP-BH-5**	**HEP-BH-1802**	**HEP-BH-1802**	**HEP-BH-1804**	**HEP-BH-1804**
				Test Sample	**AR**	**AR**	**AR**	**AR**	**AR**
				Depth	**0.80**	**1.20**	**2.00**	**1.20**	**3.00**
				Hole ID	**HEP-BH-5**	**HEP-BH-1802**	**HEP-BH-1802**	**HEP-BH-1804**	**HEP-BH-1804**
				Top Depth	**0.80**	**1.20**	**2.00**	**1.20**	**3.00**
				Date Sampled	**07-DEC-2017**	**08-DEC-2017**	**08-DEC-2017**	**06-DEC-2017**	**06-DEC-2017**
				Time Sampled	**16:30**	**10:00**	**11:00**	**12:00**	**13:20**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH520171207003**	**HEPBH180220171208001**	**HEPBH180220171208002**	**HEPBH180420171206001**	**HEPBH180420171206003**
				AGS Sample Reference	**7**	**10**	**13**	**12**	**19**
				Matrix Class	**Clay**	**Fill**	**Fill**	**Fill**	**Fill**
Determinand	**Method**	**LOD**	**Units**	**Symbol**					
Moisture @105C	Grav (1 Dec) (105 C)	0.1	%	N	**17**	**1.1**	**3.2**	**6.9**	**14**

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**704623 043**	**704623 045**	**704623 046**	**704623 048**	**704623 050**
				Customer Sample Reference	**HEP-BH-1810**	**HEP-BH-1810**	**HEP-BH-1810**	**HEP-BH-1810**	**HEP-BH-1810**
				Test Sample	**AR**	**AR**	**AR**	**AR**	**AR**
				Depth	**0.50**	**1.80**	**2.80**	**4.80**	**7.20**
				Hole ID	**HEP-BH-1810**	**HEP-BH-1810**	**HEP-BH-1810**	**HEP-BH-1810**	**HEP-BH-1810**
				Top Depth	**0.50**	**1.80**	**2.80**	**4.80**	**7.20**
				Date Sampled	**11-DEC-2017**	**11-DEC-2017**	**11-DEC-2017**	**11-DEC-2017**	**11-DEC-2017**
				Time Sampled	**10:00**	**12:00**	**13:00**	**14:30**	**16:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**FES2171211005**	**FES2171211012**	**FES2171211015**	**FES2171211021**	**FES2171211030**
				AGS Sample Reference	**5**	**12**	**15**	**21**	**30**
				Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Clay**	**Clay**
Determinand	**Method**	**LOD**	**Units**	**Symbol**					
Moisture @105C	Grav (1 Dec) (105 C)	0.1	%	N	**6.1**	**24**	**23**	**26**	**27**

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**704623 054**	**704623 055**	**704623 060**	**704623 064**	**704623 066**
				Customer Sample Reference	**HEP-BH-1863**	**HEP-BH-1863**	**HEP-BH-36**	**HEP-TP-10**	**HEP-TP-10**
				Test Sample	**AR**	**AR**	**AR**	**AR**	**AR**
				Depth	**0.30**	**0.85**	**6.90**	**0.20**	**1.30**
				Hole ID	**HEP-BH-1863**	**HEP-BH-1863**	**HEP-BH-36**	**HEP-TP-10**	**HEP-TP-10**
				Top Depth	**0.30**	**0.85**	**6.90**	**0.20**	**1.30**
				Date Sampled	**11-DEC-2017**	**11-DEC-2017**	**12-DEC-2017**	**12-DEC-2017**	**12-DEC-2017**
				Time Sampled	**13:30**	**14:40**	**13:00**	**11:00**	**13:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH186320171211002**	**HEPBH186320171211003**	**HEPBH362017121 2005**	**HEPTP1020171212001**	**HEPTP1020171212003**
				AGS Sample Reference	**4**	**7**	**28**	**3**	**9**
				Matrix Class	**Sandy Soil**	**Sandy Soil**	**Fill**	**Sandy Soil**	**Topsoil**
Determinand	**Method**	**LOD**	**Units**	**Symbol**					
Moisture @105C	Grav (1 Dec) (105 C)	0.1	%	N	**19**	**7.5**	**24**	**13**	**4.0**

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

Concept Reference	**704623 067**
Customer Sample Reference	**HEP-TP-10**
Test Sample	**AR**
Depth	**2.00**
Hole ID	**HEP-TP-10**
Top Depth	**2.00**
Date Sampled	**12-DEC-2017**
Time Sampled	**14:00**
AGS Type	**ES**
AGS Sample ID	**HEPTP1020171212004**
AGS Sample Reference	**12**
Matrix Class	**Sandy Soil**

Determinand	Method	LOD	Units	Symbol	
Moisture @105C	Grav (1 Dec) (105 C)	0.1	%	N	**4.1**

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

Concept Reference					**704623 002**	**704623 003**	**704623 004**	**704623 008**	**704623 010**
Customer Sample Reference					**HEP-BH-13**	**HEP-BH-17**	**HEP-BH-17**	**HEP-BH-23**	**HEP-BH-23**
Test Sample					**M40**	**M40**	**M40**	**M40**	**M40**
Depth					**0.30**	**1.20**	**1.70**	**2.00**	**3.80**
Hole ID					**HEP-BH-13**	**HEP-BH-17**	**HEP-BH-17**	**HEP-BH-23**	**HEP-BH-23**
Top Depth					**0.30**	**1.20**	**1.70**	**2.00**	**3.80**
Date Sampled					**08-DEC-2017**	**12-DEC-2017**	**12-DEC-2017**	**05-DEC-2017**	**05-DEC-2017**
Time Sampled					**12:00**	**09:52**	**10:17**	**13:00**	**15:00**
AGS Type					**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID					**HEPBH13201712080 02**	**HEPBH17201712120 01**	**HEPBH17201712120 02**	**HEPBH23201712050 01**	**HEPBH23201712050 03**
AGS Sample Reference					**4**	**10**	**13**	**9**	**19**
Matrix Class					**Topsoil**	**Sandy Soil**	**Clay**	**Sandy Soil**	**Clay**
Determinand	**Method**	**LOD**	**Units**	**Symbol**					
Retained on 10mm sieve	Grav	0.1	%	N	<0.1	<0.1	<0.1	<0.1	<0.1

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

Concept Reference					**704623 016**	**704623 017**	**704623 021**	**704623 022**	**704623 023**
Customer Sample Reference					**HEP-BH-25**	**HEP-BH-25**	**HEP-BH-33**	**HEP-BH-33**	**HEP-BH-33**
Test Sample					**M40**	**M40**	**M40**	**M40**	**M40**
Depth					**2.30**	**3.40**	**1.20**	**1.50**	**2.50**
Hole ID					**HEP-BH-25**	**HEP-BH-25**	**HEP-BH-33**	**HEP-BH-33**	**HEP-BH-33**
Top Depth					**2.30**	**3.40**	**1.20**	**1.50**	**2.50**
Date Sampled					**12-DEC-2017**	**12-DEC-2017**	**07-DEC-2017**	**07-DEC-2017**	**07-DEC-2017**
Time Sampled					**11:00**	**13:35**	**11:20**	**11:47**	**12:05**
AGS Type					**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID					**FES1171212008**	**FES1171212013**	**HEPBH33201712070 01**	**HEPBH33201712070 02**	**HEPBH33201712070 03**
AGS Sample Reference					**14**	**19**	**7**	**10**	**13**
Matrix Class					**Clay**	**Fill**	**Sandy Soil**	**Topsoil**	**Sandy Soil**
Determinand	**Method**	**LOD**	**Units**	**Symbol**					
Retained on 10mm sieve	Grav	0.1	%	N	<0.1	<0.1	<0.1	<0.1	<0.1

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**704623 024**	**704623 026**	**704623 027**	**704623 028**	**704623 030**
				Customer Sample Reference	**HEP-BH-33**	**HEP-BH-36**	**HEP-BH-36**	**HEP-BH-36**	**HEP-BH-5**
				Test Sample	**M40**	**M40**	**M40**	**M40**	**M40**
				Depth	**3.20**	**0.40**	**1.00**	**2.00**	**0.45**
				Hole ID	**HEP-BH-33**	**HEP-BH-36**	**HEP-BH-36**	**HEP-BH-36**	**HEP-BH-5**
				Top Depth	**3.20**	**0.40**	**1.00**	**2.00**	**0.45**
				Date Sampled	**07-DEC-2017**	**11-DEC-2017**	**11-DEC-2017**	**11-DEC-2017**	**07-DEC-2017**
				Time Sampled	**14:20**	**12:00**	**13:00**	**14:00**	**13:50**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH33201712070 04**	**FES4171212006**	**FES4171212010**	**FES4171212013**	**HEPBH52017120700 2**
				AGS Sample Reference	**16**	**6**	**10**	**13**	**4**
				Matrix Class	**Clay**	**Sandy Soil**	**Clay**	**Fill**	**Sandy Soil**
Determinand	**Method**	**LOD**	**Units**	**Symbol**					
Retained on 10mm sieve	Grav	0.1	%	N	<0.1	<0.1	<0.1	<0.1	<0.1

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**704623 031**	**704623 032**	**704623 033**	**704623 037**	**704623 039**
				Customer Sample Reference	**HEP-BH-5**	**HEP-BH-1802**	**HEP-BH-1802**	**HEP-BH-1804**	**HEP-BH-1804**
				Test Sample	**M40**	**M40**	**M40**	**M40**	**M40**
				Depth	**0.80**	**1.20**	**2.00**	**1.20**	**3.00**
				Hole ID	**HEP-BH-5**	**HEP-BH-1802**	**HEP-BH-1802**	**HEP-BH-1804**	**HEP-BH-1804**
				Top Depth	**0.80**	**1.20**	**2.00**	**1.20**	**3.00**
				Date Sampled	**07-DEC-2017**	**08-DEC-2017**	**08-DEC-2017**	**06-DEC-2017**	**06-DEC-2017**
				Time Sampled	**16:30**	**10:00**	**11:00**	**12:00**	**13:20**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH52017120700 3**	**HEPBH18022017120 8001**	**HEPBH18022017120 8002**	**HEPBH18042017120 6001**	**HEPBH18042017120 6003**
				AGS Sample Reference	**7**	**10**	**13**	**12**	**19**
				Matrix Class	**Clay**	**Fill**	**Fill**	**Fill**	**Fill**
Determinand	**Method**	**LOD**	**Units**	**Symbol**					
Retained on 10mm sieve	Grav	0.1	%	N	<0.1	<0.1	<0.1	<0.1	<0.1

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**704623 043**	**704623 045**	**704623 046**	**704623 048**	**704623 050**
				Customer Sample Reference	**HEP-BH-1810**	**HEP-BH-1810**	**HEP-BH-1810**	**HEP-BH-1810**	**HEP-BH-1810**
				Test Sample	**M40**	**M40**	**M40**	**M40**	**M40**
				Depth	**0.50**	**1.80**	**2.80**	**4.80**	**7.20**
				Hole ID	**HEP-BH-1810**	**HEP-BH-1810**	**HEP-BH-1810**	**HEP-BH-1810**	**HEP-BH-1810**
				Top Depth	**0.50**	**1.80**	**2.80**	**4.80**	**7.20**
				Date Sampled	**11-DEC-2017**	**11-DEC-2017**	**11-DEC-2017**	**11-DEC-2017**	**11-DEC-2017**
				Time Sampled	**10:00**	**12:00**	**13:00**	**14:30**	**16:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**FES2171211005**	**FES2171211012**	**FES2171211015**	**FES2171211021**	**FES2171211030**
				AGS Sample Reference	**5**	**12**	**15**	**21**	**30**
				Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Clay**	**Clay**
Determinand	**Method**	**LOD**	**Units**	**Symbol**					
Retained on 10mm sieve	Grav	0.1	%	N	<0.1	<0.1	<0.1	<0.1	<0.1

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**704623 054**	**704623 055**	**704623 060**	**704623 064**	**704623 066**
				Customer Sample Reference	**HEP-BH-1863**	**HEP-BH-1863**	**HEP-BH-36**	**HEP-TP-10**	**HEP-TP-10**
				Test Sample	**M40**	**M40**	**M40**	**M40**	**M40**
				Depth	**0.30**	**0.85**	**6.90**	**0.20**	**1.30**
				Hole ID	**HEP-BH-1863**	**HEP-BH-1863**	**HEP-BH-36**	**HEP-TP-10**	**HEP-TP-10**
				Top Depth	**0.30**	**0.85**	**6.90**	**0.20**	**1.30**
				Date Sampled	**11-DEC-2017**	**11-DEC-2017**	**12-DEC-2017**	**12-DEC-2017**	**12-DEC-2017**
				Time Sampled	**13:30**	**14:40**	**13:00**	**11:00**	**13:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH18632017121 1002**	**HEPBH18632017 1211003**	**HEPBH36201712120 05**	**HEPTP10201712120 01**	**HEPTP10201712120 03**
				AGS Sample Reference	**4**	**7**	**28**	**3**	**9**
				Matrix Class	**Sandy Soil**	**Sandy Soil**	**Fill**	**Sandy Soil**	**Topsoil**
Determinand	**Method**	**LOD**	**Units**	**Symbol**					
Retained on 10mm sieve	Grav	0.1	%	N	<0.1	<0.1	<0.1	<0.1	<0.1

Concept Reference: 704623
Project Site: Heathrow HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**704623 067**	
				Customer Sample Reference	**HEP-TP-10**	
				Test Sample	**M40**	
				Depth	**2.00**	
				Hole ID	**HEP-TP-10**	
				Top Depth	**2.00**	
				Date Sampled	**12-DEC-2017**	
				Time Sampled	**14:00**	
				AGS Type	**ES**	
				AGS Sample ID	**HEPTP10201712120 04**	
				AGS Sample Reference	**12**	
				Matrix Class	**Sandy Soil**	
Determinand	**Method**	**LOD**	**Units**	**Symbol**		
Retained on 10mm sieve	Grav	0.1	%	N	<0.1	

Index to symbols used in Third Supplemental A 704623-3

Value	Description
AR	As Received
M40	Analysis conducted on sample assisted dried at no more than 40C. Results are reported on a dry weight basis.
100	LOD determined by sample aliquot used for analysis
2	LOD Raised Due to Matrix Interference
U	Analysis is UKAS accredited
N	Analysis is not UKAS accredited

Notes

Third Supplemental A to report Dioxins and PCBS only.
"Fill" samples are outside the scope of our MCERTS accreditation. Results are UKAS only

CONCEPT LIFE SCIENCES
DELIVERING SCIENCE

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Concept Life Sciences

Certificate of Analysis

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M16 9FE
Tel : 0161 874 2400
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Report Number: 4th supplemental 706211-5 Repot C

Date of Report: 27-Jun-2018

Customer: Fugro GeoServices
Fugro House
Hithercroft Road
Wallingford
Oxfordshire
OX10 9RB

Customer Contact: Ms Karen Blackmore

Customer Job Reference:
Customer Purchase Order: 56642KB-WAL
Customer Site Reference: HEP Package 3
Date Job Received at Concept: 15-Dec-2017
Date Analysis Started: 29-Dec-2017
Date Analysis Completed: 27-Feb-2018

The results reported relate to samples received in the laboratory and may not be representative of a whole batch.

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation

This report should not be reproduced except in full without the written approval of the laboratory

Tests covered by this certificate were conducted in accordance with Concept Life Sciences SOPs

All results have been reviewed in accordance with Section 25 of the Concept Life Sciences, Analytical Services Quality Manual

UKAS TESTING
1549

mCERTS
THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME

Report checked and authorised by :
Aleksandra Pacula
Senior Customer Service Advisor

Issued by :
Aleksandra Pacula
Senior Customer Service Advisor

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**706211 006**	**706211 008**	**706211 010**	**706211 015**	**706211 017**
				Customer Sample Reference	**HEP-BH-14**	**HEP-BH-14**	**HEP-BH-14**	**HEP-BH-16**	**HEP-BH-16**
				Top Depth	**0.60**	**2.00**	**5.00**	**1.70**	**3.70**
				Hole ID	**HEP-BH-14**	**HEP-BH-14**	**HEP-BH-14**	**HEP-BH-16**	**HEP-BH-16**
				Depth	**0.60**	**2.00**	**5.00**	**1.70**	**3.70**
				Date Sampled	**13-DEC-2017**	**14-DEC-2017**	**14-DEC-2017**	**14-DEC-2017**	**14-DEC-2017**
				Time Sampled	**13:30**	**10:30**	**12:30**	**14:30**	**15:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH1420171213002**	**HEPBH1420171214001**	**HEPBH1420171214003**	**HEPBH1620171214001**	**HEPBH1620171214003**
				AGS Sample Reference	**6**	**14**	**27**	**8**	**15**
				Matrix Class	**Sandy Soil**	**Clay**	**Clay**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Moisture @105C	T162	AR	0.1	%	**18**	**22**	**27**	**15**	**19**
Retained on 10mm sieve	T2	M40	0.1	%	<0.1	<0.1	<0.1	<0.1	**1.7**

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**706211 019**	**706211 021**	**706211 041**	**706211 042**	**706211 044**
				Customer Sample Reference	**HEP-BH-16**	**HEP-BH-16**	**HEP-BH-13**	**HEP-BH-13**	**HEP-BH-13**
				Top Depth	**5.70**	**7.50**	**1.20**	**2.20**	**4.20**
				Hole ID	**HEP-BH-16**	**HEP-BH-16**	**HEP-BH-13**	**HEP-BH-13**	**HEP-BH-13**
				Depth	**5.70**	**7.50**	**1.20**	**2.20**	**4.20**
				Date Sampled	**15-DEC-2017**	**15-DEC-2017**	**14-DEC-2017**	**14-DEC-2017**	**14-DEC-2017**
				Time Sampled	**09:00**	**10:30**	**12:20**	**12:30**	**13:10**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH1620171215001**	**HEPBH1620171215003**	**HEPBH186320171214001**	**HEPBH186320171214002**	**HEPBH186320171214004**
				AGS Sample Reference	**20**	**26**	**10**	**13**	**19**
				Matrix Class	**Sandy Soil**	**Clay**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Moisture @105C	T162	AR	0.1	%	**24**	**22**	**11**	**21**	**19**
Retained on 10mm sieve	T2	M40	0.1	%	<0.1	<0.1	**3.9**	<0.1	<0.1

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**706211 046**	**706211 047**	**706211 049**	**706211 050**	**706211 054**
				Customer Sample Reference	**HEP-BH-13**	**HEP-BH-1864**	**HEP-BH-1864**	**HEP-BH-1864**	**HEP-BH-20**
				Top Depth	**6.50**	**1.20**	**3.20**	**4.20**	**0.60**
				Hole ID	**HEP-BH-13**	**HEP-BH-1864**	**HEP-BH-1864**	**HEP-BH-1864**	**HEP-BH-20**
				Depth	**6.50**	**1.20**	**3.20**	**4.20**	**0.60**
				Date Sampled	**15-DEC-2017**	**18-DEC-2017**	**18-DEC-2017**	**18-DEC-2017**	**18-DEC-2017**
				Time Sampled	**11:00**	**13:30**	**15:20**	**16:10**	**14:25**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH186320171215002**	**HEPBH186420171218001**	**HEPBH186420171218003**	**HEPBH186420171218004**	**HEPBH202017121800 3**
				AGS Sample Reference	**25**	**4**	**10**	**15**	**7**
				Matrix Class	**Sandy Soil**	**Sandy Soil**	**Clay**	**Fill**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Moisture @105C	T162	AR	0.1	%	**18**	**16**	**16**	**12**	**12**
Retained on 10mm sieve	T2	M40	0.1	%	<0.1	<0.1	<0.1	**1.9**	<0.1

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**706211 056**	**706211 062**	**706211 064**	**706211 067**	**706211 074**
				Customer Sample Reference	**HEP-BH-20**	**HEP-BH-43**	**HEP-BH-43**	**HEP-BH-43**	**HEP-BH-44**
				Top Depth	**2.40**	**0.10**	**1.90**	**4.90**	**0.10**
				Hole ID	**HEP-BH-20**	**HEP-BH-43**	**HEP-BH-43**	**HEP-BH-43**	**HEP-BH-44**
				Depth	**2.40**	**0.10**	**1.90**	**4.90**	**0.10**
				Date Sampled	**18-DEC-2017**	**13-DEC-2017**	**14-DEC-2017**	**15-DEC-2017**	**18-DEC-2017**
				Time Sampled	**14:51**	**14:05**	**15:00**	**11:00**	**15:05**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH2020171218005**	**HEPBH4320171213001**	**HEPBH4320171214001**	**HEPBH4320171215003**	**HEPBH4420171218001**
				AGS Sample Reference	**17**	**1**	**5**	**16**	**1**
				Matrix Class	**Clay**	**Sandy Soil**	**Clay**	**Fill**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Moisture @105C	T162	AR	0.1	%	**14**	**15**	**17**	**3.2**	**26**
Retained on 10mm sieve	T2	M40	0.1	%	<0.1	<0.1	<0.1	**1.8**	<0.1

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**706211 077**	**706211 082**	**706211 084**	**706211 086**	**706211 087**
				Customer Sample Reference	**HEP-BH-7**	**HEP-BH-7**	**HEP-BH-7**	**HEP-TP-1296**	**HEP-TP-1296**
				Top Depth	**0.70**	**4.30**	**6.30**	**0.40**	**1.30**
				Hole ID	**HEP-BH-7**	**HEP-BH-7**	**HEP-BH-7**	**HEP-TP-1296**	**HEP-TP-1296**
				Depth	**0.70**	**4.30**	**6.30**	**0.40**	**1.30**
				Date Sampled	**13-DEC-2017**	**14-DEC-2017**	**14-DEC-2017**	**13-DEC-2017**	**13-DEC-2017**
				Time Sampled	**15:35**	**10:50**	**13:05**	**11:00**	**12:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH720171213002**	**HEPBH720171214004**	**HEPBH720171214006**	**HEPBH1296201712130 02**	**HEPBH1296201712130 03**
				AGS Sample Reference	**4**	**27**	**37**	**6**	**9**
				Matrix Class	**Topsoil**	**Fill**	**Clay**	**Topsoil**	**Topsoil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Moisture @105C	T162	AR	0.1	%	**27**	**7.8**	**22**	**33**	**26**
Retained on 10mm sieve	T2	M40	0.1	%	<0.1	<0.1	**0.9**	**2.2**	<0.1

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**706211 089**	**706211 091**	**706211 093**	**706211 094**
				Customer Sample Reference	**HEP-TP-1296**	**HEP-TT-19**	**HEP-TT-19**	**HEP-TT-19**
				Top Depth	**2.70**	**0.30**	**2.20**	**3.10**
				Hole ID	**HEP-TP-1296**	**HEP-TT-19**	**HEP-TT-19**	**HEP-TT-19**
				Depth	**2.70**	**0.30**	**2.20**	**3.10**
				Date Sampled	**13-DEC-2017**	**13-DEC-2017**	**13-DEC-2017**	**13-DEC-2017**
				Time Sampled	**14:00**	**11:00**	**14:00**	**15:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH1296201712130 05**	**HEPTT1920171213002**	**HEPTT1920171213004**	**HEPTT1920171213005**
				AGS Sample Reference	**15**	**6**	**12**	**15**
				Matrix Class	**Sandy Soil**	**Sandy Soil**	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**				
Moisture @105C	T162	AR	0.1	%	**13**	**17**	**24**	**13**
Retained on 10mm sieve	T2	M40	0.1	%	<0.1	<0.1	<0.1	<0.1

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - Inorganics

				Concept Reference	**706211 006**	**706211 008**	**706211 010**	**706211 015**	**706211 017**
				Customer Sample Reference	**HEP-BH-14**	**HEP-BH-14**	**HEP-BH-14**	**HEP-BH-16**	**HEP-BH-16**
				Top Depth	**0.60**	**2.00**	**5.00**	**1.70**	**3.70**
				Hole ID	**HEP-BH-14**	**HEP-BH-14**	**HEP-BH-14**	**HEP-BH-16**	**HEP-BH-16**
				Depth	**0.60**	**2.00**	**5.00**	**1.70**	**3.70**
				Date Sampled	**13-DEC-2017**	**14-DEC-2017**	**14-DEC-2017**	**14-DEC-2017**	**14-DEC-2017**
				Time Sampled	**13:30**	**10:30**	**12:30**	**14:30**	**15:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH1420171213002**	**HEPBH1420171214001**	**HEPBH1420171214003**	**HEPBH1620171214001**	**HEPBH1620171214003**
				AGS Sample Reference	**6**	**14**	**27**	**8**	**15**
				Matrix Class	**Sandy Soil**	**Clay**	**Clay**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Chloride	T686	AR	1	mg/kg	**4**	**44**	**56**	**2**	**12**
Cyanide(Total)	T4	AR	1	mg/kg	<1	**130**	**6**	<1	<1
Thiocyanate	T4	A40	1	mg/kg	<10	<10	<10	<10	<10
Nitrate	T686	AR	1	mg/kg	**12**	**2**	**3**	**30**	**4**
Nitrite	T686	AR	1	mg/kg	<1	<1	<1	<1	<1
SO4(Total)	T6	A40	0.01	%	**0.55**	**1.1**	**0.41**	**0.37**	**0.78**
Sulphide	T4	A40	10	mg/kg	**11**	**910**	**28**	**60**	**140**

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - Inorganics

				Concept Reference	**706211 019**	**706211 021**	**706211 041**	**706211 042**	**706211 044**
				Customer Sample Reference	**HEP-BH-16**	**HEP-BH-16**	**HEP-BH-13**	**HEP-BH-13**	**HEP-BH-13**
				Top Depth	**5.70**	**7.50**	**1.20**	**2.20**	**4.20**
				Hole ID	**HEP-BH-16**	**HEP-BH-16**	**HEP-BH-13**	**HEP-BH-13**	**HEP-BH-13**
				Depth	**5.70**	**7.50**	**1.20**	**2.20**	**4.20**
				Date Sampled	**15-DEC-2017**	**15-DEC-2017**	**14-DEC-2017**	**14-DEC-2017**	**14-DEC-2017**
				Time Sampled	**09:00**	**10:30**	**12:20**	**12:30**	**13:10**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH1620171215001**	**HEPBH1620171215003**	**HEPBH186320171214001**	**HEPBH186320171214002**	**HEPBH186320171214004**
				AGS Sample Reference	**20**	**26**	**10**	**13**	**19**
				Matrix Class	**Sandy Soil**	**Clay**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Chloride	T686	AR	1	mg/kg	**25**	**10**	**4**	**6**	**16**
Cyanide(Total)	T4	AR	1	mg/kg	<1	<1	<1	**1**	<1
Thiocyanate	T4	A40	1	mg/kg	<10	<10	<10	<10	<10
Nitrate	T686	AR	1	mg/kg	**3**	**2**	**27**	**2**	**3**
Nitrite	T686	AR	1	mg/kg	<1	<1	**1**	<1	<1
SO4(Total)	T6	A40	0.01	%	**0.53**	**0.36**	**0.63**	**2.5**	**1.2**
Sulphide	T4	A40	10	mg/kg	**690**	**23**	**45**	**190**	**400**

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - Inorganics

Concept Reference				**706211 046**	**706211 047**	**706211 049**	**706211 050**	**706211 054**
Customer Sample Reference				**HEP-BH-13**	**HEP-BH-1864**	**HEP-BH-1864**	**HEP-BH-1864**	**HEP-BH-20**
Top Depth				**6.50**	**1.20**	**3.20**	**4.20**	**0.60**
Hole ID				**HEP-BH-13**	**HEP-BH-1864**	**HEP-BH-1864**	**HEP-BH-1864**	**HEP-BH-20**
Depth				**6.50**	**1.20**	**3.20**	**4.20**	**0.60**
Date Sampled				**15-DEC-2017**	**18-DEC-2017**	**18-DEC-2017**	**18-DEC-2017**	**18-DEC-2017**
Time Sampled				**11:00**	**13:30**	**15:20**	**16:10**	**14:25**
AGS Type				**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID				**HEPBH1863201712150 02**	**HEPBH1864201712180 01**	**HEPBH1864201712180 03**	**HEPBH1864201712180 04**	**HEPBH2020171218003**
AGS Sample Reference				**25**	**4**	**10**	**15**	**7**
Matrix Class				**Sandy Soil**	**Sandy Soil**	**Clay**	**Fill**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**				
Chloride	T686	AR	1	mg/kg	**18**	**7**	**8**	**11**	**5**
Cyanide(Total)	T4	AR	1	mg/kg	<1	<1	<1	<1	<1
Thiocyanate	T4	A40	1	mg/kg	<10	<10	<10	<10	<10
Nitrate	T686	AR	1	mg/kg	**3**	**3**	**2**	**2**	**23**
Nitrite	T686	AR	1	mg/kg	<1	<1	<1	<1	<1
SO4(Total)	T6	A40	0.01	%	**0.65**	**1.3**	**0.19**	**0.15**	**0.14**
Sulphide	T4	A40	10	mg/kg	**170**	**170**	**53**	**38**	<10

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - Inorganics

Concept Reference				**706211 056**	**706211 062**	**706211 074**	**706211 086**	**706211 087**
Customer Sample Reference				**HEP-BH-20**	**HEP-BH-43**	**HEP-BH-44**	**HEP-TP-1296**	**HEP-TP-1296**
Top Depth				**2.40**	**0.10**	**0.10**	**0.40**	**1.30**
Hole ID				**HEP-BH-20**	**HEP-BH-43**	**HEP-BH-44**	**HEP-TP-1296**	**HEP-TP-1296**
Depth				**2.40**	**0.10**	**0.10**	**0.40**	**1.30**
Date Sampled				**18-DEC-2017**	**13-DEC-2017**	**18-DEC-2017**	**13-DEC-2017**	**13-DEC-2017**
Time Sampled				**14:51**	**14:05**	**15:05**	**11:00**	**12:00**
AGS Type				**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID				**HEPBH2020171218005**	**HEPBH4320171213001**	**HEPBH4420171218001**	**HEPBH1296201712130 02**	**HEPBH1296201712130 03**
AGS Sample Reference				**17**	**1**	**1**	**6**	**9**
Matrix Class				**Clay**	**Sandy Soil**	**Sandy Soil**	**Topsoil**	**Topsoil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**				
Chloride	T686	AR	1	mg/kg	**8**	**9**	**2**	**4**	**12**
Cyanide(Total)	T4	AR	1	mg/kg	**5**	**5**	<1	<1	**4**
Thiocyanate	T4	A40	1	mg/kg	<10	<10	<10	<10	<10
Nitrate	T686	AR	1	mg/kg	**5**	**35**	**15**	**170**	**16**
Nitrite	T686	AR	1	mg/kg	<1	<1	<1	<1	**1**
SO4(Total)	T6	A40	0.01	%	**0.57**	**0.13**	**0.74**	**2.1**	**0.71**
Sulphide	T4	A40	10	mg/kg	**16**	<10	**22**	<10	**49**

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - Inorganics

Concept Reference		**706211 089**	**706211 091**	**706211 093**	**706211 094**
Customer Sample Reference		**HEP-TP-1296**	**HEP-TT-19**	**HEP-TT-19**	**HEP-TT-19**
Top Depth		**2.70**	**0.30**	**2.20**	**3.10**
Hole ID		**HEP-TP-1296**	**HEP-TT-19**	**HEP-TT-19**	**HEP-TT-19**
Depth		**2.70**	**0.30**	**2.20**	**3.10**
Date Sampled		**13-DEC-2017**	**13-DEC-2017**	**13-DEC-2017**	**13-DEC-2017**
Time Sampled		**14:00**	**11:00**	**14:00**	**15:00**
AGS Type		**ES**	**ES**	**ES**	**ES**
AGS Sample ID		**HEPBH1296201712130 05**	**HEPTT1920171213002**	**HEPTT1920171213004**	**HEPTT1920171213005**
AGS Sample Reference		**15**	**6**	**12**	**15**
Matrix Class		**Sandy Soil**	**Sandy Soil**	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**	
Chloride	T686	AR	1	mg/kg	**7**	**3**	**16**	**22**
Cyanide(Total)	T4	AR	1	mg/kg	<1	<1	<1	<1
Thiocyanate	T4	A40	1	mg/kg	<10	<10	<10	<10
Nitrate	T686	AR	1	mg/kg	**180**	**18**	**3**	**74**
Nitrite	T686	AR	1	mg/kg	**8**	<1	<1	<1
SO4(Total)	T6	A40	0.01	%	**0.47**	**0.21**	**0.20**	**0.17**
Sulphide	T4	A40	10	mg/kg	**14**	**11**	<10	**20**

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - Misc

Concept Reference					**706211 006**	**706211 008**	**706211 010**	**706211 015**	**706211 017**
Customer Sample Reference					**HEP-BH-14**	**HEP-BH-14**	**HEP-BH-14**	**HEP-BH-16**	**HEP-BH-16**
Top Depth					**0.60**	**2.00**	**5.00**	**1.70**	**3.70**
Hole ID					**HEP-BH-14**	**HEP-BH-14**	**HEP-BH-14**	**HEP-BH-16**	**HEP-BH-16**
Depth					**0.60**	**2.00**	**5.00**	**1.70**	**3.70**
Date Sampled					**13-DEC-2017**	**14-DEC-2017**	**14-DEC-2017**	**14-DEC-2017**	**14-DEC-2017**
Time Sampled					**13:30**	**10:30**	**12:30**	**14:30**	**15:00**
AGS Type					**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID					**HEPBH1420171213002**	**HEPBH1420171214001**	**HEPBH1420171214003**	**HEPBH1620171214001**	**HEPBH1620171214003**
AGS Sample Reference					**6**	**14**	**27**	**8**	**15**
Matrix Class					**Sandy Soil**	**Clay**	**Clay**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Soil Organic Matter	T287	A40	0.1	%	**3.5**	**7.8**	**6.1**	<0.1	**2.3**
pH	T7	A40			**7.9**	**7.9**	**8.7**	**7.9**	**7.6**

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Misc

				Concept Reference	**706211 019**	**706211 021**	**706211 041**	**706211 042**	**706211 044**
				Customer Sample Reference	**HEP-BH-16**	**HEP-BH-16**	**HEP-BH-13**	**HEP-BH-13**	**HEP-BH-13**
				Top Depth	**5.70**	**7.50**	**1.20**	**2.20**	**4.20**
				Hole ID	**HEP-BH-16**	**HEP-BH-16**	**HEP-BH-13**	**HEP-BH-13**	**HEP-BH-13**
				Depth	**5.70**	**7.50**	**1.20**	**2.20**	**4.20**
				Date Sampled	**15-DEC-2017**	**15-DEC-2017**	**14-DEC-2017**	**14-DEC-2017**	**14-DEC-2017**
				Time Sampled	**09:00**	**10:30**	**12:20**	**12:30**	**13:10**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH1620171215001**	**HEPBH1620171215003**	**HEPBH186320171214001**	**HEPBH186320171214002**	**HEPBH186320171214004**
				AGS Sample Reference	**20**	**26**	**10**	**13**	**19**
				Matrix Class	**Sandy Soil**	**Clay**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Soil Organic Matter	T287	A40	0.1	%	**2.8**	**3.8**	**1.9**	**1.1**	**6.4**
pH	T7	A40			**7.6**	**7.8**	**7.6**	**7.5**	**7.5**

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Misc

				Concept Reference	**706211 046**	**706211 047**	**706211 049**	**706211 050**	**706211 054**
				Customer Sample Reference	**HEP-BH-13**	**HEP-BH-1864**	**HEP-BH-1864**	**HEP-BH-1864**	**HEP-BH-20**
				Top Depth	**6.50**	**1.20**	**3.20**	**4.20**	**0.60**
				Hole ID	**HEP-BH-13**	**HEP-BH-1864**	**HEP-BH-1864**	**HEP-BH-1864**	**HEP-BH-20**
				Depth	**6.50**	**1.20**	**3.20**	**4.20**	**0.60**
				Date Sampled	**15-DEC-2017**	**18-DEC-2017**	**18-DEC-2017**	**18-DEC-2017**	**18-DEC-2017**
				Time Sampled	**11:00**	**13:30**	**15:20**	**16:10**	**14:25**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH186320171215002**	**HEPBH186420171218001**	**HEPBH186420171218003**	**HEPBH186420171218004**	**HEPBH202017121800 3**
				AGS Sample Reference	**25**	**4**	**10**	**15**	**7**
				Matrix Class	**Sandy Soil**	**Sandy Soil**	**Clay**	**Fill**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Soil Organic Matter	T287	A40	0.1	%	**4.9**	**5.7**	**19**	**4.4**	**0.7**
pH	T7	A40			**7.8**	**7.4**	**7.9**	**8.0**	**8.0**

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Misc

				Concept Reference	**706211 056**	**706211 062**	**706211 074**	**706211 086**	**706211 087**
				Customer Sample Reference	**HEP-BH-20**	**HEP-BH-43**	**HEP-BH-44**	**HEP-TP-1296**	**HEP-TP-1296**
				Top Depth	**2.40**	**0.10**	**0.10**	**0.40**	**1.30**
				Hole ID	**HEP-BH-20**	**HEP-BH-43**	**HEP-BH-44**	**HEP-TP-1296**	**HEP-TP-1296**
				Depth	**2.40**	**0.10**	**0.10**	**0.40**	**1.30**
				Date Sampled	**18-DEC-2017**	**13-DEC-2017**	**18-DEC-2017**	**13-DEC-2017**	**13-DEC-2017**
				Time Sampled	**14:51**	**14:05**	**15:05**	**11:00**	**12:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH2020171218005**	**HEPBH4320171213001**	**HEPBH4420171218001**	**HEPBH129620171213002**	**HEPBH129620171213003**
				AGS Sample Reference	**17**	**1**	**1**	**6**	**9**
				Matrix Class	**Clay**	**Sandy Soil**	**Sandy Soil**	**Topsoil**	**Topsoil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Soil Organic Matter	T287	A40	0.1	%	**1.1**	**5.3**	**2.1**	**0.4**	**1.1**
pH	T7	A40			**7.8**	**7.7**	**7.3**	**7.2**	**7.4**

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Misc

				Concept Reference	**706211 089**	**706211 091**	**706211 093**	**706211 094**
				Customer Sample Reference	**HEP-TP-1296**	**HEP-TT-19**	**HEP-TT-19**	**HEP-TT-19**
				Top Depth	**2.70**	**0.30**	**2.20**	**3.10**
				Hole ID	**HEP-TP-1296**	**HEP-TT-19**	**HEP-TT-19**	**HEP-TT-19**
				Depth	**2.70**	**0.30**	**2.20**	**3.10**
				Date Sampled	**13-DEC-2017**	**13-DEC-2017**	**13-DEC-2017**	**13-DEC-2017**
				Time Sampled	**14:00**	**11:00**	**14:00**	**15:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH1296201712130 05**	**HEPTT1920171213002**	**HEPTT1920171213004**	**HEPTT1920171213005**
				AGS Sample Reference	**15**	**6**	**12**	**15**
				Matrix Class	**Sandy Soil**	**Sandy Soil**	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**				
Soil Organic Matter	T287	A40	0.1	%	**8.2**	**7.8**	**2.6**	**2.5**
pH	T7	A40			**7.6**	**8.0**	**8.0**	**7.4**

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Cyanides

				Concept Reference	**706211 008**
				Customer Sample Reference	**HEP-BH-14**
				Top Depth	**2.00**
				Hole ID	**HEP-BH-14**
				Depth	**2.00**
				Date Sampled	**14-DEC-2017**
				Time Sampled	**10:30**
				AGS Type	**ES**
				AGS Sample ID	**HEPBH1420171214001**
				AGS Sample Reference	**14**
				Matrix Class	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**	
Cyanide(free)	T546	AR	1	mg/kg	**1**
Cyanide(Complex)	T4	AR	1	mg/kg	**120**

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings Metals and Metalloids

Concept Reference				**706211 006**	**706211 008**	**706211 010**	**706211 015**	**706211 017**
Customer Sample Reference				**HEP-BH-14**	**HEP-BH-14**	**HEP-BH-14**	**HEP-BH-16**	**HEP-BH-16**
Top Depth				**0.60**	**2.00**	**5.00**	**1.70**	**3.70**
Hole ID				**HEP-BH-14**	**HEP-BH-14**	**HEP-BH-14**	**HEP-BH-16**	**HEP-BH-16**
Depth				**0.60**	**2.00**	**5.00**	**1.70**	**3.70**
Date Sampled				**13-DEC-2017**	**14-DEC-2017**	**14-DEC-2017**	**14-DEC-2017**	**14-DEC-2017**
Time Sampled				**13:30**	**10:30**	**12:30**	**14:30**	**15:00**
AGS Type				**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID				**HEPBH1420171213002**	**HEPBH1420171214001**	**HEPBH1420171214003**	**HEPBH1620171214001**	**HEPBH1620171214003**
AGS Sample Reference				**6**	**14**	**27**	**8**	**15**
Matrix Class				**Sandy Soil**	**Clay**	**Clay**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**				
Arsenic	T6	M40	2	mg/kg	**16**	**24**	**18**	**16**	**22**
Cadmium	T6	M40	1	mg/kg	**1**	**12**	**1**	**2**	**1**
Chromium	T6	M40	1	mg/kg	**31**	**81**	**32**	**45**	**43**
Chromium VI	T6	A40	1	mg/kg	<1	<1	<1	<1	<1
Chromium (trivalent)	T85	A40	2	mg/kg	**31**	**81**	**32**	**45**	**43**
Iron	T6	A40	1	mg/kg	**23000**	**55000**	**32000**	**27000**	**34000**
Lead	T6	M40	1	mg/kg	**1700**	**1500**	**330**	**300**	**1800**
Manganese	T6	M40	1	mg/kg	**330**	**630**	**550**	**320**	**370**
Mercury	T6	M40	1	mg/kg	<1	**2**	<1	<1	<1
Nickel	T6	M40	1	mg/kg	**22**	**79**	**32**	**29**	**33**
Selenium	T6	M40	3	mg/kg	<3	<3	<3	<3	<3
Copper	T6	M40	1	mg/kg	**78**	**580**	**80**	**86**	**160**
Zinc	T6	M40	1	mg/kg	**780**	**7000**	**450**	**200**	**760**
Boron (water-soluble)	T6	A40	1	mg/kg	<1	**3**	<1	<1	**1**

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings Metals and Metalloids

Concept Reference				**706211 019**	**706211 021**	**706211 041**	**706211 042**	**706211 044**
Customer Sample Reference				**HEP-BH-16**	**HEP-BH-16**	**HEP-BH-13**	**HEP-BH-13**	**HEP-BH-13**
Top Depth				**5.70**	**7.50**	**1.20**	**2.20**	**4.20**
Hole ID				**HEP-BH-16**	**HEP-BH-16**	**HEP-BH-13**	**HEP-BH-13**	**HEP-BH-13**
Depth				**5.70**	**7.50**	**1.20**	**2.20**	**4.20**
Date Sampled				**15-DEC-2017**	**15-DEC-2017**	**14-DEC-2017**	**14-DEC-2017**	**14-DEC-2017**
Time Sampled				**09:00**	**10:30**	**12:20**	**12:30**	**13:10**
AGS Type				**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID				**HEPBH1620171215001**	**HEPBH1620171215003**	**HEPBH186320171214001**	**HEPBH186320171214002**	**HEPBH186320171214004**
AGS Sample Reference				**20**	**26**	**10**	**13**	**19**
Matrix Class				**Sandy Soil**	**Clay**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**				
Arsenic	T6	M40	2	mg/kg	**13**	**26**	**18**	**19**	**22**
Cadmium	T6	M40	1	mg/kg	**8**	<1	<1	<1	**9**
Chromium	T6	M40	1	mg/kg	**68**	**33**	**46**	**46**	**59**
Chromium VI	T6	A40	1	mg/kg	<1	<1	<1	<1	<1
Chromium (trivalent)	T85	A40	2	mg/kg	**68**	**33**	**46**	**46**	**59**
Iron	T6	A40	1	mg/kg	**28000**	**52000**	**40000**	**34000**	**47000**
Lead	T6	M40	1	mg/kg	**600**	**42**	**270**	**730**	**1500**
Manganese	T6	M40	1	mg/kg	**320**	**540**	**370**	**330**	**410**
Mercury	T6	M40	1	mg/kg	<1	<1	<1	<1	**1**
Nickel	T6	M40	1	mg/kg	**53**	**56**	**37**	**29**	**63**
Selenium	T6	M40	3	mg/kg	<3	<3	<3	<3	<3
Copper	T6	M40	1	mg/kg	**120**	**26**	**91**	**180**	**200**
Zinc	T6	M40	1	mg/kg	**650**	**89**	**590**	**770**	**3200**
Boron (water-soluble)	T6	A40	1	mg/kg	<1	<1	<1	<1	**1**

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings Metals and Metalloids

Concept Reference			**706211 046**	**706211 047**	**706211 049**	**706211 050**	**706211 054**
Customer Sample Reference			**HEP-BH-13**	**HEP-BH-1864**	**HEP-BH-1864**	**HEP-BH-1864**	**HEP-BH-20**
Top Depth			**6.50**	**1.20**	**3.20**	**4.20**	**0.60**
Hole ID			**HEP-BH-13**	**HEP-BH-1864**	**HEP-BH-1864**	**HEP-BH-1864**	**HEP-BH-20**
Depth			**6.50**	**1.20**	**3.20**	**4.20**	**0.60**
Date Sampled			**15-DEC-2017**	**18-DEC-2017**	**18-DEC-2017**	**18-DEC-2017**	**18-DEC-2017**
Time Sampled			**11:00**	**13:30**	**15:20**	**16:10**	**14:25**
AGS Type			**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID			**HEPBH1863201712150 02**	**HEPBH1864201712180 01**	**HEPBH1864201712180 03**	**HEPBH1864201712180 04**	**HEPBH2020171218003**
AGS Sample Reference			**25**	**4**	**10**	**15**	**7**
Matrix Class			**Sandy Soil**	**Sandy Soil**	**Clay**	**Fill**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Arsenic	T6	M40	2	mg/kg	**23**	**17**	**15**	**11**	**17**
Cadmium	T6	M40	1	mg/kg	**1**	<1	<1	<1	**2**
Chromium	T6	M40	1	mg/kg	**42**	**32**	**36**	**25**	**61**
Chromium VI	T6	A40	1	mg/kg	<1	<1	<1	<1	<1
Chromium (trivalent)	T85	A40	2	mg/kg	**42**	**32**	**36**	**25**	**61**
Iron	T6	A40	1	mg/kg	**33000**	**27000**	**35000**	**23000**	**34000**
Lead	T6	M40	1	mg/kg	**1700**	**870**	**150**	**260**	**250**
Manganese	T6	M40	1	mg/kg	**390**	**350**	**470**	**610**	**520**
Mercury	T6	M40	1	mg/kg	<1	<1	<1	<1	<1
Nickel	T6	M40	1	mg/kg	**27**	**38**	**41**	**28**	**42**
Selenium	T6	M40	3	mg/kg	<3	<3	<3	<3	<3
Copper	T6	M40	1	mg/kg	**370**	**230**	**28**	**32**	**89**
Zinc	T6	M40	1	mg/kg	**600**	**470**	**88**	**130**	**240**
Boron (water-soluble)	T6	A40	1	mg/kg	<1	**2**	<1	<1	<1

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings Metals and Metalloids

Concept Reference			**706211 056**	**706211 062**	**706211 074**	**706211 086**	**706211 087**
Customer Sample Reference			**HEP-BH-20**	**HEP-BH-43**	**HEP-BH-44**	**HEP-TP-1296**	**HEP-TP-1296**
Top Depth			**2.40**	**0.10**	**0.10**	**0.40**	**1.30**
Hole ID			**HEP-BH-20**	**HEP-BH-43**	**HEP-BH-44**	**HEP-TP-1296**	**HEP-TP-1296**
Depth			**2.40**	**0.10**	**0.10**	**0.40**	**1.30**
Date Sampled			**18-DEC-2017**	**13-DEC-2017**	**18-DEC-2017**	**13-DEC-2017**	**13-DEC-2017**
Time Sampled			**14:51**	**14:05**	**15:05**	**11:00**	**12:00**
AGS Type			**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID			**HEPBH2020171218005**	**HEPBH4320171213001**	**HEPBH4420171218001**	**HEPBH1296201712130 02**	**HEPBH1296201712130 03**
AGS Sample Reference			**17**	**1**	**1**	**6**	**9**
Matrix Class			**Clay**	**Sandy Soil**	**Sandy Soil**	**Topsoil**	**Topsoil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Arsenic	T6	M40	2	mg/kg	**18**	**16**	**15**	**14**	**16**
Cadmium	T6	M40	1	mg/kg	**1**	**14**	**2**	**3**	**3**
Chromium	T6	M40	1	mg/kg	**42**	**140**	**97**	**70**	**74**
Chromium VI	T6	A40	1	mg/kg	<1	<1	<1	<1	<1
Chromium (trivalent)	T85	A40	2	mg/kg	**42**	**140**	**97**	**70**	**74**
Iron	T6	A40	1	mg/kg	**32000**	**28000**	**19000**	**28000**	**30000**
Lead	T6	M40	1	mg/kg	**390**	**290**	**440**	**240**	**160**
Manganese	T6	M40	1	mg/kg	**400**	**470**	**280**	**470**	**460**
Mercury	T6	M40	1	mg/kg	<1	**1**	<1	**3**	**7**
Nickel	T6	M40	1	mg/kg	**54**	**62**	**28**	**46**	**48**
Selenium	T6	M40	3	mg/kg	<3	<3	<3	<3	<3
Copper	T6	M40	1	mg/kg	**250**	**190**	**140**	**270**	**240**
Zinc	T6	M40	1	mg/kg	**410**	**420**	**380**	**400**	**360**
Boron (water-soluble)	T6	A40	1	mg/kg	<1	<1	<1	<1	<1

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings Metals and Metalloids

Concept Reference	**706211 089**	**706211 091**	**706211 093**	**706211 094**
Customer Sample Reference	**HEP-TP-1296**	**HEP-TT-19**	**HEP-TT-19**	**HEP-TT-19**
Top Depth	**2.70**	**0.30**	**2.20**	**3.10**
Hole ID	**HEP-TP-1296**	**HEP-TT-19**	**HEP-TT-19**	**HEP-TT-19**
Depth	**2.70**	**0.30**	**2.20**	**3.10**
Date Sampled	**13-DEC-2017**	**13-DEC-2017**	**13-DEC-2017**	**13-DEC-2017**
Time Sampled	**14:00**	**11:00**	**14:00**	**15:00**
AGS Type	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**HEPBH1296201712130 05**	**HEPTT1920171213002**	**HEPTT1920171213004**	**HEPTT1920171213005**
AGS Sample Reference	**15**	**6**	**12**	**15**
Matrix Class	**Sandy Soil**	**Sandy Soil**	**Clay**	**Clay**

Determinand	Method	Test Sample	LOD	Units				
Arsenic	T6	M40	2	mg/kg	**22**	**18**	**13**	**24**
Cadmium	T6	M40	1	mg/kg	**3**	<1	<1	**11**
Chromium	T6	M40	1	mg/kg	**48**	**33**	**41**	**110**
Chromium VI	T6	A40	1	mg/kg	<1	<1	<1	<1
Chromium (trivalent)	T85	A40	2	mg/kg	**48**	**33**	**41**	**110**
Iron	T6	A40	1	mg/kg	**27000**	**31000**	**36000**	**41000**
Lead	T6	M40	1	mg/kg	**340**	**250**	**39**	**130**
Manganese	T6	M40	1	mg/kg	**380**	**490**	**440**	**860**
Mercury	T6	M40	1	mg/kg	<1	<1	<1	<1
Nickel	T6	M40	1	mg/kg	**31**	**26**	**37**	**44**
Selenium	T6	M40	3	mg/kg	<3	<3	<3	<3
Copper	T6	M40	1	mg/kg	**98**	**42**	**30**	**120**
Zinc	T6	M40	1	mg/kg	**320**	**150**	**78**	**280**
Boron (water-soluble)	T6	A40	1	mg/kg	<1	<1	<1	<1

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Chromium

Concept Reference	**706211 006**	**706211 008**	**706211 010**	**706211 015**	**706211 017**
Customer Sample Reference	**HEP-BH-14**	**HEP-BH-14**	**HEP-BH-14**	**HEP-BH-16**	**HEP-BH-16**
Top Depth	**0.60**	**2.00**	**5.00**	**1.70**	**3.70**
Hole ID	**HEP-BH-14**	**HEP-BH-14**	**HEP-BH-14**	**HEP-BH-16**	**HEP-BH-16**
Depth	**0.60**	**2.00**	**5.00**	**1.70**	**3.70**
Date Sampled	**13-DEC-2017**	**14-DEC-2017**	**14-DEC-2017**	**14-DEC-2017**	**14-DEC-2017**
Time Sampled	**13:30**	**10:30**	**12:30**	**14:30**	**15:00**
AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**HEPBH1420171213002**	**HEPBH1420171214001**	**HEPBH1420171214003**	**HEPBH1620171214001**	**HEPBH1620171214003**
AGS Sample Reference	**6**	**14**	**27**	**8**	**15**
Matrix Class	**Sandy Soil**	**Clay**	**Clay**	**Sandy Soil**	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units					
Chromium (trivalent)	T85	A40	2	mg/kg	**31**	**81**	**32**	**45**	**43**
Chromium VI	T6	A40	1	mg/kg	<1	<1	<1	<1	<1

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Chromium

Concept Reference					**706211 019**	**706211 021**	**706211 041**	**706211 042**	**706211 044**
Customer Sample Reference					**HEP-BH-16**	**HEP-BH-16**	**HEP-BH-13**	**HEP-BH-13**	**HEP-BH-13**
Top Depth					**5.70**	**7.50**	**1.20**	**2.20**	**4.20**
Hole ID					**HEP-BH-16**	**HEP-BH-16**	**HEP-BH-13**	**HEP-BH-13**	**HEP-BH-13**
Depth					**5.70**	**7.50**	**1.20**	**2.20**	**4.20**
Date Sampled					**15-DEC-2017**	**15-DEC-2017**	**14-DEC-2017**	**14-DEC-2017**	**14-DEC-2017**
Time Sampled					**09:00**	**10:30**	**12:20**	**12:30**	**13:10**
AGS Type					**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID					**HEPBH1620171215001**	**HEPBH1620171215003**	**HEPBH186320171214001**	**HEPBH186320171214002**	**HEPBH186320171214004**
AGS Sample Reference					**20**	**26**	**10**	**13**	**19**
Matrix Class					**Sandy Soil**	**Clay**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Chromium (trivalent)	T85	A40	2	mg/kg	**68**	**33**	**46**	**46**	**59**
Chromium VI	T6	A40	1	mg/kg	<1	<1	<1	<1	<1

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Chromium

Concept Reference					**706211 046**	**706211 047**	**706211 049**	**706211 050**	**706211 054**
Customer Sample Reference					**HEP-BH-13**	**HEP-BH-1864**	**HEP-BH-1864**	**HEP-BH-1864**	**HEP-BH-20**
Top Depth					**6.50**	**1.20**	**3.20**	**4.20**	**0.60**
Hole ID					**HEP-BH-13**	**HEP-BH-1864**	**HEP-BH-1864**	**HEP-BH-1864**	**HEP-BH-20**
Depth					**6.50**	**1.20**	**3.20**	**4.20**	**0.60**
Date Sampled					**15-DEC-2017**	**18-DEC-2017**	**18-DEC-2017**	**18-DEC-2017**	**18-DEC-2017**
Time Sampled					**11:00**	**13:30**	**15:20**	**16:10**	**14:25**
AGS Type					**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID					**HEPBH186320171215002**	**HEPBH186420171218001**	**HEPBH186420171218003**	**HEPBH186420171218004**	**HEPBH202017121800 3**
AGS Sample Reference					**25**	**4**	**10**	**15**	**7**
Matrix Class					**Sandy Soil**	**Sandy Soil**	**Clay**	**Fill**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Chromium (trivalent)	T85	A40	2	mg/kg	**42**	**32**	**36**	**25**	**61**
Chromium VI	T6	A40	1	mg/kg	<1	<1	<1	<1	<1

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Chromium

Concept Reference					**706211 056**	**706211 062**	**706211 074**	**706211 086**	**706211 087**
Customer Sample Reference					**HEP-BH-20**	**HEP-BH-43**	**HEP-BH-44**	**HEP-TP-1296**	**HEP-TP-1296**
Top Depth					**2.40**	**0.10**	**0.10**	**0.40**	**1.30**
Hole ID					**HEP-BH-20**	**HEP-BH-43**	**HEP-BH-44**	**HEP-TP-1296**	**HEP-TP-1296**
Depth					**2.40**	**0.10**	**0.10**	**0.40**	**1.30**
Date Sampled					**18-DEC-2017**	**13-DEC-2017**	**18-DEC-2017**	**13-DEC-2017**	**13-DEC-2017**
Time Sampled					**14:51**	**14:05**	**15:05**	**11:00**	**12:00**
AGS Type					**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID					**HEPBH2020171218005**	**HEPBH4320171213001**	**HEPBH4420171218001**	**HEPBH129620171213002**	**HEPBH129620171213003**
AGS Sample Reference					**17**	**1**	**1**	**6**	**9**
Matrix Class					**Clay**	**Sandy Soil**	**Sandy Soil**	**Topsoil**	**Topsoil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Chromium (trivalent)	T85	A40	2	mg/kg	**42**	**140**	**97**	**70**	**74**
Chromium VI	T6	A40	1	mg/kg	<1	<1	<1	<1	<1

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Chromium

Concept Reference	**706211 089**	**706211 091**	**706211 093**	**706211 094**
Customer Sample Reference	**HEP-TP-1296**	**HEP-TT-19**	**HEP-TT-19**	**HEP-TT-19**
Top Depth	**2.70**	**0.30**	**2.20**	**3.10**
Hole ID	**HEP-TP-1296**	**HEP-TT-19**	**HEP-TT-19**	**HEP-TT-19**
Depth	**2.70**	**0.30**	**2.20**	**3.10**
Date Sampled	**13-DEC-2017**	**13-DEC-2017**	**13-DEC-2017**	**13-DEC-2017**
Time Sampled	**14:00**	**11:00**	**14:00**	**15:00**
AGS Type	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**HEPBH1296201712130 05**	**HEPTT1920171213002**	**HEPTT1920171213004**	**HEPTT1920171213005**
AGS Sample Reference	**15**	**6**	**12**	**15**
Matrix Class	**Sandy Soil**	**Sandy Soil**	**Clay**	**Clay**

Determinand	Method	Test Sample	LOD	Units				
Chromium (trivalent)	T85	A40	2	mg/kg	**48**	**33**	**41**	**110**
Chromium VI	T6	A40	1	mg/kg	<1	<1	<1	<1

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Total Phenol

Concept Reference	**706211 006**	**706211 008**	**706211 010**	**706211 015**	**706211 017**
Customer Sample Reference	**HEP-BH-14**	**HEP-BH-14**	**HEP-BH-14**	**HEP-BH-16**	**HEP-BH-16**
Top Depth	**0.60**	**2.00**	**5.00**	**1.70**	**3.70**
Hole ID	**HEP-BH-14**	**HEP-BH-14**	**HEP-BH-14**	**HEP-BH-16**	**HEP-BH-16**
Depth	**0.60**	**2.00**	**5.00**	**1.70**	**3.70**
Date Sampled	**13-DEC-2017**	**14-DEC-2017**	**14-DEC-2017**	**14-DEC-2017**	**14-DEC-2017**
Time Sampled	**13:30**	**10:30**	**12:30**	**14:30**	**15:00**
AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**HEPBH1420171213002**	**HEPBH1420171214001**	**HEPBH1420171214003**	**HEPBH1620171214001**	**HEPBH1620171214003**
AGS Sample Reference	**6**	**14**	**27**	**8**	**15**
Matrix Class	**Sandy Soil**	**Clay**	**Clay**	**Sandy Soil**	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units					
Phenols(Mono)	T4	AR	0.5	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Total Phenol

Concept Reference	**706211 019**	**706211 021**	**706211 041**	**706211 042**	**706211 044**
Customer Sample Reference	**HEP-BH-16**	**HEP-BH-16**	**HEP-BH-13**	**HEP-BH-13**	**HEP-BH-13**
Top Depth	**5.70**	**7.50**	**1.20**	**2.20**	**4.20**
Hole ID	**HEP-BH-16**	**HEP-BH-16**	**HEP-BH-13**	**HEP-BH-13**	**HEP-BH-13**
Depth	**5.70**	**7.50**	**1.20**	**2.20**	**4.20**
Date Sampled	**15-DEC-2017**	**15-DEC-2017**	**14-DEC-2017**	**14-DEC-2017**	**14-DEC-2017**
Time Sampled	**09:00**	**10:30**	**12:20**	**12:30**	**13:10**
AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**HEPBH1620171215001**	**HEPBH1620171215003**	**HEPBH1863201712140 01**	**HEPBH1863201712140 02**	**HEPBH1863201712140 04**
AGS Sample Reference	**20**	**26**	**10**	**13**	**19**
Matrix Class	**Sandy Soil**	**Clay**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units					
Phenols(Mono)	T4	AR	0.5	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Total Phenol

				Concept Reference	**706211 046**	**706211 047**	**706211 049**	**706211 050**	**706211 054**
				Customer Sample Reference	**HEP-BH-13**	**HEP-BH-1864**	**HEP-BH-1864**	**HEP-BH-1864**	**HEP-BH-20**
				Top Depth	**6.50**	**1.20**	**3.20**	**4.20**	**0.60**
				Hole ID	**HEP-BH-13**	**HEP-BH-1864**	**HEP-BH-1864**	**HEP-BH-1864**	**HEP-BH-20**
				Depth	**6.50**	**1.20**	**3.20**	**4.20**	**0.60**
				Date Sampled	**15-DEC-2017**	**18-DEC-2017**	**18-DEC-2017**	**18-DEC-2017**	**18-DEC-2017**
				Time Sampled	**11:00**	**13:30**	**15:20**	**16:10**	**14:25**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH1863201712150 02**	**HEPBH1864201712180 01**	**HEPBH1864201712180 03**	**HEPBH1864201712180 04**	**HEPBH2020171218003**
				AGS Sample Reference	**25**	**4**	**10**	**15**	**7**
				Matrix Class	**Sandy Soil**	**Sandy Soil**	**Clay**	**Fill**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Phenols(Mono)	T4	AR	0.5	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Total Phenol

				Concept Reference	**706211 056**	**706211 062**	**706211 074**	**706211 086**	**706211 087**
				Customer Sample Reference	**HEP-BH-20**	**HEP-BH-43**	**HEP-BH-44**	**HEP-TP-1296**	**HEP-TP-1296**
				Top Depth	**2.40**	**0.10**	**0.10**	**0.40**	**1.30**
				Hole ID	**HEP-BH-20**	**HEP-BH-43**	**HEP-BH-44**	**HEP-TP-1296**	**HEP-TP-1296**
				Depth	**2.40**	**0.10**	**0.10**	**0.40**	**1.30**
				Date Sampled	**18-DEC-2017**	**13-DEC-2017**	**18-DEC-2017**	**13-DEC-2017**	**13-DEC-2017**
				Time Sampled	**14:51**	**14:05**	**15:05**	**11:00**	**12:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH2020171218005**	**HEPBH4320171213001**	**HEPBH4420171218001**	**HEPBH1296201712130 02**	**HEPBH1296201712130 03**
				AGS Sample Reference	**17**	**1**	**1**	**6**	**9**
				Matrix Class	**Clay**	**Sandy Soil**	**Sandy Soil**	**Topsoil**	**Topsoil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Phenols(Mono)	T4	AR	0.5	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Total Phenol

				Concept Reference	**706211 089**	**706211 091**	**706211 093**	**706211 094**
				Customer Sample Reference	**HEP-TP-1296**	**HEP-TT-19**	**HEP-TT-19**	**HEP-TT-19**
				Top Depth	**2.70**	**0.30**	**2.20**	**3.10**
				Hole ID	**HEP-TP-1296**	**HEP-TT-19**	**HEP-TT-19**	**HEP-TT-19**
				Depth	**2.70**	**0.30**	**2.20**	**3.10**
				Date Sampled	**13-DEC-2017**	**13-DEC-2017**	**13-DEC-2017**	**13-DEC-2017**
				Time Sampled	**14:00**	**11:00**	**14:00**	**15:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH1296201712130 05**	**HEPTT1920171213002**	**HEPTT1920171213004**	**HEPTT1920171213005**
				AGS Sample Reference	**15**	**6**	**12**	**15**
				Matrix Class	**Sandy Soil**	**Sandy Soil**	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**				
Phenols(Mono)	T4	AR	0.5	mg/kg	<1.0	<1.0	<1.0	<1.0

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Asbestos

Concept Reference					**706211 006**	**706211 008**	**706211 010**	**706211 015**	**706211 017**
Customer Sample Reference					**HEP-BH-14**	**HEP-BH-14**	**HEP-BH-14**	**HEP-BH-16**	**HEP-BH-16**
Top Depth					**0.60**	**2.00**	**5.00**	**1.70**	**3.70**
Hole ID					**HEP-BH-14**	**HEP-BH-14**	**HEP-BH-14**	**HEP-BH-16**	**HEP-BH-16**
Depth					**0.60**	**2.00**	**5.00**	**1.70**	**3.70**
Date Sampled					**13-DEC-2017**	**14-DEC-2017**	**14-DEC-2017**	**14-DEC-2017**	**14-DEC-2017**
Time Sampled					**13:30**	**10:30**	**12:30**	**14:30**	**15:00**
AGS Type					**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID					**HEPBH1420171213002**	**HEPBH1420171214001**	**HEPBH1420171214003**	**HEPBH1620171214001**	**HEPBH1620171214003**
AGS Sample Reference					**6**	**14**	**27**	**8**	**15**
Matrix Class					**Sandy Soil**	**Clay**	**Clay**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Asbestos ID	T27	A40			Amosite Loose Fibres Detected	N.D.	N.D.	N.D.	N.D.

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Asbestos

Concept Reference					**706211 019**	**706211 021**	**706211 041**	**706211 042**	**706211 044**
Customer Sample Reference					**HEP-BH-16**	**HEP-BH-16**	**HEP-BH-13**	**HEP-BH-13**	**HEP-BH-13**
Top Depth					**5.70**	**7.50**	**1.20**	**2.20**	**4.20**
Hole ID					**HEP-BH-16**	**HEP-BH-16**	**HEP-BH-13**	**HEP-BH-13**	**HEP-BH-13**
Depth					**5.70**	**7.50**	**1.20**	**2.20**	**4.20**
Date Sampled					**15-DEC-2017**	**15-DEC-2017**	**14-DEC-2017**	**14-DEC-2017**	**14-DEC-2017**
Time Sampled					**09:00**	**10:30**	**12:20**	**12:30**	**13:10**
AGS Type					**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID					**HEPBH1620171215001**	**HEPBH1620171215003**	**HEPBH186320171214001**	**HEPBH186320171214002**	**HEPBH186320171214004**
AGS Sample Reference					**20**	**26**	**10**	**13**	**19**
Matrix Class					**Sandy Soil**	**Clay**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Asbestos ID	T27	A40			N.D.	N.D.	Amosite Loose Fibres Detected	Amosite Loose Fibres Detected	N.D.

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Asbestos

Concept Reference					**706211 046**	**706211 047**	**706211 049**	**706211 050**	**706211 054**
Customer Sample Reference					**HEP-BH-13**	**HEP-BH-1864**	**HEP-BH-1864**	**HEP-BH-1864**	**HEP-BH-20**
Top Depth					**6.50**	**1.20**	**3.20**	**4.20**	**0.60**
Hole ID					**HEP-BH-13**	**HEP-BH-1864**	**HEP-BH-1864**	**HEP-BH-1864**	**HEP-BH-20**
Depth					**6.50**	**1.20**	**3.20**	**4.20**	**0.60**
Date Sampled					**15-DEC-2017**	**18-DEC-2017**	**18-DEC-2017**	**18-DEC-2017**	**18-DEC-2017**
Time Sampled					**11:00**	**13:30**	**15:20**	**16:10**	**14:25**
AGS Type					**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID					**HEPBH186320171215002**	**HEPBH186420171218001**	**HEPBH186420171218003**	**HEPBH186420171218004**	**HEPBH2020171218003**
AGS Sample Reference					**25**	**4**	**10**	**15**	**7**
Matrix Class					**Sandy Soil**	**Sandy Soil**	**Clay**	**Fill**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Asbestos ID	T27	A40			N.D.	N.D.	N.D.	N.D.	Amosite Loose Fibres Detected

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - Asbestos

Concept Reference					**706211 056**	**706211 062**	**706211 074**	**706211 086**	**706211 087**
Customer Sample Reference					**HEP-BH-20**	**HEP-BH-43**	**HEP-BH-44**	**HEP-TP-1296**	**HEP-TP-1296**
Top Depth					**2.40**	**0.10**	**0.10**	**0.40**	**1.30**
Hole ID					**HEP-BH-20**	**HEP-BH-43**	**HEP-BH-44**	**HEP-TP-1296**	**HEP-TP-1296**
Depth					**2.40**	**0.10**	**0.10**	**0.40**	**1.30**
Date Sampled					**18-DEC-2017**	**13-DEC-2017**	**18-DEC-2017**	**13-DEC-2017**	**13-DEC-2017**
Time Sampled					**14:51**	**14:05**	**15:05**	**11:00**	**12:00**
AGS Type					**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID					**HEPBH2020171218005**	**HEPBH4320171213001**	**HEPBH4420171218001**	**HEPBH1296201712130002**	**HEPBH1296201712130003**
AGS Sample Reference					**17**	**1**	**1**	**6**	**9**
Matrix Class					**Clay**	**Sandy Soil**	**Sandy Soil**	**Topsoil**	**Topsoil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Asbestos ID	T27	A40			N.D.	Chrysotile Loose Fibres Detected	Amosite Loose Fibres Detected	N.D.	N.D.

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - Asbestos

Concept Reference					**706211 089**	**706211 091**	**706211 093**	**706211 094**	
Customer Sample Reference					**HEP-TP-1296**	**HEP-TT-19**	**HEP-TT-19**	**HEP-TT-19**	
Top Depth					**2.70**	**0.30**	**2.20**	**3.10**	
Hole ID					**HEP-TP-1296**	**HEP-TT-19**	**HEP-TT-19**	**HEP-TT-19**	
Depth					**2.70**	**0.30**	**2.20**	**3.10**	
Date Sampled					**13-DEC-2017**	**13-DEC-2017**	**13-DEC-2017**	**13-DEC-2017**	
Time Sampled					**14:00**	**11:00**	**14:00**	**15:00**	
AGS Type					**ES**	**ES**	**ES**	**ES**	
AGS Sample ID					**HEPBH1296201712130005**	**HEPTT1920171213002**	**HEPTT1920171213004**	**HEPTT1920171213005**	
AGS Sample Reference					**15**	**6**	**12**	**15**	
Matrix Class					**Sandy Soil**	**Sandy Soil**	**Clay**	**Clay**	
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Asbestos ID	T27	A40			N.D.	Chrysotile Loose Fibres Detected	N.D.	N.D.	

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Asbestos Quantification

Concept Reference					**706211 006**	**706211 041**	**706211 042**	**706211 054**	**706211 062**
Customer Sample Reference					**HEP-BH-14**	**HEP-BH-13**	**HEP-BH-13**	**HEP-BH-20**	**HEP-BH-43**
Top Depth					**0.60**	**1.20**	**2.20**	**0.60**	**0.10**
Hole ID					**HEP-BH-14**	**HEP-BH-13**	**HEP-BH-13**	**HEP-BH-20**	**HEP-BH-43**
Depth					**0.60**	**1.20**	**2.20**	**0.60**	**0.10**
Date Sampled					**13-DEC-2017**	**14-DEC-2017**	**14-DEC-2017**	**18-DEC-2017**	**13-DEC-2017**
Time Sampled					**13:30**	**12:20**	**12:30**	**14:25**	**14:05**
AGS Type					**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID					**HEPBH1420171213002**	**HEPBH1863201712140001**	**HEPBH1863201712140002**	**HEPBH2020171218003**	**HEPBH4320171213001**
AGS Sample Reference					**6**	**10**	**13**	**7**	**1**
Matrix Class					**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Asbestos Quantification Stage 3	T413	A40	0.001	%	Amosite Fibres Detected **1.9**	**0.014** Amosite Fibres Detected	<0.001 Amosite Fibres Detected	Amosite Fibres Detected <0.001	Amosite Fibres Detected Chrysotile Fibres Detected <0.001

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Asbestos Quantification

Concept Reference					**706211 074**	**706211 091**
Customer Sample Reference					**HEP-BH-44**	**HEP-TT-19**
Top Depth					**0.10**	**0.30**
Hole ID					**HEP-BH-44**	**HEP-TT-19**
Depth					**0.10**	**0.30**
Date Sampled					**18-DEC-2017**	**13-DEC-2017**
Time Sampled					**15:05**	**11:00**
AGS Type					**ES**	**ES**
AGS Sample ID					**HEPBH4420171218001**	**HEPTT1920171213002**
AGS Sample Reference					**1**	**6**
Matrix Class					**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**		
Asbestos Quantification Stage 3	T413	A40	0.001	%	Chrysotile Fibres Detected **0.001**	Chrysotile Fibres Detected <0.001

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground Soils with Elevated PID Readings - Organics PAH US EPA 16

Concept Reference		**706211 006**	**706211 008**	**706211 010**	**706211 015**	**706211 017**
Customer Sample Reference		**HEP-BH-14**	**HEP-BH-14**	**HEP-BH-14**	**HEP-BH-16**	**HEP-BH-16**
Top Depth		**0.60**	**2.00**	**5.00**	**1.70**	**3.70**
Hole ID		**HEP-BH-14**	**HEP-BH-14**	**HEP-BH-14**	**HEP-BH-16**	**HEP-BH-16**
Depth		**0.60**	**2.00**	**5.00**	**1.70**	**3.70**
Date Sampled		**13-DEC-2017**	**14-DEC-2017**	**14-DEC-2017**	**14-DEC-2017**	**14-DEC-2017**
Time Sampled		**13:30**	**10:30**	**12:30**	**14:30**	**15:00**
AGS Type		**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID		**HEPBH1420171213002**	**HEPBH1420171214001**	**HEPBH1420171214003**	**HEPBH1620171214001**	**HEPBH1620171214003**
AGS Sample Reference		**6**	**14**	**27**	**8**	**15**
Matrix Class		**Sandy Soil**	**Clay**	**Clay**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**		
Naphthalene	T207	M105	0.1	mg/kg	<0.1	(9) <1.0	**0.5**	<0.1	<0.1
Acenaphthylene	T207	M105	0.1	mg/kg	<0.1	(9) <1.0	<0.1	<0.1	<0.1
Acenaphthene	T207	M105	0.1	mg/kg	<0.1	(9) <1.0	**0.4**	**0.4**	<0.1
Fluorene	T207	M105	0.1	mg/kg	<0.1	(9) <1.0	**0.4**	**0.4**	<0.1
Phenanthrene	T207	M105	0.1	mg/kg	**0.3**	**1.8**	**3.4**	**2.6**	**0.5**
Anthracene	T207	M105	0.1	mg/kg	<0.1	(9) <1.0	**0.8**	**0.6**	**0.1**
Fluoranthene	T207	M105	0.1	mg/kg	**0.8**	**2.8**	**3.5**	**2.7**	**1.4**
Pyrene	T207	M105	0.1	mg/kg	**0.7**	**2.5**	**2.7**	**2.1**	**1.2**
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	**0.3**	(9) <1.0	**1.3**	**0.9**	**0.5**
Chrysene	T207	M105	0.1	mg/kg	**0.3**	**1.0**	**1.2**	**0.9**	**0.5**
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	**0.2**	(9) <1.0	**0.9**	**0.7**	**0.3**
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	**0.3**	(9) <1.0	**0.7**	**0.6**	**0.3**
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	**0.4**	(9) <1.0	**0.9**	**0.7**	**0.4**
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	**0.2**	(9) <1.0	**0.4**	**0.4**	**0.2**
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	<0.1	(9) <1.0	**0.3**	**0.2**	<0.1
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	**0.2**	(9) <1.0	**0.5**	**0.5**	**0.2**
PAH(total)	T207	M105	0.1	mg/kg	**3.8**	**8.1**	**18**	**14**	**5.6**

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground Soils with Elevated PID Readings - Organics PAH US EPA 16

Concept Reference	**706211 019**	**706211 021**	**706211 041**	**706211 042**	**706211 044**
Customer Sample Reference	**HEP-BH-16**	**HEP-BH-16**	**HEP-BH-13**	**HEP-BH-13**	**HEP-BH-13**
Top Depth	**5.70**	**7.50**	**1.20**	**2.20**	**4.20**
Hole ID	**HEP-BH-16**	**HEP-BH-16**	**HEP-BH-13**	**HEP-BH-13**	**HEP-BH-13**
Depth	**5.70**	**7.50**	**1.20**	**2.20**	**4.20**
Date Sampled	**15-DEC-2017**	**15-DEC-2017**	**14-DEC-2017**	**14-DEC-2017**	**14-DEC-2017**
Time Sampled	**09:00**	**10:30**	**12:20**	**12:30**	**13:10**
AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**HEPBH1620171215001**	**HEPBH1620171215003**	**HEPBH186320171214001**	**HEPBH186320171214002**	**HEPBH186320171214004**
AGS Sample Reference	**20**	**26**	**10**	**13**	**19**
Matrix Class	**Sandy Soil**	**Clay**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units					
Naphthalene	T207	M105	0.1	mg/kg	(9) <1.0	<0.1	(9) <1.0	(9) <1.0	(9) <1.0
Acenaphthylene	T207	M105	0.1	mg/kg	(9) <1.0	<0.1	(9) <1.0	(9) <1.0	(9) <1.0
Acenaphthene	T207	M105	0.1	mg/kg	(9) <1.0	<0.1	(9) <1.0	**4.1**	(9) <1.0
Fluorene	T207	M105	0.1	mg/kg	(9) <1.0	<0.1	(9) <1.0	**1.0**	(9) <1.0
Phenanthrene	T207	M105	0.1	mg/kg	**3.4**	<0.1	**2.2**	**1.9**	**3.2**
Anthracene	T207	M105	0.1	mg/kg	(9) <1.0	<0.1	(9) <1.0	(9) <1.0	(9) <1.0
Fluoranthene	T207	M105	0.1	mg/kg	**4.6**	<0.1	**5.6**	**8.8**	**5.9**
Pyrene	T207	M105	0.1	mg/kg	**3.7**	<0.1	**4.1**	**8.1**	**5.0**
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	**1.7**	<0.1	**1.9**	**2.4**	**1.9**
Chrysene	T207	M105	0.1	mg/kg	**1.7**	<0.1	**2.9**	**2.6**	**2.0**
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	**1.4**	<0.1	**1.8**	**1.5**	**1.3**
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	**1.2**	<0.1	**1.9**	**2.2**	**2.0**
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	**1.5**	<0.1	**2.0**	**2.0**	**1.7**
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	(9) <1.0	<0.1	**1.2**	**1.1**	**1.0**
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	(9) <1.0	<0.1	(9) <1.0	(9) <1.0	(9) <1.0
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	**1.0**	<0.1	**1.5**	**1.4**	**1.2**
PAH(total)	T207	M105	0.1	mg/kg	**20**	<0.1	**25**	**37**	**25**

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground Soils with Elevated PID Readings - Organics PAH US EPA 16

Concept Reference			**706211 046**	**706211 047**	**706211 049**	**706211 050**	**706211 054**
Customer Sample Reference			**HEP-BH-13**	**HEP-BH-1864**	**HEP-BH-1864**	**HEP-BH-1864**	**HEP-BH-20**
Top Depth			**6.50**	**1.20**	**3.20**	**4.20**	**0.60**
Hole ID			**HEP-BH-13**	**HEP-BH-1864**	**HEP-BH-1864**	**HEP-BH-1864**	**HEP-BH-20**
Depth			**6.50**	**1.20**	**3.20**	**4.20**	**0.60**
Date Sampled			**15-DEC-2017**	**18-DEC-2017**	**18-DEC-2017**	**18-DEC-2017**	**18-DEC-2017**
Time Sampled			**11:00**	**13:30**	**15:20**	**16:10**	**14:25**
AGS Type			**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID			**HEPBH1863201712150 02**	**HEPBH1864201712180 01**	**HEPBH1864201712180 03**	**HEPBH1864201712180 04**	**HEPBH2020171218003**
AGS Sample Reference			**25**	**4**	**10**	**15**	**7**
Matrix Class			**Sandy Soil**	**Sandy Soil**	**Clay**	**Fill**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Naphthalene	T207	M105	0.1	mg/kg	(9,100) <10	(9) <1.0	<0.1	<0.1	**0.8**
Acenaphthylene	T207	M105	0.1	mg/kg	(9,100) <10	(9) <1.0	<0.1	<0.1	**0.1**
Acenaphthene	T207	M105	0.1	mg/kg	(100,9) <10	(9) <1.0	<0.1	<0.1	**0.7**
Fluorene	T207	M105	0.1	mg/kg	(100,9) <10	(9) <1.0	<0.1	<0.1	**0.8**
Phenanthrene	T207	M105	0.1	mg/kg	(100,9) <10	(9) <1.0	<0.1	<0.1	**5.8**
Anthracene	T207	M105	0.1	mg/kg	(100,9) <10	(9) <1.0	<0.1	<0.1	**1.4**
Fluoranthene	T207	M105	0.1	mg/kg	**(9) 15**	**1.6**	<0.1	<0.1	**5.4**
Pyrene	T207	M105	0.1	mg/kg	**(9) 11**	**1.4**	<0.1	<0.1	**4.5**
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	(100,9) <10	(9) <1.0	<0.1	<0.1	**2.1**
Chrysene	T207	M105	0.1	mg/kg	(9,100) <10	(9) <1.0	<0.1	<0.1	**2.4**
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	(9,100) <10	(9) <1.0	<0.1	<0.1	**1.7**
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	(100,9) <10	(9) <1.0	<0.1	<0.1	**1.4**
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	(100,9) <10	(9) <1.0	<0.1	<0.1	**2.0**
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	(9,100) <10	(9) <1.0	<0.1	<0.1	**1.1**
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	(9,100) <10	(9) <1.0	<0.1	<0.1	**0.4**
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	(9,100) <10	(9) <1.0	<0.1	<0.1	**1.2**
PAH(total)	T207	M105	0.1	mg/kg	**27**	**3.1**	<0.1	<0.1	**32**

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground Soils with Elevated PID Readings - Organics PAH US EPA 16

Concept Reference	**706211 056**	**706211 062**	**706211 074**	**706211 086**	**706211 087**
Customer Sample Reference	**HEP-BH-20**	**HEP-BH-43**	**HEP-BH-44**	**HEP-TP-1296**	**HEP-TP-1296**
Top Depth	**2.40**	**0.10**	**0.10**	**0.40**	**1.30**
Hole ID	**HEP-BH-20**	**HEP-BH-43**	**HEP-BH-44**	**HEP-TP-1296**	**HEP-TP-1296**
Depth	**2.40**	**0.10**	**0.10**	**0.40**	**1.30**
Date Sampled	**18-DEC-2017**	**13-DEC-2017**	**18-DEC-2017**	**13-DEC-2017**	**13-DEC-2017**
Time Sampled	**14:51**	**14:05**	**15:05**	**11:00**	**12:00**
AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**HEPBH2020171218005**	**HEPBH4320171213001**	**HEPBH4420171218001**	**HEPBH1296201712130 02**	**HEPBH1296201712130 03**
AGS Sample Reference	**17**	**1**	**1**	**6**	**9**
Matrix Class	**Clay**	**Sandy Soil**	**Sandy Soil**	**Topsoil**	**Topsoil**

Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Naphthalene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	T207	M105	0.1	mg/kg	**0.1**	**0.1**	**0.1**	**0.4**	<0.1
Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	T207	M105	0.1	mg/kg	**0.4**	**0.4**	**0.4**	**1.1**	**0.3**
Pyrene	T207	M105	0.1	mg/kg	**0.3**	**0.3**	**0.4**	**1.0**	**0.3**
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	**0.2**	**0.2**	**0.2**	**0.6**	**0.2**
Chrysene	T207	M105	0.1	mg/kg	**0.2**	**0.2**	**0.3**	**0.6**	**0.2**
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	**0.2**	**0.2**	**0.2**	**0.6**	**0.1**
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	**0.2**	**0.2**	**0.2**	**0.6**	**0.2**
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	**0.2**	**0.2**	**0.2**	**0.6**	**0.2**
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	**0.1**	**0.2**	**0.2**	**0.5**	**0.1**
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	**0.3**	<0.1
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	**0.2**	**0.2**	**0.2**	**0.5**	<0.1
PAH(total)	T207	M105	0.1	mg/kg	**2.1**	**2.2**	**2.5**	**6.9**	**1.5**

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground Soils with Elevated PID Readings - Organics PAH US EPA 16

Concept Reference	**706211 089**	**706211 091**	**706211 093**	**706211 094**
Customer Sample Reference	**HEP-TP-1296**	**HEP-TT-19**	**HEP-TT-19**	**HEP-TT-19**
Top Depth	**2.70**	**0.30**	**2.20**	**3.10**
Hole ID	**HEP-TP-1296**	**HEP-TT-19**	**HEP-TT-19**	**HEP-TT-19**
Depth	**2.70**	**0.30**	**2.20**	**3.10**
Date Sampled	**13-DEC-2017**	**13-DEC-2017**	**13-DEC-2017**	**13-DEC-2017**
Time Sampled	**14:00**	**11:00**	**14:00**	**15:00**
AGS Type	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**HEPBH1296201712130 05**	**HEPTT1920171213002**	**HEPTT1920171213004**	**HEPTT1920171213005**
AGS Sample Reference	**15**	**6**	**12**	**15**
Matrix Class	**Sandy Soil**	**Sandy Soil**	**Clay**	**Clay**

Determinand	Method	Test Sample	LOD	Units				
Naphthalene	T207	M105	0.1	mg/kg	(9) <1.0	<0.1	(9) <1.0	<0.1
Acenaphthylene	T207	M105	0.1	mg/kg	(9) <1.0	<0.1	(9) <1.0	<0.1
Acenaphthene	T207	M105	0.1	mg/kg	(9) <1.0	<0.1	**1.3**	<0.1
Fluorene	T207	M105	0.1	mg/kg	(9) <1.0	<0.1	**1.5**	<0.1
Phenanthrene	T207	M105	0.1	mg/kg	**2.3**	<0.1	**15**	**0.1**
Anthracene	T207	M105	0.1	mg/kg	(9) <1.0	<0.1	**3.3**	<0.1
Fluoranthene	T207	M105	0.1	mg/kg	**2.9**	**0.3**	**23**	**0.3**
Pyrene	T207	M105	0.1	mg/kg	**2.4**	**0.3**	**18**	**0.3**
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	**1.0**	**0.2**	**8.2**	**0.1**
Chrysene	T207	M105	0.1	mg/kg	**1.2**	**0.2**	**7.3**	**0.1**
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	(9) <1.0	**0.2**	**5.1**	**0.1**
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	**1.1**	**0.2**	**7.0**	**0.1**
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	**1.1**	**0.2**	**7.0**	**0.2**
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	(9) <1.0	**0.1**	**3.8**	<0.1
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	(9) <1.0	<0.1	**1.7**	<0.1
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	(9) <1.0	**0.2**	**4.4**	**0.1**
PAH(total)	T207	M105	0.1	mg/kg	**12**	**1.8**	**110**	**1.5**

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - TPH (CWG)

