VPI Immingham Energy Park Site A

Geo-environmental Interpretative Report

VPI Immingham LLP

June 2022

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Quality information

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1 Introduction

1.1 Terms of Appointment

AECOM were appointed by VPI Immingham LLP to undertake works comprising a ground investigation and interpretive report for an area of land located north of the current power station

AECOM was commissioned by VPI Immingham LLP to provide design, management and full time technical oversight of the ground investigation works, which were completed by SOCOTEC in April 2018; and to provide an interpretative and advisory report on the ground conditions in relation to development proposals.

1.2 Background

A Geotechnical & Geo-environmental interpretive report was previously prepared by AECOM, dated August 2018, covering this area of land.

The scheme has since been separated into two separate planning applications comprising VPI-A which is to be submitted to the local planning authority and VPI -B which is to be submitted as part of the DCO. This report concerns the VPI-A land area, referred to hereafter as the 'site'.

The current VPI Immingham LLP (VPI) Immingham LLP Combined Heat and Power plant (CHP) has been operational since 2004. The CHP plant produces steam which is supplied to the nearby Humber and Lindsey Oil Refineries. It is understood that the CHP will be extended to the north of the site for the development of several gas fired power generation and storage projects including reciprocating engines and an Open Cycle Gas Turbine (OCGT) plant. The development land is partly occupied by an access road, partially cuts across a car park, crosses several buildings in the current VPI Immingham power station compound. and an area of open, hummocky land.

Therefore, AECOM have produced a Phase 1 Site A Geo-environmental Assessment (June 2022) to recommendations for a Phase 2 Ground Investigation to inform the risks from contamination for the proposed development.

The site location and the proposed development plans can be found in Appendix A.

1.3 Scope and objective of the report

This Geo-environmental Phase 2 report relates to geo-environmental ground conditions at the proposed construction site of a new power generation and plant and buildings adjacent to the Humber and Lindsey Oil Refineries at Immingham, Humberside. Geotechnical assessment is outside the scope of this report.

The objectives of this report are to:

- Report on contamination investigation findings (including soil, gas and groundwater monitoring)
- Assessment of the ground-related risk from soil contamination from comparison against Generic Assessment Criteria;
- Assessment of the risk to controlled waters using published water quality standards;
- Preliminary advice on the likely disposal classification for arisings from the proposed construction works;
- Assessment of the risk from ground gas to the development; and
- Assessment of the requirement, or otherwise, for remedial action.

2 Existing Information

The following provides a summary of the information from the "VPI Immingham Phase 1 Site A Geo-environmental Assessment (June 2022)" prepared by AECOM. A Groundsure Insight Report was obtained by AECOM to inform the Phase 1 report.

2.1 Site Description

The site is located off Rosper Road, Immingham, North East Lincolnshire (see Appendix A, Figure 1), and is approximately 2km east of South Killingholme. The site is centred on National Grid Reference (NGR) TA 516641 618468.

The site is surrounded by a mix of industrial and agricultural land use, namely the Lindsey Oil Refinery to the North West, which is operated by Total Ltd. To the South West is the Phillips 66 Humber refinery. Directly to the east is agricultural land and the River Humber is located approximately 1.3km from the site. The site crosses into the current VPI Immingham CHP plant footprint. The rest of the CHP plant lies to the south of the site.

2.1.1 Site Layout

The site occupies a total area of 3.4 ha with approximately 1.25 ha being used for power generation with the rest of the area used for construction laydown and access during both construction and operation. The north of the site comprises the access roads associated with the carpark. The south west of the site is covered in shrubbery/grassland and contains various stockpiles of unknown origin. The site crosses to the south into the current VPI Immingham CHP plant The site is bounded to the east by Rosper Road. Immingham Port is located approximately 2.5km to the South East and the River Humber is located approximately 1.3km to the east.

With the exceptions of the various stockpiles on site the elevation of the site is <10m above ordnance datum (AOD).

2.1.2 Surrounding Land Use

Based on a review of google maps satellite imagery, the land use immediately surrounding the site has been summarised below:

North: Directly north of the site there is an access road which links the Lindsey Oil Refinery and Rosper Road. Beyond this, various utility buildings belonging to the Oil Refinery as well as unoccupied parcels of land are present.

East: An unnamed drain and Rosper Road are directly east of the site, beyond which there are agricultural fields.

West: To the west of the site mapping shows a settling tank, pond, electricity pylon as well as a railway track linking into the Lindsey Oil Refinery

South: The site crosses into the current VPI Immingham CHP plant footprint. A utility line containing gas and liquid hydrocarbon pipes is present crossing through the south of the site. The rest of the CHP plant lies to the south of the site.

2.2 Anticipated Geology

The anticipated geology of the site was assessed through examination of a Groundsure® Report (GS-8784127) obtained by AECOM to inform the Phase I (June 2022) report, publicly available BGS borehole data and examination of historic reports made available to AECOM.

Table 2-1 details existing ground investigations which have taken place on the site.

Table 2-1 Previous Ground Investigations Reports

Contractor/ Consultant	Investigation Description	Date
Soil Mechanics	Interpretive Report on Ground Investigation 6 cable percussion boreholes (BH1 to 6) to a maximum depth of 25 m and 10 trial pits (TP1-3, CBR2, 3, 5, 7,9,10 &13) to a maximum depth of 2m	2006
ABB	Surrender of Waste Management Licence 13 trial pits (TP4-16) and drilling of 3 boreholes (done by Soil Mechanics; BH3-BH5). Groundwater sampling was also taken from existing monitoring wells (BH7 & BH8) installed in 1991.	2006

Table 2-2 summarises the anticipated geological conditions underlying the site based on the data reviewed.

Table 2-2 Summary of Geological Sequence

Strata	Thickness (m)	Comment	Source
Made Ground	Unknown	"*Soft to firm brown slightly sandy slightly gravelly clay with bands of soft black slightly sandy slightly gravelly clay. Gravel is subangular to subrounded fine to medium of various lithologies including chalk and pottery."*	Ground Investigation by Soil Mechanics, 2006
Glacial Deposits	16-26	*"slightly sandy, slightly gravelly clay. The sand and gravel component comprises subangular to subrounded chalk, occasionally sandstone and shell fragments."*	Ground Investigation by Soil Mechanics, 2006
Burnham Chalk	Unknown	*"White, thinly-bedded chalk with common tabular and discontinuous flint bands; sporadic marl seams"*	BGS Lexicon

2.3 Hydrogeology and Hydrology

A review of Ordnance Survey maps indicated that the site is located approximately 1.3km south west of the River Humber, which flows north west to south east. Drains flow along the southern and western site boundaries, and a small water storage pond is located approximately 80m west of the site.

The site is located within an area whereby the Environment Agency issue flood warnings and is identified as flood risk zone 3, meaning there is a high (greater than 1 in 100) annual probability of flooding. Flood defences are located along the banks of the River Humber and the area falls under the jurisdiction of North East Lindsey Internal Drainage Board.

A review of the Environment Agency Groundwater Vulnerability Maps provided by Groundsure® indicates that:

- The superficial glacial deposits are classified as a 'Secondary Aquifer (undifferentiated)' which are defined either as 'permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers', or 'lower permeability layers which may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering'.
- The Burnham Chalk Formation bedrock is classified as a Principal Aquifer which are defined as 'highly permeable formations usually with a known or probable presence of significant fracturing. They may be highly productive and able to support large abstractions for public supply and other purposes.

2.4 Regulatory Database Review

The Groundsure Insight Report includes information on regulatory activities at the site and surrounding areas which could potentially to adversely affect the site. The results of these searches are summarised below in **Table 2-3**.

Table 2-3 Summary of Regulatory Database Review

Category	Summary of Information (<500m)
Part A(1) Licensed industrial activities	3 no. effective: one 19m south west and two 31m south east; 11 superseded: 259m south west all relating to Immingham CHP
List 1 Dangerous Substances Inventory Sites	1 no. inactive: 374m south for Mercury and Cadmium relating to the Phillips 66 Humber Refinery site.
List 2 Dangerous Substance Inventory Sites	1 no. active: 374m south for arsenic, chromium, copper, lead, nickel and zinc relating to the Phillips 66 Humber Refinery site.
Licensed Discharges to controlled waters	1 no. active: 10m north west relating to the Lindsey oil refinery. 3 revoked: one 82m south west (relating to the Lindsey oil refinery oil interceptor) and two other unspecified trade discharges 374m south.
Hazardous Substance storage/ usage	2 no. approved active consents: 21m south east (no details provided) and 492m south (ammonium based fertilizer). 2 historical consents 141m south west (Consent to store 3050 tonnes of petroleum gas oil) and 492m south (ammonium based fertilizer).
Control of Major Accident Hazards (COMAH)	1 no. on site current COMAH site (lower tier) relating to VPI Immingham CHP 2 no. off site current COMAH sites (both upper tier) relating to the Total Lindsey Oil Refinery (173m west) and Phillips 66 Humber refinery (345m south) 2 no. off site historical NIHHS site relating to Humberside Sea & Land Services Ltd (394m south) and relating to Conoco Manufacturing Ltd (399m south) 1 no. off site historical COMAH site relating to Humber LPG terminal Ltd (425 m east)
Pollution Incidents (Environment Agency/Natural Resources Wales)	2 no. recorded: 23m west – minor impact to air (atmospheric pollutants and effects) 316m south west – minor impact to land & air (Oils and Fuels).
Historical Landfill (Environment	1 no. historical landfill license relating to liquid sludge from the Lindsey Oil Refinery.

Category	Summary of Information (<500m)
Agency/Natural Resources Wales)	
Licensed waste sites (Environment Agency/Natural Resources Wales)	1 no. surrendered license 40m north west of the site relating to a biological treatment facility operated by the Lindsey Oil Refinery

No other database entries were identified within 500m of the site boundary.

Database listings reviewed included: Historical IPC Authorisations, Red List Discharge Consent Register Part A(2) and Part B Activities and Enforcements, Category 3 or 4 Radioactive Substances Authorisations, Water Industry Referrals, Sites Determined as Contaminated land (Part 2a) or Petrol & fuel sites.

2.5 Radon

The Groundsure® report indicates that the site is not in a Radon affected area, as less than 1% of properties are above the action level.

2.6 Sensitive Land Uses

The Groundsure Report provides information on environmentally sensitive sites or land uses in the surrounding area which may be affected by activity at the site. In addition, online resources such as the Natural England MAGIC database (https://magic.defra.gov.uk) were also consulted. The results of these searches are summarised below in **Table 2-4**.

Table 2-4 Summary of Sensitive Land Uses (<2000m)

Land use/Site/Designation	Name	Distance
Sites of Special Scientific Interest (SSSI)	Humber Estuary N. Killingholme Haven Pits	1322m north east 1856m north
National Nature Reserves (NNR)	None	N/A
Special Areas of Conservation (SAC)	Humber Estuary	1322m north east
Conserved wetland sites (Ramsar Sites)	Humber Estuary	1322m north east
Special Protection Areas (SPA)	Humber Estuary	1322m north east
Ancient Woodland	None	N/A
Local Nature Reserves (LNR)	None	N/A
World Heritage Site	None	N/A
Areas of Outstanding Natural Beauty (AONB)	None	N/A
National Parks (NP)	None	N/A

Rosper Road Pool approximately 750m south east of this site is labelled as a Local Nature reserve on Current Ordnance Survey Mapping although a check on the Natural England MAGIC database (https://magic.defra.gov.uk) it is not officially recognised as a Local Nature Reserve.

3 Preliminary Conceptual Site Model

As part of the AECOM report “VPI Immingham Phase I Geo-environmental Assessment (January, 2018)”, a conceptual site model was developed to identify potential source- pathways- receptor linkages that may exist on the site. These linkages informed the conceptual site model and in turn informed the design of the ground investigation.

An updated conceptual site model was produced within the “VPI Immingham Phase I Site A Geo-environmental Assessment (June 2022)” to reflect the updated site boundary (the other assessment within this report).

The evaluation identified there overall geo-environmental risk to the site is M*oderate*/*Low*.

4 Fieldwork

4.1 Ground Investigations

AECOM was commissioned by VPI Immingham LLP to provide design, management and full time technical oversight of the ground investigation works, which were completed by SOCOTEC in April 2018; who subsequently provide a factual report detailing the ground conditions encountered on the site.

Following the ground investigation AECOM undertook 3 no. rounds of gas and groundwater monitoring on the site in May and June 2018.

4.1.1 Description of Field Work

A summary of the exploratory holes designed by AECOM and undertaken by SOCOTEC during the site works within the VPI A site is provided in **Table 4-1**.

Table 4-1 Summary of Exploratory Locations

Type	Quantity	Depth Range (m)	Exploratory hole refence	Installation Details
Cable Percussion Boring	2	22.34 to 28.66	BH1 and BH2	50mm Groundwater monitoring wells
Dynamic Sampling	5	3.75 to 5.45	WS1 to WS5	50mm gas and Groundwater monitoring wells
Trial Pits/Trenches	7	2.50 to 4.60	TP1 to TP2 and TP4 to TP7	NA

Source: SOCOTEC Factual Report No A805-18, contained in Appendix B

The findings from the 2018 ground investigation, including exploratory hole logs and laboratory testing results, are presented in SOCOTEC's ground investigation factual report:

- SOCOTEC, July 2018. VPI Immingham Factual Report on Ground Investigation Report No A8015-18

A copy of the SOCOTEC report can be found in Appendix B.

Samples taken for geotechnical purposes were collected and transported to SOCOTEC's laboratory in Doncaster for analysis the results are presented in the factual report but interpretation of the results is outside the scope of this report.

4.1.2 Laboratory Testing

Soil testing was undertaken on samples recovered from boreholes and trial pits. The testing regime was prescribed by AECOM, and the testing was performed by SOCOTEC Ltd and Exova Jones Ltd. All geochemical tests were where available UKAS and MCERTs accredited. Copies of the tests results and laboratory certificates are presented in Appendix C.

4.1.3 Sample Analysis

Sampling and testing for contamination was conducted on 26 no. soil samples and 7 no. groundwater samples taken during the Ground Investigation works (inclusive of the VPI A site and the wider site).

The full results of this testing can be found in the Ground Investigation Factual Report presented in Appendix B.

A summary of the soil and groundwater testing scheduled within the VPI A site following the ground investigation is summarised below;

Table 4-2 Summary of Geo-Environmental Soil Testing

Suite	Test Determinants	No. of Tests	Locations
CLEA Metals	Arsenic, Barium, Beryllium, Cadmium, Chromium, Copper, Mercury, Nickel, Lead, Selenium, Vanadium, Zinc, Chromium VI, Chromium III	14	BH01-BH02, WS01-05, TP01-TP02, TP04-TP6
Volatile Organic Compounds Tentatively identified compounds (TIC)s		9	BH01, BH02, TP01, TP02, TP06, WS01-WS03, WS05
Semi Volatile Organic Compounds +TICs	Semi Volatile Organic Compounds target list including Poly aromatic hydrocarbons, phenol, chlorinated phenols and phthalates (100ug/kg) plus TICs	9	BH01, BH02, TP01, TP02, TP06, WS01-WS03, WS05
Total Petroleum Hydrocarbons (as TPH – CWG)	TPH CWG (Aliphatics C5-6,>6-8,>8-10,>10-12,>12-16,>16-21,>21-35) (Aromatics >C5-7,>7-8,>8-10,>10-12,>12-16,>16-21,>21-35) inc BTEX/MTBE	9	BH01, BH02, TP01, TP02, TP06, WS01-WS03, WS05
Inorganics	Fluoride (soluble), Nitrate (soluble), Sulphide, Total Sulphate	9	BH01, BH02, TP01, TP02, TP06, WS01-WS03, WS05
Chloride		6	BH01, BH02, WS01-WS03, WS05
pH		14	BH01-BH02, WS01-05, TP01-TP02, TP04-TP7
Soil Organic Matter (SOM)		12	BH01-BH02, WS01-05, TP04-TP06
Ammoniacal Nitrogen		14	BH01-BH02, WS01-05, TP01-TP02, TP04-TP06
Asbestos	Fibre screen/ asbestos ID (as described in HSE document HSG 248)	14	BH01-BH02, WS01-05, TP01-TP02, TP04-TP06

Table 4-3 Summary of Geo-Environmental Groundwater Testing

Suite	Test Determinants	No. of Tests	Locations
Volatile Organic Compounds Tentatively identified compounds (TIC)s	VOC target list including BTEX/MTBE + TICs by GC-MS	3	WS03-WS05
Semi Volatile Organic Compounds +TICs	SVOC target list including PAHs, phenol and chlorinated phenols by GC-MS	3	WS03-WS05
Total Petroleum Hydrocarbons (as TPH – CWG)	TPH CWG (Aliphatics C5-6,>6-8,>8-10,>10-12,>12-16,>16-21,>21-35) (aromatics >C5-7,>7-8,>8-10,>10-12,>12-16,>16-21,>21-35)	6	BH01-BH02, WS03-WS05

Suite	Test Determinants	No. of Tests	Locations
CLEA full metals + Fe (II)	Arsenic, Cadmium , Chromium r, Copper, Lead, Mercury Nickel, Selenium, Zinc, Vanadium, Beryllium, Barium, Boron, Chromium VI, Chromium III iron(II)	6	BH01-BH02, WS03-WS05
Dissolved Organic Carbon (DOC)		6	BH01-BH02, WS03-WS05
Inorganics	pH, Ammoniacal Nitrogen as N, Total Alkalinity as CaCO3, Chloride, Nitrate as N, Ortho-Phosphate as P, Sulphate	6	BH01-BH02, WS03-WS05
Total Suspended Solids (TSS)		6	BH01-BH02, WS03-WS05

4.2 Post-Ground Investigation

Seven dual-purpose gas / groundwater monitoring wells were installed on the site as part of the ground investigation with 3 no. rounds of in-situ monitoring including groundwater level and ground gas subsequently undertaken on 11th May 2018, 23rd May 2018 and 1st June 2018.

Depth to water was recorded at each location on each visit, while Temperature (°C), Specific Conductivity (µS/cm), Dissolved Oxygen concentration (mg/L) and Oxidation-Reduction Potential (ORP) (mV) were recorded at all wells containing groundwater on the first visit when the single round of groundwater sampling was undertaken. Gas flow rates and Oxygen, Carbon dioxide and Methane concentrations were recorded at each location on each monitoring visit.

The result of this monitoring is presented in Appendix D.

5 Ground Summary

5.1 Summary of Ground Conditions

The following information is intended to summarise the results of the 2018 ground investigation by SOCOTEC UK Limited and has been used to refine the preliminary understanding of the ground conditions encountered.

An outline ground model for the site is summarised in **Table 5-1** and discussed in more detail in **Sections 5.1.1** to **5.1.3**.

Table 5-1 Outline Ground Model of the Site

Material	Typical Description	Top of Strata, m bgl	Base of Strata, m bgl	Top of Strata, m OD	Base of Strata, m OD
Made Ground	Sandy gravelly clay	0.0	0.3 to 1.4	6.49 to 4.70	5.26 to 3.45
Glacial Till	Firm to stiff sandy gravelly clay	1.0 to 1.4	27.5	5.26 to 3.45	--21.14
Glacial Sands and Gravels [1]	Medium dense clayey sand and gravel	13.0	17.70	-6.64	-9.34
Weathered Chalk	Extremely weak to very weak chalk	27.5	Unproven	-21.14	Unproven

5.1.1 Made Ground

Made Ground is found in all exploratory holes except TP7 where topsoil was present.

Made Ground was predominately described as a mix of slightly sandy, slightly gravelly, clay and sandy, clayey, gravel. It contains a mixture of angular to sub-angular gravel of chalk, flint and sandstone. Cobbles are described as subrounded to subangular of concrete and chalk. The layers of different materials suggest both re-worked natural material and placed fill which follow no discernible pattern and so will collectively be assigned as Made Ground. WS1 WS2 , BH1 a well as TP1 and TP2 were located within the historical landfill onsite relates to liquid sludge from the Lindsey Oil Refinery. Although hydrocarbon odours were detected in there was no significant thicknesses of Made Ground present that could be representative of a landfill site.

5.1.2 Superficial Deposits – Glacial Till and Glacial Sands and Gravels

Superficial materials are found to be Glacial Deposits, comprising Glacial Till and Glacial Sands and Gravels. Glacial Till is found consistently in all of the boreholes. It has been described mainly as firm, becoming stiff to very stiff, brown, mottled grey, slightly sandy, slightly gravelly, clay. There is a clear trend that shows the material stiffness increasing with depth.

Layers of Glacial Sands and Gravels were encountered BH1. The material is described as medium dense, brown, slightly sandy, slightly clayey sand and slightly sandy, slightly clayey, gravel. A

5.1.3 Bedrock – Burnham Chalk Formation

The Burnham Chalk Formation bedrock was encountered in BH1. The top the bedrock was encountered at approximately at -21.4m OD. The upper levels of the chalk are frequently described as extremely weak to very weak with clusters of sub-horizontal and sub-vertical fractures and mostly recovered as sandy, gravelly, clay indicating the upper part of the Chalk is highly weathered.

5.1.4 Observations of Contamination

Visual and olfactory evidence of contamination was encountered at shallow depth in the made ground at 9 no. locations during the ground investigation.

Headspace analysis for the presence of Volatile Organic Compounds (VOCs) was undertaken on samples taken from these locations and Photo Ionisation Detector (PID) readings recorded.

These observations, along with the PID readings, are summarised in **Table 5-2** . These observations albeit not quantitative were used to select samples sent for laboratory analysis. All observations were made in exploratory holes located within the footprint of the VPI-A site.

Table 5-2 Summary of Observations of Contamination

Location	Depth (m bgl)	Description	PID Reading (ppm)
BH01	0.45-0.7	Made Ground, oily smell, black staining, wet	3.3
BH02	0.6-1.0	Made Ground, oily smell, black staining	0.9
WS01	0.5-1.2	Made Ground, oily smell	1.3
WS02	0.0-0.5	Made Ground, oily smell, black staining	0.8
WS03	0.0-1.2	Made Ground, oily smell, black staining	0.5
WS05	0.0-1.2	Made Ground, oily smell, black staining	0.1
TP01	0.7-0.9	Made Ground, oily smell, black staining	4.4
TP02	0.3-0.5	Made Ground, oily smell, black staining	42.4
TP06	0.4-0.6	Made Ground, oily smell, black staining	0.3

WS1 WS2 , BH1 a well as TP1 and TP2 were located within the historical landfill onsite relates to liquid sludge from the Lindsey Oil Refinery

6 Contamination Assessment

6.1 Stage 2 Contamination Assessment

6.1.1 Human Health Assessment Methodology

This assessment has been based on the proposed end use as a new gas-fired power station. The results from soil testing have been compared against assessment criteria for a commercial land use

The assessment undertaken considers environmental impacts from construction and operational risks during intrusive works.

Where the conceptual site model identifies one or more complete pollutant linkage(s) with respect to human health it is often necessary to clarify the risk posed by that pollutant linkage by comparison of reported concentrations with guideline values that represent acceptable concentrations. This includes assessing risks to human health at a generic level termed 'Generic Quantitative Risk Assessment' (GQRA) or 'Tier 2' in the Environment Agency guidance on Land Contamination Risk Management (LCRM), April 2021.

The assessment of cumulative risk from multiple substances is not required at GQRA level, with the exception of TPH. In accordance with Environment Agency science report P5-080/TR3, a hazard index (HI) is calculated for each individual sample based on the summation of the hazard quotient (HQ) for each TPH fraction.

Stage 2 Generic Assessment Criteria (GAC) for soils have been calculated using the reported Total Organic Carbon (TOC) concentration of samples collected and analysed as part of the intrusive investigation.

Based on the exploratory records, the most appropriate soil type for the Made Ground and the superficial deposits was considered to be the worse-case 'SAND' scenario, as provided by the Environment Agency's standard default soil descriptions.

It should be noted that Stage 2 assessments tend to be relatively conservative and are therefore suitable for initial screening of the potential chronic long-term risks to human health at a site only. Full details of the physical and chemical parameters used in the derivation of the GAC can be made available upon request.

6.1.1.1 Human Health Results Assessment

A total 14 no. soil samples were tested for a variety of determinates as detailed in section 4.13. A comparison of the laboratory testing results against the Stage 2 GAC for a commercial end use selected for this site indicate has been undertaken and presented in Appendix E.

The results of the contamination assessment show there are no exceedances of the screening values in soil including the locations where visual / olfactory evidence of contamination was encountered.

Contamination assessment tables have been provided in Appendix E.

6.1.1.2 Asbestos

A total of 11 no. samples were analysed by the laboratory for asbestos across the site. Asbestos fibres (chrysotile) were present in 6 no. samples of made ground at a volume of less than 0.1% mass by weight in each case.

Further Gravimetric Quantification testing of the samples was conducted by the laboratory, and a summary of the asbestos quantification is presented in **Table 6-1**. Laboratory certificates are presented in Appendix C. All observations were made in exploratory holes located within the footprint of the VPI-A site.

Table 6-1 Results of asbestos analysis

Location	Depth (m bgl)	Asbestos type	Present as	Quantity (w/w%)
BH01	0.45-0.70	Chrysotile	Fibre bundles	<0.001%
BH02	0.6-1.0	Chrysotile	Fibre bundles	<0.001%
WS01	1.0-1.25	Chrysotile	Fibre bundles	<0.001%
TP01	0.7-0.9	Chrysotile	Fibre bundles	<0.001%
TP02	0.3-0.5	Chrysotile	Fibre bundles	<0.001%
TP06	0.4-0.6	Chrysotile	Fibre bundles	<0.001%

The presence of asbestos fibres could represent a risk to groundworks which may be undertaken at the site and should be considered by the contractor as part of any risk assessment for future intended works and as well as off-site disposal of soils. However as the site will be covered in hard standing the risk to the end user is considered to be low.

6.1.2 Controlled Waters Assessment Methodology

AECOM has a prescribed methodology for assessing risks to controlled waters at a generic level termed 'generic quantitative risk assessment' (GQRA) or 'Tier 2' in the Environment Agency guidance on Land Contamination Risk Management (LCRM), April 2021

Where the conceptual site model has identified a potentially complete contaminant linkage to controlled waters, the first step is to define a suitable water target value (WTV) for the identified point of compliance upon which the risk assessment can be based. For groundwater compliance points which may support potable abstraction, the UK Drinking Water Standard (DWS) is used in England and Wales whilst for surface water compliance points or non-potable aquifer units, an Environmental Quality Standard (EQS) is adopted. EQS coastal has been adopted for this site due to the site's proximity to the Humber Estuary.

The following Controlled Waters receptors have been considered in the following assessment:

- Superficial deposits underlying the site are classified as a Secondary A Aquifer;
- The Burnham Chalk Formation limestone bedrock underlying the site is classified as a Principal Aquifer; and
- Offsite Drain and pond adjacent to the site
- The Humber estuary.

6.1.2.1 Controlled Waters Results Assessment

At total of 6 no. groundwater samples were tested for a variety of contaminants as indicated in section 4.13. A comparison of the laboratory testing results with the Stage 2 GAC selected for this site indicate that there are a limited number of exceedances of the screening values. The exceedances of GAC found within the VPI A site are detailed in **Table 6-2**; The full contamination assessment can be found Appendix E.

Table 6-2 Exceedance of Stage 2 GAC for Controlled Waters: Groundwater

Parameter	Location	Highest Concentration (µg/l)	Exceedance of DWS	Exceedance of EQS	Strata
Zinc	BH01, WS05	12 in BH01		X	Glacial Sand and Gravel/ Glacial Till
Sulphate	WS03-WS05	983,900 in WS05	X		Glacial Till
Chloride	WS03-WS05	1,280,000 in WS04	X		Glacial Till

Table 6-2 shows that analysis of groundwater from the site indicates that Sulphate and Chloride exceed the Water Supply Regulations although this considered to be representative of the background concentrations in ground water and related to saline intrusion due to the vicinity of the River Humber.

Zinc, was present in 2 of 6 samples marginally above the Coastal EQS. It is considered that due to marginal exceedance and low permeability of Glacial Till Deposits / limited lateral continuity of glacial sand deposits lateral migration of zinc will be limited**.**

6.1.3 Ground Gas Assessment

The ground gas assessment is based on a three rounds of ground gas monitoring undertaken during May and June 2018. Details of the ground gas monitoring is provided in Appendix D.

The results of the gas monitoring are summarised in Appendix D and indicate that:

- Methane was recorded at levels <0.1 Vol. which is below the lower explosive limit.
- Carbon dioxide was recorded at levels <0.1 – 3.9% Vol.
- Oxygen was recorded at levels between 14.4– 20.7% Vol;
- Peak Gas flow rates were recorded between -17.0 and 7.3 litres/hour (l/hr);
- Steady gas flow rates were recorded between <0.1 and 0.2l/hr

Potential risks posed by the identified ground gas regime have been considered using the methodology outlined in BS 8485:2015+A1:2019.

A summary of the ground gas monitoring results is given in Error! Reference source not found.

In order to calculate the characteristic situation,

The highest ground gas concentrations of 3.9% for carbon dioxide and <0.1% for methane and highest steady flow rate of 0.0 l/hr (lower instrument detection limit <0.1 l/hr) has been used to calculate the Gas Screening Values. This is, therefore, calculated as less than instrument detection limit indicating the site would be consistent with Characteristic Situation (CS) 1 in BS8485:2015:A1+2019.

Furthermore, concentrations of Carbon Dioxide and Methane were below 5% and 1%.

However, it should be noted that the majority of the well screens are flooded and therefore an additional assessment of the gas generation potential of the soils has been undertaken.

The historical landfill onsite relates to liquid sludge from the Lindsey Oil Refinery, although the ground investigation indicates that limited thickness of Made Ground are present

The average thickness of made ground identified in exploratory holes at the site is 0.88m and this material was predominantly described as a mix of slightly sandy, slightly gravelly, clay and sandy, clayey, gravel. No evidence of potentially highly degradable material was encountered from the investigation which could give rise to significant ground gas generation.

It is therefore considered that the gas generation potential of the soils is likely to be low and the site would be fall into a CS1 as per the gas monitoring data. Presented in Appendix

6.1.3.1 Discussion of Risks to Ecological Receptors

The Statutory Guidance which accompanies Part 2A of the Environmental Protection Act 1990 defines ecological receptors as any ecological system, or living organism forming part of such a system, within a location which is:

- A site of special scientific interest (under section 28 of the Wildlife and Countryside Act 1981)
- A national nature reserve (under s.35 of the 1981 Act)
- A marine nature reserve (under s.36 of the 1981 Act)
- An area of special protection for birds (under s.3 of the 1981 Act)
- A “European site” within the meaning of regulation 8 of the Conservation of Habitats and Species Regulations 2010
- Any habitat or site afforded policy protection under section 176 of the National Planning Policy Framework 2018 (NPPF) on nature conservation (i.e. candidate Special Areas of Conservation, potential Special Protection Areas and listed Ramsar sites); or
- Any nature reserve established under section 21 of the National Parks and Access to the Countryside Act 1949.

Any risk assessment must consider whether significant harm is being caused or a significant possibility of significant harm exists to any given ecological receptor. Harm in this context could be defined as;

- Harm which results in an irreversible adverse change, or in some other substantial adverse change, in the functioning of the ecological system within any substantial part of that location; or
- Harm which significantly affects any species of special interest within that location and which endangers the long-term maintenance of the population of that species at that location.
- In the case of “European Sites”, harm can exist where the sites designation could be affected by the presence of a contaminant linkage.

A significant possibility of significant harm exists where significant harm is more likely than not to exist for any given linkage or where there is a reasonable possibility of significant harm of that description being caused, and if that harm were to occur, it would result in such a degree of damage to features of special interest at the location in question that they would be beyond any practicable possibility of restoration.

In the case of this site, there are a number of potentially sensitive ecological sites in the wider area, but the closest (the Humber Estuary which is a SSSI, SPA and Ramsar site) is 1.3km away and so unlikely to be affected by pollutants present on the site.

6.2 Revised Conceptual Site Model

6.2.1 Introduction

A refined conceptual site model (CSM) has been developed on the basis of the desk study and the findings of the ground investigation and contamination assessment.

To assess the potential geo-environmental impacts associated with chemicals of potential concern in the section, the conceptual model has been revised using the source pathway receptor approach, promoted by DEFRA and the Environment Agency. For there to be an identifiable risk, not only must there be contaminants present across the section (source) there must also be a receptor and a pathway which allows the source to impact on the receptor.

6.2.2 Risk Assessment Framework

The site, in terms of potential land contamination, will be regulated by the local authority (North Lincolnshire County Council) under the Town and Country Planning Act 1990 (as amended), taking account of the National Planning Policy Framework 2012, with the Environment Agency, Natural England and English Heritage acting as statutory consultees.

The ‘suitable for use’ approach is adopted for the assessment of contaminated land where remedial measures are only undertaken where unacceptable risks to human health or the environment are realised taking into account the use (or proposed use) of the land in question and the environmental setting.

Additional environmental liabilities can arise through provisions contained within statutory legislation including Part 2A of the EPA 1990, the Water Resources Act 1991, the Groundwater Regulations 2009 and the Water Act 2003.

Current best practice recommends that the determination of health hazards due to contaminated land is based on the principle of risk assessment, as outlined in the Statutory Guidance to Part 2A (2012) and Land Contamination: Risk Management, Environment Agency Guidance (April 2021). The risk assessment process for environmental contaminants is based on a source-pathway-receptor analysis. These terms can be defined as follows:

- Source: hazardous substance that has the potential to cause adverse impacts;
- Pathway: route whereby a hazardous substance may come into contact with the receptor: examples include ingestion of contaminated soil and leaching of contaminants from soil into watercourses; and
- Receptor: target that may be affected by contamination: examples include human occupants / users of site, water resources (surface waters or groundwater), or structures.

For a risk to be present there must be a relevant pollutant linkage; i.e. a mechanism whereby a source impacts on a sensitive receptor via a pathway resulting in potentially significant harm.

6.2.3 Pollutant Linkages

The Potential Pollutant Linkages identified in the previous AECOM report “VPI Immingham Phase I Site A Geo-environmental Assessment” have been revised following the completion of the ground investigation and the residual linkages are presented in **Table 6-3**. Linkages previously assessed to be ‘Low’ risk in the Phase 1 Desk Study document have been removed from the table unless a new linkage a has been identified.

Table 6-3 Revised Conceptual Site Mode

SOURCE	PATHWAY	RECEPTOR	Phase 1 LEVEL OF RISK	Phase 1 Potential Risk LC:RM	DISCUSSION AND POSSIBLE MITIGATION	Potential Severity	Likelihood	Residual level of Risk	Residual level of Risk LC:RM
On site Made ground within areas of potentially infilled land/ stockpiles	Direct dermal contact with substances in shallow soil and/or groundwater during potential groundworks; Accidental ingestion and/or inhalation of substances in soil/dust and/or shallow groundwater during potential groundworks.	On site construction workers and future site employees	Moderate / Low	Acceptable	A Stage 2 Risk Assessment of the results of the ground investigation has not deemed that the soils pose an unacceptable risk to human health for the proposed end use. Low levels of asbestos fibres were found to be present in made ground at several locations on the site, but these concentrations are not sufficient to present a risk to receptors on adjacent sites furthermore upon completion to the proposed development will be covered by hardstanding or structures.	Medium	Unlikely	Low	Acceptable
	Inhalation of substances from the partitioning of vapours from soil and / or shallow groundwater;,	On site construction workers/ employees	Moderate / Low	Acceptable	Visual and Olfactory evidence and asbestos impacted soil was encountered in several locations therefore during construction the use of correct PPE and an appropriate Construction Environmental Management Plan (CEMP) will protect construction workers from exposure pathways created by excavations and stockpiled material and make sure that migration of contaminants to more sensitive adjacent land uses is controlled. The Construction Phase Plan should make sure that construction workers take suitable precautions if working in enclosed spaces.	Medium	Unlikely	Low	Acceptable
	Migration of ground gases and accumulation in confined spaces associated with the future development of the site (e.g. basements, service ducts).	Newly constructed infrastructure	Low	Acceptable	It is considered that the site falls into a characteristic situation where no ground gas protection measures are required. Any works in confined spaces should be controlled by appropriate confided space risk assessment including presences of gases.	Medium	Unlikely	Low	Acceptable

	Lateral overland flow, including via drains, to nearby surface waters; Preferential lateral and vertical migration along routes of underground services, pipelines and associated trenches;	Surface waters	Low	Acceptable	Analysis of groundwater samples show minor exceedances of zinc within against EQS saltwater however due to the low permeability of the glacial till deposits and limited lateral continuity of glacial sand deposits it is considered unlikely there is a risk to offsite controlled water receptor. Chloride and Sulphate against the water supply regulations this is consider to be background levels due to saline intrusion. An appropriate CEMP should minimise the risk of run-off from site-won material, while further risk assessment may be required with regard foundation design to prevent the creation of additional pathways to deeper bodies of groundwater. An appropriate risk assessment will be required for any piled foundations that are required in the final design. The distance to the Humber makes it unlikely that there is an unacceptable risk to ecological receptors, given the small number and relatively low magnitude of the exceedances detected during groundwater monitoring. The low permeable superficial deposits are likely acting as a protective layer above the Burnham formation chalk bedrock. Considering that this bedrock is listed as a principal aquifer any piling design or intrusive construction works which are likely to go beyond the superficial deposits may require preparation of a piling risk assessment, completed in accordance with the EA's 'Piling and Penetrative Ground Improvement Methods on Land Affected by Contamination: Guidance on Pollution Prevention'.	Medium	Unlikely	Low	Acceptable
		Flora and fauna (Humber Estuary Ramsar, SPA, SSSI)	Low	Acceptable		Medium	Unlikely	Low	Acceptable
	Lateral and vertical migration within the made ground and superficial deposits (Secondary A Aquifer), e.g. leaching from made ground vertically	Secondary A Aquifer	Moderate / Low	Acceptable		Medium	Unlikely	Low	Acceptable
						Medium	Unlikely	Low	Acceptable
		Deeper groundwater in the bedrock	Low	Acceptable		Medium	Unlikely	Low	Acceptable
	Lateral and vertical migration within deeper groundwater with the chalk aquifer	Deeper groundwater in the bedrock	Moderate	Acceptable		Medium	Unlikely	Low	Acceptable

6.2.4 Residual Contaminant Linkages

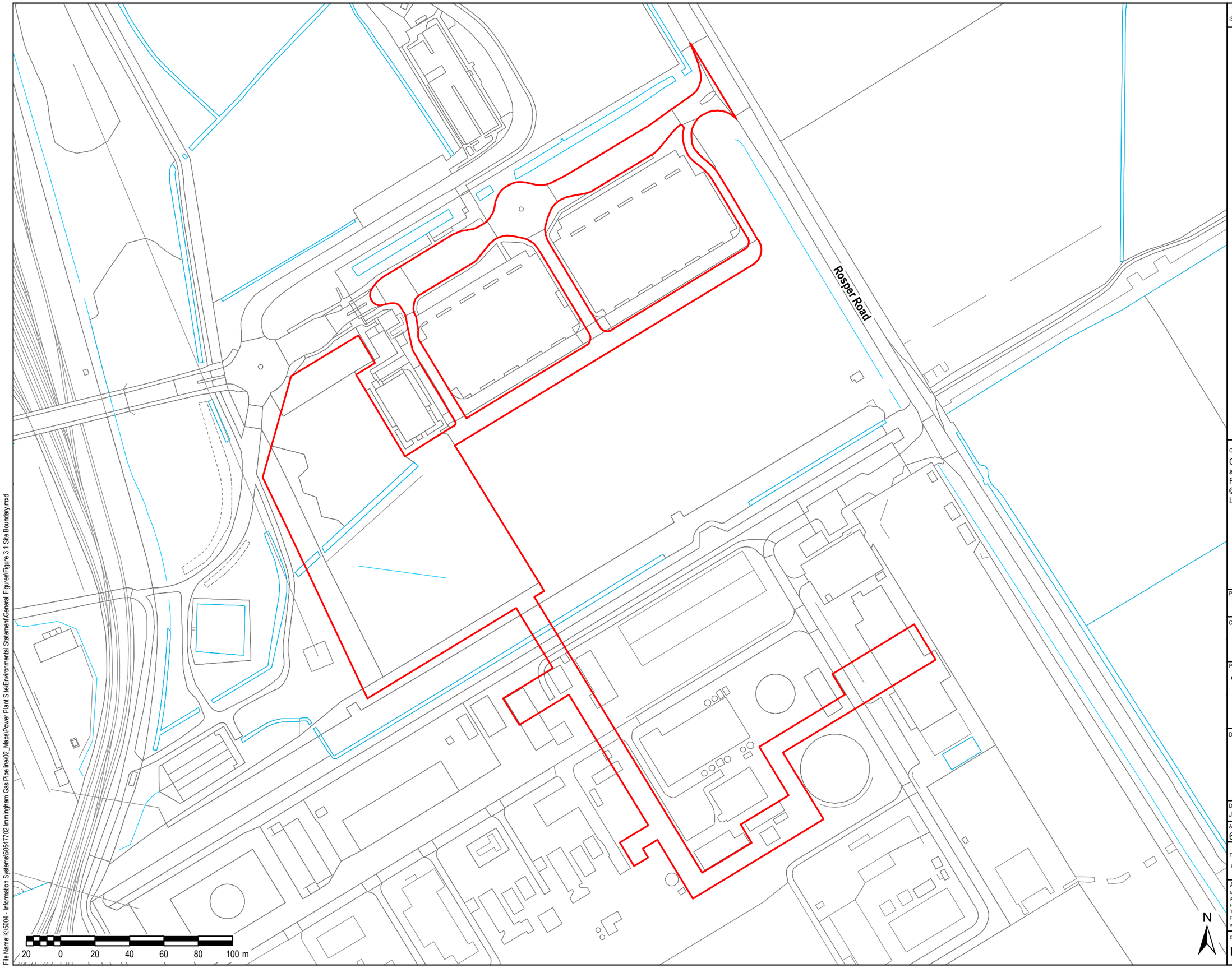
Following the Stage 2 Risk Assessment and consideration of the findings of the Ground Investigation, all outstanding pollutant linkages can be regarded as having a low level of risk, assuming that an appropriate CEMP is developed for the development and that appropriate risk assessment including consideration of ground conditions is applied to the design of piled foundations.

6.3 Summary of Contaminant Linkages

Table 6-4 Summary of Contaminant Linkages

	Conclusions	Recommendations
Buildings (Ground Gas)	Following a ground gas risk assessment it is considered that the site would be consistent with Characteristic Situation 1 as defined in BS8485:2015+A1:2019.	No gas protection measures should be required. Standard good health and safety practice and PPE should be specified within the Construction Phase Plan in order to protect construction workers from gas within confined spaces.
Human Health	Stage 2 Screening of laboratory samples against appropriate GAC does not indicate any risk to human health for the current or proposed land use.	No remedial actions are required to protect site users or future site users from substances in the soils. The stage 2 risk assessment does not assess the specific risks to construction workers, but appropriate PPE and CEMP (Including an asbestos management plan) precautions will be sufficient to mitigate risk to construction works.
Controlled Waters	Assessment of risks to controlled waters from concluded that the risk to controlled water is Low.	No remedial measures are required on site to protect controlled waters. However, any piles should be designed in accordance with the EA guidance entitled *Piling and Penetrative Ground Improvement Methods on Land Affected by Contamination: Guidance on Pollution Prevention (2001)*
Ecological Receptors	The Humber Estuary and Rosper Road Pools represents ecological receptors, but the distance to the receptor is such that harm is unlikely to be caused.	Although it is not considered the site is a significant risk to Statutory ecological receptors. A landscape architected should be provided with the chemical analysis in order to establish suitable plant species for the site.
Subsurface infrastructure		Advice should be sought from the local water supply company to confirm the appropriate pipe specification for the identified ground conditions.

Appendix A Site Location



File Name:K:\5004 - Information Systems\60547702 Immingham Gas Pipeline\02_Maps\Power Plant Site\Environmental Statement\General Figures\Figure 3.1 Site Boundary.mxd

THIS DRAWING IS TO BE USED ONLY FOR THE PURPOSE OF ISSUE THAT IT WAS ISSUED FOR AND IS SUBJECT TO AMENDMENT

LEGEND

Red Line Boundary

Purpose of Issue

FOR INFORMATION

Client

VPI IMMINGHAM

Project Title

VPI IMMINGHAM ENERGY PARK 'A' ENVIRONMENTAL STATEMENT VOLUME 2

Drawing Title

SITE BOUNDARY

Drawn	Checked	Approved	Date
JW	BB	MS	20/04/2018

AECOM Internal Project No.	Scale @ A3
60547702	1:2,000

AECOM
Midpoint
Alencon Link, Basingstoke
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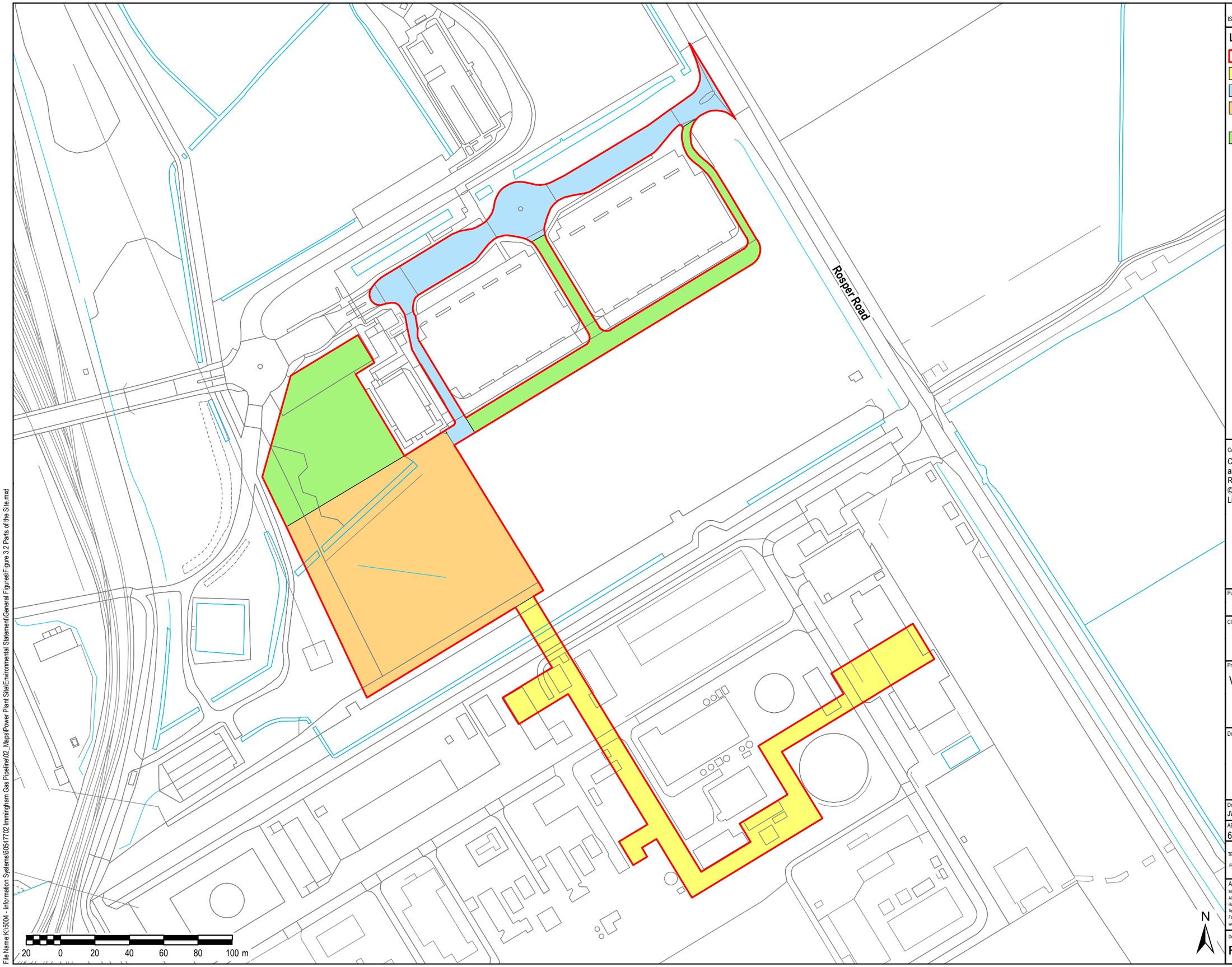
Drawing Number

FIGURE 3.1

Rev



THIS DRAWING IS TO BE USED ONLY FOR THE PURPOSE OF ISSUE THAT IT WAS ISSUED FOR AND IS SUBJECT TO AMENDMENT

LEGEND

- Red Line Boundary
- Gas and Electricity Connections
- Permanent Site Access
- Proposed Power Plant Site
- Temporary Construction Laydown Area and Temporary Construction Access

Purpose of Issue
FOR INFORMATION

Client
VPI IMMINGHAM

Project Title
VPI IMMINGHAM ENERGY PARK 'A' ENVIRONMENTAL STATEMENT VOLUME 2

Drawing Title
PARTS OF THE SITE

Drawn	Checked	Approved	Date
JW	BB	MS	20/04/2018

AECOM Internal Project No.	Scale @ A3
60547702	1:2,000

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Drawing Number
FIGURE 3.2

Rev

File Name:K:\5004 - Information Systems\60547702 Immingham Gas Pipeline\02_Maps\Power Plant Site\Environmental Statement\General Figures\Figure 3.2 Parts of the Site.mxd

Appendix B Factual Report

VPI IMMINGHAM

FACTUAL REPORT ON GROUND INVESTIGATION

Report No A8015-18

August 2018

Client:
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Report No A8015-18

August 2018

Issue No Date	Status	Prepared by	Checked by	Approved by
1 Jul 2018	Draft report	NAME and QUALIFICATIONS W Hopkins BSc (Hons)	NAME and QUALIFICATIONS T Clifford BEng FGS	NAME and QUALIFICATIONS T Clifford BEng FGS
		SIGNATURE	SIGNATURE	SIGNATURE
2 Aug 2018	Final report	NAME and QUALIFICATIONS W Hopkins BSc (Hons)	NAME and QUALIFICATIONS T Clifford BEng FGS	NAME and QUALIFICATIONS T Clifford BEng FGS
		SIGNATURE	SIGNATURE	SIGNATURE

SOCOTEC UK Limited was formerly known as Environmental Scientifics Group Limited. The Certificate of Incorporation on Change of Name was filed on 16 October 2017.

CONTENTS

1 INTRODUCTION

In March 2018 SOCOTEC UK Limited was commissioned by AECOM Environmental Solutions Ltd (AECOM) on behalf of VPI Immingham, to carry out a ground investigation at Total Lindsey Oil Refinery (TLOR). The investigation was required to obtain geotechnical information for the proposed development.

The scope of the investigation was specified by AECOM and comprised cable percussion and rotary drilled boreholes, trial pits and laboratory testing. The investigation was performed in accordance with the contract specification, and the general requirements of BS 5930 (2015), BS EN 1997-2 (2007), BS EN ISO 22475-1 (2006) and other relevant related standards identified below. The fieldwork took place between 5 and 20 April.

This report presents the factual records of the fieldwork and laboratory testing. The information is also presented as digital data as defined in AGS (2017).

2 SITE SETTING

2.1 Location and Description

The site is adjacent to the east side of Total Lindsey Oil Refinery, approximately 4 km north west of Immingham town centre, Lincolnshire. The National Grid reference is TA 167 175, see Site Location Plan in Appendix A.

The site is a L-shaped parcel of land, approximately 350 by 200 m, and generally flat and level.

The majority of the site, the southern portion (about 350 by 120 m), comprises rough grass and scrub land, which is it is boggy in places. There are several soil mounds, up to about 5 m in height.

The north west portion is within the perimeter fence of the adjacent car park, and comprises a compacted generally flat hardcore surface with very little vegetation.

To the north the site is bound by a carpark, belonging to TLOR, and to the west is infrastructure associated with the refinery, including access roads, railway lines, plant and equipment. To the south is VPI Immingham, a power generation facility. To the east is open farmland and the Humber Estuary beyond, approximately 500 m away.

2.2 Published Geology

The published geological map for the area, BGS Sheet 90 (1990) and the BGS Geology of Britain Viewer (2018) show the site located on Glacial Till over bedrock of the Burnham Chalk Formation.

3 FIELDWORK

3.1 General

The exploratory hole locations were selected by AECOM and set out from local features. The co-ordinates and reduced levels were surveyed by SOCOTEC to National Grid and Ordnance Datum and the locations are shown on the Site Plan in Appendix A

3.2 Exploratory Holes

The exploratory holes are listed in the following table.

TABLE 1: SUMMARY OF EXPLORATORY HOLES

TYPE	QUANTITY	DEPTH RANGE (m)	REMARKS
Cable Percussion Boring	3	22.34 to 28.66	BH1, BH2 and BH5
Cable Percussion Boring extended by Rotary Core Drilling/Open Hole Drilling	3	28.60 to 34.60	BH3, BH4 and BH6
Dynamic Sampling	8	3.75 to 5.45	WS1 to WS8
Trial Pits/ Trenches	13	2.50 to 4.60	TP1 to TP10 and TT1 to TT3

The exploratory hole logs are presented in Appendix B. These provide information including the equipment and methods used, samples taken, tests carried out, water observations and descriptions of the strata encountered. Explanation of the terms and abbreviations used on the logs is given in the Key to Exploratory Hole Records in Appendix B, together with other explanatory information. The logging of soil and rock materials is in accordance with BS 5930 (2015).

Standard penetration tests (SPT) in the boreholes were carried out in accordance with BS EN ISO 22476-3+A1 (2011) and the SPT hammer energy ratio certificate is included in Appendix B. The SPT results are presented on the logs as uncorrected N values.

Photographs of the trial pits and rotary drilled core are presented in Appendix E.

On completion of the fieldwork geotechnical samples were transported to the Doncaster laboratory of SOCOTEC for testing and temporary retention.

3.3 Groundwater and Gas Monitoring

Instrumentation installed in the exploratory holes for groundwater and gas monitoring are shown on the logs and summarised in Appendix C. SOCOTEC were not required to undertake any post fieldwork.

4 LABORATORY TESTING

Geotechnical laboratory testing was scheduled by AECOM and was carried out in accordance with BS 1377 (1990), unless otherwise stated. The testing is summarised below and the results are presented in Appendix E.

- Moisture Content Determination
- Atterberg Limit Determination
- Particle Density
- Particle Size Distribution Analysis
- Unconsolidated Undrained Triaxial Compression Testing
- Consolidated Undrained Triaxial Compression Testing
- One Dimensional Oedometer Consolidation Testing
- Determination of Consolidation Properties Using a Hydraulic Cell
- Dry Density / Moisture Content Relationship
- California Bearing Ratio
- pH, Water Soluble Sulphate, Acid Soluble Sulphate and Total Sulphur Content of Soils Test methods are BS 1377 or others recognised in BRE Special Digest 1 (2005)
- Loss on Ignition
- Organic Matter

REFERENCES

AGS : 2017 : Electronic transfer of geotechnical and geoenvironmental data (Edition 4.0.4 February 2017). Association of Geotechnical and Geoenvironmental Specialists.

BGS England and Wales Sheet 90 : 1990 : Grimsby. 1:50,000 geological map (solid and drift). British Geological Survey.

BGS Geology of Britain Viewer : 2018. www.bgs.ac.uk. British Geological Survey.

BRE Special Digest 1 : 2005 : Concrete in aggressive ground. Building Research Establishment.

BS 1377 : 1990 : Methods of test for soils for civil engineering purposes. British Standards Institution.

BS 5930 : 2015 : Code of practice for ground investigations. British Standards Institution.

BS EN 1997-2 : 2007 : Eurocode 7 - Geotechnical design - Part 2 Ground investigation and testing. British Standards Institution.

BS EN ISO 14688-1:2002+A1 : 2013 : Geotechnical investigation and testing - Identification and classification of soil - Part 1 Identification and description. British Standards Institution.

BS EN ISO 14688-2:2004+A1 : 2013 : Geotechnical investigation and testing - Identification and classification of soil - Part 2 Principles for a classification. British Standards Institution.

BS EN ISO 14689-1 : 2003 : Geotechnical investigation and testing - Identification and classification of rock - Part 1 Identification and description. British Standards Institution.

BS EN ISO 22475-1 : 2006 : Geotechnical investigation and testing – Sampling methods and groundwater measurements - Part 1 Technical principles for execution. British Standards Institution.

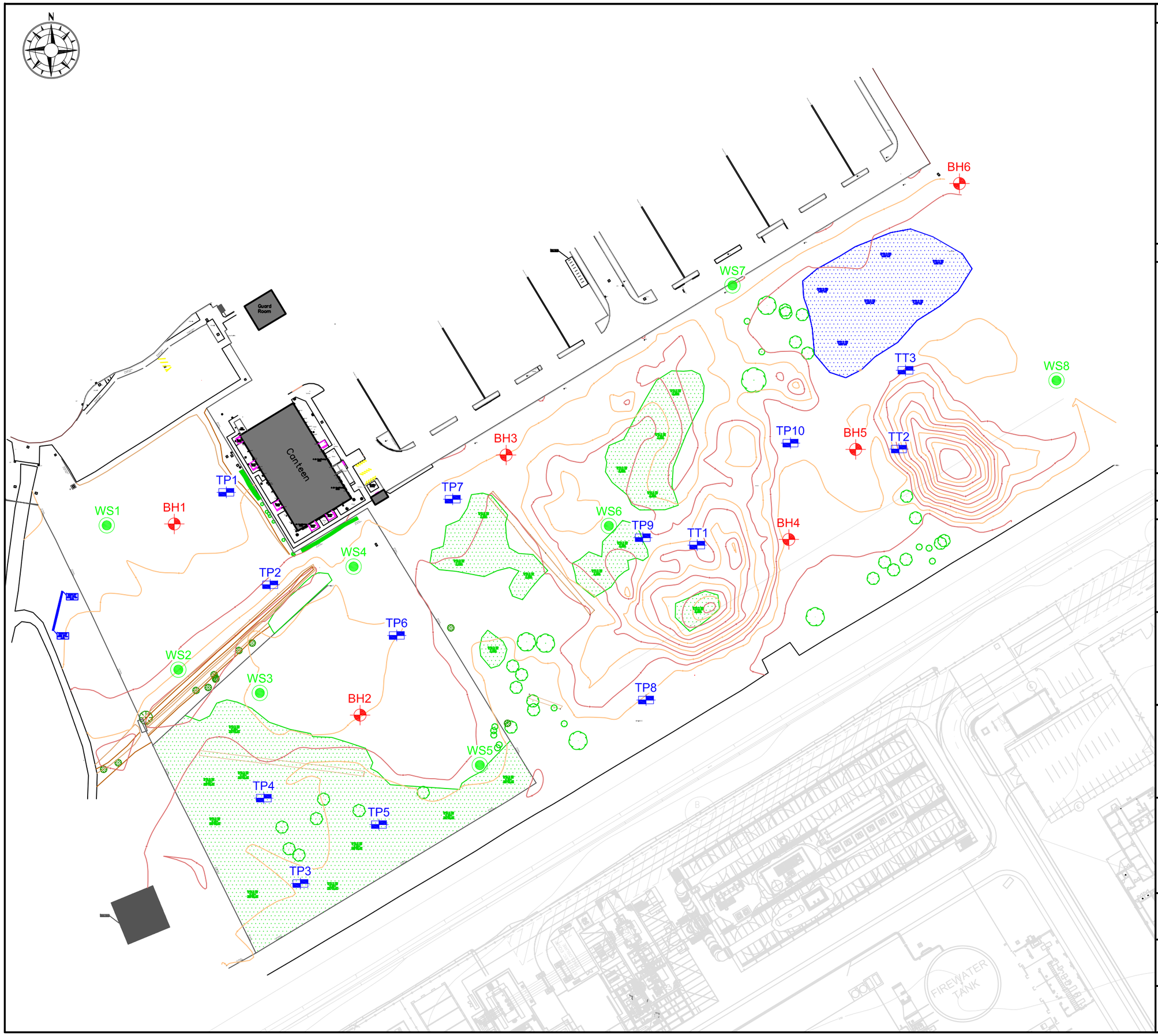
BS EN ISO 22476-3:2005+A1 : 2011 : Geotechnical investigation and testing - Field testing - Part 3 Standard penetration test. British Standards Institution.

APPENDIX A
FIGURES AND DRAWINGS

Site Location Plan

SOCOTEC

Notes: Scale 1:50 000	**Project** VPI IMMINGHAM **Project No.** A8015-18 **Carried out for** AECOM	**Figure** **A1**



GENERAL NOTES

1. Reproduced from VPI Immingham's Drawing No. VPII–IMMB–CIV–CI01–0001.
2. Hole Locations to National Grid Co–ordinate Reference System.

LEGEND TO SYMBOLS

- Borehole
- Window Sample
- Trial Pit

Scale: 1:1200

0 12m 24 36 48 60

x	x	x	x	x	x
Rev	Drawn	Date	Approv.	Date	Modification Details

AMENDMENTS

Title

SITE PLAN

Project

VPI IMMINGHAM

Client

AECOM
Environmental Solution Ltd

SOCOTEC

Date	Drawn By	Approv. By
04/06/2018	BS	WH

Sheet Size	Scale	Project No
A3	1:1200	A8015-18

Drawing No	Rev
A2	0

APPENDIX B

EXPLORATORY HOLE RECORDS

Key to Exploratory Hole Records	Key
SPT Hammer Energy Ratio Report	SPT Hammer Reference: SW15470 AR2068 DART235
Borehole Logs	BH1 to BH6
Borehole Logs (Dynamic Sampling)	WS1 to WS8
Trial Pit and Trench Logs	TP1 to TP10 and TT1 to TT3

Key to Exploratory Hole Records

SOCOTEC

SAMPLES

Undisturbed

U	Driven tube sample	nominally 100 mm diameter and full recovery unless otherwise stated
UT	Driven thin wall tube sample	
TW	Pushed thin wall tube sample	
P	Pushed piston sample	
L	Liner sample from dynamic (windowless) sampling. Full recovery unless otherwise stated	
CBR	CBR mould sample	
BLK	Block sample	
C / CS	Core sample (from rotary core) taken for laboratory testing.	
AMAL	Amalgamated sample	

Disturbed

D	Small sample
B	Bulk sample

Other

W	Water sample
G	Gas sample
	Environmental chemistry samples (in more than one container where appropriate)
ES	Soil sample
EW	Water sample

Comments

Sample reference numbers are assigned to every sample taken. A sample reference of 'NR' indicates that, while an attempt was made to take a tube sample, there was no recovery.

Samples taken from borehole installations (ie water or gas) after hole construction are not shown on the exploratory hole logs.

Specimens for point load testing undertaken on site (or other non-lab location) are not shown on the log.

IN SITU TESTS

SPT S or SPT C — Standard Penetration Test, open shoe (S) or solid cone (C)

The Standard Penetration Test is defined in BS EN ISO 22476-3:2005+A1:2011.
The incremental blow counts are given in the Field Records column; each increment is 75 mm unless stated otherwise and any penetration under self-weight in mm (SW) is noted. Where the full 300 mm test drive is achieved the total number of blows for the test drive is presented as N = ** in the Test column. Where the test drive blows reach 50 the total blow count beyond the seating drive is given (without the N = prefix).

IV	*in situ* vane shear strength, peak (p) and remoulded (r)
HV	Hand vane shear strength, peak (p) and remoulded (r)
PP	Pocket penetrometer test, converted to shear strength
KFH, KRH, KPI	Permeability tests (KFH = falling head, KRH = rising head; KPI = packer inflow); results provided in Field Records column (one value per stage for packer tests)

DRILLING RECORDS

The mechanical indices (TCR/SCR/RQD & If) are defined in BS 5930:2015

TCR	Total Core Recovery, %
SCR	Solid Core Recovery, %
RQD	Rock Quality Designation, %
If	Fracture spacing, mm. Minimum, typical and maximum spacing measurements are presented.
NI	The term non-intact (NI) is used where the core is fragmented.
NA	Used where a measurement is not applicable (eg. If, SCR and RQD in non-rock materials).

Flush returns, estimated percentage with colour where relevant, are given in the Records column

CRF	Core recovered (length in m) in the following run
AZCL	Assessed zone of core loss

GROUNDWATER

▼	Groundwater entry
▽	Depth to groundwater after standing period

Key to Exploratory Hole Records

INSTALLATION Details of standpipe/piezometer installations are given on the Record. Legend column shows installed instrument depths including slotted pipe section or tip depth, response zone filter material type and layers of backfill.

Standpipe/ piezometer The type of instrument installed is indicated by a code in the Legend column at the depth of the response zone:

SP	Standpipe
SPIE	Standpipe piezometer
PPIE	Pneumatic piezometer
EPIE	Electronic piezometer

Plain Pipe 

Slotted Pipe 

Piezometer Tip 

Inclinometer or Slip Indicator The installation of vertical profiling instruments is indicated on the Record. The base of tubing is shown in the Legend column.

The type of instrument installed is indicated by a code in the Legend column at the base of the tubing:

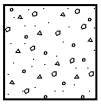
ICE	Biaxial inclinometer
ICM	Inclinometer tubing for use with probe
SLIP	Slip indicator

Settlement Points or Pressure Cells The installation of single point instruments is indicated on the Record. The location of the measuring device is shown in the Legend column.

The type of instrument installed is indicated by a code in the Legend column:

ESET	Electronic settlement cell/gauge
ETM	Magnetic extensometer settlement point
EPCE	Electronic embedment pressure cell
PPCE	Electronic push in pressure cell

INSTALLATION / BACKFILL LEGENDS A legend describing the installation is shown in the rightmost column. Legend symbols used to describe the backfill materials are indicated below.

Macadam 
Concrete 
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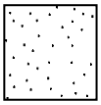
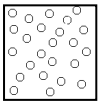
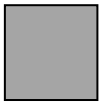
Bentonite 
Sand 
Gravel 
Arisings 

STRATUM LEGENDS The legend symbols used for graphical representation of soils, rocks and other materials on the borehole logs are shown below. For soils with significant proportions of secondary soil types, a combination of two or more symbols may be used.

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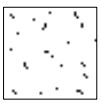
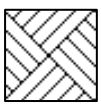
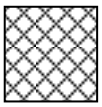
Concrete 
Topsoil 
Made Ground / Fill 
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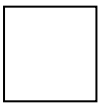
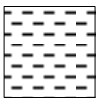
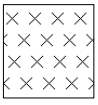
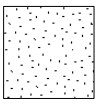
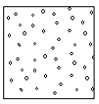
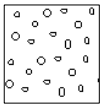
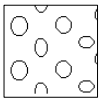
Void or No Information 

Clay 
Silt 
Sand 
Gravel 
Cobbles 
Boulders 
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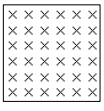
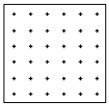
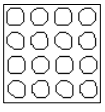
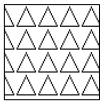
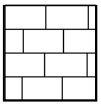
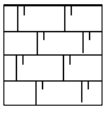
Siltstone 
Sandstone 
Conglomerate 
Breccia 
Limestone 
Chalk 

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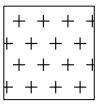
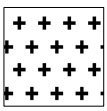
Igneous (Med) 
Igneous (Coarse) 
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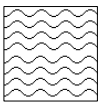
Metamorphic (Med) 
Metamorphic (Coarse) 
Tuff 

Notes:

See report text for full references of standards.

Updated October 2017

Project VPI Immingham

Project No. A8015-18

Carried out for AECOM Environmental Solutions Ltd

Key

Key to Exploratory Hole Records

SOCOTEC

NOTES

1 Soils and rocks are described in accordance with BS EN ISO 14688-1:2002+A1:2013 and 14689-1:2003 respectively as amplified by BS 5930:2015.

2 For fine soils, consistency determined during description is reported for those strata where undisturbed samples are available. Where the logger considers that the sample may not be representative of the condition in situ, for whatever reason, the reported consistency is given in brackets. The reliability of the sample is indicated by Probably or Possibly as appropriate. Hence (Probably firm) indicates the logger is reasonably confident of the assessment, but (Possibly firm) means less certainty. Where the samples available are too disturbed to allow a reasonable assessment of the in situ condition, no consistency is given.

3 Evidence of the occurrence of very coarse particles (cobbles and boulders) is presented on the logs. However, because of their size in relation to the exploratory hole these records may not be fully representative of their size and frequency in the ground mass.

4 The declination of bedding and joints is given with respect to the normal to the core axis. Thus in a vertical borehole this will be the dip.

5 The assessment of SCR, RQD and Fracture Spacing excludes artificial fractures.

6 Observations of discernible groundwater entries during the advancement of the exploratory hole are given at the foot of the log and in the Legend column. The absence of a recorded groundwater entry should not, however, be interpreted as a groundwater level below the base of the borehole. Under certain conditions groundwater entry may not be observed, for instance, drilling with water flush or overwater, or boring at a rate faster than water can accumulate in the borehole. Similarly, where water entry observations do exist, groundwater may also be present at higher elevations in the ground than where recorded in the borehole. In addition, where appropriate, water levels in the hole at the time of recovering individual samples or carrying out in situ tests and at shift changes are given in the Records column.

7 The borehole logs present the results of Standard Penetration Tests recorded in the field without correction or interpretation. However, in certain ground conditions (eg high hydraulic head or where very coarse particles are present) some judgement may be necessary in considering whether the results are representative of in situ mass conditions.

REFERENCES

1 BS EN ISO 14688-1:2002+A1 : 2013 : Geotechnical investigation and testing - Identification and classification of soil. Part 1 Identification and description. British Standards Institution

2 BS EN ISO 14689-1 : 2003 : Geotechnical investigation and testing - Identification and classification of rock. Part 1 Identification and description. British Standards Institution

3 BS EN ISO 22476-3:2005+A1 : 2011 : Geotechnical investigation and testing - Field testing. Part 3 Standard penetration test. British Standards Institution

4 BS 5930 : 2015 : Code of practice for ground investigations. British Standards Institution

SPT Hammer Energy Test Report

in accordance with BSEN ISO 22476-3:2005

ARCHWAY ENGINEERING
AINLEYS INDUSTRIAL ESTATE
ELLAND
WEST YORKSHIRE
HX5 9JP

SPT Hammer Ref:	AR1940
Test Date:	21/09/2017
Report Date:	21/09/2017
File Name:	AR1940.spt
Test Operator:	SH

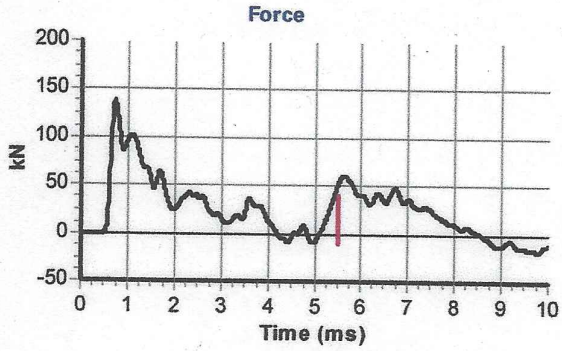
Instrumented Rod Data

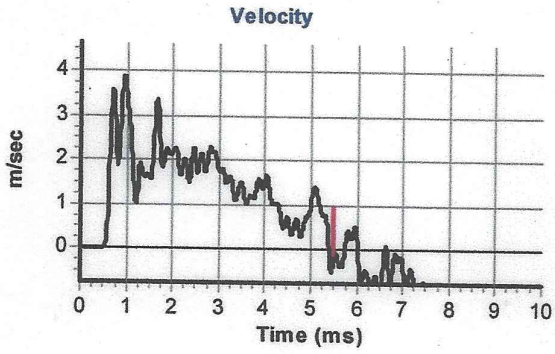
Diameter d_r (mm):	54
Wall Thickness t_r (mm):	6.0
Assumed Modulus E_a (GPa):	200
Accelerometer No.1:	7080
Accelerometer No.2:	11609

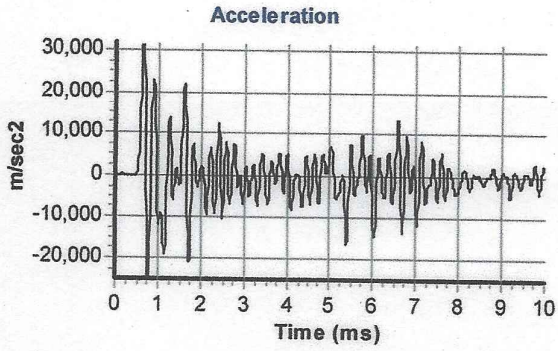
SPT Hammer Information

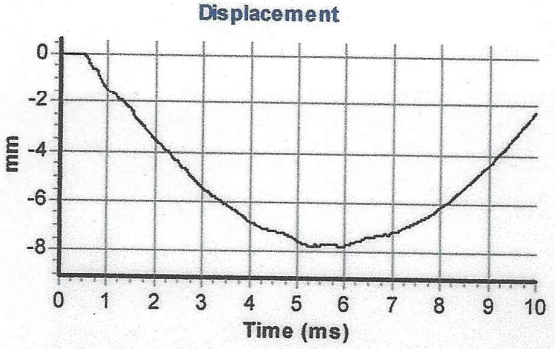
Hammer Mass m (kg):	63.5
Falling Height h (mm):	760
SPT String Length L (m):	10.0

Comments / Location
CALIBRATION









Calculations

Area of Rod A (mm2):	905
Theoretical Energy E_{theor} (J):	473
Measured Energy E_{meas} (J):	332

Energy Ratio E_r (%): **70**

M. Gardner

Signed: M.GARDNER
Title: FITTER

The recommended calibration interval is 12 months

SPT Hammer Energy Test Report

in accordance with BSEN ISO 22476-3:2005

ARCHWAY ENGINEERING
AINLEYS INDUSTRIAL ESTATE
ELLAND
WEST YORKSHIRE
HX5 9JP

SPT Hammer Ref:	AR2068
Test Date:	15/12/2017
Report Date:	15/12/2017
File Name:	AR2068.spt
Test Operator:	SH

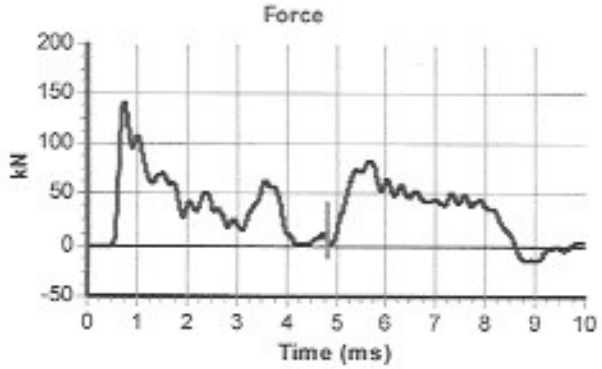
Instrumented Rod Data

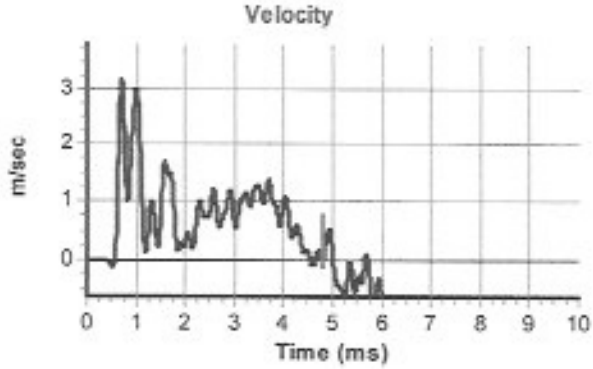
Diameter d_r (mm):	54
Wall Thickness t_r (mm):	6.0
Assumed Modulus E_a (GPa):	200
Accelerometer No.1:	7080
Accelerometer No.2:	11609

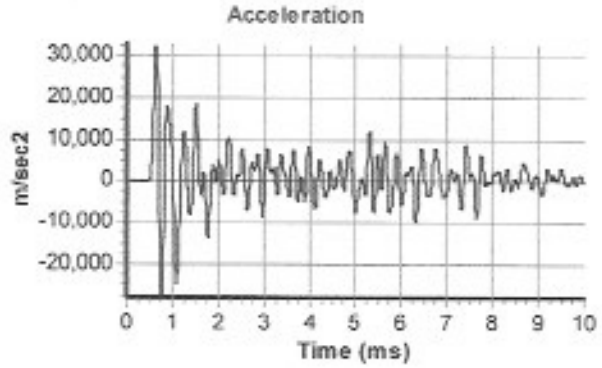
SPT Hammer Information

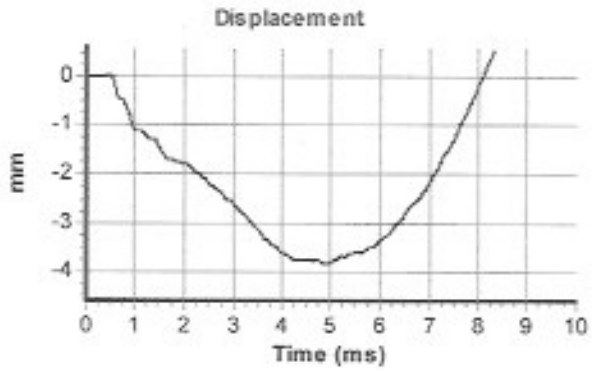
Hammer Mass m (kg):	63.5
Falling Height h (mm):	760
SPT String Length L (m):	10.0

Comments / Location
CALIBRATION









Calculations

Area of Rod A (mm2):	905
Theoretical Energy E_{theor} (J):	473
Measured Energy E_{meas} (J):	296

Energy Ratio E_r (%): **63**

Signed: M.GARDNER
Title: FITTER

The recommended calibration interval is 12 months

SPT Hammer Energy Test Report

in accordance with BSEN ISO 22476-3:2005

ARCHWAY ENGINEERING
AINLEYS INDUSTRIAL ESTATE
ELLAND
WEST YORKSHIRE
HX59JP

SPT Hammer Ref:	DART235
Test Date:	13/04/2017
Report Date:	13/04/2017
File Name:	DART235.spt
Test Operator:	SH

Instrumented Rod Data

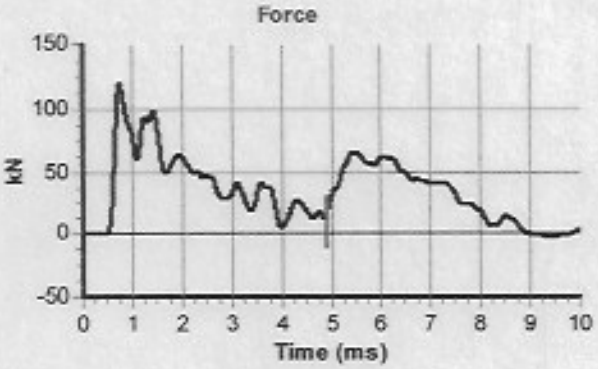
Diameter d_r (mm):	54
Wall Thickness t_r (mm):	6.0
Assumed Modulus E_a (GPa):	208
Accelerometer No.1:	7080
Accelerometer No.2:	11609

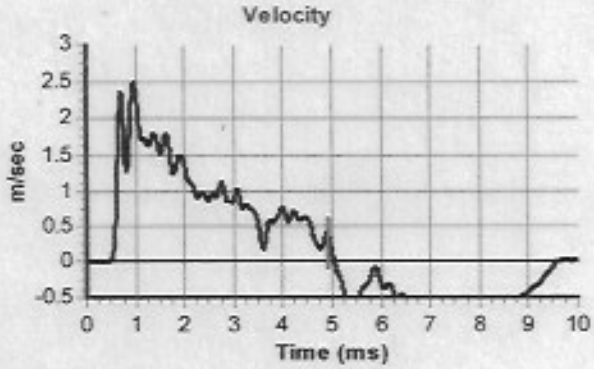
SPT Hammer Information

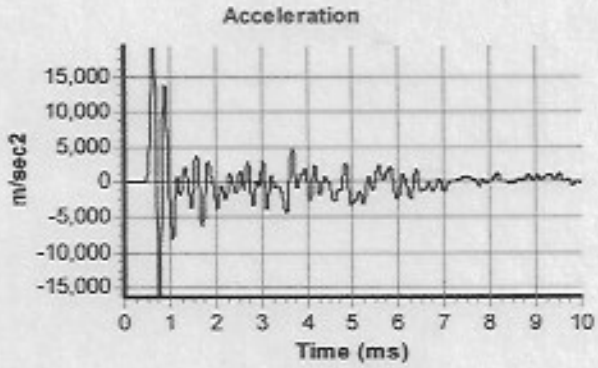
Hammer Mass m (kg):	63.5
Falling Height h (mm):	760
SPT String Length L (m):	10.0

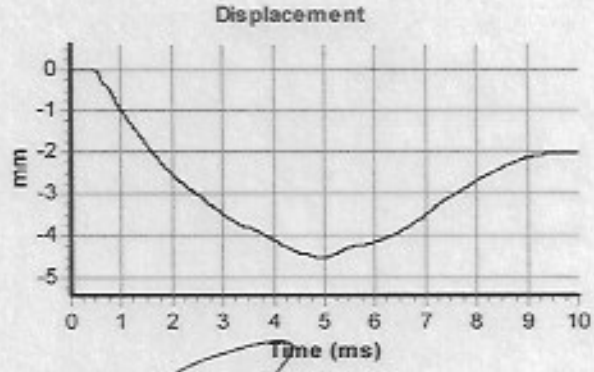
Comments / Location

CALIBRATION









Calculations

Area of Rod A (mm2):	905
Theoretical Energy E_{theor} (J):	473
Measured Energy E_{meas} (J):	276

Energy Ratio E_r (%): **58**

Signed: S. HOWARTH

Title: FITTER

The recommended calibration interval is 12 months

Borehole Log

SOCOTEC

Drilled	GC	**Start**	**Equipment, Methods and Remarks**	**Depth from (m)**	**to (m)**	**Diameter (mm)**	**Casing Depth (m)**	**Ground Level**	6.36 mOD
Logged	MJS	05/04/2018	Dando 2000.	1.20	14.00	200	14.00	**Coordinates (m)**	E 516528.04
Checked	TC	**End**	Cable percussion boring.	14.00	28.50	150	28.50	**National Grid**	N 417415.39
Approved	TC	11/04/2018	SPT Hammer ID: AR1940, Rod type: 54mm Whitworth.						

Samples and Tests / Strata Description

Depth	Type & No.	Records	Date Casing	Time Water	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.10	D 1	0.00-1.20 Hand excavated inspection pit.			Brown sandy clayey GRAVEL. Gravel is angular to subangular fine to coarse of chalk and limestone. (MADE GROUND)		0.10 (0.10) +6.26		
0.20 - 0.40	B 2						(0.35)		
0.45	D 3				Brown, locally greyish brown, slightly sandy gravelly CLAY. Gravel is angular fine to coarse of chalk and mudstone. Strong hydrocarbon odour. (MADE GROUND)		0.45 +5.91		
0.50 - 0.70	B 4						(0.65)		
1.00 - 1.20	B 5		05/04/18	1800 Dry	Greyish brown, locally dark grey, slightly sandy slightly gravelly CLAY. Gravel is angular to subangular fine to coarse of slag, mudstone, sandstone and chalk. Strong hydrocarbon odour. (MADE GROUND)	1.10-1.20 locally dark grey, occasional rootlets	1.10 +5.26		
1.20 - 1.65	UT 6	52 blows 100% rec	06/04/18	0800 Dry					
1.65 - 1.80	D 7				Stiff brown, locally mottled light grey, slightly sandy slightly gravelly CLAY. Gravel is angular to subrounded fine to coarse of quartz, mudstone, sandstone and chalk.				
2.00 - 2.45	SPTS	N=25 (3,4/5,6,7,7)	1.70	Dry					
2.00 - 2.45	D 8								
2.50 - 3.00	B 9						(2.70)		
3.00 - 3.45	UT 10	56 blows 100% rec	2.80	Dry					
3.45 - 3.60	D 11								
3.80	W 14				Thinly laminated brown, locally light grey, CLAY with frequent gravel size pockets of fine to coarse sand.		3.80 +2.56 (0.20)		
4.00 - 4.45	SPTS	N=14 (2,2/3,3,4,4)	3.90	Dry	Stiff, becoming very stiff, greyish brown slightly sandy slightly gravelly CLAY. Gravel is angular to subrounded fine to coarse of chalk, sandstone, mudstone and quartz.		4.00 +2.36		
4.00 - 4.45	D 12								
4.00 - 4.45	B 13								
5.00 - 5.45	UT 15	50 blows 100% rec	4.70	Dry					
5.45 - 5.60	D 16								
6.50 - 6.95	SPTS	N=14 (2,2/3,3,4,4)	4.70	Dry					
6.50 - 6.95	D 17								
7.00 - 7.50	B 18					7.10-8.40 locally sandy			
7.20	D 19								
8.00 - 8.45	UT 20	38 blows 100% rec	4.70	Dry					
8.45	B 21						(9.00)		
8.50	W 21A								
9.50 - 9.95	SPTS	N=14 (2,3/3,3,4,4)	9.20	Dry					
9.50 - 9.95	D 22								
9.50 - 10.00	B 23								

Groundwater Entries

No.	Depth Strike (m)	Remarks	Depth Sealed (m)
1	3.80	Rose to 2.30 m after 20 minutes. Medium inflow	4.00
2	8.50	Rose to 6.30 m after 20 minutes. Medium inflow	9.00

Depth Related Remarks

Depths (m)	Remarks

Hard Boring

Depths (m)	Duration (mins)	Tools used

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

14/08/2018 13:42:20

Project VPI IMMINGHAM

Project No. A8015-18

Carried out for AECOM

Borehole

BH1

Borehole Log

SOCOTEC

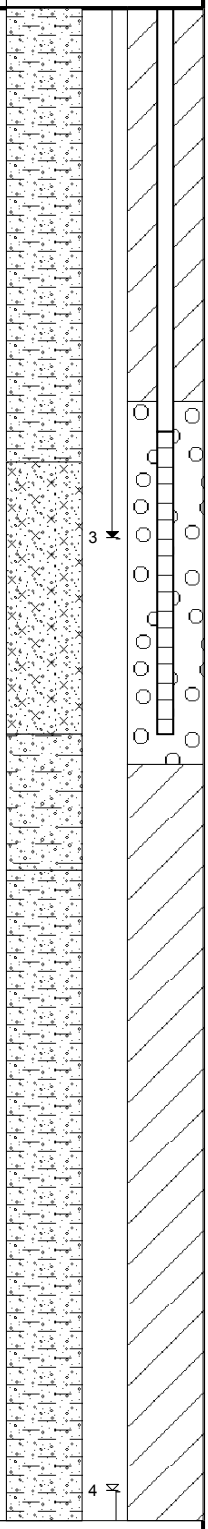
Drilled	GC	**Start**	**Equipment, Methods and Remarks**	**Depth from (m)**	**to (m)**	**Diameter (mm)**	**Casing Depth (m)**	**Ground Level**	6.36 mOD
Logged	MJS	05/04/2018	Dando 2000.	1.20	14.00	200	14.00	**Coordinates (m)**	E 516528.04
Checked	TC	**End**	Cable percussion boring.	14.00	28.50	150	28.50	**National Grid**	N 417415.39
Approved	TC	11/04/2018	SPT Hammer ID: AR1940, Rod type: 54mm Whitworth.						