				Concept Reference	**706211 006**	**706211 008**	**706211 010**	**706211 015**	**706211 017**
				Customer Sample Reference	**HEP-BH-14**	**HEP-BH-14**	**HEP-BH-14**	**HEP-BH-16**	**HEP-BH-16**
				Top Depth	**0.60**	**2.00**	**5.00**	**1.70**	**3.70**
				Hole ID	**HEP-BH-14**	**HEP-BH-14**	**HEP-BH-14**	**HEP-BH-16**	**HEP-BH-16**
				Depth	**0.60**	**2.00**	**5.00**	**1.70**	**3.70**
				Date Sampled	**13-DEC-2017**	**14-DEC-2017**	**14-DEC-2017**	**14-DEC-2017**	**14-DEC-2017**
				Time Sampled	**13:30**	**10:30**	**12:30**	**14:30**	**15:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH1420171213002**	**HEPBH1420171214001**	**HEPBH1420171214003**	**HEPBH1620171214001**	**HEPBH1620171214003**
				AGS Sample Reference	**6**	**14**	**27**	**8**	**15**
				Matrix Class	**Sandy Soil**	**Clay**	**Clay**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
TPH (C5-C6 aliphatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C6-C8 aliphatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C8-C10 aliphatic)	T209	AR	100	µg/kg	<100	**270**	<100	<100	<100
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	(13) **2**	(13) **17**	(13) **2**	(13) **1**	(13,9) <10
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	(13) **2**	(13) **24**	(13) **3**	(13) **1**	(9,13) <10
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	(13) **5**	(13) **40**	(13) **15**	(13) **2**	(13,9) <10
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	(13) **11**	(13) **220**	(13) **45**	(13) **9**	(13) **46**
TPH (C6-C7 aromatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C7-C8 aromatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C8-C10 aromatic)	T209	AR	100	µg/kg	<100	**240**	<100	<100	<100
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	(13) <2	(13,9) <10	(13) <2	(13) <2	(9,13) <10
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	(13) **2**	(13) **46**	(13) **5**	(13) **1**	(13,9) <10
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	(13) **4**	(13) **270**	(13) **13**	(13) **4**	(13) **14**
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	(13) **13**	(13) **110**	(13) **14**	(13) **10**	(13) **38**

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - TPH (CWG)

				Concept Reference	**706211 019**	**706211 021**	**706211 041**	**706211 042**	**706211 044**
				Customer Sample Reference	**HEP-BH-16**	**HEP-BH-16**	**HEP-BH-13**	**HEP-BH-13**	**HEP-BH-13**
				Top Depth	**5.70**	**7.50**	**1.20**	**2.20**	**4.20**
				Hole ID	**HEP-BH-16**	**HEP-BH-16**	**HEP-BH-13**	**HEP-BH-13**	**HEP-BH-13**
				Depth	**5.70**	**7.50**	**1.20**	**2.20**	**4.20**
				Date Sampled	**15-DEC-2017**	**15-DEC-2017**	**14-DEC-2017**	**14-DEC-2017**	**14-DEC-2017**
				Time Sampled	**09:00**	**10:30**	**12:20**	**12:30**	**13:10**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH1620171215001**	**HEPBH1620171215003**	**HEPBH186320171214001**	**HEPBH186320171214002**	**HEPBH186320171214004**
				AGS Sample Reference	**20**	**26**	**10**	**13**	**19**
				Matrix Class	**Sandy Soil**	**Clay**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
TPH (C5-C6 aliphatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C6-C8 aliphatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C8-C10 aliphatic)	T209	AR	100	µg/kg	**1100**	<100	<100	<100	**710**
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	(13) **60**	(13) **1**	(9,13) <10	(13) **13**	(13) **19**
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	(13) **130**	(13) **2**	(13) **10**	(13) **19**	(13) **29**
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	(13) **140**	(13) **5**	(13) **15**	(13) **26**	(13) **180**
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	(13) **140**	(13) **11**	(13) **55**	(13) **76**	(13) **720**
TPH (C6-C7 aromatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C7-C8 aromatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C8-C10 aromatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	(13,9) <10	(13) <2	(13,9) <10	(13,9) <10	(13,9) <10
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	(13) **79**	(13) <1	(13) **18**	(13) **24**	(13) **34**
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	(13) **93**	(13) **1**	(13) **85**	(13) **170**	(13) **120**
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	(13) **53**	(13) **2**	(13) **160**	(13) **240**	(13) **140**

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - TPH (CWG)

Concept Reference				**706211 046**	**706211 047**	**706211 049**	**706211 050**	**706211 054**
Customer Sample Reference				**HEP-BH-13**	**HEP-BH-1864**	**HEP-BH-1864**	**HEP-BH-1864**	**HEP-BH-20**
Top Depth				**6.50**	**1.20**	**3.20**	**4.20**	**0.60**
Hole ID				**HEP-BH-13**	**HEP-BH-1864**	**HEP-BH-1864**	**HEP-BH-1864**	**HEP-BH-20**
Depth				**6.50**	**1.20**	**3.20**	**4.20**	**0.60**
Date Sampled				**15-DEC-2017**	**18-DEC-2017**	**18-DEC-2017**	**18-DEC-2017**	**18-DEC-2017**
Time Sampled				**11:00**	**13:30**	**15:20**	**16:10**	**14:25**
AGS Type				**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID				**HEPBH186320171215002**	**HEPBH186420171218001**	**HEPBH186420171218003**	**HEPBH186420171218004**	**HEPBH202017121800 3**
AGS Sample Reference				**25**	**4**	**10**	**15**	**7**
Matrix Class				**Sandy Soil**	**Sandy Soil**	**Clay**	**Fill**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**				
TPH (C5-C6 aliphatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C6-C8 aliphatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C8-C10 aliphatic)	T209	AR	100	µg/kg	**6800**	<100	<100	**270**	<100
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	**(13) 28**	**(13) 2**	**(13) 2**	**(13) 2**	**(13) 2**
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	**(13) 20**	**(13) 6**	**(13) 1**	**(13) 2**	**(13) 1**
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	**(13) 91**	**(13) 43**	**(13) 2**	**(13) 2**	**(13) 5**
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	**(13) 850**	**(13) 56**	**(13) 12**	**(13) 21**	**(13) 16**
TPH (C6-C7 aromatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C7-C8 aromatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C8-C10 aromatic)	T209	AR	100	µg/kg	**180**	<100	<100	<100	<100
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	(100,13) <10	(13) <2	(13) <2	(13) <2	(13) <2
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	**(13) 28**	**(13) 6**	(13) <1	(13) <1	**(13) 3**
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	**(13) 120**	**(13) 24**	**(13) 2**	**(13) 1**	**(13) 14**
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	**(13) 180**	**(13) 28**	**(13) 2**	**(13) 3**	**(13) 27**

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - TPH (CWG)

Concept Reference				**706211 056**	**706211 062**	**706211 074**	**706211 086**	**706211 087**
Customer Sample Reference				**HEP-BH-20**	**HEP-BH-43**	**HEP-BH-44**	**HEP-TP-1296**	**HEP-TP-1296**
Top Depth				**2.40**	**0.10**	**0.10**	**0.40**	**1.30**
Hole ID				**HEP-BH-20**	**HEP-BH-43**	**HEP-BH-44**	**HEP-TP-1296**	**HEP-TP-1296**
Depth				**2.40**	**0.10**	**0.10**	**0.40**	**1.30**
Date Sampled				**18-DEC-2017**	**13-DEC-2017**	**18-DEC-2017**	**13-DEC-2017**	**13-DEC-2017**
Time Sampled				**14:51**	**14:05**	**15:05**	**11:00**	**12:00**
AGS Type				**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID				**HEPBH202017121800 5**	**HEPBH432017121300 1**	**HEPBH442017121800 1**	**HEPBH129620171213002**	**HEPBH129620171213003**
AGS Sample Reference				**17**	**1**	**1**	**6**	**9**
Matrix Class				**Clay**	**Sandy Soil**	**Sandy Soil**	**Topsoil**	**Topsoil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**				
TPH (C5-C6 aliphatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C6-C8 aliphatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C8-C10 aliphatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	**(13) 2**	**(13) 1**	**(13) 2**	**(13) 3**	**(13) 2**
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	**(13) 1**	**(13) 1**	**(13) 2**	**(13) 4**	**(13) 9**
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	**(13) 2**	**(13) 2**	**(13) 3**	**(13) 30**	**(13) 3**
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	**(13) 7**	**(13) 11**	**(13) 19**	**(13) 150**	**(13) 120**
TPH (C6-C7 aromatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C7-C8 aromatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C8-C10 aromatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	(13) <2	(13) <2	(13) <2	(13) <2	(13) <2
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	(13) <1	(13) <1	**(13) 2**	**(13) 2**	**(13) 3**
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	**(13) 3**	**(13) 3**	**(13) 2**	**(13) 19**	**(13) 18**
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	**(13) 9**	**(13) 10**	(13) <1	**(13) 29**	**(13) 14**

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - TPH (CWG)

Concept Reference		**706211 089**	**706211 091**	**706211 093**	**706211 094**
Customer Sample Reference		**HEP-TP-1296**	**HEP-TT-19**	**HEP-TT-19**	**HEP-TT-19**
Top Depth		**2.70**	**0.30**	**2.20**	**3.10**
Hole ID		**HEP-TP-1296**	**HEP-TT-19**	**HEP-TT-19**	**HEP-TT-19**
Depth		**2.70**	**0.30**	**2.20**	**3.10**
Date Sampled		**13-DEC-2017**	**13-DEC-2017**	**13-DEC-2017**	**13-DEC-2017**
Time Sampled		**14:00**	**11:00**	**14:00**	**15:00**
AGS Type		**ES**	**ES**	**ES**	**ES**
AGS Sample ID		**HEPBH1296201712130 05**	**HEPTT1920171213002**	**HEPTT1920171213004**	**HEPTT1920171213005**
AGS Sample Reference		**15**	**6**	**12**	**15**
Matrix Class		**Sandy Soil**	**Sandy Soil**	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**	
TPH (C5-C6 aliphatic)	T209	AR	100	µg/kg	<100	<100	<100	<100
TPH (C6-C8 aliphatic)	T209	AR	100	µg/kg	<100	<100	<100	<100
TPH (C8-C10 aliphatic)	T209	AR	100	µg/kg	<100	<100	<100	<100
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	(13) <1	**(13) 1**	(13,9) <10	(13) <1
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	(13) <1	(13) <1	(13,9) <10	(13) <1
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	(13) <1	**(13) 2**	(13,9) <10	**(13) 6**
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	(13) <2	**(13) 4**	**(13) 40**	**(13) 28**
TPH (C6-C7 aromatic)	T209	AR	100	µg/kg	<100	<100	<100	<100
TPH (C7-C8 aromatic)	T209	AR	100	µg/kg	<100	<100	<100	<100
TPH (C8-C10 aromatic)	T209	AR	100	µg/kg	<100	<100	<100	<100
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	(13) <2	(13) <2	(9,13) <10	(13) <2
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	(13) <1	**(13) 4**	**(13) 18**	(13) <1
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	(13) <1	**(13) 26**	**(13) 110**	**(13) 1**
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	(13) <1	**(13) 40**	**(13) 180**	**(13) 7**

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil

Total Petroleum Hydrocarbons (Aliphatics+Aromatics) Total

Concept Reference					**706211 006**	**706211 008**	**706211 010**	**706211 015**	**706211 017**
Customer Sample Reference					**HEP-BH-14**	**HEP-BH-14**	**HEP-BH-14**	**HEP-BH-16**	**HEP-BH-16**
Top Depth					**0.60**	**2.00**	**5.00**	**1.70**	**3.70**
Hole ID					**HEP-BH-14**	**HEP-BH-14**	**HEP-BH-14**	**HEP-BH-16**	**HEP-BH-16**
Depth					**0.60**	**2.00**	**5.00**	**1.70**	**3.70**
Date Sampled					**13-DEC-2017**	**14-DEC-2017**	**14-DEC-2017**	**14-DEC-2017**	**14-DEC-2017**
Time Sampled					**13:30**	**10:30**	**12:30**	**14:30**	**15:00**
AGS Type					**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID					**HEPBH142017121300 2**	**HEPBH142017121400 1**	**HEPBH142017121400 3**	**HEPBH162017121400 1**	**HEPBH162017121400 3**
AGS Sample Reference					**6**	**14**	**27**	**8**	**15**
Matrix Class					**Sandy Soil**	**Clay**	**Clay**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
TPH (Aliphatic) total	T85	M105		mg/kg	**(13) 20**	**(13) 300**	**(13) 65**	**(13) 13**	**(13) 46**
TPH (Aromatic) total	T85	M105		mg/kg	**(13) 19**	**(13) 430**	**(13) 32**	**(13) 15**	**(13) 52**
TPH (Aliphatic+Aromatic) (sum)	T85	M105		mg/kg	**(13) 39.0**	**(13) 730**	**(13) 97.0**	**(13) 28.0**	**(13) 98.0**

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Total Petroleum Hydrocarbons (Aliphatics+Aromatics) Total

Concept Reference	**706211 019**	**706211 021**	**706211 041**	**706211 042**	**706211 044**
Customer Sample Reference	**HEP-BH-16**	**HEP-BH-16**	**HEP-BH-13**	**HEP-BH-13**	**HEP-BH-13**
Top Depth	**5.70**	**7.50**	**1.20**	**2.20**	**4.20**
Hole ID	**HEP-BH-16**	**HEP-BH-16**	**HEP-BH-13**	**HEP-BH-13**	**HEP-BH-13**
Depth	**5.70**	**7.50**	**1.20**	**2.20**	**4.20**
Date Sampled	**15-DEC-2017**	**15-DEC-2017**	**14-DEC-2017**	**14-DEC-2017**	**14-DEC-2017**
Time Sampled	**09:00**	**10:30**	**12:20**	**12:30**	**13:10**
AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**HEPBH1620171215001**	**HEPBH1620171215003**	**HEPBH1863201712140001**	**HEPBH1863201712140002**	**HEPBH1863201712140004**
AGS Sample Reference	**20**	**26**	**10**	**13**	**19**
Matrix Class	**Sandy Soil**	**Clay**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units					
TPH (Aliphatic) total	T85	M105		mg/kg	(13) **470**	(13) **19**	(13) **80**	(13) **130**	(13) **950**
TPH (Aromatic) total	T85	M105		mg/kg	(13) **230**	(13) **3.0**	(13) **260**	(13) **430**	(13) **290**
TPH (Aliphatic+Aromatic) (sum)	T85	M105		mg/kg	(13) **700**	(13) **22.0**	(13) **340**	(13) **560**	(13) **1240**

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Total Petroleum Hydrocarbons (Aliphatics+Aromatics) Total

Concept Reference	**706211 046**	**706211 047**	**706211 049**	**706211 050**	**706211 054**
Customer Sample Reference	**HEP-BH-13**	**HEP-BH-1864**	**HEP-BH-1864**	**HEP-BH-1864**	**HEP-BH-20**
Top Depth	**6.50**	**1.20**	**3.20**	**4.20**	**0.60**
Hole ID	**HEP-BH-13**	**HEP-BH-1864**	**HEP-BH-1864**	**HEP-BH-1864**	**HEP-BH-20**
Depth	**6.50**	**1.20**	**3.20**	**4.20**	**0.60**
Date Sampled	**15-DEC-2017**	**18-DEC-2017**	**18-DEC-2017**	**18-DEC-2017**	**18-DEC-2017**
Time Sampled	**11:00**	**13:30**	**15:20**	**16:10**	**14:25**
AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**HEPBH1863201712150002**	**HEPBH1864201712180001**	**HEPBH1864201712180003**	**HEPBH1864201712180004**	**HEPBH2020171218003**
AGS Sample Reference	**25**	**4**	**10**	**15**	**7**
Matrix Class	**Sandy Soil**	**Sandy Soil**	**Clay**	**Fill**	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units					
TPH (Aliphatic) total	T85	M105		mg/kg	(13) **990**	(13) **110**	(13) **17**	(13) **27**	(13) **24**
TPH (Aromatic) total	T85	M105		mg/kg	(13) **330**	(13) **58**	(13) **4.0**	(13) **4.0**	(13) **44**
TPH (Aliphatic+Aromatic) (sum)	T85	M105		mg/kg	(13) **1320**	(13) **168**	(13) **21.0**	(13) **31.0**	(13) **68.0**

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Total Petroleum Hydrocarbons (Aliphatics+Aromatics) Total

Concept Reference	**706211 056**	**706211 062**	**706211 074**	**706211 086**	**706211 087**
Customer Sample Reference	**HEP-BH-20**	**HEP-BH-43**	**HEP-BH-44**	**HEP-TP-1296**	**HEP-TP-1296**
Top Depth	**2.40**	**0.10**	**0.10**	**0.40**	**1.30**
Hole ID	**HEP-BH-20**	**HEP-BH-43**	**HEP-BH-44**	**HEP-TP-1296**	**HEP-TP-1296**
Depth	**2.40**	**0.10**	**0.10**	**0.40**	**1.30**
Date Sampled	**18-DEC-2017**	**13-DEC-2017**	**18-DEC-2017**	**13-DEC-2017**	**13-DEC-2017**
Time Sampled	**14:51**	**14:05**	**15:05**	**11:00**	**12:00**
AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**HEPBH2020171218005**	**HEPBH4320171213001**	**HEPBH4420171218001**	**HEPBH1296201712130002**	**HEPBH1296201712130003**
AGS Sample Reference	**17**	**1**	**1**	**6**	**9**
Matrix Class	**Clay**	**Sandy Soil**	**Sandy Soil**	**Topsoil**	**Topsoil**

Determinand	Method	Test Sample	LOD	Units					
TPH (Aliphatic) total	T85	M105		mg/kg	(13) **12**	(13) **15**	(13) **26**	(13) **190**	(13) **130**
TPH (Aromatic) total	T85	M105		mg/kg	(13) **12**	(13) **13**	(13) **4.0**	(13) **50**	(13) **35**
TPH (Aliphatic+Aromatic) (sum)	T85	M105		mg/kg	(13) **24.0**	(13) **28.0**	(13) **30.0**	(13) **240**	(13) **165**

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Total Petroleum Hydrocarbons (Aliphatics+Aromatics) Total

Concept Reference	**706211 089**	**706211 091**	**706211 093**	**706211 094**
Customer Sample Reference	**HEP-TP-1296**	**HEP-TT-19**	**HEP-TT-19**	**HEP-TT-19**
Top Depth	**2.70**	**0.30**	**2.20**	**3.10**
Hole ID	**HEP-TP-1296**	**HEP-TT-19**	**HEP-TT-19**	**HEP-TT-19**
Depth	**2.70**	**0.30**	**2.20**	**3.10**
Date Sampled	**13-DEC-2017**	**13-DEC-2017**	**13-DEC-2017**	**13-DEC-2017**
Time Sampled	**14:00**	**11:00**	**14:00**	**15:00**
AGS Type	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**HEPBH1296201712130005**	**HEPTT1920171213002**	**HEPTT1920171213004**	**HEPTT1920171213005**
AGS Sample Reference	**15**	**6**	**12**	**15**
Matrix Class	**Sandy Soil**	**Sandy Soil**	**Clay**	**Clay**

Determinand	Method	Test Sample	LOD	Units				
TPH (Aliphatic) total	T85	M105		mg/kg	(13) N.D.	(13) **7.0**	(13) **40**	(13) **34**
TPH (Aromatic) total	T85	M105		mg/kg	(13) N.D.	(13) **70**	(13) **310**	(13) **8.0**
TPH (Aliphatic+Aromatic) (sum)	T85	M105		mg/kg	(13) N.D.	(13) **77.0**	(13) **350**	(13) **42.0**

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite B - Inorganics

Concept Reference	**706211 064**	**706211 067**	**706211 077**	**706211 082**	**706211 084**
Customer Sample Reference	**HEP-BH-43**	**HEP-BH-43**	**HEP-BH-7**	**HEP-BH-7**	**HEP-BH-7**
Top Depth	**1.90**	**4.90**	**0.70**	**4.30**	**6.30**
Hole ID	**HEP-BH-43**	**HEP-BH-43**	**HEP-BH-7**	**HEP-BH-7**	**HEP-BH-7**
Depth	**1.90**	**4.90**	**0.70**	**4.30**	**6.30**
Date Sampled	**14-DEC-2017**	**15-DEC-2017**	**13-DEC-2017**	**14-DEC-2017**	**14-DEC-2017**
Time Sampled	**15:00**	**11:00**	**15:35**	**10:50**	**13:05**
AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**HEPBH4320171214001**	**HEPBH4320171215003**	**HEPBH720171213002**	**HEPBH720171214004**	**HEPBH720171214006**
AGS Sample Reference	**5**	**16**	**4**	**27**	**37**
Matrix Class	**Clay**	**Fill**	**Topsoil**	**Fill**	**Clay**

Determinand	Method	Test Sample	LOD	Units					
Chloride	T686	AR	1	mg/kg	**12**	**3**	**6**	**5**	**13**

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite B - Natural Ground - Misc

Concept Reference	**706211 064**	**706211 067**	**706211 077**	**706211 082**	**706211 084**
Customer Sample Reference	**HEP-BH-43**	**HEP-BH-43**	**HEP-BH-7**	**HEP-BH-7**	**HEP-BH-7**
Top Depth	**1.90**	**4.90**	**0.70**	**4.30**	**6.30**
Hole ID	**HEP-BH-43**	**HEP-BH-43**	**HEP-BH-7**	**HEP-BH-7**	**HEP-BH-7**
Depth	**1.90**	**4.90**	**0.70**	**4.30**	**6.30**
Date Sampled	**14-DEC-2017**	**15-DEC-2017**	**13-DEC-2017**	**14-DEC-2017**	**14-DEC-2017**
Time Sampled	**15:00**	**11:00**	**15:35**	**10:50**	**13:05**
AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**HEPBH4320171214001**	**HEPBH4320171215003**	**HEPBH720171213002**	**HEPBH720171214004**	**HEPBH720171214006**
AGS Sample Reference	**5**	**16**	**4**	**27**	**37**
Matrix Class	**Clay**	**Fill**	**Topsoil**	**Fill**	**Clay**

Determinand	Method	Test Sample	LOD	Units					
Fraction Organic Carbon - F(oc)	T21	AR	1	%	**62**	**61**	**91**	**51**	**90**
Soil Organic Matter	T287	A40	0.1	%	**2.5**	**5.5**	**0.6**	**8.2**	**6.9**
pH	T7	A40			**8.1**	**7.8**	**5.9**	**7.7**	**7.7**
TPH C10-C40 (sum)	T85	M105	1	mg/kg	**(13) 5**	(13) <1	**(13) 200**	**(13) 2**	(13) <1

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite B - Natural Ground - Metals and Metalloids

Concept Reference	**706211 064**	**706211 067**	**706211 077**	**706211 082**	**706211 084**
Customer Sample Reference	**HEP-BH-43**	**HEP-BH-43**	**HEP-BH-7**	**HEP-BH-7**	**HEP-BH-7**
Top Depth	**1.90**	**4.90**	**0.70**	**4.30**	**6.30**
Hole ID	**HEP-BH-43**	**HEP-BH-43**	**HEP-BH-7**	**HEP-BH-7**	**HEP-BH-7**
Depth	**1.90**	**4.90**	**0.70**	**4.30**	**6.30**
Date Sampled	**14-DEC-2017**	**15-DEC-2017**	**13-DEC-2017**	**14-DEC-2017**	**14-DEC-2017**
Time Sampled	**15:00**	**11:00**	**15:35**	**10:50**	**13:05**
AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**HEPBH4320171214001**	**HEPBH4320171215003**	**HEPBH720171213002**	**HEPBH720171214004**	**HEPBH720171214006**
AGS Sample Reference	**5**	**16**	**4**	**27**	**37**
Matrix Class	**Clay**	**Fill**	**Topsoil**	**Fill**	**Clay**

Determinand	Method	Test Sample	LOD	Units					
Arsenic	T6	M40	2	mg/kg	**13**	**11**	**36**	**7.1**	**10**
Cadmium	T6	M40	1	mg/kg	**2**	<1	**11**	<1	<1
Chromium	T6	M40	1	mg/kg	**46**	**20**	**150**	**19**	**38**
Iron	T6	A40	1	mg/kg	**26000**	**10000**	**46000**	**20000**	**35000**
Lead	T6	M40	1	mg/kg	**140**	**19**	**200**	**11**	**21**
Manganese	T6	M40	1	mg/kg	**430**	**110**	**480**	**220**	**360**
Mercury	T6	M40	1	mg/kg	<1	<1	**1**	<1	<1
Nickel	T6	M40	1	mg/kg	**31**	**26**	**45**	**15**	**41**
Selenium	T6	M40	3	mg/kg	<3	<3	<3	<3	<3
Copper	T6	M40	1	mg/kg	**57**	**15**	**160**	**9**	**30**
Zinc	T6	M40	1	mg/kg	**160**	**40**	**380**	**33**	**86**
Boron (water-soluble)	T6	A40	1	mg/kg	<1	<1	<1	<1	<1

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite B - Chromium

Concept Reference	**706211 064**	**706211 067**	**706211 077**	**706211 082**	**706211 084**
Customer Sample Reference	**HEP-BH-43**	**HEP-BH-43**	**HEP-BH-7**	**HEP-BH-7**	**HEP-BH-7**
Top Depth	**1.90**	**4.90**	**0.70**	**4.30**	**6.30**
Hole ID	**HEP-BH-43**	**HEP-BH-43**	**HEP-BH-7**	**HEP-BH-7**	**HEP-BH-7**
Depth	**1.90**	**4.90**	**0.70**	**4.30**	**6.30**
Date Sampled	**14-DEC-2017**	**15-DEC-2017**	**13-DEC-2017**	**14-DEC-2017**	**14-DEC-2017**
Time Sampled	**15:00**	**11:00**	**15:35**	**10:50**	**13:05**
AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**HEPBH4320171214001**	**HEPBH4320171215003**	**HEPBH720171213002**	**HEPBH720171214004**	**HEPBH720171214006**
AGS Sample Reference	**5**	**16**	**4**	**27**	**37**
Matrix Class	**Clay**	**Fill**	**Topsoil**	**Fill**	**Clay**

Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Chromium (trivalent)	T85	A40	2	mg/kg	**46**	**20**	**150**	**19**	**38**
Chromium VI	T6	A40	1	mg/kg	<1	<1	<1	<1	<1

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite B - Natural Material - Organic - PAHs

Concept Reference	**706211 064**	**706211 067**	**706211 077**	**706211 082**	**706211 084**
Customer Sample Reference	**HEP-BH-43**	**HEP-BH-43**	**HEP-BH-7**	**HEP-BH-7**	**HEP-BH-7**
Top Depth	**1.90**	**4.90**	**0.70**	**4.30**	**6.30**
Hole ID	**HEP-BH-43**	**HEP-BH-43**	**HEP-BH-7**	**HEP-BH-7**	**HEP-BH-7**
Depth	**1.90**	**4.90**	**0.70**	**4.30**	**6.30**
Date Sampled	**14-DEC-2017**	**15-DEC-2017**	**13-DEC-2017**	**14-DEC-2017**	**14-DEC-2017**
Time Sampled	**15:00**	**11:00**	**15:35**	**10:50**	**13:05**
AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**HEPBH4320171214001**	**HEPBH4320171215003**	**HEPBH720171213002**	**HEPBH720171214004**	**HEPBH720171214006**
AGS Sample Reference	**5**	**16**	**4**	**27**	**37**
Matrix Class	**Clay**	**Fill**	**Topsoil**	**Fill**	**Clay**

Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Naphthalene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	T207	M105	0.1	mg/kg	<0.1	<0.1	**0.1**	<0.1	<0.1
Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	T207	M105	0.1	mg/kg	<0.1	<0.1	**0.3**	<0.1	<0.1
Pyrene	T207	M105	0.1	mg/kg	<0.1	<0.1	**0.3**	<0.1	<0.1
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1	**0.2**	<0.1	<0.1
Chrysene	T207	M105	0.1	mg/kg	<0.1	<0.1	**0.2**	<0.1	<0.1
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	<0.1	<0.1	**0.2**	<0.1	<0.1
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	<0.1	<0.1	**0.2**	<0.1	<0.1
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	<0.1	<0.1	**0.2**	<0.1	<0.1
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	<0.1	<0.1	**0.2**	<0.1	<0.1
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	<0.1	<0.1	**0.2**	<0.1	<0.1
PAH(total)	T207	M105	0.1	mg/kg	<0.1	<0.1	**2.2**	<0.1	<0.1

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite B - Natural Material - Organic - TPH

Concept Reference	**706211 064**	**706211 067**	**706211 077**	**706211 082**	**706211 084**
Customer Sample Reference	**HEP-BH-43**	**HEP-BH-43**	**HEP-BH-7**	**HEP-BH-7**	**HEP-BH-7**
Top Depth	**1.90**	**4.90**	**0.70**	**4.30**	**6.30**
Hole ID	**HEP-BH-43**	**HEP-BH-43**	**HEP-BH-7**	**HEP-BH-7**	**HEP-BH-7**
Depth	**1.90**	**4.90**	**0.70**	**4.30**	**6.30**
Date Sampled	**14-DEC-2017**	**15-DEC-2017**	**13-DEC-2017**	**14-DEC-2017**	**14-DEC-2017**
Time Sampled	**15:00**	**11:00**	**15:35**	**10:50**	**13:05**
AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**HEPBH4320171214001**	**HEPBH4320171215003**	**HEPBH720171213002**	**HEPBH720171214004**	**HEPBH720171214006**
AGS Sample Reference	**5**	**16**	**4**	**27**	**37**
Matrix Class	**Clay**	**Fill**	**Topsoil**	**Fill**	**Clay**

Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
TPH (C10-C35)	T8	M105	1	mg/kg	**(13) 3**	(13) <1	**(13) 170**	(13) <1	(13) <1
TPH (C35-C40)	T8	M105	1	mg/kg	**(13) 2**	(13) <1	**(13) 27**	**(13) 2**	(13) <1

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Sub Suite 4 - MRPS by GC MS MS

Concept Reference	**706211 042**
Customer Sample Reference	**HEP-BH-13**
Top Depth	**2.20**
Hole ID	**HEP-BH-13**
Depth	**2.20**
Date Sampled	**14-DEC-2017**
Time Sampled	**12:30**
AGS Type	**ES**
AGS Sample ID	**HEPBH18632017121 4002**
AGS Sample Reference	**13**
Matrix Class	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units	
2,4,6-Trichlorophenol	T826	AR	0.01	mg/kg	<0.01
2-Methyl-4,6-dinitrophenol	T826	AR	0.01	mg/kg	<0.01
2-Phenylphenol	T826	AR	0.01	mg/kg	<0.01
9,10-Anthraquinone	T826	AR	0.01	mg/kg	**0.43**
Acetochlor	T826	AR	0.01	mg/kg	<0.01
Aclonifen	T826	AR	0.01	mg/kg	<0.01
Acrinathrin	T826	AR	0.01	mg/kg	<0.01
Alachlor	T826	AR	0.01	mg/kg	<0.01
Aldrin	T826	AR	0.01	mg/kg	<0.01
Ametryn	T826	AR	0.01	mg/kg	<0.01
Atraton	T826	AR	0.01	mg/kg	<0.01
Atrazine	T826	AR	0.01	mg/kg	<0.01
Azaconazole	T826	AR	0.01	mg/kg	<0.01
Azobenzene	T826	AR	0.01	mg/kg	<0.01
Azoxystrobin	T826	AR	0.01	mg/kg	<0.01
Benalaxyl	T826	AR	0.01	mg/kg	<0.01
Benfluralin	T826	AR	0.01	mg/kg	<0.01
Bifenox	T826	AR	0.01	mg/kg	<0.01
Bifenthrin	T826	AR	0.01	mg/kg	<0.01
Binapacryl	T826	AR	0.01	mg/kg	(278) <0.01
Biphenyl	T826	AR	0.01	mg/kg	(278) <0.01
Bitertanol	T826	AR	0.01	mg/kg	<0.01
Boscalid	T826	AR	0.01	mg/kg	<0.01
Bromacil	T826	AR	0.01	mg/kg	<0.01
Bromophos	T826	AR	0.01	mg/kg	<0.01
Bromophos-Ethyl	T826	AR	0.01	mg/kg	<0.01
Bromopropylate	T826	AR	0.01	mg/kg	<0.01
Bupirimate	T826	AR	0.01	mg/kg	<0.01
Buprofezine	T826	AR	0.01	mg/kg	<0.01
Butachlor	T826	AR	0.01	mg/kg	<0.01
Cadusafos	T826	AR	0.01	mg/kg	<0.01
Captan	T826	AR	0.01	mg/kg	(278) <0.01
Carbaryl	T826	AR	0.01	mg/kg	<0.01
Carbophenothion	T826	AR	0.01	mg/kg	<0.01
Carboxine	T826	AR	0.01	mg/kg	<0.01
Carfentrazone Ethyl	T826	AR	0.01	mg/kg	<0.01
Chlorbenzilate	T826	AR	0.01	mg/kg	<0.01
Chlorbufam	T826	AR	0.01	mg/kg	<0.01
Chlordane	T826	AR	0.01	mg/kg	<0.01
Chlordimeform	T826	AR	0.01	mg/kg	<0.01
Chlorethoxyfos	T826	AR	0.01	mg/kg	<0.01
Chlorfenapyr	T826	AR	0.01	mg/kg	<0.01
Chlorfenson	T826	AR	0.01	mg/kg	<0.01
Chlorfenvinphos	T826	AR	0.01	mg/kg	<0.01
Chlormephos	T826	AR	0.01	mg/kg	<0.01
Chloropropylate	T826	AR	0.01	mg/kg	<0.01
Chlorothalonil	T826	AR	0.01	mg/kg	(278) <0.01
Chlorpropham	T826	AR	0.01	mg/kg	<0.01
Chlorpyrifos	T826	AR	0.01	mg/kg	<0.01
Chlorpyrifos methyl	T826	AR	0.01	mg/kg	<0.01
Chlorthal Dimethyl	T826	AR	0.01	mg/kg	<0.01

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Sub Suite 4 - MRPS by GC MS MS

Concept Reference	**706211 042**
Customer Sample Reference	**HEP-BH-13**
Top Depth	**2.20**
Hole ID	**HEP-BH-13**
Depth	**2.20**
Date Sampled	**14-DEC-2017**
Time Sampled	**12:30**
AGS Type	**ES**
AGS Sample ID	**HEPBH18632017121 4002**
AGS Sample Reference	**13**
Matrix Class	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units	
Chlorthion	T826	AR	0.01	mg/kg	<0.01
Chlorthiophos	T826	AR	0.01	mg/kg	<0.01
Chlozolinate	T826	AR	0.01	mg/kg	(278) <0.01
cis-1,2,3,6-Tetrahydrophthalimide	T826	AR	0.01	mg/kg	<0.01
Clodinafop propargy	T826	AR	0.01	mg/kg	<0.01
Clomazone	T826	AR	0.01	mg/kg	<0.01
Cloquintocet mexyl	T826	AR	0.01	mg/kg	<0.01
Coumaphos	T826	AR	0.01	mg/kg	<0.01
Cyflufenamid	T826	AR	0.01	mg/kg	<0.01
Cyfluthrin	T826	AR	0.01	mg/kg	<0.01
Cypermethrin	T826	AR	0.01	mg/kg	<0.01
Cyphenothrin	T826	AR	0.01	mg/kg	<0.01
Cyproconazole	T826	AR	0.01	mg/kg	<0.01
Cyprodinil	T826	AR	0.01	mg/kg	<0.01
DEET	T826	AR	0.01	mg/kg	<0.01
Deltamethrin	T826	AR	0.01	mg/kg	<0.01
Desmetryn	T826	AR	0.01	mg/kg	<0.01
Diafenthiuron	T826	AR	0.01	mg/kg	(278) <0.01
Dialifos	T826	AR	0.01	mg/kg	<0.01
Diazinon	T826	AR	0.01	mg/kg	<0.01
Dichlobenil	T826	AR	0.01	mg/kg	<0.01
Dichlofenthion	T826	AR	0.01	mg/kg	<0.01
Dichlorvos	T826	AR	0.01	mg/kg	<0.01
Diclobutrazol	T826	AR	0.01	mg/kg	**0.01**
Dicloran	T826	AR	0.01	mg/kg	<0.01
Dicofol	T826	AR	0.01	mg/kg	<0.01
Dieldrin	T826	AR	0.01	mg/kg	**0.22**
Difenoconazole	T826	AR	0.01	mg/kg	<0.01
Diflufenican	T826	AR	0.01	mg/kg	<0.01
Dimethenamid	T826	AR	0.01	mg/kg	<0.01
Dimethomorph	T826	AR	0.01	mg/kg	<0.01
Dimoxystrobin	T826	AR	0.01	mg/kg	<0.01
Dinoterb	T826	AR	0.01	mg/kg	<0.01
Dioxabenzofos	T826	AR	0.01	mg/kg	(278) <0.01
Diphenamid	T826	AR	0.01	mg/kg	<0.01
Diphenylamine	T826	AR	0.01	mg/kg	<0.01
Disulfoton	T826	AR	0.01	mg/kg	<0.01
Ditalimfos	T826	AR	0.01	mg/kg	<0.01
Edifenphos	T826	AR	0.01	mg/kg	<0.01
Endosulphan alpha	T826	AR	0.01	mg/kg	<0.01
Endosulphan beta	T826	AR	0.01	mg/kg	<0.01
Endosulphan sulphate	T826	AR	0.01	mg/kg	<0.01
Endrin	T826	AR	0.01	mg/kg	<0.01
Epn	T826	AR	0.01	mg/kg	<0.01
Epoxiconazole	T826	AR	0.01	mg/kg	<0.01
EPTC	T826	AR	0.01	mg/kg	<0.01
Etaconazole	T826	AR	0.01	mg/kg	<0.01
Ethion	T826	AR	0.01	mg/kg	<0.01
Ethofumesate	T826	AR	0.01	mg/kg	<0.01
Ethoprophos	T826	AR	0.01	mg/kg	<0.01
Ethoxyquin	T826	AR	0.01	mg/kg	(278) <0.01

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Sub Suite 4 - MRPS by GC MS MS

Concept Reference	**706211 042**
Customer Sample Reference	**HEP-BH-13**
Top Depth	**2.20**
Hole ID	**HEP-BH-13**
Depth	**2.20**
Date Sampled	**14-DEC-2017**
Time Sampled	**12:30**
AGS Type	**ES**
AGS Sample ID	**HEPBH18632017121 4002**
AGS Sample Reference	**13**
Matrix Class	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units	
Etofenprox	T826	AR	0.01	mg/kg	<0.01
Etoxazole	T826	AR	0.01	mg/kg	<0.01
Etridiazole	T826	AR	0.01	mg/kg	<0.01
Etrimfos	T826	AR	0.01	mg/kg	<0.01
Famoxadone	T826	AR	0.01	mg/kg	<0.01
Famphur	T826	AR	0.01	mg/kg	<0.01
Fenamidone	T826	AR	0.01	mg/kg	<0.01
Fenamiphos	T826	AR	0.01	mg/kg	<0.01
Fenarimol	T826	AR	0.01	mg/kg	<0.01
Fenbuconazole	T826	AR	0.01	mg/kg	<0.01
Fenchlorphos	T826	AR	0.01	mg/kg	<0.01
Fenhexamid	T826	AR	0.01	mg/kg	<0.01
Fenitrothion	T826	AR	0.01	mg/kg	<0.01
Fenpiclonil	T826	AR	0.01	mg/kg	<0.01
Fenpropathrin	T826	AR	0.01	mg/kg	<0.01
Fenson	T826	AR	0.01	mg/kg	<0.01
Fensulfothion	T826	AR	0.01	mg/kg	<0.01
Fenthion	T826	AR	0.01	mg/kg	<0.01
Fenvalerate	T826	AR	0.01	mg/kg	<0.01
Fipronil	T826	AR	0.01	mg/kg	<0.01
Fipronil sulphone	T826	AR	0.01	mg/kg	<0.01
Flamprop isopropyl	T826	AR	0.01	mg/kg	<0.01
Fluazifop-P-Butyl	T826	AR	0.01	mg/kg	<0.01
Flucythrinate	T826	AR	0.01	mg/kg	<0.01
Fludioxonil	T826	AR	0.01	mg/kg	<0.01
Flufenacet	T826	AR	0.01	mg/kg	<0.01
Flumetralin	T826	AR	0.01	mg/kg	<0.01
Flumioxazin	T826	AR	0.01	mg/kg	<0.01
Flumorph	T826	AR	0.01	mg/kg	<0.01
Fluopyram	T826	AR	0.01	mg/kg	<0.01
Fluquinconazole	T826	AR	0.01	mg/kg	<0.01
Fluroxypyr-1-methylheptyl ester	T826	AR	0.01	mg/kg	<0.01
Flusilazole	T826	AR	0.01	mg/kg	<0.01
Flutolanil	T826	AR	0.01	mg/kg	<0.01
Fluxapyroxad	T826	AR	0.01	mg/kg	<0.01
Folpet	T826	AR	0.01	mg/kg	<0.01
Fonophos	T826	AR	0.01	mg/kg	<0.01
Formothion	T826	AR	0.01	mg/kg	<0.01
Furalaxyl	T826	AR	0.01	mg/kg	<0.01
Haloxyfop etotyl	T826	AR	0.01	mg/kg	<0.01
Haloxyfop Methyl	T826	AR	0.01	mg/kg	<0.01
Heptachlor	T826	AR	0.01	mg/kg	<0.01
Heptachlor epoxide	T826	AR	0.01	mg/kg	<0.01
Heptachlor exo Epoxide	T826	AR	0.01	mg/kg	<0.01
Heptenophos	T826	AR	0.01	mg/kg	<0.01
Hexachlorobenzene	T826	AR	0.01	mg/kg	<0.01
Hexachlorocyclohexane (alpha)	T826	AR	0.01	mg/kg	<0.01
Hexachlorocyclohexane (beta)	T826	AR	0.01	mg/kg	<0.01
Hexachlorocyclohexane (delta)	T826	AR	0.01	mg/kg	<0.01
Hexaconazole	T826	AR	0.01	mg/kg	<0.01
Hexazinone	T826	AR	0.01	mg/kg	<0.01

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Sub Suite 4 - MRPS by GC MS MS

Concept Reference	**706211 042**
Customer Sample Reference	**HEP-BH-13**
Top Depth	**2.20**
Hole ID	**HEP-BH-13**
Depth	**2.20**
Date Sampled	**14-DEC-2017**
Time Sampled	**12:30**
AGS Type	**ES**
AGS Sample ID	**HEPBH18632017121 4002**
AGS Sample Reference	**13**
Matrix Class	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units	
Imazalil	T826	AR	0.01	mg/kg	<0.01
Iodofenphos	T826	AR	0.01	mg/kg	<0.01
Iprodione	T826	AR	0.01	mg/kg	<0.01
Isazofos	T826	AR	0.01	mg/kg	<0.01
Isocarbophos	T826	AR	0.01	mg/kg	<0.01
Isodrin	T826	AR	0.01	mg/kg	<0.01
Isofenphos	T826	AR	0.01	mg/kg	<0.01
Isofenphos Methyl	T826	AR	0.01	mg/kg	<0.01
Isomethiozin	T826	AR	0.01	mg/kg	<0.01
Isoprothiolane	T826	AR	0.01	mg/kg	<0.01
Isopyrazam	T826	AR	0.01	mg/kg	<0.01
Isothiazolinone	T826	AR	0.01	mg/kg	<0.01
Kresoxim Methyl	T826	AR	0.01	mg/kg	<0.01
Lambda Cyhalothrin	T826	AR	0.01	mg/kg	<0.01
Lenacil	T826	AR	0.01	mg/kg	<0.01
Leptophos	T826	AR	0.01	mg/kg	<0.01
Lindane	T826	AR	0.01	mg/kg	<0.01
Malathion	T826	AR	0.01	mg/kg	<0.01
MCPA-thioethyl	T826	AR	0.01	mg/kg	<0.01
Mecarbam	T826	AR	0.01	mg/kg	<0.01
Mepanipyrim	T826	AR	0.01	mg/kg	<0.01
Mephosfolan	T826	AR	0.01	mg/kg	<0.01
Mepronil	T826	AR	0.01	mg/kg	<0.01
Metalaxyl	T826	AR	0.01	mg/kg	<0.01
Metazachlor	T826	AR	0.01	mg/kg	<0.01
Methacrifos	T826	AR	0.01	mg/kg	<0.01
Methidathion	T826	AR	0.01	mg/kg	<0.01
Methoxychlor	T826	AR	0.01	mg/kg	<0.01
Methyl Paraoxon	T826	AR	0.01	mg/kg	<0.01
Metolachlor	T826	AR	0.01	mg/kg	<0.01
Metolcarb	T826	AR	0.01	mg/kg	<0.01
Metrafenone	T826	AR	0.01	mg/kg	<0.01
Metribuzin	T826	AR	0.01	mg/kg	<0.01
Mevinphos	T826	AR	0.01	mg/kg	<0.01
Mirex	T826	AR	0.01	mg/kg	<0.01
Molinate	T826	AR	0.01	mg/kg	<0.01
Myclobutanil	T826	AR	0.01	mg/kg	<0.01
Napropamide	T826	AR	0.01	mg/kg	<0.01
Nitrofen	T826	AR	0.01	mg/kg	<0.01
Nitrothal isopropyl	T826	AR	0.01	mg/kg	<0.01
Nuarimol	T826	AR	0.01	mg/kg	<0.01
o,p'-DDT	T826	AR	0.01	mg/kg	<0.01
Octhilinone	T826	AR	0.01	mg/kg	<0.01
Ofurace	T826	AR	0.01	mg/kg	<0.01
Orysastrobin	T826	AR	0.01	mg/kg	<0.01
Oxadiazon	T826	AR	0.01	mg/kg	<0.01
Oxadixyl	T826	AR	0.01	mg/kg	<0.01
Oxyfluorfen	T826	AR	0.01	mg/kg	<0.01
p,p-DDD	T826	AR	0.01	mg/kg	**0.01**
p,p-DDE	T826	AR	0.01	mg/kg	<0.01
p,p-DDT	T826	AR	0.01	mg/kg	<0.01

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Sub Suite 4 - MRPS by GC MS MS

Concept Reference	**706211 042**
Customer Sample Reference	**HEP-BH-13**
Top Depth	**2.20**
Hole ID	**HEP-BH-13**
Depth	**2.20**
Date Sampled	**14-DEC-2017**
Time Sampled	**12:30**
AGS Type	**ES**
AGS Sample ID	**HEPBH18632017121 4002**
AGS Sample Reference	**13**
Matrix Class	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units	
Paclobutrazol	T826	AR	0.01	mg/kg	<0.01
Paraoxon	T826	AR	0.01	mg/kg	<0.01
Parathion	T826	AR	0.01	mg/kg	<0.01
Parathion methyl	T826	AR	0.01	mg/kg	<0.01
Penconazole	T826	AR	0.01	mg/kg	<0.01
Pendimethalin	T826	AR	0.01	mg/kg	<0.01
Pentachloroaniline	T826	AR	0.01	mg/kg	(278) <0.01
Pentachlorophenol	T826	AR	0.01	mg/kg	**(278,147) 0.04**
Pentanochlor	T826	AR	0.01	mg/kg	<0.01
Permethrin	T826	AR	0.01	mg/kg	<0.01
Pethoxamid	T826	AR	0.01	mg/kg	<0.01
Phenothrin	T826	AR	0.01	mg/kg	<0.01
Phenthoate	T826	AR	0.01	mg/kg	<0.01
Phorate	T826	AR	0.01	mg/kg	<0.01
Phosalone	T826	AR	0.01	mg/kg	<0.01
Phosfolan	T826	AR	0.01	mg/kg	<0.01
Phosmet	T826	AR	0.01	mg/kg	<0.01
Phthalimide	T826	AR	0.01	mg/kg	(278) <0.01
Picoxystrobin	T826	AR	0.01	mg/kg	<0.01
Piperonyl Butoxide	T826	AR	0.01	mg/kg	<0.01
Pirimicarb	T826	AR	0.01	mg/kg	<0.01
Pirimiphos Ethyl	T826	AR	0.01	mg/kg	<0.01
Pirimiphos methyl	T826	AR	0.01	mg/kg	<0.01
Pretilachlor	T826	AR	0.01	mg/kg	<0.01
Prochloraz	T826	AR	0.01	mg/kg	<0.01
Procymidone	T826	AR	0.01	mg/kg	<0.01
Profenofos	T826	AR	0.01	mg/kg	<0.01
Prometon	T826	AR	0.01	mg/kg	<0.01
Prometryn	T826	AR	0.01	mg/kg	<0.01
Propachlor	T826	AR	0.01	mg/kg	<0.01
Propanil	T826	AR	0.01	mg/kg	<0.01
Propaphos	T826	AR	0.01	mg/kg	<0.01
Propargite	T826	AR	0.01	mg/kg	<0.01
Propazine	T826	AR	0.01	mg/kg	<0.01
Propetamphos	T826	AR	0.01	mg/kg	<0.01
Propham	T826	AR	0.01	mg/kg	<0.01
Propiconazole	T826	AR	0.01	mg/kg	<0.01
Propyzamide	T826	AR	0.01	mg/kg	<0.01
Proquinazid	T826	AR	0.01	mg/kg	<0.01
Prosulfocarb	T826	AR	0.01	mg/kg	<0.01
Prothiofos	T826	AR	0.01	mg/kg	<0.01
Pyraclostrobin	T826	AR	0.01	mg/kg	<0.01
Pyraflufen ethyl	T826	AR	0.01	mg/kg	<0.01
Pyrazophos	T826	AR	0.01	mg/kg	<0.01
Pyridaben	T826	AR	0.01	mg/kg	<0.01
Pyridaphenthion	T826	AR	0.01	mg/kg	<0.01
Pyrimethanil	T826	AR	0.01	mg/kg	<0.01
Pyriproxyfen	T826	AR	0.01	mg/kg	<0.01
Quinalphos	T826	AR	0.01	mg/kg	<0.01
Quinoxyfen	T826	AR	0.01	mg/kg	<0.01
Quintozene	T826	AR	0.01	mg/kg	<0.01

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Sub Suite 4 - MRPS by GC MS MS

Concept Reference	**706211 042**
Customer Sample Reference	**HEP-BH-13**
Top Depth	**2.20**
Hole ID	**HEP-BH-13**
Depth	**2.20**
Date Sampled	**14-DEC-2017**
Time Sampled	**12:30**
AGS Type	**ES**
AGS Sample ID	**HEPBH18632017121 4002**
AGS Sample Reference	**13**
Matrix Class	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units	
Quizalofop-ethyl	T826	AR	0.01	mg/kg	<0.01
S421	T826	AR	0.01	mg/kg	<0.01
Secbumeton	T826	AR	0.01	mg/kg	<0.01
Silafluofen	T826	AR	0.01	mg/kg	<0.01
Simazine	T826	AR	0.01	mg/kg	<0.01
Simeconazole	T826	AR	0.01	mg/kg	<0.01
Sulfallate	T826	AR	0.01	mg/kg	<0.01
Sulfentrazone	T826	AR	0.01	mg/kg	<0.01
Sulprofos	T826	AR	0.01	mg/kg	<0.01
Tau-Fluvalinate	T826	AR	0.01	mg/kg	<0.01
Tebuconazole	T826	AR	0.01	mg/kg	<0.01
Tebufenpyrad	T826	AR	0.01	mg/kg	<0.01
Tebupirimiphos	T826	AR	0.01	mg/kg	<0.01
Tecnazene	T826	AR	0.01	mg/kg	<0.01
Tefluthrin	T826	AR	0.01	mg/kg	<0.01
Terbacil	T826	AR	0.01	mg/kg	<0.01
Terbufos	T826	AR	0.01	mg/kg	<0.01
Terbumeton	T826	AR	0.01	mg/kg	<0.01
Terbuthylazine	T826	AR	0.01	mg/kg	<0.01
Terbutryn	T826	AR	0.01	mg/kg	<0.01
Tetrachlorvinphos	T826	AR	0.01	mg/kg	<0.01
Tetraconazole	T826	AR	0.01	mg/kg	<0.01
Tetradifon	T826	AR	0.01	mg/kg	<0.01
sulfotep	T826	AR	0.01	mg/kg	<0.01
Tetramethrin	T826	AR	0.01	mg/kg	<0.01
Tetrasul	T826	AR	0.01	mg/kg	<0.01
Thiamethoxam	T826	AR	0.01	mg/kg	<0.01
Thiobencarb	T826	AR	0.01	mg/kg	<0.01
Thiocyclam	T826	AR	0.01	mg/kg	(278) <0.01
Thiometon	T826	AR	0.01	mg/kg	<0.01
Tolclofos-methyl	T826	AR	0.01	mg/kg	<0.01
Triadimefon	T826	AR	0.01	mg/kg	<0.01
Triadimenol	T826	AR	0.01	mg/kg	<0.01
Triallate	T826	AR	0.01	mg/kg	<0.01
Triazamate	T826	AR	0.01	mg/kg	<0.01
Triazophos	T826	AR	0.01	mg/kg	<0.01
Trietazine	T826	AR	0.01	mg/kg	<0.01
Trifloxystrobin	T826	AR	0.01	mg/kg	<0.01
Triflumizole	T826	AR	0.01	mg/kg	<0.01
Trifluralin	T826	AR	0.01	mg/kg	<0.01
Uniconazole	T826	AR	0.01	mg/kg	<0.01
Vinclozolin	T826	AR	0.01	mg/kg	<0.01

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Sub Suite 4 - MRPS by LC MS MS

Concept Reference	**706211 042**
Customer Sample Reference	**HEP-BH-13**
Top Depth	**2.20**
Hole ID	**HEP-BH-13**
Depth	**2.20**
Date Sampled	**14-DEC-2017**
Time Sampled	**12:30**
AGS Type	**ES**
AGS Sample ID	**HEPBH186320171214002**
AGS Sample Reference	**13**
Matrix Class	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units	
2-(1-Naphthyl)acetamide	T310	AR	0.01	mg/kg	<0.01
3-hydroxycarbofuran	T310	AR	0.01	mg/kg	<0.01
6-Benzyladenine	T310	AR	0.01	mg/kg	(278) <0.01
Abamectin	T310	AR	0.01	mg/kg	<0.01
Acephate	T310	AR	0.01	mg/kg	<0.01
Acetamiprid	T310	AR	0.01	mg/kg	<0.01
Acibenzolar-S-methyl	T310	AR	0.01	mg/kg	<0.01
Aldicarb	T310	AR	0.01	mg/kg	<0.01
Aldicarb sulphone	T310	AR	0.01	mg/kg	<0.01
Aldicarb sulphoxide	T310	AR	0.01	mg/kg	<0.01
Aminocarb	T310	AR	0.01	mg/kg	<0.01
Amitraz	T310	AR	0.01	mg/kg	(278) <0.01
Azinphos ethyl	T310	AR	0.01	mg/kg	<0.01
Azinphos methyl	T310	AR	0.01	mg/kg	<0.01
Azoxystrobin	T310	AR	0.01	mg/kg	<0.01
Bendiocarb	T310	AR	0.01	mg/kg	<0.01
Benfuracarb	T310	AR	0.01	mg/kg	(278) <0.01
Bifenazate	T310	AR	0.01	mg/kg	(278) <0.01
Butoxycarboxim	T310	AR	0.01	mg/kg	(278) <0.01
Butralin	T310	AR	0.01	mg/kg	<0.01
Carbaryl	T310	AR	0.01	mg/kg	<0.01
Carbendazim	T310	AR	0.01	mg/kg	<0.01
Carbetamide	T310	AR	0.01	mg/kg	<0.01
Carbofuran	T310	AR	0.01	mg/kg	<0.01
Carpropamid	T310	AR	0.01	mg/kg	<0.01
Chinomethionat	T310	AR	0.01	mg/kg	(278) <0.01
chlorantraniliprole	T310	AR	0.01	mg/kg	<0.01
Chlorbromuron	T310	AR	0.01	mg/kg	<0.01
Chlorfluazuron	T310	AR	0.01	mg/kg	(278) <0.01
Chloridazon	T310	AR	0.01	mg/kg	<0.01
Chlorotoluron	T310	AR	0.01	mg/kg	<0.01
Chlorpropham	T310	AR	0.01	mg/kg	<0.01
Clofentezine	T310	AR	0.01	mg/kg	<0.01
Clothianidin	T310	AR	0.01	mg/kg	<0.01
Cyanazine	T310	AR	0.01	mg/kg	<0.01
Cyazofamid	T310	AR	0.01	mg/kg	<0.01
Cycluron	T310	AR	0.01	mg/kg	<0.01
Cymoxanil	T310	AR	0.01	mg/kg	<0.01
Cyromazine	T310	AR	0.01	mg/kg	<0.01
Cythioate	T310	AR	0.01	mg/kg	<0.01
Demeton	T310	AR	0.01	mg/kg	<0.01
Demeton-s-methyl sulphone	T310	AR	0.01	mg/kg	<0.01
Desmedipham	T310	AR	0.01	mg/kg	<0.01
Dicrotophos	T310	AR	0.01	mg/kg	<0.01
Diethofencarb	T310	AR	0.01	mg/kg	<0.01
Diflubenzuron	T310	AR	0.01	mg/kg	<0.01
Dimefuron	T310	AR	0.01	mg/kg	<0.01
Dimethoate	T310	AR	0.01	mg/kg	<0.01
Diniconazole	T310	AR	0.01	mg/kg	<0.01
Dinotefuran	T310	AR	0.01	mg/kg	<0.01
Dioxacarb	T310	AR	0.01	mg/kg	<0.01

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Sub Suite 4 - MRPS by LC MS MS

Concept Reference	**706211 042**
Customer Sample Reference	**HEP-BH-13**
Top Depth	**2.20**
Hole ID	**HEP-BH-13**
Depth	**2.20**
Date Sampled	**14-DEC-2017**
Time Sampled	**12:30**
AGS Type	**ES**
AGS Sample ID	**HEPBH186320171214 002**
AGS Sample Reference	**13**
Matrix Class	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units	
Disulfoton sulfoxide	T310	AR	0.01	mg/kg	<0.01
Disulfoton sulphone	T310	AR	0.01	mg/kg	<0.01
Diuron	T310	AR	0.01	mg/kg	<0.01
DMSA	T310	AR	0.01	mg/kg	<0.01
DMST	T310	AR	0.01	mg/kg	(278) <0.01
Dodemorph	T310	AR	0.01	mg/kg	<0.01
Emamectin	T310	AR	0.01	mg/kg	<0.01
Ethidimuron	T310	AR	0.01	mg/kg	<0.01
Ethiofencarb	T310	AR	0.01	mg/kg	<0.01
Ethiofencarb sulfone	T310	AR	0.01	mg/kg	<0.01
Ethiofencarb sulfoxide	T310	AR	0.01	mg/kg	<0.01
Ethiprole	T310	AR	0.01	mg/kg	<0.01
Ethirimol	T310	AR	0.01	mg/kg	(278) <0.01
Fenamiphos sulfone	T310	AR	0.01	mg/kg	<0.01
Fenamiphos sulfoxide	T310	AR	0.01	mg/kg	<0.01
Fenazaquin	T310	AR	0.01	mg/kg	<0.01
Fenchlorphos oxon	T310	AR	0.01	mg/kg	<0.01
Fenhexamid	T310	AR	0.01	mg/kg	<0.01
Fenpropidin	T310	AR	0.01	mg/kg	<0.01
Fenpropimorph	T310	AR	0.01	mg/kg	<0.01
Fenpyroximate	T310	AR	0.01	mg/kg	<0.01
Fenthion Sulphone	T310	AR	0.01	mg/kg	<0.01
Fenthion Sulphoxide	T310	AR	0.01	mg/kg	<0.01
Fenuron	T310	AR	0.01	mg/kg	<0.01
Flonicamid	T310	AR	0.01	mg/kg	<0.01
Fluazinam	T310	AR	0.01	mg/kg	(278) <0.01
Flufenoxuron	T310	AR	0.01	mg/kg	(278) <0.01
Fluometuron	T310	AR	0.01	mg/kg	<0.01
Fluopicolide	T310	AR	0.01	mg/kg	<0.01
Fluorochloridone	T310	AR	0.01	mg/kg	<0.01
Flurtamone	T310	AR	0.01	mg/kg	<0.01
Flutriafol	T310	AR	0.01	mg/kg	<0.01
Forchlorfenuron	T310	AR	0.01	mg/kg	<0.01
Formetanate	T310	AR	0.01	mg/kg	(278) <0.01
Fuberidazole	T310	AR	0.01	mg/kg	<0.01
Furathiocarb	T310	AR	0.01	mg/kg	<0.01
Hexaflumuron	T310	AR	0.01	mg/kg	<0.01
Hexythiazox	T310	AR	0.01	mg/kg	(278) <0.01
Imazalil	T310	AR	0.01	mg/kg	<0.01
Imidacloprid	T310	AR	0.01	mg/kg	<0.01
Indoxacarb	T310	AR	0.01	mg/kg	<0.01
Iprovalicarb	T310	AR	0.01	mg/kg	<0.01
Isoprocarb	T310	AR	0.01	mg/kg	<0.01
Isoproturon	T310	AR	0.01	mg/kg	<0.01
Isoxaben	T310	AR	0.01	mg/kg	<0.01
Karbutylate	T310	AR	0.01	mg/kg	<0.01
Linuron	T310	AR	0.01	mg/kg	<0.01
Lufenuron	T310	AR	0.01	mg/kg	(278) <0.01
Malaoxon	T310	AR	0.01	mg/kg	<0.01
Mandipropamid	T310	AR	0.01	mg/kg	<0.01
Mefenacet	T310	AR	0.01	mg/kg	<0.01

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Sub Suite 4 - MRPS by LC MS MS

Concept Reference	**706211 042**
Customer Sample Reference	**HEP-BH-13**
Top Depth	**2.20**
Hole ID	**HEP-BH-13**
Depth	**2.20**
Date Sampled	**14-DEC-2017**
Time Sampled	**12:30**
AGS Type	**ES**
AGS Sample ID	**HEPBH186320171214 002**
AGS Sample Reference	**13**
Matrix Class	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units	
Metaflumizone	T310	AR	0.01	mg/kg	(278) <0.01
Metamitron	T310	AR	0.01	mg/kg	<0.01
Metconazole	T310	AR	0.01	mg/kg	<0.01
Methabenzthiazuron	T310	AR	0.01	mg/kg	<0.01
Methamidophos	T310	AR	0.01	mg/kg	<0.01
Methiocarb	T310	AR	0.01	mg/kg	<0.01
Methiocarb sulfone	T310	AR	0.01	mg/kg	<0.01
Methiocarb Sulfoxide	T310	AR	0.01	mg/kg	<0.01
Methomyl	T310	AR	0.01	mg/kg	<0.01
Methoxyfenozide	T310	AR	0.01	mg/kg	<0.01
Metobromuron	T310	AR	0.01	mg/kg	<0.01
Monocrotophos	T310	AR	0.01	mg/kg	<0.01
Monolinuron	T310	AR	0.01	mg/kg	<0.01
Monuron	T310	AR	0.01	mg/kg	<0.01
Neburon	T310	AR	0.01	mg/kg	<0.01
Nicotine	T310	AR	0.01	mg/kg	(5,278) <0.01
Nitenpyram	T310	AR	0.01	mg/kg	<0.01
Novaluron	T310	AR	0.01	mg/kg	<0.01
Omethoate	T310	AR	0.01	mg/kg	<0.01
Oxadiargyl	T310	AR	0.01	mg/kg	(278) <0.01
Oxamyl	T310	AR	0.01	mg/kg	<0.01
Oxycarboxin	T310	AR	0.01	mg/kg	<0.01
Pencycuron	T310	AR	0.01	mg/kg	(278) <0.01
Phenmedipham	T310	AR	0.01	mg/kg	<0.01
Phorate sulfone	T310	AR	0.01	mg/kg	<0.01
Phorate sulfoxide	T310	AR	0.01	mg/kg	<0.01
Phosmet	T310	AR	0.01	mg/kg	<0.01
Phosphamidon	T310	AR	0.01	mg/kg	<0.01
Phoxim	T310	AR	0.01	mg/kg	(278) <0.01
Pirimicarb	T310	AR	0.01	mg/kg	<0.01
Pirimicarb desmethyl	T310	AR	0.01	mg/kg	<0.01
Prochloraz	T310	AR	0.01	mg/kg	<0.01
Propamocarb	T310	AR	0.01	mg/kg	<0.01
Propaquizafop	T310	AR	0.01	mg/kg	<0.01
Propargite	T310	AR	0.01	mg/kg	(278) <0.01
Propoxur	T310	AR	0.01	mg/kg	<0.01
Prothioconazole desthio	T310	AR	0.01	mg/kg	<0.01
Pyraclostrobin	T310	AR	0.01	mg/kg	(278) <0.01
Pyrethrin I	T310	AR	0.01	mg/kg	(278) <0.01
Pyrifenox	T310	AR	0.01	mg/kg	<0.01
Resmethrin	T310	AR	0.01	mg/kg	(278) <0.01
Spinetoram	T310	AR	0.01	mg/kg	<0.01
Spinosad	T310	AR	0.01	mg/kg	<0.01
Spirodiclofen	T310	AR	0.01	mg/kg	(278) <0.01
Spiromesifen	T310	AR	0.01	mg/kg	<0.01
Spirotetramat	T310	AR	0.01	mg/kg	<0.01
Spiroxamine	T310	AR	0.01	mg/kg	<0.01
Tebufenozide	T310	AR	0.01	mg/kg	<0.01
Teflubenzuron	T310	AR	0.01	mg/kg	<0.01
Temephos	T310	AR	0.01	mg/kg	(278) <0.01
Terbufos sulfone	T310	AR	0.01	mg/kg	<0.01

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Sub Suite 4 - MRPS by LC MS MS

Concept Reference	**706211 042**
Customer Sample Reference	**HEP-BH-13**
Top Depth	**2.20**
Hole ID	**HEP-BH-13**
Depth	**2.20**
Date Sampled	**14-DEC-2017**
Time Sampled	**12:30**
AGS Type	**ES**
AGS Sample ID	**HEPBH186320171214002**
AGS Sample Reference	**13**
Matrix Class	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units	
Terbufos sulfoxide	T310	AR	0.01	mg/kg	<0.01
Thiabendazole	T310	AR	0.01	mg/kg	<0.01
Thiacloprid	T310	AR	0.01	mg/kg	<0.01
Thiamethoxam	T310	AR	0.01	mg/kg	<0.01
Thiazafluron	T310	AR	0.01	mg/kg	<0.01
Thidiazuron	T310	AR	0.01	mg/kg	<0.01
Thiodicarb	T310	AR	0.01	mg/kg	(278) <0.01
Thiofanox	T310	AR	0.01	mg/kg	<0.01
Thiophanate Methyl	T310	AR	0.01	mg/kg	<0.01
Tolylfluanid	T310	AR	0.01	mg/kg	(278) <0.01
Tribenuron methyl	T310	AR	0.01	mg/kg	(278) <0.01
Tridemorph	T310	AR	0.01	mg/kg	<0.01
Triflumuron	T310	AR	0.01	mg/kg	<0.01
Triflusulfuron-methyl	T310	AR	0.01	mg/kg	<0.01
Triforine	T310	AR	0.01	mg/kg	<0.01
Triticonazole	T310	AR	0.01	mg/kg	<0.01
Vamidothion	T310	AR	0.01	mg/kg	<0.01
Vernolate	T310	AR	0.01	mg/kg	<0.01
Zoxamide	T310	AR	0.01	mg/kg	<0.01

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Sub Suite 4 - Phenoxy Acetic acid herbicides

Concept Reference	**706211 042**
Customer Sample Reference	**HEP-BH-13**
Top Depth	**2.20**
Hole ID	**HEP-BH-13**
Depth	**2.20**
Date Sampled	**14-DEC-2017**
Time Sampled	**12:30**
AGS Type	**ES**
AGS Sample ID	**HEPBH186320171214002**
AGS Sample Reference	**13**
Matrix Class	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units	
Mecoprop	T16	AR	0.01	mg/kg	<0.01
Phenoxy Acetic acid herbicide: MCPA	T16	AR	0.01	mg/kg	<0.01
Dichlorprop	T16	AR	0.01	mg/kg	<0.01
Phenoxy Acetic acid herbicide: 2,4-D	T16	AR	0.01	mg/kg	<0.01
Fenoprop	T16	AR	0.01	mg/kg	<0.01
Phenoxy Acetic acid herbicide: 2,4,5-T	T16	AR	0.01	mg/kg	<0.01

Index to symbols used in 4th supplemental 706211-5 Repot C

Value	Description
A40	Assisted dried < 40C
M105	Analysis conducted on an "as received" aliquot. Results are reported on a dry weight basis where moisture content was determined by assisted drying of sample at 105C
AR	As Received
M40	Analysis conducted on sample assisted dried at no more than 40C. Results are reported on a dry weight basis.
N.D.	Not Detected
5	Results are Semiquantitative
278	Data reported is qualitative as recovery is outside the 60 to 140% range
147	Result has been Recovery corrected.
9	LOD raised due to dilution of sample
100	LOD determined by sample aliquot used for analysis
13	Results have been blank corrected.
S	Analysis was subcontracted
M	Analysis is MCERTS accredited
U	Analysis is UKAS accredited
N	Analysis is not UKAS accredited

Notes

Fourth supplemental C to report TPH totals.
"Fill" samples are outside the scope of our MCERTS accreditation. Results are UKAS only
Samples taken 14/12/17 or earlier have been analysed exceeding recommended holding times. It is possible therefore that the results provided may be compromised for TPH, PCBs, PAH, phenols, Organochloride pesticides, organophosphorus pesticides, Nitrogen and phosphorus containing pesticides.
Pesticide testing was transferred within group to CLS Cambridge
Asbestos testing was subcontracted to REC Asbestos.
NO2 and NO3 testing was transferred within group to CLS EK.

Method Index

Value	Description
T909	GCxGC
T546	Colorimetry (CF)
T686	Discrete Analyser
T4	Colorimetry
T21	OX/IR
T7	Probe
T162	Grav (1 Dec) (105 C)
T2	Grav
T16	GC/MS
T27	PLM
T209	GC/MS (Head Space)(MCERTS)
T287	Calc TOC/0.58
T310	LC/MS/MS
T8	GC/FID
T207	GC/MS (MCERTS)
T85	Calc
T826	SOP611 (GC MSMS)
T6	ICP/OES
T413	PLM/Grav

Accreditation Summary

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Chromium (trivalent)	T85	A40	2	mg/kg	N	006,008,010,015,017,019,021,041-042,044,046-047,049-050,054,056,062,064,067,074,077,082,084,086-087,089,091,093-094
Chromium VI	T6	A40	1	mg/kg	N	006,008,010,015,017,019,021,041-042,044,046-047,049-050,054,056,062,064,067,074,077,082,084,086-087,089,091,093-094
Moisture @105C	T162	AR	0.1	%	N	006,008,010,015,017,019,021,041-042,044,046-047,049-050,054,056,062,064,067,074,077,082,084,086-087,089,091,093-094
Retained on 10mm sieve	T2	M40	0.1	%	N	006,008,010,015,017,019,021,041-042,044,046-047,049-050,054,056,062,064,067,074,077,082,084,086-087,089,091,093-094
Asbestos Quantification Stage 3	T413	A40	0.001	%	SU	006,041-042,054,062,074,091
Fraction Organic Carbon - F(oc)	T21	AR	1	%	N	064,067,077,082,084
TPH C10-C40 (sum)	T85	M105	1	mg/kg	N	064,067,077,082,084
TPH (C10-C35)	T8	M105	1	mg/kg	M	064,077,084
TPH (C10-C35)	T8	M105	1	mg/kg	U	067,082

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
TPH (C35-C40)	T8	M105	1	mg/kg	N	064,067,077,082,084
Soil Organic Matter	T287	A40	0.1	%	N	006,008,010,015,017,019,021,041-042,044,046-047,049-050,054,056,062,064,067,074,077,082,084,086-087,089,091,093-094
pH	T7	A40			M	006,008,010,015,017,019,021,041-042,044,046-047,049,054,056,062,064,074,077,084,086-087,089,091,093-094
pH	T7	A40			U	050,067,082
Asbestos ID	T27	A40			SU	006,008,010,015,017,019,021,041-042,044,046-047,049-050,054,056,062,074,086-087,089,091,093-094
Phenols(Mono)	T4	AR	0.5	mg/kg	M	006,008,010,015,017,019,021,041-042,044,046-047,049,054,056,062,074,086-087,089,091,093-094
Phenols(Mono)	T4	AR	0.5	mg/kg	U	050
Chloride	T686	AR	1	mg/kg	N	006,008,010,015,017,019,021,041-042,044,046-047,049-050,054,056,062,064,067,074,077,082,084,086-087,089,091,093-094
Cyanide(Total)	T4	AR	1	mg/kg	M	006,008,010,015,017,019,021,041-042,044,046-047,049,054,056,062,074,086-087,089,091,093-094
Cyanide(Total)	T4	AR	1	mg/kg	U	050
Thiocyanate	T4	A40	1	mg/kg	N	006,008,010,015,017,019,021,041-042,044,046-047,049-050,054,056,062,074,086-087,089,091,093-094
Nitrate	T686	AR	1	mg/kg	N	006,008,010,015,017,019,021,041-042,044,046-047,049-050,054,056,062,074,086-087,089,091,093-094
Nitrite	T686	AR	1	mg/kg	N	006,008,010,015,017,019,021,041-042,044,046-047,049-050,054,056,062,074,086-087,089,091,093-094
SO4(Total)	T6	A40	0.01	%	U	006,008,010,015,017,019,021,041-042,044,046-047,049-050,054,056,062,074,086-087,089,091,093-094
Sulphide	T4	A40	10	mg/kg	N	006,008,010,015,017,019,021,041-042,044,046-047,049-050,054,056,062,074,086-087,089,091,093-094
Arsenic	T6	M40	2	mg/kg	M	006,008,010,015,017,019,021,041-042,044,046-047,049,054,056,062,064,074,077,084,086-087,089,091,093-094
Arsenic	T6	M40	2.0	mg/kg	U	050,067,082
Cadmium	T6	M40	1	mg/kg	M	006,008,010,015,017,019,021,041-042,044,046-047,049,054,056,062,064,074,077,084,086-087,089,091,093-094
Cadmium	T6	M40	1	mg/kg	U	050,067,082
Chromium	T6	M40	1	mg/kg	M	006,008,010,015,017,019,021,041-042,044,046-047,049,054,056,062,064,074,077,084,086-087,089,091,093-094
Chromium	T6	M40	1	mg/kg	U	050,067,082
Iron	T6	A40	1	mg/kg	U	006,008,010,015,017,019,021,041-042,044,046-047,049-050,054,056,062,064,067,074,077,082,084,086-087,089,091,093-094
Lead	T6	M40	1	mg/kg	M	006,008,010,015,017,019,021,041-042,044,046-047,049,054,056,062,064,074,077,084,086-087,089,091,093-094
Lead	T6	M40	1	mg/kg	U	050,067,082
Manganese	T6	M40	1	mg/kg	M	006,008,010,015,017,019,021,041-042,044,046-047,049,054,056,062,064,074,077,084,086-087,089,091,093-094
Manganese	T6	M40	1	mg/kg	U	050,067,082
Mercury	T6	M40	1	mg/kg	M	006,008,010,015,017,019,021,041-042,044,046-047,049,054,056,062,064,074,077,084,086-087,089,091,093-094
Mercury	T6	M40	1	mg/kg	U	050,067,082
Nickel	T6	M40	1	mg/kg	M	006,008,010,015,017,019,021,041-042,044,046-047,049,054,056,062,064,074,077,084,086-087,089,091,093-094
Nickel	T6	M40	1	mg/kg	U	050,067,082
Selenium	T6	M40	3	mg/kg	M	006,008,010,015,017,019,021,041-042,044,046-047,049,054,056,062,064,074,077,084,086-087,089,091,093-094
Selenium	T6	M40	3	mg/kg	U	050,067,082
Copper	T6	M40	1	mg/kg	M	006,008,010,015,017,019,021,041-042,044,046-047,049,054,056,062,064,074,077,084,086-087,089,091,093-094
Copper	T6	M40	1	mg/kg	U	050,067,082
Zinc	T6	M40	1	mg/kg	M	006,008,010,015,017,019,021,041-042,044,046-047,049,054,056,062,064,074,077,084,086-087,089,091,093-094
Zinc	T6	M40	1	mg/kg	U	050,067,082
Boron (water-soluble)	T6	A40	1	mg/kg	N	006,008,010,015,017,019,021,041-042,044,046-047,049-050,054,056,062,064,067,074,077,082,084,086-087,089,091,093-094
Naphthalene	T207	M105	0.1	mg/kg	M	006,008,010,015,017,019,021,041-042,044,046-047,049,054,056,062,064,074,077,084,086-087,089,091,093-094
Naphthalene	T207	M105	0.1	mg/kg	U	050,067,082
Acenaphthylene	T207	M105	0.1	mg/kg	U	006,008,010,015,017,019,021,041-042,044,046-047,049-050,054,056,062,064,067,074,077,082,084,086-087,089,091,093-094
Acenaphthene	T207	M105	0.1	mg/kg	M	006,008,010,015,017,019,021,041-042,044,046-047,049,054,056,062,064,074,077,084,086-087,089,091,093-094
Acenaphthene	T207	M105	0.1	mg/kg	U	050,067,082
Fluorene	T207	M105	0.1	mg/kg	M	006,008,010,015,017,019,021,041-042,044,046-047,049,054,056,062,064,074,077,084,086-087,089,091,093-094
Fluorene	T207	M105	0.1	mg/kg	U	050,067,082
Phenanthrene	T207	M105	0.1	mg/kg	M	006,008,010,015,017,019,021,041-042,044,046-047,049,054,056,062,064,074,077,084,086-087,089,091,093-094
Phenanthrene	T207	M105	0.1	mg/kg	U	050,067,082
Anthracene	T207	M105	0.1	mg/kg	U	006,008,010,015,017,019,021,041-042,044,046-047,049-050,054,056,062,064,067,074,077,082,084,086-087,089,091,093-094
Fluoranthene	T207	M105	0.1	mg/kg	M	006,008,010,015,017,019,021,041-042,044,046-047,049,054,056,062,064,074,077,084,086-087,089,091,093-094
Fluoranthene	T207	M105	0.1	mg/kg	U	050,067,082
Pyrene	T207	M105	0.1	mg/kg	M	006,008,010,015,017,019,021,041-042,044,046-047,049,054,056,062,064,074,077,084,086-087,089,091,093-094
Pyrene	T207	M105	0.1	mg/kg	U	050,067,082

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	M	006,008,010,015,017,019,021,041-042,044,046-047,049,054,056,062,064,074,077,084,086-087,089,091,093-094
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	U	050,067,082
Chrysene	T207	M105	0.1	mg/kg	M	006,008,010,015,017,019,021,041-042,044,046-047,049,054,056,062,064,074,077,084,086-087,089,091,093-094
Chrysene	T207	M105	0.1	mg/kg	U	050,067,082
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	M	006,008,010,015,017,019,021,041-042,044,046-047,049,054,056,062,064,074,077,084,086-087,089,091,093-094
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	U	050,067,082
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	M	006,008,010,015,017,019,021,041-042,044,046-047,049,054,056,062,064,074,077,084,086-087,089,091,093-094
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	U	050,067,082
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	M	006,008,010,015,017,019,021,041-042,044,046-047,049,054,056,062,064,074,077,084,086-087,089,091,093-094
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	U	050,067,082
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	M	006,008,010,015,017,019,021,041-042,044,046-047,049,054,056,062,064,074,077,084,086-087,089,091,093-094
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	U	050,067,082
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	M	006,008,010,015,017,019,021,041-042,044,046-047,049,054,056,062,064,074,077,084,086-087,089,091,093-094
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	U	050,067,082
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	M	006,008,010,015,017,019,021,041-042,044,046-047,049,054,056,062,064,074,077,084,086-087,089,091,093-094
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	U	050,067,082
PAH(total)	T207	M105	0.1	mg/kg	U	006,008,010,015,017,019,021,041-042,044,046-047,049-050,054,056,062,064,067,074,077,082,084,086-087,089,091,093-094
TPH (C5-C6 aliphatic)	T209	AR	100	µg/kg	N	006,008,010,015,017,019,021,041-042,044,046-047,049-050,054,056,062,074,086-087,089,091,093-094
TPH (C6-C8 aliphatic)	T209	AR	100	µg/kg	N	006,008,010,015,017,019,021,041-042,044,046-047,049-050,054,056,062,074,086-087,089,091,093-094
TPH (C8-C10 aliphatic)	T209	AR	100	µg/kg	N	006,008,010,015,017,019,021,041-042,044,046-047,049-050,054,056,062,074,086-087,089,091,093-094
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	M	006,008,010,015,017,019,021,041-042,044,046-047,049,054,056,062,074,086-087,089,091,093-094
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	U	050
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	M	006,008,010,015,017,019,021,041-042,044,046-047,049,054,056,062,074,086-087,089,091,093-094
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	U	050
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	M	006,008,010,015,017,019,021,041-042,044,046-047,049,054,056,062,074,086-087,089,091,093-094
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	U	050
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	M	006,008,010,015,017,019,021,041-042,044,046-047,049,054,056,062,074,086-087,089,091,093-094
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	U	050
TPH (C6-C7 aromatic)	T209	AR	100	µg/kg	N	006,008,010,015,017,019,021,041-042,044,046-047,049-050,054,056,062,074,086-087,089,091,093-094
TPH (C7-C8 aromatic)	T209	AR	100	µg/kg	N	006,008,010,015,017,019,021,041-042,044,046-047,049-050,054,056,062,074,086-087,089,091,093-094
TPH (C8-C10 aromatic)	T209	AR	100	µg/kg	N	006,008,010,015,017,019,021,041-042,044,046-047,049-050,054,056,062,074,086-087,089,091,093-094
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	M	006,008,010,015,017,019,021,041-042,044,046-047,049,054,056,062,074,086-087,089,091,093-094
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	U	050
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	M	006,008,010,015,017,019,021,041-042,044,046-047,049,054,056,062,074,086-087,089,091,093-094
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	U	050
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	M	006,008,010,015,017,019,021,041-042,044,046-047,049,054,056,062,074,086-087,089,091,093-094
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	U	050
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	M	006,008,010,015,017,019,021,041-042,044,046-047,049,054,056,062,074,086-087,089,091,093-094
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	U	050
TPH (Aliphatic) total	T85	M105		mg/kg	N	006,008,010,015,017,019,021,041-042,044,046-047,049-050,054,056,062,074,086-087,089,091,093-094
TPH (Aromatic) total	T85	M105		mg/kg	N	006,008,010,015,017,019,021,041-042,044,046-047,049-050,054,056,062,074,086-087,089,091,093-094
TPH (Aliphatic+Aromatic) (sum)	T85	M105		mg/kg	N	006,008,010,015,017,019,021,041-042,044,046-047,049-050,054,056,062,074,086-087,089,091,093-094
Cyanide(free)	T546	AR	1	mg/kg	M	008
Cyanide(Complex)	T4	AR	1	mg/kg	U	008
2,4,6-Trichlorophenol	T826	AR	0.01	mg/kg	N	042
2-Methyl-4,6-dinitrophenol	T826	AR	0.01	mg/kg	N	042
2-Phenylphenol	T826	AR	0.01	mg/kg	N	042
9,10-Anthraquinone	T826	AR	0.01	mg/kg	N	042
Acetochlor	T826	AR	0.01	mg/kg	N	042
Aclonifen	T826	AR	0.01	mg/kg	N	042
Acrinathrin	T826	AR	0.01	mg/kg	N	042
Alachlor	T826	AR	0.01	mg/kg	N	042
Aldrin	T826	AR	0.01	mg/kg	N	042
Ametryn	T826	AR	0.01	mg/kg	N	042

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Atraton	T826	AR	0.01	mg/kg	N	042
Atrazine	T826	AR	0.01	mg/kg	N	042
Azaconazole	T826	AR	0.01	mg/kg	N	042
Azobenzene	T826	AR	0.01	mg/kg	N	042
Azoxystrobin	T826	AR	0.01	mg/kg	N	042
Benalaxyl	T826	AR	0.01	mg/kg	N	042
Benfluralin	T826	AR	0.01	mg/kg	N	042
Bifenox	T826	AR	0.01	mg/kg	N	042
Bifenthrin	T826	AR	0.01	mg/kg	N	042
Binapacryl	T826	AR	0.01	mg/kg	N	042
Biphenyl	T826	AR	0.01	mg/kg	N	042
Bitertanol	T826	AR	0.01	mg/kg	N	042
Boscalid	T826	AR	0.01	mg/kg	N	042
Bromacil	T826	AR	0.01	mg/kg	N	042
Bromophos	T826	AR	0.01	mg/kg	N	042
Bromophos-Ethyl	T826	AR	0.01	mg/kg	N	042
Bromopropylate	T826	AR	0.01	mg/kg	N	042
Bupirimate	T826	AR	0.01	mg/kg	N	042
Buprofezine	T826	AR	0.01	mg/kg	N	042
Butachlor	T826	AR	0.01	mg/kg	N	042
Cadusafos	T826	AR	0.01	mg/kg	N	042
Captan	T826	AR	0.01	mg/kg	N	042
Carbaryl	T826	AR	0.01	mg/kg	N	042
Carbophenothion	T826	AR	0.01	mg/kg	N	042
Carboxine	T826	AR	0.01	mg/kg	N	042
Carfentrazone Ethyl	T826	AR	0.01	mg/kg	N	042
Chlorbenzilate	T826	AR	0.01	mg/kg	N	042
Chlorbufam	T826	AR	0.01	mg/kg	N	042
Chlordane	T826	AR	0.01	mg/kg	N	042
Chlordimeform	T826	AR	0.01	mg/kg	N	042
Chlorethoxyfos	T826	AR	0.01	mg/kg	N	042
Chlorfenapyr	T826	AR	0.01	mg/kg	N	042
Chlorfenson	T826	AR	0.01	mg/kg	N	042
Chlorfenvinphos	T826	AR	0.01	mg/kg	N	042
Chlormephos	T826	AR	0.01	mg/kg	N	042
Chloropropylate	T826	AR	0.01	mg/kg	N	042
Chlorothalonil	T826	AR	0.01	mg/kg	N	042
Chlorpropham	T826	AR	0.01	mg/kg	N	042
Chlorpyrifos	T826	AR	0.01	mg/kg	N	042
Chlorpyrifos methyl	T826	AR	0.01	mg/kg	N	042
Chlorthal Dimethyl	T826	AR	0.01	mg/kg	N	042
Chlorthion	T826	AR	0.01	mg/kg	N	042
Chlorthiophos	T826	AR	0.01	mg/kg	N	042
Chlozolinate	T826	AR	0.01	mg/kg	N	042
cis-1,2,3,6-Tetrahydrophthalimide	T826	AR	0.01	mg/kg	N	042
Clodinafop propargy	T826	AR	0.01	mg/kg	N	042
Clomazone	T826	AR	0.01	mg/kg	N	042
Cloquintocet mexyl	T826	AR	0.01	mg/kg	N	042
Coumaphos	T826	AR	0.01	mg/kg	N	042
Cyflufenamid	T826	AR	0.01	mg/kg	N	042
Cyfluthrin	T826	AR	0.01	mg/kg	N	042
Cypermethrin	T826	AR	0.01	mg/kg	N	042
Cyphenothrin	T826	AR	0.01	mg/kg	N	042
Cyproconazole	T826	AR	0.01	mg/kg	N	042
Cyprodinil	T826	AR	0.01	mg/kg	N	042
DEET	T826	AR	0.01	mg/kg	N	042
Deltamethrin	T826	AR	0.01	mg/kg	N	042
Desmetryn	T826	AR	0.01	mg/kg	N	042
Diafenthiuron	T826	AR	0.01	mg/kg	N	042
Dialifos	T826	AR	0.01	mg/kg	N	042
Diazinon	T826	AR	0.01	mg/kg	N	042
Dichlobenil	T826	AR	0.01	mg/kg	N	042
Dichlofenthion	T826	AR	0.01	mg/kg	N	042
Dichlorvos	T826	AR	0.01	mg/kg	N	042
Diclobutrazol	T826	AR	0.01	mg/kg	N	042
Dicloran	T826	AR	0.01	mg/kg	N	042
Dicofol	T826	AR	0.01	mg/kg	N	042
Dieldrin	T826	AR	0.01	mg/kg	N	042
Difenoconazole	T826	AR	0.01	mg/kg	N	042
Diflufenican	T826	AR	0.01	mg/kg	N	042