Samples and Tests

Strata Description

Depth	Type & No.	Records	Date / Casing	Time / Water	Main	Detail	Depth, Level (Thickness)
					Stiff, becoming very stiff, greyish brown slightly sandy slightly gravelly CLAY. Gravel is angular to subrounded fine to coarse of chalk, sandstone, mudstone and quartz.		
11.00 - 11.45	UT 24	40 blows 100% rec	9.20	Dry			
11.45 - 11.60	D 25						
12.50 - 12.95	SPTS	N=31 (5,5/6,7,8,10)	9.20	Dry			
12.50 - 12.95	D 26						
13.00	D 28						13.00 -6.64
13.00 - 13.50	B 27				Medium dense brown gravelly very silty fine to coarse SAND. Gravel is angular to subrounded fine to coarse of chalk and flint.		
13.50	W 30						(1.80)
14.00 - 14.45	SPTS	N=10 (3,3/2,3,2,3)	9.20	10.00			
14.00 - 14.45	D 29		06/04/18	1800			
			9.20	10.00			
			09/04/18	0800			
			9.20	3.80			
14.80	D 31				Medium dense brown sandy slightly clayey GRAVEL. Gravel is angular to subangular fine to coarse of flint and chalk.		14.80 -8.44
15.00 - 15.50	B 32						(0.90)
15.50 - 15.95	SPTS	N=28 (3,3/5,5,8,10)	15.00	10.00			
15.50 - 15.95	D 33						15.70 -9.34
16.00 - 17.00	B 34				Very stiff brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse of chalk and rare flint.		
17.00 - 17.45	UT 35	78 blows 100% rec	16.50	15.00		17.10 becoming greyish brown	
17.45 - 17.60	D 36						
18.50 - 18.77	SPTS	50 (15,10 for 50mm/23,27 for 70mm)	18.00	17.00			(5.80)
18.50 - 18.77	D 37						
18.50 - 19.00	B 38						

Legend / Backfill



Groundwater Entries

No.	Depth Strike (m)	Remarks	Depth Sealed (m)
3	13.50	Rose to 9.00 m after 20 minutes. Fast inflow	

Depth Related Remarks

Depths (m)	Remarks

Hard Boring

Depths (m)	Duration (mins)	Tools used
14.50 - 14.80	60	Chisel

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

14/08/2018 13:42:20

Project VPI IMMINGHAM

Project No. A8015-18

Carried out for AECOM

Borehole

BH1

Borehole Log

SOCOTEC

Drilled	GC	**Start**	**Equipment, Methods and Remarks**	**Depth from (m)**	**to (m)**	**Diameter (mm)**	**Casing Depth (m)**	**Ground Level**	6.36 mOD
Logged	MJS	05/04/2018	Dando 2000.	1.20	14.00	200	14.00	**Coordinates (m)**	E 516528.04
Checked	TC	**End**	Cable percussion boring.	14.00	28.50	150	28.50	**National Grid**	N 417415.39
Approved	TC	11/04/2018	SPT Hammer ID: AR1940, Rod type: 54mm Whitworth.						

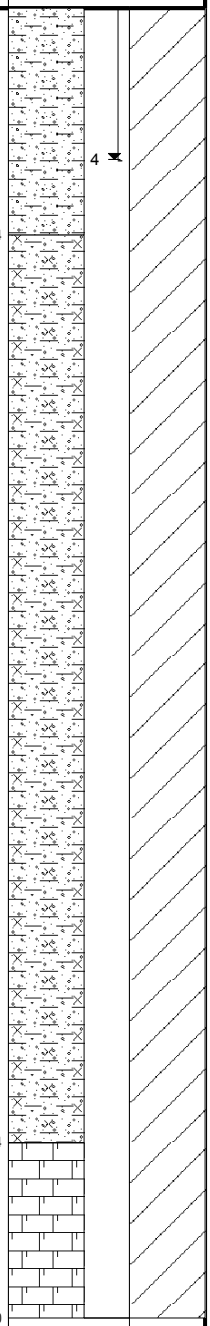
Samples and Tests

Depth	Type & No.	Records	Date / Casing	Time / Water
20.00 - 20.40	UT 39	100 blows 56% rec	19.50	19.50
20.40 - 20.50	D 40			
21.00 - 21.50	B 41			
21.50 - 21.79	SPTS	50 (10,15 for	19.50	20.00
21.50 - 21.79	D 42	60mm/22,25,3 for 5mm)		
22.50 - 22.70	SPTS	50 (25 for 75mm/28,22 for	09/04/18	1800
22.50	UT NR	55mm)	19.50	20.00
22.50 - 22.70	D 43	100 blows No Recovery	10/04/18	0800
			19.50	9.00
23.00 - 24.00	B 44			
24.00 - 24.28	SPTS	50 (15,10 for	23.50	10.00
24.00 - 24.28	D 45	45mm/20,27,3 for 5mm)		
25.00 - 25.22	SPTS	50 (20,5 for 15mm/25,25	24.90	8.00
25.00 - 25.22	D 46	for 60mm)		
26.00 - 26.22	SPTS	50 (25 for 75mm/27,23 for	25.90	8.00
26.00 - 26.22	D 47	65mm)	10/04/18	1700
26.00 - 27.00	B 48		25.90	8.00
			11/04/18	0800
			25.90	4.00
27.50 - 27.78	SPTS	50 (15,10 for	27.50	7.00
27.50 - 27.78	D 49	50mm/22,24,4 for 5mm)		
27.50 - 28.50	B 50			
28.50 - 28.66	SPTS	50 (25 for 60mm/38,12 for	11/04/18	1500
28.50 - 28.66	D 51	20mm)	28.50	9.00

Strata Description

Main	Detail	Depth, Level (Thickness)
Very stiff brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse of chalk and rare flint.		
Very stiff light grey slightly sandy gravelly silty CLAY. Gravel is subangular to subrounded fine to coarse of chalk.		21.50 -15.14
	25.50 recovered as clayey angular fine to coarse gravel	(6.00)
Extremely weak to very weak white CHALK. Recovered as gravelly clay. Gravel is angular to subangular fine to coarse.		27.50 -21.14
		(1.16)
END OF EXPLORATORY HOLE		28.66 -22.30

Legend / Backfill



Groundwater Entries

No.	Depth Strike (m)	Remarks	Depth Sealed (m)
4	21.00	Rose to 19.80 m after 20 minutes. Medium inflow	

Depth Related Remarks

Depths (m)	Remarks

Hard Boring

Depths (m)	Duration (mins)	Tools used
24.50 - 26.00	180	Chisel
26.50 - 27.50	120	Chisel

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

14/08/2018 13:42:20

Project	**VPI IMMINGHAM**
Project No.	**A8015-18**
Carried out for	**AECOM**

Borehole

BH1

Borehole Log

SOCOTEC

Drilled	GC	**Start**	**Equipment, Methods and Remarks**	**Depth from (m)**	**to (m)**	**Diameter (mm)**	**Casing Depth (m)**	**Ground Level**	5.43 mOD
Logged	WH	11/04/2018	Dando 2000.	1.20	14.50	200	14.50	**Coordinates (m)**	E 516588.10
Checked	TC	**End**	Cable percussion boring.	14.50	22.20	150	22.20	**National Grid**	N 417353.62
Approved	TC	16/04/2018	SPT Hammer ID: AR1940, Rod type: 54mm Whitworth.						

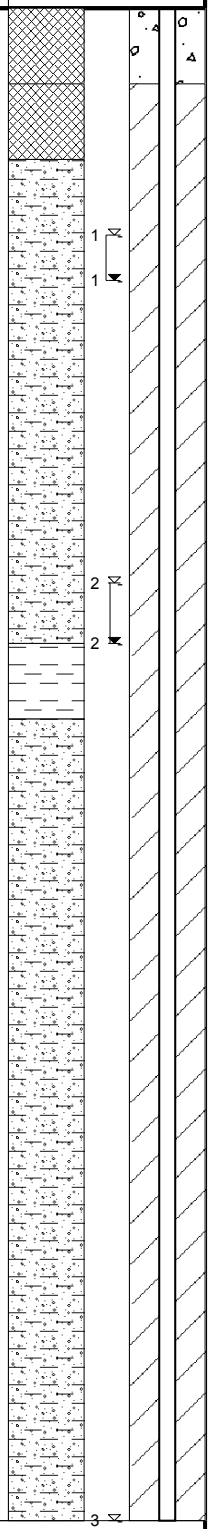
Samples and Tests

Depth	Type & No.	Records	Date Casing	Time Water
		0.00-1.20 Hand excavated inspection pit.		
0.20	D 1			
0.30 - 0.50	B 2			
0.60	D 3			
0.60 - 1.00	B 4			
1.00	D 5			
1.00 - 1.20	B 6			
1.20 - 1.65	UT 7	30 blows 100% rec		Dry
1.65 - 1.80	D 8			
1.80 - 2.25	SPTS	N=13 (2,2/2,3,4,4)		1.50
1.80 - 2.25	D 9			
1.80 - 2.25	B 10		11/04/18	1800
2.20 - 2.70	B 13			1.50
2.25 - 2.70	UT NR	28 blows No Recovery	12/04/18	0800
				2.00
2.70 - 2.80	D 12			
2.80 - 3.25	SPTS	N=15 (1,2/3,3,4,5)	1.70	Dry
2.80 - 3.25	D 14			
3.30 - 3.75	UT 15	45 blows 100% rec	1.70	Dry
3.75 - 3.90	D 16			
3.90 - 4.35	SPTS	N=15 (6,7/4,3,3,5)	2.90	Dry
3.90 - 4.35	D 17		3.90	Dry
3.90 - 4.35	B 18			
4.00 - 4.45	UT NR	36 blows No Recovery		
4.45 - 4.60	D 20			
4.60 - 5.05	SPTS	N=17 (2,2/3,4,4,6)	4.50	4.00
4.60 - 5.05	D 21			
4.60 - 5.05	B 27			
5.10 - 5.55	UT 28	38 blows 100% rec	5.00	4.80
5.55 - 5.70	D 29			
5.70 - 6.15	SPTS	N=25 (3,4/5,6,7,7)	5.60	Dry
5.70 - 6.15	D 30			
5.70 - 6.15	B 31			
6.50 - 6.95	UT NR	48 blows No Recovery	6.00	Dry
6.50 - 7.00	B 33			
7.10 - 7.55	SPTS	N=22 (3,4/4,5,6,7)	6.00	Dry
7.10 - 7.55	D 34			
7.10 - 7.55	B 35			
8.00 - 8.45	UT 36	60 blows 100% rec	6.00	Dry
8.45 - 8.60	D 37			
8.60 - 9.05	SPTS	N=27 (3,4/5,7,7,8)	6.00	Dry
8.60 - 9.05	D 38			
8.60 - 9.05	B 39			
9.50 - 9.95	UT 40	62 blows 100% rec	6.00	Dry
9.95 - 10.10	D 41			

Strata Description

Main	Detail	Depth, Level (Thickness)
Dark brown sandy very gravelly CLAY with high cobble content. Gravel is subrounded fine to coarse of various lithologies including chalk, macadam and sandstone. Cobbles are subrounded of chalk. (MADE GROUND)		(0.50) 0.50 +4.93
Dark brown and black very gravelly very silty fine to coarse SAND. Gravel is subangular fine to coarse of chalk and sandstone. Strong hydrocarbon odour. (MADE GROUND)		(0.50) 1.00 +4.43
Firm dark greyish brown slightly sandy slightly gravelly CLAY. Gravel is angular medium of flint and chalk.		(3.20)
Brown mottled grey CLAY.	4.45 slightly gravelly sandy, gravel is subangular fine of chalk and mudstone	4.20 +1.23 (0.50)
Stiff to very stiff brown slightly sandy slightly gravelly CLAY. Gravel is subangular fine to medium of sandstone and chalk.		4.70 +0.73 (9.40)

Legend / **Backfill**



Groundwater Entries

No.	Depth Strike (m)	Remarks	Depth Sealed (m)
1	1.80	Rose to 1.50 m after 20 minutes. Slow inflow	
2	4.20	Rose to 3.80 m after 20 minutes. Slow inflow	5.00

Depth Related Remarks

Depths (m)	Remarks

Hard Boring

Depths (m)	Duration (mins)	Tools used

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

14/08/2018 13:42:21

Project VPI IMMINGHAM

Project No. A8015-18

Carried out for AECOM

Borehole

BH2

Sheet 1 of 3

Borehole Log

SOCOTEC

Drilled	GC	**Start**	**Equipment, Methods and Remarks**	**Depth from (m)**	**to (m)**	**Diameter (mm)**	**Casing Depth (m)**	**Ground Level**	5.43 mOD
Logged	WH	11/04/2018	Dando 2000.	1.20	14.50	200	14.50	**Coordinates (m)**	E 516588.10
Checked	TC	**End**	Cable percussion boring.	14.50	22.20	150	22.20	**National Grid**	N 417353.62
Approved	TC	16/04/2018	SPT Hammer ID: AR1940, Rod type: 54mm Whitworth.						

Samples and Tests

Strata Description

Depth	Type & No.	Records	Date Casing	Time Water	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
10.10 - 10.55 10.10 - 10.55 10.10 - 10.55	SPTS D 42 B 43	N=22 (3,4/4,5,6,7)	6.00	Dry	Stiff to very stiff brown slightly sandy slightly gravelly CLAY. Gravel is subangular fine to medium of sandstone and chalk.				
11.00 - 11.45	UT 44	64 blows 100% rec	6.00	Dry					
11.45 - 11.60	D 45								
11.60 - 12.05 11.60 - 12.05 11.60 - 12.05	SPTS D 46 B 47	N=23 (3,4/4,5,6,8)	6.00	Dry					
12.50 - 12.95	UT 48	70 blows 100% rec	6.00	Dry					
12.95 - 13.10	D 49								
13.10 - 13.55 13.10 - 13.55 13.10 - 13.55	SPTS D 50 B 51	N=30 (4,6/6,7,8,9)	6.00	Dry					
14.00 - 14.45 14.00 - 14.60 14.10	UT NR B 53 W 59	80 blows No Recovery	6.00	Dry	Firm light brown sandy very gravelly CLAY. Gravel is subangular to subrounded fine to coarse of chalk and mudstone.		14.10 -8.67 (0.30) 14.40 -8.97		3
14.60 - 15.05 14.60 - 15.05	SPTS D 54	N=39 (7,8/10,10,9,10)	14.50	10.00	Firm to stiff light brown sandy gravelly CLAY. Gravel is subangular to subrounded fine to coarse of chalk, mudstone and flint. Occasional gravel size pockets of fine to medium sand.				
15.20	D 55								
15.50 - 15.95	UT 56	70 blows 33% rec	14.50	10.00			(2.00)		
16.20 - 16.65 16.20 - 16.65 16.40 - 17.00	SPTS D 57 B 58	N=37 (6,8/8,9,10,10)	15.50	7.00					
17.00 - 17.45	UT 60	55 blows 56% rec	12/04/18 16.50 13/04/18 16.50	1800 7.00 0800 5.00	Stiff greyish brown slightly sandy slightly gravelly CLAY. Gravel is angular to subrounded fine to medium of chalk.		16.40 -10.97		
17.45 - 17.60	D 61					17.45-18.05 light grey silty fine to coarse sand			
17.60 - 18.05 17.60 - 18.05	SPTS D 62	N=35 (3,5/7,8,10,10)	16.50	5.00			(3.10)		
18.50 - 18.95 18.50 - 19.00	UT NR B 63	60 blows No Recovery	18.40	9.00					
19.10 - 19.55 19.10 - 19.55	SPTS D 64	N=35 (4,6/7,8,9,11)	18.40	9.00					
19.50	D 65				Stiff to very stiff brownish grey slightly sandy CLAY with occasional gravel. Gravel is subangular fine to medium of chalk.		19.50 -14.07		

Groundwater Entries

No.	Depth Strike (m)	Remarks	Depth Sealed (m)
3	14.10	Rose to 10.00 m after 20 minutes. Medium inflow	

Depth Related Remarks

Depths (m)	Remarks

Hard Boring

Depths (m)	Duration (mins)	Tools used

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

14/08/2018 13:42:21

Project VPI IMMINGHAM

Project No. A8015-18

Carried out for AECOM

Borehole

BH2

Borehole Log

SOCOTEC

Drilled	GC	**Start**	**Equipment, Methods and Remarks**	**Depth from (m)**	**to (m)**	**Diameter (mm)**	**Casing Depth (m)**	**Ground Level**	5.43 mOD
Logged	WH	11/04/2018	Dando 2000.	1.20	14.50	200	14.50	**Coordinates (m)**	E 516588.10
Checked	TC	**End**	Cable percussion boring.	14.50	22.20	150	22.20	**National Grid**	N 417353.62
Approved	TC	16/04/2018	SPT Hammer ID: AR1940, Rod type: 54mm Whitworth.						

Samples and Tests

Strata Description

Depth	Type & No.	Records	Date / Casing	Time / Water	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
20.00 - 20.45	UT 66	100 blows 56% rec	20.00	11.00	Stiff to very stiff brownish grey slightly sandy CLAY with occasional gravel. Gravel is subangular fine to medium of chalk.				
20.60 - 20.93	SPTS	50 (12,13 for	20.00	11.00					
20.60 - 20.93	D 67	65mm/17,21,12 for 40mm)							
20.60 - 21.00	B 68						(2.84)		
21.50 - 21.64	SPTS	50 (25 for 50mm/42,8 for	21.00	11.00					
21.50 - 21.64	D 69	10mm)							
			13/04/18	1800					
			21.50	11.00					
			16/04/18	0800					
			21.50	6.00					
22.20 - 22.34	SPTS	50 (25 for 50mm/39,11 for	16/04/18	1000					
22.20 - 22.34	D 70	15mm)	22.20	8.00			22.34 -16.91		
					END OF EXPLORATORY HOLE				

Groundwater Entries

No.	Depth Strike (m)	Remarks	Depth Sealed (m)

Depth Related Remarks

Depths (m)	Remarks

Hard Boring

Depths (m)	Duration (mins)	Tools used
21.90 - 21.90	180	Chisel
21.90 - 22.20	60	Chisel

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

14/08/2018 13:42:21

Project VPI IMMINGHAM

Project No. A8015-18

Carried out for AECOM

Borehole

BH2

Borehole Log

SOCOTEC

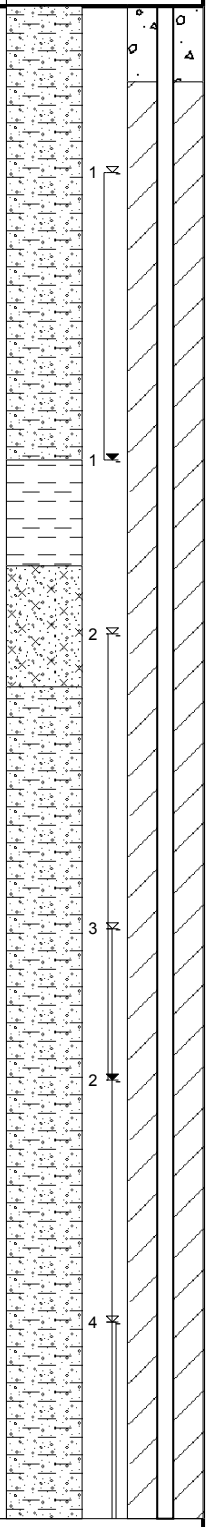
Drilled	SS/MB	**Start**	**Equipment, Methods and Remarks**	**Depth from (m)**	**to (m)**	**Diameter (mm)**	**Casing Depth (m)**	**Ground Level**	5.43 mOD
Logged	MJS/PC	11/04/2018	Dando 175./Beretta T44.	1.20	28.00	200	28.00	**Coordinates (m)**	E 516635.31
Checked	TC	**End**	Cable percussion boring./Rotary core drilling (SWF size) using air mist flush.	28.00	28.60	146	28.00	**National Grid**	N 417437.68
Approved	TC	16/04/2018	SPT Hammer ID: AR2068, Rod type: 54mm Whitworth.						

Samples and Tests

Strata Description

Depth	Type & No.	Records	Date Casing	Time Water	Main	Detail	Depth, Level (Thickness)
		0.00-1.20 Hand excavated inspection pit.			Firm brown, locally mottled light grey, slightly sandy slightly gravelly CLAY. Gravel is angular to subrounded fine to coarse of quartz, sandstone, chalk and mudstone.	0.00-1.20 occasional rootlets	
0.40 - 1.20	B 1						
1.20 - 1.65	SPTS	N=16 (3,4/4,4,4,4)	1.20	Dry			
1.20 - 1.65	D 2						
1.65 - 2.00	B 3						(3.00)
2.00 - 2.45	SPTS	N=13 (3,3/3,4,3,3)	1.50	Dry			
2.00 - 2.45	D 4						
2.50 - 3.00	B 5						
3.00 - 3.45	SPTS	N=8 (1,2/2,2,2,2)	1.50	1.10			3.00 +2.43
3.00 - 3.45	D 6				Firm thinly laminated brown CLAY with frequent partings of fine to medium sand.		
3.50 - 4.00	B 7						(0.70)
							3.70 +1.73
4.00 - 4.45	SPTS	N=13 (2,2/3,3,3,4)	4.00	Dry	Medium dense brown slightly gravelly very silty fine to medium SAND. Gravel is angular to subrounded fine to medium of various lithologies.		
4.00 - 4.45	D 8						(0.80)
4.50 - 5.00	B 9						4.50 +0.93
					Stiff brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse of chalk, mudstone, quartz and sandstone.		
5.00 - 5.45	UT 10	39 blows 100% rec	4.50	Dry			
5.45 - 5.65	D 11						
5.65 - 6.00	B 12						
6.00 - 6.45	SPTS	N=22 (3,3/4,6,6,6)	6.00	Dry			
6.00 - 6.45	D 13						
6.50 - 7.10	B 14						
						7.10-7.40 foreman reports reddish brown sand 7.40 becoming greyish brown	
7.50 - 7.95	UT 15	49 blows 100% rec	7.50	Dry			
7.95 - 8.15	D 16						
8.15 - 8.60	SPTS	N=23 (3,3/4,5,6,8)	7.50	Dry			
8.15 - 8.60	D 17						
8.60 - 9.00	B 18						
9.00 - 9.45	UT 19	59 blows 100% rec	9.00	Dry			(8.80)
9.45 - 9.65	D 20						
9.65 - 10.10	SPTS	N=29 (3,5/7,7,8,7)	9.50	Dry			
9.65 - 10.10	D 21						

Legend



Backfill

Groundwater Entries

No.	Depth Strike (m)	Remarks	Depth Sealed (m)
1	3.00	Rose to 1.10 m after 20 minutes.	3.60
2	7.10	Rose to 4.15 m after 20 minutes.	7.40

Depth Related Remarks

Depths (m)	Remarks

Hard Boring

Depths (m)	Duration (mins)	Tools used

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

14/08/2018 13:42:22

Project VPI IMMINGHAM

Project No. A8015-18

Carried out for AECOM

Borehole

BH3

Borehole Log

SOCOTEC

Drilled	SS/MB	**Start**	**Equipment, Methods and Remarks**	**Depth from (m)**	**to (m)**	**Diameter (mm)**	**Casing Depth (m)**	**Ground Level**	5.43 mOD
Logged	MJS/PC	11/04/2018	Dando 175./Beretta T44.	1.20	28.00	200	28.00	**Coordinates (m)**	E 516635.31
Checked	TC	**End**	Cable percussion boring./Rotary core drilling (SWF size) using air mist flush.	28.00	28.60	146	28.00	**National Grid**	N 417437.68
Approved	TC	16/04/2018	SPT Hammer ID: AR2068, Rod type: 54mm Whitworth.						

Samples and Tests

Depth	Type & No.	Records	Date Casing	Time Water
10.00 - 10.50	B 22			
10.50 - 10.95	UT 23	76 blows 100% rec	10.50	Dry
10.95 - 11.15	D 24			
11.00 - 12.00	B 26			
11.15 - 11.60	SPTS	N=36 (4,6/7,9,11,9)	11.00	Dry
11.15 - 11.60	D 25			
12.00 - 12.45	UT 27	69 blows 100% rec	12.00	Dry
12.45 - 12.65	D 28			
12.65 - 13.10	SPTS	N=30 (3,5/5,7,9,9)	12.00	Dry
12.65 - 13.10	D 29			
12.80 - 13.30	B 30			
13.50 - 13.95	SPTS	N=11 (1,2/2,3,3,3)	12.00	7.90
13.50	D 31			
13.50 - 13.95	D 32			
14.10 - 15.00	B 33			
			11/04/18	1700
			15.00	7.00
15.00 - 15.45	SPTS	N=11 (2,3/2,2,3,4)		
15.00 - 15.45	D 34		12/04/18	0800
			15.00	3.30
16.00 - 16.50	B 35			
16.50 - 16.77	SPTS	57 (10,15 for 60mm/28,29 for 60mm)	16.50	5.10
16.50 - 16.80	D 36			
17.00 - 18.00	B 37			
18.00 - 18.20	SPTS	50 (15,10 for 50mm/50 for 70mm)	18.00	Dry
18.00 - 18.30	D 38			
18.60 - 19.50	B 39			
19.50 - 19.75	SPTS	50 (11,14 for 50mm/22,28 for 50mm)	19.50	Dry
19.50 - 19.80	D 40			

Strata Description

Main	Detail	Depth, Level (Thickness)	Legend	Backfill
Stiff brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse of chalk, mudstone, quartz and sandstone.				
Medium dense greenish brown gravelly clayey fine to medium SAND. Gravel is angular to subrounded fine to coarse of various lithologies. Occasional gravel size pockets of clay.		13.30 -7.87 (0.80)		3
Stiff greyish brown slightly sandy slightly gravelly CLAY. Gravel is angular to subrounded fine to coarse of chalk, quartz, sandstone and mudstone.		14.10 -8.67 (1.00)		
Medium dense yellowish brown gravelly fine to medium SAND. Gravel is angular to subrounded fine to coarse of various lithologies. Occasional gravel size pockets of clay.		15.10 -9.67 (0.90)		
Grey slightly sandy clayey SILT. Rare subangular fine to medium gravel of chalk.		16.00 -10.57 (2.70)		
Very stiff light grey slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse of chalk with rare flint. Locally silty.		18.70 -13.27		

Groundwater Entries

No.	Depth Strike (m)	Remarks	Depth Sealed (m)
3	13.30	Rose to 6.10 m after 20 minutes.	14.10

Depth Related Remarks

Depths (m)	Remarks

Hard Boring

Depths (m)	Duration (mins)	Tools used

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

14/08/2018 13:42:22

Project VPI IMMINGHAM

Project No. A8015-18

Carried out for AECOM

Borehole

BH3

Borehole Log

SOCOTEC

Drilled	SS/MB	**Start**	**Equipment, Methods and Remarks**	**Depth from (m)**	**to (m)**	**Diameter (mm)**	**Casing Depth (m)**	**Ground Level**	5.43 mOD
Logged	MJS/PC	11/04/2018	Dando 175./Beretta T44.	1.20	28.00	200	28.00	**Coordinates (m)**	E 516635.31
Checked	TC	**End**	Cable percussion boring./Rotary core drilling (SWF size) using air mist flush.	28.00	28.60	146	28.00	**National Grid**	N 417437.68
Approved	TC	16/04/2018	SPT Hammer ID: AR2068, Rod type: 54mm Whitworth.						

Samples and Tests

Strata Description

Depth	Type & No.	Records	Date Casing	Time Water	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
20.00 - 21.00	B 41				Very stiff light grey slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse of chalk with rare flint. Locally silty.				
21.00 - 21.20 21.00 - 21.30	SPTS D 42	50 (19,6 for 10mm/31,19 for 40mm)	21.00	Dry					
22.00 - 22.50	B 43								
22.50 - 22.62 22.50 - 22.70	SPTS D 44	50 (25 for 75mm/50 for 40mm)	22.50	Dry			(8.10)		
23.00 - 24.00	B 45								
			12/04/18 24.00	1700 Dry					
24.00 - 24.14 24.00 - 24.10	SPTS D 46		13/04/18 24.00	0800 19.30		24.00 becoming locally gravelly			
25.00 - 25.50	B 47								
25.50 - 25.62 25.50 - 25.62	SPTS D 48	50 (25 for 75mm/50 for 50mm)	25.50	Dry					
26.00 - 26.50	B 49								
26.80 - 27.02 26.80 - 27.02 27.00 - 27.50	SPTS D 50 B 51	50 (18,7 for 10mm/28,22 for 60mm)	26.50	8.70	Extremely weak white CHALK. Recovered as gravelly clay. Gravel is angular to subangular fine to coarse of chalk with rare flint.	27.00 becoming recovered as clayey angular fine to coarse gravel	26.80 -21.37 (1.20)		4
			13/04/18 28.00	1630 4.10					
28.00 - 28.10 28.00 - 28.60	42 0 0 - - NI -	50 (25 for 60mm/50 for 40mm) Flush: 28.00 - 28.60 Air/ mist 100%	16/04/18 28.00 16/04/18 28.00	1300 0.70 1700 0.70	Medium strong white CHALK. Recovered as subangular to subrounded fine to coarse gravel.		28.00 -22.57 (0.60)		
					END OF EXPLORATORY HOLE		28.60 -23.17		

Depth	TCR SCR RQD	If	Records	Date Casing	Time Water

Groundwater Entries

No.	Depth Strike (m)	Remarks	Depth Sealed (m)
4	26.80	Rose to 8.70 m after 20 minutes.	

Depth Related Remarks

Depths (m)	Remarks

Hard Boring

Depths (m)	Duration (mins)	Tools used
27.60 - 28.00	60	Chisel

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

14/08/2018 13:42:22

Project VPI IMMINGHAM

Project No. A8015-18

Carried out for AECOM

Borehole

BH3

Sheet 3 of 3

Borehole Log

SOCOTEC

Drilled	SS/MB	**Start**	**Equipment, Methods and Remarks**	**Depth from (m)**	**to (m)**	**Diameter (mm)**	**Casing Depth (m)**	**Ground Level**	4.19 mOD
Logged	WH/PC	16/04/2018	Dando 175./Beretta T44.	1.20	24.00	200	16.50	**Coordinates (m)**	E 516726.70
Checked	TC	**End**	Cable percussion boring./Rotary open hole drilling to 28.50m followed by rotary core drilling (SWF size) using air mist flush.	24.00	34.60	146	28.60	**National Grid**	N 417410.38
Approved	TC	20/04/2018	SPT Hammer ID: AR2068, Rod type: 54mm Whitworth.						

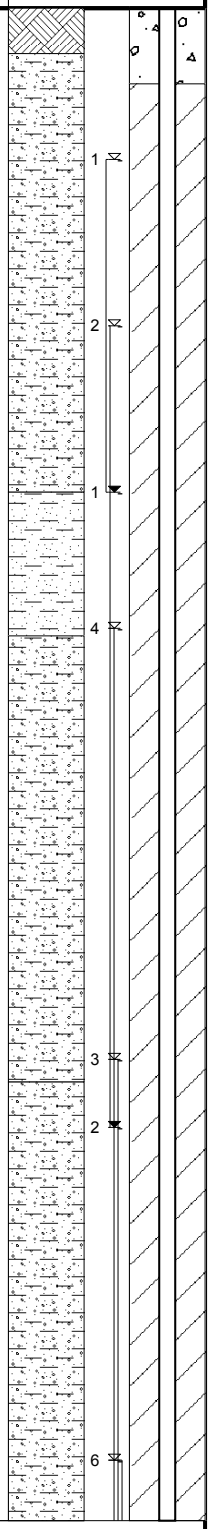
Samples and Tests

Depth	Type & No.	Records	Date Casing	Time Water
		0.00-1.20 Hand excavated inspection pit.		
0.50 - 1.20	B 1			
1.20 - 1.65	SPTS	N=16 (2,3/4,4,4,4)	1.20	Dry
1.20 - 1.65	D 2			
1.65 - 2.00	B 3			
2.00 - 2.45	UT 4	59 blows 100% rec	1.50	Dry
2.45 - 2.65	D 5			
2.65 - 3.10	SPTS	N=15 (2,3/3,4,3,5)	1.50	Dry
2.65 - 3.10	D 6			
3.10 - 3.55	UT 7	51 blows 100% rec	3.00	Dry
3.75 - 4.20	SPTS	N=6 (1,2/1,2,1,2)	3.00	1.00
3.75 - 4.20	D 8			
4.00 - 4.50	B 9			
4.50 - 4.95	UT 10	47 blows 100% rec	4.50	Dry
4.95 - 5.15	D 11			
5.15 - 5.60	SPTS	N=22 (2,3/4,6,6,6)	4.50	Dry
5.15 - 5.60	D 12			
5.50 - 6.00	B 13			
6.00 - 6.45	UT 14	42 blows 100% rec	6.00	Dry
6.45 - 6.65	D 15			
6.65 - 7.10	SPTS	N=24 (2,3/4,6,6,8)	6.00	Dry
6.65 - 7.10	D 16			
			16/04/18 6.00	1700 2.10
7.20 - 7.50	B 17		17/04/18 6.00	0800 2.00
7.50 - 7.95	UT 18	51 blows 100% rec	7.50	Dry
7.95 - 8.15	D 19			
8.15 - 8.60	SPTS	N=25 (4,4/5,6,7,7)	7.50	Dry
8.15 - 8.60	D 20			
8.50 - 9.00	B 21			
9.00 - 9.45	UT 22	42 blows 100% rec	9.00	Dry
9.65 - 10.10	SPTS	N=23 (3,4/5,5,7,6)	9.00	Damp
9.65 - 10.10	D 23			

Strata Description

Main	Detail	Depth, Level (Thickness)
Light brown, mottled grey, slightly sandy slightly gravelly CLAY. Gravel is subrounded fine to medium of chalk and sandstone with frequent rootlets. (TOPSOIL)		(0.30) 0.30 +3.89
Firm brown, mottled grey and light brown, slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse of chalk, flint and sandstone.		(2.90)
Soft brown very sandy CLAY.	3.55 brown clayey sand	3.20 +0.99 (0.95)
Stiff dark brown slightly sandy slightly gravelly CLAY. Gravel is subangular to rounded fine to coarse of chalk and sandstone.		4.15 +0.04 (2.95)
Stiff to very stiff dark brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to medium of chalk and sandstone.	7.10-7.20 fine sand and gravel	7.10 -2.91 (4.90)

Legend / Backfill



Groundwater Entries

No.	Depth Strike (m)	Remarks	Depth Sealed (m)
1	3.20	Rose to 1.00 m after 20 minutes.	4.15
2	7.40	Rose to 2.10 m after 20 minutes.	7.20

Depth Related Remarks

Depths (m)	Remarks

Hard Boring

Depths (m)	Duration (mins)	Tools used

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

14/08/2018 13:42:23

Project VPI IMMINGHAM

Project No. A8015-18

Carried out for AECOM

Borehole BH4

Borehole Log

SOCOTEC

Drilled	SS/MB	**Start**	**Equipment, Methods and Remarks**	**Depth from (m)**	**to (m)**	**Diameter (mm)**	**Casing Depth (m)**	**Ground Level**	4.19 mOD
Logged	WH/PC	16/04/2018	Dando 175./Beretta T44.	1.20	24.00	200	16.50	**Coordinates (m)**	E 516726.70
Checked	TC	**End**	Cable percussion boring./Rotary open hole drilling to 28.50m followed by rotary core drilling (SWF size) using air mist flush.	24.00	34.60	146	28.60	**National Grid**	N 417410.38
Approved	TC	20/04/2018	SPT Hammer ID: AR2068, Rod type: 54mm Whitworth.						

Samples and Tests

Depth	Type & No.	Records	Date Casing	Time Water
10.00 - 10.50	B 24			
10.50 - 10.95	UT 25	40 blows 100% rec	10.50	Dry
10.95 - 11.15	D 26			
11.15 - 11.60	SPTS	N=24 (3,4/5,6,6,7)	10.50	Dry
11.15 - 11.60	D 27			
11.50 - 12.00	B 28			
12.00 - 12.45	SPTS	N=33 (4,4/6,7,9,11)	10.50	7.20
12.00 - 12.45	D 29			
12.50 - 13.00	B 30			
13.50 - 13.95	SPTS	N=37 (5,5/7,10,9,11)	13.50	2.10
13.50 - 13.95	D 31			
14.00 - 15.00	B 32			
15.00 - 15.45	SPTS	N=16 (3,3/4,3,4,5)	15.00	1.10
15.00 - 15.45	D 33			
15.50 - 16.00	B 34			
16.50 - 16.95	SPTS	N=44 (6,8/7,11,13,13)	16.50	1.30
			17/04/18	1700
			16.50	1.30
			18/04/18	0800
17.10 - 17.50	B 36		16.50	1.30
18.00 - 18.45	SPTS	N=13 (2,3/2,3,3,5)		
18.00 - 18.45	D 37			
18.00 - 19.00	B 38			
19.50 - 19.74	SPTS			
19.50 - 19.70	D 39			

Strata Description

Main	Detail	Depth, Level (Thickness)	Legend	Backfill
Stiff to very stiff dark brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to medium of chalk and sandstone.				
Brown slightly sandy slightly gravelly CLAY. Gravel is subrounded fine to coarse of chalk, sandstone and flint.	12.00-12.30 driller notes reddish brown fine sand 12.50 becomes light brown sandy	12.00 -7.81 (1.40)		3
Stiff to very stiff light yellowish brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse of chalk, mudstone, sandstone and flint.	14.00-15.00 becoming slightly gravelly clayey sand	13.40 -9.21 (3.70)		4 5
Dark brown slightly sandy slightly gravelly CLAY. Gravel is subrounded fine to medium of chalk and sandstone.	15.50-16.00 sandy clayey gravel	17.10 -12.91 (0.70)		
Very stiff greyish brown slightly sandy slightly gravelly CLAY. Gravel is subrounded fine to medium of chalk and sandstone.		17.80 -13.61 (1.30)		5
Very stiff greyish brown slightly sandy slightly gravelly CLAY with pockets of coarse gravel size extremely weak weathered chalk. Gravel is subrounded fine to coarse of chalk.		19.10 -14.91		

Groundwater Entries

No.	Depth Strike (m)	Remarks	Depth Sealed (m)
3	12.00	Rose to 6.95 m after 20 minutes.	12.30
4	13.40	Rose to 4.10 m after 20 minutes.	
5	17.80	Rose to 15.10 m after 20 minutes.	

Depth Related Remarks

Depths (m)	Remarks
13.50 - 16.50	Water added to assist boring.

Hard Boring

Depths (m)	Duration (mins)	Tools used

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

14/08/2018 13:42:23

Project VPI IMMINGHAM

Project No. A8015-18

Carried out for AECOM

Borehole

BH4

Borehole Log

SOCOTEC

Drilled	SS/MB	**Start**	**Equipment, Methods and Remarks**	**Depth from (m)**	**to (m)**	**Diameter (mm)**	**Casing Depth (m)**	**Ground Level**	4.19 mOD
Logged	WH/PC	16/04/2018	Dando 175./Beretta T44.	1.20	24.00	200	16.50	**Coordinates (m)**	E 516726.70
Checked	TC	**End**	Cable percussion boring./Rotary open hole drilling to 28.50m followed by rotary core drilling (SWF size) using air mist flush.	24.00	34.60	146	28.60	**National Grid**	N 417410.38
Approved	TC	20/04/2018	SPT Hammer ID: AR2068, Rod type: 54mm Whitworth.						

Samples and Tests

Depth	Type & No.	Records	Date Casing	Time Water
20.00 - 21.00	B 40			
21.00 - 21.22 21.00 - 21.25	SPTS D 41			
22.00 - 22.50	B 42			
22.50 - 22.64 22.50 - 22.60	SPTS D 43	50 (18,7 for 10mm/50 for 60mm)		
23.00 - 24.00	B 44			
			18/04/18 16.50	1700
24.00 - 24.15 24.00 - 24.15	SPTS D 45	50 (25/50 for 60mm)	19/04/18 19/04/18 16.50	0800 0800 0.85
28.50 - 30.00	90 6 0	NI NI 80		

Depth	TCR SCR RQD	If	Records	Date Casing	Time Water

Strata Description

Main	Detail	Depth, Level (Thickness)	Legend	Backfill
Very stiff greyish brown slightly sandy slightly gravelly CLAY with pockets of coarse gravel size extremely weak weathered chalk. Gravel is subrounded fine to coarse of chalk.	21.00-21.25 white chalk, possible cobble	(2.30)		
Very stiff dark greyish brown slightly sandy slightly gravelly CLAY. Gravel is subrounded fine to medium of chalk.		21.40 -17.21 (2.00)		
Very stiff light grey slightly sandy slightly gravelly CLAY. Gravel is subrounded fine to medium of chalk and flint.		23.40 -19.21 (0.60)		
Stiff grey clay. (Rotary open hole drilling) (Drillers description)	24.00-24.15 light grey clayey silt	24.00 -19.81	6	
Medium strong to strong white CHALK. Fractures are: 1) subhorizontal, very closely spaced, undulating, rough with occasional grey staining. 2) subvertical, undulating, rough with occasional grey staining.	28.60-28.72 recovered as subangular gravel with rare angular flint 28.86-28.96 grey flint nodule 29.30-30.00 recovered as gravel 29.44-29.47 soft cream mottled greyish green clay with frequent angular fine gravel of chalk 30.00-30.27 AZCL	28.50 -24.31 (4.50) (2.15)		

Groundwater Entries

No.	Depth Strike (m)	Remarks	Depth Sealed (m)
6	24.00	Rose to 9.60 m after 20 minutes.	

Depth Related Remarks

Depths (m)	Remarks

Hard Boring

Depths (m)	Duration (mins)	Tools used
21.40 - 21.90	40	
23.40 - 24.00	60	

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

14/08/2018 13:42:23

Project VPI IMMINGHAM

Project No. A8015-18

Carried out for AECOM

Borehole

BH4

Borehole Log

SOCOTEC

Drilled	SS/MB	**Start**	**Equipment, Methods and Remarks**	**Depth from (m)**	**to (m)**	**Diameter (mm)**	**Casing Depth (m)**	**Ground Level**	4.19 mOD
Logged	WH/PC	16/04/2018	Dando 175. Beretta T44.	1.20	24.00	200	16.50	**Coordinates (m)**	E 516726.70
Checked	TC	**End**	Cable percussion boring. Rotary open hole drilling to 28.50m followed by rotary core drilling (SWF size) using air mist flush.	24.00	34.60	146	28.60	**National Grid**	N 417410.38
Approved	TC	20/04/2018	SPT Hammer ID: AR2068, Rod type: 54mm Whitworth.						

Samples and Tests

Strata Description

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
30.00 - 31.50	82 35 11			19/04/18 28.60	1700 0.85	Medium strong to strong white CHALK. Fractures are: 1) subhorizontal, very closely spaced, undulating, rough with occasional grey staining. 2) subvertical, undulating, rough with occasional grey staining.	30.27-30.37 recovered as subangular coarse gravel			
31.50 - 32.10	47 12 0		Flush: 28.50 - 34.60 Air/ mist 100%	20/04/18 28.60	0800 1.00	Strong white CHALK. Fractures are subhorizontal, very closely spaced, undulating, rough with brownish grey staining and rare infill of very soft greyish brown CLAY.	30.51-30.57 recovered as subangular coarse gravel 31.50-31.81 AZCL	30.65 -26.46		
32.10 - 33.10	100 46 19	NI 60 180					32.42-32.46 recovered as subangular coarse gravel 32.64-32.75 recovered as subangular medium to coarse gravel including flint	(3.95)		
33.10 - 34.10	100 44 15						32.77-33.00 subvertical undulating smooth fracture with clay infill 33.00-33.02 recovered as grey angular to subangular gravel of flint			
34.10 - 34.60	100 66 30			20/04/18 28.60	1700 1.00		33.40-33.42 rare subangular coarse gravel of flint 33.80-33.82 recovered as grey angular fine to medium gravel of flint	34.60 -30.41		
						END OF EXPLORATORY HOLE				

Groundwater Entries

No.	Depth Strike	Remarks	Depth Sealed

Depth Related Remarks

Depths (m)	Remarks

Chiselling Details

Depths (m)	Duration (mins)	Tools used

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

14/08/2018 13:42:24

Project VPI IMMINGHAM

Project No. A8015-18

Carried out for AECOM

Borehole

BH4

Borehole Log

SOCOTEC

Drilled	GC	**Start**	**Equipment, Methods and Remarks**	**Depth from (m)**	**to (m)**	**Diameter (mm)**	**Casing Depth (m)**	**Ground Level**	4.65 mOD
Logged	WH	17/04/2018	Dando 2000.	1.20	13.00	200	13.00	**Coordinates (m)**	E 516748.31
Checked	TC	**End**	Cable percussion boring.	13.00	26.10	150	26.00	**National Grid**	N 417439.50
Approved	TC	19/04/2018	SPT Hammer ID: AR1940, Rod type: 54mm Whitworth.						

Samples and Tests

Strata Description

Depth	Type & No.	Records	Date Casing	Time Water	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.10 0.10 - 0.40	D 1 B 2	0.00-1.20 Hand excavated inspection pit.			Dark brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to medium of chalk and sandstone. (TOPSOIL)		(0.40) 0.40 +4.25		
0.50 0.50 - 0.80	D 3 B 4				Firm dark brown slightly sandy slightly gravelly CLAY. Gravel is angular to subangular fine to medium of flint.		(0.50) 0.90 +3.75		
1.00 1.00 - 1.20 1.20 - 1.65	D 5 B 6 UT 7	35 blows 89% rec		Dry	Firm brown, mottled light grey, slightly sandy slightly gravelly CLAY. Gravel is subrounded fine to coarse of chalk, flint and mudstone.				
1.65 - 1.80	D 8								
1.80 - 2.25 1.80 - 2.25 1.80 - 2.25	SPTS D 9 B 10	N=16 (2,3/3,4,4,5)		Dry					
2.30 - 2.75	UT 11	38 blows 100% rec	1.70	Dry					
2.75 - 2.90	D 12						(3.60)		
2.90 - 3.35 2.90 - 3.35 2.90 - 3.35	SPTS D 13 B 14	N=19 (3,4/4,5,5,5)	1.70	Dry		2.90-4.45 gravel is subangular to subrounded			
3.40 - 3.85	UT 15	32 blows 100% rec	3.00	Dry					
3.85 - 3.90	D 16								
4.00 - 4.45 4.00 - 4.45 4.00 - 4.45	SPTS D 17 B 18	N=17 (2,3/4,4,4,5)	3.00	Dry					
4.50 - 4.95 4.50	UT 20 D 19	40 blows 100% rec	4.40	Dry	Firm to stiff dark brown slightly sandy slightly gravelly CLAY. Gravel is subrounded fine of chalk, sandstone and mudstone.		4.50 +0.15		
4.95 - 5.10	D 21								
5.10 - 5.55 5.10 - 5.55 5.10 - 5.55	SPTS D 22 B 22A	N=13 (2,2/3,3,3,4)	4.40	Dry					
6.50 - 6.95	UT 23	46 blows 100% rec	4.60	Dry					
6.95 - 7.10	D 24								
7.10 - 7.55 7.10 - 7.55 7.10 - 7.55	SPTS D 25 B 26	N=15 (2,3/3,4,4,4)	4.60	Dry					
8.00 - 8.45	UT 27	60 blows 100% rec	4.60	Dry					
8.45 - 8.60	D 28						(7.90)		
8.60 - 9.05 8.60 - 9.05 8.60 - 9.05	SPTS D 29 B 30	N=29 (3,5/6,7,8,8)	4.60	Dry					
9.50 - 9.95	UT 31	50 blows 100% rec	4.60	Dry					
9.95 - 10.10	D 32								

Groundwater Entries

No.	Depth Strike (m)	Remarks	Depth Sealed (m)

Depth Related Remarks

Depths (m)	Remarks

Hard Boring

Depths (m)	Duration (mins)	Tools used

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

14/08/2018 13:42:24

Project VPI IMMINGHAM

Project No. A8015-18

Carried out for AECOM

Borehole

BH5

Borehole Log

SOCOTEC

Drilled	GC	**Start**	**Equipment, Methods and Remarks**	**Depth from (m)**	**to (m)**	**Diameter (mm)**	**Casing Depth (m)**	**Ground Level**	4.65 mOD
Logged	WH	17/04/2018	Dando 2000.	1.20	13.00	200	13.00	**Coordinates (m)**	E 516748.31
Checked	TC	**End**	Cable percussion boring.	13.00	26.10	150	26.00	**National Grid**	N 417439.50
Approved	TC	19/04/2018	SPT Hammer ID: AR1940, Rod type: 54mm Whitworth.						

Samples and Tests

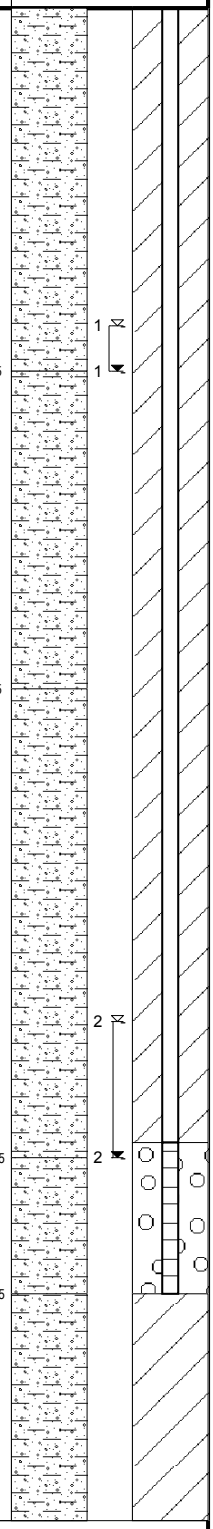
Depth	Type & No.	Records	Date Casing	Time Water
10.10 - 10.55	SPTS	N=30 (2,4/7,7,8,8)	4.60	Dry
10.10 - 10.55	D 33			
10.10 - 10.55	B 34			
11.00 - 11.45	UT 35	60 blows 100% rec	4.60	Dry
11.45 - 11.60	D 36			
11.60 - 12.05	SPTS	N=31 (4,6/7,7,8,9)	4.60	Dry
11.60 - 12.05	D 37			
11.60 - 12.05	B 38			
12.40	W 41			
12.50 - 12.95	SPTS	N=32 (4,6/7,7,8,10)	4.60	Dry
12.50 - 12.95	D 39			
12.50 - 12.95	B 40		17/04/18	1800
			4.60	12.10
13.00	D 42		18/04/18	0800
			4.60	2.00
14.00 - 14.45	UT 43	70 blows 100% rec	13.50	
14.45 - 14.60	D 44			
14.60 - 15.05	SPTS	N=46 (7,8/9,10,13,14)	13.50	
14.60 - 15.05	D 45			
14.60 - 15.05	B 46			
15.50 - 15.95	UT 47	100 blows 100% rec	15.00	
15.95 - 16.10	D 48			
16.10 - 16.48	SPTS	50 (8,10/13,18,19 for 75mm)	15.00	Dry
16.10 - 16.48	D 49			
16.10 - 16.48	B 50			
17.00 - 17.36	SPTS	50 (10,12/14,17,19 for 65mm)	15.00	Dry
17.00 - 17.36	D 51			
17.00 - 17.36	B 52			
17.70	D 53			
17.70 - 18.50	B 54			
18.50 - 18.86	SPTS	50 (11,13/15,18,17 for 65mm)	18.00	18.00
18.50 - 18.86	D 55			
18.50 - 18.86	B 56			

Strata Description

Main	Detail	Depth, Level (Thickness)
Firm to stiff dark brown slightly sandy slightly gravelly CLAY. Gravel is subrounded fine of chalk, sandstone and mudstone.	11.45-12.05 dark brown, gravel is fine to medium	
Stiff light brown slightly sandy gravelly CLAY. Gravel is subrounded fine to medium of chalk, sandstone and mudstone.		12.40 -7.75
		(2.10)
Stiff to very stiff brown slightly sandy slightly gravelly CLAY. Gravel is subrounded fine to coarse of chalk and mudstone.		14.50 -9.85
	16.10 becoming light grey	(3.10)
Very stiff light grey slightly sandy slightly gravelly CLAY with coarse gravel size pockets of extremely weak chalk. Gravel is subrounded fine to medium of chalk.		17.60 -12.95
		(0.90)
Very stiff light grey slightly sandy slightly gravelly CLAY. Gravel is subrounded fine to coarse of chalk.		18.50 -13.85

Legend

Backfill



Groundwater Entries

No.	Depth Strike (m)	Remarks	Depth Sealed (m)
1	12.40	Rose to 12.10 m after 20 minutes. Slow inflow	
2	17.60	Rose to 16.70 m after 20 minutes. Medium inflow	18.00

Depth Related Remarks

Depths (m)	Remarks

Hard Boring

Depths (m)	Duration (mins)	Tools used

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

14/08/2018 13:42:24

Project VPI IMMINGHAM

Project No. A8015-18

Carried out for AECOM

Borehole BH5

Borehole Log

SOCOTEC

Drilled	GC	**Start**	**Equipment, Methods and Remarks**	**Depth from (m)**	**to (m)**	**Diameter (mm)**	**Casing Depth (m)**	**Ground Level**	4.65 mOD
Logged	WH	17/04/2018	Dando 2000.	1.20	13.00	200	13.00	**Coordinates (m)**	E 516748.31
Checked	TC	**End**	Cable percussion boring.	13.00	26.10	150	26.00	**National Grid**	N 417439.50
Approved	TC	19/04/2018	SPT Hammer ID: AR1940, Rod type: 54mm Whitworth.						

Samples and Tests / Strata Description

Depth	Type & No.	Records	Date Casing	Time Water	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
20.00 - 20.28 20.00 - 20.28 20.00 - 20.28	SPTS D 57 B 58	50 (12,13 for 55mm/20,30 for 75mm)	19.50	19.50	Very stiff light grey slightly sandy slightly gravelly CLAY. Gravel is subrounded fine to coarse of chalk.				
21.50 - 21.74 21.50 - 21.74 21.50 - 21.74	SPTS D 59 B 60	50 (20,5 for 15mm/26,24 for 70mm)	21.00	21.00			(7.65)		
23.00 - 23.21 23.00 - 23.21 23.00 - 23.21	SPTS D 61 B 62	50 (18,2 for 20mm/30,20 for 40mm)	22.50	22.00		23.00-23.30 including gravel of sandstone			
24.50 - 24.62 24.50 - 24.62 24.50 - 24.62	SPTS D 63 B 64	45 (25 for 20mm/33,12 for 25mm)	23.50	24.00					
25.60 - 25.72 25.60 - 25.72	SPTS D 65	50 (25 for 50mm/50 for 70mm)	18/04/18 25.00	1800 24.00					
			19/04/18 25.00	0800 21.00					
26.10 - 26.15	SPTC	50 (25 for 20mm/50 for 30mm)	19/04/18 26.00	1530 23.00	END OF EXPLORATORY HOLE		26.15 -21.50		

Groundwater Entries

No.	Depth Strike (m)	Remarks	Depth Sealed (m)

Depth Related Remarks

Depths (m)	Remarks

Hard Boring

Depths (m)	Duration (mins)	Tools used
25.40 - 25.60	60	Chisel
25.70 - 26.10	180	Chisel

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

14/08/2018 13:42:24

Project VPI IMMINGHAM

Project No. A8015-18

Carried out for AECOM

Borehole

BH5

Borehole Log

SOCOTEC

Drilled	SS/MB	**Start**	**Equipment, Methods and Remarks**	**Depth from (m)**	**to (m)**	**Diameter (mm)**	**Casing Depth (m)**	**Ground Level**	4.71 mOD
Logged	MJS/IH	05/04/2018	Dando 175./Beretta T44.	1.20	24.60	200	24.60	**Coordinates (m)**	E 516781.85
Checked	TC	**End**	Cable percussion boring./Rotary core drilling (SWF size) using air mist flush.	24.60	34.50	146	24.60	**National Grid**	N 417525.42
Approved	TC	16/04/2018	SPT Hammer ID AR2068, Rod type: 54mm Whitworth.						

Samples and Tests

Strata Description

Depth	Type & No.	Records	Date / Time Casing	Water	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.00 - 0.30	B 1	0.00-1.20 Hand excavated inspection pit.			Greyish brown very sandy clayey GRAVEL. Gravel is angular to subrounded fine to coarse of mudstone, sandstone, chalk and brick. (MADE GROUND)		(0.30) 0.30 +4.41		
0.30 - 0.55	B 2				Firm brown, locally greyish brown, slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse of chalk, mudstone and sandstone.		(0.30) 0.60 +4.11		
0.55 - 1.20	B 3				Stiff to very stiff brown slightly sandy slightly gravelly CLAY. Gravel is subangular to rounded fine to coarse of predominantly chalk, mudstone, quartz and sandstone and rare coal.				
1.20 - 1.65	SPTS	N=14 (1,2/2,4,4,4)	1.20	Dry					
1.20 - 1.65	D 4								
1.65 - 2.00	B 5								
2.00 - 2.45	UT 6	71 blows 100% rec	1.50						
2.45 - 2.65	D 7						(4.05)		1
3.00 - 3.45	SPTS	N=16 (3,4/3,4,4,5)	3.00	Dry					2
3.00 - 3.45	D 8								
3.50 - 4.00	B 9								
4.00 - 4.45	UT 10	60 blows 100% rec	4.00						
4.45 - 4.65	D 11		05/04/18 4.00	1700 2.50			4.65 +0.06		1
			06/04/18 4.00	0800 2.00	Firm thinly laminated CLAY with occasional partings of fine sand. Frequent gravel size pockets of fine to coarse sand.		(0.65)		
5.00 - 5.45	SPTS	N=10 (1,1/1,2,3,4)	4.60	2.90			5.30 -0.59		
5.00 - 5.45	D 12								
5.50 - 6.00	B 13				Stiff to very stiff greyish brown slightly sandy slightly gravelly CLAY. Gravel is subangular to rounded fine to coarse of chalk, mudstone and sandstone.				
6.00 - 6.45	UT 14	71 blows 100% rec	6.00						
6.45 - 6.65	D 15								
7.00 - 7.50	B 16								
7.50 - 7.95	SPTS	N=18 (3,3/4,4,5,5)	7.50	Dry					
7.50 - 7.95	D 17								
8.00 - 9.00	B 18								
9.00 - 9.45	UT 19	61 blows 100% rec	9.00				(7.60)		
9.45 - 9.65	D 20								

Groundwater Entries

No.	Depth Strike (m)	Remarks	Depth Sealed (m)
1	4.65	Rose to 2.50 m after 20 minutes.	5.30

Depth Related Remarks

Depths (m)	Remarks

Hard Boring

Depths (m)	Duration (mins)	Tools used

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

14/08/2018 13:42:25

Project VPI IMMINGHAM

Project No. A8015-18

Carried out for AECOM

Borehole

BH6

Borehole Log

SOCOTEC

Drilled	SS/MB	**Start**	**Equipment, Methods and Remarks**	**Depth from (m)**	**to (m)**	**Diameter (mm)**	**Casing Depth (m)**	**Ground Level**	4.71 mOD
Logged	MJS/IH	05/04/2018	Dando 175./Beretta T44.	1.20	24.60	200	24.60	**Coordinates (m)**	E 516781.85
Checked	TC	**End**	Cable percussion boring./Rotary core drilling (SWF size) using air mist flush.	24.60	34.50	146	24.60	**National Grid**	N 417525.42
Approved	TC	16/04/2018	SPT Hammer ID AR2068, Rod type: 54mm Whitworth.						

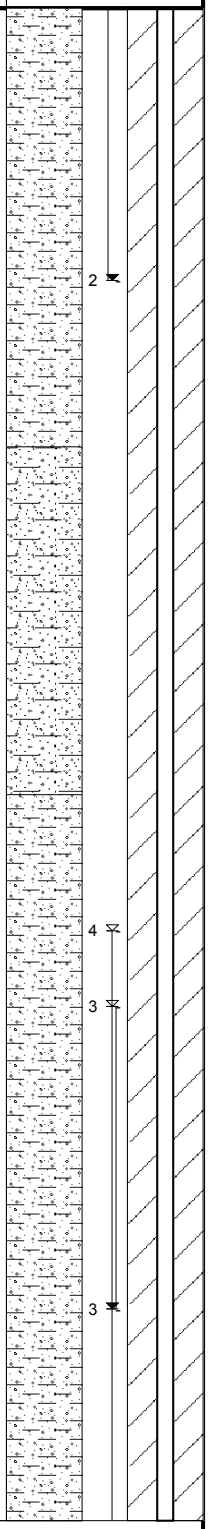
Samples and Tests

Depth	Type & No.	Records	Date Casing	Time Water
10.00 - 10.50	B 21			
10.50 - 10.95	SPTS	N=18 (3,3/4,5,4,5)	10.50	Dry
10.50 - 10.95	D 22			
11.00 - 11.80	B 23			
12.00 - 12.45	SPTS	N=21 (3,4/5,4,6,6)	12.00	4.10
12.00 - 12.45	D 24			
13.00 - 13.50	B 25			
13.50 - 13.95	SPTS	N=4 (1,0/1,1,1,1)	13.50	9.10
13.70	D 26			
14.00 - 15.00	B 27			
			06/04/18	1630
			15.00	9.10
15.00 - 15.45	SPTS	N=34 (6,6/7,9,10,8)		
15.00 - 15.45	D 28		09/04/18	0800
			15.00	10.40
15.50 - 16.50	B 29			
16.50 - 16.95	SPTS	N=28 (7,7/7,7,7,7)	16.50	14.10
16.70	D 30			
17.50 - 18.00	B 31			
18.00 - 18.45	SPTS	N=28 (6,7/6,7,7,8)	18.00	Dry
18.00 - 18.45	D 32			
18.50 - 19.50	B 33			
19.50 - 19.95	SPTS	N=39 (7,8/9,10,10,10)	19.50	Dry
19.50 - 19.95	D 34			
19.50 - 21.00	B 35			

Strata Description

Main	Detail	Depth, Level (Thickness)
Stiff to very stiff greyish brown slightly sandy slightly gravelly CLAY. Gravel is subangular to rounded fine to coarse of chalk, mudstone and sandstone.	11.80-12.00 occasional gravel size pockets of gravelly fine to coarse sand. Gravel is angular to subangular fine to coarse of chalk	
Brown gravelly clayey fine to coarse SAND. Gravel is subangular to subrounded fine to coarse of chalk and flint.	13.50 SPT may be affected by groundwater disturbance at base of hole (piping)	12.90 -8.19 (2.30)
Stiff to very stiff light grey slightly sandy gravelly CLAY. Gravel is angular to subangular fine to coarse of chalk and rare flint.		15.20 -10.49 (6.30)

Legend / Backfill



Groundwater Entries

No.	Depth Strike (m)	Remarks	Depth Sealed (m)
2	11.80	Rose to 3.10 m after 20 minutes.	
3	18.60	Rose to 16.60 m after 20 minutes.	18.70

Depth Related Remarks

Depths (m)	Remarks

Hard Boring

Depths (m)	Duration (mins)	Tools used

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

14/08/2018 13:42:25

Project VPI IMMINGHAM

Project No. A8015-18

Carried out for AECOM

Borehole

BH6

Borehole Log

SOCOTEC

Drilled	SS/MB	**Start**	**Equipment, Methods and Remarks**	**Depth from (m)**	**to (m)**	**Diameter (mm)**	**Casing Depth (m)**	**Ground Level**	4.71 mOD
Logged	MJS/IH	05/04/2018	Dando 175./Beretta T44.	1.20	24.60	200	24.60	**Coordinates (m)**	E 516781.85
Checked	TC	**End**	Cable percussion boring./Rotary core drilling (SWF size) using air mist flush.	24.60	34.50	146	24.60	**National Grid**	N 417525.42
Approved	TC	16/04/2018	SPT Hammer ID AR2068, Rod type: 54mm Whitworth.						

Samples and Tests

Strata Description

Depth	Type & No.	If	Records	Date Casing	Time Water	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
						Stiff to very stiff light grey slightly sandy gravelly CLAY. Gravel is angular to subangular fine to coarse of chalk and rare flint.				
21.00 - 21.45 21.00 - 21.45	SPTS D 36		N=33 (4,5/5,9,9,10)	21.00	Dry					
21.50 - 22.50	B 37					Extremely weak cream CHALK. Recovered as gravelly clay.		21.50 -16.79 (1.00)		4
22.50 - 22.95 22.50 - 22.95	SPTS D 38		N=44 (7,8/9,10,13,12)	22.00 09/04/18 22.00	13.00 1700 13.00	Very weak white, locally orangish brown, CHALK. Recovered as subangular fine to coarse gravel to cobbles.		22.50 -17.79		
23.00 - 23.80	B 39			10/04/18 22.00	0800 4.00			(2.10)		
23.80 - 23.91	SPTC		50 (25 for 60mm/50 for 50mm)	22.50	4.00					
24.25 - 24.30	SPTC		50 (25 for 30mm/50 for 20mm)	10/04/18 22.50	1010 4.00					
24.60 - 25.60	95 46 30	NI 100 196		13/04/18 22.50	0800 2.60	Weak cream CHALK. Fractures are: 1. Subhorizontal, closely spaced, undulating, rough with dark brown staining. 2. Subvertical, planar, smooth with yellowish brown staining. 3. Incipient fractures are very closely spaced, stepped, striated.		24.60 -19.89		
25.60 - 27.10	95 49 37							(2.95)		
							26.85-26.98 1No. subangular cobble of flint 27.02-27.30 AZCL			
27.10 - 28.40	80 21 8	NI NI 90				Weak cream, occasionally speckled black, CHALK. Recovered as slightly silty subangular fine to coarse gravel. Fractures are subhorizontal, closely spaced, undulating, rough with yellowish brown staining.		27.55 -22.84 (1.15)		
							28.34-28.60 AZCL 28.55 rare subangular coarse gravel of flint			
28.40 - 29.90	77 30 17	NI 120 170	Flush: 24.60 - 34.50 Air/ mist 100%			Weak cream CHALK. Fractures are: 1. Subhorizontal, closely spaced, planar, rough with dark greyish brown staining. 2. Occasionally subvertical, planar, smooth. 3. Incipient fractures are subhorizontal, extremely closely spaced, stepped, rough with occasional dark grey staining.	29.59-30.66 1No. cobble of flint 29.75-29.95 AZCL	28.70 -23.99 (2.20)		

Depth	TCR SCR RQD	If	Records	Date Casing	Time Water

Groundwater Entries

No.	Depth Strike (m)	Remarks	Depth Sealed (m)
4	21.50	Rose to 16.10 m after 20 minutes.	

Depth Related Remarks

Depths (m)	Remarks

Hard Boring

Depths (m)	Duration (mins)	Tools used
23.80 - 24.25	60	Chisel

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

14/08/2018 13:42:25

Project VPI IMMINGHAM

Project No. A8015-18

Carried out for AECOM

Borehole

BH6

Borehole Log

SOCOTEC

Drilled	SS/MB	**Start**	**Equipment, Methods and Remarks**	**Depth from (m)**	**to (m)**	**Diameter (mm)**	**Casing Depth (m)**	**Ground Level**	4.71 mOD
Logged	MJS/IH	05/04/2018	Dando 175. Beretta T44.	1.20	24.60	200	24.60	**Coordinates (m)**	E 516781.85
Checked	TC	**End**	Cable percussion boring. Rotary core drilling (SWF size) using air mist flush.	24.60	34.50	146	24.60	**National Grid**	N 417525.42
Approved	TC	16/04/2018	SPT Hammer ID AR2068, Rod type: 54mm Whitworth.						

Samples and Tests

Strata Description

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
29.90 - 31.40	97 63 40					Weak cream CHALK. Fractures are: 1. Subhorizontal, closely spaced, planar, rough with dark greyish brown staining. 2. Occasionally subvertical, planar, smooth. 3. Incipient fractures are subhorizontal, extremely closely spaced, stepped, rough with occasional dark grey staining.	30.90-33.80 dark grey staining is possible mudstone partings (<5mm thick)	30.90 -26.19		
31.40 - 32.90	100 83 67	NI 150 310		13/04/18 24.60	1630 2.60	Weak to medium strong cream CHALK. Fractures are: 1. Subhorizontal, closely spaced, undulating, rough and planar, rough with dark grey staining. 2. Rare 45 degree, undulating, rough with dark grey staining. 3. Incipient fractures are subhorizontal, very closely to closely spaced, undulating, striated, stepped, rough.		(3.60)		
32.90 - 34.50	94 82 73			16/04/18 24.60	1100 2.60		32.90-34.50 rare angular to subangular fine to coarse gravel of flint, rare incipient fractures are closely spaced 33.80-33.89 1No. cobble of chalk and flint conglomerate			
				16/04/18 24.60	1300 0.70					
						END OF EXPLORATORY HOLE		34.50 -29.79		

Groundwater Entries

No.	Depth Strike	Remarks	Depth Sealed

Depth Related Remarks

Depths (m)	Remarks

Chiselling Details

Depths (m)	Duration (mins)	Tools used

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

14/08/2018 13:42:25

Project VPI IMMINGHAM

Project No. A8015-18

Carried out for AECOM

Borehole

BH6

Borehole Log

SOCOTEC

Drilled	MB	**Start**	**Equipment, Methods and Remarks**	**Depth from (m)**	**to (m)**	**Diameter (mm)**	**Casing Depth (m)**	**Ground Level**	6.49 mOD
Logged	IH	06/04/2018	Archway Dart.	1.20	3.60	87		**Coordinates (m)**	E 516506.21
Checked	TC	**End**	Dynamic sampling.	3.60	4.60	55		**National Grid**	N 417414.94
Approved	TC	06/04/2018	SPT Hammer ID: DART235, Rod type: quick thread.						

Samples and Tests

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water
0.00 - 0.50	D 2				
0.00 - 0.50	B 1				
0.25	HV		p 120kPa, r N/A		
0.50	HV		p 120kPa, r N/A		
0.50 - 1.20	D 4				
0.50 - 1.20	B 3				
1.00	HV		p 120kPa, r N/A		
1.20 - 1.65	SPTS		N=10 (2,2/2,2,3,3)		
1.20 - 1.65	D 5				
1.20 - 1.70	B 7				
1.20 - 2.00	L		100% rec, diameter 87mm		
1.30 - 1.50	D 6				
1.80 - 2.00	D 8				
2.00 - 2.45	SPTS		N=26 (3,5/4,5,8,9)		
2.00 - 2.20	D 10				
2.00 - 2.45	D 9				
2.00 - 2.80	B 12				
2.00 - 2.80	L		100% rec, diameter 87mm		
2.30 - 2.50	D 11				
2.80 - 3.25	SPTS		N=20 (4,4/4,4,5,7)		
2.80 - 3.25	D 13				
2.80 - 3.60	L		100% rec, diameter 87mm		
3.00 - 3.20	D 14				
3.40 - 3.60	D 15				
3.60 - 4.05	SPTS		N=20 (4,5/4,4,5,7)		
3.60 - 3.80	D 16				
3.60 - 4.05	D 17				
3.60 - 4.60	L		75% rec, diameter 55mm		
4.20 - 4.40	D 18				
4.50 - 4.60	D 19				
4.60 - 5.05	SPTS		N=16 (3,3/3,4,4,5)		
4.60 - 5.05	D 20			06/04/18	1200

Strata Description

Main	Detail	Depth, Level (Thickness)
Dark brown slightly sandy slightly gravelly CLAY with low cobble content. Gravel is subangular to rounded fine to medium, rarely coarse, of chalk and mudstone with occasional concrete, quartz and flint. Cobbles are subangular of chalk. (MADE GROUND)	0.50 rare rootlets	(0.50) 0.50 +5.99
Dark brown, locally mottled black, slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to medium of chalk, mudstone and rare flint. Strong hydrocarbon odour. (MADE GROUND)		(0.90) 1.40 +5.09
Firm reddish brown, occasionally mottled red, slightly sandy slightly gravelly CLAY. Gravel is angular to subrounded fine to coarse of chalk and mudstone with occasional flint and rare sandstone.		(0.35) 1.75 +4.74
Firm grey, mottled brown, slightly sandy slightly gravelly CLAY. Gravel is angular to subrounded fine to coarse of chalk and mudstone with occasional flint and rare sandstone.	2.10 unknown fibrous rock/material	(0.25) 2.00 +4.49
Firm to stiff indistinctly laminated reddish brown, mottled grey, slightly sandy slightly gravelly CLAY. Gravel is angular to subrounded fine to coarse of chalk and mudstone with occasional flint and rare sandstone.	2.40 occasional pockets of reddish pink clayey fine sand	(1.60) 3.60 +2.89
Firm dark brown slightly sandy slightly gravelly CLAY. Gravel is subangular to rounded fine to medium of chalk.		(0.60) 4.20 +2.29
Brown fine to medium SAND.		(0.40) 4.60 +1.89
Firm dark brown slightly gravelly sandy CLAY. Gravel is subangular to rounded fine to medium of chalk.	4.50-4.60 brown slightly gravelly fine to coarse sand. Gravel is subangular to well rounded fine to medium of chalk and rare quartz	(0.45) 5.05 +1.44
END OF EXPLORATORY HOLE		

Legend

Backfill

1 ▽

Groundwater Entries

No.	Depth Strike	Remarks	Depth Sealed
1	4.20		

Depth Related Remarks

Depths (m)	Remarks
0.00 - 1.20	Hand excavated inspection pit.

Chiselling Details

Depths (m)	Duration (mins)	Tools used

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

14/08/2018 13:47:31

Project VPI IMMINGHAM

Project No. A8015-18

Carried out for AECOM

Borehole

WS1

Sheet 1 of 1

Borehole Log

SOCOTEC

Drilled	MB	**Start**	**Equipment, Methods and Remarks**	**Depth from (m)**	**to (m)**	**Diameter (mm)**	**Casing Depth (m)**	**Ground Level**	5.46 mOD
Logged	IH	10/04/2018	Archway Dart.	1.20	1.70	87		**Coordinates (m)**	E 516529.35
Checked	TC	**End**	Dynamic sampling.	1.70	2.50	77		**National Grid**	N 417368.31
Approved	TC	10/04/2018	SPT Hammer ID: DART235, Rod type: quick thread.	2.50	3.30	67			

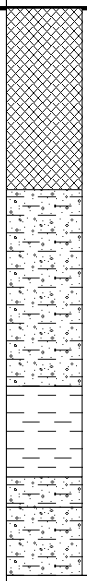
Samples and Tests

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water
0.00 - 0.50	D 2				
0.00 - 0.50	B 1				
0.25	HV		p 120kPa, r N/A		
0.50	HV		p 120kPa, r N/A		
0.50 - 1.20	D 4				
0.50 - 1.20	B 3				
1.00	HV		p 120kPa, r N/A		
1.20 - 1.65	SPTS		N=16 (2,2/3,3,5,5)		
1.20 - 1.40	D 5				
1.20 - 1.65	D 6				
1.20 - 1.70	B 8				
1.20 - 1.70	L		100% rec, diameter 87mm		
1.50 - 1.70	D 7				
1.70 - 2.15	SPTS		N=28 (3,3/5,8,7,8)		
1.70 - 2.15	D 9				
1.70 - 2.50	B 11				
1.70 - 2.50	L		100% rec, diameter 77mm		
2.20 - 2.40	D 10				
2.40 - 2.50	D 12				
2.50 - 2.95	SPTS		N=22 (2,4/4,5,6,7)		
2.50 - 2.95	D 13				
2.50 - 3.10	B 16				
2.50 - 3.30	L		100% rec, diameter 67mm		
2.85 - 3.10	D 14				
3.10 - 3.30	D 15				
3.30 - 3.75	SPTS		N=26 (3,5/5,5,8,8)		
3.30 - 3.75	D 17			10/04/18	1100

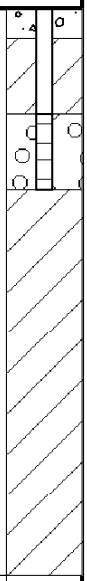
Strata Description

Main	Detail	Depth, Level (Thickness)
Brown, mottled orange and grey, slightly sandy slightly gravelly CLAY. Gravel is subangular to rounded fine to coarse of mudstone and sandstone. Strong oil/hydrocarbon odour. (MADE GROUND)	0.50 rare angular to subrounded fine to medium gravel of flint and sandstone with rare chalk	(1.20)
Firm orangish brown, mottled grey, slightly sandy slightly gravelly CLAY with rare rootlets. Gravel is subangular to subrounded fine to medium of chalk and mudstone with rare flint.	1.50-2.50 indistinctly laminated	1.20 +4.26 (1.30)
Firm indistinctly laminated dark brown, mottled grey, CLAY.	2.30 gravel size pocket of dark grey fine sand 2.85-3.10 gravel size pockets of fine sand	2.50 +2.96 (0.60)
Firm yellowish dark brown, mottled grey, slightly sandy slightly gravelly CLAY. Gravel is angular to subangular fine to medium of chalk, flint and sandstone.		3.10 +2.36 (0.20) 3.30 +2.16
Firm dark brown slightly gravelly sandy CLAY. Gravel is subangular to subrounded fine to medium of chalk and sandstone.		(0.45) 3.75 +1.71
END OF EXPLORATORY HOLE		

Legend



Backfill



Groundwater Entries

No.	Depth Strike	Remarks	Depth Sealed

Depth Related Remarks

Depths (m)	Remarks
0.00 - 1.20	Hand excavated inspection pit.
0.00 - 3.75	No groundwater encountered during drilling.

Chiselling Details

Depths (m)	Duration (mins)	Tools used

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

14/08/2018 13:47:32

Project VPI IMMINGHAM

Project No. A8015-18

Carried out for AECOM

Borehole

WS2

Sheet 1 of 1

Borehole Log

SOCOTEC

Drilled	MB	**Start**	**Equipment, Methods and Remarks**	**Depth from (m)**	**to (m)**	**Diameter (mm)**	**Casing Depth (m)**	**Ground Level**	5.52 mOD
Logged	IH	10/04/2018	Archway Dart.	1.20	2.00	87		**Coordinates (m)**	E 516555.69
Checked	TC	**End**	Dynamic sampling.	2.00	3.00	77		**National Grid**	N 417360.77
Approved	TC	10/04/2018	SPT Hammer ID: DART235, Rod type: quick thread.	3.00	4.00	67			

Samples and Tests

Strata Description

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.00 - 1.20	D 2					Brown, mottled black and grey and rarely orangish brown, slightly sandy slightly gravelly CLAY with frequent roots and wood fragments. Gravel is subangular to rounded fine to medium of chalk and mudstone with occasional concrete. 1No. angular cobble of chalk. (MADE GROUND)		(1.20)		
0.00 - 1.20	B 1									
1.20 - 1.65	SPTS		N=11 (2,2/2,2,3,4)			Soft, becoming firm, orangish brown slightly sandy slightly gravelly CLAY. Gravel is subangular to rounded fine to medium of mudstone and flint with rare chalk.		1.20 +4.32 (0.10) 1.30 +4.22		
1.20 - 1.30	D 3									
1.20 - 1.65	D 4									
1.20 - 2.00	L		100% rec, diameter 87mm							
1.30 - 2.00	B 6									
1.50 - 1.70	D 5									
2.00 - 2.45	SPTS		N=23 (3,5/6,5,6,6)			Firm to stiff brown, mottled grey and rarely black, slightly sandy slightly gravelly CLAY. Gravel is angular to rounded fine to coarse of chalk and flint with rare sandstone.	2.05-2.55 indistinctly laminated 2.30 becoming with no gravel 2.55 becoming thinly laminated	(2.10)		
2.00 - 2.20	D 7									
2.00 - 2.45	D 8									
2.00 - 3.00	L		100% rec, diameter 77mm							
2.30 - 3.00	B 10									
2.80 - 3.00	D 9									
3.00 - 3.45	SPTS		N=14 (4,5/4,3,3,4)							
3.00 - 3.45	D 11									
3.00 - 4.00	L		40% rec, diameter 67mm							
3.40 - 3.65	D 12					Brown fine to coarse SAND.		3.40 +2.12 (0.25) 3.65 +1.87		
3.65 - 3.80	D 13					Firm brown, mottled grey, sandy slightly gravelly CLAY. Gravel is angular to subrounded fine to medium of chalk.		(0.80)		
4.00 - 4.45	SPTS		N=20 (2,3/5,4,5,6)							
				10/04/18	0000					
						END OF EXPLORATORY HOLE		4.45 +1.07		

Groundwater Entries

No.	Depth Strike	Remarks	Depth Sealed

Depth Related Remarks

Depths (m)	Remarks
0.00 - 1.20	Hand excavated inspection pit.
0.00 - 1.00	Material too granular for hand vane testing.
0.00 - 4.45	No groundwater encountered during drilling.

Chiselling Details

Depths (m)	Duration (mins)	Tools used

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

14/08/2018 13:47:32

Project VPI IMMINGHAM

Project No. A8015-18

Carried out for AECOM

Borehole

WS3

Sheet 1 of 1

Borehole Log

SOCOTEC

Drilled	MB	**Start**	**Equipment, Methods and Remarks**	**Depth from (m)**	**to (m)**	**Diameter (mm)**	**Casing Depth (m)**	**Ground Level**	5.10 mOD
Logged	IH	06/04/2018	Archway Dart.	1.20	2.00	87		**Coordinates (m)**	E 516586.01
Checked	TC	**End**	Dynamic sampling.	2.00	3.00	77		**National Grid**	N 417401.62
Approved	TC	06/04/2018	SPT Hammer ID: DART235, Rod type: quick thread.	3.00	3.60	57			

Samples and Tests

Strata Description

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.00 - 0.50	D 2					Brown, occasionally mottled grey, slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse of chalk and mudstone with rare flint and occasional rootlets. (MADE GROUND)	0.50 dark brown	(1.40)		
0.00 - 0.50	B 1									
0.25	HV		p 120kPa, r N/A							
0.50	HV		p 120kPa, r N/A							
0.50 - 1.20	D 4									
0.50 - 1.20	B 3									
1.00	HV		p 120kPa, r N/A							
1.20 - 1.65	SPTS		N=19 (2,3/4,5,5,5)							
1.20 - 1.40	D 5						1.35-1.40 layer of brick, recovered as subangular medium to coarse gravel	1.40 +3.70		
1.20 - 1.65	D 6					Firm brown, occasionally mottled grey and rarely reddish brown, slightly sandy slightly gravelly CLAY. Gravel is subangular to rounded fine to coarse of chalk and mudstone with rare sandstone and flint.	1.60 pocket of sandy clay (30mm diameter)			
1.20 - 2.00	B 8						2.00-2.40 sandy			
1.20 - 2.00	L		100% rec, diameter 87mm					(1.60)		
1.60 - 1.80	D 7						2.40 indistinctly laminated			
2.00 - 2.45	SPTS		N=22 (3,4/5,5,6,6)				2.70 thinly laminated			
2.00 - 2.20	D 10									
2.00 - 2.45	D 9									
2.00 - 3.00	L		75% rec, diameter 77mm							
2.40 - 2.60	D 11									
2.80 - 3.00	D 12									
3.00 - 3.45	SPTS		N=20 (2,3/4,5,5,6)					3.00 +2.10		
3.00 - 3.20	D 13					Medium dense orangish brown fine to coarse SAND.				
3.00 - 3.45	D 14							(0.60)		
3.00 - 3.50	B 16									
3.00 - 3.60	L		83% rec, diameter 57mm				3.50-3.60 brown slightly clayey fine to medium sand			
3.50 - 3.60	D 15									
3.60 - 4.05	SPTS		N=15 (3,3/3,4,4,4)			Firm dark brown slightly gravelly sandy CLAY. Gravel is subangular to rounded fine to medium of chalk and mudstone.		3.60 +1.50		
3.60 - 4.05	D 17			06/04/18	1500			(0.45)		
						END OF EXPLORATORY HOLE		4.05 +1.05		

Groundwater Entries

No.	Depth Strike	Remarks	Depth Sealed
1	3.00		

Depth Related Remarks

Depths (m)	Remarks
0.00 - 1.20	Hand excavated inspection pit.

Chiselling Details

Depths (m)	Duration (mins)	Tools used

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

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Project VPI IMMINGHAM

Project No. A8015-18

Carried out for AECOM

Borehole

WS4

Sheet 1 of 1

Borehole Log

SOCOTEC

Drilled	MB	**Start**	**Equipment, Methods and Remarks**	**Depth from (m)**	**to (m)**	**Diameter (mm)**	**Casing Depth (m)**	**Ground Level**	4.70 mOD
Logged	IH	10/04/2018	Archway Dart.	1.20	2.00	87		**Coordinates (m)**	E 516626.81
Checked	TC	**End**	Dynamic sampling.	2.00	3.00	77		**National Grid**	N 417337.47
Approved	TC	10/04/2018	SPT Hammer ID: DART235, Rod type: quick thread.	3.00	5.00	67			

Samples and Tests

Strata Description

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.00 - 1.20	D 2					Firm dark brown, mottled grey and black, slightly sandy slightly gravelly CLAY with low cobble content and occasional rootlets. Gravel is subangular of mudstone, chalk, sandstone and occasional brick fragments. Cobble is subangular of chalk. (MADE GROUND)				
0.00 - 1.20	B 1									
0.25	HV		p 110kPa, r N/A							
0.50	HV		p 100kPa, r N/A					(1.25)		
1.00	HV		p 100kPa, r N/A							
1.20 - 1.65	SPTS		N=9 (1,2/2,2,2,3)				1.20 soft	1.25 +3.45		
1.20 - 1.25	D 3					Firm, becoming stiff, greyish brown slightly sandy slightly gravelly CLAY. Gravel is subangular to well rounded fine to coarse of mudstone with occasional sandstone and flint.				
1.20 - 1.65	D 4									
1.20 - 2.00	L		100% rec, diameter 87mm							
1.25 - 1.80	B 7									
1.50 - 1.70	D 5									
1.80 - 2.00	D 6						1.80 brown mottled grey. Gravel is chalk and occasional mudstone			
2.00 - 2.45	SPTS		N=20 (3,4/5,4,5,6)							
2.00 - 2.45	D 8									
2.00 - 3.00	B 11									
2.00 - 3.00	L		88% rec, diameter 77mm				2.35-5.45 indistinctly laminated			
2.20 - 2.40	D 9									
2.80 - 3.00	D 10						2.65-5.45 rare gravel			
3.00 - 3.45	SPTS		N=24 (3,4/5,6,6,7)							
3.00 - 3.20	D 12									
3.00 - 3.45	D 13									
3.00 - 4.00	L		85% rec, diameter 67mm				3.35-5.45 soft, gravelly. Gravel is subangular to subrounded fine to medium of chalk and mudstone with rare sandstone and flint	(4.20)		
3.75 - 3.85	D 14						3.40 dark brown 3.75 firm 4.00-4.45 occasional gravel size pockets of sand			
4.00 - 4.45	SPTS		N=23 (4,4/4,5,6,8)							
4.00 - 4.45	D 15									
4.00 - 5.00	L		Diameter 67mm							
5.00 - 5.45	SPTS		N=19 (4,4/4,4,5,6)							
5.00 - 5.45	D 16									
				10/04/18	1300					
						END OF EXPLORATORY HOLE		5.45 -0.75		

Groundwater Entries

No.	Depth Strike	Remarks	Depth Sealed

Depth Related Remarks

Depths (m)	Remarks
0.00 - 1.20	Hand excavated inspection pit.
0.00 - 5.45	No groundwater encountered during drilling.

Chiselling Details

Depths (m)	Duration (mins)	Tools used

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

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Project VPI IMMINGHAM

Project No. A8015-18

Carried out for AECOM

Borehole

WS5

Sheet 1 of 1

Borehole Log

SOCOTEC

Drilled	MB	**Start**	**Equipment, Methods and Remarks**	**Depth from (m)**	**to (m)**	**Diameter (mm)**	**Casing Depth (m)**	**Ground Level**	5.69 mOD
Logged	WH	11/04/2018	Archway Dart.	1.20	3.00	87		**Coordinates (m)**	E 516668.52
Checked	TC	**End**	Dynamic sampling.	3.00	4.00	77		**National Grid**	N 417414.78
Approved	TC	11/04/2018	SPT Hammer ID: DART235, Rod type: quick thread.	4.00	5.00	67			

Samples and Tests

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water
0.00 - 1.20	B 1				
0.25	HV		p 90kPa, r N/A		
0.50	HV		p 90kPa, r N/A		
0.60	D 2				
1.00	HV		p 90kPa, r N/A		
1.20 - 1.65	SPTS		N=8 (1,1/3,1,1,3)		
1.20 - 1.65	D 3				
1.20 - 2.00	L		94% rec, diameter 87mm		
1.30 - 1.70	B 5				
1.50	D 4				
1.70 - 2.00	B 7				
1.80	D 6				
2.00 - 2.45	SPTS		N=22 (3,3/4,6,5,7)		
2.00 - 2.45	D 8				
2.00 - 3.00	B 10				
2.00 - 3.00	L		100% rec, diameter 87mm		
2.50	D 9				
2.80 - 3.25	SPTS		N=21 (4,4/5,4,6,6)		
2.80 - 3.25	D 11				
3.00 - 3.60	B 13				
3.00 - 4.00	L		100% rec, diameter 77mm		
3.50	D 12				
3.80 - 4.25	SPTS		N=29 (5,8/8,7,7,7)		
3.80	D 14				
3.80 - 4.25	D 15				
4.00 - 5.00	L		70% rec, diameter 67mm		
4.30 - 5.00	B 17				
4.50	D 16				
5.00 - 5.45	SPTS		N=19 (4,4/5,4,5,5)		
				11/04/18	1100

Strata Description

Main	Detail	Depth, Level (Thickness)
Brown sandy gravelly CLAY. Gravel is subangular to subrounded fine to coarse of chalk, mudstone and sandstone. (MADE GROUND)	1.20-1.30 1No. subrounded cobble of chalk 1.40-1.50 dark greyish brown clay	(1.70)
Firm to stiff brown, occasionally mottled grey, slightly sandy slightly gravelly CLAY. Gravel is subangular fine to coarse of chalk, flint and sandstone.		1.70 +3.99 (1.99)
Soft brown CLAY	3.69-3.80 light brown fine to coarse sand pocket	3.69 +2.00 (0.31)
Medium dense light brown gravelly slightly clayey fine to coarse SAND with rare pockets of gravelly clay. Gravel is subangular coarse of sandstone.		4.00 +1.69 (1.45)
END OF EXPLORATORY HOLE		5.45 +0.24

Legend: Backfill

Groundwater Entries

No.	Depth Strike	Remarks	Depth Sealed
1	4.00		

Depth Related Remarks

Depths (m)	Remarks
0.00 - 1.20	Hand excavated inspection pit.