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Dimethenamid	T826	AR	0.01	mg/kg	N	042
Dimethomorph	T826	AR	0.01	mg/kg	N	042
Dimoxystrobin	T826	AR	0.01	mg/kg	N	042
Dinoterb	T826	AR	0.01	mg/kg	N	042
Dioxabenzofos	T826	AR	0.01	mg/kg	N	042
Diphenamid	T826	AR	0.01	mg/kg	N	042
Diphenylamine	T826	AR	0.01	mg/kg	N	042
Disulfoton	T826	AR	0.01	mg/kg	N	042
Ditalimfos	T826	AR	0.01	mg/kg	N	042
Edifenphos	T826	AR	0.01	mg/kg	N	042
Endosulphan alpha	T826	AR	0.01	mg/kg	N	042
Endosulphan beta	T826	AR	0.01	mg/kg	N	042
Endosulphan sulphate	T826	AR	0.01	mg/kg	N	042
Endrin	T826	AR	0.01	mg/kg	N	042
Epn	T826	AR	0.01	mg/kg	N	042
Epoxiconazole	T826	AR	0.01	mg/kg	N	042
EPTC	T826	AR	0.01	mg/kg	N	042
Etaconazole	T826	AR	0.01	mg/kg	N	042
Ethion	T826	AR	0.01	mg/kg	N	042
Ethofumesate	T826	AR	0.01	mg/kg	N	042
Ethoprophos	T826	AR	0.01	mg/kg	N	042
Ethoxyquin	T826	AR	0.01	mg/kg	N	042
Etofenprox	T826	AR	0.01	mg/kg	N	042
Etoxazole	T826	AR	0.01	mg/kg	N	042
Etridiazole	T826	AR	0.01	mg/kg	N	042
Etrimfos	T826	AR	0.01	mg/kg	N	042
Famoxadone	T826	AR	0.01	mg/kg	N	042
Famphur	T826	AR	0.01	mg/kg	N	042
Fenamidone	T826	AR	0.01	mg/kg	N	042
Fenamiphos	T826	AR	0.01	mg/kg	N	042
Fenarimol	T826	AR	0.01	mg/kg	N	042
Fenbuconazole	T826	AR	0.01	mg/kg	N	042
Fenchlorphos	T826	AR	0.01	mg/kg	N	042
Fenhexamid	T826	AR	0.01	mg/kg	N	042
Fenitrothion	T826	AR	0.01	mg/kg	N	042
Fenpiclonil	T826	AR	0.01	mg/kg	N	042
Fenpropathrin	T826	AR	0.01	mg/kg	N	042
Fenson	T826	AR	0.01	mg/kg	N	042
Fensulfothion	T826	AR	0.01	mg/kg	N	042
Fenthion	T826	AR	0.01	mg/kg	N	042
Fenvalerate	T826	AR	0.01	mg/kg	N	042
Fipronil	T826	AR	0.01	mg/kg	N	042
Fipronil sulphone	T826	AR	0.01	mg/kg	N	042
Flamprop isopropyl	T826	AR	0.01	mg/kg	N	042
Fluazifop-P-Butyl	T826	AR	0.01	mg/kg	N	042
Flucythrinate	T826	AR	0.01	mg/kg	N	042
Fludioxonil	T826	AR	0.01	mg/kg	N	042
Flufenacet	T826	AR	0.01	mg/kg	N	042
Flumetralin	T826	AR	0.01	mg/kg	N	042
Flumioxazin	T826	AR	0.01	mg/kg	N	042
Flumorph	T826	AR	0.01	mg/kg	N	042
Fluopyram	T826	AR	0.01	mg/kg	N	042
Fluquinconazole	T826	AR	0.01	mg/kg	N	042
Fluroxypyr-1-methylheptyl ester	T826	AR	0.01	mg/kg	N	042
Flusilazole	T826	AR	0.01	mg/kg	N	042
Flutolanil	T826	AR	0.01	mg/kg	N	042
Fluxapyroxad	T826	AR	0.01	mg/kg	N	042
Folpet	T826	AR	0.01	mg/kg	N	042
Fonophos	T826	AR	0.01	mg/kg	N	042
Formothion	T826	AR	0.01	mg/kg	N	042
Furalaxyl	T826	AR	0.01	mg/kg	N	042
Haloxyfop etotyl	T826	AR	0.01	mg/kg	N	042
Haloxyfop Methyl	T826	AR	0.01	mg/kg	N	042
Heptachlor	T826	AR	0.01	mg/kg	N	042
Heptachlor epoxide	T826	AR	0.01	mg/kg	N	042
Heptachlor exo Epoxide	T826	AR	0.01	mg/kg	N	042
Heptenophos	T826	AR	0.01	mg/kg	N	042
Hexachlorobenzene	T826	AR	0.01	mg/kg	N	042
Hexachlorocyclohexane (alpha)	T826	AR	0.01	mg/kg	N	042
Hexachlorocyclohexane (beta)	T826	AR	0.01	mg/kg	N	042

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Hexachlorocyclohexane (delta)	T826	AR	0.01	mg/kg	N	042
Hexaconazole	T826	AR	0.01	mg/kg	N	042
Hexazinone	T826	AR	0.01	mg/kg	N	042
Imazalil	T826	AR	0.01	mg/kg	N	042
Iodofenphos	T826	AR	0.01	mg/kg	N	042
Iprodione	T826	AR	0.01	mg/kg	N	042
Isazofos	T826	AR	0.01	mg/kg	N	042
Isocarbophos	T826	AR	0.01	mg/kg	N	042
Isodrin	T826	AR	0.01	mg/kg	N	042
Isofenphos	T826	AR	0.01	mg/kg	N	042
Isofenphos Methyl	T826	AR	0.01	mg/kg	N	042
Isomethiozin	T826	AR	0.01	mg/kg	N	042
Isoprothiolane	T826	AR	0.01	mg/kg	N	042
Isopyrazam	T826	AR	0.01	mg/kg	N	042
Isothiazolinone	T826	AR	0.01	mg/kg	N	042
Kresoxim Methyl	T826	AR	0.01	mg/kg	N	042
Lambda Cyhalothrin	T826	AR	0.01	mg/kg	N	042
Lenacil	T826	AR	0.01	mg/kg	N	042
Leptophos	T826	AR	0.01	mg/kg	N	042
Lindane	T826	AR	0.01	mg/kg	N	042
Malathion	T826	AR	0.01	mg/kg	N	042
MCPA-thioethyl	T826	AR	0.01	mg/kg	N	042
Mecarbam	T826	AR	0.01	mg/kg	N	042
Mepanipyrim	T826	AR	0.01	mg/kg	N	042
Mephosfolan	T826	AR	0.01	mg/kg	N	042
Mepronil	T826	AR	0.01	mg/kg	N	042
Metalaxyl	T826	AR	0.01	mg/kg	N	042
Metazachlor	T826	AR	0.01	mg/kg	N	042
Methacrifos	T826	AR	0.01	mg/kg	N	042
Methidathion	T826	AR	0.01	mg/kg	N	042
Methoxychlor	T826	AR	0.01	mg/kg	N	042
Methyl Paraoxon	T826	AR	0.01	mg/kg	N	042
Metolachlor	T826	AR	0.01	mg/kg	N	042
Metolcarb	T826	AR	0.01	mg/kg	N	042
Metrafenone	T826	AR	0.01	mg/kg	N	042
Metribuzin	T826	AR	0.01	mg/kg	N	042
Mevinphos	T826	AR	0.01	mg/kg	N	042
Mirex	T826	AR	0.01	mg/kg	N	042
Molinate	T826	AR	0.01	mg/kg	N	042
Myclobutanil	T826	AR	0.01	mg/kg	N	042
Napropamide	T826	AR	0.01	mg/kg	N	042
Nitrofen	T826	AR	0.01	mg/kg	N	042
Nitrothal isopropyl	T826	AR	0.01	mg/kg	N	042
Nuarimol	T826	AR	0.01	mg/kg	N	042
o,p'-DDT	T826	AR	0.01	mg/kg	N	042
Octhilinone	T826	AR	0.01	mg/kg	N	042
Ofurace	T826	AR	0.01	mg/kg	N	042
Orysastrobin	T826	AR	0.01	mg/kg	N	042
Oxadiazon	T826	AR	0.01	mg/kg	N	042
Oxadixyl	T826	AR	0.01	mg/kg	N	042
Oxyfluorfen	T826	AR	0.01	mg/kg	N	042
p,p-DDD	T826	AR	0.01	mg/kg	N	042
p,p-DDE	T826	AR	0.01	mg/kg	N	042
p,p-DDT	T826	AR	0.01	mg/kg	N	042
Paclobutrazol	T826	AR	0.01	mg/kg	N	042
Paraoxon	T826	AR	0.01	mg/kg	N	042
Parathion	T826	AR	0.01	mg/kg	N	042
Parathion methyl	T826	AR	0.01	mg/kg	N	042
Penconazole	T826	AR	0.01	mg/kg	N	042
Pendimethalin	T826	AR	0.01	mg/kg	N	042
Pentachloroaniline	T826	AR	0.01	mg/kg	N	042
Pentachlorophenol	T826	AR	0.01	mg/kg	N	042
Pentanochlor	T826	AR	0.01	mg/kg	N	042
Permethrin	T826	AR	0.01	mg/kg	N	042
Pethoxamid	T826	AR	0.01	mg/kg	N	042
Phenothrin	T826	AR	0.01	mg/kg	N	042
Phenthoate	T826	AR	0.01	mg/kg	N	042
Phorate	T826	AR	0.01	mg/kg	N	042
Phosalone	T826	AR	0.01	mg/kg	N	042
Phosfolan	T826	AR	0.01	mg/kg	N	042

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Phosmet	T826	AR	0.01	mg/kg	N	042
Phthalimide	T826	AR	0.01	mg/kg	N	042
Picoxystrobin	T826	AR	0.01	mg/kg	N	042
Piperonyl Butoxide	T826	AR	0.01	mg/kg	N	042
Pirimicarb	T826	AR	0.01	mg/kg	N	042
Pirimiphos Ethyl	T826	AR	0.01	mg/kg	N	042
Pirimiphos methyl	T826	AR	0.01	mg/kg	N	042
Pretilachlor	T826	AR	0.01	mg/kg	N	042
Prochloraz	T826	AR	0.01	mg/kg	N	042
Procymidone	T826	AR	0.01	mg/kg	N	042
Profenofos	T826	AR	0.01	mg/kg	N	042
Prometon	T826	AR	0.01	mg/kg	N	042
Prometryn	T826	AR	0.01	mg/kg	N	042
Propachlor	T826	AR	0.01	mg/kg	N	042
Propanil	T826	AR	0.01	mg/kg	N	042
Propaphos	T826	AR	0.01	mg/kg	N	042
Propargite	T826	AR	0.01	mg/kg	N	042
Propazine	T826	AR	0.01	mg/kg	N	042
Propetamphos	T826	AR	0.01	mg/kg	N	042
Propham	T826	AR	0.01	mg/kg	N	042
Propiconazole	T826	AR	0.01	mg/kg	N	042
Propyzamide	T826	AR	0.01	mg/kg	N	042
Proquinazid	T826	AR	0.01	mg/kg	N	042
Prosulfocarb	T826	AR	0.01	mg/kg	N	042
Prothiofos	T826	AR	0.01	mg/kg	N	042
Pyraclostrobin	T826	AR	0.01	mg/kg	N	042
Pyraflufen ethyl	T826	AR	0.01	mg/kg	N	042
Pyrazophos	T826	AR	0.01	mg/kg	N	042
Pyridaben	T826	AR	0.01	mg/kg	N	042
Pyridaphenthion	T826	AR	0.01	mg/kg	N	042
Pyrimethanil	T826	AR	0.01	mg/kg	N	042
Pyriproxyfen	T826	AR	0.01	mg/kg	N	042
Quinalphos	T826	AR	0.01	mg/kg	N	042
Quinoxyfen	T826	AR	0.01	mg/kg	N	042
Quintozene	T826	AR	0.01	mg/kg	N	042
Quizalofop-ethyl	T826	AR	0.01	mg/kg	N	042
S421	T826	AR	0.01	mg/kg	N	042
Secbumeton	T826	AR	0.01	mg/kg	N	042
Silafluofen	T826	AR	0.01	mg/kg	N	042
Simazine	T826	AR	0.01	mg/kg	N	042
Simeconazole	T826	AR	0.01	mg/kg	N	042
Sulfallate	T826	AR	0.01	mg/kg	N	042
Sulfentrazone	T826	AR	0.01	mg/kg	N	042
Sulprofos	T826	AR	0.01	mg/kg	N	042
Tau-Fluvalinate	T826	AR	0.01	mg/kg	N	042
Tebuconazole	T826	AR	0.01	mg/kg	N	042
Tebufenpyrad	T826	AR	0.01	mg/kg	N	042
Tebupirimiphos	T826	AR	0.01	mg/kg	N	042
Tecnazene	T826	AR	0.01	mg/kg	N	042
Tefluthrin	T826	AR	0.01	mg/kg	N	042
Terbacil	T826	AR	0.01	mg/kg	N	042
Terbufos	T826	AR	0.01	mg/kg	N	042
Terbumeton	T826	AR	0.01	mg/kg	N	042
Terbuthylazine	T826	AR	0.01	mg/kg	N	042
Terbutryn	T826	AR	0.01	mg/kg	N	042
Tetrachlorvinphos	T826	AR	0.01	mg/kg	N	042
Tetraconazole	T826	AR	0.01	mg/kg	N	042
Tetradifon	T826	AR	0.01	mg/kg	N	042
sulfotep	T826	AR	0.01	mg/kg	N	042
Tetramethrin	T826	AR	0.01	mg/kg	N	042
Tetrasul	T826	AR	0.01	mg/kg	N	042
Thiamethoxam	T826	AR	0.01	mg/kg	N	042
Thiobencarb	T826	AR	0.01	mg/kg	N	042
Thiocyclam	T826	AR	0.01	mg/kg	N	042
Thiometon	T826	AR	0.01	mg/kg	N	042
Tolclofos-methyl	T826	AR	0.01	mg/kg	N	042
Triadimefon	T826	AR	0.01	mg/kg	N	042
Triadimenol	T826	AR	0.01	mg/kg	N	042
Triallate	T826	AR	0.01	mg/kg	N	042
Triazamate	T826	AR	0.01	mg/kg	N	042

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Triazophos	T826	AR	0.01	mg/kg	N	042
Trietazine	T826	AR	0.01	mg/kg	N	042
Trifloxystrobin	T826	AR	0.01	mg/kg	N	042
Triflumizole	T826	AR	0.01	mg/kg	N	042
Trifluralin	T826	AR	0.01	mg/kg	N	042
Uniconazole	T826	AR	0.01	mg/kg	N	042
Vinclozolin	T826	AR	0.01	mg/kg	N	042
2-(1-Naphthyl)acetamide	T310	AR	0.01	mg/kg	N	042
3-hydroxycarbofuran	T310	AR	0.01	mg/kg	N	042
6-Benzyladenine	T310	AR	0.01	mg/kg	N	042
Abamectin	T310	AR	0.01	mg/kg	N	042
Acephate	T310	AR	0.01	mg/kg	N	042
Acetamiprid	T310	AR	0.01	mg/kg	N	042
Acibenzolar-S-methyl	T310	AR	0.01	mg/kg	N	042
Aldicarb	T310	AR	0.01	mg/kg	N	042
Aldicarb sulphone	T310	AR	0.01	mg/kg	N	042
Aldicarb sulphoxide	T310	AR	0.01	mg/kg	N	042
Aminocarb	T310	AR	0.01	mg/kg	N	042
Amitraz	T310	AR	0.01	mg/kg	N	042
Azinphos ethyl	T310	AR	0.01	mg/kg	N	042
Azinphos methyl	T310	AR	0.01	mg/kg	N	042
Azoxystrobin	T310	AR	0.01	mg/kg	N	042
Bendiocarb	T310	AR	0.01	mg/kg	N	042
Benfuracarb	T310	AR	0.01	mg/kg	N	042
Bifenazate	T310	AR	0.01	mg/kg	N	042
Butoxycarboxim	T310	AR	0.01	mg/kg	N	042
Butralin	T310	AR	0.01	mg/kg	N	042
Carbaryl	T310	AR	0.01	mg/kg	N	042
Carbendazim	T310	AR	0.01	mg/kg	N	042
Carbetamide	T310	AR	0.01	mg/kg	N	042
Carbofuran	T310	AR	0.01	mg/kg	N	042
Carpropamid	T310	AR	0.01	mg/kg	N	042
Chinomethionat	T310	AR	0.01	mg/kg	N	042
chlorantraniliprole	T310	AR	0.01	mg/kg	N	042
Chlorbromuron	T310	AR	0.01	mg/kg	N	042
Chlorfluazuron	T310	AR	0.01	mg/kg	N	042
Chloridazon	T310	AR	0.01	mg/kg	N	042
Chlorotoluron	T310	AR	0.01	mg/kg	N	042
Chlorpropham	T310	AR	0.01	mg/kg	N	042
Clofentezine	T310	AR	0.01	mg/kg	N	042
Clothianidin	T310	AR	0.01	mg/kg	N	042
Cyanazine	T310	AR	0.01	mg/kg	N	042
Cyazofamid	T310	AR	0.01	mg/kg	N	042
Cycluron	T310	AR	0.01	mg/kg	N	042
Cymoxanil	T310	AR	0.01	mg/kg	N	042
Cyromazine	T310	AR	0.01	mg/kg	N	042
Cythioate	T310	AR	0.01	mg/kg	N	042
Demeton	T310	AR	0.01	mg/kg	N	042
Demeton-s-methyl sulphone	T310	AR	0.01	mg/kg	N	042
Desmedipham	T310	AR	0.01	mg/kg	N	042
Dicrotophos	T310	AR	0.01	mg/kg	N	042
Diethofencarb	T310	AR	0.01	mg/kg	N	042
Diflubenzuron	T310	AR	0.01	mg/kg	N	042
Dimefuron	T310	AR	0.01	mg/kg	N	042
Dimethoate	T310	AR	0.01	mg/kg	N	042
Diniconazole	T310	AR	0.01	mg/kg	N	042
Dinotefuran	T310	AR	0.01	mg/kg	N	042
Dioxacarb	T310	AR	0.01	mg/kg	N	042
Disulfoton sulfoxide	T310	AR	0.01	mg/kg	N	042
Disulfoton sulphone	T310	AR	0.01	mg/kg	N	042
Diuron	T310	AR	0.01	mg/kg	N	042
DMSA	T310	AR	0.01	mg/kg	N	042
DMST	T310	AR	0.01	mg/kg	N	042
Dodemorph	T310	AR	0.01	mg/kg	N	042
Emamectin	T310	AR	0.01	mg/kg	N	042
Ethidimuron	T310	AR	0.01	mg/kg	N	042
Ethiofencarb	T310	AR	0.01	mg/kg	N	042
Ethiofencarb sulfone	T310	AR	0.01	mg/kg	N	042
Ethiofencarb sulfoxide	T310	AR	0.01	mg/kg	N	042
Ethiprole	T310	AR	0.01	mg/kg	N	042

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Ethirimol	T310	AR	0.01	mg/kg	N	042
Fenamiphos sulfone	T310	AR	0.01	mg/kg	N	042
Fenamiphos sulfoxide	T310	AR	0.01	mg/kg	N	042
Fenazaquin	T310	AR	0.01	mg/kg	N	042
Fenchlorphos oxon	T310	AR	0.01	mg/kg	N	042
Fenhexamid	T310	AR	0.01	mg/kg	N	042
Fenpropidin	T310	AR	0.01	mg/kg	N	042
Fenpropimorph	T310	AR	0.01	mg/kg	N	042
Fenpyroximate	T310	AR	0.01	mg/kg	N	042
Fenthion Sulphone	T310	AR	0.01	mg/kg	N	042
Fenthion Sulphoxide	T310	AR	0.01	mg/kg	N	042
Fenuron	T310	AR	0.01	mg/kg	N	042
Flonicamid	T310	AR	0.01	mg/kg	N	042
Fluazinam	T310	AR	0.01	mg/kg	N	042
Flufenoxuron	T310	AR	0.01	mg/kg	N	042
Fluometuron	T310	AR	0.01	mg/kg	N	042
Fluopicolide	T310	AR	0.01	mg/kg	N	042
Fluorochloridone	T310	AR	0.01	mg/kg	N	042
Flurtamone	T310	AR	0.01	mg/kg	N	042
Flutriafol	T310	AR	0.01	mg/kg	N	042
Forchlorfenuron	T310	AR	0.01	mg/kg	N	042
Formetanate	T310	AR	0.01	mg/kg	N	042
Fuberidazole	T310	AR	0.01	mg/kg	N	042
Furathiocarb	T310	AR	0.01	mg/kg	N	042
Hexaflumuron	T310	AR	0.01	mg/kg	N	042
Hexythiazox	T310	AR	0.01	mg/kg	N	042
Imazalil	T310	AR	0.01	mg/kg	N	042
Imidacloprid	T310	AR	0.01	mg/kg	N	042
Indoxacarb	T310	AR	0.01	mg/kg	N	042
Iprovalicarb	T310	AR	0.01	mg/kg	N	042
Isoprocarb	T310	AR	0.01	mg/kg	N	042
Isoproturon	T310	AR	0.01	mg/kg	N	042
Isoxaben	T310	AR	0.01	mg/kg	N	042
Karbutylate	T310	AR	0.01	mg/kg	N	042
Linuron	T310	AR	0.01	mg/kg	N	042
Lufenuron	T310	AR	0.01	mg/kg	N	042
Malaoxon	T310	AR	0.01	mg/kg	N	042
Mandipropamid	T310	AR	0.01	mg/kg	N	042
Mefenacet	T310	AR	0.01	mg/kg	N	042
Metaflumizone	T310	AR	0.01	mg/kg	N	042
Metamitron	T310	AR	0.01	mg/kg	N	042
Metconazole	T310	AR	0.01	mg/kg	N	042
Methabenzthiazuron	T310	AR	0.01	mg/kg	N	042
Methamidophos	T310	AR	0.01	mg/kg	N	042
Methiocarb	T310	AR	0.01	mg/kg	N	042
Methiocarb sulfone	T310	AR	0.01	mg/kg	N	042
Methiocarb Sulfoxide	T310	AR	0.01	mg/kg	N	042
Methomyl	T310	AR	0.01	mg/kg	N	042
Methoxyfenozide	T310	AR	0.01	mg/kg	N	042
Metobromuron	T310	AR	0.01	mg/kg	N	042
Monocrotophos	T310	AR	0.01	mg/kg	N	042
Monolinuron	T310	AR	0.01	mg/kg	N	042
Monuron	T310	AR	0.01	mg/kg	N	042
Neburon	T310	AR	0.01	mg/kg	N	042
Nicotine	T310	AR	0.01	mg/kg	N	042
Nitenpyram	T310	AR	0.01	mg/kg	N	042
Novaluron	T310	AR	0.01	mg/kg	N	042
Omethoate	T310	AR	0.01	mg/kg	N	042
Oxadiargyl	T310	AR	0.01	mg/kg	N	042
Oxamyl	T310	AR	0.01	mg/kg	N	042
Oxycarboxin	T310	AR	0.01	mg/kg	N	042
Pencycuron	T310	AR	0.01	mg/kg	N	042
Phenmedipham	T310	AR	0.01	mg/kg	N	042
Phorate sulfone	T310	AR	0.01	mg/kg	N	042
Phorate sulfoxide	T310	AR	0.01	mg/kg	N	042
Phosmet	T310	AR	0.01	mg/kg	N	042
Phosphamidon	T310	AR	0.01	mg/kg	N	042
Phoxim	T310	AR	0.01	mg/kg	N	042
Pirimicarb	T310	AR	0.01	mg/kg	N	042
Pirimicarb desmethyl	T310	AR	0.01	mg/kg	N	042

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Prochloraz	T310	AR	0.01	mg/kg	N	042
Propamocarb	T310	AR	0.01	mg/kg	N	042
Propaquizafop	T310	AR	0.01	mg/kg	N	042
Propargite	T310	AR	0.01	mg/kg	N	042
Propoxur	T310	AR	0.01	mg/kg	N	042
Prothioconazole desthio	T310	AR	0.01	mg/kg	N	042
Pyraclostrobin	T310	AR	0.01	mg/kg	N	042
Pyrethrin I	T310	AR	0.01	mg/kg	N	042
Pyrifenox	T310	AR	0.01	mg/kg	N	042
Resmethrin	T310	AR	0.01	mg/kg	N	042
Spinetoram	T310	AR	0.01	mg/kg	N	042
Spinosad	T310	AR	0.01	mg/kg	N	042
Spirodiclofen	T310	AR	0.01	mg/kg	N	042
Spiromesifen	T310	AR	0.01	mg/kg	N	042
Spirotetramat	T310	AR	0.01	mg/kg	N	042
Spiroxamine	T310	AR	0.01	mg/kg	N	042
Tebufenozide	T310	AR	0.01	mg/kg	N	042
Teflubenzuron	T310	AR	0.01	mg/kg	N	042
Temephos	T310	AR	0.01	mg/kg	N	042
Terbufos sulfone	T310	AR	0.01	mg/kg	N	042
Terbufos sulfoxide	T310	AR	0.01	mg/kg	N	042
Thiabendazole	T310	AR	0.01	mg/kg	N	042
Thiacloprid	T310	AR	0.01	mg/kg	N	042
Thiamethoxam	T310	AR	0.01	mg/kg	N	042
Thiazafluron	T310	AR	0.01	mg/kg	N	042
Thidiazuron	T310	AR	0.01	mg/kg	N	042
Thiodicarb	T310	AR	0.01	mg/kg	N	042
Thiofanox	T310	AR	0.01	mg/kg	N	042
Thiophanate Methyl	T310	AR	0.01	mg/kg	N	042
Tolylfluanid	T310	AR	0.01	mg/kg	N	042
Tribenuron methyl	T310	AR	0.01	mg/kg	N	042
Tridemorph	T310	AR	0.01	mg/kg	N	042
Triflumuron	T310	AR	0.01	mg/kg	N	042
Triflusulfuron-methyl	T310	AR	0.01	mg/kg	N	042
Triforine	T310	AR	0.01	mg/kg	N	042
Triticonazole	T310	AR	0.01	mg/kg	N	042
Vamidothion	T310	AR	0.01	mg/kg	N	042
Vernolate	T310	AR	0.01	mg/kg	N	042
Zoxamide	T310	AR	0.01	mg/kg	N	042
Mecoprop	T16	AR	0.01	mg/kg	N	042
Phenoxy Acetic acid herbicide: MCPA	T16	AR	0.01	mg/kg	N	042
Dichlorprop	T16	AR	0.01	mg/kg	N	042
Phenoxy Acetic acid herbicide: 2,4-D	T16	AR	0.01	mg/kg	N	042
Fenoprop	T16	AR	0.01	mg/kg	N	042
Phenoxy Acetic acid herbicide: 2,4,5-T	T16	AR	0.01	mg/kg	N	042

CONCEPT LIFE SCIENCES
DELIVERING SCIENCE

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Concept Life Sciences

Certificate of Analysis

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Report Number: Forth Supplemental A 706211-5

Date of Report: 22-Jun-2018

Customer: Fugro GeoServices
Fugro House
Hithercroft Road
Wallingford
Oxfordshire
OX10 9RB

Customer Contact: Ms Karen Blackmore

Customer Job Reference:
Customer Purchase Order: 56642KB-WAL
Customer Site Reference: HEP Package 3
Date Job Received at Concept: 15-Dec-2017
Date Analysis Started: 29-Dec-2017
Date Analysis Completed: 27-Feb-2018

The results reported relate to samples received in the laboratory and may not be representative of a whole batch.

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation

This report should not be reproduced except in full without the written approval of the laboratory

Tests covered by this certificate were conducted in accordance with Concept Life Sciences SOPs

All results have been reviewed in accordance with Section 25 of the Concept Life Sciences, Analytical Services Quality Manual

UKAS TESTING
1549

Report checked
and authorised by :
Sara Abou-Shakra
Customer Service Manager

Issued by :
Sara Abou-Shakra
Customer Service Manager

Summary Of Results

Soil

Dioxins

Corrected to 0% Moisture

				WHO2005 Toxic Equivalents ng/kg		WHO Toxic Equivalents ng/kg	
Concept Reference	**Customer Sample Reference**	**Analysis**	**Symbol**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**
706211 008	HEP-BH-14	Dioxins and Furans (Based on US EPA 1613)	U	27	**39**	27	**38**
		Poly-Chlorinated Biphenyls (WHO 12)	U	22	**610**	94	**670**
			Sum :	49	**650**	120	**710**
706211 015	HEP-BH-16	Dioxins and Furans (Based on US EPA 1613)	U	2.8	**20**	2.4	**21**
		Poly-Chlorinated Biphenyls (WHO 12)	U	0.17	**94**	0.99	**84**
			Sum :	3.0	**110**	3.4	**100**
706211 047	HEP-BH-1864	Dioxins and Furans (Based on US EPA 1613)	U	12	**33**	10	**33**
		Poly-Chlorinated Biphenyls (WHO 12)	U	0.34	**78**	1.2	**67**
			Sum :	12	**110**	11	**100**
706211 056	HEP-BH-20	Dioxins and Furans (Based on US EPA 1613)	U	1.7	**22**	1.4	**23**
		Poly-Chlorinated Biphenyls (WHO 12)	U	0.10	**76**	0.34	**65**
			Sum :	1.8	**98**	1.7	**88**
706211 087	HEP-TP-1296	Dioxins and Furans (Based on US EPA 1613)	U	3.0	**20**	2.5	**21**
		Poly-Chlorinated Biphenyls (WHO 12)	U	0.17	**96**	0.94	**83**
			Sum :	3.1	**120**	3.5	**100**
706211 093	HEP-TT-19	Dioxins and Furans (Based on US EPA 1613)	U	0.0	**12**	0.0	**12**
		Poly-Chlorinated Biphenyls (WHO 12)	U	0.020	**8.6**	0.067	**7.4**
			Sum :	0.020	**20**	0.067	**20**

Soil

Customer Sample Reference : HEP-BH-14
Our Sample Reference : 706211 008
Moisture Content : 22.1 %
Hole ID : HEP-BH-14
Test Portion Mass (g) : 175
Depth : 2.00
Top Depth : 2.00
Date Sampled : 14-DEC-2017
Time Sampled : 10:30
AGS Type : ES
AGS Sample ID : HEPBH1420171214001
AGS Sample Reference : 14
Matrix Class : Clay

Dioxins and Furans (Based on US EPA 1613)

Technique : GC/MS (HR)

						WHO2005 Toxic Equivalents ng/kg		WHO Toxic Equivalents ng/kg	
Determinand	**Symbol**	**Result ng/kg As Received @22% Moisture**	**LOD As Received @22% Moisture**	**Lower Bound ng/kg @ 0% Moisture**	**LOD @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**
2,3,7,8-TCDD	U	<2.0	2.0	<2.6	2.6	0.0	**2.6**	0.0	**2.6**
1,2,3,7,8-PeCDD	U	<5.0	5.0	<6.4	6.4	0.0	**6.4**	0.0	**6.4**
1,2,3,4,7,8-HxCDD	U	<5.0	5.0	<6.4	6.4	0.0	**0.64**	0.0	**0.64**
1,2,3,6,7,8-HxCDD	U	**15**	0.91	19	1.2	1.9	**1.9**	1.9	**1.9**
1,2,3,7,8,9-HxCDD	U	**6.2**	0.91	8.0	1.2	0.80	**0.80**	0.80	**0.80**
1,2,3,4,6,7,8-HpCDD	U	**940**	1.3	1200	1.7	12	**12**	12	**12**
OCDD	U	**11000**	2.0	14000	2.6	4.2	**4.2**	1.4	**1.4**
					Dioxins Totals :	19	**29**	16	**26**
2,3,7,8-TCDF	U	**9.5**	0.83	12	1.1	1.2	**1.2**	1.2	**1.2**
1,2,3,7,8-PeCDF	U	<6.0	6.0	<7.7	7.7	0.0	**0.23**	0.0	**0.39**
2,3,4,7,8-PeCDF	U	**8.6**	0.64	11	0.82	3.3	**3.3**	5.5	**5.5**
1,2,3,4,7,8-HxCDF	U	**12**	1.0	15	1.3	1.5	**1.5**	1.5	**1.5**
1,2,3,6,7,8-HxCDF	U	**6.8**	0.90	8.7	1.2	0.87	**0.87**	0.87	**0.87**
2,3,4,6,7,8-HxCDF	U	<12	12	<15	15	0.0	**1.5**	0.0	**1.5**
1,2,3,4,6,7,8-HpCDF	U	**94**	1.6	120	2.1	1.2	**1.2**	1.2	**1.2**
1,2,3,4,7,8,9-HpCDF	U	<11	11	<14	14	0.0	**0.14**	0.0	**0.14**
OCDF	U	**410**	1.7	530	2.2	0.16	**0.16**	0.053	**0.053**
					Furans Totals :	8.3	**10**	10	**12**
					Totals :	**27**	**39**	**27**	**38**

Poly-Chlorinated Biphenyls (WHO 12)

Technique : GC/MS (HR)

						WHO2005 Toxic Equivalents ng/kg		WHO Toxic Equivalents ng/kg	
Determinand	**Symbol**	**Result ng/kg As Received @22% Moisture**	**LOD As Received @22% Moisture**	**Lower Bound ng/kg @ 0% Moisture**	**LOD @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**
PCB BZ#77	U	**31000**	500	40000	640	4.0	**4.0**	4.0	**4.0**
PCB BZ#81	U	(100) <13000	13000	<17000	17000	0.0	**5.0**	0.0	**1.7**
PCB BZ#105	U	**140000**	500	180000	640	5.4	**5.4**	18	**18**
PCB BZ#114	U	**11000**	500	14000	640	0.42	**0.42**	7.1	**7.1**

PCB BZ#118	U	**270000**	500	350000	640	10	**10**	35	**35**
PCB BZ#123	U	(2, 100) <35000	35000	<45000	45000	0.0	**1.3**	0.0	**4.5**
PCB BZ#126	U	(100, 2) <4400	4400	<5700	5700	0.0	**570**	0.0	**570**
PCB BZ#156	U	**39000**	500	50000	640	1.5	**1.5**	25	**25**
PCB BZ#157	U	**7500**	500	9600	640	0.29	**0.29**	4.8	**4.8**
PCB BZ#167	U	(100, 2) <43000	43000	<55000	55000	0.0	**1.7**	0.0	**0.55**
PCB BZ#169	U	(100) <500	500	<640	640	0.0	**19**	0.0	**6.4**
PCB BZ#189	U	**1600**	500	2100	640	0.062	**0.062**	0.21	**0.21**
					Totals :	**22**	**610**	**94**	**670**

Soil

Customer Sample Reference : HEP-BH-16
Our Sample Reference : 706211 015
Moisture Content : 14.8 %
Top Depth : 1.70
Test Portion Mass (g) : 175
Hole ID : HEP-BH-16
Depth : 1.70
Date Sampled : 14-DEC-2017
Time Sampled : 14:30
AGS Type : ES
AGS Sample ID : HEPBH1620171214001
AGS Sample Reference : 8
Matrix Class : Sandy Soil

Dioxins and Furans (Based on US EPA 1613)

Technique : GC/MS (HR)

						WHO2005 Toxic Equivalents ng/kg		WHO Toxic Equivalents ng/kg	
Determinand	**Symbol**	**Result ng/kg As Received @15% Moisture**	**LOD As Received @15% Moisture**	**Lower Bound ng/kg @ 0% Moisture**	**LOD @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**
2,3,7,8-TCDD	U	<3.3	3.3	<3.9	3.9	0.0	**3.9**	0.0	**3.9**
1,2,3,7,8-PeCDD	U	<5.0	5.0	<5.9	5.9	0.0	**5.9**	0.0	**5.9**
1,2,3,4,7,8-HxCDD	U	<8.1	8.1	<9.5	9.5	0.0	**0.95**	0.0	**0.95**
1,2,3,6,7,8-HxCDD	U	<8.2	8.2	<9.6	9.6	0.0	**0.96**	0.0	**0.96**
1,2,3,7,8,9-HxCDD	U	<8.2	8.2	<9.6	9.6	0.0	**0.96**	0.0	**0.96**
1,2,3,4,6,7,8-HpCDD	U	**150**	1.6	180	1.9	1.8	**1.8**	1.8	**1.8**
OCDD	U	**1600**	2.4	1900	2.8	0.56	**0.56**	0.19	**0.19**
					Dioxins Totals :	2.3	**15**	1.9	**15**
2,3,7,8-TCDF	U	<5.3	5.3	<6.2	6.2	0.0	**0.62**	0.0	**0.62**
1,2,3,7,8-PeCDF	U	<4.0	4.0	<4.7	4.7	0.0	**0.14**	0.0	**0.23**
2,3,4,7,8-PeCDF	U	<4.0	4.0	<4.7	4.7	0.0	**1.4**	0.0	**2.3**
1,2,3,4,7,8-HxCDF	U	<5.3	5.3	<6.2	6.2	0.0	**0.62**	0.0	**0.62**
1,2,3,6,7,8-HxCDF	U	<5.3	5.3	<6.2	6.2	0.0	**0.62**	0.0	**0.62**
2,3,4,6,7,8-HxCDF	U	<5.3	5.3	<6.2	6.2	0.0	**0.62**	0.0	**0.62**
1,2,3,7,8,9-HxCDF	U	<4.8	4.8	<5.6	5.6	0.0	**0.56**	0.0	**0.56**
1,2,3,4,6,7,8-HpCDF	U	**40**	1.6	47	1.9	0.47	**0.47**	0.47	**0.47**
1,2,3,4,7,8,9-HpCDF	U	<6.8	6.8	<8.0	8.0	0.0	**0.080**	0.0	**0.080**
OCDF	U	**61**	2.0	72	2.3	0.021	**0.021**	0.0072	**0.0072**
					Furans Totals :	0.49	**5.2**	0.48	**6.2**
					Totals :	**2.8**	**20**	**2.4**	**21**

Poly-Chlorinated Biphenyls (WHO 12)

Technique : GC/MS (HR)

						WHO2005 Toxic Equivalents ng/kg		WHO Toxic Equivalents ng/kg	
Determinand	**Symbol**	**Result ng/kg As Received @15% Moisture**	**LOD As Received @15% Moisture**	**Lower Bound ng/kg @ 0% Moisture**	**LOD @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**
PCB BZ#77	U	(100) <500	500	<590	590	0.0	**0.059**	0.0	**0.059**
PCB BZ#81	U	(100) <500	500	<590	590	0.0	**0.18**	0.0	**0.059**
PCB BZ#105	U	**1600**	500	1900	590	0.056	**0.056**	0.19	**0.19**

PCB BZ#114	U	(100) <500	500	<590	590	0.0	**0.018**	0.0	**0.29**
PCB BZ#118	U	**2400**	500	2800	590	0.084	**0.084**	0.28	**0.28**
PCB BZ#123	U	(2, 100) <670	670	<790	790	0.0	**0.024**	0.0	**0.079**
PCB BZ#126	U	(100, 2) <650	650	<760	760	0.0	**76**	0.0	**76**
PCB BZ#156	U	**890**	500	1000	590	0.031	**0.031**	0.52	**0.52**
PCB BZ#157	U	(100) <500	500	<590	590	0.0	**0.018**	0.0	**0.29**
PCB BZ#167	U	(2, 100) <1300	1300	<1500	1500	0.0	**0.046**	0.0	**0.015**
PCB BZ#169	U	(100) <500	500	<590	590	0.0	**18**	0.0	**5.9**
PCB BZ#189	U	(100) <500	500	<590	590	0.0	**0.018**	0.0	**0.059**
					Totals :	**0.17**	**94**	**0.99**	**84**

Soil

Customer Sample Reference : HEP-BH-1864
Our Sample Reference : 706211 047
Moisture Content : 15.9 %
Top Depth : 1.20
Depth : 1.20
Hole ID : HEP-BH-1864
Test Portion Mass (g) : 175
Date Sampled : 18-DEC-2017
Time Sampled : 13:30
AGS Type : ES
AGS Sample ID : HEPBH186420171218001
AGS Sample Reference : 4
Matrix Class : Sandy Soil

Dioxins and Furans (Based on US EPA 1613)

Technique : GC/MS (HR)

						WHO2005 Toxic Equivalents ng/kg		WHO Toxic Equivalents ng/kg	
Determinand	**Symbol**	**Result ng/kg As Received @16% Moisture**	**LOD As Received @16% Moisture**	**Lower Bound ng/kg @ 0% Moisture**	**LOD @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**
2,3,7,8-TCDD	U	<5.0	5.0	<5.9	5.9	0.0	**5.9**	0.0	**5.9**
1,2,3,7,8-PeCDD	U	<5.0	5.0	<5.9	5.9	0.0	**5.9**	0.0	**5.9**
1,2,3,4,7,8-HxCDD	U	<5.2	5.2	<6.2	6.2	0.0	**0.62**	0.0	**0.62**
1,2,3,6,7,8-HxCDD	U	<5.3	5.3	<6.3	6.3	0.0	**0.63**	0.0	**0.63**
1,2,3,7,8,9-HxCDD	U	<5.3	5.3	<6.3	6.3	0.0	**0.63**	0.0	**0.63**
1,2,3,4,6,7,8-HpCDD	U	**630**	1.6	750	1.9	7.5	**7.5**	7.5	**7.5**
OCDD	U	**7700**	2.2	9200	2.6	2.7	**2.7**	0.92	**0.92**
					Dioxins Totals :	10	**24**	8.4	**22**
2,3,7,8-TCDF	U	<5.4	5.4	<6.4	6.4	0.0	**0.64**	0.0	**0.64**
1,2,3,7,8-PeCDF	U	<4.0	4.0	<4.8	4.8	0.0	**0.14**	0.0	**0.24**
2,3,4,7,8-PeCDF	U	<4.1	4.1	<4.9	4.9	0.0	**1.5**	0.0	**2.4**
1,2,3,4,7,8-HxCDF	U	<12	12	<14	14	0.0	**1.4**	0.0	**1.4**
1,2,3,6,7,8-HxCDF	U	<12	12	<14	14	0.0	**1.4**	0.0	**1.4**
2,3,4,6,7,8-HxCDF	U	<12	12	<14	14	0.0	**1.4**	0.0	**1.4**
1,2,3,7,8,9-HxCDF	U	<10	10	<12	12	0.0	**1.2**	0.0	**1.2**
1,2,3,4,6,7,8-HpCDF	U	**130**	2.0	150	2.4	1.5	**1.5**	1.5	**1.5**
1,2,3,4,7,8,9-HpCDF	U	<10	10	<12	12	0.0	**0.12**	0.0	**0.12**
OCDF	U	**160**	1.7	190	2.0	0.057	**0.057**	0.019	**0.019**
					Furans Totals :	1.6	**9.4**	1.6	**10**
					Totals :	**12**	**33**	**10**	**33**

Poly-Chlorinated Biphenyls (WHO 12)

Technique : GC/MS (HR)

						WHO2005 Toxic Equivalents ng/kg		WHO Toxic Equivalents ng/kg	
Determinand	**Symbol**	**Result ng/kg As Received @16% Moisture**	**LOD As Received @16% Moisture**	**Lower Bound ng/kg @ 0% Moisture**	**LOD @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**
PCB BZ#77	U	**830**	500	990	590	0.099	**0.099**	0.099	**0.099**
PCB BZ#81	U	(100) <500	500	<590	590	0.0	**0.18**	0.0	**0.059**
PCB BZ#105	U	**2100**	500	2500	590	0.075	**0.075**	0.25	**0.25**

PCB BZ#114	U	(100) <500	500	<590	590	0.0	**0.018**	0.0	**0.30**
PCB BZ#118	U	**4000**	500	4800	590	0.14	**0.14**	0.48	**0.48**
PCB BZ#123	U	(2, 100) <820	820	<980	980	0.0	**0.029**	0.0	**0.098**
PCB BZ#126	U	(100) <500	500	<590	590	0.0	**59**	0.0	**59**
PCB BZ#156	U	**590**	500	700	590	0.021	**0.021**	0.35	**0.35**
PCB BZ#157	U	(100) <500	500	<590	590	0.0	**0.018**	0.0	**0.30**
PCB BZ#167	U	(2, 100) <1100	1100	<1300	1300	0.0	**0.039**	0.0	**0.013**
PCB BZ#169	U	(100) <500	500	<590	590	0.0	**18**	0.0	**5.9**
PCB BZ#189	U	(100) <500	500	<590	590	0.0	**0.018**	0.0	**0.059**
					Totals :	**0.34**	**78**	**1.2**	**67**

Soil

Customer Sample Reference : HEP-BH-20
Our Sample Reference : 706211 056
Moisture Content : 13.9 %
Test Portion Mass (g) : 175
Depth : 2.40
Hole ID : HEP-BH-20
Top Depth : 2.40
Date Sampled : 18-DEC-2017
Time Sampled : 14:51
AGS Type : ES
AGS Sample ID : HEPBH2020171218005
AGS Sample Reference : 17
Matrix Class : Clay

Dioxins and Furans (Based on US EPA 1613)

Technique : GC/MS (HR)

						WHO2005 Toxic Equivalents ng/kg		WHO Toxic Equivalents ng/kg	
Determinand	**Symbol**	**Result ng/kg As Received @14% Moisture**	**LOD As Received @14% Moisture**	**Lower Bound ng/kg @ 0% Moisture**	**LOD @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**
2,3,7,8-TCDD	U	<3.5	3.5	<4.1	4.1	0.0	**4.1**	0.0	**4.1**
1,2,3,7,8-PeCDD	U	<6.5	6.5	<7.5	7.5	0.0	**7.5**	0.0	**7.5**
1,2,3,4,7,8-HxCDD	U	<9.0	9.0	<10	10	0.0	**1.0**	0.0	**1.0**
1,2,3,6,7,8-HxCDD	U	<9.2	9.2	<11	11	0.0	**1.1**	0.0	**1.1**
1,2,3,7,8,9-HxCDD	U	<9.2	9.2	<11	11	0.0	**1.1**	0.0	**1.1**
1,2,3,4,6,7,8-HpCDD	U	**110**	1.8	130	2.1	1.3	**1.3**	1.3	**1.3**
OCDD	U	**1100**	3.0	1300	3.5	0.38	**0.38**	0.13	**0.13**
					Dioxins Totals :	1.7	**16**	1.4	**16**
2,3,7,8-TCDF	U	<3.5	3.5	<4.1	4.1	0.0	**0.41**	0.0	**0.41**
1,2,3,7,8-PeCDF	U	<4.8	4.8	<5.6	5.6	0.0	**0.17**	0.0	**0.28**
2,3,4,7,8-PeCDF	U	<4.8	4.8	<5.6	5.6	0.0	**1.7**	0.0	**2.8**
1,2,3,4,7,8-HxCDF	U	<7.3	7.3	<8.5	8.5	0.0	**0.85**	0.0	**0.85**
1,2,3,6,7,8-HxCDF	U	<6.2	6.2	<7.2	7.2	0.0	**0.72**	0.0	**0.72**
2,3,4,6,7,8-HxCDF	U	<6.1	6.1	<7.1	7.1	0.0	**0.71**	0.0	**0.71**
1,2,3,7,8,9-HxCDF	U	<6.2	6.2	<7.2	7.2	0.0	**0.72**	0.0	**0.72**
1,2,3,4,6,7,8-HpCDF	U	<2.2	2.2	<2.6	2.6	0.0	**0.026**	0.0	**0.026**
1,2,3,4,7,8,9-HpCDF	U	<2.5	2.5	<2.9	2.9	0.0	**0.029**	0.0	**0.029**
OCDF	U	<2.8	2.8	<3.3	3.3	0.0	**0.00098**	0.0	**0.00033**
					Furans Totals :	0.0	**5.3**	0.0	**6.5**
					Totals :	**1.7**	**22**	**1.4**	**23**

Poly-Chlorinated Biphenyls (WHO 12)

Technique : GC/MS (HR)

						WHO2005 Toxic Equivalents ng/kg		WHO Toxic Equivalents ng/kg	
Determinand	**Symbol**	**Result ng/kg As Received @14% Moisture**	**LOD As Received @14% Moisture**	**Lower Bound ng/kg @ 0% Moisture**	**LOD @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**
PCB BZ#77	U	(100) <500	500	<580	580	0.0	**0.058**	0.0	**0.058**
PCB BZ#81	U	(100) <500	500	<580	580	0.0	**0.17**	0.0	**0.058**
PCB BZ#105	U	**1100**	500	1300	580	0.038	**0.038**	0.13	**0.13**

PCB BZ#114	U	(100) <500	500	<580	580	0.0	**0.017**	0.0	**0.29**
PCB BZ#118	U	**1800**	500	2100	580	0.063	**0.063**	0.21	**0.21**
PCB BZ#123	U	(100) <500	500	<580	580	0.0	**0.017**	0.0	**0.058**
PCB BZ#126	U	(100) <500	500	<580	580	0.0	**58**	0.0	**58**
PCB BZ#156	U	(100) <500	500	<580	580	0.0	**0.017**	0.0	**0.29**
PCB BZ#157	U	(100) <500	500	<580	580	0.0	**0.017**	0.0	**0.29**
PCB BZ#167	U	(2, 100) <750	750	<870	870	0.0	**0.026**	0.0	**0.0087**
PCB BZ#169	U	(100) <500	500	<580	580	0.0	**17**	0.0	**5.8**
PCB BZ#189	U	(100) <500	500	<580	580	0.0	**0.017**	0.0	**0.058**
					Totals :	**0.10**	**76**	**0.34**	**65**

Soil

Customer Sample Reference : HEP-TP-1296
Our Sample Reference : 706211 087
Moisture Content : 26.3 %
Depth : 1.30
Top Depth : 1.30
Test Portion Mass (g) : 175
Sample in Dish @ 105C : 83
Wet Sample in Dish Weight : 100
Hole ID : HEP-TP-1296
Empty Dish Weight : 0
Date Sampled : 13-DEC-2017
Time Sampled : 12:00
AGS Type : ES
AGS Sample ID : HEPBH1296201712130003
AGS Sample Reference : 9
Matrix Class : Topsoil

Dioxins and Furans (Based on US EPA 1613)

Technique : GC/MS (HR)

						WHO2005 Toxic Equivalents ng/kg		WHO Toxic Equivalents ng/kg	
Determinand	**Symbol**	**Result ng/kg As Received @26% Moisture**	**LOD As Received @26% Moisture**	**Lower Bound ng/kg @ 0% Moisture**	**LOD @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**
2,3,7,8-TCDD	U	<2.5	2.5	<3.4	3.4	0.0	**3.4**	0.0	**3.4**
1,2,3,7,8-PeCDD	U	<5.0	5.0	<6.8	6.8	0.0	**6.8**	0.0	**6.8**
1,2,3,4,7,8-HxCDD	U	<3.5	3.5	<4.7	4.7	0.0	**0.47**	0.0	**0.47**
1,2,3,6,7,8-HxCDD	U	<3.5	3.5	<4.7	4.7	0.0	**0.47**	0.0	**0.47**
1,2,3,7,8,9-HxCDD	U	<3.5	3.5	<4.7	4.7	0.0	**0.47**	0.0	**0.47**
1,2,3,4,6,7,8-HpCDD	U	**150**	2.1	200	2.8	2.0	**2.0**	2.0	**2.0**
OCDD	U	**1500**	3.0	2000	4.1	0.61	**0.61**	0.20	**0.20**
					Dioxins Totals :	2.6	**14**	2.2	**14**
2,3,7,8-TCDF	U	<6.0	6.0	<8.1	8.1	0.0	**0.81**	0.0	**0.81**
1,2,3,7,8-PeCDF	U	<5.0	5.0	<6.8	6.8	0.0	**0.20**	0.0	**0.34**
2,3,4,7,8-PeCDF	U	<5.0	5.0	<6.8	6.8	0.0	**2.0**	0.0	**3.4**
1,2,3,4,7,8-HxCDF	U	<4.2	4.2	<5.7	5.7	0.0	**0.57**	0.0	**0.57**
1,2,3,6,7,8-HxCDF	U	<4.3	4.3	<5.8	5.8	0.0	**0.58**	0.0	**0.58**
2,3,4,6,7,8-HxCDF	U	<4.3	4.3	<5.8	5.8	0.0	**0.58**	0.0	**0.58**
1,2,3,7,8,9-HxCDF	U	<4.2	4.2	<5.7	5.7	0.0	**0.57**	0.0	**0.57**
1,2,3,4,6,7,8-HpCDF	U	**22**	2.5	30	3.4	0.30	**0.30**	0.30	**0.30**
1,2,3,4,7,8,9-HpCDF	U	<5.7	5.7	<7.7	7.7	0.0	**0.077**	0.0	**0.077**
OCDF	U	**54**	3.1	73	4.2	0.022	**0.022**	0.0073	**0.0073**
					Furans Totals :	0.32	**5.8**	0.31	**7.2**
					Totals :	**3.0**	**20**	**2.5**	**21**

Poly-Chlorinated Biphenyls (WHO 12)

Technique : GC/MS (HR)

WHO2005 Toxic Equivalents ng/kg	WHO Toxic Equivalents ng/kg

Determinand	Symbol	Result ng/kg As Received @26% Moisture	LOD As Received @26% Moisture	Lower Bound ng/kg @ 0% Moisture	LOD @ 0% Moisture	Lower Bound @ 0% Moisture	Upper Bound @ 0% Moisture	Lower Bound @ 0% Moisture	Upper Bound @ 0% Moisture
PCB BZ#77	U	(100) <500	500	<680	680	0.0	**0.068**	0.0	**0.068**
PCB BZ#81	U	(100) <500	500	<680	680	0.0	**0.20**	0.0	**0.068**
PCB BZ#105	U	**1300**	500	1800	680	0.053	**0.053**	0.18	**0.18**
PCB BZ#114	U	(100) <500	500	<680	680	0.0	**0.020**	0.0	**0.34**
PCB BZ#118	U	**2300**	500	3100	680	0.094	**0.094**	0.31	**0.31**
PCB BZ#123	U	(100, 2) <640	640	<870	870	0.0	**0.026**	0.0	**0.087**
PCB BZ#126	U	(100, 2) <550	550	<750	750	0.0	**75**	0.0	**75**
PCB BZ#156	U	**660**	500	900	680	0.027	**0.027**	0.45	**0.45**
PCB BZ#157	U	(100) <500	500	<680	680	0.0	**0.020**	0.0	**0.34**
PCB BZ#167	U	(2, 100) <950	950	<1300	1300	0.0	**0.039**	0.0	**0.013**
PCB BZ#169	U	(100) <500	500	<680	680	0.0	**20**	0.0	**6.8**
PCB BZ#189	U	(100) <500	500	<680	680	0.0	**0.020**	0.0	**0.068**
					Totals :	**0.17**	**96**	**0.94**	**83**

Soil

Customer Sample Reference : HEP-TT-19
Our Sample Reference : 706211 093
Moisture Content : 23.8 %
Hole ID : HEP-TT-19
Top Depth : 2.20
Depth : 2.20
Test Portion Mass (g) : 175
Date Sampled : 13-DEC-2017
Time Sampled : 14:00
AGS Type : ES
AGS Sample ID : HEPTT1920171213004
AGS Sample Reference : 12
Matrix Class : Clay

Dioxins and Furans (Based on US EPA 1613)

Technique : GC/MS (HR)

						WHO2005 Toxic Equivalents ng/kg		WHO Toxic Equivalents ng/kg	
Determinand	**Symbol**	**Result ng/kg As Received @24% Moisture**	**LOD As Received @24% Moisture**	**Lower Bound ng/kg @ 0% Moisture**	**LOD @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**
2,3,7,8-TCDD	U	<2.3	2.3	<3.0	3.0	0.0	**3.0**	0.0	**3.0**
1,2,3,7,8-PeCDD	U	<4.0	4.0	<5.2	5.2	0.0	**5.2**	0.0	**5.2**
1,2,3,4,7,8-HxCDD	U	<2.3	2.3	<3.0	3.0	0.0	**0.30**	0.0	**0.30**
1,2,3,6,7,8-HxCDD	U	<2.3	2.3	<3.0	3.0	0.0	**0.30**	0.0	**0.30**
1,2,3,7,8,9-HxCDD	U	<2.3	2.3	<3.0	3.0	0.0	**0.30**	0.0	**0.30**
1,2,3,4,6,7,8-HpCDD	U	<3.5	3.5	<4.6	4.6	0.0	**0.046**	0.0	**0.046**
OCDD	U	<3.2	3.2	<4.2	4.2	0.0	**0.0013**	0.0	**0.00042**
					Dioxins Totals :	0.0	**9.2**	0.0	**9.2**
2,3,7,8-TCDF	U	<2.9	2.9	<3.8	3.8	0.0	**0.38**	0.0	**0.38**
1,2,3,7,8-PeCDF	U	<2.2	2.2	<2.9	2.9	0.0	**0.087**	0.0	**0.14**
2,3,4,7,8-PeCDF	U	<2.2	2.2	<2.9	2.9	0.0	**0.87**	0.0	**1.4**
1,2,3,4,7,8-HxCDF	U	<2.0	2.0	<2.6	2.6	0.0	**0.26**	0.0	**0.26**
1,2,3,6,7,8-HxCDF	U	<2.0	2.0	<2.6	2.6	0.0	**0.26**	0.0	**0.26**
2,3,4,6,7,8-HxCDF	U	<2.0	2.0	<2.6	2.6	0.0	**0.26**	0.0	**0.26**
1,2,3,7,8,9-HxCDF	U	<2.0	2.0	<2.6	2.6	0.0	**0.26**	0.0	**0.26**
1,2,3,4,6,7,8-HpCDF	U	<3.8	3.8	<5.0	5.0	0.0	**0.050**	0.0	**0.050**
1,2,3,4,7,8,9-HpCDF	U	<3.8	3.8	<5.0	5.0	0.0	**0.050**	0.0	**0.050**
OCDF	U	<3.1	3.1	<4.1	4.1	0.0	**0.0012**	0.0	**0.00041**
					Furans Totals :	0.0	**2.5**	0.0	**3.1**
					Totals :	**0.0**	**12**	**0.0**	**12**

Poly-Chlorinated Biphenyls (WHO 12)

Technique : GC/MS (HR)

						WHO2005 Toxic Equivalents ng/kg		WHO Toxic Equivalents ng/kg	
Determinand	**Symbol**	**Result ng/kg As Received @24% Moisture**	**LOD As Received @24% Moisture**	**Lower Bound ng/kg @ 0% Moisture**	**LOD @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**
PCB BZ#77	U	<50	50	<66	66	0.0	**0.0066**	0.0	**0.0066**
PCB BZ#81	U	<50	50	<66	66	0.0	**0.020**	0.0	**0.0066**
PCB BZ#105	U	**190**	50	250	66	0.0075	**0.0075**	0.025	**0.025**

PCB BZ#114	U	<50	50	<66	66	0.0	**0.0020**	0.0	**0.033**
PCB BZ#118	U	**320**	50	420	66	0.013	**0.013**	0.042	**0.042**
PCB BZ#123	U	(2) <60	60	<79	79	0.0	**0.0024**	0.0	**0.0079**
PCB BZ#126	U	<50	50	<66	66	0.0	**6.6**	0.0	**6.6**
PCB BZ#156	U	<50	50	<66	66	0.0	**0.0020**	0.0	**0.033**
PCB BZ#157	U	<50	50	<66	66	0.0	**0.0020**	0.0	**0.033**
PCB BZ#167	U	(2) <70	70	<92	92	0.0	**0.0028**	0.0	**0.00092**
PCB BZ#169	U	<50	50	<66	66	0.0	**2.0**	0.0	**0.66**
PCB BZ#189	U	<50	50	<66	66	0.0	**0.0020**	0.0	**0.0066**
					Totals :	**0.020**	**8.6**	**0.067**	**7.4**

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**706211 006**	**706211 008**	**706211 010**	**706211 015**	**706211 017**
				Customer Sample Reference	**HEP-BH-14**	**HEP-BH-14**	**HEP-BH-14**	**HEP-BH-16**	**HEP-BH-16**
				Test Sample	**AR**	**AR**	**AR**	**AR**	**AR**
				Depth	**0.60**	**2.00**	**5.00**	**1.70**	**3.70**
				Hole ID	**HEP-BH-14**	**HEP-BH-14**	**HEP-BH-14**	**HEP-BH-16**	**HEP-BH-16**
				Top Depth	**0.60**	**2.00**	**5.00**	**1.70**	**3.70**
				Date Sampled	**13-DEC-2017**	**14-DEC-2017**	**14-DEC-2017**	**14-DEC-2017**	**14-DEC-2017**
				Time Sampled	**13:30**	**10:30**	**12:30**	**14:30**	**15:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH142017121 3002**	**HEPBH142017121 4001**	**HEPBH142017121 4003**	**HEPBH162017121 4001**	**HEPBH162017121 4003**
				AGS Sample Reference	**6**	**14**	**27**	**8**	**15**
				Matrix Class	**Sandy Soil**	**Clay**	**Clay**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**LOD**	**Units**	**Symbol**					
Moisture @105C	Grav (1 Dec) (105 C)	0.1	%	N	**18**	**22**	**27**	**15**	**19**

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**706211 019**	**706211 021**	**706211 041**	**706211 042**	**706211 044**
				Customer Sample Reference	**HEP-BH-16**	**HEP-BH-16**	**HEP-BH-13**	**HEP-BH-13**	**HEP-BH-13**
				Test Sample	**AR**	**AR**	**AR**	**AR**	**AR**
				Depth	**5.70**	**7.50**	**1.20**	**2.20**	**4.20**
				Hole ID	**HEP-BH-16**	**HEP-BH-16**	**HEP-BH-13**	**HEP-BH-13**	**HEP-BH-13**
				Top Depth	**5.70**	**7.50**	**1.20**	**2.20**	**4.20**
				Date Sampled	**15-DEC-2017**	**15-DEC-2017**	**14-DEC-2017**	**14-DEC-2017**	**14-DEC-2017**
				Time Sampled	**09:00**	**10:30**	**12:20**	**12:30**	**13:10**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH162017121 5001**	**HEPBH162017121 5003**	**HEPBH186320171 214001**	**HEPBH186320171 214002**	**HEPBH186320171 214004**
				AGS Sample Reference	**20**	**26**	**10**	**13**	**19**
				Matrix Class	**Sandy Soil**	**Clay**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**LOD**	**Units**	**Symbol**					
Moisture @105C	Grav (1 Dec) (105 C)	0.1	%	N	**24**	**22**	**11**	**21**	**19**

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**706211 046**	**706211 047**	**706211 049**	**706211 050**	**706211 054**
				Customer Sample Reference	**HEP-BH-13**	**HEP-BH-1864**	**HEP-BH-1864**	**HEP-BH-1864**	**HEP-BH-20**
				Test Sample	**AR**	**AR**	**AR**	**AR**	**AR**
				Depth	**6.50**	**1.20**	**3.20**	**4.20**	**0.60**
				Hole ID	**HEP-BH-13**	**HEP-BH-1864**	**HEP-BH-1864**	**HEP-BH-1864**	**HEP-BH-20**
				Top Depth	**6.50**	**1.20**	**3.20**	**4.20**	**0.60**
				Date Sampled	**15-DEC-2017**	**18-DEC-2017**	**18-DEC-2017**	**18-DEC-2017**	**18-DEC-2017**
				Time Sampled	**11:00**	**13:30**	**15:20**	**16:10**	**14:25**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH186320171 215002**	**HEPBH186420171 218001**	**HEPBH186420171 218003**	**HEPBH186420171 218004**	**HEPBH202017121 8003**
				AGS Sample Reference	**25**	**4**	**10**	**15**	**7**
				Matrix Class	**Sandy Soil**	**Sandy Soil**	**Clay**	**Fill**	**Sandy Soil**
Determinand	**Method**	**LOD**	**Units**	**Symbol**					
Moisture @105C	Grav (1 Dec) (105 C)	0.1	%	N	**18**	**16**	**16**	**12**	**12**

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**706211 056**	**706211 062**	**706211 064**	**706211 067**	**706211 074**
				Customer Sample Reference	**HEP-BH-20**	**HEP-BH-43**	**HEP-BH-43**	**HEP-BH-43**	**HEP-BH-44**
				Test Sample	**AR**	**AR**	**AR**	**AR**	**AR**
				Depth	**2.40**	**0.10**	**1.90**	**4.90**	**0.10**
				Hole ID	**HEP-BH-20**	**HEP-BH-43**	**HEP-BH-43**	**HEP-BH-43**	**HEP-BH-44**
				Top Depth	**2.40**	**0.10**	**1.90**	**4.90**	**0.10**
				Date Sampled	**18-DEC-2017**	**13-DEC-2017**	**14-DEC-2017**	**15-DEC-2017**	**18-DEC-2017**
				Time Sampled	**14:51**	**14:05**	**15:00**	**11:00**	**15:05**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH202017121 8005**	**HEPBH432017121 3001**	**HEPBH432017121 4001**	**HEPBH432017121 5003**	**HEPBH442017121 8001**
				AGS Sample Reference	**17**	**1**	**5**	**16**	**1**
				Matrix Class	**Clay**	**Sandy Soil**	**Clay**	**Fill**	**Sandy Soil**
Determinand	**Method**	**LOD**	**Units**	**Symbol**					
Moisture @105C	Grav (1 Dec) (105 C)	0.1	%	N	**14**	**15**	**17**	**3.2**	**26**

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**706211 077**	**706211 082**	**706211 084**	**706211 086**	**706211 087**
				Customer Sample Reference	**HEP-BH-7**	**HEP-BH-7**	**HEP-BH-7**	**HEP-TP-1296**	**HEP-TP-1296**
				Test Sample	**AR**	**AR**	**AR**	**AR**	**AR**
				Depth	**0.70**	**4.30**	**6.30**	**0.40**	**1.30**
				Hole ID	**HEP-BH-7**	**HEP-BH-7**	**HEP-BH-7**	**HEP-TP-1296**	**HEP-TP-1296**
				Top Depth	**0.70**	**4.30**	**6.30**	**0.40**	**1.30**
				Date Sampled	**13-DEC-2017**	**14-DEC-2017**	**14-DEC-2017**	**13-DEC-2017**	**13-DEC-2017**
				Time Sampled	**15:35**	**10:50**	**13:05**	**11:00**	**12:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH720171213 002**	**HEPBH720171214 004**	**HEPBH720171214 006**	**HEPBH129620171 213002**	**HEPBH129620171 213003**
				AGS Sample Reference	**4**	**27**	**37**	**6**	**9**
				Matrix Class	**Topsoil**	**Fill**	**Clay**	**Topsoil**	**Topsoil**
Determinand	**Method**	**LOD**	**Units**	**Symbol**					
Moisture @105C	Grav (1 Dec) (105 C)	0.1	%	N	**27**	**7.8**	**22**	**33**	**26**

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**706211 089**	**706211 091**	**706211 093**	**706211 094**
				Customer Sample Reference	**HEP-TP-1296**	**HEP-TT-19**	**HEP-TT-19**	**HEP-TT-19**
				Test Sample	**AR**	**AR**	**AR**	**AR**
				Depth	**2.70**	**0.30**	**2.20**	**3.10**
				Hole ID	**HEP-TP-1296**	**HEP-TT-19**	**HEP-TT-19**	**HEP-TT-19**
				Top Depth	**2.70**	**0.30**	**2.20**	**3.10**
				Date Sampled	**13-DEC-2017**	**13-DEC-2017**	**13-DEC-2017**	**13-DEC-2017**
				Time Sampled	**14:00**	**11:00**	**14:00**	**15:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH129620171 213005**	**HEPTT1920171213 002**	**HEPTT1920171213 004**	**HEPTT1920171213 005**
				AGS Sample Reference	**15**	**6**	**12**	**15**
				Matrix Class	**Sandy Soil**	**Sandy Soil**	**Clay**	**Clay**
Determinand	**Method**	**LOD**	**Units**	**Symbol**				
Moisture @105C	Grav (1 Dec) (105 C)	0.1	%	N	**13**	**17**	**24**	**13**

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**706211 006**	**706211 008**	**706211 010**	**706211 015**	**706211 017**
				Customer Sample Reference	**HEP-BH-14**	**HEP-BH-14**	**HEP-BH-14**	**HEP-BH-16**	**HEP-BH-16**
				Test Sample	**M40**	**M40**	**M40**	**M40**	**M40**
				Depth	**0.60**	**2.00**	**5.00**	**1.70**	**3.70**
				Hole ID	**HEP-BH-14**	**HEP-BH-14**	**HEP-BH-14**	**HEP-BH-16**	**HEP-BH-16**
				Top Depth	**0.60**	**2.00**	**5.00**	**1.70**	**3.70**
				Date Sampled	**13-DEC-2017**	**14-DEC-2017**	**14-DEC-2017**	**14-DEC-2017**	**14-DEC-2017**
				Time Sampled	**13:30**	**10:30**	**12:30**	**14:30**	**15:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH14201712130 02**	**HEPBH14201712140 01**	**HEPBH14201712140 03**	**HEPBH16201712140 01**	**HEPBH16201712140 03**
				AGS Sample Reference	**6**	**14**	**27**	**8**	**15**
				Matrix Class	**Sandy Soil**	**Clay**	**Clay**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**LOD**	**Units**	**Symbol**					
Retained on 10mm sieve	Grav	0.1	%	N	<0.1	<0.1	<0.1	<0.1	**1.7**

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**706211 019**	**706211 021**	**706211 041**	**706211 042**	**706211 044**
				Customer Sample Reference	**HEP-BH-16**	**HEP-BH-16**	**HEP-BH-13**	**HEP-BH-13**	**HEP-BH-13**
				Test Sample	**M40**	**M40**	**M40**	**M40**	**M40**
				Depth	**5.70**	**7.50**	**1.20**	**2.20**	**4.20**
				Hole ID	**HEP-BH-16**	**HEP-BH-16**	**HEP-BH-13**	**HEP-BH-13**	**HEP-BH-13**
				Top Depth	**5.70**	**7.50**	**1.20**	**2.20**	**4.20**
				Date Sampled	**15-DEC-2017**	**15-DEC-2017**	**14-DEC-2017**	**14-DEC-2017**	**14-DEC-2017**
				Time Sampled	**09:00**	**10:30**	**12:20**	**12:30**	**13:10**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH16201712150 01**	**HEPBH16201712150 03**	**HEPBH18632017121 4001**	**HEPBH18632017121 4002**	**HEPBH18632017121 4004**
				AGS Sample Reference	**20**	**26**	**10**	**13**	**19**
				Matrix Class	**Sandy Soil**	**Clay**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**LOD**	**Units**	**Symbol**					
Retained on 10mm sieve	Grav	0.1	%	N	<0.1	<0.1	**3.9**	<0.1	<0.1

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**706211 046**	**706211 047**	**706211 049**	**706211 050**	**706211 054**
				Customer Sample Reference	**HEP-BH-13**	**HEP-BH-1864**	**HEP-BH-1864**	**HEP-BH-1864**	**HEP-BH-20**
				Test Sample	**M40**	**M40**	**M40**	**M40**	**M40**
				Depth	**6.50**	**1.20**	**3.20**	**4.20**	**0.60**
				Hole ID	**HEP-BH-13**	**HEP-BH-1864**	**HEP-BH-1864**	**HEP-BH-1864**	**HEP-BH-20**
				Top Depth	**6.50**	**1.20**	**3.20**	**4.20**	**0.60**
				Date Sampled	**15-DEC-2017**	**18-DEC-2017**	**18-DEC-2017**	**18-DEC-2017**	**18-DEC-2017**
				Time Sampled	**11:00**	**13:30**	**15:20**	**16:10**	**14:25**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH18632017121 5002**	**HEPBH18642017121 8001**	**HEPBH18642017121 8003**	**HEPBH18642017121 8004**	**HEPBH20201712180 03**
				AGS Sample Reference	**25**	**4**	**10**	**15**	**7**
				Matrix Class	**Sandy Soil**	**Sandy Soil**	**Clay**	**Fill**	**Sandy Soil**
Determinand	**Method**	**LOD**	**Units**	**Symbol**					
Retained on 10mm sieve	Grav	0.1	%	N	<0.1	<0.1	<0.1	**1.9**	<0.1

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**706211 056**	**706211 062**	**706211 064**	**706211 067**	**706211 074**
				Customer Sample Reference	**HEP-BH-20**	**HEP-BH-43**	**HEP-BH-43**	**HEP-BH-43**	**HEP-BH-44**
				Test Sample	**M40**	**M40**	**M40**	**M40**	**M40**
				Depth	**2.40**	**0.10**	**1.90**	**4.90**	**0.10**
				Hole ID	**HEP-BH-20**	**HEP-BH-43**	**HEP-BH-43**	**HEP-BH-43**	**HEP-BH-44**
				Top Depth	**2.40**	**0.10**	**1.90**	**4.90**	**0.10**
				Date Sampled	**18-DEC-2017**	**13-DEC-2017**	**14-DEC-2017**	**15-DEC-2017**	**18-DEC-2017**
				Time Sampled	**14:51**	**14:05**	**15:00**	**11:00**	**15:05**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH20201712180 05**	**HEPBH43201712130 01**	**HEPBH43201712140 01**	**HEPBH43201712150 03**	**HEPBH44201712180 01**
				AGS Sample Reference	**17**	**1**	**5**	**16**	**1**
				Matrix Class	**Clay**	**Sandy Soil**	**Clay**	**Fill**	**Sandy Soil**
Determinand	**Method**	**LOD**	**Units**	**Symbol**					
Retained on 10mm sieve	Grav	0.1	%	N	<0.1	<0.1	<0.1	**1.8**	<0.1

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**706211 077**	**706211 082**	**706211 084**	**706211 086**	**706211 087**
				Customer Sample Reference	**HEP-BH-7**	**HEP-BH-7**	**HEP-BH-7**	**HEP-TP-1296**	**HEP-TP-1296**
				Test Sample	**M40**	**M40**	**M40**	**M40**	**M40**
				Depth	**0.70**	**4.30**	**6.30**	**0.40**	**1.30**
				Hole ID	**HEP-BH-7**	**HEP-BH-7**	**HEP-BH-7**	**HEP-TP-1296**	**HEP-TP-1296**
				Top Depth	**0.70**	**4.30**	**6.30**	**0.40**	**1.30**
				Date Sampled	**13-DEC-2017**	**14-DEC-2017**	**14-DEC-2017**	**13-DEC-2017**	**13-DEC-2017**
				Time Sampled	**15:35**	**10:50**	**13:05**	**11:00**	**12:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH72017121300 2**	**HEPBH72017121400 4**	**HEPBH72017121400 6**	**HEPBH12962017121 3002**	**HEPBH12962017121 3003**
				AGS Sample Reference	**4**	**27**	**37**	**6**	**9**
				Matrix Class	**Topsoil**	**Fill**	**Clay**	**Topsoil**	**Topsoil**
Determinand	**Method**	**LOD**	**Units**	**Symbol**					
Retained on 10mm sieve	Grav	0.1	%	N	<0.1	<0.1	**0.9**	**2.2**	<0.1

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**706211 089**	**706211 091**	**706211 093**	**706211 094**
				Customer Sample Reference	**HEP-TP-1296**	**HEP-TT-19**	**HEP-TT-19**	**HEP-TT-19**
				Test Sample	**M40**	**M40**	**M40**	**M40**
				Depth	**2.70**	**0.30**	**2.20**	**3.10**
				Hole ID	**HEP-TP-1296**	**HEP-TT-19**	**HEP-TT-19**	**HEP-TT-19**
				Top Depth	**2.70**	**0.30**	**2.20**	**3.10**
				Date Sampled	**13-DEC-2017**	**13-DEC-2017**	**13-DEC-2017**	**13-DEC-2017**
				Time Sampled	**14:00**	**11:00**	**14:00**	**15:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH12962017121 3005**	**HEPTT19201712130 02**	**HEPTT19201712130 04**	**HEPTT19201712130 05**
				AGS Sample Reference	**15**	**6**	**12**	**15**
				Matrix Class	**Sandy Soil**	**Sandy Soil**	**Clay**	**Clay**
Determinand	**Method**	**LOD**	**Units**	**Symbol**				
Retained on 10mm sieve	Grav	0.1	%	N	<0.1	<0.1	<0.1	<0.1

Index to symbols used in Forth Supplemental A 706211-5

Value	Description
M40	Analysis conducted on sample assisted dried at no more than 40C. Results are reported on a dry weight basis.
AR	As Received
100	LOD determined by sample aliquot used for analysis
2	LOD Raised Due to Matrix Interference
U	Analysis is UKAS accredited
N	Analysis is not UKAS accredited

Notes

Samples taken 14/12/17 or earlier have been analysed exceeding recommended holding times for PCBs. It is possible therefore that the results provided may be compromised.
Forth Supplemental A to report Dioxins and PCBS only.

CONCEPT LIFE SCIENCES
DELIVERING SCIENCE

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Concept Life Sciences

Certificate of Analysis

Hadfield House
Hadfield Street
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Manchester
M16 9FE
Tel : 0161 874 2400
Fax : 0161 874 2468

Report Number: 4th supplemental 706211-5 Report B

Date of Report: 27-Jun-2018

Customer: Fugro GeoServices
Fugro House
Hithercroft Road
Wallingford
Oxfordshire
OX10 9RB

Customer Contact: Ms Karen Blackmore

Customer Job Reference:
Customer Purchase Order: 56642KB-WAL
Customer Site Reference: HEP Package 3
Date Job Received at Concept: 15-Dec-2017
Date Analysis Started: 29-Dec-2017
Date Analysis Completed: 27-Feb-2018

The results reported relate to samples received in the laboratory and may not be representative of a whole batch.

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation

This report should not be reproduced except in full without the written approval of the laboratory

Tests covered by this certificate were conducted in accordance with Concept Life Sciences SOPs

All results have been reviewed in accordance with Section 25 of the Concept Life Sciences, Analytical Services Quality Manual

UKAS TESTING
1549

Report checked and authorised by :
Sara Abou-Shakra
Customer Service Manager

Issued by :
Aleksandra Pacula
Senior Customer Service Advisor

Waste Acceptance Criteria

Customer Sample Reference : HEP-TP-1296
Our Sample Reference : 706211 087
Project Site : HEP Package 3
Sample in Dish @ 105C : 83
Test Portion Mass (g) : 175
Hole ID : HEP-TP-1296
Depth : 1.30
Top Depth : 1.30
Empty Dish Weight : 0
Wet Sample in Dish Weight : 100
Date Sampled : 13-DEC-2017
Time Sampled : 12:00
AGS Type : ES
AGS Sample ID : HEPBH129620171213003
AGS Sample Reference : 9
Matrix Class : Topsoil

Soil					Result	Inert Waste Landfill	Stable non reactive	Hazardous Waste Landfill
Determinand	**Technique**	**LOD**	**Units**	**Symbol**				
Loss on Ignition	Grav	0.1	%	N	**14**			**10.0**
Moisture	Grav	0.1	%	N	**26**			
Total Organic Carbon	OX/IR	0.1	%	N	**0.6**	3.0	5.0	6.0

Data for BS EN 12457-2 (10:1)					Result	Inert Waste Landfill	Stable non reactive	Hazardous Waste Landfill
Determinand	**Technique**	**LOD**	**Units**	**Symbol**				
Antimony	Calc WAC ICP/MS	0.010	mg/kg	N	**0.052**	0.06	0.7	5.0
Arsenic	Calc WAC ICP/MS	0.0020	mg/kg	N	**0.061**	0.5	2.0	25.0
Barium	Calc WAC ICP/MS	0.010	mg/kg	N	**0.10**	20.0	100.0	300.0
Cadmium	Calc WAC ICP/MS	0.00020	mg/kg	N	**0.00081**	0.04	1.0	5.0
Chloride	Calc (W)	10	mg/kg	N	**26**	800.0	15000.0	25000.0
Chromium	Calc WAC ICP/MS	0.010	mg/kg	N	**0.016**	0.5	10.0	70.0
Copper	Calc WAC ICP/MS	0.0050	mg/kg	N	**0.044**	2.0	50.0	100.0
Dissolved Organic Carbon	Calc	10	mg/kg	N	**190**	500.0	800.0	1000.0
Fluoride	Calc (W)	0.50	mg/kg	N	<0.50	10.0	150.0	500.0
Lead	Calc WAC ICP/MS	0.0030	mg/kg	N	<0.0030	0.5	10.0	50.0
Mercury	Calc WAC ICP/MS	0.00050	mg/kg	N	**0.0010**	0.01	0.2	2.0
Molybdenum	Calc WAC ICP/MS	0.010	mg/kg	N	**0.34**	0.5	10.0	30.0
Nickel	Calc WAC ICP/MS	0.010	mg/kg	N	**0.13**	0.4	10.0	40.0
Phenols (Total-Mono)	Calc	1.0	mg/kg	N	<1.0	1.0		
Selenium	Calc WAC ICP/MS	0.0050	mg/kg	N	**0.0081**	0.1	0.5	7.0
Sulphate	Calc (W)	5	mg/kg	N	**3000**	**1000.0**	20000.0	50000.0
Total Dissolved Solids	Calc	1000	mg/kg	N	**5300**	**4000.0**	60000.0	100000.0
Zinc	Calc WAC ICP/MS	0.020	mg/kg	N	**0.053**	4.0	50.0	200.0

Following the recommendation from the Environment Agency (England and Wales)*, the leachate preparation in this report has been carried out to BS EN 12457-2 : One Stage batch test at a liquid to solid ratio of 10 l/kg. This is also compliant with Schedule 10 of the Environmental Permitting Regulations 2010.

Note : This is the minimum amount of testing which is required.

Further testing may be required if :

- evidence of immediately leachable parameters becomes available.
- evidence to indicate that the sample could be classified as hazardous under H1-H14 of the Waste(England and Wales) Regulations 2011(as amended) becomes available.

Acceptance of waste at landfill is always at the discretion of the Landfill Operator.

*** Waste Sampling and Testing for Disposal at Landfill, EBPRI 11507B, Environment Agency (England and Wales) March 2013**

As detailed in- Waste Classification. Guidance on the classification and assessment of waste. Technical Guidance WM3:

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/427077/LIT_10121.pdf

Landfill WAC analysis (specifically leaching test results) should not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

Concept Reference	**706211 087**
Customer Sample Reference	**HEP-TP-1296**
Test Sample	**AR**
Depth	**1.30**
Top Depth	**1.30**
Hole ID	**HEP-TP-1296**
Date Sampled	**13-DEC-2017**
Time Sampled	**12:00**
AGS Type	**ES**
AGS Sample ID	**HEPBH129620171213003**
AGS Sample Reference	**9**
Matrix Class	**Topsoil**

Determinand	Method	LOD	Units	Symbol	
Moisture @105C	Grav (1 Dec) (105 C)	0.1	%	N	**26**

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

Concept Reference	**706211 087**
Customer Sample Reference	**HEP-TP-1296**
Test Sample	**M40**
Depth	**1.30**
Top Depth	**1.30**
Hole ID	**HEP-TP-1296**
Date Sampled	**13-DEC-2017**
Time Sampled	**12:00**
AGS Type	**ES**
AGS Sample ID	**HEPBH129620171213003**
AGS Sample Reference	**9**
Matrix Class	**Topsoil**

Determinand	Method	LOD	Units	Symbol	
Retained on 10mm sieve	Grav	0.1	%	N	<0.1

Concept Reference: 706211
Project Site: HEP Package 3
Customer Reference:

Leachate to BS EN 12457-2 (10:1) Analysed as Water
WAC Eluate Analysis

Concept Reference	**706211 087**
Customer Sample Reference	**HEP-TP-1296**
Test Sample	**10:1**
Depth	**1.30**
Top Depth	**1.30**
Hole ID	**HEP-TP-1296**
Date Sampled	**13-DEC-2017**
Time Sampled	**12:00**
AGS Type	**ES**
AGS Sample ID	**HEPBH129620171213003**
AGS Sample Reference	**9**
Matrix Class	**Topsoil**

Determinand	Method	LOD	Units	Symbol	
Arsenic (Dissolved)	ICP/MS (Filtered)	0.2	µg/l	U	**6.1**
Barium (Dissolved)	ICP/MS (Filtered)	1	µg/l	U	**10**
Molybdenum (Dissolved)	ICP/MS (Filtered)	1	µg/l	N	**34**
Total Dissolved Solids	Grav	100	mg/l	N	**530**
Phenols (Total-Mono)	Colorimetry	0.1	mg/l	U	<0.1
Dissolved Organic Carbon	OX/IR	1	mg/l	N	**19**
Electrical Conductivity	Probe	10	µS/cm	N	**880**
Antimony (Dissolved)	ICP/MS (Filtered)	1	µg/l	U	**5**
Cadmium (Dissolved)	ICP/MS (Filtered)	0.02	µg/l	U	**0.08**
Chromium (Dissolved)	ICP/MS (Filtered)	1	µg/l	U	**2**
Copper (Dissolved)	ICP/MS (Filtered)	0.5	µg/l	U	**4.4**
Lead (Dissolved)	ICP/MS (Filtered)	0.3	µg/l	U	<0.3
Mercury (Dissolved)	ICP/MS (Filtered)	0.05	µg/l	U	**0.10**
Nickel (Dissolved)	ICP/MS (Filtered)	1	µg/l	U	**13**
Selenium (Dissolved)	ICP/MS (Filtered)	0.5	µg/l	U	**0.8**
Zinc (Dissolved)	ICP/MS (Filtered)	2	µg/l	U	**5**
Chloride	Discrete Analyser	1	mg/l	U	**3**
Fluoride	Discrete Analyser	0.05	mg/l	U	<0.05
Sulphate	Discrete Analyser	0.5	mg/l	U	**300**

Index to symbols used in 4th supplemental 706211-5 Report B

Value	Description
A40	Assisted dried < 40C
M40	Analysis conducted on sample assisted dried at no more than 40C. Results are reported on a dry weight basis.
10:1 S	Data for BS EN 12457-2 (10:1)
AR	As Received
10:1	Leachate to BS EN 12457-2 (10:1)
U	Analysis is UKAS accredited
N	Analysis is not UKAS accredited

Notes

Fourth supplemental report B to report WAC only.

CONCEPT LIFE SCIENCES
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Concept Life Sciences

Certificate of Analysis

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Hadfield Street
Cornbrook
Manchester
M16 9FE
Tel : 0161 874 2400
Fax : 0161 874 2468

Report Number: Supplemental B 706245-3

Date of Report: 27-Jun-2018

Customer: Fugro GeoServices
Fugro House
Hithercroft Road
Wallingford
Oxfordshire
OX10 9RB

Customer Contact: Ms Karen Blackmore

Customer Job Reference:
Customer Purchase Order: 56642KB-WAL
Customer Site Reference: HEP Package 3 CoC AGS4
Date Job Received at Concept: 21-Dec-2017
Date Analysis Started: 29-Dec-2017
Date Analysis Completed: 16-Jan-2018

The results reported relate to samples received in the laboratory and may not be representative of a whole batch.