Chiselling Details

Depths (m)	Duration (mins)	Tools used

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

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Project VPI IMMINGHAM

Project No. A8015-18

Carried out for AECOM

Borehole

WS6

Sheet 1 of 1

Borehole Log

SOCOTEC

Drilled	MB	**Start**	**Equipment, Methods and Remarks**	**Depth from (m)**	**to (m)**	**Diameter (mm)**	**Casing Depth (m)**	**Ground Level**	5.79 mOD
Logged	WH	11/04/2018	Archway Dart.	1.20	3.00	87		**Coordinates (m)**	E 516708.48
Checked	TC	**End**	Dynamic sampling.	3.00	4.00	77		**National Grid**	N 417492.50
Approved	TC	11/04/2018	SPT Hammer ID: DART235, Rod type: quick thread.	4.00	5.00	67			

Samples and Tests

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water
0.00 - 0.30	B 1				
0.20	D 2				
0.30 - 0.80	B 3				
0.50	D 4				
0.80 - 1.20	B 5				
0.90	D 6				
1.20 - 1.65	SPTS		N=6 (3,3/2,2,1,1)		
1.20 - 1.65	D 7				
1.20 - 1.80	B 9				
1.20 - 2.00	L		100% rec, diameter 87mm		
1.50	D 8				
1.80 - 2.00	B 11				
1.90	D 10				
2.00 - 2.45	SPTS		N=19 (3,4/4,4,5,6)		
2.00 - 2.45	D 12				
2.00 - 3.00	L		80% rec, diameter 87mm		
2.40 - 3.00	B 14				
2.80	D 13				
3.00 - 3.45	SPTS		N=23 (4,5/5,6,6,6)		
3.00 - 3.45	D 15				
3.00 - 4.00	L		40% rec, diameter 77mm		
3.60 - 4.00	B 17				
3.80	D 16				
4.00 - 4.45	SPTS		N=23 (5,5/5,6,6,6)		
4.00 - 4.45	D 18				
4.00 - 5.00	L		90% rec, diameter 67mm		
4.60 - 5.00	B 20				
4.90	D 19				
5.00 - 5.45	SPTS		N=18 (5,5/5,4,5,4)		
5.00 - 5.45	D 21			11/04/18	1300

Strata Description

Main	Detail	Depth, Level (Thickness)
Brown slightly gravelly sandy CLAY with rootlets and low cobble content. Gravel is subangular fine to coarse of chalk and sandstone. Cobbles are subrounded of chalk. (TOPSOIL)	0.50-0.70 pockets of dark greyish brown clay	(0.30) 0.30 +5.49
Light brown sandy gravelly CLAY with low cobble content. Gravel is subangular fine to coarse of sandstone. Cobbles are subrounded of chalk. (MADE GROUND)		(0.90) 1.20 +4.59
Soft greyish brown slightly sandy CLAY with rare subrounded fine to medium gravel of chalk.		(0.60) 1.80 +3.99
Firm, becoming stiff, brown, mottled light grey, slightly sandy slightly gravelly CLAY. Gravel is subrounded fine to coarse of chalk.		(3.20)
	4.80-4.85 soft brown clay	
Medium dense light brown gravelly fine to coarse SAND. Gravel is subrounded coarse of igneous rock and chalk.		(0.45) 5.00 +0.79
END OF EXPLORATORY HOLE		5.45 +0.34

Legend

Backfill

1

Groundwater Entries

No.	Depth Strike	Remarks	Depth Sealed
1	5.00		

Depth Related Remarks

Depths (m)	Remarks
0.00 - 1.20	Hand excavated inspection pit.
0.00 - 1.00	Material too granular for hand vane testing.

Chiselling Details

Depths (m)	Duration (mins)	Tools used

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

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Project VPI IMMINGHAM

Project No. A8015-18

Carried out for AECOM

Borehole

WS7

Sheet 1 of 1

Borehole Log

SOCOTEC

Drilled	MB	**Start**	**Equipment, Methods and Remarks**	**Depth from (m)**	**to (m)**	**Diameter (mm)**	**Casing Depth (m)**	**Ground Level**	4.53 mOD
Logged	WH	11/04/2018	Archway Dart.	1.20	2.00	87		**Coordinates (m)**	E 516813.22
Checked	TC	**End**	Dynamic sampling.	2.00	3.00	77		**National Grid**	N 417461.78
Approved	TC	11/04/2018	SPT Hammer ID: DART235, Rod type: quick thread.	3.00	4.00	67			

Samples and Tests

Strata Description

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.00 - 1.20	B 1					Brown slightly sandy slightly gravelly CLAY with rootlets. Gravel is subangular fine to medium of sandstone. (MADE GROUND)				
0.25	HV		p 120kPa, r N/A							
0.50	HV		p 120kPa, r N/A							
0.60	D 2							(1.35)		
1.00	HV		p 120kPa, r N/A							
1.20 - 1.65	SPTS		N=12 (1,1/3,3,3,3)							
1.20 - 1.65	D 3							1.35 +3.18		
1.20 - 2.00	L		100% rec, diameter 87mm			Firm brown slightly sandy slightly gravelly CLAY. Gravel is subrounded fine to coarse of chalk and sandstone.		(0.35)		
1.35 - 1.70	B 5							1.70 +2.83		
1.50	D 4									
1.70	D 6									
1.70 - 2.00	B 7					Firm brown slightly sandy slightly gravelly CLAY. Gravel is subrounded fine to medium of chalk and sandstone.				
2.00 - 2.45	SPTS		N=18 (3,4/4,4,5,5)							
2.00 - 2.45	D 8									
2.00 - 3.00	L		40% rec, diameter 77mm					(2.00)		
2.70	D 9									
2.70 - 3.00	B 10									
3.00 - 3.45	SPTS		N=12 (3,3/3,2,3,4)							
3.00 - 3.45	D 11									
3.00 - 4.00	L		30% rec, diameter 67mm							
3.70	D 12					Soft brown CLAY.		3.70 +0.83		
4.00 - 4.45	SPTS		N=14 (3,3/3,3,4,4)					(0.75)		
4.00 - 4.45	D 13			11/04/18	1500					
						END OF EXPLORATORY HOLE		4.45 +0.08		

Groundwater Entries

No.	Depth Strike	Remarks	Depth Sealed

Depth Related Remarks

Depths (m)	Remarks
0.00 - 1.20	Hand excavated inspection pit.
0.00 - 4.45	No groundwater encountered during drilling.

Chiselling Details

Depths (m)	Duration (mins)	Tools used

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

14/08/2018 13:47:34

Project VPI IMMINGHAM

Project No. A8015-18

Carried out for AECOM

Borehole

WS8

Sheet 1 of 1

Trial Pit Log

SOCOTEC

Logged WH	**Start** 11/04/2018	**Equipment, Methods and Remarks** Tracked 360 excavator. Machine excavated.	**Dimension and Orientation** Width 0.60 m, Length 4.00 m, 270 (Deg)	**Ground Level**	6.33 mOD
Checked TC	**End** 11/04/2018			**Coordinates (m)**	E 516544.31
Approved TC				**National Grid**	N 417427.12

Samples and Tests

Strata Description

Depth	Type & No.	Records	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.10 0.10 - 0.30	D1 B2		Dark brown sandy clayey subangular to subrounded fine to coarse GRAVEL of sandstone, chalk, clinker, macadam and slag with low cobble content. Cobbles are subrounded to subangular of concrete and chalk. (MADE GROUND)		(0.50)		
					0.50 +5.83		
0.70 0.70 - 0.90	D3 B4		Firm dark greyish brown, mottled black, slightly sandy gravelly CLAY. Gravel is subangular to subrounded of brick, clinker, sandstone, flint and chalk. Strong oil/hydrocarbon odour. (MADE GROUND)		(0.60)		
					1.10 +5.23		
1.20 1.20 1.20 - 1.50	HV D5 B6	p 120kPa, r N/A	Stiff brown, mottled grey, slightly sandy gravelly CLAY. Gravel is subrounded fine to medium of chalk and sandstone.		(1.40)		
2.00 2.00 2.00 - 2.20	HV D7 B8	p 120kPa, r N/A					
					2.50 +3.83		
			Firm brown, mottled light grey, slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse of predominantly chalk with sandstone.		(1.40)		
3.40 - 3.60 3.50	B10 D9						
		11/04/18 Dry					
			END OF EXPLORATORY HOLE		3.90 +2.43		

Groundwater Entries

No.	Depth Strike (m)	Remarks

Remarks

Depth (m)	Remarks
0.00 - 3.90	No groundwater encountered during excavation.

Stability Stable

Shoring None

Weather Overcast

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:25

14/08/2018 13:48:23

AGS

Project **VPI IMMINGHAM**

Project No. **A8015-18**

Carried out for **AECOM**

Trial Pit

TP1

Trial Pit Log

SOCOTEC

Logged WH **Checked** TC **Approved** TC	**Start** 11/04/2018 **End** 11/04/2018	**Equipment, Methods and Remarks** Tracked 360 excavator. Machine excavated.	**Dimension and Orientation** Width 0.60 m Length 4.00 m A / D / B / C 270 (Deg)	**Ground Level** 5.70 mOD **Coordinates (m)** E 516559.56 **National Grid** N 417394.29	

Samples and Tests

Depth	Type & No.	Records
0.10 - 0.30	B2	
0.20	D1	
0.30	D3	
0.30 - 0.50	B4	
1.30	HV	p 120kPa, r N/A
1.30	D5	
1.30 - 1.50	B6	
2.30 - 2.50	B8	
2.50	D7	
3.10	HV	p 120kPa, r N/A
3.40	D9	
3.40 - 3.50	B10	
4.00	D11	
4.00 - 4.20	B12	
		11/04/18 Dry
4.40	HV	p 120kPa, r N/A
4.40	D13	
4.40 - 4.50	B14	

Strata Description

Main	Detail	Depth, Level (Thickness)	Legend	Backfill
Soft dark brown slightly gravelly sandy CLAY with low cobble content and rootlets. Gravel is subangular to subrounded fine to coarse of chalk, flint, sandstone and debris including metal bolts, wood and concrete. Cobbles are subrounded of chalk. (MADE GROUND)		(0.30)		
Firm dark brown, mottled black, slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse of chalk, sandstone and flint. Strong oil/hydrocarbon odour. (MADE GROUND)		0.30 +5.40 (0.30)		
Firm brown, mottled light grey, slightly sandy slightly gravelly CLAY with low cobble content. Gravel is subangular to subrounded fine to coarse of predominantly chalk with sandstone and flint. Cobbles are subrounded of chalk.	0.60-0.90 firm light brown slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse of chalk, sandstone and flint	0.60 +5.10		
	3.20-3.50 becoming grey with less gravel	(2.90)		
Light brown clayey, locally very clayey, fine to medium SAND.		3.50 +2.20 (0.90)		
Firm dark brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to medium of chalk.		4.40 +1.30 (0.10)		
END OF EXPLORATORY HOLE		4.50 +1.20		

Groundwater Entries

No.	Depth Strike (m)	Remarks

Remarks

Depth (m)	Remarks
0.00 - 4.50	No groundwater encountered during excavation.
0.00 - 3.50	Material too friable for hand vane testing.

Stability Stable
Shoring None
Weather Overcast

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:25

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AGS

Project **VPI IMMINGHAM**

Project No. **A8015-18**

Carried out for **AECOM**

Trial Pit

TP2

Sheet 1 of 1

Trial Pit Log

SOCOTEC

Logged WH **Checked** TC **Approved** TC	**Start** 10/04/2018 **End** 10/04/2018	**Equipment, Methods and Remarks** Tracked 360 excavator. Machine excavated.	**Dimension and Orientation** Width 0.60 m Length 4.00 m A / D / B / C 340 (Deg)	**Ground Level** 4.41 mOD **Coordinates (m)** E 516568.48 **National Grid** N 417297.43	

Samples and Tests

Depth	Type & No.	Records
0.10 0.10 - 0.20	D1 B2	
0.50 0.50 0.50 - 0.80	HV D3 B4	p 120kPa, r N/A
1.80 1.80 - 2.00	D5 B6	
2.50 2.50 2.50 - 2.80	HV D7 B8	p 120kPa, r N/A
3.40 3.40 - 3.60	D9 B10	
4.00 4.00 - 4.20	D11 B12	
		10/04/18 Dry

Strata Description

Main	Detail	Depth, Level (Thickness)	Legend	Backfill
Soft dark brown slightly sandy slightly gravelly CLAY with frequent rootlets. Gravel is subangular to subrounded fine to medium of sandstone, chalk and flint. (MADE GROUND)	0.20-0.40 light brown, mottled orangish brown	(0.20)		
		0.20 +4.21		
Firm light brown, mottled grey, slightly sandy gravelly CLAY with low cobble content. Gravel is subrounded fine to medium of predominantly chalk with sandstone and mudstone. Cobbles are subrounded of flint and chalk.		(2.30)		
Firm brown CLAY.		2.50 +1.91		
		(0.30)		
Dark brown slightly clayey fine to coarse SAND.		2.80 +1.61		
		(0.80)		
Soft dark brown very sandy CLAY with occasional gravel size pockets of sand.		3.60 +0.81		
		(0.90)		
END OF EXPLORATORY HOLE		4.50 -0.09		

Groundwater Entries

No.	Depth Strike (m)	Remarks

Remarks

Depth (m)	Remarks
0.00 - 4.50	No groundwater encountered during excavation.

Stability	Face A and E collapsed from 2.80m
Shoring	None
Weather	Overcast

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:25

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AGS

Project **VPI IMMINGHAM**

Project No. **A8015-18**

Carried out for **AECOM**

Trial Pit

TP3

Trial Pit Log

SOCOTEC

Logged WH **Checked** TC **Approved** TC	**Start** 09/04/2018 **End** 10/04/2018	**Equipment, Methods and Remarks** Tracked 360 excavator Machine excavated pit	**Dimension and Orientation** Width 0.60 m Length 4.00 m A / D / B / C 290 (Deg)	**Ground Level** 4.47 mOD **Coordinates (m)** E 516556.55 **National Grid** N 417325.06	

Samples and Tests

Strata Description

Depth	Type & No.	Records	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.10 0.10 - 0.30	D1 B2	09/04/18	Dark brown slightly sandy slightly gravelly CLAY with frequent rootlets. Gravel is subangular to subrounded fine to medium of sandstone, chalk and flint. (MADE GROUND)		(0.30) 0.30 +4.17		
0.80 0.80 - 1.00	D3 B4		Firm brown, mottled light grey, slightly sandy gravelly CLAY. Gravel is subangular to subrounded fine to coarse of predominantly chalk with sandstone, mudstone and flint.		(1.10)		
				1.10 land drain			1
1.40 1.40 1.40 - 1.60	HV D5 B6	p 120kPa, r N/A	Firm brown, mottled light grey, CLAY.		1.40 +3.07		
				2.60-3.00 grey mottled brown	(2.00)		
3.00 3.00 - 3.20	D7 B8			3.00-3.40 brown slightly gravelly clayey sand. Gravel is subangular fine to coarse of chalk			
3.40 3.50	B10 D9		Firm brown slightly sandy gravelly CLAY. Gravel is subangular to subrounded fine to medium of chalk, flint and sandstone.		3.40 +1.07		
4.00 4.00 - 4.30	D11 B12				(1.10)		
		10/04/18					
			END OF EXPLORATORY HOLE		4.50 -0.03		

Groundwater Entries

No.	Depth Strike (m)	Remarks
1	1.10	Seepage

Remarks

Depth (m)	Remarks

Stability Stable
Shoring None
Weather overcast

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:25

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AGS

Project **VPI IMMINGHAM**

Project No. **A8015-18**

Carried out for **AECOM**

Trial Pit

TP4

Sheet 1 of 1

Trial Pit Log

SOCOTEC

Logged WH **Checked** TC **Approved** TC	**Start** 10/04/2018 **End** 10/04/2018	**Equipment, Methods and Remarks** Tracked 360 excavator. Machine excavated.	**Dimension and Orientation** Width 0.60 m Length 4.00 m A / D / B / C 120 (Deg)	**Ground Level** 4.31 mOD **Coordinates (m)** E 516595.86 **National Grid** N 417316.85	

Samples and Tests

Strata Description

Depth	Type & No.	Records	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.10 0.10 - 0.20	D1 B2		Soft dark brown slightly sandy slightly gravelly CLAY with frequent rootlets. Gravel is subangular to subrounded fine to medium of sandstone, chalk and flint. (MADE GROUND)		(0.30)		
					0.30 +4.01		
0.50 0.50 0.50 - 0.70	HV D3 B4	p 120kPa, r N/A	Firm brown, mottled grey, gravelly slightly sandy CLAY with low cobble content. Gravel is subrounded fine to medium of chalk, flint and mudstone. Cobbles are subangular of chalk.	0.60-0.90 soft light yellowish brown slightly sandy clay	(1.40)		
				1.20 land drain			1
1.50 1.50 1.50 - 1.70	HV D5 B6	p 120kPa, r N/A			1.70 +2.61		
2.00 2.00 - 2.20	D7 B8		Stiff bluish grey, mottled brown, CLAY.		(0.80)		
2.50 2.50 - 2.70	D9 B10		Light brown slightly clayey to clayey fine to medium SAND. Rare angular fine gravel of mudstone.		2.50 +1.81		
		10/04/18			(0.50)		
			END OF EXPLORATORY HOLE		3.00 +1.31		

Groundwater Entries

No.	Depth Strike (m)	Remarks
1	1.20	Seepage

Remarks

Depth (m)	Remarks

Stability Faces A and C collapsed

Shoring None

Weather Overcast

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:25

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Project **VPI IMMINGHAM**

Project No. **A8015-18**

Carried out for **AECOM**

Trial Pit

TP5

Trial Pit Log

SOCOTEC

Logged WH **Checked** TC **Approved** TC	**Start** 10/04/2018 **End** 10/04/2018	**Equipment, Methods and Remarks** Tracked 360 excavator. Machine excavated.	**Dimension and Orientation** Width 0.60 m Length 4.00 m A / D / B / C 240 (Deg)	**Ground Level** 5.43 mOD **Coordinates (m)** E 516601.66 **National Grid** N 417379.51	

Samples and Tests

Depth	Type & No.	Records
0.10 0.10 - 0.30	D1 B2	
0.40 - 0.60	B4	
0.50	D3	
1.00 1.00 - 1.20	D5 B6	
1.50	HV	p 120kPa, r N/A
2.00	HV	p 120kPa, r N/A
2.50 2.50 - 3.00	D7 B8	
4.10 4.10 - 4.30	D9 B10	
		10/04/18

Strata Description

Main	Detail	Depth, Level (Thickness)
Dark brown slightly gravelly clayey SAND with medium cobble content. Gravel is subangular fine to coarse of clinker, chalk and macadam. Cobbles are subrounded of chalk. (MADE GROUND)		(0.30)
Firm dark brown, mottled orangish brown, slightly sandy slightly gravelly CLAY. Gravel is subrounded fine to coarse of chalk and flint. (MADE GROUND)		0.30 +5.13 (0.30)
Firm light brown slightly sandy slightly gravelly CLAY. Gravel is subrounded fine to coarse of flint, chalk, mudstone and sandstone.	0.60-1.20 brown mottled grey gravelly clay 1.20 land drain	0.60 +4.83 (3.50)
Firm dark brown sandy CLAY with occasional gravel size pockets of sand.		4.10 +1.33 (0.50)
END OF EXPLORATORY HOLE		4.60 +0.83

Legend / Backfill: 1

Groundwater Entries

No.	Depth Strike (m)	Remarks
1	1.90	Seepage

Remarks

Depth (m)	Remarks

Stability Stable
Shoring None
Weather Overcast

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:25

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Project **VPI IMMINGHAM**

Project No. **A8015-18**

Carried out for **AECOM**

Trial Pit

TP6

Sheet 1 of 1

Trial Pit Log

SOCOTEC

Logged WH **Checked** TC **Approved** TC	**Start** 10/04/2018 **End** 10/04/2018	**Equipment, Methods and Remarks** Tracked 360 excavator. Machine excavated.	**Dimension and Orientation** Width 0.60 m Length 4.00 m A / D / B / C 140 (Deg)	**Ground Level** 5.29 mOD **Coordinates (m)** E 516616.25 **National Grid** N 417423.18	

Samples and Tests

Strata Description

Depth	Type & No.	Records	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.10 - 0.30 0.20	B2 D1		Soft brown sandy slightly gravelly CLAY with frequent rootlets. Gravel is subrounded fine to medium of chalk. (TOPSOIL)		(0.30)		
			Soft brown slightly gravelly sandy CLAY. Gravel is subangular to subrounded fine to medium of chalk sandstone and flint.	1.10 soft orangish brown sandy clay 1.10 land drain	0.30 +4.99		1
1.30 1.30 1.30 - 1.60	HV D3 B4	p 120kPa, r N/A			(2.60)		
			Brown clayey fine to coarse SAND.		2.90 +2.39		
3.50 3.50 - 3.80	D5 B6				(0.90)		
			Firm dark greyish brown CLAY.		3.80 +1.49		
4.00 4.00 - 4.20	D7 B8	10/04/18			(0.40)		
			END OF EXPLORATORY HOLE		4.20 +1.09		

Groundwater Entries

No.	Depth Strike (m)	Remarks
1	1.10	Seepage

Remarks

Depth (m)	Remarks

Stability	Faces A and C collapsed from 2.90m
Shoring	None
Weather	Overcast

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:25

14/08/2018 13:48:25

AGS

Project	**VPI IMMINGHAM**
Project No.	**A8015-18**
Carried out for	**AECOM**

Trial Pit

TP7

Sheet 1 of 1

Trial Pit Log

SOCOTEC

Logged WH **Checked** TC **Approved** TC	**Start** 10/04/2018 **End** 10/04/2018	**Equipment, Methods and Remarks** Tracked 360 excavator. Machine excavated.	**Dimension and Orientation** Width 0.60 m Length 4.00 m A / D / B / C 35 (Deg)	**Ground Level** 4.60 mOD **Coordinates (m)** E 516678.60 **National Grid** N 556494.03	

Samples and Tests

Depth	Type & No.	Records
0.10	D1	
0.10 - 0.20	B2	
0.20	HV	p 120kPa, r N/A
0.20	D3	
0.20 - 0.50	B4	
0.80	HV	p 120kPa, r N/A
0.80	D5	
0.80 - 1.00	B6	
2.00	D7	
2.00 - 2.20	B8	
3.10	D9	
3.10 - 3.30	B10	
3.70 - 3.90	B12	
3.80	D11	
4.00	HV	p 100kPa, r N/A
4.00	D13	
4.00 - 4.50	B14	
		10/04/18 Dry

Strata Description

Main	Detail	Depth, Level (Thickness)
Soft dark brown silty CLAY with rootlets. (TOPSOIL)		(0.20) 0.20 +4.40
Light orangish brown slightly sandy gravelly CLAY. Gravel is subrounded fine to coarse of sandstone and chalk. (MADE GROUND)		(0.30) 0.50 +4.10
Firm brown, mottled light grey, slightly sandy gravelly CLAY with low cobble content. Gravel is subrounded to rounded fine to coarse of chalk and sandstone. Cobbles are subrounded of chalk.		(2.50)
Soft light grey, mottled brown, CLAY with rare subrounded fine to medium gravel of chalk.	3.20-3.90 firm dark brown clay	3.00 +1.60 (0.30) 3.30 +1.30
Dark brown clayey fine to medium SAND with occasional gravel size pockets of sandy clay.		(0.60) 3.90 +0.70
Firm brown slightly sandy silty CLAY.		(0.60) 4.50 +0.10
END OF EXPLORATORY HOLE		

Legend: Backfill

Groundwater Entries

No.	Depth Strike (m)	Remarks

Remarks

Depth (m)	Remarks
0.00 - 4.50	No groundwater encountered during excavation.

Stability Stable
Shoring None
Weather Overcast

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:25

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AGS

Project **VPI IMMINGHAM**

Project No. **A8015-18**

Carried out for **AECOM**

Trial Pit

TP8

Sheet 1 of 1

Trial Pit Log

SOCOTEC

Logged WH **Checked** TC **Approved** TC	**Start** 10/04/2018 **End** 10/04/2018	**Equipment, Methods and Remarks** Tracked 360 excavator. Machine excavated.	**Dimension and Orientation** Width 0.60 m Length 4.00 m A / D / B / C 310 (Deg)	**Ground Level** 5.71 mOD **Coordinates (m)** E 516677.98 **National Grid** N 417410.00	

Samples and Tests

Depth	Type & No.	Records
0.10 0.10 - 0.20	D1 B2	
0.30 0.30 - 0.40	D3 B4	
0.80 0.80 - 1.00	D5 B6	
1.60 1.60 1.60 - 1.80	HV D7 B8	p 120kPa, r N/A
2.00 2.00 - 2.20	D9 B10	
3.20 3.20 - 3.40	D11 B12	
		10/04/18

Strata Description

Main	Detail	Depth, Level (Thickness)
Soft dark brown slightly gravelly slightly silty CLAY with frequent rootlets. Gravel is angular to subrounded fine to medium of sandstone and flint. (TOPSOIL)		(0.20) 0.20 +5.51
Light yellowish brown very sandy clayey angular to subangular fine to coarse GRAVEL of limestone and sandstone. (MADE GROUND)		(1.40) 1.60 +4.11
Stiff dark orangish brown, mottled dark brown, CLAY with rare subangular fine gravel of flint.		(0.40) 2.00 +3.71
Stiff light brown, mottled grey, slightly gravelly sandy CLAY. Gravel is subangular fine to coarse of chalk.		(2.20) 4.20 +1.51
END OF EXPLORATORY HOLE		

Legend / Backfill: 1

Groundwater Entries

No.	Depth Strike (m)	Remarks
1	0.70	Seepage

Remarks

Depth (m)	Remarks

Stability Faces A and C collapsed from 0.20 to 4.20m
Shoring None
Weather Overcast

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:25

14/08/2018 13:48:25

AGS

Project **VPI IMMINGHAM**

Project No. **A8015-18**

Carried out for **AECOM**

Trial Pit

TP9

Sheet 1 of 1

Trial Pit Log

SOCOTEC

Logged WH **Checked** TC **Approved** TC	**Start** 06/04/2018 **End** 06/04/2018	**Equipment, Methods and Remarks** Tracked 360 excavator. Machine excavated.	**Dimension and Orientation** Width 0.60 m Length 3.00 m A / D / B / C 230 (Deg)	**Ground Level** 4.70 mOD **Coordinates (m)** E 516725.56 **National Grid** N 417441.68	

Samples and Tests

Strata Description

Depth	Type & No.	Records	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.10 - 0.40	B2		Soft light brown, mottled greyish brown, slightly sandy slightly gravelly CLAY with frequent rootlets. Gravel is subangular to rounded of chalk and mudstone. (TOPSOIL)		(0.40)		
0.30	D1						
0.40	HV	p 120kPa, r N/A	Firm dark greyish brown, mottled dark grey, slightly sandy CLAY with frequent wood and plant material.		0.40 +4.30		
0.40	D3						
0.40 - 0.60	B4				(0.40)		
0.80	HV	p 120kPa, r N/A	Firm light orangish brown, mottled light grey, slightly sandy gravelly CLAY. Gravel is subangular to subrounded of predominantly chalk with mudstone and flint.		0.80 +3.90		
0.90	D5						
0.90 - 1.20	B6			1.00-1.20 light yellowish brown sand pockets		1	
					(2.20)		
2.20	D7						
2.20 - 2.70	B8						
3.00	D9		Firm dark brown CLAY with rare subrounded fine to medium gravel of mudstone.		3.00 +1.70		
3.20 - 3.70	B10						
					(1.00)		
			Greyish brown slightly gravelly clayey fine to coarse SAND. Gravel is subrounded fine to medium of mudstone.		4.00 +0.70		
4.20	D11						
4.20 - 4.50	B12	06/04/18			(0.50)		
			END OF EXPLORATORY HOLE		4.50 +0.20		

Groundwater Entries

No.	Depth Strike (m)	Remarks
1	1.00	Seepage

Remarks

Depth (m)	Remarks

Stability Stable
Shoring None
Weather Overcast

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:25

14/08/2018 13:48:26

AGS

Project **VPI IMMINGHAM**

Project No. **A8015-18**

Carried out for **AECOM**

Trial Pit

TP10

Sheet 1 of 1

Trial Pit Log

SOCOTEC

Logged WH **Checked** TC **Approved** TC	**Start** 09/04/2018 **End** 09/04/2018	**Equipment, Methods and Remarks** Tracked 360 excavator. Machine excavated.	**Dimension and Orientation** Width 0.60 m Length 4.00 m A / D / B / C 220 (Deg)	**Ground Level** 6.44 mOD **Coordinates (m)** E 516698.32 **National Grid** N 417407.31	

Samples and Tests

Strata Description

Depth	Type & No.	Records	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.10 0.10 - 0.30	D1 B2		Soft brown slightly sandy slightly gravelly CLAY. Gravel is angular to rounded fine to coarse of chalk, brick, sandstone and concrete. (MADE GROUND)		(0.50)		
0.50 0.50 0.50 - 0.70	HV D3 B4	p 120kPa, r N/A	Firm brown, mottled light grey, slightly sandy gravelly CLAY. Gravel is subangular to subrounded fine to coarse of chalk, mudstone, flint and sandstone.	0.50 concrete block wider than trench on Face D	0.50 +5.94		
1.70 1.70	D5 D6			1.40 low cobble content. Cobbles are subrounded of chalk	(1.60)		1
2.20 2.20 2.20 - 2.30	HV D7 B8	p 100kPa, r N/A	Firm dark greyish brown, mottled dark grey, slightly gravelly slightly sandy to sandy CLAY. Gravel is subrounded fine to coarse of sandstone.		2.10 +4.34 (0.30)		
2.50 2.50 - 2.70	D9 B10		Firm light brown, mottled light grey, locally light orange brown, slightly gravelly CLAY. Gravel is subrounded to rounded fine to coarse of chalk.		2.40 +4.04 (1.00)		
3.40 3.50 - 3.70	D11 B12		Stiff light brown, mottled grey slightly sandy slightly gravelly CLAY. Gravel is subrounded fine to coarse of sandstone and chalk.		3.40 +3.04 (1.10)		
		09/04/18		4.10 locally slightly sandy gravelly clay			
			END OF EXPLORATORY HOLE		4.50 +1.94		

Groundwater Entries

No.	Depth Strike (m)	Remarks
1	1.50	Seepage

Remarks

Depth (m)	Remarks

Stability Stable

Shoring None

Weather Overcast

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:25

14/08/2018 13:51:53

AGS

Project **VPI IMMINGHAM**

Project No. **A8015-18**

Carried out for **AECOM**

Trial Pit

TT1

Trial Pit Log

SOCOTEC

Logged WH **Checked** TC **Approved** TC	**Start** 06/04/2018 **End** 06/04/2018	**Equipment, Methods and Remarks** Wheeled 360 excavator. Machine excavated. Top strata too friable to do hand vane.	**Dimension and Orientation** Width 0.60 m Length 4.00 m A / D / B / C 160 (Deg)	**Ground Level** 5.22 mOD **Coordinates (m)** E 516764.39 **National Grid** N 417439.42	

Samples and Tests

Depth	Type & No.	Records
0.00 - 0.25	B2	
0.25	D1	
1.00	D3	
1.00 - 1.25	B4	
2.00	HV	p 70kPa, r N/A
2.00	D5	
2.00 - 2.15	B6	
3.00	HV	p 120kPa, r N/A
3.00	D7	
3.00 - 3.20	B8	
3.25	HV	p 120kPa, r N/A
3.25	D9	Dry
3.25 - 3.50	B10	06/04/18

Strata Description

Main	Detail	Depth, Level (Thickness)	Legend	Backfill
Soft light brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded of flint and sandstone. Occasional rootlets. (MADE GROUND)		(3.00)		
Dark greyish brown, mottled light brown, CLAY with rare angular to subrounded fine to medium gravel of various lithologies including flint and quartzite.		3.00 +2.22 (0.25)		
Firm light brown slightly gravelly sandy CLAY. Gravel is subangular to subrounded fine to medium of flint and mudstone.		3.25 +1.97 (0.25)		
END OF EXPLORATORY HOLE		3.50 +1.72		

Groundwater Entries

No.	Depth Strike (m)	Remarks

Remarks

Depth (m)	Remarks
0.00 - 3.50	No groundwater encountered during excavation.

Stability Stable
Shoring None
Weather Overcast

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:25

14/08/2018 13:51:53

AGS

Project **VPI IMMINGHAM**

Project No. **A8015-18**

Carried out for **AECOM**

Trial Pit

TT2

Sheet 1 of 1

Trial Pit Log

SOCOTEC

Logged WH **Checked** TC **Approved** TC	**Start** 05/04/2018 **End** 06/04/2018	**Equipment, Methods and Remarks** Tracked 360 excavator Machine excavated pit	**Dimension and Orientation** Width 0.60 m Length 4.00 m A / D / B / C 230 (Deg)	**Ground Level** 5.40 mOD **Coordinates (m)** E 516764.82 **National Grid** N 417461.85	

Samples and Tests

Strata Description

Depth	Type & No.	Records	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
		05/04/18	Brown, locally light brown, slightly sandy CLAY with low cobble content. Cobbles are subrounded of flint and sandstone.				
0.30 0.30 - 0.60	D1 B2				(1.40)		
1.30 1.30 - 1.60	D3 B4		Dark greyish brown silty CLAY with occasional wood fragments. Slight organic odour.		1.40 +4.00 (0.60)		
2.10 2.10 2.10 - 2.50	HV D5 B6	p 120kPa, r N/A 06/04/18	Firm light brown, mottled light grey, slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to medium of sandstone, chalk and quartzite.		2.00 +3.40 (0.50)		
			END OF EXPLORATORY HOLE		2.50 +2.90		

Groundwater Entries

No.	Depth Strike (m)	Remarks

Remarks

Depth (m)	Remarks
0.00 - 2.00	Material too friable for hand vane testing.
0.00 - 2.50	No groundwater encountered during excavation.

Stability Stable
Shoring None
Weather overcast

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:25

14/08/2018 13:51:54

AGS

Project **VPI IMMINGHAM**

Project No. **A8015-18**

Carried out for **AECOM**

Trial Pit

TT3

APPENDIX C

INSTRUMENTATION AND MONITORING

Installation Details Table C1

Installation Details

Instrument Reference	Instrument Type (See Notes)	Installation Date, dd/mm/yyyy	Pipe Diameter, mm	Instrument Base, mbgl	Response Zone Range, mbgl	Pipe Top Details	Headworks	Remarks
BH1 (1)	SP	11/04/2018	50	14.80	12.60 to 15.00	Gas tap	Raised cover	
BH2 (1)	SP	16/04/2018	50	15.10	14.00 to 15.20	Gas tap	Flush cover	
BH3 (1)	SP	18/04/2018	50	28.60	26.60 to 28.60	Gas tap	Flush cover	
BH4 (1)	SP	20/04/2018	50	34.60	28.60 to 34.60	Gas tap	Flush cover	
BH5 (1)	SP	19/04/2018	50	18.50	17.50 to 18.50	Gas tap	Flush cover	
BH6 (1)	SP	16/04/2018	50	34.50	25.50 to 34.50	Gas tap	Raised cover	
WS1 (1)	SP	06/04/2018	50	1.40	1.00 to 1.40	Gas tap	Raised covers	
WS2 (1)	SP	10/04/2018	50	1.20	0.70 to 1.20	Gas tap	Raised cover	
WS3 (1)	SP	10/04/2018	50	3.50	2.50 to 3.50	Gas tap	Raised cover	
WS4 (1)	SP	06/04/2018	50	2.30	1.30 to 2.30	Gas tap	Raised cover	
WS5 (1)	SP	10/04/2018	50	4.30	3.30 to 4.30	Gas tap	Raised cover	
WS6 (1)	SP	11/04/2018	50	3.70	3.10 to 3.70	Gas tap	Raised cover	
WS7 (1)	SP	11/04/2018	50	3.60	3.10 to 3.60	Gas tap	Raised cover	
WS8 (1)	SP	11/04/2018	50	4.10	3.60 to 4.10	Gas tap	Raised cover	

Notes: Type: SP - Standpipe, SPIE - Standpipe Piezometer, HPIE - Hydraulic Piezometer, PPIE - Pneumatic Piezometer, EPIE - Vibrating Wire Piezometer, PWEL - Pumping Well

AGS

Project VPI IMMINGHAM

Project No. A8015-18

Carried out for AECOM

Table C1

APPENDIX D

GEOTECHNICAL LABORATORY TEST RESULTS

Index Properties – Summary of Results	INDX 1 to 3
Particle Size Distribution Analyses	PSD 1 to 24
Unconsolidated Undrained Triaxial Compression Tests – Summary of Results	UUSUM
Consolidated Undrained Triaxial Compression Tests with Measurement of Pore Water Pressure	CUM 1 to 6 (3 sheets per test)
One Dimensional Consolidation Test	OED 1 to 8
Determination of Consolidation Properties Using a Hydraulic Cell	HC 1 and 3 (2 sheets per test)
Dry Density / Moisture Content Relationship (Light)	COMPL 1 to 7
Dry Density / Moisture Content Relationship (Heavy)	COMPH 1 to 9
California Bearing Ratio	CBR 1 to 11
Chemical Tests	EFS/187041 EFS/187043 EFS/187204 EFS/187902

INDEX PROPERTIES - SUMMARY OF RESULTS

Hole No.	Sample No.	Depth (m) from	Depth (m) to	type	Soil Description	p Mg/m3	p_d Mg/m3	w %	< 425 µm sieve %	W_L %	W_P %	I_P	p_s Mg/m3	Remarks
BH1	4	0.50	0.70	B	Greyish brown slightly sandy slightly gravelly silty CLAY.			27	91	54 a	26	28		
BH1	8	2.00	2.45	D	Brown slightly sandy slightly gravelly CLAY.			14	92	43 a	19	24		
BH1	9	2.50	3.00	B	Brown slightly sandy slightly gravelly silty CLAY with chalk fragments.								2.71-p	
BH1	17	6.50	6.95	D	Brown slightly sandy slightly gravelly CLAY.			13	82	33 a	15	18		
BH1	22	9.50	9.95	D	Brown slightly sandy slightly gravelly CLAY.			14	88	29 a	15	14		
BH1	27	13.00	13.50	B	Brown slightly gravelly sandy silty CLAY.								2.68-p	
BH1	35	17.00	17.45	UT	Very stiff greyish brown slightly sandy slightly gravelly CLAY. Gravel is mainly chalk.								2.72-p	
BH1	36	17.45	17.60	D	Dark grey sandy gravelly CLAY.			13	82	30 a	15	15		
BH1	40	20.40	20.50	D	Grey slightly sandy gravelly CLAY.			22						
BH1	43	22.50	22.70	D	Grey slightly sandy slightly gravelly CLAY. Gravel contains chalk fragments.			13						
BH1	46	25.00	25.22	D	Grey slightly gravelly sandy CLAY. Gravel is chalk fragments.			13	89	27 a	15	12		
BH2	2	0.30	0.50	B	Brown slightly sandy gravelly CLAY.			20	56	44 a	22	22		
BH2	5	1.00		D	Brown slightly sandy slightly gravelly CLAY.			22						
BH2	8	1.65	1.80	D	Brown slightly sandy slightly gravelly CLAY.			24	91	42 a	19	23		
BH2	15	3.30	3.75	UT	Firm laminated brown slightly sandy CLAY.			23	100	47 a	22	25		
BH2	28	5.10	5.55	UT	Firm dark brown slightly sandy slightly gravelly CLAY.			16	83	32 a	17	15	2.70-p	
BH2	34	7.10	7.55	D	Brown slightly sandy slightly gravelly CLAY.			18	88	33 a	14	19		
BH2	40	9.50	9.95	UT	Firm bown slightly sandy slightly gravelly silty CLAY. Gravel is chalk fragments.			14	87	32 a	13	19		
BH2	51	13.10	13.55	B	Brown slightly sandy slightly gravelly silty CLAY. Gravel is chalk.			16	89	31 a	15	16		
BH2	63	18.50	19.00	B	Greenish grey slightly sandy SILT.			22	100	23 a	NP			
BH3	3	1.65	2.00	B	Brown slightly sandy slightly gravelly silty CLAY with chalk fragments.			28	95	37 a	21	16	2.71-p	
BH3	8	4.00	4.45	D	Brown slightly gravelly very sandy silty CLAY.			21						
BH3	12	5.65	6.00	B	Brown slightly sandy slightly gravelly CLAY.			18	85	32 a	15	17	2.70-p	
BH3	19	9.00	9.45	UT	Firm greyish brown slightly sandy slightly gravelly silty CLAY. Gravel contains chalk fragments.			17						
BH3	27	12.00	12.45	UT	Firm brown slightly sandy slightly gravelly CLAY.			17						
BH3	32	13.50	13.95	D	Light brown silty SAND.			25						
BH3	45	23.00	24.00	B	Greenish grey CLAY with chalk fragments.			15						
BH4	1	0.50	1.20	B	Brown slightly sandy slightly gravelly CLAY.			24	95	43 a	21	22		
BH4	7	3.10	3.55	UT	Brown slightly sandy SILT.			21						
BH4	10	4.50	4.95	UT	Firm to stiff greyish brown slightly sandy slightly gravelly CLAY.								2.70-p	
BH4	14	6.00	6.45	UT	Firm brown slightly sandy slightly gravelly CLAY.			14	89	33 a	14	19		

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 2.91
Mar 17

SOCOTEC

Project No A8015-18

Project Name VPI IMMINGHAM

Figure

INDX

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INDEX PROPERTIES - SUMMARY OF RESULTS

Hole No.	Sample No.	Depth (m) from	Depth (m) to	type	Soil Description	p Mg/m3	p_d Mg/m3	w %	< 425 µm sieve %	W_L %	W_P %	I_P	p_s Mg/m3	Remarks
BH4	22	9.00	9.45	UT	Firm to stiff dark brown slightly sandy slightly gravelly CLAY. Gravel contains chalk fragments.			15	89	32 a	15	17		
BH4	27	11.15	11.60	D	Brown slightly sandy slightly gravelly CLAY.			12						
BH4	34	15.50	16.00	B	Light brown gravelly SAND.			8.6						
BH4	42	22.00	22.50	B	Grey slightly sandy slightly gravelly CLAY. Gravel is chalk fragments.			17						
BH5	3	0.50		D	Brown slightly sandy slightly gravelly CLAY.			16	96	39 a	19	20		
BH5	11	2.30	2.75	UT	Very stiff brown slightly sandy slightly gravelly CLAY. Gravel is chalk fragments.			16					2.71-p	
BH5	20	4.50	4.95	UT	Firm laminated brown slightly gravelly sandy CLAY.			17	88	27 a	16	11		
BH5	27	8.00	8.45	UT	Firm greyish brown slightly sandy slightly gravelly CLAY. Gravel contains chalk.			16	82	30 a	14	16		
BH5	35	11.00	11.45	UT	Firm brown slightly sandy slightly gravelly CLAY.			16						
BH5	42	13.00		D	Soft brown slightly gravelly, slightly sandy CLAY.			15						
BH5	51	17.00	17.36	D	Light grey sandy gravelly CLAY.			1.7						
BH5	58	20.00	20.28	B	Greenish grey CLAY with chalk fragments.			4.9						
BH6	1	0.00	0.30	B	Brown very sandy clayey GRAVEL.			20						
BH6	6	2.00	2.45	UT	Very stiff brown mottled grey slightly sandy slightly gravelly CLAY. Gravel contains chalk.								2.71-p	
BH6	9	3.50	4.00	B	Brown slightly silty CLAY.			27						
BH6	14	6.00	6.45	UT	Firm to stiff greyish brown slightly gravelly sandy CLAY. Gravel contains chalk.			15	90	29 a	18	11		
BH6	21	10.00	10.50	B				17						
BH6	25	13.00	13.50	B	Brown slightly sandy slightly gravelly CLAY.			16					2.65-g	
BH6	28	15.00	15.45	D	Light brown sandy gravelly CLAY.			16						
BH6	35	19.50	21.00	B	Greyish brown gravelly CLAY. Gravel is chalk fragments.			17						
TP1	4	0.70	0.90	B	Brown slightly sandy CLAY with occasional chalk fragments.			26						
TP1	8	2.00	2.20	B	Brown slightly sandy slightly gravelly CLAY.			20	96	47 a	19	28	2.69-p	
TP10	8	2.20	2.70	B	Brown slightly sandy slightly gravelly CLAY.			22	95	41 a	19	22		
TP10	12	4.20	4.50	B	Brown SAND.			21						
TP2	1	0.20		D	Dark brown slightly sandy slightly gravelly CLAY.			25						
TP2	8	2.30	2.50	B	Brown slightly sandy slightly gravelly CLAY.			11	94	45 a	19	26		
TP2	12	4.00	4.20	B	Brown slightly gravelly silty SAND.			25					2.72-p	
TP2	13	4.40		D	Brownish grey slightly gravelly sandy CLAY.			16	88	32 a	17	15		
TP3	10	3.40	3.60	B	Light brown SAND.			25					2.69-p	
TP3	12	4.00	4.20	B	Brown very clayey SAND with chalk fragments.			21	92	23 a	14	9		
TP4	4	0.80	1.00	B	Brown slightly sandy CLAY with chalk fragments.			17	94	42 a	17	25		

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 2.91
Mar 17

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Project No A8015-18

Project Name VPI IMMINGHAM

Figure

INDX

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INDEX PROPERTIES - SUMMARY OF RESULTS

Hole No.	Sample No.	Depth (m) from	Depth (m) to	type	Soil Description	p Mg/m3	p_d Mg/m3	w %	< 425 µm sieve %	W_L %	W_P %	I_P	p_s Mg/m3	Remarks
TP4	12	4.00	4.30	B	Brown slightly sandy slightly gravelly CLAY.			18	93	39 a	17	22		
TP5	6	1.50	1.70	B	Brown slightly sandy CLAY with chalk fragments.			24	98	50 a	23	27		
TP5	10	2.50	2.70	B	Brown silty SAND.			24					2.65-p	
TP6	1	0.10		D	Dark brown slightly sandy slightly gravelly CLAY.			20						
TP6	8	2.50	3.00	B	Brown slightly sandy slightly gravelly CLAY.			25	95	41 a	17	24		
TP7	5	3.50		D	Brown slightly gravelly SAND.			23						
TP8	4	0.20	0.50	B	Brown slightly sandy slightly gravelly silty CLAY.			20	94	48 a	19	29		
TP8	8	2.00	2.20	B	Brown slightly sandy slightly gravelly CLAY.			24	94	46 a	18	28	2.72-p	
TP8	11	3.80		D	Brown slightly gravelly silty SAND.			23						
TP8	14	4.00	4.50	B	Brown SAND.			23						
TP9	4	0.30	0.40	B	Light brown slightly sandy slightly gravelly CLAY.			16						
TP9	12	3.20	3.40	B	Brown slightly sandy slightly gravelly CLAY. Gravel is chalk.			19	95	44 a	21	23		
TT1	1	0.10		D	Brown slightly sandy slightly gravelly CLAY.			22	82	44 a	18	26		
TT1	9	2.50		D	Brown slightly sandy slightly gravelly CLAY.			15	95	40 a	19	21	2.71-p	
TT2	4	1.00	1.25	B	Brown slightly sandy slightly gravelly silty CLAY with rootlets.			24	92	46 a	25	21		
TT2	10	3.25	3.50	B	Brown slightly gravelly sandy silty CLAY.			22	87	37 a	19	18		
TT3	4	1.30	1.60	B	Brown silty CLAY.			20						
TT3	6	2.10	2.50	B	Brown slightly sandy silty CLAY			18	95	43 a	20	23	2.67-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

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 2.91
Mar 17

SOCOTEC

Project No A8015-18

Project Name VPI IMMINGHAM

Figure

INDX

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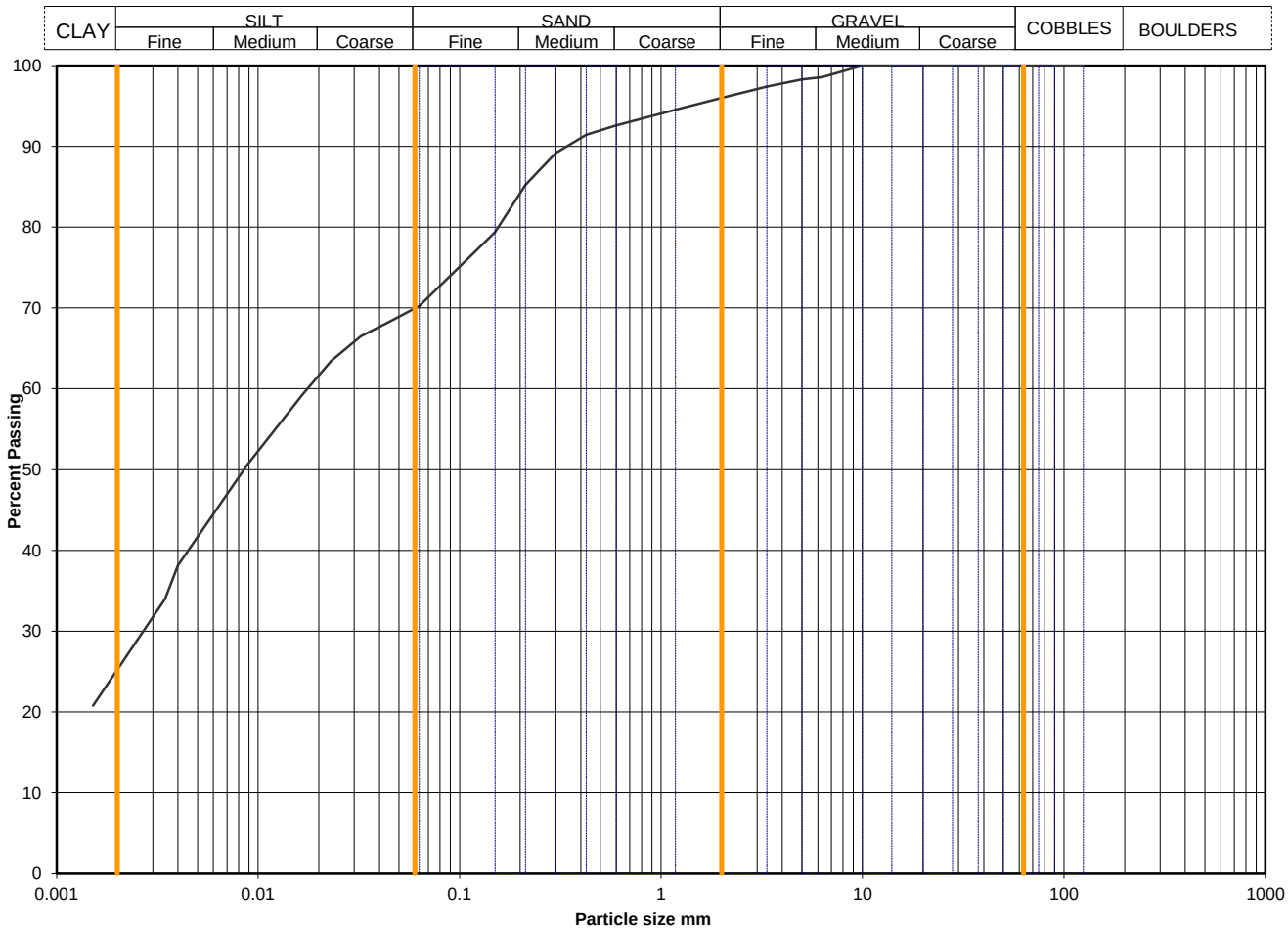
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	A8015-1820180409104548

Hole No	BH1
Sample Depth (m BGL)	0.50 - 0.70
Sample Type and No	B4
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	70
90	100	0.0453	68
75	100	0.0323	66
63	100	0.0231	63
50	100	0.0166	59
37.5	100	0.0089	51
28	100	0.0040	38
20	100	0.0035	34
14	100	0.0015	21
10	100		
6.3	99		
5.0	98		
3.35	97		
2.00	96		
1.18	95	Particle density, Mg/m3	
0.600	93		
0.425	91	2.65 assumed	
0.300	89	Dry mass of sample, kg	
0.212	85		
0.150	79	12.2	
0.063	70		

Soil description	Greyish 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	4	4
	Sand	26	26
*<60mm values to aid description only	Silt	45	45
	Clay	25	25

Uniformity Coefficient	**D60 / D10**	Not applicable

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

QA Ref
SLR 2,9
Rev 2.10
Oct 16

UKAS TESTING
1157

SOCOTEC

Project No A8015-18

Project Name VPI IMMINGHAM

Figure

PSD

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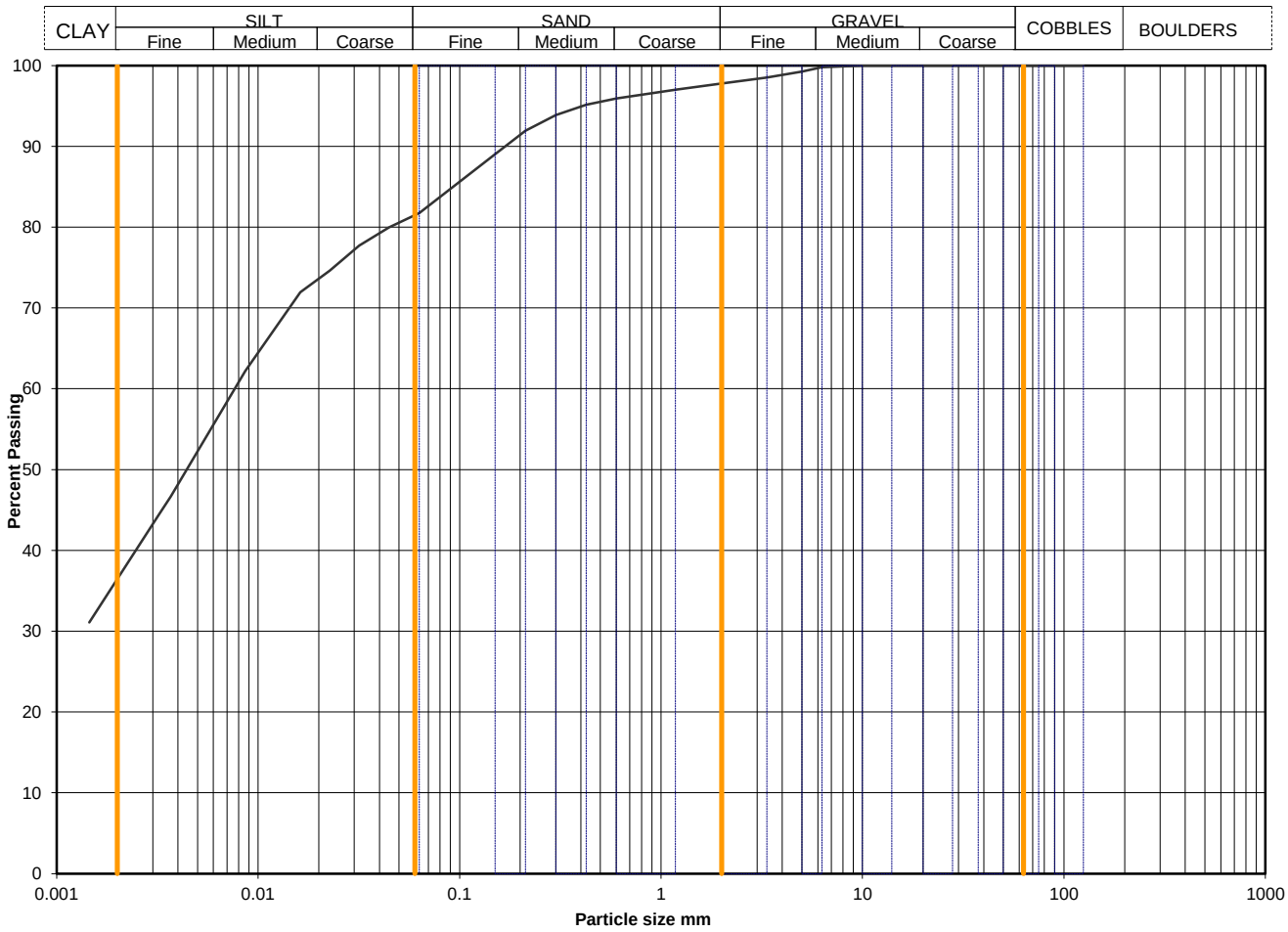
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	A8015-1820180409104626

Hole No	BH1
Sample Depth (m BGL)	2.50 - 3.00
Sample Type and No	B9
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	82
90	100	0.0446	80
75	100	0.0318	78
63	100	0.0227	75
50	100	0.0162	72
37.5	100	0.0086	62
28	100	0.0037	47
20	100	0.0032	44
14	100	0.0015	31
10	100		
6.3	100		
5.0	99		
3.35	99		
2.00	98		
1.18	97	Particle density, Mg/m3	
0.600	96		
0.425	95	2.71 measured	
0.300	94	Dry mass of sample, kg	
0.212	92		
0.150	89	11.1	
0.063	82		

Soil description	Brown slightly sandy slightly gravelly silty CLAY with chalk fragments.
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	2	2
	Sand	16	16
*<60mm values to aid description only	Silt	45	45
	Clay	36	36

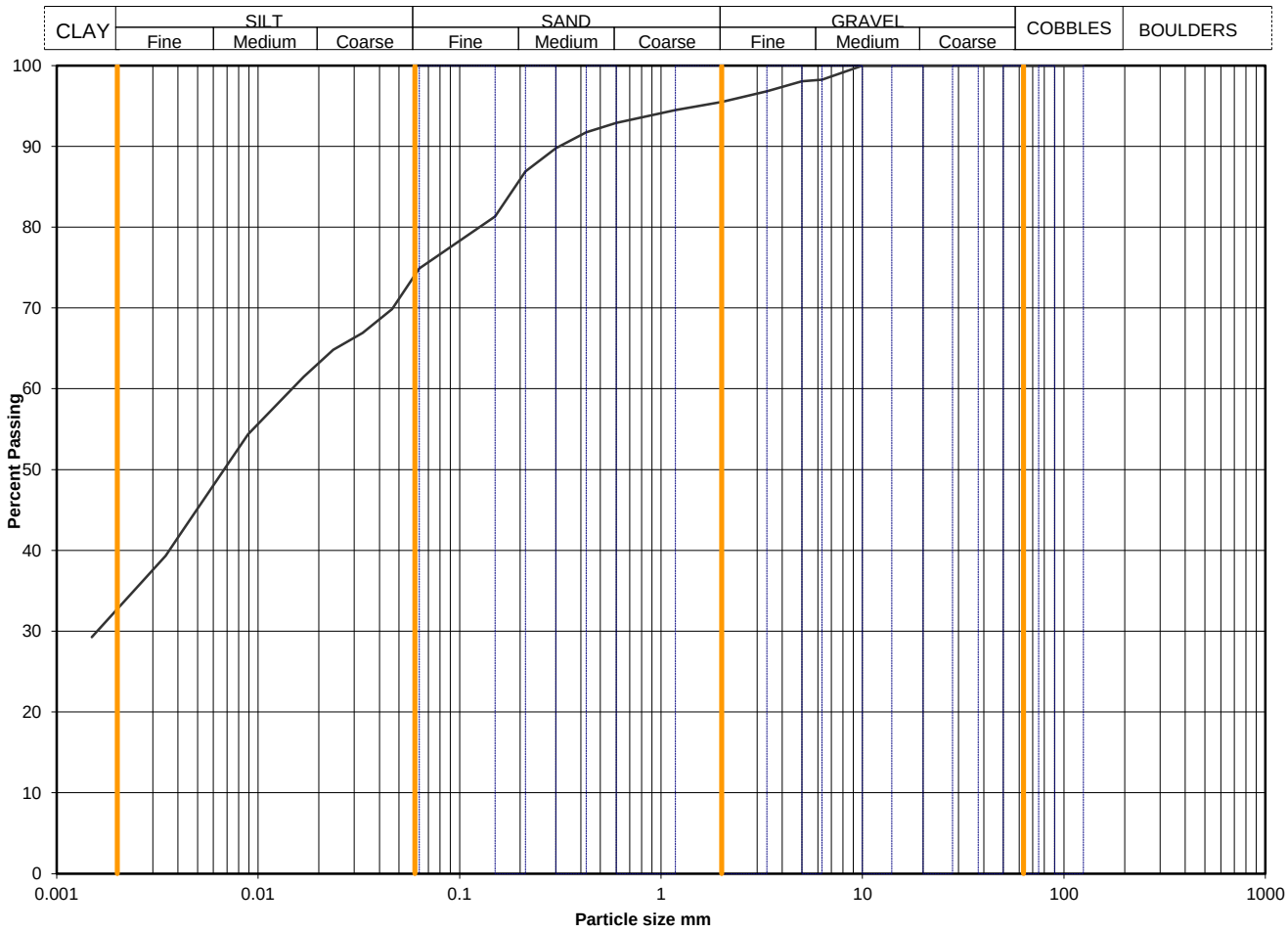
Uniformity Coefficient	D60 / D10	Not applicable

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	A8015-1820180409104655

Hole No	BH1
Sample Depth (m BGL)	4.00 - 4.45
Sample Type and No	B13
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	75
90	100	0.0463	70
75	100	0.0331	67
63	100	0.0236	65
50	100	0.0168	61
37.5	100	0.0089	54
28	100	0.0041	42
20	100	0.0035	39
14	100	0.0015	29
10	100		
6.3	98		
5.0	98		
3.35	97		
2.00	95		
1.18	94	Particle density, Mg/m3	
0.600	93		
0.425	92	2.65 assumed	
0.300	90	Dry mass of sample, kg	
0.212	87		
0.150	81	13.1	
0.063	75		

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	5	5
	Sand	21	21
*<60mm values to aid description only	Silt	42	42
	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

QA Ref
SLR 2,9
Rev 2.10
Oct 16

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1157

SOCOTEC

Project No A8015-18

Project Name VPI IMMINGHAM

Figure

PSD

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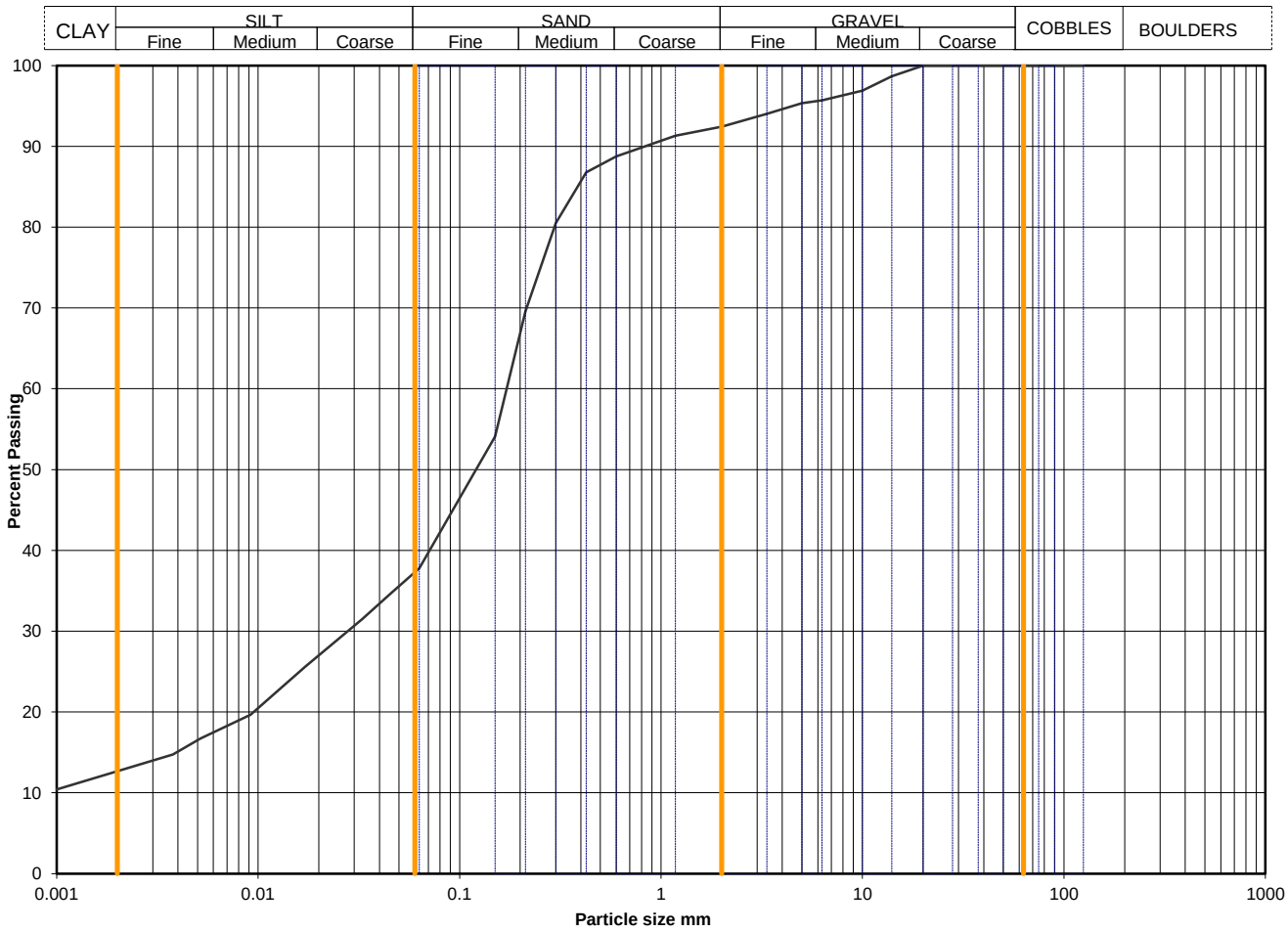
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	A8015-1820180409105002

Hole No	BH1
Sample Depth (m BGL)	13.00 - 13.50
Sample Type and No	B27
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	38
90	100	0.0453	35
75	100	0.0328	31
63	100	0.0237	29
50	100	0.0171	26
37.5	100	0.0092	20
28	100	0.0052	17
20	100	0.0038	15
14	99	0.0008	10
10	97		
6.3	96		
5.0	95		
3.35	94		
2.00	92		
1.18	91	Particle density, Mg/m3	
0.600	89		
0.425	87	2.68 assumed	
0.300	81	Dry mass of sample, kg	
0.212	70		
0.150	54	8.5	
0.063	38		

Soil description	Brown slightly gravelly sandy silty CLAY.
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	8	8
	Sand	55	55
*<60mm values to aid description only	Silt	25	25
	Clay	13	13

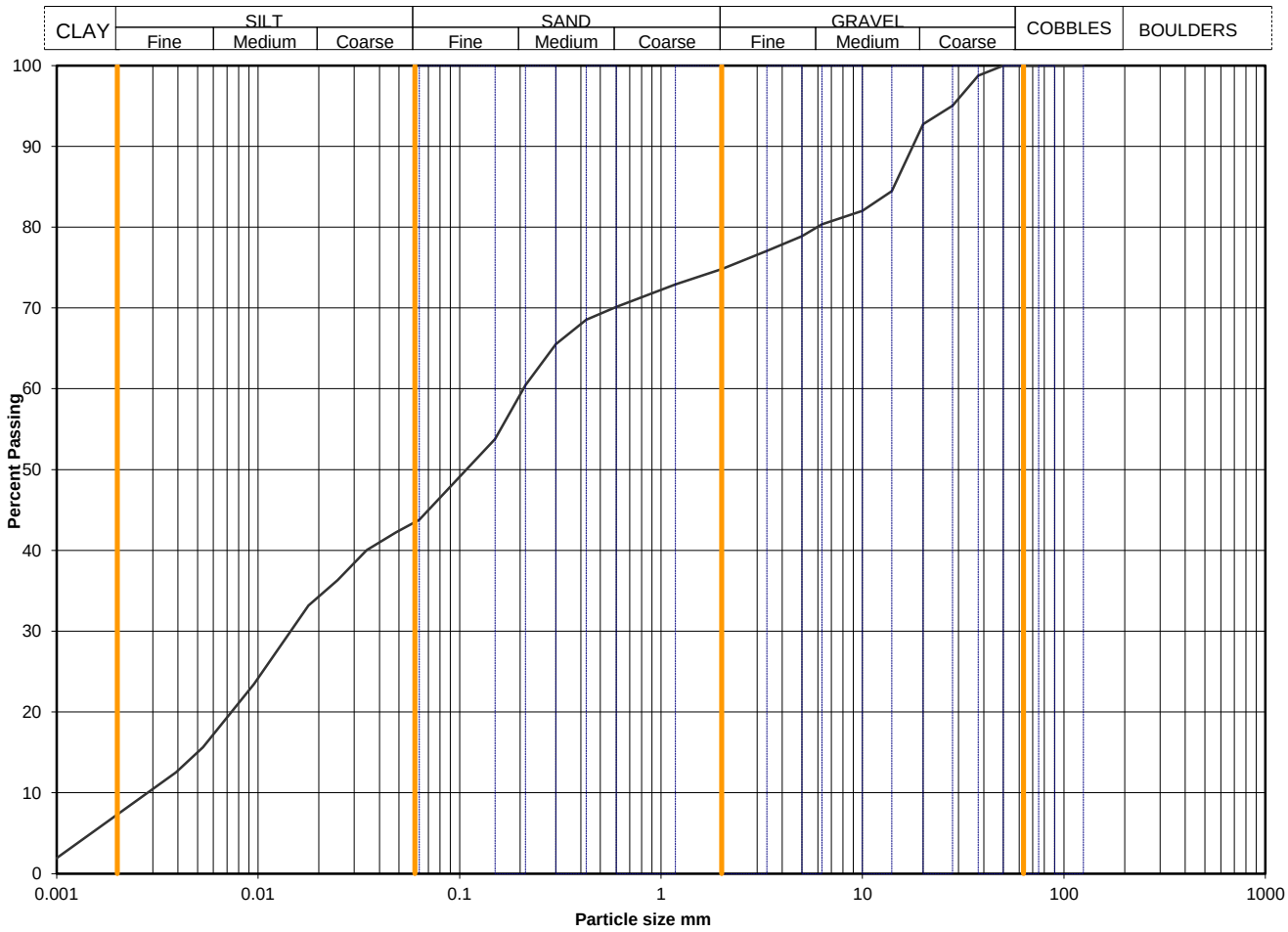
Uniformity Coefficient	D60 / D10	196

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	A8015-1820180413011418

Hole No	BH2
Sample Depth (m BGL)	0.60 - 1.00
Sample Type and No	B4
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	44
90	100	0.0484	42
75	100	0.0346	40
63	100	0.0248	36
50	100	0.0178	33
37.5	99	0.0095	23
28	95	0.0053	16
20	93	0.0039	13
14	84	0.0009	1
10	82		
6.3	80		
5.0	79		
3.35	77		
2.00	75		
1.18	73	Particle density, Mg/m3	
0.600	70		
0.425	69	2.65 assumed	
0.300	66	Dry mass of sample, kg	
0.212	60		
0.150	54	5.1	
0.063	44		

Soil description	Dark brown slightly sandy slightly gravelly clayey SILT.
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	25	25
	Sand	31	31
*<60mm values to aid description only	Silt	37	37
	Clay	7	7

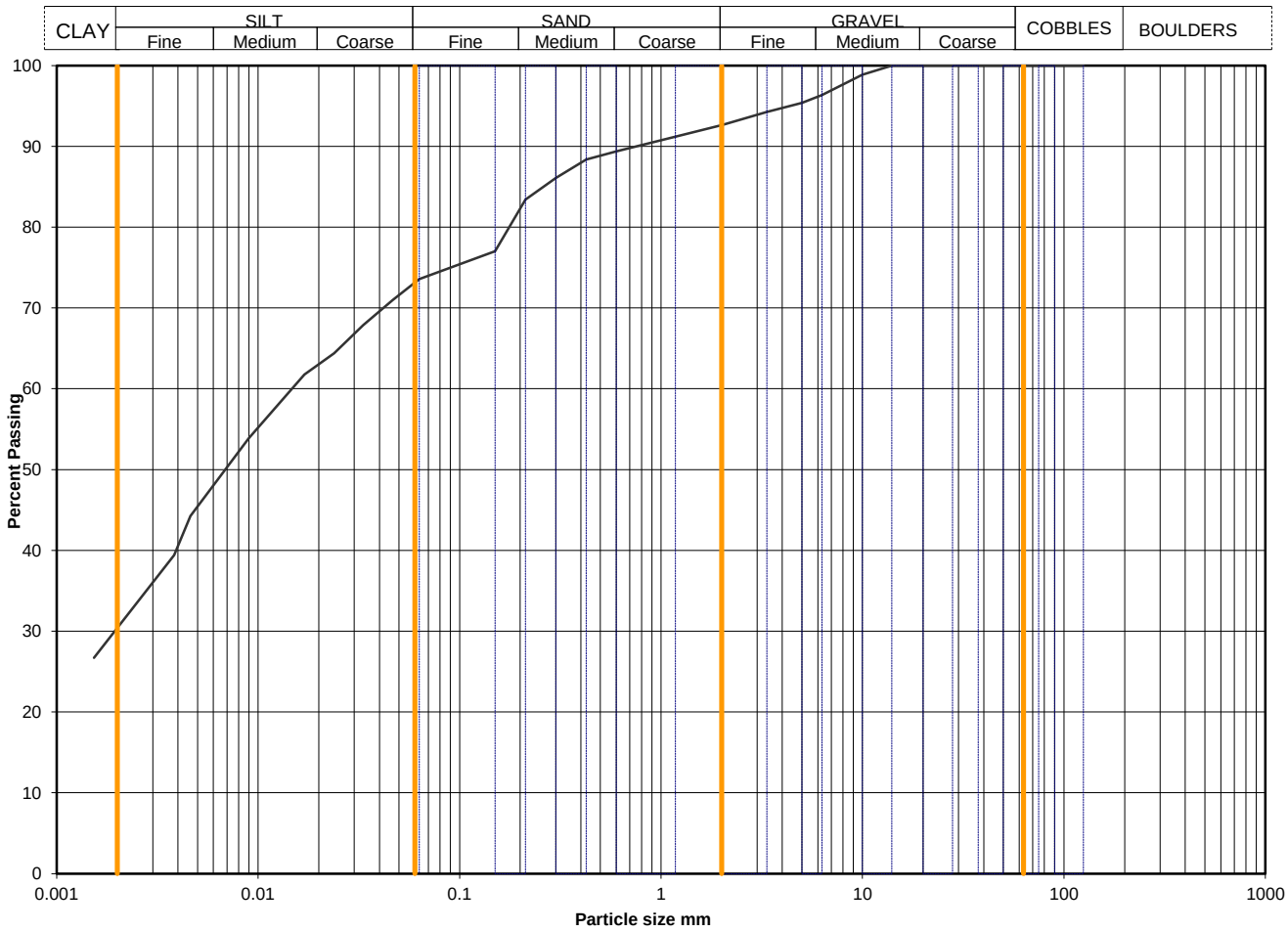
Uniformity Coefficient	D60 / D10	73

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	A8015-1820180413011538

Hole No	BH2
Sample Depth (m BGL)	2.70 - 2.80
Sample Type and No	D12
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	74
90	100	0.0466	71
75	100	0.0333	68
63	100	0.0238	64
50	100	0.0170	62
37.5	100	0.0090	54
28	100	0.0046	44
20	100	0.0038	39
14	100	0.0015	27
10	99		
6.3	96		
5.0	95		
3.35	94		
2.00	93		
1.18	91	Particle density, Mg/m3	
0.600	89		
0.425	88	2.65 assumed	
0.300	86	Dry mass of sample, kg	
0.212	83		
0.150	77	0.9	
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	7	7
	Sand	19	19
*<60mm values to aid description only	Silt	43	43
	Clay	30	30

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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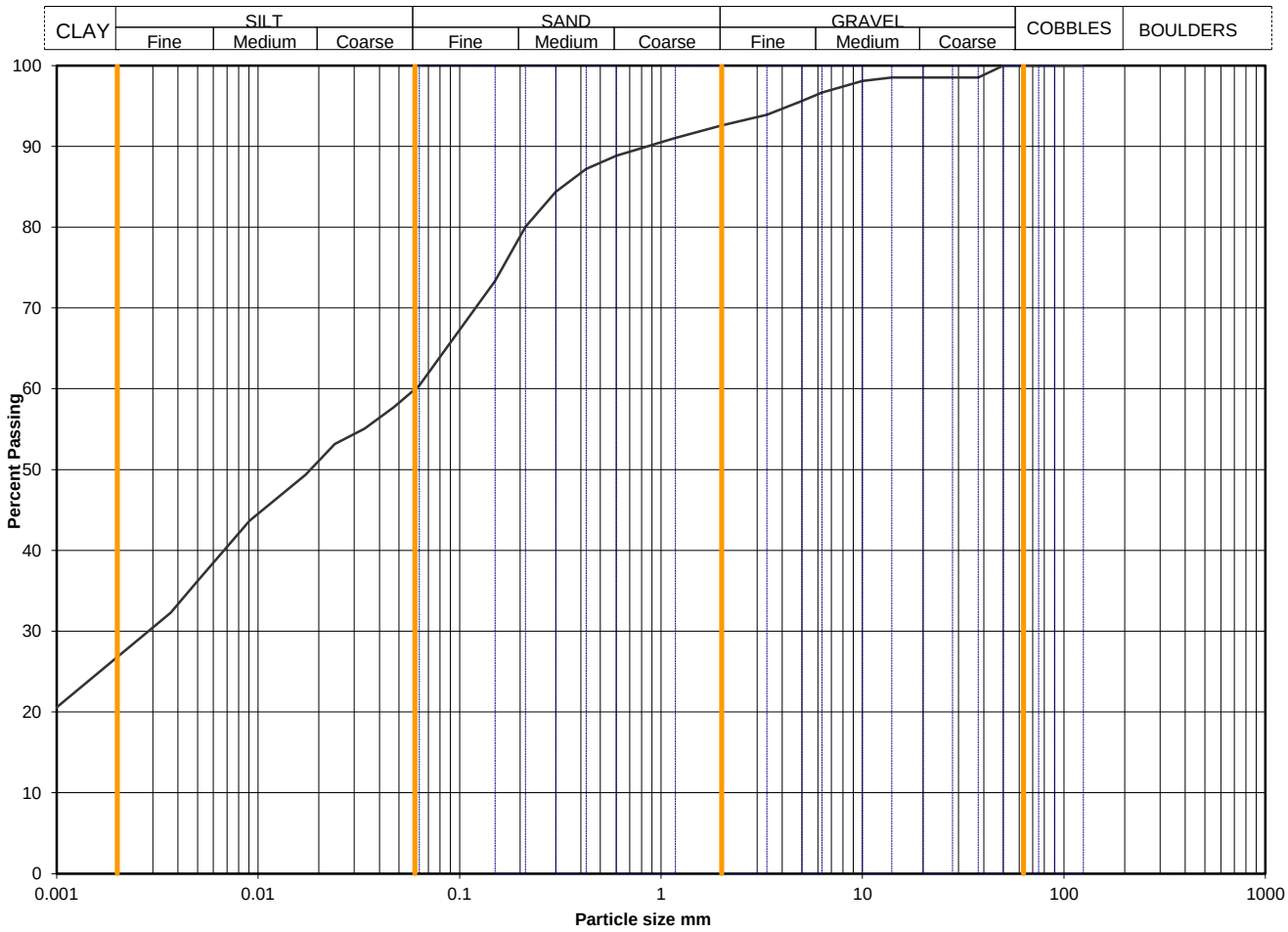
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	A8015-1820180413012751

Hole No	BH2
Sample Depth (m BGL)	9.50 - 9.95
Sample Type and No	UT40
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	60
90	100	0.0473	58
75	100	0.0338	55
63	100	0.0241	53
50	100	0.0172	49
37.5	99	0.0091	44
28	99	0.0050	36
20	99	0.0037	32
14	99	0.0008	19
10	98		
6.3	97		
5.0	96		
3.35	94		
2.00	93		
1.18	91	Particle density, Mg/m3	
0.600	89		
0.425	87	2.65 assumed	
0.300	84	Dry mass of sample, kg	
0.212	80		
0.150	73	7.2	
0.063	60		

Soil description	Firm bown slightly sandy slightly gravelly silty CLAY. Gravel is chalk fragments.		
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377		
Remarks			
Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	7	7
	Sand	32	32
*<60mm values to aid description only	Silt	34	34
	Clay	27	27

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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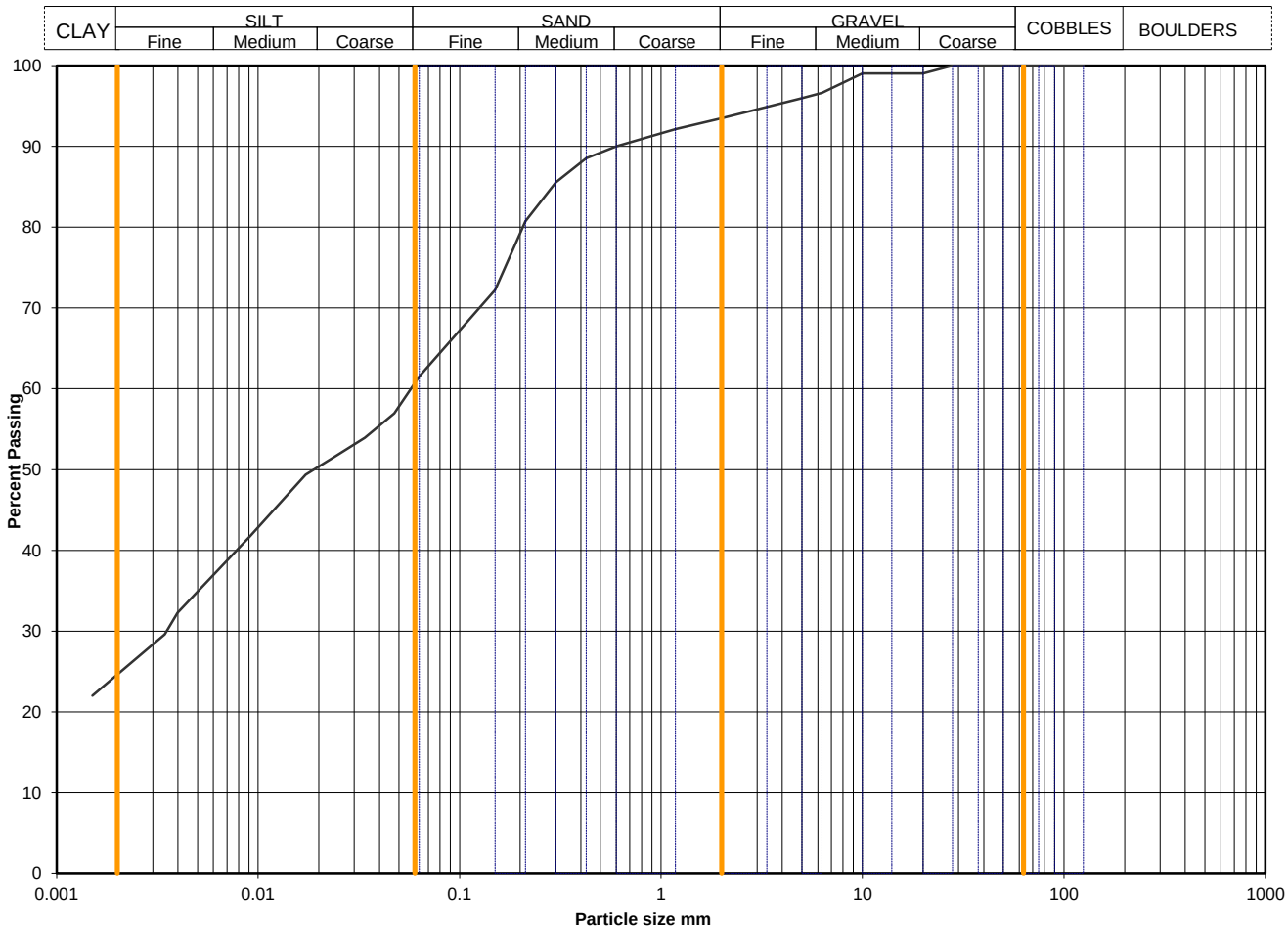
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	A8015-1820180413012921

Hole No	BH2
Sample Depth (m BGL)	13.10 - 13.55
Sample Type and No	B51
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	62
90	100	0.0474	57
75	100	0.0339	54
63	100	0.0242	52
50	100	0.0172	49
37.5	100	0.0091	42
28	100	0.0040	32
20	99	0.0034	30
14	99	0.0015	22
10	99		
6.3	97		
5.0	96		
3.35	95		
2.00	93		
1.18	92	Particle density, Mg/m3	
0.600	90		
0.425	89	2.65 assumed	
0.300	86	Dry mass of sample, kg	
0.212	81		
0.150	72	15.8	
0.063	62		

Soil description	Brown slightly sandy slightly gravelly silty CLAY. Gravel is chalk.
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	7	7
	Sand	32	32
*<60mm values to aid description only	Silt	37	37
	Clay	25	25

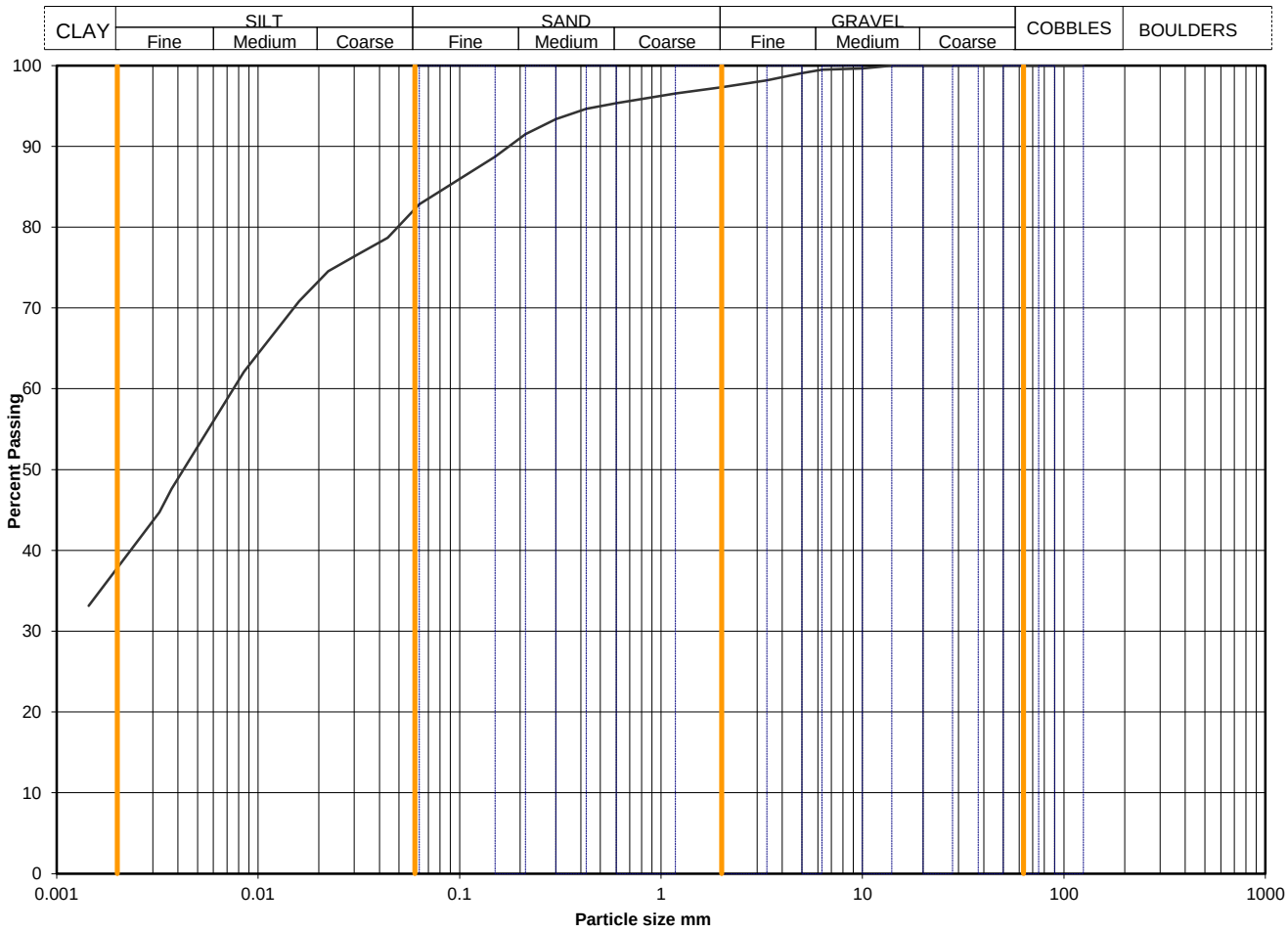
Uniformity Coefficient	D60 / D10	Not applicable