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation

This report should not be reproduced except in full without the written approval of the laboratory

Tests covered by this certificate were conducted in accordance with Concept Life Sciences SOPs

All results have been reviewed in accordance with Section 25 of the Concept Life Sciences, Analytical Services Quality Manual

UKAS TESTING
1549

mCERTS
THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME

Report checked
and authorised by :
Sara Abou-Shakra
Customer Service Manager

Issued by :
Sara Abou-Shakra
Customer Service Manager

Concept Reference: 706245
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

Concept Reference					**706245 002**	**706245 004**	**706245 006**	**706245 008**	**706245 010**
Customer Sample Reference					**HEP-BH-1319**	**HEP-BH-1319**	**HEP-BH-1797**	**HEP-BH-1797**	**HEP-BH-1798**
Top Depth					**0.30**	**1.50**	**6.20**	**8.10**	**1.00**
Depth					**0.30**	**1.50**	**6.20**	**8.10**	**1.00**
Hole ID					**HEP-BH-1319**	**HEP-BH-1319**	**HEP-BH-1797**	**HEP-BH-1797**	**HEP-BH-1798**
Date Sampled					**19-DEC-2017**	**19-DEC-2017**	**19-DEC-2017**	**19-DEC-2017**	**19-DEC-2017**
Time Sampled					**14:05**	**14:50**	**13:00**	**15:00**	**14:00**
AGS Type					**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID					**HEPBH131920171219002**	**HEPBH131920171219004**	**HEPBH179720171219002**	**HEPBH179720171219004**	**HEPBH179820171219002**
AGS Sample Reference					**3**	**9**	**25**	**31**	**6**
Matrix Class					**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Clay**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Moisture @105C	T162	AR	0.1	%	**25**	**13**	**25**	**8.7**	**23**
Retained on 10mm sieve	T2	M40	0.1	%	<0.1	<0.1	<0.1	<0.1	<0.1

Concept Reference: 706245
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

Concept Reference					**706245 012**	**706245 014**	**706245 015**	**706245 018**	**706245 020**
Customer Sample Reference					**HEP-BH-20**	**HEP-BH-20**	**HEP-BH-5**	**HEP-BH-5**	**HEP-BH-5**
Top Depth					**4.80**	**7.30**	**1.20**	**4.20**	**6.20**
Depth					**4.80**	**7.30**	**1.20**	**4.20**	**6.20**
Hole ID					**HEP-BH-20**	**HEP-BH-20**	**HEP-BH-5**	**HEP-BH-5**	**HEP-BH-5**
Date Sampled					**19-DEC-2017**	**19-DEC-2017**	**19-DEC-2017**	**19-DEC-2017**	**19-DEC-2017**
Time Sampled					**09:45**	**11:30**	**10:00**	**12:00**	**14:00**
AGS Type					**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID					**HEPBH2020171219002**	**HEPBH2020171219004**	**HEPBH520171219001**	**HEPBH520171219004**	**HEPBH520171219006**
AGS Sample Reference					**29**	**39**	**7**	**17**	**23**
Matrix Class					**Sandy Soil**	**Clay**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Moisture @105C	T162	AR	0.1	%	**20**	**23**	**42**	**18**	**26**
Retained on 10mm sieve	T2	M40	0.1	%	<0.1	<0.1	**26.1**	**13.0**	<0.1

Concept Reference: 706245
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

Concept Reference					**706245 022**
Customer Sample Reference					**HEP-BH-5**
Top Depth					**8.20**
Depth					**8.20**
Hole ID					**HEP-BH-5**
Date Sampled					**20-DEC-2017**
Time Sampled					**10:00**
AGS Type					**ES**
AGS Sample ID					**HEPBH520171220001**
AGS Sample Reference					**29**
Matrix Class					**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**	
Moisture @105C	T162	AR	0.1	%	**29**
Retained on 10mm sieve	T2	M40	0.1	%	<0.1

Concept Reference: 706245
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - Inorganics

				Concept Reference	**706245 002**	**706245 004**	**706245 006**	**706245 008**	**706245 010**
				Customer Sample Reference	**HEP-BH-1319**	**HEP-BH-1319**	**HEP-BH-1797**	**HEP-BH-1797**	**HEP-BH-1798**
				Top Depth	**0.30**	**1.50**	**6.20**	**8.10**	**1.00**
				Depth	**0.30**	**1.50**	**6.20**	**8.10**	**1.00**
				Hole ID	**HEP-BH-1319**	**HEP-BH-1319**	**HEP-BH-1797**	**HEP-BH-1797**	**HEP-BH-1798**
				Date Sampled	**19-DEC-2017**	**19-DEC-2017**	**19-DEC-2017**	**19-DEC-2017**	**19-DEC-2017**
				Time Sampled	**14:05**	**14:50**	**13:00**	**15:00**	**14:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH131920171219002**	**HEPBH131920171219004**	**HEPBH179720171219002**	**HEPBH179720171219004**	**HEPBH179820171219002**
				AGS Sample Reference	**3**	**9**	**25**	**31**	**6**
				Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Clay**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Chloride	T686	AR	1	mg/kg	**6**	**21**	**100**	**30**	**42**
Cyanide(Total)	T4	AR	1	mg/kg	<1	**1**	**3**	<1	**8**
Thiocyanate	T4	A40	1	mg/kg	<10	<10	<10	<10	<10
Nitrate	T686	AR	1	mg/kg	**6**	**8**	<1	**2**	**6**
Nitrite	T686	AR	1	mg/kg	<1	<1	<1	<1	<1
SO4(Total)	T6	A40	0.01	%	**0.11**	**0.21**	**1.0**	**0.06**	**0.55**
Sulphide	T4	AR	10	mg/kg	<10	<10	**400**	**16**	**190**

Concept Reference: 706245
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - Inorganics

				Concept Reference	**706245 012**	**706245 014**	**706245 015**	**706245 018**	**706245 020**
				Customer Sample Reference	**HEP-BH-20**	**HEP-BH-20**	**HEP-BH-5**	**HEP-BH-5**	**HEP-BH-5**
				Top Depth	**4.80**	**7.30**	**1.20**	**4.20**	**6.20**
				Depth	**4.80**	**7.30**	**1.20**	**4.20**	**6.20**
				Hole ID	**HEP-BH-20**	**HEP-BH-20**	**HEP-BH-5**	**HEP-BH-5**	**HEP-BH-5**
				Date Sampled	**19-DEC-2017**	**19-DEC-2017**	**19-DEC-2017**	**19-DEC-2017**	**19-DEC-2017**
				Time Sampled	**09:45**	**11:30**	**10:00**	**12:00**	**14:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH2020171219002**	**HEPBH2020171219004**	**HEPBH520171219001**	**HEPBH520171219004**	**HEPBH520171219006**
				AGS Sample Reference	**29**	**39**	**7**	**17**	**23**
				Matrix Class	**Sandy Soil**	**Clay**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Chloride	T686	AR	1	mg/kg	**38**	**37**	**26**	**69**	**75**
Cyanide(Total)	T4	AR	1	mg/kg	<1	<1	**3**	<1	<1
Thiocyanate	T4	A40	1	mg/kg	<10	<10	<10	<10	<10
Nitrate	T686	AR	1	mg/kg	**2**	**2**	**2**	**2**	**2**
Nitrite	T686	AR	1	mg/kg	<1	<1	<1	<1	<1
SO4(Total)	T6	A40	0.01	%	**0.51**	**0.14**	**0.63**	**0.29**	**0.44**
Sulphide	T4	AR	10	mg/kg	**770**	**11**	**120**	**690**	**180**

Concept Reference: 706245
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - Inorganics

Concept Reference	**706245 022**
Customer Sample Reference	**HEP-BH-5**
Top Depth	**8.20**
Depth	**8.20**
Hole ID	**HEP-BH-5**
Date Sampled	**20-DEC-2017**
Time Sampled	**10:00**
AGS Type	**ES**
AGS Sample ID	**HEPBH520171220001**
AGS Sample Reference	**29**
Matrix Class	**Clay**

Determinand	Method	Test Sample	LOD	Units	
Chloride	T686	AR	1	mg/kg	**110**
Cyanide(Total)	T4	AR	1	mg/kg	<1
Thiocyanate	T4	A40	1	mg/kg	<10
Nitrate	T686	AR	1	mg/kg	**2**
Nitrite	T686	AR	1	mg/kg	<1
SO4(Total)	T6	A40	0.01	%	**0.24**
Sulphide	T4	AR	10	mg/kg	**780**

Concept Reference: 706245
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - Misc

Concept Reference					**706245 002**	**706245 004**	**706245 006**	**706245 008**	**706245 010**
Customer Sample Reference					**HEP-BH-1319**	**HEP-BH-1319**	**HEP-BH-1797**	**HEP-BH-1797**	**HEP-BH-1798**
Top Depth					**0.30**	**1.50**	**6.20**	**8.10**	**1.00**
Depth					**0.30**	**1.50**	**6.20**	**8.10**	**1.00**
Hole ID					**HEP-BH-1319**	**HEP-BH-1319**	**HEP-BH-1797**	**HEP-BH-1797**	**HEP-BH-1798**
Date Sampled					**19-DEC-2017**	**19-DEC-2017**	**19-DEC-2017**	**19-DEC-2017**	**19-DEC-2017**
Time Sampled					**14:05**	**14:50**	**13:00**	**15:00**	**14:00**
AGS Type					**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID					**HEPBH131920171219002**	**HEPBH131920171219004**	**HEPBH179720171219002**	**HEPBH179720171219004**	**HEPBH179820171219002**
AGS Sample Reference					**3**	**9**	**25**	**31**	**6**
Matrix Class					**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Clay**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Soil Organic Matter	T287	A40	0.1	%	**3.5**	**2.1**	**7.2**	**2.0**	**2.0**
pH	T7	AR			**8.0**	**7.8**	**9.0**	**7.7**	**7.9**

Concept Reference: 706245
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Misc

				Concept Reference	**706245 012**	**706245 014**	**706245 015**	**706245 018**	**706245 020**
				Customer Sample Reference	**HEP-BH-20**	**HEP-BH-20**	**HEP-BH-5**	**HEP-BH-5**	**HEP-BH-5**
				Top Depth	**4.80**	**7.30**	**1.20**	**4.20**	**6.20**
				Depth	**4.80**	**7.30**	**1.20**	**4.20**	**6.20**
				Hole ID	**HEP-BH-20**	**HEP-BH-20**	**HEP-BH-5**	**HEP-BH-5**	**HEP-BH-5**
				Date Sampled	**19-DEC-2017**	**19-DEC-2017**	**19-DEC-2017**	**19-DEC-2017**	**19-DEC-2017**
				Time Sampled	**09:45**	**11:30**	**10:00**	**12:00**	**14:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH2020171219002**	**HEPBH2020171219004**	**HEPBH520171219001**	**HEPBH520171219004**	**HEPBH520171219006**
				AGS Sample Reference	**29**	**39**	**7**	**17**	**23**
				Matrix Class	**Sandy Soil**	**Clay**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Soil Organic Matter	T287	A40	0.1	%	**3.9**	**0.8**	**6.4**	**2.2**	**6.7**
pH	T7	AR			**9.8**	**8.3**	**7.5**	**8.8**	**8.1**

Concept Reference: 706245
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Misc

				Concept Reference	**706245 022**
				Customer Sample Reference	**HEP-BH-5**
				Top Depth	**8.20**
				Depth	**8.20**
				Hole ID	**HEP-BH-5**
				Date Sampled	**20-DEC-2017**
				Time Sampled	**10:00**
				AGS Type	**ES**
				AGS Sample ID	**HEPBH520171220001**
				AGS Sample Reference	**29**
				Matrix Class	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**	
Soil Organic Matter	T287	A40	0.1	%	**1.4**
pH	T7	AR			**8.6**

Concept Reference: 706245
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings Metals and Metalloids

Concept Reference				**706245 002**	**706245 004**	**706245 006**	**706245 008**	**706245 010**
Customer Sample Reference				**HEP-BH-1319**	**HEP-BH-1319**	**HEP-BH-1797**	**HEP-BH-1797**	**HEP-BH-1798**
Top Depth				**0.30**	**1.50**	**6.20**	**8.10**	**1.00**
Depth				**0.30**	**1.50**	**6.20**	**8.10**	**1.00**
Hole ID				**HEP-BH-1319**	**HEP-BH-1319**	**HEP-BH-1797**	**HEP-BH-1797**	**HEP-BH-1798**
Date Sampled				**19-DEC-2017**	**19-DEC-2017**	**19-DEC-2017**	**19-DEC-2017**	**19-DEC-2017**
Time Sampled				**14:05**	**14:50**	**13:00**	**15:00**	**14:00**
AGS Type				**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID				**HEPBH131920171219002**	**HEPBH131920171219004**	**HEPBH179720171219002**	**HEPBH179720171219004**	**HEPBH179820171219002**
AGS Sample Reference				**3**	**9**	**25**	**31**	**6**
Matrix Class				**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Clay**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**				
Arsenic	T6	M40	2	mg/kg	**19**	**20**	**18**	**25**	**21**
Cadmium	T6	M40	1	mg/kg	<1	**1**	<1	**1**	**7**
Chromium	T6	M40	1	mg/kg	**45**	**49**	**68**	**43**	**59**
Chromium VI	T6	AR	1	mg/kg	<1	<1	<1	<1	<1
Chromium (trivalent)	T85	AR	2	mg/kg	**45**	**49**	**68**	**43**	**59**
Iron	T6	A40	1	mg/kg	**34000**	**38000**	**36000**	**45000**	**52000**
Lead	T6	M40	1	mg/kg	**220**	**220**	**610**	**50**	**770**
Manganese	T6	M40	1	mg/kg	**470**	**390**	**800**	**510**	**540**
Mercury	T6	M40	1	mg/kg	<1	<1	<1	<1	**1**
Nickel	T6	M40	1	mg/kg	**34**	**70**	**31**	**35**	**67**
Selenium	T6	M40	3	mg/kg	<3	<3	<3	<3	<3
Copper	T6	M40	1	mg/kg	**60**	**300**	**140**	**31**	**430**
Zinc	T6	M40	1	mg/kg	**160**	**290**	**1000**	**94**	**3200**
Boron (water-soluble)	T6	AR	1	mg/kg	<1	<1	<1	<1	<1

Concept Reference: 706245
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings Metals and Metalloids

Concept Reference				**706245 012**	**706245 014**	**706245 015**	**706245 018**	**706245 020**
Customer Sample Reference				**HEP-BH-20**	**HEP-BH-20**	**HEP-BH-5**	**HEP-BH-5**	**HEP-BH-5**
Top Depth				**4.80**	**7.30**	**1.20**	**4.20**	**6.20**
Depth				**4.80**	**7.30**	**1.20**	**4.20**	**6.20**
Hole ID				**HEP-BH-20**	**HEP-BH-20**	**HEP-BH-5**	**HEP-BH-5**	**HEP-BH-5**
Date Sampled				**19-DEC-2017**	**19-DEC-2017**	**19-DEC-2017**	**19-DEC-2017**	**19-DEC-2017**
Time Sampled				**09:45**	**11:30**	**10:00**	**12:00**	**14:00**
AGS Type				**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID				**HEPBH2020171219002**	**HEPBH2020171219004**	**HEPBH520171219001**	**HEPBH520171219004**	**HEPBH520171219006**
AGS Sample Reference				**29**	**39**	**7**	**17**	**23**
Matrix Class				**Sandy Soil**	**Clay**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**				
Arsenic	T6	M40	2	mg/kg	**19**	**16**	**19**	**16**	**18**
Cadmium	T6	M40	1	mg/kg	<1	<1	**2**	<1	<1
Chromium	T6	M40	1	mg/kg	**42**	**45**	**39**	**32**	**36**
Chromium VI	T6	AR	1	mg/kg	<1	<1	<1	<1	<1
Chromium (trivalent)	T85	AR	2	mg/kg	**42**	**45**	**39**	**32**	**36**
Iron	T6	A40	1	mg/kg	**38000**	**44000**	**61000**	**40000**	**38000**
Lead	T6	M40	1	mg/kg	**270**	**28**	**580**	**450**	**260**
Manganese	T6	M40	1	mg/kg	**410**	**400**	**480**	**420**	**670**
Mercury	T6	M40	1	mg/kg	**1**	<1	**1**	<1	<1
Nickel	T6	M40	1	mg/kg	**38**	**48**	**51**	**28**	**37**
Selenium	T6	M40	3	mg/kg	<3	<3	<3	<3	<3
Copper	T6	M40	1	mg/kg	**110**	**33**	**140**	**98**	**76**
Zinc	T6	M40	1	mg/kg	**200**	**96**	**1300**	**860**	**200**
Boron (water-soluble)	T6	AR	1	mg/kg	<1	<1	<1	<1	<1

Concept Reference: 706245
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings Metals and Metalloids

Concept Reference	**706245 022**
Customer Sample Reference	**HEP-BH-5**
Top Depth	**8.20**
Depth	**8.20**
Hole ID	**HEP-BH-5**
Date Sampled	**20-DEC-2017**
Time Sampled	**10:00**
AGS Type	**ES**
AGS Sample ID	**HEPBH520171220001**
AGS Sample Reference	**29**
Matrix Class	**Clay**

Determinand	Method	Test Sample	LOD	Units	
Arsenic	T6	M40	2	mg/kg	**15**
Cadmium	T6	M40	1	mg/kg	<1
Chromium	T6	M40	1	mg/kg	**41**
Chromium VI	T6	AR	1	mg/kg	<1
Chromium (trivalent)	T85	AR	2	mg/kg	**41**
Iron	T6	A40	1	mg/kg	**65000**
Lead	T6	M40	1	mg/kg	**85**
Manganese	T6	M40	1	mg/kg	**400**
Mercury	T6	M40	1	mg/kg	<1
Nickel	T6	M40	1	mg/kg	**42**
Selenium	T6	M40	3	mg/kg	<3
Copper	T6	M40	1	mg/kg	**42**
Zinc	T6	M40	1	mg/kg	**4600**
Boron (water-soluble)	T6	AR	1	mg/kg	<1

Concept Reference: 706245
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil

Suite A - Chromium

Concept Reference					**706245 002**	**706245 004**	**706245 006**	**706245 008**	**706245 010**
Customer Sample Reference					**HEP-BH-1319**	**HEP-BH-1319**	**HEP-BH-1797**	**HEP-BH-1797**	**HEP-BH-1798**
Top Depth					**0.30**	**1.50**	**6.20**	**8.10**	**1.00**
Depth					**0.30**	**1.50**	**6.20**	**8.10**	**1.00**
Hole ID					**HEP-BH-1319**	**HEP-BH-1319**	**HEP-BH-1797**	**HEP-BH-1797**	**HEP-BH-1798**
Date Sampled					**19-DEC-2017**	**19-DEC-2017**	**19-DEC-2017**	**19-DEC-2017**	**19-DEC-2017**
Time Sampled					**14:05**	**14:50**	**13:00**	**15:00**	**14:00**
AGS Type					**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID					**HEPBH131920171219002**	**HEPBH131920171219004**	**HEPBH179720171219002**	**HEPBH179720171219004**	**HEPBH179820171219002**
AGS Sample Reference					**3**	**9**	**25**	**31**	**6**
Matrix Class					**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Clay**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Chromium (trivalent)	T85	AR	2	mg/kg	**45**	**49**	**68**	**43**	**59**
Chromium VI	T6	AR	1	mg/kg	<1	<1	<1	<1	<1

Concept Reference: 706245
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil
Suite A - Chromium

				Concept Reference	**706245 012**	**706245 014**	**706245 015**	**706245 018**	**706245 020**
				Customer Sample Reference	**HEP-BH-20**	**HEP-BH-20**	**HEP-BH-5**	**HEP-BH-5**	**HEP-BH-5**
				Top Depth	**4.80**	**7.30**	**1.20**	**4.20**	**6.20**
				Depth	**4.80**	**7.30**	**1.20**	**4.20**	**6.20**
				Hole ID	**HEP-BH-20**	**HEP-BH-20**	**HEP-BH-5**	**HEP-BH-5**	**HEP-BH-5**
				Date Sampled	**19-DEC-2017**	**19-DEC-2017**	**19-DEC-2017**	**19-DEC-2017**	**19-DEC-2017**
				Time Sampled	**09:45**	**11:30**	**10:00**	**12:00**	**14:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH2020171219002**	**HEPBH2020171219004**	**HEPBH520171219001**	**HEPBH520171219004**	**HEPBH520171219006**
				AGS Sample Reference	**29**	**39**	**7**	**17**	**23**
				Matrix Class	**Sandy Soil**	**Clay**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Chromium (trivalent)	T85	AR	2	mg/kg	**42**	**45**	**39**	**32**	**36**
Chromium VI	T6	AR	1	mg/kg	<1	<1	<1	<1	<1

Concept Reference: 706245
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil
Suite A - Chromium

				Concept Reference	**706245 022**
				Customer Sample Reference	**HEP-BH-5**
				Top Depth	**8.20**
				Depth	**8.20**
				Hole ID	**HEP-BH-5**
				Date Sampled	**20-DEC-2017**
				Time Sampled	**10:00**
				AGS Type	**ES**
				AGS Sample ID	**HEPBH520171220001**
				AGS Sample Reference	**29**
				Matrix Class	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**	
Chromium (trivalent)	T85	AR	2	mg/kg	**41**
Chromium VI	T6	AR	1	mg/kg	<1

Concept Reference: 706245
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Total Phenol

				Concept Reference	**706245 002**	**706245 004**	**706245 006**	**706245 008**	**706245 010**
				Customer Sample Reference	**HEP-BH-1319**	**HEP-BH-1319**	**HEP-BH-1797**	**HEP-BH-1797**	**HEP-BH-1798**
				Top Depth	**0.30**	**1.50**	**6.20**	**8.10**	**1.00**
				Depth	**0.30**	**1.50**	**6.20**	**8.10**	**1.00**
				Hole ID	**HEP-BH-1319**	**HEP-BH-1319**	**HEP-BH-1797**	**HEP-BH-1797**	**HEP-BH-1798**
				Date Sampled	**19-DEC-2017**	**19-DEC-2017**	**19-DEC-2017**	**19-DEC-2017**	**19-DEC-2017**
				Time Sampled	**14:05**	**14:50**	**13:00**	**15:00**	**14:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH1319201712190 02**	**HEPBH1319201712190 04**	**HEPBH1797201712190 02**	**HEPBH1797201712190 04**	**HEPBH1798201712190 02**
				AGS Sample Reference	**3**	**9**	**25**	**31**	**6**
				Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Clay**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Phenols(Mono)	T4	AR	0.5	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0

Concept Reference: 706245
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - Total Phenol

				Concept Reference	**706245 012**	**706245 014**	**706245 015**	**706245 018**	**706245 020**
				Customer Sample Reference	**HEP-BH-20**	**HEP-BH-20**	**HEP-BH-5**	**HEP-BH-5**	**HEP-BH-5**
				Top Depth	**4.80**	**7.30**	**1.20**	**4.20**	**6.20**
				Depth	**4.80**	**7.30**	**1.20**	**4.20**	**6.20**
				Hole ID	**HEP-BH-20**	**HEP-BH-20**	**HEP-BH-5**	**HEP-BH-5**	**HEP-BH-5**
				Date Sampled	**19-DEC-2017**	**19-DEC-2017**	**19-DEC-2017**	**19-DEC-2017**	**19-DEC-2017**
				Time Sampled	**09:45**	**11:30**	**10:00**	**12:00**	**14:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH2020171219002**	**HEPBH2020171219004**	**HEPBH520171219001**	**HEPBH520171219004**	**HEPBH520171219006**
				AGS Sample Reference	**29**	**39**	**7**	**17**	**23**
				Matrix Class	**Sandy Soil**	**Clay**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Phenols(Mono)	T4	AR	0.5	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0

Concept Reference: 706245
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - Total Phenol

				Concept Reference	**706245 022**
				Customer Sample Reference	**HEP-BH-5**
				Top Depth	**8.20**
				Depth	**8.20**
				Hole ID	**HEP-BH-5**
				Date Sampled	**20-DEC-2017**
				Time Sampled	**10:00**
				AGS Type	**ES**
				AGS Sample ID	**HEPBH520171220001**
				AGS Sample Reference	**29**
				Matrix Class	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**	
Phenols(Mono)	T4	AR	0.5	mg/kg	<1.0

Concept Reference: 706245
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - Asbestos

				Concept Reference	**706245 002**	**706245 004**	**706245 006**	**706245 008**	**706245 010**
				Customer Sample Reference	**HEP-BH-1319**	**HEP-BH-1319**	**HEP-BH-1797**	**HEP-BH-1797**	**HEP-BH-1798**
				Top Depth	**0.30**	**1.50**	**6.20**	**8.10**	**1.00**
				Depth	**0.30**	**1.50**	**6.20**	**8.10**	**1.00**
				Hole ID	**HEP-BH-1319**	**HEP-BH-1319**	**HEP-BH-1797**	**HEP-BH-1797**	**HEP-BH-1798**
				Date Sampled	**19-DEC-2017**	**19-DEC-2017**	**19-DEC-2017**	**19-DEC-2017**	**19-DEC-2017**
				Time Sampled	**14:05**	**14:50**	**13:00**	**15:00**	**14:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH1319201712190 02**	**HEPBH1319201712190 04**	**HEPBH1797201712190 02**	**HEPBH1797201712190 04**	**HEPBH1798201712190 02**
				AGS Sample Reference	**3**	**9**	**25**	**31**	**6**
				Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Clay**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Asbestos ID	T27	AR			N.D.	N.D.	N.D.	N.D.	N.D.

Concept Reference: 706245
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Asbestos

				Concept Reference	**706245 012**	**706245 014**	**706245 015**	**706245 018**	**706245 020**
				Customer Sample Reference	**HEP-BH-20**	**HEP-BH-20**	**HEP-BH-5**	**HEP-BH-5**	**HEP-BH-5**
				Top Depth	**4.80**	**7.30**	**1.20**	**4.20**	**6.20**
				Depth	**4.80**	**7.30**	**1.20**	**4.20**	**6.20**
				Hole ID	**HEP-BH-20**	**HEP-BH-20**	**HEP-BH-5**	**HEP-BH-5**	**HEP-BH-5**
				Date Sampled	**19-DEC-2017**	**19-DEC-2017**	**19-DEC-2017**	**19-DEC-2017**	**19-DEC-2017**
				Time Sampled	**09:45**	**11:30**	**10:00**	**12:00**	**14:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH2020171219002**	**HEPBH2020171219004**	**HEPBH520171219001**	**HEPBH520171219004**	**HEPBH520171219006**
				AGS Sample Reference	**29**	**39**	**7**	**17**	**23**
				Matrix Class	**Sandy Soil**	**Clay**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Asbestos ID	T27	AR			N.D.	N.D.	N.D.	N.D.	Chrysotile Loose Fibres Detected

Concept Reference: 706245
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Asbestos

				Concept Reference	**706245 022**
				Customer Sample Reference	**HEP-BH-5**
				Top Depth	**8.20**
				Depth	**8.20**
				Hole ID	**HEP-BH-5**
				Date Sampled	**20-DEC-2017**
				Time Sampled	**10:00**
				AGS Type	**ES**
				AGS Sample ID	**HEPBH520171220001**
				AGS Sample Reference	**29**
				Matrix Class	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**	
Asbestos ID	T27	AR			N.D.

Concept Reference: 706245
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil
Suite A - Asbestos Quantification

				Concept Reference	**706245 020**
				Customer Sample Reference	**HEP-BH-5**
				Top Depth	**6.20**
				Depth	**6.20**
				Hole ID	**HEP-BH-5**
				Date Sampled	**19-DEC-2017**
				Time Sampled	**14:00**
				AGS Type	**ES**
				AGS Sample ID	**HEPBH520171219006**
				AGS Sample Reference	**23**
				Matrix Class	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**	
Asbestos Quantification Stage 3	T413	AR	0.001	%	Chrysotile Loose Fibres Detected <0.001

Concept Reference: 706245
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground Soils with Elevated PID Readings - Organics PAH US EPA 16

Concept Reference			**706245 002**	**706245 004**	**706245 006**	**706245 008**	**706245 010**
Customer Sample Reference			**HEP-BH-1319**	**HEP-BH-1319**	**HEP-BH-1797**	**HEP-BH-1797**	**HEP-BH-1798**
Top Depth			**0.30**	**1.50**	**6.20**	**8.10**	**1.00**
Depth			**0.30**	**1.50**	**6.20**	**8.10**	**1.00**
Hole ID			**HEP-BH-1319**	**HEP-BH-1319**	**HEP-BH-1797**	**HEP-BH-1797**	**HEP-BH-1798**
Date Sampled			**19-DEC-2017**	**19-DEC-2017**	**19-DEC-2017**	**19-DEC-2017**	**19-DEC-2017**
Time Sampled			**14:05**	**14:50**	**13:00**	**15:00**	**14:00**
AGS Type			**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID			**HEPBH131920171219002**	**HEPBH131920171219004**	**HEPBH179720171219002**	**HEPBH179720171219004**	**HEPBH179820171219002**
AGS Sample Reference			**3**	**9**	**25**	**31**	**6**
Matrix Class			**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Clay**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Naphthalene	T207	M105	0.1	mg/kg	(9) <1.0	<0.1	(9) <1.0	<0.1	(9) <1.0
Acenaphthylene	T207	AR	0.1	mg/kg	(9) <1.0	<0.1	(9) <1.0	<0.1	(9) <1.0
Acenaphthene	T207	M105	0.1	mg/kg	(9) <1.0	<0.1	**3.6**	<0.1	(9) <1.0
Fluorene	T207	M105	0.1	mg/kg	(9) <1.0	<0.1	**2.7**	<0.1	(9) <1.0
Phenanthrene	T207	M105	0.1	mg/kg	**1.0**	**0.1**	**11**	<0.1	**1.1**
Anthracene	T207	AR	0.1	mg/kg	(9) <1.0	<0.1	**3.6**	<0.1	(9) <1.0
Fluoranthene	T207	M105	0.1	mg/kg	**6.0**	**0.3**	**17**	<0.1	**1.6**
Pyrene	T207	M105	0.1	mg/kg	**5.4**	**0.3**	**14**	<0.1	**1.5**
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	**2.5**	**0.1**	**5.4**	<0.1	(9) <1.0
Chrysene	T207	M105	0.1	mg/kg	**2.7**	<0.1	**5.0**	<0.1	(9) <1.0
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	**2.7**	<0.1	**2.9**	<0.1	(9) <1.0
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	**2.5**	<0.1	**4.3**	<0.1	(9) <1.0
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	**2.9**	**0.1**	**4.2**	<0.1	(9) <1.0
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	**1.7**	<0.1	**2.3**	<0.1	(9) <1.0
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	(9) <1.0	<0.1	**1.0**	<0.1	(9) <1.0
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	**2.1**	<0.1	**2.9**	<0.1	(9) <1.0
PAH(total)	T207	AR	0.1	mg/kg	**29**	**0.9**	**80**	<0.1	**4.2**

Concept Reference: 706245
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground Soils with Elevated PID Readings - Organics PAH US EPA 16

Concept Reference			**706245 012**	**706245 014**	**706245 015**	**706245 018**	**706245 020**
Customer Sample Reference			**HEP-BH-20**	**HEP-BH-20**	**HEP-BH-5**	**HEP-BH-5**	**HEP-BH-5**
Top Depth			**4.80**	**7.30**	**1.20**	**4.20**	**6.20**
Depth			**4.80**	**7.30**	**1.20**	**4.20**	**6.20**
Hole ID			**HEP-BH-20**	**HEP-BH-20**	**HEP-BH-5**	**HEP-BH-5**	**HEP-BH-5**
Date Sampled			**19-DEC-2017**	**19-DEC-2017**	**19-DEC-2017**	**19-DEC-2017**	**19-DEC-2017**
Time Sampled			**09:45**	**11:30**	**10:00**	**12:00**	**14:00**
AGS Type			**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID			**HEPBH2020171219002**	**HEPBH2020171219004**	**HEPBH520171219001**	**HEPBH520171219004**	**HEPBH520171219006**
AGS Sample Reference			**29**	**39**	**7**	**17**	**23**
Matrix Class			**Sandy Soil**	**Clay**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Naphthalene	T207	M105	0.1	mg/kg	(9) <1.0	<0.1	(9) <1.0	(100) <1.0	<0.1
Acenaphthylene	T207	AR	0.1	mg/kg	(9) <1.0	<0.1	(9) <1.0	(100) <1.0	<0.1
Acenaphthene	T207	M105	0.1	mg/kg	**1.6**	<0.1	(9) <1.0	**2.2**	<0.1
Fluorene	T207	M105	0.1	mg/kg	**2.1**	<0.1	(9) <1.0	**2.4**	<0.1
Phenanthrene	T207	M105	0.1	mg/kg	**17**	<0.1	(9) <1.0	**15**	**0.1**
Anthracene	T207	AR	0.1	mg/kg	**6.3**	<0.1	(9) <1.0	**2.8**	<0.1
Fluoranthene	T207	M105	0.1	mg/kg	**28**	<0.1	(9) <1.0	**15**	**0.2**
Pyrene	T207	M105	0.1	mg/kg	**20**	<0.1	(9) <1.0	**11**	**0.2**
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	**7.9**	<0.1	(9) <1.0	**3.7**	<0.1
Chrysene	T207	M105	0.1	mg/kg	**7.8**	<0.1	(9) <1.0	**3.5**	<0.1
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	**4.1**	<0.1	(9) <1.0	**2.2**	<0.1
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	**4.7**	<0.1	(9) <1.0	**2.4**	**0.1**
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	**5.0**	<0.1	(9) <1.0	**3.3**	**0.3**
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	**2.5**	<0.1	(9) <1.0	**1.5**	**0.2**
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	**1.2**	<0.1	(9) <1.0	(100) <1.0	<0.1
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	**2.7**	<0.1	(9) <1.0	**1.8**	**0.2**
PAH(total)	T207	AR	0.1	mg/kg	**110**	<0.1	<1.0	**67**	**1.3**

Concept Reference: 706245
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground Soils with Elevated PID Readings - Organics PAH US EPA 16

Concept Reference	**706245 022**
Customer Sample Reference	**HEP-BH-5**
Top Depth	**8.20**
Depth	**8.20**
Hole ID	**HEP-BH-5**
Date Sampled	**20-DEC-2017**
Time Sampled	**10:00**
AGS Type	**ES**
AGS Sample ID	**HEPBH520171220001**
AGS Sample Reference	**29**
Matrix Class	**Clay**

Determinand	Method	Test Sample	LOD	Units	
Naphthalene	T207	M105	0.1	mg/kg	(9) <1.0
Acenaphthylene	T207	AR	0.1	mg/kg	(9) <1.0
Acenaphthene	T207	M105	0.1	mg/kg	(9) <1.0
Fluorene	T207	M105	0.1	mg/kg	(9) <1.0
Phenanthrene	T207	M105	0.1	mg/kg	**7.4**
Anthracene	T207	AR	0.1	mg/kg	(9) <1.0
Fluoranthene	T207	M105	0.1	mg/kg	**4.3**
Pyrene	T207	M105	0.1	mg/kg	**6.1**
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	**1.6**
Chrysene	T207	M105	0.1	mg/kg	**2.0**
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	(9) <1.0
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	(9) <1.0
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	(9) <1.0
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	(9) <1.0
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	(9) <1.0
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	(9) <1.0
PAH(total)	T207	AR	0.1	mg/kg	**21**

Concept Reference: 706245
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - TPH (CWG)

				Concept Reference	**706245 002**	**706245 004**	**706245 006**	**706245 008**	**706245 010**
				Customer Sample Reference	**HEP-BH-1319**	**HEP-BH-1319**	**HEP-BH-1797**	**HEP-BH-1797**	**HEP-BH-1798**
				Top Depth	**0.30**	**1.50**	**6.20**	**8.10**	**1.00**
				Depth	**0.30**	**1.50**	**6.20**	**8.10**	**1.00**
				Hole ID	**HEP-BH-1319**	**HEP-BH-1319**	**HEP-BH-1797**	**HEP-BH-1797**	**HEP-BH-1798**
				Date Sampled	**19-DEC-2017**	**19-DEC-2017**	**19-DEC-2017**	**19-DEC-2017**	**19-DEC-2017**
				Time Sampled	**14:05**	**14:50**	**13:00**	**15:00**	**14:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH131920171219002**	**HEPBH131920171219004**	**HEPBH179720171219002**	**HEPBH179720171219004**	**HEPBH179820171219002**
				AGS Sample Reference	**3**	**9**	**25**	**31**	**6**
				Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Clay**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
TPH (C5-C6 aliphatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C6-C8 aliphatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C8-C10 aliphatic)	T209	AR	100	µg/kg	<100	<100	**2300**	<100	<100
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	**(13) 1**	**(13) 4**	**(13) 90**	**(13) 4**	**(13) 5**
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	(13) <1	**(13) 8**	**(13) 52**	**(13) 5**	**(13) 9**
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	(13) <1	**(13) 9**	**(13) 150**	**(13) 4**	**(13) 9**
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	(13) <2	**(13) 10**	**(13) 400**	**(13) 21**	**(13) 35**
TPH (C6-C7 aromatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C7-C8 aromatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C8-C10 aromatic)	T209	AR	100	µg/kg	<100	<100	**560**	<100	<100
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	(13) <2	(13) <2	**(13) 18**	(13) <2	(13) <2
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	(13) <1	(13) <1	**(13) 48**	**(13) 1**	**(13) 1**
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	(13) <1	**(13) 1**	**(13) 130**	(13) <1	**(13) 8**
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	(13) <1	(13) <1	(13) <10	(13) <1	**(13) 8**

Concept Reference: 706245
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - TPH (CWG)

				Concept Reference	**706245 012**	**706245 014**	**706245 015**	**706245 018**	**706245 020**
				Customer Sample Reference	**HEP-BH-20**	**HEP-BH-20**	**HEP-BH-5**	**HEP-BH-5**	**HEP-BH-5**
				Top Depth	**4.80**	**7.30**	**1.20**	**4.20**	**6.20**
				Depth	**4.80**	**7.30**	**1.20**	**4.20**	**6.20**
				Hole ID	**HEP-BH-20**	**HEP-BH-20**	**HEP-BH-5**	**HEP-BH-5**	**HEP-BH-5**
				Date Sampled	**19-DEC-2017**	**19-DEC-2017**	**19-DEC-2017**	**19-DEC-2017**	**19-DEC-2017**
				Time Sampled	**09:45**	**11:30**	**10:00**	**12:00**	**14:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH2020171219002**	**HEPBH2020171219004**	**HEPBH520171219001**	**HEPBH520171219004**	**HEPBH520171219006**
				AGS Sample Reference	**29**	**39**	**7**	**17**	**23**
				Matrix Class	**Sandy Soil**	**Clay**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
TPH (C5-C6 aliphatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C6-C8 aliphatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C8-C10 aliphatic)	T209	AR	100	µg/kg	<100	<100	**3900**	**610**	<100
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	**(13) 9**	**(13) 2**	**(13) 10**	**(13) 37**	**(13) 2**
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	**(13) 10**	**(13) 2**	**(13) 20**	**(13) 35**	**(13) 1**
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	**(13) 8**	**(13) 3**	**(13) 34**	**(13) 14**	(13) <1
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	**(13) 12**	**(13) 10**	**(13) 220**	**(13) 72**	(13) <2
TPH (C6-C7 aromatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C7-C8 aromatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C8-C10 aromatic)	T209	AR	100	µg/kg	<100	<100	**290**	**630**	<100
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	(13) <2	(13) <2	**(13) 4**	(13) <10	(13) <2
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	**(13) 4**	(13) <1	**(13) 17**	(13) <10	(13) <1
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	**(13) 26**	(13) <1	**(13) 24**	(13) <10	(13) <1
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	**(13) 4**	(13) <1	(13) <1	(13) <10	(13) <1

Concept Reference: 706245
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - TPH (CWG)

Concept Reference	**706245 022**
Customer Sample Reference	**HEP-BH-5**
Top Depth	**8.20**
Depth	**8.20**
Hole ID	**HEP-BH-5**
Date Sampled	**20-DEC-2017**
Time Sampled	**10:00**
AGS Type	**ES**
AGS Sample ID	**HEPBH520171220001**
AGS Sample Reference	**29**
Matrix Class	**Clay**

Determinand	Method	Test Sample	LOD	Units	
TPH (C5-C6 aliphatic)	T209	AR	100	µg/kg	<100
TPH (C6-C8 aliphatic)	T209	AR	100	µg/kg	<100
TPH (C8-C10 aliphatic)	T209	AR	100	µg/kg	<100
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	(13) **3**
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	(13) **1**
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	(13) <1
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	(13) <2
TPH (C6-C7 aromatic)	T209	AR	100	µg/kg	<100
TPH (C7-C8 aromatic)	T209	AR	100	µg/kg	<100
TPH (C8-C10 aromatic)	T209	AR	100	µg/kg	<100
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	(13) <2
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	(13) <1
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	(13) <1
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	(13) <1

Concept Reference: 706245
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil

Total Petroleum Hydrocarbons (Aliphatics+Aromatics) Total

Concept Reference	**706245 002**	**706245 004**	**706245 006**	**706245 008**	**706245 010**
Customer Sample Reference	**HEP-BH-1319**	**HEP-BH-1319**	**HEP-BH-1797**	**HEP-BH-1797**	**HEP-BH-1798**
Top Depth	**0.30**	**1.50**	**6.20**	**8.10**	**1.00**
Depth	**0.30**	**1.50**	**6.20**	**8.10**	**1.00**
Hole ID	**HEP-BH-1319**	**HEP-BH-1319**	**HEP-BH-1797**	**HEP-BH-1797**	**HEP-BH-1798**
Date Sampled	**19-DEC-2017**	**19-DEC-2017**	**19-DEC-2017**	**19-DEC-2017**	**19-DEC-2017**
Time Sampled	**14:05**	**14:50**	**13:00**	**15:00**	**14:00**
AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**HEPBH131920171219002**	**HEPBH131920171219004**	**HEPBH179720171219002**	**HEPBH179720171219004**	**HEPBH179820171219002**
AGS Sample Reference	**3**	**9**	**25**	**31**	**6**
Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Clay**	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units					
TPH (Aliphatic) total	T85	M105		mg/kg	(13) **1.0**	(13) **31**	(13) **690**	(13) **21**	(13) **58**
TPH (Aromatic) total	T85	M105		mg/kg	(13) N.D.	(13) **1.0**	(13) **200**	(13) **1.0**	(13) **17**
TPH (Aliphatic+Aromatic) (sum)	T85	M105		mg/kg	**1.00**	**32.0**	**890**	**22.0**	**75.0**

Concept Reference: 706245
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil
Total Petroleum Hydrocarbons (Aliphatics+Aromatics) Total

Concept Reference					**706245 012**	**706245 014**	**706245 015**	**706245 018**	**706245 020**
Customer Sample Reference					**HEP-BH-20**	**HEP-BH-20**	**HEP-BH-5**	**HEP-BH-5**	**HEP-BH-5**
Top Depth					**4.80**	**7.30**	**1.20**	**4.20**	**6.20**
Depth					**4.80**	**7.30**	**1.20**	**4.20**	**6.20**
Hole ID					**HEP-BH-20**	**HEP-BH-20**	**HEP-BH-5**	**HEP-BH-5**	**HEP-BH-5**
Date Sampled					**19-DEC-2017**	**19-DEC-2017**	**19-DEC-2017**	**19-DEC-2017**	**19-DEC-2017**
Time Sampled					**09:45**	**11:30**	**10:00**	**12:00**	**14:00**
AGS Type					**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID					**HEPBH2020171219002**	**HEPBH2020171219004**	**HEPBH520171219001**	**HEPBH520171219004**	**HEPBH520171219006**
AGS Sample Reference					**29**	**39**	**7**	**17**	**23**
Matrix Class					**Sandy Soil**	**Clay**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
TPH (Aliphatic) total	T85	M105		mg/kg	**(13) 39**	**(13) 10**	**(13) 280**	**(13) 160**	**(13) 3.0**
TPH (Aromatic) total	T85	M105		mg/kg	**(13) 34**	(13) N.D.	**(13) 45**	(9,13) <10	(13) N.D.
TPH (Aliphatic+Aromatic) (sum)	T85	M105		mg/kg	**73.0**	**10.0**	**325**	**160**	**3.00**

Concept Reference: 706245
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil
Total Petroleum Hydrocarbons (Aliphatics+Aromatics) Total

Concept Reference					**706245 022**
Customer Sample Reference					**HEP-BH-5**
Top Depth					**8.20**
Depth					**8.20**
Hole ID					**HEP-BH-5**
Date Sampled					**20-DEC-2017**
Time Sampled					**10:00**
AGS Type					**ES**
AGS Sample ID					**HEPBH520171220001**
AGS Sample Reference					**29**
Matrix Class					**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**	
TPH (Aliphatic) total	T85	M105		mg/kg	**(13) 4.0**
TPH (Aromatic) total	T85	M105		mg/kg	(13) N.D.
TPH (Aliphatic+Aromatic) (sum)	T85	M105		mg/kg	**4.00**

Index to symbols used in Supplemental B 706245-3

Value	Description
M40	Analysis conducted on sample assisted dried at no more than 40C. Results are reported on a dry weight basis.
M105	Analysis conducted on an "as received" aliquot. Results are reported on a dry weight basis where moisture content was determined by assisted drying of sample at 105C
AR	As Received
A40	Assisted dried < 40C
N.D.	Not Detected
13	Results have been blank corrected.
100	LOD determined by sample aliquot used for analysis
9	LOD raised due to dilution of sample
S	Analysis was subcontracted
M	Analysis is MCERTS accredited
U	Analysis is UKAS accredited
N	Analysis is not UKAS accredited

Notes

NO2 & NO3 testing was transferred within group to CLS EK.
Asbestos testing was subcontracted to REC Asbestos.
These samples have been analysed exceeding our recommended holding time of days for pH. It is possible therefore that the results provided may be compromised.
These samples have been analysed exceeding recommended holding time of 14 days for TPH. It is possible therefore that the results provided may be compromised.
Supplemental B to report in standard format with TPH totals.

Method Index

Value	Description
T162	Grav (1 Dec) (105 C)
T207	GC/MS (MCERTS)
T2	Grav
T686	Discrete Analyser
T4	Colorimetry
T413	PLM/Grav
T6	ICP/OES
T909	GCxGC
T85	Calc
T287	Calc TOC/0.58
T27	PLM
T7	Probe
T209	GC/MS (Head Space)(MCERTS)

Accreditation Summary

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Soil Organic Matter	T287	A40	0.1	%	N	002,004,006,008,010,012,014-015,018,020,022
pH	T7	AR			M	002,004,006,008,010,012,014-015,018,020,022
Asbestos ID	T27	AR			SU	002,004,006,008,010,012,014-015,018,020,022
Phenols(Mono)	T4	AR	0.5	mg/kg	M	002,004,006,008,010,012,014-015,018,020,022
Chloride	T686	AR	1	mg/kg	N	002,004,006,008,010,012,014-015,018,020,022
Cyanide(Total)	T4	AR	1	mg/kg	M	002,004,006,008,010,012,014-015,018,020,022
Thiocyanate	T4	A40	1	mg/kg	N	002,004,006,008,010,012,014-015,018,020,022
Nitrate	T686	AR	1	mg/kg	N	002,004,006,008,010,012,014-015,018,020,022
Nitrite	T686	AR	1	mg/kg	N	002,004,006,008,010,012,014-015,018,020,022
SO4(Total)	T6	A40	0.01	%	U	002,004,006,008,010,012,014-015,018,020,022
Sulphide	T4	AR	10	mg/kg	N	002,004,006,008,010,012,014-015,018,020,022
Arsenic	T6	M40	2	mg/kg	M	002,004,006,008,010,012,014-015,018,020,022
Cadmium	T6	M40	1	mg/kg	M	002,004,006,008,010,012,014-015,018,020,022
Chromium	T6	M40	1	mg/kg	M	002,004,006,008,010,012,014-015,018,020,022
Iron	T6	A40	1	mg/kg	U	002,004,006,008,010,012,014-015,018,020,022
Lead	T6	M40	1	mg/kg	M	002,004,006,008,010,012,014-015,018,020,022
Manganese	T6	M40	1	mg/kg	M	002,004,006,008,010,012,014-015,018,020,022
Mercury	T6	M40	1	mg/kg	M	002,004,006,008,010,012,014-015,018,020,022
Nickel	T6	M40	1	mg/kg	M	002,004,006,008,010,012,014-015,018,020,022
Selenium	T6	M40	3	mg/kg	M	002,004,006,008,010,012,014-015,018,020,022
Copper	T6	M40	1	mg/kg	M	002,004,006,008,010,012,014-015,018,020,022
Zinc	T6	M40	1	mg/kg	M	002,004,006,008,010,012,014-015,018,020,022
Boron (water-soluble)	T6	AR	1	mg/kg	N	002,004,006,008,010,012,014-015,018,020,022
Naphthalene	T207	M105	0.1	mg/kg	M	002,004,006,008,010,012,014-015,018,020,022
Acenaphthylene	T207	AR	0.1	mg/kg	U	002,004,006,008,010,012,014-015,018,020,022
Acenaphthene	T207	M105	0.1	mg/kg	M	002,004,006,008,010,012,014-015,018,020,022
Fluorene	T207	M105	0.1	mg/kg	M	002,004,006,008,010,012,014-015,018,020,022
Phenanthrene	T207	M105	0.1	mg/kg	M	002,004,006,008,010,012,014-015,018,020,022
Anthracene	T207	AR	0.1	mg/kg	U	002,004,006,008,010,012,014-015,018,020,022
Fluoranthene	T207	M105	0.1	mg/kg	M	002,004,006,008,010,012,014-015,018,020,022
Pyrene	T207	M105	0.1	mg/kg	M	002,004,006,008,010,012,014-015,018,020,022
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	M	002,004,006,008,010,012,014-015,018,020,022
Chrysene	T207	M105	0.1	mg/kg	M	002,004,006,008,010,012,014-015,018,020,022
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	M	002,004,006,008,010,012,014-015,018,020,022
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	M	002,004,006,008,010,012,014-015,018,020,022
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	M	002,004,006,008,010,012,014-015,018,020,022
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	M	002,004,006,008,010,012,014-015,018,020,022
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	M	002,004,006,008,010,012,014-015,018,020,022
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	M	002,004,006,008,010,012,014-015,018,020,022
PAH(total)	T207	AR	0.1	mg/kg	U	002,004,006,008,010,012,014-015,018,020,022
TPH (C5-C6 aliphatic)	T209	AR	100	µg/kg	N	002,004,006,008,010,012,014-015,018,020,022
TPH (C6-C8 aliphatic)	T209	AR	100	µg/kg	N	002,004,006,008,010,012,014-015,018,020,022
TPH (C8-C10 aliphatic)	T209	AR	100	µg/kg	N	002,004,006,008,010,012,014-015,018,020,022

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	M	002,004,006,008,010,012,014-015,018,020,022
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	M	002,004,006,008,010,012,014-015,018,020,022
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	M	002,004,006,008,010,012,014-015,018,020,022
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	M	002,004,006,008,010,012,014-015,018,020,022
TPH (C6-C7 aromatic)	T209	AR	100	µg/kg	N	002,004,006,008,010,012,014-015,018,020,022
TPH (C7-C8 aromatic)	T209	AR	100	µg/kg	N	002,004,006,008,010,012,014-015,018,020,022
TPH (C8-C10 aromatic)	T209	AR	100	µg/kg	N	002,004,006,008,010,012,014-015,018,020,022
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	M	002,004,006,008,010,012,014-015,018,020,022
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	M	002,004,006,008,010,012,014-015,018,020,022
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	M	002,004,006,008,010,012,014-015,018,020,022
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	M	002,004,006,008,010,012,014-015,018,020,022
TPH (Aliphatic) total	T85	M105		mg/kg	N	002,004,006,008,010,012,014-015,018,020,022
TPH (Aromatic) total	T85	M105		mg/kg	N	002,004,006,008,010,012,014-015,018,020,022
TPH (Aliphatic+Aromatic) (sum)	T85	M105		mg/kg	N	002,004,006,008,010,012,014-015,018,020,022
Chromium (trivalent)	T85	AR	2	mg/kg	N	002,004,006,008,010,012,014-015,018,020,022
Chromium VI	T6	AR	1	mg/kg	N	002,004,006,008,010,012,014-015,018,020,022
Moisture @105C	T162	AR	0.1	%	N	002,004,006,008,010,012,014-015,018,020,022
Retained on 10mm sieve	T2	M40	0.1	%	N	002,004,006,008,010,012,014-015,018,020,022
Asbestos Quantification Stage 3	T413	AR	0.001	%	SU	020

CONCEPT LIFE SCIENCES
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Certificate of Analysis

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Report Number: Supplemental A 706245-3

Date of Report: 22-Jun-2018

Customer: Fugro GeoServices
Fugro House
Hithercroft Road
Wallingford
Oxfordshire
OX10 9RB

Customer Contact: Ms Karen Blackmore

Customer Job Reference:
Customer Purchase Order: 56642KB-WAL
Customer Site Reference: HEP Package 3 CoC AGS4
Date Job Received at Concept: 21-Dec-2017
Date Analysis Started: 29-Dec-2017
Date Analysis Completed: 16-Jan-2018

The results reported relate to samples received in the laboratory and may not be representative of a whole batch.

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation

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Tests covered by this certificate were conducted in accordance with Concept Life Sciences SOPs

All results have been reviewed in accordance with Section 25 of the Concept Life Sciences, Analytical Services Quality Manual

UKAS TESTING
1549

Report checked
and authorised by :
Sara Abou-Shakra
Customer Service Manager

Issued by :
Sara Abou-Shakra
Customer Service Manager

Summary Of Results

Soil

Dioxins

Corrected to 0% Moisture

				WHO2005 Toxic Equivalents ng/kg		WHO Toxic Equivalents ng/kg	
Concept Reference	**Customer Sample Reference**	**Analysis**	**Symbol**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**
706245 004	HEP-BH-1319	Dioxins and Furans (Based on US EPA 1613)	U	0.19	**7.5**	0.15	**8.0**
		Poly-Chlorinated Biphenyls (WHO 12)	U	0.020	**75**	0.066	**65**
			Sum :	0.21	**83**	0.21	**73**
706245 006	HEP-BH-1797	Dioxins and Furans (Based on US EPA 1613)	U	36	**43**	35	**43**
		Poly-Chlorinated Biphenyls (WHO 12)	U	0.98	**970**	4.7	**950**
			Sum :	37	**1000**	40	**1000**
706245 014	HEP-BH-20	Dioxins and Furans (Based on US EPA 1613)	U	0.0	**13**	0.0	**14**
		Poly-Chlorinated Biphenyls (WHO 12)	U	0.0	**85**	0.0	**73**
			Sum :	0.0	**98**	0.0	**87**
706245 018	HEP-BH-5	Dioxins and Furans (Based on US EPA 1613)	U	1.0	**10**	0.92	**11**
		Poly-Chlorinated Biphenyls (WHO 12)	U	0.21	**80**	0.46	**69**
			Sum :	1.3	**90**	1.4	**79**

Soil

Customer Sample Reference : HEP-BH-1319
Our Sample Reference : 706245 004
Moisture Content : 13.2 %
Hole ID : HEP-BH-1319
Top Depth : 1.50
Depth : 1.50
Date Sampled : 19-DEC-2017
Time Sampled : 14:50
AGS Type : ES
AGS Sample ID : HEPBH131920171219004
AGS Sample Reference : 9
Matrix Class : Sandy Soil

Dioxins and Furans (Based on US EPA 1613)

Technique : GC/MS (HR)

						WHO2005 Toxic Equivalents ng/kg		WHO Toxic Equivalents ng/kg	
Determinand	**Symbol**	**Result ng/kg As Received @13% Moisture**	**LOD As Received @13% Moisture**	**Lower Bound ng/kg @ 0% Moisture**	**LOD @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**
2,3,7,8-TCDD	U	<2.0	2.0	<2.3	2.3	0.0	**2.3**	0.0	**2.3**
1,2,3,7,8-PeCDD	U	<2.0	2.0	<2.3	2.3	0.0	**2.3**	0.0	**2.3**
1,2,3,4,7,8-HxCDD	U	<2.0	2.0	<2.3	2.3	0.0	**0.23**	0.0	**0.23**
1,2,3,6,7,8-HxCDD	U	<2.0	2.0	<2.3	2.3	0.0	**0.23**	0.0	**0.23**
1,2,3,7,8,9-HxCDD	U	<2.0	2.0	<2.3	2.3	0.0	**0.23**	0.0	**0.23**
1,2,3,4,6,7,8-HpCDD	U	<5.3	5.3	<6.1	6.1	0.0	**0.061**	0.0	**0.061**
OCDD	U	**190**	1.7	220	2.0	0.066	**0.066**	0.022	**0.022**
					Dioxins Totals :	0.066	**5.4**	0.022	**5.4**
2,3,7,8-TCDF	U	<2.0	2.0	<2.3	2.3	0.0	**0.23**	0.0	**0.23**
1,2,3,7,8-PeCDF	U	<2.0	2.0	<2.3	2.3	0.0	**0.069**	0.0	**0.12**
2,3,4,7,8-PeCDF	U	<2.0	2.0	<2.3	2.3	0.0	**0.69**	0.0	**1.2**
1,2,3,4,7,8-HxCDF	U	<2.0	2.0	<2.3	2.3	0.0	**0.23**	0.0	**0.23**
1,2,3,6,7,8-HxCDF	U	<2.0	2.0	<2.3	2.3	0.0	**0.23**	0.0	**0.23**
2,3,4,6,7,8-HxCDF	U	<2.0	2.0	<2.3	2.3	0.0	**0.23**	0.0	**0.23**
1,2,3,7,8,9-HxCDF	U	<2.0	2.0	<2.3	2.3	0.0	**0.23**	0.0	**0.23**
1,2,3,4,6,7,8-HpCDF	U	**11**	1.5	13	1.7	0.13	**0.13**	0.13	**0.13**
1,2,3,4,7,8,9-HpCDF	U	<3.5	3.5	<4.0	4.0	0.0	**0.040**	0.0	**0.040**
OCDF	U	<12	12	<14	14	0.0	**0.0041**	0.0	**0.0014**
					Furans Totals :	0.13	**2.1**	0.13	**2.6**
					Totals :	**0.19**	**7.5**	**0.15**	**8.0**

Poly-Chlorinated Biphenyls (WHO 12)

Technique : GC/MS (HR)

						WHO2005 Toxic Equivalents ng/kg		WHO Toxic Equivalents ng/kg	
Determinand	**Symbol**	**Result ng/kg As Received @13% Moisture**	**LOD As Received @13% Moisture**	**Lower Bound ng/kg @ 0% Moisture**	**LOD @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**
PCB BZ#77	U	(100) <500	500	<580	580	0.0	**0.058**	0.0	**0.058**
PCB BZ#81	U	(100) <0.50	0.50	<0.58	0.58	0.0	**0.00017**	0.0	**0.00006**
PCB BZ#105	U	(100) <500	500	<580	580	0.0	**0.017**	0.0	**0.058**
PCB BZ#114	U	(100) <500	500	<580	580	0.0	**0.017**	0.0	**0.29**

PCB BZ#118	U	**570**	500	660	580	0.020	**0.020**	0.066	**0.066**
PCB BZ#123	U	(100) <500	500	<580	580	0.0	**0.017**	0.0	**0.058**
PCB BZ#126	U	(100) <500	500	<580	580	0.0	**58**	0.0	**58**
PCB BZ#156	U	(100) <500	500	<580	580	0.0	**0.017**	0.0	**0.29**
PCB BZ#157	U	(100) <500	500	<580	580	0.0	**0.017**	0.0	**0.29**
PCB BZ#167	U	(100) <500	500	<580	580	0.0	**0.017**	0.0	**0.0058**
PCB BZ#169	U	(100) <500	500	<580	580	0.0	**17**	0.0	**5.8**
PCB BZ#189	U	(100) <500	500	<580	580	0.0	**0.017**	0.0	**0.058**
					Totals :	**0.020**	**75**	**0.066**	**65**

Soil

Customer Sample Reference : HEP-BH-1797
Our Sample Reference : 706245 006
Moisture Content : 24.5 %
Top Depth : 6.20
Hole ID : HEP-BH-1797
Depth : 6.20
Date Sampled : 19-DEC-2017
Time Sampled : 13:00
AGS Type : ES
AGS Sample ID : HEPBH179720171219002
AGS Sample Reference : 25
Matrix Class : Sandy Soil

Dioxins and Furans (Based on US EPA 1613)

Technique : GC/MS (HR)

						WHO2005 Toxic Equivalents ng/kg		WHO Toxic Equivalents ng/kg	
Determinand	**Symbol**	**Result ng/kg As Received @25% Moisture**	**LOD As Received @25% Moisture**	**Lower Bound ng/kg @ 0% Moisture**	**LOD @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**
2,3,7,8-TCDD	U	<2.0	2.0	<2.7	2.7	0.0	**2.7**	0.0	**2.7**
1,2,3,7,8-PeCDD	U	<2.8	2.8	<3.7	3.7	0.0	**3.7**	0.0	**3.7**
1,2,3,4,7,8-HxCDD	U	**4.4**	0.70	5.8	0.93	0.58	**0.58**	0.58	**0.58**
1,2,3,6,7,8-HxCDD	U	**23**	1.0	30	1.3	3.0	**3.0**	3.0	**3.0**
1,2,3,7,8,9-HxCDD	U	**7.9**	1.0	10	1.3	1.0	**1.0**	1.0	**1.0**
1,2,3,4,6,7,8-HpCDD	U	**1000**	1.7	1300	2.3	13	**13**	13	**13**
OCDD	U	**11000**	2.4	15000	3.2	4.4	**4.4**	1.5	**1.5**
					Dioxins Totals :	22	**29**	19	**26**
2,3,7,8-TCDF	U	**9.3**	0.82	12	1.1	1.2	**1.2**	1.2	**1.2**
1,2,3,7,8-PeCDF	U	**5.1**	0.95	6.8	1.3	0.20	**0.20**	0.34	**0.34**
2,3,4,7,8-PeCDF	U	**9.3**	0.88	12	1.2	3.7	**3.7**	6.2	**6.2**
1,2,3,4,7,8-HxCDF	U	**8.7**	0.88	12	1.2	1.2	**1.2**	1.2	**1.2**
1,2,3,6,7,8-HxCDF	U	**7.6**	1.1	10	1.5	1.0	**1.0**	1.0	**1.0**
2,3,4,6,7,8-HxCDF	U	**9.6**	0.98	13	1.3	1.3	**1.3**	1.3	**1.3**
1,2,3,7,8,9-HxCDF	U	<7.1	7.1	<9.4	9.4	0.0	**0.94**	0.0	**0.94**
1,2,3,4,6,7,8-HpCDF	U	**350**	1.9	460	2.5	4.6	**4.6**	4.6	**4.6**
1,2,3,4,7,8,9-HpCDF	U	<8.0	8.0	<11	11	0.0	**0.11**	0.0	**0.11**
OCDF	U	**1300**	2.5	1700	3.3	0.52	**0.52**	0.17	**0.17**
					Furans Totals :	14	**15**	16	**17**
					Totals :	**36**	**43**	**35**	**43**

Poly-Chlorinated Biphenyls (WHO 12)

Technique : GC/MS (HR)

						WHO2005 Toxic Equivalents ng/kg		WHO Toxic Equivalents ng/kg	
Determinand	**Symbol**	**Result ng/kg As Received @25% Moisture**	**LOD As Received @25% Moisture**	**Lower Bound ng/kg @ 0% Moisture**	**LOD @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**
PCB BZ#77	U	**760**	500	1000	660	0.10	**0.10**	0.10	**0.10**
PCB BZ#81	U	(100) <1.3	1.3	<1.7	1.7	0.0	**0.00052**	0.0	**0.00017**
PCB BZ#105	U	**4000**	500	5300	660	0.16	**0.16**	0.53	**0.53**
PCB BZ#114	U	(100) <500	500	<660	660	0.0	**0.020**	0.0	**0.33**

PCB BZ#118	U	**9400**	500	12000	660	0.37	**0.37**	1.2	**1.2**
PCB BZ#123	U	(100) <1600	1600	<2100	2100	0.0	**0.064**	0.0	**0.21**
PCB BZ#126	U	(100) <7100	7100	<9400	9400	0.0	**940**	0.0	**940**
PCB BZ#156	U	**3900**	500	5200	660	0.16	**0.16**	2.6	**2.6**
PCB BZ#157	U	(100) <800	800	<1100	1100	0.0	**0.032**	0.0	**0.53**
PCB BZ#167	U	**3400**	500	4500	660	0.14	**0.14**	0.045	**0.045**
PCB BZ#169	U	(100) <600	600	<800	800	0.0	**24**	0.0	**8.0**
PCB BZ#189	U	**1300**	500	1700	660	0.052	**0.052**	0.17	**0.17**
					Totals :	**0.98**	**970**	**4.7**	**950**

Soil

Customer Sample Reference : HEP-BH-20
Our Sample Reference : 706245 014
Moisture Content : 23.3 %
Hole ID : HEP-BH-20
Depth : 7.30
Top Depth : 7.30
Date Sampled : 19-DEC-2017
Time Sampled : 11:30
AGS Type : ES
AGS Sample ID : HEPBH2020171219004
AGS Sample Reference : 39
Matrix Class : Clay

Dioxins and Furans (Based on US EPA 1613)

Technique : GC/MS (HR)

						WHO2005 Toxic Equivalents ng/kg		WHO Toxic Equivalents ng/kg	
Determinand	**Symbol**	**Result ng/kg As Received @23% Moisture**	**LOD As Received @23% Moisture**	**Lower Bound ng/kg @ 0% Moisture**	**LOD @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**
2,3,7,8-TCDD	U	<2.6	2.6	<3.4	3.4	0.0	**3.4**	0.0	**3.4**
1,2,3,7,8-PeCDD	U	<4.0	4.0	<5.2	5.2	0.0	**5.2**	0.0	**5.2**
1,2,3,4,7,8-HxCDD	U	<5.3	5.3	<6.9	6.9	0.0	**0.69**	0.0	**0.69**
1,2,3,6,7,8-HxCDD	U	<5.7	5.7	<7.4	7.4	0.0	**0.74**	0.0	**0.74**
1,2,3,7,8,9-HxCDD	U	<5.7	5.7	<7.4	7.4	0.0	**0.74**	0.0	**0.74**
1,2,3,4,6,7,8-HpCDD	U	<5.5	5.5	<7.2	7.2	0.0	**0.072**	0.0	**0.072**
OCDD	U	<5.0	5.0	<6.5	6.5	0.0	**0.0020**	0.0	**0.00065**
					Dioxins Totals :	0.0	**11**	0.0	**11**
2,3,7,8-TCDF	U	<2.0	2.0	<2.6	2.6	0.0	**0.26**	0.0	**0.26**
1,2,3,7,8-PeCDF	U	<2.0	2.0	<2.6	2.6	0.0	**0.078**	0.0	**0.13**
2,3,4,7,8-PeCDF	U	<2.0	2.0	<2.6	2.6	0.0	**0.78**	0.0	**1.3**
1,2,3,4,7,8-HxCDF	U	<2.0	2.0	<2.6	2.6	0.0	**0.26**	0.0	**0.26**
1,2,3,6,7,8-HxCDF	U	<2.0	2.0	<2.6	2.6	0.0	**0.26**	0.0	**0.26**
2,3,4,6,7,8-HxCDF	U	<2.0	2.0	<2.6	2.6	0.0	**0.26**	0.0	**0.26**
1,2,3,7,8,9-HxCDF	U	<2.0	2.0	<2.6	2.6	0.0	**0.26**	0.0	**0.26**
1,2,3,4,6,7,8-HpCDF	U	<2.9	2.9	<3.8	3.8	0.0	**0.038**	0.0	**0.038**
1,2,3,4,7,8,9-HpCDF	U	<3.1	3.1	<4.0	4.0	0.0	**0.040**	0.0	**0.040**
OCDF	U	<3.6	3.6	<4.7	4.7	0.0	**0.0014**	0.0	**0.00047**
					Furans Totals :	0.0	**2.2**	0.0	**2.8**
					Totals :	**0.0**	**13**	**0.0**	**14**

Poly-Chlorinated Biphenyls (WHO 12)

Technique : GC/MS (HR)

						WHO2005 Toxic Equivalents ng/kg		WHO Toxic Equivalents ng/kg	
Determinand	**Symbol**	**Result ng/kg As Received @23% Moisture**	**LOD As Received @23% Moisture**	**Lower Bound ng/kg @ 0% Moisture**	**LOD @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**
PCB BZ#77	U	(100) <500	500	<650	650	0.0	**0.065**	0.0	**0.065**
PCB BZ#81	U	(100) <0.50	0.50	<0.65	0.65	0.0	**0.00020**	0.0	**0.00007**
PCB BZ#105	U	(100) <500	500	<650	650	0.0	**0.020**	0.0	**0.065**
PCB BZ#114	U	(100) <500	500	<650	650	0.0	**0.020**	0.0	**0.33**

PCB BZ#118	U	(100) <500	500	<650	650	0.0	**0.020**	0.0	**0.065**
PCB BZ#123	U	(100) <500	500	<650	650	0.0	**0.020**	0.0	**0.065**
PCB BZ#126	U	(100) <500	500	<650	650	0.0	**65**	0.0	**65**
PCB BZ#156	U	(100) <500	500	<650	650	0.0	**0.020**	0.0	**0.33**
PCB BZ#157	U	(100) <500	500	<650	650	0.0	**0.020**	0.0	**0.33**
PCB BZ#167	U	(100) <500	500	<650	650	0.0	**0.020**	0.0	**0.0065**
PCB BZ#169	U	(100) <500	500	<650	650	0.0	**20**	0.0	**6.5**
PCB BZ#189	U	(100) <500	500	<650	650	0.0	**0.020**	0.0	**0.065**
					Totals :	**0.0**	**85**	**0.0**	**73**

Soil

Customer Sample Reference : HEP-BH-5
Our Sample Reference : 706245 018
Moisture Content : 18.1 %
Depth : 4.20
Hole ID : HEP-BH-5
Top Depth : 4.20
Date Sampled : 19-DEC-2017
Time Sampled : 12:00
AGS Type : ES
AGS Sample ID : HEPBH520171219004
AGS Sample Reference : 17
Matrix Class : Sandy Soil

Dioxins and Furans (Based on US EPA 1613)

Technique : GC/MS (HR)

						WHO2005 Toxic Equivalents ng/kg		WHO Toxic Equivalents ng/kg	
Determinand	**Symbol**	**Result ng/kg As Received @18% Moisture**	**LOD As Received @18% Moisture**	**Lower Bound ng/kg @ 0% Moisture**	**LOD @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**
2,3,7,8-TCDD	U	<2.0	2.0	<2.4	2.4	0.0	**2.4**	0.0	**2.4**
1,2,3,7,8-PeCDD	U	<2.0	2.0	<2.4	2.4	0.0	**2.4**	0.0	**2.4**
1,2,3,4,7,8-HxCDD	U	<2.0	2.0	<2.4	2.4	0.0	**0.24**	0.0	**0.24**
1,2,3,6,7,8-HxCDD	U	<2.0	2.0	<2.4	2.4	0.0	**0.24**	0.0	**0.24**
1,2,3,7,8,9-HxCDD	U	<2.0	2.0	<2.4	2.4	0.0	**0.24**	0.0	**0.24**
1,2,3,4,6,7,8-HpCDD	U	**58**	1.3	71	1.6	0.71	**0.71**	0.71	**0.71**
OCDD	U	**510**	2.0	620	2.4	0.19	**0.19**	0.062	**0.062**
					Dioxins Totals :	0.89	**6.5**	0.77	**6.4**
2,3,7,8-TCDF	U	<4.2	4.2	<5.1	5.1	0.0	**0.51**	0.0	**0.51**
1,2,3,7,8-PeCDF	U	<2.5	2.5	<3.1	3.1	0.0	**0.092**	0.0	**0.15**
2,3,4,7,8-PeCDF	U	<2.5	2.5	<3.1	3.1	0.0	**0.92**	0.0	**1.5**
1,2,3,4,7,8-HxCDF	U	<3.8	3.8	<4.6	4.6	0.0	**0.46**	0.0	**0.46**
1,2,3,6,7,8-HxCDF	U	<3.9	3.9	<4.8	4.8	0.0	**0.48**	0.0	**0.48**
2,3,4,6,7,8-HxCDF	U	<3.9	3.9	<4.8	4.8	0.0	**0.48**	0.0	**0.48**
1,2,3,7,8,9-HxCDF	U	<3.7	3.7	<4.5	4.5	0.0	**0.45**	0.0	**0.45**
1,2,3,4,6,7,8-HpCDF	U	**12**	1.6	15	2.0	0.15	**0.15**	0.15	**0.15**
1,2,3,4,7,8,9-HpCDF	U	<5.6	5.6	<6.8	6.8	0.0	**0.068**	0.0	**0.068**
OCDF	U	**15**	1.9	18	2.3	0.0055	**0.0055**	0.0018	**0.0018**
					Furans Totals :	0.15	**3.6**	0.15	**4.3**
					Totals :	**1.0**	**10**	**0.92**	**11**

Poly-Chlorinated Biphenyls (WHO 12)

Technique : GC/MS (HR)

						WHO2005 Toxic Equivalents ng/kg		WHO Toxic Equivalents ng/kg	
Determinand	**Symbol**	**Result ng/kg As Received @18% Moisture**	**LOD As Received @18% Moisture**	**Lower Bound ng/kg @ 0% Moisture**	**LOD @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**
PCB BZ#77	U	**830**	500	1000	610	0.10	**0.10**	0.10	**0.10**
PCB BZ#81	U	(100) <0.50	0.50	<0.61	0.61	0.0	**0.00018**	0.0	**0.00006**
PCB BZ#105	U	**1100**	500	1300	610	0.040	**0.040**	0.13	**0.13**
PCB BZ#114	U	(100) <500	500	<610	610	0.0	**0.018**	0.0	**0.31**

PCB BZ#118	U	**1800**	500	2200	610	0.066	**0.066**	0.22	**0.22**
PCB BZ#123	U	(100) <140	140	<170	170	0.0	**0.0051**	0.0	**0.017**
PCB BZ#126	U	(100) <500	500	<610	610	0.0	**61**	0.0	**61**
PCB BZ#156	U	(100) <500	500	<610	610	0.0	**0.018**	0.0	**0.31**
PCB BZ#157	U	(100) <500	500	<610	610	0.0	**0.018**	0.0	**0.31**
PCB BZ#167	U	(100) <500	500	<610	610	0.0	**0.018**	0.0	**0.0061**
PCB BZ#169	U	(100) <500	500	<610	610	0.0	**18**	0.0	**6.1**
PCB BZ#189	U	(100) <500	500	<610	610	0.0	**0.018**	0.0	**0.061**
					Totals :	**0.21**	**80**	**0.46**	**69**

Concept Reference: 706245
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**706245 002**	**706245 004**	**706245 006**	**706245 008**	**706245 010**
				Customer Sample Reference	**HEP-BH-1319**	**HEP-BH-1319**	**HEP-BH-1797**	**HEP-BH-1797**	**HEP-BH-1798**
				Test Sample	**AR**	**AR**	**AR**	**AR**	**AR**
				Hole ID	**HEP-BH-1319**	**HEP-BH-1319**	**HEP-BH-1797**	**HEP-BH-1797**	**HEP-BH-1798**
				Depth	**0.30**	**1.50**	**6.20**	**8.10**	**1.00**
				Top Depth	**0.30**	**1.50**	**6.20**	**8.10**	**1.00**
				Date Sampled	**19-DEC-2017**	**19-DEC-2017**	**19-DEC-2017**	**19-DEC-2017**	**19-DEC-2017**
				Time Sampled	**14:05**	**14:50**	**13:00**	**15:00**	**14:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH131920171219002**	**HEPBH131920171219004**	**HEPBH179720171219002**	**HEPBH179720171219004**	**HEPBH179820171219002**
				AGS Sample Reference	**3**	**9**	**25**	**31**	**6**
				Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Clay**	**Sandy Soil**
Determinand	**Method**	**LOD**	**Units**	**Symbol**					
Moisture @105C	Grav (1 Dec) (105 C)	0.1	%	N	**25**	**13**	**25**	**8.7**	**23**

Concept Reference: 706245
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**706245 012**	**706245 014**	**706245 015**	**706245 018**	**706245 020**
				Customer Sample Reference	**HEP-BH-20**	**HEP-BH-20**	**HEP-BH-5**	**HEP-BH-5**	**HEP-BH-5**
				Test Sample	**AR**	**AR**	**AR**	**AR**	**AR**
				Hole ID	**HEP-BH-20**	**HEP-BH-20**	**HEP-BH-5**	**HEP-BH-5**	**HEP-BH-5**
				Depth	**4.80**	**7.30**	**1.20**	**4.20**	**6.20**
				Top Depth	**4.80**	**7.30**	**1.20**	**4.20**	**6.20**
				Date Sampled	**19-DEC-2017**	**19-DEC-2017**	**19-DEC-2017**	**19-DEC-2017**	**19-DEC-2017**
				Time Sampled	**09:45**	**11:30**	**10:00**	**12:00**	**14:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH2020171219002**	**HEPBH2020171219004**	**HEPBH5201712190001**	**HEPBH5201712190004**	**HEPBH5201712190006**
				AGS Sample Reference	**29**	**39**	**7**	**17**	**23**
				Matrix Class	**Sandy Soil**	**Clay**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**LOD**	**Units**	**Symbol**					
Moisture @105C	Grav (1 Dec) (105 C)	0.1	%	N	**20**	**23**	**42**	**18**	**26**

Concept Reference: 706245
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**706245 022**
				Customer Sample Reference	**HEP-BH-5**
				Test Sample	**AR**
				Hole ID	**HEP-BH-5**
				Depth	**8.20**
				Top Depth	**8.20**
				Date Sampled	**20-DEC-2017**
				Time Sampled	**10:00**
				AGS Type	**ES**
				AGS Sample ID	**HEPBH5201712200001**
				AGS Sample Reference	**29**
				Matrix Class	**Clay**
Determinand	**Method**	**LOD**	**Units**	**Symbol**	
Moisture @105C	Grav (1 Dec) (105 C)	0.1	%	N	**29**

Concept Reference: 706245
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**706245 002**	**706245 004**	**706245 006**	**706245 008**	**706245 010**
				Customer Sample Reference	**HEP-BH-1319**	**HEP-BH-1319**	**HEP-BH-1797**	**HEP-BH-1797**	**HEP-BH-1798**
				Test Sample	**M40**	**M40**	**M40**	**M40**	**M40**
				Hole ID	**HEP-BH-1319**	**HEP-BH-1319**	**HEP-BH-1797**	**HEP-BH-1797**	**HEP-BH-1798**
				Depth	**0.30**	**1.50**	**6.20**	**8.10**	**1.00**
				Top Depth	**0.30**	**1.50**	**6.20**	**8.10**	**1.00**
				Date Sampled	**19-DEC-2017**	**19-DEC-2017**	**19-DEC-2017**	**19-DEC-2017**	**19-DEC-2017**
				Time Sampled	**14:05**	**14:50**	**13:00**	**15:00**	**14:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH131920171219002**	**HEPBH131920171219004**	**HEPBH179720171219002**	**HEPBH179720171219004**	**HEPBH179820171219002**
				AGS Sample Reference	**3**	**9**	**25**	**31**	**6**
				Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Clay**	**Sandy Soil**
Determinand	**Method**	**LOD**	**Units**	**Symbol**					
Retained on 10mm sieve	Grav	0.1	%	N	<0.1	<0.1	<0.1	<0.1	<0.1

Concept Reference: 706245
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**706245 012**	**706245 014**	**706245 015**	**706245 018**	**706245 020**
				Customer Sample Reference	**HEP-BH-20**	**HEP-BH-20**	**HEP-BH-5**	**HEP-BH-5**	**HEP-BH-5**
				Test Sample	**M40**	**M40**	**M40**	**M40**	**M40**
				Hole ID	**HEP-BH-20**	**HEP-BH-20**	**HEP-BH-5**	**HEP-BH-5**	**HEP-BH-5**
				Depth	**4.80**	**7.30**	**1.20**	**4.20**	**6.20**
				Top Depth	**4.80**	**7.30**	**1.20**	**4.20**	**6.20**
				Date Sampled	**19-DEC-2017**	**19-DEC-2017**	**19-DEC-2017**	**19-DEC-2017**	**19-DEC-2017**
				Time Sampled	**09:45**	**11:30**	**10:00**	**12:00**	**14:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH2020171219002**	**HEPBH2020171219004**	**HEPBH5201712190001**	**HEPBH5201712190004**	**HEPBH5201712190006**
				AGS Sample Reference	**29**	**39**	**7**	**17**	**23**
				Matrix Class	**Sandy Soil**	**Clay**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**LOD**	**Units**	**Symbol**					
Retained on 10mm sieve	Grav	0.1	%	N	<0.1	<0.1	**26.1**	**13.0**	<0.1

Concept Reference: 706245
Project Site: HEP Package 3 CoC AGS4
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**706245 022**	
				Customer Sample Reference	**HEP-BH-5**	
				Test Sample	**M40**	
				Hole ID	**HEP-BH-5**	
				Depth	**8.20**	
				Top Depth	**8.20**	
				Date Sampled	**20-DEC-2017**	
				Time Sampled	**10:00**	
				AGS Type	**ES**	
				AGS Sample ID	**HEPBH5201712200001**	
				AGS Sample Reference	**29**	
				Matrix Class	**Clay**	
Determinand	**Method**	**LOD**	**Units**	**Symbol**		
Retained on 10mm sieve	Grav	0.1	%	N	<0.1	

Index to symbols used in Supplemental A 706245-3

Value	Description
AR	As Received
M40	Analysis conducted on sample assisted dried at no more than 40C. Results are reported on a dry weight basis.
100	LOD determined by sample aliquot used for analysis
U	Analysis is UKAS accredited
N	Analysis is not UKAS accredited

Notes

Supplemental A to report Dioxins and PCBS only.

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Concept Life Sciences

Certificate of Analysis

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Report Number: Second Supplemental 707108-2

Date of Report: 11-May-2018

Customer: Fugro GeoServices
Fugro House
Hithercroft Road
Wallingford
Oxfordshire
OX10 9RB

Customer Contact: Ms Karen Blackmore

Customer Job Reference:
Customer Purchase Order: 56642KB-WAL
Customer Site Reference: HEP Package 3
Date Job Received at Concept: 05-Jan-2018
Date Analysis Started: 09-Jan-2018
Date Analysis Completed: 18-Jan-2018

The results reported relate to samples received in the laboratory and may not be representative of a whole batch.

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation

This report should not be reproduced except in full without the written approval of the laboratory

Tests covered by this certificate were conducted in accordance with Concept Life Sciences SOPs

All results have been reviewed in accordance with Section 25 of the Concept Life Sciences, Analytical Services Quality Manual

UKAS TESTING
1549

Report checked
and authorised by :
Sara Abou-Shakra
Customer Service Manager

Issued by :
Jack Nagy
Customer Service Advisor

Concept Reference: 707108
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

Concept Reference	**707108 004**	**707108 005**	**707108 007**
Customer Sample Reference	**HEP-BH-44**	**HEP-BH-44**	**HEP-BH-44**
Depth	**1.2**	**2.2**	**4.2**
Hole ID	**HEP-BH-44**	**HEP-BH-44**	**HEP-BH-44**
Top Depth	**1.2**	**2.2**	**4.2**
Date Sampled	**03-JAN-2018**	**03-JAN-2018**	**03-JAN-2018**
Time Sampled	**13:00**	**13:30**	**14:10**
AGS Type	**ES**	**ES**	**ES**
AGS Sample ID	**FES2180103009**	**FES2180103012**	**FES2180103018**
AGS Sample Reference	**9**	**12**	**18**
Matrix Class	**Fill**	**Fill**	**Fill**

Determinand	**Method**	**Test Sample**	**LOD**	**Units**			
Moisture @105C	T162	AR	0.1	%	**5.4**	**13**	**6.4**
Retained on 10mm sieve	T2	M40	0.1	%	**1.9**	**1.9**	**3.9**

Concept Reference: 707108
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite B - Natural Ground - Metals and Metalloids

Concept Reference	**707108 004**	**707108 005**	**707108 007**
Customer Sample Reference	**HEP-BH-44**	**HEP-BH-44**	**HEP-BH-44**
Depth	**1.2**	**2.2**	**4.2**
Hole ID	**HEP-BH-44**	**HEP-BH-44**	**HEP-BH-44**
Top Depth	**1.2**	**2.2**	**4.2**
Date Sampled	**03-JAN-2018**	**03-JAN-2018**	**03-JAN-2018**
Time Sampled	**13:00**	**13:30**	**14:10**
AGS Type	**ES**	**ES**	**ES**
AGS Sample ID	**FES2180103009**	**FES2180103012**	**FES2180103018**
AGS Sample Reference	**9**	**12**	**18**
Matrix Class	**Fill**	**Fill**	**Fill**

Determinand	**Method**	**Test Sample**	**LOD**	**Units**			
Arsenic	T6	M40	2.0	mg/kg	**7.1**	**11**	**8.0**
Cadmium	T6	M40	1	mg/kg	<1	<1	<1
Chromium	T6	M40	1	mg/kg	**18**	**14**	**29**
Iron	T6	A40	1	mg/kg	**14000**	**22000**	**16000**
Lead	T6	M40	1	mg/kg	**32**	**10**	**13**
Manganese	T6	M40	1	mg/kg	**230**	**320**	**270**
Mercury	T6	M40	1	mg/kg	<1	<1	<1
Nickel	T6	M40	1	mg/kg	**13**	**14**	**18**
Selenium	T6	M40	3	mg/kg	<3	<3	<3
Copper	T6	M40	1	mg/kg	**11**	**7**	**13**
Zinc	T6	M40	1	mg/kg	**35**	**25**	**29**
Boron (water-soluble)	T6	AR	1	mg/kg	<1	<1	<1

Concept Reference: 707108
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite B - Natural Material - Organic - TPH

Concept Reference	**707108 004**	**707108 005**	**707108 007**
Customer Sample Reference	**HEP-BH-44**	**HEP-BH-44**	**HEP-BH-44**
Depth	**1.2**	**2.2**	**4.2**
Hole ID	**HEP-BH-44**	**HEP-BH-44**	**HEP-BH-44**
Top Depth	**1.2**	**2.2**	**4.2**
Date Sampled	**03-JAN-2018**	**03-JAN-2018**	**03-JAN-2018**
Time Sampled	**13:00**	**13:30**	**14:10**
AGS Type	**ES**	**ES**	**ES**
AGS Sample ID	**FES2180103009**	**FES2180103012**	**FES2180103018**
AGS Sample Reference	**9**	**12**	**18**
Matrix Class	**Fill**	**Fill**	**Fill**

Determinand	**Method**	**Test Sample**	**LOD**	**Units**			
TPH (C10-C35)	T8	M105	1	mg/kg	(13) 3	(13) 6	(13) 3
TPH (C35-C40)	T8	M105	1	mg/kg	(13) <1	(13) <1	(13) <1

Concept Reference: 707108
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite B - Natural Material - Organic - PAHs

Concept Reference	**707108 004**	**707108 005**	**707108 007**
Customer Sample Reference	**HEP-BH-44**	**HEP-BH-44**	**HEP-BH-44**
Depth	**1.2**	**2.2**	**4.2**
Hole ID	**HEP-BH-44**	**HEP-BH-44**	**HEP-BH-44**
Top Depth	**1.2**	**2.2**	**4.2**
Date Sampled	**03-JAN-2018**	**03-JAN-2018**	**03-JAN-2018**
Time Sampled	**13:00**	**13:30**	**14:10**
AGS Type	**ES**	**ES**	**ES**
AGS Sample ID	**FES2180103009**	**FES2180103012**	**FES2180103018**
AGS Sample Reference	**9**	**12**	**18**
Matrix Class	**Fill**	**Fill**	**Fill**

Determinand	**Method**	**Test Sample**	**LOD**	**Units**			
Naphthalene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1
Acenaphthylene	T207	AR	0.1	mg/kg	<0.1	<0.1	<0.1
Acenaphthene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1
Fluorene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1
Phenanthrene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1
Anthracene	T207	AR	0.1	mg/kg	<0.1	<0.1	<0.1
Fluoranthene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1
Pyrene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1
Chrysene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1
PAH(total)	T207	AR	0.1	mg/kg	<0.1	<0.1	<0.1

Concept Reference: 707108
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Chromium

Concept Reference	**707108 004**	**707108 005**	**707108 007**
Customer Sample Reference	**HEP-BH-44**	**HEP-BH-44**	**HEP-BH-44**
Depth	**1.2**	**2.2**	**4.2**
Hole ID	**HEP-BH-44**	**HEP-BH-44**	**HEP-BH-44**
Top Depth	**1.2**	**2.2**	**4.2**
Date Sampled	**03-JAN-2018**	**03-JAN-2018**	**03-JAN-2018**
Time Sampled	**13:00**	**13:30**	**14:10**
AGS Type	**ES**	**ES**	**ES**
AGS Sample ID	**FES2180103009**	**FES2180103012**	**FES2180103018**
AGS Sample Reference	**9**	**12**	**18**
Matrix Class	**Fill**	**Fill**	**Fill**

Determinand	**Method**	**Test Sample**	**LOD**	**Units**			
Chromium (trivalent)	T85	AR	2	mg/kg	**18**	**14**	**29**
Chromium VI	T6	AR	1	mg/kg	<1	<1	<1

Concept Reference: 707108
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite B - Inorganics

Concept Reference	**707108 004**	**707108 005**	**707108 007**
Customer Sample Reference	**HEP-BH-44**	**HEP-BH-44**	**HEP-BH-44**
Depth	**1.2**	**2.2**	**4.2**
Hole ID	**HEP-BH-44**	**HEP-BH-44**	**HEP-BH-44**
Top Depth	**1.2**	**2.2**	**4.2**
Date Sampled	**03-JAN-2018**	**03-JAN-2018**	**03-JAN-2018**
Time Sampled	**13:00**	**13:30**	**14:10**
AGS Type	**ES**	**ES**	**ES**
AGS Sample ID	**FES2180103009**	**FES2180103012**	**FES2180103018**
AGS Sample Reference	**9**	**12**	**18**
Matrix Class	**Fill**	**Fill**	**Fill**

Determinand	**Method**	**Test Sample**	**LOD**	**Units**			
Chloride	T686	AR	1	mg/kg	**7**	**10**	**4**

Concept Reference: 707108
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite B - Natural Ground - Misc

Concept Reference	**707108 004**	**707108 005**	**707108 007**
Customer Sample Reference	**HEP-BH-44**	**HEP-BH-44**	**HEP-BH-44**
Depth	**1.2**	**2.2**	**4.2**
Hole ID	**HEP-BH-44**	**HEP-BH-44**	**HEP-BH-44**
Top Depth	**1.2**	**2.2**	**4.2**
Date Sampled	**03-JAN-2018**	**03-JAN-2018**	**03-JAN-2018**
Time Sampled	**13:00**	**13:30**	**14:10**
AGS Type	**ES**	**ES**	**ES**
AGS Sample ID	**FES2180103009**	**FES2180103012**	**FES2180103018**
AGS Sample Reference	**9**	**12**	**18**
Matrix Class	**Fill**	**Fill**	**Fill**

Determinand	**Method**	**Test Sample**	**LOD**	**Units**			
Fraction Organic Carbon - F(oc)	T21	AR	1	%	<1	<1	<1
Soil Organic Matter	T287	A40	0.1	%	**0.4**	**0.2**	**12**
pH	T7	AR			**7.7**	**8.5**	**8.1**
TPH C10-C40 (sum)	T85	M105	1	mg/kg	**(13) 3**	**(13) 6**	**(13) 3**

Index to symbols used in Second Supplemental 707108-2

Value	Description
M40	Analysis conducted on sample assisted dried at no more than 40C. Results are reported on a dry weight basis.
M105	Analysis conducted on an "as received" aliquot. Results are reported on a dry weight basis where moisture content was determined by assisted drying of sample at 105C
A40	Assisted dried < 40C
AR	As Received
13	Results have been blank corrected.
U	Analysis is UKAS accredited
N	Analysis is not UKAS accredited

Notes

Second Supplemental to report TPH Sums.
Samples 1-3 have been analysed exceeding recommended holding time for TPH, PAH and pH. It is possible therefore that the results provided may be compromised.
"Fill" samples are outside the scope of our MCERTS accreditation. Results are UKAS only

Method Index

Value	Description
T287	Calc TOC/0.58
T8	GC/FID
T85	Calc
T7	Probe
T162	Grav (1 Dec) (105 C)
T207	GC/MS (MCERTS)
T686	Discrete Analyser
T2	Grav
T6	ICP/OES
T21	OX/IR

Accreditation Summary

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Chromium (trivalent)	T85	AR	2	mg/kg	N	004-005,007
Chromium VI	T6	AR	1	mg/kg	N	004-005,007
Fraction Organic Carbon - F(oc)	T21	AR	1	%	N	004-005,007
Soil Organic Matter	T287	A40	0.1	%	N	004-005,007
pH	T7	AR			U	004-005,007
TPH C10-C40 (sum)	T85	M105	1	mg/kg	N	004-005,007
TPH (C10-C35)	T8	M105	1	mg/kg	U	004-005,007
TPH (C35-C40)	T8	M105	1	mg/kg	N	004-005,007
Chloride	T686	AR	1	mg/kg	N	004-005,007
Arsenic	T6	M40	2.0	mg/kg	U	004-005,007
Cadmium	T6	M40	1	mg/kg	U	004-005,007
Chromium	T6	M40	1	mg/kg	U	004-005,007
Iron	T6	A40	1	mg/kg	U	004-005,007
Lead	T6	M40	1	mg/kg	U	004-005,007
Manganese	T6	M40	1	mg/kg	U	004-005,007
Mercury	T6	M40	1	mg/kg	U	004-005,007
Nickel	T6	M40	1	mg/kg	U	004-005,007
Selenium	T6	M40	3	mg/kg	U	004-005,007
Copper	T6	M40	1	mg/kg	U	004-005,007
Zinc	T6	M40	1	mg/kg	U	004-005,007
Boron (water-soluble)	T6	AR	1	mg/kg	N	004-005,007
Naphthalene	T207	M105	0.1	mg/kg	U	004-005,007
Acenaphthylene	T207	AR	0.1	mg/kg	U	004-005,007
Acenaphthene	T207	M105	0.1	mg/kg	U	004-005,007
Fluorene	T207	M105	0.1	mg/kg	U	004-005,007
Phenanthrene	T207	M105	0.1	mg/kg	U	004-005,007
Anthracene	T207	AR	0.1	mg/kg	U	004-005,007
Fluoranthene	T207	M105	0.1	mg/kg	U	004-005,007
Pyrene	T207	M105	0.1	mg/kg	U	004-005,007
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	U	004-005,007

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Chrysene	T207	M105	0.1	mg/kg	U	004-005,007
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	U	004-005,007
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	U	004-005,007
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	U	004-005,007
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	U	004-005,007
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	U	004-005,007
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	U	004-005,007
PAH(total)	T207	AR	0.1	mg/kg	U	004-005,007
Moisture @105C	T162	AR	0.1	%	N	004-005,007
Retained on 10mm sieve	T2	M40	0.1	%	N	004-005,007

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Concept Life Sciences

Certificate of Analysis

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Report Number: Second Supplemental B 707552-2

Date of Report: 25-Jun-2018

Customer: Fugro GeoServices
Fugro House
Hithercroft Road
Wallingford
Oxfordshire
OX10 9RB

Customer Contact: Ms Karen Blackmore

Customer Job Reference:
Customer Purchase Order: 56642KB-WAL
Customer Site Reference: HEP Package 3
Date Job Received at Concept: 30-Nov-2017
Date Analysis Started: 10-Jan-2018
Date Analysis Completed: 30-Jan-2018

The results reported relate to samples received in the laboratory and may not be representative of a whole batch.

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation

This report should not be reproduced except in full without the written approval of the laboratory

Tests covered by this certificate were conducted in accordance with Concept Life Sciences SOPs

All results have been reviewed in accordance with Section 25 of the Concept Life Sciences, Analytical Services Quality Manual

UKAS TESTING
1549

mCERTS
THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME

Report checked
and authorised by :
Sara Abou-Shakra
Customer Service Manager

Issued by :
Sara Abou-Shakra
Customer Service Manager

Concept Reference: 707552
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

Concept Reference	**707552 001**	**707552 002**	**707552 004**	**707552 005**	**707552 007**
Customer Sample Reference	**HEP-BH-1861**	**HEP-BH-1861**	**HEP-BH-1861**	**HEP-BH-1861**	**HEP-BH-1861**
Depth	**3.00**	**4.00**	**6.00**	**7.00**	**9.00**
Top Depth	**3.00**	**4.00**	**6.00**	**7.00**	**9.00**
Hole ID	**HEP-BH-1861**	**HEP-BH-1861**	**HEP-BH-1861**	**HEP-BH-1861**	**HEP-BH-1861**
Date Sampled	**28-NOV-2017**	**28-NOV-2017**	**28-NOV-2017**	**28-NOV-2017**	**28-NOV-2017**
Time Sampled	**09:00**	**09:30**	**11:00**	**11:45**	**13:00**
AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**FES2171128001**	**FES2171128004**	**FES2171128010**	**FES2171128014**	**FES2171128021**
AGS Sample Reference	**12**	**15**	**21**	**25**	**32**
Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Clay**	**Clay**

Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Moisture @105C	T162	AR	0.1	%	**16**	**7.5**	**31**	**20**	**17**
Retained on 10mm sieve	T2	M40	0.1	%	<0.1	<0.1	<0.1	<0.1	<0.1

Concept Reference: 707552
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Inorganics

Concept Reference	**707552 001**	**707552 002**	**707552 004**	**707552 005**	**707552 007**
Customer Sample Reference	**HEP-BH-1861**	**HEP-BH-1861**	**HEP-BH-1861**	**HEP-BH-1861**	**HEP-BH-1861**
Depth	**3.00**	**4.00**	**6.00**	**7.00**	**9.00**
Top Depth	**3.00**	**4.00**	**6.00**	**7.00**	**9.00**
Hole ID	**HEP-BH-1861**	**HEP-BH-1861**	**HEP-BH-1861**	**HEP-BH-1861**	**HEP-BH-1861**
Date Sampled	**28-NOV-2017**	**28-NOV-2017**	**28-NOV-2017**	**28-NOV-2017**	**28-NOV-2017**
Time Sampled	**09:00**	**09:30**	**11:00**	**11:45**	**13:00**
AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**FES2171128001**	**FES2171128004**	**FES2171128010**	**FES2171128014**	**FES2171128021**
AGS Sample Reference	**12**	**15**	**21**	**25**	**32**
Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Clay**	**Clay**

Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Chloride	T686	AR	1	mg/kg	**38**	**95**	**29**	**5**	**7**
Cyanide(Total)	T4	AR	1	mg/kg	<1	<1	<1	<1	<1
Thiocyanate	T4	A40	1	mg/kg	<10	<10	<10	<10	<10
Nitrate	T686	AR	1	mg/kg	<1	<1	<1	<1	**5**
Nitrite	T686	AR	1	mg/kg	<1	<1	<1	<1	<1
SO4(Total)	T6	A40	0.01	%	**1.2**	**0.74**	**0.45**	**0.11**	**0.11**
Sulphide	T4	AR	10	mg/kg	**190**	**59**	**32**	<10	**20**

Concept Reference: 707552
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - Misc

				Concept Reference	**707552 001**	**707552 002**	**707552 004**	**707552 005**	**707552 007**
				Customer Sample Reference	**HEP-BH-1861**	**HEP-BH-1861**	**HEP-BH-1861**	**HEP-BH-1861**	**HEP-BH-1861**
				Depth	**3.00**	**4.00**	**6.00**	**7.00**	**9.00**
				Top Depth	**3.00**	**4.00**	**6.00**	**7.00**	**9.00**
				Hole ID	**HEP-BH-1861**	**HEP-BH-1861**	**HEP-BH-1861**	**HEP-BH-1861**	**HEP-BH-1861**
				Date Sampled	**28-NOV-2017**	**28-NOV-2017**	**28-NOV-2017**	**28-NOV-2017**	**28-NOV-2017**
				Time Sampled	**09:00**	**09:30**	**11:00**	**11:45**	**13:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**FES2171128001**	**FES2171128004**	**FES2171128010**	**FES2171128014**	**FES2171128021**
				AGS Sample Reference	**12**	**15**	**21**	**25**	**32**
				Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Soil Organic Matter	T287	A40	0.1	%	**3.6**	**2.0**	**3.4**	**1.0**	**1.6**
pH	T7	AR			**9.5**	**11.6**	**8.2**	**8.2**	**8.1**

Concept Reference: 707552
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings Metals and Metalloids

				Concept Reference	**707552 001**	**707552 002**	**707552 004**	**707552 005**	**707552 007**
				Customer Sample Reference	**HEP-BH-1861**	**HEP-BH-1861**	**HEP-BH-1861**	**HEP-BH-1861**	**HEP-BH-1861**
				Depth	**3.00**	**4.00**	**6.00**	**7.00**	**9.00**
				Top Depth	**3.00**	**4.00**	**6.00**	**7.00**	**9.00**
				Hole ID	**HEP-BH-1861**	**HEP-BH-1861**	**HEP-BH-1861**	**HEP-BH-1861**	**HEP-BH-1861**
				Date Sampled	**28-NOV-2017**	**28-NOV-2017**	**28-NOV-2017**	**28-NOV-2017**	**28-NOV-2017**
				Time Sampled	**09:00**	**09:30**	**11:00**	**11:45**	**13:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**FES2171128001**	**FES2171128004**	**FES2171128010**	**FES2171128014**	**FES2171128021**
				AGS Sample Reference	**12**	**15**	**21**	**25**	**32**
				Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Arsenic	T6	M40	2	mg/kg	**16**	**12**	**11**	**13**	**13**
Cadmium	T6	M40	1	mg/kg	<1	<1	<1	<1	<1
Chromium	T6	M40	1	mg/kg	**27**	**29**	**30**	**27**	**29**
Iron	T6	A40	1	mg/kg	**26000**	**22000**	**31000**	**31000**	**28000**
Lead	T6	M40	1	mg/kg	**520**	**380**	**140**	**41**	**69**
Manganese	T6	M40	1	mg/kg	**290**	**340**	**440**	**480**	**420**
Mercury	T6	M40	1	mg/kg	<1	<1	<1	<1	<1
Nickel	T6	M40	1	mg/kg	**23**	**20**	**31**	**30**	**30**
Selenium	T6	M40	3	mg/kg	<3	<3	<3	<3	<3
Copper	T6	M40	1	mg/kg	**60**	**140**	**73**	**29**	**25**
Zinc	T6	M40	1	mg/kg	**270**	**150**	**230**	**76**	**74**
Boron (water-soluble)	T6	AR	1	mg/kg	<1	<1	<1	<1	<1

Concept Reference: 707552
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Chromium

				Concept Reference	**707552 001**	**707552 002**	**707552 004**	**707552 005**	**707552 007**
				Customer Sample Reference	**HEP-BH-1861**	**HEP-BH-1861**	**HEP-BH-1861**	**HEP-BH-1861**	**HEP-BH-1861**
				Depth	**3.00**	**4.00**	**6.00**	**7.00**	**9.00**
				Top Depth	**3.00**	**4.00**	**6.00**	**7.00**	**9.00**
				Hole ID	**HEP-BH-1861**	**HEP-BH-1861**	**HEP-BH-1861**	**HEP-BH-1861**	**HEP-BH-1861**
				Date Sampled	**28-NOV-2017**	**28-NOV-2017**	**28-NOV-2017**	**28-NOV-2017**	**28-NOV-2017**
				Time Sampled	**09:00**	**09:30**	**11:00**	**11:45**	**13:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**FES2171128001**	**FES2171128004**	**FES2171128010**	**FES2171128014**	**FES2171128021**
				AGS Sample Reference	**12**	**15**	**21**	**25**	**32**
				Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Chromium (trivalent)	T85	AR	2	mg/kg	**27**	**29**	**30**	**27**	**29**
Chromium VI	T6	AR	1	mg/kg	<1	<1	<1	<1	<1

Concept Reference: 707552
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Total Phenol

				Concept Reference	**707552 001**	**707552 002**	**707552 004**	**707552 005**	**707552 007**
				Customer Sample Reference	**HEP-BH-1861**	**HEP-BH-1861**	**HEP-BH-1861**	**HEP-BH-1861**	**HEP-BH-1861**
				Depth	**3.00**	**4.00**	**6.00**	**7.00**	**9.00**
				Top Depth	**3.00**	**4.00**	**6.00**	**7.00**	**9.00**
				Hole ID	**HEP-BH-1861**	**HEP-BH-1861**	**HEP-BH-1861**	**HEP-BH-1861**	**HEP-BH-1861**
				Date Sampled	**28-NOV-2017**	**28-NOV-2017**	**28-NOV-2017**	**28-NOV-2017**	**28-NOV-2017**
				Time Sampled	**09:00**	**09:30**	**11:00**	**11:45**	**13:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**FES2171128001**	**FES2171128004**	**FES2171128010**	**FES2171128014**	**FES2171128021**
				AGS Sample Reference	**12**	**15**	**21**	**25**	**32**
				Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Phenols(Mono)	T4	AR	0.5	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0

Concept Reference: 707552
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Asbestos

				Concept Reference	**707552 001**	**707552 002**	**707552 004**	**707552 005**	**707552 007**
				Customer Sample Reference	**HEP-BH-1861**	**HEP-BH-1861**	**HEP-BH-1861**	**HEP-BH-1861**	**HEP-BH-1861**
				Depth	**3.00**	**4.00**	**6.00**	**7.00**	**9.00**
				Top Depth	**3.00**	**4.00**	**6.00**	**7.00**	**9.00**
				Hole ID	**HEP-BH-1861**	**HEP-BH-1861**	**HEP-BH-1861**	**HEP-BH-1861**	**HEP-BH-1861**
				Date Sampled	**28-NOV-2017**	**28-NOV-2017**	**28-NOV-2017**	**28-NOV-2017**	**28-NOV-2017**
				Time Sampled	**09:00**	**09:30**	**11:00**	**11:45**	**13:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**FES2171128001**	**FES2171128004**	**FES2171128010**	**FES2171128014**	**FES2171128021**
				AGS Sample Reference	**12**	**15**	**21**	**25**	**32**
				Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Asbestos ID	T27	AR			N.D.	N.D.	N.D.	N.D.	N.D.

Concept Reference: 707552
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground Soils with Elevated PID Readings - Organics PAH US EPA 16

Concept Reference			**707552 001**	**707552 002**	**707552 004**	**707552 005**	**707552 007**
Customer Sample Reference			**HEP-BH-1861**	**HEP-BH-1861**	**HEP-BH-1861**	**HEP-BH-1861**	**HEP-BH-1861**
Depth			**3.00**	**4.00**	**6.00**	**7.00**	**9.00**
Top Depth			**3.00**	**4.00**	**6.00**	**7.00**	**9.00**
Hole ID			**HEP-BH-1861**	**HEP-BH-1861**	**HEP-BH-1861**	**HEP-BH-1861**	**HEP-BH-1861**
Date Sampled			**28-NOV-2017**	**28-NOV-2017**	**28-NOV-2017**	**28-NOV-2017**	**28-NOV-2017**
Time Sampled			**09:00**	**09:30**	**11:00**	**11:45**	**13:00**
AGS Type			**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID			**FES2171128001**	**FES2171128004**	**FES2171128010**	**FES2171128014**	**FES2171128021**
AGS Sample Reference			**12**	**15**	**21**	**25**	**32**
Matrix Class			**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Naphthalene	T207	M105	0.1	mg/kg	<0.1	(9) <1.0	<0.1	<0.1	<0.1
Acenaphthylene	T207	AR	0.1	mg/kg	<0.1	(9) <1.0	<0.1	<0.1	<0.1
Acenaphthene	T207	M105	0.1	mg/kg	**0.1**	(9) <1.0	<0.1	<0.1	<0.1
Fluorene	T207	M105	0.1	mg/kg	<0.1	(9) <1.0	<0.1	<0.1	<0.1
Phenanthrene	T207	M105	0.1	mg/kg	**0.2**	**3.0**	<0.1	<0.1	<0.1
Anthracene	T207	AR	0.1	mg/kg	<0.1	(9) <1.0	<0.1	<0.1	<0.1
Fluoranthene	T207	M105	0.1	mg/kg	**1.2**	**3.7**	<0.1	<0.1	**0.1**
Pyrene	T207	M105	0.1	mg/kg	**1.2**	**3.2**	<0.1	<0.1	<0.1
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	**0.6**	(9) <1.0	<0.1	<0.1	<0.1
Chrysene	T207	M105	0.1	mg/kg	**0.5**	**1.0**	<0.1	<0.1	<0.1
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	**0.3**	(9) <1.0	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	**0.4**	(9) <1.0	<0.1	<0.1	<0.1
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	**0.4**	(9) <1.0	<0.1	<0.1	<0.1
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	**0.2**	(9) <1.0	<0.1	<0.1	<0.1
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	<0.1	(9) <1.0	<0.1	<0.1	<0.1
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	**0.2**	(9) <1.0	<0.1	<0.1	<0.1
PAH(total)	T207	AR	0.1	mg/kg	**5.3**	**11**	<0.1	<0.1	**0.1**

Concept Reference: 707552
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - TPH (CWG)

Concept Reference			**707552 001**	**707552 002**	**707552 004**	**707552 005**	**707552 007**
Customer Sample Reference			**HEP-BH-1861**	**HEP-BH-1861**	**HEP-BH-1861**	**HEP-BH-1861**	**HEP-BH-1861**
Depth			**3.00**	**4.00**	**6.00**	**7.00**	**9.00**
Top Depth			**3.00**	**4.00**	**6.00**	**7.00**	**9.00**
Hole ID			**HEP-BH-1861**	**HEP-BH-1861**	**HEP-BH-1861**	**HEP-BH-1861**	**HEP-BH-1861**
Date Sampled			**28-NOV-2017**	**28-NOV-2017**	**28-NOV-2017**	**28-NOV-2017**	**28-NOV-2017**
Time Sampled			**09:00**	**09:30**	**11:00**	**11:45**	**13:00**
AGS Type			**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID			**FES2171128001**	**FES2171128004**	**FES2171128010**	**FES2171128014**	**FES2171128021**
AGS Sample Reference			**12**	**15**	**21**	**25**	**32**
Matrix Class			**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
TPH (C5-C6 aliphatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C6-C8 aliphatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C8-C10 aliphatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	(13,9) <10	**(13) 11**	(13) <1	(13) <1	(13) <1
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	(9,13) <10	**(13) 26**	(13) <1	**(13) 6**	(13) <1
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	**(13) 15**	**(13) 59**	**(13) 2**	**(13) 11**	**(13) 1**
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	**(13) 86**	**(13) 180**	**(13) 7**	**(13) 15**	**(13) 6**
TPH (C6-C7 aromatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C7-C8 aromatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C8-C10 aromatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	(13,9) <10	(9,13) <10	(13) <2	(13) <2	(13) <2
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	**(13) 17**	**(13) 15**	(13) <1	(13) <1	(13) <1
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	**(13) 21**	**(13) 51**	(13) <1	(13) <1	(13) <1
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	(9,13) <10	(9,13) <10	(13) <1	(13) <1	(13) <1

Concept Reference: 707552
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Total Petroleum Hydrocarbons (Aliphatics+Aromatics) Total

Concept Reference	**707552 001**	**707552 002**	**707552 004**	**707552 005**	**707552 007**
Customer Sample Reference	**HEP-BH-1861**	**HEP-BH-1861**	**HEP-BH-1861**	**HEP-BH-1861**	**HEP-BH-1861**
Depth	**3.00**	**4.00**	**6.00**	**7.00**	**9.00**
Top Depth	**3.00**	**4.00**	**6.00**	**7.00**	**9.00**
Hole ID	**HEP-BH-1861**	**HEP-BH-1861**	**HEP-BH-1861**	**HEP-BH-1861**	**HEP-BH-1861**
Date Sampled	**28-NOV-2017**	**28-NOV-2017**	**28-NOV-2017**	**28-NOV-2017**	**28-NOV-2017**
Time Sampled	**09:00**	**09:30**	**11:00**	**11:45**	**13:00**
AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**FES2171128001**	**FES2171128004**	**FES2171128010**	**FES2171128014**	**FES2171128021**
AGS Sample Reference	**12**	**15**	**21**	**25**	**32**
Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Clay**	**Clay**

Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
TPH (Aliphatic) total	T85	M105		mg/kg	**(13) 100**	**(13) 280**	**(13) 9.0**	**(13) 32**	**(13) 7.0**
TPH (Aromatic) total	T85	M105		mg/kg	**(13) 38**	**(13) 66**	(13) N.D.	(13) N.D.	(13) N.D.
TPH (Aliphatic+Aromatic) (sum)	T85	M105		mg/kg	**138**	**346**	**9.00**	**32.0**	**7.00**

Index to symbols used in Second Supplemental B 707552-2

Value	Description
AR	As Received
A40	Assisted dried < 40C
M40	Analysis conducted on sample assisted dried at no more than 40C. Results are reported on a dry weight basis.
M105	Analysis conducted on an "as received" aliquot. Results are reported on a dry weight basis where moisture content was determined by assisted drying of sample at 105C
N.D.	Not Detected
9	LOD raised due to dilution of sample
13	Results have been blank corrected.
S	Analysis was subcontracted
M	Analysis is MCERTS accredited
U	Analysis is UKAS accredited
N	Analysis is not UKAS accredited

Notes

Second Supplemental B to report in standard format with TPH totals.
Nitrate and Nitrite transferred to Concept Braintree
Asbestos subcontracted to REC Asbestos
Supplemental report to report sample depths.

Method Index

Value	Description
T287	Calc TOC/0.58
T686	Discrete Analyser
T7	Probe
T2	Grav
T4	Colorimetry
T6	ICP/OES
T162	Grav (1 Dec) (105 C)
T209	GC/MS (Head Space)(MCERTS)
T27	PLM
T909	GCxGC
T85	Calc
T207	GC/MS (MCERTS)

Accreditation Summary

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Moisture @105C	T162	AR	0.1	%	N	001-002,004-005,007
Retained on 10mm sieve	T2	M40	0.1	%	N	001-002,004-005,007
Chromium (trivalent)	T85	AR	2	mg/kg	N	001-002,004-005,007
Chromium VI	T6	AR	1	mg/kg	N	001-002,004-005,007
Soil Organic Matter	T287	A40	0.1	%	N	001-002,004-005,007
pH	T7	AR			M	001-002,004-005,007
Asbestos ID	T27	AR			SU	001-002,004-005,007
Phenols(Mono)	T4	AR	0.5	mg/kg	M	001-002,004-005,007
Chloride	T686	AR	1	mg/kg	N	001-002,004-005,007
Cyanide(Total)	T4	AR	1	mg/kg	M	001-002,004-005,007
Thiocyanate	T4	A40	1	mg/kg	N	001-002,004-005,007
Nitrate	T686	AR	1	mg/kg	N	001-002,004-005,007
Nitrite	T686	AR	1	mg/kg	N	001-002,004-005,007
SO4(Total)	T6	A40	0.01	%	U	001-002,004-005,007
Sulphide	T4	AR	10	mg/kg	N	001-002,004-005,007
Arsenic	T6	M40	2	mg/kg	M	001-002,004-005,007
Cadmium	T6	M40	1	mg/kg	M	001-002,004-005,007
Chromium	T6	M40	1	mg/kg	M	001-002,004-005,007
Iron	T6	A40	1	mg/kg	U	001-002,004-005,007
Lead	T6	M40	1	mg/kg	M	001-002,004-005,007
Manganese	T6	M40	1	mg/kg	M	001-002,004-005,007
Mercury	T6	M40	1	mg/kg	M	001-002,004-005,007
Nickel	T6	M40	1	mg/kg	M	001-002,004-005,007
Selenium	T6	M40	3	mg/kg	M	001-002,004-005,007
Copper	T6	M40	1	mg/kg	M	001-002,004-005,007
Zinc	T6	M40	1	mg/kg	M	001-002,004-005,007
Boron (water-soluble)	T6	AR	1	mg/kg	N	001-002,004-005,007
Naphthalene	T207	M105	0.1	mg/kg	M	001-002,004-005,007
Acenaphthylene	T207	AR	0.1	mg/kg	U	001-002,004-005,007
Acenaphthene	T207	M105	0.1	mg/kg	M	001-002,004-005,007
Fluorene	T207	M105	0.1	mg/kg	M	001-002,004-005,007
Phenanthrene	T207	M105	0.1	mg/kg	M	001-002,004-005,007
Anthracene	T207	AR	0.1	mg/kg	U	001-002,004-005,007
Fluoranthene	T207	M105	0.1	mg/kg	M	001-002,004-005,007
Pyrene	T207	M105	0.1	mg/kg	M	001-002,004-005,007
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	M	001-002,004-005,007
Chrysene	T207	M105	0.1	mg/kg	M	001-002,004-005,007
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	M	001-002,004-005,007
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	M	001-002,004-005,007
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	M	001-002,004-005,007
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	M	001-002,004-005,007
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	M	001-002,004-005,007
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	M	001-002,004-005,007
PAH(total)	T207	AR	0.1	mg/kg	U	001-002,004-005,007
TPH (C5-C6 aliphatic)	T209	AR	100	µg/kg	N	001-002,004-005,007
TPH (C6-C8 aliphatic)	T209	AR	100	µg/kg	N	001-002,004-005,007
TPH (C8-C10 aliphatic)	T209	AR	100	µg/kg	N	001-002,004-005,007
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	M	001-002,004-005,007
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	M	001-002,004-005,007
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	M	001-002,004-005,007
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	M	001-002,004-005,007
TPH (C6-C7 aromatic)	T209	AR	100	µg/kg	N	001-002,004-005,007
TPH (C7-C8 aromatic)	T209	AR	100	µg/kg	N	001-002,004-005,007
TPH (C8-C10 aromatic)	T209	AR	100	µg/kg	N	001-002,004-005,007
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	M	001-002,004-005,007
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	M	001-002,004-005,007
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	M	001-002,004-005,007
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	M	001-002,004-005,007
TPH (Aliphatic) total	T85	M105		mg/kg	N	001-002,004-005,007
TPH (Aromatic) total	T85	M105		mg/kg	N	001-002,004-005,007
TPH (Aliphatic+Aromatic) (sum)	T85	M105		mg/kg	N	001-002,004-005,007

CONCEPT LIFE SCIENCES
DELIVERING SCIENCE

Concept Life Sciences is a trading name of Concept Life Sciences Analytical & Development Services Limited registered in England and Wales (No 2514788)

Concept Life Sciences

Certificate of Analysis

Hadfield House
Hadfield Street
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Manchester
M16 9FE
Tel : 0161 874 2400
Fax : 0161 874 2468

Report Number: Second Supplemental A 707552-2

Date of Report: 25-Jun-2018

Customer: Fugro GeoServices
Fugro House
Hithercroft Road
Wallingford
Oxfordshire
OX10 9RB

Customer Contact: Ms Karen Blackmore

Customer Job Reference:
Customer Purchase Order: 56642KB-WAL
Customer Site Reference: HEP Package 3
Date Job Received at Concept: 30-Nov-2017
Date Analysis Started: 10-Jan-2018
Date Analysis Completed: 30-Jan-2018

The results reported relate to samples received in the laboratory and may not be representative of a whole batch.

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation

This report should not be reproduced except in full without the written approval of the laboratory

Tests covered by this certificate were conducted in accordance with Concept Life Sciences SOPs

All results have been reviewed in accordance with Section 25 of the Concept Life Sciences, Analytical Services Quality Manual

UKAS TESTING
1549

Report checked
and authorised by :
Sara Abou-Shakra
Customer Service Manager

Issued by :
Sara Abou-Shakra
Customer Service Manager

Summary Of Results

Soil

Dioxins

Corrected to 0% Moisture

				WHO2005 Toxic Equivalents ng/kg		WHO Toxic Equivalents ng/kg	
Concept Reference	**Customer Sample Reference**	**Analysis**	**Symbol**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**
707552 002	HEP-BH-1861	Dioxins and Furans (Based on US EPA 1613)	U	13	**23**	16	**25**
		Poly-Chlorinated Biphenyls (WHO 12)	U	1300	**66000**	3200	**67000**
			Sum :	1300	**66000**	3200	**67000**

Soil

Customer Sample Reference : HEP-BH-1861
Our Sample Reference : 707552 002
Moisture Content : 7.48 %
Top Depth : 4.00
Depth : 4.00
Hole ID : HEP-BH-1861
Date Sampled : 28-NOV-2017
Time Sampled : 09:30
AGS Type : ES
AGS Sample ID : FES2171128004
AGS Sample Reference : 15
Matrix Class : Sandy Soil

Dioxins and Furans (Based on US EPA 1613)

Technique : GC/MS (HR)

						WHO2005 Toxic Equivalents ng/kg		WHO Toxic Equivalents ng/kg	
Determinand	**Symbol**	**Result ng/kg As Received @7.5% Moisture**	**LOD As Received @7.5% Moisture**	**Lower Bound ng/kg @ 0% Moisture**	**LOD @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**
2,3,7,8-TCDD	U	<2.0	2.0	<2.2	2.2	0.0	**2.2**	0.0	**2.2**
1,2,3,7,8-PeCDD	U	<4.0	4.0	<4.3	4.3	0.0	**4.3**	0.0	**4.3**
1,2,3,4,7,8-HxCDD	U	<8.0	8.0	<8.6	8.6	0.0	**0.86**	0.0	**0.86**
1,2,3,6,7,8-HxCDD	U	<8.5	8.5	<9.2	9.2	0.0	**0.92**	0.0	**0.92**
1,2,3,7,8,9-HxCDD	U	<8.0	8.0	<8.6	8.6	0.0	**0.86**	0.0	**0.86**
1,2,3,4,6,7,8-HpCDD	U	**170**	1.5	180	1.6	1.8	**1.8**	1.8	**1.8**
OCDD	U	**2100**	2.6	2300	2.8	0.68	**0.68**	0.23	**0.23**
					Dioxins Totals :	2.5	**12**	2.1	**11**
2,3,7,8-TCDF	U	**5.4**	1.0	5.8	1.1	0.58	**0.58**	0.58	**0.58**
1,2,3,7,8-PeCDF	U	**9.5**	1.2	10	1.3	0.31	**0.31**	0.51	**0.51**
2,3,4,7,8-PeCDF	U	**11**	1.1	12	1.2	3.6	**3.6**	5.9	**5.9**
1,2,3,4,7,8-HxCDF	U	**17**	0.83	18	0.90	1.8	**1.8**	1.8	**1.8**
1,2,3,6,7,8-HxCDF	U	**16**	0.92	17	0.99	1.7	**1.7**	1.7	**1.7**
2,3,4,6,7,8-HxCDF	U	**17**	0.95	18	1.0	1.8	**1.8**	1.8	**1.8**
1,2,3,7,8,9-HxCDF	U	<5.0	5.0	<5.4	5.4	0.0	**0.54**	0.0	**0.54**
1,2,3,4,6,7,8-HpCDF	U	**91**	1.9	98	2.1	0.98	**0.98**	0.98	**0.98**
1,2,3,4,7,8,9-HpCDF	U	**8.8**	1.9	9.5	2.1	0.095	**0.095**	0.095	**0.095**
OCDF	U	**78**	2.1	84	2.3	0.025	**0.025**	0.0084	**0.0084**
					Furans Totals :	11	**12**	14	**14**
					Totals :	**13**	**23**	**16**	**25**

Poly-Chlorinated Biphenyls (WHO 12)

Technique : GC/MS (HR)

						WHO2005 Toxic Equivalents ng/kg		WHO Toxic Equivalents ng/kg	
Determinand	**Symbol**	**Result ng/kg As Received @7.5% Moisture**	**LOD As Received @7.5% Moisture**	**Lower Bound ng/kg @ 0% Moisture**	**LOD @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**
PCB BZ#77	U	**6000000**	410000	6500000	440000	650	**650**	650	**650**
PCB BZ#81	U	**410000**	410000	440000	440000	130	**130**	44	**44**
PCB BZ#105	U	**3300000**	190000	3600000	210000	110	**110**	360	**360**
PCB BZ#114	U	**330000**	44000	360000	48000	11	**11**	180	**180**

PCB BZ#118	U	**11000000**	230000	12000000	250000	360	**360**	1200	**1200**
PCB BZ#123	U	<1400000	1400000	<1500000	1500000	0.0	**45**	0.0	**150**
PCB BZ#126	U	<590000	590000	<640000	640000	0.0	**64000**	0.0	**64000**
PCB BZ#156	U	**1100000**	28000	1200000	30000	36	**36**	590	**590**
PCB BZ#157	U	**260000**	28000	280000	30000	8.4	**8.4**	140	**140**
PCB BZ#167	U	**1100000**	28000	1200000	30000	36	**36**	12	**12**
PCB BZ#169	U	<28000	28000	<30000	30000	0.0	**910**	0.0	**300**
PCB BZ#189	U	<120000	120000	<130000	130000	0.0	**3.9**	0.0	**13**
					Totals :	**1300**	**66000**	**3200**	**67000**

Concept Reference: 707552
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**707552 001**	**707552 002**	**707552 004**	**707552 005**	**707552 007**
				Customer Sample Reference	**HEP-BH-1861**	**HEP-BH-1861**	**HEP-BH-1861**	**HEP-BH-1861**	**HEP-BH-1861**
				Test Sample	**AR**	**AR**	**AR**	**AR**	**AR**
				Hole ID	**HEP-BH-1861**	**HEP-BH-1861**	**HEP-BH-1861**	**HEP-BH-1861**	**HEP-BH-1861**
				Top Depth	**3.00**	**4.00**	**6.00**	**7.00**	**9.00**
				Depth	**3.00**	**4.00**	**6.00**	**7.00**	**9.00**
				Date Sampled	**28-NOV-2017**	**28-NOV-2017**	**28-NOV-2017**	**28-NOV-2017**	**28-NOV-2017**
				Time Sampled	**09:00**	**09:30**	**11:00**	**11:45**	**13:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**FES2171128001**	**FES2171128004**	**FES2171128010**	**FES2171128014**	**FES2171128021**
				AGS Sample Reference	**12**	**15**	**21**	**25**	**32**
				Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Clay**	**Clay**
Determinand	**Method**	**LOD**	**Units**	**Symbol**					
Moisture @105C	Grav (1 Dec) (105 C)	0.1	%	N	**16**	**7.5**	**31**	**20**	**17**

Concept Reference: 707552
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**707552 001**	**707552 002**	**707552 004**	**707552 005**	**707552 007**
				Customer Sample Reference	**HEP-BH-1861**	**HEP-BH-1861**	**HEP-BH-1861**	**HEP-BH-1861**	**HEP-BH-1861**
				Test Sample	**M40**	**M40**	**M40**	**M40**	**M40**
				Hole ID	**HEP-BH-1861**	**HEP-BH-1861**	**HEP-BH-1861**	**HEP-BH-1861**	**HEP-BH-1861**
				Top Depth	**3.00**	**4.00**	**6.00**	**7.00**	**9.00**
				Depth	**3.00**	**4.00**	**6.00**	**7.00**	**9.00**
				Date Sampled	**28-NOV-2017**	**28-NOV-2017**	**28-NOV-2017**	**28-NOV-2017**	**28-NOV-2017**
				Time Sampled	**09:00**	**09:30**	**11:00**	**11:45**	**13:00**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**FES2171128001**	**FES2171128004**	**FES2171128010**	**FES2171128014**	**FES2171128021**
				AGS Sample Reference	**12**	**15**	**21**	**25**	**32**
				Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Clay**	**Clay**
Determinand	**Method**	**LOD**	**Units**	**Symbol**					
Retained on 10mm sieve	Grav	0.1	%	N	<0.1	<0.1	<0.1	<0.1	<0.1

Index to symbols used in Second Supplemental A 707552-2

Value	Description
AR	As Received
M40	Analysis conducted on sample assisted dried at no more than 40C. Results are reported on a dry weight basis.
U	Analysis is UKAS accredited
N	Analysis is not UKAS accredited

Notes

Second Supplemental A to report Dioxins and PCBS only.

CONCEPT LIFE SCIENCES
DELIVERING SCIENCE

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Concept Life Sciences

Certificate of Analysis

Hadfield House
Hadfield Street
Cornbrook
Manchester
M16 9FE
Tel : 0161 874 2400
Fax : 0161 874 2468

Report Number: Second Supplemental B 708032-3

Date of Report: 25-Jun-2018

Customer: Fugro GeoServices
Fugro House
Hithercroft Road
Wallingford
Oxfordshire
OX10 9RB

Customer Contact: Ms Karen Blackmore

Customer Job Reference:
Customer Purchase Order: 56642KB-WAL
Customer Site Reference: HEP Package 3
Date Job Received at Concept: 11-Jan-2018
Date Analysis Started: 11-Jan-2018
Date Analysis Completed: 20-Mar-2018

The results reported relate to samples received in the laboratory and may not be representative of a whole batch.

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation

This report should not be reproduced except in full without the written approval of the laboratory

Tests covered by this certificate were conducted in accordance with Concept Life Sciences SOPs

All results have been reviewed in accordance with Section 25 of the Concept Life Sciences, Analytical Services Quality Manual

UKAS TESTING
1549

mCERTS
THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME

Report checked
and authorised by :
Sara Abou-Shakra
Customer Service Manager

Issued by :
Sara Abou-Shakra
Customer Service Manager

Concept Reference: 708032
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

Concept Reference	**708032 003**	**708032 005**	**708032 006**	**708032 007**	**708032 013**
Customer Sample Reference	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-85**
Top Depth	**0.3**	**0.9**	**1.2**	**2.1**	**0.6**
Hole ID	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-85**
Depth	**0.3**	**0.9**	**1.2**	**2.1**	**0.6**
Date Sampled	**04-JAN-2018**	**04-JAN-2018**	**04-JAN-2018**	**04-JAN-2018**	**08-JAN-2018**
Time Sampled	**09:50**	**11:00**	**13:50**	**14:15**	**14:55**
AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**HEPBH7720180104001**	**HEPBH7720180104003**	**HEPBH7720180104004**	**HEPBH7720180104005**	**HEPBH8520180108002**
AGS Sample Reference	**1**	**7**	**9**	**13**	**5**
Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Fill**	**Sandy Soil**

Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Moisture @105C	T162	AR	0.1	%	**9.9**	**10**	**6.9**	**5.5**	**9.9**
Retained on 10mm sieve	T2	M40	0.1	%	<0.1	<0.1	<0.1	<0.1	<0.1

Concept Reference: 708032
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

Concept Reference	**708032 014**	**708032 016**
Customer Sample Reference	**HEP-BH-85**	**HEP-BH-85**
Top Depth	**1.5**	**3.1**
Hole ID	**HEP-BH-85**	**HEP-BH-85**
Depth	**1.5**	**3.1**
Date Sampled	**09-JAN-2018**	**09-JAN-2018**
Time Sampled	**10:20**	**11:15**
AGS Type	**ES**	**ES**
AGS Sample ID	**FES1180109001**	**FES1180110003**
AGS Sample Reference	**8**	**16**
Matrix Class	**Sandy Soil**	**Fill**

Determinand	**Method**	**Test Sample**	**LOD**	**Units**		
Moisture @105C	T162	AR	0.1	%	**15**	**1.7**
Retained on 10mm sieve	T2	M40	0.1	%	<0.1	<0.1

Concept Reference: 708032
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Inorganics

Concept Reference	**708032 003**	**708032 005**	**708032 006**	**708032 007**	**708032 013**
Customer Sample Reference	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-85**
Top Depth	**0.3**	**0.9**	**1.2**	**2.1**	**0.6**
Hole ID	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-85**
Depth	**0.3**	**0.9**	**1.2**	**2.1**	**0.6**
Date Sampled	**04-JAN-2018**	**04-JAN-2018**	**04-JAN-2018**	**04-JAN-2018**	**08-JAN-2018**
Time Sampled	**09:50**	**11:00**	**13:50**	**14:15**	**14:55**
AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**HEPBH7720180104001**	**HEPBH7720180104003**	**HEPBH7720180104004**	**HEPBH7720180104005**	**HEPBH8520180108002**
AGS Sample Reference	**1**	**7**	**9**	**13**	**5**
Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Fill**	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units					
Chloride	T686	AR	1	mg/kg	**17**	**14**	**8**	**2**	**8**
Cyanide(Total)	T4	AR	1	mg/kg	<1	**1**	**2**	<1	**1**
Thiocyanate	T4	A40	1	mg/kg	<10	<10	<10	<10	<10
Nitrate	T686	AR	1	mg/kg	**4**	**29**	**25**	**3**	**12**
Nitrite	T686	AR	1	mg/kg	<1	<1	<1	<1	<1
SO4(Total)	T6	A40	0.01	%	**0.36**	**0.45**	**0.20**	**0.02**	**0.19**
Sulphide	T4	AR	10	mg/kg	**69**	**11**	**18**	<10	**21**

Concept Reference: 708032
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Inorganics

Concept Reference	**708032 014**	**708032 016**
Customer Sample Reference	**HEP-BH-85**	**HEP-BH-85**
Top Depth	**1.5**	**3.1**
Hole ID	**HEP-BH-85**	**HEP-BH-85**
Depth	**1.5**	**3.1**
Date Sampled	**09-JAN-2018**	**09-JAN-2018**
Time Sampled	**10:20**	**11:15**
AGS Type	**ES**	**ES**
AGS Sample ID	**FES1180109001**	**FES1180110003**
AGS Sample Reference	**8**	**16**
Matrix Class	**Sandy Soil**	**Fill**

Determinand	Method	Test Sample	LOD	Units		
Chloride	T686	AR	1	mg/kg	**8**	**3**
Cyanide(Total)	T4	AR	1	mg/kg	<1	**2**
Thiocyanate	T4	A40	1	mg/kg	<10	<10
Nitrate	T686	AR	1	mg/kg	**2**	**3**
Nitrite	T686	AR	1	mg/kg	<1	<1
SO4(Total)	T6	A40	0.01	%	<0.01	**0.03**
Sulphide	T4	AR	10	mg/kg	<10	<10

Concept Reference: 708032
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Misc

				Concept Reference	**708032 003**	**708032 005**	**708032 006**	**708032 007**	**708032 013**
				Customer Sample Reference	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-85**
				Top Depth	**0.3**	**0.9**	**1.2**	**2.1**	**0.6**
				Hole ID	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-85**
				Depth	**0.3**	**0.9**	**1.2**	**2.1**	**0.6**
				Date Sampled	**04-JAN-2018**	**04-JAN-2018**	**04-JAN-2018**	**04-JAN-2018**	**08-JAN-2018**
				Time Sampled	**09:50**	**11:00**	**13:50**	**14:15**	**14:55**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH7720180104001**	**HEPBH7720180104003**	**HEPBH7720180104004**	**HEPBH7720180104005**	**HEPBH8520180108002**
				AGS Sample Reference	**1**	**7**	**9**	**13**	**5**
				Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Fill**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Soil Organic Matter	T287	A40	0.1	%	**4.2**	**3.2**	**4.0**	**0.2**	**2.5**
pH	T7	AR			**10.9**	**7.8**	**9.7**	**8.2**	**7.8**

Concept Reference: 708032
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Misc

				Concept Reference	**708032 014**	**708032 016**
				Customer Sample Reference	**HEP-BH-85**	**HEP-BH-85**
				Top Depth	**1.5**	**3.1**
				Hole ID	**HEP-BH-85**	**HEP-BH-85**
				Depth	**1.5**	**3.1**
				Date Sampled	**09-JAN-2018**	**09-JAN-2018**
				Time Sampled	**10:20**	**11:15**
				AGS Type	**ES**	**ES**
				AGS Sample ID	**FES1180109001**	**FES1180110003**
				AGS Sample Reference	**8**	**16**
				Matrix Class	**Sandy Soil**	**Fill**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**		
Soil Organic Matter	T287	A40	0.1	%	<0.1	**0.3**
pH	T7	AR			**8.6**	**8.4**

Concept Reference: 708032
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings Metals and Metalloids

Concept Reference	**708032 003**	**708032 005**	**708032 006**	**708032 007**	**708032 013**
Customer Sample Reference	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-85**
Top Depth	**0.3**	**0.9**	**1.2**	**2.1**	**0.6**
Hole ID	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-85**
Depth	**0.3**	**0.9**	**1.2**	**2.1**	**0.6**
Date Sampled	**04-JAN-2018**	**04-JAN-2018**	**04-JAN-2018**	**04-JAN-2018**	**08-JAN-2018**
Time Sampled	**09:50**	**11:00**	**13:50**	**14:15**	**14:55**
AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**HEPBH7720180104001**	**HEPBH7720180104003**	**HEPBH7720180104004**	**HEPBH7720180104005**	**HEPBH8520180108002**
AGS Sample Reference	**1**	**7**	**9**	**13**	**5**
Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Fill**	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units					
Arsenic	T6	M40	2	mg/kg	**12**	**15**	**15**	**4.0**	**14**
Cadmium	T6	M40	1	mg/kg	<1	<1	**1**	<1	<1
Chromium	T6	M40	1	mg/kg	**24**	**26**	**31**	**27**	**25**
Chromium VI	T6	AR	1	mg/kg	**2**	<1	<1	<1	<1
Chromium (trivalent)	T85	AR	2	mg/kg	**22**	**26**	**31**	**27**	**25**
Iron	T6	A40	1	mg/kg	**14000**	**22000**	**27000**	**6900**	**24000**
Lead	T6	M40	1	mg/kg	**69**	**310**	**480**	**22**	**42**
Manganese	T6	M40	1	mg/kg	**390**	**300**	**350**	**76**	**380**
Mercury	T6	M40	1	mg/kg	<1	<1	<1	<1	<1
Nickel	T6	M40	1	mg/kg	**19**	**21**	**24**	**12**	**17**
Selenium	T6	M40	3	mg/kg	<3	<3	<3	<3	<3
Copper	T6	M40	1	mg/kg	**21**	**31**	**59**	**9**	**18**
Zinc	T6	M40	1	mg/kg	**120**	**180**	**170**	**31**	**62**
Boron (water-soluble)	T6	AR	1	mg/kg	<1	<1	<1	<1	<1

Concept Reference: 708032
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings Metals and Metalloids

Concept Reference	**708032 014**	**708032 016**
Customer Sample Reference	**HEP-BH-85**	**HEP-BH-85**
Top Depth	**1.5**	**3.1**
Hole ID	**HEP-BH-85**	**HEP-BH-85**
Depth	**1.5**	**3.1**
Date Sampled	**09-JAN-2018**	**09-JAN-2018**
Time Sampled	**10:20**	**11:15**
AGS Type	**ES**	**ES**
AGS Sample ID	**FES1180109001**	**FES1180110003**
AGS Sample Reference	**8**	**16**
Matrix Class	**Sandy Soil**	**Fill**

Determinand	Method	Test Sample	LOD	Units		
Arsenic	T6	M40	2	mg/kg	**5**	**7.6**
Cadmium	T6	M40	1	mg/kg	<1	<1
Chromium	T6	M40	1	mg/kg	**13**	**23**
Chromium VI	T6	AR	1	mg/kg	<1	<1
Chromium (trivalent)	T85	AR	2	mg/kg	**13**	**23**
Iron	T6	A40	1	mg/kg	**14000**	**16000**
Lead	T6	M40	1	mg/kg	**5**	**10**
Manganese	T6	M40	1	mg/kg	**120**	**150**
Mercury	T6	M40	1	mg/kg	<1	<1
Nickel	T6	M40	1	mg/kg	**8**	**13**
Selenium	T6	M40	3	mg/kg	<3	<3
Copper	T6	M40	1	mg/kg	**4**	**8**
Zinc	T6	M40	1	mg/kg	**14**	**22**
Boron (water-soluble)	T6	AR	1	mg/kg	<1	<1

Concept Reference: 708032
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Chromium

				Concept Reference	**708032 003**	**708032 005**	**708032 006**	**708032 007**	**708032 013**
				Customer Sample Reference	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-85**
				Top Depth	**0.3**	**0.9**	**1.2**	**2.1**	**0.6**
				Hole ID	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-85**
				Depth	**0.3**	**0.9**	**1.2**	**2.1**	**0.6**
				Date Sampled	**04-JAN-2018**	**04-JAN-2018**	**04-JAN-2018**	**04-JAN-2018**	**08-JAN-2018**
				Time Sampled	**09:50**	**11:00**	**13:50**	**14:15**	**14:55**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH7720180104001**	**HEPBH7720180104003**	**HEPBH7720180104004**	**HEPBH7720180104005**	**HEPBH8520180108002**
				AGS Sample Reference	**1**	**7**	**9**	**13**	**5**
				Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Fill**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Chromium (trivalent)	T85	AR	2	mg/kg	**22**	**26**	**31**	**27**	**25**
Chromium VI	T6	AR	1	mg/kg	**2**	<1	<1	<1	<1

Concept Reference: 708032
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Chromium

				Concept Reference	**708032 014**	**708032 016**
				Customer Sample Reference	**HEP-BH-85**	**HEP-BH-85**
				Top Depth	**1.5**	**3.1**
				Hole ID	**HEP-BH-85**	**HEP-BH-85**
				Depth	**1.5**	**3.1**
				Date Sampled	**09-JAN-2018**	**09-JAN-2018**
				Time Sampled	**10:20**	**11:15**
				AGS Type	**ES**	**ES**
				AGS Sample ID	**FES1180109001**	**FES1180110003**
				AGS Sample Reference	**8**	**16**
				Matrix Class	**Sandy Soil**	**Fill**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**		
Chromium (trivalent)	T85	AR	2	mg/kg	**13**	**23**
Chromium VI	T6	AR	1	mg/kg	<1	<1

Concept Reference: 708032
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Total Phenol

				Concept Reference	**708032 003**	**708032 005**	**708032 006**	**708032 007**	**708032 013**
				Customer Sample Reference	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-85**
				Top Depth	**0.3**	**0.9**	**1.2**	**2.1**	**0.6**
				Hole ID	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-85**
				Depth	**0.3**	**0.9**	**1.2**	**2.1**	**0.6**
				Date Sampled	**04-JAN-2018**	**04-JAN-2018**	**04-JAN-2018**	**04-JAN-2018**	**08-JAN-2018**
				Time Sampled	**09:50**	**11:00**	**13:50**	**14:15**	**14:55**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH7720180104001**	**HEPBH7720180104003**	**HEPBH7720180104004**	**HEPBH7720180104005**	**HEPBH8520180108002**
				AGS Sample Reference	**1**	**7**	**9**	**13**	**5**
				Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Fill**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Phenols(Mono)	T4	AR	0.5	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0

Concept Reference: 708032
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Total Phenol

Concept Reference	**708032 014**	**708032 016**
Customer Sample Reference	**HEP-BH-85**	**HEP-BH-85**
Top Depth	**1.5**	**3.1**
Hole ID	**HEP-BH-85**	**HEP-BH-85**
Depth	**1.5**	**3.1**
Date Sampled	**09-JAN-2018**	**09-JAN-2018**
Time Sampled	**10:20**	**11:15**
AGS Type	**ES**	**ES**
AGS Sample ID	**FES1180109001**	**FES1180110003**
AGS Sample Reference	**8**	**16**
Matrix Class	**Sandy Soil**	**Fill**

Determinand	Method	Test Sample	LOD	Units		
Phenols(Mono)	T4	AR	0.5	mg/kg	<1.0	<1.0

Concept Reference: 708032
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Asbestos

Concept Reference	**708032 003**	**708032 005**	**708032 006**	**708032 007**	**708032 013**
Customer Sample Reference	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-85**
Top Depth	**0.3**	**0.9**	**1.2**	**2.1**	**0.6**
Hole ID	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-85**
Depth	**0.3**	**0.9**	**1.2**	**2.1**	**0.6**
Date Sampled	**04-JAN-2018**	**04-JAN-2018**	**04-JAN-2018**	**04-JAN-2018**	**08-JAN-2018**
Time Sampled	**09:50**	**11:00**	**13:50**	**14:15**	**14:55**
AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**HEPBH7720180104001**	**HEPBH7720180104003**	**HEPBH7720180104004**	**HEPBH7720180104005**	**HEPBH8520180108002**
AGS Sample Reference	**1**	**7**	**9**	**13**	**5**
Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Fill**	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units				
Asbestos ID	T27	AR			N.D.	N.D.	Chrysotile Detected Crocidolite Detected	N.D.	N.D.

Concept Reference: 708032
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Asbestos

Concept Reference	**708032 014**	**708032 016**
Customer Sample Reference	**HEP-BH-85**	**HEP-BH-85**
Top Depth	**1.5**	**3.1**
Hole ID	**HEP-BH-85**	**HEP-BH-85**
Depth	**1.5**	**3.1**
Date Sampled	**09-JAN-2018**	**09-JAN-2018**
Time Sampled	**10:20**	**11:15**
AGS Type	**ES**	**ES**
AGS Sample ID	**FES1180109001**	**FES1180110003**
AGS Sample Reference	**8**	**16**
Matrix Class	**Sandy Soil**	**Fill**

Determinand	Method	Test Sample	LOD	Units		
Asbestos ID	T27	AR			N.D.	N.D.

Concept Reference: 708032
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
MRPS by GC (CSOPP611)

Concept Reference	**708032 013**	**708032 014**
Customer Sample Reference	**HEP-BH-85**	**HEP-BH-85**
Top Depth	**0.6**	**1.5**
Hole ID	**HEP-BH-85**	**HEP-BH-85**
Depth	**0.6**	**1.5**
Date Sampled	**08-JAN-2018**	**09-JAN-2018**
Time Sampled	**14:55**	**10:20**
AGS Type	**ES**	**ES**
AGS Sample ID	**HEPBH85201801080 02**	**FES1180109001**
AGS Sample Reference	**5**	**8**
Matrix Class	**Sandy Soil**	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units		
2,4,6-Trichlorophenol	T826	AR	0.01	mg/kg	<0.01	<0.01
2-Methyl-4,6-dinitrophenol	T826	AR	0.01	mg/kg	<0.01	<0.01
2-Phenylphenol	T826	AR	0.01	mg/kg	<0.01	<0.01
9,10-Anthraquinone	T826	AR	0.01	mg/kg	<0.01	<0.01
Acetochlor	T826	AR	0.01	mg/kg	<0.01	<0.01
Aclonifen	T826	AR	0.01	mg/kg	<0.01	<0.01
Acrinathrin	T826	AR	0.01	mg/kg	<0.01	<0.01
Alachlor	T826	AR	0.01	mg/kg	<0.01	<0.01
Aldrin	T826	AR	0.01	mg/kg	<0.01	<0.01
Ametryn	T826	AR	0.01	mg/kg	<0.01	<0.01
Atraton	T826	AR	0.01	mg/kg	<0.01	<0.01
Atrazine	T826	AR	0.01	mg/kg	<0.01	<0.01
Azaconazole	T826	AR	0.01	mg/kg	<0.01	<0.01
Azobenzene	T826	AR	0.01	mg/kg	<0.01	<0.01
Azoxystrobin	T826	AR	0.01	mg/kg	<0.01	<0.01
Benalaxyl	T826	AR	0.01	mg/kg	<0.01	<0.01
Benfluralin	T826	AR	0.01	mg/kg	<0.01	<0.01
Bifenox	T826	AR	0.01	mg/kg	<0.01	<0.01
Bifenthrin	T826	AR	0.01	mg/kg	<0.01	<0.01
Binapacryl	T826	AR	0.01	mg/kg	(278) <0.01	(278) <0.01
Biphenyl	T826	AR	0.01	mg/kg	(278) <0.01	(278) <0.01
Bitertanol	T826	AR	0.01	mg/kg	<0.01	<0.01
Boscalid	T826	AR	0.01	mg/kg	<0.01	<0.01
Bromacil	T826	AR	0.01	mg/kg	<0.01	<0.01
Bromophos	T826	AR	0.01	mg/kg	<0.01	<0.01
Bromophos-Ethyl	T826	AR	0.01	mg/kg	<0.01	<0.01
Bromopropylate	T826	AR	0.01	mg/kg	<0.01	<0.01
Bupirimate	T826	AR	0.01	mg/kg	<0.01	<0.01
Buprofezine	T826	AR	0.01	mg/kg	<0.01	<0.01
Butachlor	T826	AR	0.01	mg/kg	<0.01	<0.01
Cadusafos	T826	AR	0.01	mg/kg	<0.01	<0.01
Captan	T826	AR	0.01	mg/kg	<0.01	<0.01
Carbaryl	T826	AR	0.01	mg/kg	<0.01	<0.01
Carbophenothion	T826	AR	0.01	mg/kg	<0.01	<0.01
Carboxine	T826	AR	0.01	mg/kg	<0.01	<0.01
Carfentrazone Ethyl	T826	AR	0.01	mg/kg	<0.01	<0.01
Chlorbenzilate	T826	AR	0.01	mg/kg	<0.01	<0.01
Chlorbufam	T826	AR	0.01	mg/kg	<0.01	<0.01
Chlordane	T826	AR	0.01	mg/kg	<0.01	<0.01
Chlordimeform	T826	AR	0.01	mg/kg	<0.01	<0.01
Chlorethoxyfos	T826	AR	0.01	mg/kg	<0.01	<0.01
Chlorfenapyr	T826	AR	0.01	mg/kg	<0.01	<0.01
Chlorfenson	T826	AR	0.01	mg/kg	<0.01	<0.01
Chlorfenvinphos	T826	AR	0.01	mg/kg	<0.01	<0.01
Chlormephos	T826	AR	0.01	mg/kg	<0.01	<0.01
Chloropropylate	T826	AR	0.01	mg/kg	<0.01	<0.01
Chlorothalonil	T826	AR	0.01	mg/kg	<0.01	<0.01
Chlorpropham	T826	AR	0.01	mg/kg	<0.01	<0.01
Chlorpyrifos	T826	AR	0.01	mg/kg	<0.01	<0.01
Chlorpyrifos methyl	T826	AR	0.01	mg/kg	<0.01	<0.01
Chlorthal Dimethyl	T826	AR	0.01	mg/kg	<0.01	<0.01

Concept Reference: 708032
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
MRPS by GC (CSOPP611)

Concept Reference	**708032 013**	**708032 014**
Customer Sample Reference	**HEP-BH-85**	**HEP-BH-85**
Top Depth	**0.6**	**1.5**
Hole ID	**HEP-BH-85**	**HEP-BH-85**
Depth	**0.6**	**1.5**
Date Sampled	**08-JAN-2018**	**09-JAN-2018**
Time Sampled	**14:55**	**10:20**
AGS Type	**ES**	**ES**
AGS Sample ID	**HEPBH85201801080 02**	**FES1180109001**
AGS Sample Reference	**5**	**8**
Matrix Class	**Sandy Soil**	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units		
Chlorthion	T826	AR	0.01	mg/kg	<0.01	<0.01
Chlorthiophos	T826	AR	0.01	mg/kg	<0.01	<0.01
Chlozolinate	T826	AR	0.01	mg/kg	<0.01	<0.01
cis-1,2,3,6-Tetrahydrophthalimide	T826	AR	0.01	mg/kg	<0.01	<0.01
Clodinafop propargy	T826	AR	0.01	mg/kg	<0.01	<0.01
Clomazone	T826	AR	0.01	mg/kg	<0.01	<0.01
Cloquintocet mexyl	T826	AR	0.01	mg/kg	<0.01	<0.01
Coumaphos	T826	AR	0.01	mg/kg	<0.01	<0.01
Cyflufenamid	T826	AR	0.01	mg/kg	<0.01	<0.01
Cyfluthrin	T826	AR	0.01	mg/kg	<0.01	<0.01
Cypermethrin	T826	AR	0.01	mg/kg	<0.01	<0.01
Cyphenothrin	T826	AR	0.01	mg/kg	<0.01	<0.01
Cyproconazole	T826	AR	0.01	mg/kg	<0.01	<0.01
Cyprodinil	T826	AR	0.01	mg/kg	<0.01	<0.01
DEET	T826	AR	0.01	mg/kg	<0.01	<0.01
Deltamethrin	T826	AR	0.01	mg/kg	<0.01	<0.01
Desmetryn	T826	AR	0.01	mg/kg	<0.01	<0.01
Diafenthiuron	T826	AR	0.01	mg/kg	(278) <0.01	(278) <0.01
Dialifos	T826	AR	0.01	mg/kg	<0.01	<0.01
Diazinon	T826	AR	0.01	mg/kg	<0.01	<0.01
Dichlobenil	T826	AR	0.01	mg/kg	<0.01	<0.01
Dichlofenthion	T826	AR	0.01	mg/kg	<0.01	<0.01
Dichlorvos	T826	AR	0.01	mg/kg	<0.01	<0.01
Diclobutrazol	T826	AR	0.01	mg/kg	<0.01	<0.01
Dicloran	T826	AR	0.01	mg/kg	<0.01	<0.01
Dicofol	T826	AR	0.01	mg/kg	(278) <0.01	(278) <0.01
Dieldrin	T826	AR	0.01	mg/kg	<0.01	<0.01
Difenoconazole	T826	AR	0.01	mg/kg	<0.01	<0.01
Diflufenican	T826	AR	0.01	mg/kg	<0.01	<0.01
Dimethenamid	T826	AR	0.01	mg/kg	<0.01	<0.01
Dimethomorph	T826	AR	0.01	mg/kg	<0.01	<0.01
Dimoxystrobin	T826	AR	0.01	mg/kg	<0.01	<0.01
Dinoterb	T826	AR	0.01	mg/kg	<0.01	<0.01
Dioxabenzofos	T826	AR	0.01	mg/kg	(278) <0.01	(278) <0.01
Diphenamid	T826	AR	0.01	mg/kg	<0.01	<0.01
Diphenylamine	T826	AR	0.01	mg/kg	<0.01	<0.01
Disulfoton	T826	AR	0.01	mg/kg	<0.01	<0.01
Ditalimfos	T826	AR	0.01	mg/kg	<0.01	<0.01
Edifenphos	T826	AR	0.01	mg/kg	<0.01	<0.01
Endosulphan alpha	T826	AR	0.01	mg/kg	<0.01	<0.01
Endosulphan beta	T826	AR	0.01	mg/kg	<0.01	<0.01
Endosulphan sulphate	T826	AR	0.01	mg/kg	<0.01	<0.01
Endrin	T826	AR	0.01	mg/kg	<0.01	<0.01
Epn	T826	AR	0.01	mg/kg	<0.01	<0.01
Epoxiconazole	T826	AR	0.01	mg/kg	<0.01	<0.01
EPTC	T826	AR	0.01	mg/kg	<0.01	<0.01
Etaconazole	T826	AR	0.01	mg/kg	<0.01	<0.01
Ethion	T826	AR	0.01	mg/kg	<0.01	<0.01
Ethofumesate	T826	AR	0.01	mg/kg	<0.01	<0.01
Ethoprophos	T826	AR	0.01	mg/kg	<0.01	<0.01
Ethoxyquin	T826	AR	0.01	mg/kg	<0.01	<0.01

Concept Reference: 708032
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
MRPS by GC (CSOPP611)

Concept Reference	**708032 013**	**708032 014**
Customer Sample Reference	**HEP-BH-85**	**HEP-BH-85**
Top Depth	**0.6**	**1.5**
Hole ID	**HEP-BH-85**	**HEP-BH-85**
Depth	**0.6**	**1.5**
Date Sampled	**08-JAN-2018**	**09-JAN-2018**
Time Sampled	**14:55**	**10:20**
AGS Type	**ES**	**ES**
AGS Sample ID	**HEPBH85201801080 02**	**FES1180109001**
AGS Sample Reference	**5**	**8**
Matrix Class	**Sandy Soil**	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units		
Etofenprox	T826	AR	0.01	mg/kg	<0.01	<0.01
Etoxazole	T826	AR	0.01	mg/kg	<0.01	<0.01
Etridiazole	T826	AR	0.01	mg/kg	(278) <0.01	(278) <0.01
Etrimfos	T826	AR	0.01	mg/kg	<0.01	<0.01
Famoxadone	T826	AR	0.01	mg/kg	<0.01	<0.01
Famphur	T826	AR	0.01	mg/kg	<0.01	<0.01
Fenamidone	T826	AR	0.01	mg/kg	<0.01	<0.01
Fenamiphos	T826	AR	0.01	mg/kg	<0.01	<0.01
Fenarimol	T826	AR	0.01	mg/kg	<0.01	<0.01
Fenbuconazole	T826	AR	0.01	mg/kg	<0.01	<0.01
Fenchlorphos	T826	AR	0.01	mg/kg	<0.01	<0.01
Fenhexamid	T826	AR	0.01	mg/kg	<0.01	<0.01
Fenitrothion	T826	AR	0.01	mg/kg	<0.01	<0.01
Fenpiclonil	T826	AR	0.01	mg/kg	<0.01	<0.01
Fenpropathrin	T826	AR	0.01	mg/kg	<0.01	<0.01
Fenson	T826	AR	0.01	mg/kg	<0.01	<0.01
Fensulfothion	T826	AR	0.01	mg/kg	<0.01	<0.01
Fenthion	T826	AR	0.01	mg/kg	<0.01	<0.01
Fenvalerate	T826	AR	0.01	mg/kg	<0.01	<0.01
Fipronil	T826	AR	0.01	mg/kg	<0.01	<0.01
Fipronil sulphone	T826	AR	0.01	mg/kg	<0.01	<0.01
Flamprop isopropyl	T826	AR	0.01	mg/kg	<0.01	<0.01
Fluazifop-P-Butyl	T826	AR	0.01	mg/kg	<0.01	<0.01
Flucythrinate	T826	AR	0.01	mg/kg	<0.01	<0.01
Fludioxonil	T826	AR	0.01	mg/kg	<0.01	<0.01
Flufenacet	T826	AR	0.01	mg/kg	<0.01	<0.01
Flumetralin	T826	AR	0.01	mg/kg	<0.01	<0.01
Flumioxazin	T826	AR	0.01	mg/kg	<0.01	<0.01
Flumorph	T826	AR	0.01	mg/kg	<0.01	<0.01
Fluopyram	T826	AR	0.01	mg/kg	<0.01	<0.01
Fluquinconazole	T826	AR	0.01	mg/kg	<0.01	<0.01
Fluroxypyr-1-methylheptyl ester	T826	AR	0.01	mg/kg	<0.01	<0.01
Flusilazole	T826	AR	0.01	mg/kg	<0.01	<0.01
Flutolanil	T826	AR	0.01	mg/kg	<0.01	<0.01
Fluxapyroxad	T826	AR	0.01	mg/kg	<0.01	<0.01
Folpet	T826	AR	0.01	mg/kg	<0.01	<0.01
Fonophos	T826	AR	0.01	mg/kg	<0.01	<0.01
Formothion	T826	AR	0.01	mg/kg	<0.01	<0.01
Furalaxyl	T826	AR	0.01	mg/kg	<0.01	<0.01
Haloxyfop etotyl	T826	AR	0.01	mg/kg	<0.01	<0.01
Haloxyfop Methyl	T826	AR	0.01	mg/kg	<0.01	<0.01
Heptachlor	T826	AR	0.01	mg/kg	<0.01	<0.01
Heptachlor epoxide	T826	AR	0.01	mg/kg	<0.01	<0.01
Heptachlor exo Epoxide	T826	AR	0.01	mg/kg	<0.01	<0.01
Heptenophos	T826	AR	0.01	mg/kg	<0.01	<0.01
Hexachlorobenzene	T826	AR	0.01	mg/kg	<0.01	<0.01
Hexachlorocyclohexane (alpha)	T826	AR	0.01	mg/kg	<0.01	<0.01
Hexachlorocyclohexane (beta)	T826	AR	0.01	mg/kg	<0.01	<0.01
Hexachlorocyclohexane (delta)	T826	AR	0.01	mg/kg	<0.01	<0.01
Hexaconazole	T826	AR	0.01	mg/kg	<0.01	<0.01
Hexazinone	T826	AR	0.01	mg/kg	<0.01	<0.01

Concept Reference: 708032
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
MRPS by GC (CSOPP611)

Concept Reference	**708032 013**	**708032 014**
Customer Sample Reference	**HEP-BH-85**	**HEP-BH-85**
Top Depth	**0.6**	**1.5**
Hole ID	**HEP-BH-85**	**HEP-BH-85**
Depth	**0.6**	**1.5**
Date Sampled	**08-JAN-2018**	**09-JAN-2018**
Time Sampled	**14:55**	**10:20**
AGS Type	**ES**	**ES**
AGS Sample ID	**HEPBH85201801080 02**	**FES1180109001**
AGS Sample Reference	**5**	**8**
Matrix Class	**Sandy Soil**	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units		
Imazalil	T826	AR	0.01	mg/kg	<0.01	<0.01
Iodofenphos	T826	AR	0.01	mg/kg	<0.01	<0.01
Iprodione	T826	AR	0.01	mg/kg	<0.01	<0.01
Isazofos	T826	AR	0.01	mg/kg	<0.01	<0.01
Isocarbophos	T826	AR	0.01	mg/kg	<0.01	<0.01
Isodrin	T826	AR	0.01	mg/kg	<0.01	<0.01
Isofenphos	T826	AR	0.01	mg/kg	<0.01	<0.01
Isofenphos Methyl	T826	AR	0.01	mg/kg	<0.01	<0.01
Isomethiozin	T826	AR	0.01	mg/kg	<0.01	<0.01
Isoprothiolane	T826	AR	0.01	mg/kg	<0.01	<0.01
Isopyrazam	T826	AR	0.01	mg/kg	<0.01	<0.01
Isothiazolinone	T826	AR	0.01	mg/kg	<0.01	<0.01
Kresoxim Methyl	T826	AR	0.01	mg/kg	<0.01	<0.01
Lambda Cyhalothrin	T826	AR	0.01	mg/kg	<0.01	<0.01
Lenacil	T826	AR	0.01	mg/kg	<0.01	<0.01
Leptophos	T826	AR	0.01	mg/kg	<0.01	<0.01
Lindane	T826	AR	0.01	mg/kg	<0.01	<0.01
Malathion	T826	AR	0.01	mg/kg	<0.01	<0.01
MCPA-thioethyl	T826	AR	0.01	mg/kg	<0.01	<0.01
Mecarbam	T826	AR	0.01	mg/kg	<0.01	<0.01
Mepanipyrim	T826	AR	0.01	mg/kg	<0.01	<0.01
Mephosfolan	T826	AR	0.01	mg/kg	<0.01	<0.01
Mepronil	T826	AR	0.01	mg/kg	<0.01	<0.01
Metalaxyl	T826	AR	0.01	mg/kg	<0.01	<0.01
Metazachlor	T826	AR	0.01	mg/kg	<0.01	<0.01
Methacrifos	T826	AR	0.01	mg/kg	<0.01	<0.01
Methidathion	T826	AR	0.01	mg/kg	<0.01	<0.01
Methoxychlor	T826	AR	0.01	mg/kg	<0.01	<0.01
Methyl Paraoxon	T826	AR	0.01	mg/kg	<0.01	<0.01
Metolachlor	T826	AR	0.01	mg/kg	<0.01	<0.01
Metolcarb	T826	AR	0.01	mg/kg	<0.01	<0.01
Metrafenone	T826	AR	0.01	mg/kg	<0.01	<0.01
Metribuzin	T826	AR	0.01	mg/kg	<0.01	<0.01
Mevinphos	T826	AR	0.01	mg/kg	<0.01	<0.01
Mirex	T826	AR	0.01	mg/kg	<0.01	<0.01
Molinate	T826	AR	0.01	mg/kg	<0.01	<0.01
Myclobutanil	T826	AR	0.01	mg/kg	<0.01	<0.01
Napropamide	T826	AR	0.01	mg/kg	<0.01	<0.01
Nitrofen	T826	AR	0.01	mg/kg	<0.01	<0.01
Nitrothal isopropyl	T826	AR	0.01	mg/kg	<0.01	<0.01
Nuarimol	T826	AR	0.01	mg/kg	<0.01	<0.01
o,p'-DDT	T826	AR	0.01	mg/kg	<0.01	<0.01
Octhilinone	T826	AR	0.01	mg/kg	<0.01	<0.01
Ofurace	T826	AR	0.01	mg/kg	<0.01	<0.01
Orysastrobin	T826	AR	0.01	mg/kg	<0.01	<0.01
Oxadiazon	T826	AR	0.01	mg/kg	<0.01	<0.01
Oxadixyl	T826	AR	0.01	mg/kg	<0.01	<0.01
Oxyfluorfen	T826	AR	0.01	mg/kg	<0.01	<0.01
p,p-DDD	T826	AR	0.01	mg/kg	<0.01	<0.01
p,p-DDE	T826	AR	0.01	mg/kg	<0.01	<0.01
p,p-DDT	T826	AR	0.01	mg/kg	<0.01	<0.01

Concept Reference: 708032
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
MRPS by GC (CSOPP611)

Concept Reference	**708032 013**	**708032 014**
Customer Sample Reference	**HEP-BH-85**	**HEP-BH-85**
Top Depth	**0.6**	**1.5**
Hole ID	**HEP-BH-85**	**HEP-BH-85**
Depth	**0.6**	**1.5**
Date Sampled	**08-JAN-2018**	**09-JAN-2018**
Time Sampled	**14:55**	**10:20**
AGS Type	**ES**	**ES**
AGS Sample ID	**HEPBH85201801080 02**	**FES1180109001**
AGS Sample Reference	**5**	**8**
Matrix Class	**Sandy Soil**	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units		
Paclobutrazol	T826	AR	0.01	mg/kg	<0.01	<0.01
Paraoxon	T826	AR	0.01	mg/kg	<0.01	<0.01
Parathion	T826	AR	0.01	mg/kg	<0.01	<0.01
Parathion methyl	T826	AR	0.01	mg/kg	<0.01	<0.01
Penconazole	T826	AR	0.01	mg/kg	<0.01	<0.01
Pendimethalin	T826	AR	0.01	mg/kg	<0.01	<0.01
Pentachloroaniline	T826	AR	0.01	mg/kg	<0.01	<0.01
Pentachlorophenol	T826	AR	0.01	mg/kg	<0.01	<0.01
Pentanochlor	T826	AR	0.01	mg/kg	<0.01	<0.01
Permethrin	T826	AR	0.01	mg/kg	<0.01	<0.01
Pethoxamid	T826	AR	0.01	mg/kg	<0.01	<0.01
Phenothrin	T826	AR	0.01	mg/kg	<0.01	<0.01
Phenthoate	T826	AR	0.01	mg/kg	<0.01	<0.01
Phorate	T826	AR	0.01	mg/kg	<0.01	<0.01
Phosalone	T826	AR	0.01	mg/kg	<0.01	<0.01
Phosfolan	T826	AR	0.01	mg/kg	<0.01	<0.01
Phosmet	T826	AR	0.01	mg/kg	<0.01	<0.01
Phthalimide	T826	AR	0.01	mg/kg	<0.01	<0.01
Picoxystrobin	T826	AR	0.01	mg/kg	<0.01	<0.01
Piperonyl Butoxide	T826	AR	0.01	mg/kg	<0.01	<0.01
Pirimicarb	T826	AR	0.01	mg/kg	<0.01	<0.01
Pirimiphos Ethyl	T826	AR	0.01	mg/kg	<0.01	<0.01
Pirimiphos methyl	T826	AR	0.01	mg/kg	<0.01	<0.01
Pretilachlor	T826	AR	0.01	mg/kg	<0.01	<0.01
Prochloraz	T826	AR	0.01	mg/kg	<0.01	<0.01
Procymidone	T826	AR	0.01	mg/kg	<0.01	<0.01
Profenofos	T826	AR	0.01	mg/kg	<0.01	<0.01
Prometon	T826	AR	0.01	mg/kg	<0.01	<0.01
Prometryn	T826	AR	0.01	mg/kg	<0.01	<0.01
Propachlor	T826	AR	0.01	mg/kg	<0.01	<0.01
Propanil	T826	AR	0.01	mg/kg	<0.01	<0.01
Propaphos	T826	AR	0.01	mg/kg	<0.01	<0.01
Propargite	T826	AR	0.01	mg/kg	<0.01	<0.01
Propazine	T826	AR	0.01	mg/kg	<0.01	<0.01
Propetamphos	T826	AR	0.01	mg/kg	<0.01	<0.01
Propham	T826	AR	0.01	mg/kg	<0.01	<0.01
Propiconazole	T826	AR	0.01	mg/kg	<0.01	<0.01
Propyzamide	T826	AR	0.01	mg/kg	<0.01	<0.01
Proquinazid	T826	AR	0.01	mg/kg	<0.01	<0.01
Prosulfocarb	T826	AR	0.01	mg/kg	<0.01	<0.01
Prothiofos	T826	AR	0.01	mg/kg	<0.01	<0.01
Pyraclostrobin	T826	AR	0.01	mg/kg	<0.01	<0.01
Pyraflufen ethyl	T826	AR	0.01	mg/kg	<0.01	<0.01
Pyrazophos	T826	AR	0.01	mg/kg	<0.01	<0.01
Pyridaben	T826	AR	0.01	mg/kg	<0.01	<0.01
Pyridaphenthion	T826	AR	0.01	mg/kg	<0.01	<0.01
Pyrimethanil	T826	AR	0.01	mg/kg	<0.01	<0.01
Pyriproxyfen	T826	AR	0.01	mg/kg	<0.01	<0.01
Quinalphos	T826	AR	0.01	mg/kg	<0.01	<0.01
Quinoxyfen	T826	AR	0.01	mg/kg	<0.01	<0.01
Quintozene	T826	AR	0.01	mg/kg	<0.01	<0.01

Concept Reference: 708032
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
MRPS by GC (CSOPP611)

Concept Reference	**708032 013**	**708032 014**
Customer Sample Reference	**HEP-BH-85**	**HEP-BH-85**
Top Depth	**0.6**	**1.5**
Hole ID	**HEP-BH-85**	**HEP-BH-85**
Depth	**0.6**	**1.5**
Date Sampled	**08-JAN-2018**	**09-JAN-2018**
Time Sampled	**14:55**	**10:20**
AGS Type	**ES**	**ES**
AGS Sample ID	**HEPBH85201801080 02**	**FES1180109001**
AGS Sample Reference	**5**	**8**
Matrix Class	**Sandy Soil**	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units		
Quizalofop-ethyl	T826	AR	0.01	mg/kg	<0.01	<0.01
S421	T826	AR	0.01	mg/kg	<0.01	<0.01
Secbumeton	T826	AR	0.01	mg/kg	<0.01	<0.01
Silafluofen	T826	AR	0.01	mg/kg	<0.01	<0.01
Simazine	T826	AR	0.01	mg/kg	<0.01	<0.01
Simeconazole	T826	AR	0.01	mg/kg	<0.01	<0.01
Sulfallate	T826	AR	0.01	mg/kg	<0.01	<0.01
Sulfentrazone	T826	AR	0.01	mg/kg	<0.01	<0.01
Sulprofos	T826	AR	0.01	mg/kg	<0.01	<0.01
Tau-Fluvalinate	T826	AR	0.01	mg/kg	<0.01	<0.01
Tebuconazole	T826	AR	0.01	mg/kg	<0.01	<0.01
Tebufenpyrad	T826	AR	0.01	mg/kg	<0.01	<0.01
Tebupirimiphos	T826	AR	0.01	mg/kg	<0.01	<0.01
Tecnazene	T826	AR	0.01	mg/kg	<0.01	<0.01
Tefluthrin	T826	AR	0.01	mg/kg	<0.01	<0.01
Terbacil	T826	AR	0.01	mg/kg	<0.01	<0.01
Terbufos	T826	AR	0.01	mg/kg	<0.01	<0.01
Terbumeton	T826	AR	0.01	mg/kg	<0.01	<0.01
Terbuthylazine	T826	AR	0.01	mg/kg	<0.01	<0.01
Terbutryn	T826	AR	0.01	mg/kg	<0.01	<0.01
Tetrachlorvinphos	T826	AR	0.01	mg/kg	<0.01	<0.01
Tetraconazole	T826	AR	0.01	mg/kg	<0.01	<0.01
Tetradifon	T826	AR	0.01	mg/kg	<0.01	<0.01
sulfotep	T826	AR	0.01	mg/kg	<0.01	<0.01
Tetramethrin	T826	AR	0.01	mg/kg	<0.01	<0.01
Tetrasul	T826	AR	0.01	mg/kg	<0.01	<0.01
Thiamethoxam	T826	AR	0.01	mg/kg	<0.01	<0.01
Thiobencarb	T826	AR	0.01	mg/kg	<0.01	<0.01
Thiocyclam	T826	AR	0.01	mg/kg	<0.01	<0.01
Thiometon	T826	AR	0.01	mg/kg	<0.01	<0.01
Tolclofos-methyl	T826	AR	0.01	mg/kg	<0.01	<0.01
Triadimefon	T826	AR	0.01	mg/kg	<0.01	<0.01
Triadimenol	T826	AR	0.01	mg/kg	<0.01	<0.01
Triallate	T826	AR	0.01	mg/kg	<0.01	<0.01
Triazamate	T826	AR	0.01	mg/kg	<0.01	<0.01
Triazophos	T826	AR	0.01	mg/kg	<0.01	<0.01
Trietazine	T826	AR	0.01	mg/kg	<0.01	<0.01
Trifloxystrobin	T826	AR	0.01	mg/kg	<0.01	<0.01
Triflumizole	T826	AR	0.01	mg/kg	(278) <0.01	(278) <0.01
Trifluralin	T826	AR	0.01	mg/kg	<0.01	<0.01
Uniconazole	T826	AR	0.01	mg/kg	<0.01	<0.01
Vinclozolin	T826	AR	0.01	mg/kg	<0.01	<0.01

Concept Reference: 708032
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
MRPS by LC (CSOPP603)

Concept Reference	**708032 013**	**708032 014**
Customer Sample Reference	**HEP-BH-85**	**HEP-BH-85**
Top Depth	**0.6**	**1.5**
Hole ID	**HEP-BH-85**	**HEP-BH-85**
Depth	**0.6**	**1.5**
Date Sampled	**08-JAN-2018**	**09-JAN-2018**
Time Sampled	**14:55**	**10:20**
AGS Type	**ES**	**ES**
AGS Sample ID	**HEPBH852018010800 2**	**FES1180109001**
AGS Sample Reference	**5**	**8**
Matrix Class	**Sandy Soil**	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units		
2-(1-Naphthyl)acetamide	T310	AR	0.01	mg/kg	<0.01	<0.01
3-hydroxycarbofuran	T310	AR	0.01	mg/kg	<0.01	<0.01
6-Benzyladenine	T310	AR	0.01	mg/kg	<0.01	<0.01
Abamectin	T310	AR	0.01	mg/kg	<0.01	<0.01
Acephate	T310	AR	0.01	mg/kg	<0.01	<0.01
Acetamiprid	T310	AR	0.01	mg/kg	<0.01	<0.01
Acibenzolar-S-methyl	T310	AR	0.01	mg/kg	<0.01	<0.01
Aldicarb	T310	AR	0.01	mg/kg	<0.01	<0.01
Aldicarb sulphone	T310	AR	0.01	mg/kg	<0.01	<0.01
Aldicarb sulphoxide	T310	AR	0.01	mg/kg	<0.01	<0.01
Aminocarb	T310	AR	0.01	mg/kg	<0.01	<0.01
Amitraz	T310	AR	0.01	mg/kg	(278) <0.01	(278) <0.01
Azinphos ethyl	T310	AR	0.01	mg/kg	<0.01	<0.01
Azinphos methyl	T310	AR	0.01	mg/kg	<0.01	<0.01
Azoxystrobin	T310	AR	0.01	mg/kg	<0.01	<0.01
Bendiocarb	T310	AR	0.01	mg/kg	<0.01	<0.01
Benfuracarb	T310	AR	0.01	mg/kg	(278) <0.01	(278) <0.01
Bifenazate	T310	AR	0.01	mg/kg	<0.01	<0.01
Butoxycarboxim	T310	AR	0.01	mg/kg	(278) <0.01	(278) <0.01
Butralin	T310	AR	0.01	mg/kg	<0.01	<0.01
Carbaryl	T310	AR	0.01	mg/kg	<0.01	<0.01
Carbendazim	T310	AR	0.01	mg/kg	<0.01	<0.01
Carbetamide	T310	AR	0.01	mg/kg	<0.01	<0.01
Carbofuran	T310	AR	0.01	mg/kg	<0.01	<0.01
Carpropamid	T310	AR	0.01	mg/kg	<0.01	<0.01
Chinomethionat	T310	AR	0.01	mg/kg	(278) <0.01	(278) <0.01
chlorantraniliprole	T310	AR	0.01	mg/kg	<0.01	<0.01
Chlorbromuron	T310	AR	0.01	mg/kg	<0.01	<0.01
Chlorfluazuron	T310	AR	0.01	mg/kg	<0.01	<0.01
Chloridazon	T310	AR	0.01	mg/kg	<0.01	<0.01
Chlorotoluron	T310	AR	0.01	mg/kg	<0.01	<0.01
Chlorpropham	T310	AR	0.01	mg/kg	<0.01	<0.01
Clofentezine	T310	AR	0.01	mg/kg	<0.01	<0.01
Clothianidin	T310	AR	0.01	mg/kg	<0.01	<0.01
Cyanazine	T310	AR	0.01	mg/kg	<0.01	<0.01
Cyazofamid	T310	AR	0.01	mg/kg	<0.01	<0.01
Cycluron	T310	AR	0.01	mg/kg	<0.01	<0.01
Cymoxanil	T310	AR	0.01	mg/kg	<0.01	<0.01
Cyromazine	T310	AR	0.01	mg/kg	(278) <0.01	(278) <0.01
Cythioate	T310	AR	0.01	mg/kg	<0.01	<0.01
Demeton	T310	AR	0.01	mg/kg	<0.01	<0.01
Demeton-s-methyl sulphone	T310	AR	0.01	mg/kg	<0.01	<0.01
Desmedipham	T310	AR	0.01	mg/kg	<0.01	<0.01
Dicrotophos	T310	AR	0.01	mg/kg	<0.01	<0.01
Diethofencarb	T310	AR	0.01	mg/kg	<0.01	<0.01
Diflubenzuron	T310	AR	0.01	mg/kg	<0.01	<0.01
Dimefuron	T310	AR	0.01	mg/kg	<0.01	<0.01
Dimethoate	T310	AR	0.01	mg/kg	<0.01	<0.01
Diniconazole	T310	AR	0.01	mg/kg	<0.01	<0.01
Dinotefuran	T310	AR	0.01	mg/kg	<0.01	<0.01
Dioxacarb	T310	AR	0.01	mg/kg	<0.01	<0.01

Concept Reference: 708032
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
MRPS by LC (CSOPP603)