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	A8015-1820180413102616

Hole No	BH3
Sample Depth (m BGL)	1.65 - 2.00
Sample Type and No	B3
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	83
90	100	0.0439	79
75	100	0.0313	77
63	100	0.0223	75
50	100	0.0160	71
37.5	100	0.0085	62
28	100	0.0037	48
20	100	0.0032	45
14	100	0.0014	33
10	100		
6.3	99		
5.0	99		
3.35	98		
2.00	97		
1.18	97	Particle density, Mg/m3	
0.600	95		
0.425	95	2.71 measured	
0.300	93	Dry mass of sample, kg	
0.212	91		
0.150	89	6.9	
0.063	83		

Soil description	Brown slightly sandy slightly gravelly silty CLAY with chalk fragments.
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	3	3
	Sand	14	14
*<60mm values to aid description only	Silt	45	45
	Clay	38	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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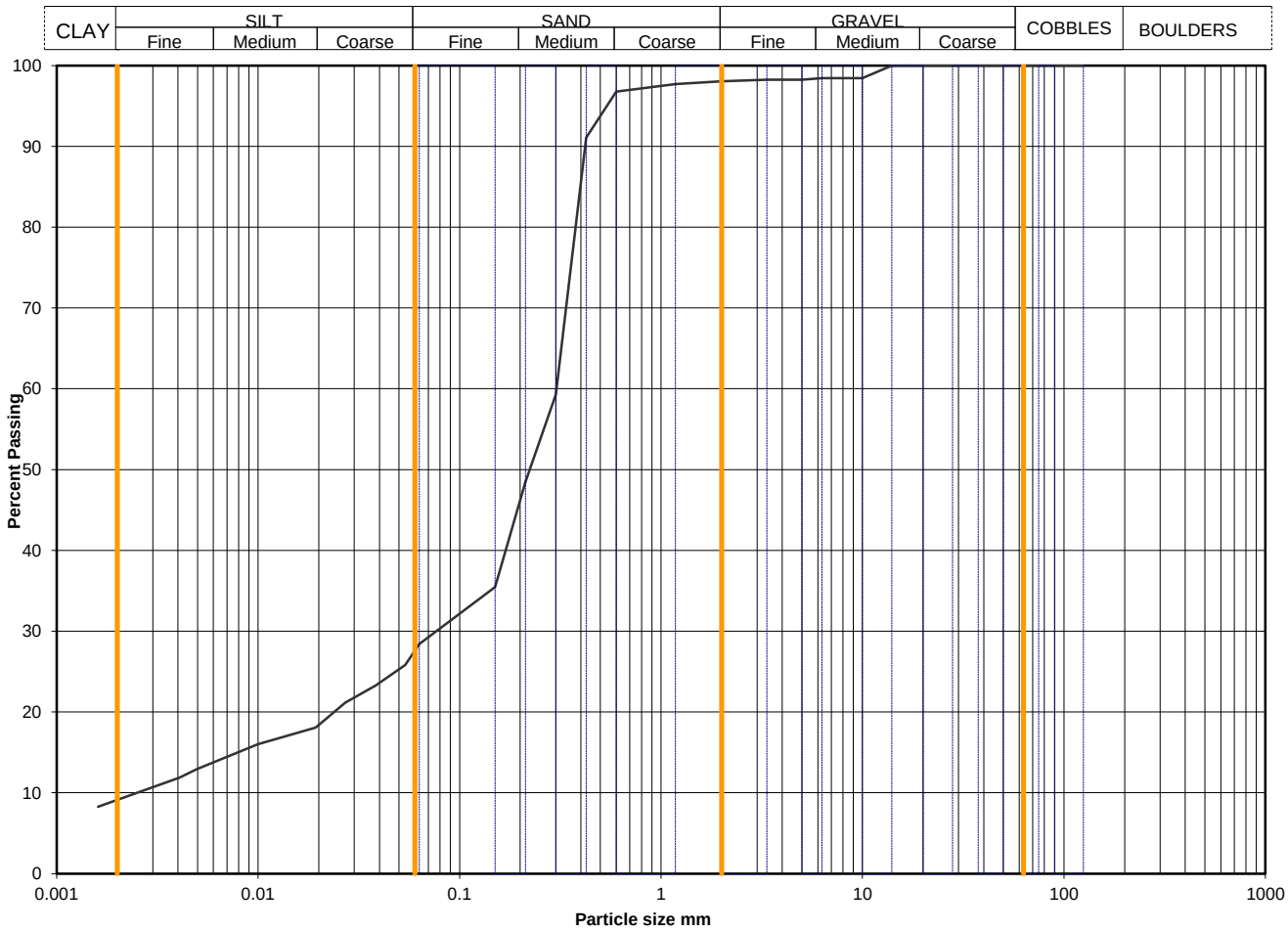
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	A8015-1820180413102638

Hole No	BH3
Sample Depth (m BGL)	4.00 - 4.45
Sample Type and No	D8
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	28
90	100	0.0537	26
75	100	0.0382	23
63	100	0.0271	21
50	100	0.0193	18
37.5	100	0.0100	16
28	100	0.0050	13
20	100	0.0041	12
14	100	0.0016	8
10	98		
6.3	98		
5.0	98		
3.35	98		
2.00	98		
1.18	98	Particle density, Mg/m3	
0.600	97		
0.425	91	2.65 assumed	
0.300	59	Dry mass of sample, kg	
0.212	48		
0.150	35	0.4	
0.063	28		

Soil description	Brown slightly gravelly very sandy silty CLAY.
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	2	2
	Sand	70	70
*<60mm values to aid description only	Silt	19	19
	Clay	9	9

Uniformity Coefficient	D60 / D10	120

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

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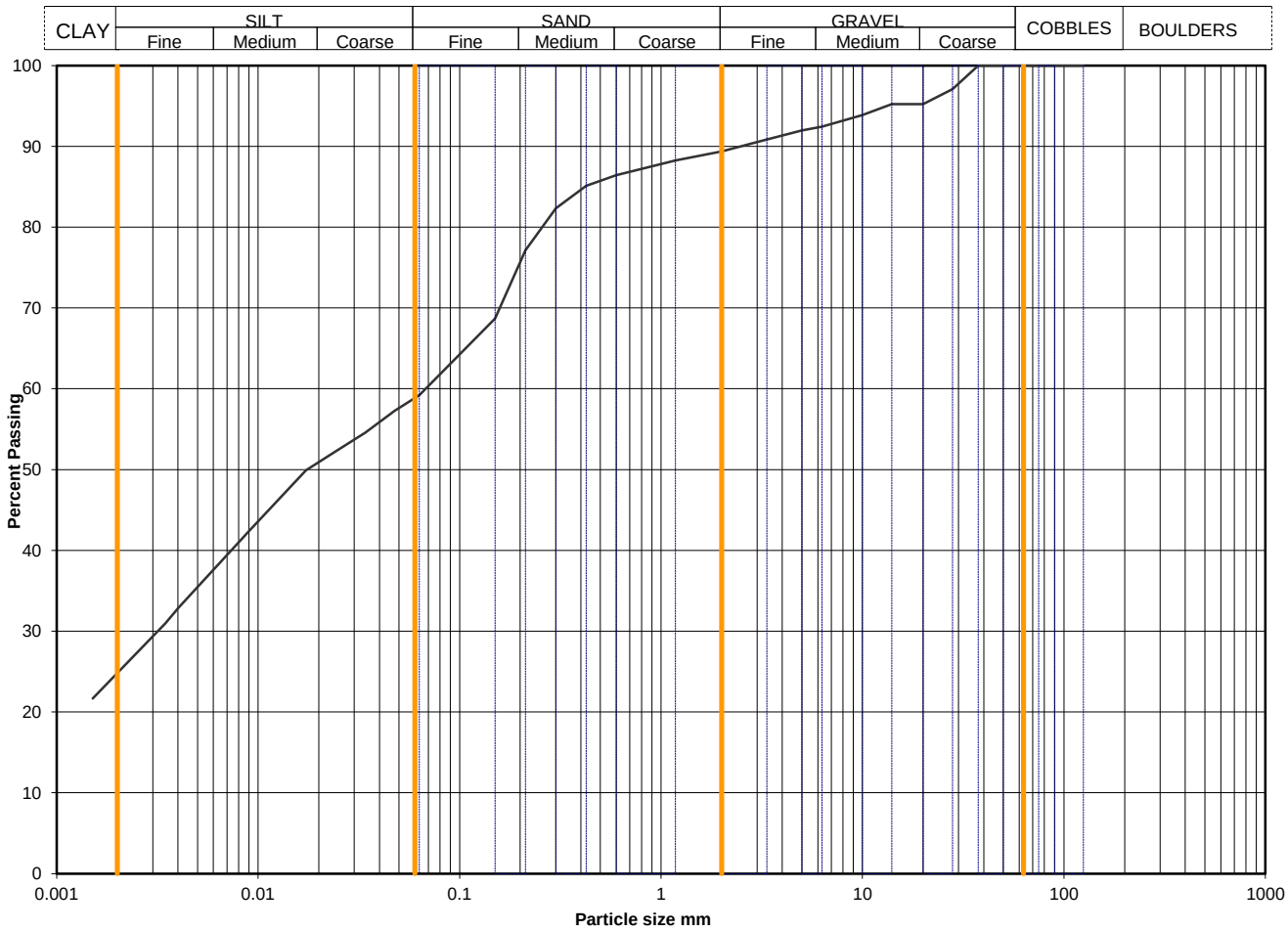
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	A8015-1820180413102754

Hole No	BH3
Sample Depth (m BGL)	9.00 - 9.45
Sample Type and No	UT19
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	59
90	100	0.0476	57
75	100	0.0340	55
63	100	0.0242	52
50	100	0.0173	50
37.5	100	0.0091	43
28	97	0.0040	33
20	95	0.0035	31
14	95	0.0015	22
10	94		
6.3	92		
5.0	92		
3.35	91		
2.00	89		
1.18	88	Particle density, Mg/m3	
0.600	86		
0.425	85	2.65 assumed	
0.300	82	Dry mass of sample, kg	
0.212	77		
0.150	69	4.7	
0.063	59		

Soil description	Firm greyish brown slightly sandy slightly gravelly silty CLAY. Gravel contains chalk fragments.
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	11	11
	Sand	30	30
*<60mm values to aid description only	Silt	34	34
	Clay	25	25

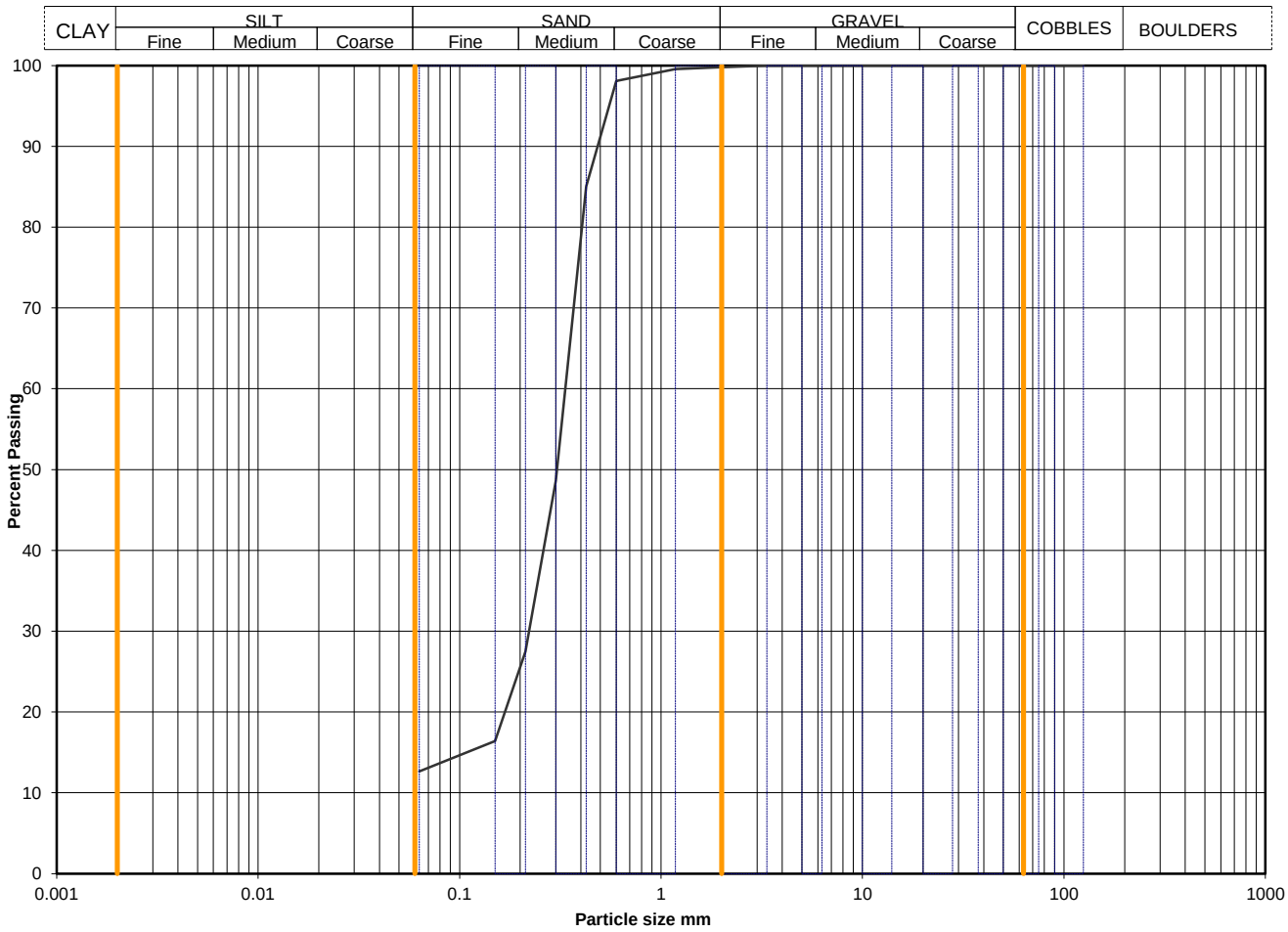
Uniformity Coefficient	D60 / D10	Not applicable

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	A8015-1820180413102944

Hole No	BH3
Sample Depth (m BGL)	13.50 - 13.95
Sample Type and No	D32
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	100		
10	100		
6.3	100		
5.0	100		
3.35	100		
2.00	100		
1.18	100		
0.600	98		
0.425	85		
0.300	49	Dry mass of sample, kg	
0.212	27		
0.150	16	0.4	
0.063	13		

Soil description	Light brown silty SAND.
Preparation / Pretreatment	Sieve: natural material
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	0	0
	Sand	87	87
*<60mm values to aid description only	Silt	silt+clay =	
	Clay	13	13

Uniformity Coefficient	D60 / D10	Not applicable

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	none

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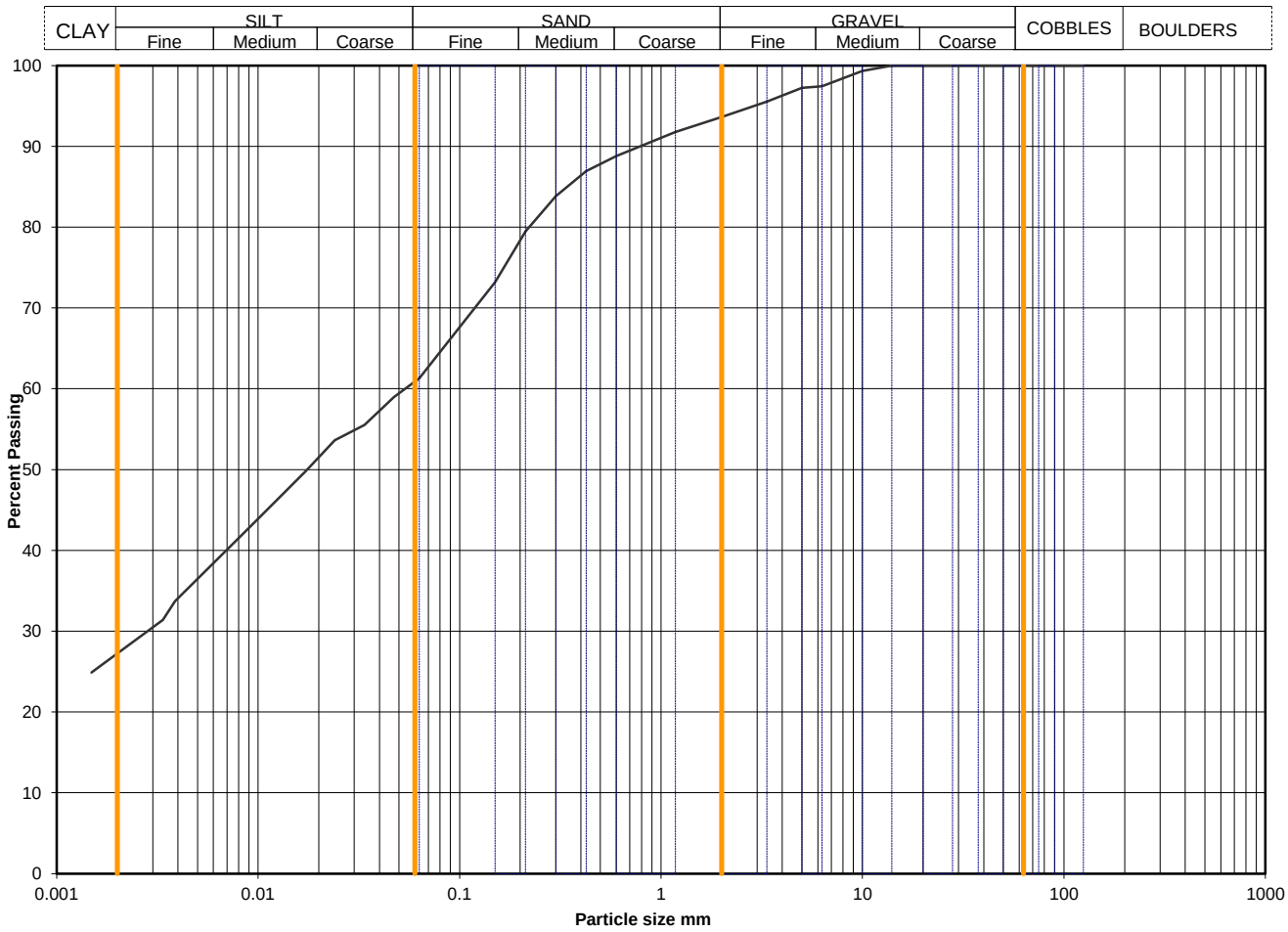
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	A8015-1820180418115116

Hole No	BH4
Sample Depth (m BGL)	5.50 - 6.00
Sample Type and No	B13
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	61
90	100	0.0472	59
75	100	0.0338	56
63	100	0.0241	54
50	100	0.0172	50
37.5	100	0.0091	43
28	100	0.0039	34
20	100	0.0034	31
14	100	0.0015	25
10	99		
6.3	97		
5.0	97		
3.35	96		
2.00	94		
1.18	92	Particle density, Mg/m3	
0.600	89		
0.425	87	2.65 assumed	
0.300	84	Dry mass of sample, kg	
0.212	79		
0.150	73	7.9	
0.063	61		

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	6	6
	Sand	32	32
*<60mm values to aid description only	Silt	34	34
	Clay	27	27

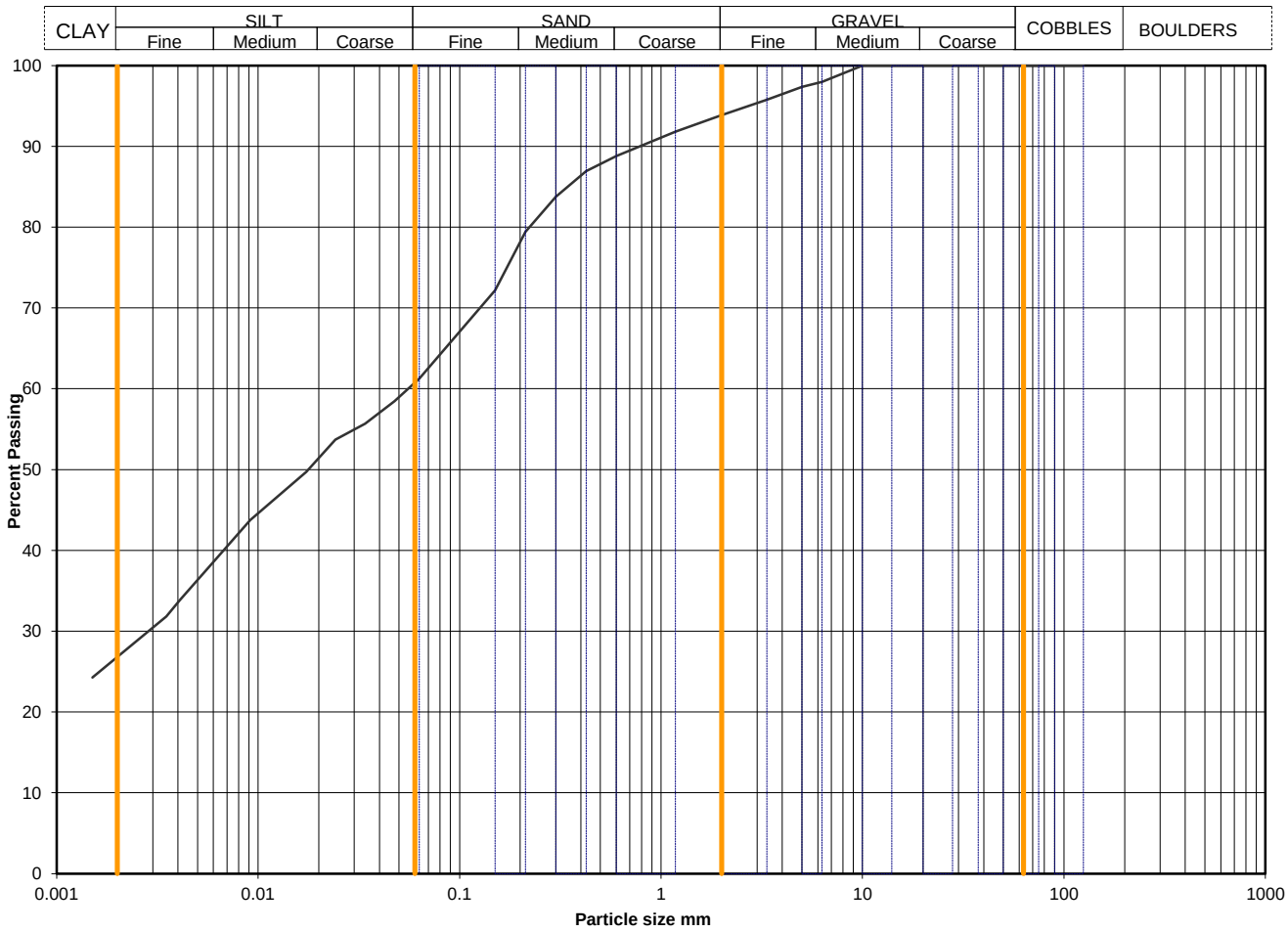
Uniformity Coefficient	D60 / D10	Not applicable

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	A8015-1820180418120720

Hole No	BH5
Sample Depth (m BGL)	7.10 - 7.55
Sample Type and No	B26
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	61
90	100	0.0476	58
75	100	0.0340	56
63	100	0.0242	54
50	100	0.0174	50
37.5	100	0.0091	44
28	100	0.0041	34
20	100	0.0035	32
14	100	0.0015	24
10	100		
6.3	98		
5.0	97		
3.35	96		
2.00	94		
1.18	92	Particle density, Mg/m3	
0.600	89		
0.425	87	2.65 assumed	
0.300	84	Dry mass of sample, kg	
0.212	79		
0.150	72	14.1	
0.063	61		

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	6	6
	Sand	33	33
*<60mm values to aid description only	Silt	34	34
	Clay	27	27

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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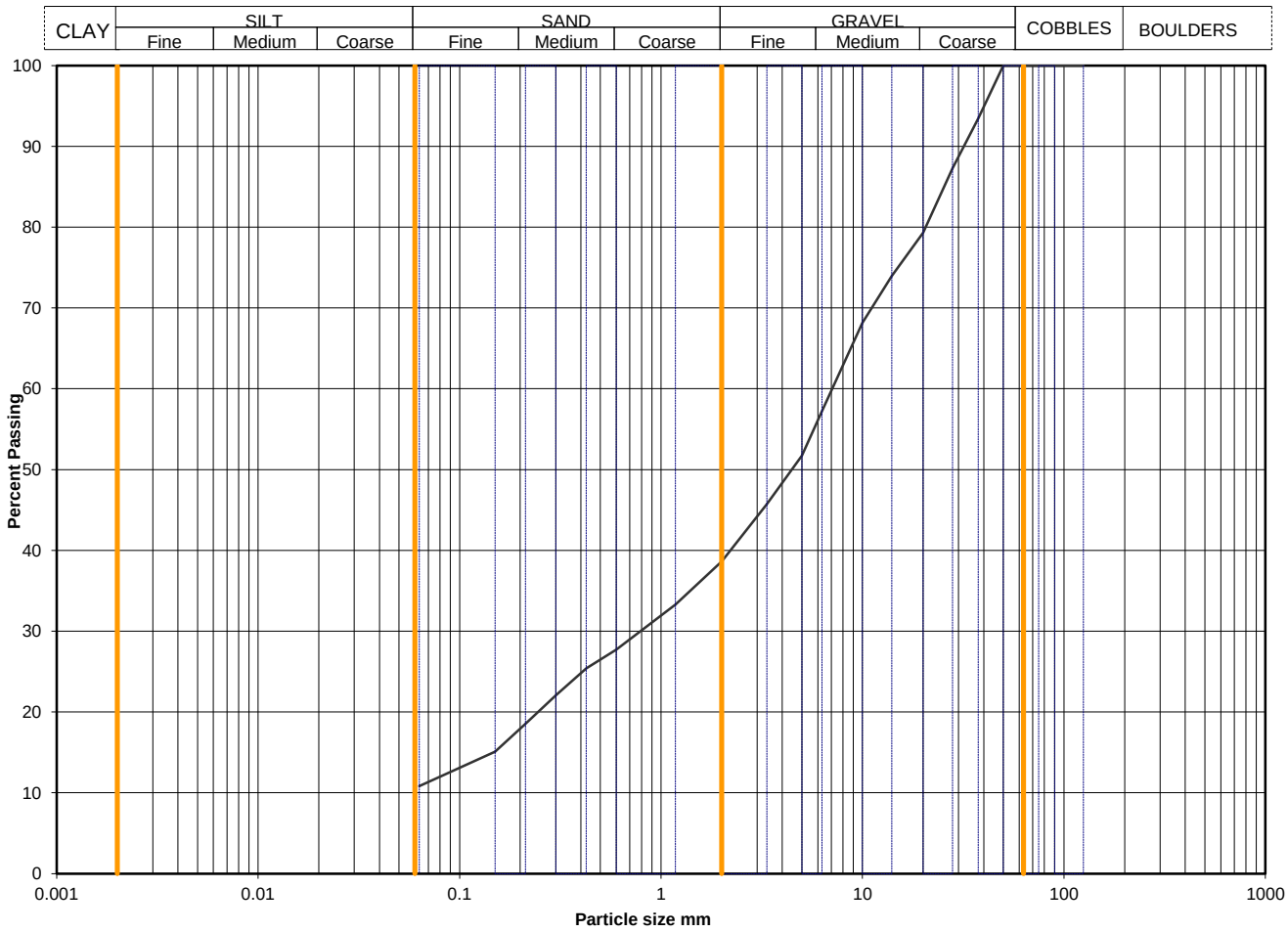
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	A8015-1820180409092440

Hole No	BH6
Sample Depth (m BGL)	0.00 - 0.30
Sample Type and No	B1
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	93		
28	87		
20	79		
14	74		
10	68		
6.3	57		
5.0	52		
3.35	46		
2.00	39		
1.18	33		
0.600	28		
0.425	25		
0.300	22	Dry mass of sample, kg	
0.212	19		
0.150	15	6.4	
0.063	11		

Soil description	Brown very sandy clayey GRAVEL.
Preparation / Pretreatment	Sieve: natural material
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	61	61
	Sand	28	28
*<60mm values to aid description only	Silt	silt+clay =	
	Clay	11	11

Uniformity Coefficient	D60 / D10	Not applicable

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	none

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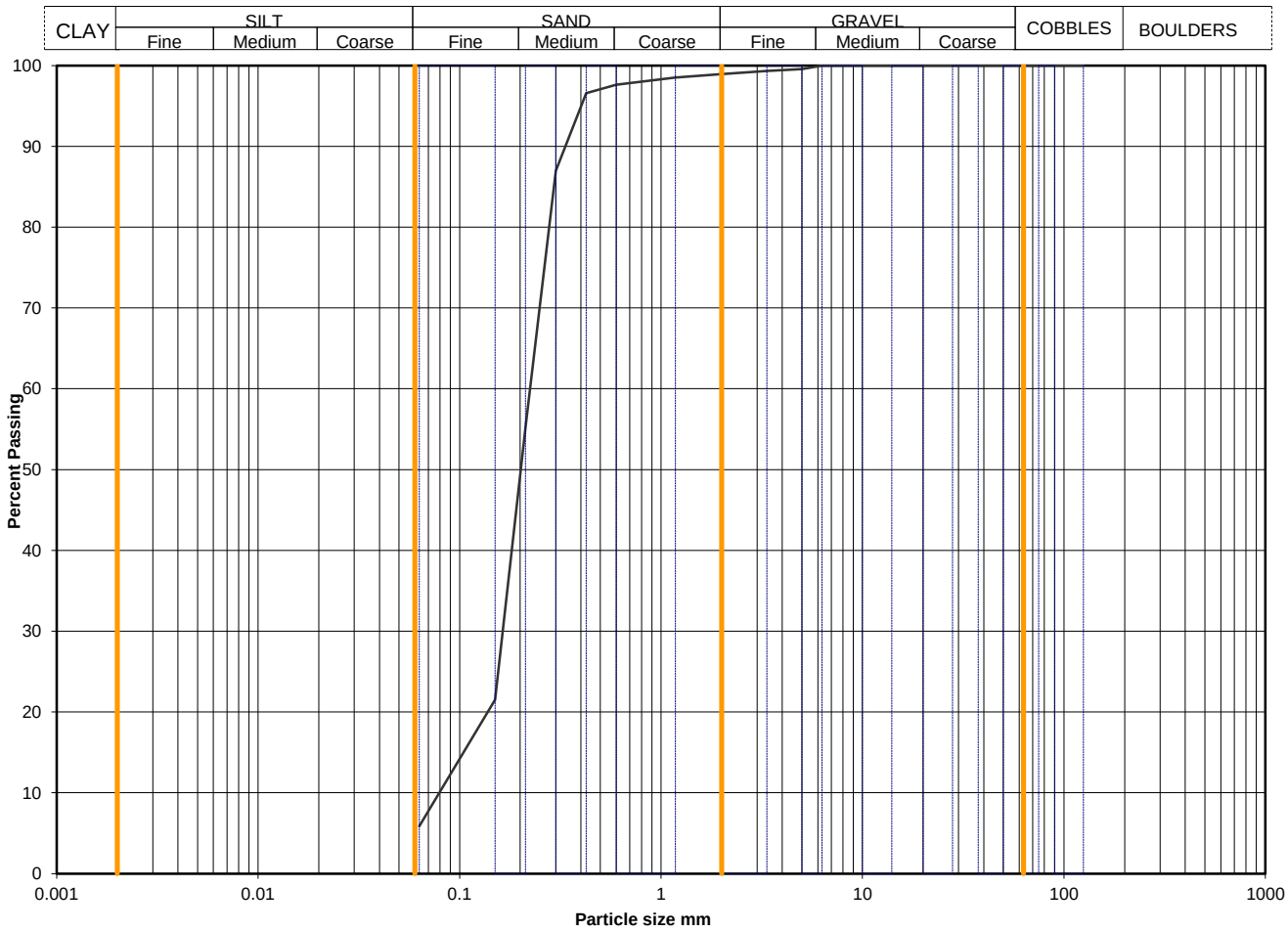
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	A8015-18-20180413090532

Hole No	TP2
Sample Depth (m BGL)	4.00 - 4.20
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	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5.0	100		
3.35	99		
2.00	99		
1.18	99		
0.600	98		
0.425	97		
0.300	87	Dry mass of sample, kg	
0.212	55		
0.150	22	11.1	
0.063	6		

Soil description	Brown slightly gravelly silty SAND.
Preparation / Pretreatment	Sieve: natural material
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	1	1
	Sand	93	93
*<60mm values to aid description only	Silt	silt+clay =	
	Clay	6	6

Uniformity Coefficient	D60 / D10	3

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	none

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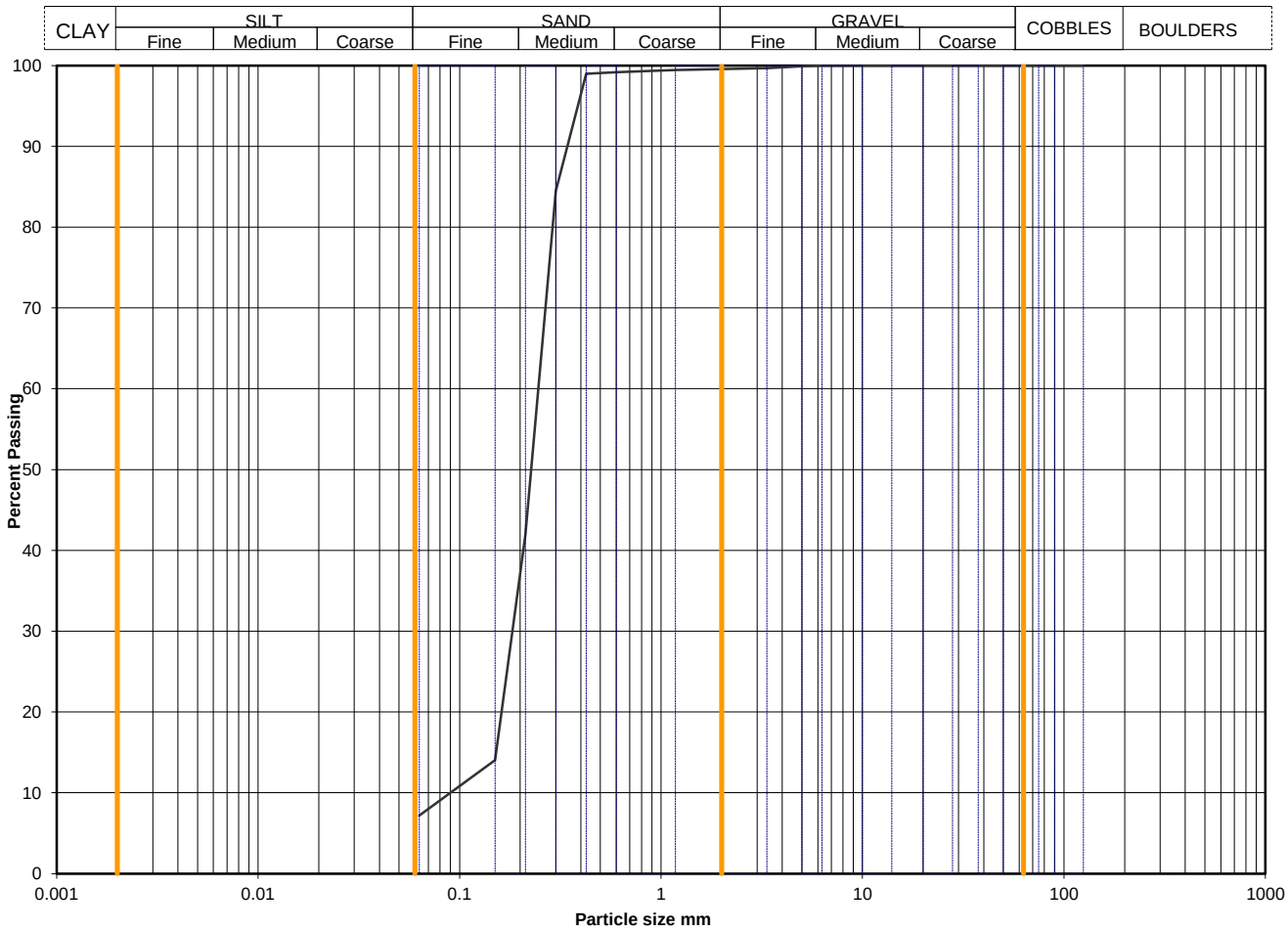
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	A8015-18-20180410090059

Hole No	TP5
Sample Depth (m BGL)	2.50 - 2.70
Sample Type and No	B10
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	100		
10	100		
6.3	100		
5.0	100		
3.35	100		
2.00	100		
1.18	99		
0.600	99		
0.425	99		
0.300	85	Dry mass of sample, kg	
0.212	42		
0.150	14	13.5	
0.063	7		

Soil description	Brown silty SAND.		
Preparation / Pretreatment	Sieve: natural material		
Remarks			
Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	0	0
	Sand	92	92
*<60mm values to aid description only	Silt	silt+clay =	
	Clay	7	7

Uniformity Coefficient	**D60 / D10**	3

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	none

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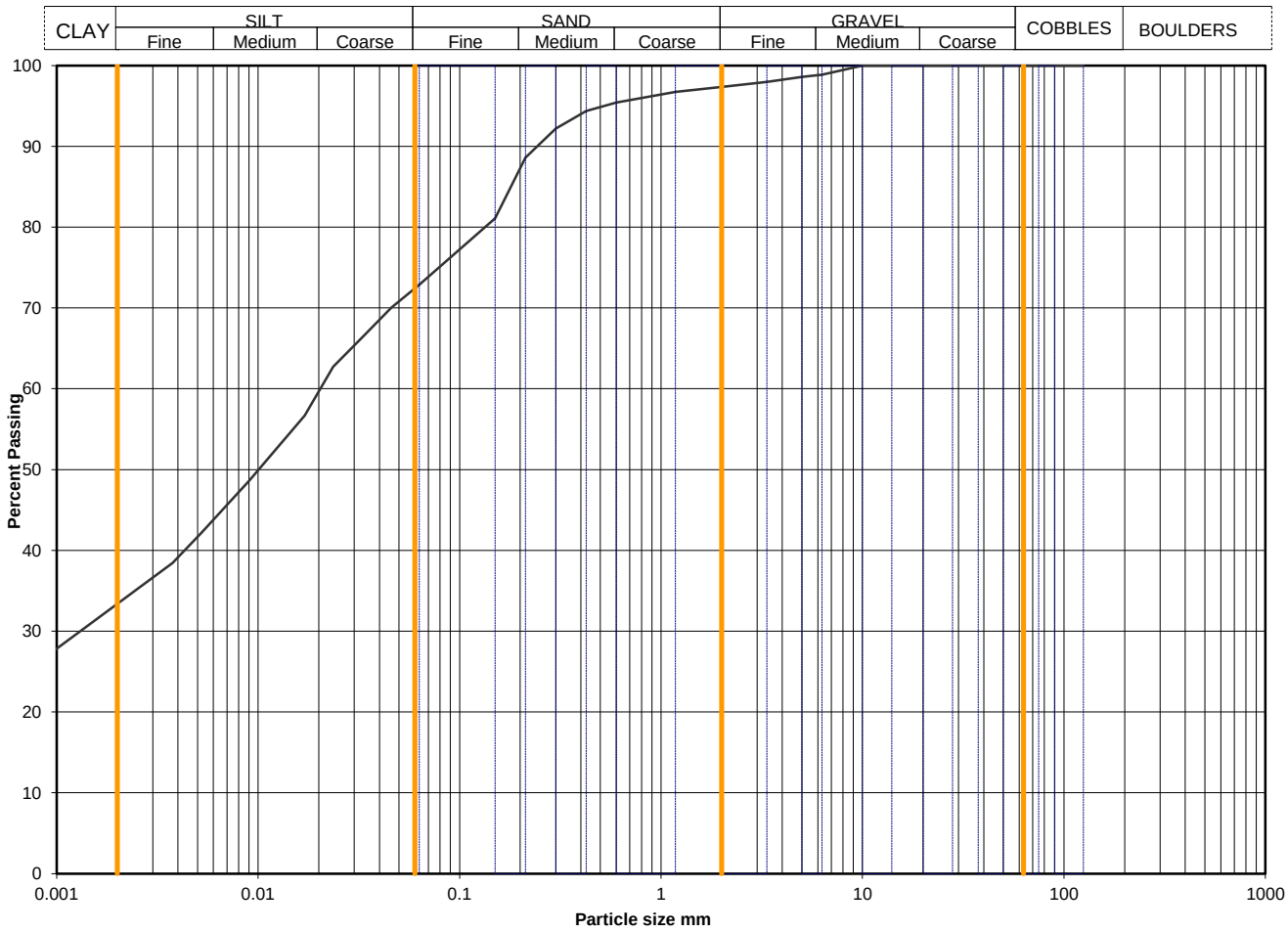
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	A8015-18-20180410074235

Hole No	TP8
Sample Depth (m BGL)	0.20 - 0.50
Sample Type and No	B4
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	73
90	100	0.0459	70
75	100	0.0329	66
63	100	0.0236	63
50	100	0.0170	57
37.5	100	0.0090	49
28	100	0.0052	42
20	100	0.0038	38
14	100	0.0008	26
10	100		
6.3	99		
5.0	99		
3.35	98		
2.00	97		
1.18	97	Particle density, Mg/m3	
0.600	95		
0.425	94	2.65 assumed	
0.300	92	Dry mass of sample, kg	
0.212	89		
0.150	81	10.6	
0.063	73		

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	3	3
	Sand	24	24
*<60mm values to aid description only	Silt	39	39
	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

QA Ref
SLR 2,9
Rev 2.10
Oct 16

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SOCOTEC

Project No A8015-18

Project Name VPI IMMINGHAM

Figure

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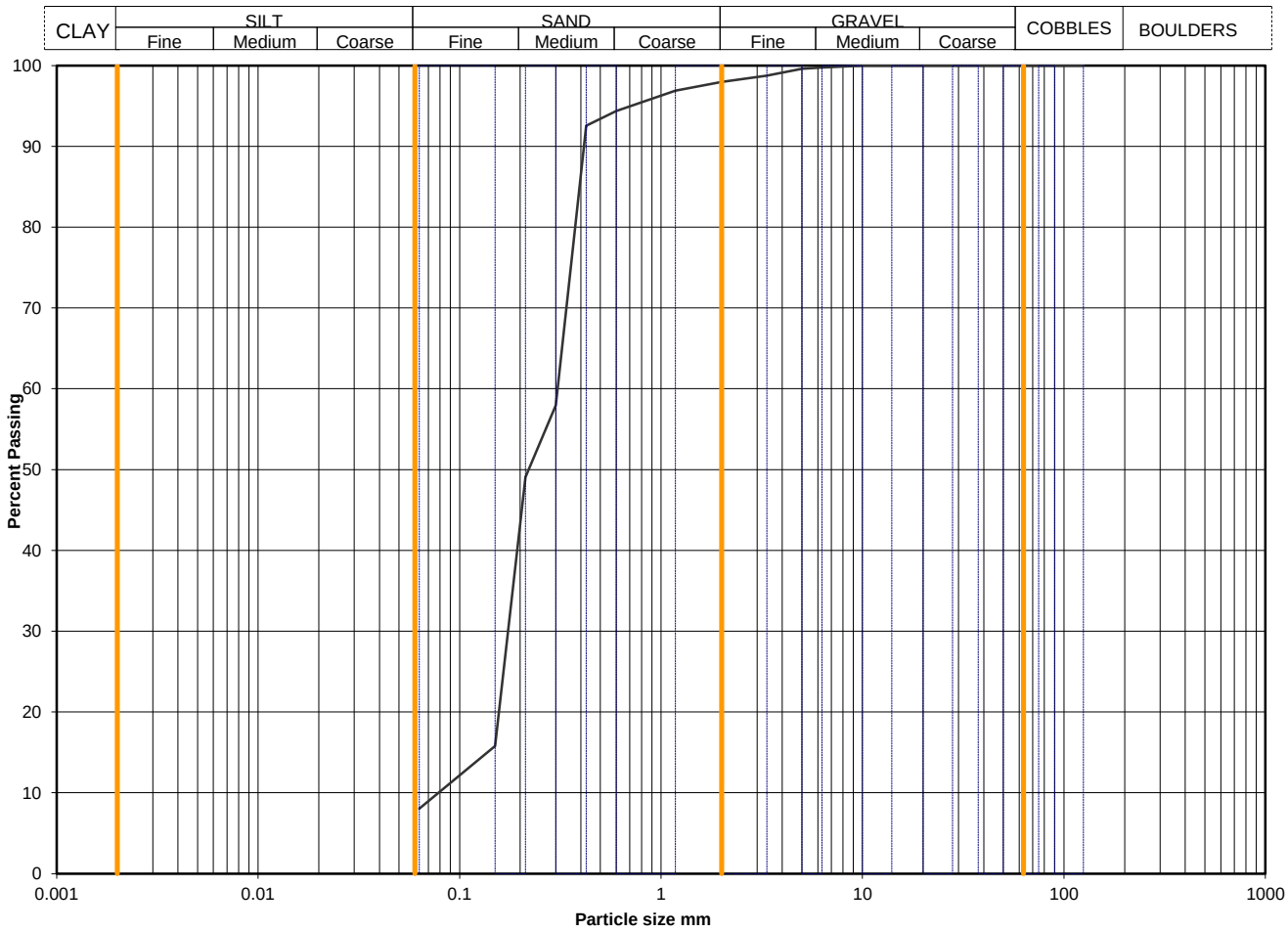
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	A8015-18-20180410074504

Hole No	TP8
Sample Depth (m BGL)	3.8
Sample Type and No	D11
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	100		
10	100		
6.3	100		
5.0	100		
3.35	99		
2.00	98		
1.18	97		
0.600	94		
0.425	93		
0.300	58	Dry mass of sample, kg	
0.212	49		
0.150	16	1.1	
0.063	8		

Soil description	Brown slightly gravelly silty SAND.
Preparation / Pretreatment	Sieve: natural material
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	2	2
	Sand	90	90
*<60mm values to aid description only	Silt	silt+clay =	
	Clay	8	8

Uniformity Coefficient	D60 / D10	4

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	none

QA Ref
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Project No A8015-18

Project Name VPI IMMINGHAM

Figure

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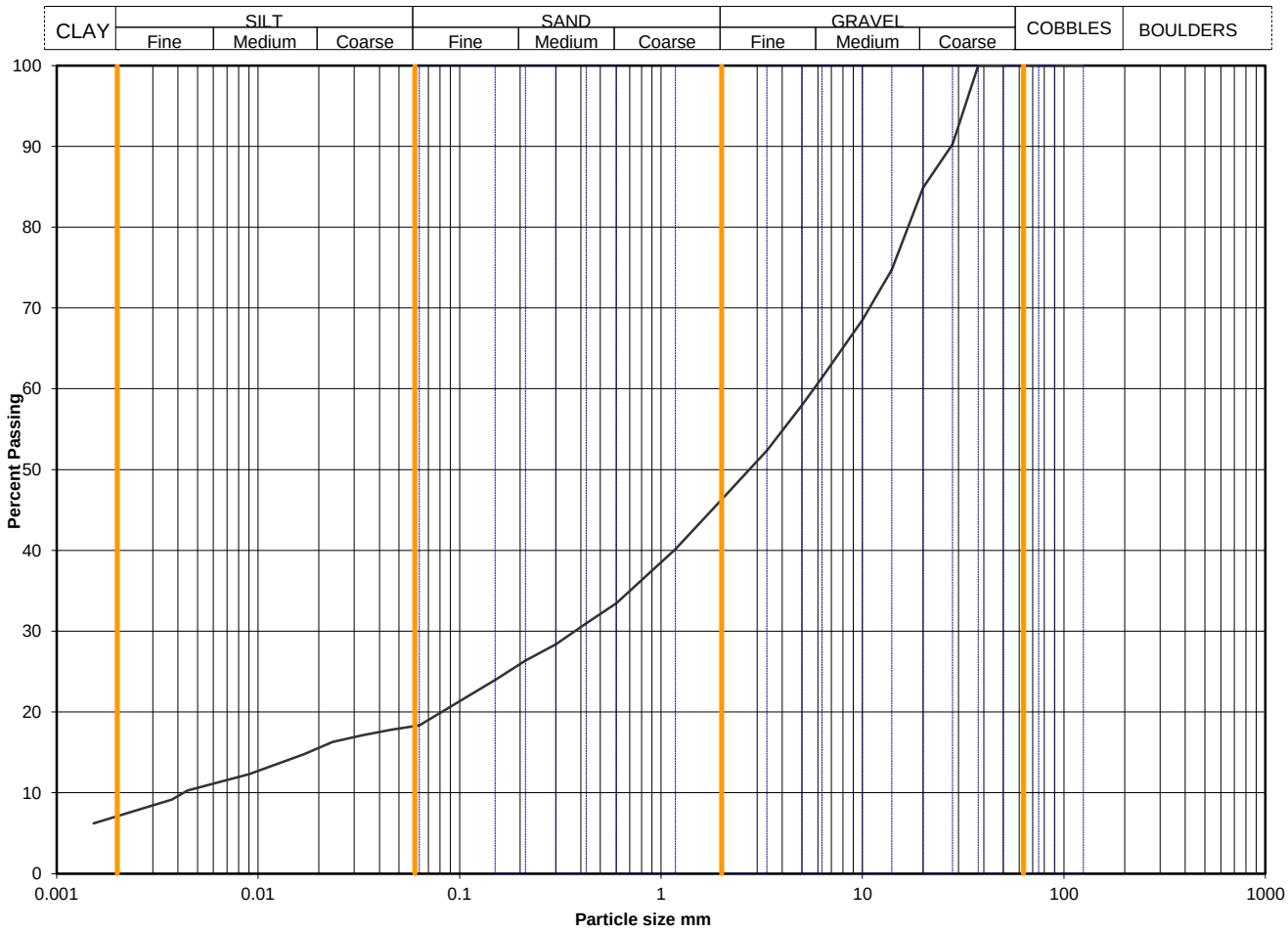
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	A8015-18-20180410091457

Hole No	TP9
Sample Depth (m BGL)	0.3
Sample Type and No	D3
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	18
90	100	0.0457	18
75	100	0.0327	17
63	100	0.0234	16
50	100	0.0169	15
37.5	100	0.0090	12
28	90	0.0045	10
20	85	0.0037	9
14	75	0.0015	6
10	69		
6.3	61		
5.0	58		
3.35	52		
2.00	46		
1.18	40	Particle density, Mg/m3	
0.600	33		
0.425	31	2.65 assumed	
0.300	28	Dry mass of sample, kg	
0.212	26		
0.150	24	1.1	
0.063	18		

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	54	54
	Sand	28	28
*<60mm values to aid description only	Silt	11	11
	Clay	7	7

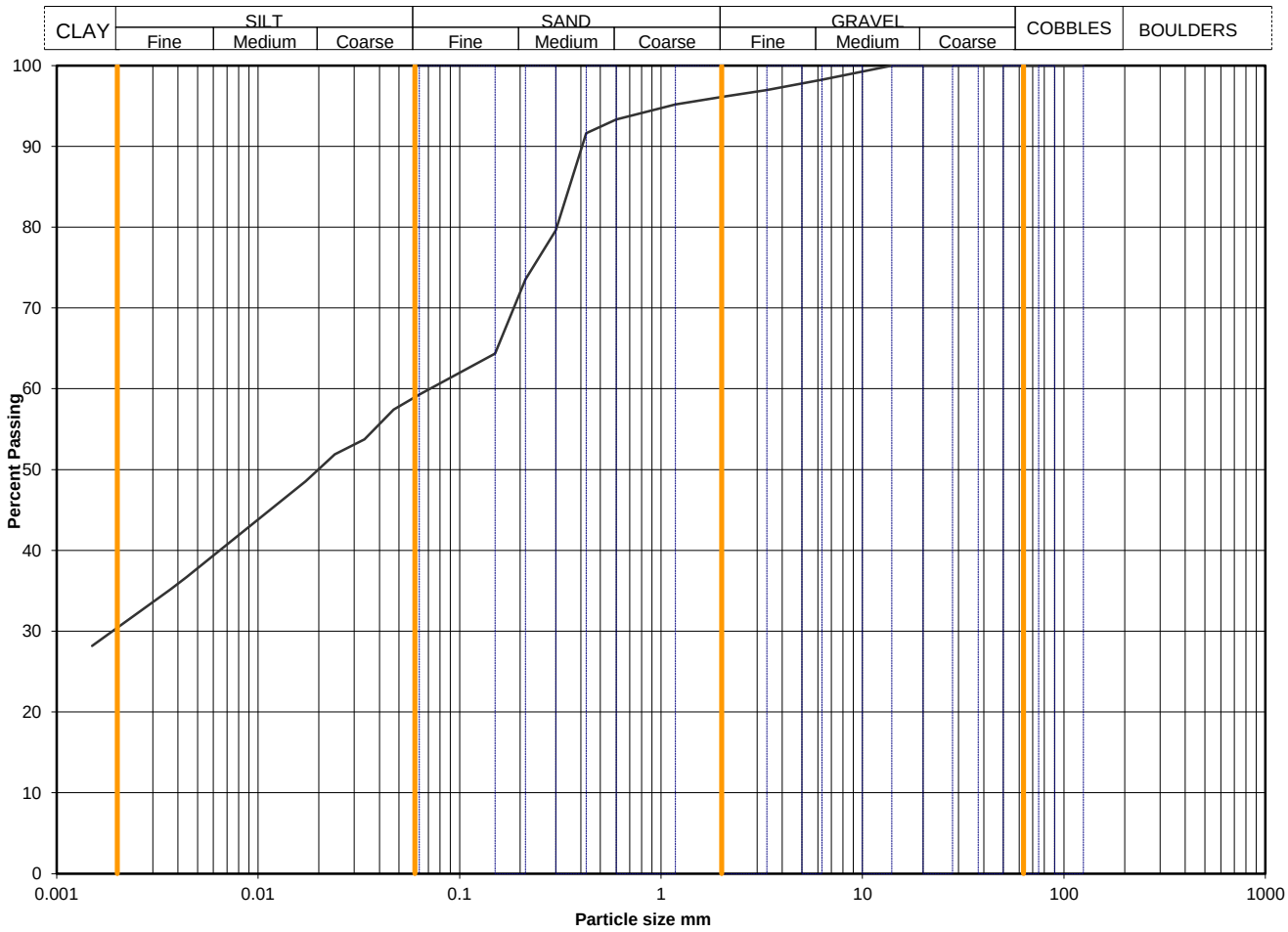
Uniformity Coefficient	D60 / D10	1347

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	A8015-18-20180410091609

Hole No	TP9
Sample Depth (m BGL)	2.00 - 2.20
Sample Type and No	B10
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	59
90	100	0.0471	57
75	100	0.0338	54
63	100	0.0241	52
50	100	0.0172	49
37.5	100	0.0091	43
28	100	0.0044	37
20	100	0.0037	35
14	100	0.0015	28
10	99		
6.3	98		
5.0	98		
3.35	97		
2.00	96		
1.18	95	Particle density, Mg/m3	
0.600	93		
0.425	92	2.65 assumed	
0.300	80	Dry mass of sample, kg	
0.212	74		
0.150	64	10.4	
0.063	59		

Soil description	Brown slightly gravelly sandy silty CLAY.
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	4	4
	Sand	37	37
*<60mm values to aid description only	Silt	29	29
	Clay	30	30

Uniformity Coefficient	D60 / D10	Not applicable

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

QA Ref
SLR 2,9
Rev 2.10
Oct 16

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Project No A8015-18

Project Name VPI IMMINGHAM

Figure

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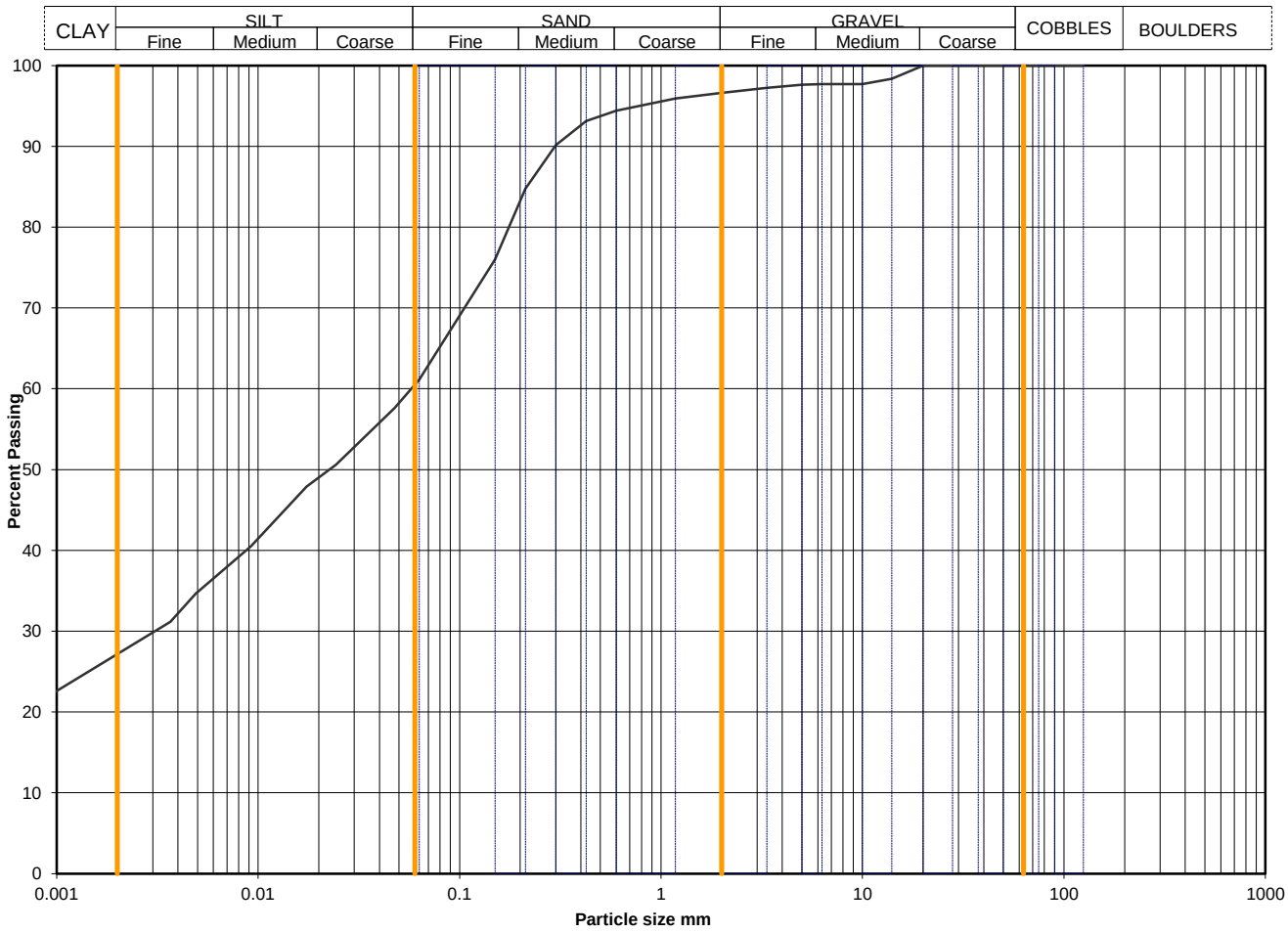
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	A8015-18-20180413014845

Hole No	TT1
Sample Depth (m BGL)	2.20 - 2.30
Sample Type and No	B8
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	61
90	100	0.0476	58
75	100	0.0341	54
63	100	0.0244	51
50	100	0.0174	48
37.5	100	0.0092	40
28	100	0.0049	35
20	100	0.0037	31
14	98	0.0008	21
10	98		
6.3	98		
5.0	98		
3.35	97		
2.00	97		
1.18	96	Particle density, Mg/m3	
0.600	94		
0.425	93	2.65 assumed	
0.300	90	Dry mass of sample, kg	
0.212	85		
0.150	76	11.2	
0.063	61		

Soil description	Brown slightly gravelly sandy silty CLAY.		
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377		
Remarks			
Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	3	3
	Sand	35	35
*<60mm values to aid description only	Silt	34	34
	Clay	27	27

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	A8015-18
Project Name	VPI IMMINGHAM

Figure

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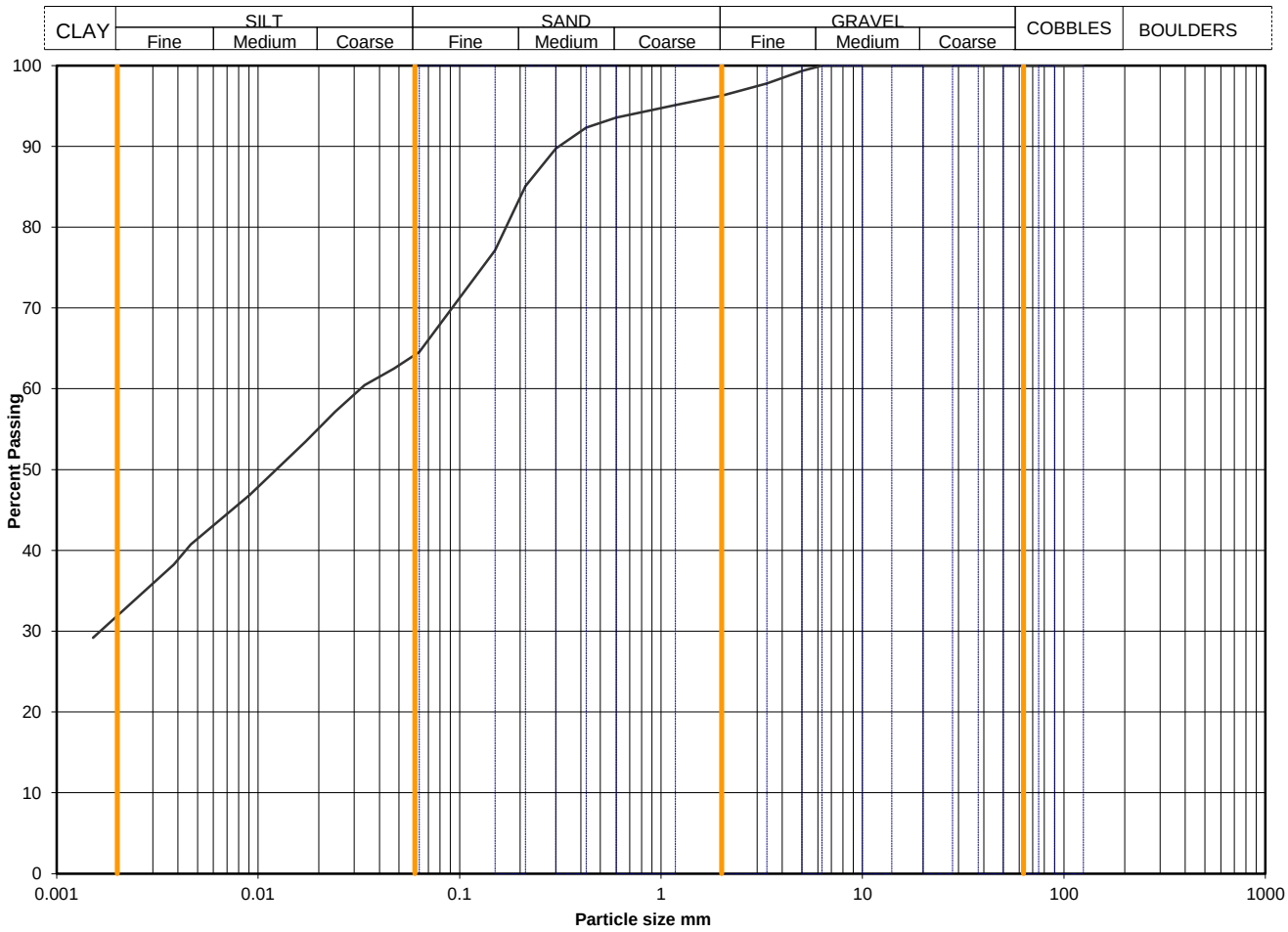
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	A8015-18-20180408083410

Hole No	TT2
Sample Depth (m BGL)	1.00 - 1.25
Sample Type and No	B4
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	65
90	100	0.0473	63
75	100	0.0337	60
63	100	0.0241	57
50	100	0.0172	53
37.5	100	0.0091	47
28	100	0.0046	41
20	100	0.0038	38
14	100	0.0015	29
10	100		
6.3	100		
5.0	99		
3.35	98		
2.00	96		
1.18	95	Particle density, Mg/m3	
0.600	94		
0.425	92	2.65 assumed	
0.300	90	Dry mass of sample, kg	
0.212	85		
0.150	77	13.9	
0.063	65		

Soil description	Brown slightly sandy slightly gravelly silty CLAY with rootlets.		
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377		
Remarks			
Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	4	4
	Sand	32	32
*<60mm values to aid description only	Silt	33	33
	Clay	32	32

Uniformity Coefficient	**D60 / D10**	Not applicable

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

QA Ref
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Project No	A8015-18
Project Name	VPI IMMINGHAM

Figure

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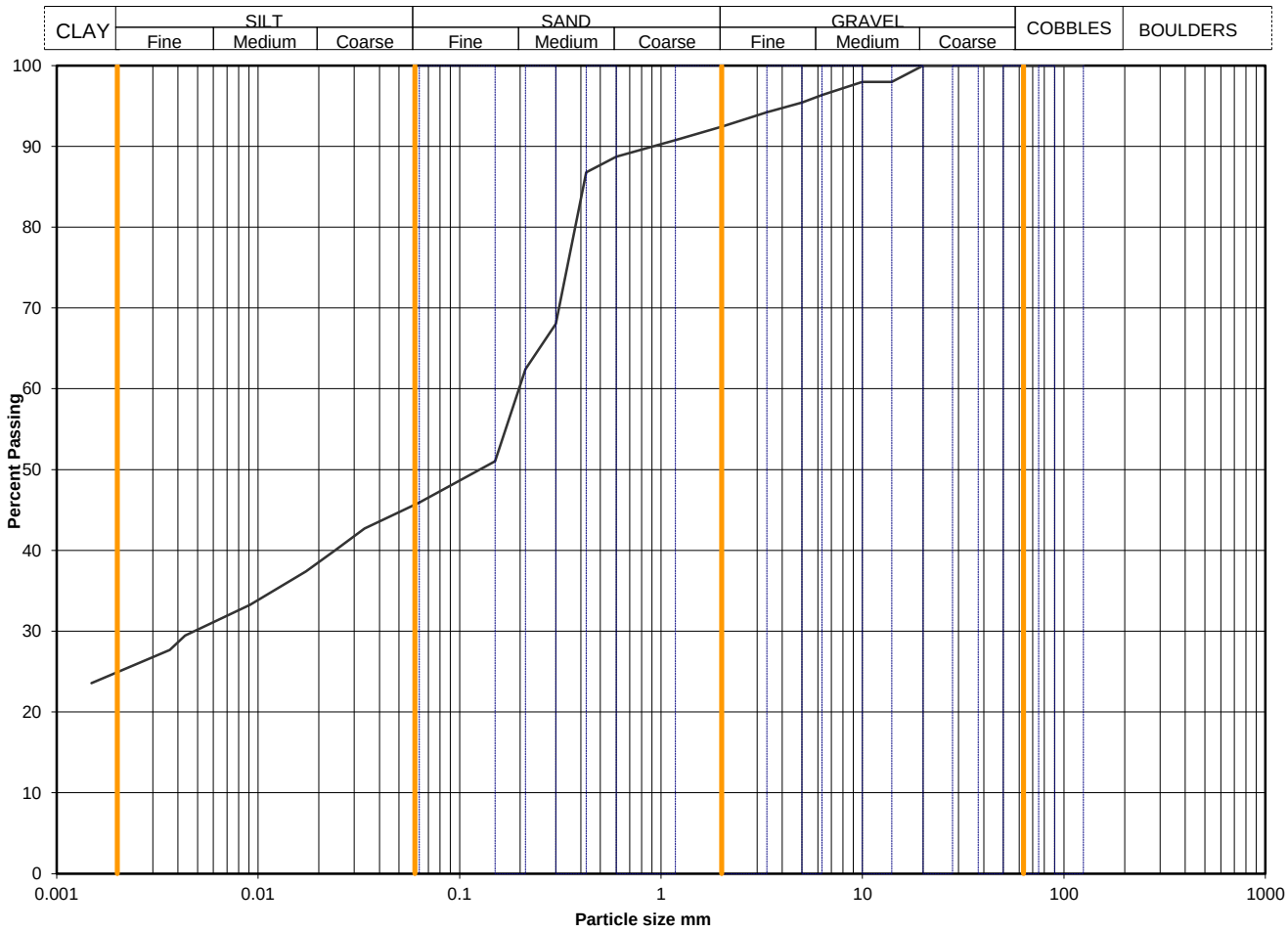
Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:
	A8015-18-20180408083738

Hole No	TT2
Sample Depth (m BGL)	3.25 - 3.50
Sample Type and No	B10
Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	46
90	100	0.0474	44
75	100	0.0338	43
63	100	0.0242	40
50	100	0.0173	37
37.5	100	0.0091	33
28	100	0.0043	29
20	100	0.0036	28
14	98	0.0015	24
10	98		
6.3	96		
5.0	95		
3.35	94		
2.00	92		
1.18	91	Particle density, Mg/m3	
0.600	89		
0.425	87	2.65 assumed	
0.300	68	Dry mass of sample, kg	
0.212	62		
0.150	51	14.0	
0.063	46		

Soil description	Brown slightly gravelly sandy silty CLAY.
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377
Remarks	

Sample Proportions		Whole	*<60mm
	Cobbles / boulders	0	0
	Gravel	8	8
	Sand	46	46
*<60mm values to aid description only	Silt	21	21
	Clay	25	25

Uniformity Coefficient	D60 / D10	Not applicable

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

QA Ref
SLR 2,9
Rev 2.10
Oct 16

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Project No A8015-18

Project Name VPI IMMINGHAM

Figure

PSD

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UNCONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TESTS WITHOUT MEASUREMENT OF PORE PRESSURE - SUMMARY OF RESULTS

Hole No.	Sample No.	Depth (m) from	Depth (m) to	Sample type	Soil Description	Density bulk Mg/m3	Density dry Mg/m3	w %	Test type	Dia. mm	ó3 kPa	At failure / end of stage: Axial strain %	ó1 - ó3 kPa	cu kPa	MODE	Membrane Thickness mm	Remarks
BH1	15	5.00	5.45	UT	Stiff greyish brown slightly sandy slightly gravelly CLAY.	2.21	1.93	15	UUM	99.4 99.4 99.4	100 200 400	11.4 13.4 18.8	203 216 229	101 108 114	P	0.4	
BH1	20	8.00	8.45	UT	Firm greyish brown slightly sandy slightly gravelly CLAY.	2.21	1.92	15	UUM	102.6 102.6 102.6	160 320 640	7.9 10.4 19.8	110 127 163	55 64 82	P	0.4	
BH1	35	17.00	17.45	UT	Very stiff greyish brown slightly sandy slightly gravelly CLAY. Gravel is mainly chalk.	2.23	1.96	14	UUM	103.8	250	19.9	506	253	P	0.4	Sample reached 20% axial strain during 1st stage.
BH1	39	20.00	20.40	UT	Very stiff greyish brown slightly sandy slightly gravelly CLAY. Gravel is chalk.	2.2	1.92	14	UUM UUM	103.6 103.6	250 500	18.4 19.9	524 535	262 268	P	0.4	Sample reached 20% axial strain during 2nd stage.
BH2	7	1.20	1.65	UT	Firm stiff brown slightly sandy slightly gravelly CLAY	2.05	1.71	20	UUM	103.9 103.9 103.9	25 50 100	7.9 9.8 19.1	166 180 213	83 90 106	P	0.4	
BH2	28	5.10	5.55	UT	Firm dark brown slightly sandy slightly gravelly CLAY.	2.16	1.86	16	UUM	102.7 102.7 102.7	100 200 400	2.5 4.5 19.8	33 43 66	17 22 33	P	0.4	
BH2	44	11.00	11.45	UT	Stff greyish brown slightly sandy slightly gravelly CLAY.	2.2	1.91	15	UUM	102.8 102.8 102.8	220 440 880	10.9 12.9 19.9	217 225 254	109 113 127	P	0.4	
BH3	19	9.00	9.45	UT	Firm greyish brown slightly sandy slightly gravelly CLAY. Gravel contains chalk fragments.	2.12	1.81	17	UUMR	102.9 102.9 102.9	180 360 720	5.0 6.9 19.8	81 89 113	41 45 56	P	0.4	
BH4	10	4.50	4.95	UT	Firm to stiff greyish brown slightly sandy slightly gravelly CLAY.	2.19	1.91	14	UUM	102.6 102.6 102.6	90 180 360	10.4 12.3 19.7	220 229 246	110 114 123	P	0.4	
BH4	22	9.00	9.45	UT	Firm to stiff dark brown slightly sandy slightly gravelly CLAY. Gravel contains chalk fragments.	2.16	1.87	15	UUM	95.9 95.9 95.9	180 360 720	5.4 6.9 19.7	100 108 148	50 54 74	P	0.4	
BH5	11	2.30	2.75	UT	Very stiff brown slightly sandy slightly gravelly CLAY. Gravel is chalk fragments.	2.14	1.84	16	UUM	102.5 102.5 102.5	45 90 180	16.3 18.8 19.8	537 541 542	268 270 271	P	0.4	
BH5	27	8.00	8.45	UT	Firm greyish brown slightly sandy slightly gravelly CLAY. Gravel contains chalk.	2.19	1.89	16	UUM	101.9 101.9 101.9	160 320 640	4.0 5.9 18.8	69 83 115	35 41 58	P	0.4	
BH6	6	2.00	2.45	UT	Very stiff brown mottled grey slightly sandy slightly gravelly CLAY. Gravel contains chalk.	2.13	1.82	17	UUM	102.7 102.7 102.7	40 80 160	10.9 12.4 19.8	446 452 480	223 226 240	P	0.4	
BH6	14	6.00	6.45	UT	Firm to stiff greyish brown slightly sandy slightly gravelly CLAY. Gravel contains chalk.	2.2	1.91	15	UUM	102.5 102.5 102.5	120 240 480	4.0 6.4 19.3	109 134 174	54 67 87	P	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

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Project No A8015-18

Project Name VPI IMMINGHAM

Figure

UUSUM

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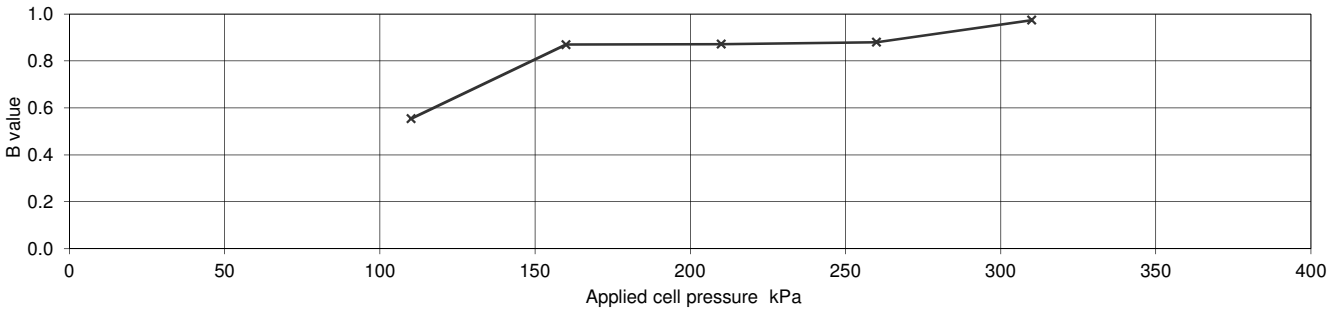
Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	A8015-18	Sample Details:	Hole No	BH1		
Project Name	IMMINGHAM		Depth (m BGL)	1.20 - 1.65		
			No	6	Type	UT
			ID			
			Spec Ref			

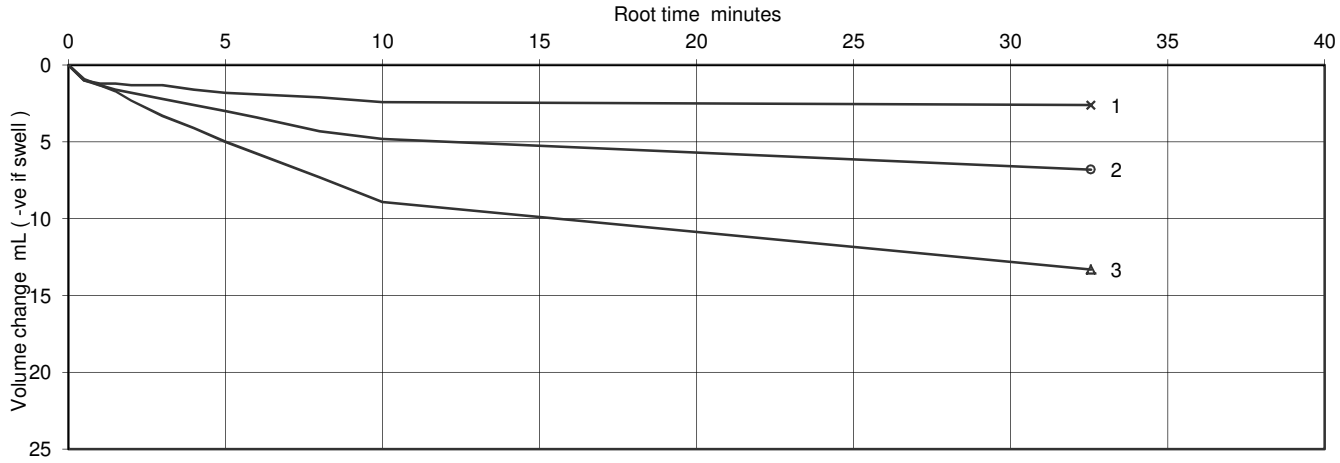
Specimen Details		
Initial		
Length	mm	203.24
Diameter	mm	103.57
Bulk Density	Mg/m³	2.10
Water Content	%	19
Dry density	Mg/m³	1.76
After test		
Bulk Density	Mg/m³	2.08
Water Content	%	20
Dry density	Mg/m³	1.73

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	310
Final pore water pressure	kPa	293.8
Final B Value		0.97



Consolidation Details						
	Drainage Conditions		From radial boundary and one end			
	Stage No.		1	2	3	
	Cell Pressure applied		312	325	350	kPa
	Back Pressure applied		300	300	300	kPa
	Effective Pressure		12	25	50	kPa
	Pore pressure at start of consolidation		303	308	324	kPa
	Pore pressure at end of consolidation		301	300	300	kPa
	Pore pressure dissipation at end of consolidation		70	95	100	%
Consolidation parameters (see note to BS1377 : pt 8, clause 6.3.4)	Coefficient of Consolidation	C_{vi}	2.12	1.17	1.08	m^2/year
	Coefficient of Compressibility	M_{vi}	0.67	0.48	0.32	m^2/MN
	Coefficient of Permeability (calculated)	k_{vi}	4.4E-10	1.7E-10	1.1E-10	m/s



Ref		Figure
SLR8.1 Rev 86.0 Feb18	Printed:20/07/2018 10:42	CUM
		sheet 1 of 3

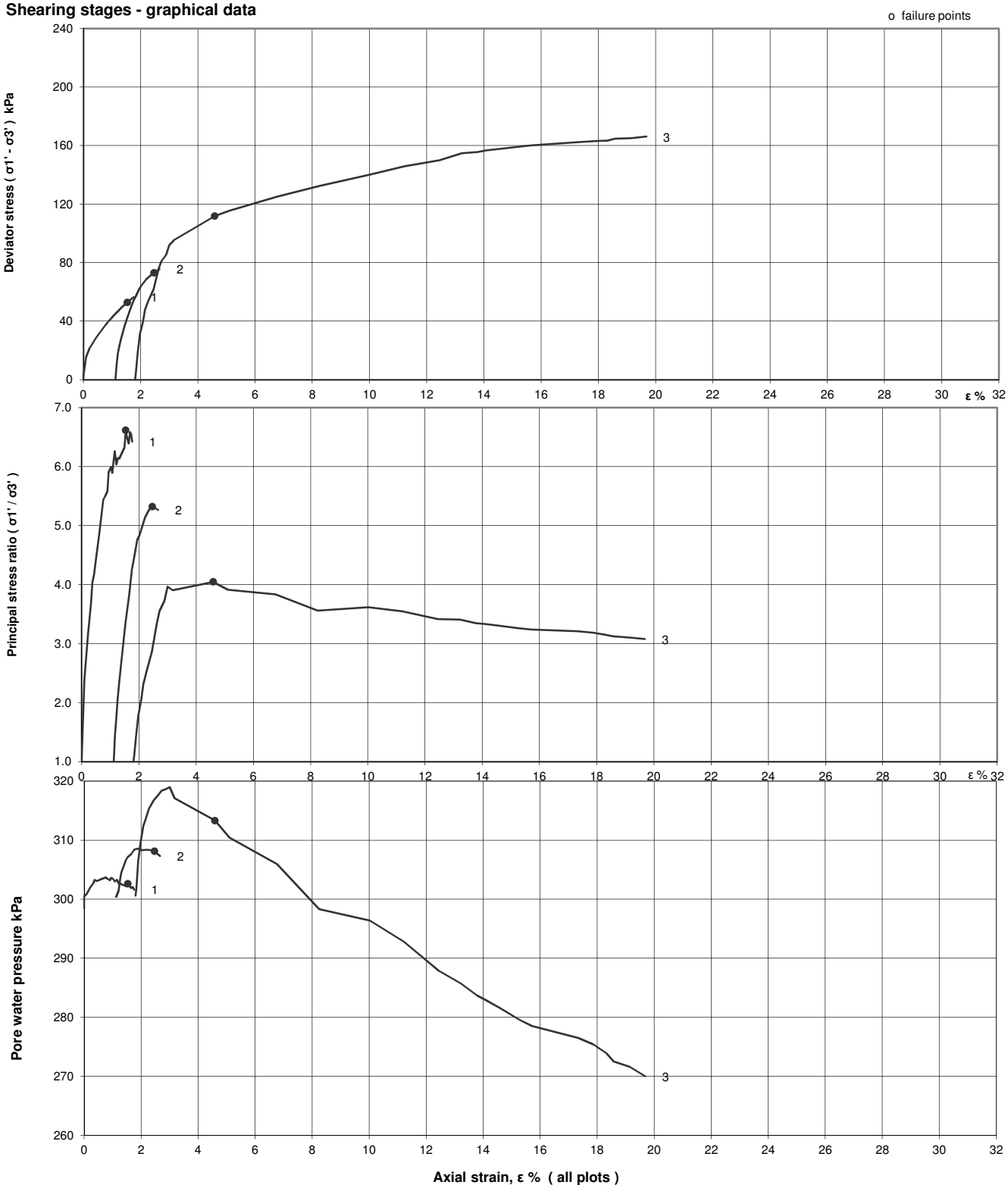
SOCOTEC

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	A8015-18	Sample Details:	Hole No	BH1		
Project Name	IMMINGHAM		Depth (m BGL)	1.20 - 1.65		
			No	6	Type	UT
			ID			
			Spec Ref			

Shearing stages - graphical data

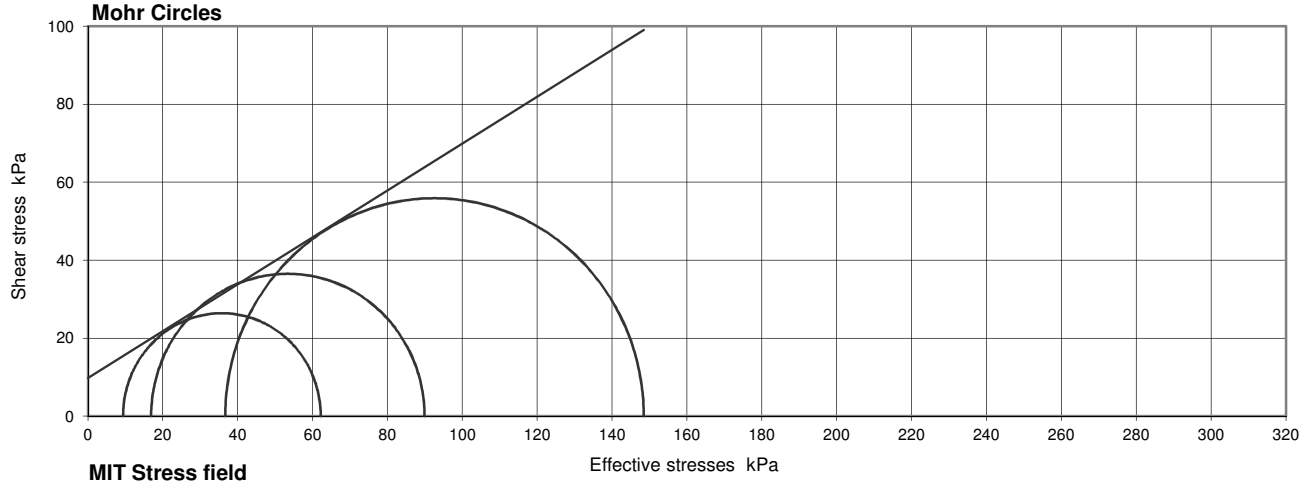


Ref			Figure
SLR8.1 Rev 86.0 Feb18	SOCOTEC UKAS TESTING 1157	Printed:20/07/2018 10:42	**CUM** sheet 2 of 3

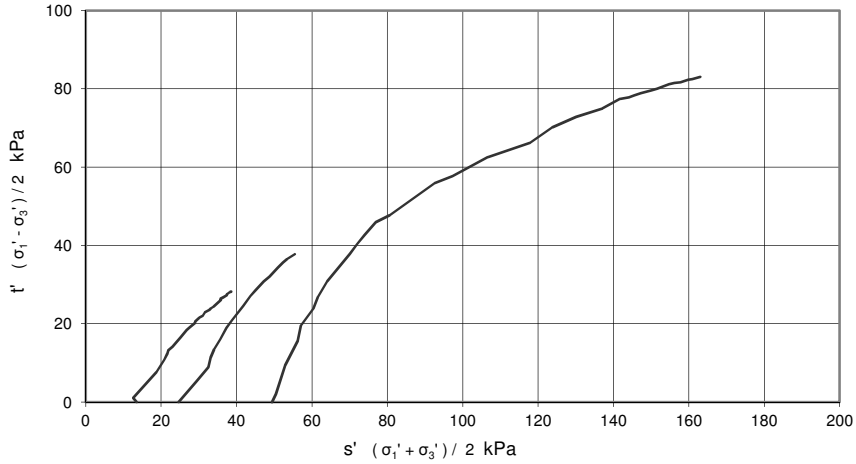
Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	A8015-18	Sample Details:	Hole No	BH1		
Project Name	IMMINGHAM		Depth (m BGL)	1.20 - 1.65		
			No	6	Type	UT
			ID			
			Spec Ref			