Concept Reference	**708032 013**	**708032 014**
Customer Sample Reference	**HEP-BH-85**	**HEP-BH-85**
Top Depth	**0.6**	**1.5**
Hole ID	**HEP-BH-85**	**HEP-BH-85**
Depth	**0.6**	**1.5**
Date Sampled	**08-JAN-2018**	**09-JAN-2018**
Time Sampled	**14:55**	**10:20**
AGS Type	**ES**	**ES**
AGS Sample ID	**HEPBH852018010800 2**	**FES1180109001**
AGS Sample Reference	**5**	**8**
Matrix Class	**Sandy Soil**	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units		
Disulfoton sulfoxide	T310	AR	0.01	mg/kg	<0.01	<0.01
Disulfoton sulphone	T310	AR	0.01	mg/kg	<0.01	<0.01
Diuron	T310	AR	0.01	mg/kg	<0.01	<0.01
DMSA	T310	AR	0.01	mg/kg	<0.01	<0.01
DMST	T310	AR	0.01	mg/kg	<0.01	<0.01
Dodemorph	T310	AR	0.01	mg/kg	<0.01	<0.01
Emamectin	T310	AR	0.01	mg/kg	<0.01	<0.01
Ethidimuron	T310	AR	0.01	mg/kg	<0.01	<0.01
Ethiofencarb	T310	AR	0.01	mg/kg	<0.01	<0.01
Ethiofencarb sulfone	T310	AR	0.01	mg/kg	<0.01	<0.01
Ethiofencarb sulfoxide	T310	AR	0.01	mg/kg	<0.01	<0.01
Ethiprole	T310	AR	0.01	mg/kg	<0.01	<0.01
Ethirimol	T310	AR	0.01	mg/kg	(278) <0.01	(278) <0.01
Fenamiphos sulfone	T310	AR	0.01	mg/kg	<0.01	<0.01
Fenamiphos sulfoxide	T310	AR	0.01	mg/kg	<0.01	<0.01
Fenazaquin	T310	AR	0.01	mg/kg	<0.01	<0.01
Fenchlorphos oxon	T310	AR	0.01	mg/kg	<0.01	<0.01
Fenhexamid	T310	AR	0.01	mg/kg	<0.01	<0.01
Fenpropidin	T310	AR	0.01	mg/kg	<0.01	<0.01
Fenpropimorph	T310	AR	0.01	mg/kg	<0.01	<0.01
Fenpyroximate	T310	AR	0.01	mg/kg	<0.01	<0.01
Fenthion Sulphone	T310	AR	0.01	mg/kg	<0.01	<0.01
Fenthion Sulphoxide	T310	AR	0.01	mg/kg	<0.01	<0.01
Fenuron	T310	AR	0.01	mg/kg	<0.01	<0.01
Flonicamid	T310	AR	0.01	mg/kg	<0.01	<0.01
Fluazinam	T310	AR	0.01	mg/kg	<0.01	<0.01
Flufenoxuron	T310	AR	0.01	mg/kg	<0.01	<0.01
Fluometuron	T310	AR	0.01	mg/kg	<0.01	<0.01
Fluopicolide	T310	AR	0.01	mg/kg	<0.01	<0.01
Fluorochloridone	T310	AR	0.01	mg/kg	<0.01	<0.01
Flurtamone	T310	AR	0.01	mg/kg	<0.01	<0.01
Flutriafol	T310	AR	0.01	mg/kg	<0.01	<0.01
Forchlorfenuron	T310	AR	0.01	mg/kg	<0.01	<0.01
Formetanate	T310	AR	0.01	mg/kg	(278) <0.01	(278) <0.01
Fuberidazole	T310	AR	0.01	mg/kg	<0.01	<0.01
Furathiocarb	T310	AR	0.01	mg/kg	<0.01	<0.01
Hexaflumuron	T310	AR	0.01	mg/kg	<0.01	<0.01
Hexythiazox	T310	AR	0.01	mg/kg	<0.01	<0.01
Imazalil	T310	AR	0.01	mg/kg	<0.01	<0.01
Imidacloprid	T310	AR	0.01	mg/kg	<0.01	<0.01
Indoxacarb	T310	AR	0.01	mg/kg	<0.01	<0.01
Iprovalicarb	T310	AR	0.01	mg/kg	<0.01	<0.01
Isoprocarb	T310	AR	0.01	mg/kg	<0.01	<0.01
Isoproturon	T310	AR	0.01	mg/kg	<0.01	<0.01
Isoxaben	T310	AR	0.01	mg/kg	<0.01	<0.01
Karbutylate	T310	AR	0.01	mg/kg	<0.01	<0.01
Linuron	T310	AR	0.01	mg/kg	<0.01	<0.01
Lufenuron	T310	AR	0.01	mg/kg	<0.01	<0.01
Malaoxon	T310	AR	0.01	mg/kg	<0.01	<0.01
Mandipropamid	T310	AR	0.01	mg/kg	<0.01	<0.01
Mefenacet	T310	AR	0.01	mg/kg	<0.01	<0.01

Concept Reference: 708032
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
MRPS by LC (CSOPP603)

Concept Reference	**708032 013**	**708032 014**
Customer Sample Reference	**HEP-BH-85**	**HEP-BH-85**
Top Depth	**0.6**	**1.5**
Hole ID	**HEP-BH-85**	**HEP-BH-85**
Depth	**0.6**	**1.5**
Date Sampled	**08-JAN-2018**	**09-JAN-2018**
Time Sampled	**14:55**	**10:20**
AGS Type	**ES**	**ES**
AGS Sample ID	**HEPBH852018010800 2**	**FES1180109001**
AGS Sample Reference	**5**	**8**
Matrix Class	**Sandy Soil**	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units		
Metaflumizone	T310	AR	0.01	mg/kg	<0.01	<0.01
Metamitron	T310	AR	0.01	mg/kg	<0.01	<0.01
Metconazole	T310	AR	0.01	mg/kg	<0.01	<0.01
Methabenzthiazuron	T310	AR	0.01	mg/kg	<0.01	<0.01
Methamidophos	T310	AR	0.01	mg/kg	<0.01	<0.01
Methiocarb	T310	AR	0.01	mg/kg	<0.01	<0.01
Methiocarb sulfone	T310	AR	0.01	mg/kg	<0.01	<0.01
Methiocarb Sulfoxide	T310	AR	0.01	mg/kg	<0.01	<0.01
Methomyl	T310	AR	0.01	mg/kg	<0.01	<0.01
Methoxyfenozide	T310	AR	0.01	mg/kg	<0.01	<0.01
Metobromuron	T310	AR	0.01	mg/kg	<0.01	<0.01
Monocrotophos	T310	AR	0.01	mg/kg	<0.01	<0.01
Monolinuron	T310	AR	0.01	mg/kg	<0.01	<0.01
Monuron	T310	AR	0.01	mg/kg	<0.01	<0.01
Neburon	T310	AR	0.01	mg/kg	<0.01	<0.01
Nicotine	T310	AR	0.01	mg/kg	(278,5) <0.01	(5,278) <0.01
Nitenpyram	T310	AR	0.01	mg/kg	<0.01	<0.01
Novaluron	T310	AR	0.01	mg/kg	<0.01	<0.01
Omethoate	T310	AR	0.01	mg/kg	<0.01	<0.01
Oxadiargyl	T310	AR	0.01	mg/kg	<0.01	<0.01
Oxamyl	T310	AR	0.01	mg/kg	<0.01	<0.01
Oxycarboxin	T310	AR	0.01	mg/kg	<0.01	<0.01
Pencycuron	T310	AR	0.01	mg/kg	<0.01	<0.01
Phenmedipham	T310	AR	0.01	mg/kg	<0.01	<0.01
Phorate sulfone	T310	AR	0.01	mg/kg	<0.01	<0.01
Phorate sulfoxide	T310	AR	0.01	mg/kg	<0.01	<0.01
Phosmet	T310	AR	0.01	mg/kg	<0.01	<0.01
Phosphamidon	T310	AR	0.01	mg/kg	<0.01	<0.01
Phoxim	T310	AR	0.01	mg/kg	<0.01	<0.01
Pirimicarb	T310	AR	0.01	mg/kg	<0.01	<0.01
Pirimicarb desmethyl	T310	AR	0.01	mg/kg	<0.01	<0.01
Prochloraz	T310	AR	0.01	mg/kg	<0.01	<0.01
Propamocarb	T310	AR	0.01	mg/kg	<0.01	<0.01
Propaquizafop	T310	AR	0.01	mg/kg	<0.01	<0.01
Propargite	T310	AR	0.01	mg/kg	(278) <0.01	(278) <0.01
Propoxur	T310	AR	0.01	mg/kg	<0.01	<0.01
Prothioconazole desthio	T310	AR	0.01	mg/kg	<0.01	<0.01
Pyraclostrobin	T310	AR	0.01	mg/kg	<0.01	<0.01
Pyrethrin I	T310	AR	0.01	mg/kg	<0.01	<0.01
Pyrifenox	T310	AR	0.01	mg/kg	<0.01	<0.01
Resmethrin	T310	AR	0.01	mg/kg	(278) <0.01	(278) <0.01
Spinetoram	T310	AR	0.01	mg/kg	<0.01	<0.01
Spinosad	T310	AR	0.01	mg/kg	<0.01	<0.01
Spirodiclofen	T310	AR	0.01	mg/kg	<0.01	<0.01
Spiromesifen	T310	AR	0.01	mg/kg	<0.01	<0.01
Spirotetramat	T310	AR	0.01	mg/kg	<0.01	<0.01
Spiroxamine	T310	AR	0.01	mg/kg	<0.01	<0.01
Tebufenozide	T310	AR	0.01	mg/kg	<0.01	<0.01
Teflubenzuron	T310	AR	0.01	mg/kg	<0.01	<0.01
Temephos	T310	AR	0.01	mg/kg	<0.01	<0.01
Terbufos sulfone	T310	AR	0.01	mg/kg	<0.01	<0.01

Concept Reference: 708032
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
MRPS by LC (CSOPP603)

Concept Reference	**708032 013**	**708032 014**
Customer Sample Reference	**HEP-BH-85**	**HEP-BH-85**
Top Depth	**0.6**	**1.5**
Hole ID	**HEP-BH-85**	**HEP-BH-85**
Depth	**0.6**	**1.5**
Date Sampled	**08-JAN-2018**	**09-JAN-2018**
Time Sampled	**14:55**	**10:20**
AGS Type	**ES**	**ES**
AGS Sample ID	**HEPBH8520180108002**	**FES1180109001**
AGS Sample Reference	**5**	**8**
Matrix Class	**Sandy Soil**	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units		
Terbufos sulfoxide	T310	AR	0.01	mg/kg	<0.01	<0.01
Thiabendazole	T310	AR	0.01	mg/kg	<0.01	<0.01
Thiacloprid	T310	AR	0.01	mg/kg	<0.01	<0.01
Thiamethoxam	T310	AR	0.01	mg/kg	<0.01	<0.01
Thiazafluron	T310	AR	0.01	mg/kg	<0.01	<0.01
Thidiazuron	T310	AR	0.01	mg/kg	(278) <0.01	(278) <0.01
Thiodicarb	T310	AR	0.01	mg/kg	<0.01	<0.01
Thiofanox	T310	AR	0.01	mg/kg	<0.01	<0.01
Thiophanate Methyl	T310	AR	0.01	mg/kg	<0.01	<0.01
Tolylfluanid	T310	AR	0.01	mg/kg	(278) <0.01	(278) <0.01
Tribenuron methyl	T310	AR	0.01	mg/kg	<0.01	<0.01
Tridemorph	T310	AR	0.01	mg/kg	<0.01	<0.01
Triflumuron	T310	AR	0.01	mg/kg	<0.01	<0.01
Triflusulfuron-methyl	T310	AR	0.01	mg/kg	<0.01	<0.01
Triforine	T310	AR	0.01	mg/kg	<0.01	<0.01
Triticonazole	T310	AR	0.01	mg/kg	<0.01	<0.01
Vamidothion	T310	AR	0.01	mg/kg	<0.01	<0.01
Vernolate	T310	AR	0.01	mg/kg	<0.01	<0.01
Zoxamide	T310	AR	0.01	mg/kg	<0.01	<0.01

Concept Reference: 708032
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Sub Suite 3 - Radiological

Concept Reference	**708032 003**	**708032 005**	**708032 006**	**708032 013**	**708032 014**
Customer Sample Reference	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-85**	**HEP-BH-85**
Top Depth	**0.3**	**0.9**	**1.2**	**0.6**	**1.5**
Hole ID	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-85**	**HEP-BH-85**
Depth	**0.3**	**0.9**	**1.2**	**0.6**	**1.5**
Date Sampled	**04-JAN-2018**	**04-JAN-2018**	**04-JAN-2018**	**08-JAN-2018**	**09-JAN-2018**
Time Sampled	**09:50**	**11:00**	**13:50**	**14:55**	**10:20**
AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**HEPBH7720180104001**	**HEPBH7720180104003**	**HEPBH7720180104004**	**HEPBH8520180108002**	**FES1180109001**
AGS Sample Reference	**1**	**7**	**9**	**5**	**8**
Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units					
High resolution gamma spectrometry	T100	AR	0.1	Bq/g	**0.3**	**0.2**	**0.1**	**0.3**	<0.1
Tritium	T510	AR	0.1	Bq/g	<0.1	**0.1**	<0.1	<0.1	<0.1

Concept Reference: 708032
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil

Sub Suite 4 - Phenoxy Acetic acid herbicides

Concept Reference	**708032 013**	**708032 014**
Customer Sample Reference	**HEP-BH-85**	**HEP-BH-85**
Top Depth	**0.6**	**1.5**
Hole ID	**HEP-BH-85**	**HEP-BH-85**
Depth	**0.6**	**1.5**
Date Sampled	**08-JAN-2018**	**09-JAN-2018**
Time Sampled	**14:55**	**10:20**
AGS Type	**ES**	**ES**
AGS Sample ID	**HEPBH8520180108002**	**FES1180109001**
AGS Sample Reference	**5**	**8**
Matrix Class	**Sandy Soil**	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units		
Mecoprop	T16	AR	0.01	mg/kg	(36) <0.02	(36) <0.02
Phenoxy Acetic acid herbicide: MCPA	T16	AR	0.01	mg/kg	(36) <0.02	(36) <0.02
Dichlorprop	T16	AR	0.01	mg/kg	(36) <0.02	(36) <0.02
Phenoxy Acetic acid herbicide: 2,4-D	T16	AR	0.01	mg/kg	(36) <0.02	(36) <0.02
Fenoprop	T16	AR	0.01	mg/kg	(36) <0.02	(36) <0.02
Phenoxy Acetic acid herbicide: 2,4,5-T	T16	AR	0.01	mg/kg	(36) <0.02	(36) <0.02

Concept Reference: 708032
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground Soils with Elevated PID Readings - Organics PAH US EPA 16

Concept Reference	**708032 003**	**708032 005**	**708032 006**	**708032 007**	**708032 013**
Customer Sample Reference	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-85**
Top Depth	**0.3**	**0.9**	**1.2**	**2.1**	**0.6**
Hole ID	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-85**
Depth	**0.3**	**0.9**	**1.2**	**2.1**	**0.6**
Date Sampled	**04-JAN-2018**	**04-JAN-2018**	**04-JAN-2018**	**04-JAN-2018**	**08-JAN-2018**
Time Sampled	**09:50**	**11:00**	**13:50**	**14:15**	**14:55**
AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**HEPBH7720180104001**	**HEPBH7720180104003**	**HEPBH7720180104004**	**HEPBH7720180104005**	**HEPBH8520180108002**
AGS Sample Reference	**1**	**7**	**9**	**13**	**5**
Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Fill**	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units					
Naphthalene	T207	M105	0.1	mg/kg	(9) <1.0	(9) <1.0	<0.1	<0.1	(9) <1.0
Acenaphthylene	T207	M105	0.1	mg/kg	(9) <1.0	(9) <1.0	<0.1	<0.1	(9) <1.0
Acenaphthene	T207	M105	0.1	mg/kg	(9) <1.0	(9) <1.0	<0.1	<0.1	(9) <1.0
Fluorene	T207	M105	0.1	mg/kg	(9) <1.0	(9) <1.0	<0.1	<0.1	(9) <1.0
Phenanthrene	T207	M105	0.1	mg/kg	**6.9**	**1.6**	**0.3**	<0.1	(9) <1.0
Anthracene	T207	M105	0.1	mg/kg	**1.9**	(9) <1.0	<0.1	<0.1	(9) <1.0
Fluoranthene	T207	M105	0.1	mg/kg	**18**	**4.1**	**0.8**	<0.1	(9) <1.0
Pyrene	T207	M105	0.1	mg/kg	**15**	**3.7**	**0.7**	<0.1	(9) <1.0
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	**6.4**	**1.6**	**0.4**	<0.1	(9) <1.0
Chrysene	T207	M105	0.1	mg/kg	**6.9**	**1.7**	**0.3**	<0.1	(9) <1.0
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	**5.4**	**1.6**	**0.3**	<0.1	(9) <1.0
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	**5.7**	**1.4**	**0.3**	<0.1	(9) <1.0
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	**6.0**	**1.7**	**0.3**	<0.1	(9) <1.0
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	**5.1**	**1.0**	**0.2**	<0.1	(9) <1.0
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	**1.6**	(9) <1.0	<0.1	<0.1	(9) <1.0
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	**6.4**	**1.2**	**0.3**	<0.1	(9) <1.0
PAH(total)	T207	M105	0.1	mg/kg	**85**	**20**	**3.9**	<0.1	(9) <1.0

Concept Reference: 708032
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground Soils with Elevated PID Readings - Organics PAH US EPA 16

				Concept Reference	**708032 014**	**708032 016**
				Customer Sample Reference	**HEP-BH-85**	**HEP-BH-85**
				Top Depth	**1.5**	**3.1**
				Hole ID	**HEP-BH-85**	**HEP-BH-85**
				Depth	**1.5**	**3.1**
				Date Sampled	**09-JAN-2018**	**09-JAN-2018**
				Time Sampled	**10:20**	**11:15**
				AGS Type	**ES**	**ES**
				AGS Sample ID	**FES1180109001**	**FES1180110003**
				AGS Sample Reference	**8**	**16**
				Matrix Class	**Sandy Soil**	**Fill**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**		
Naphthalene	T207	M105	0.1	mg/kg	<0.1	<0.1
Acenaphthylene	T207	M105	0.1	mg/kg	<0.1	<0.1
Acenaphthene	T207	M105	0.1	mg/kg	<0.1	<0.1
Fluorene	T207	M105	0.1	mg/kg	<0.1	<0.1
Phenanthrene	T207	M105	0.1	mg/kg	<0.1	<0.1
Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1
Fluoranthene	T207	M105	0.1	mg/kg	<0.1	<0.1
Pyrene	T207	M105	0.1	mg/kg	<0.1	<0.1
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1
Chrysene	T207	M105	0.1	mg/kg	<0.1	<0.1
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	<0.1	<0.1
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	<0.1	<0.1
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	<0.1	<0.1
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	<0.1	<0.1
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	<0.1	<0.1
PAH(total)	T207	M105	0.1	mg/kg	<0.1	<0.1

Concept Reference: 708032
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - TPH (CWG)

				Concept Reference	**708032 003**	**708032 005**	**708032 006**	**708032 007**	**708032 013**
				Customer Sample Reference	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-85**
				Top Depth	**0.3**	**0.9**	**1.2**	**2.1**	**0.6**
				Hole ID	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-85**
				Depth	**0.3**	**0.9**	**1.2**	**2.1**	**0.6**
				Date Sampled	**04-JAN-2018**	**04-JAN-2018**	**04-JAN-2018**	**04-JAN-2018**	**08-JAN-2018**
				Time Sampled	**09:50**	**11:00**	**13:50**	**14:15**	**14:55**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH7720180104001**	**HEPBH7720180104003**	**HEPBH7720180104004**	**HEPBH7720180104005**	**HEPBH8520180108002**
				AGS Sample Reference	**1**	**7**	**9**	**13**	**5**
				Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Fill**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
TPH (C5-C6 aliphatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C6-C8 aliphatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C8-C10 aliphatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	(9,13) <10	(9,13) <10	(13) <1	(13) <1	(13) <1
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	(13,9) <10	(13,9) <10	(13) <1	(13) <1	(13) <1
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	**(9,13) 10**	(9,13) <10	(13) <1	(13) <1	(13) <1
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	**(13,9) 82**	**(9,13) 84**	(13) <2	(13) <2	**(13) 4**
TPH (C6-C7 aromatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C7-C8 aromatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C8-C10 aromatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	(9,13) <10	(9,13) <10	(13) <2	(13) <2	(13) <2
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	**(13,9) 23**	(13,9) <10	(13) <1	(13) <1	(13) <1
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	**(9,13) 140**	**(13,9) 24**	**(13) 4**	(13) <1	(13) <1
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	**(9,13) 290**	**(13,9) 77**	**(13) 8**	(13) <1	(13) <1

Concept Reference: 708032
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - TPH (CWG)

Concept Reference	**708032 014**	**708032 016**
Customer Sample Reference	**HEP-BH-85**	**HEP-BH-85**
Top Depth	**1.5**	**3.1**
Hole ID	**HEP-BH-85**	**HEP-BH-85**
Depth	**1.5**	**3.1**
Date Sampled	**09-JAN-2018**	**09-JAN-2018**
Time Sampled	**10:20**	**11:15**
AGS Type	**ES**	**ES**
AGS Sample ID	**FES1180109001**	**FES1180110003**
AGS Sample Reference	**8**	**16**
Matrix Class	**Sandy Soil**	**Fill**

Determinand	Method	Test Sample	LOD	Units		
TPH (C5-C6 aliphatic)	T209	AR	100	µg/kg	<100	<100
TPH (C6-C8 aliphatic)	T209	AR	100	µg/kg	<100	<100
TPH (C8-C10 aliphatic)	T209	AR	100	µg/kg	<100	<100
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	(13) <1	(13) <1
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	(13) <1	(13) <1
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	(13) <1	(13) <1
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	**(13) 5**	(13) <2
TPH (C6-C7 aromatic)	T209	AR	100	µg/kg	<100	<100
TPH (C7-C8 aromatic)	T209	AR	100	µg/kg	<100	<100
TPH (C8-C10 aromatic)	T209	AR	100	µg/kg	<100	<100
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	(13) <2	(13) <2
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	(13) <1	(13) <1
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	(13) <1	(13) <1
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	(13) <1	(13) <1

Concept Reference: 708032
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil

Total Petroleum Hydrocarbons (Aliphatics+Aromatics) Total

Concept Reference	**708032 003**	**708032 005**	**708032 006**	**708032 007**	**708032 013**
Customer Sample Reference	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-85**
Top Depth	**0.3**	**0.9**	**1.2**	**2.1**	**0.6**
Hole ID	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-85**
Depth	**0.3**	**0.9**	**1.2**	**2.1**	**0.6**
Date Sampled	**04-JAN-2018**	**04-JAN-2018**	**04-JAN-2018**	**04-JAN-2018**	**08-JAN-2018**
Time Sampled	**09:50**	**11:00**	**13:50**	**14:15**	**14:55**
AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**HEPBH772018010400 1**	**HEPBH772018010400 3**	**HEPBH772018010400 4**	**HEPBH772018010400 5**	**HEPBH852018010800 2**
AGS Sample Reference	**1**	**7**	**9**	**13**	**5**
Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Fill**	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units					
TPH (Aliphatic) total	T85	M105		mg/kg	**(13) 92**	**(13) 84**	(13) N.D.	(13) N.D.	**(13) 4.0**
TPH (Aromatic) total	T85	M105		mg/kg	**(13) 450**	**(13) 100**	**(13) 12**	(13) N.D.	(13) N.D.
TPH (Aliphatic+Aromatic) (sum)	T85	M105		mg/kg	**542**	**184**	**12.0**	N.D.	**4.00**

Concept Reference: 708032
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Total Petroleum Hydrocarbons (Aliphatics+Aromatics) Total

Concept Reference	**708032 014**	**708032 016**
Customer Sample Reference	**HEP-BH-85**	**HEP-BH-85**
Top Depth	**1.5**	**3.1**
Hole ID	**HEP-BH-85**	**HEP-BH-85**
Depth	**1.5**	**3.1**
Date Sampled	**09-JAN-2018**	**09-JAN-2018**
Time Sampled	**10:20**	**11:15**
AGS Type	**ES**	**ES**
AGS Sample ID	**FES1180109001**	**FES1180110003**
AGS Sample Reference	**8**	**16**
Matrix Class	**Sandy Soil**	**Fill**

Determinand	Method	Test Sample	LOD	Units		
TPH (Aliphatic) total	T85	M105		mg/kg	**(13) 5.0**	(13) N.D.
TPH (Aromatic) total	T85	M105		mg/kg	(13) N.D.	(13) N.D.
TPH (Aliphatic+Aromatic) (sum)	T85	M105		mg/kg	**5.00**	N.D.

Index to symbols used in Second Supplemental B 708032-3

Value	Description
M40	Analysis conducted on sample assisted dried at no more than 40C. Results are reported on a dry weight basis.
A40	Assisted dried < 40C
AR	As Received
M105	Analysis conducted on an "as received" aliquot. Results are reported on a dry weight basis where moisture content was determined by assisted drying of sample at 105C
N.D.	Not Detected
13	Results have been blank corrected.
36	LOD Raised due to low Matrix spike recovery
278	Data reported is qualitative as recovery is outside the 60 to 140% range
9	LOD raised due to dilution of sample
5	Results are Semiquantitative
S	Analysis was subcontracted
M	Analysis is MCERTS accredited
U	Analysis is UKAS accredited
N	Analysis is not UKAS accredited

Notes

Second Supplemental B to report in standard format with TPH totals.
Gamma and Tritium subcontracted to Socotec
Asbestos subcontracted to REC Asbestos
MRPS transferred to Concept Cambridge.
"Fill" samples are outside the scope of our MCERTS accreditation. Results are UKAS only
Sample 6 is Asbestos Cement and cannot be quantified

Method Index

Value	Description
T826	SOP611 (GC MSMS)
T4	Colorimetry
T100	Gamma Spectrometry
T27	PLM
T85	Calc
T6	ICP/OES
T909	GCxGC
T510	Probe (Sub)
T209	GC/MS (Head Space)(MCERTS)
T686	Discrete Analyser
T287	Calc TOC/0.58
T16	GC/MS
T162	Grav (1 Dec) (105 C)

T310	LC/MS/MS
T2	Grav
T7	Probe
T207	GC/MS (MCERTS)

Accreditation Summary

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Soil Organic Matter	T287	A40	0.1	%	N	003,005-007,013-014,016
pH	T7	AR			M	003,005-006,013-014
pH	T7	AR			U	007,016
Asbestos ID	T27	AR			SU	003,005-007,013-014,016
Phenols(Mono)	T4	AR	0.5	mg/kg	M	003,005-006,013-014
Phenols(Mono)	T4	AR	0.5	mg/kg	U	007,016
Chloride	T686	AR	1	mg/kg	N	003,005-007,013-014,016
Cyanide(Total)	T4	AR	1	mg/kg	M	003,005-006,013-014
Cyanide(Total)	T4	AR	1	mg/kg	U	007,016
Thiocyanate	T4	A40	1	mg/kg	N	003,005-007,013-014,016
Nitrate	T686	AR	1	mg/kg	N	003,005-007,013-014,016
Nitrite	T686	AR	1	mg/kg	N	003,005-007,013-014,016
SO4(Total)	T6	A40	0.01	%	U	003,005-007,013-014,016
Sulphide	T4	AR	10	mg/kg	N	003,005-007,013-014,016
Arsenic	T6	M40	2	mg/kg	M	003,005-006,013-014
Arsenic	T6	M40	2.0	mg/kg	U	007,016
Cadmium	T6	M40	1	mg/kg	M	003,005-006,013-014
Cadmium	T6	M40	1	mg/kg	U	007,016
Chromium	T6	M40	1	mg/kg	M	003,005-006,013-014
Chromium	T6	M40	1	mg/kg	U	007,016
Chromium VI	T6	AR	1	mg/kg	N	003,005-007,013-014,016
Chromium (trivalent)	T85	AR	2	mg/kg	N	003,005-007,013-014,016
Iron	T6	A40	1	mg/kg	U	003,005-007,013-014,016
Lead	T6	M40	1	mg/kg	M	003,005-006,013-014
Lead	T6	M40	1	mg/kg	U	007,016
Manganese	T6	M40	1	mg/kg	M	003,005-006,013-014
Manganese	T6	M40	1	mg/kg	U	007,016
Mercury	T6	M40	1	mg/kg	M	003,005-006,013-014
Mercury	T6	M40	1	mg/kg	U	007,016
Nickel	T6	M40	1	mg/kg	M	003,005-006,013-014
Nickel	T6	M40	1	mg/kg	U	007,016
Selenium	T6	M40	3	mg/kg	M	003,005-006,013-014
Selenium	T6	M40	3	mg/kg	U	007,016
Copper	T6	M40	1	mg/kg	M	003,005-006,013-014
Copper	T6	M40	1	mg/kg	U	007,016
Zinc	T6	M40	1	mg/kg	M	003,005-006,013-014
Zinc	T6	M40	1	mg/kg	U	007,016
Boron (water-soluble)	T6	AR	1	mg/kg	N	003,005-007,013-014,016
Naphthalene	T207	M105	0.1	mg/kg	M	003,005-006,013-014
Naphthalene	T207	M105	0.1	mg/kg	U	007,016
Acenaphthylene	T207	M105	0.1	mg/kg	U	003,005-007,013-014,016
Acenaphthene	T207	M105	0.1	mg/kg	M	003,005-006,013-014
Acenaphthene	T207	M105	0.1	mg/kg	U	007,016
Fluorene	T207	M105	0.1	mg/kg	M	003,005-006,013-014
Fluorene	T207	M105	0.1	mg/kg	U	007,016
Phenanthrene	T207	M105	0.1	mg/kg	M	003,005-006,013-014
Phenanthrene	T207	M105	0.1	mg/kg	U	007,016
Anthracene	T207	M105	0.1	mg/kg	U	003,005-007,013-014,016
Fluoranthene	T207	M105	0.1	mg/kg	M	003,005-006,013-014
Fluoranthene	T207	M105	0.1	mg/kg	U	007,016
Pyrene	T207	M105	0.1	mg/kg	M	003,005-006,013-014
Pyrene	T207	M105	0.1	mg/kg	U	007,016
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	M	003,005-006,013-014
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	U	007,016
Chrysene	T207	M105	0.1	mg/kg	M	003,005-006,013-014
Chrysene	T207	M105	0.1	mg/kg	U	007,016
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	M	003,005-006,013-014
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	U	007,016
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	M	003,005-006,013-014
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	U	007,016
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	M	003,005-006,013-014
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	U	007,016

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	M	003,005-006,013-014
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	U	007,016
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	M	003,005-006,013-014
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	U	007,016
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	M	003,005-006,013-014
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	U	007,016
PAH(total)	T207	M105	0.1	mg/kg	U	003,005-007,013-014,016
TPH (C5-C6 aliphatic)	T209	AR	100	µg/kg	N	003,005-007,013-014,016
TPH (C6-C8 aliphatic)	T209	AR	100	µg/kg	N	003,005-007,013-014,016
TPH (C8-C10 aliphatic)	T209	AR	100	µg/kg	N	003,005-007,013-014,016
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	M	003,005-006,013-014
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	U	007,016
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	M	003,005-006,013-014
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	U	007,016
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	M	003,005-006,013-014
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	U	007,016
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	M	003,005-006,013-014
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	U	007,016
TPH (C6-C7 aromatic)	T209	AR	100	µg/kg	N	003,005-007,013-014,016
TPH (C7-C8 aromatic)	T209	AR	100	µg/kg	N	003,005-007,013-014,016
TPH (C8-C10 aromatic)	T209	AR	100	µg/kg	N	003,005-007,013-014,016
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	M	003,005-006,013-014
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	U	007,016
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	M	003,005-006,013-014
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	U	007,016
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	M	003,005-006,013-014
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	U	007,016
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	M	003,005-006,013-014
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	U	007,016
TPH (Aliphatic) total	T85	M105		mg/kg	N	003,005-007,013-014,016
TPH (Aromatic) total	T85	M105		mg/kg	N	003,005-007,013-014,016
TPH (Aliphatic+Aromatic) (sum)	T85	M105		mg/kg	N	003,005-007,013-014,016
High resolution gamma spectrometry	T100	AR	0.1	Bq/g	SU	003,005-006,013-014
Tritium	T510	AR	0.1	Bq/g	SU	003,005-006,013-014
Moisture @105C	T162	AR	0.1	%	N	003,005-007,013-014,016
Retained on 10mm sieve	T2	M40	0.1	%	N	003,005-007,013-014,016
Mecoprop	T16	AR	0.01	mg/kg	N	013-014
Phenoxy Acetic acid herbicide: MCPA	T16	AR	0.01	mg/kg	N	013-014
Dichlorprop	T16	AR	0.01	mg/kg	N	013-014
Phenoxy Acetic acid herbicide: 2,4-D	T16	AR	0.01	mg/kg	N	013-014
Fenoprop	T16	AR	0.01	mg/kg	N	013-014
Phenoxy Acetic acid herbicide: 2,4,5-T	T16	AR	0.01	mg/kg	N	013-014
2,4,6-Trichlorophenol	T826	AR	0.01	mg/kg	N	013-014
2-Methyl-4,6-dinitrophenol	T826	AR	0.01	mg/kg	N	013-014
2-Phenylphenol	T826	AR	0.01	mg/kg	N	013-014
9,10-Anthraquinone	T826	AR	0.01	mg/kg	N	013-014
Acetochlor	T826	AR	0.01	mg/kg	N	013-014
Aclonifen	T826	AR	0.01	mg/kg	N	013-014
Acrinathrin	T826	AR	0.01	mg/kg	N	013-014
Alachlor	T826	AR	0.01	mg/kg	N	013-014
Aldrin	T826	AR	0.01	mg/kg	N	013-014
Ametryn	T826	AR	0.01	mg/kg	N	013-014
Atraton	T826	AR	0.01	mg/kg	N	013-014
Atrazine	T826	AR	0.01	mg/kg	N	013-014
Azaconazole	T826	AR	0.01	mg/kg	N	013-014
Azobenzene	T826	AR	0.01	mg/kg	N	013-014
Azoxystrobin	T826	AR	0.01	mg/kg	N	013-014
Benalaxyl	T826	AR	0.01	mg/kg	N	013-014
Benfluralin	T826	AR	0.01	mg/kg	N	013-014
Bifenox	T826	AR	0.01	mg/kg	N	013-014
Bifenthrin	T826	AR	0.01	mg/kg	N	013-014
Binapacryl	T826	AR	0.01	mg/kg	N	013-014
Biphenyl	T826	AR	0.01	mg/kg	N	013-014
Bitertanol	T826	AR	0.01	mg/kg	N	013-014
Boscalid	T826	AR	0.01	mg/kg	N	013-014
Bromacil	T826	AR	0.01	mg/kg	N	013-014
Bromophos	T826	AR	0.01	mg/kg	N	013-014
Bromophos-Ethyl	T826	AR	0.01	mg/kg	N	013-014
Bromopropylate	T826	AR	0.01	mg/kg	N	013-014
Bupirimate	T826	AR	0.01	mg/kg	N	013-014

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Buprofezine	T826	AR	0.01	mg/kg	N	013-014
Butachlor	T826	AR	0.01	mg/kg	N	013-014
Cadusafos	T826	AR	0.01	mg/kg	N	013-014
Captan	T826	AR	0.01	mg/kg	N	013-014
Carbaryl	T826	AR	0.01	mg/kg	N	013-014
Carbophenothion	T826	AR	0.01	mg/kg	N	013-014
Carboxine	T826	AR	0.01	mg/kg	N	013-014
Carfentrazone Ethyl	T826	AR	0.01	mg/kg	N	013-014
Chlorbenzilate	T826	AR	0.01	mg/kg	N	013-014
Chlorbufam	T826	AR	0.01	mg/kg	N	013-014
Chlordane	T826	AR	0.01	mg/kg	N	013-014
Chlordimeform	T826	AR	0.01	mg/kg	N	013-014
Chlorethoxyfos	T826	AR	0.01	mg/kg	N	013-014
Chlorfenapyr	T826	AR	0.01	mg/kg	N	013-014
Chlorfenson	T826	AR	0.01	mg/kg	N	013-014
Chlorfenvinphos	T826	AR	0.01	mg/kg	N	013-014
Chlormephos	T826	AR	0.01	mg/kg	N	013-014
Chloropropylate	T826	AR	0.01	mg/kg	N	013-014
Chlorothalonil	T826	AR	0.01	mg/kg	N	013-014
Chlorpropham	T826	AR	0.01	mg/kg	N	013-014
Chlorpyrifos	T826	AR	0.01	mg/kg	N	013-014
Chlorpyrifos methyl	T826	AR	0.01	mg/kg	N	013-014
Chlorthal Dimethyl	T826	AR	0.01	mg/kg	N	013-014
Chlorthion	T826	AR	0.01	mg/kg	N	013-014
Chlorthiophos	T826	AR	0.01	mg/kg	N	013-014
Chlozolinate	T826	AR	0.01	mg/kg	N	013-014
cis-1,2,3,6-Tetrahydrophthalimide	T826	AR	0.01	mg/kg	N	013-014
Clodinafop propargy	T826	AR	0.01	mg/kg	N	013-014
Clomazone	T826	AR	0.01	mg/kg	N	013-014
Cloquintocet mexyl	T826	AR	0.01	mg/kg	N	013-014
Coumaphos	T826	AR	0.01	mg/kg	N	013-014
Cyflufenamid	T826	AR	0.01	mg/kg	N	013-014
Cyfluthrin	T826	AR	0.01	mg/kg	N	013-014
Cypermethrin	T826	AR	0.01	mg/kg	N	013-014
Cyphenothrin	T826	AR	0.01	mg/kg	N	013-014
Cyproconazole	T826	AR	0.01	mg/kg	N	013-014
Cyprodinil	T826	AR	0.01	mg/kg	N	013-014
DEET	T826	AR	0.01	mg/kg	N	013-014
Deltamethrin	T826	AR	0.01	mg/kg	N	013-014
Desmetryn	T826	AR	0.01	mg/kg	N	013-014
Diafenthiuron	T826	AR	0.01	mg/kg	N	013-014
Dialifos	T826	AR	0.01	mg/kg	N	013-014
Diazinon	T826	AR	0.01	mg/kg	N	013-014
Dichlobenil	T826	AR	0.01	mg/kg	N	013-014
Dichlofenthion	T826	AR	0.01	mg/kg	N	013-014
Dichlorvos	T826	AR	0.01	mg/kg	N	013-014
Diclobutrazol	T826	AR	0.01	mg/kg	N	013-014
Dicloran	T826	AR	0.01	mg/kg	N	013-014
Dicofol	T826	AR	0.01	mg/kg	N	013-014
Dieldrin	T826	AR	0.01	mg/kg	N	013-014
Difenoconazole	T826	AR	0.01	mg/kg	N	013-014
Diflufenican	T826	AR	0.01	mg/kg	N	013-014
Dimethenamid	T826	AR	0.01	mg/kg	N	013-014
Dimethomorph	T826	AR	0.01	mg/kg	N	013-014
Dimoxystrobin	T826	AR	0.01	mg/kg	N	013-014
Dinoterb	T826	AR	0.01	mg/kg	N	013-014
Dioxabenzofos	T826	AR	0.01	mg/kg	N	013-014
Diphenamid	T826	AR	0.01	mg/kg	N	013-014
Diphenylamine	T826	AR	0.01	mg/kg	N	013-014
Disulfoton	T826	AR	0.01	mg/kg	N	013-014
Ditalimfos	T826	AR	0.01	mg/kg	N	013-014
Edifenphos	T826	AR	0.01	mg/kg	N	013-014
Endosulphan alpha	T826	AR	0.01	mg/kg	N	013-014
Endosulphan beta	T826	AR	0.01	mg/kg	N	013-014
Endosulphan sulphate	T826	AR	0.01	mg/kg	N	013-014
Endrin	T826	AR	0.01	mg/kg	N	013-014
Epn	T826	AR	0.01	mg/kg	N	013-014
Epoxiconazole	T826	AR	0.01	mg/kg	N	013-014
EPTC	T826	AR	0.01	mg/kg	N	013-014
Etaconazole	T826	AR	0.01	mg/kg	N	013-014

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Ethion	T826	AR	0.01	mg/kg	N	013-014
Ethofumesate	T826	AR	0.01	mg/kg	N	013-014
Ethoprophos	T826	AR	0.01	mg/kg	N	013-014
Ethoxyquin	T826	AR	0.01	mg/kg	N	013-014
Etofenprox	T826	AR	0.01	mg/kg	N	013-014
Etoxazole	T826	AR	0.01	mg/kg	N	013-014
Etridiazole	T826	AR	0.01	mg/kg	N	013-014
Etrimfos	T826	AR	0.01	mg/kg	N	013-014
Famoxadone	T826	AR	0.01	mg/kg	N	013-014
Famphur	T826	AR	0.01	mg/kg	N	013-014
Fenamidone	T826	AR	0.01	mg/kg	N	013-014
Fenamiphos	T826	AR	0.01	mg/kg	N	013-014
Fenarimol	T826	AR	0.01	mg/kg	N	013-014
Fenbuconazole	T826	AR	0.01	mg/kg	N	013-014
Fenchlorphos	T826	AR	0.01	mg/kg	N	013-014
Fenhexamid	T826	AR	0.01	mg/kg	N	013-014
Fenitrothion	T826	AR	0.01	mg/kg	N	013-014
Fenpiclonil	T826	AR	0.01	mg/kg	N	013-014
Fenpropathrin	T826	AR	0.01	mg/kg	N	013-014
Fenson	T826	AR	0.01	mg/kg	N	013-014
Fensulfothion	T826	AR	0.01	mg/kg	N	013-014
Fenthion	T826	AR	0.01	mg/kg	N	013-014
Fenvalerate	T826	AR	0.01	mg/kg	N	013-014
Fipronil	T826	AR	0.01	mg/kg	N	013-014
Fipronil sulphone	T826	AR	0.01	mg/kg	N	013-014
Flamprop isopropyl	T826	AR	0.01	mg/kg	N	013-014
Fluazifop-P-Butyl	T826	AR	0.01	mg/kg	N	013-014
Flucythrinate	T826	AR	0.01	mg/kg	N	013-014
Fludioxonil	T826	AR	0.01	mg/kg	N	013-014
Flufenacet	T826	AR	0.01	mg/kg	N	013-014
Flumetralin	T826	AR	0.01	mg/kg	N	013-014
Flumioxazin	T826	AR	0.01	mg/kg	N	013-014
Flumorph	T826	AR	0.01	mg/kg	N	013-014
Fluopyram	T826	AR	0.01	mg/kg	N	013-014
Fluquinconazole	T826	AR	0.01	mg/kg	N	013-014
Fluroxypyr-1-methylheptyl ester	T826	AR	0.01	mg/kg	N	013-014
Flusilazole	T826	AR	0.01	mg/kg	N	013-014
Flutolanil	T826	AR	0.01	mg/kg	N	013-014
Fluxapyroxad	T826	AR	0.01	mg/kg	N	013-014
Folpet	T826	AR	0.01	mg/kg	N	013-014
Fonophos	T826	AR	0.01	mg/kg	N	013-014
Formothion	T826	AR	0.01	mg/kg	N	013-014
Furalaxyl	T826	AR	0.01	mg/kg	N	013-014
Haloxyfop etotyl	T826	AR	0.01	mg/kg	N	013-014
Haloxyfop Methyl	T826	AR	0.01	mg/kg	N	013-014
Heptachlor	T826	AR	0.01	mg/kg	N	013-014
Heptachlor epoxide	T826	AR	0.01	mg/kg	N	013-014
Heptachlor exo Epoxide	T826	AR	0.01	mg/kg	N	013-014
Heptenophos	T826	AR	0.01	mg/kg	N	013-014
Hexachlorobenzene	T826	AR	0.01	mg/kg	N	013-014
Hexachlorocyclohexane (alpha)	T826	AR	0.01	mg/kg	N	013-014
Hexachlorocyclohexane (beta)	T826	AR	0.01	mg/kg	N	013-014
Hexachlorocyclohexane (delta)	T826	AR	0.01	mg/kg	N	013-014
Hexaconazole	T826	AR	0.01	mg/kg	N	013-014
Hexazinone	T826	AR	0.01	mg/kg	N	013-014
Imazalil	T826	AR	0.01	mg/kg	N	013-014
Iodofenphos	T826	AR	0.01	mg/kg	N	013-014
Iprodione	T826	AR	0.01	mg/kg	N	013-014
Isazofos	T826	AR	0.01	mg/kg	N	013-014
Isocarbophos	T826	AR	0.01	mg/kg	N	013-014
Isodrin	T826	AR	0.01	mg/kg	N	013-014
Isofenphos	T826	AR	0.01	mg/kg	N	013-014
Isofenphos Methyl	T826	AR	0.01	mg/kg	N	013-014
Isomethiozin	T826	AR	0.01	mg/kg	N	013-014
Isoprothiolane	T826	AR	0.01	mg/kg	N	013-014
Isopyrazam	T826	AR	0.01	mg/kg	N	013-014
Isothiazolinone	T826	AR	0.01	mg/kg	N	013-014
Kresoxim Methyl	T826	AR	0.01	mg/kg	N	013-014
Lambda Cyhalothrin	T826	AR	0.01	mg/kg	N	013-014
Lenacil	T826	AR	0.01	mg/kg	N	013-014

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Leptophos	T826	AR	0.01	mg/kg	N	013-014
Lindane	T826	AR	0.01	mg/kg	N	013-014
Malathion	T826	AR	0.01	mg/kg	N	013-014
MCPA-thioethyl	T826	AR	0.01	mg/kg	N	013-014
Mecarbam	T826	AR	0.01	mg/kg	N	013-014
Mepanipyrim	T826	AR	0.01	mg/kg	N	013-014
Mephosfolan	T826	AR	0.01	mg/kg	N	013-014
Mepronil	T826	AR	0.01	mg/kg	N	013-014
Metalaxyl	T826	AR	0.01	mg/kg	N	013-014
Metazachlor	T826	AR	0.01	mg/kg	N	013-014
Methacrifos	T826	AR	0.01	mg/kg	N	013-014
Methidathion	T826	AR	0.01	mg/kg	N	013-014
Methoxychlor	T826	AR	0.01	mg/kg	N	013-014
Methyl Paraoxon	T826	AR	0.01	mg/kg	N	013-014
Metolachlor	T826	AR	0.01	mg/kg	N	013-014
Metolcarb	T826	AR	0.01	mg/kg	N	013-014
Metrafenone	T826	AR	0.01	mg/kg	N	013-014
Metribuzin	T826	AR	0.01	mg/kg	N	013-014
Mevinphos	T826	AR	0.01	mg/kg	N	013-014
Mirex	T826	AR	0.01	mg/kg	N	013-014
Molinate	T826	AR	0.01	mg/kg	N	013-014
Myclobutanil	T826	AR	0.01	mg/kg	N	013-014
Napropamide	T826	AR	0.01	mg/kg	N	013-014
Nitrofen	T826	AR	0.01	mg/kg	N	013-014
Nitrothal isopropyl	T826	AR	0.01	mg/kg	N	013-014
Nuarimol	T826	AR	0.01	mg/kg	N	013-014
o,p'-DDT	T826	AR	0.01	mg/kg	N	013-014
Octhilinone	T826	AR	0.01	mg/kg	N	013-014
Ofurace	T826	AR	0.01	mg/kg	N	013-014
Orysastrobin	T826	AR	0.01	mg/kg	N	013-014
Oxadiazon	T826	AR	0.01	mg/kg	N	013-014
Oxadixyl	T826	AR	0.01	mg/kg	N	013-014
Oxyfluorfen	T826	AR	0.01	mg/kg	N	013-014
p,p-DDD	T826	AR	0.01	mg/kg	N	013-014
p,p-DDE	T826	AR	0.01	mg/kg	N	013-014
p,p-DDT	T826	AR	0.01	mg/kg	N	013-014
Paclobutrazol	T826	AR	0.01	mg/kg	N	013-014
Paraoxon	T826	AR	0.01	mg/kg	N	013-014
Parathion	T826	AR	0.01	mg/kg	N	013-014
Parathion methyl	T826	AR	0.01	mg/kg	N	013-014
Penconazole	T826	AR	0.01	mg/kg	N	013-014
Pendimethalin	T826	AR	0.01	mg/kg	N	013-014
Pentachloroaniline	T826	AR	0.01	mg/kg	N	013-014
Pentachlorophenol	T826	AR	0.01	mg/kg	N	013-014
Pentanochlor	T826	AR	0.01	mg/kg	N	013-014
Permethrin	T826	AR	0.01	mg/kg	N	013-014
Pethoxamid	T826	AR	0.01	mg/kg	N	013-014
Phenothrin	T826	AR	0.01	mg/kg	N	013-014
Phenthoate	T826	AR	0.01	mg/kg	N	013-014
Phorate	T826	AR	0.01	mg/kg	N	013-014
Phosalone	T826	AR	0.01	mg/kg	N	013-014
Phosfolan	T826	AR	0.01	mg/kg	N	013-014
Phosmet	T826	AR	0.01	mg/kg	N	013-014
Phthalimide	T826	AR	0.01	mg/kg	N	013-014
Picoxystrobin	T826	AR	0.01	mg/kg	N	013-014
Piperonyl Butoxide	T826	AR	0.01	mg/kg	N	013-014
Pirimicarb	T826	AR	0.01	mg/kg	N	013-014
Pirimiphos Ethyl	T826	AR	0.01	mg/kg	N	013-014
Pirimiphos methyl	T826	AR	0.01	mg/kg	N	013-014
Pretilachlor	T826	AR	0.01	mg/kg	N	013-014
Prochloraz	T826	AR	0.01	mg/kg	N	013-014
Procymidone	T826	AR	0.01	mg/kg	N	013-014
Profenofos	T826	AR	0.01	mg/kg	N	013-014
Prometon	T826	AR	0.01	mg/kg	N	013-014
Prometryn	T826	AR	0.01	mg/kg	N	013-014
Propachlor	T826	AR	0.01	mg/kg	N	013-014
Propanil	T826	AR	0.01	mg/kg	N	013-014
Propaphos	T826	AR	0.01	mg/kg	N	013-014
Propargite	T826	AR	0.01	mg/kg	N	013-014
Propazine	T826	AR	0.01	mg/kg	N	013-014

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Propetamphos	T826	AR	0.01	mg/kg	N	013-014
Propham	T826	AR	0.01	mg/kg	N	013-014
Propiconazole	T826	AR	0.01	mg/kg	N	013-014
Propyzamide	T826	AR	0.01	mg/kg	N	013-014
Proquinazid	T826	AR	0.01	mg/kg	N	013-014
Prosulfocarb	T826	AR	0.01	mg/kg	N	013-014
Prothiofos	T826	AR	0.01	mg/kg	N	013-014
Pyraclostrobin	T826	AR	0.01	mg/kg	N	013-014
Pyraflufen ethyl	T826	AR	0.01	mg/kg	N	013-014
Pyrazophos	T826	AR	0.01	mg/kg	N	013-014
Pyridaben	T826	AR	0.01	mg/kg	N	013-014
Pyridaphenthion	T826	AR	0.01	mg/kg	N	013-014
Pyrimethanil	T826	AR	0.01	mg/kg	N	013-014
Pyriproxyfen	T826	AR	0.01	mg/kg	N	013-014
Quinalphos	T826	AR	0.01	mg/kg	N	013-014
Quinoxyfen	T826	AR	0.01	mg/kg	N	013-014
Quintozene	T826	AR	0.01	mg/kg	N	013-014
Quizalofop-ethyl	T826	AR	0.01	mg/kg	N	013-014
S421	T826	AR	0.01	mg/kg	N	013-014
Secbumeton	T826	AR	0.01	mg/kg	N	013-014
Silafluofen	T826	AR	0.01	mg/kg	N	013-014
Simazine	T826	AR	0.01	mg/kg	N	013-014
Simeconazole	T826	AR	0.01	mg/kg	N	013-014
Sulfallate	T826	AR	0.01	mg/kg	N	013-014
Sulfentrazone	T826	AR	0.01	mg/kg	N	013-014
Sulprofos	T826	AR	0.01	mg/kg	N	013-014
Tau-Fluvalinate	T826	AR	0.01	mg/kg	N	013-014
Tebuconazole	T826	AR	0.01	mg/kg	N	013-014
Tebufenpyrad	T826	AR	0.01	mg/kg	N	013-014
Tebupirimiphos	T826	AR	0.01	mg/kg	N	013-014
Tecnazene	T826	AR	0.01	mg/kg	N	013-014
Tefluthrin	T826	AR	0.01	mg/kg	N	013-014
Terbacil	T826	AR	0.01	mg/kg	N	013-014
Terbufos	T826	AR	0.01	mg/kg	N	013-014
Terbumeton	T826	AR	0.01	mg/kg	N	013-014
Terbuthylazine	T826	AR	0.01	mg/kg	N	013-014
Terbutryn	T826	AR	0.01	mg/kg	N	013-014
Tetrachlorvinphos	T826	AR	0.01	mg/kg	N	013-014
Tetraconazole	T826	AR	0.01	mg/kg	N	013-014
Tetradifon	T826	AR	0.01	mg/kg	N	013-014
sulfotep	T826	AR	0.01	mg/kg	N	013-014
Tetramethrin	T826	AR	0.01	mg/kg	N	013-014
Tetrasul	T826	AR	0.01	mg/kg	N	013-014
Thiamethoxam	T826	AR	0.01	mg/kg	N	013-014
Thiobencarb	T826	AR	0.01	mg/kg	N	013-014
Thiocyclam	T826	AR	0.01	mg/kg	N	013-014
Thiometon	T826	AR	0.01	mg/kg	N	013-014
Tolclofos-methyl	T826	AR	0.01	mg/kg	N	013-014
Triadimefon	T826	AR	0.01	mg/kg	N	013-014
Triadimenol	T826	AR	0.01	mg/kg	N	013-014
Triallate	T826	AR	0.01	mg/kg	N	013-014
Triazamate	T826	AR	0.01	mg/kg	N	013-014
Triazophos	T826	AR	0.01	mg/kg	N	013-014
Trietazine	T826	AR	0.01	mg/kg	N	013-014
Trifloxystrobin	T826	AR	0.01	mg/kg	N	013-014
Triflumizole	T826	AR	0.01	mg/kg	N	013-014
Trifluralin	T826	AR	0.01	mg/kg	N	013-014
Uniconazole	T826	AR	0.01	mg/kg	N	013-014
Vinclozolin	T826	AR	0.01	mg/kg	N	013-014
2-(1-Naphthyl)acetamide	T310	AR	0.01	mg/kg	N	013-014
3-hydroxycarbofuran	T310	AR	0.01	mg/kg	N	013-014
6-Benzyladenine	T310	AR	0.01	mg/kg	N	013-014
Abamectin	T310	AR	0.01	mg/kg	N	013-014
Acephate	T310	AR	0.01	mg/kg	N	013-014
Acetamiprid	T310	AR	0.01	mg/kg	N	013-014
Acibenzolar-S-methyl	T310	AR	0.01	mg/kg	N	013-014
Aldicarb	T310	AR	0.01	mg/kg	N	013-014
Aldicarb sulphone	T310	AR	0.01	mg/kg	N	013-014
Aldicarb sulphoxide	T310	AR	0.01	mg/kg	N	013-014
Aminocarb	T310	AR	0.01	mg/kg	N	013-014

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Amitraz	T310	AR	0.01	mg/kg	N	013-014
Azinphos ethyl	T310	AR	0.01	mg/kg	N	013-014
Azinphos methyl	T310	AR	0.01	mg/kg	N	013-014
Azoxystrobin	T310	AR	0.01	mg/kg	N	013-014
Bendiocarb	T310	AR	0.01	mg/kg	N	013-014
Benfuracarb	T310	AR	0.01	mg/kg	N	013-014
Bifenazate	T310	AR	0.01	mg/kg	N	013-014
Butoxycarboxim	T310	AR	0.01	mg/kg	N	013-014
Butralin	T310	AR	0.01	mg/kg	N	013-014
Carbaryl	T310	AR	0.01	mg/kg	N	013-014
Carbendazim	T310	AR	0.01	mg/kg	N	013-014
Carbetamide	T310	AR	0.01	mg/kg	N	013-014
Carbofuran	T310	AR	0.01	mg/kg	N	013-014
Carpropamid	T310	AR	0.01	mg/kg	N	013-014
Chinomethionat	T310	AR	0.01	mg/kg	N	013-014
chlorantraniliprole	T310	AR	0.01	mg/kg	N	013-014
Chlorbromuron	T310	AR	0.01	mg/kg	N	013-014
Chlorfluazuron	T310	AR	0.01	mg/kg	N	013-014
Chloridazon	T310	AR	0.01	mg/kg	N	013-014
Chlorotoluron	T310	AR	0.01	mg/kg	N	013-014
Chlorpropham	T310	AR	0.01	mg/kg	N	013-014
Clofentezine	T310	AR	0.01	mg/kg	N	013-014
Clothianidin	T310	AR	0.01	mg/kg	N	013-014
Cyanazine	T310	AR	0.01	mg/kg	N	013-014
Cyazofamid	T310	AR	0.01	mg/kg	N	013-014
Cycluron	T310	AR	0.01	mg/kg	N	013-014
Cymoxanil	T310	AR	0.01	mg/kg	N	013-014
Cyromazine	T310	AR	0.01	mg/kg	N	013-014
Cythioate	T310	AR	0.01	mg/kg	N	013-014
Demeton	T310	AR	0.01	mg/kg	N	013-014
Demeton-s-methyl sulphone	T310	AR	0.01	mg/kg	N	013-014
Desmedipham	T310	AR	0.01	mg/kg	N	013-014
Dicrotophos	T310	AR	0.01	mg/kg	N	013-014
Diethofencarb	T310	AR	0.01	mg/kg	N	013-014
Diflubenzuron	T310	AR	0.01	mg/kg	N	013-014
Dimefuron	T310	AR	0.01	mg/kg	N	013-014
Dimethoate	T310	AR	0.01	mg/kg	N	013-014
Diniconazole	T310	AR	0.01	mg/kg	N	013-014
Dinotefuran	T310	AR	0.01	mg/kg	N	013-014
Dioxacarb	T310	AR	0.01	mg/kg	N	013-014
Disulfoton sulfoxide	T310	AR	0.01	mg/kg	N	013-014
Disulfoton sulphone	T310	AR	0.01	mg/kg	N	013-014
Diuron	T310	AR	0.01	mg/kg	N	013-014
DMSA	T310	AR	0.01	mg/kg	N	013-014
DMST	T310	AR	0.01	mg/kg	N	013-014
Dodemorph	T310	AR	0.01	mg/kg	N	013-014
Emamectin	T310	AR	0.01	mg/kg	N	013-014
Ethidimuron	T310	AR	0.01	mg/kg	N	013-014
Ethiofencarb	T310	AR	0.01	mg/kg	N	013-014
Ethiofencarb sulfone	T310	AR	0.01	mg/kg	N	013-014
Ethiofencarb sulfoxide	T310	AR	0.01	mg/kg	N	013-014
Ethiprole	T310	AR	0.01	mg/kg	N	013-014
Ethirimol	T310	AR	0.01	mg/kg	N	013-014
Fenamiphos sulfone	T310	AR	0.01	mg/kg	N	013-014
Fenamiphos sulfoxide	T310	AR	0.01	mg/kg	N	013-014
Fenazaquin	T310	AR	0.01	mg/kg	N	013-014
Fenchlorphos oxon	T310	AR	0.01	mg/kg	N	013-014
Fenhexamid	T310	AR	0.01	mg/kg	N	013-014
Fenpropidin	T310	AR	0.01	mg/kg	N	013-014
Fenpropimorph	T310	AR	0.01	mg/kg	N	013-014
Fenpyroximate	T310	AR	0.01	mg/kg	N	013-014
Fenthion Sulphone	T310	AR	0.01	mg/kg	N	013-014
Fenthion Sulphoxide	T310	AR	0.01	mg/kg	N	013-014
Fenuron	T310	AR	0.01	mg/kg	N	013-014
Flonicamid	T310	AR	0.01	mg/kg	N	013-014
Fluazinam	T310	AR	0.01	mg/kg	N	013-014
Flufenoxuron	T310	AR	0.01	mg/kg	N	013-014
Fluometuron	T310	AR	0.01	mg/kg	N	013-014
Fluopicolide	T310	AR	0.01	mg/kg	N	013-014
Fluorochloridone	T310	AR	0.01	mg/kg	N	013-014

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Flurtamone	T310	AR	0.01	mg/kg	N	013-014
Flutriafol	T310	AR	0.01	mg/kg	N	013-014
Forchlorfenuron	T310	AR	0.01	mg/kg	N	013-014
Formetanate	T310	AR	0.01	mg/kg	N	013-014
Fuberidazole	T310	AR	0.01	mg/kg	N	013-014
Furathiocarb	T310	AR	0.01	mg/kg	N	013-014
Hexaflumuron	T310	AR	0.01	mg/kg	N	013-014
Hexythiazox	T310	AR	0.01	mg/kg	N	013-014
Imazalil	T310	AR	0.01	mg/kg	N	013-014
Imidacloprid	T310	AR	0.01	mg/kg	N	013-014
Indoxacarb	T310	AR	0.01	mg/kg	N	013-014
Iprovalicarb	T310	AR	0.01	mg/kg	N	013-014
Isoprocarb	T310	AR	0.01	mg/kg	N	013-014
Isoproturon	T310	AR	0.01	mg/kg	N	013-014
Isoxaben	T310	AR	0.01	mg/kg	N	013-014
Karbutylate	T310	AR	0.01	mg/kg	N	013-014
Linuron	T310	AR	0.01	mg/kg	N	013-014
Lufenuron	T310	AR	0.01	mg/kg	N	013-014
Malaoxon	T310	AR	0.01	mg/kg	N	013-014
Mandipropamid	T310	AR	0.01	mg/kg	N	013-014
Mefenacet	T310	AR	0.01	mg/kg	N	013-014
Metaflumizone	T310	AR	0.01	mg/kg	N	013-014
Metamitron	T310	AR	0.01	mg/kg	N	013-014
Metconazole	T310	AR	0.01	mg/kg	N	013-014
Methabenzthiazuron	T310	AR	0.01	mg/kg	N	013-014
Methamidophos	T310	AR	0.01	mg/kg	N	013-014
Methiocarb	T310	AR	0.01	mg/kg	N	013-014
Methiocarb sulfone	T310	AR	0.01	mg/kg	N	013-014
Methiocarb Sulfoxide	T310	AR	0.01	mg/kg	N	013-014
Methomyl	T310	AR	0.01	mg/kg	N	013-014
Methoxyfenozide	T310	AR	0.01	mg/kg	N	013-014
Metobromuron	T310	AR	0.01	mg/kg	N	013-014
Monocrotophos	T310	AR	0.01	mg/kg	N	013-014
Monolinuron	T310	AR	0.01	mg/kg	N	013-014
Monuron	T310	AR	0.01	mg/kg	N	013-014
Neburon	T310	AR	0.01	mg/kg	N	013-014
Nicotine	T310	AR	0.01	mg/kg	N	013-014
Nitenpyram	T310	AR	0.01	mg/kg	N	013-014
Novaluron	T310	AR	0.01	mg/kg	N	013-014
Omethoate	T310	AR	0.01	mg/kg	N	013-014
Oxadiargyl	T310	AR	0.01	mg/kg	N	013-014
Oxamyl	T310	AR	0.01	mg/kg	N	013-014
Oxycarboxin	T310	AR	0.01	mg/kg	N	013-014
Pencycuron	T310	AR	0.01	mg/kg	N	013-014
Phenmedipham	T310	AR	0.01	mg/kg	N	013-014
Phorate sulfone	T310	AR	0.01	mg/kg	N	013-014
Phorate sulfoxide	T310	AR	0.01	mg/kg	N	013-014
Phosmet	T310	AR	0.01	mg/kg	N	013-014
Phosphamidon	T310	AR	0.01	mg/kg	N	013-014
Phoxim	T310	AR	0.01	mg/kg	N	013-014
Pirimicarb	T310	AR	0.01	mg/kg	N	013-014
Pirimicarb desmethyl	T310	AR	0.01	mg/kg	N	013-014
Prochloraz	T310	AR	0.01	mg/kg	N	013-014
Propamocarb	T310	AR	0.01	mg/kg	N	013-014
Propaquizafop	T310	AR	0.01	mg/kg	N	013-014
Propargite	T310	AR	0.01	mg/kg	N	013-014
Propoxur	T310	AR	0.01	mg/kg	N	013-014
Prothioconazole desthio	T310	AR	0.01	mg/kg	N	013-014
Pyraclostrobin	T310	AR	0.01	mg/kg	N	013-014
Pyrethrin I	T310	AR	0.01	mg/kg	N	013-014
Pyrifenox	T310	AR	0.01	mg/kg	N	013-014
Resmethrin	T310	AR	0.01	mg/kg	N	013-014
Spinetoram	T310	AR	0.01	mg/kg	N	013-014
Spinosad	T310	AR	0.01	mg/kg	N	013-014
Spirodiclofen	T310	AR	0.01	mg/kg	N	013-014
Spiromesifen	T310	AR	0.01	mg/kg	N	013-014
Spirotetramat	T310	AR	0.01	mg/kg	N	013-014
Spiroxamine	T310	AR	0.01	mg/kg	N	013-014
Tebufenozide	T310	AR	0.01	mg/kg	N	013-014
Teflubenzuron	T310	AR	0.01	mg/kg	N	013-014

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Temephos	T310	AR	0.01	mg/kg	N	013-014
Terbufos sulfone	T310	AR	0.01	mg/kg	N	013-014
Terbufos sulfoxide	T310	AR	0.01	mg/kg	N	013-014
Thiabendazole	T310	AR	0.01	mg/kg	N	013-014
Thiacloprid	T310	AR	0.01	mg/kg	N	013-014
Thiamethoxam	T310	AR	0.01	mg/kg	N	013-014
Thiazafluron	T310	AR	0.01	mg/kg	N	013-014
Thidiazuron	T310	AR	0.01	mg/kg	N	013-014
Thiodicarb	T310	AR	0.01	mg/kg	N	013-014
Thiofanox	T310	AR	0.01	mg/kg	N	013-014
Thiophanate Methyl	T310	AR	0.01	mg/kg	N	013-014
Tolylfluanid	T310	AR	0.01	mg/kg	N	013-014
Tribenuron methyl	T310	AR	0.01	mg/kg	N	013-014
Tridemorph	T310	AR	0.01	mg/kg	N	013-014
Triflumuron	T310	AR	0.01	mg/kg	N	013-014
Triflusulfuron-methyl	T310	AR	0.01	mg/kg	N	013-014
Triforine	T310	AR	0.01	mg/kg	N	013-014
Triticonazole	T310	AR	0.01	mg/kg	N	013-014
Vamidothion	T310	AR	0.01	mg/kg	N	013-014
Vernolate	T310	AR	0.01	mg/kg	N	013-014
Zoxamide	T310	AR	0.01	mg/kg	N	013-014

CONCEPT LIFE SCIENCES
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Concept Life Sciences

Certificate of Analysis

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Report Number: Second Supplemental A 708032-3

Date of Report: 25-Jun-2018

Customer: Fugro GeoServices
Fugro House
Hithercroft Road
Wallingford
Oxfordshire
OX10 9RB

Customer Contact: Ms Karen Blackmore

Customer Job Reference:
Customer Purchase Order: 56642KB-WAL
Customer Site Reference: HEP Package 3
Date Job Received at Concept: 11-Jan-2018
Date Analysis Started: 11-Jan-2018
Date Analysis Completed: 20-Mar-2018

The results reported relate to samples received in the laboratory and may not be representative of a whole batch.

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation

This report should not be reproduced except in full without the written approval of the laboratory

Tests covered by this certificate were conducted in accordance with Concept Life Sciences SOPs

All results have been reviewed in accordance with Section 25 of the Concept Life Sciences, Analytical Services Quality Manual

UKAS TESTING
1549

Report checked
and authorised by :
Sara Abou-Shakra
Customer Service Manager

Issued by :
Sara Abou-Shakra
Customer Service Manager

Summary Of Results

Soil

Dioxins

Corrected to 0% Moisture

				WHO2005 Toxic Equivalents ng/kg		WHO Toxic Equivalents ng/kg	
Concept Reference	**Customer Sample Reference**	**Analysis**	**Symbol**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**
708032 013	HEP-BH-85	Dioxins and Furans (Based on US EPA 1613)	U	7.1	**14**	9.5	**16**
		Poly-Chlorinated Biphenyls (WHO 12)	U	0.0	**72**	0.0	**62**
			Sum :	7.1	**86**	9.5	**78**
708032 014	HEP-BH-85	Dioxins and Furans (Based on US EPA 1613)	U	0.0	**11**	0.0	**11**
		Poly-Chlorinated Biphenyls (WHO 12)	U	0.0	**77**	0.0	**66**
			Sum :	0.0	**87**	0.0	**77**

Soil

Customer Sample Reference : HEP-BH-85
Our Sample Reference : 708032 013
Moisture Content : 9.90 %
Top Depth : 0.6
Depth : 0.6
Hole ID : HEP-BH-85
Date Sampled : 08-JAN-2018
Time Sampled : 14:55
AGS Type : ES
AGS Sample ID : HEPBH8520180108002
AGS Sample Reference : 5
Matrix Class : Sandy Soil

Dioxins and Furans (Based on US EPA 1613)

Technique : GC/MS (HR)

						WHO2005 Toxic Equivalents ng/kg		WHO Toxic Equivalents ng/kg	
Determinand	**Symbol**	**Result ng/kg As Received @9.9% Moisture**	**LOD As Received @9.9% Moisture**	**Lower Bound ng/kg @ 0% Moisture**	**LOD @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**
2,3,7,8-TCDD	U	<2.0	2.0	<2.2	2.2	0.0	**2.2**	0.0	**2.2**
1,2,3,7,8-PeCDD	U	<2.4	2.4	<2.7	2.7	0.0	**2.7**	0.0	**2.7**
1,2,3,4,7,8-HxCDD	U	<2.0	2.0	<2.3	2.3	0.0	**0.23**	0.0	**0.23**
1,2,3,6,7,8-HxCDD	U	<2.2	2.2	<2.4	2.4	0.0	**0.24**	0.0	**0.24**
1,2,3,7,8,9-HxCDD	U	<3.6	3.6	<4.0	4.0	0.0	**0.40**	0.0	**0.40**
1,2,3,4,6,7,8-HpCDD	U	**18**	1.4	21	1.5	0.21	**0.21**	0.21	**0.21**
OCDD	U	**23**	3.0	25	3.3	0.0076	**0.0076**	0.0025	**0.0025**
					Dioxins Totals :	0.21	**6.0**	0.21	**6.0**
2,3,7,8-TCDF	U	**11**	1.5	13	1.7	1.3	**1.3**	1.3	**1.3**
1,2,3,7,8-PeCDF	U	**9.0**	1.5	10	1.7	0.30	**0.30**	0.50	**0.50**
2,3,4,7,8-PeCDF	U	**10**	1.4	11	1.5	3.4	**3.4**	5.6	**5.6**
1,2,3,4,7,8-HxCDF	U	**8.7**	1.6	9.6	1.8	0.96	**0.96**	0.96	**0.96**
1,2,3,6,7,8-HxCDF	U	<5.0	5.0	<5.5	5.5	0.0	**0.55**	0.0	**0.55**
2,3,4,6,7,8-HxCDF	U	**7.0**	1.6	7.8	1.7	0.78	**0.78**	0.78	**0.78**
1,2,3,7,8,9-HxCDF	U	<3.0	3.0	<3.3	3.3	0.0	**0.33**	0.0	**0.33**
1,2,3,4,6,7,8-HpCDF	U	**15**	0.65	17	0.73	0.17	**0.17**	0.17	**0.17**
1,2,3,4,7,8,9-HpCDF	U	<2.0	2.0	<2.2	2.2	0.0	**0.022**	0.0	**0.022**
OCDF	U	<2.0	2.0	<2.2	2.2	0.0	**0.00067**	0.0	**0.00022**
					Furans Totals :	6.8	**7.8**	9.3	**10**
					Totals :	**7.1**	**14**	**9.5**	**16**

Poly-Chlorinated Biphenyls (WHO 12)

Technique : GC/MS (HR)

						WHO2005 Toxic Equivalents ng/kg		WHO Toxic Equivalents ng/kg	
Determinand	**Symbol**	**Result ng/kg As Received @9.9% Moisture**	**LOD As Received @9.9% Moisture**	**Lower Bound ng/kg @ 0% Moisture**	**LOD @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**
PCB BZ#77	U	(100) <500	500	<550	550	0.0	**0.055**	0.0	**0.055**
PCB BZ#81	U	(100) <500	500	<550	550	0.0	**0.17**	0.0	**0.055**
PCB BZ#105	U	(100) <500	500	<550	550	0.0	**0.017**	0.0	**0.055**
PCB BZ#114	U	(100) <500	500	<550	550	0.0	**0.017**	0.0	**0.28**

PCB BZ#118	U	(100) <500	500	<550	550	0.0	**0.017**	0.0	**0.055**
PCB BZ#123	U	(100) <500	500	<550	550	0.0	**0.017**	0.0	**0.055**
PCB BZ#126	U	(100) <500	500	<550	550	0.0	**55**	0.0	**55**
PCB BZ#156	U	(100) <500	500	<550	550	0.0	**0.017**	0.0	**0.28**
PCB BZ#157	U	(100) <500	500	<550	550	0.0	**0.017**	0.0	**0.28**
PCB BZ#167	U	(100) <500	500	<550	550	0.0	**0.017**	0.0	**0.0055**
PCB BZ#169	U	(100) <500	500	<550	550	0.0	**17**	0.0	**5.5**
PCB BZ#189	U	(100) <500	500	<550	550	0.0	**0.017**	0.0	**0.055**
					Totals :	**0.0**	**72**	**0.0**	**62**

Soil

Customer Sample Reference : HEP-BH-85
Our Sample Reference : 708032 014
Moisture Content : 14.9 %
Hole ID : HEP-BH-85
Top Depth : 1.5
Depth : 1.5
Date Sampled : 09-JAN-2018
Time Sampled : 10:20
AGS Type : ES
AGS Sample ID : FES1180109001
AGS Sample Reference : 8
Matrix Class : Sandy Soil

Dioxins and Furans (Based on US EPA 1613)

Technique : GC/MS (HR)

						WHO2005 Toxic Equivalents ng/kg		WHO Toxic Equivalents ng/kg	
Determinand	**Symbol**	**Result ng/kg As Received @15% Moisture**	**LOD As Received @15% Moisture**	**Lower Bound ng/kg @ 0% Moisture**	**LOD @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**
2,3,7,8-TCDD	U	<2.0	2.0	<2.4	2.4	0.0	**2.4**	0.0	**2.4**
1,2,3,7,8-PeCDD	U	<3.5	3.5	<4.1	4.1	0.0	**4.1**	0.0	**4.1**
1,2,3,4,7,8-HxCDD	U	<3.6	3.6	<4.2	4.2	0.0	**0.42**	0.0	**0.42**
1,2,3,6,7,8-HxCDD	U	<3.6	3.6	<4.2	4.2	0.0	**0.42**	0.0	**0.42**
1,2,3,7,8,9-HxCDD	U	<3.6	3.6	<4.2	4.2	0.0	**0.42**	0.0	**0.42**
1,2,3,4,6,7,8-HpCDD	U	<5.0	5.0	<5.9	5.9	0.0	**0.059**	0.0	**0.059**
OCDD	U	<9.0	9.0	<11	11	0.0	**0.0032**	0.0	**0.0011**
					Dioxins Totals :	0.0	**7.8**	0.0	**7.8**
2,3,7,8-TCDF	U	<2.0	2.0	<2.4	2.4	0.0	**0.24**	0.0	**0.24**
1,2,3,7,8-PeCDF	U	<2.2	2.2	<2.6	2.6	0.0	**0.078**	0.0	**0.13**
2,3,4,7,8-PeCDF	U	<2.2	2.2	<2.6	2.6	0.0	**0.78**	0.0	**1.3**
1,2,3,4,7,8-HxCDF	U	<3.3	3.3	<3.9	3.9	0.0	**0.39**	0.0	**0.39**
1,2,3,6,7,8-HxCDF	U	<3.3	3.3	<3.9	3.9	0.0	**0.39**	0.0	**0.39**
2,3,4,6,7,8-HxCDF	U	<3.6	3.6	<4.2	4.2	0.0	**0.42**	0.0	**0.42**
1,2,3,7,8,9-HxCDF	U	<3.7	3.7	<4.3	4.3	0.0	**0.43**	0.0	**0.43**
1,2,3,4,6,7,8-HpCDF	U	<5.3	5.3	<6.2	6.2	0.0	**0.062**	0.0	**0.062**
1,2,3,4,7,8,9-HpCDF	U	<4.8	4.8	<5.6	5.6	0.0	**0.056**	0.0	**0.056**
OCDF	U	<7.6	7.6	<8.9	8.9	0.0	**0.0027**	0.0	**0.00089**
					Furans Totals :	0.0	**2.8**	0.0	**3.4**
					Totals :	**0.0**	**11**	**0.0**	**11**

Poly-Chlorinated Biphenyls (WHO 12)

Technique : GC/MS (HR)

						WHO2005 Toxic Equivalents ng/kg		WHO Toxic Equivalents ng/kg	
Determinand	**Symbol**	**Result ng/kg As Received @15% Moisture**	**LOD As Received @15% Moisture**	**Lower Bound ng/kg @ 0% Moisture**	**LOD @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**	**Lower Bound @ 0% Moisture**	**Upper Bound @ 0% Moisture**
PCB BZ#77	U	(100) <500	500	<590	590	0.0	**0.059**	0.0	**0.059**
PCB BZ#81	U	(100) <500	500	<590	590	0.0	**0.18**	0.0	**0.059**
PCB BZ#105	U	(100) <500	500	<590	590	0.0	**0.018**	0.0	**0.059**
PCB BZ#114	U	(100) <500	500	<590	590	0.0	**0.018**	0.0	**0.29**

PCB BZ#118	U	(100) <500	500	<590	590	0.0	**0.018**	0.0	**0.059**
PCB BZ#123	U	(100) <500	500	<590	590	0.0	**0.018**	0.0	**0.059**
PCB BZ#126	U	(100) <500	500	<590	590	0.0	**59**	0.0	**59**
PCB BZ#156	U	(100) <500	500	<590	590	0.0	**0.018**	0.0	**0.29**
PCB BZ#157	U	(100) <500	500	<590	590	0.0	**0.018**	0.0	**0.29**
PCB BZ#167	U	(100) <500	500	<590	590	0.0	**0.018**	0.0	**0.0059**
PCB BZ#169	U	(100) <500	500	<590	590	0.0	**18**	0.0	**5.9**
PCB BZ#189	U	(100) <500	500	<590	590	0.0	**0.018**	0.0	**0.059**
					Totals :	**0.0**	**77**	**0.0**	**66**

Concept Reference: 708032
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**708032 003**	**708032 005**	**708032 006**	**708032 007**	**708032 013**
				Customer Sample Reference	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-85**
				Test Sample	**AR**	**AR**	**AR**	**AR**	**AR**
				Top Depth	**0.3**	**0.9**	**1.2**	**2.1**	**0.6**
				Depth	**0.3**	**0.9**	**1.2**	**2.1**	**0.6**
				Hole ID	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-85**
				Date Sampled	**04-JAN-2018**	**04-JAN-2018**	**04-JAN-2018**	**04-JAN-2018**	**08-JAN-2018**
				Time Sampled	**09:50**	**11:00**	**13:50**	**14:15**	**14:55**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH772018010 4001**	**HEPBH772018010 4003**	**HEPBH772018010 4004**	**HEPBH772018010 4005**	**HEPBH852018010 8002**
				AGS Sample Reference	**1**	**7**	**9**	**13**	**5**
				Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Fill**	**Sandy Soil**
Determinand	**Method**	**LOD**	**Units**	**Symbol**					
Moisture @105C	Grav (1 Dec) (105 C)	0.1	%	N	**9.9**	**10**	**6.9**	**5.5**	**9.9**

Concept Reference: 708032
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**708032 014**	**708032 016**
				Customer Sample Reference	**HEP-BH-85**	**HEP-BH-85**
				Test Sample	**AR**	**AR**
				Top Depth	**1.5**	**3.1**
				Depth	**1.5**	**3.1**
				Hole ID	**HEP-BH-85**	**HEP-BH-85**
				Date Sampled	**09-JAN-2018**	**09-JAN-2018**
				Time Sampled	**10:20**	**11:15**
				AGS Type	**ES**	**ES**
				AGS Sample ID	**FES1180109001**	**FES1180110003**
				AGS Sample Reference	**8**	**16**
				Matrix Class	**Sandy Soil**	**Fill**
Determinand	**Method**	**LOD**	**Units**	**Symbol**		
Moisture @105C	Grav (1 Dec) (105 C)	0.1	%	N	**15**	**1.7**

Concept Reference: 708032
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

				Concept Reference	**708032 003**	**708032 005**	**708032 006**	**708032 007**	**708032 013**
				Customer Sample Reference	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-85**
				Test Sample	**M40**	**M40**	**M40**	**M40**	**M40**
				Top Depth	**0.3**	**0.9**	**1.2**	**2.1**	**0.6**
				Depth	**0.3**	**0.9**	**1.2**	**2.1**	**0.6**
				Hole ID	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-77**	**HEP-BH-85**
				Date Sampled	**04-JAN-2018**	**04-JAN-2018**	**04-JAN-2018**	**04-JAN-2018**	**08-JAN-2018**
				Time Sampled	**09:50**	**11:00**	**13:50**	**14:15**	**14:55**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH77201801040 01**	**HEPBH77201801040 03**	**HEPBH77201801040 04**	**HEPBH77201801040 05**	**HEPBH85201801080 02**
				AGS Sample Reference	**1**	**7**	**9**	**13**	**5**
				Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Fill**	**Sandy Soil**
Determinand	**Method**	**LOD**	**Units**	**Symbol**					
Retained on 10mm sieve	Grav	0.1	%	N	<0.1	<0.1	<0.1	<0.1	<0.1

Concept Reference: 708032
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

Concept Reference	**708032 014**	**708032 016**
Customer Sample Reference	**HEP-BH-85**	**HEP-BH-85**
Test Sample	**M40**	**M40**
Top Depth	**1.5**	**3.1**
Depth	**1.5**	**3.1**
Hole ID	**HEP-BH-85**	**HEP-BH-85**
Date Sampled	**09-JAN-2018**	**09-JAN-2018**
Time Sampled	**10:20**	**11:15**
AGS Type	**ES**	**ES**
AGS Sample ID	**FES1180109001**	**FES1180110003**
AGS Sample Reference	**8**	**16**
Matrix Class	**Sandy Soil**	**Fill**

Determinand	Method	LOD	Units	Symbol		
Retained on 10mm sieve	Grav	0.1	%	N	<0.1	<0.1

Index to symbols used in Second Supplemental A 708032-3

Value	Description
AR	As Received
M40	Analysis conducted on sample assisted dried at no more than 40C. Results are reported on a dry weight basis.
100	LOD determined by sample aliquot used for analysis
U	Analysis is UKAS accredited
N	Analysis is not UKAS accredited

Notes

Second Supplemental A to report Dioxins and PCBS only.
Second Supplemental A to report Dioxins and PCBS only.
"Fill" samples are outside the scope of our MCERTS accreditation. Results are UKAS only

SOCOTEC

Analysis of Soil Samples

Client:	Concept Life Sciences Hadfield House 9 Hadfield Street Old Trafford Manchester M16 9FE
Testing Facility:	SOCOTEC UK Unit 12 Moorbrook Southmead Industrial Park Didcot Oxfordshire OX11 7HP
Laboratory Reference:	18-0045
Customer Reference:	708032
Quote Number:	ENR-ANU-9093
PO Number:	708032
Samples Received:	17 January 2018
Sample Condition:	Satisfactory, Ambient
Analysis Completed:	24 January 2018
Report Author:	
Author's Name:	Trevor Harding
Job Title:	Senior Analyst
Approved By:	
Approver's name:	Carla Thompson
Job Title:	Deputy Project Manager
Report Date:	25 January 2018

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Sample Summary

The analysis schedule and sample details were confirmed by email on 22 January 2018.

Customer Reference	Laboratory Reference	Matrix	Sampling Date
Sample 003	RW0539	Soil (S)	11/01/2018 12:00
Sample 005	RW0540	Soil (S)	11/01/2018 12:00
Sample 006	RW0541	Soil (S)	11/01/2018 12:00

Experimental

Total Tritium by Combustion and Liquid Scintillation Counting

As received samples were analysed using method "ANU/SOP/2094 Issue 3." A sub-sample of known weight was taken from each sample and combusted in an oxygen rich atmosphere in the presence of a copper oxide catalyst. Under these conditions the hydrogen and tritium were converted to water vapour. These were then selectively trapped in a series of gas-bubblers containing dilute acid. Aliquots of known weight were then assessed for their tritium content by liquid scintillation counting. The tritium activity was corrected for the proportion of the bubbler trapping solution taken and for the weight of combusted sample.

Gamma Spectrometry

Oven dried samples were analysed using method "ANU/SOP/2029 Issue 4." The measurement technique is based on the use of high purity germanium (HPGe) detectors coupled to an Ortec gamma ray spectroscopy system. The gamma ray spectra are stored on a computer and analysed using the software programme Fitzpeaks for photopeak identification and quantification. The detectors are calibrated for efficiency using a mixed radionuclide standard, which covers an energy range of approximately 60-2000 keV. The efficiency of gamma rays between 30 keV and 120 keV are determined on an individual basis.

Application of decay corrections for the naturally occurring daughter radionuclides of uranium and thorium assumes that the series daughter radionuclides are all in secular equilibrium and therefore decay with the half-life of the first radionuclide in the series." (^{226}Ra is not UKAS accredited)

Results

Results are presented in the following tables.

Any opinions and interpretations expressed herein are outside the scope of our UKAS accreditation.

The results in this test report relate only to the items tested, and test portions taken thereof. This test report must not be reproduced except in full, without written approval of the laboratory.

SOCOTEC

Results Summary – Tritium

Customer Reference	Laboratory Reference	Tritium
Sample 003	RW0539	26 ± 9.9
Sample 005	RW0540	99 ± 31
Sample 006	RW0541	90 ± 22

Notes:

1. Results are presented as $Bq.kg^{-1}$ of sample as received and are decay corrected to the sampling date.
2. Uncertainties are quoted at 2 s.d. based on expanded uncertainties.

SOCOTEC

Results Summary – Gamma Spectrometry

Customer Reference	Laboratory Reference	Be-7	K-40	Co-60	Cs-134	Cs-137	Tl-208	Pb-210	Bi-212	Pb-212
Sample 003	RW0539	<12	210 ± 40	<1.6	<1.6	<1.4	5.0 ± 1.4	<31	<20	16 ± 3
Sample 005	RW0540	<13	120 ± 30	<1.7	<1.7	<1.6	<1.9	<30	<22	13 ± 3
Sample 006	RW0541	<12	100 ± 30	<1.6	<1.7	<1.4	3.5 ± 1.3	<28	<20	10 ± 2

Customer Reference	Laboratory Reference	Bi-214	Pb-214	Ra-224	Ra-226*	Ac-228	Pa-234m	Th-234	U-235	Am-241
Sample 003	RW0539	16 ± 4	19 ± 3	<26	<28	17 ± 4	<170	<34	<1.8	<3.1
Sample 005	RW0540	15 ± 3	14 ± 3	<38	<29	17 ± 5	<170	<31	<1.8	<2.9
Sample 006	RW0541	<3.7	8 ± 3	<33	<26	<6.9	<170	<29	<1.6	<2.7

Notes:

1. An asterisk "*" indicates that the analysis is not covered by the laboratory's UKAS accreditation.
2. Results are presented as $Bq.kg^{-1}$ of dried and homogenised sample and are decay corrected to the sampling date.
3. Results above the LoD are reported with expanded (2σ) uncertainties based on a total uncertainty budget.
4. 1σ uncertainties are rounded to 1 significant figure; results and 2σ uncertainties are rounded to the same precision.
5. For results below the Limit of Detection, the LoD is rounded up to 2 significant figures.
6. Detector calibrations are based upon homogeneous standard solutions. For quantification purposes the sample is assumed to be homogeneous.
7. ^{226}Ra has only one gamma ray at 186 keV and the major gamma ray from ^{235}U also occurs at 186 keV. ^{235}U can be measured by the lower abundance gamma ray at 144 keV and if a positive result for ^{235}U is reported, the ^{226}Ra result will be unreliable and overestimated. However even if ^{235}U is below the LoD there may still be a contribution to the ^{226}Ra from ^{235}U and the ^{226}Ra result may be unreliable and overestimated. If an accurate result for ^{226}Ra is required this is better obtained by radiochemical analysis.