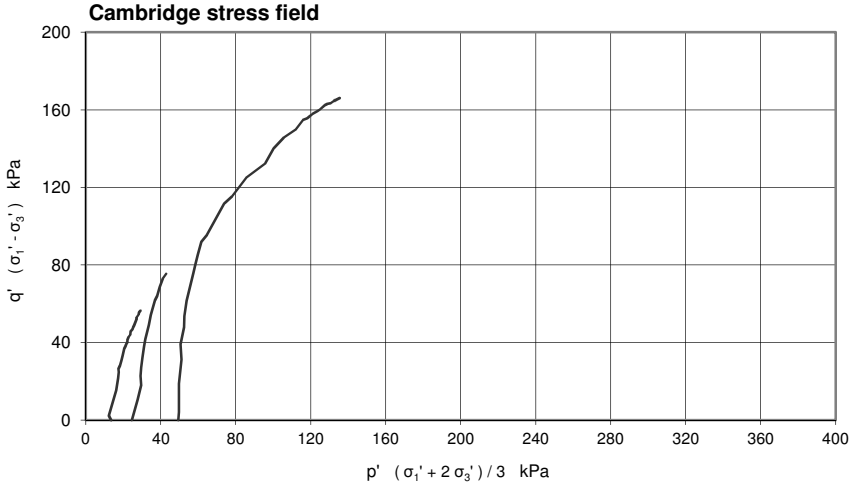
Mohr Circles



MIT Stress field



Cambridge stress field



Compression stages

Stage	1	2	3	
Cell pressure	312	325	350	kPa
Initial pwp	299	300	301	kPa
Initial σ_3'	14	25	49	kPa
Rate of strain	1.51	1.51	1.51	%/hr

Failure conditions

Criterion	Maximum effective principal stress ratio			
Axial strain	1.54	2.47	4.60	%
$(\sigma_1' / \sigma_3')_f$	6.616	5.321	4.046	
$(\sigma_1' - \sigma_3')_f$	52.8	73.0	111.8	kPa
u_f	303	308	313	kPa
$\sigma_3'_f$	9	17	37	kPa
$\sigma_1'_f$	62	90	148	kPa
A_f	0.08	0.11	0.11	
Time to failure	1.0	1.6	3.0	hrs

Shear Strength Parameters

at peak stress ratio

		Linear regression
c '	kPa	9.8
Ø '	degrees	31.0
		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)

Ref			Figure
SLR8.1 Rev 86.0 Feb18	SOCOTEC UKAS TESTING 1157	Printed:20/07/2018 10:42	**CUM** sheet 3 of 3

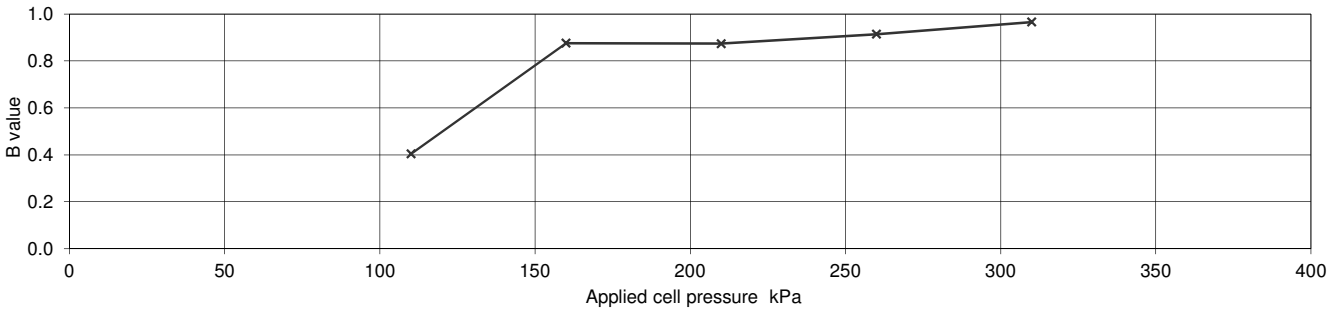
Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	A8015-18	Sample Details:	Hole No	BH2		
Project Name	IMMINGHAM		Depth (m BGL)	3.30 - 3.75		
			No	15	Type	UT
			ID			
			Spec Ref			

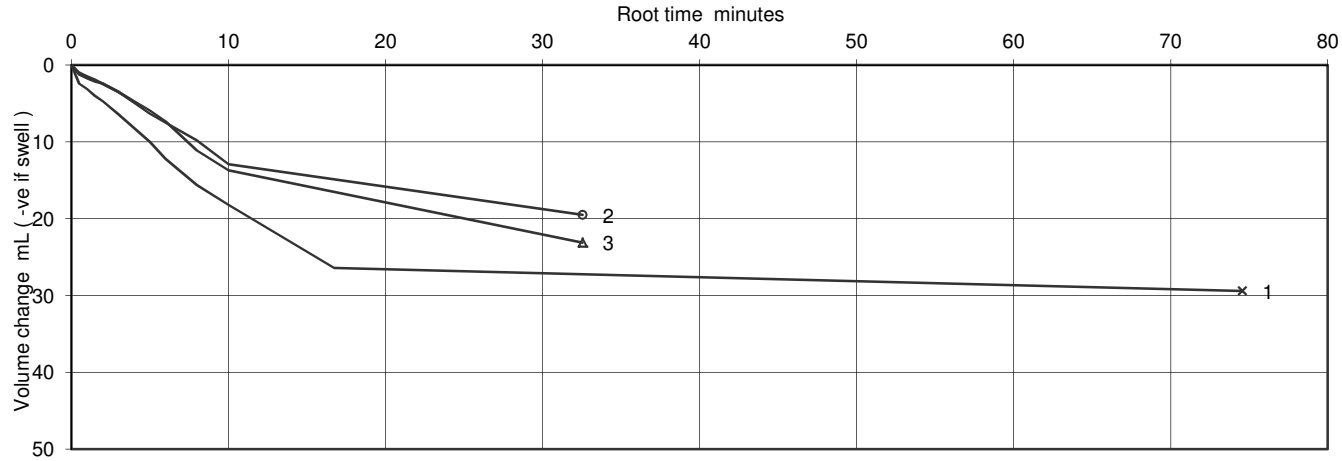
Specimen Details		
Initial		
Length	mm	202.89
Diameter	mm	103.07
Bulk Density	Mg/m³	2.03
Water Content	%	25
Dry density	Mg/m³	1.63
After test		
Bulk Density	Mg/m³	2.04
Water Content	%	24
Dry density	Mg/m³	1.64

Soil Description	Firm 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	310
Final pore water pressure	kPa	300
Final B Value		0.97



Consolidation Details	Drainage Conditions		From radial boundary and one end			
	Stage No.		1	2	3	
	Cell Pressure applied		355	410	520	kPa
	Back Pressure applied		300	300	300	kPa
	Effective Pressure		55	110	220	kPa
	Pore pressure at start of consolidation		348	365	419	kPa
	Pore pressure at end of consolidation		301	301	302	kPa
	Pore pressure dissipation at end of consolidation		97	99	98	%
Consolidation parameters (see note to BS1377 : pt 8, clause 6.3.4)	Coefficient of Consolidation	C_{vi}	0.97	0.94	0.93	m^2/year
	Coefficient of Compressibility	M_{vi}	0.36	0.18	0.12	m^2/MN
	Coefficient of Permeability (calculated)	k_{vi}	1.1E-10	5.1E-11	3.3E-11	m/s

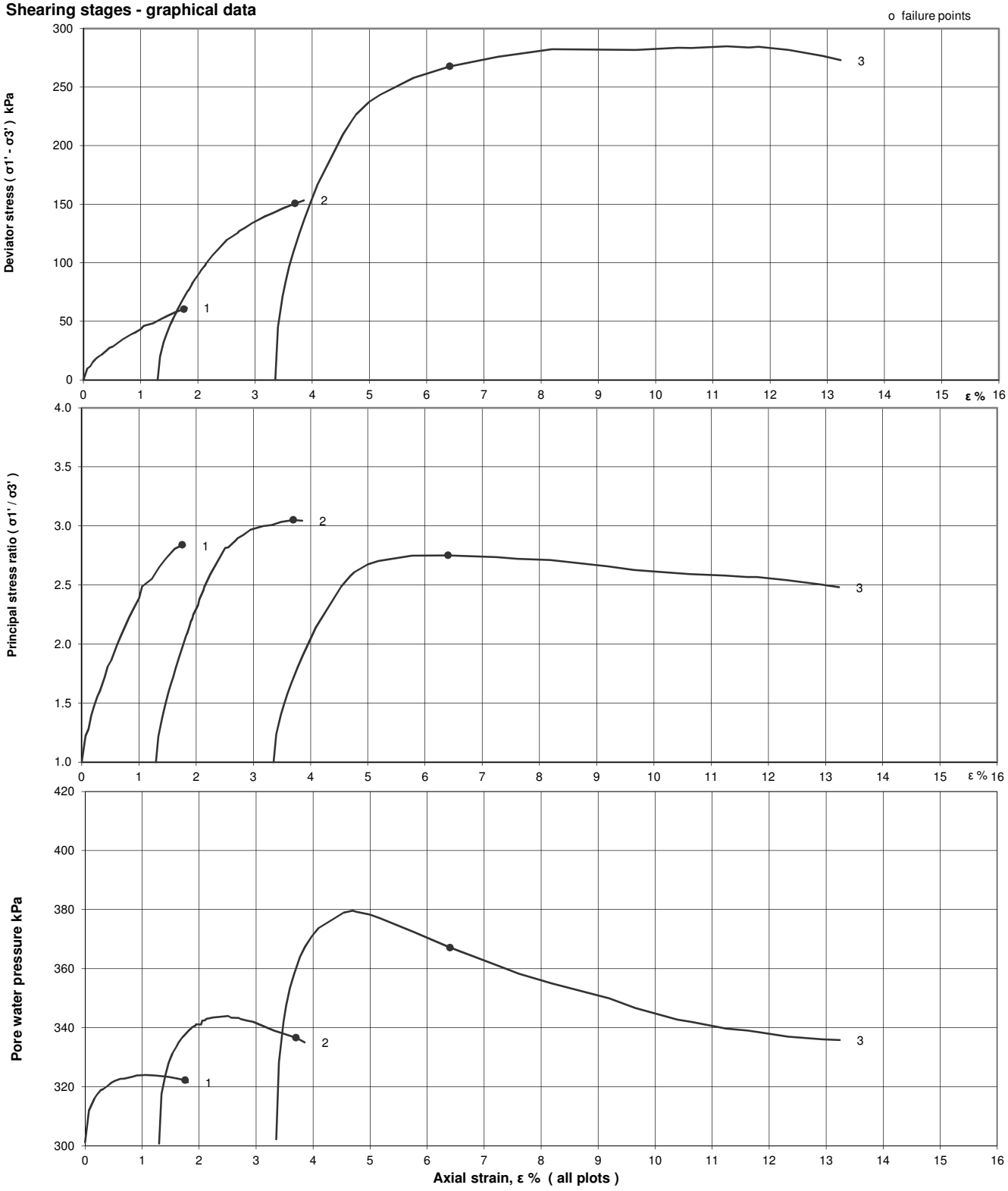


Ref			Figure
SLR8.1 Rev 86.0 Feb18	SOCOTEC	UKAS TESTING 1157	Printed:20/07/2018 10:43	CUM sheet 1 of 3

Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	A8015-18	Sample Details:	Hole No	BH2		
Project Name	IMMINGHAM		Depth (m BGL)	3.30 - 3.75		
			No	15	Type	UT
			ID			
			Spec Ref			

Shearing stages - graphical data

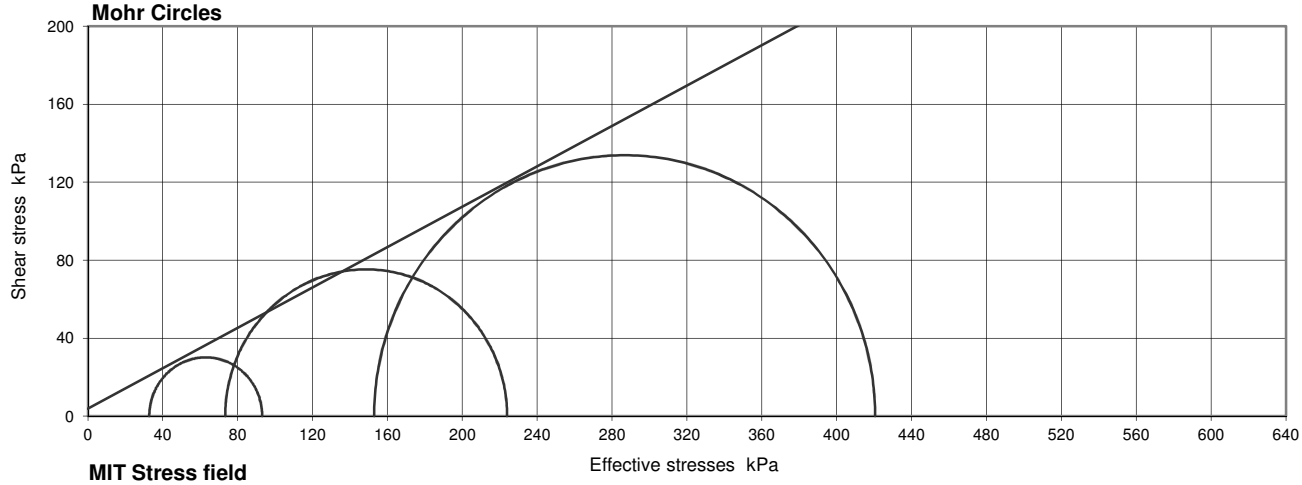


Ref			Figure
SLR8.1 Rev 86.0 Feb18	SOCOTEC 1157	Printed:20/07/2018 10:43	**CUM** sheet 2 of 3

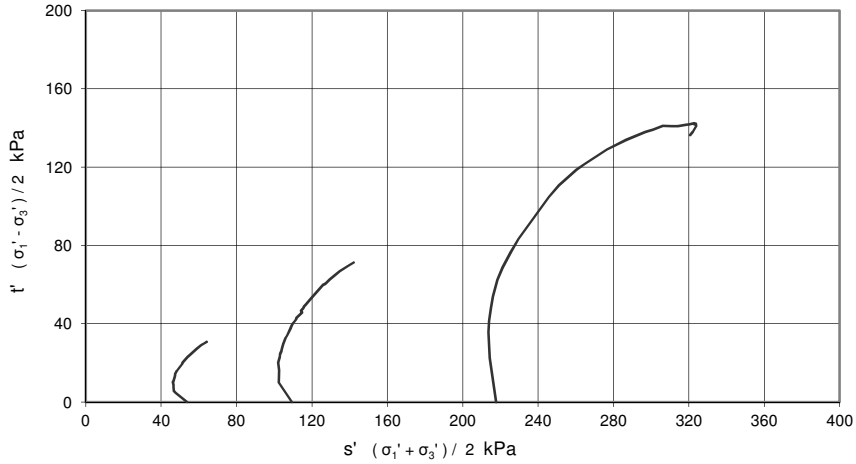
Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure
(BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	A8015-18	Sample Details:	Hole No	BH2		
Project Name	IMMINGHAM		Depth (m BGL)	3.30 - 3.75		
			No	15	Type	UT
			ID			
			Spec Ref			

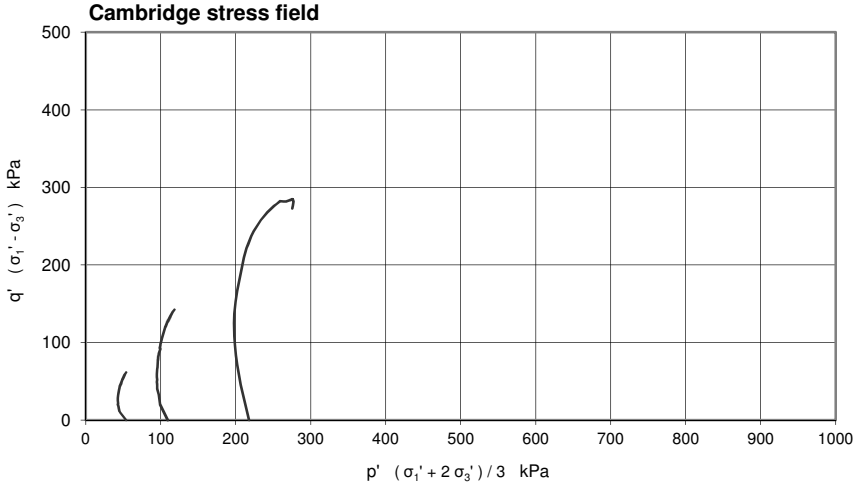
Mohr Circles



MIT Stress field



Cambridge stress field



Compression stages

Stage	1	2	3	
Cell pressure	355	410	520	kPa
Initial pwp	301	301	302	kPa
Initial σ_3'	54	109	218	kPa
Rate of strain	0.71	0.71	0.71	%/hr

Failure conditions

Criterion	Maximum effective principal stress ratio			
Axial strain	1.76	3.70	6.40	%
$(\sigma_1' / \sigma_3')_f$	2.839	3.051	2.751	
$(\sigma_1' - \sigma_3')_f$	60.3	150.5	267.7	kPa
u_f	322	337	367	kPa
$\sigma_3'_f$	33	73	153	kPa
$\sigma_1'_f$	93	224	421	kPa
A_f	0.35	0.24	0.24	
Time to failure	2.5	5.2	9.0	hrs

Shear Strength Parameters

at peak stress ratio

		Linear regression
c '	kPa	3.8
Ø '	degrees	27.4
		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)

Ref			Figure
SLR8.1 Rev 86.0 Feb18	SOCOTEC UKAS TESTING 1157	Printed:20/07/2018 10:43	**CUM** sheet 3 of 3

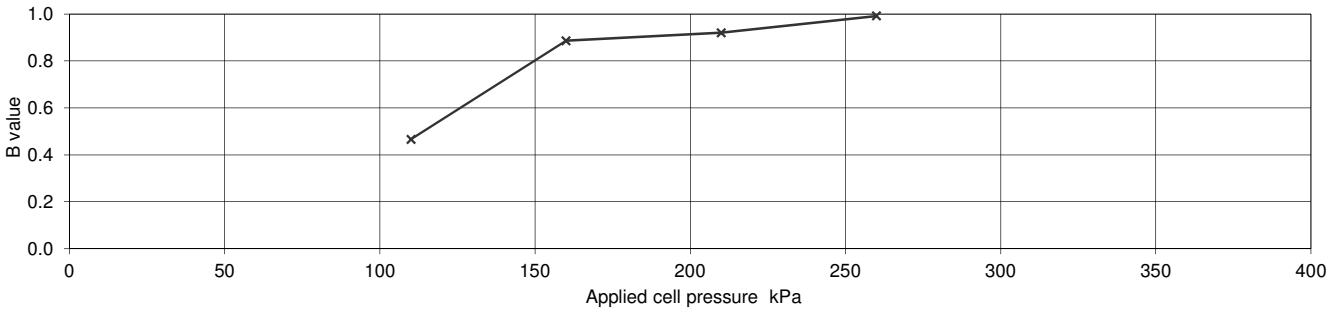
Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	A8015-18	Sample Details:	Hole No	BH3		
Project Name	IMMINGHAM		Depth (m BGL)	5 - 5.45		
			No	10	Type	UT
			ID			
			Spec Ref			

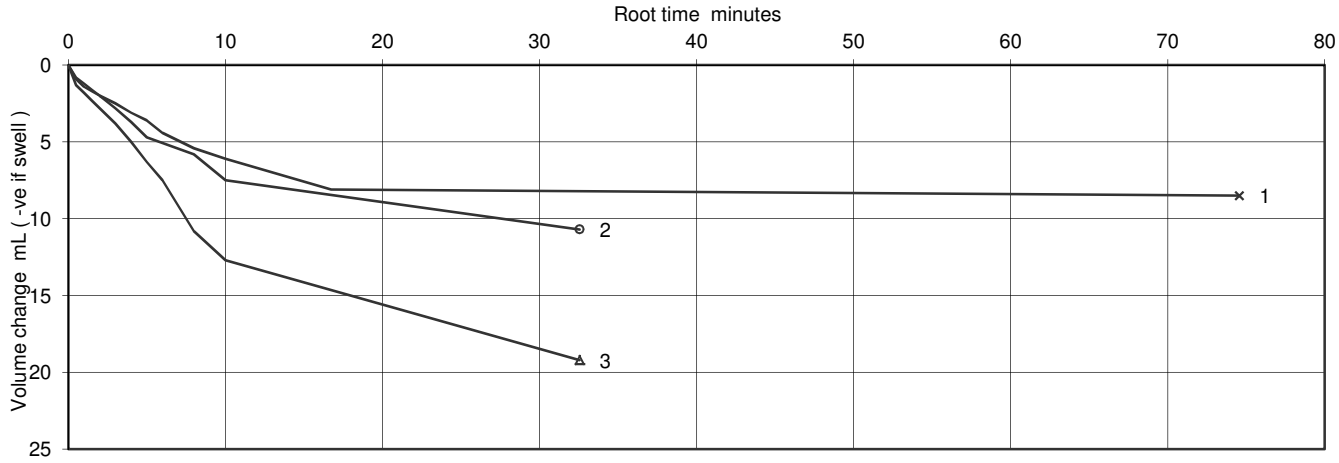
Specimen Details		
Initial		
Length	mm	203.48
Diameter	mm	102.37
Bulk Density	Mg/m³	2.19
Water Content	%	20
Dry density	Mg/m³	1.82
After test		
Bulk Density	Mg/m³	2.26
Water Content	%	16
Dry density	Mg/m³	1.94

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	260
Final pore water pressure	kPa	237.3
Final B Value		0.99



Consolidation Details						
	Drainage Conditions		From radial boundary and one end			
	Stage No.		1	2	3	
	Cell Pressure applied		335	370	440	kPa
	Back Pressure applied		300	300	300	kPa
	Effective Pressure		35	70	140	kPa
	Pore pressure at start of consolidation		314	327	383	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}	1.30	0.95	0.84	m^2/year
	Coefficient of Compressibility	M_{vi}	0.39	0.25	0.15	m^2/MN
	Coefficient of Permeability (calculated)	k_{vi}	1.6E-10	7.4E-11	3.9E-11	m/s

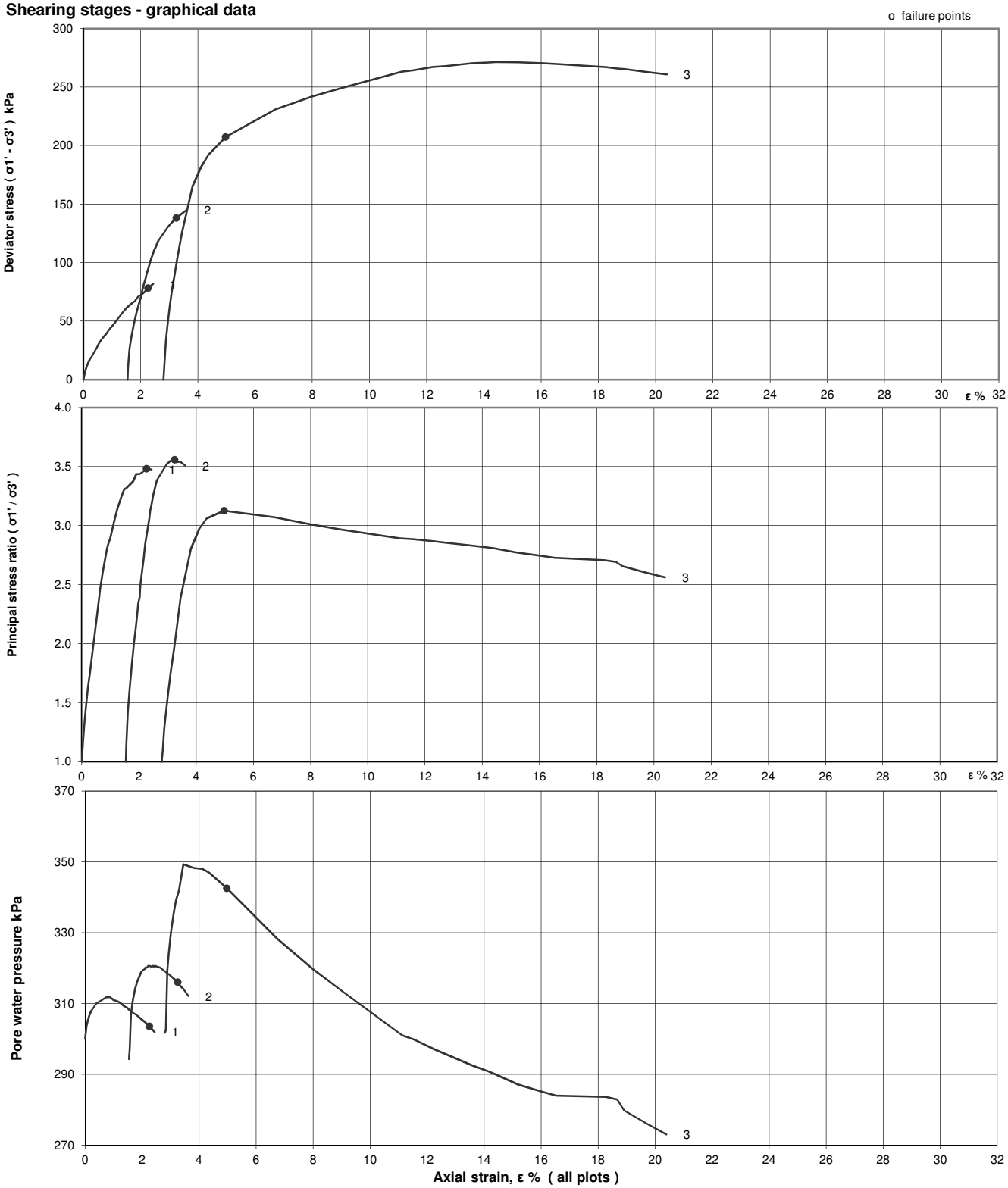


Ref			Figure
SLR8.1 Rev 86.0 Feb18	SOCOTEC	Printed:20/07/2018 10:43	CUM
	UKAS TESTING 1157		sheet 1 of 3

Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	A8015-18	Sample Details:	Hole No	BH3		
Project Name	IMMINGHAM		Depth (m BGL)	5 - 5.45		
			No	10	Type	UT
			ID			
			Spec Ref			

Shearing stages - graphical data

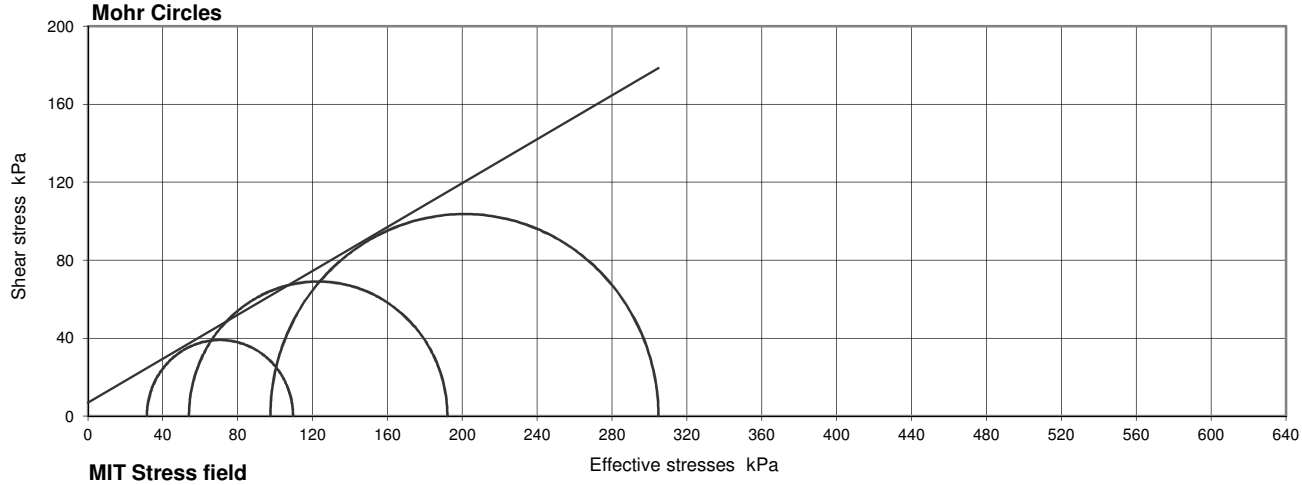


Ref			Figure
SLR8.1 Rev 86.0 Feb18	SOCOTEC 1157	Printed:20/07/2018 10:43	**CUM** sheet 2 of 3

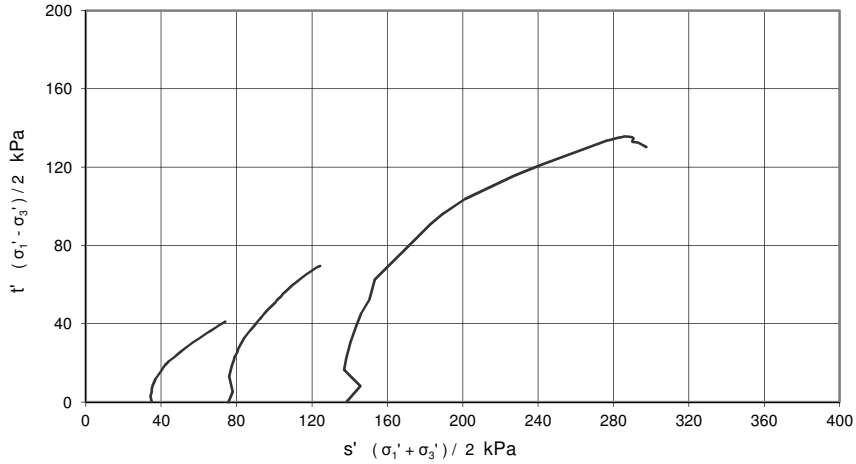
Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure
(BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	A8015-18	Sample Details:	Hole No	BH3		
Project Name	IMMINGHAM		Depth (m BGL)	5 - 5.45		
			No	10	Type	UT
			ID			
			Spec Ref			

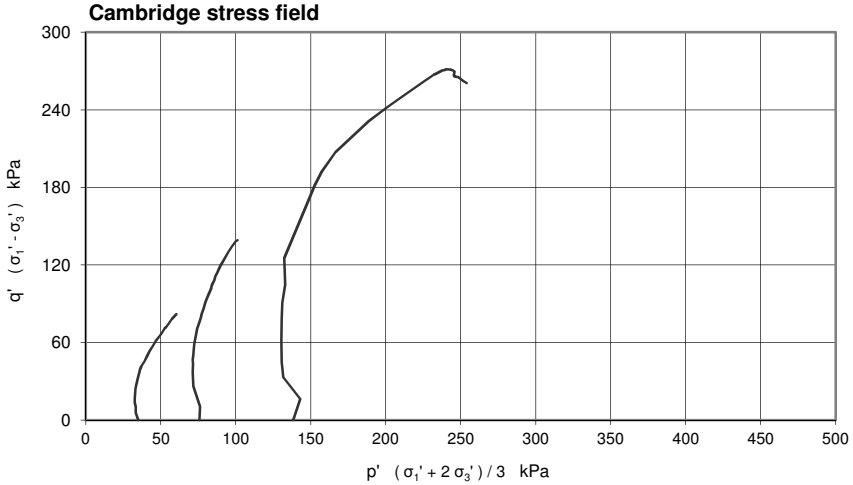
Mohr Circles



MIT Stress field



Cambridge stress field



Compression stages

Stage	1	2	3	
Cell pressure	335	370	440	kPa
Initial pwp	300	294	302	kPa
Initial σ_3'	35	76	138	kPa
Rate of strain	1.02	1.02	1.02	%/hr

Failure conditions

Criterion	Maximum effective principal stress ratio			
Axial strain	2.26	3.25	4.98	%
$(\sigma_1' / \sigma_3')_f$	3.480	3.556	3.126	
$(\sigma_1' - \sigma_3')_f$	78.1	138.0	207.3	kPa
u_f	304	316	343	kPa
$\sigma_3'_f$	32	54	98	kPa
$\sigma_1'_f$	110	192	305	kPa
A_f	0.04	0.16	0.20	
Time to failure	2.2	3.2	4.9	hrs

Shear Strength Parameters

at peak stress ratio

		Linear regression
c '	kPa	6.9
Ø '	degrees	29.4
		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:20/07/2018 10:43	**CUM** sheet 3 of 3

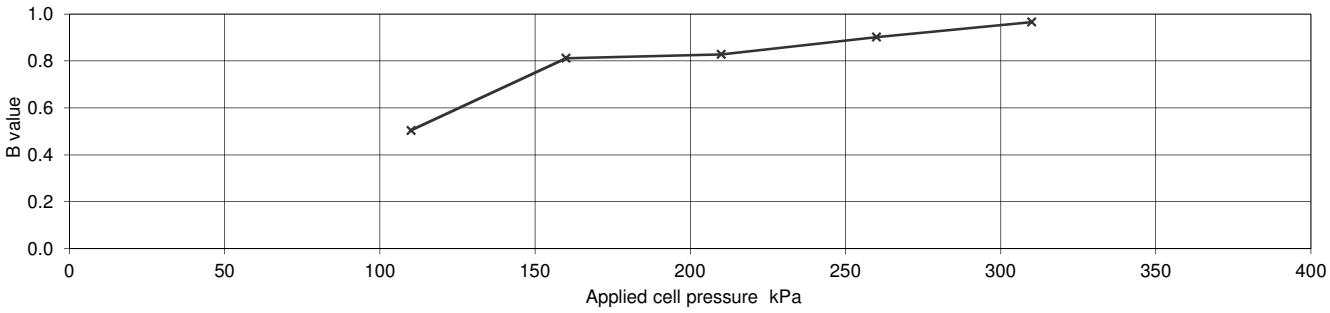
Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	A8015-18	Sample Details:	Hole No	BH4		
Project Name	IMMINGHAM		Depth (m BGL)	7.50 - 7.95		
			No	18	Type	UT
			ID			
			Spec Ref			

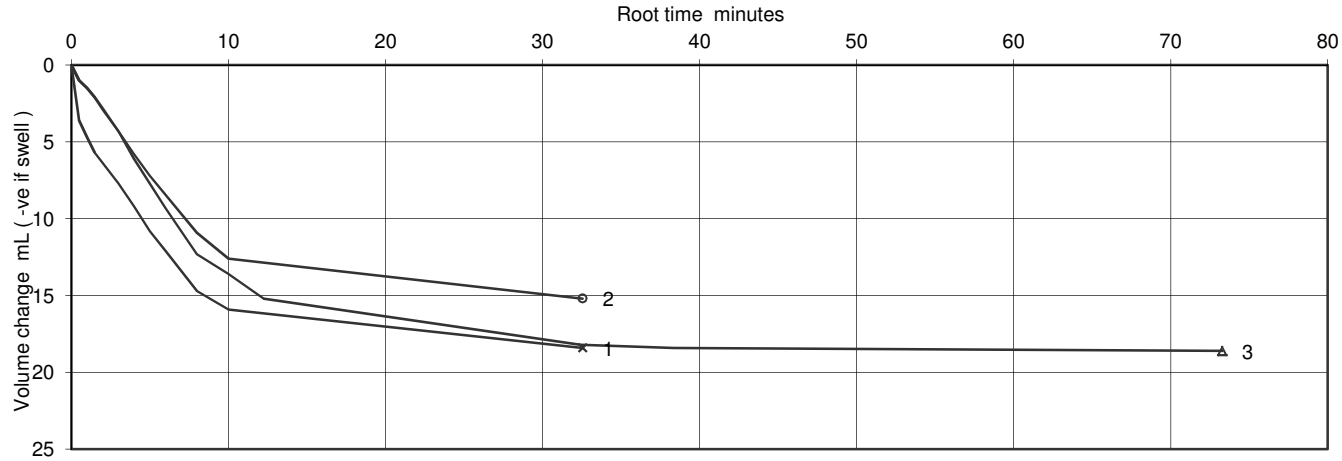
Specimen Details		
Initial		
Length	mm	203.49
Diameter	mm	103.68
Bulk Density	Mg/m³	2.22
Water Content	%	14
Dry density	Mg/m³	1.95
After test		
Bulk Density	Mg/m³	2.23
Water Content	%	13
Dry density	Mg/m³	1.97

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	310
Final pore water pressure	kPa	287.6
Final B Value		0.97



Consolidation Details	Drainage Conditions		From radial boundary and one end			
	Stage No.		1	2	3	
	Cell Pressure applied		365	430	560	kPa
	Back Pressure applied		300	300	300	kPa
	Effective Pressure		65	130	260	kPa
	Pore pressure at start of consolidation		347	374	457	kPa
	Pore pressure at end of consolidation		303	300	302	kPa
	Pore pressure dissipation at end of consolidation		94	100	99	%
Consolidation parameters (see note to BS1377 : pt 8, clause 6.3.4)	Coefficient of Consolidation	C_{vi}	2.17	2.09	1.63	m^2/year
	Coefficient of Compressibility	M_{vi}	0.24	0.12	0.07	m^2/MN
	Coefficient of Permeability (calculated)	k_{vi}	1.6E-10	7.7E-11	3.5E-11	m/s

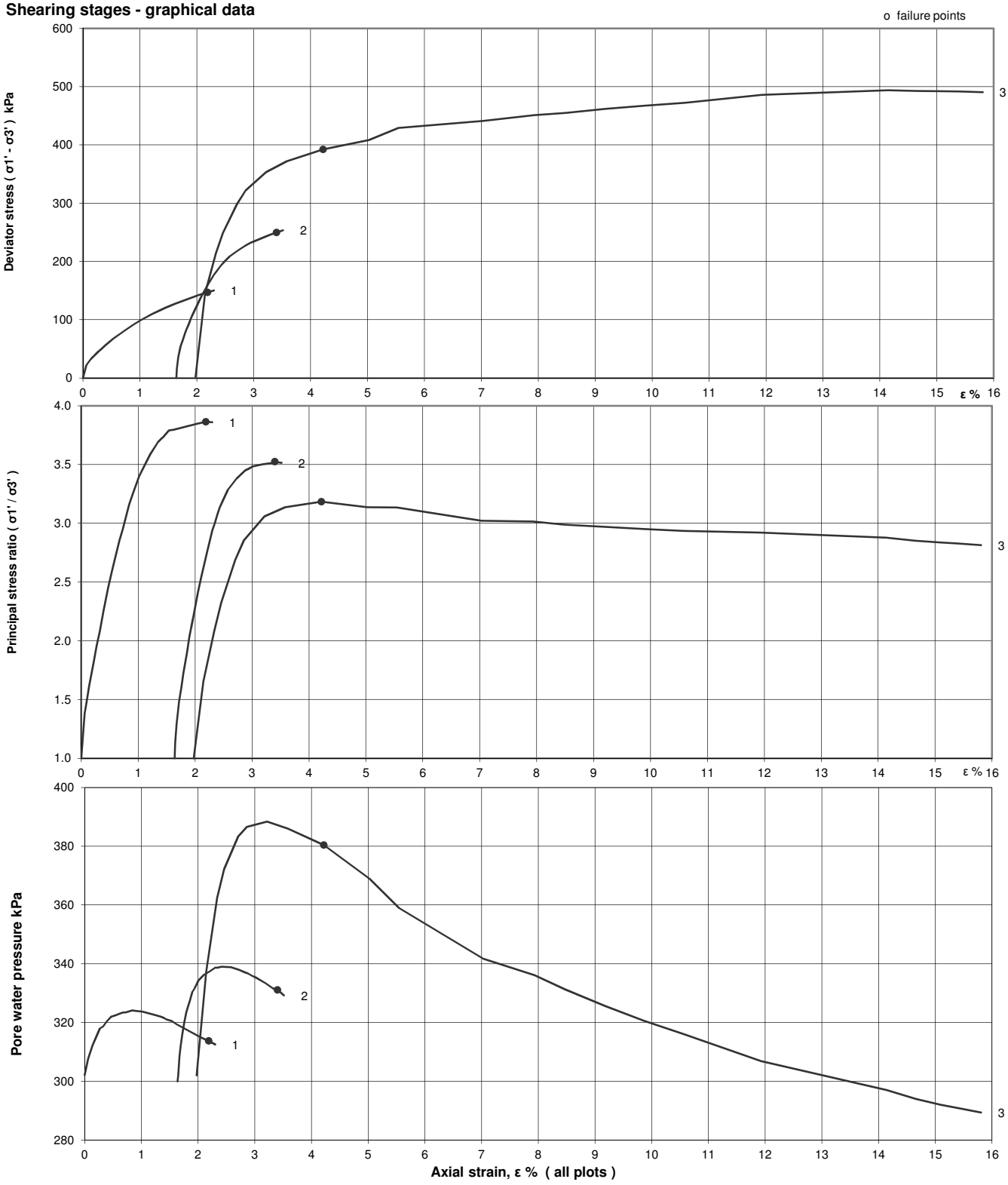


Ref			Figure
SLR8.1 Rev 86.0 Feb18	SOCOTEC	1157	CUM
	Printed:20/07/2018 10:44		sheet 1 of 3

Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	A8015-18	Sample Details:	Hole No	BH4		
Project Name	IMMINGHAM		Depth (m BGL)	7.50 - 7.95		
			No	18	Type	UT
			ID			
			Spec Ref			

Shearing stages - graphical data

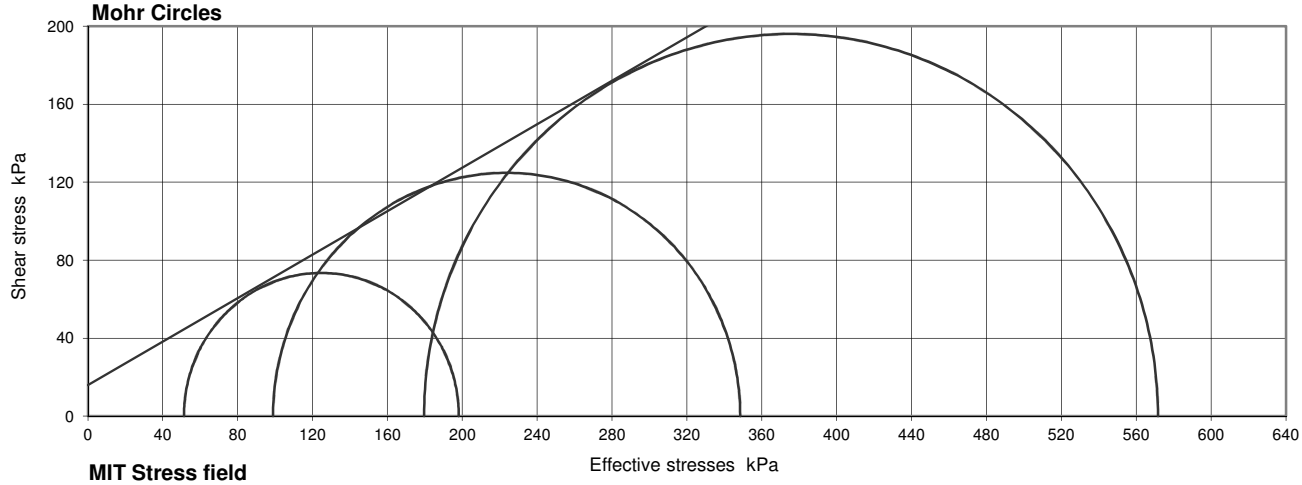


Ref			Figure
SLR8.1 Rev 86.0 Feb18	SOCOTEC	1157	Printed:20/07/2018 10:44	**CUM** sheet 2 of 3

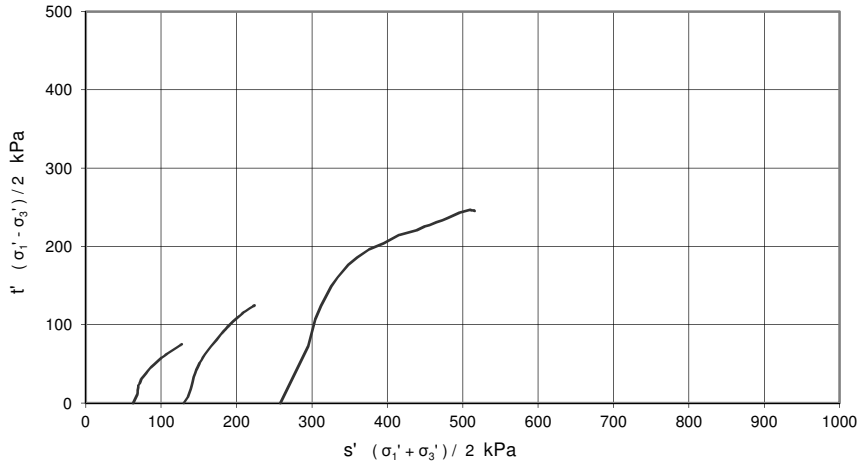
Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure
(BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	A8015-18	Sample Details:	Hole No	BH4		
Project Name	IMMINGHAM		Depth (m BGL)	7.50 - 7.95		
			No	18	Type	UT
			ID			
			Spec Ref			

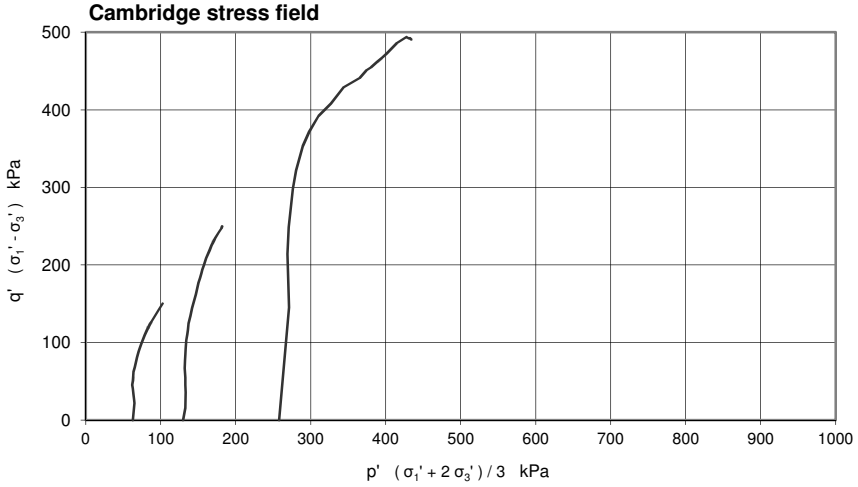
Mohr Circles



MIT Stress field



Cambridge stress field



Compression stages

Stage	1	2	3	
Cell pressure	365	430	560	kPa
Initial pwp	302	300	302	kPa
Initial σ_3'	63	130	258	kPa
Rate of strain	1.56	1.56	1.56	%/hr

Failure conditions

Criterion	Maximum effective principal stress ratio			
Axial strain	2.19	3.40	4.22	%
$(\sigma_1' / \sigma_3')_f$	3.863	3.523	3.183	
$(\sigma_1' - \sigma_3')_f$	146.9	249.6	392.0	kPa
u_f	314	331	380	kPa
$\sigma_3'_f$	51	99	180	kPa
$\sigma_1'_f$	198	348	572	kPa
A_f	0.08	0.12	0.20	
Time to failure	1.4	2.2	2.7	hrs

Shear Strength Parameters

at peak stress ratio

		Linear regression
c '	kPa	15.9
Ø '	degrees	29.1
		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:20/07/2018 10:44	**CUM** sheet 3 of 3

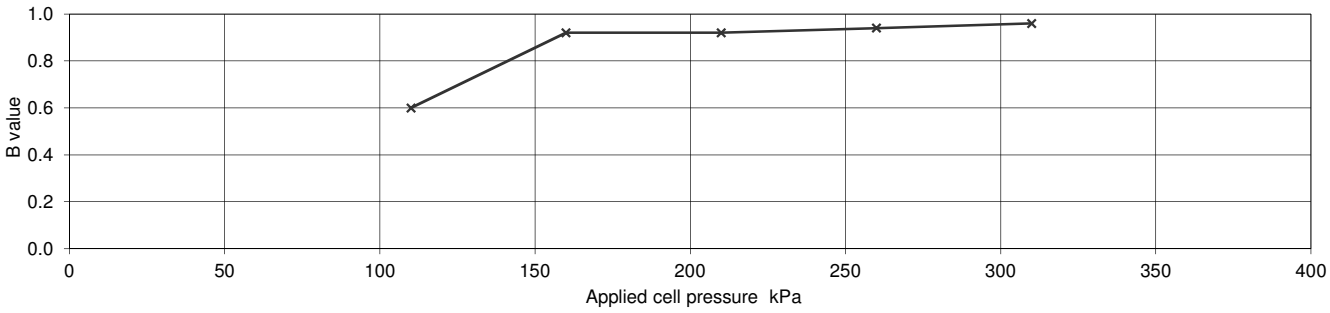
Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	A8015-18	Sample Details:	Hole No	BH5		
Project Name	IMMINGHAM		Depth (m BGL)	11 - 11.45		
			No	35	Type	UT
			ID			
			Spec Ref			

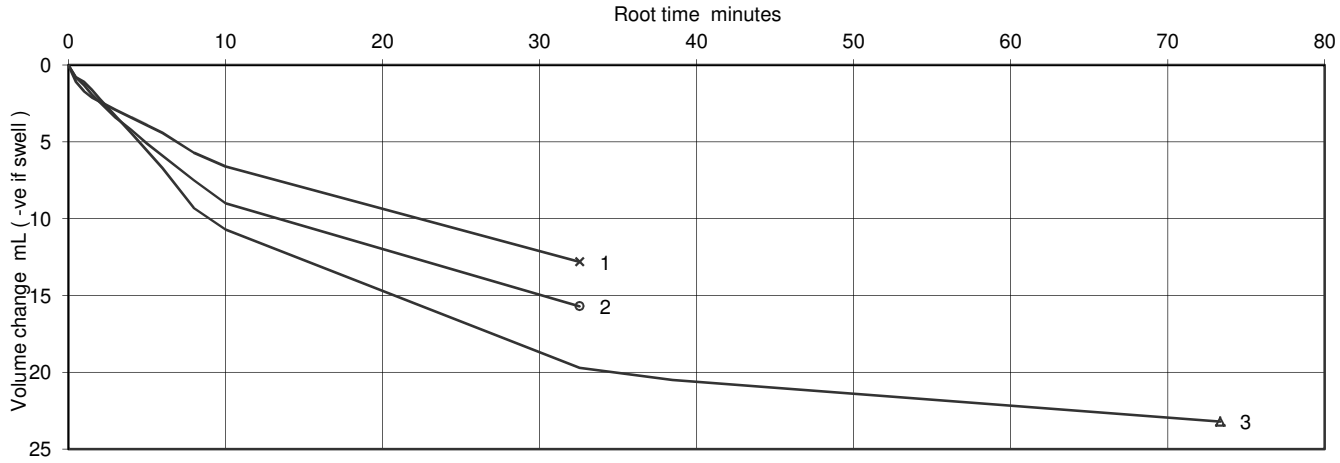
Specimen Details		
Initial		
Length	mm	203.00
Diameter	mm	103.08
Bulk Density	Mg/m³	2.16
Water Content	%	17
Dry density	Mg/m³	1.84
After test		
Bulk Density	Mg/m³	2.17
Water Content	%	17
Dry density	Mg/m³	1.85

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	310
Final pore water pressure	kPa	295
Final B Value		0.96



Consolidation Details	Drainage Conditions		From radial boundary and one end			
	Stage No.		1	2	3	
	Cell Pressure applied		327	355	410	kPa
	Back Pressure applied		300	300	300	kPa
	Effective Pressure		27	55	110	kPa
	Pore pressure at start of consolidation		319	334	369	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}	0.68	0.76	0.57	m^2/year
	Coefficient of Compressibility	M_{vi}	0.39	0.27	0.20	m^2/MN
	Coefficient of Permeability (calculated)	k_{vi}	8.2E-11	6.3E-11	3.4E-11	m/s



Ref		Figure
SLR8.1 Rev 86.0 Feb18	Printed:20/07/2018 10:44	CUM
		sheet 1 of 3

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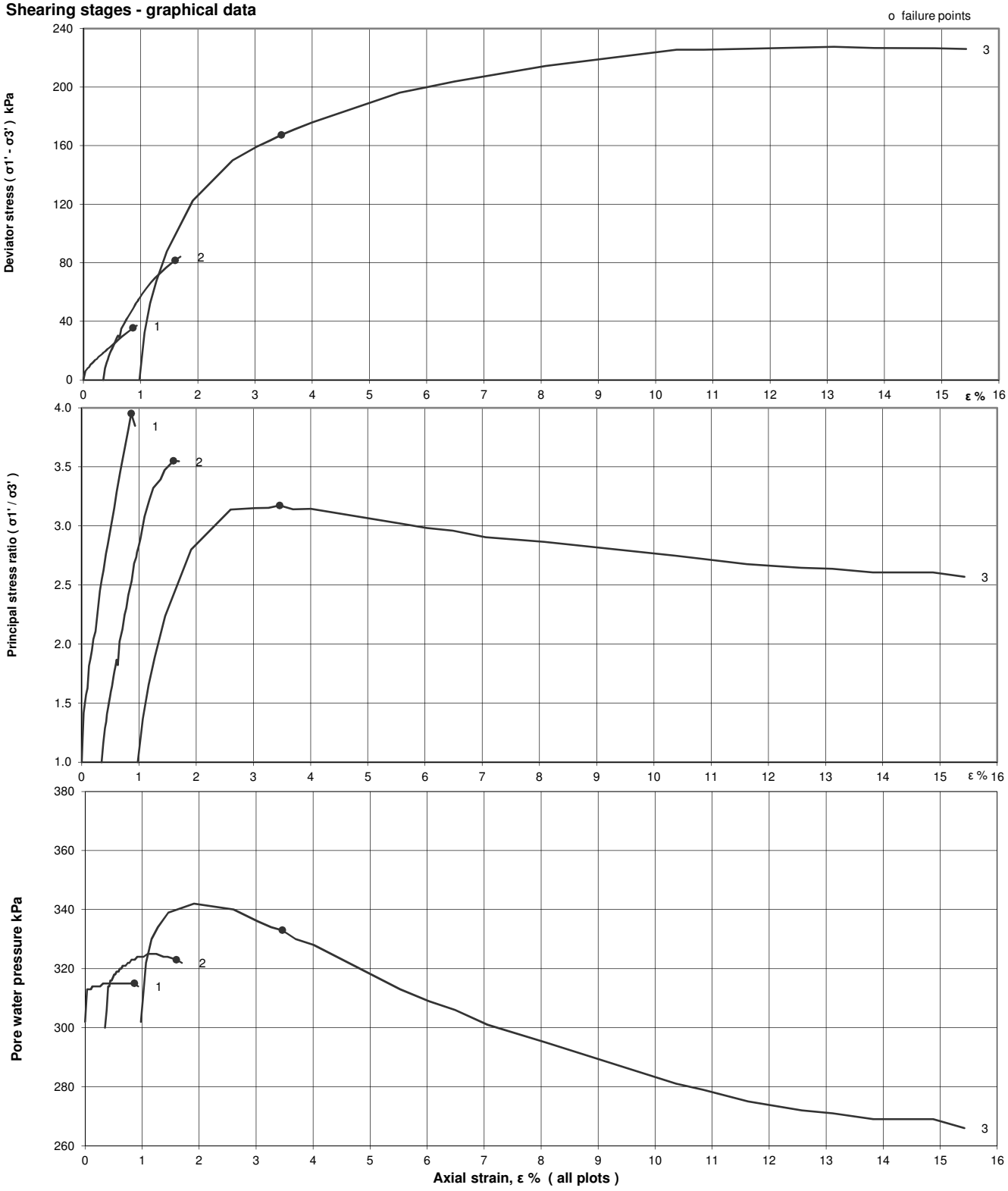
Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	A8015-18	Sample Details:	Hole No	BH5		
Project Name	IMMINGHAM		Depth (m BGL)	11 - 11.45		
			No	35	Type	UT
			ID			
			Spec Ref			

Shearing stages - graphical data

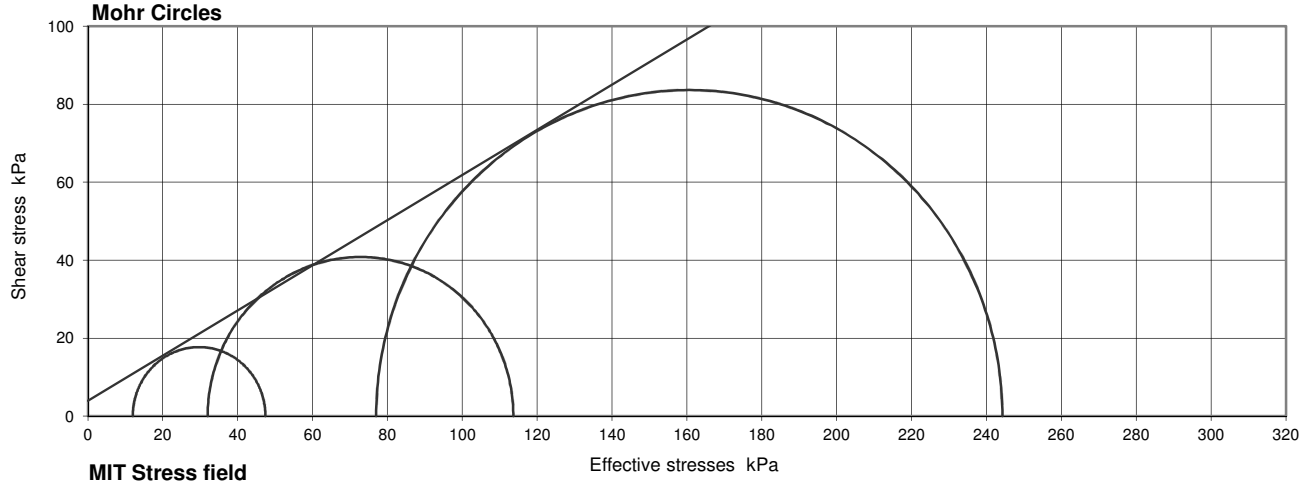


Ref			Figure
SLR8.1 Rev 86.0 Feb18	SOCOTEC UKAS TESTING 1157	Printed:20/07/2018 10:44	**CUM** sheet 2 of 3

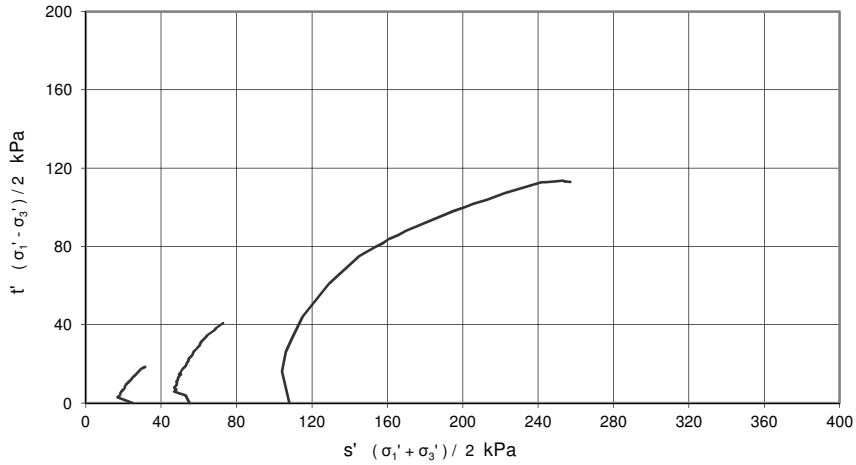
Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	A8015-18	Sample Details:	Hole No	BH5		
Project Name	IMMINGHAM		Depth (m BGL)	11 - 11.45		
			No	35	Type	UT
			ID			
			Spec Ref			

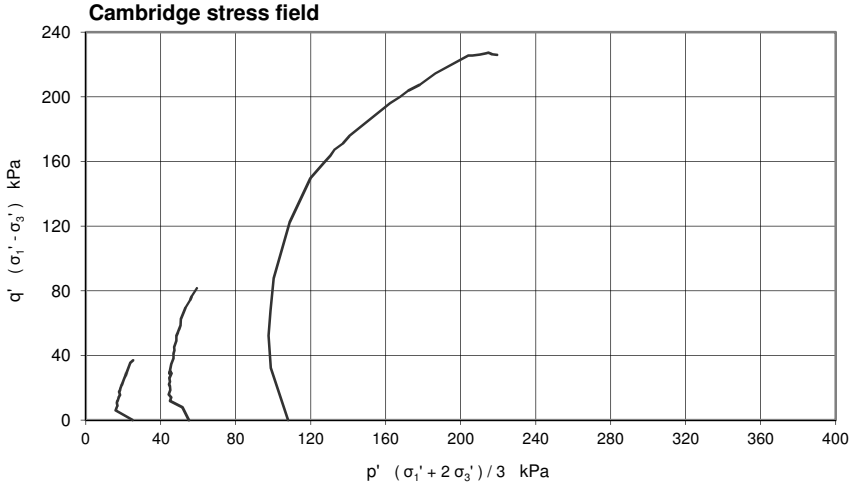
Mohr Circles



MIT Stress field



Cambridge stress field



Compression stages

Stage	1	2	3	
Cell pressure	327	355	410	kPa
Initial pwp	302	300	302	kPa
Initial σ_3'	25	55	108	kPa
Rate of strain	0.50	0.50	0.50	%/hr

Failure conditions

Criterion	Maximum effective principal stress ratio			
Axial strain	0.87	1.60	3.46	%
$(\sigma_1' / \sigma_3')_f$	3.952	3.551	3.172	
$(\sigma_1' - \sigma_3')_f$	35.4	81.6	167.3	kPa
u_f	315	323	333	kPa
$\sigma_3'_f$	12	32	77	kPa
$\sigma_1'_f$	47	114	244	kPa
A_f	0.37	0.28	0.19	
Time to failure	1.7	3.2	6.9	hrs

Shear Strength Parameters

at peak stress ratio

		Linear regression
c '	kPa	4.0
Ø '	degrees	30.1
		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
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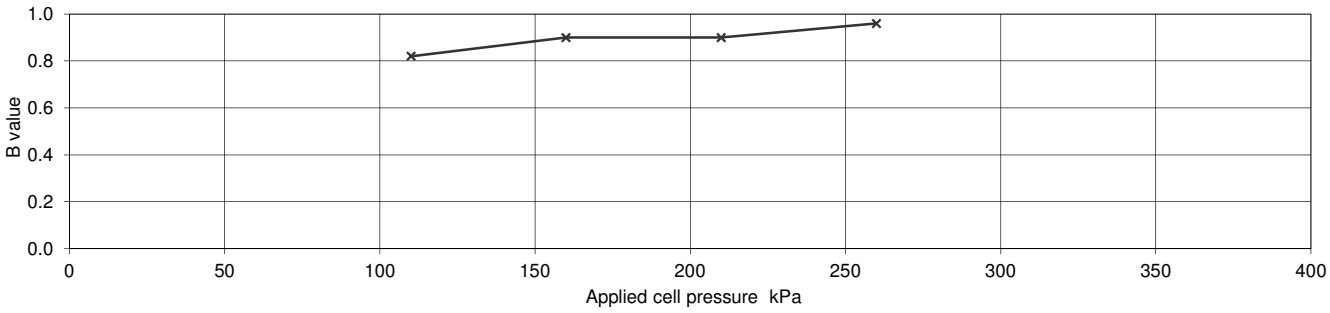
Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	A8015-18	Sample Details:	Hole No	BH6		
Project Name	IMMINGHAM		Depth (m BGL)	9 - 9.45		
			No	19	Type	UT
			ID			
			Spec Ref			

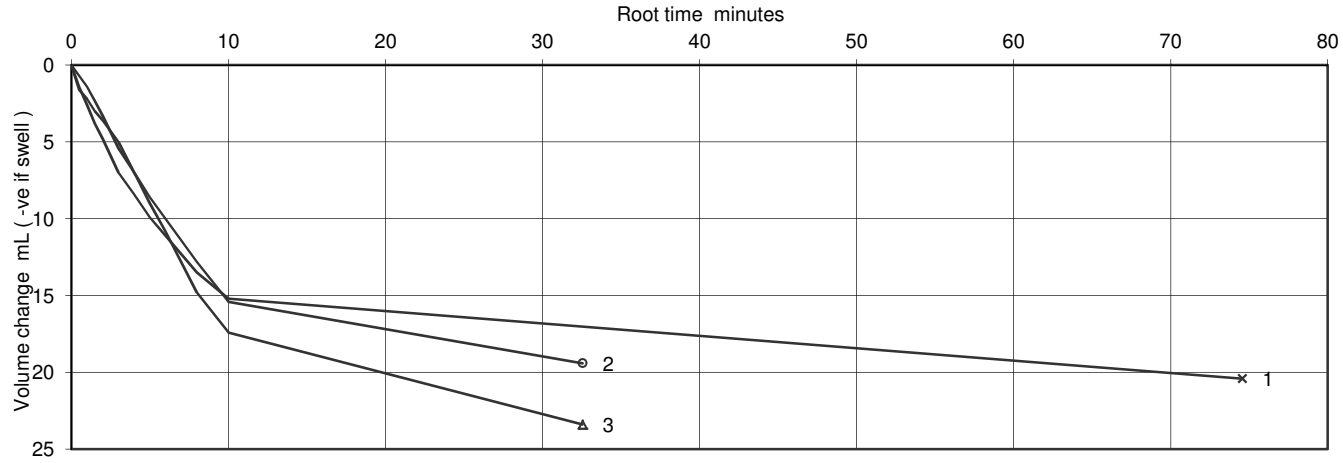
Specimen Details		
Initial		
Length	mm	203.49
Diameter	mm	102.79
Bulk Density	Mg/m³	2.14
Water Content	%	17
Dry density	Mg/m³	1.84
After test		
Bulk Density	Mg/m³	2.17
Water Content	%	15
Dry density	Mg/m³	1.88

Soil Description	Soft to 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	260
Final pore water pressure	kPa	238
Final B Value		0.96



Consolidation Details	Drainage Conditions		From radial boundary and one end			
	Stage No.		1	2	3	
	Cell Pressure applied		355	410	520	kPa
	Back Pressure applied		300	300	300	kPa
	Effective Pressure		55	110	220	kPa
	Pore pressure at start of consolidation		333	371	459	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}	2.41	1.42	1.38	m^2/year
	Coefficient of Compressibility	M_{vi}	0.36	0.17	0.09	m^2/MN
	Coefficient of Permeability (calculated)	k_{vi}	2.7E-10	7.4E-11	3.8E-11	m/s



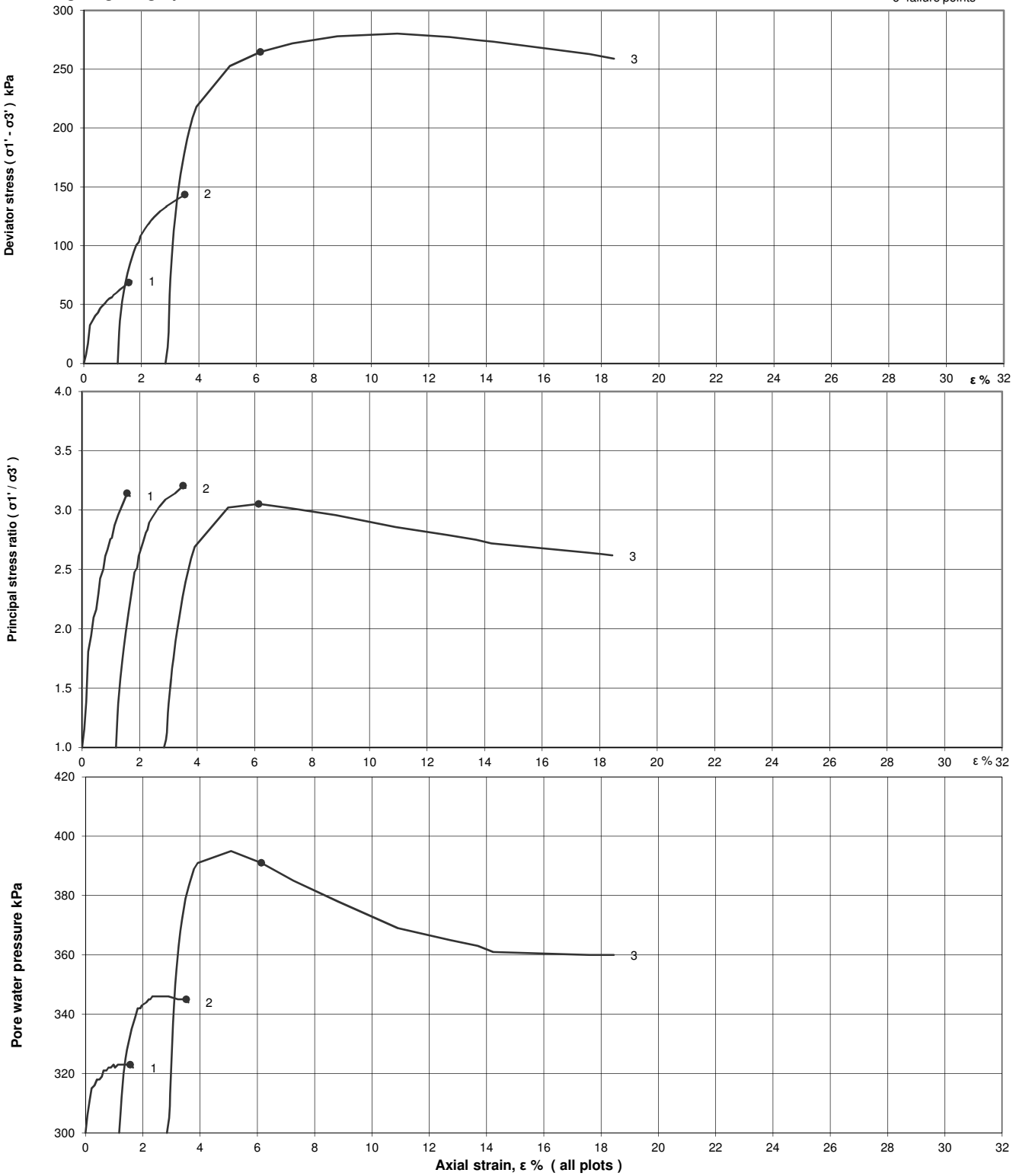
Ref			Figure
SLR8.1 Rev 86.0 Feb18	SOCOTEC	Printed:20/07/2018 10:45	CUM
	UKAS TESTING 1157		sheet 1 of 3

Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure (BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	A8015-18	Sample Details:	Hole No	BH6		
Project Name	IMMINGHAM		Depth (m BGL)	9 - 9.45		
			No	19	Type	UT
			ID			
			Spec Ref			

Shearing stages - graphical data

o failure points

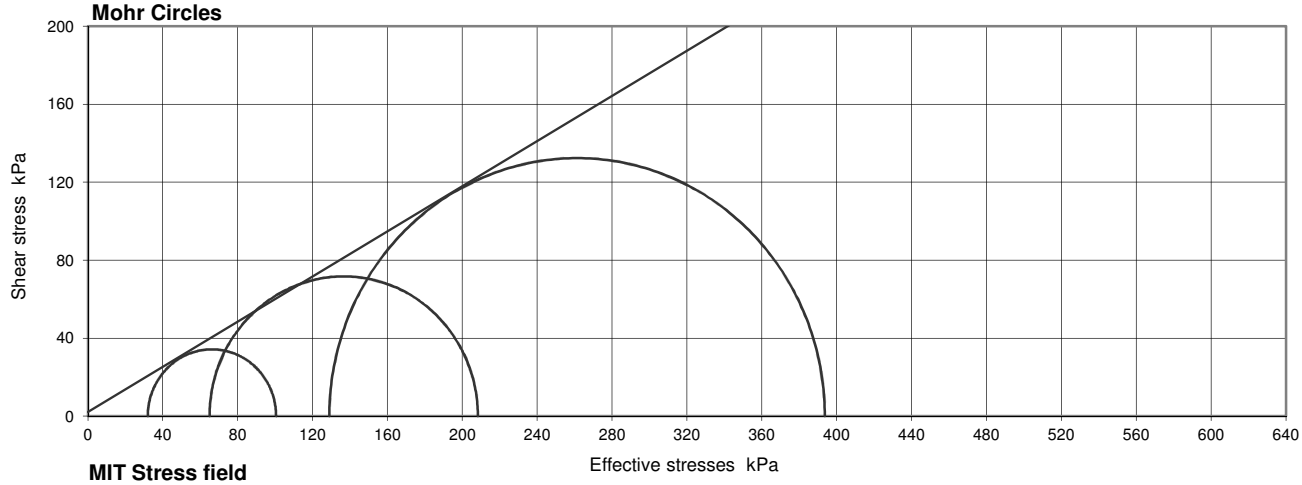


Ref			Figure
SLR8.1 Rev 86.0 Feb18	SOCOTEC 1157	Printed:20/07/2018 10:45	**CUM** sheet 2 of 3

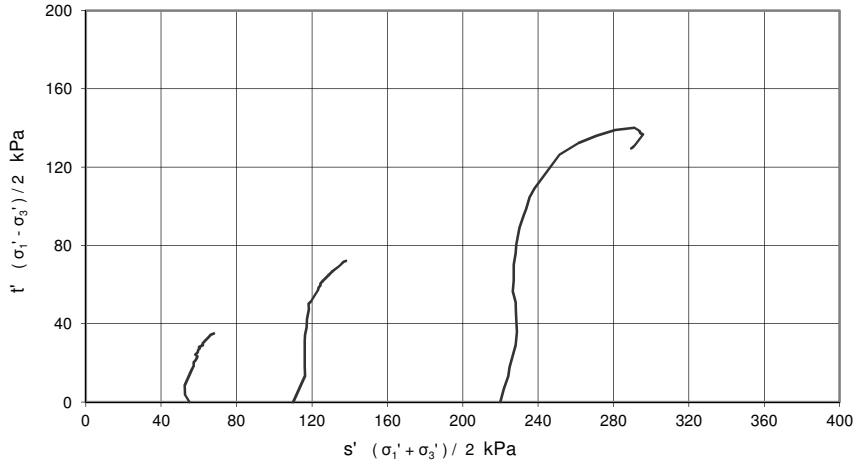
Consolidated Undrained Triaxial Compression test with Measurement of Pore Water Pressure
(BS1377 : Part 8 : 1990) - Multistage test on a single specimen

Project No	A8015-18	Sample Details:	Hole No	BH6		
Project Name	IMMINGHAM		Depth (m BGL)	9 - 9.45		
			No	19	Type	UT
			ID			
			Spec Ref			

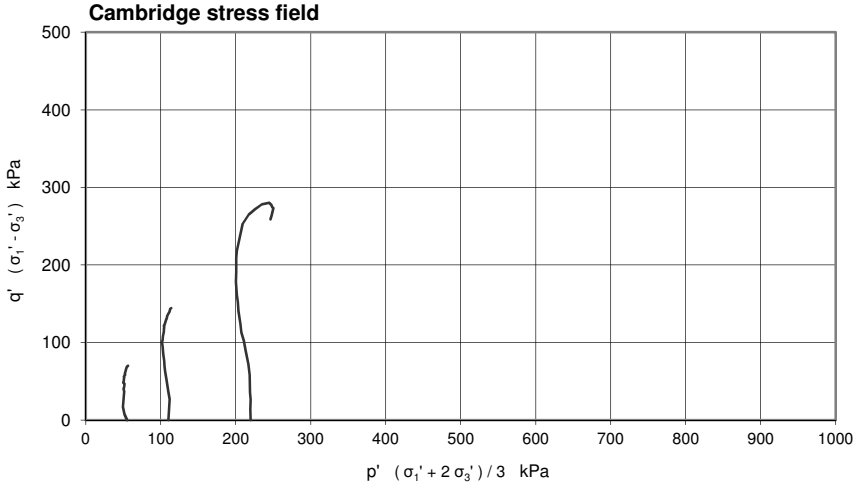
Mohr Circles



MIT Stress field



Cambridge stress field



Compression stages

Stage	1	2	3	
Cell pressure	355	410	520	kPa
Initial pwp	300	300	300	kPa
Initial σ_3'	55	110	220	kPa
Rate of strain	1.80	1.80	1.80	%/hr

Failure conditions

Criterion	Maximum effective principal stress ratio			
Axial strain	1.57	3.52	6.15	%
$(\sigma_1' / \sigma_3')_f$	3.142	3.205	3.052	
$(\sigma_1' - \sigma_3')_f$	68.5	143.3	264.7	kPa
u_f	323	345	391	kPa
$\sigma_3'_f$	32	65	129	kPa
$\sigma_1'_f$	101	208	394	kPa
A_f	0.34	0.31	0.34	
Time to failure	0.9	2.0	3.4	hrs

Shear Strength Parameters

at peak stress ratio

		Linear regression
c '	kPa	2.2
Ø '	degrees	30.1
		Manual re-assessment
c '	kPa	-
Ø '	degrees	-

Mode of failure

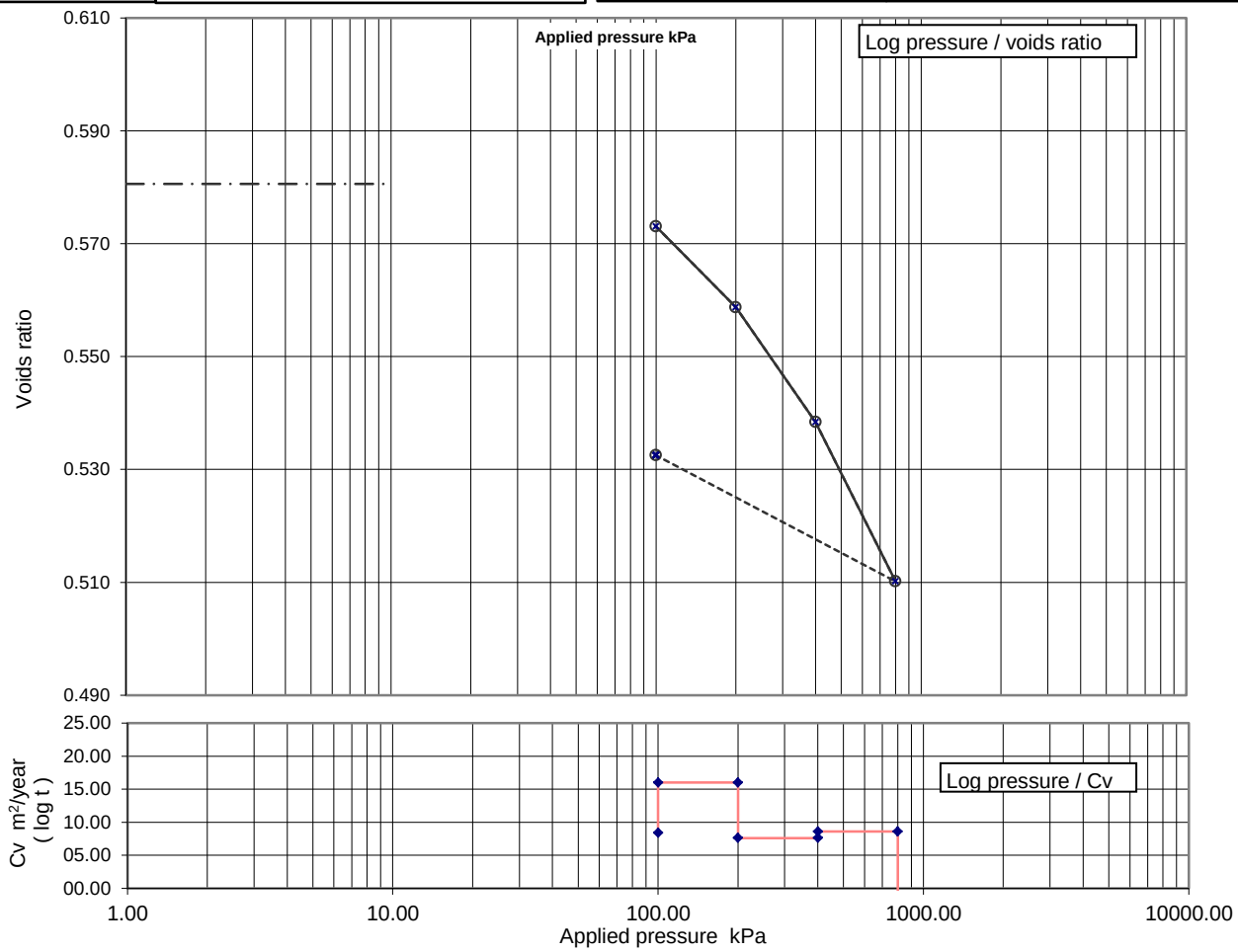
Notes : Deviator stresses corrected for area change, vertical side drains and 0.595 mm thick rubber membrane(s)

Ref			Figure
SLR8.1 Rev 86.0 Feb18	SOCOTEC UKAS TESTING 1157	Printed:20/07/2018 10:45	**CUM** sheet 3 of 3

ONE DIMENSIONAL CONSOLIDATION TEST

Sample Details:	SAMPLE ID:
	A8015-1820180409104630

Hole No	BH1
Sample Depth (m BGL)	3.00 - 3.45
Sample Type and No	UT10
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	2.70	assumed	Mg/m3
Diameter	75.08		mm
Height	19.11	18.52	mm
Voids ratio	0.581	0.533	
Moisture content	21	21	%
Bulk density	2.06	2.13	Mg/m3
Dry density	1.71	1.76	Mg/m3
Saturation	97	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	0.5806				
100	0.5730	0.095	8.4	9	
200	0.5587	0.091	16	17	
400	0.5384	0.065	7.6	8.1	
800	0.5102	0.046	8.6	9.2	
100	0.5325	0.021	-	-	

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Project No A8015-18
Project Name VPI IMMINGHAM

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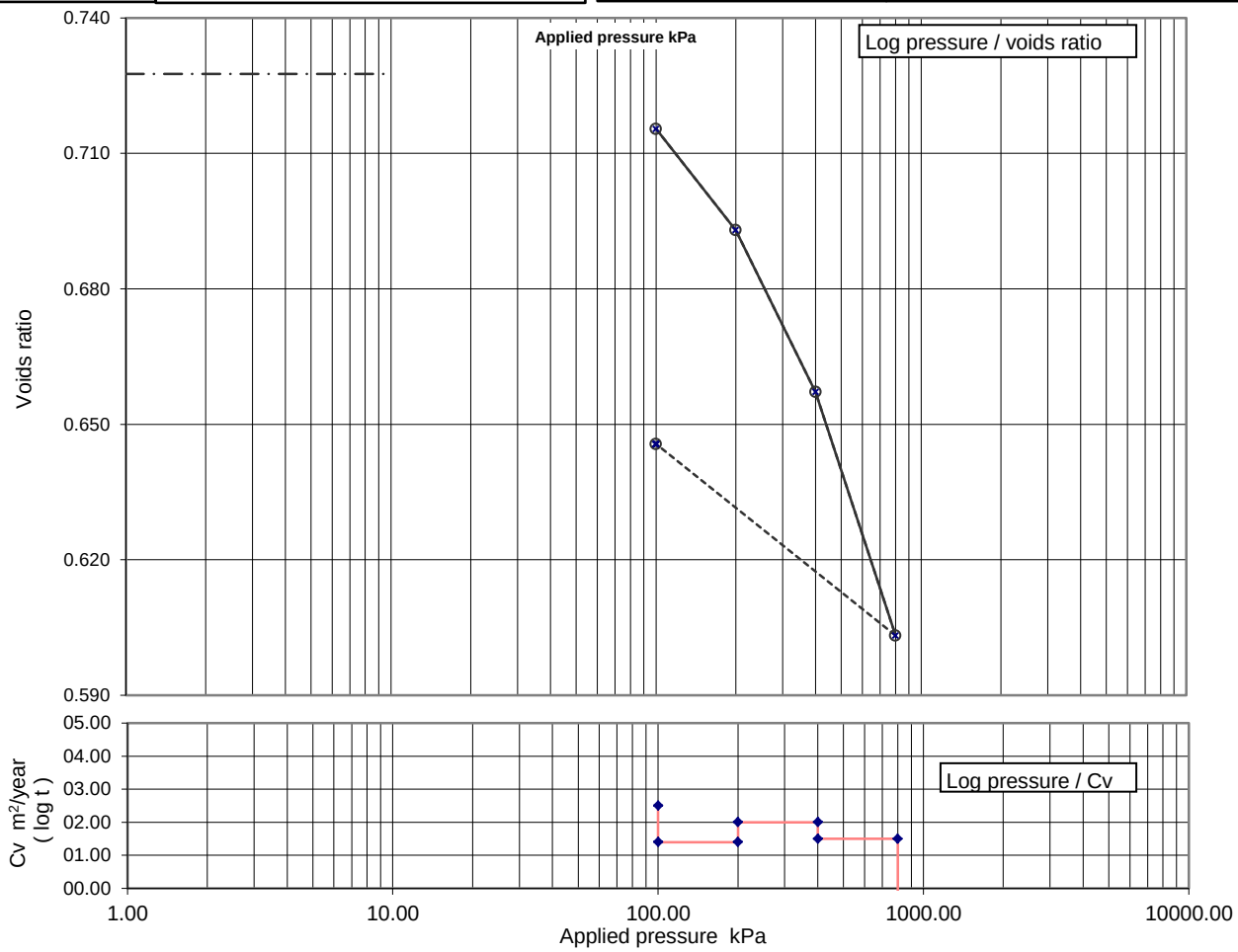
ONE DIMENSIONAL CONSOLIDATION TEST

Sample Details:	SAMPLE ID:
	A8015-1820180413011601

Hole No	BH2
Sample Depth (m BGL)	3.30 - 3.75
Sample Type and No	UT15
Specimen Ref	



Soil description	Firm laminated brown slightly sandy CLAY.
Preparation	Undisturbed
Index properties	Liquid limit % 47 Plastic limit % 22

(if available)

Specimen details	Initial	Final	
Particle density	2.75	assumed	Mg/m3
Diameter	75.08		mm
Height	18.94	18.04	mm
Voids ratio	0.728	0.646	
Moisture content	26	25	%
Bulk density	2.01	2.08	Mg/m3
Dry density	1.59	1.67	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	0.7276				
100	0.7154	0.142	2.5	2.6	
200	0.6930	0.131	1.4	1.5	
400	0.6571	0.106	2	2	
800	0.6032	0.081	1.5	1.6	
100	0.6456	0.038	-	-	

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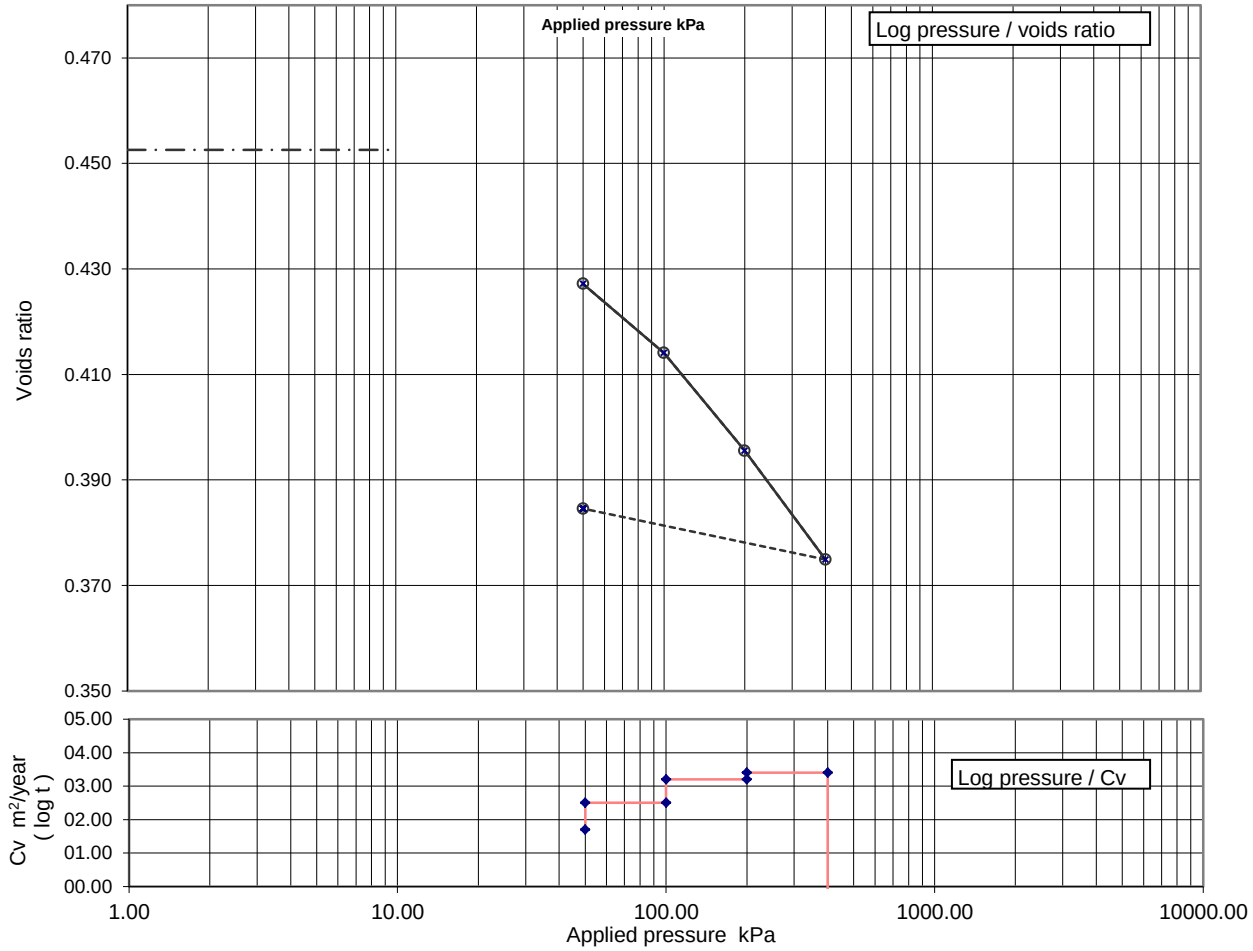
ONE DIMENSIONAL CONSOLIDATION TEST

Sample Details:	SAMPLE ID:
	A8015-1820180413012711

Hole No	BH2
Sample Depth (m BGL)	8.00 - 8.45
Sample Type and No	UT36
Specimen Ref	



Soil description	Firm brown slightly sandy slightly gravelly CLAY. Gravel is chalk.
Preparation	Undisturbed
Index properties	Liquid limit %		Plastic limit %	

(if available)

Specimen details	Initial	Final	
Particle density	2.75	assumed	Mg/m3
Diameter	75.08		mm
Height	19.10	18.20	mm
Voids ratio	0.453	0.385	
Moisture content	16	14	%
Bulk density	2.19	2.27	Mg/m3
Dry density	1.89	1.99	Mg/m3
Saturation	97	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	0.4526				
50	0.4272	0.350	1.7	1.8	
100	0.4141	0.183	2.5	2.7	
200	0.3955	0.131	3.2	3.3	
400	0.3749	0.074	3.4	3.5	
50	0.3846	0.020	-	-	

Specimen taken 20 mm from base of sample

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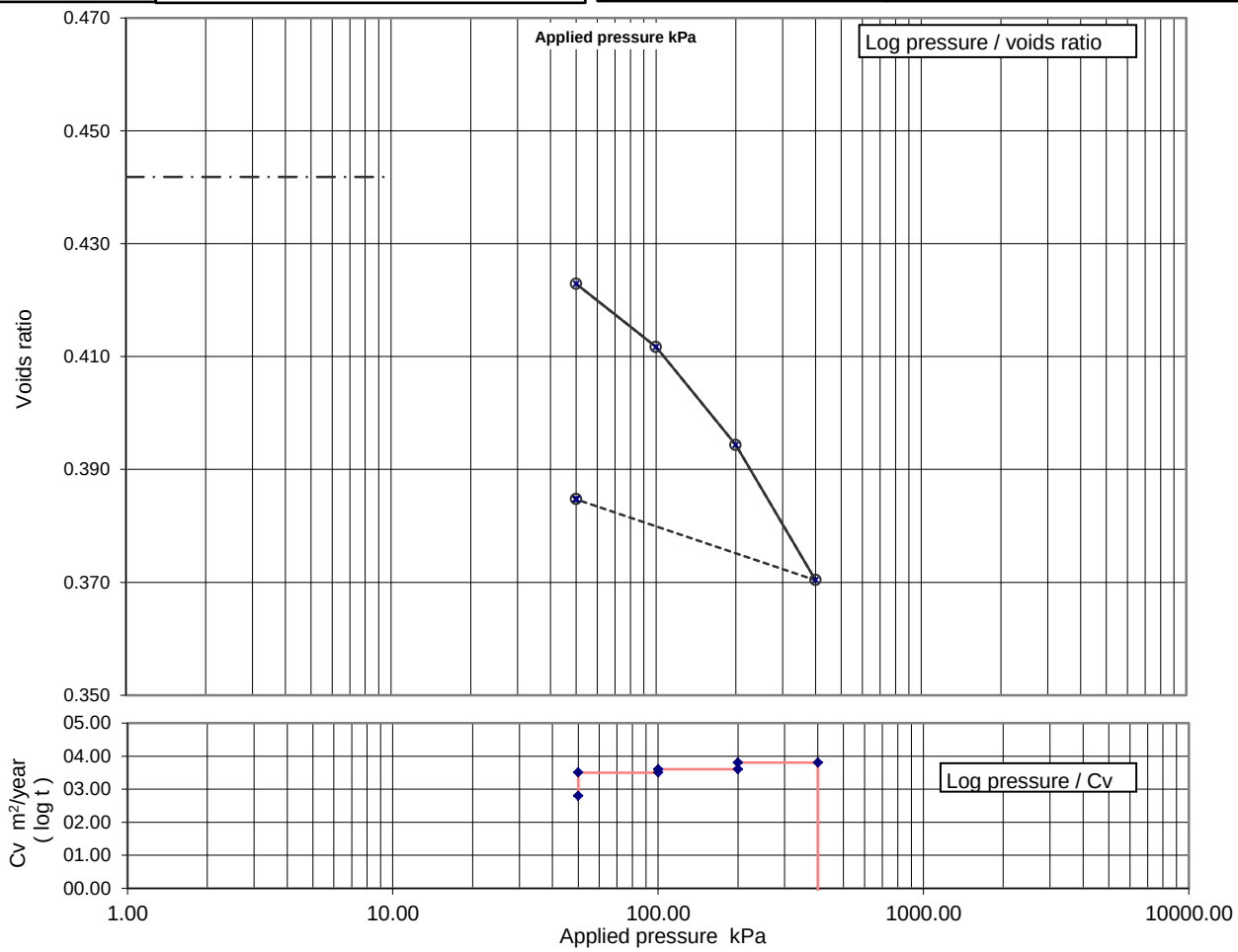
ONE DIMENSIONAL CONSOLIDATION TEST

Sample Details:	SAMPLE ID:
	A8015-1820180413102646

Hole No	BH3
Sample Depth (m BGL)	5.00 - 5.45
Sample Type and No	UT10
Specimen Ref	



Soil description: Firm brown 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	75.03		mm
Height	18.93	18.18	mm
Voids ratio	0.442	0.385	
Moisture content	16	15	%
Bulk density	2.18	2.24	Mg/m3
Dry density	1.87	1.95	Mg/m3
Saturation	100	105	%
Average temperature for test	20		oC

Swelling pressure: not measured kPa

Notes :

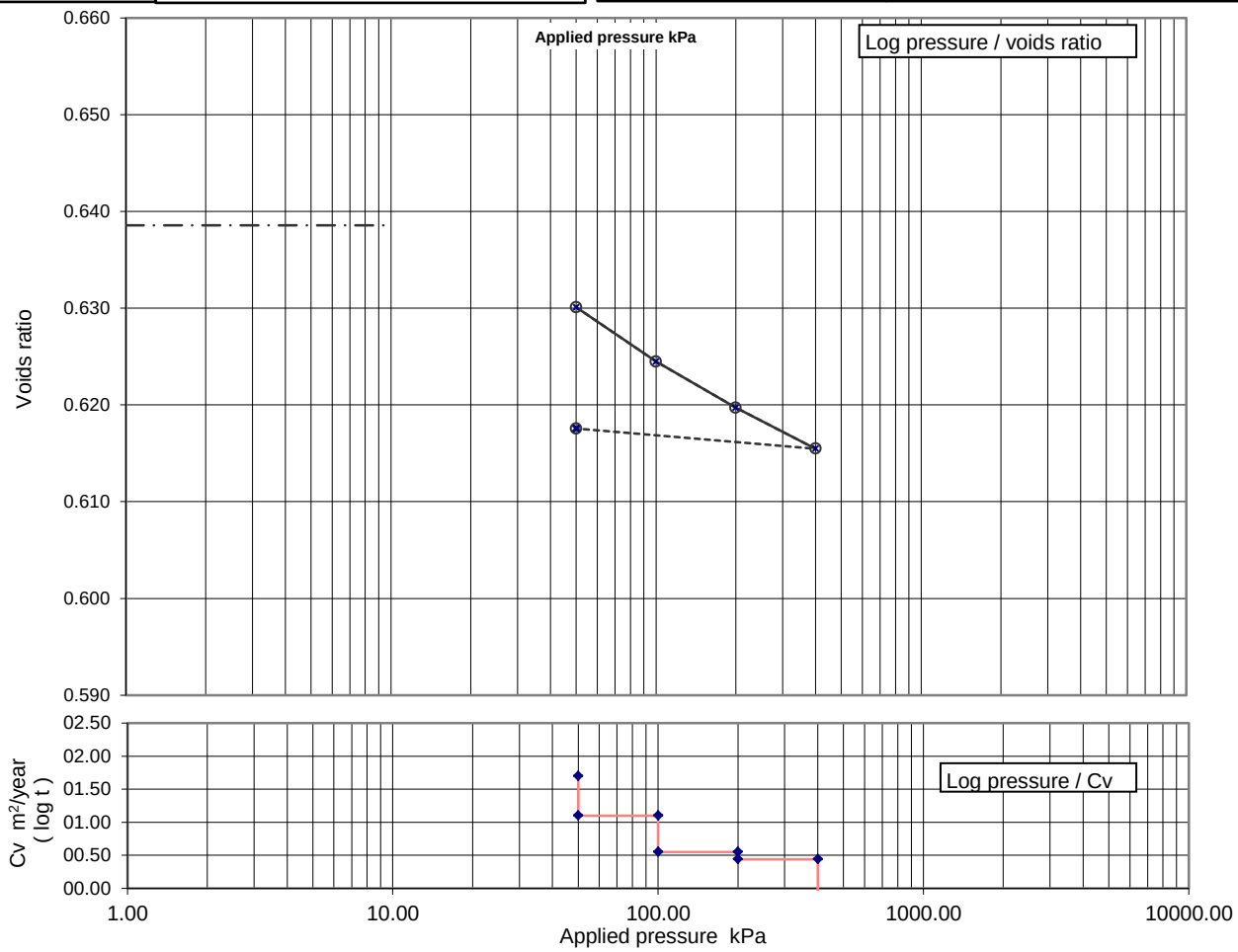
Specimen taken 10 mm from base of sample

Applied Pressure kPa	Voids ratio	mv m2/MN	cv (t50, log) m2/year	cv (t90, root) m2/year	
0	0.4418				
50	0.4229	0.263	2.8	3	
100	0.4117	0.157	3.5	3.7	
200	0.3943	0.123	3.6	3.8	
400	0.3704	0.086	3.8	4.1	
50	0.3847	0.030	-	-	

ONE DIMENSIONAL CONSOLIDATION TEST

Sample Details:	SAMPLE ID:
	A8015-1820180418115035

Hole No	BH4
Sample Depth (m BGL)	3.10 - 3.55
Sample Type and No	UT7
Specimen Ref	



Soil description: Brown slightly sandy SILT.

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	18.94	18.69	mm
Voids ratio	0.639	0.618	
Moisture content	23	21	%
Bulk density	2.06	2.06	Mg/m3
Dry density	1.68	1.70	Mg/m3
Saturation	98	94	%
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	0.6386				
50	0.6301	0.104	1.7	1.6	
100	0.6245	0.069	1.1	0.91	
200	0.6197	0.029	0.55	0.61	
400	0.6155	0.013	0.44	0.46	
50	0.6175	0.004	-	-	

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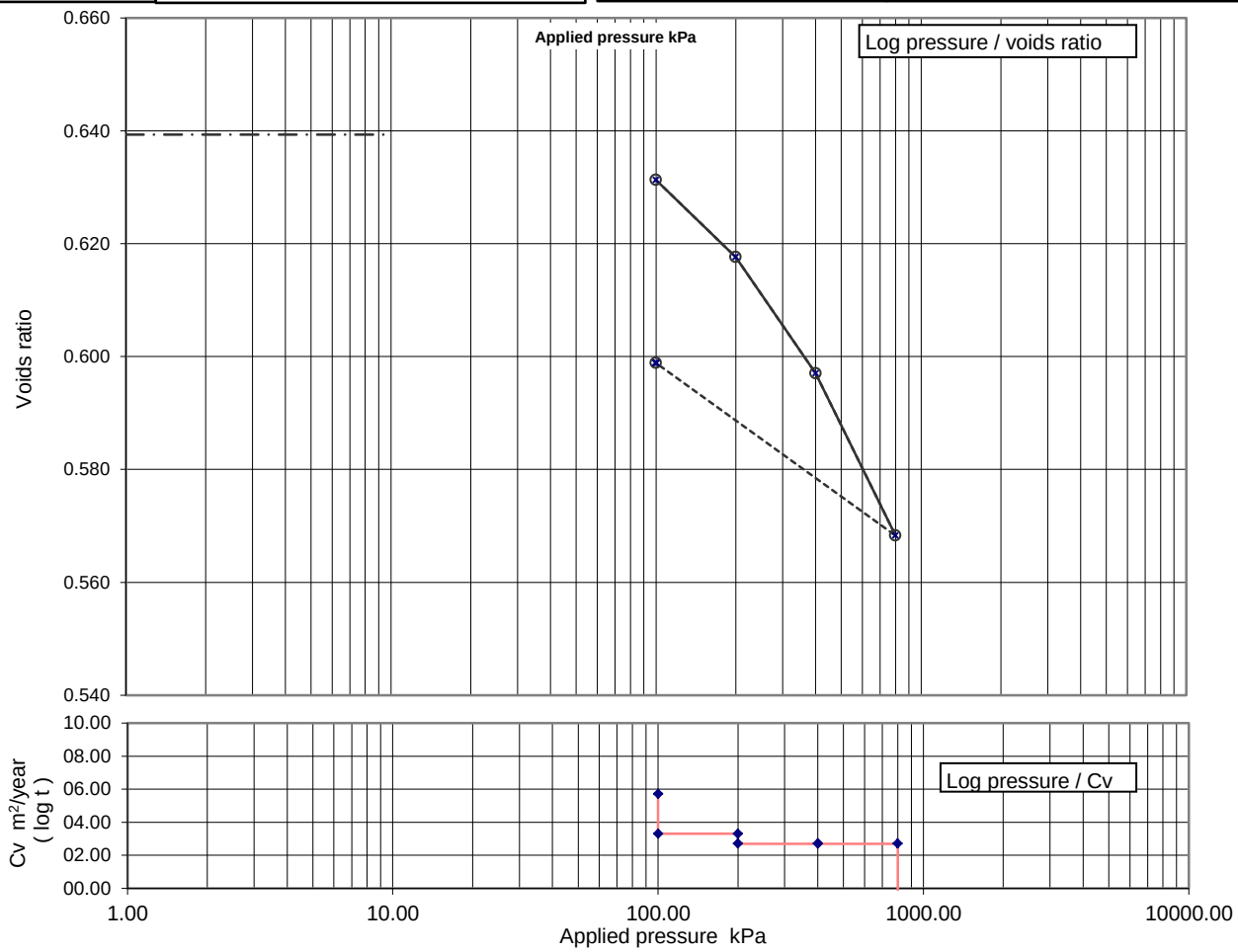
ONE DIMENSIONAL CONSOLIDATION TEST

Sample Details:	SAMPLE ID:
	A8015-1820180418120528

Hole No	BH5
Sample Depth (m BGL)	3.40 - 3.85
Sample Type and No	UT15
Specimen Ref	



Soil description	Firm to stiff brown slightly sandy slightly gravelly CLAY. Gravel is chalk.
Preparation	Undisturbed
Index properties	Liquid limit % / Plastic limit %

(if available)

Specimen details	Initial	Final	
Particle density	2.75	assumed	Mg/m3
Diameter	75.17		mm
Height	18.97	18.50	mm
Voids ratio	0.639	0.599	
Moisture content	23	22	%
Bulk density	2.06	2.10	Mg/m3
Dry density	1.68	1.72	Mg/m3
Saturation	99	102	%
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	0.6393				
100	0.6313	0.098	5.7	6.1	
200	0.6176	0.084	3.3	1.8	
400	0.5970	0.064	2.7	2.9	
800	0.5683	0.045	2.7	2.9	
100	0.5989	0.028	-	-	

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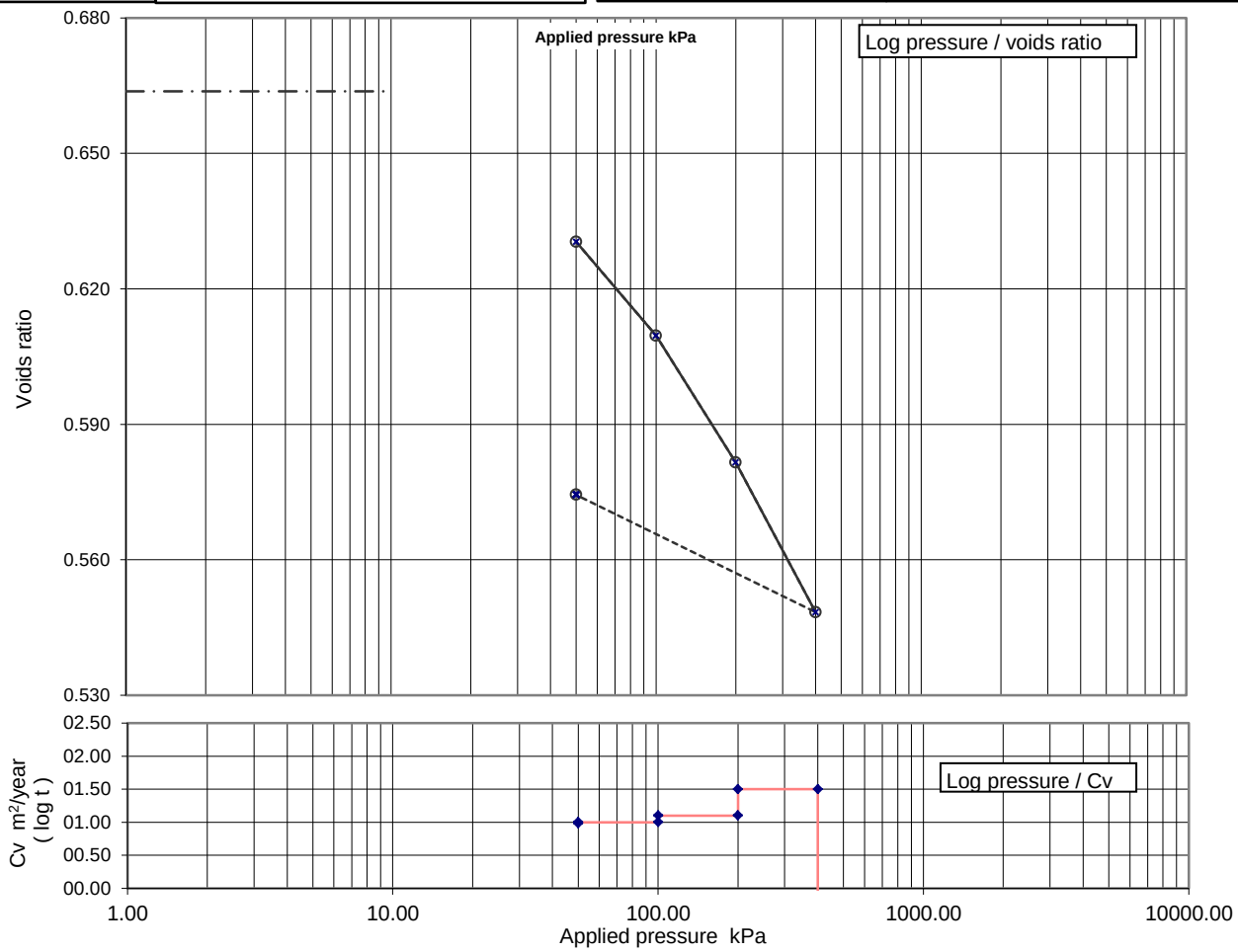
ONE DIMENSIONAL CONSOLIDATION TEST

Sample Details:	SAMPLE ID:
	A8015-1820180409092542

Hole No	BH6
Sample Depth (m BGL)	4.00 - 4.45
Sample Type and No	UT10
Specimen Ref	



Soil description	Soft 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	75.19		mm
Height	19.12	18.09	mm
Voids ratio	0.664	0.574	
Moisture content	24	21	%
Bulk density	2.05	2.12	Mg/m3
Dry density	1.65	1.75	Mg/m3
Saturation	99	103	%
Average temperature for test	20		oC

Swelling pressure: not measured 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	
0	0.6638				
50	0.6304	0.401	0.98	1.1	
100	0.6096	0.255	1	1	
200	0.5815	0.175	1.1	1.1	
400	0.5484	0.105	1.5	1.5	
50	0.5744	0.048	-	-	

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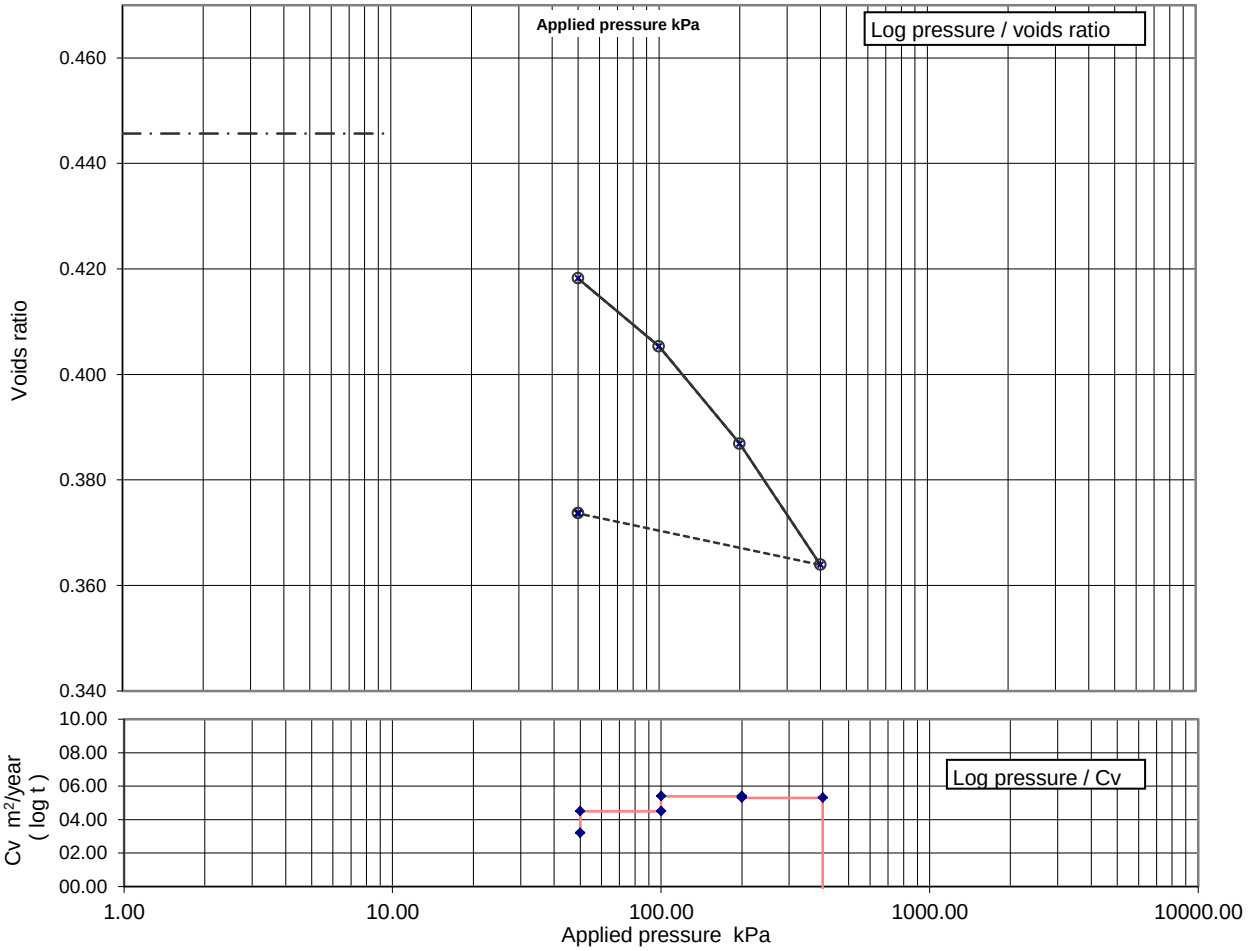
ONE DIMENSIONAL CONSOLIDATION TEST

Sample Details:	SAMPLE ID:
	A8015-1820180409092658

Hole No	BH6
Sample Depth (m BGL)	9.00 - 9.45
Sample Type and No	UT19
Specimen Ref	



Soil description	Firm brown slightly sandy slightly gravelly CLAY. Gravel is chalk.
Preparation	Undisturbed
Index properties	Liquid limit %		Plastic limit %	

(if available)

Specimen details	Initial	Final	
Particle density	2.65	assumed	Mg/m3
Diameter	75.04		mm
Height	18.96	18.02	mm
Voids ratio	0.446	0.374	
Moisture content	17	15	%
Bulk density	2.14	2.21	Mg/m3
Dry density	1.83	1.93	Mg/m3
Saturation	98	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	0.4456				
50	0.4182	0.380	3.2	3.3	
100	0.4053	0.182	4.5	4.8	
200	0.3868	0.131	5.4	5.7	
400	0.3639	0.083	5.3	5.5	
50	0.3737	0.020	-	-	

Specimen taken 10 mm from base of sample

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Determination of consolidation properties using a hydraulic cell
BS 1377: Part 6: 1990

Sample Details:	SAMPLE ID:	Hole No	BH2
		Sample Depth (m BGL)	1.20 - 1.65
	A8015-1820180413011428	Sample Type and No	UT7
		Specimen Ref	

Specimen Description: Firm brown slightly sandy slightly gravelly CLAY

Test Method: BS 1377: Part 6: 1990, clause 3.7 — Date of test: 26/06/2018

SPECIMEN DETAILS

Type of sample: Undisturbed

Preparation:

	Initial	Final	
Height	19.32		mm
Diameter	71.94		mm
Bulk density	2.08	3.52	Mg/m3
Moisture content	18.0	23.0	%
Dry density	1.76	2.67	Mg/m3
Voids Ratio	0.502		
Degree of Saturation	95		%
Particle density	2.65		Mg/m3 (Assumed)

SWELLING

Swelling pressure		kPa
Water taken in during swelling stage		ml

SATURATION

Back pressure

Cell pressure increments	50	kPa
Pressure differential	10	kPa
Final diaphragm pressure	460	kPa
Final back pressure	443	kPa
Final pore pressure ratio, δu / δσ	1.00	
Water taken in during saturation stage	28.9	ml
Voids ratio at end of saturation stage	0.500	

CONSOLIDATION STAGES

Type of drainage: Radial outwards
Type of loading: Free strain
PWP location: Centre base

Centre drain (if applicable)
Diameter: mm
Material:
Method of formation:

Stage number	1	2	3	4	5		
Diaphragm pressure	475	500	550	650	500		kPa
Back pressure	450	450	450	450	450		kPa
Initial Pore pressure built up	459	476	486	493	362		kPa
Final pore pressure	450	450	451	450	450		kPa
Effective stress (actual) at end of stage	25	50	99	200	50		kPa
Voids at start	0.500	0.173	0.173	0.121	0.102		
Voids at end	0.222	0.173	0.121	0.102	-0.009		
PWP dissipation	100	100	97	100	100		%
Settlement in stage	0.37	0.24	0.17	0.29	-0.12		mm
Volume change in stage (water out = +ve)	14.5	2.6	2.7	1.0	5.8		ml
Mv	7.4	1.6	0.9	0.17	-0.671		m2/MN
Cro	400	1.5	1.4	0.53	0	0	m2/year
Csec	0	0	0	0			
Cro method	Settlement, root time, t90	Settlement, root time, t90	Settlement, root time, t90	Settlement, root time, t90			
Average stage temperature	20.6	20.6	21.5	21.0	19.6		oC

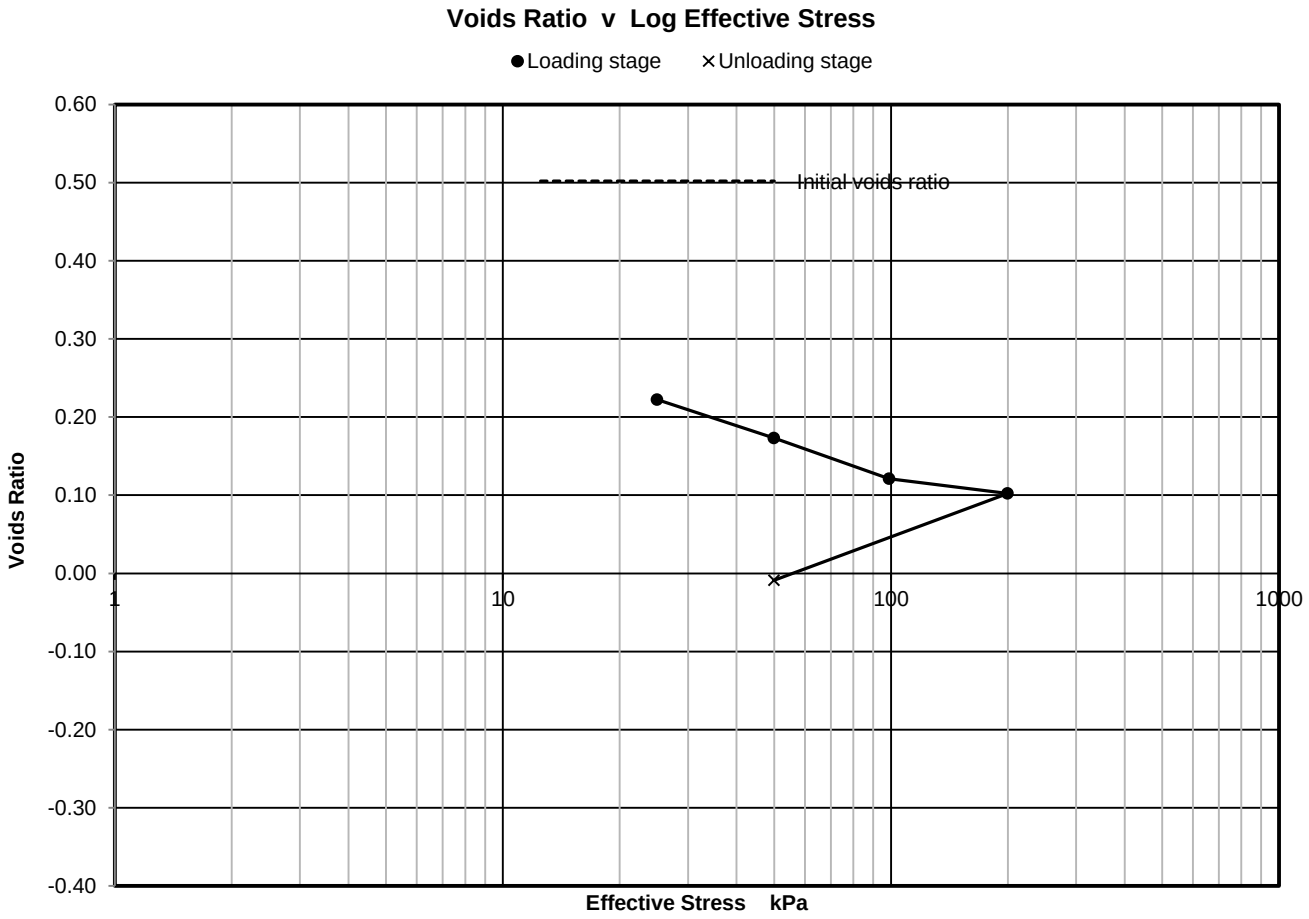
Remarks:

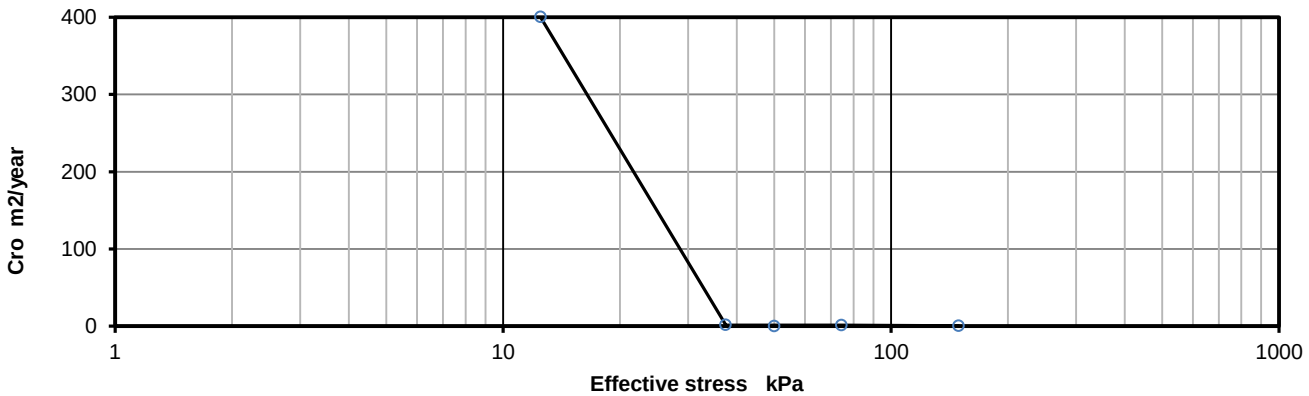
Determination of consolidation properties using a hydraulic cell
BS 1377: Part 6: 1990

Sample Details:	SAMPLE ID:
	A8015-1820180413011428

Hole No	BH2
Sample Depth (m BGL)	1.20 - 1.65
Sample Type and No	UT7
Specimen Ref	

Graphical data





Voids ratio plotted at effective stress at the end of the stage.
Cro plotted at the average effective stress during the stage.

QA Ref SLD 3, 5/9 Rev 2.7	SOCOTEC	Project No A8015-18 Project Name VPI IMMINGHAM	**Figure** **HC**
		Test carried out outside the scope of UKAS accreditation. © Copyright 2017 SOCOTEC UK Limited	Printed: 31/07/2018 12:23

Determination of consolidation properties using a hydraulic cell
BS 1377: Part 6: 1990

Sample Details:	SAMPLE ID:	Hole No	BH4
		Sample Depth (m BGL)	2.00 - 2.45
	A8015-1820180418115015	Sample Type and No	UT4
		Specimen Ref	

Specimen Description:

Test Method: BS 1377: Part 6: 1990, clause 3.7 — Date of test: 26/06/2018

SPECIMEN DETAILS

Type of sample: Undisturbed

Preparation:

	Initial	Final	
Height	18.86		mm
Diameter	72.13		mm
Bulk density	2.04	3.32	Mg/m3
Moisture content	22.0	25.0	%
Dry density	1.67	2.41	Mg/m3
Voids Ratio	0.585		
Degree of Saturation	100		%
Particle density	2.65		Mg/m3 Assumed

SWELLING

Swelling pressure		kPa
Water taken in during swelling stage		ml

SATURATION

Back pressure

Cell pressure increments	50	kPa
Pressure differential	10	kPa
Final diaphragm pressure	310	kPa
Final back pressure	298	kPa
Final pore pressure ratio, δu / δσ	0.99	
Water taken in during saturation stage	27.2	ml
Voids ratio at end of saturation stage	0.560	

CONSOLIDATION STAGES

Type of drainage: Radial outwards
Type of loading: Free strain
PWP location: Centre base

Centre drain (if applicable)
Diameter: mm
Material:
Method of formation:

Stage number	1	2	3	4	5		
Diaphragm pressure	325	350	400	500	350		kPa
Back pressure	300	300	300	300	300		kPa
Initial Pore pressure built up	315	321	335	330	255		kPa
Final pore pressure	300	300	300	300	294		kPa
Effective stress (actual) at end of stage	25	50	100	200	56		kPa
Voids at start	0.560	0.312	0.312	0.235	0.182		
Voids at end	0.388	0.312	0.235	0.182	0.102		
PWP dissipation	100	100	100	100	86		%
Settlement in stage	0.00	0.11	0.26	0.21	-0.09		mm
Volume change in stage (water out = +ve)	8.4	3.7	3.7	2.6	3.9		ml
Mv	4.4	2.2	1.2	0.43	-0.471		m2/MN
Cro	0	36	8.6	7	0	0	m2/year
Csec		0	0	0			
Cro method	Settlement, root time, t90	Settlement, root time, t90	Settlement, root time, t90	Settlement, root time, t90			
Average stage temperature	21.1	20.8	20.3	21.1	21.8		oC

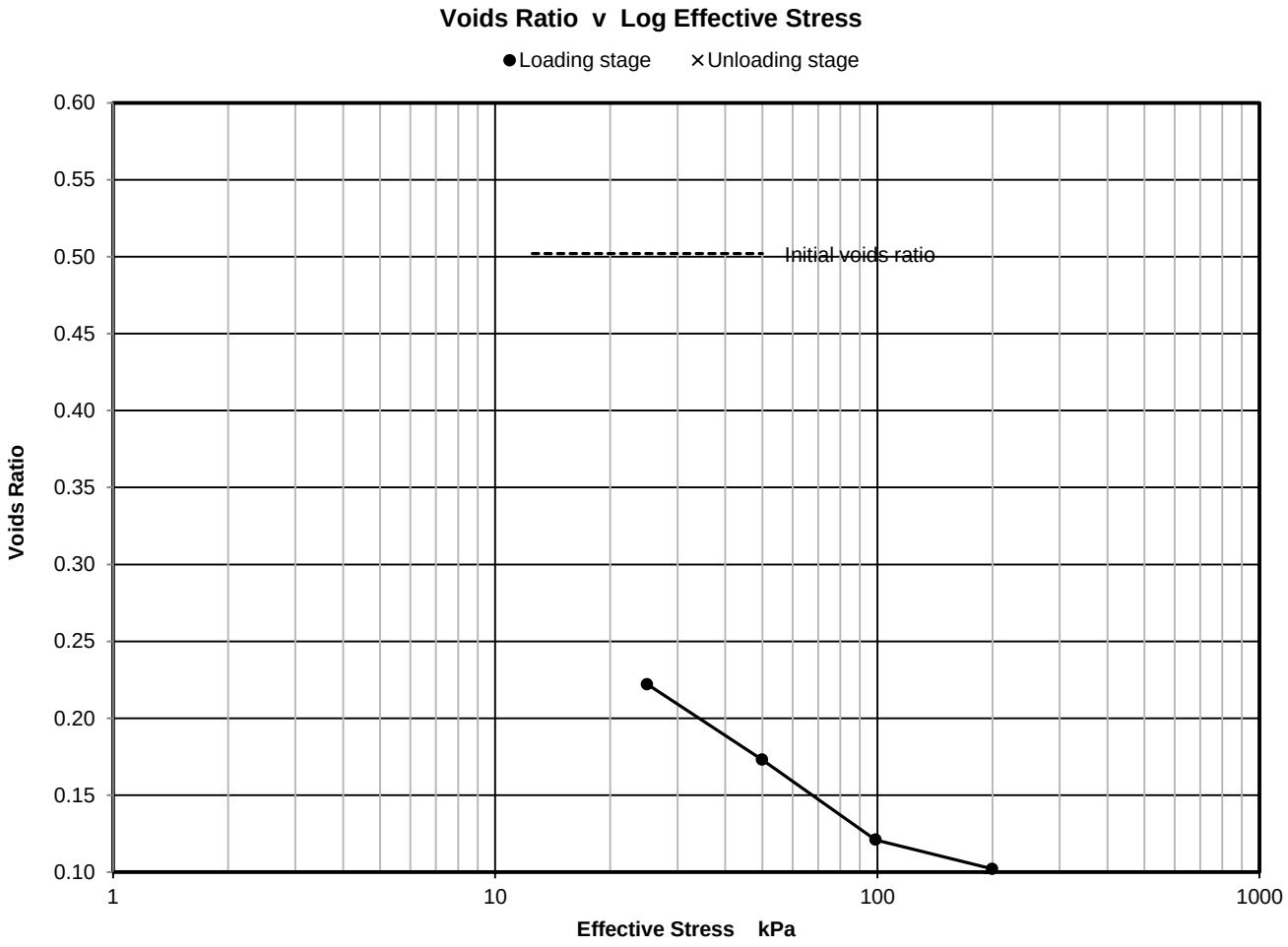
Remarks:

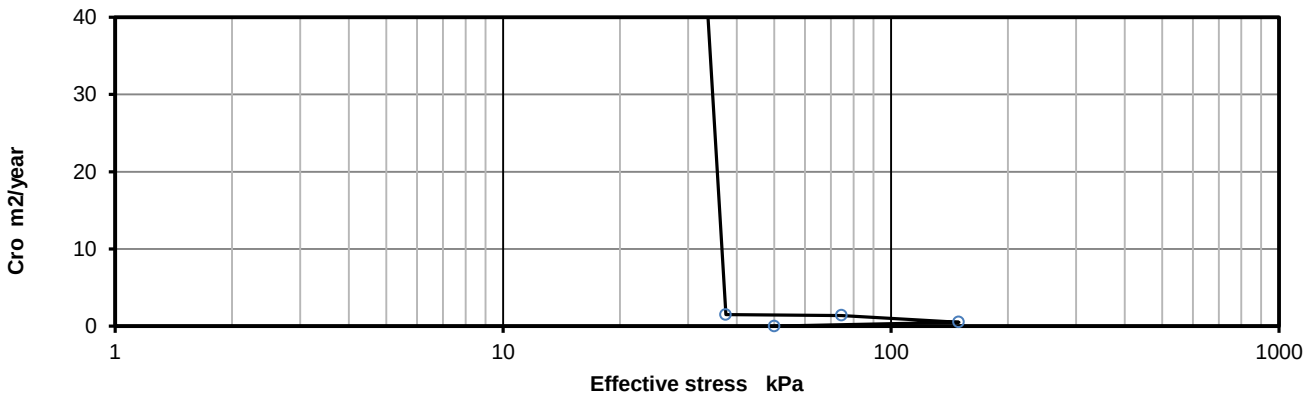
Determination of consolidation properties using a hydraulic cell
BS 1377: Part 6: 1990

Sample Details:	SAMPLE ID:
	A8015-1820180418115015

Hole No	BH4
Sample Depth (m BGL)	2.00 - 2.45
Sample Type and No	UT4
Specimen Ref	

Graphical data





Voids ratio plotted at effective stress at the end of the stage.
Cro plotted at the average effective stress during the stage.

QA Ref SLD 3, 5/9 Rev 2.7	SOCOTEC	Project No A8015-18 Project Name VPI IMMINGHAM	**Figure** **HC**
		Test carried out outside the scope of UKAS accreditation. © Copyright 2017 SOCOTEC UK Limited	Printed: 31/07/2018 12:23

Determination of consolidation properties using a hydraulic cell
BS 1377: Part 6: 1990

Sample Details:	SAMPLE ID:	Hole No	BH5
		Sample Depth (m BGL)	1.20 - 1.65
	A8015-1820180418120419	Sample Type and No	UT7
		Specimen Ref	

Specimen Description: Soft to firm brown slightly sandy slightly gravelly CLAY.

Test Method: BS 1377: Part 6: 1990, clause 3.7 — Date of test: 11/07/2018

SPECIMEN DETAILS

Type of sample: Undisturbed

Preparation:

	Initial	Final	
Height	18.55		mm
Diameter	72.06		mm
Bulk density	2.24	4.58	Mg/m3
Moisture content	15.0	20.0	%
Dry density	1.95	4.02	Mg/m3
Voids Ratio	0.359		
Degree of Saturation	111		%
Particle density	2.65		Mg/m3 (Assumed)

SWELLING

Swelling pressure		kPa
Water taken in during swelling stage		ml

SATURATION

Back pressure

Cell pressure increments	50	kPa
Pressure differential	10	kPa
Final diaphragm pressure	360	kPa
Final back pressure	341	kPa
Final pore pressure ratio, δu / δσ	0.96	
Water taken in during saturation stage	22.3	ml
Voids ratio at end of saturation stage	0.290	

CONSOLIDATION STAGES

Type of drainage: Radial outwards
Type of loading: Free strain
PWP location: Centre base

Centre drain (if applicable)
Diameter: mm
Material:
Method of formation:

Stage number	1	2	3	4	5		
Diaphragm pressure	375	400	450	550	400		kPa
Back pressure	350	350	350	350	350		kPa
Initial Pore pressure built up	356	369	385	422	246		kPa
Final pore pressure	350	350	350	350	350		kPa
Effective stress (actual) at end of stage	25	50	100	200	50		kPa
Voids at start	0.290	0.145	0.145	0.093	0.041		
Voids at end	0.215	0.145	0.093	0.041	-0.340		
PWP dissipation	100	100	100	100	100		%
Settlement in stage	0.01	0.19	0.22	0.22	-0.62		mm
Volume change in stage (water out = +ve)	4.2	3.9	2.9	2.9	21.2		ml
Mv	2.3	2.3	0.91	0.48	-2.44		m2/MN
Cro	1.3	29	19	2.7	0	0	m2/year
Csec	0	0	0	0			
Cro method	Settlement, root time, t90	Settlement, root time, t90	Settlement, root time, t90	Settlement, root time, t90			
Average stage temperature	20.3	20.1	20.3	21.3	20.6		oC

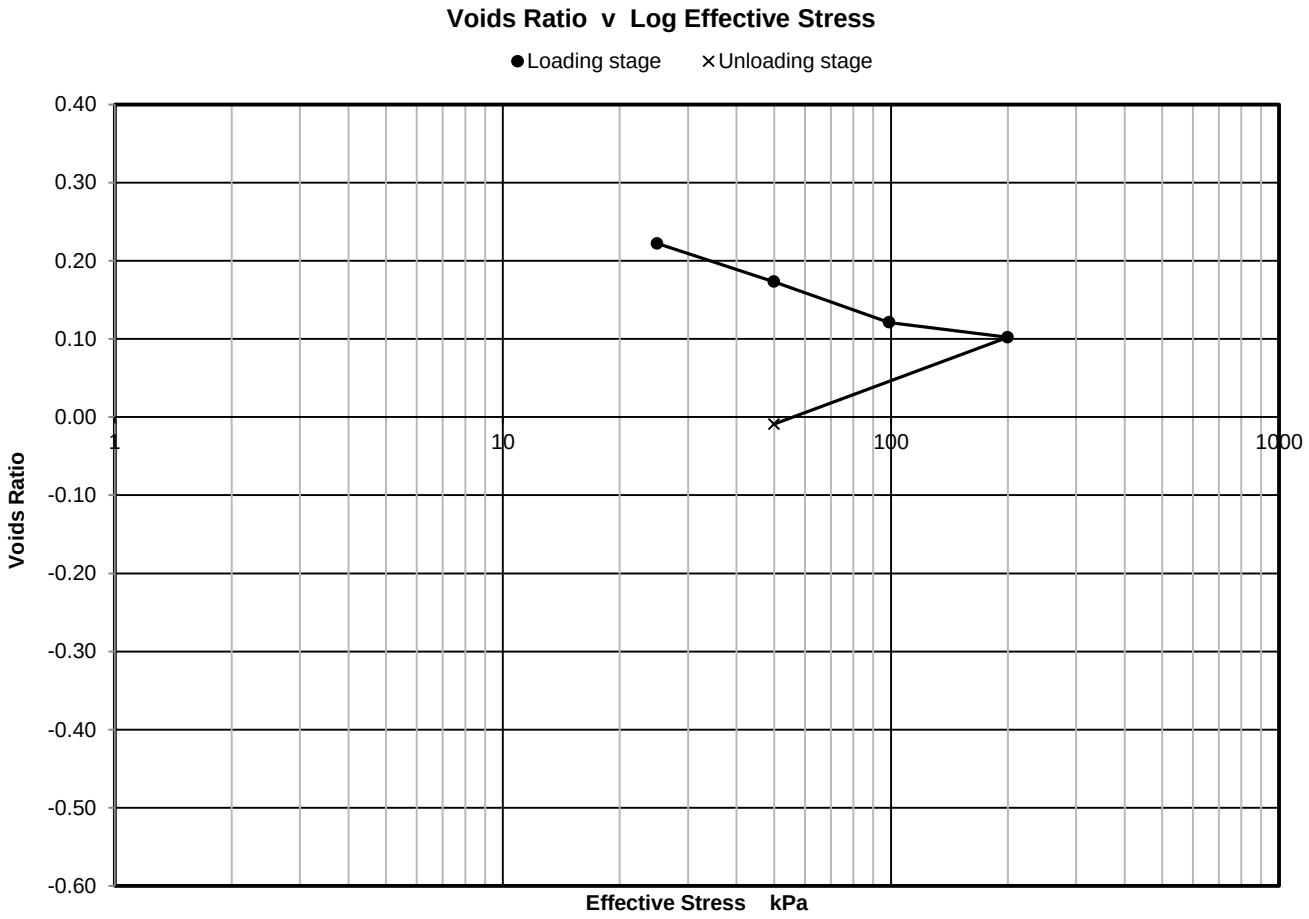
Remarks:

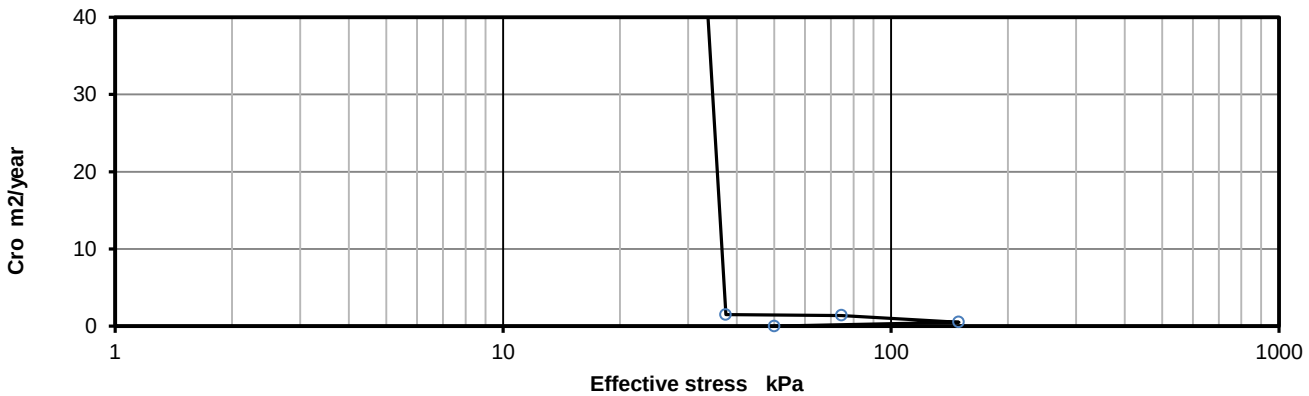
Determination of consolidation properties using a hydraulic cell
BS 1377: Part 6: 1990

Sample Details:	SAMPLE ID:
	A8015-1820180418120419

Hole No	BH5
Sample Depth (m BGL)	1.20 - 1.65
Sample Type and No	UT7
Specimen Ref	

Graphical data





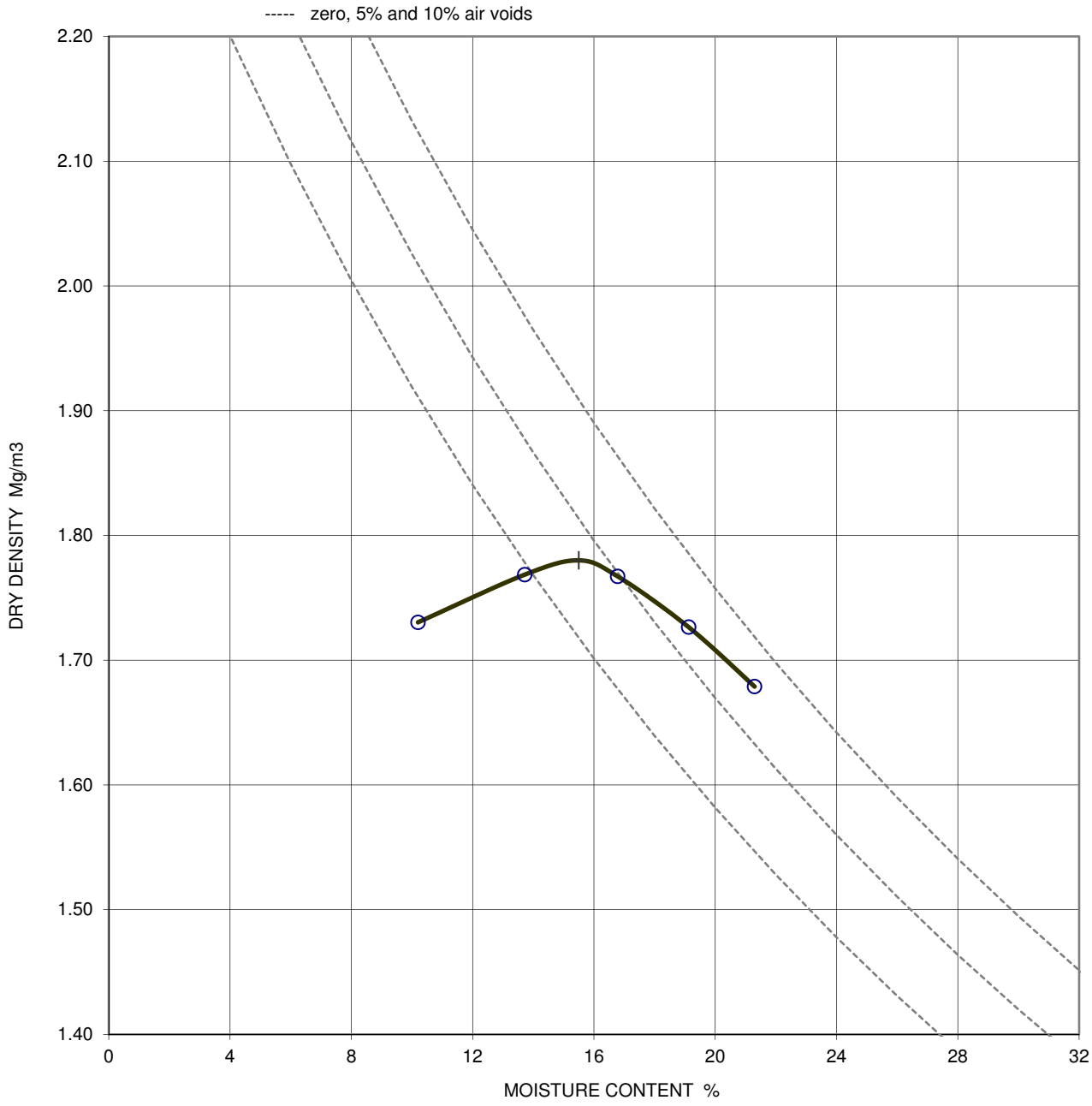
Voids ratio plotted at effective stress at the end of the stage.
Cro plotted at the average effective stress during the stage.

QA Ref SLD 3, 5/9 Rev 2.7	SOCOTEC	Project No A8015-18 Project Name VPI IMMINGHAM	**Figure** **HC**
		Test carried out outside the scope of UKAS accreditation.	Printed: 31/07/2018 12:23

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP
BS1377 : PART 4 : 1990 : LIGHT COMPACTION, 2.5 kg rammer

Sample Details:	SAMPLE ID:
	A8015-1820180409104626

Hole No	BH1
Sample Depth (m BGL)	2.50 - 3.00
Sample Type and No	B9
Specimen Ref	



Soil description	Brown CLAY with chalk fragments.		
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	2.71	measured - small pyknometer	
Remarks			

Derived Parameters +

Maximum dry density, Mg/m3
1.78

Optimum moisture content, %
16

QA Ref
SLD 4, 3.5/6
Rev 2.5
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Project No A8015-18
Project Name VPI IMMINGHAM

Figure
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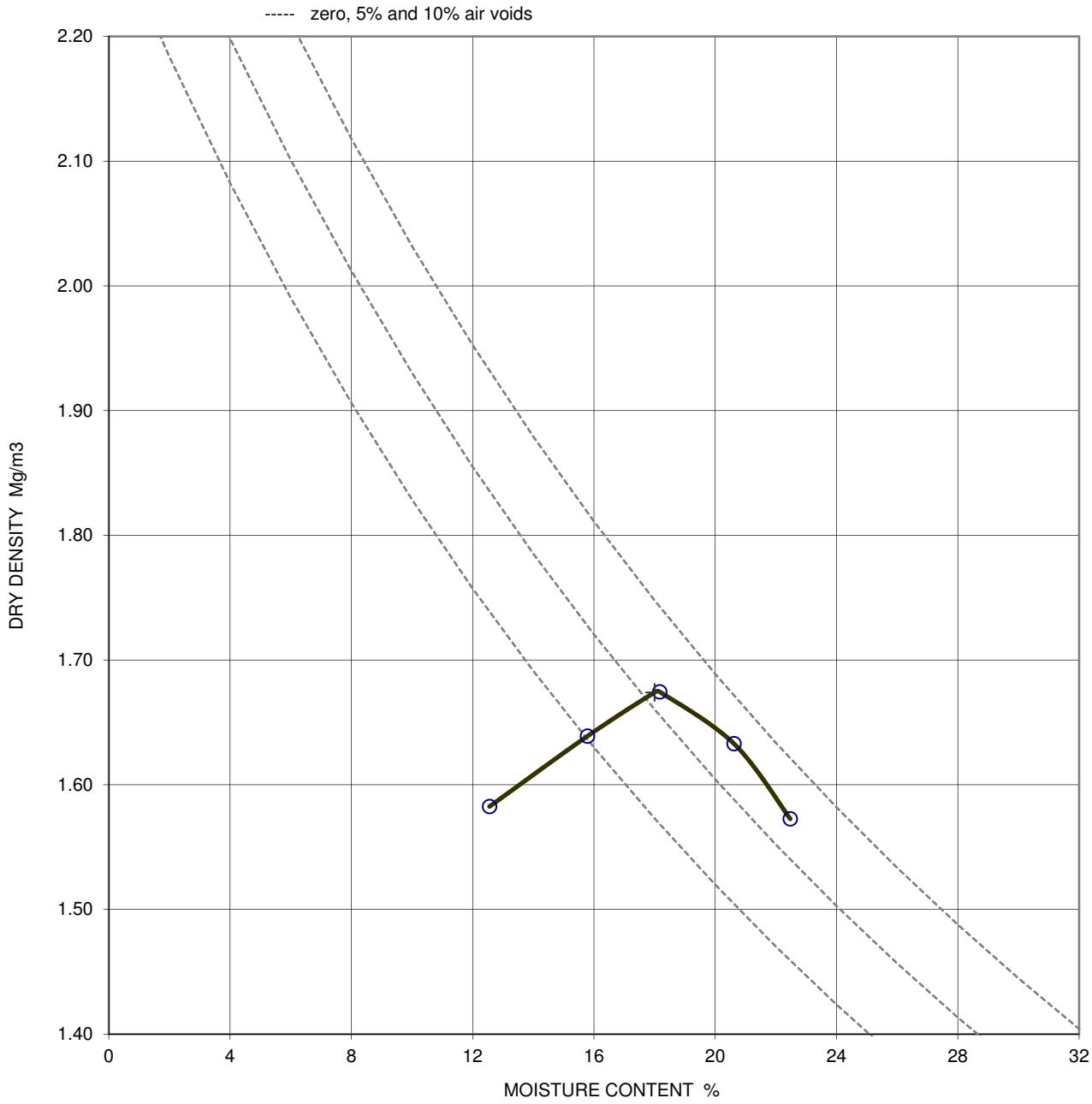
02/07/2018 15:44

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP
BS1377 : PART 4 : 1990 : LIGHT COMPACTION, 2.5 kg rammer

Sample Details:	SAMPLE ID:
	A8015-1820180418120410

Hole No	BH5
Sample Depth (m BGL)	0.50 - 0.80
Sample Type and No	B4
Specimen Ref	



Soil description	Brown slightly sandy CLAY.		
Test method	BS 1377:part 4:1990: clause 3.5, 2.5 kg rammer in a 1 litre mould		
Preparation	Original material wassingle sample tested		
Material > 37.5mm	0	%	
Material < 37.5mm > 20mm	0	%	
Particle density	2.55	assumed	
Remarks			

Derived Parameters +

Maximum dry density, Mg/m3
1.67

Optimum moisture content, %
18

QA Ref
SLD 4, 3.5/6
Rev 2.5
Sep 17

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Project No	A8015-18
Project Name	VPI IMMINGHAM

Figure
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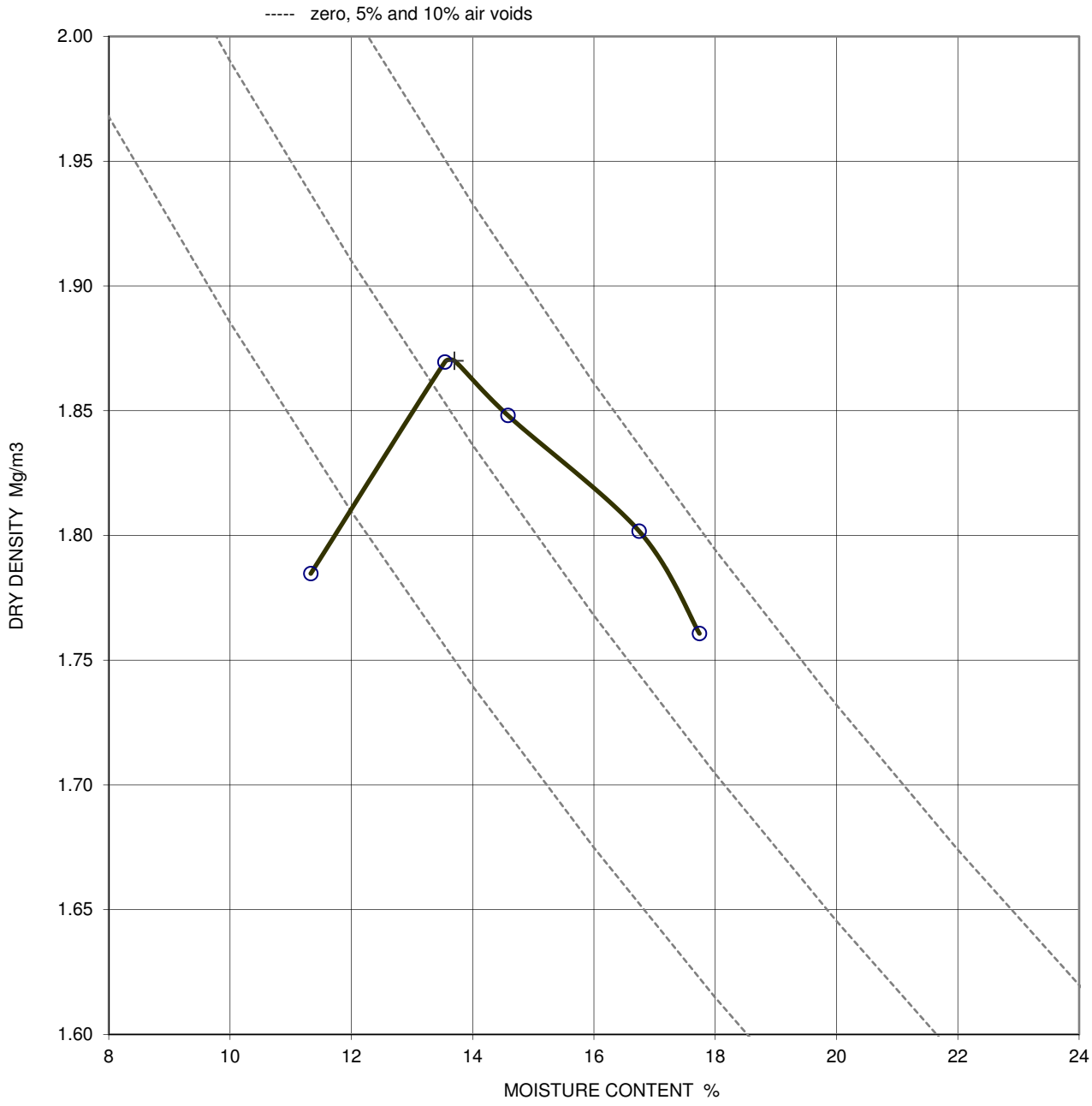
DRY DENSITY / MOISTURE CONTENT RELATIONSHIP
BS1377 : PART 4 : 1990 : LIGHT COMPACTION, 2.5 kg rammer

Sample Details:	SAMPLE ID:
	A8015-18-20180413084026

Hole No	TP1
Sample Depth (m BGL)	0.10 - 0.30
Sample Type and No	B2
Specimen Ref	



Soil description	Brown slightly sandy gravelly 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	4	%	
Particle density	2.65	assumed	
Remarks			

Derived Parameters +

Maximum dry density, Mg/m3 **1.87**

Optimum moisture content, % **14**

QA Ref
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Sep 17

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Project No	A8015-18
Project Name	VPI IMMINGHAM

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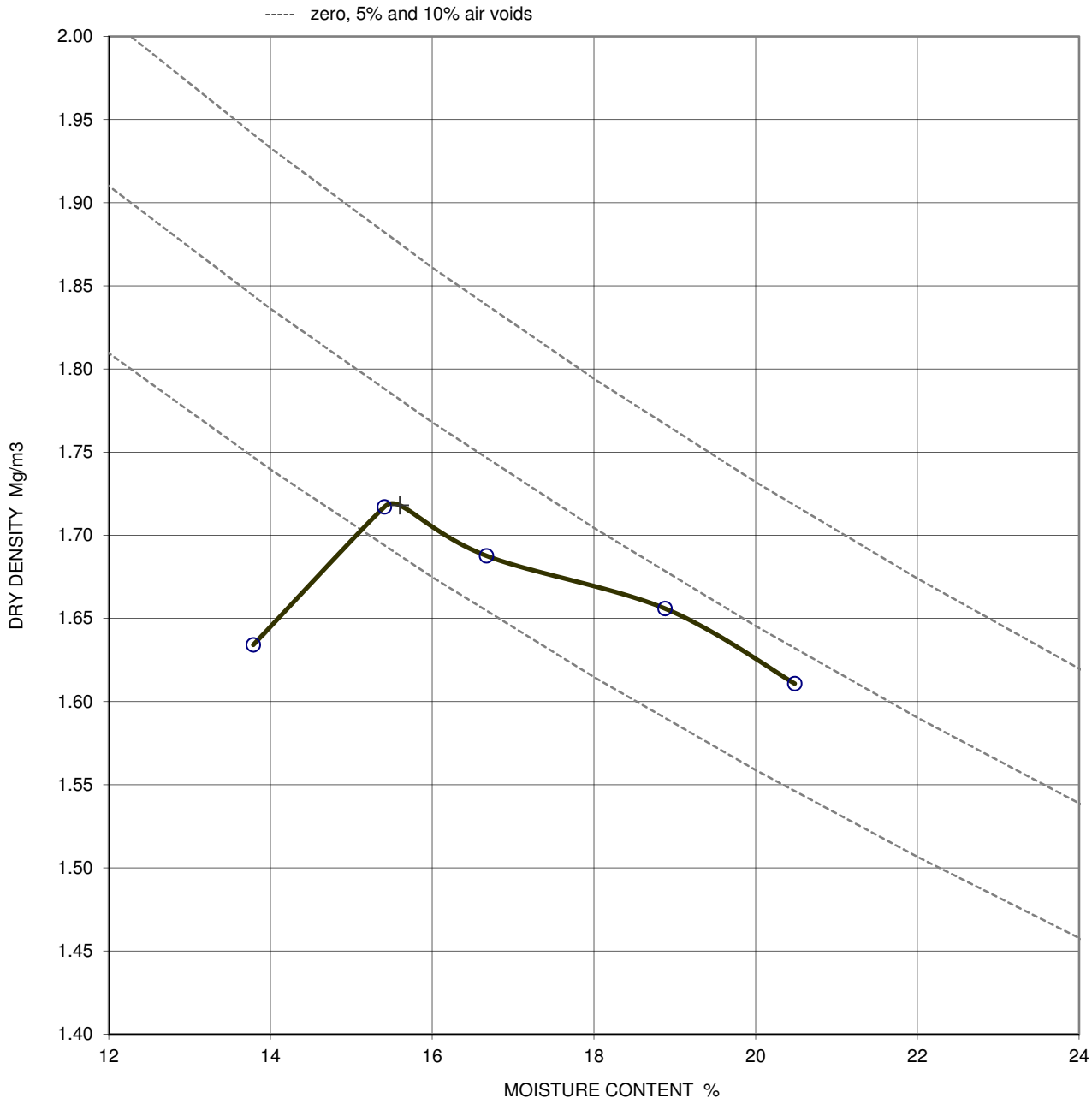
DRY DENSITY / MOISTURE CONTENT RELATIONSHIP
BS1377 : PART 4 : 1990 : LIGHT COMPACTION, 2.5 kg rammer

Sample Details:	SAMPLE ID:
	A8015-18-20180410084322

Hole No	TP3
Sample Depth (m BGL)	0.10 - 0.20
Sample Type and No	B2
Specimen Ref	



Soil description	Brown slightly sandy 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	0	%	
Material < 37.5mm > 20mm	8	%	
Particle density	2.65	assumed	
Remarks			

Derived Parameters +

Maximum dry density, Mg/m3
1.72

Optimum moisture content, %
16

QA Ref
SLD 4, 3.5/6
Rev 2.5
Sep 17

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Project No	A8015-18
Project Name	VPI IMMINGHAM

Figure
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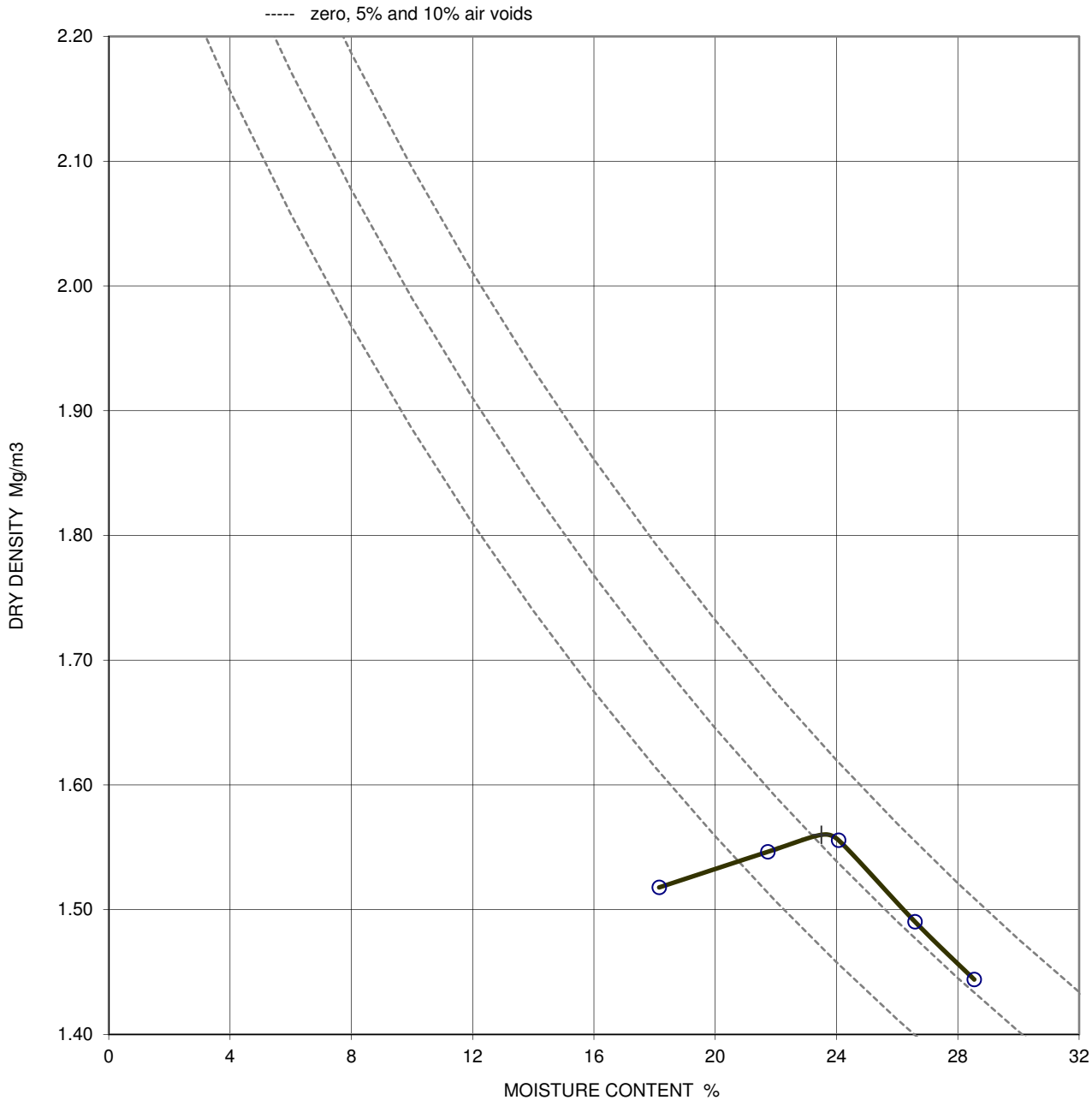
05/07/2018 11:42

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP
BS1377 : PART 4 : 1990 : LIGHT COMPACTION, 2.5 kg rammer

Sample Details:	SAMPLE ID:
	A8015-18-20180410090003

Hole No	TP5
Sample Depth (m BGL)	0.10 - 0.20
Sample Type and No	B2
Specimen Ref	



Soil description	Greenish brown slightly sandy slightly gravelly 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	1	%	
Particle density	2.65	assumed	
Remarks			

Derived Parameters +

Maximum dry density, Mg/m3
1.56

Optimum moisture content, %
24

QA Ref
SLD 4, 3.5/6
Rev 2.5
Sep 17

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SOCOTEC

Project No A8015-18
Project Name VPI IMMINGHAM

Figure
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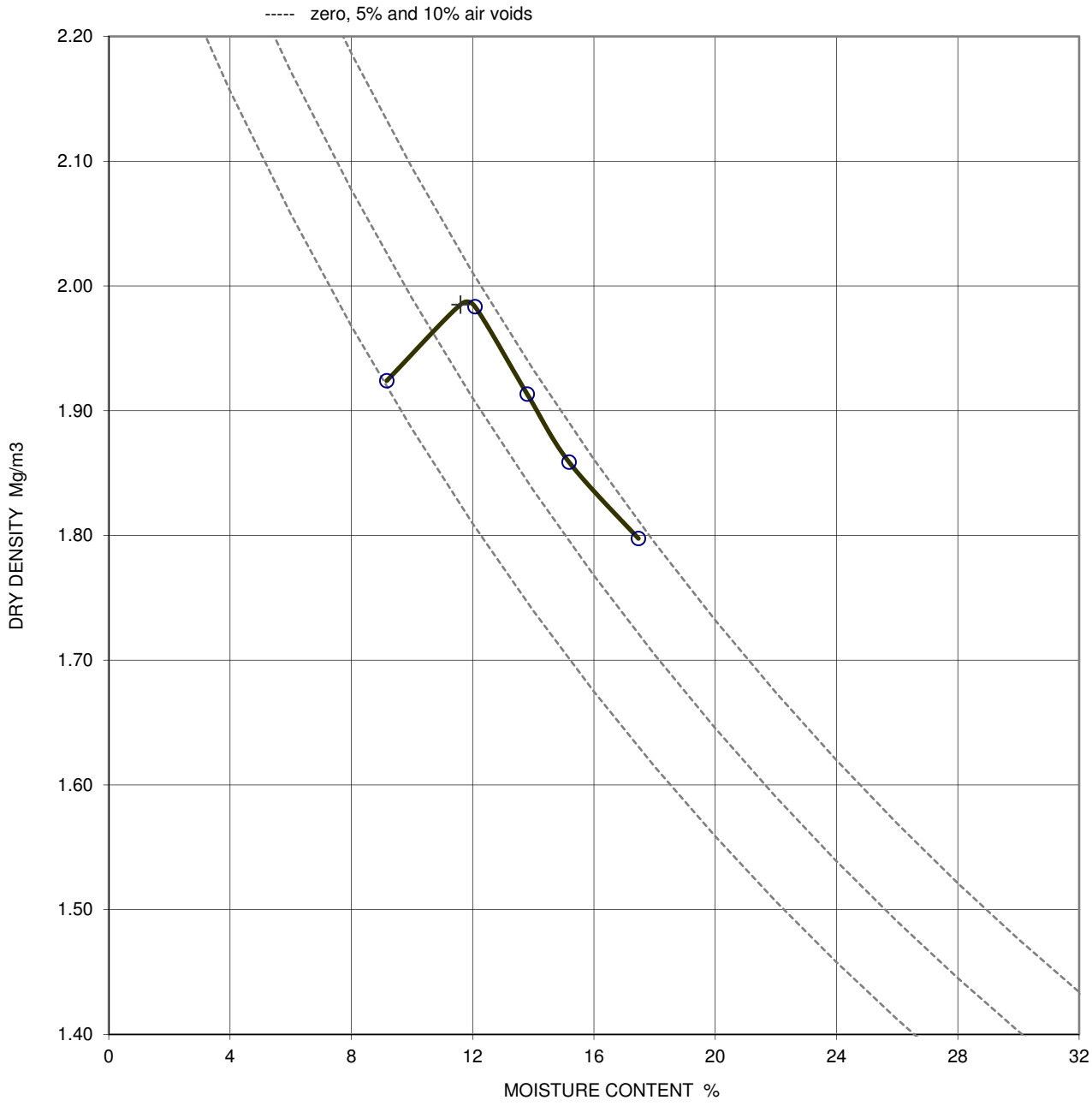
02/07/2018 15:46

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP
BS1377 : PART 4 : 1990 : LIGHT COMPACTION, 2.5 kg rammer

Sample Details:	SAMPLE ID:
	A8015-18-20180410091510

Hole No	TP9
Sample Depth (m BGL)	0.30 - 0.40
Sample Type and No	B4
Specimen Ref	



Soil description	Light brown slightly sandy slightly gravelly 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	15	%	
Particle density	2.65	assumed	
Remarks			

Derived Parameters +

Maximum dry density, Mg/m3
1.99

Optimum moisture content, %
12

QA Ref
SLD 4, 3.5/6
Rev 2.5
Sep 17

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SOCOTEC

Project No	A8015-18
Project Name	VPI IMMINGHAM

Figure
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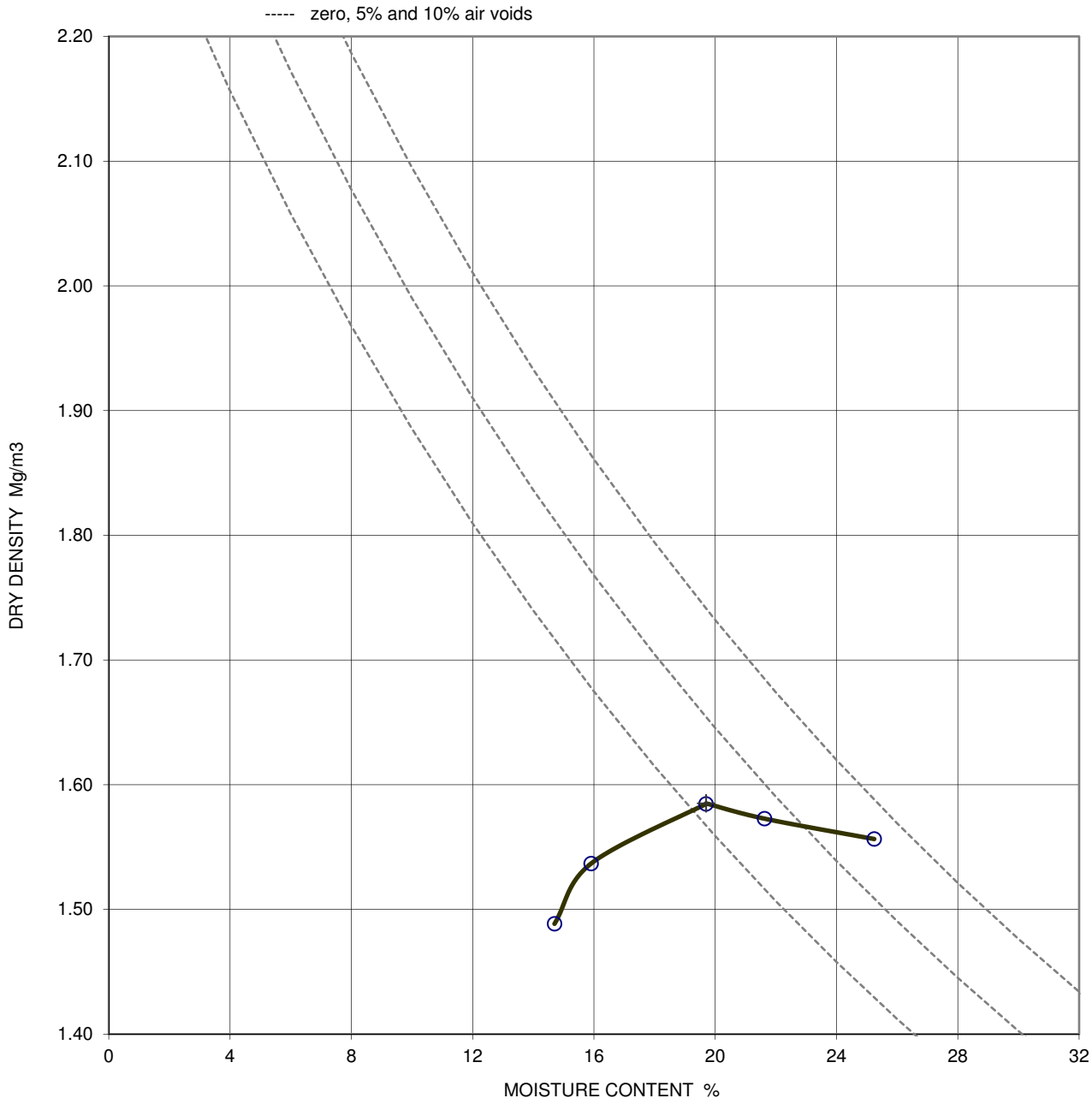
02/07/2018 15:47

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP
BS1377 : PART 4 : 1990 : LIGHT COMPACTION, 2.5 kg rammer

Sample Details:	SAMPLE ID:
	A8015-18-20180413014653

Hole No	TT1
Sample Depth (m BGL)	0.10 - 0.30
Sample Type and No	B2
Specimen Ref	



Soil description	Brown slightly sandy slightly gravelly CLAY.		
Test method	BS 1377:part 4:1990: clause 3.5, 2.5 kg rammer in a 1 litre mould		
Preparation	Original material wassingle sample tested		
Material > 37.5mm	0	%	
Material < 37.5mm > 20mm	3	%	
Particle density	2.65	assumed	
Remarks			

Derived Parameters +

Maximum dry density, Mg/m3
1.59

Optimum moisture content, %
20

QA Ref
SLD 4, 3.5/6
Rev 2.5
Sep 17

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SOCOTEC

Project No A8015-18
Project Name VPI IMMINGHAM

Figure
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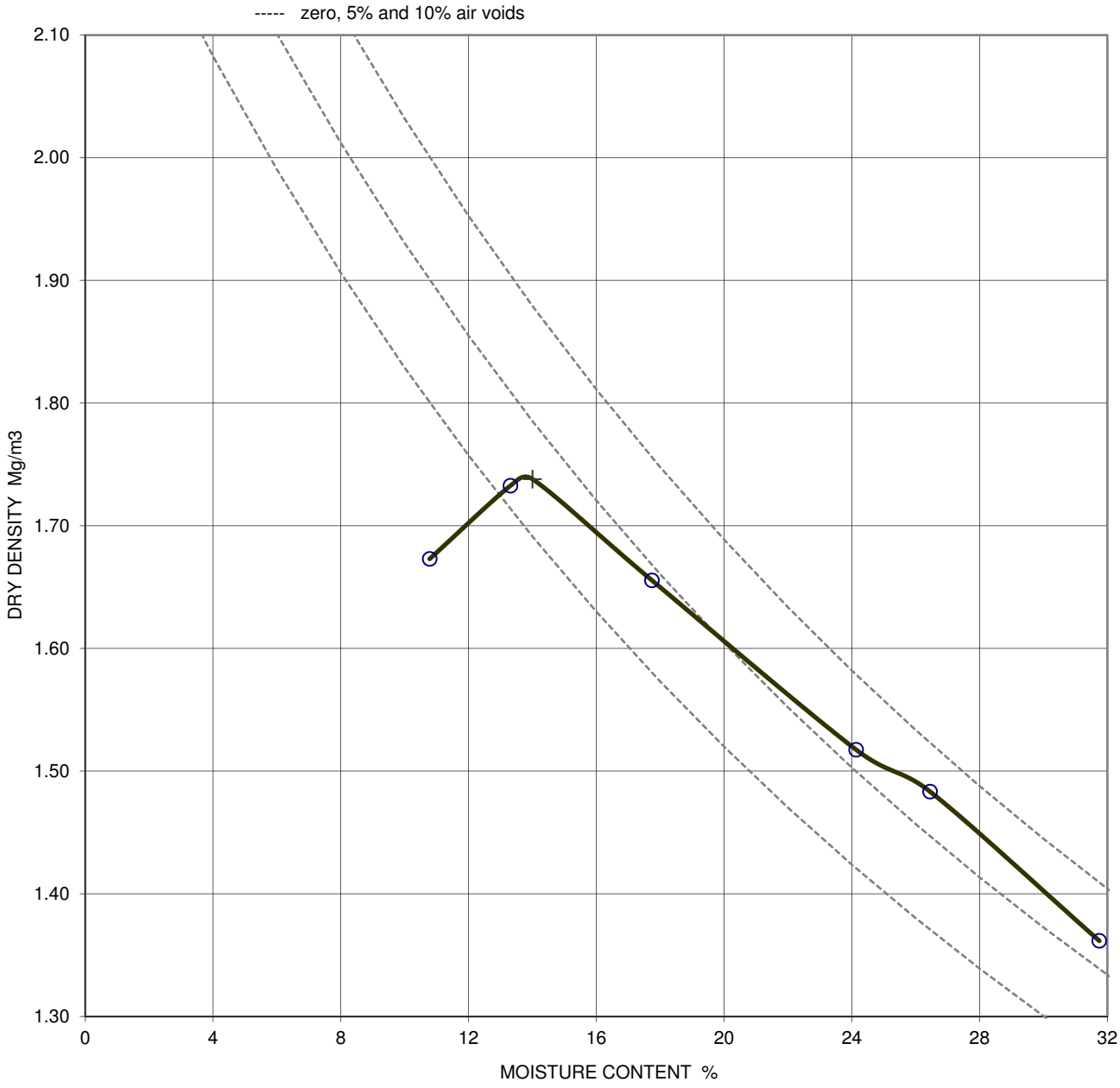
DRY DENSITY / MOISTURE CONTENT RELATIONSHIP
BS1377 : PART 4 : 1990 : HEAVY COMPACTION, 4.5 kg rammer

Sample Details:	SAMPLE ID:
	A8015-1820180409104548

Hole No	BH1
Sample Depth (m BGL)	0.50 - 0.70
Sample Type and No	B4
Specimen Ref	



Soil description	Greyish brown slightly sandy 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, separate specimens tested	
Material > 37.5mm	0	%
Material < 37.5mm > 20mm	0	%
Particle density	2.55	assumed
Remarks		