UKAS TESTING
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SOCOTEC

Analysis of Soil Samples

Client:	Concept Life Sciences Hadfield House 9 Hadfield Street Old Trafford Manchester M16 9FE
Testing Facility:	SOCOTEC UK Unit 12 Moorbrook Southmead Industrial Park Didcot Oxfordshire OX11 7HP
Laboratory Reference:	18-0097ADD
Customer Reference:	708032
Quote Number:	ENR-ANU-9093
PO Number:	708032
Samples Received:	14 February 2018
Sample Condition:	Satisfactory, Ambient
Analysis Completed:	23 February 2018
Report Author:	Kiran
Author's Name:	Kiran Bala
Job Title:	Analyst
Approved By:	CHHunston
Approver's name:	Charlene Hunston
Job Title:	Senior Analyst
Report Date:	23 February 2018

SOCOTEC

Sample Summary

Customer Reference	Laboratory Reference	Matrix	Sampling Date
Sample 013	RW0905ADD	Soil (Loam/Stones)	08/01/2018 14:55
Sample 014	RW0906ADD	Soil (Sand/Stones)	08/01/2018 12:00

Experimental

Gamma Spectrometry

Oven dried samples were analysed using method "ANU/SOP/2029 Issue 4." The measurement technique is based on the use of high purity germanium (HPGe) detectors coupled to an Ortec gamma ray spectroscopy system. The gamma ray spectra are stored on a computer and analysed using the software programme Fitzpeaks for photopeak identification and quantification. The detectors are calibrated for efficiency using a mixed radionuclide standard, which covers an energy range of approximately 60-2000 keV. The efficiency of gamma rays between 30 keV and 120 keV are determined on an individual basis.

Application of decay corrections for the naturally occurring daughter radionuclides of uranium and thorium assumes that the series daughter radionuclides are all in secular equilibrium and therefore decay with the half-life of the first radionuclide in the series." (^{226}Ra is not UKAS accredited)

Results

Results are presented in the following tables.

Any opinions and interpretations expressed herein are outside the scope of our UKAS accreditation.

The results in this test report relate only to the items tested, and test portions taken thereof. This test report must not be reproduced except in full, without written approval of the laboratory.

SOCOTEC

Results Summary – Gamma Spectrometry

Customer Reference	Laboratory Reference	Be-7	K-40	Co-60	Cs-134	Cs-137	Tl-208	Pb-210	Bi-212	Pb-212
Sample 013	RW0905ADD	< 21	210 ± 40	< 1.8	< 2.0	< 1.8	9.3 ± 1.8	< 32	< 24	22 ± 4
Sample 014	RW0906ADD	< 15	< 25	< 1.3	< 1.4	< 1.2	< 1.4	< 25	< 15	< 2.0

Customer Reference	Laboratory Reference	Bi-214	Pb-214	Ra-224	Ra-226*	Ac-228	Pa-234m	Th-234	U-235	Am-241
Sample 013	RW0905ADD	18 ± 4	22 ± 3	< 54	< 29	27 ± 5	< 180	< 34	< 1.9	< 3.4
Sample 014	RW0906ADD	< 3.2	< 2.9	< 28	< 21	< 5.5	< 150	< 25	< 1.3	< 2.5

Notes:

1. An asterisk "*" indicates that the analysis is not covered by the laboratory's UKAS accreditation.
2. Results are presented as $Bq.kg^{-1}$ of dried and homogenised samples and are decay corrected to the sampling date.
3. Results above the LoD are reported with expanded (2σ) uncertainties based on a total uncertainty budget.
4. 1σ uncertainties are rounded to 1 significant figure; results and 2σ uncertainties are rounded to the same precision.
5. For results below the Limit of Detection, the LoD is rounded up to 2 significant figures.
6. Detector calibrations are based upon homogeneous standard solutions. For quantification purposes the samples are assumed to be homogeneous.
7. ^{226}Ra has only one gamma ray at 186 keV and the major gamma ray from ^{235}U also occurs at 186 keV. ^{235}U can be measured by the lower abundance gamma ray at 144 keV and if a positive result for ^{235}U is reported, the ^{226}Ra result will be unreliable and overestimated. However even if ^{235}U is below the LoD there may still be a contribution to the ^{226}Ra from ^{235}U and the ^{226}Ra result may be unreliable and overestimated. If an accurate result for ^{226}Ra is required this is better obtained by radiochemical analysis.

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CONCEPT LIFE SCIENCES
DELIVERING SCIENCE

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Concept Life Sciences

Certificate of Analysis

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Tel : 0161 874 2400
Fax : 0161 874 2468

Report Number: Second Supplemental 709003-3

Date of Report: 25-Jun-2018

Customer: Fugro GeoServices
Fugro House
Hithercroft Road
Wallingford
Oxfordshire
OX10 9RB

Customer Contact: Ms Karen Blackmore

Customer Job Reference:
Customer Purchase Order: 56642KB-WAL
Customer Site Reference: HEP Package 3
Date Job Received at Concept: 15-Jan-2018
Date Analysis Started: 17-Jan-2018
Date Analysis Completed: 23-Mar-2018

The results reported relate to samples received in the laboratory and may not be representative of a whole batch.

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation

This report should not be reproduced except in full without the written approval of the laboratory

Tests covered by this certificate were conducted in accordance with Concept Life Sciences SOPs

All results have been reviewed in accordance with Section 25 of the Concept Life Sciences, Analytical Services Quality Manual

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mCERTS
THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME

Report checked
and authorised by :
Sara Abou-Shakra
Customer Service Manager

Issued by :
Sara Abou-Shakra
Customer Service Manager

Concept Reference: 709003
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

Concept Reference	**709003 001**	**709003 002**	**709003 003**	**709003 004**
Customer Sample Reference	**HEP-BH-821**	**HEP-BH-821**	**HEP-BH-821**	**HEP-BH-821**
Top Depth	**0.35**	**0.75**	**0.95**	**1.55**
Depth	**0.35**	**0.75**	**0.95**	**1.55**
Hole ID	**HEP-BH-821**	**HEP-BH-821**	**HEP-BH-821**	**HEP-BH-821**
Date Sampled	**11-JAN-2018**	**11-JAN-2018**	**11-JAN-2018**	**11-JAN-2018**
Time Sampled	**08:50**	**09:10**	**09:30**	**10:25**
AGS Type	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**FES1180111002**	**FES1180111005**	**FES1180111008**	**FES1180111011**
AGS Sample Reference	**2**	**5**	**8**	**11**
Matrix Class	**Topsoil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units				
Moisture @105C	T162	AR	0.1	%	**6.4**	**7.1**	**9.4**	**17**
Retained on 10mm sieve	T2	M40	0.1	%	<0.1	<0.1	<0.1	<0.1

Concept Reference: 709003
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Inorganics

Concept Reference	**709003 001**	**709003 002**	**709003 003**	**709003 004**
Customer Sample Reference	**HEP-BH-821**	**HEP-BH-821**	**HEP-BH-821**	**HEP-BH-821**
Top Depth	**0.35**	**0.75**	**0.95**	**1.55**
Depth	**0.35**	**0.75**	**0.95**	**1.55**
Hole ID	**HEP-BH-821**	**HEP-BH-821**	**HEP-BH-821**	**HEP-BH-821**
Date Sampled	**11-JAN-2018**	**11-JAN-2018**	**11-JAN-2018**	**11-JAN-2018**
Time Sampled	**08:50**	**09:10**	**09:30**	**10:25**
AGS Type	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**FES1180111002**	**FES1180111005**	**FES1180111008**	**FES1180111011**
AGS Sample Reference	**2**	**5**	**8**	**11**
Matrix Class	**Topsoil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units				
Chloride	T686	AR	1	mg/kg	**64**	**36**	**23**	**18**
Cyanide(Total)	T4	AR	1	mg/kg	<1	<1	**4**	<1
Thiocyanate	T4	A40	1	mg/kg	<10	<10	<10	<10
Nitrate	T686	AR	1	mg/kg	**4**	**17**	**24**	**9**
Nitrite	T686	AR	1	mg/kg	<1	<1	<1	<1
SO4(Total)	T6	A40	0.01	%	**0.49**	**0.32**	**0.22**	**0.17**
Sulphide	T4	AR	10	mg/kg	**26**	**28**	**15**	**18**

Concept Reference: 709003
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - Misc

				Concept Reference	**709003 001**	**709003 002**	**709003 003**	**709003 004**
				Customer Sample Reference	**HEP-BH-821**	**HEP-BH-821**	**HEP-BH-821**	**HEP-BH-821**
				Top Depth	**0.35**	**0.75**	**0.95**	**1.55**
				Depth	**0.35**	**0.75**	**0.95**	**1.55**
				Hole ID	**HEP-BH-821**	**HEP-BH-821**	**HEP-BH-821**	**HEP-BH-821**
				Date Sampled	**11-JAN-2018**	**11-JAN-2018**	**11-JAN-2018**	**11-JAN-2018**
				Time Sampled	**08:50**	**09:10**	**09:30**	**10:25**
				AGS Type	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**FES1180111002**	**FES1180111005**	**FES1180111008**	**FES1180111011**
				AGS Sample Reference	**2**	**5**	**8**	**11**
				Matrix Class	**Topsoil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**				
Soil Organic Matter	T287	A40	0.1	%	**3.7**	**2.9**	**2.9**	**2.5**
pH	T7	A40			**11.8**	**9.6**	**9.5**	**10.1**

Concept Reference: 709003
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings Metals and Metalloids

				Concept Reference	**709003 001**	**709003 002**	**709003 003**	**709003 004**
				Customer Sample Reference	**HEP-BH-821**	**HEP-BH-821**	**HEP-BH-821**	**HEP-BH-821**
				Top Depth	**0.35**	**0.75**	**0.95**	**1.55**
				Depth	**0.35**	**0.75**	**0.95**	**1.55**
				Hole ID	**HEP-BH-821**	**HEP-BH-821**	**HEP-BH-821**	**HEP-BH-821**
				Date Sampled	**11-JAN-2018**	**11-JAN-2018**	**11-JAN-2018**	**11-JAN-2018**
				Time Sampled	**08:50**	**09:10**	**09:30**	**10:25**
				AGS Type	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**FES1180111002**	**FES1180111005**	**FES1180111008**	**FES1180111011**
				AGS Sample Reference	**2**	**5**	**8**	**11**
				Matrix Class	**Topsoil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**				
Arsenic	T6	M40	2	mg/kg	**16**	**13**	**13**	**12**
Cadmium	T6	M40	1	mg/kg	<1	<1	<1	<1
Chromium	T6	M40	1	mg/kg	**18**	**18**	**26**	**19**
Chromium VI	T6	AR	1	mg/kg	<1	<1	<1	<1
Chromium (trivalent)	T85	AR	2	mg/kg	**18**	**18**	**26**	**19**
Iron	T6	A40	1	mg/kg	**15000**	**15000**	**20000**	**19000**
Lead	T6	M40	1	mg/kg	**86**	**91**	**120**	**94**
Manganese	T6	M40	1	mg/kg	**380**	**320**	**320**	**280**
Mercury	T6	M40	1	mg/kg	<1	<1	<1	<1
Nickel	T6	M40	1	mg/kg	**15**	**15**	**20**	**18**
Selenium	T6	M40	3	mg/kg	<3	<3	<3	<3
Copper	T6	M40	1	mg/kg	**120**	**24**	**37**	**23**
Zinc	T6	M40	1	mg/kg	**150**	**120**	**130**	**110**
Boron (water-soluble)	T6	AR	1	mg/kg	<1	<1	<1	<1

Concept Reference: 709003
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Chromium

				Concept Reference	**709003 001**	**709003 002**	**709003 003**	**709003 004**
				Customer Sample Reference	**HEP-BH-821**	**HEP-BH-821**	**HEP-BH-821**	**HEP-BH-821**
				Top Depth	**0.35**	**0.75**	**0.95**	**1.55**
				Depth	**0.35**	**0.75**	**0.95**	**1.55**
				Hole ID	**HEP-BH-821**	**HEP-BH-821**	**HEP-BH-821**	**HEP-BH-821**
				Date Sampled	**11-JAN-2018**	**11-JAN-2018**	**11-JAN-2018**	**11-JAN-2018**
				Time Sampled	**08:50**	**09:10**	**09:30**	**10:25**
				AGS Type	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**FES1180111002**	**FES1180111005**	**FES1180111008**	**FES1180111011**
				AGS Sample Reference	**2**	**5**	**8**	**11**
				Matrix Class	**Topsoil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**				
Chromium (trivalent)	T85	AR	2	mg/kg	**18**	**18**	**26**	**19**
Chromium VI	T6	AR	1	mg/kg	<1	<1	<1	<1

Concept Reference: 709003
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Total Phenol

				Concept Reference	**709003 001**	**709003 002**	**709003 003**	**709003 004**
				Customer Sample Reference	**HEP-BH-821**	**HEP-BH-821**	**HEP-BH-821**	**HEP-BH-821**
				Top Depth	**0.35**	**0.75**	**0.95**	**1.55**
				Depth	**0.35**	**0.75**	**0.95**	**1.55**
				Hole ID	**HEP-BH-821**	**HEP-BH-821**	**HEP-BH-821**	**HEP-BH-821**
				Date Sampled	**11-JAN-2018**	**11-JAN-2018**	**11-JAN-2018**	**11-JAN-2018**
				Time Sampled	**08:50**	**09:10**	**09:30**	**10:25**
				AGS Type	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**FES1180111002**	**FES1180111005**	**FES1180111008**	**FES1180111011**
				AGS Sample Reference	**2**	**5**	**8**	**11**
				Matrix Class	**Topsoil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**				
Phenols(Mono)	T4	AR	0.5	mg/kg	<1.0	<1.0	<1.0	<1.0

Concept Reference: 709003
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Asbestos

				Concept Reference	**709003 001**	**709003 002**	**709003 003**	**709003 004**
				Customer Sample Reference	**HEP-BH-821**	**HEP-BH-821**	**HEP-BH-821**	**HEP-BH-821**
				Top Depth	**0.35**	**0.75**	**0.95**	**1.55**
				Depth	**0.35**	**0.75**	**0.95**	**1.55**
				Hole ID	**HEP-BH-821**	**HEP-BH-821**	**HEP-BH-821**	**HEP-BH-821**
				Date Sampled	**11-JAN-2018**	**11-JAN-2018**	**11-JAN-2018**	**11-JAN-2018**
				Time Sampled	**08:50**	**09:10**	**09:30**	**10:25**
				AGS Type	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**FES1180111002**	**FES1180111005**	**FES1180111008**	**FES1180111011**
				AGS Sample Reference	**2**	**5**	**8**	**11**
				Matrix Class	**Topsoil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**				
Asbestos ID	T27	A40			N.D.	N.D.	N.D.	Chrysotile Detected

Concept Reference: 709003
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Asbestos Quantification

Concept Reference	**709003 004**
Customer Sample Reference	**HEP-BH-821**
Top Depth	**1.55**
Depth	**1.55**
Hole ID	**HEP-BH-821**
Date Sampled	**11-JAN-2018**
Time Sampled	**10:25**
AGS Type	**ES**
AGS Sample ID	**FES1180111011**
AGS Sample Reference	**11**
Matrix Class	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units	
Asbestos Quantification Stage 3	T413	AR	0.001	%	Chrysotile Fibres Detected **0.004**

Concept Reference: 709003
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Sub Suite 3 - Radiological

Concept Reference	**709003 001**	**709003 002**	**709003 003**
Customer Sample Reference	**HEP-BH-821**	**HEP-BH-821**	**HEP-BH-821**
Top Depth	**0.35**	**0.75**	**0.95**
Depth	**0.35**	**0.75**	**0.95**
Hole ID	**HEP-BH-821**	**HEP-BH-821**	**HEP-BH-821**
Date Sampled	**11-JAN-2018**	**11-JAN-2018**	**11-JAN-2018**
Time Sampled	**08:50**	**09:10**	**09:30**
AGS Type	**ES**	**ES**	**ES**
AGS Sample ID	**FES1180111002**	**FES1180111005**	**FES1180111008**
AGS Sample Reference	**2**	**5**	**8**
Matrix Class	**Topsoil**	**Sandy Soil**	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units			
High resolution gamma spectrometry	T100	AR	0.1	Bq/g	**0.2**	**0.2**	**0.2**
Tritium	T510	AR	0.1	Bq/g	<0.1	<0.1	<0.1

Concept Reference: 709003
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground Soils with Elevated PID Readings - Organics PAH US EPA 16

				Concept Reference	**709003 001**	**709003 002**	**709003 003**	**709003 004**
				Customer Sample Reference	**HEP-BH-821**	**HEP-BH-821**	**HEP-BH-821**	**HEP-BH-821**
				Top Depth	**0.35**	**0.75**	**0.95**	**1.55**
				Depth	**0.35**	**0.75**	**0.95**	**1.55**
				Hole ID	**HEP-BH-821**	**HEP-BH-821**	**HEP-BH-821**	**HEP-BH-821**
				Date Sampled	**11-JAN-2018**	**11-JAN-2018**	**11-JAN-2018**	**11-JAN-2018**
				Time Sampled	**08:50**	**09:10**	**09:30**	**10:25**
				AGS Type	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**FES1180111002**	**FES1180111005**	**FES1180111008**	**FES1180111011**
				AGS Sample Reference	**2**	**5**	**8**	**11**
				Matrix Class	**Topsoil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**				
Naphthalene	T207	M105	0.1	mg/kg	**0.1**	<0.1	<0.1	<0.1
Acenaphthylene	T207	M105	0.1	mg/kg	**0.2**	**0.1**	<0.1	<0.1
Acenaphthene	T207	M105	0.1	mg/kg	**0.3**	<0.1	<0.1	<0.1
Fluorene	T207	M105	0.1	mg/kg	**0.3**	**0.2**	<0.1	<0.1
Phenanthrene	T207	M105	0.1	mg/kg	**2.6**	**2.2**	**1.2**	<0.1
Anthracene	T207	M105	0.1	mg/kg	**0.7**	**0.6**	**0.4**	<0.1
Fluoranthene	T207	M105	0.1	mg/kg	**3.4**	**2.6**	**1.8**	<0.1
Pyrene	T207	M105	0.1	mg/kg	**2.7**	**2.1**	**1.4**	<0.1
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	**1.7**	**1.2**	**0.8**	<0.1
Chrysene	T207	M105	0.1	mg/kg	**1.5**	**1.1**	**0.7**	<0.1
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	**1.4**	**1.0**	**0.6**	<0.1
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	**1.5**	**0.9**	**0.7**	<0.1
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	**1.7**	**1.1**	**0.7**	<0.1
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	**1.1**	**0.7**	**0.5**	<0.1
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	**0.5**	**0.3**	**0.2**	<0.1
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	**1.3**	**0.7**	**0.5**	<0.1
PAH(total)	T207	M105	0.1	mg/kg	**21**	**15**	**9.4**	<0.1

Concept Reference: 709003
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - TPH (CWG)

				Concept Reference	**709003 001**	**709003 002**	**709003 003**	**709003 004**
				Customer Sample Reference	**HEP-BH-821**	**HEP-BH-821**	**HEP-BH-821**	**HEP-BH-821**
				Top Depth	**0.35**	**0.75**	**0.95**	**1.55**
				Depth	**0.35**	**0.75**	**0.95**	**1.55**
				Hole ID	**HEP-BH-821**	**HEP-BH-821**	**HEP-BH-821**	**HEP-BH-821**
				Date Sampled	**11-JAN-2018**	**11-JAN-2018**	**11-JAN-2018**	**11-JAN-2018**
				Time Sampled	**08:50**	**09:10**	**09:30**	**10:25**
				AGS Type	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**FES1180111002**	**FES1180111005**	**FES1180111008**	**FES1180111011**
				AGS Sample Reference	**2**	**5**	**8**	**11**
				Matrix Class	**Topsoil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**				
TPH (C5-C6 aliphatic)	T209	M105	100	µg/kg	<100	<100	<100	<100
TPH (C6-C8 aliphatic)	T209	M105	100	µg/kg	<100	<100	<100	<100
TPH (C8-C10 aliphatic)	T209	M105	100	µg/kg	<100	<100	<100	<100
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	(13) <1	(13) <1	(13) <1	(13) <1
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	**(13) 7**	**(13) 3**	(13) <1	**(13) 1**
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	**(13) 13**	(13) <1	(13) <1	(13) <1
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	**(13) 16**	**(13) 6**	**(13) 6**	**(13) 10**
TPH (C6-C7 aromatic)	T209	M105	100	µg/kg	<100	<100	<100	<100
TPH (C7-C8 aromatic)	T209	M105	100	µg/kg	<100	<100	<100	<100
TPH (C8-C10 aromatic)	T209	M105	100	µg/kg	<100	<100	<100	<100
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	(13) <2	(13) <2	(13) <2	(13) <2
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	**(13) 9**	(13) <1	(13) <1	(13) <1
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	**(13) 51**	**(13) 7**	**(13) 4**	**(13) 1**
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	**(13) 120**	**(13) 20**	**(13) 28**	**(13) 3**

Concept Reference: 709003
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil

Total Petroleum Hydrocarbons (Aliphatics+Aromatics) Total

Concept Reference	**709003 001**	**709003 002**	**709003 003**	**709003 004**
Customer Sample Reference	**HEP-BH-821**	**HEP-BH-821**	**HEP-BH-821**	**HEP-BH-821**
Top Depth	**0.35**	**0.75**	**0.95**	**1.55**
Depth	**0.35**	**0.75**	**0.95**	**1.55**
Hole ID	**HEP-BH-821**	**HEP-BH-821**	**HEP-BH-821**	**HEP-BH-821**
Date Sampled	**11-JAN-2018**	**11-JAN-2018**	**11-JAN-2018**	**11-JAN-2018**
Time Sampled	**08:50**	**09:10**	**09:30**	**10:25**
AGS Type	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**FES1180111002**	**FES1180111005**	**FES1180111008**	**FES1180111011**
AGS Sample Reference	**2**	**5**	**8**	**11**
Matrix Class	**Topsoil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units				
TPH (Aliphatic) total	T85	M105		mg/kg	(13) **36**	(13) **9.0**	(13) **6.0**	(13) **11**
TPH (Aromatic) total	T85	M105		mg/kg	(13) **180**	(13) **27**	(13) **32**	(13) **4.0**
TPH (Aliphatic+Aromatic) (sum)	T85	M105		mg/kg	**216**	**36.0**	**38.0**	**15.0**

Index to symbols used in Second Supplemental 709003-3

Value	Description
M105	Analysis conducted on an "as received" aliquot. Results are reported on a dry weight basis where moisture content was determined by assisted drying of sample at 105C
AR	As Received
A40	Assisted dried < 40C
M40	Analysis conducted on sample assisted dried at no more than 40C. Results are reported on a dry weight basis.
N.D.	Not Detected
13	Results have been blank corrected.
S	Analysis was subcontracted
M	Analysis is MCERTS accredited
U	Analysis is UKAS accredited
N	Analysis is not UKAS accredited

Notes

Second Supplemental to report TPH totals.
Nitrate and Nitrite transferred to Braintree
High resolution gamma spectrometry and Tritium is subcontracted to ESG.

Method Index

Value	Description
T2	Grav
T207	GC/MS (MCERTS)
T413	PLM/Grav
T6	ICP/OES
T510	Probe (Sub)
T7	Probe
T209	GC/MS (Head Space)(MCERTS)
T909	GCxGC
T162	Grav (1 Dec) (105 C)
T686	Discrete Analyser
T287	Calc TOC/0.58
T27	PLM
T85	Calc
T100	Gamma Spectrometry
T4	Colorimetry

Accreditation Summary

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Chromium VI	T6	AR	1	mg/kg	N	001-004
Soil Organic Matter	T287	A40	0.1	%	N	001-004
pH	T7	A40			M	001-004
Asbestos ID	T27	A40			SU	001-004
Phenols(Mono)	T4	AR	0.5	mg/kg	M	001-004
Chloride	T686	AR	1	mg/kg	N	001-004
Cyanide(Total)	T4	AR	1	mg/kg	M	001-004
Thiocyanate	T4	A40	1	mg/kg	N	001-004
Nitrate	T686	AR	1	mg/kg	N	001-004
Nitrite	T686	AR	1	mg/kg	N	001-004
SO4(Total)	T6	A40	0.01	%	U	001-004
Sulphide	T4	AR	10	mg/kg	N	001-004
Arsenic	T6	M40	2	mg/kg	M	001-004
Cadmium	T6	M40	1	mg/kg	M	001-004
Chromium	T6	M40	1	mg/kg	M	001-004
Chromium (trivalent)	T85	AR	2	mg/kg	N	001-004
Iron	T6	A40	1	mg/kg	U	001-004
Lead	T6	M40	1	mg/kg	M	001-004
Manganese	T6	M40	1	mg/kg	M	001-004
Mercury	T6	M40	1	mg/kg	M	001-004
Nickel	T6	M40	1	mg/kg	M	001-004
Selenium	T6	M40	3	mg/kg	M	001-004
Copper	T6	M40	1	mg/kg	M	001-004
Zinc	T6	M40	1	mg/kg	M	001-004
Boron (water-soluble)	T6	AR	1	mg/kg	N	001-004
Naphthalene	T207	M105	0.1	mg/kg	M	001-004
Acenaphthylene	T207	M105	0.1	mg/kg	U	001-004
Acenaphthene	T207	M105	0.1	mg/kg	M	001-004
Fluorene	T207	M105	0.1	mg/kg	M	001-004
Phenanthrene	T207	M105	0.1	mg/kg	M	001-004
Anthracene	T207	M105	0.1	mg/kg	U	001-004
Fluoranthene	T207	M105	0.1	mg/kg	M	001-004
Pyrene	T207	M105	0.1	mg/kg	M	001-004
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	M	001-004
Chrysene	T207	M105	0.1	mg/kg	M	001-004
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	M	001-004
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	M	001-004
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	M	001-004
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	M	001-004
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	M	001-004
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	M	001-004
PAH(total)	T207	M105	0.1	mg/kg	U	001-004
TPH (C5-C6 aliphatic)	T209	M105	100	µg/kg	N	001-004
TPH (C6-C8 aliphatic)	T209	M105	100	µg/kg	N	001-004
TPH (C8-C10 aliphatic)	T209	M105	100	µg/kg	N	001-004
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	M	001-004
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	M	001-004
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	M	001-004
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	M	001-004
TPH (C6-C7 aromatic)	T209	M105	100	µg/kg	N	001-004
TPH (C7-C8 aromatic)	T209	M105	100	µg/kg	N	001-004
TPH (C8-C10 aromatic)	T209	M105	100	µg/kg	N	001-004
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	M	001-004
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	M	001-004
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	M	001-004
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	M	001-004
TPH (Aliphatic) total	T85	M105		mg/kg	N	001-004
TPH (Aromatic) total	T85	M105		mg/kg	N	001-004
TPH (Aliphatic+Aromatic) (sum)	T85	M105		mg/kg	N	001-004
Asbestos Quantification Stage 3	T413	AR	0.001	%	SU	004
High resolution gamma spectrometry	T100	AR	0.1	Bq/g	SU	001-003
Tritium	T510	AR	0.1	Bq/g	SU	001-003
Moisture @105C	T162	AR	0.1	%	N	001-004
Retained on 10mm sieve	T2	M40	0.1	%	N	001-004

SOCOTEC

Analysis of Soil Samples

Client:	Concept Life Sciences Hadfield House 9 Hadfield Street Old Trafford Manchester M16 9FE
Testing Facility:	SOCOTEC UK Unit 12 Moorbrook Southmead Industrial Park Didcot Oxfordshire OX11 7HP
Laboratory Reference:	18-0124
Customer Reference:	709003
Quote Number:	ENR-ANU-9093
PO Number:	709003
Samples Received:	19 January 2018
Sample Condition:	Satisfactory, Ambient
Analysis Completed:	16 February 2018
Report Author:	
Author's Name:	Charlene Hunston
Job Title:	Senior Analyst
Approved By:	
Approver's name:	Carla Thompson
Job Title:	Deputy Project Manager
Report Date:	16 February 2018

SOCOTEC

Sample Summary

The samples were received 19 January 2018 and the results sent 01 February 2018, detailed in report 18-0052. The re-analysis schedule and sample details were confirmed by email on 02 February 2018.

Customer Reference	Laboratory Reference	Matrix	Sampling Date
Sample 001	RW1045 (RW0558 repeat)	Soil (0.35m)	11/01/2018 08:50
Sample 002	RW1046 (RW0559 repeat)	Soil (0.75m)	11/01/2018 09:10
Sample 003	RW1047 (RW0560 repeat)	Soil (0.95m)	11/01/2018 09:30

Experimental

Gamma Spectrometry

Oven dried samples were analysed using method "ANU/SOP/2029 Issue 4." The measurement technique is based on the use of high purity germanium (HPGe) detectors coupled to an Ortec gamma ray spectroscopy system. The gamma ray spectra are stored on a computer and analysed using the software programme Fitzpeaks for photopeak identification and quantification. The detectors are calibrated for efficiency using a mixed radionuclide standard, which covers an energy range of approximately 60-2000 keV. The efficiency of gamma rays between 30 keV and 120 keV are determined on an individual basis.

Application of decay corrections for the naturally occurring daughter radionuclides of uranium and thorium assumes that the series daughter radionuclides are all in secular equilibrium and therefore decay with the half-life of the first radionuclide in the series." (^{226}Ra is not UKAS accredited)

Results

Results are presented in the following tables.

Any opinions and interpretations expressed herein are outside the scope of our UKAS accreditation.

The results in this test report relate only to the items tested, and test portions taken thereof. This test report must not be reproduced except in full, without written approval of the laboratory.

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Results Summary – Gamma Spectrometry

Customer Reference	Laboratory Reference	Be-7	K-40	Co-60	Cs-134	Cs-137	Tl-208	Pb-210	Bi-212	Pb-212
Sample 001	RW1045	< 14	190 ± 30	< 1.5	< 1.4	< 1.3	4.9 ± 1.1	< 27	< 19	11.7 ± 1.8
Sample 002	RW1046	< 13	160 ± 30	< 1.5	< 1.5	< 1.3	5.8 ± 1.2	< 23	< 19	17 ± 2
Sample 003	RW1047	< 14	170 ± 30	< 1.5	< 1.5	< 1.3	4.3 ± 1.1	< 22	< 18	12.8 ± 1.8

Customer Reference	Laboratory Reference	Bi-214	Pb-214	Ra-224	Ra-226*	Ac-228	Pa-234m	Th-234	U-235	Am-241
Sample 001	RW1045	19 ± 3	21 ± 2	< 20	< 21	12 ± 3	< 150	< 28	< 1.3	< 2.4
Sample 002	RW1046	20 ± 3	26 ± 2	< 21	47 ± 16	16 ± 4	< 170	< 26	< 5.1	< 2.3
Sample 003	RW1047	12 ± 3	14 ± 2	< 20	< 21	13 ± 4	< 150	< 24	< 1.3	< 2.1

Notes:

1. Results and/or samples marked with an asterisk are not UKAS accredited.
2. Results are presented as $Bq.kg^{-1}$ of dried and homogenised sample and are decay corrected to the sampling date.
3. Results above the LoD are reported with expanded (2σ) uncertainties based on a total uncertainty budget.
4. 1σ uncertainties are rounded to 1 significant figure; results and 2σ uncertainties are rounded to the same precision.
5. For results below the Limit of Detection, the LoD is rounded up to 2 significant figures.
6. Detector calibrations are based upon homogeneous standard solutions. For quantification purposes the sample is assumed to be homogeneous.
7. ^{226}Ra has only one gamma ray at 186 keV and the major gamma ray from ^{235}U also occurs at 186 keV. ^{235}U can be measured by the lower abundance gamma ray at 144 keV and if a positive result for ^{235}U is reported, the ^{226}Ra result will be unreliable and overestimated. However even if ^{235}U is below the LoD there may still be a contribution to the ^{226}Ra from ^{235}U and the ^{226}Ra result may be unreliable and overestimated. If an accurate result for ^{226}Ra is required this is better obtained by radiochemical analysis.

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1015

CONCEPT LIFE SCIENCES
DELIVERING SCIENCE

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Concept Life Sciences

Certificate of Analysis

Hadfield House
Hadfield Street
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M16 9FE
Tel : 0161 874 2400
Fax : 0161 874 2468

Report Number: Supplemental 710090-2

Date of Report: 25-Jun-2018

Customer: Fugro GeoServices
Fugro House
Hithercroft Road
Wallingford
Oxfordshire
OX10 9RB

Customer Contact: Ms Karen Blackmore

Customer Job Reference:
Customer Purchase Order: 56642KB-WAL
Customer Site Reference: HEP Package 3
Date Job Received at Concept: 18-Jan-2018
Date Analysis Started: 22-Jan-2018
Date Analysis Completed: 14-Feb-2018

The results reported relate to samples received in the laboratory and may not be representative of a whole batch.

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation

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Tests covered by this certificate were conducted in accordance with Concept Life Sciences SOPs

All results have been reviewed in accordance with Section 25 of the Concept Life Sciences, Analytical Services Quality Manual

UKAS TESTING
1549

mCERTS
THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME

Report checked
and authorised by :
Sara Abou-Shakra
Customer Service Manager

Issued by :
Sara Abou-Shakra
Customer Service Manager

Concept Reference: 710090
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

Concept Reference	**710090 002**	**710090 003**	**710090 004**
Customer Sample Reference	**HEP-BH-65**	**HEP-BH-65**	**HEP-BH-65**
Top Depth	**0.65**	**1.25**	**2.10**
Hole ID	**HEP-BH-65**	**HEP-BH-65**	**HEP-BH-65**
Depth	**0.65**	**1.25**	**2.10**
Date Sampled	**16-JAN-2018**	**16-JAN-2018**	**16-JAN-2018**
Time Sampled	**14:40**	**15:40**	**16:20**
AGS Type	**ES**	**ES**	**ES**
AGS Sample ID	**HEPBH6520180116002**	**HEPBH6520180116003**	**HEPBH6520180116004**
AGS Sample Reference	**5**	**8**	**12**
Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units			
Moisture @105C	T162	AR	0.1	%	**14**	**15**	**5.0**
Retained on 10mm sieve	T2	M40	0.1	%	<0.1	<0.1	<0.1

Concept Reference: 710090
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Inorganics

Concept Reference	**710090 002**	**710090 003**	**710090 004**
Customer Sample Reference	**HEP-BH-65**	**HEP-BH-65**	**HEP-BH-65**
Top Depth	**0.65**	**1.25**	**2.10**
Hole ID	**HEP-BH-65**	**HEP-BH-65**	**HEP-BH-65**
Depth	**0.65**	**1.25**	**2.10**
Date Sampled	**16-JAN-2018**	**16-JAN-2018**	**16-JAN-2018**
Time Sampled	**14:40**	**15:40**	**16:20**
AGS Type	**ES**	**ES**	**ES**
AGS Sample ID	**HEPBH6520180116002**	**HEPBH6520180116003**	**HEPBH6520180116004**
AGS Sample Reference	**5**	**8**	**12**
Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units			
Chloride	T686	AR	1	mg/kg	**39**	**8**	**4**
Cyanide(Total)	T4	AR	1	mg/kg	<1	<1	<1
Thiocyanate	T4	A40	1	mg/kg	<10	<10	<10
Nitrate	T686	AR	1	mg/kg	**20**	**4**	**3**
Nitrite	T686	AR	1	mg/kg	<1	<1	<1
SO4(Total)	T6	A40	0.01	%	**0.17**	**0.07**	**0.01**
Sulphide	T4	A40	10	mg/kg	<10	<10	<10

Concept Reference: 710090
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - Misc

				Concept Reference	**710090 002**	**710090 003**	**710090 004**
				Customer Sample Reference	**HEP-BH-65**	**HEP-BH-65**	**HEP-BH-65**
				Top Depth	**0.65**	**1.25**	**2.10**
				Hole ID	**HEP-BH-65**	**HEP-BH-65**	**HEP-BH-65**
				Depth	**0.65**	**1.25**	**2.10**
				Date Sampled	**16-JAN-2018**	**16-JAN-2018**	**16-JAN-2018**
				Time Sampled	**14:40**	**15:40**	**16:20**
				AGS Type	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH6520180116002**	**HEPBH6520180116003**	**HEPBH6520180116004**
				AGS Sample Reference	**5**	**8**	**12**
				Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**			
Soil Organic Matter	T287	A40	0.1	%	**5.8**	**1.6**	**0.1**
pH	T7	A40			**8.8**	**8.4**	**8.2**

Concept Reference: 710090
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings Metals and Metalloids

				Concept Reference	**710090 002**	**710090 003**	**710090 004**
				Customer Sample Reference	**HEP-BH-65**	**HEP-BH-65**	**HEP-BH-65**
				Top Depth	**0.65**	**1.25**	**2.10**
				Hole ID	**HEP-BH-65**	**HEP-BH-65**	**HEP-BH-65**
				Depth	**0.65**	**1.25**	**2.10**
				Date Sampled	**16-JAN-2018**	**16-JAN-2018**	**16-JAN-2018**
				Time Sampled	**14:40**	**15:40**	**16:20**
				AGS Type	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH6520180116002**	**HEPBH6520180116003**	**HEPBH6520180116004**
				AGS Sample Reference	**5**	**8**	**12**
				Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**			
Arsenic	T6	M40	2	mg/kg	**21**	**9**	<2
Cadmium	T6	M40	1	mg/kg	<1	<1	<1
Chromium	T6	M40	1	mg/kg	**33**	**40**	**28**
Chromium VI	T6	A40	1	mg/kg	<1	<1	<1
Chromium (trivalent)	T85	AR	2	mg/kg	**33**	**40**	**28**
Iron	T6	A40	1	mg/kg	**35000**	**14000**	**4800**
Lead	T6	M40	1	mg/kg	**150**	**42**	**7**
Manganese	T6	M40	1	mg/kg	**400**	**170**	**52**
Mercury	T6	M40	1	mg/kg	<1	<1	<1
Nickel	T6	M40	1	mg/kg	**31**	**15**	**7**
Selenium	T6	M40	3	mg/kg	<3	<3	<3
Copper	T6	M40	1	mg/kg	**68**	**23**	**8**
Zinc	T6	M40	1	mg/kg	**170**	**58**	**12**
Boron (water-soluble)	T6	A40	1	mg/kg	<1	<1	<1

Concept Reference: 710090
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Total Phenol

Concept Reference	**710090 002**	**710090 003**	**710090 004**
Customer Sample Reference	**HEP-BH-65**	**HEP-BH-65**	**HEP-BH-65**
Top Depth	**0.65**	**1.25**	**2.10**
Hole ID	**HEP-BH-65**	**HEP-BH-65**	**HEP-BH-65**
Depth	**0.65**	**1.25**	**2.10**
Date Sampled	**16-JAN-2018**	**16-JAN-2018**	**16-JAN-2018**
Time Sampled	**14:40**	**15:40**	**16:20**
AGS Type	**ES**	**ES**	**ES**
AGS Sample ID	**HEPBH6520180116002**	**HEPBH6520180116003**	**HEPBH6520180116004**
AGS Sample Reference	**5**	**8**	**12**
Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units			
Phenols(Mono)	T4	AR	0.5	mg/kg	<1.0	<1.0	<1.0

Concept Reference: 710090
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Asbestos

Concept Reference	**710090 002**	**710090 003**	**710090 004**
Customer Sample Reference	**HEP-BH-65**	**HEP-BH-65**	**HEP-BH-65**
Top Depth	**0.65**	**1.25**	**2.10**
Hole ID	**HEP-BH-65**	**HEP-BH-65**	**HEP-BH-65**
Depth	**0.65**	**1.25**	**2.10**
Date Sampled	**16-JAN-2018**	**16-JAN-2018**	**16-JAN-2018**
Time Sampled	**14:40**	**15:40**	**16:20**
AGS Type	**ES**	**ES**	**ES**
AGS Sample ID	**HEPBH6520180116002**	**HEPBH6520180116003**	**HEPBH6520180116004**
AGS Sample Reference	**5**	**8**	**12**
Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units			
Asbestos ID	T27	AR			N.D.	N.D.	Chrysotile Fibres Detected

Concept Reference: 710090
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Asbestos Quantification

Concept Reference	**710090 004**
Customer Sample Reference	**HEP-BH-65**
Top Depth	**2.10**
Hole ID	**HEP-BH-65**
Depth	**2.10**
Date Sampled	**16-JAN-2018**
Time Sampled	**16:20**
AGS Type	**ES**
AGS Sample ID	**HEPBH6520180116004**
AGS Sample Reference	**12**
Matrix Class	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units	
Asbestos Quantification Stage 3	T413	AR	0.001	%	Chrysotile Fibres Detected <0.001

Concept Reference: 710090
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Sub Suite 3 - Radiological

Concept Reference	**710090 002**	**710090 003**	**710090 004**
Customer Sample Reference	**HEP-BH-65**	**HEP-BH-65**	**HEP-BH-65**
Top Depth	**0.65**	**1.25**	**2.10**
Hole ID	**HEP-BH-65**	**HEP-BH-65**	**HEP-BH-65**
Depth	**0.65**	**1.25**	**2.10**
Date Sampled	**16-JAN-2018**	**16-JAN-2018**	**16-JAN-2018**
Time Sampled	**14:40**	**15:40**	**16:20**
AGS Type	**ES**	**ES**	**ES**
AGS Sample ID	**HEPBH6520180116002**	**HEPBH6520180116003**	**HEPBH6520180116004**
AGS Sample Reference	**5**	**8**	**12**
Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units			
High resolution gamma spectrometry	T100	AR	0.1	Bq/g	**0.1**	<0.1	<0.1
Tritium	T510	AR	0.1	Bq/g	<0.1	<0.1	<0.1

Concept Reference: 710090
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground Soils with Elevated PID Readings - Organics PAH US EPA 16

Concept Reference	**710090 002**	**710090 003**	**710090 004**
Customer Sample Reference	**HEP-BH-65**	**HEP-BH-65**	**HEP-BH-65**
Top Depth	**0.65**	**1.25**	**2.10**
Hole ID	**HEP-BH-65**	**HEP-BH-65**	**HEP-BH-65**
Depth	**0.65**	**1.25**	**2.10**
Date Sampled	**16-JAN-2018**	**16-JAN-2018**	**16-JAN-2018**
Time Sampled	**14:40**	**15:40**	**16:20**
AGS Type	**ES**	**ES**	**ES**
AGS Sample ID	**HEPBH6520180116002**	**HEPBH6520180116003**	**HEPBH6520180116004**
AGS Sample Reference	**5**	**8**	**12**
Matrix Class	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units			
Naphthalene	T207	M105	0.1	mg/kg	**0.4**	<0.1	<0.1
Acenaphthylene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1
Acenaphthene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1
Fluorene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1
Phenanthrene	T207	M105	0.1	mg/kg	**0.2**	<0.1	<0.1
Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1
Fluoranthene	T207	M105	0.1	mg/kg	**0.5**	<0.1	<0.1
Pyrene	T207	M105	0.1	mg/kg	**0.4**	<0.1	<0.1
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	**0.2**	<0.1	<0.1
Chrysene	T207	M105	0.1	mg/kg	**0.3**	<0.1	<0.1
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	**0.2**	<0.1	<0.1
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	**0.3**	<0.1	<0.1
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	**0.2**	<0.1	<0.1
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	**0.2**	<0.1	<0.1
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	**0.2**	<0.1	<0.1
PAH(total)	T207	M105	0.1	mg/kg	**3.1**	<0.1	<0.1

Concept Reference: 710090
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - TPH (CWG)

Concept Reference					**710090 002**	**710090 003**	**710090 004**
Customer Sample Reference					**HEP-BH-65**	**HEP-BH-65**	**HEP-BH-65**
Top Depth					**0.65**	**1.25**	**2.10**
Hole ID					**HEP-BH-65**	**HEP-BH-65**	**HEP-BH-65**
Depth					**0.65**	**1.25**	**2.10**
Date Sampled					**16-JAN-2018**	**16-JAN-2018**	**16-JAN-2018**
Time Sampled					**14:40**	**15:40**	**16:20**
AGS Type					**ES**	**ES**	**ES**
AGS Sample ID					**HEPBH6520180116002**	**HEPBH6520180116003**	**HEPBH6520180116004**
AGS Sample Reference					**5**	**8**	**12**
Matrix Class					**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**			
TPH (C5-C6 aliphatic)	T209	M105	100	µg/kg	<100	<100	<100
TPH (C6-C8 aliphatic)	T209	M105	100	µg/kg	<100	<100	<100
TPH (C8-C10 aliphatic)	T209	M105	100	µg/kg	<100	<100	<100
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	(13) <1	(13) <1	(13) <1
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	(13) <1	(13) <1	(13) <1
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	(13) <1	(13) <1	(13) <1
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	(13) <2	(13) <2	(13) <2
TPH (C6-C7 aromatic)	T209	M105	100	µg/kg	<100	<100	<100
TPH (C7-C8 aromatic)	T209	M105	100	µg/kg	<100	<100	<100
TPH (C8-C10 aromatic)	T209	M105	100	µg/kg	<100	<100	<100
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	(13) <2	(13) <2	(13) <2
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	(13) <1	(13) <1	(13) <1
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	**(13) 1**	(13) <1	(13) <1
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	**(13) 3**	(13) <1	(13) <1

Concept Reference: 710090
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil

Total Petroleum Hydrocarbons (Aliphatics+Aromatics) Total

Concept Reference					**710090 002**	**710090 003**	**710090 004**
Customer Sample Reference					**HEP-BH-65**	**HEP-BH-65**	**HEP-BH-65**
Top Depth					**0.65**	**1.25**	**2.10**
Hole ID					**HEP-BH-65**	**HEP-BH-65**	**HEP-BH-65**
Depth					**0.65**	**1.25**	**2.10**
Date Sampled					**16-JAN-2018**	**16-JAN-2018**	**16-JAN-2018**
Time Sampled					**14:40**	**15:40**	**16:20**
AGS Type					**ES**	**ES**	**ES**
AGS Sample ID					**HEPBH6520180116002**	**HEPBH6520180116003**	**HEPBH6520180116004**
AGS Sample Reference					**5**	**8**	**12**
Matrix Class					**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**			
TPH (Aliphatic) total	T85	M105		mg/kg	(13) N.D.	(13) N.D.	(13) N.D.
TPH (Aromatic) total	T85	M105		mg/kg	**(13) 4.0**	(13) N.D.	(13) N.D.
TPH (Aliphatic+Aromatic) (sum)	T85	M105		mg/kg	**4.00**	N.D.	N.D.

Index to symbols used in Supplemental 710090-2

Value	Description
AR	As Received
M40	Analysis conducted on sample assisted dried at no more than 40C. Results are reported on a dry weight basis.
M105	Analysis conducted on an "as received" aliquot. Results are reported on a dry weight basis where moisture content was determined by assisted drying of sample at 105C
A40	Assisted dried < 40C

N.D.	Not Detected
13	Results have been blank corrected.
S	Analysis was subcontracted
M	Analysis is MCERTS accredited
U	Analysis is UKAS accredited
N	Analysis is not UKAS accredited

Notes

Supplemental to report TPH totals
Nitrate and Nitrite transferred to Concept Braintree
Radiological testing was subcontracted to ESG
These samples have been analysed exceeding recommended holding time for pH. It is possible therefore that the results provided may be compromised.
Asbestos testing was subcontracted to REC Asbestos.

Method Index

Value	Description
T4	Colorimetry
T909	GCxGC
T6	ICP/OES
T7	Probe
T686	Discrete Analyser
T2	Grav
T162	Grav (1 Dec) (105 C)
T510	Probe (Sub)
T27	PLM
T100	Gamma Spectrometry
T207	GC/MS (MCERTS)
T287	Calc TOC/0.58
T209	GC/MS (Head Space)(MCERTS)
T413	PLM/Grav
T85	Calc

Accreditation Summary

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Moisture @105C	T162	AR	0.1	%	N	002-004
Retained on 10mm sieve	T2	M40	0.1	%	N	002-004
Asbestos Quantification Stage 3	T413	AR	0.001	%	SU	004
High resolution gamma spectrometry	T100	AR	0.1	Bq/g	SU	002-004
Tritium	T510	AR	0.1	Bq/g	SU	002-004
Soil Organic Matter	T287	A40	0.1	%	N	002-004
pH	T7	A40			M	002-004
Asbestos ID	T27	AR			SU	002-004
Phenols(Mono)	T4	AR	0.5	mg/kg	M	002-004
Chloride	T686	AR	1	mg/kg	N	002-004
Cyanide(Total)	T4	AR	1	mg/kg	M	002-004
Thiocyanate	T4	A40	1	mg/kg	N	002-004
Nitrate	T686	AR	1	mg/kg	N	002-004
Nitrite	T686	AR	1	mg/kg	N	002-004
SO4(Total)	T6	A40	0.01	%	U	002-004
Sulphide	T4	A40	10	mg/kg	N	002-004
Arsenic	T6	M40	2	mg/kg	M	002-004
Cadmium	T6	M40	1	mg/kg	M	002-004
Chromium	T6	M40	1	mg/kg	M	002-004
Chromium VI	T6	A40	1	mg/kg	N	002-004
Chromium (trivalent)	T85	AR	2	mg/kg	N	002-004
Iron	T6	A40	1	mg/kg	U	002-004
Lead	T6	M40	1	mg/kg	M	002-004
Manganese	T6	M40	1	mg/kg	M	002-004
Mercury	T6	M40	1	mg/kg	M	002-004
Nickel	T6	M40	1	mg/kg	M	002-004
Selenium	T6	M40	3	mg/kg	M	002-004
Copper	T6	M40	1	mg/kg	M	002-004
Zinc	T6	M40	1	mg/kg	M	002-004
Boron (water-soluble)	T6	A40	1	mg/kg	N	002-004
Naphthalene	T207	M105	0.1	mg/kg	M	002-004

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Acenaphthylene	T207	M105	0.1	mg/kg	U	002-004
Acenaphthene	T207	M105	0.1	mg/kg	M	002-004
Fluorene	T207	M105	0.1	mg/kg	M	002-004
Phenanthrene	T207	M105	0.1	mg/kg	M	002-004
Anthracene	T207	M105	0.1	mg/kg	U	002-004
Fluoranthene	T207	M105	0.1	mg/kg	M	002-004
Pyrene	T207	M105	0.1	mg/kg	M	002-004
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	M	002-004
Chrysene	T207	M105	0.1	mg/kg	M	002-004
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	M	002-004
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	M	002-004
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	M	002-004
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	M	002-004
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	M	002-004
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	M	002-004
PAH(total)	T207	M105	0.1	mg/kg	U	002-004
TPH (C5-C6 aliphatic)	T209	M105	100	µg/kg	N	002-004
TPH (C6-C8 aliphatic)	T209	M105	100	µg/kg	N	002-004
TPH (C8-C10 aliphatic)	T209	M105	100	µg/kg	N	002-004
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	M	002-004
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	M	002-004
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	M	002-004
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	M	002-004
TPH (C6-C7 aromatic)	T209	M105	100	µg/kg	N	002-004
TPH (C7-C8 aromatic)	T209	M105	100	µg/kg	N	002-004
TPH (C8-C10 aromatic)	T209	M105	100	µg/kg	N	002-004
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	M	002-004
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	M	002-004
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	M	002-004
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	M	002-004
TPH (Aliphatic) total	T85	M105		mg/kg	N	002-004
TPH (Aromatic) total	T85	M105		mg/kg	N	002-004
TPH (Aliphatic+Aromatic) (sum)	T85	M105		mg/kg	N	002-004

SOCOTEC

Analysis of Solid Samples

Client:	Concept Life Sciences Hadfield House 9 Hadfield Street Old Trafford Manchester M16 9FE
Testing Facility:	SOCOTEC UK Unit 12 Moorbrook Southmead Industrial Park Didcot Oxfordshire OX11 7HP
Laboratory Reference:	18-0071
Customer Reference:	710090
Quote Number:	ENR-ANU-9093
PO Number:	710090
Samples Received:	23 January 2018
Sample Condition:	Satisfactory, Ambient
Analysis Completed:	06 February 2018
Report Author:	
Author's Name:	Carla Thompson
Job Title:	Deputy Project Manager
Approved By:	
Approver's name:	Trevor Harding
Job Title:	Senior Analyst
Report Date:	06 February 2018

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Sample Summary

Customer Reference	Laboratory Reference	Matrix	Sampling Date
Sample 002	RW0678	Soil	16/01/2018 14:40
Sample 003	RW0679	Stones	16/01/2018 15:40
Sample 004	RW0680	Stones	16/01/2018 16:20

Experimental

Total Tritium by Combustion and Liquid Scintillation Counting

As received samples were analysed following method "ANU/SOP/2094 Issue 3." A sub-sample of known weight was taken from each sample and combusted in an oxygen rich atmosphere in the presence of a copper oxide catalyst. Under these conditions the hydrogen and tritium were converted to water vapour. These were then selectively trapped in a series of gas-bubblers containing dilute acid. Aliquots of known weight were then assessed for their tritium content by liquid scintillation counting. The tritium activity was corrected for the proportion of the bubbler trapping solution taken and for the weight of combusted sample.

Gamma Spectrometry

Oven dried samples were analysed using method "ANU/SOP/2029 Issue 4." The measurement technique is based on the use of high purity germanium (HPGe) detectors coupled to an Ortec gamma ray spectroscopy system. The gamma ray spectra are stored on a computer and analysed using the software programme Fitzpeaks for photopeak identification and quantification. The detectors are calibrated for efficiency using a mixed radionuclide standard, which covers an energy range of approximately 60-2000 keV. The efficiency of gamma rays between 30 keV and 120 keV are determined on an individual basis.

Application of decay corrections for the naturally occurring daughter radionuclides of uranium and thorium assumes that the series daughter radionuclides are all in secular equilibrium and therefore decay with the half-life of the first radionuclide in the series." (^{226}Ra is not UKAS accredited)

Deviating Sample Disclaimer

H) The matrix of stones is not covered by our UKAS accreditation and is therefore not subject to our deviating sample policy.

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Results

Results are presented in the following tables.

Any opinions and interpretations expressed herein are outside the scope of our UKAS accreditation.

The results in this test report relate only to the items tested, and test portions taken thereof. This test report must not be reproduced except in full, without written approval of the laboratory.

Results Summary – Tritium

Customer Reference	Laboratory Reference	Tritium
Sample 002	**RW0678**	<23
Sample 003	**RW0679**	<26
Sample 004	**RW0680**	<22

Notes:
1. Results are presented as $Bq.kg^{-1}$ of sample as received and are decay corrected to the sampling date.
2. Uncertainties are quoted at 2 s.d. based on expanded uncertainties.

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Results Summary – Gamma Spectrometry

Customer Reference	Laboratory Reference	Be-7	K-40	Co-60	Cs-134	Cs-137	Tl-208	Pb-210	Bi-212	Pb-212
Sample 002	RW0678	<9.6	90 ± 20	<1.3	<1.5	<1.2	<1.5	<30	<17	11 ± 2
Sample 003	RW0679 *	<8.6	<23	<1.2	<1.3	<1.1	<1.3	<26	<15	<2.0
Sample 004	RW0680 *	<9.2	<22	<1.3	<1.3	<1.2	<1.3	<25	<15	<1.9

Customer Reference	Laboratory Reference	Bi-214	Pb-214	Ra-224	Ra-226 *	Ac-228	Pa-234m	Th-234	U-235	Am-241
Sample 002	RW0678	10 ± 3	12 ± 2	<38	<24	<5.9	<150	<31	<1.5	<3.0
Sample 003	RW0679 *	<2.8	<2.7	<27	<20	<4.9	<130	<25	<1.3	<2.4
Sample 004	RW0680 *	<2.7	<2.8	<26	<20	<5.0	<130	<25	<1.3	<2.4

Notes:

1. Results and/or samples marked with an asterisk are not UKAS accredited.
2. Results are presented as $Bq.kg^{-1}$ of dried and homogenised sample and are decay corrected to the sampling date.
3. Results above the LoD are reported with expanded (2σ) uncertainties based on a total uncertainty budget.
4. 1σ uncertainties are rounded to 1 significant figure; results and 2σ uncertainties are rounded to the same precision.
5. For results below the Limit of Detection, the LoD is rounded up to 2 significant figures.
6. Detector calibrations are based upon homogeneous standard solutions. For quantification purposes the sample is assumed to be homogeneous.
7. ^{226}Ra has only one gamma ray at 186 keV and the major gamma ray from ^{235}U also occurs at 186 keV. ^{235}U can be measured by the lower abundance gamma ray at 144 keV and if a positive result for ^{235}U is reported, the ^{226}Ra result will be unreliable and overestimated. However even if ^{235}U is below the LoD there may still be a contribution to the ^{226}Ra from ^{235}U and the ^{226}Ra result may be unreliable and overestimated. If an accurate result for ^{226}Ra is required this is better obtained by radiochemical analysis.

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DELIVERING SCIENCE

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Concept Life Sciences

Certificate of Analysis

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Report Number: Supplemental 720766-1

Date of Report: 27-Jun-2018

Customer: Fugro GeoServices
Fugro House
Hithercroft Road
Wallingford
Oxfordshire
OX10 9RB

Customer Contact: Ms Karen Blackmore

Customer Job Reference: G170029U
Customer Purchase Order: 56642KB-WAL
Customer Site Reference: HEP Package 3
Date Job Received at Concept: 07-Mar-2018
Date Analysis Started: 09-Mar-2018
Date Analysis Completed: 19-Mar-2018

The results reported relate to samples received in the laboratory and may not be representative of a whole batch.

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation

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Tests covered by this certificate were conducted in accordance with Concept Life Sciences SOPs

All results have been reviewed in accordance with Section 25 of the Concept Life Sciences, Analytical Services Quality Manual

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mCERTS
THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME

Report checked
and authorised by :
Sara Abou-Shakra
Customer Service Manager

Issued by :
Sara Abou-Shakra
Customer Service Manager

Concept Reference: 720766
Project Site: HEP Package 3
Customer Reference: G170029U

Soil Analysed as Soil
MCERTS Preparation

Concept Reference					**720766 001**	**720766 003**	**720766 004**	**720766 005**	**720766 009**
Customer Sample Reference					**HEP-BH-820**	**HEP-BH-820**	**HEP-BH-820**	**HEP-BH-820**	**HEP-BH-822**
Top Depth					**0.05**	**0.60**	**1.60**	**2.60**	**0.20**
Depth					**0.05**	**0.60**	**1.60**	**2.60**	**0.20**
Hole ID					**HEP-BH-820**	**HEP-BH-820**	**HEP-BH-820**	**HEP-BH-820**	**HEP-BH-822**
Date Sampled					**06-MAR-2018**	**06-MAR-2018**	**06-MAR-2018**	**06-MAR-2018**	**05-MAR-2018**
Time Sampled					**14:00**	**15:00**	**15:30**	**16:00**	**09:30**
AGS Type					**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID					**HEPBH8202018030600 1**	**HEPBH8202018030600 3**	**HEPBH8202018030600 4**	**HEPBH8202018030600 5**	**HEPBH8222018030500 2**
AGS Sample Reference					**2**	**7**	**10**	**14**	**6**
Matrix Class					**Topsoil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Moisture @105C	T162	AR	0.1	%	**25**	**18**	**27**	**16**	**20**
Retained on 10mm sieve	T2	M40	0.1	%	<0.1	<0.1	<0.1	<0.1	<0.1

Concept Reference: 720766
Project Site: HEP Package 3
Customer Reference: G170029U

Soil Analysed as Soil
MCERTS Preparation

Concept Reference					**720766 011**	**720766 014**
Customer Sample Reference					**HEP-BH-822**	**HEP-BH-822**
Top Depth					**1.50**	**3.00**
Depth					**1.50**	**3.00**
Hole ID					**HEP-BH-822**	**HEP-BH-822**
Date Sampled					**05-MAR-2018**	**05-MAR-2018**
Time Sampled					**10:30**	**12:00**
AGS Type					**ES**	**ES**
AGS Sample ID					**HEPBH8222018030500 4**	**HEPBH8222018030500 7**
AGS Sample Reference					**11**	**18**
Matrix Class					**Sandy Soil**	**Other**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**		
Moisture @105C	T162	AR	0.1	%	**20**	**0.8**
Retained on 10mm sieve	T2	M40	0.1	%	<0.1	<0.1

Concept Reference: 720766
Project Site: HEP Package 3
Customer Reference: G170029U

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - Inorganics

				Concept Reference	**720766 001**	**720766 003**	**720766 004**	**720766 005**	**720766 009**
				Customer Sample Reference	**HEP-BH-820**	**HEP-BH-820**	**HEP-BH-820**	**HEP-BH-820**	**HEP-BH-822**
				Top Depth	**0.05**	**0.60**	**1.60**	**2.60**	**0.20**
				Depth	**0.05**	**0.60**	**1.60**	**2.60**	**0.20**
				Hole ID	**HEP-BH-820**	**HEP-BH-820**	**HEP-BH-820**	**HEP-BH-820**	**HEP-BH-822**
				Date Sampled	**06-MAR-2018**	**06-MAR-2018**	**06-MAR-2018**	**06-MAR-2018**	**05-MAR-2018**
				Time Sampled	**14:00**	**15:00**	**15:30**	**16:00**	**09:30**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH82020180306001**	**HEPBH82020180306003**	**HEPBH82020180306004**	**HEPBH82020180306005**	**HEPBH82220180305002**
				AGS Sample Reference	**2**	**7**	**10**	**14**	**6**
				Matrix Class	**Topsoil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Chloride	T686	AR	1	mg/kg	**4**	**5**	**12**	**6**	**3**
Cyanide(Total)	T4	AR	1	mg/kg	<1	<1	<1	<1	<1
Thiocyanate	T4	A40	1	mg/kg	<10	<10	<10	<10	<10
Nitrate	T686	AR	1	mg/kg	<1	<1	<1	<1	<1
Nitrite	T686	AR	1	mg/kg	<1	<1	<1	<1	<1
SO4(Total)	T6	A40	0.01	%	**0.10**	**0.09**	**0.18**	**0.06**	**0.06**
Sulphide	T4	A40	10	mg/kg	<10	<10	**45**	**240**	<10

Concept Reference: 720766
Project Site: HEP Package 3
Customer Reference: G170029U

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - Inorganics

				Concept Reference	**720766 011**	**720766 014**
				Customer Sample Reference	**HEP-BH-822**	**HEP-BH-822**
				Top Depth	**1.50**	**3.00**
				Depth	**1.50**	**3.00**
				Hole ID	**HEP-BH-822**	**HEP-BH-822**
				Date Sampled	**05-MAR-2018**	**05-MAR-2018**
				Time Sampled	**10:30**	**12:00**
				AGS Type	**ES**	**ES**
				AGS Sample ID	**HEPBH82220180305004**	**HEPBH82220180305007**
				AGS Sample Reference	**11**	**18**
				Matrix Class	**Sandy Soil**	**Other**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**		
Chloride	T686	AR	1	mg/kg	**11**	**2**
Cyanide(Total)	T4	AR	1	mg/kg	<1	<1
Thiocyanate	T4	A40	1	mg/kg	<10	<10
Nitrate	T686	AR	1	mg/kg	<1	<1
Nitrite	T686	AR	1	mg/kg	<1	<1
SO4(Total)	T6	A40	0.01	%	**0.08**	**0.06**
Sulphide	T4	A40	10	mg/kg	<10	<10

Concept Reference: 720766
Project Site: HEP Package 3
Customer Reference: G170029U

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - Misc

				Concept Reference	**720766 001**	**720766 003**	**720766 004**	**720766 005**	**720766 009**
				Customer Sample Reference	**HEP-BH-820**	**HEP-BH-820**	**HEP-BH-820**	**HEP-BH-820**	**HEP-BH-822**
				Top Depth	**0.05**	**0.60**	**1.60**	**2.60**	**0.20**
				Depth	**0.05**	**0.60**	**1.60**	**2.60**	**0.20**
				Hole ID	**HEP-BH-820**	**HEP-BH-820**	**HEP-BH-820**	**HEP-BH-820**	**HEP-BH-822**
				Date Sampled	**06-MAR-2018**	**06-MAR-2018**	**06-MAR-2018**	**06-MAR-2018**	**05-MAR-2018**
				Time Sampled	**14:00**	**15:00**	**15:30**	**16:00**	**09:30**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH8202018030600 1**	**HEPBH8202018030600 3**	**HEPBH8202018030600 4**	**HEPBH8202018030600 5**	**HEPBH8222018030500 2**
				AGS Sample Reference	**2**	**7**	**10**	**14**	**6**
				Matrix Class	**Topsoil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Soil Organic Matter	T287	A40	0.1	%	**8.6**	**5.1**	**8.3**	**3.3**	**4.1**
pH	T7	A40			**7.1**	**7.6**	**7.1**	**7.4**	**7.5**

Concept Reference: 720766
Project Site: HEP Package 3
Customer Reference: G170029U

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - Misc

				Concept Reference	**720766 011**	**720766 014**
				Customer Sample Reference	**HEP-BH-822**	**HEP-BH-822**
				Top Depth	**1.50**	**3.00**
				Depth	**1.50**	**3.00**
				Hole ID	**HEP-BH-822**	**HEP-BH-822**
				Date Sampled	**05-MAR-2018**	**05-MAR-2018**
				Time Sampled	**10:30**	**12:00**
				AGS Type	**ES**	**ES**
				AGS Sample ID	**HEPBH8222018030500 4**	**HEPBH8222018030500 7**
				AGS Sample Reference	**11**	**18**
				Matrix Class	**Sandy Soil**	**Other**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**		
Soil Organic Matter	T287	A40	0.1	%	**1.9**	**1.1**
pH	T7	A40			**8.1**	**7.9**

Concept Reference: 720766
Project Site: HEP Package 3
Customer Reference: G170029U

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings Metals and Metalloids

Concept Reference				**720766 001**	**720766 003**	**720766 004**	**720766 005**	**720766 009**
Customer Sample Reference				**HEP-BH-820**	**HEP-BH-820**	**HEP-BH-820**	**HEP-BH-820**	**HEP-BH-822**
Top Depth				**0.05**	**0.60**	**1.60**	**2.60**	**0.20**
Depth				**0.05**	**0.60**	**1.60**	**2.60**	**0.20**
Hole ID				**HEP-BH-820**	**HEP-BH-820**	**HEP-BH-820**	**HEP-BH-820**	**HEP-BH-822**
Date Sampled				**06-MAR-2018**	**06-MAR-2018**	**06-MAR-2018**	**06-MAR-2018**	**05-MAR-2018**
Time Sampled				**14:00**	**15:00**	**15:30**	**16:00**	**09:30**
AGS Type				**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID				**HEPBH8202018030600 1**	**HEPBH8202018030600 3**	**HEPBH8202018030600 4**	**HEPBH8202018030600 5**	**HEPBH8222018030500 2**
AGS Sample Reference				**2**	**7**	**10**	**14**	**6**
Matrix Class				**Topsoil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**				
Arsenic	T6	M40	2	mg/kg	**8**	**21**	**22**	**16**	**15**
Cadmium	T6	M40	1	mg/kg	<1	<1	<1	<1	<1
Chromium	T6	M40	1	mg/kg	**32**	**32**	**35**	**39**	**33**
Chromium VI	T6	A40	1	mg/kg	<1	<1	<1	<1	<1
Chromium (trivalent)	T85	AR	2	mg/kg	**32**	**32**	**35**	**39**	**33**
Iron	T6	A40	1	mg/kg	**15000**	**24000**	**23000**	**32000**	**28000**
Lead	T6	M40	1	mg/kg	**53**	**120**	**110**	**200**	**130**
Manganese	T6	M40	1	mg/kg	**280**	**320**	**230**	**460**	**450**
Mercury	T6	M40	1	mg/kg	<1	<1	<1	<1	<1
Nickel	T6	M40	1	mg/kg	**21**	**33**	**43**	**32**	**26**
Selenium	T6	M40	3	mg/kg	<3	<3	<3	<3	<3
Copper	T6	M40	1	mg/kg	**30**	**54**	**67**	**100**	**54**
Zinc	T6	M40	1	mg/kg	**130**	**120**	**150**	**240**	**140**
Boron (water-soluble)	T6	A40	1	mg/kg	<1	<1	<1	<1	<1

Concept Reference: 720766
Project Site: HEP Package 3
Customer Reference: G170029U

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings Metals and Metalloids

Concept Reference				**720766 011**	**720766 014**
Customer Sample Reference				**HEP-BH-822**	**HEP-BH-822**
Top Depth				**1.50**	**3.00**
Depth				**1.50**	**3.00**
Hole ID				**HEP-BH-822**	**HEP-BH-822**
Date Sampled				**05-MAR-2018**	**05-MAR-2018**
Time Sampled				**10:30**	**12:00**
AGS Type				**ES**	**ES**
AGS Sample ID				**HEPBH8222018030500 4**	**HEPBH8222018030500 7**
AGS Sample Reference				**11**	**18**
Matrix Class				**Sandy Soil**	**Other**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**		
Arsenic	T6	M40	2	mg/kg	**14**	**5.1**
Cadmium	T6	M40	1	mg/kg	<1	<1
Chromium	T6	M40	1	mg/kg	**32**	**26**
Chromium VI	T6	A40	1	mg/kg	<1	<1
Chromium (trivalent)	T85	AR	2	mg/kg	**32**	**26**
Iron	T6	A40	1	mg/kg	**32000**	**13000**
Lead	T6	M40	1	mg/kg	**72**	**23**
Manganese	T6	M40	1	mg/kg	**430**	**220**
Mercury	T6	M40	1	mg/kg	<1	<1
Nickel	T6	M40	1	mg/kg	**26**	**15**
Selenium	T6	M40	3	mg/kg	<3	<3
Copper	T6	M40	1	mg/kg	**30**	**17**
Zinc	T6	M40	1	mg/kg	**88**	**60**
Boron (water-soluble)	T6	A40	1	mg/kg	<1	<1

Concept Reference: 720766
Project Site: HEP Package 3
Customer Reference: G170029U

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - Total Phenol

Concept Reference					**720766 001**	**720766 003**	**720766 004**	**720766 005**	**720766 009**
Customer Sample Reference					**HEP-BH-820**	**HEP-BH-820**	**HEP-BH-820**	**HEP-BH-820**	**HEP-BH-822**
Top Depth					**0.05**	**0.60**	**1.60**	**2.60**	**0.20**
Depth					**0.05**	**0.60**	**1.60**	**2.60**	**0.20**
Hole ID					**HEP-BH-820**	**HEP-BH-820**	**HEP-BH-820**	**HEP-BH-820**	**HEP-BH-822**
Date Sampled					**06-MAR-2018**	**06-MAR-2018**	**06-MAR-2018**	**06-MAR-2018**	**05-MAR-2018**
Time Sampled					**14:00**	**15:00**	**15:30**	**16:00**	**09:30**
AGS Type					**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID					**HEPBH8202018030600 1**	**HEPBH8202018030600 3**	**HEPBH8202018030600 4**	**HEPBH8202018030600 5**	**HEPBH8222018030500 2**
AGS Sample Reference					**2**	**7**	**10**	**14**	**6**
Matrix Class					**Topsoil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Phenols(Mono)	T4	AR	0.5	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0

Concept Reference: 720766
Project Site: HEP Package 3
Customer Reference: G170029U

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - Total Phenol

Concept Reference					**720766 011**	**720766 014**
Customer Sample Reference					**HEP-BH-822**	**HEP-BH-822**
Top Depth					**1.50**	**3.00**
Depth					**1.50**	**3.00**
Hole ID					**HEP-BH-822**	**HEP-BH-822**
Date Sampled					**05-MAR-2018**	**05-MAR-2018**
Time Sampled					**10:30**	**12:00**
AGS Type					**ES**	**ES**
AGS Sample ID					**HEPBH8222018030500 4**	**HEPBH8222018030500 7**
AGS Sample Reference					**11**	**18**
Matrix Class					**Sandy Soil**	**Other**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**		
Phenols(Mono)	T4	AR	0.5	mg/kg	<1.0	<1.0

Concept Reference: 720766
Project Site: HEP Package 3
Customer Reference: G170029U

Soil Analysed as Soil

Suite A - Made Ground Soils with Elevated PID Readings - Organics PAH US EPA 16

Concept Reference	**720766 001**	**720766 003**	**720766 004**	**720766 005**	**720766 009**
Customer Sample Reference	**HEP-BH-820**	**HEP-BH-820**	**HEP-BH-820**	**HEP-BH-820**	**HEP-BH-822**
Top Depth	**0.05**	**0.60**	**1.60**	**2.60**	**0.20**
Depth	**0.05**	**0.60**	**1.60**	**2.60**	**0.20**
Hole ID	**HEP-BH-820**	**HEP-BH-820**	**HEP-BH-820**	**HEP-BH-820**	**HEP-BH-822**
Date Sampled	**06-MAR-2018**	**06-MAR-2018**	**06-MAR-2018**	**06-MAR-2018**	**05-MAR-2018**
Time Sampled	**14:00**	**15:00**	**15:30**	**16:00**	**09:30**
AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**HEPBH8202018030600 1**	**HEPBH8202018030600 3**	**HEPBH8202018030600 4**	**HEPBH8202018030600 5**	**HEPBH8222018030500 2**
AGS Sample Reference	**2**	**7**	**10**	**14**	**6**
Matrix Class	**Topsoil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**

Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Naphthalene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	T207	M105	0.1	mg/kg	**0.3**	<0.1	<0.1	<0.1	<0.1
Acenaphthene	T207	M105	0.1	mg/kg	**0.4**	<0.1	<0.1	<0.1	<0.1
Fluorene	T207	M105	0.1	mg/kg	**0.5**	<0.1	<0.1	<0.1	<0.1
Phenanthrene	T207	M105	0.1	mg/kg	**4.5**	<0.1	<0.1	<0.1	<0.1
Anthracene	T207	M105	0.1	mg/kg	**1.4**	<0.1	<0.1	<0.1	<0.1
Fluoranthene	T207	M105	0.1	mg/kg	**8.6**	<0.1	<0.1	**0.2**	<0.1
Pyrene	T207	M105	0.1	mg/kg	**7.3**	<0.1	<0.1	**0.2**	<0.1
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	**3.8**	<0.1	<0.1	<0.1	<0.1
Chrysene	T207	M105	0.1	mg/kg	**3.3**	<0.1	<0.1	<0.1	<0.1
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	**3.2**	<0.1	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	**3.2**	<0.1	<0.1	<0.1	<0.1
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	**3.6**	<0.1	<0.1	<0.1	<0.1
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	**2.1**	<0.1	<0.1	<0.1	<0.1
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	**1.0**	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	**2.6**	<0.1	<0.1	<0.1	<0.1
PAH(total)	T207	M105	0.1	mg/kg	**46**	<0.1	<0.1	**0.3**	<0.1

Concept Reference: 720766
Project Site: HEP Package 3
Customer Reference: G170029U

Soil Analysed as Soil

Suite A - Made Ground Soils with Elevated PID Readings - Organics PAH US EPA 16

Concept Reference	**720766 011**	**720766 014**
Customer Sample Reference	**HEP-BH-822**	**HEP-BH-822**
Top Depth	**1.50**	**3.00**
Depth	**1.50**	**3.00**
Hole ID	**HEP-BH-822**	**HEP-BH-822**
Date Sampled	**05-MAR-2018**	**05-MAR-2018**
Time Sampled	**10:30**	**12:00**
AGS Type	**ES**	**ES**
AGS Sample ID	**HEPBH8222018030500 4**	**HEPBH8222018030500 7**
AGS Sample Reference	**11**	**18**
Matrix Class	**Sandy Soil**	**Other**

Determinand	Method	Test Sample	LOD	Units		
Naphthalene	T207	M105	0.1	mg/kg	<0.1	<0.1
Acenaphthylene	T207	M105	0.1	mg/kg	<0.1	<0.1
Acenaphthene	T207	M105	0.1	mg/kg	<0.1	<0.1
Fluorene	T207	M105	0.1	mg/kg	<0.1	<0.1
Phenanthrene	T207	M105	0.1	mg/kg	<0.1	<0.1
Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1
Fluoranthene	T207	M105	0.1	mg/kg	<0.1	<0.1
Pyrene	T207	M105	0.1	mg/kg	<0.1	<0.1
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1
Chrysene	T207	M105	0.1	mg/kg	<0.1	<0.1
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	<0.1	<0.1
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	<0.1	<0.1
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	<0.1	<0.1
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	<0.1	<0.1
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	<0.1	<0.1
PAH(total)	T207	M105	0.1	mg/kg	<0.1	<0.1

Concept Reference: 720766
Project Site: HEP Package 3
Customer Reference: G170029U

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - Asbestos

Concept Reference	**720766 001**	**720766 003**	**720766 004**	**720766 005**	**720766 009**
Customer Sample Reference	**HEP-BH-820**	**HEP-BH-820**	**HEP-BH-820**	**HEP-BH-820**	**HEP-BH-822**
Top Depth	**0.05**	**0.60**	**1.60**	**2.60**	**0.20**
Depth	**0.05**	**0.60**	**1.60**	**2.60**	**0.20**
Hole ID	**HEP-BH-820**	**HEP-BH-820**	**HEP-BH-820**	**HEP-BH-820**	**HEP-BH-822**
Date Sampled	**06-MAR-2018**	**06-MAR-2018**	**06-MAR-2018**	**06-MAR-2018**	**05-MAR-2018**
Time Sampled	**14:00**	**15:00**	**15:30**	**16:00**	**09:30**
AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**HEPBH8202018030600 1**	**HEPBH8202018030600 3**	**HEPBH8202018030600 4**	**HEPBH8202018030600 5**	**HEPBH8222018030500 2**
AGS Sample Reference	**2**	**7**	**10**	**14**	**6**
Matrix Class	**Topsoil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units					
Asbestos ID	T27	AR			N.D.	N.D.	N.D.	N.D.	N.D.

Concept Reference: 720766
Project Site: HEP Package 3
Customer Reference: G170029U

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - Asbestos

Concept Reference	**720766 011**	**720766 014**
Customer Sample Reference	**HEP-BH-822**	**HEP-BH-822**
Top Depth	**1.50**	**3.00**
Depth	**1.50**	**3.00**
Hole ID	**HEP-BH-822**	**HEP-BH-822**
Date Sampled	**05-MAR-2018**	**05-MAR-2018**
Time Sampled	**10:30**	**12:00**
AGS Type	**ES**	**ES**
AGS Sample ID	**HEPBH8222018030500 4**	**HEPBH8222018030500 7**
AGS Sample Reference	**11**	**18**
Matrix Class	**Sandy Soil**	**Other**

Determinand	Method	Test Sample	LOD	Units		
Asbestos ID	T27	AR			N.D.	N.D.

Concept Reference: 720766
Project Site: HEP Package 3
Customer Reference: G170029U

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - TPH (CWG)

Concept Reference					**720766 001**	**720766 003**	**720766 004**	**720766 005**	**720766 009**
Customer Sample Reference					**HEP-BH-820**	**HEP-BH-820**	**HEP-BH-820**	**HEP-BH-820**	**HEP-BH-822**
Top Depth					**0.05**	**0.60**	**1.60**	**2.60**	**0.20**
Depth					**0.05**	**0.60**	**1.60**	**2.60**	**0.20**
Hole ID					**HEP-BH-820**	**HEP-BH-820**	**HEP-BH-820**	**HEP-BH-820**	**HEP-BH-822**
Date Sampled					**06-MAR-2018**	**06-MAR-2018**	**06-MAR-2018**	**06-MAR-2018**	**05-MAR-2018**
Time Sampled					**14:00**	**15:00**	**15:30**	**16:00**	**09:30**
AGS Type					**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID					**HEPBH8202018030600 1**	**HEPBH8202018030600 3**	**HEPBH8202018030600 4**	**HEPBH8202018030600 5**	**HEPBH8222018030500 2**
AGS Sample Reference					**2**	**7**	**10**	**14**	**6**
Matrix Class					**Topsoil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
TPH (C5-C6 aliphatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C6-C8 aliphatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C8-C10 aliphatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	(13) <1	(13) <1	(13) <1	(13) <1	(13) <1
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	**(13) 1**	(13) <1	(13) <1	(13) <1	(13) <1
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	**(13) 4**	(13) <1	(13) <1	(13) <1	(13) <1
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	**(13) 14**	(13) <2	(13) <2	(13) <2	(13) <2
TPH (C6-C7 aromatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C7-C8 aromatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C8-C10 aromatic)	T209	AR	100	µg/kg	<100	<100	<100	<100	<100
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	(13) <2	(13) <2	(13) <2	(13) <2	(13) <2
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	**(13) 6**	(13) <1	(13) <1	(13) <1	(13) <1
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	**(13) 56**	**(13) 2**	(13) <1	(13) <1	(13) <1
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	**(13) 110**	**(13) 8**	(13) <1	(13) <1	(13) <1

Concept Reference: 720766
Project Site: HEP Package 3
Customer Reference: G170029U

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - TPH (CWG)

Concept Reference	**720766 011**	**720766 014**
Customer Sample Reference	**HEP-BH-822**	**HEP-BH-822**
Top Depth	**1.50**	**3.00**
Depth	**1.50**	**3.00**
Hole ID	**HEP-BH-822**	**HEP-BH-822**
Date Sampled	**05-MAR-2018**	**05-MAR-2018**
Time Sampled	**10:30**	**12:00**
AGS Type	**ES**	**ES**
AGS Sample ID	**HEPBH82220180305004**	**HEPBH82220180305007**
AGS Sample Reference	**11**	**18**
Matrix Class	**Sandy Soil**	**Other**

Determinand	Method	Test Sample	LOD	Units		
TPH (C5-C6 aliphatic)	T209	AR	100	µg/kg	<100	<100
TPH (C6-C8 aliphatic)	T209	AR	100	µg/kg	<100	<100
TPH (C8-C10 aliphatic)	T209	AR	100	µg/kg	<100	<100
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	**(13) 1**	(13) <1
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	**(13) 1**	(13) <1
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	**(13) 1**	**(13) 1**
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	**(13) 9**	**(13) 25**
TPH (C6-C7 aromatic)	T209	AR	100	µg/kg	<100	<100
TPH (C7-C8 aromatic)	T209	AR	100	µg/kg	<100	<100
TPH (C8-C10 aromatic)	T209	AR	100	µg/kg	<100	<100
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	(13) <2	(13) <2
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	(13) <1	(13) <1
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	**(13) 5**	(13) <1
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	**(13) 11**	**(13) 2**

Concept Reference: 720766
Project Site: HEP Package 3
Customer Reference: G170029U

Soil Analysed as Soil

Total Petroleum Hydrocarbons (Aliphatics+Aromatics) Total

Concept Reference	**720766 001**	**720766 003**	**720766 004**	**720766 005**	**720766 009**
Customer Sample Reference	**HEP-BH-820**	**HEP-BH-820**	**HEP-BH-820**	**HEP-BH-820**	**HEP-BH-822**
Top Depth	**0.05**	**0.60**	**1.60**	**2.60**	**0.20**
Depth	**0.05**	**0.60**	**1.60**	**2.60**	**0.20**
Hole ID	**HEP-BH-820**	**HEP-BH-820**	**HEP-BH-820**	**HEP-BH-820**	**HEP-BH-822**
Date Sampled	**06-MAR-2018**	**06-MAR-2018**	**06-MAR-2018**	**06-MAR-2018**	**05-MAR-2018**
Time Sampled	**14:00**	**15:00**	**15:30**	**16:00**	**09:30**
AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**HEPBH82020180306001**	**HEPBH82020180306003**	**HEPBH82020180306004**	**HEPBH82020180306005**	**HEPBH82220180305002**
AGS Sample Reference	**2**	**7**	**10**	**14**	**6**
Matrix Class	**Topsoil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**

Determinand	Method	Test Sample	LOD	Units					
TPH (Aliphatic) total	T85	M105		mg/kg	**(13) 19**	(13) N.D.	(13) N.D.	(13) N.D.	(13) N.D.
TPH (Aromatic) total	T85	M105		mg/kg	**(13) 170**	**(13) 10**	(13) N.D.	(13) N.D.	(13) N.D.
TPH (Aliphatic+Aromatic) (sum)	T85	M105		mg/kg	**189**	**10.0**	N.D.	N.D.	N.D.

Concept Reference: 720766
Project Site: HEP Package 3
Customer Reference: G170029U

Soil Analysed as Soil

Total Petroleum Hydrocarbons (Aliphatics+Aromatics) Total

Concept Reference	**720766 011**	**720766 014**
Customer Sample Reference	**HEP-BH-822**	**HEP-BH-822**
Top Depth	**1.50**	**3.00**
Depth	**1.50**	**3.00**
Hole ID	**HEP-BH-822**	**HEP-BH-822**
Date Sampled	**05-MAR-2018**	**05-MAR-2018**
Time Sampled	**10:30**	**12:00**
AGS Type	**ES**	**ES**
AGS Sample ID	**HEPBH822201803050 04**	**HEPBH822201803050 07**
AGS Sample Reference	**11**	**18**
Matrix Class	**Sandy Soil**	**Other**

Determinand	Method	Test Sample	LOD	Units		
TPH (Aliphatic) total	T85	M105		mg/kg	(13) **12**	(13) **26**
TPH (Aromatic) total	T85	M105		mg/kg	(13) **16**	(13) **2.0**
TPH (Aliphatic+Aromatic) (sum)	T85	M105		mg/kg	**28.0**	**28.0**

Index to symbols used in Supplemental 720766-1

Value	Description
M40	Analysis conducted on sample assisted dried at no more than 40C. Results are reported on a dry weight basis.
A40	Assisted dried < 40C
M105	Analysis conducted on an "as received" aliquot. Results are reported on a dry weight basis where moisture content was determined by assisted drying of sample at 105C
AR	As Received
N.D.	Not Detected
13	Results have been blank corrected.
S	Analysis was subcontracted
M	Analysis is MCERTS accredited
U	Analysis is UKAS accredited
N	Analysis is not UKAS accredited

Notes

Asbestos subcontracted to REC Asbestos
"Other" samples are outside the scope of our accreditation.
Supplemental to report TPH totals.