Derived Parameters +

Maximum dry density, Mg/m3
1.74

Optimum moisture content, %
14

QA Ref
SLD 4, 3.5/6
Rev 2.5
Sep 17

UKAS TESTING
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SOCOTEC

Project No	A8015-18
Project Name	VPI IMMINGHAM

Figure
COMPH

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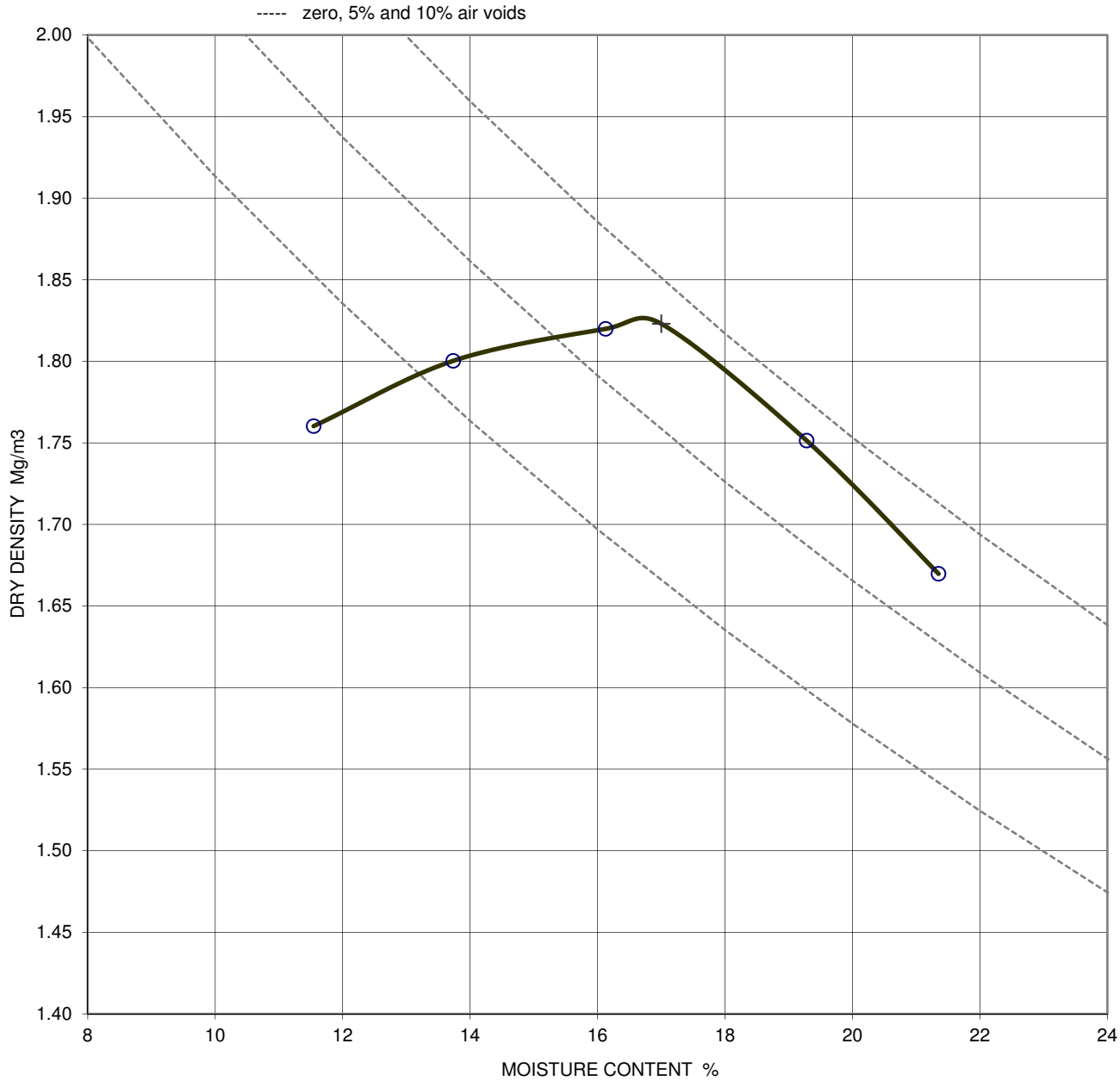
DRY DENSITY / MOISTURE CONTENT RELATIONSHIP
BS1377 : PART 4 : 1990 : HEAVY COMPACTION, 4.5 kg rammer

Sample Details:	SAMPLE ID:
	A8015-1820180413011454

Hole No	BH2
Sample Depth (m BGL)	1.80 - 2.25
Sample Type and No	B10
Specimen Ref	



Soil description	Brown slightly gravelly CLAY. Gravel is chalk		
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	2.70	assumed	
Remarks			

Derived Parameters +

Maximum dry density, Mg/m3
1.82

Optimum moisture content, %
17

QA Ref
SLD 4, 3.5/6
Rev 2.5
Sep 17

UKAS TESTING
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SOCOTEC

Project No	A8015-18
Project Name	VPI IMMINGHAM

Figure
COMPH

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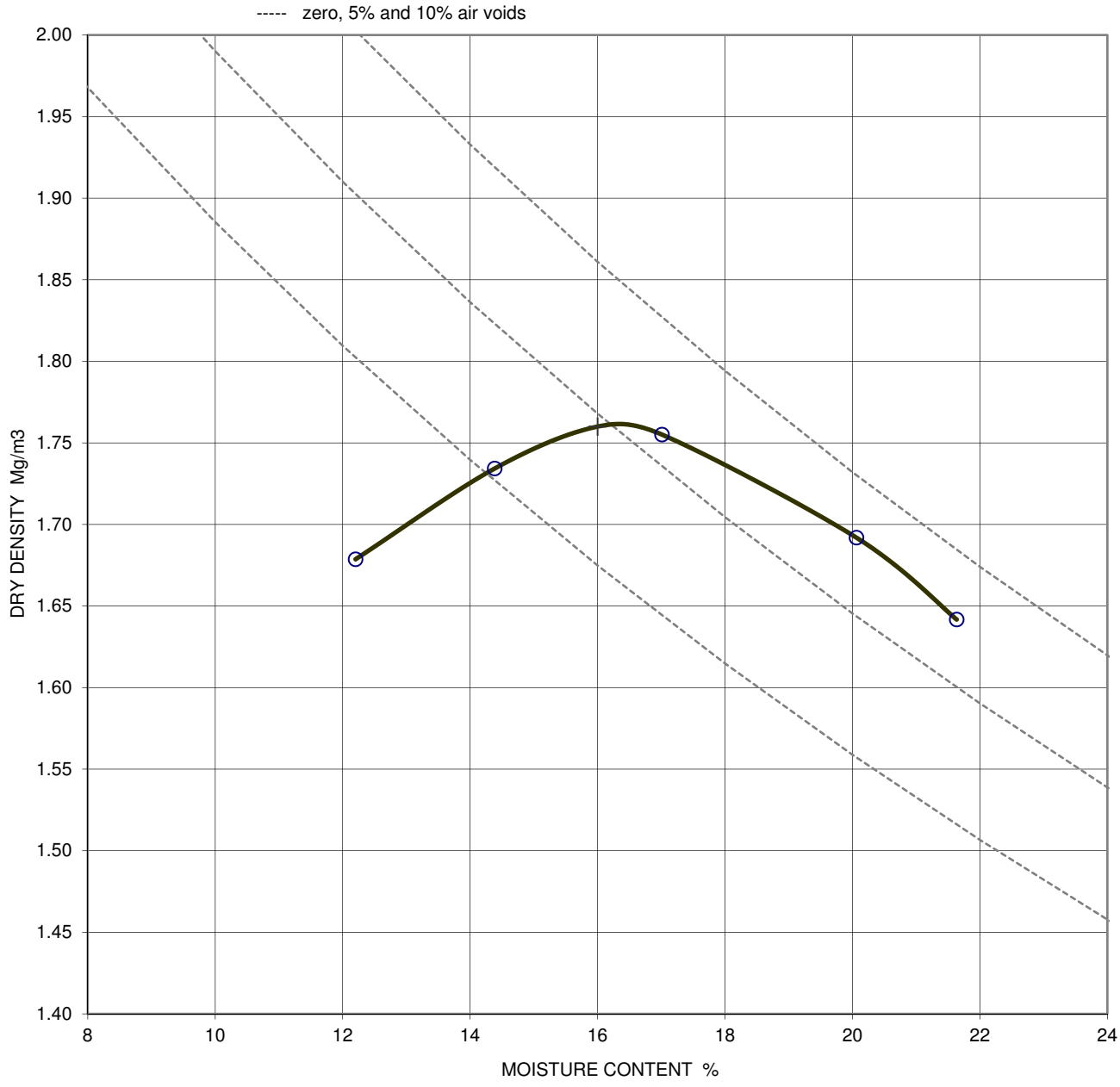
DRY DENSITY / MOISTURE CONTENT RELATIONSHIP
BS1377 : PART 4 : 1990 : HEAVY COMPACTION, 4.5 kg rammer

Sample Details:	SAMPLE ID:
	A8015-1820180413102609

Hole No	BH3
Sample Depth (m BGL)	0.40 - 1.20
Sample Type and No	B1
Specimen Ref	



Soil description	Brown slightly sandy CLAY with chalk fragments.		
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	2.65	assumed	
Remarks			

Derived Parameters +

Maximum dry density, Mg/m3
1.76

Optimum moisture content, %
16

QA Ref
SLD 4, 3.5/6
Rev 2.5
Sep 17

UKAS TESTING
1157

SOCOTEC

Project No A8015-18

Project Name VPI IMMINGHAM

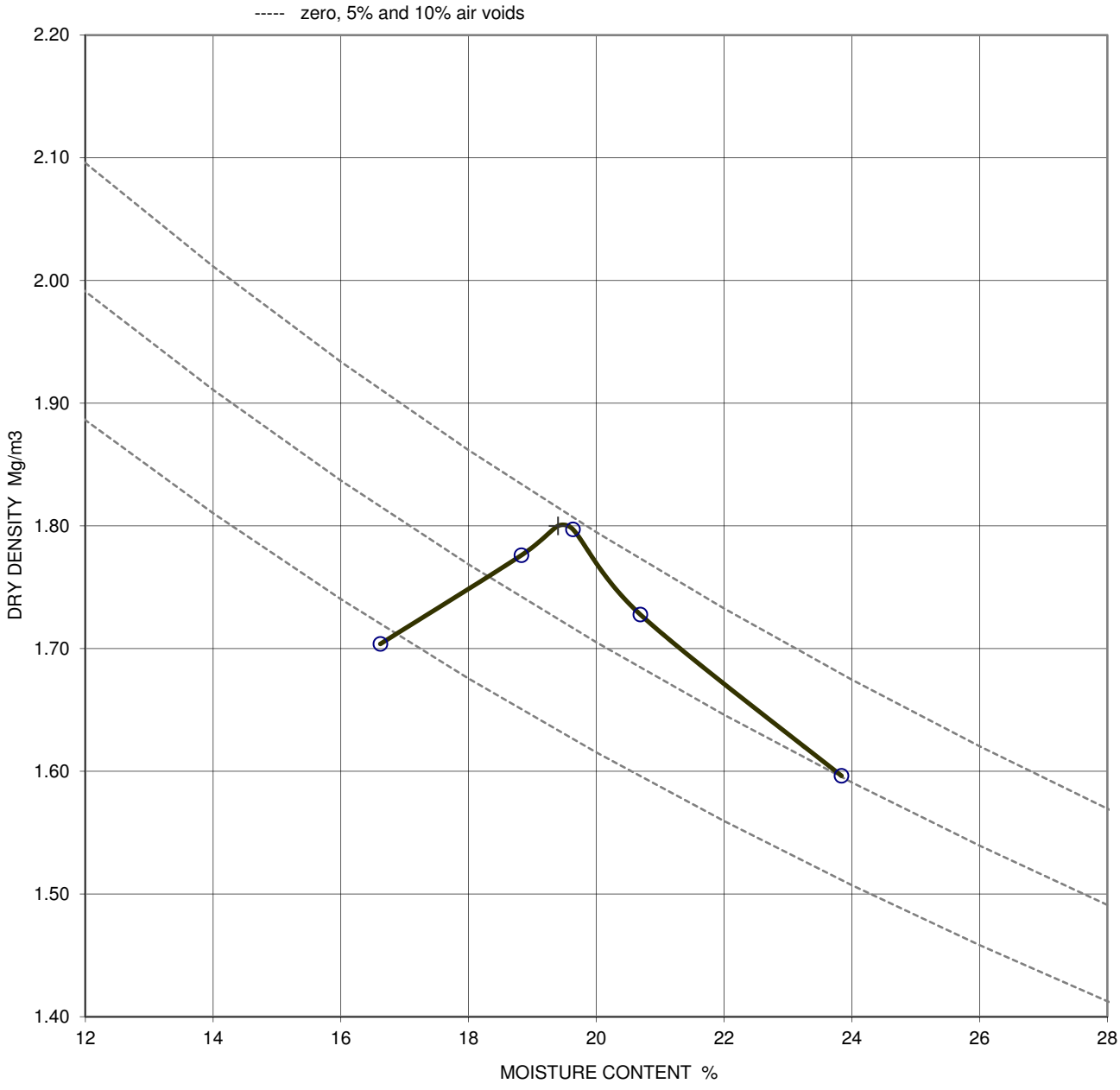
Figure
COMPH

Printed:
02/07/2018
15:40

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP
BS1377 : PART 4 : 1990 : HEAVY COMPACTION, 4.5 kg rammer

Sample Details:	SAMPLE ID:
	A8015-1820180409092443

Hole No	BH6
Sample Depth (m BGL)	0.30 - 0.55
Sample Type and No	B2
Specimen Ref	



Soil description	Brown slightly sandy 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
1.80

Optimum moisture content, %
19

QA Ref
SLD 4, 3.5/6
Rev 2.5
Sep 17

UKAS TESTING
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SOCOTEC

Project No	A8015-18
Project Name	VPI IMMINGHAM

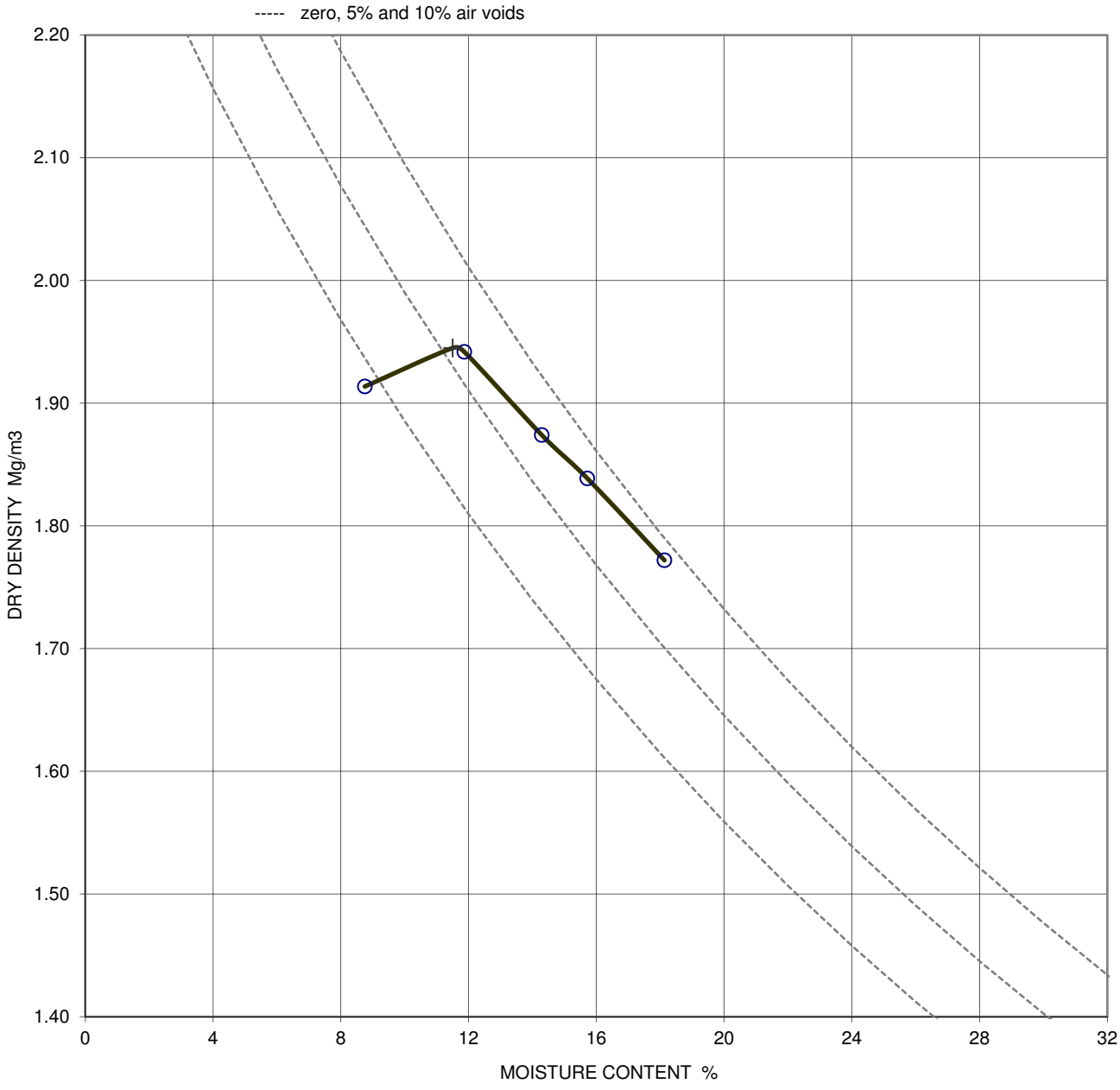
Figure
COMPH

Printed:
05/07/2018
11:41

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP
BS1377 : PART 4 : 1990 : HEAVY COMPACTION, 4.5 kg rammer

Sample Details:	SAMPLE ID:
	A8015-18-20180408084806

Hole No	TP10
Sample Depth (m BGL)	0.40 - 0.60
Sample Type and No	B4
Specimen Ref	



Soil description	Brown slightly sandy 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	2.65	assumed	
Remarks			

Derived Parameters +

Maximum dry density, Mg/m3
1.95

Optimum moisture content, %
12

QA Ref
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Sep 17

UKAS TESTING
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SOCOTEC

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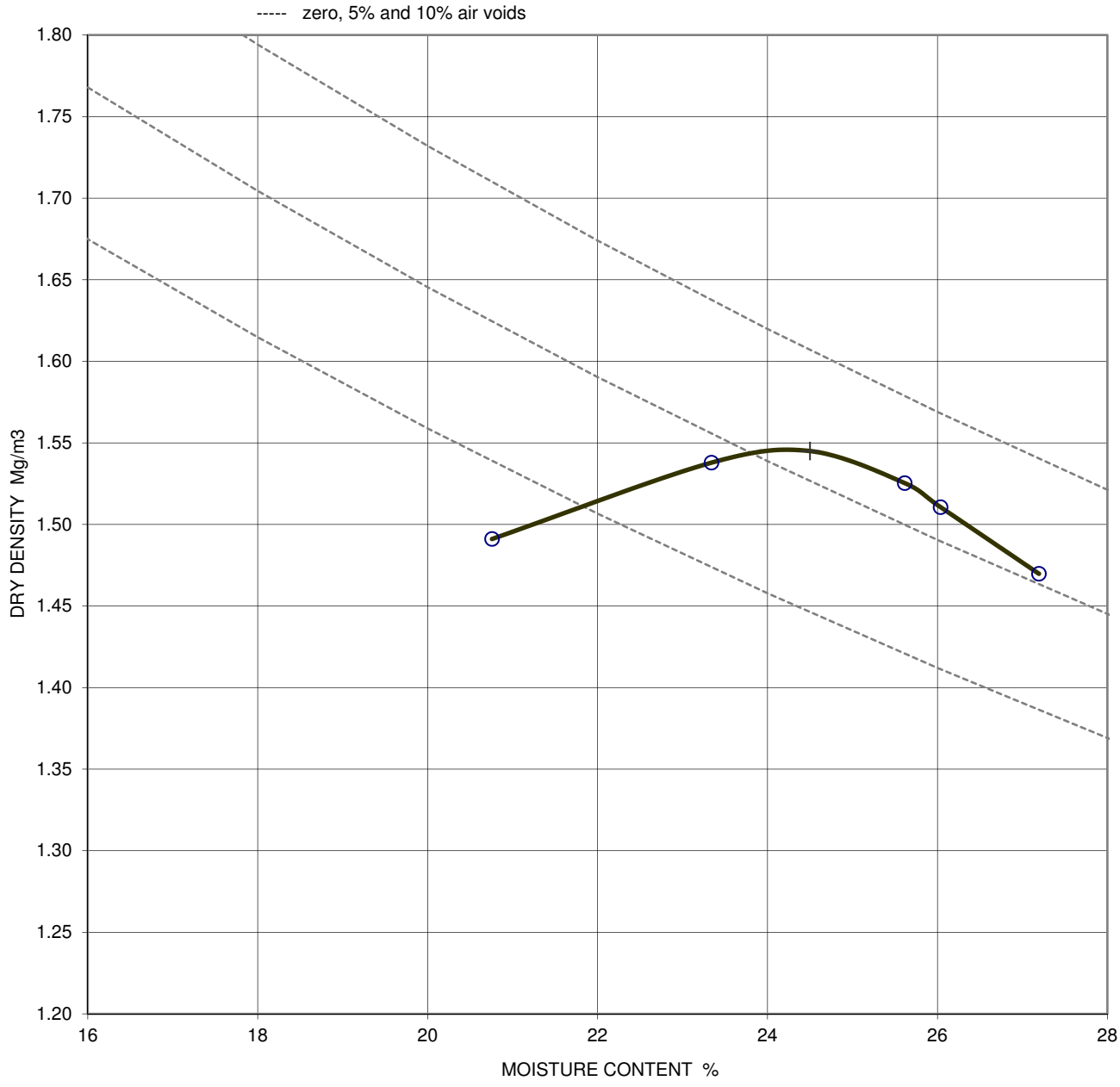
Figure
COMPH

Printed:
02/07/2018
15:40

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP
BS1377 : PART 4 : 1990 : HEAVY COMPACTION, 4.5 kg rammer

Sample Details:	SAMPLE ID:
	A8015-18-20180413090338

Hole No	TP2
Sample Depth (m BGL)	0.10 - 0.30
Sample Type and No	B2
Specimen Ref	



Soil description	Dark brown 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	4	%	
Particle density	2.65	assumed	
Remarks			

Derived Parameters +

Maximum dry density, Mg/m3
1.55

Optimum moisture content, %
25

QA Ref
SLD 4, 3.5/6
Rev 2.5
Sep 17

UKAS TESTING
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Project No A8015-18
Project Name VPI IMMINGHAM

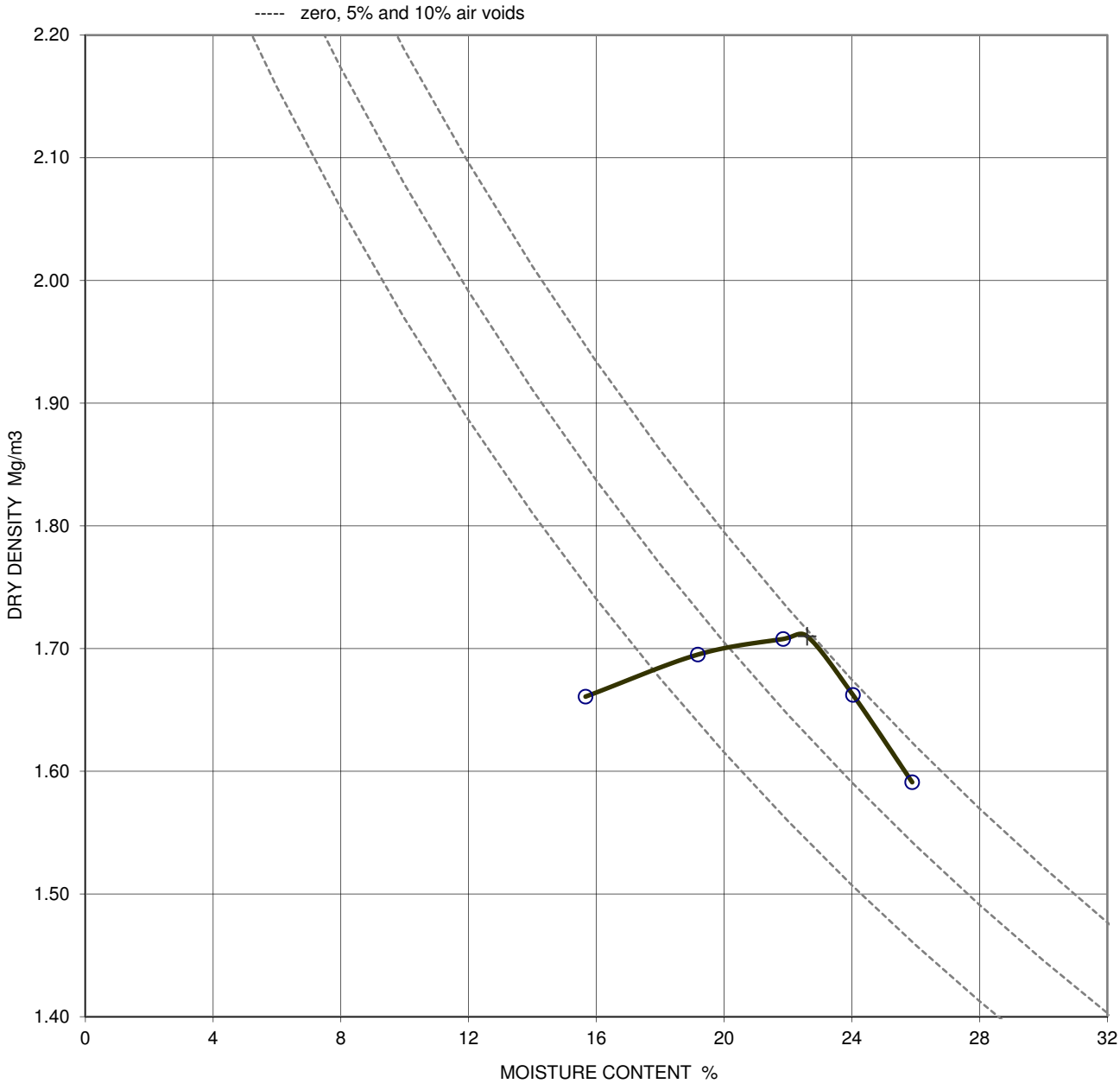
Figure
COMPH

Printed:
06/07/2018
07:56

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP
BS1377 : PART 4 : 1990 : HEAVY COMPACTION, 4.5 kg rammer

Sample Details:	SAMPLE ID:
	A8015-18-20180410075427

Hole No	TP4
Sample Depth (m BGL)	0.10 - 0.30
Sample Type and No	B2
Specimen Ref	



Soil description	Brown 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
1.71

Optimum moisture content, %
23

QA Ref
SLD 4, 3.5/6
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Sep 17

UKAS TESTING
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Project No	A8015-18
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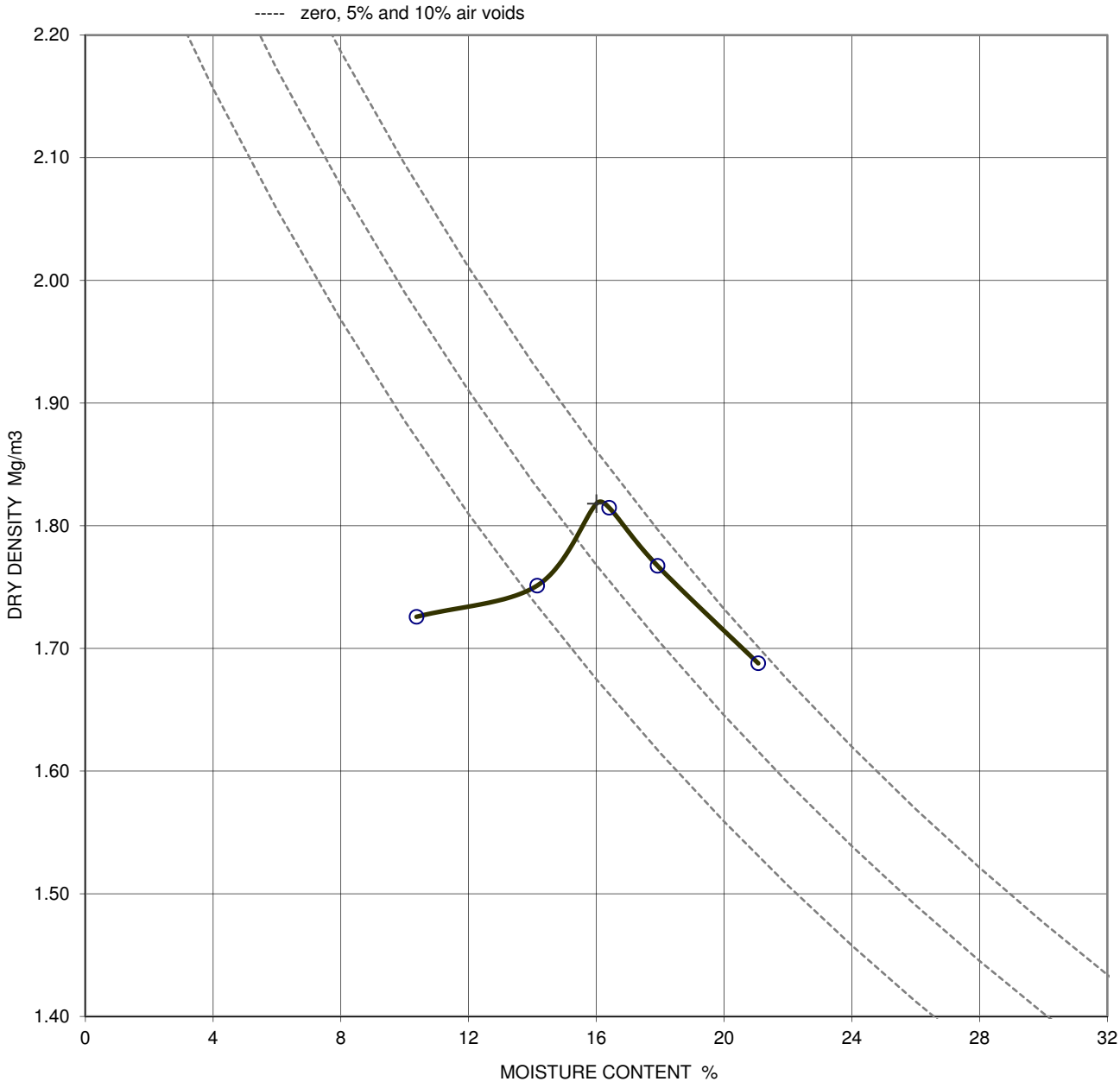
Figure
COMPH

Printed:
02/07/2018
15:42

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP
BS1377 : PART 4 : 1990 : HEAVY COMPACTION, 4.5 kg rammer

Sample Details:	SAMPLE ID:
	A8015-18-20180410082549

Hole No	TP6
Sample Depth (m BGL)	0.10 - 0.30
Sample Type and No	B2
Specimen Ref	



Soil description	Brown CLAY with chalk fragments.		
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	2	%	
Particle density	2.65	assumed	
Remarks			

Derived Parameters +

Maximum dry density, Mg/m3
1.82

Optimum moisture content, %
16

QA Ref
SLD 4, 3.5/6
Rev 2.5
Sep 17

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Project No	A8015-18
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Printed:
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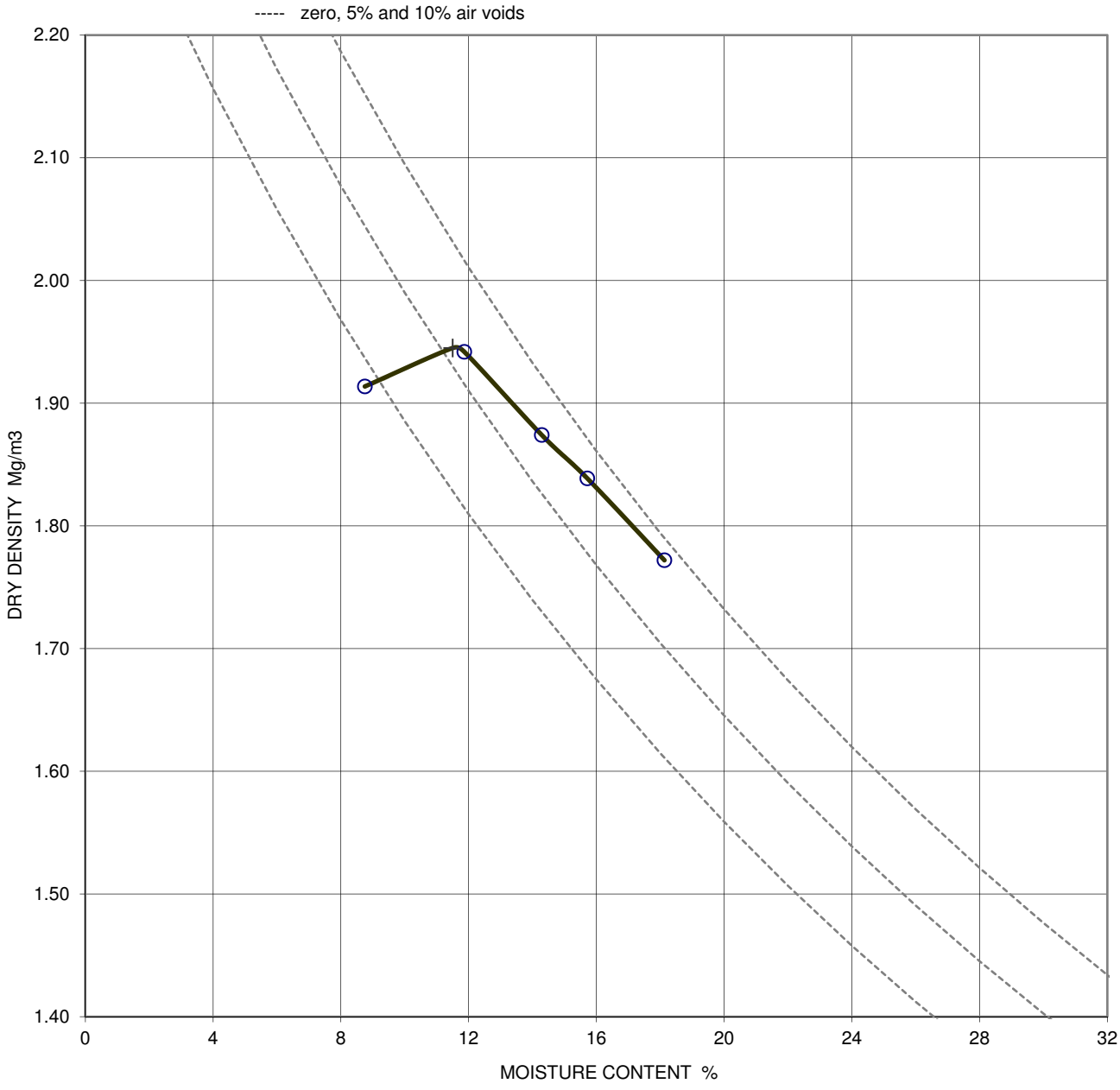
DRY DENSITY / MOISTURE CONTENT RELATIONSHIP
BS1377 : PART 4 : 1990 : HEAVY COMPACTION, 4.5 kg rammer

Sample Details:	SAMPLE ID:
	A8015-18-20180408084806

Hole No	TP10
Sample Depth (m BGL)	0.40 - 0.60
Sample Type and No	B4
Specimen Ref	



Soil description	Brown slightly sandy 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	2.65	assumed	
Remarks			

Derived Parameters +

Maximum dry density, Mg/m3
1.95

Optimum moisture content, %
12

QA Ref
SLD 4, 3.5/6
Rev 2.5
Sep 17

UKAS TESTING
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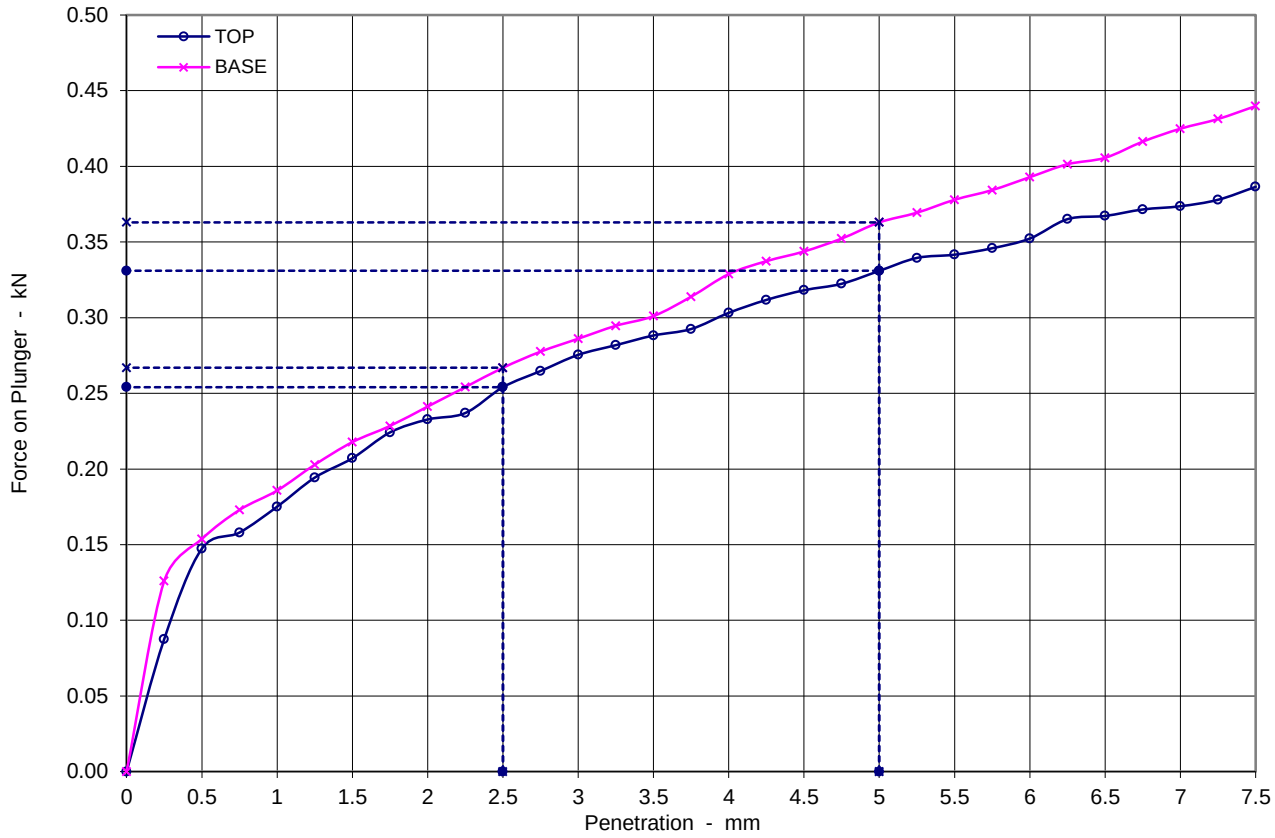
California Bearing Ratio (BS1377:1990:Part 4 , section 7)

Sample Details:	SAMPLE ID:
	A8015-1820180409104552

Hole No	BH1
Sample Depth (m)	1.00 - 1.20
Sample Type and No	B5
Specimen Ref	1



Soil description	Brown slightly sandy slightly gravelly CLAY with rare rootlets.

Test Conditions		
Sample Retained on 20 mm sieve	%	27

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	16
	kPa	10

Notes :

Sample Conditions		
Initial Moisture Content	%	22.0
Bulk Density	Mg/m³	2.02
Dry Density	Mg/m³	1.66
Moisture Content - TOP	%	22.0
Moisture Content - BASE	%	21.0

Penetration mm	CBR Values %	
	TOP	BASE
2.5	1.9	2.0
5	1.7	1.8

Accepted CBR %	**1.9**	**2.0**

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Figure

CBR

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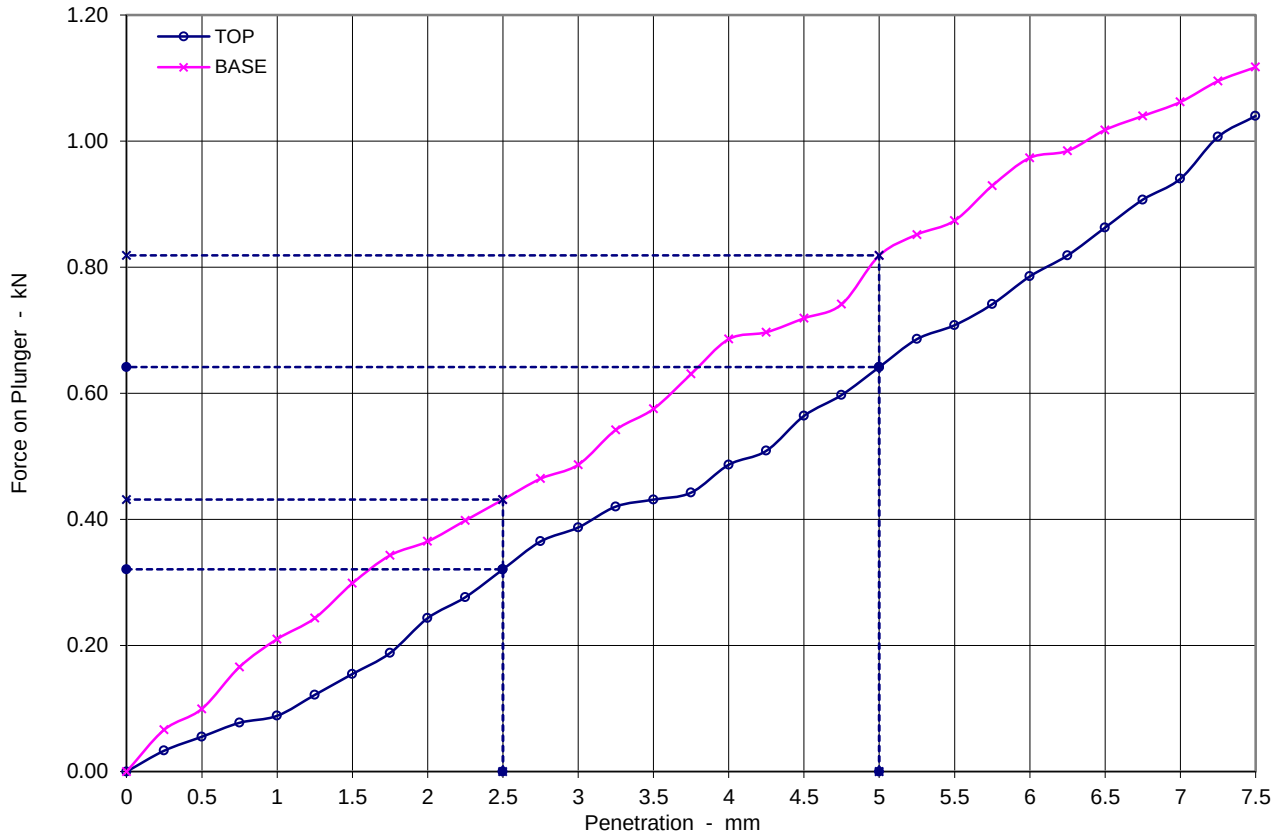
California Bearing Ratio (BS1377:1990:Part 4 , section 7)

Sample Details:	SAMPLE ID:
	A8015-1820180413011424

Hole No	BH2
Sample Depth (m)	1.00 - 1.20
Sample Type and No	B6
Specimen Ref	1



Soil description	Brown slightly sandy CLAY.

Test Conditions		
Sample Retained on 20 mm sieve	%	3

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	16
	kPa	10

Notes :

Sample Conditions		
Initial Moisture Content	%	25.0
Bulk Density	Mg/m³	1.97
Dry Density	Mg/m³	1.58
Moisture Content - TOP	%	26.0
Moisture Content - BASE	%	24.0

Penetration mm	CBR Values %	
	TOP	BASE
2.5	2.4	3.3
5	3.2	4.1

Accepted CBR %	**3.2**	**4.1**

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Figure

CBR

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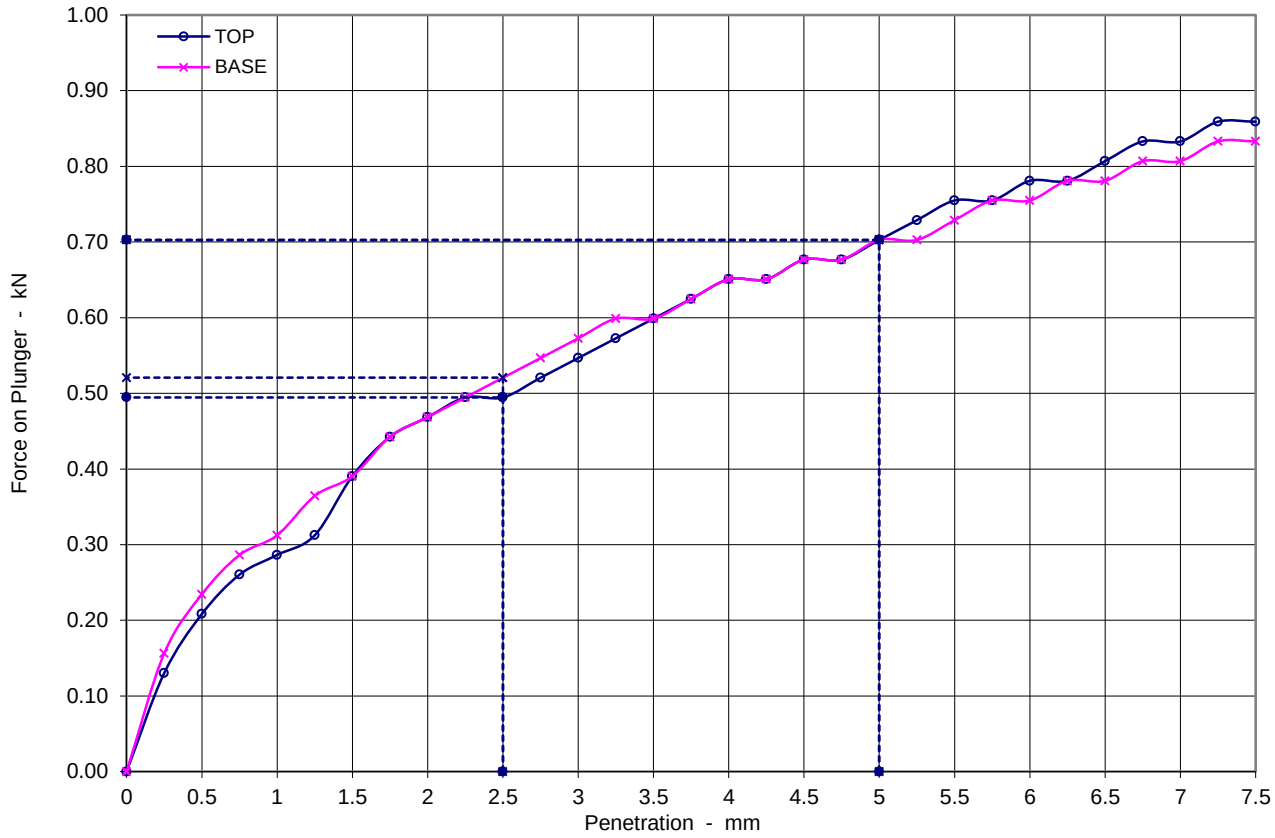
California Bearing Ratio (BS1377:1990:Part 4 , section 7)

Sample Details:	SAMPLE ID:
	A8015-1820180413102609

Hole No	BH3
Sample Depth (m)	0.40 - 1.20
Sample Type and No	B1
Specimen Ref	1



Soil description	Brown slightly sandy CLAY with chalk fragments.

Test Conditions		
Sample Retained on 20 mm sieve	%	0

Preparation	Method of Compaction		
	Undisturbed		
	Soaked test		NO
	Soaking Period	days	N/A
	Amount of Swell	mm	N/A

Surcharge applied		
	kg	16
	kPa	10

Notes :

Sample Conditions		
Initial Moisture Content	%	21.0
Bulk Density	Mg/m³	2.03
Dry Density	Mg/m³	1.68
Moisture Content - TOP	%	22.0
Moisture Content - BASE	%	22.0

Penetration mm	CBR Values %	
	TOP	BASE
2.5	3.7	3.9
5	3.5	3.5

Accepted CBR %	**3.7**	**3.9**

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Figure

CBR

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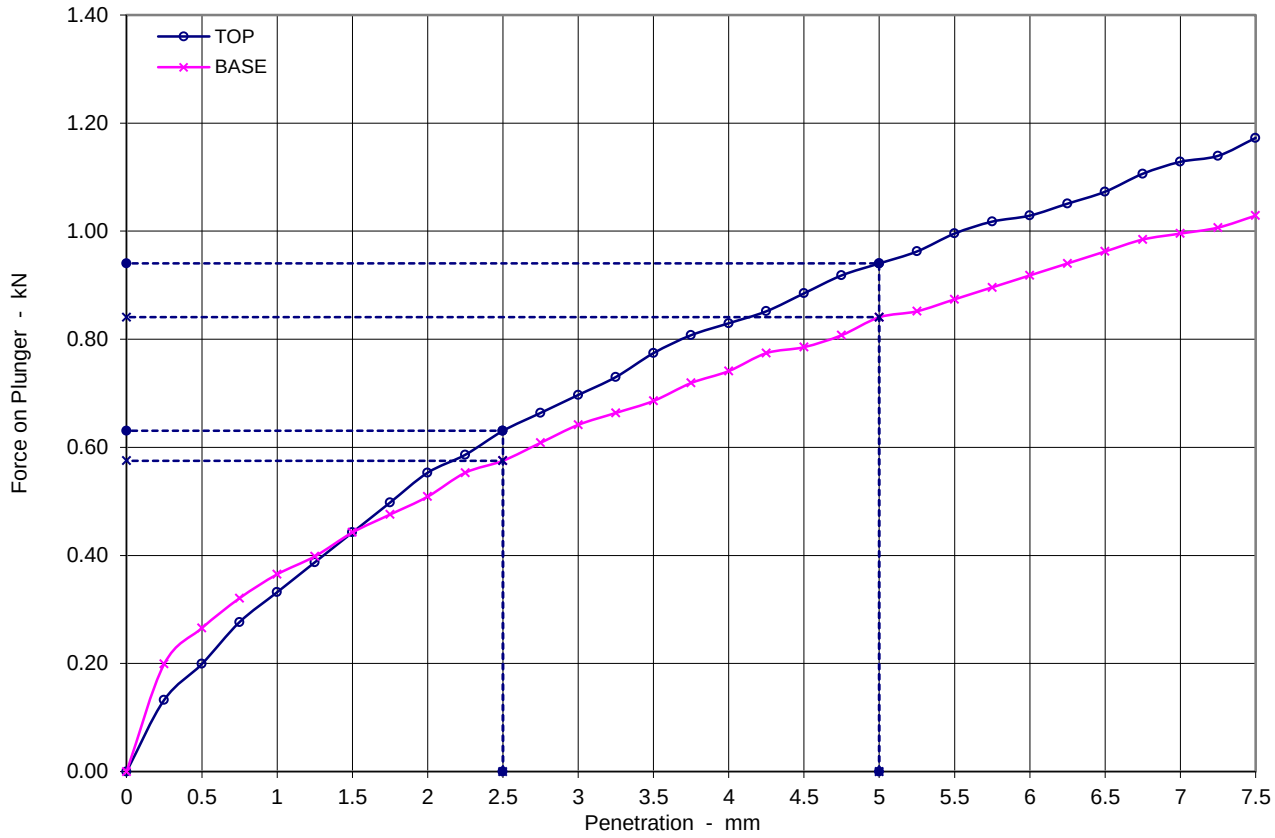
California Bearing Ratio (BS1377:1990:Part 4 , section 7)

Sample Details:	SAMPLE ID:
	A8015-1820180418115011

Hole No	BH4
Sample Depth (m)	1.65 - 2.00
Sample Type and No	B3
Specimen Ref	1



Soil description	Brown slightly sandy CLAY with chalk fragments.

Test Conditions		
Sample Retained on 20 mm sieve	%	0

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	16
	kPa	10

Notes :

Sample Conditions		
Initial Moisture Content	%	19.0
Bulk Density	Mg/m³	2.12
Dry Density	Mg/m³	1.78
Moisture Content - TOP	%	20.0
Moisture Content - BASE	%	19.0

Penetration mm	CBR Values %	
	TOP	BASE
2.5	4.8	4.4
5	4.7	4.2

Accepted CBR %	**4.8**	**4.4**

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Figure

CBR

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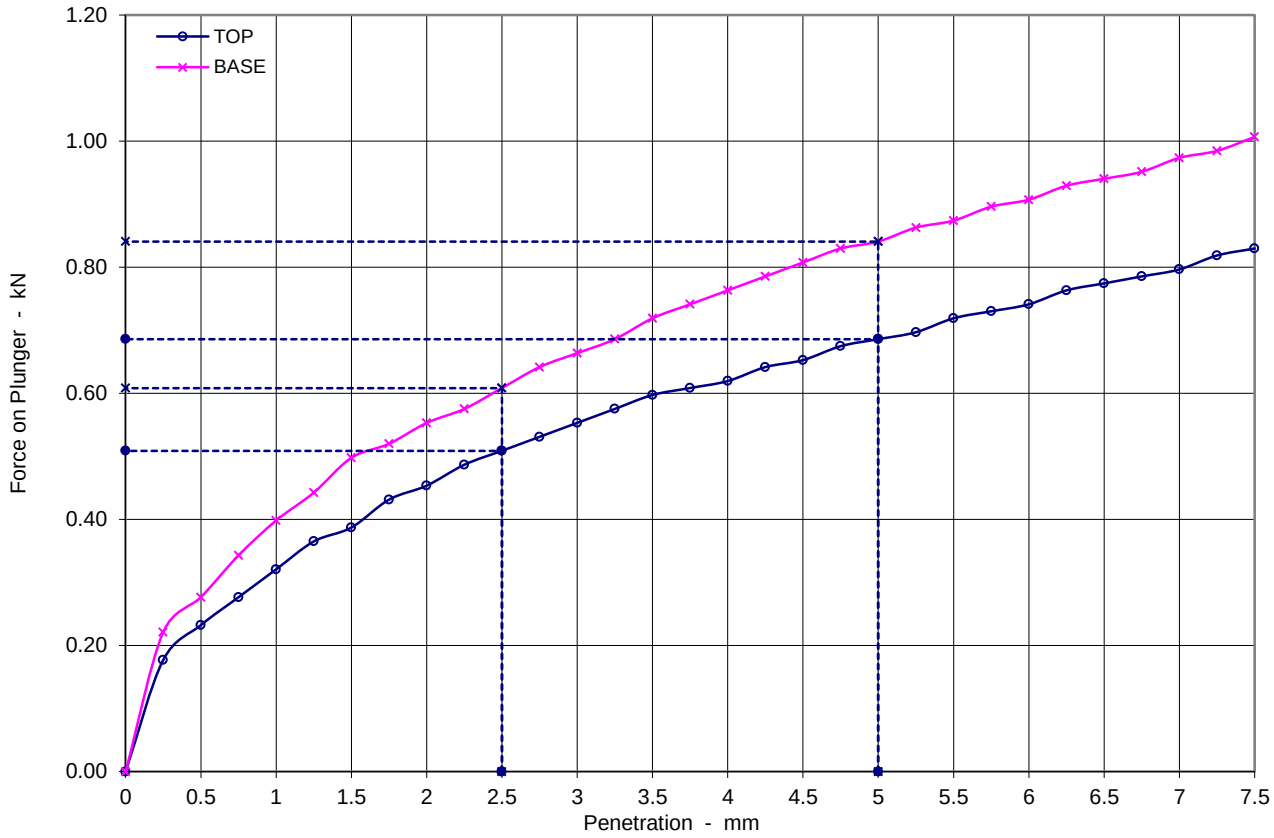
California Bearing Ratio (BS1377:1990:Part 4 , section 7)

Sample Details:	SAMPLE ID:
	A8015-18-20180413084055

Hole No	TP1
Sample Depth (m)	0.70 - 0.90
Sample Type and No	B4
Specimen Ref	1



Soil description	Brown slightly sandy CLAY with occasional chalk fragments.

Test Conditions		
Sample Retained on 20 mm sieve	%	0

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	16
	kPa	10

Notes :

Sample Conditions		
Initial Moisture Content	%	23.0
Bulk Density	Mg/m³	1.98
Dry Density	Mg/m³	1.61
Moisture Content - TOP	%	22.0
Moisture Content - BASE	%	22.0

Penetration mm	CBR Values %	
	TOP	BASE
2.5	3.9	4.6
5	3.4	4.2

Accepted CBR %	**3.9**	**4.6**

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Figure

CBR

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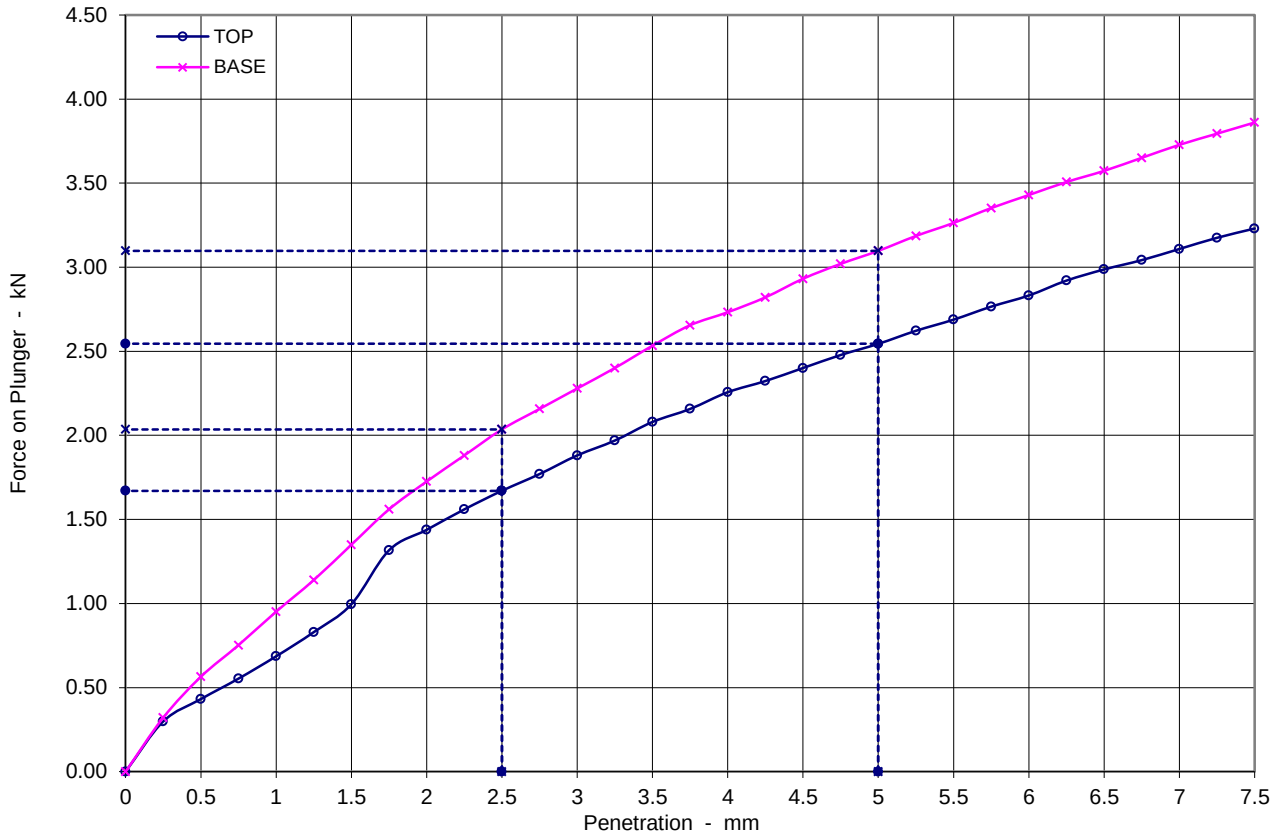
California Bearing Ratio (BS1377:1990:Part 4 , section 7)

Sample Details:	SAMPLE ID:
	A8015-18-20180413084231

Hole No	TP1
Sample Depth (m)	3.40 - 3.60
Sample Type and No	B10
Specimen Ref	1



Soil description	Light brown slightly sandy CLAY.

Test Conditions		
Sample Retained on 20 mm sieve	%	0

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	16
	kPa	10

Notes :

Sample Conditions		
Initial Moisture Content	%	14.0
Bulk Density	Mg/m³	2.19
Dry Density	Mg/m³	1.92
Moisture Content - TOP	%	13.0
Moisture Content - BASE	%	13.0

Penetration mm	CBR Values %	
	TOP	BASE
2.5	13.0	15.0
5	13.0	15.0

Accepted CBR %	**13.0**	**15.0**

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Figure

CBR

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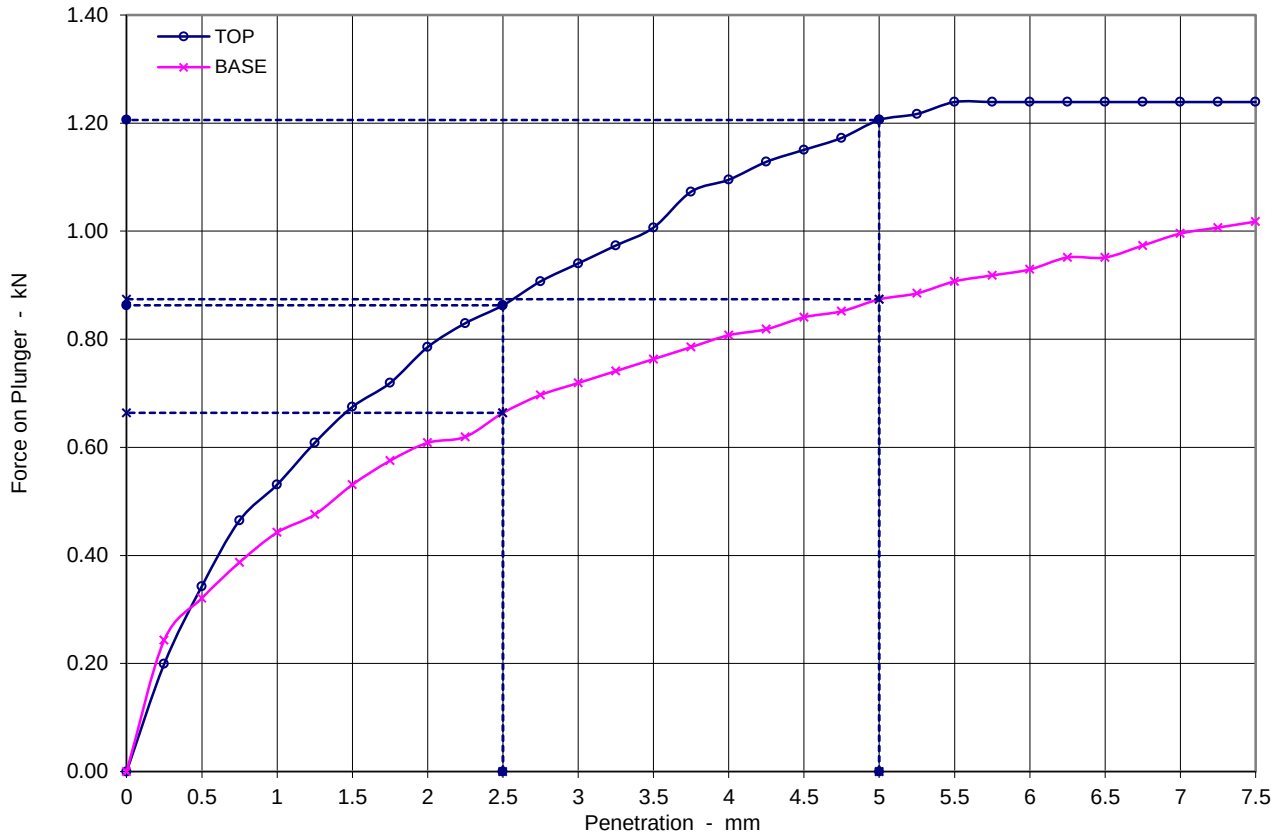
California Bearing Ratio (BS1377:1990:Part 4 , section 7)

Sample Details:	SAMPLE ID:
	A8015-18-20180413090359

Hole No	TP2
Sample Depth (m)	0.30 - 0.50
Sample Type and No	B4
Specimen Ref	1



Soil description	Brown slightly sandy slightly gravelly CLAY.

Test Conditions		
Sample Retained on 20 mm sieve	%	0

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	16
	kPa	10

Notes :

Sample Conditions		
Initial Moisture Content	%	20.0
Bulk Density	Mg/m³	1.92
Dry Density	Mg/m³	1.60
Moisture Content - TOP	%	21.0
Moisture Content - BASE	%	22.0

Penetration mm	CBR Values %	
	TOP	BASE
2.5	6.5	5.0
5	6.0	4.4

Accepted CBR %	**6.5**	**5.0**

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Figure

CBR

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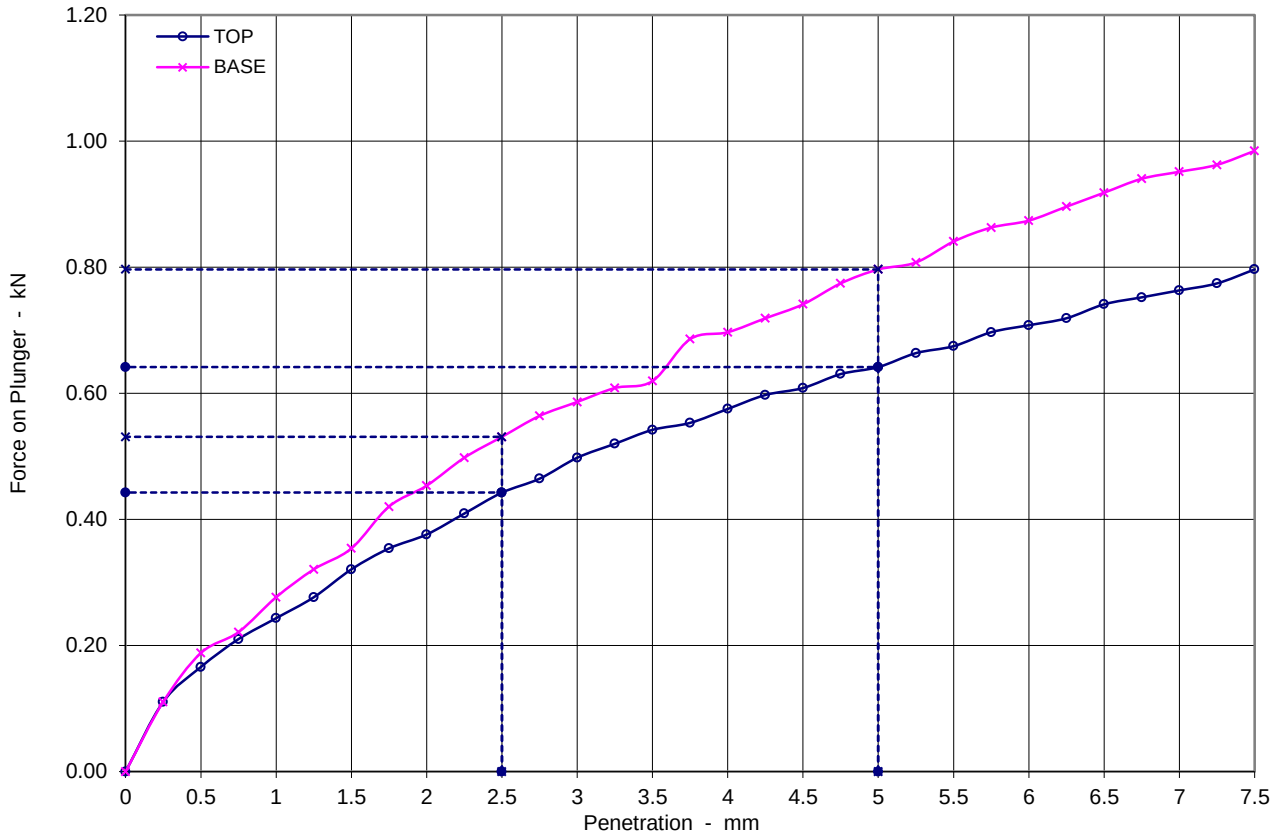
California Bearing Ratio (BS1377:1990:Part 4 , section 7)

Sample Details:	SAMPLE ID:
	A8015-18-20180410092425

Hole No	TP7
Sample Depth (m)	1.30 - 1.60
Sample Type and No	B4
Specimen Ref	1



Soil description	Brown slightly sandy CLAY with chalk fragments.

Test Conditions		
Sample Retained on 20 mm sieve	%	0

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	16
	kPa	10

Notes :

Sample Conditions		
Initial Moisture Content	%	17.0
Bulk Density	Mg/m³	2.14
Dry Density	Mg/m³	1.83
Moisture Content - TOP	%	17.0
Moisture Content - BASE	%	17.0

Penetration mm	CBR Values %	
	TOP	BASE
2.5	3.4	4.0
5	3.2	4.0

Accepted CBR %	**3.4**	**4.0**

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Figure

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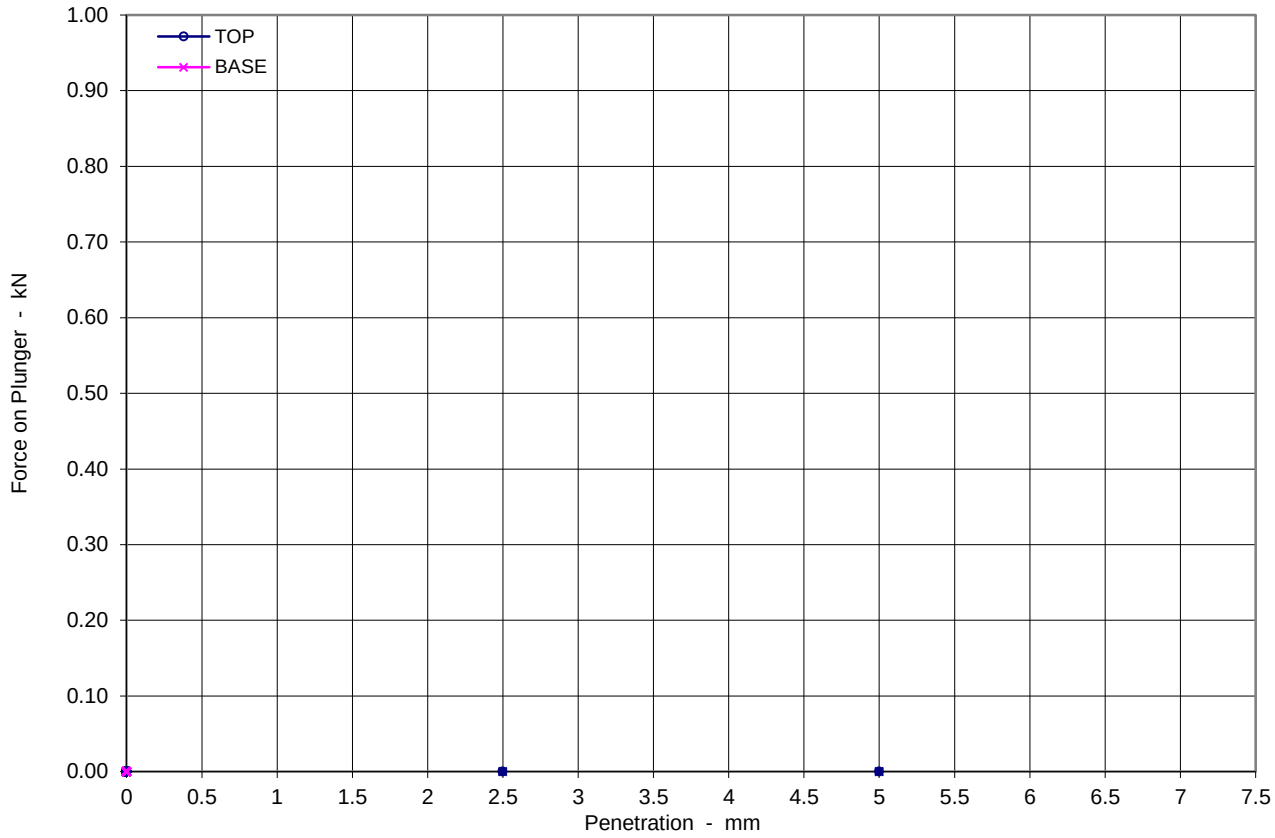
California Bearing Ratio (BS1377:1990:Part 4 , section 7)

Sample Details:	SAMPLE ID:
	A8015-18-20180410074518

Hole No	TP8
Sample Depth (m)	3.70 - 3.90
Sample Type and No	B12
Specimen Ref	1



Soil description	Brown SAND with occasional chalk fragments.

Test Conditions		
Sample Retained on 20 mm sieve	%	

Preparation	Method of Compaction		
	Undisturbed		
	Soaked test		NO
	Soaking Period	days	N/A
	Amount of Swell	mm	N/A

Surcharge applied	kg	
	kPa	0

Notes :

Test attempted @ NMC & various dryer MC's, sample protruded from mould at NMC & dryer MC's when CBR testing equipment came into contact with sample.

Sample Conditions		
Initial Moisture Content	%	
Bulk Density	Mg/m³	
Dry Density	Mg/m³	
Moisture Content - TOP	%	
Moisture Content - BASE	%	

Penetration mm	CBR Values %	
	TOP	BASE
2.5	-	-
5.0	-	-
Accepted CBR %	**-**	**-**

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Project Name VPI IMMINGHAM

Figure

CBR

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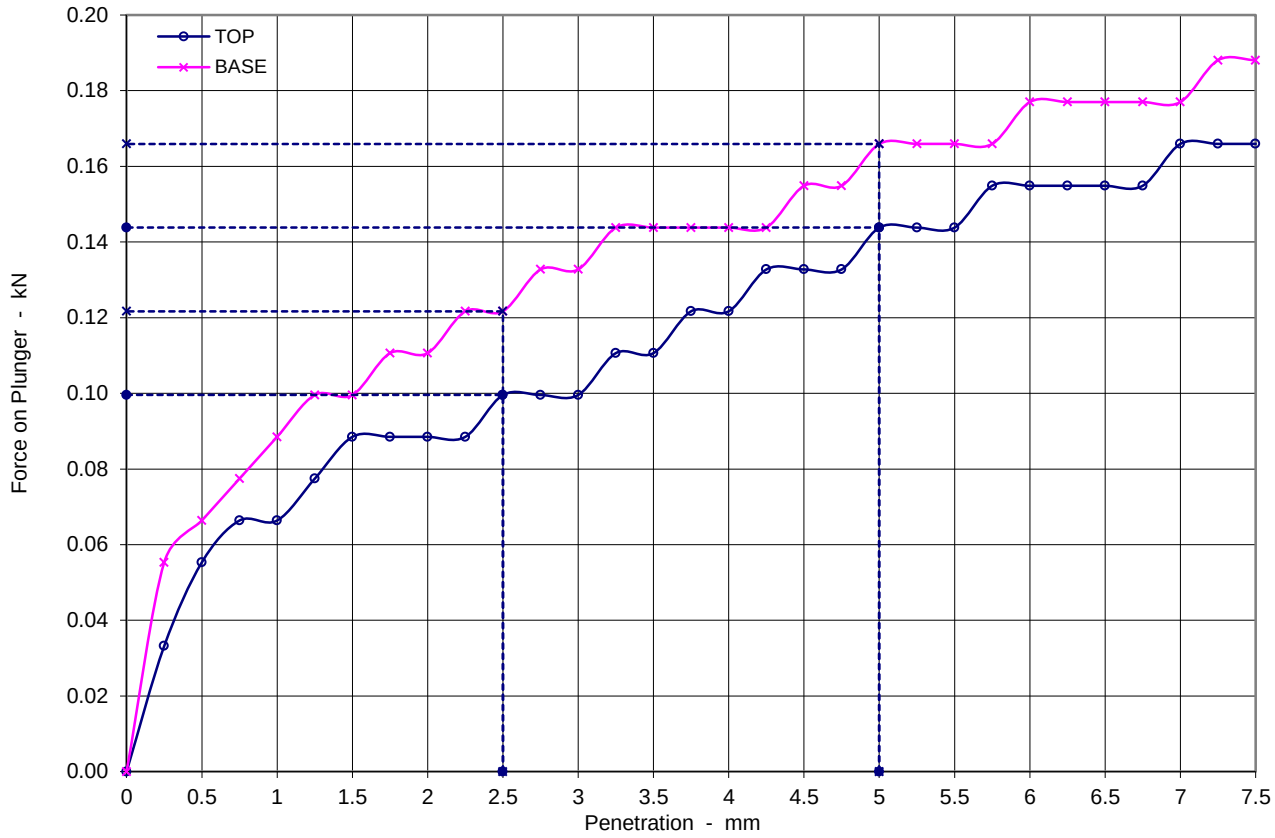
California Bearing Ratio (BS1377:1990:Part 4 , section 7)

Sample Details:	SAMPLE ID:
	A8015-18-20180413014738

Hole No	TT1
Sample Depth (m)	0.50 - 0.70
Sample Type and No	B4
Specimen Ref	1



Soil description	Brown slightly gravelly CLAY with occasional chalk fragments.

Test Conditions		
Sample Retained on 20 mm sieve	%	2

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	16
	kPa	10

Notes :

Sample Conditions		
Initial Moisture Content	%	27.0
Bulk Density	Mg/m³	2.40
Dry Density	Mg/m³	1.90
Moisture Content - TOP	%	25.0
Moisture Content - BASE	%	26.0

Penetration mm	CBR Values %	
	TOP	BASE
2.5	0.8	0.9
5	0.7	0.8

Accepted CBR %	**0.8**	**0.9**

QA Ref
SLR 2
Rev 2.7
Apr 15

SOCOTEC

Project No A8015-18

Project Name VPI IMMINGHAM

Figure

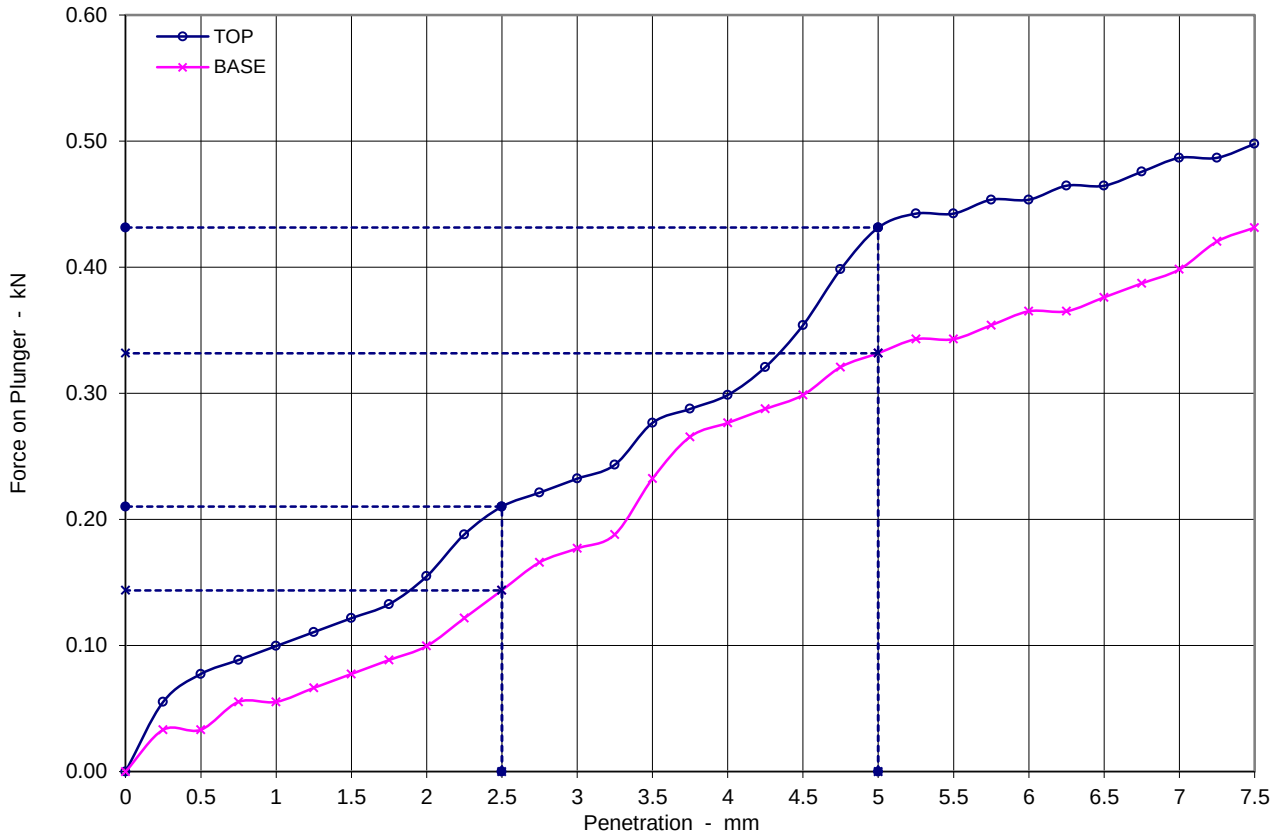
CBR

Printed: 14/08/2018 11:15

California Bearing Ratio (BS1377:1990:Part 4 , section 7)

Sample Details:	SAMPLE ID:
	A8015-18-20180408080446

Hole No	TT3
Sample Depth (m)	0.30 - 0.60
Sample Type and No	B2
Specimen Ref	1



Soil description	Brown slightly sandy CLAY.

Test Conditions		
Sample Retained on 20 mm sieve	%	0

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	16
	kPa	10

Notes :

Sample Conditions		
Initial Moisture Content	%	25.0
Bulk Density	Mg/m³	1.94
Dry Density	Mg/m³	1.56
Moisture Content - TOP	%	24.0
Moisture Content - BASE	%	27.0

Penetration mm	CBR Values %	
	TOP	BASE
2.5	1.6	1.1
5	2.2	1.7

Accepted CBR %	**2.2**	**1.7**

QA Ref
SLR 2
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Apr 15

SOCOTEC

Project No A8015-18

Project Name VPI IMMINGHAM

Figure

CBR

Printed: 14/08/2018 11:15

TEST REPORT

Report No. EFS/187041 (Ver. 1)

SOCOTEC UK Doncaster
Askern Road
Carcroft
Doncaster
South Yorkshire
DN6 8DG

Site: A8015-18 VPI Immingham

The 4 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: 03-Jul-2018

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-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 :	%															
		Method Codes :	ORGMAT															
		Method Reporting Limits :	0.1															
LAB ID Number CL/	**Client Sample Description**	**Sample Date**	**Organic Matter %**															
1910777	BH4 D 2 1.20		1.4															
1910778	TP02 D 3 0.30		7.1															
1910779	BH5 D 13 2.90		1.4															
1910780	BH2 D 3 0.60		16.7															

SOCOTEC

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Fax +44 (0) 1283 554422

Client Name	**SOCOTEC UK Doncaster**
Contact	Tim Clifford

A8015-18 VPI Immingham

Sample Analysis

Date Printed	**03-Jul-2018**
Report Number	**EFS/187041**
Table Number	**1**

Analytical and Deviating Sample Overview

Customer SOCOTEC UK Doncaster
Site A8015-18 VPI Immingham
Report No S187041

Consignment No S75653
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	ORGMAT
		Sampled	REPORT A	Organic Matter %
CL/1910777	BH4 1.20-1.65	D	D	D
CL/1910778	TP02 0.30	D	D	D
CL/1910779	BH5 2.90-3.35	D	D	D
CL/1910780	BH2 0.60	D	D	D

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	ORGMAT	Oven Dried @ < 35°C	Acid Dichromate oxidation of the sample followed by colorimetric analysis of the extract

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 : A8015-18 VPI Immingham

Report Number : S18_7041

Note: major constituent in upper case

Lab ID Number	Client ID	Description
CL/1910777	BH4 D 2 1.20	CLAY
CL/1910778	TP02 D 3 0.30	SILT
CL/1910779	BH5 D 13 2.90	CLAY
CL/1910780	BH2 D 3 0.60	SILT

TEST REPORT

UKAS TESTING
1252

Report No. EFS/187043 (Ver. 1)

SOCOTEC UK Doncaster
Askern Road
Carcroft
Doncaster
South Yorkshire
DN6 8DG

Site: A8015-18 VPI Immingham

The 12 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	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)**											
1910790	BH2 D 14 2.80				1.6													
1910791	BH3 D 4 2.00				1.4													
1910792	BH3 D 6 3.00		433	116		0.041	8.4											
1910793	BH6 D 26 13.70		200	23		0.029	8.7											
1910794	TP1 D 1 0.10				3.6													
1910795	TP2 D 11 4.00		276	56		0.031	8.8											
1910796	TP3 D 9 3.40				1.5													
1910797	TP5 D 1 0.10				3.6													
1910798	TP6 D 3 0.40		1420	479		0.085	7.8											
1910799	TP8 D 7 2.00				1.9													
1910800	TP9 D 5 0.80				3.1													
1910801	TT2 B 6 2.00		643	118		0.039	7.5											

SOCOTEC

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Client Name SOCOTEC UK Doncaster

Contact Tim Clifford

A8015-18 VPI Immingham

Sample Analysis

Date Printed	**04-Jul-2018**
Report Number	**EFS/187043**
Table Number	**1**

Where individual results are flagged see report notes for status.

Analytical and Deviating Sample Overview

Customer SOCOTEC UK Doncaster
Site A8015-18 VPI Immingham
Report No S187043

Consignment No S75655
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/1910790	BH2 2.80-3.25	D	D									D		
CL/1910791	BH3 2.00-2.45	D	D									D		
CL/1910792	BH3 3.00-3.45	D	D	D	D	D	D	D	D	D	D		D	D
CL/1910793	BH6 13.70	D	D				D	D	D	D	D		D	D
CL/1910794	TP1 0.10	D	D									D		
CL/1910795	TP2 4.00	D	D				D	D	D	D	D		D	D
CL/1910796	TP3 3.40	D	D									D		
CL/1910797	TP5 0.10	D	D									D		
CL/1910798	TP6 0.40	D	D				D	D	D	D	D		D	D
CL/1910799	TP8 2.00	D	D									D		
CL/1910800	TP9 0.80	D	D									D		
CL/1910801	TT2 2.00-2.15	D	D				D	D	D	D	D		D	D

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.

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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	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
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Sample Descriptions

Client : SOCOTEC UK Doncaster

Site : A8015-18 VPI Immingham

Report Number : S18_7043

Note: major constituent in upper case

Lab ID Number	Client ID	Description
CL/1910790	BH2 D 14 2.80	CLAY
CL/1910791	BH3 D 4 2.00	CLAY
CL/1910792	BH3 D 6 3.00	CLAY
CL/1910793	BH6 D 26 13.70	CLAY
CL/1910794	TP1 D 1 0.10	SILT
CL/1910795	TP2 D 11 4.00	SAND
CL/1910796	TP3 D 9 3.40	SILT
CL/1910797	TP5 D 1 0.10	CLAY
CL/1910798	TP6 D 3 0.40	SILT
CL/1910799	TP8 D 7 2.00	CLAY
CL/1910800	TP9 D 5 0.80	SILT
CL/1910801	TT2 B 6 2.00	SILT

TEST REPORT

UKAS TESTING
1252

Report No. EFS/187204 (Ver. 1)

SOCOTEC UK Doncaster
Askern Road
Carcroft
Doncaster
South Yorkshire
DN6 8DG

Site: A8015-18 VPI Immingham

The 11 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	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)**											
1911581	TT02 B 6 2.00		498	79		0.033	7.8											
1911582	TT03 B 4 1.30				2.6													
1911583	BH5 B 18 4.00		737	205		0.153	8.0											
1911584	BH6 B 1 0.00				3.2													
1911585	TP02 B 10 3.40				1.6													
1911586	TP6 B 6 1.00				1.4													
1911587	TP09 B 6 0.80		626	121		0.053	7.6											
1911588	BH1 D 3 0.45				13.7													
1911589	BH1 B 5 1.00		1260	847		0.068	7.8											
1911590	BH2 B 13 2.20		1170	530		0.075	8.1											
1911591	BH2 B 31 5.70		604	178		0.319	8.5											

SOCOTEC

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Client Name SOCOTEC UK Doncaster

Contact Tim Clifford

A8015-18 VPI Immingham

Sample Analysis

Date Printed	**09-Jul-2018**
Report Number	**EFS/187204**
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 A8015-18 VPI Immingham
Report No S187204

Consignment No S75795
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	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/1911581	TT02 2.00-2.15	D	D	D	D	D	D	D	D	D	D		D	D
CL/1911582	TT03 1.30-1.60	D	D									D		
CL/1911583	BH5 4.00-4.45	D	D				D	D	D	D	D		D	D
CL/1911584	BH6 0.00-0.30	D	D									D		
CL/1911585	TP02 3.40-3.50	D	D									D		
CL/1911586	TP6 1.00-1.20	D	D									D		
CL/1911587	TP09 0.80-1.00	D	D				D	D	D	D	D		D	D
CL/1911588	BH1 0.45	D	D									D		
CL/1911589	BH1 1.00-1.20	D	D				D	D	D	D	D		D	D
CL/1911590	BH2 2.20-2.70	D	D				D	D	D	D	D		D	D
CL/1911591	BH2 5.70-6.15	D	D				D	D	D	D	D		D	D

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
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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.