Method Index

Value	Description
T6	ICP/OES
T686	Discrete Analyser
T207	GC/MS (MCERTS)
T209	GC/MS (Head Space)(MCERTS)
T287	Calc TOC/0.58
T162	Grav (1 Dec) (105 C)
T27	PLM
T2	Grav
T4	Colorimetry
T85	Calc
T7	Probe
T909	GCxGC

Accreditation Summary

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Moisture @105C	T162	AR	0.1	%	N	001,003-005,009,011,014
Retained on 10mm sieve	T2	M40	0.1	%	N	001,003-005,009,011,014
Soil Organic Matter	T287	A40	0.1	%	N	001,003-005,009,011,014
pH	T7	A40			M	001,003-005,009,011
pH	T7	A40			N	014
Asbestos ID	T27	AR			SU	001,003-005,009,011
Asbestos ID	T27	AR			SN	014
Phenols(Mono)	T4	AR	0.5	mg/kg	M	001,003-005,009,011
Phenols(Mono)	T4	AR	0.5	mg/kg	N	014
Chloride	T686	AR	1	mg/kg	N	001,003-005,009,011,014
Cyanide(Total)	T4	AR	1	mg/kg	M	001,003-005,009,011
Cyanide(Total)	T4	AR	1.0	mg/kg	N	014
Thiocyanate	T4	A40	1	mg/kg	N	001,003-005,009,011,014
Nitrate	T686	AR	1	mg/kg	N	001,003-005,009,011,014
Nitrite	T686	AR	1	mg/kg	N	001,003-005,009,011,014
SO4(Total)	T6	A40	0.01	%	U	001,003-005,009,011
SO4(Total)	T6	A40	0.01	%	N	014
Sulphide	T4	A40	10	mg/kg	N	001,003-005,009,011,014
Arsenic	T6	M40	2	mg/kg	M	001,003-005,009,011
Arsenic	T6	M40	2.0	mg/kg	N	014
Cadmium	T6	M40	1	mg/kg	M	001,003-005,009,011
Cadmium	T6	M40	1.0	mg/kg	N	014
Chromium	T6	M40	1	mg/kg	M	001,003-005,009,011
Chromium	T6	M40	1	mg/kg	N	014
Chromium VI	T6	A40	1	mg/kg	N	001,003-005,009,011,014
Chromium (trivalent)	T85	AR	2	mg/kg	N	001,003-005,009,011,014
Iron	T6	A40	1	mg/kg	U	001,003-005,009,011
Iron	T6	A40	1	mg/kg	N	014
Lead	T6	M40	1	mg/kg	M	001,003-005,009,011
Lead	T6	M40	1	mg/kg	N	014
Manganese	T6	M40	1	mg/kg	M	001,003-005,009,011
Manganese	T6	M40	1	mg/kg	N	014
Mercury	T6	M40	1	mg/kg	M	001,003-005,009,011
Mercury	T6	M40	1	mg/kg	N	014
Nickel	T6	M40	1	mg/kg	M	001,003-005,009,011
Nickel	T6	M40	1	mg/kg	N	014
Selenium	T6	M40	3	mg/kg	M	001,003-005,009,011
Selenium	T6	M40	3	mg/kg	N	014
Copper	T6	M40	1	mg/kg	M	001,003-005,009,011
Copper	T6	M40	1	mg/kg	N	014
Zinc	T6	M40	1	mg/kg	M	001,003-005,009,011
Zinc	T6	M40	1	mg/kg	N	014
Boron (water-soluble)	T6	A40	1	mg/kg	N	001,003-005,009,011,014
Naphthalene	T207	M105	0.1	mg/kg	M	001,003-005,009,011
Naphthalene	T207	M105	0.1	mg/kg	N	014
Acenaphthylene	T207	M105	0.1	mg/kg	U	001,003-005,009,011
Acenaphthylene	T207	M105	0.1	mg/kg	N	014
Acenaphthene	T207	M105	0.1	mg/kg	M	001,003-005,009,011
Acenaphthene	T207	M105	0.1	mg/kg	N	014
Fluorene	T207	M105	0.1	mg/kg	M	001,003-005,009,011
Fluorene	T207	M105	0.1	mg/kg	N	014
Phenanthrene	T207	M105	0.1	mg/kg	M	001,003-005,009,011
Phenanthrene	T207	M105	0.1	mg/kg	N	014
Anthracene	T207	M105	0.1	mg/kg	U	001,003-005,009,011
Anthracene	T207	M105	0.1	mg/kg	N	014
Fluoranthene	T207	M105	0.1	mg/kg	M	001,003-005,009,011
Fluoranthene	T207	M105	0.1	mg/kg	N	014
Pyrene	T207	M105	0.1	mg/kg	M	001,003-005,009,011
Pyrene	T207	M105	0.1	mg/kg	N	014
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	M	001,003-005,009,011
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	N	014
Chrysene	T207	M105	0.1	mg/kg	M	001,003-005,009,011
Chrysene	T207	M105	0.1	mg/kg	N	014
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	M	001,003-005,009,011
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	N	014
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	M	001,003-005,009,011
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	N	014
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	M	001,003-005,009,011
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	N	014
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	M	001,003-005,009,011

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	N	014
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	M	001,003-005,009,011
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	N	014
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	M	001,003-005,009,011
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	N	014
PAH(total)	T207	M105	0.1	mg/kg	U	001,003-005,009,011
PAH(total)	T207	M105	0.1	mg/kg	N	014
TPH (C5-C6 aliphatic)	T209	AR	100	µg/kg	N	001,003-005,009,011,014
TPH (C6-C8 aliphatic)	T209	AR	100	µg/kg	N	001,003-005,009,011,014
TPH (C8-C10 aliphatic)	T209	AR	100	µg/kg	N	001,003-005,009,011,014
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	M	001,003-005,009,011
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	N	014
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	M	001,003-005,009,011
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	N	014
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	M	001,003-005,009,011
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	N	014
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	M	001,003-005,009,011
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	N	014
TPH (C6-C7 aromatic)	T209	AR	100	µg/kg	N	001,003-005,009,011,014
TPH (C7-C8 aromatic)	T209	AR	100	µg/kg	N	001,003-005,009,011,014
TPH (C8-C10 aromatic)	T209	AR	100	µg/kg	N	001,003-005,009,011,014
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	M	001,003-005,009,011
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	N	014
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	M	001,003-005,009,011
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	N	014
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	M	001,003-005,009,011
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	N	014
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	M	001,003-005,009,011
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	N	014
TPH (Aliphatic) total	T85	M105		mg/kg	N	001,003-005,009,011,014
TPH (Aromatic) total	T85	M105		mg/kg	N	001,003-005,009,011,014
TPH (Aliphatic+Aromatic) (sum)	T85	M105		mg/kg	N	001,003-005,009,011,014

CONCEPT LIFE SCIENCES
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Concept Life Sciences

Certificate of Analysis

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Report Number: Supplemental 722427-2

Date of Report: 27-Jun-2018

Customer: Fugro GeoServices
Fugro House
Hithercroft Road
Wallingford
Oxfordshire
OX10 9RB

Customer Contact: Ms Karen Blackmore

Customer Job Reference:
Customer Purchase Order: 56642KB-WAL
Customer Site Reference: HEP Package 3
Date Job Received at Concept: 13-Mar-2018
Date Analysis Started: 19-Mar-2018
Date Analysis Completed: 22-Mar-2018

The results reported relate to samples received in the laboratory and may not be representative of a whole batch.

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation

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Tests covered by this certificate were conducted in accordance with Concept Life Sciences SOPs

All results have been reviewed in accordance with Section 25 of the Concept Life Sciences, Analytical Services Quality Manual

UKAS TESTING
1549

mCERTS
THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME

Report checked
and authorised by :
Sara Abou-Shakra
Customer Service Manager

Issued by :
Sara Abou-Shakra
Customer Service Manager

Concept Reference: 722427
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

Concept Reference	**722427 003**	**722427 005**	**722427 007**	**722427 008**
Customer Sample Reference	**HEP-BH-64**	**HEP-BH-64**	**HEP-BH-64**	**HEP-BH-64**
Depth	**0.15**	**0.85**	**2.45**	**4.45**
Hole ID	**HEP-BH-64**	**HEP-BH-64**	**HEP-BH-64**	**HEP-BH-64**
Top Depth	**0.15**	**0.85**	**2.45**	**4.45**
Date Sampled	**08-MAR-2018**	**08-MAR-2018**	**08-MAR-2018**	**08-MAR-2018**
Time Sampled	**10:20**	**10:41**	**13:07**	**14:01**
AGS Type	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**HEPBH6420180308002**	**HEPBH6420180308004**	**HEPBH6420180308006**	**HEPBH6420180308007**
AGS Sample Reference	**5**	**11**	**19**	**26**
Matrix Class	**Topsoil**	**Sandy Soil**	**Clay**	**Fill**

Determinand	Method	Test Sample	LOD	Units				
Moisture @105C	T162	AR	0.1	%	**16**	**18**	**18**	**3.9**
Retained on 10mm sieve	T2	M40	0.1	%	<0.1	<0.1	<0.1	<0.1

Concept Reference: 722427
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Inorganics

Concept Reference	**722427 003**	**722427 005**	**722427 007**	**722427 008**
Customer Sample Reference	**HEP-BH-64**	**HEP-BH-64**	**HEP-BH-64**	**HEP-BH-64**
Depth	**0.15**	**0.85**	**2.45**	**4.45**
Hole ID	**HEP-BH-64**	**HEP-BH-64**	**HEP-BH-64**	**HEP-BH-64**
Top Depth	**0.15**	**0.85**	**2.45**	**4.45**
Date Sampled	**08-MAR-2018**	**08-MAR-2018**	**08-MAR-2018**	**08-MAR-2018**
Time Sampled	**10:20**	**10:41**	**13:07**	**14:01**
AGS Type	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**HEPBH6420180308002**	**HEPBH6420180308004**	**HEPBH6420180308006**	**HEPBH6420180308007**
AGS Sample Reference	**5**	**11**	**19**	**26**
Matrix Class	**Topsoil**	**Sandy Soil**	**Clay**	**Fill**

Determinand	Method	Test Sample	LOD	Units				
Chloride	T686	AR	1	mg/kg	**8**	**6**	**44**	**2**
Cyanide(Total)	T4	AR	1	mg/kg	<1	<1	<1	<1
Thiocyanate	T4	A40	1	mg/kg	<10	<10	<10	<10
Nitrate	T686	AR	1	mg/kg	**12**	**12**	<1	<1
Nitrite	T686	AR	1	mg/kg	<1	<1	<1	<1
SO4(Total)	T6	A40	0.01	%	**0.13**	**0.28**	**0.33**	**0.03**
Sulphide	T4	A40	10	mg/kg	**10**	<10	**310**	<10

Concept Reference: 722427
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - Misc

Concept Reference	**722427 003**	**722427 005**	**722427 007**	**722427 008**
Customer Sample Reference	**HEP-BH-64**	**HEP-BH-64**	**HEP-BH-64**	**HEP-BH-64**
Depth	**0.15**	**0.85**	**2.45**	**4.45**
Hole ID	**HEP-BH-64**	**HEP-BH-64**	**HEP-BH-64**	**HEP-BH-64**
Top Depth	**0.15**	**0.85**	**2.45**	**4.45**
Date Sampled	**08-MAR-2018**	**08-MAR-2018**	**08-MAR-2018**	**08-MAR-2018**
Time Sampled	**10:20**	**10:41**	**13:07**	**14:01**
AGS Type	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**HEPBH6420180308002**	**HEPBH6420180308004**	**HEPBH6420180308006**	**HEPBH6420180308007**
AGS Sample Reference	**5**	**11**	**19**	**26**
Matrix Class	**Topsoil**	**Sandy Soil**	**Clay**	**Fill**

Determinand	**Method**	**Test Sample**	**LOD**	**Units**				
Soil Organic Matter	T287	A40	0.1	%	**7.8**	**5.2**	**7.4**	**0.5**
pH	T7	A40			**7.4**	**7.4**	**7.1**	**7.4**

Concept Reference: 722427
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings Metals and Metalloids

Concept Reference	**722427 003**	**722427 005**	**722427 007**	**722427 008**
Customer Sample Reference	**HEP-BH-64**	**HEP-BH-64**	**HEP-BH-64**	**HEP-BH-64**
Depth	**0.15**	**0.85**	**2.45**	**4.45**
Hole ID	**HEP-BH-64**	**HEP-BH-64**	**HEP-BH-64**	**HEP-BH-64**
Top Depth	**0.15**	**0.85**	**2.45**	**4.45**
Date Sampled	**08-MAR-2018**	**08-MAR-2018**	**08-MAR-2018**	**08-MAR-2018**
Time Sampled	**10:20**	**10:41**	**13:07**	**14:01**
AGS Type	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**HEPBH6420180308002**	**HEPBH6420180308004**	**HEPBH6420180308006**	**HEPBH6420180308007**
AGS Sample Reference	**5**	**11**	**19**	**26**
Matrix Class	**Topsoil**	**Sandy Soil**	**Clay**	**Fill**

Determinand	**Method**	**Test Sample**	**LOD**	**Units**				
Arsenic	T6	M40	2	mg/kg	**9**	**26**	**20**	**2.3**
Cadmium	T6	M40	1	mg/kg	<1	<1	<1	<1
Chromium	T6	M40	1	mg/kg	**48**	**35**	**33**	**9**
Chromium VI	T6	A40	1	mg/kg	<1	<1	<1	<1
Chromium (trivalent)	T85	A40	2	mg/kg	**48**	**35**	**33**	**9**
Iron	T6	A40	1	mg/kg	**21000**	**29000**	**26000**	**5000**
Lead	T6	M40	1	mg/kg	**37**	**96**	**72**	**7**
Manganese	T6	M40	1	mg/kg	**190**	**830**	**770**	**72**
Mercury	T6	M40	1	mg/kg	<1	<1	<1	<1
Nickel	T6	M40	1	mg/kg	**29**	**36**	**34**	**8**
Selenium	T6	M40	3	mg/kg	<3	<3	<3	<3
Copper	T6	M40	1	mg/kg	**28**	**40**	**35**	**7**
Zinc	T6	M40	1	mg/kg	**76**	**110**	**110**	**17**
Boron (water-soluble)	T6	A40	1	mg/kg	<1	<1	<1	<1

Concept Reference: 722427
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Total Phenol

				Concept Reference	**722427 003**	**722427 005**	**722427 007**	**722427 008**
				Customer Sample Reference	**HEP-BH-64**	**HEP-BH-64**	**HEP-BH-64**	**HEP-BH-64**
				Depth	**0.15**	**0.85**	**2.45**	**4.45**
				Hole ID	**HEP-BH-64**	**HEP-BH-64**	**HEP-BH-64**	**HEP-BH-64**
				Top Depth	**0.15**	**0.85**	**2.45**	**4.45**
				Date Sampled	**08-MAR-2018**	**08-MAR-2018**	**08-MAR-2018**	**08-MAR-2018**
				Time Sampled	**10:20**	**10:41**	**13:07**	**14:01**
				AGS Type	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH6420180308002**	**HEPBH6420180308004**	**HEPBH6420180308006**	**HEPBH6420180308007**
				AGS Sample Reference	**5**	**11**	**19**	**26**
				Matrix Class	**Topsoil**	**Sandy Soil**	**Clay**	**Fill**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**				
Phenols(Mono)	T4	AR	0.5	mg/kg	<1.0	<1.0	<1.0	<1.0

Concept Reference: 722427
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Asbestos

				Concept Reference	**722427 003**	**722427 005**	**722427 007**	**722427 008**
				Customer Sample Reference	**HEP-BH-64**	**HEP-BH-64**	**HEP-BH-64**	**HEP-BH-64**
				Depth	**0.15**	**0.85**	**2.45**	**4.45**
				Hole ID	**HEP-BH-64**	**HEP-BH-64**	**HEP-BH-64**	**HEP-BH-64**
				Top Depth	**0.15**	**0.85**	**2.45**	**4.45**
				Date Sampled	**08-MAR-2018**	**08-MAR-2018**	**08-MAR-2018**	**08-MAR-2018**
				Time Sampled	**10:20**	**10:41**	**13:07**	**14:01**
				AGS Type	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH6420180308002**	**HEPBH6420180308004**	**HEPBH6420180308006**	**HEPBH6420180308007**
				AGS Sample Reference	**5**	**11**	**19**	**26**
				Matrix Class	**Topsoil**	**Sandy Soil**	**Clay**	**Fill**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**				
Asbestos ID	T27	A40			N.D.	N.D.	N.D.	N.D.

Concept Reference: 722427
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Miscellaneous

				Concept Reference	**722427 001**
				Customer Sample Reference	**HEP-BH-1323**
				Depth	**0.50**
				Hole ID	**HEP-BH-1323**
				Top Depth	**0.50**
				Date Sampled	**29-NOV-2017**
				Time Sampled	**11:30**
				AGS Type	**B**
				AGS Sample ID	**HEPBH1323201711290 06**
				AGS Sample Reference	**6**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**	
Asbestos ID	T27	A40			Chrysotile Detected

Concept Reference: 722427
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground Soils with Elevated PID Readings - Organics PAH US EPA 16

				Concept Reference	**722427 003**	**722427 005**	**722427 007**	**722427 008**
				Customer Sample Reference	**HEP-BH-64**	**HEP-BH-64**	**HEP-BH-64**	**HEP-BH-64**
				Depth	**0.15**	**0.85**	**2.45**	**4.45**
				Hole ID	**HEP-BH-64**	**HEP-BH-64**	**HEP-BH-64**	**HEP-BH-64**
				Top Depth	**0.15**	**0.85**	**2.45**	**4.45**
				Date Sampled	**08-MAR-2018**	**08-MAR-2018**	**08-MAR-2018**	**08-MAR-2018**
				Time Sampled	**10:20**	**10:41**	**13:07**	**14:01**
				AGS Type	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH6420180308002**	**HEPBH6420180308004**	**HEPBH6420180308006**	**HEPBH6420180308007**
				AGS Sample Reference	**5**	**11**	**19**	**26**
				Matrix Class	**Topsoil**	**Sandy Soil**	**Clay**	**Fill**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**				
Naphthalene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	T207	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1
Acenaphthene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1
Fluorene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1
Phenanthrene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1
Anthracene	T207	AR	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1
Fluoranthene	T207	M105	0.1	mg/kg	<0.1	**0.2**	<0.1	<0.1
Pyrene	T207	M105	0.1	mg/kg	<0.1	**0.2**	<0.1	<0.1
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	<0.1	**0.1**	<0.1	<0.1
Chrysene	T207	M105	0.1	mg/kg	<0.1	**0.2**	<0.1	<0.1
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	<0.1	**0.1**	<0.1	<0.1
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	<0.1	**0.2**	<0.1	<0.1
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	<0.1	**0.2**	<0.1	<0.1
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	<0.1	**0.1**	<0.1	<0.1
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	<0.1	**0.1**	<0.1	<0.1
PAH(total)	T207	AR	0.1	mg/kg	<0.1	**1.5**	<0.1	<0.1

Concept Reference: 722427
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - TPH (CWG)

				Concept Reference	**722427 003**	**722427 005**	**722427 007**	**722427 008**
				Customer Sample Reference	**HEP-BH-64**	**HEP-BH-64**	**HEP-BH-64**	**HEP-BH-64**
				Depth	**0.15**	**0.85**	**2.45**	**4.45**
				Hole ID	**HEP-BH-64**	**HEP-BH-64**	**HEP-BH-64**	**HEP-BH-64**
				Top Depth	**0.15**	**0.85**	**2.45**	**4.45**
				Date Sampled	**08-MAR-2018**	**08-MAR-2018**	**08-MAR-2018**	**08-MAR-2018**
				Time Sampled	**10:20**	**10:41**	**13:07**	**14:01**
				AGS Type	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH6420180308002**	**HEPBH6420180308004**	**HEPBH6420180308006**	**HEPBH6420180308007**
				AGS Sample Reference	**5**	**11**	**19**	**26**
				Matrix Class	**Topsoil**	**Sandy Soil**	**Clay**	**Fill**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**				
TPH (C5-C6 aliphatic)	T209	AR	100	µg/kg	<100	<100	<100	<100
TPH (C6-C8 aliphatic)	T209	AR	100	µg/kg	<100	<100	<100	<100
TPH (C8-C10 aliphatic)	T209	AR	100	µg/kg	<100	<100	<100	<100
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	(13) <1	(13) <1	**(13) 2**	(13) <1
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	(13) <1	(13) <1	**(13) 2**	(13) <1
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	(13) <1	(13) <1	(13) <1	(13) <1
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	(13) <2	**(13) 9**	**(13) 4**	**(13) 18**
TPH (C6-C7 aromatic)	T209	AR	100	µg/kg	<100	<100	<100	<100
TPH (C7-C8 aromatic)	T209	AR	100	µg/kg	<100	<100	<100	<100
TPH (C8-C10 aromatic)	T209	AR	100	µg/kg	<100	<100	<100	<100
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	(13) <2	(13) <2	(13) <2	(13) <2
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	(13) <1	**(13) 4**	(13) <1	(13) <1
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	(13) <1	**(13) 24**	(13) <1	(13) <1
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	**(13) 2**	**(13) 27**	**(13) 1**	(13) <1

Concept Reference: 722427
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil

Total Petroleum Hydrocarbons (Aliphatics+Aromatics) Total

Concept Reference	**722427 003**	**722427 005**	**722427 007**	**722427 008**
Customer Sample Reference	**HEP-BH-64**	**HEP-BH-64**	**HEP-BH-64**	**HEP-BH-64**
Depth	**0.15**	**0.85**	**2.45**	**4.45**
Hole ID	**HEP-BH-64**	**HEP-BH-64**	**HEP-BH-64**	**HEP-BH-64**
Top Depth	**0.15**	**0.85**	**2.45**	**4.45**
Date Sampled	**08-MAR-2018**	**08-MAR-2018**	**08-MAR-2018**	**08-MAR-2018**
Time Sampled	**10:20**	**10:41**	**13:07**	**14:01**
AGS Type	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**HEPBH6420180308002**	**HEPBH6420180308004**	**HEPBH6420180308006**	**HEPBH6420180308007**
AGS Sample Reference	**5**	**11**	**19**	**26**
Matrix Class	**Topsoil**	**Sandy Soil**	**Clay**	**Fill**

Determinand	Method	Test Sample	LOD	Units				
TPH (Aliphatic) total	T85	M105		mg/kg	(13) N.D.	**(13) 9.0**	**(13) 8.0**	**(13) 18**
TPH (Aromatic) total	T85	M105		mg/kg	**(13) 2.0**	**(13) 55**	**(13) 1.0**	(13) N.D.
TPH (Aliphatic+Aromatic) (sum)	T85	M105		mg/kg	**2.00**	**64.0**	**9.00**	**18.0**

Index to symbols used in Supplemental 722427-2

Value	Description
A40	Assisted dried < 40C
AR	As Received
M105	Analysis conducted on an "as received" aliquot. Results are reported on a dry weight basis where moisture content was determined by assisted drying of sample at 105C
M40	Analysis conducted on sample assisted dried at no more than 40C. Results are reported on a dry weight basis.
N.D.	Not Detected
13	Results have been blank corrected.
S	Analysis was subcontracted
M	Analysis is MCERTS accredited
U	Analysis is UKAS accredited
N	Analysis is not UKAS accredited

Notes

Asbestos subcontracted to REC Asbestos
Sample 1 is Asbestos Cement and cannot be quantified
"Fill" samples are outside the scope of our MCERTS accreditation. Results are UKAS only
Supplemental to report TPH totals.

Method Index

Value	Description
T27	PLM
T909	GCxGC
T2	Grav
T4	Colorimetry
T7	Probe
T85	Calc
T209	GC/MS (Head Space)(MCERTS)
T287	Calc TOC/0.58
T162	Grav (1 Dec) (105 C)
T207	GC/MS (MCERTS)
T6	ICP/OES
T686	Discrete Analyser

Accreditation Summary

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Moisture @105C	T162	AR	0.1	%	N	003,005,007-008
Retained on 10mm sieve	T2	M40	0.1	%	N	003,005,007-008
Asbestos ID	T27	A40			SU	001,003,005,007-008
Soil Organic Matter	T287	A40	0.1	%	N	003,005,007-008
pH	T7	A40			M	003,005,007
pH	T7	A40			U	008
Phenols(Mono)	T4	AR	0.5	mg/kg	M	003,005,007
Phenols(Mono)	T4	AR	0.5	mg/kg	U	008
Chloride	T686	AR	1	mg/kg	N	003,005,007-008
Cyanide(Total)	T4	AR	1	mg/kg	M	003,005,007
Cyanide(Total)	T4	AR	1	mg/kg	U	008
Thiocyanate	T4	A40	1	mg/kg	N	003,005,007-008
Nitrate	T686	AR	1	mg/kg	N	003,005,007-008
Nitrite	T686	AR	1	mg/kg	N	003,005,007-008
SO4(Total)	T6	A40	0.01	%	U	003,005,007-008
Sulphide	T4	A40	10	mg/kg	N	003,005,007-008
Arsenic	T6	M40	2	mg/kg	M	003,005,007
Arsenic	T6	M40	2.0	mg/kg	U	008
Cadmium	T6	M40	1	mg/kg	M	003,005,007
Cadmium	T6	M40	1	mg/kg	U	008
Chromium	T6	M40	1	mg/kg	M	003,005,007
Chromium	T6	M40	1	mg/kg	U	008
Chromium VI	T6	A40	1	mg/kg	N	003,005,007-008
Chromium (trivalent)	T85	A40	2	mg/kg	N	003,005,007-008
Iron	T6	A40	1	mg/kg	U	003,005,007-008
Lead	T6	M40	1	mg/kg	M	003,005,007
Lead	T6	M40	1	mg/kg	U	008
Manganese	T6	M40	1	mg/kg	M	003,005,007
Manganese	T6	M40	1	mg/kg	U	008
Mercury	T6	M40	1	mg/kg	M	003,005,007
Mercury	T6	M40	1	mg/kg	U	008
Nickel	T6	M40	1	mg/kg	M	003,005,007
Nickel	T6	M40	1	mg/kg	U	008
Selenium	T6	M40	3	mg/kg	M	003,005,007
Selenium	T6	M40	3	mg/kg	U	008
Copper	T6	M40	1	mg/kg	M	003,005,007
Copper	T6	M40	1	mg/kg	U	008
Zinc	T6	M40	1	mg/kg	M	003,005,007
Zinc	T6	M40	1	mg/kg	U	008
Boron (water-soluble)	T6	A40	1	mg/kg	N	003,005,007-008
Naphthalene	T207	M105	0.1	mg/kg	M	003,005,007
Naphthalene	T207	M105	0.1	mg/kg	U	008
Acenaphthylene	T207	AR	0.1	mg/kg	U	003,005,007-008
Acenaphthene	T207	M105	0.1	mg/kg	M	003,005,007
Acenaphthene	T207	M105	0.1	mg/kg	U	008
Fluorene	T207	M105	0.1	mg/kg	M	003,005,007
Fluorene	T207	M105	0.1	mg/kg	U	008
Phenanthrene	T207	M105	0.1	mg/kg	M	003,005,007
Phenanthrene	T207	M105	0.1	mg/kg	U	008
Anthracene	T207	AR	0.1	mg/kg	U	003,005,007-008
Fluoranthene	T207	M105	0.1	mg/kg	M	003,005,007
Fluoranthene	T207	M105	0.1	mg/kg	U	008
Pyrene	T207	M105	0.1	mg/kg	M	003,005,007
Pyrene	T207	M105	0.1	mg/kg	U	008
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	M	003,005,007
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	U	008
Chrysene	T207	M105	0.1	mg/kg	M	003,005,007
Chrysene	T207	M105	0.1	mg/kg	U	008
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	M	003,005,007
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	U	008
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	M	003,005,007
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	U	008
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	M	003,005,007
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	U	008
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	M	003,005,007
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	U	008
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	M	003,005,007
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	U	008
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	M	003,005,007
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	U	008

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
PAH(total)	T207	AR	0.1	mg/kg	U	003,005,007-008
TPH (C5-C6 aliphatic)	T209	AR	100	µg/kg	N	003,005,007-008
TPH (C6-C8 aliphatic)	T209	AR	100	µg/kg	N	003,005,007-008
TPH (C8-C10 aliphatic)	T209	AR	100	µg/kg	N	003,005,007-008
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	M	003,005,007
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	U	008
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	M	003,005,007
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	U	008
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	M	003,005,007
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	U	008
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	M	003,005,007
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	U	008
TPH (C6-C7 aromatic)	T209	AR	100	µg/kg	N	003,005,007-008
TPH (C7-C8 aromatic)	T209	AR	100	µg/kg	N	003,005,007-008
TPH (C8-C10 aromatic)	T209	AR	100	µg/kg	N	003,005,007-008
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	M	003,005,007
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	U	008
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	M	003,005,007
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	U	008
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	M	003,005,007
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	U	008
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	M	003,005,007
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	U	008
TPH (Aliphatic) total	T85	M105		mg/kg	N	003,005,007-008
TPH (Aromatic) total	T85	M105		mg/kg	N	003,005,007-008
TPH (Aliphatic+Aromatic) (sum)	T85	M105		mg/kg	N	003,005,007-008

CONCEPT LIFE SCIENCES
DELIVERING SCIENCE

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Concept Life Sciences

Certificate of Analysis

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Report Number: Supplemental 722990-1

Date of Report: 27-Jun-2018

Customer: Fugro GeoServices
Fugro House
Hithercroft Road
Wallingford
Oxfordshire
OX10 9RB

Customer Contact: Ms Karen Blackmore

Customer Job Reference:
Customer Purchase Order: 56642KB-WAL
Customer Site Reference: HEP Package 3
Date Job Received at Concept: 14-Mar-2018
Date Analysis Started: 19-Mar-2018
Date Analysis Completed: 29-Mar-2018

The results reported relate to samples received in the laboratory and may not be representative of a whole batch.

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation

This report should not be reproduced except in full without the written approval of the laboratory

Tests covered by this certificate were conducted in accordance with Concept Life Sciences SOPs

All results have been reviewed in accordance with Section 25 of the Concept Life Sciences, Analytical Services Quality Manual

UKAS TESTING
1549

mCERTS
THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME

Report checked
and authorised by :
Sara Abou-Shakra
Customer Service Manager

Issued by :
Sara Abou-Shakra
Customer Service Manager

Concept Reference: 722990
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
MCERTS Preparation

Concept Reference	**722990 002**	**722990 004**	**722990 006**
Customer Sample Reference	**HEP-BH-52**	**HEP-BH-52**	**HEP-BH-52**
Top Depth	**0.15**	**1.60**	**4.45**
Depth	**0.15**	**1.60**	**4.45**
Hole ID	**HEP-BH-52**	**HEP-BH-52**	**HEP-BH-52**
Date Sampled	**12-MAR-2018**	**12-MAR-2018**	**12-MAR-2018**
Time Sampled	**14:45**	**15:30**	**16:30**
AGS Type	**ES**	**ES**	**ES**
AGS Sample ID	**HEPBH5220180312002**	**HEPBH5220180312004**	**HEPBH5220180312006**
AGS Sample Reference	**6**	**11**	**20**
Matrix Class	**Fill**	**Clay**	**Fill**

Determinand	Method	Test Sample	LOD	Units			
Moisture @105C	T162	AR	0.1	%	**53**	**35**	**6.9**
Retained on 10mm sieve	T2	M40	0.1	%	<0.1	<0.1	<0.1

Concept Reference: 722990
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil
Suite A - Made Ground and Soils with Elevated PID Readings - Inorganics

Concept Reference	**722990 002**	**722990 004**	**722990 006**
Customer Sample Reference	**HEP-BH-52**	**HEP-BH-52**	**HEP-BH-52**
Top Depth	**0.15**	**1.60**	**4.45**
Depth	**0.15**	**1.60**	**4.45**
Hole ID	**HEP-BH-52**	**HEP-BH-52**	**HEP-BH-52**
Date Sampled	**12-MAR-2018**	**12-MAR-2018**	**12-MAR-2018**
Time Sampled	**14:45**	**15:30**	**16:30**
AGS Type	**ES**	**ES**	**ES**
AGS Sample ID	**HEPBH5220180312002**	**HEPBH5220180312004**	**HEPBH5220180312006**
AGS Sample Reference	**6**	**11**	**20**
Matrix Class	**Fill**	**Clay**	**Fill**

Determinand	Method	Test Sample	LOD	Units			
Chloride	T686	AR	1	mg/kg	**12**	**8**	**2**
Cyanide(Total)	T4	AR	1	mg/kg	<1	<1	<1
Thiocyanate	T4	A40	1	mg/kg	<10	<10	<10
Nitrate	T686	AR	1	mg/kg	<1	<1	<1
Nitrite	T686	AR	1	mg/kg	<1	<1	<1
SO4(Total)	T6	A40	0.01	%	**0.20**	**0.25**	**0.09**
Sulphide	T4	A40	10	mg/kg	<10	**150**	<10

Concept Reference: 722990
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - Misc

				Concept Reference	**722990 002**	**722990 004**	**722990 006**
				Customer Sample Reference	**HEP-BH-52**	**HEP-BH-52**	**HEP-BH-52**
				Top Depth	**0.15**	**1.60**	**4.45**
				Depth	**0.15**	**1.60**	**4.45**
				Hole ID	**HEP-BH-52**	**HEP-BH-52**	**HEP-BH-52**
				Date Sampled	**12-MAR-2018**	**12-MAR-2018**	**12-MAR-2018**
				Time Sampled	**14:45**	**15:30**	**16:30**
				AGS Type	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH5220180312002**	**HEPBH5220180312004**	**HEPBH5220180312006**
				AGS Sample Reference	**6**	**11**	**20**
				Matrix Class	**Fill**	**Clay**	**Fill**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**			
Soil Organic Matter	T287	A40	0.1	%	**10**	**6.7**	**0.3**
pH	T7	A40			**7.5**	**7.3**	**7.4**

Concept Reference: 722990
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings Metals and Metalloids

				Concept Reference	**722990 002**	**722990 004**	**722990 006**
				Customer Sample Reference	**HEP-BH-52**	**HEP-BH-52**	**HEP-BH-52**
				Top Depth	**0.15**	**1.60**	**4.45**
				Depth	**0.15**	**1.60**	**4.45**
				Hole ID	**HEP-BH-52**	**HEP-BH-52**	**HEP-BH-52**
				Date Sampled	**12-MAR-2018**	**12-MAR-2018**	**12-MAR-2018**
				Time Sampled	**14:45**	**15:30**	**16:30**
				AGS Type	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH5220180312002**	**HEPBH5220180312004**	**HEPBH5220180312006**
				AGS Sample Reference	**6**	**11**	**20**
				Matrix Class	**Fill**	**Clay**	**Fill**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**			
Arsenic	T6	M40	2.0	mg/kg	**25**	**13**	**13**
Cadmium	T6	M40	1	mg/kg	<1	<1	<1
Chromium	T6	M40	1	mg/kg	**39**	**22**	**21**
Chromium VI	T6	A40	1	mg/kg	<1	<1	<1
Chromium (trivalent)	T85	A40	2	mg/kg	**39**	**22**	**21**
Iron	T6	A40	1	mg/kg	**36000**	**14000**	**12000**
Lead	T6	M40	1	mg/kg	**70**	**25**	**9**
Manganese	T6	M40	1	mg/kg	**220**	**130**	**86**
Mercury	T6	M40	1	mg/kg	<1	<1	<1
Nickel	T6	M40	1	mg/kg	**32**	**18**	**27**
Selenium	T6	M40	3	mg/kg	<3	<3	<3
Copper	T6	M40	1	mg/kg	**28**	**13**	**16**
Zinc	T6	M40	1	mg/kg	**85**	**43**	**33**
Boron (water-soluble)	T6	A40	1	mg/kg	<1	<1	<1

Concept Reference: 722990
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - Total Phenol

				Concept Reference	**722990 002**	**722990 004**	**722990 006**
				Customer Sample Reference	**HEP-BH-52**	**HEP-BH-52**	**HEP-BH-52**
				Top Depth	**0.15**	**1.60**	**4.45**
				Depth	**0.15**	**1.60**	**4.45**
				Hole ID	**HEP-BH-52**	**HEP-BH-52**	**HEP-BH-52**
				Date Sampled	**12-MAR-2018**	**12-MAR-2018**	**12-MAR-2018**
				Time Sampled	**14:45**	**15:30**	**16:30**
				AGS Type	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH5220180312002**	**HEPBH5220180312004**	**HEPBH5220180312006**
				AGS Sample Reference	**6**	**11**	**20**
				Matrix Class	**Fill**	**Clay**	**Fill**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**			
Phenols(Mono)	T4	AR	0.5	mg/kg	<1.0	<1.0	<1.0

Concept Reference: 722990
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - Asbestos

				Concept Reference	**722990 002**	**722990 004**	**722990 006**
				Customer Sample Reference	**HEP-BH-52**	**HEP-BH-52**	**HEP-BH-52**
				Top Depth	**0.15**	**1.60**	**4.45**
				Depth	**0.15**	**1.60**	**4.45**
				Hole ID	**HEP-BH-52**	**HEP-BH-52**	**HEP-BH-52**
				Date Sampled	**12-MAR-2018**	**12-MAR-2018**	**12-MAR-2018**
				Time Sampled	**14:45**	**15:30**	**16:30**
				AGS Type	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH5220180312002**	**HEPBH5220180312004**	**HEPBH5220180312006**
				AGS Sample Reference	**6**	**11**	**20**
				Matrix Class	**Fill**	**Clay**	**Fill**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**			
Asbestos ID	T27	A40			N.D.	N.D.	N.D.

Concept Reference: 722990
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground Soils with Elevated PID Readings - Organics PAH US EPA 16

				Concept Reference	**722990 002**	**722990 004**	**722990 006**
				Customer Sample Reference	**HEP-BH-52**	**HEP-BH-52**	**HEP-BH-52**
				Top Depth	**0.15**	**1.60**	**4.45**
				Depth	**0.15**	**1.60**	**4.45**
				Hole ID	**HEP-BH-52**	**HEP-BH-52**	**HEP-BH-52**
				Date Sampled	**12-MAR-2018**	**12-MAR-2018**	**12-MAR-2018**
				Time Sampled	**14:45**	**15:30**	**16:30**
				AGS Type	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH5220180312002**	**HEPBH5220180312004**	**HEPBH5220180312006**
				AGS Sample Reference	**6**	**11**	**20**
				Matrix Class	**Fill**	**Clay**	**Fill**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**			
Naphthalene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1
Acenaphthylene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1
Acenaphthene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1
Fluorene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1
Phenanthrene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1
Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1
Fluoranthene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1
Pyrene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1
Chrysene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1
PAH(total)	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1

Concept Reference: 722990
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - TPH (CWG)

				Concept Reference	**722990 002**	**722990 004**	**722990 006**
				Customer Sample Reference	**HEP-BH-52**	**HEP-BH-52**	**HEP-BH-52**
				Top Depth	**0.15**	**1.60**	**4.45**
				Depth	**0.15**	**1.60**	**4.45**
				Hole ID	**HEP-BH-52**	**HEP-BH-52**	**HEP-BH-52**
				Date Sampled	**12-MAR-2018**	**12-MAR-2018**	**12-MAR-2018**
				Time Sampled	**14:45**	**15:30**	**16:30**
				AGS Type	**ES**	**ES**	**ES**
				AGS Sample ID	**HEPBH5220180312002**	**HEPBH5220180312004**	**HEPBH5220180312006**
				AGS Sample Reference	**6**	**11**	**20**
				Matrix Class	**Fill**	**Clay**	**Fill**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**			
TPH (C5-C6 aliphatic)	T209	AR	100	µg/kg	(109) <220	<100	<100
TPH (C6-C8 aliphatic)	T209	AR	100	µg/kg	(109) <220	<100	<100
TPH (C8-C10 aliphatic)	T209	AR	100	µg/kg	(109) <220	<100	<100
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	**(13) 1**	**(13) 1**	(13) <1
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	**(13) 2**	**(13) 4**	(13) <1
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	**(13) 1**	**(13) 1**	**(13) 1**
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	**(13) 13**	**(13) 18**	**(13) 18**
TPH (C6-C7 aromatic)	T209	AR	100	µg/kg	(109) <220	<100	<100
TPH (C7-C8 aromatic)	T209	AR	100	µg/kg	(109) <220	<100	<100
TPH (C8-C10 aromatic)	T209	AR	100	µg/kg	(109) <220	<100	<100
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	(13) <2	(13) <2	(13) <2
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	**(13) 1**	**(13) 1**	(13) <1
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	**(13) 1**	**(13) 1**	(13) <1
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	**(13) 2**	**(13) 3**	**(13) 3**

Concept Reference: 722990
Project Site: HEP Package 3
Customer Reference:

Soil Analysed as Soil

Total Petroleum Hydrocarbons (Aliphatics+Aromatics) Total

Concept Reference	**722990 002**	**722990 004**	**722990 006**
Customer Sample Reference	**HEP-BH-52**	**HEP-BH-52**	**HEP-BH-52**
Top Depth	**0.15**	**1.60**	**4.45**
Depth	**0.15**	**1.60**	**4.45**
Hole ID	**HEP-BH-52**	**HEP-BH-52**	**HEP-BH-52**
Date Sampled	**12-MAR-2018**	**12-MAR-2018**	**12-MAR-2018**
Time Sampled	**14:45**	**15:30**	**16:30**
AGS Type	**ES**	**ES**	**ES**
AGS Sample ID	**HEPBH5220180312002**	**HEPBH5220180312004**	**HEPBH5220180312006**
AGS Sample Reference	**6**	**11**	**20**
Matrix Class	**Fill**	**Clay**	**Fill**

Determinand	Method	Test Sample	LOD	Units			
TPH (Aliphatic) total	T85	M105		mg/kg	(13) **17**	(13) **24**	(13) **19**
TPH (Aromatic) total	T85	M105		mg/kg	(13) **4.0**	(13) **5.0**	(13) **3.0**
TPH (Aliphatic+Aromatic) (sum)	T85	M105		mg/kg	**21.0**	**29.0**	**22.0**

Index to symbols used in Supplemental 722990-1

Value	Description
A40	Assisted dried < 40C
M40	Analysis conducted on sample assisted dried at no more than 40C. Results are reported on a dry weight basis.
AR	As Received
M105	Analysis conducted on an "as received" aliquot. Results are reported on a dry weight basis where moisture content was determined by assisted drying of sample at 105C
N.D.	Not Detected
13	Results have been blank corrected.
109	LOD raised due to high moisture content of the sample.
S	Analysis was subcontracted
M	Analysis is MCERTS accredited
U	Analysis is UKAS accredited
N	Analysis is not UKAS accredited

Notes

Asbestos subcontracted to REC Asbestos
Supplemental to report TPH totals.
"Fill" samples are outside the scope of our MCERTS accreditation. Results are UKAS only

Method Index

Value	Description
T207	GC/MS (MCERTS)
T209	GC/MS (Head Space)(MCERTS)
T7	Probe
T6	ICP/OES
T85	Calc
T27	PLM
T686	Discrete Analyser
T162	Grav (1 Dec) (105 C)
T909	GCxGC
T2	Grav
T287	Calc TOC/0.58
T4	Colorimetry

Accreditation Summary

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Moisture @105C	T162	AR	0.1	%	N	002,004,006

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Retained on 10mm sieve	T2	M40	0.1	%	N	002,004,006
Soil Organic Matter	T287	A40	0.1	%	N	002,004,006
pH	T7	A40			U	002,006
pH	T7	A40			M	004
Asbestos ID	T27	A40			SU	002,004,006
Phenols(Mono)	T4	AR	0.5	mg/kg	U	002,006
Phenols(Mono)	T4	AR	0.5	mg/kg	M	004
Chloride	T686	AR	1	mg/kg	N	002,004,006
Cyanide(Total)	T4	AR	1	mg/kg	U	002,006
Cyanide(Total)	T4	AR	1	mg/kg	M	004
Thiocyanate	T4	A40	1	mg/kg	N	002,004,006
Nitrate	T686	AR	1	mg/kg	N	002,004,006
Nitrite	T686	AR	1	mg/kg	N	002,004,006
SO4(Total)	T6	A40	0.01	%	U	002,004,006
Sulphide	T4	A40	10	mg/kg	N	002,004,006
Arsenic	T6	M40	2.0	mg/kg	U	002,006
Arsenic	T6	M40	2	mg/kg	M	004
Cadmium	T6	M40	1	mg/kg	U	002,006
Cadmium	T6	M40	1	mg/kg	M	004
Chromium	T6	M40	1	mg/kg	U	002,006
Chromium	T6	M40	1	mg/kg	M	004
Chromium VI	T6	A40	1	mg/kg	N	002,004,006
Chromium (trivalent)	T85	A40	2	mg/kg	N	002,004,006
Iron	T6	A40	1	mg/kg	U	002,004,006
Lead	T6	M40	1	mg/kg	U	002,006
Lead	T6	M40	1	mg/kg	M	004
Manganese	T6	M40	1	mg/kg	U	002,006
Manganese	T6	M40	1	mg/kg	M	004
Mercury	T6	M40	1	mg/kg	U	002,006
Mercury	T6	M40	1	mg/kg	M	004
Nickel	T6	M40	1	mg/kg	U	002,006
Nickel	T6	M40	1	mg/kg	M	004
Selenium	T6	M40	3	mg/kg	U	002,006
Selenium	T6	M40	3	mg/kg	M	004
Copper	T6	M40	1	mg/kg	U	002,006
Copper	T6	M40	1	mg/kg	M	004
Zinc	T6	M40	1	mg/kg	U	002,006
Zinc	T6	M40	1	mg/kg	M	004
Boron (water-soluble)	T6	A40	1	mg/kg	N	002,004,006
Naphthalene	T207	M105	0.1	mg/kg	U	002,006
Naphthalene	T207	M105	0.1	mg/kg	M	004
Acenaphthylene	T207	M105	0.1	mg/kg	U	002,004,006
Acenaphthene	T207	M105	0.1	mg/kg	U	002,006
Acenaphthene	T207	M105	0.1	mg/kg	M	004
Fluorene	T207	M105	0.1	mg/kg	U	002,006
Fluorene	T207	M105	0.1	mg/kg	M	004
Phenanthrene	T207	M105	0.1	mg/kg	U	002,006
Phenanthrene	T207	M105	0.1	mg/kg	M	004
Anthracene	T207	M105	0.1	mg/kg	U	002,004,006
Fluoranthene	T207	M105	0.1	mg/kg	U	002,006
Fluoranthene	T207	M105	0.1	mg/kg	M	004
Pyrene	T207	M105	0.1	mg/kg	U	002,006
Pyrene	T207	M105	0.1	mg/kg	M	004
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	U	002,006
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	M	004
Chrysene	T207	M105	0.1	mg/kg	U	002,006
Chrysene	T207	M105	0.1	mg/kg	M	004
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	U	002,006
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	M	004
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	U	002,006
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	M	004
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	U	002,006
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	M	004
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	U	002,006
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	M	004
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	U	002,006
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	M	004
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	U	002,006
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	M	004
PAH(total)	T207	M105	0.1	mg/kg	U	002,004,006

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
TPH (C5-C6 aliphatic)	T209	AR	100	µg/kg	N	002,004,006
TPH (C6-C8 aliphatic)	T209	AR	100	µg/kg	N	002,004,006
TPH (C8-C10 aliphatic)	T209	AR	100	µg/kg	N	002,004,006
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	U	002,006
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	M	004
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	U	002,006
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	M	004
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	U	002,006
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	M	004
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	U	002,006
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	M	004
TPH (C6-C7 aromatic)	T209	AR	100	µg/kg	N	002,004,006
TPH (C7-C8 aromatic)	T209	AR	100	µg/kg	N	002,004,006
TPH (C8-C10 aromatic)	T209	AR	100	µg/kg	N	002,004,006
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	U	002,006
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	M	004
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	U	002,006
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	M	004
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	U	002,006
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	M	004
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	U	002,006
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	M	004
TPH (Aliphatic) total	T85	M105		mg/kg	N	002,004,006
TPH (Aromatic) total	T85	M105		mg/kg	N	002,004,006
TPH (Aliphatic+Aromatic) (sum)	T85	M105		mg/kg	N	002,004,006

CONCEPT LIFE SCIENCES
DELIVERING SCIENCE

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Concept Life Sciences

Certificate of Analysis

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Report Number: Supplemental 724097-2

Date of Report: 27-Jun-2018

Customer: Fugro GeoServices
Fugro House
Hithercroft Road
Wallingford
Oxfordshire
OX10 9RB

Customer Contact: Ms Karen Blackmore

Customer Job Reference: G170029U
Customer Purchase Order: 56642KB-WAL
Customer Site Reference: HEP Package 3
Date Job Received at Concept: 20-Mar-2018
Date Analysis Started: 03-Apr-2018
Date Analysis Completed: 04-May-2018

The results reported relate to samples received in the laboratory and may not be representative of a whole batch.

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation

This report should not be reproduced except in full without the written approval of the laboratory

Tests covered by this certificate were conducted in accordance with Concept Life Sciences SOPs

All results have been reviewed in accordance with Section 25 of the Concept Life Sciences, Analytical Services Quality Manual

UKAS TESTING
1549

mCERTS
THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME

Report checked
and authorised by :
Sara Abou-Shakra
Customer Service Manager

Issued by :
Sara Abou-Shakra
Customer Service Manager

Concept Reference: 724097
Project Site: HEP Package 3
Customer Reference: G170029U

Soil Analysed as Soil
MCERTS Preparation

Concept Reference					**724097 002**	**724097 003**	**724097 006**	**724097 016**	**724097 017**
Customer Sample Reference					**HEP-BH-1047**	**HEP-BH-1047**	**HEP-BH-1047**	**HEP-BH-1050**	**HEP-BH-1050**
Hole ID					**HEP-BH-1047**	**HEP-BH-1047**	**HEP-BH-1047**	**HEP-BH-1050**	**HEP-BH-1050**
Depth					**0.40**	**1.20**	**2.60**	**0.10**	**0.70**
Top Depth					**0.40**	**1.20**	**2.60**	**0.10**	**0.70**
Date Sampled					**17-MAR-2018**	**17-MAR-2018**	**17-MAR-2018**	**16-MAR-2018**	**17-MAR-2018**
Time Sampled					**09:50**	**10:15**	**11:20**	**16:30**	**09:55**
AGS Type					**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID					**FES1180318004**	**FES1180318008**	**FES1180318018**	**HEPBH1050201803160 01**	**HEPBH1050201803170 02**
AGS Sample Reference					**4**	**8**	**18**	**3**	**6**
Matrix Class					**Topsoil**	**Clay**	**Sandy Soil**	**Topsoil**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Moisture @105C	T162	AR	0.1	%	**13**	**14**	**9.1**	**16**	**9.7**
Retained on 10mm sieve	T2	M40	0.1	%	<0.1	<0.1	<0.1	<0.1	<0.1

Concept Reference: 724097
Project Site: HEP Package 3
Customer Reference: G170029U

Soil Analysed as Soil
MCERTS Preparation

Concept Reference					**724097 018**	**724097 021**
Customer Sample Reference					**HEP-BH-1050**	**HEP-BH-1050**
Hole ID					**HEP-BH-1050**	**HEP-BH-1050**
Depth					**1.10**	**2.90**
Top Depth					**1.10**	**2.90**
Date Sampled					**17-MAR-2018**	**17-MAR-2018**
Time Sampled					**09:50**	**10:30**
AGS Type					**ES**	**ES**
AGS Sample ID					**HEPBH1050201803170 03**	**HEPBH1050201803170 06**
AGS Sample Reference					**9**	**17**
Matrix Class					**Clay**	**Topsoil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**		
Moisture @105C	T162	AR	0.1	%	**12**	**31**
Retained on 10mm sieve	T2	M40	0.1	%	<0.1	<0.1

Concept Reference: 724097
Project Site: HEP Package 3
Customer Reference: G170029U

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - Inorganics

Concept Reference				**724097 002**	**724097 003**	**724097 006**	**724097 016**	**724097 017**
Customer Sample Reference				**HEP-BH-1047**	**HEP-BH-1047**	**HEP-BH-1047**	**HEP-BH-1050**	**HEP-BH-1050**
Hole ID				**HEP-BH-1047**	**HEP-BH-1047**	**HEP-BH-1047**	**HEP-BH-1050**	**HEP-BH-1050**
Depth				**0.40**	**1.20**	**2.60**	**0.10**	**0.70**
Top Depth				**0.40**	**1.20**	**2.60**	**0.10**	**0.70**
Date Sampled				**17-MAR-2018**	**17-MAR-2018**	**17-MAR-2018**	**16-MAR-2018**	**17-MAR-2018**
Time Sampled				**09:50**	**10:15**	**11:20**	**16:30**	**09:55**
AGS Type				**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID				**FES1180318004**	**FES1180318008**	**FES1180318018**	**HEPBH105020180316001**	**HEPBH105020180317002**
AGS Sample Reference				**4**	**8**	**18**	**3**	**6**
Matrix Class				**Topsoil**	**Clay**	**Sandy Soil**	**Topsoil**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**				
Chloride	T686	AR	1	mg/kg	**13**	**16**	**17**	**120**	**25**
Cyanide(Total)	T4	AR	1	mg/kg	<1	<1	<1	<1	**3**
Thiocyanate	T4	A40	1	mg/kg	<10	<10	<10	<10	<10
Nitrate	T686	AR	1	mg/kg	<1	<1	<1	<1	<1
Nitrite	T686	AR	1	mg/kg	<1	<1	<1	<1	<1
SO4(Total)	T6	A40	0.01	%	**0.04**	**0.04**	**0.11**	**1.4**	<0.01
Sulphide	T4	A40	10	mg/kg	<10	<10	<10	**28**	**170**

Concept Reference: 724097
Project Site: HEP Package 3
Customer Reference: G170029U

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - Inorganics

Concept Reference				**724097 018**	**724097 021**
Customer Sample Reference				**HEP-BH-1050**	**HEP-BH-1050**
Hole ID				**HEP-BH-1050**	**HEP-BH-1050**
Depth				**1.10**	**2.90**
Top Depth				**1.10**	**2.90**
Date Sampled				**17-MAR-2018**	**17-MAR-2018**
Time Sampled				**09:50**	**10:30**
AGS Type				**ES**	**ES**
AGS Sample ID				**HEPBH105020180317003**	**HEPBH105020180317006**
AGS Sample Reference				**9**	**17**
Matrix Class				**Clay**	**Topsoil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**		
Chloride	T686	AR	1	mg/kg	**13**	**31**
Cyanide(Total)	T4	AR	1	mg/kg	<1	<1
Thiocyanate	T4	A40	1	mg/kg	<10	<10
Nitrate	T686	AR	1	mg/kg	<1	<1
Nitrite	T686	AR	1	mg/kg	<1	<1
SO4(Total)	T6	A40	0.01	%	**0.07**	**0.10**
Sulphide	T4	A40	10	mg/kg	**20**	<10

Concept Reference: 724097
Project Site: HEP Package 3
Customer Reference: G170029U

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - Misc

				Concept Reference	**724097 002**	**724097 003**	**724097 006**	**724097 016**	**724097 017**
				Customer Sample Reference	**HEP-BH-1047**	**HEP-BH-1047**	**HEP-BH-1047**	**HEP-BH-1050**	**HEP-BH-1050**
				Hole ID	**HEP-BH-1047**	**HEP-BH-1047**	**HEP-BH-1047**	**HEP-BH-1050**	**HEP-BH-1050**
				Depth	**0.40**	**1.20**	**2.60**	**0.10**	**0.70**
				Top Depth	**0.40**	**1.20**	**2.60**	**0.10**	**0.70**
				Date Sampled	**17-MAR-2018**	**17-MAR-2018**	**17-MAR-2018**	**16-MAR-2018**	**17-MAR-2018**
				Time Sampled	**09:50**	**10:15**	**11:20**	**16:30**	**09:55**
				AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
				AGS Sample ID	**FES1180318004**	**FES1180318008**	**FES1180318018**	**HEPBH105020180316001**	**HEPBH105020180317002**
				AGS Sample Reference	**4**	**8**	**18**	**3**	**6**
				Matrix Class	**Topsoil**	**Clay**	**Sandy Soil**	**Topsoil**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Soil Organic Matter	T287	A40	0.1	%	**1.9**	**1.3**	**4.3**	**2.1**	**2.0**
pH	T7	A40			**7.8**	**7.3**	**7.3**	**8.1**	**8.3**

Concept Reference: 724097
Project Site: HEP Package 3
Customer Reference: G170029U

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - Misc

				Concept Reference	**724097 018**	**724097 021**
				Customer Sample Reference	**HEP-BH-1050**	**HEP-BH-1050**
				Hole ID	**HEP-BH-1050**	**HEP-BH-1050**
				Depth	**1.10**	**2.90**
				Top Depth	**1.10**	**2.90**
				Date Sampled	**17-MAR-2018**	**17-MAR-2018**
				Time Sampled	**09:50**	**10:30**
				AGS Type	**ES**	**ES**
				AGS Sample ID	**HEPBH105020180317003**	**HEPBH105020180317006**
				AGS Sample Reference	**9**	**17**
				Matrix Class	**Clay**	**Topsoil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**		
Soil Organic Matter	T287	A40	0.1	%	**1.3**	**6.4**
pH	T7	A40			**8.0**	**7.8**

Concept Reference: 724097
Project Site: HEP Package 3
Customer Reference: G170029U

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings Metals and Metalloids

Concept Reference	**724097 002**	**724097 003**	**724097 006**	**724097 016**	**724097 017**
Customer Sample Reference	**HEP-BH-1047**	**HEP-BH-1047**	**HEP-BH-1047**	**HEP-BH-1050**	**HEP-BH-1050**
Hole ID	**HEP-BH-1047**	**HEP-BH-1047**	**HEP-BH-1047**	**HEP-BH-1050**	**HEP-BH-1050**
Depth	**0.40**	**1.20**	**2.60**	**0.10**	**0.70**
Top Depth	**0.40**	**1.20**	**2.60**	**0.10**	**0.70**
Date Sampled	**17-MAR-2018**	**17-MAR-2018**	**17-MAR-2018**	**16-MAR-2018**	**17-MAR-2018**
Time Sampled	**09:50**	**10:15**	**11:20**	**16:30**	**09:55**
AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**FES1180318004**	**FES1180318008**	**FES1180318018**	**HEPBH105020180316001**	**HEPBH105020180317002**
AGS Sample Reference	**4**	**8**	**18**	**3**	**6**
Matrix Class	**Topsoil**	**Clay**	**Sandy Soil**	**Topsoil**	**Clay**

Determinand	Method	Test Sample	LOD	Units					
Arsenic	T6	M40	2	mg/kg	**13**	**13**	**16**	**17**	**18**
Cadmium	T6	M40	1	mg/kg	<1	<1	**1**	<1	<1
Chromium	T6	M40	1	mg/kg	**26**	**32**	**48**	**15**	**28**
Chromium VI	T6	A40	1	mg/kg	<1	<1	<1	<1	<1
Chromium (trivalent)	T85	A40	2	mg/kg	<2	<2	<2	<2	<2
Iron	T6	A40	1	mg/kg	**26000**	**32000**	**38000**	**7900**	**29000**
Lead	T6	M40	1	mg/kg	**97**	**86**	**40**	**14**	**410**
Manganese	T6	M40	1	mg/kg	**550**	**470**	**390**	**70**	**510**
Mercury	T6	M40	1	mg/kg	<1	<1	<1	<1	**2**
Nickel	T6	M40	1	mg/kg	**22**	**26**	**40**	**35**	**28**
Selenium	T6	M40	3	mg/kg	<3	<3	<3	<3	<3
Copper	T6	M40	1	mg/kg	**120**	**36**	**39**	**10**	**52**
Zinc	T6	M40	1	mg/kg	**110**	**95**	**110**	**39**	**220**
Boron (water-soluble)	T6	A40	1	mg/kg	<1	<1	<1	<1	<1

Concept Reference: 724097
Project Site: HEP Package 3
Customer Reference: G170029U

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings Metals and Metalloids

Concept Reference	**724097 018**	**724097 021**
Customer Sample Reference	**HEP-BH-1050**	**HEP-BH-1050**
Hole ID	**HEP-BH-1050**	**HEP-BH-1050**
Depth	**1.10**	**2.90**
Top Depth	**1.10**	**2.90**
Date Sampled	**17-MAR-2018**	**17-MAR-2018**
Time Sampled	**09:50**	**10:30**
AGS Type	**ES**	**ES**
AGS Sample ID	**HEPBH105020180317003**	**HEPBH105020180317006**
AGS Sample Reference	**9**	**17**
Matrix Class	**Clay**	**Topsoil**

Determinand	Method	Test Sample	LOD	Units		
Arsenic	T6	M40	2	mg/kg	**16**	**18**
Cadmium	T6	M40	1	mg/kg	<1	<1
Chromium	T6	M40	1	mg/kg	**33**	**37**
Chromium VI	T6	A40	1	mg/kg	<1	<1
Chromium (trivalent)	T85	A40	2	mg/kg	<2	<2
Iron	T6	A40	1	mg/kg	**31000**	**39000**
Lead	T6	M40	1	mg/kg	**180**	**180**
Manganese	T6	M40	1	mg/kg	**550**	**960**
Mercury	T6	M40	1	mg/kg	<1	<1
Nickel	T6	M40	1	mg/kg	**33**	**36**
Selenium	T6	M40	3	mg/kg	<3	<3
Copper	T6	M40	1	mg/kg	**680**	**91**
Zinc	T6	M40	1	mg/kg	**130**	**230**
Boron (water-soluble)	T6	A40	1	mg/kg	<1	<1

Concept Reference: 724097
Project Site: HEP Package 3
Customer Reference: G170029U

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - Asbestos

Concept Reference					**724097 002**	**724097 003**	**724097 006**	**724097 016**	**724097 017**
Customer Sample Reference					**HEP-BH-1047**	**HEP-BH-1047**	**HEP-BH-1047**	**HEP-BH-1050**	**HEP-BH-1050**
Hole ID					**HEP-BH-1047**	**HEP-BH-1047**	**HEP-BH-1047**	**HEP-BH-1050**	**HEP-BH-1050**
Depth					**0.40**	**1.20**	**2.60**	**0.10**	**0.70**
Top Depth					**0.40**	**1.20**	**2.60**	**0.10**	**0.70**
Date Sampled					**17-MAR-2018**	**17-MAR-2018**	**17-MAR-2018**	**16-MAR-2018**	**17-MAR-2018**
Time Sampled					**09:50**	**10:15**	**11:20**	**16:30**	**09:55**
AGS Type					**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID					**FES1180318004**	**FES1180318008**	**FES1180318018**	**HEPBH105020180316001**	**HEPBH105020180317002**
AGS Sample Reference					**4**	**8**	**18**	**3**	**6**
Matrix Class					**Topsoil**	**Clay**	**Sandy Soil**	**Topsoil**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Asbestos ID	T27	A40			N.D.	N.D.	N.D.	N.D.	N.D.

Concept Reference: 724097
Project Site: HEP Package 3
Customer Reference: G170029U

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - Asbestos

Concept Reference					**724097 018**	**724097 021**
Customer Sample Reference					**HEP-BH-1050**	**HEP-BH-1050**
Hole ID					**HEP-BH-1050**	**HEP-BH-1050**
Depth					**1.10**	**2.90**
Top Depth					**1.10**	**2.90**
Date Sampled					**17-MAR-2018**	**17-MAR-2018**
Time Sampled					**09:50**	**10:30**
AGS Type					**ES**	**ES**
AGS Sample ID					**HEPBH105020180317003**	**HEPBH105020180317006**
AGS Sample Reference					**9**	**17**
Matrix Class					**Clay**	**Topsoil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**		
Asbestos ID	T27	A40			N.D.	N.D.

Concept Reference: 724097
Project Site: HEP Package 3
Customer Reference: G170029U

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - Total Phenol

Concept Reference					**724097 002**	**724097 003**	**724097 006**	**724097 016**	**724097 017**
Customer Sample Reference					**HEP-BH-1047**	**HEP-BH-1047**	**HEP-BH-1047**	**HEP-BH-1050**	**HEP-BH-1050**
Hole ID					**HEP-BH-1047**	**HEP-BH-1047**	**HEP-BH-1047**	**HEP-BH-1050**	**HEP-BH-1050**
Depth					**0.40**	**1.20**	**2.60**	**0.10**	**0.70**
Top Depth					**0.40**	**1.20**	**2.60**	**0.10**	**0.70**
Date Sampled					**17-MAR-2018**	**17-MAR-2018**	**17-MAR-2018**	**16-MAR-2018**	**17-MAR-2018**
Time Sampled					**09:50**	**10:15**	**11:20**	**16:30**	**09:55**
AGS Type					**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID					**FES1180318004**	**FES1180318008**	**FES1180318018**	**HEPBH105020180316001**	**HEPBH105020180317002**
AGS Sample Reference					**4**	**8**	**18**	**3**	**6**
Matrix Class					**Topsoil**	**Clay**	**Sandy Soil**	**Topsoil**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Phenols(Mono)	T4	AR	0.5	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0

Concept Reference: 724097
Project Site: HEP Package 3
Customer Reference: G170029U

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - Total Phenol

Concept Reference	**724097 018**	**724097 021**
Customer Sample Reference	**HEP-BH-1050**	**HEP-BH-1050**
Hole ID	**HEP-BH-1050**	**HEP-BH-1050**
Depth	**1.10**	**2.90**
Top Depth	**1.10**	**2.90**
Date Sampled	**17-MAR-2018**	**17-MAR-2018**
Time Sampled	**09:50**	**10:30**
AGS Type	**ES**	**ES**
AGS Sample ID	**HEPBH1050201803170 03**	**HEPBH1050201803170 06**
AGS Sample Reference	**9**	**17**
Matrix Class	**Clay**	**Topsoil**

Determinand	Method	Test Sample	LOD	Units		
Phenols(Mono)	T4	AR	0.5	mg/kg	<1.0	<1.0

Concept Reference: 724097
Project Site: HEP Package 3
Customer Reference: G170029U

Soil Analysed as Soil

Sub Suite 3 - Radiological

Concept Reference	**724097 016**	**724097 017**	**724097 018**
Customer Sample Reference	**HEP-BH-1050**	**HEP-BH-1050**	**HEP-BH-1050**
Hole ID	**HEP-BH-1050**	**HEP-BH-1050**	**HEP-BH-1050**
Depth	**0.10**	**0.70**	**1.10**
Top Depth	**0.10**	**0.70**	**1.10**
Date Sampled	**16-MAR-2018**	**17-MAR-2018**	**17-MAR-2018**
Time Sampled	**16:30**	**09:55**	**09:50**
AGS Type	**ES**	**ES**	**ES**
AGS Sample ID	**HEPBH10502018031 6001**	**HEPBH10502018031 7002**	**HEPBH10502018031 7003**
AGS Sample Reference	**3**	**6**	**9**
Matrix Class	**Topsoil**	**Clay**	**Clay**

Determinand	Method	Test Sample	LOD	Units			
High resolution gamma spectrometry	T100	AR	20	Bq/kg	**250**	**420**	**490**
Total Tritium	T510	AR	50	Bq/kg	<50	<50	<50

Concept Reference: 724097
Project Site: HEP Package 3
Customer Reference: G170029U

Soil Analysed as Soil

Suite A - Made Ground Soils with Elevated PID Readings - Organics PAH US EPA 16

Concept Reference	**724097 002**	**724097 003**	**724097 006**	**724097 016**	**724097 017**
Customer Sample Reference	**HEP-BH-1047**	**HEP-BH-1047**	**HEP-BH-1047**	**HEP-BH-1050**	**HEP-BH-1050**
Hole ID	**HEP-BH-1047**	**HEP-BH-1047**	**HEP-BH-1047**	**HEP-BH-1050**	**HEP-BH-1050**
Depth	**0.40**	**1.20**	**2.60**	**0.10**	**0.70**
Top Depth	**0.40**	**1.20**	**2.60**	**0.10**	**0.70**
Date Sampled	**17-MAR-2018**	**17-MAR-2018**	**17-MAR-2018**	**16-MAR-2018**	**17-MAR-2018**
Time Sampled	**09:50**	**10:15**	**11:20**	**16:30**	**09:55**
AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID	**FES1180318004**	**FES1180318008**	**FES1180318018**	**HEPBH105020180316001**	**HEPBH105020180317002**
AGS Sample Reference	**4**	**8**	**18**	**3**	**6**
Matrix Class	**Topsoil**	**Clay**	**Sandy Soil**	**Topsoil**	**Clay**

Determinand	Method	Test Sample	LOD	Units					
Naphthalene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	T207	AR	0.1	mg/kg	<0.1	<0.1	<0.1	**0.1**	<0.1
Acenaphthene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	T207	M105	0.1	mg/kg	**0.4**	**0.2**	<0.1	**0.5**	**0.2**
Anthracene	T207	AR	0.1	mg/kg	**0.1**	<0.1	<0.1	**0.3**	<0.1
Fluoranthene	T207	M105	0.1	mg/kg	**0.8**	**0.5**	<0.1	**0.9**	**0.3**
Pyrene	T207	M105	0.1	mg/kg	**0.7**	**0.4**	<0.1	**0.8**	**0.2**
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	**0.4**	**0.2**	<0.1	**0.5**	**0.1**
Chrysene	T207	M105	0.1	mg/kg	**0.4**	**0.3**	<0.1	**0.6**	**0.1**
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	**0.3**	**0.2**	<0.1	**0.5**	**0.1**
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	**0.4**	**0.2**	<0.1	**0.5**	**0.1**
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	**0.3**	**0.3**	<0.1	**0.6**	**0.1**
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	**0.2**	**0.1**	<0.1	**0.4**	<0.1
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	**0.2**	<0.1
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	**0.2**	**0.2**	<0.1	**0.4**	<0.1
PAH(total)	T207	AR	0.1	mg/kg	**4.2**	**2.7**	<0.1	**6.4**	**1.3**

Concept Reference: 724097
Project Site: HEP Package 3
Customer Reference: G170029U

Soil Analysed as Soil

Suite A - Made Ground Soils with Elevated PID Readings - Organics PAH US EPA 16

Concept Reference	**724097 018**	**724097 021**
Customer Sample Reference	**HEP-BH-1050**	**HEP-BH-1050**
Hole ID	**HEP-BH-1050**	**HEP-BH-1050**
Depth	**1.10**	**2.90**
Top Depth	**1.10**	**2.90**
Date Sampled	**17-MAR-2018**	**17-MAR-2018**
Time Sampled	**09:50**	**10:30**
AGS Type	**ES**	**ES**
AGS Sample ID	**HEPBH1050201803170 03**	**HEPBH1050201803170 06**
AGS Sample Reference	**9**	**17**
Matrix Class	**Clay**	**Topsoil**

Determinand	Method	Test Sample	LOD	Units		
Naphthalene	T207	M105	0.1	mg/kg	<0.1	<0.1
Acenaphthylene	T207	AR	0.1	mg/kg	<0.1	<0.1
Acenaphthene	T207	M105	0.1	mg/kg	<0.1	<0.1
Fluorene	T207	M105	0.1	mg/kg	<0.1	<0.1
Phenanthrene	T207	M105	0.1	mg/kg	<0.1	<0.1
Anthracene	T207	AR	0.1	mg/kg	<0.1	<0.1
Fluoranthene	T207	M105	0.1	mg/kg	<0.1	<0.1
Pyrene	T207	M105	0.1	mg/kg	<0.1	<0.1
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1
Chrysene	T207	M105	0.1	mg/kg	<0.1	<0.1
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	<0.1	<0.1
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	<0.1	<0.1
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	<0.1	<0.1
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	<0.1	<0.1
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	<0.1	<0.1
PAH(total)	T207	AR	0.1	mg/kg	<0.1	<0.1

Concept Reference: 724097
Project Site: HEP Package 3
Customer Reference: G170029U

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - TPH (CWG)

					Concept Reference	**724097 002**	**724097 003**	**724097 006**	**724097 016**	**724097 017**
					Customer Sample Reference	**HEP-BH-1047**	**HEP-BH-1047**	**HEP-BH-1047**	**HEP-BH-1050**	**HEP-BH-1050**
					Hole ID	**HEP-BH-1047**	**HEP-BH-1047**	**HEP-BH-1047**	**HEP-BH-1050**	**HEP-BH-1050**
					Depth	**0.40**	**1.20**	**2.60**	**0.10**	**0.70**
					Top Depth	**0.40**	**1.20**	**2.60**	**0.10**	**0.70**
					Date Sampled	**17-MAR-2018**	**17-MAR-2018**	**17-MAR-2018**	**16-MAR-2018**	**17-MAR-2018**
					Time Sampled	**09:50**	**10:15**	**11:20**	**16:30**	**09:55**
					AGS Type	**ES**	**ES**	**ES**	**ES**	**ES**
					AGS Sample ID	**FES1180318004**	**FES1180318008**	**FES1180318018**	**HEPBH105020180316001**	**HEPBH105020180317002**
					AGS Sample Reference	**4**	**8**	**18**	**3**	**6**
					Matrix Class	**Topsoil**	**Clay**	**Sandy Soil**	**Topsoil**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**						
TPH (C5-C6 aliphatic)	T209	AR	100	µg/kg		<100	<100	<100	<100	<100
TPH (C6-C8 aliphatic)	T209	AR	100	µg/kg		<100	<100	<100	<100	<100
TPH (C8-C10 aliphatic)	T209	AR	100	µg/kg		<100	<100	<100	<100	<100
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg		(13) <1	(13) <1	(13) <1	(13) <1	(13) <1
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg		(13) <1	(13) <1	(13) <1	(13) <1	**(13) 2**
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg		(13) <1	(13) <1	(13) <1	**(13) 9**	**(13) 12**
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg		(13) <2	**(13) 3**	(13) <2	**(13) 28**	**(13) 39**
TPH (C6-C7 aromatic)	T209	AR	100	µg/kg		<100	<100	<100	<100	<100
TPH (C7-C8 aromatic)	T209	AR	100	µg/kg		<100	<100	<100	<100	<100
TPH (C8-C10 aromatic)	T209	AR	100	µg/kg		<100	<100	<100	<100	<100
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg		(13) <2	(13) <2	(13) <2	(13) <2	(13) <2
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg		(13) <1	**(13) 4**	(13) <1	**(13) 2**	**(13) 16**
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg		**(13) 6**	**(13) 27**	(13) <1	**(13) 10**	**(13) 32**
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg		**(13) 13**	**(13) 57**	(13) <1	**(13) 27**	**(13) 17**

Concept Reference: 724097
Project Site: HEP Package 3
Customer Reference: G170029U

Soil Analysed as Soil

Suite A - Made Ground and Soils with Elevated PID Readings - TPH (CWG)

					Concept Reference	**724097 018**	**724097 021**
					Customer Sample Reference	**HEP-BH-1050**	**HEP-BH-1050**
					Hole ID	**HEP-BH-1050**	**HEP-BH-1050**
					Depth	**1.10**	**2.90**
					Top Depth	**1.10**	**2.90**
					Date Sampled	**17-MAR-2018**	**17-MAR-2018**
					Time Sampled	**09:50**	**10:30**
					AGS Type	**ES**	**ES**
					AGS Sample ID	**HEPBH105020180317003**	**HEPBH105020180317006**
					AGS Sample Reference	**9**	**17**
					Matrix Class	**Clay**	**Topsoil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**			
TPH (C5-C6 aliphatic)	T209	AR	100	µg/kg		<100	<100
TPH (C6-C8 aliphatic)	T209	AR	100	µg/kg		<100	<100
TPH (C8-C10 aliphatic)	T209	AR	100	µg/kg		<100	<100
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg		**(13) 1**	(13) <1
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg		**(13) 9**	(13) <1
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg		**(13) 12**	(13) <1
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg		**(13) 6**	(13) <2
TPH (C6-C7 aromatic)	T209	AR	100	µg/kg		<100	<100
TPH (C7-C8 aromatic)	T209	AR	100	µg/kg		<100	<100
TPH (C8-C10 aromatic)	T209	AR	100	µg/kg		<100	<100
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg		(13) <2	(13) <2
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg		**(13) 1**	(13) <1
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg		**(13) 3**	(13) <1
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg		**(13) 9**	(13) <1

Concept Reference: 724097
Project Site: HEP Package 3
Customer Reference: G170029U

Soil Analysed as Soil
Total Petroleum Hydrocarbons (Aliphatics+Aromatics) Total

Concept Reference					**724097 002**	**724097 003**	**724097 006**	**724097 016**	**724097 017**
Customer Sample Reference					**HEP-BH-1047**	**HEP-BH-1047**	**HEP-BH-1047**	**HEP-BH-1050**	**HEP-BH-1050**
Hole ID					**HEP-BH-1047**	**HEP-BH-1047**	**HEP-BH-1047**	**HEP-BH-1050**	**HEP-BH-1050**
Depth					**0.40**	**1.20**	**2.60**	**0.10**	**0.70**
Top Depth					**0.40**	**1.20**	**2.60**	**0.10**	**0.70**
Date Sampled					**17-MAR-2018**	**17-MAR-2018**	**17-MAR-2018**	**16-MAR-2018**	**17-MAR-2018**
Time Sampled					**09:50**	**10:15**	**11:20**	**16:30**	**09:55**
AGS Type					**ES**	**ES**	**ES**	**ES**	**ES**
AGS Sample ID					**FES1180318004**	**FES1180318008**	**FES1180318018**	**HEPBH105020180316 001**	**HEPBH105020180317 002**
AGS Sample Reference					**4**	**8**	**18**	**3**	**6**
Matrix Class					**Topsoil**	**Clay**	**Sandy Soil**	**Topsoil**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
TPH (Aliphatic) total	T85	M105		mg/kg	(13) N.D.	**(13) 3.0**	(13) N.D.	**(13) 37**	**(13) 53**
TPH (Aromatic) total	T85	M105		mg/kg	**(13) 19**	**(13) 88**	(13) N.D.	**(13) 39**	**(13) 65**
TPH (Aliphatic+Aromatic) (sum)	T85	M105		mg/kg	**19.0**	**91.0**	N.D.	**76.0**	**118**

Concept Reference: 724097
Project Site: HEP Package 3
Customer Reference: G170029U

Soil Analysed as Soil
Total Petroleum Hydrocarbons (Aliphatics+Aromatics) Total

Concept Reference					**724097 018**	**724097 021**
Customer Sample Reference					**HEP-BH-1050**	**HEP-BH-1050**
Hole ID					**HEP-BH-1050**	**HEP-BH-1050**
Depth					**1.10**	**2.90**
Top Depth					**1.10**	**2.90**
Date Sampled					**17-MAR-2018**	**17-MAR-2018**
Time Sampled					**09:50**	**10:30**
AGS Type					**ES**	**ES**
AGS Sample ID					**HEPBH105020180317 003**	**HEPBH105020180317 006**
AGS Sample Reference					**9**	**17**
Matrix Class					**Clay**	**Topsoil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**		
TPH (Aliphatic) total	T85	M105		mg/kg	**(13) 28**	(13) N.D.
TPH (Aromatic) total	T85	M105		mg/kg	**(13) 13**	(13) N.D.
TPH (Aliphatic+Aromatic) (sum)	T85	M105		mg/kg	**41.0**	N.D.

Index to symbols used in Supplemental 724097-2

Value	Description
M105	Analysis conducted on an "as received" aliquot. Results are reported on a dry weight basis where moisture content was determined by assisted drying of sample at 105C
A40	Assisted dried < 40C
AR	As Received
M40	Analysis conducted on sample assisted dried at no more than 40C. Results are reported on a dry weight basis.
N.D.	Not Detected
13	Results have been blank corrected.
S	Analysis was subcontracted
M	Analysis is MCERTS accredited
U	Analysis is UKAS accredited
N	Analysis is not UKAS accredited

Notes

Supplemental to report TPH totals.
Radiological testing subcontracted to Socotec.
Asbestos subcontracted to REC Asbestos

Method Index

Value	Description
T85	Calc
T510	Probe (Sub)
T209	GC/MS (Head Space)(MCERTS)
T7	Probe
T207	GC/MS (MCERTS)
T909	GCxGC
T2	Grav
T162	Grav (1 Dec) (105 C)
T686	Discrete Analyser
T287	Calc TOC/0.58
T4	Colorimetry
T6	ICP/OES
T27	PLM
T100	Gamma Spectrometry

Accreditation Summary

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Moisture @105C	T162	AR	0.1	%	N	002-003,006,016-018,021
Retained on 10mm sieve	T2	M40	0.1	%	N	002-003,006,016-018,021
Soil Organic Matter	T287	A40	0.1	%	N	002-003,006,016-018,021
pH	T7	A40			M	002-003,006,016-018,021
TPH (Aliphatic) total	T85	M105		mg/kg	N	002-003,006,016-018,021
TPH (Aromatic) total	T85	M105		mg/kg	N	002-003,006,016-018,021
TPH (Aliphatic+Aromatic) (sum)	T85	M105		mg/kg	N	002-003,006,016-018,021
Asbestos ID	T27	A40			SU	002-003,006,016-018,021
Phenols(Mono)	T4	AR	0.5	mg/kg	M	002-003,006,016-018,021
Chloride	T686	AR	1	mg/kg	N	002-003,006,016-018,021
Cyanide(Total)	T4	AR	1	mg/kg	M	002-003,006,016-018,021
Thiocyanate	T4	A40	1	mg/kg	N	002-003,006,016-018,021
Nitrate	T686	AR	1	mg/kg	N	002-003,006,016-018,021
Nitrite	T686	AR	1	mg/kg	N	002-003,006,016-018,021
SO4(Total)	T6	A40	0.01	%	U	002-003,006,016-018,021
Sulphide	T4	A40	10	mg/kg	N	002-003,006,016-018,021
Arsenic	T6	M40	2	mg/kg	M	002-003,006,016-018,021
Cadmium	T6	M40	1	mg/kg	M	002-003,006,016-018,021
Chromium	T6	M40	1	mg/kg	M	002-003,006,016-018,021
Chromium VI	T6	A40	1	mg/kg	N	002-003,006,016-018,021
Chromium (trivalent)	T85	A40	2	mg/kg	N	002-003,006,016-018,021
Iron	T6	A40	1	mg/kg	U	002-003,006,016-018,021
Lead	T6	M40	1	mg/kg	M	002-003,006,016-018,021
Manganese	T6	M40	1	mg/kg	M	002-003,006,016-018,021
Mercury	T6	M40	1	mg/kg	M	002-003,006,016-018,021
Nickel	T6	M40	1	mg/kg	M	002-003,006,016-018,021
Selenium	T6	M40	3	mg/kg	M	002-003,006,016-018,021
Copper	T6	M40	1	mg/kg	M	002-003,006,016-018,021
Zinc	T6	M40	1	mg/kg	M	002-003,006,016-018,021
Boron (water-soluble)	T6	A40	1	mg/kg	N	002-003,006,016-018,021
Naphthalene	T207	M105	0.1	mg/kg	M	002-003,006,016-018,021
Acenaphthylene	T207	AR	0.1	mg/kg	U	002-003,006,016-018,021
Acenaphthene	T207	M105	0.1	mg/kg	M	002-003,006,016-018,021
Fluorene	T207	M105	0.1	mg/kg	M	002-003,006,016-018,021
Phenanthrene	T207	M105	0.1	mg/kg	M	002-003,006,016-018,021
Anthracene	T207	AR	0.1	mg/kg	U	002-003,006,016-018,021
Fluoranthene	T207	M105	0.1	mg/kg	M	002-003,006,016-018,021
Pyrene	T207	M105	0.1	mg/kg	M	002-003,006,016-018,021
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	M	002-003,006,016-018,021
Chrysene	T207	M105	0.1	mg/kg	M	002-003,006,016-018,021
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	M	002-003,006,016-018,021
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	M	002-003,006,016-018,021
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	M	002-003,006,016-018,021
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	M	002-003,006,016-018,021

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	M	002-003,006,016-018,021
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	M	002-003,006,016-018,021
PAH(total)	T207	AR	0.1	mg/kg	U	002-003,006,016-018,021
TPH (C5-C6 aliphatic)	T209	AR	100	µg/kg	N	002-003,006,016-018,021
TPH (C6-C8 aliphatic)	T209	AR	100	µg/kg	N	002-003,006,016-018,021
TPH (C8-C10 aliphatic)	T209	AR	100	µg/kg	N	002-003,006,016-018,021
TPH (C10-C12 aliphatic)	T909	M105	1	mg/kg	M	002-003,006,016-018,021
TPH (C12-C16 aliphatic)	T909	M105	1	mg/kg	M	002-003,006,016-018,021
TPH (C16-C21 aliphatic)	T909	M105	1	mg/kg	M	002-003,006,016-018,021
TPH (C21-C35 aliphatic)	T909	M105	2	mg/kg	M	002-003,006,016-018,021
TPH (C6-C7 aromatic)	T209	AR	100	µg/kg	N	002-003,006,016-018,021
TPH (C7-C8 aromatic)	T209	AR	100	µg/kg	N	002-003,006,016-018,021
TPH (C8-C10 aromatic)	T209	AR	100	µg/kg	N	002-003,006,016-018,021
TPH (C10-C12 aromatic)	T909	M105	2	mg/kg	M	002-003,006,016-018,021
TPH (C12-C16 aromatic)	T909	M105	1	mg/kg	M	002-003,006,016-018,021
TPH (C16-C21 aromatic)	T909	M105	1	mg/kg	M	002-003,006,016-018,021
TPH (C21-C35 aromatic)	T909	M105	1	mg/kg	M	002-003,006,016-018,021
High resolution gamma spectrometry	T100	AR	20	Bq/kg	SU	016-018
Total Tritium	T510	AR	50	Bq/kg	SU	016-018

SOCOTEC

Analysis of Soil Samples

Client: Concept Life Sciences
Hadfield House
9 Hadfield Street
Manchester
M16 9FE

Testing Facility: SOCOTEC UK
Unit 12
Moorbrook
Southmead Industrial Park
Didcot
Oxfordshire
OX11 7HP

Laboratory Reference: 18-0266

Customer Reference: 724097

Quote Number: ENR-ANU-9093

PO Number: 724097

Sample Received: 04 April 2018

Sample Condition: Satisfactory, Ambient

Analysis Completed: 01 May 2018

Report Author: 

Author's Name: Trevor Harding

Job Title: Senior Analyst

Approved By: 

Approver's name: Gary Shaw

Job Title: Senior Analyst

Report Date: 01 May 2018

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Sample Summary

Customer Reference	Laboratory Reference	Matrix	Sampling Date
SAMPLE 016	RW2147	Soil	16/03/2018 12:00
SAMPLE 017	RW2148	Soil	16/03/2018 12:00
SAMPLE 018	RW2149	Soil	16/03/2018 12:00

Experimental

Total Tritium by Combustion and Liquid Scintillation Counting

As received sample was analysed using method "ANU/SOP/2094 Issue 3." A sub-sample of known weight was taken from each sample and combusted in an oxygen rich atmosphere in the presence of a copper oxide catalyst. Under these conditions the hydrogen and tritium were converted to water vapour. These were then selectively trapped in a series of gas-bubblers containing dilute acid. Aliquots of known weight were then assessed for their tritium content by liquid scintillation counting. The tritium activity was corrected for the proportion of the bubbler trapping solution taken and for the weight of combusted sample.

Gamma Spectrometry

As received sample was analysed using method "ANU/SOP/2029 Issue 4." The measurement technique is based on the use of high purity germanium (HPGe) detectors coupled to an Ortec gamma ray spectroscopy system. The gamma ray spectra are stored on a computer and analysed using the software programme Fitzpeaks for photopeak identification and quantification. The detectors are calibrated for efficiency using a mixed radionuclide standard, which covers an energy range of approximately 60-2000 keV. The efficiency of gamma rays between 30 keV and 120 keV are determined on an individual basis.

Application of decay corrections for the naturally occurring daughter radionuclides of uranium and thorium assumes that the series daughter radionuclides are all in secular equilibrium and therefore decay with the half-life of the first radionuclide in the series." (^{226}Ra is not UKAS accredited)

Results

Results are presented in the following tables.

Any opinions and interpretations expressed herein are outside the scope of our UKAS accreditation.

The results in this test report relate only to the items tested, and test portions taken thereof. This test report must not be reproduced except in full, without written approval of the laboratory.

Deviating Sample Disclaimer:

The reported results are representative of the samples upon receipt. However:

E): Analysis has commenced outside the recommended holding time for tritium.

Consequently the samples are considered deviating and the validity of the reported data may be compromised.

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Results Summary – Tritium

Customer Reference	Laboratory Reference	Tritium
SAMPLE 016	RW2147	<15
SAMPLE 017	RW2148	<19
SAMPLE 018	RW2149	<19

Notes:

1. Results are presented as $Bq.kg^{-1}$ of sample as received and are decay corrected to the sampling date.
2. Uncertainties are quoted at 2 s.d. based on expanded uncertainties.

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Results Summary – Gamma Spectrometry

Customer Reference	Laboratory Reference	Be-7	K-40	Co-60	Cs-134	Cs-137	Tl-208	Pb-210	Bi-212	Pb-212
SAMPLE 016	RW2147	<21	190 ± 50	<2.7	<2.5	<2.2	7 ± 2	<25	<30	17 ± 3
SAMPLE 017	RW2148	<16	310 ± 50	<2.3	<2.1	<1.8	9.1 ± 1.8	<24	<26	27 ± 3
SAMPLE 018	RW2149	<21	370 ± 70	<3.0	<2.6	<2.3	10 ± 2	<24	<32	31 ± 4

Customer Reference	Laboratory Reference	Bi-214	Pb-214	Ra-224	Ra-226*	Ac-228	Pa-234m	Th-234	U-235	Am-241
SAMPLE 016	RW2147	17 ± 4	19 ± 3	<29	<31	<11	<280	<30	<1.9	<2.6
SAMPLE 017	RW2148	20 ± 4	21 ± 3	<24	<25	30 ± 5	<230	<29	<1.6	<2.6
SAMPLE 018	RW2149	22 ± 4	27 ± 4	<30	<30	32 ± 6	<280	<30	<1.9	<2.7

Notes:

1. An asterisk "*" indicates that the analysis is not covered by the laboratory's UKAS accreditation.
2. Results are presented as $Bq.kg^{-1}$ of dried and homogenised sample and are decay corrected to the sampling date.
3. For results below the Limit of Detection, the LoD is rounded up to 2 significant figures.
4. 1σ uncertainties are rounded to 1 significant figure; results and 2σ uncertainties are rounded to the same precision.
5. Detector calibrations are based upon homogeneous standard solutions. For quantification purposes the sample is assumed to be homogeneous.
6. ^{226}Ra has only one gamma ray at 186 keV and the major gamma ray from ^{235}U also occurs at 186 keV. ^{235}U can be measured by the lower abundance gamma ray at 144 keV and if a positive result for ^{235}U is reported, the ^{226}Ra result will be unreliable and overestimated. However even if ^{235}U is below the LoD there may still be a contribution to the ^{226}Ra from ^{235}U and the ^{226}Ra result may be unreliable and overestimated. If an accurate result for ^{226}Ra is required this is better obtained by radiochemical analysis.

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