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Method Descriptions

Matrix	MethodID	Analysis Basis	Method Description
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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

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¥ 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

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Sample Descriptions

Client : SOCOTEC UK Doncaster

Site : A8015-18 VPI Immingham

Report Number : S18_7204

Note: major constituent in upper case

Lab ID Number	Client ID	Description
CL/1911581	TT02 B 6 2.00	SILT
CL/1911582	TT03 B 4 1.30	SILT
CL/1911583	BH5 B 18 4.00	CLAY
CL/1911584	BH6 B 1 0.00	GRAVEL
CL/1911585	TP02 B 10 3.40	CLAY
CL/1911586	TP6 B 6 1.00	CLAY
CL/1911587	TP09 B 6 0.80	CLAY
CL/1911588	BH1 D 3 0.45	SILT
CL/1911589	BH1 B 5 1.00	CLAY
CL/1911590	BH2 B 13 2.20	CLAY
CL/1911591	BH2 B 31 5.70	CLAY

TEST REPORT

Report No. EFS/187902 (Ver. 1)

SOCOTEC UK Doncaster
Askern Road
Carcroft
Doncaster
South Yorkshire
DN6 8DG

Site: A8015-18 VPI Immingham

The 1 sample described in this report were registered for analysis by SOCOTEC UK Limited on 19-Jul-2018. This report supersedes any versions previously issued by the laboratory.

The analysis was completed by: 25-Jul-2018

The following tables are contained in this report:

On behalf of
SOCOTEC UK Lim
Tim Barnes Operations Director
Energy & Waste Services

Date of Issue: 25-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 :	%															
		Method Codes :	ORGMAT															
		Method Reporting Limits :	0.1															
LAB ID Number CL/	**Client Sample Description**	**Sample Date**	**Organic Matter %**															
1914695	BH1 D 7 1.65		1.1															

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	Tim Clifford

A8015-18 VPI Immingham

Sample Analysis

Date Printed	**25-Jul-2018**
Report Number	**EFS/187902**
Table Number	**1**

Where individual results are flagged see report notes for status.

Analytical and Deviating Sample Overview

Customer SOCOTEC UK Doncaster
Site A8015-18 VPI Immingham
Report No S187902

Consignment No S75653
Date Logged 19-Jul-2018
In-House Report Due 25-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	ORGMAT
				REPORT A	Organic Matter %
CL/1914695	BH1 1.65-1.80	D		D	D

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	ORGMAT	Oven Dried @ < 35°C	Acid Dichromate oxidation of the sample followed by colorimetric analysis of the extract

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

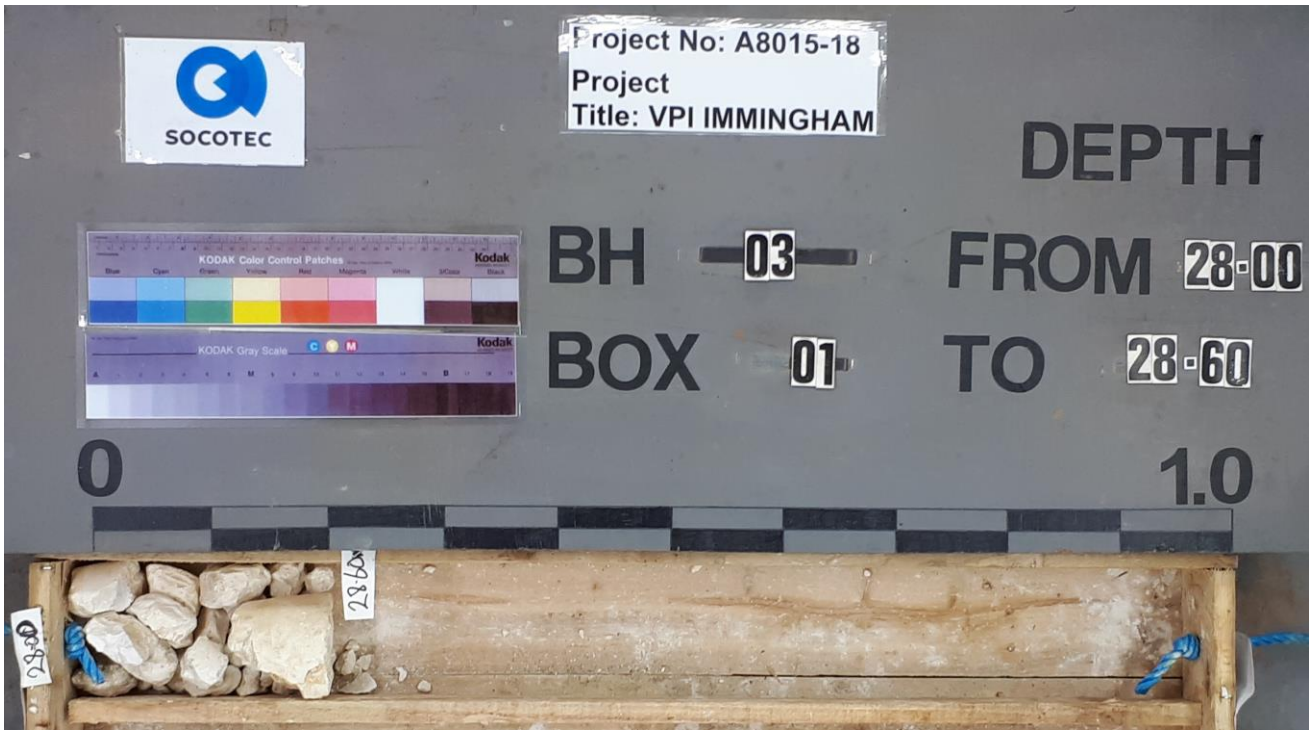
Client : SOCOTEC UK Doncaster
Site : A8015-18 VPI Immingham
Report Number : S18_7902

Note: major constituent in upper case

Lab ID Number	Client ID	Description
CL/1914695	BH1 D 7 1.65	Brown Stone CLAY

APPENDIX E
PHOTOGRAPHS

Photographs

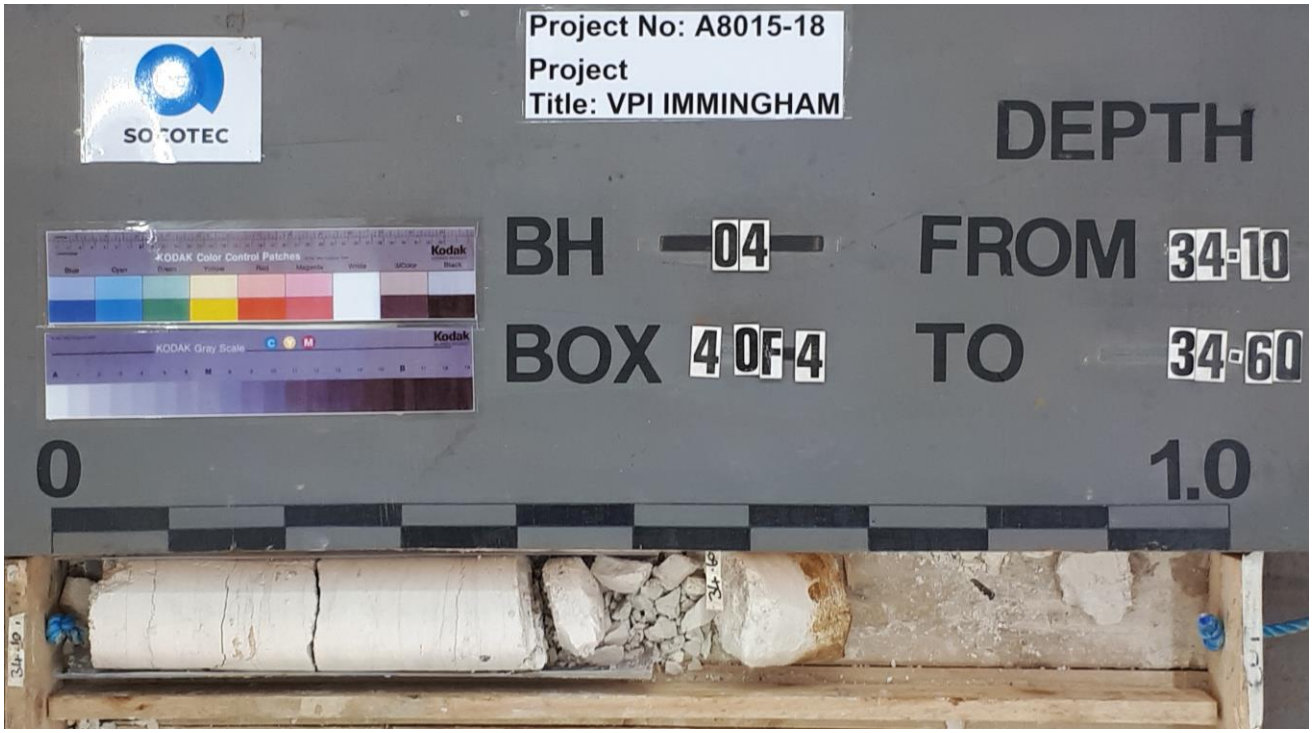


Notes:	Project VPI IMMINGHAM Project No. A8015-18 Carried out for AECOM	Plate 1

Photographs

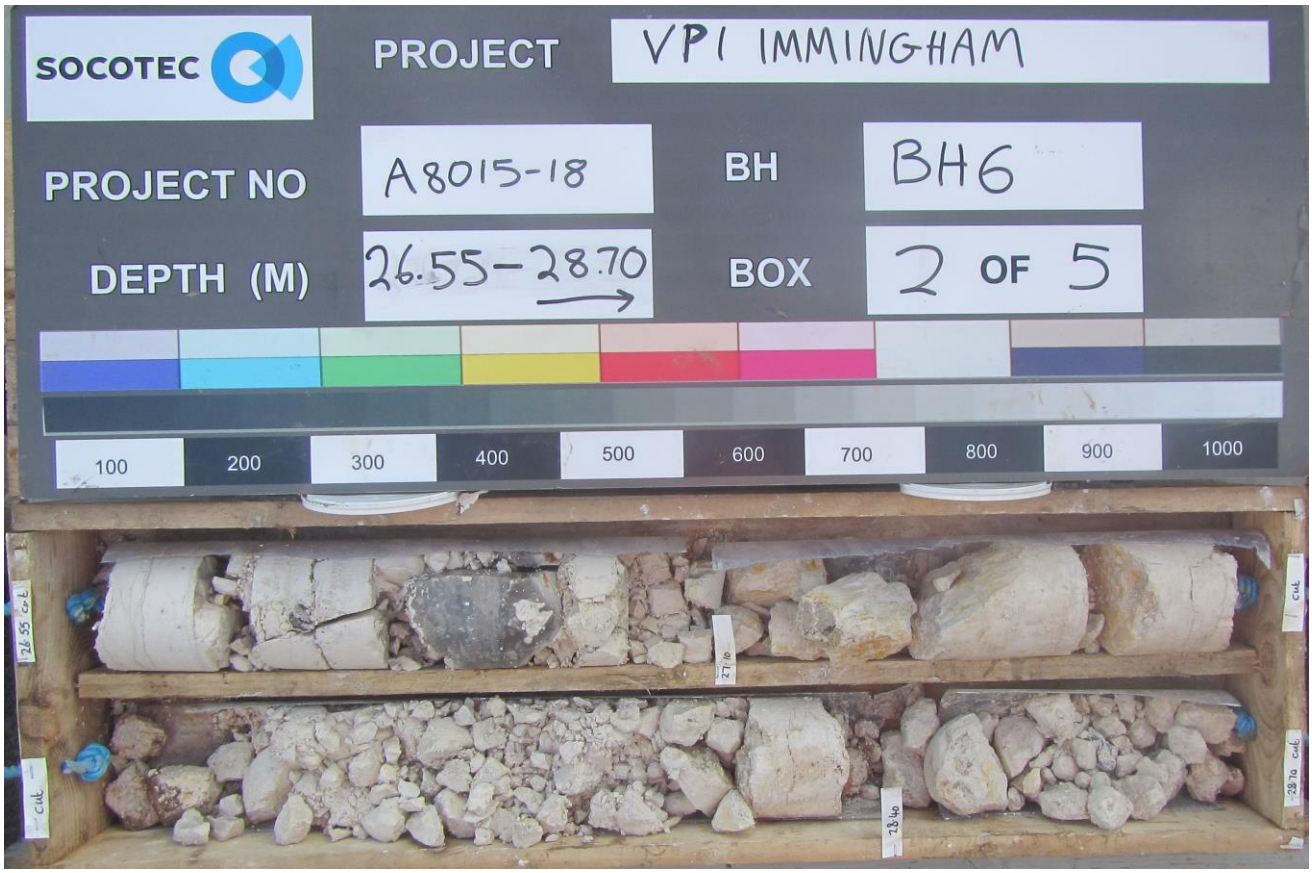
Notes:	Project VPI IMMINGHAM Project No. A8015-18 Carried out for AECOM	Plate 2

Photographs



Notes:	Project VPI IMMINGHAM Project No. A8015-18 Carried out for AECOM	Plate 3

Photographs



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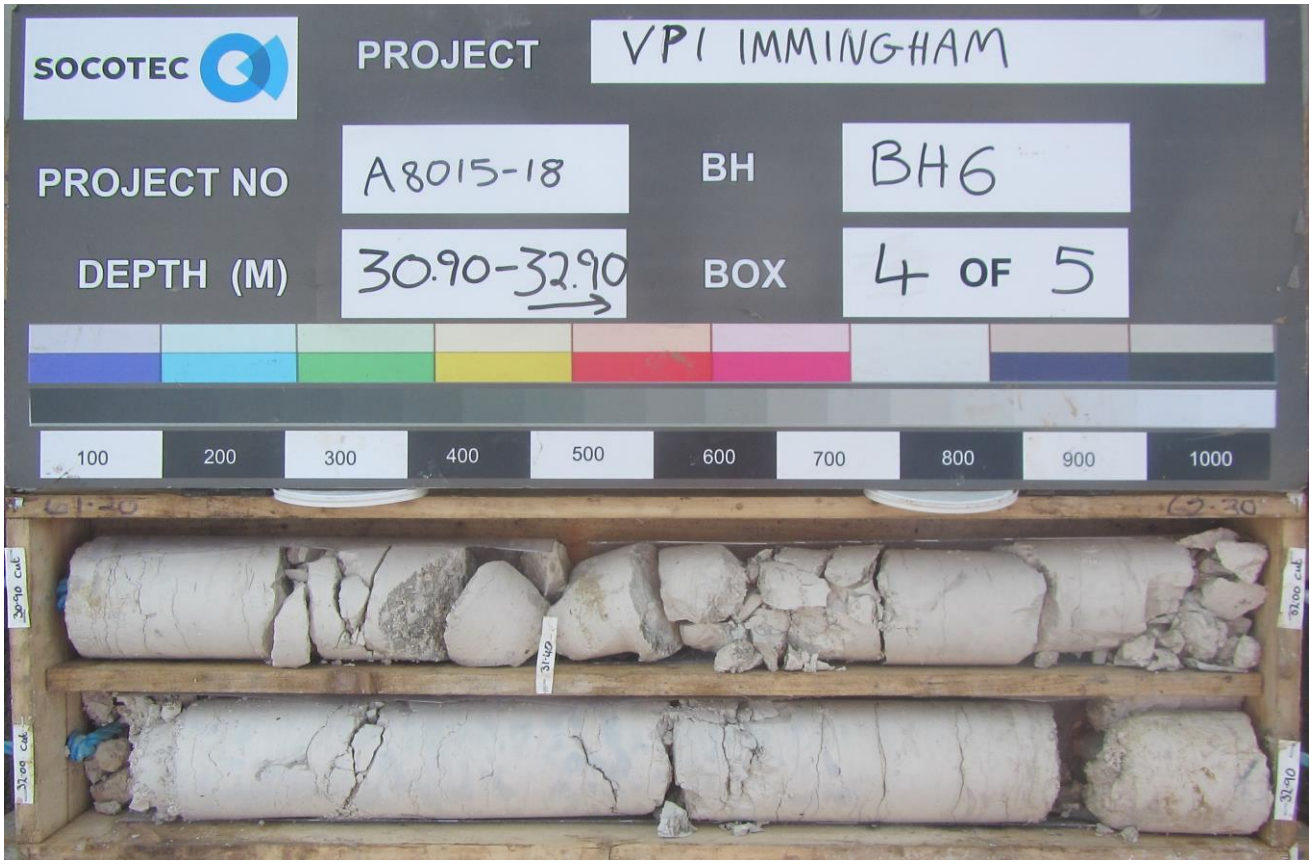
	Project No.	A8015-18	4
	Carried out for	AECOM	

Photographs



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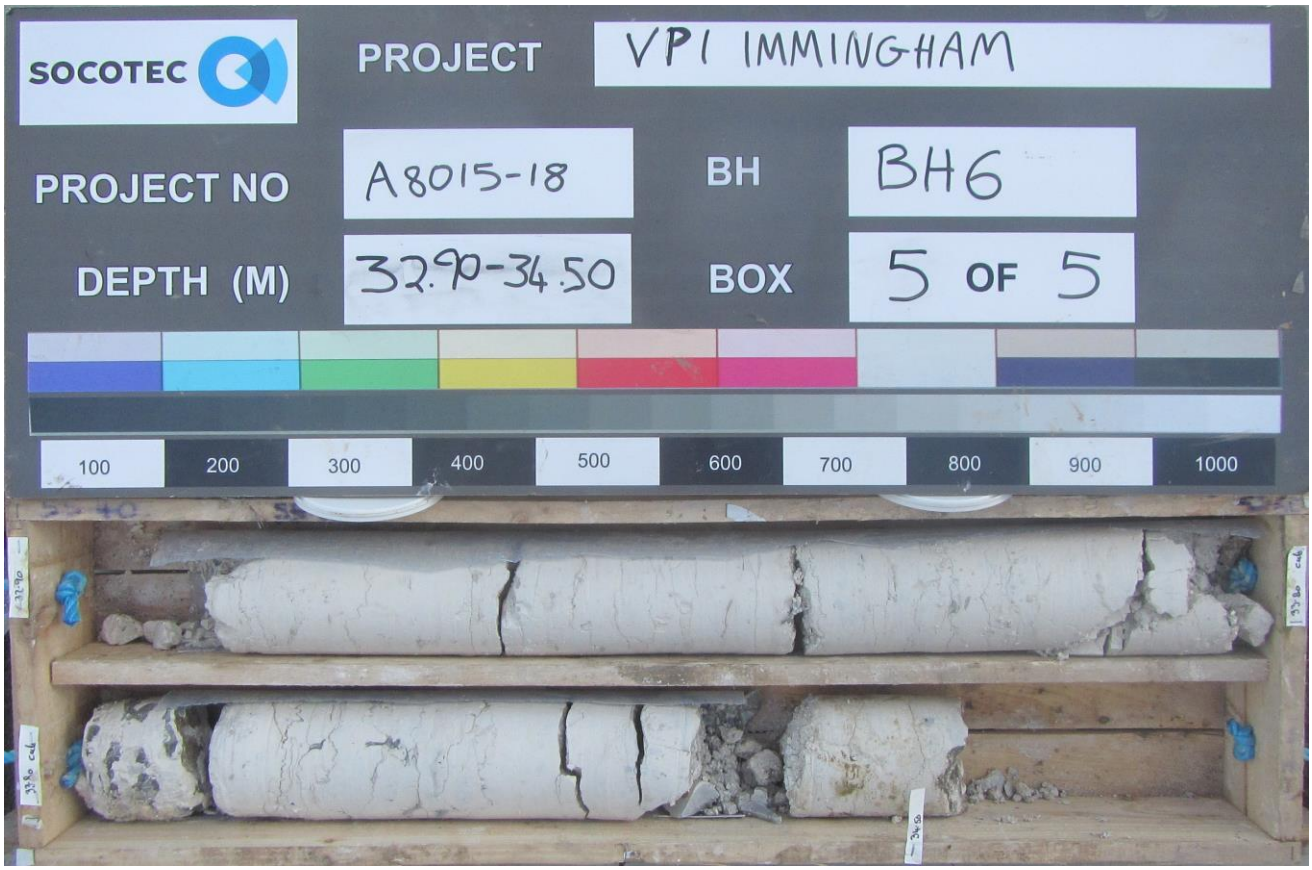
	Project No.	A8015-18	5
	Carried out for	AECOM	

Photographs



Notes:	Project	VPI IMMINGHAM	Plate
	Project No.	A8015-18	6
	Carried out for	AECOM	

Photographs

TP1

Notes:	Project	VPI IMMINGHAM	Plate
	Project No.	A8015-18	7
	Carried out for	AECOM	

Photographs

TP1 Spoil

Notes:	Project VPI IMMINGHAM Project No. A8015-18 Carried out for AECOM	Plate 8

Photographs

TP2

Notes:	Project	VPI IMMINGHAM	Plate
	Project No.	A8015-18	9
	Carried out for	AECOM	

Photographs

TP2 Spoil

Notes:	Project VPI IMMINGHAM Project No. A8015-18 Carried out for AECOM	Plate 10

Photographs

TP3

Notes:	Project	VPI IMMINGHAM	Plate
	Project No.	A8015-18	11
	Carried out for	AECOM	

Photographs

TP3 Spoil

Notes:	Project	VPI IMMINGHAM	Plate
	Project No.	A8015-18	12
	Carried out for	AECOM	

Photographs

TP5

Notes:	Project	VPI IMMINGHAM	Plate
	Project No.	A8015-18	13
	Carried out for	AECOM	

Photographs

TP6

Notes:	Project VPI IMMINGHAM Project No. A8015-18 Carried out for AECOM	Plate 14

Photographs

TP6 Spoil

Notes:	Project	VPI IMMINGHAM	Plate
	Project No.	A8015-18	15
	Carried out for	AECOM	

Photographs

TP9 Spoil

Notes:	Project	VPI IMMINGHAM	Plate
	Project No.	A8015-18	16
	Carried out for	AECOM	

Photographs

TP10

Notes:	Project	VPI IMMINGHAM	Plate
	Project No.	A8015-18	17
	Carried out for	AECOM	

Photographs

TP10 Spoil

Notes:	Project VPI IMMINGHAM Project No. A8015-18 Carried out for AECOM	Plate 18

Photographs

TT02

Notes:	**Project** VPI IMMINGHAM **Project No.** A8015-18 **Carried out for** AECOM	**Plate** 19

Photographs

TT02 Spoil

Notes:	Project	VPI IMMINGHAM	Plate
	Project No.	A8015-18	20
	Carried out for	AECOM	

Photographs

TT03

Notes:	Project	VPI IMMINGHAM	Plate
	Project No.	A8015-18	21
	Carried out for	AECOM	

Appendix C Laboratory Certificates

Exova Jones Environmental

Registered Address : Exova (UK) Ltd, Lochend Industrial Estate, Newbridge, Midlothian, EH28 8PL

Unit 3 Deeside Point
Zone 3
Deeside Industrial Park
Deeside
CH5 2UA

Tel: +44 (0) 1244 833780
Fax: +44 (0) 1244 833781

AECOM
2 City Walk
Leeds
LS11 9AR

4225

Attention :	Alex Freeman
Date :	23rd August, 2018
Your reference :	60569745
Our reference :	Test Report 18/7222 Batch 1 18/5333 Batch 1 18/5166 Batch 1 18/5455 Batch 1 18/5
Location :	VP1 (TLOR)
Date samples received :	
Status :	Final report
Issue :	1

Compiled By:

Simon Gomery BSc
Project Manager

Client Name: AECOM
Reference: 60569745
Location: VP1 (TLOR)
Contact: Alex Freeman

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Job No.	18/5166	18/5166	18/5166	18/5166	18/5166	18/5166	18/5166	18/5333	18/5333	18/5333	LOD/LOR	Units	Method No.
J E Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21	1-3	4-6	7-9			
Sample ID	BH06	BH01	TT03	TT02	WS01	WS04	TP10	TT01	TP09	TP07			
Depth	0.40-0.70	0.45-0.70	0.00-1.40	0.50-1.20	1.00-1.25	0.50	0.40-0.60	1.70-1.90	0.30-0.40	1.30-1.60			
COC No / misc													
Containers	V J B	V J B	V J B	V J B	V J B	V J B	V J B	V J B	V J B	V J B			
Sample Date	05/04/2018	05/04/2018	06/04/2018	06/04/2018	06/04/2018	06/04/2018	06/04/2018	09/04/2018	09/04/2018	09/04/2018			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	07/04/2018	07/04/2018	07/04/2018	07/04/2018	07/04/2018	07/04/2018	07/04/2018	11/04/2018	11/04/2018	11/04/2018			
Arsenic #M	10.7	NDP	9.8	10.8	NDP	8.9	10.7	9.0	6.8	9.4	<0.5	mg/kg	TM30/PM15
Barium #M	163	NDP	98	144	NDP	169	112	112	65	127	<1	mg/kg	TM30/PM15
Beryllium	4.2	NDP	1.0	1.5	NDP	1.3	1.3	1.4	0.7	1.3	<0.5	mg/kg	TM30/PM15
Cadmium #M	<0.1	NDP	0.1	0.2	NDP	<0.1	0.2	0.2	0.3	0.2	<0.1	mg/kg	TM30/PM15
Chromium #M	81.5	NDP	106.0	75.9	NDP	85.2	87.6	52.6	44.9	69.0	<0.5	mg/kg	TM30/PM15
Copper #M	13	NDP	13	21	NDP	15	21	16	11	9	<1	mg/kg	TM30/PM15
Lead #M	15	NDP	19	20	NDP	16	26	13	11	15	<5	mg/kg	TM30/PM15
Mercury #M	<0.1	NDP	<0.1	<0.1	NDP	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM30/PM15
Nickel #M	19.7	NDP	23.0	30.9	NDP	30.1	26.4	32.4	19.0	28.6	<0.7	mg/kg	TM30/PM15
Selenium #M	2	NDP	1	<1	NDP	2	<1	2	2	2	<1	mg/kg	TM30/PM15
Total Sulphate as SO4 #M	-	NDP	-	-	NDP	-	-	-	-	-	<50	mg/kg	TM50/PM29
Vanadium	79	NDP	56	62	NDP	54	56	46	30	46	<1	mg/kg	TM30/PM15
Water Soluble Boron #M	2.5	NDP	1.2	1.7	NDP	2.1	1.5	1.7	0.9	1.0	<0.1	mg/kg	TM74/PM32
Zinc #M	53	NDP	57	71	NDP	67	106	61	73	62	<5	mg/kg	TM30/PM15
Arsenic	-	21.0	-	-	16.3	-	-	-	-	-	<0.5	mg/kg	TM30/PM62
Barium	-	504	-	-	310	-	-	-	-	-	<1	mg/kg	TM30/PM62
Beryllium	-	2.1	-	-	1.9	-	-	-	-	-	<0.5	mg/kg	TM30/PM62
Cadmium	-	3.1	-	-	1.6	-	-	-	-	-	<0.1	mg/kg	TM30/PM62
Chromium	-	79.8	-	-	68.7	-	-	-	-	-	<0.5	mg/kg	TM30/PM62
Copper	-	148	-	-	113	-	-	-	-	-	<1	mg/kg	TM30/PM62
Lead	-	124	-	-	73	-	-	-	-	-	<5	mg/kg	TM30/PM62
Mercury	-	1.7	-	-	<0.1	-	-	-	-	-	<0.1	mg/kg	TM30/PM62
Nickel	-	163.1	-	-	92.4	-	-	-	-	-	<0.7	mg/kg	TM30/PM62
Selenium	-	10	-	-	4	-	-	-	-	-	<1	mg/kg	TM30/PM62
Total Sulphate as SO4	-	8841	-	-	10971	-	-	-	-	-	<50	mg/kg	TM50/PM29
Vanadium	-	338	-	-	231	-	-	-	-	-	<1	mg/kg	TM30/PM62
Water Soluble Boron	-	2.9	-	-	2.6	-	-	-	-	-	<0.1	mg/kg	TM74/PM61
Zinc	-	1275	-	-	663	-	-	-	-	-	<5	mg/kg	TM30/PM62
VOC TICs	-	See Attached	-	-	ND	-	-	-	-	-		None	TM15/PM10
Methyl Tertiary Butyl Ether #M	-	<6	-	-	<6	-	-	-	-	-	<6	ug/kg	TM15/PM10
Benzene #M	-	46	-	-	47	-	-	-	-	-	<5	ug/kg	TM15/PM10
Toluene #M	-	7	-	-	15	-	-	-	-	-	<3	ug/kg	TM15/PM10
Ethylbenzene #M	-	60	-	-	31	-	-	-	-	-	<3	ug/kg	TM15/PM10
p/m-Xylene #M	-	114	-	-	89	-	-	-	-	-	<4	ug/kg	TM15/PM10
o-Xylene #M	-	36	-	-	31	-	-	-	-	-	<4	ug/kg	TM15/PM10
Surrogate Recovery Toluene D8	-	57	-	-	57	-	-	-	-	-	<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	-	59	-	-	55	-	-	-	-	-	<0	%	TM15/PM10
SVOC TICs	-	See Attached$_{AB}$	-	-	See Attached$_{AB}$	-	-	-	-	-		None	TM16/PM8

Please see attached notes for all abbreviations and acronyms

Client Name: AECOM
Reference: 60569745
Location: VP1 (TLOR)
Contact: Alex Freeman

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Job No.	18/5166	18/5166	18/5166	18/5166	18/5166	18/5166	18/5166	18/5333	18/5333	18/5333	LOD/LOR	Units	Method No.
J E Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21	1-3	4-6	7-9			
Sample ID	BH06	BH01	TT03	TT02	WS01	WS04	TP10	TT01	TP09	TP07			
Depth	0.40-0.70	0.45-0.70	0.00-1.40	0.50-1.20	1.00-1.25	0.50	0.40-0.60	1.70-1.90	0.30-0.40	1.30-1.60			
COC No / misc													
Containers	V J B	V J B	V J B	V J B	V J B	V J B	V J B	V J B	V J B	V J B			
Sample Date	05/04/2018	05/04/2018	06/04/2018	06/04/2018	06/04/2018	06/04/2018	06/04/2018	09/04/2018	09/04/2018	09/04/2018			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	07/04/2018	07/04/2018	07/04/2018	07/04/2018	07/04/2018	07/04/2018	07/04/2018	11/04/2018	11/04/2018	11/04/2018			
TPH CWG													
Aliphatics													
>C5-C6 #M	-	<0.1 SV	-	-	<0.1 SV	-	-	-	-	-	<0.1	mg/kg	TM36/PM12
>C6-C8 #M	-	<0.1 SV	-	-	0.2 SV	-	-	-	-	-	<0.1	mg/kg	TM36/PM12
>C8-C10	-	1.0 SV	-	-	1.1 SV	-	-	-	-	-	<0.1	mg/kg	TM36/PM12
>C10-C12 #M	-	588.8	-	-	51.8	-	-	-	-	-	<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 #M	-	1627	-	-	343	-	-	-	-	-	<4	mg/kg	TM5/PM8/PM16
>C16-C21 #M	-	2885	-	-	977	-	-	-	-	-	<7	mg/kg	TM5/PM8/PM16
>C21-C35 #M	-	5172	-	-	2523	-	-	-	-	-	<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-35	-	10274	-	-	3896	-	-	-	-	-	<19	mg/kg	TM5/TM36/PM8/PM12/PM16
Aromatics													
>C5-EC7 #	-	<0.1 SV	-	-	<0.1 SV	-	-	-	-	-	<0.1	mg/kg	TM36/PM12
>EC7-EC8 #	-	<0.1 SV	-	-	<0.1 SV	-	-	-	-	-	<0.1	mg/kg	TM36/PM12
>EC8-EC10 #M	-	<0.1 SV	-	-	<0.1 SV	-	-	-	-	-	<0.1	mg/kg	TM36/PM12
>EC10-EC12 #	-	92.9	-	-	10.3	-	-	-	-	-	<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 #	-	809	-	-	104	-	-	-	-	-	<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 #	-	3404	-	-	629	-	-	-	-	-	<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 #	-	8205	-	-	3203	-	-	-	-	-	<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-35 #	-	12511	-	-	3946	-	-	-	-	-	<19	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aliphatics and aromatics(C5-35)	-	22785	-	-	7842	-	-	-	-	-	<38	mg/kg	TM5/TM36/PM8/PM12/PM16
Natural Moisture Content	20.9	NDP	15.5	20.5	NDP	17.5	17.1	21.1	11.9	13.7	<0.1	%	PM4/PM0
Ammoniacal Nitrogen as N	-	-	-	-	-	-	-	-	-	-	<0.6	mg/kg	TM38/PM20
Ammoniacal Nitrogen as NH4	0.8	39.3	<0.6	<0.6	30.5	<0.6	1.5	<0.6	<0.6	<0.6	<0.6	mg/kg	TM38/PM20
Chloride #M	-	NDP	-	-	NDP	-	-	-	-	-	<2	mg/kg	TM38/PM20
Chloride (2:1 Ext BRE)	-	-	-	-	-	-	-	-	-	-	<0.002	g/l	TM38/PM60
Chloride	-	39	-	-	89	-	-	-	-	-	<2	mg/kg	TM38/PM60
Fluoride	-	4.5	-	-	3.7	-	-	-	-	-	<0.3	mg/kg	TM173/PM20
Hexavalent Chromium #	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	mg/kg	TM38/PM20
Nitrate as N	-	-	-	-	-	-	-	-	-	-	<2.5	mg/kg	TM38/PM20
Nitrate as NO3	-	NDP	-	-	NDP	-	-	-	-	-	<2.5	mg/kg	TM38/PM20
Nitrate as NO3	-	<2.5	-	-	<2.5	-	-	-	-	-	<2.5	mg/kg	TM38/PM60
Nitrate as N	-	-	-	-	-	-	-	-	-	-	<2.5	mg/kg	TM38/PM60
Sulphate as SO4 (2:1 Ext) #M	-	-	-	-	-	-	-	-	-	-	<0.0015	g/l	TM38/PM20
Chromium III	81.5	NDP	106.0	75.9	NDP	85.2	87.6	52.6	44.9	69.0	<0.5	mg/kg	NONE/NONE
Chromium III	-	79.8	-	-	68.7	-	-	-	-	-	<0.5	mg/kg	NONE/NONE
Organic Matter	1.2	NDP	1.5	2.1	NDP	1.0	2.0	0.7	0.7	0.8	<0.2	%	TM21/PM24
Sulphide	-	53	-	-	25	-	-	-	-	-	<10	mg/kg	TM107/PM119
pH #M	8.07	7.31	7.69	7.78	7.29	8.50	7.26	7.97	8.46	8.25	<0.01	pH units	TM73/PM11
Sample Type	Clay	NDP	Clay	Clay	NDP	Clay	Clay	Clay	Clay	Clay		None	PM13/PM0

Please see attached notes for all abbreviations and acronyms

Client Name: AECOM
Reference: 60569745
Location: VP1 (TLOR)
Contact: Alex Freeman

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Job No.	18/5166	18/5166	18/5166	18/5166	18/5166	18/5166	18/5166	18/5333	18/5333	18/5333	Please see attached notes for all abbreviations and acronyms		
J E Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21	1-3	4-6	7-9			
Sample ID	BH06	BH01	TT03	TT02	WS01	WS04	TP10	TT01	TP09	TP07			
Depth	0.40-0.70	0.45-0.70	0.00-1.40	0.50-1.20	1.00-1.25	0.50	0.40-0.60	1.70-1.90	0.30-0.40	1.30-1.60			
COC No / misc													
Containers	V J B	V J B	V J B	V J B	V J B	V J B	V J B	V J B	V J B	V J B			
Sample Date	05/04/2018	05/04/2018	06/04/2018	06/04/2018	06/04/2018	06/04/2018	06/04/2018	09/04/2018	09/04/2018	09/04/2018			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1	LOD/LOR	Units	Method No.
Date of Receipt	07/04/2018	07/04/2018	07/04/2018	07/04/2018	07/04/2018	07/04/2018	07/04/2018	11/04/2018	11/04/2018	11/04/2018			
Sample Colour	Medium Brown	NDP	Medium Brown	Medium Brown	NDP	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown		None	PM13/PM0
Other Items	stones	NDP	, sand	carbon, sand, vegetation	NDP	chalk	sand	chalk, carbon	vegetation, stones	sand, stone		None	PM13/PM0

Client Name: AECOM
Reference: 60569745
Location: VP1 (TLOR)
Contact: Alex Freeman

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Job No.	18/5333	18/5333	18/5333	18/5333	18/5333	18/5333	18/5384	18/5384	18/5384	18/5384			
J E Sample No.	13-15	16-18	19-21	22-24	25-27	28-29	1-3	7-9	13-15	19-21			
Sample ID	TP08	WS02	TP05	WS05	TP04	WS03	TP06	TP01	TP02	WS06			
Depth	0.20-0.50	0.00-0.50	0.50-0.70	0.50-1.00	0.80-1.00	0.00-1.20	0.40-0.60	0.70-0.90	0.30-0.50	0.00-1.20	Please see attached notes for all abbreviations and acronyms		
COC No / misc													
Containers	V J B	V J B	V J B	V J B	V J B	V B	V J B	V J B	V J B	V J B			
Sample Date	09/04/2018	10/04/2018	10/04/2018	10/04/2018	10/04/2018	10/04/2018	10/04/2018	11/04/2018	11/04/2018	11/04/2018			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1	LOD/LOR	Units	Method No.
Date of Receipt	11/04/2018	11/04/2018	11/04/2018	11/04/2018	11/04/2018	11/04/2018	12/04/2018	12/04/2018	12/04/2018	12/04/2018			
Arsenic #M	7.2	11.4	9.0	10.5	7.4	7.3	NDP	NDP	NDP	6.4	<0.5	mg/kg	TM30/PM15
Barium #M	117	121	162	147	116	169	NDP	NDP	NDP	133	<1	mg/kg	TM30/PM15
Beryllium	1.4	1.3	1.3	1.5	1.1	1.5	NDP	NDP	NDP	1.4	<0.5	mg/kg	TM30/PM15
Cadmium #M	<0.1	0.3	0.2	0.4	0.2	0.2	NDP	NDP	NDP	0.2	<0.1	mg/kg	TM30/PM15
Chromium #M	81.4	60.0	60.4	71.5	64.0	65.2	NDP	NDP	NDP	50.1	<0.5	mg/kg	TM30/PM15
Copper #M	15	20	15	28	11	45	NDP	NDP	NDP	10	<1	mg/kg	TM30/PM15
Lead #M	15	22	11	34	9	42	NDP	NDP	NDP	10	<5	mg/kg	TM30/PM15
Mercury #M	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	NDP	NDP	NDP	<0.1	<0.1	mg/kg	TM30/PM15
Nickel #M	37.3	36.1	28.2	29.8	26.5	45.8	NDP	NDP	NDP	33.3	<0.7	mg/kg	TM30/PM15
Selenium #M	<1	1	2	2	2	<1	NDP	NDP	NDP	<1	<1	mg/kg	TM30/PM15
Total Sulphate as SO4 #M	-	701	-	2252	-	6510	NDP	NDP	NDP	-	<50	mg/kg	TM50/PM29
Vanadium	52	67	45	69	39	87	NDP	NDP	NDP	45	<1	mg/kg	TM30/PM15
Water Soluble Boron #M	1.2	1.8	1.6	2.2	1.5	3.4	NDP	NDP	NDP	1.0	<0.1	mg/kg	TM74/PM32
Zinc #M	66	131	56	149	50	231	NDP	NDP	NDP	113	<5	mg/kg	TM30/PM15
Arsenic	-	-	-	-	-	-	10.3	26.3	21.6	-	<0.5	mg/kg	TM30/PM62
Barium	-	-	-	-	-	-	118	369	337	-	<1	mg/kg	TM30/PM62
Beryllium	-	-	-	-	-	-	1.3	1.9	1.8	-	<0.5	mg/kg	TM30/PM62
Cadmium	-	-	-	-	-	-	0.3	1.8	0.8	-	<0.1	mg/kg	TM30/PM62
Chromium	-	-	-	-	-	-	36.0	75.1	63.4	-	<0.5	mg/kg	TM30/PM62
Copper	-	-	-	-	-	-	18	205	158	-	<1	mg/kg	TM30/PM62
Lead	-	-	-	-	-	-	28	103	71	-	<5	mg/kg	TM30/PM62
Mercury	-	-	-	-	-	-	<0.1	2.3	1.7	-	<0.1	mg/kg	TM30/PM62
Nickel	-	-	-	-	-	-	29.7	121.9	81.6	-	<0.7	mg/kg	TM30/PM62
Selenium	-	-	-	-	-	-	<1	4	4	-	<1	mg/kg	TM30/PM62
Total Sulphate as SO4	-	-	-	-	-	-	856	16251$_{AB}$	6783	-	<50	mg/kg	TM50/PM29
Vanadium	-	-	-	-	-	-	58	275	186	-	<1	mg/kg	TM30/PM62
Water Soluble Boron	-	-	-	-	-	-	4.4	3.4	3.6	-	<0.1	mg/kg	TM74/PM61
Zinc	-	-	-	-	-	-	84	947	623	-	<5	mg/kg	TM30/PM62
VOC TICs	-	ND	-	ND	-	ND	ND	See Attached	ND	-		None	TM15/PM10
Methyl Tertiary Butyl Ether #M	-	<6	-	<6	-	<6	<6	<6	<6	-	<6	ug/kg	TM15/PM10
Benzene #M	-	<5	-	<5	-	<5	<5	45	60	-	<5	ug/kg	TM15/PM10
Toluene #M	-	<3	-	<3	-	<3	<3	5	19	-	<3	ug/kg	TM15/PM10
Ethylbenzene #M	-	<3	-	<3	-	<3	<3	39	121	-	<3	ug/kg	TM15/PM10
p/m-Xylene #M	-	<4	-	<4	-	9	<4	213	115	-	<4	ug/kg	TM15/PM10
o-Xylene #M	-	<4	-	<4	-	<4	<4	49	54	-	<4	ug/kg	TM15/PM10
Surrogate Recovery Toluene D8	-	93	-	92	-	78	85	52	52	-	<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	-	86	-	77	-	64	74	58	54	-	<0	%	TM15/PM10
SVOC TICs	-	ND	-	ND	-	ND	ND	See Attached	See Attached	-		None	TM16/PM8

Client Name: AECOM
Reference: 60569745
Location: VP1 (TLOR)
Contact: Alex Freeman

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Job No.	18/5333	18/5333	18/5333	18/5333	18/5333	18/5333	18/5384	18/5384	18/5384	18/5384	LOD/LOR	Units	Method No.
J E Sample No.	13-15	16-18	19-21	22-24	25-27	28-29	1-3	7-9	13-15	19-21			
Sample ID	TP08	WS02	TP05	WS05	TP04	WS03	TP06	TP01	TP02	WS06			
Depth	0.20-0.50	0.00-0.50	0.50-0.70	0.50-1.00	0.80-1.00	0.00-1.20	0.40-0.60	0.70-0.90	0.30-0.50	0.00-1.20			
COC No / misc													
Containers	V J B	V J B	V J B	V J B	V J B	V B	V J B	V J B	V J B	V J B			
Sample Date	09/04/2018	10/04/2018	10/04/2018	10/04/2018	10/04/2018	10/04/2018	10/04/2018	11/04/2018	11/04/2018	11/04/2018			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	11/04/2018	11/04/2018	11/04/2018	11/04/2018	11/04/2018	11/04/2018	12/04/2018	12/04/2018	12/04/2018	12/04/2018			
TPH CWG													
Aliphatics													
>C5-C6 #M	-	<0.1	-	<0.1	-	<0.1	<0.1	<0.1 SV	<0.1 SV	-	<0.1	mg/kg	TM36/PM12
>C6-C8 #M	-	<0.1	-	<0.1	-	<0.1	<0.1	<0.1 SV	1.3 SV	-	<0.1	mg/kg	TM36/PM12
>C8-C10	-	<0.1	-	<0.1	-	<0.1	<0.1	0.3 SV	5.6 SV	-	<0.1	mg/kg	TM36/PM12
>C10-C12 #M	-	<0.2	-	4.9	-	9.7	<0.2	154.5	325.9	-	<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 #M	-	9	-	52	-	101	<4	789	925	-	<4	mg/kg	TM5/PM8/PM16
>C16-C21 #M	-	26	-	256	-	367	<7	1715	1534	-	<7	mg/kg	TM5/PM8/PM16
>C21-C35 #M	-	82	-	675	-	876	<7	3414	3001	-	<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-35	-	117	-	988	-	1354	<19	6073	5793	-	<19	mg/kg	TM5/TM36/PM8/PM12/PM16
Aromatics													
>C5-EC7 #	-	<0.1	-	<0.1	-	<0.1	<0.1	<0.1 SV	<0.1 SV	-	<0.1	mg/kg	TM36/PM12
>EC7-EC8 #	-	<0.1	-	<0.1	-	<0.1	<0.1	<0.1 SV	<0.1 SV	-	<0.1	mg/kg	TM36/PM12
>EC8-EC10 #M	-	<0.1	-	<0.1	-	<0.1	<0.1	<0.1 SV	<0.1 SV	-	<0.1	mg/kg	TM36/PM12
>EC10-EC12 #	-	<0.2	-	<0.2	-	<0.2	<0.2	33.9	103.8	-	<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 #	-	<4	-	32	-	37	<4	358	688	-	<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 #	-	17	-	322	-	357	<7	1663	1953	-	<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 #	-	158	-	1581	-	1790	<7	5036	5372	-	<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-35 #	-	175	-	1935	-	2184	<19	7091	8117	-	<19	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aliphatics and aromatics(C5-35)	-	292	-	2923	-	3538	<38	13164	13910	-	<38	mg/kg	TM5/TM36/PM8/PM12/PM16
Natural Moisture Content	22.0	20.7	23.8	22.0	17.6	34.3	NDP	NDP	NDP	20.4	<0.1	%	PM4/PM0
Ammoniacal Nitrogen as N	-	-	-	-	-	-	-	-	-	-	<0.6	mg/kg	TM38/PM20
Ammoniacal Nitrogen as NH4	<0.6	2.6	<0.6	14.2	<0.6	20.2	8.3	41.7	13.5	<0.6	<0.6	mg/kg	TM38/PM20
Chloride #M	-	1582	-	54	-	58	NDP	NDP	NDP	-	<2	mg/kg	TM38/PM20
Chloride (2:1 Ext BRE)	-	-	-	-	-	-	0.050	0.035	6.546	-	<0.002	g/l	TM38/PM60
Chloride	-	-	-	-	-	-	-	-	-	-	<2	mg/kg	TM38/PM60
Fluoride	-	0.9	-	3.7	-	2.3	6.9	8.0	16.4	-	<0.3	mg/kg	TM173/PM20
Hexavalent Chromium #	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	mg/kg	TM38/PM20
Nitrate as N	-	-	-	-	-	-	-	-	-	-	<2.5	mg/kg	TM38/PM20
Nitrate as NO3	-	<2.5	-	<2.5	-	<2.5	NDP	NDP	NDP	-	<2.5	mg/kg	TM38/PM20
Nitrate as NO3	-	-	-	-	-	-	<2.5	<2.5	<2.5	-	<2.5	mg/kg	TM38/PM60
Nitrate as N	-	-	-	-	-	-	-	-	-	-	<2.5	mg/kg	TM38/PM60
Sulphate as SO4 (2:1 Ext) #M	-	-	-	-	-	-	-	-	-	-	<0.0015	g/l	TM38/PM20
Chromium III	81.4	60.0	60.4	71.5	64.0	65.2	NDP	NDP	NDP	50.1	<0.5	mg/kg	NONE/NONE
Chromium III	-	-	-	-	-	-	-	-	-	-	<0.5	mg/kg	NONE/NONE
Organic Matter	0.7	2.0	1.0	3.9	0.6	7.9	NDP	NDP	NDP	0.6	<0.2	%	TM21/PM24
Sulphide	-	<10	-	<100 AB	-	53	<10	30	21	-	<10	mg/kg	TM107/PM119
pH #M	7.85	7.52	8.52	7.55	8.09	7.34	7.67	7.22	7.67	8.28	<0.01	pH units	TM73/PM11
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay	NDP	NDP	NDP	Clay		None	PM13/PM0

Please see attached notes for all abbreviations and acronyms

Client Name: AECOM
Reference: 60569745
Location: VP1 (TLOR)
Contact: Alex Freeman

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Job No.	18/5333	18/5333	18/5333	18/5333	18/5333	18/5333	18/5384	18/5384	18/5384	18/5384	Please see attached notes for all abbreviations and acronyms		
J E Sample No.	13-15	16-18	19-21	22-24	25-27	28-29	1-3	7-9	13-15	19-21			
Sample ID	TP08	WS02	TP05	WS05	TP04	WS03	TP06	TP01	TP02	WS06			
Depth	0.20-0.50	0.00-0.50	0.50-0.70	0.50-1.00	0.80-1.00	0.00-1.20	0.40-0.60	0.70-0.90	0.30-0.50	0.00-1.20			
COC No / misc													
Containers	V J B	V J B	V J B	V J B	V J B	V B	V J B	V J B	V J B	V J B			
Sample Date	09/04/2018	10/04/2018	10/04/2018	10/04/2018	10/04/2018	10/04/2018	10/04/2018	11/04/2018	11/04/2018	11/04/2018			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1	LOD/LOR	Units	Method No.
Date of Receipt	11/04/2018	11/04/2018	11/04/2018	11/04/2018	11/04/2018	11/04/2018	12/04/2018	12/04/2018	12/04/2018	12/04/2018			
Sample Colour	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	NDP	NDP	NDP	Medium Brown		None	PM13/PM0
Other Items	chalk, carbon	carbon	vegetation, chalk	vegetation, carbon, stones	chalk	vegetation,stones	NDP	NDP	NDP	stones, chalk, vegetation		None	PM13/PM0

Client Name: AECOM
Reference: 60569745
Location: VP1 (TLOR)
Contact: Alex Freeman

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Job No.	18/5384	18/5384	18/5384	18/5455	18/5775	18/5775					LOD/LOR	Units	Method No.
J E Sample No.	22-24	25-27	28-30	1-3	1-3	4-6							
Sample ID	BH03	WS07	WS08	BH02	BH04	BH05							
Depth	1.50-2.00	0.30-0.80	0.00-1.20	0.60-1.00	0.50-1.20	1.80-2.25							
COC No / misc													
Containers	V J B	V J B	V J B	V J B	V J B	V J B							
Sample Date	10/04/2018	11/04/2018	11/04/2018	11/04/2018	16/04/2018	17/04/2018							
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil							
Batch Number	1	1	1	1	1	1							
Date of Receipt	12/04/2018	12/04/2018	12/04/2018	13/04/2018	18/04/2018	18/04/2018							
Arsenic #M	8.9	7.9	12.7	NDP	9.3	8.0					<0.5	mg/kg	TM30/PM15
Barium #M	133	120	116	NDP	127	129					<1	mg/kg	TM30/PM15
Beryllium	1.2	1.0	1.3	NDP	1.4	1.2					<0.5	mg/kg	TM30/PM15
Cadmium #M	0.2	0.6	0.2	NDP	0.2	0.1					<0.1	mg/kg	TM30/PM15
Chromium #M	59.8	67.0	112.0	NDP	62.1	34.6					<0.5	mg/kg	TM30/PM15
Copper #M	11	8	6	NDP	14	11					<1	mg/kg	TM30/PM15
Lead #M	13	21	19	NDP	12	12					<5	mg/kg	TM30/PM15
Mercury #M	<0.1	<0.1	<0.1	NDP	<0.1	<0.1					<0.1	mg/kg	TM30/PM15
Nickel #M	39.4	22.3	27.6	NDP	30.2	29.6					<0.7	mg/kg	TM30/PM15
Selenium #M	<1	<1	1	NDP	<1	<1					<1	mg/kg	TM30/PM15
Total Sulphate as SO4 #M	-	-	-	NDP	-	439					<50	mg/kg	TM50/PM29
Vanadium	42	40	53	NDP	49	36					<1	mg/kg	TM30/PM15
Water Soluble Boron #M	0.8	1.2	1.1	NDP	1.0	1.0					<0.1	mg/kg	TM74/PM32
Zinc #M	61	93	79	NDP	55	59					<5	mg/kg	TM30/PM15
Arsenic	-	-	-	35.8	-	-					<0.5	mg/kg	TM30/PM62
Barium	-	-	-	350	-	-					<1	mg/kg	TM30/PM62
Beryllium	-	-	-	2.3	-	-					<0.5	mg/kg	TM30/PM62
Cadmium	-	-	-	1.7	-	-					<0.1	mg/kg	TM30/PM62
Chromium	-	-	-	82.2	-	-					<0.5	mg/kg	TM30/PM62
Copper	-	-	-	291	-	-					<1	mg/kg	TM30/PM62
Lead	-	-	-	126	-	-					<5	mg/kg	TM30/PM62
Mercury	-	-	-	<0.1	-	-					<0.1	mg/kg	TM30/PM62
Nickel	-	-	-	111.9	-	-					<0.7	mg/kg	TM30/PM62
Selenium	-	-	-	4	-	-					<1	mg/kg	TM30/PM62
Total Sulphate as SO4	-	-	-	44355$_{AB}$	-	-					<50	mg/kg	TM50/PM29
Vanadium	-	-	-	227	-	-					<1	mg/kg	TM30/PM62
Water Soluble Boron	-	-	-	4.2	-	-					<0.1	mg/kg	TM74/PM61
Zinc	-	-	-	937	-	-					<5	mg/kg	TM30/PM62
VOC TICs	-	-	-	See Attached	-	-						None	TM15/PM10
Methyl Tertiary Butyl Ether #M	-	-	-	<6	-	<6					<6	ug/kg	TM15/PM10
Benzene #M	-	-	-	28	-	<5					<5	ug/kg	TM15/PM10
Toluene #M	-	-	-	6	-	<3					<3	ug/kg	TM15/PM10
Ethylbenzene #M	-	-	-	24	-	<3					<3	ug/kg	TM15/PM10
p/m-Xylene #M	-	-	-	78	-	<4					<4	ug/kg	TM15/PM10
o-Xylene #M	-	-	-	23	-	<4					<4	ug/kg	TM15/PM10
Surrogate Recovery Toluene D8	-	-	-	51	-	111					<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	-	-	-	51	-	103					<0	%	TM15/PM10
SVOC TICs	-	-	-	ND$_{AB}$	-	-						None	TM16/PM8

Please see attached notes for all abbreviations and acronyms

Client Name: AECOM
Reference: 60569745
Location: VP1 (TLOR)
Contact: Alex Freeman

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Job No.	18/5384	18/5384	18/5384	18/5455	18/5775	18/5775							
J E Sample No.	22-24	25-27	28-30	1-3	1-3	4-6							
Sample ID	BH03	WS07	WS08	BH02	BH04	BH05							
Depth	1.50-2.00	0.30-0.80	0.00-1.20	0.60-1.00	0.50-1.20	1.80-2.25					Please see attached notes for all abbreviations and acronyms		
COC No / misc													
Containers	V J B	V J B	V J B	V J B	V J B	V J B							
Sample Date	10/04/2018	11/04/2018	11/04/2018	11/04/2018	16/04/2018	17/04/2018							
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil							
Batch Number	1	1	1	1	1	1							
Date of Receipt	12/04/2018	12/04/2018	12/04/2018	13/04/2018	18/04/2018	18/04/2018							
TPH CWG													
Aliphatics													
>C5-C6 #M	-	-	-	<0.1	-	<0.1					<0.1	mg/kg	TM36/PM12
>C6-C8 #M	-	-	-	<0.1	-	<0.1					<0.1	mg/kg	TM36/PM12
>C8-C10	-	-	-	<0.1	-	<0.1					<0.1	mg/kg	TM36/PM12
>C10-C12 #M	-	-	-	23.2	-	<0.2					<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 #M	-	-	-	251	-	<4					<4	mg/kg	TM5/PM8/PM16
>C16-C21 #M	-	-	-	858	-	<7					<7	mg/kg	TM5/PM8/PM16
>C21-C35 #M	-	-	-	2127	-	<7					<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-35	-	-	-	3259	-	<19					<19	mg/kg	TM5/TM36/PM8/PM12/PM16
Aromatics													
>C5-EC7 #	-	-	-	<0.1	-	<0.1					<0.1	mg/kg	TM36/PM12
>EC7-EC8 #	-	-	-	<0.1	-	<0.1					<0.1	mg/kg	TM36/PM12
>EC8-EC10 #M	-	-	-	<0.1	-	<0.1					<0.1	mg/kg	TM36/PM12
>EC10-EC12 #	-	-	-	<0.2	-	<0.2					<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 #	-	-	-	<4	-	<4					<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 #	-	-	-	<7	-	<7					<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 #	-	-	-	40	-	<7					<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-35 #	-	-	-	40	-	<19					<19	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aliphatics and aromatics(C5-35)	-	-	-	3299	-	<38					<38	mg/kg	TM5/TM36/PM8/PM12/PM16
Natural Moisture Content	17.1	17.6	24.9	NDP	16.0	16.5					<0.1	%	PM4/PM0
Ammoniacal Nitrogen as N	-	-	-	-	-	<0.6					<0.6	mg/kg	TM38/PM20
Ammoniacal Nitrogen as NH4	<0.6	<0.6	<0.6	12.8	-	-					<0.6	mg/kg	TM38/PM20
Chloride #M	-	-	-	NDP	-	17					<2	mg/kg	TM38/PM20
Chloride (2:1 Ext BRE)	-	-	-	-	-	-					<0.002	g/l	TM38/PM60
Chloride	-	-	-	11	-	-					<2	mg/kg	TM38/PM60
Fluoride	-	-	-	11.2	-	<0.3					<0.3	mg/kg	TM173/PM20
Hexavalent Chromium #	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3					<0.3	mg/kg	TM38/PM20
Nitrate as N	-	-	-	NDP	-	-					<2.5	mg/kg	TM38/PM20
Nitrate as NO3	-	-	-	-	-	<2.5					<2.5	mg/kg	TM38/PM20
Nitrate as NO3	-	-	-	-	-	-					<2.5	mg/kg	TM38/PM60
Nitrate as N	-	-	-	<2.5	-	-					<2.5	mg/kg	TM38/PM60
Sulphate as SO4 (2:1 Ext) #M	-	-	-	-	-	0.0965					<0.0015	g/l	TM38/PM20
Chromium III	59.8	67.0	112.0	NDP	62.1	34.6					<0.5	mg/kg	NONE/NONE
Chromium III	-	-	-	-	-	-					<0.5	mg/kg	NONE/NONE
Organic Matter	0.7	1.1	0.9	NDP	0.6	0.6					<0.2	%	TM21/PM24
Sulphide	-	-	-	<10	-	-					<10	mg/kg	TM107/PM119
pH #M	8.27	8.32	7.86	7.17	7.91	8.12					<0.01	pH units	TM73/PM11
Sample Type	Clay	Clay	Clay	NDP	Clay	Clay						None	PM13/PM0

Client Name: AECOM
Reference: 60569745
Location: VP1 (TLOR)
Contact: Alex Freeman

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Job No.	18/5384	18/5384	18/5384	18/5455	18/5775	18/5775							
J E Sample No.	22-24	25-27	28-30	1-3	1-3	4-6							
Sample ID	BH03	WS07	WS08	BH02	BH04	BH05							
Depth	1.50-2.00	0.30-0.80	0.00-1.20	0.60-1.00	0.50-1.20	1.80-2.25					Please see attached notes for all abbreviations and acronyms		
COC No / misc													
Containers	V J B	V J B	V J B	V J B	V J B	V J B							
Sample Date	10/04/2018	11/04/2018	11/04/2018	11/04/2018	16/04/2018	17/04/2018							
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil							
Batch Number	1	1	1	1	1	1					LOD/LOR	Units	Method No.
Date of Receipt	12/04/2018	12/04/2018	12/04/2018	13/04/2018	18/04/2018	18/04/2018							
Sample Colour	Medium Brown	Medium Brown	Medium Brown	NDP	Medium Brown	Medium Brown						None	PM13/PM0
Other Items	chalk	sand, stones,	sand,vegetation, stones	NDP	chalk, stones	chalk						None	PM13/PM0

Client Name: AECOM
Reference: 60569745
Location: VP1 (TLOR)
Contact: Alex Freeman

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
H=H_2SO_4, Z=ZnAc, N=NaOH, HN=$HN0_3$

J E Job No.	18/7222	18/7222	18/7222	18/7222	18/7222	18/7222	18/7222	18/7222					
J E Sample No.	1-7	8-14	15-21	22-28	29-35	36-42	43-49	50-56					
Sample ID	BH01	BH02	BH03	WS03	WS04	WS05	WS06	DUP01					
Depth											Please see attached notes for all abbreviations and acronyms		
COC No / misc													
Containers	V H HN HCL P G	V H HN HCL P G	V H HN HCL P G	V H HN HCL P G	V H HN HCL P G	V H HN HCL P G	V H HN HCL P G	V H HN HCL P G					
Sample Date	10/05/2018	10/05/2018	10/05/2018	10/05/2018	10/05/2018	10/05/2018	10/05/2018	10/05/2018					
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water					
Batch Number	1	1	1	1	1	1	1	1			LOD/LOR	Units	Method No.
Date of Receipt	12/05/2018	12/05/2018	12/05/2018	12/05/2018	12/05/2018	12/05/2018	12/05/2018	12/05/2018					
Dissolved Arsenic #	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5			<2.5	ug/l	TM30/PM14
Dissolved Barium #	57	63	63	41	53	33	44	62			<3	ug/l	TM30/PM14
Dissolved Beryllium	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5			<0.5	ug/l	TM30/PM14
Dissolved Boron	132	73	<12	49	54	178	34	<12			<12	ug/l	TM30/PM14
Dissolved Cadmium #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5			<0.5	ug/l	TM30/PM14
Total Dissolved Chromium #	6.2	6.8	<1.5	6.3	5.4	3.3	<1.5	6.7			<1.5	ug/l	TM30/PM14
Dissolved Copper #	<7	<7	<7	<7	<7	<7	<7	<7			<7	ug/l	TM30/PM14
Dissolved Lead #	<5	<5	<5	<5	<5	<5	<5	<5			<5	ug/l	TM30/PM14
Dissolved Mercury #	<1	<1	<1	<1	<1	<1	<1	<1			<1	ug/l	TM30/PM14
Dissolved Nickel #	2	<2	5	4	3	8	4	5			<2	ug/l	TM30/PM14
Dissolved Selenium #	<3	5	16	<3	<3	<3	<3	<3			<3	ug/l	TM30/PM14
Dissolved Vanadium #	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5			<1.5	ug/l	TM30/PM14
Dissolved Zinc #	12	6	7	<3	<3	10	6	6			<3	ug/l	TM30/PM14
VOC TICs	-	-	-	ND	ND	ND	ND	-				None	TM15/PM10
Methyl Tertiary Butyl Ether #	-	-	-	<0.1	2.8	<0.2 $_{AA}$	<0.1	-			<0.1	ug/l	TM15/PM10
Benzene #	-	-	-	<0.5	<0.5	<0.5	<0.5	-			<0.5	ug/l	TM15/PM10
Toluene #	-	-	-	<5	<5	<5	<5	-			<5	ug/l	TM15/PM10
Ethylbenzene #	-	-	-	<1	<1	<1	<1	-			<1	ug/l	TM15/PM10
p/m-Xylene #	-	-	-	<2	<2	<2	<2	-			<2	ug/l	TM15/PM10
o-Xylene #	-	-	-	<1	<1	<1	<1	-			<1	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	-	-	-	95	96	98	96	-			<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	-	-	-	96	96	100	101	-			<0	%	TM15/PM10
TPH CWG													
Aliphatics													
>C5-C6 #	<10	<10	<10	<10	<10	<10	<10	<10			<10	ug/l	TM36/PM12
>C6-C8 #	<10	<10	<10	<10	<10	<10	<10	<10			<10	ug/l	TM36/PM12
>C8-C10 #	<10	<10	<10	<10	<10	<10	<10	<10			<10	ug/l	TM36/PM12
>C10-C12 #	<5	<5	<5	<5	<5	<5	<5	<5			<5	ug/l	TM5/PM16/PM30
>C12-C16 #	<10	<10	<10	<10	<10	<10	<10	<10			<10	ug/l	TM5/PM16/PM30
>C16-C21 #	<10	<10	<10	<10	<10	<10	<10	<10			<10	ug/l	TM5/PM16/PM30
>C21-C35 #	<10	<10	<10	<10	<10	<10	<10	<10			<10	ug/l	TM5/PM16/PM30
Total aliphatics C5-35 #	<10	<10	<10	<10	<10	<10	<10	<10			<10	ug/l	TM5/TM36/PM12/PM16/PM30

Client Name: AECOM
Reference: 60569745
Location: VP1 (TLOR)
Contact: Alex Freeman

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
H=H_2SO_4, Z=ZnAc, N=NaOH, HN=$HN0_3$

J E Job No.	18/7222	18/7222	18/7222	18/7222	18/7222	18/7222	18/7222	18/7222				
J E Sample No.	1-7	8-14	15-21	22-28	29-35	36-42	43-49	50-56				
Sample ID	BH01	BH02	BH03	WS03	WS04	WS05	WS06	DUP01				
Depth										Please see attached notes for all abbreviations and acronyms		
COC No / misc												
Containers	V H HN HCL P G	V H HN HCL P G	V H HN HCL P G	V H HN HCL P G	V H HN HCL P G	V H HN HCL P G	V H HN HCL P G	V H HN HCL P G				
Sample Date	10/05/2018	10/05/2018	10/05/2018	10/05/2018	10/05/2018	10/05/2018	10/05/2018	10/05/2018				
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water				
Batch Number	1	1	1	1	1	1	1	1			LOD/LOR	Units	Method No.
Date of Receipt	12/05/2018	12/05/2018	12/05/2018	12/05/2018	12/05/2018	12/05/2018	12/05/2018	12/05/2018					
TPH CWG													
Aromatics													
>C5-EC7 #	<10	<10	<10	<10	<10	<10	<10	<10			<10	ug/l	TM36/PM12
>EC7-EC8 #	<10	<10	<10	<10	<10	<10	<10	<10			<10	ug/l	TM36/PM12
>EC8-EC10 #	<10	<10	<10	<10	<10	<10	<10	<10			<10	ug/l	TM36/PM12
>EC10-EC12 #	<5	<5	<5	<5	<5	<5	<5	<5			<5	ug/l	TM5/PM16/PM30
>EC12-EC16 #	<10	<10	<10	<10	<10	<10	<10	<10			<10	ug/l	TM5/PM16/PM30
>EC16-EC21 #	<10	<10	<10	<10	<10	<10	<10	<10			<10	ug/l	TM5/PM16/PM30
>EC21-EC35 #	<10	<10	<10	<10	<10	<10	<10	<10			<10	ug/l	TM5/PM16/PM30
Total aromatics C5-35 #	<10	<10	<10	<10	<10	<10	<10	<10			<10	ug/l	TM5/TM36/PM12/PM16/PM30
Total aliphatics and aromatics(C5-35) #	<10	<10	<10	<10	<10	<10	<10	<10			<10	ug/l	TM5/TM36/PM12/PM16/PM30
MTBE #	<5	<5	<5	-	-	-	-	<5			<5	ug/l	TM31/PM12
Benzene #	<5	<5	<5	-	-	-	-	<5			<5	ug/l	TM31/PM12
Toluene #	<5	<5	<5	-	-	-	-	<5			<5	ug/l	TM31/PM12
Ethylbenzene #	<5	<5	<5	-	-	-	-	<5			<5	ug/l	TM31/PM12
m/p-Xylene #	<5	<5	<5	-	-	-	-	<5			<5	ug/l	TM31/PM12
o-Xylene #	<5	<5	<5	-	-	-	-	<5			<5	ug/l	TM31/PM12
Sulphate as SO4 #	62.9	42.8	94.2	417.5	720.3	983.9	299.8	76.4			<0.5	mg/l	TM38/PM0
Chloride #	24.3	18.2	26.8	563.4	1280.0	304.2	69.2	26.2			<0.3	mg/l	TM38/PM0
Nitrate as N #	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05			<0.05	mg/l	TM38/PM0
Ortho Phosphate as P #	0.19	0.15	<0.03	0.12	<0.03	<0.03	<0.03	<0.03			<0.03	mg/l	TM38/PM0
Ammoniacal Nitrogen as N #	0.42	0.27	0.06	0.06	0.09	0.87	0.05	0.06			<0.03	mg/l	TM38/PM0
Hexavalent Chromium	<6	<6	<6	<6	<6	<6	<6	<6			<6	ug/l	TM38/PM0
Total Dissolved Chromium III	6	7	<6	6	<6	<6	<6	7			<6	ug/l	TM0/PM0
Total Alkalinity as CaCO3 #	352	300	276	346	378	612	762	274			<1	mg/l	TM75/PM0
Dissolved Organic Carbon #	<2	<2	<2	6	9	38	3	<2			<2	mg/l	TM60/PM0
Dissolved Iron II	<0.02	<0.02	0.02	0.10	0.26	1.63	0.15	<0.02			<0.02	mg/l	TM48/PM0
pH #	7.63	7.40	7.31	6.95	6.83	6.97	7.19	7.28			<0.01	pH units	TM73/PM0
Total Suspended Solids #	35	<10	19	10	14	21	1787	15			<10	mg/l	TM37/PM0

Client Name: AECOM
Reference: 60569745
Location: VP1 (TLOR)
Contact: Alex Freeman

Report : Misc

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Job No.	18/5166	18/5333	18/5384	18/5455									
J E Sample No.	1-3	1-3	1-3	1-3									
Sample ID	BH06	TT01	TP06	BH02									
Depth	0.40-0.70	1.70-1.90	0.40-0.60	0.60-1.00							Please see attached notes for all abbreviations and acronyms		
COC No / misc													
Containers	V J B	V J B	V J B	V J B									
Sample Date	05/04/2018	09/04/2018	10/04/2018	11/04/2018									
Sample Type	Soil	Soil	Soil	Soil									
Batch Number	1	1	1	1							LOD/LOR	Units	Method No.
Date of Receipt	07/04/2018	11/04/2018	12/04/2018	13/04/2018									
Sample Temperature	5.5	8.8	6.7	3.0							<0.1	Degrees C	NONE/NONE

Client Name: AECOM
Reference: 60569745
Location: VP1 (TLOR)
Contact: Alex Freeman

SVOC Report : **Solid**

J E Job No.	18/5166	18/5166	18/5333	18/5333	18/5333	18/5384	18/5384	18/5384	18/5455	18/5775			
J E Sample No.	4-6	13-15	16-18	22-24	28-29	1-3	7-9	13-15	1-3	4-6			
Sample ID	BH01	WS01	WS02	WS05	WS03	TP06	TP01	TP02	BH02	BH05			
Depth	0.45-0.70	1.00-1.25	0.00-0.50	0.50-1.00	0.00-1.20	0.40-0.60	0.70-0.90	0.30-0.50	0.60-1.00	1.80-2.25	Please see attached notes for all abbreviations and acronyms		
COC No / misc													
Containers	V J B	V J B	V J B	V J B	V B	V J B	V J B	V J B	V J B	V J B			
Sample Date	05/04/2018	06/04/2018	10/04/2018	10/04/2018	10/04/2018	10/04/2018	11/04/2018	11/04/2018	11/04/2018	17/04/2018			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1	LOD/LOR	Units	Method No.
Date of Receipt	07/04/2018	07/04/2018	11/04/2018	11/04/2018	11/04/2018	12/04/2018	12/04/2018	12/04/2018	13/04/2018	18/04/2018			
SVOC MS													
Phenols													
2-Chlorophenol #M	<100 AB	<100 AB	<10	<10	<10	<10	<10	<10	<100 AB	<10	<10	ug/kg	TM16/PM8
2-Methylphenol	<100 AB	<100 AB	<10	<10	<10	<10	<10	<10	<100 AB	<10	<10	ug/kg	TM16/PM8
2-Nitrophenol	<100 AB	<100 AB	<10	<10	<10	<10	<10	<10	<100 AB	<10	<10	ug/kg	TM16/PM8
2,4-Dichlorophenol #M	<100 AB	<100 AB	<10	<10	<10	<10	<10	<10	<100 AB	<10	<10	ug/kg	TM16/PM8
2,4-Dimethylphenol	<100 AB	<100 AB	<10	<10	<10	<10	<10	<10	<100 AB	<10	<10	ug/kg	TM16/PM8
2,4,5-Trichlorophenol	<100 AB	<100 AB	<10	<10	<10	<10	<10	<10	<100 AB	<10	<10	ug/kg	TM16/PM8
2,4,6-Trichlorophenol	<100 AB	<100 AB	<10	<10	<10	<10	<10	<10	<100 AB	<10	<10	ug/kg	TM16/PM8
4-Chloro-3-methylphenol	<100 AB	<100 AB	<10	<10	<10	<10	<10	<10	<100 AB	<10	<10	ug/kg	TM16/PM8
4-Methylphenol	<100 AB	<100 AB	<10	<10	<10	<10	<10	<10	<100 AB	<10	<10	ug/kg	TM16/PM8
4-Nitrophenol	<100 AB	<100 AB	<10	<10	<10	<10	<10	<10	<100 AB	<10	<10	ug/kg	TM16/PM8
Pentachlorophenol	<100 AB	<100 AB	<10	<10	<10	<10	<10	<10	<100 AB	<10	<10	ug/kg	TM16/PM8
Phenol #M	<100 AB	<100 AB	<10	<10	<10	<10	<10	<10	<100 AB	<10	<10	ug/kg	TM16/PM8
PAHs													
2-Chloronaphthalene #M	<100 AB	<100 AB	<10	<10	<10	<10	<10	<10	<100 AB	<10	<10	ug/kg	TM16/PM8
2-Methylnaphthalene #M	1998 AB	<100 AB	127	44	53	<10	2857	4537	1136 AB	<10	<10	ug/kg	TM16/PM8
Naphthalene	<100 AB	<100 AB	<10	<10	<10	<10	601	1360	<100 AB	<10	<10	ug/kg	TM16/PM8
Acenaphthylene	<100 AB	<100 AB	<10	<10	<10	<10	<10	<10	<100 AB	<10	<10	ug/kg	TM16/PM8
Acenaphthene	<100 AB	<100 AB	<10	<10	<10	<10	<10	1651	<100 AB	<10	<10	ug/kg	TM16/PM8
Fluorene	<100 AB	<100 AB	<10	<10	<10	<10	<10	2305	<100 AB	<10	<10	ug/kg	TM16/PM8
Phenanthrene #M	<100 AB	<100 AB	<10	124	130	110	1872	7600	<100 AB	<10	<10	ug/kg	TM16/PM8
Anthracene	<100 AB	<100 AB	<10	41	46	50	603	1072	<100 AB	<10	<10	ug/kg	TM16/PM8
Fluoranthene #M	<100 AB	<100 AB	<10	29	26	23	<10	1569	<100 AB	<10	<10	ug/kg	TM16/PM8
Pyrene #M	<100 AB	<100 AB	<10	171	110	91	2469	4180	2817 AB	<10	<10	ug/kg	TM16/PM8
Benzo(a)anthracene	<100 AB	<100 AB	<10	56	89	72	662	1520	<100 AB	<10	<10	ug/kg	TM16/PM8
Chrysene	<100 AB	<100 AB	<10	288	318	258	2415	3179	<100 AB	<10	<10	ug/kg	TM16/PM8
Benzo(bk)fluoranthene	<100 AB	<100 AB	<10	159	180	158	796	1190	<100 AB	<10	<10	ug/kg	TM16/PM8
Benzo(a)pyrene	<100 AB	<100 AB	<10	105	89	96	938	1089	<100 AB	<10	<10	ug/kg	TM16/PM8
Indeno(123cd)pyrene	<100 AB	<100 AB	<10	47	37	40	237	263	<100 AB	<10	<10	ug/kg	TM16/PM8
Dibenzo(ah)anthracene	<100 AB	<100 AB	<10	38	40	50	255	346	<100 AB	<10	<10	ug/kg	TM16/PM8
Benzo(ghi)perylene	<100 AB	<100 AB	<10	104	114	105	581	591	<100 AB	<10	<10	ug/kg	TM16/PM8
Benzo(b)fluoranthene	<100 AB	<100 AB	<10	114	130	114	573	857	<100 AB	<10	<10	ug/kg	TM16/PM8
Benzo(k)fluoranthene	<100 AB	<100 AB	<10	45	50	44	223	333	<100 AB	<10	<10	ug/kg	TM16/PM8
Phthalates													
Bis(2-ethylhexyl) phthalate	<1000 AB	<1000 AB	<100	<100	<100	<100	1926	3119	<1000 AB	<100	<100	ug/kg	TM16/PM8
Butylbenzyl phthalate	<1000 AB	<1000 AB	<100	<100	<100	<100	<100	<100	<1000 AB	<100	<100	ug/kg	TM16/PM8
Di-n-butyl phthalate	<1000 AB	<1000 AB	<100	<100	<100	<100	<100	<100	<1000 AB	<100	<100	ug/kg	TM16/PM8
Di-n-Octyl phthalate	<1000 AB	<1000 AB	<100	<100	<100	<100	<100	<100	<1000 AB	<100	<100	ug/kg	TM16/PM8
Diethyl phthalate	<1000 AB	<1000 AB	<100	<100	<100	<100	<100	<100	<1000 AB	<100	<100	ug/kg	TM16/PM8
Dimethyl phthalate #M	<1000 AB	<1000 AB	<100	<100	<100	<100	<100	<100	<1000 AB	<100	<100	ug/kg	TM16/PM8

Client Name: AECOM
Reference: 60569745
Location: VP1 (TLOR)
Contact: Alex Freeman

SVOC Report : **Solid**

J E Job No.	18/5166	18/5166	18/5333	18/5333	18/5333	18/5384	18/5384	18/5384	18/5455	18/5775			
J E Sample No.	4-6	13-15	16-18	22-24	28-29	1-3	7-9	13-15	1-3	4-6			
Sample ID	BH01	WS01	WS02	WS05	WS03	TP06	TP01	TP02	BH02	BH05			
Depth	0.45-0.70	1.00-1.25	0.00-0.50	0.50-1.00	0.00-1.20	0.40-0.60	0.70-0.90	0.30-0.50	0.60-1.00	1.80-2.25	Please see attached notes for all abbreviations and acronyms		
COC No / misc													
Containers	V J B	V J B	V J B	V J B	V B	V J B	V J B	V J B	V J B	V J B			
Sample Date	05/04/2018	06/04/2018	10/04/2018	10/04/2018	10/04/2018	10/04/2018	11/04/2018	11/04/2018	11/04/2018	17/04/2018			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	07/04/2018	07/04/2018	11/04/2018	11/04/2018	11/04/2018	12/04/2018	12/04/2018	12/04/2018	13/04/2018	18/04/2018	LOD/LOR	Units	Method No.
SVOC MS													
Other SVOCs													
1,2-Dichlorobenzene	<100 AB	<100 AB	<10	<10	<10	<10	<10	<10	<100 AB	<10	<10	ug/kg	TM16/PM8
1,2,4-Trichlorobenzene #M	<100 AB	<100 AB	<10	<10	<10	<10	<10	<10	<100 AB	<10	<10	ug/kg	TM16/PM8
1,3-Dichlorobenzene	<100 AB	<100 AB	<10	<10	<10	<10	<10	<10	<100 AB	<10	<10	ug/kg	TM16/PM8
1,4-Dichlorobenzene	<100 AB	<100 AB	<10	<10	<10	<10	<10	<10	<100 AB	<10	<10	ug/kg	TM16/PM8
2-Nitroaniline	<100 AB	<100 AB	<10	<10	<10	<10	<10	<10	<100 AB	<10	<10	ug/kg	TM16/PM8
2,4-Dinitrotoluene	<100 AB	<100 AB	<10	<10	<10	<10	<10	<10	<100 AB	<10	<10	ug/kg	TM16/PM8
2,6-Dinitrotoluene	<100 AB	<100 AB	<10	<10	<10	<10	<10	<10	<100 AB	<10	<10	ug/kg	TM16/PM8
3-Nitroaniline	<100 AB	<100 AB	<10	<10	<10	<10	<10	<10	<100 AB	<10	<10	ug/kg	TM16/PM8
4-Bromophenylphenylether #M	<100 AB	<100 AB	<10	<10	<10	<10	<10	<10	<100 AB	<10	<10	ug/kg	TM16/PM8
4-Chloroaniline	<100 AB	<100 AB	<10	<10	<10	<10	<10	<10	<100 AB	<10	<10	ug/kg	TM16/PM8
4-Chlorophenylphenylether	<100 AB	<100 AB	<10	<10	<10	<10	<10	<10	<100 AB	<10	<10	ug/kg	TM16/PM8
4-Nitroaniline	<100 AB	<100 AB	<10	<10	<10	<10	<10	<10	<100 AB	<10	<10	ug/kg	TM16/PM8
Azobenzene	<100 AB	<100 AB	<10	<10	<10	<10	<10	<10	<100 AB	<10	<10	ug/kg	TM16/PM8
Bis(2-chloroethoxy)methane	<100 AB	<100 AB	<10	<10	<10	<10	<10	<10	<100 AB	<10	<10	ug/kg	TM16/PM8
Bis(2-chloroethyl)ether	<100 AB	<100 AB	<10	<10	<10	<10	<10	<10	<100 AB	<10	<10	ug/kg	TM16/PM8
Carbazole	<100 AB	<100 AB	<10	<10	<10	<10	<10	<10	<100 AB	<10	<10	ug/kg	TM16/PM8
Dibenzofuran #M	<100 AB	<100 AB	<10	<10	<10	<10	<10	818	<100 AB	<10	<10	ug/kg	TM16/PM8
Hexachlorobenzene	<100 AB	<100 AB	<10	<10	<10	<10	<10	<10	<100 AB	<10	<10	ug/kg	TM16/PM8
Hexachlorobutadiene #M	<100 AB	<100 AB	<10	<10	<10	<10	<10	<10	<100 AB	<10	<10	ug/kg	TM16/PM8
Hexachlorocyclopentadiene	<100 AB	<100 AB	<10	<10	<10	<10	<10	<10	<100 AB	<10	<10	ug/kg	TM16/PM8
Hexachloroethane	<100 AB	<100 AB	<10	<10	<10	<10	<10	<10	<100 AB	<10	<10	ug/kg	TM16/PM8
Isophorone #M	<100 AB	<100 AB	<10	<10	<10	<10	<10	<10	<100 AB	<10	<10	ug/kg	TM16/PM8
N-nitrosodi-n-propylamine #M	<100 AB	<100 AB	<10	<10	<10	<10	<10	<10	<100 AB	<10	<10	ug/kg	TM16/PM8
Nitrobenzene #M	<100 AB	<100 AB	<10	<10	<10	<10	<10	<10	<100 AB	<10	<10	ug/kg	TM16/PM8
Surrogate Recovery 2-Fluorobiphenyl	112 AB	108 AB	114	120	123	108	112	121	114 AB	119	<0	%	TM16/PM8
Surrogate Recovery p-Terphenyl-d14	113 AB	113 AB	104	120	122	116	114	115	130 AB	127	<0	%	TM16/PM8

Client Name: AECOM
Reference: 60569745
Location: VP1 (TLOR)
Contact: Alex Freeman

SVOC Report : **Liquid**

J E Job No.	18/7222	18/7222	18/7222	18/7222									
J E Sample No.	22-28	29-35	36-42	43-49									
Sample ID	WS03	WS04	WS05	WS06									
Depth											Please see attached notes for all abbreviations and acronyms		
COC No / misc													
Containers	V H HN HCL P G	V H HN HCL P G	V H HN HCL P G	V H HN HCL P G									
Sample Date	10/05/2018	10/05/2018	10/05/2018	10/05/2018									
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water									
Batch Number	1	1	1	1									
Date of Receipt	12/05/2018	12/05/2018	12/05/2018	12/05/2018							LOD/LOR	Units	Method No.
SVOC MS													
Phenols													
2-Chlorophenol #	<1	<1	<1	<1							<1	ug/l	TM16/PM30
2-Methylphenol #	<0.5	<0.5	<0.5	<0.5							<0.5	ug/l	TM16/PM30
2-Nitrophenol	<0.5	<0.5	<0.5	<0.5							<0.5	ug/l	TM16/PM30
2,4-Dichlorophenol #	<0.5	<0.5	<0.5	<0.5							<0.5	ug/l	TM16/PM30
2,4-Dimethylphenol	<1	<1	<1	<1							<1	ug/l	TM16/PM30
2,4,5-Trichlorophenol #	<0.5	<0.5	<0.5	<0.5							<0.5	ug/l	TM16/PM30
2,4,6-Trichlorophenol	<1	<1	<1	<1							<1	ug/l	TM16/PM30
4-Chloro-3-methylphenol #	<0.5	<0.5	<0.5	<0.5							<0.5	ug/l	TM16/PM30
4-Methylphenol	<1	<1	<1	<1							<1	ug/l	TM16/PM30
4-Nitrophenol	<10	<10	<10	<10							<10	ug/l	TM16/PM30
Pentachlorophenol	<1	<1	<1	<1							<1	ug/l	TM16/PM30
Phenol	<1	<1	<1	<1							<1	ug/l	TM16/PM30
PAHs													
2-Chloronaphthalene #	<1	<1	<1	<1							<1	ug/l	TM16/PM30
2-Methylnaphthalene #	<1	<1	<1	<1							<1	ug/l	TM16/PM30
Naphthalene #	<1	<1	<1	<1							<1	ug/l	TM16/PM30
Acenaphthylene #	<0.5	<0.5	<0.5	<0.5							<0.5	ug/l	TM16/PM30
Acenaphthene #	<1	<1	<1	<1							<1	ug/l	TM16/PM30
Fluorene #	<0.5	<0.5	<0.5	<0.5							<0.5	ug/l	TM16/PM30
Phenanthrene #	<0.5	<0.5	<0.5	<0.5							<0.5	ug/l	TM16/PM30
Anthracene #	<0.5	<0.5	<0.5	<0.5							<0.5	ug/l	TM16/PM30
Fluoranthene #	<0.5	<0.5	<0.5	<0.5							<0.5	ug/l	TM16/PM30
Pyrene #	<0.5	<0.5	<0.5	<0.5							<0.5	ug/l	TM16/PM30
Benzo(a)anthracene #	<0.5	<0.5	<0.5	<0.5							<0.5	ug/l	TM16/PM30
Chrysene #	<0.5	<0.5	<0.5	<0.5							<0.5	ug/l	TM16/PM30
Benzo(bk)fluoranthene #	<1	<1	<1	<1							<1	ug/l	TM16/PM30
Benzo(a)pyrene	<1	<1	<1	<1							<1	ug/l	TM16/PM30
Indeno(123cd)pyrene	<1	<1	<1	<1							<1	ug/l	TM16/PM30
Dibenzo(ah)anthracene #	<0.5	<0.5	<0.5	<0.5							<0.5	ug/l	TM16/PM30
Benzo(ghi)perylene #	<0.5	<0.5	<0.5	<0.5							<0.5	ug/l	TM16/PM30
Phthalates													
Bis(2-ethylhexyl) phthalate	<5	<5	<5	<5							<5	ug/l	TM16/PM30
Butylbenzyl phthalate	<1	<1	<1	<1							<1	ug/l	TM16/PM30
Di-n-butyl phthalate #	<1.5	<1.5	<1.5	<1.5							<1.5	ug/l	TM16/PM30
Di-n-Octyl phthalate	<1	<1	<1	<1							<1	ug/l	TM16/PM30
Diethyl phthalate #	<1	<1	<1	<1							<1	ug/l	TM16/PM30
Dimethyl phthalate	<1	<1	<1	<1							<1	ug/l	TM16/PM30

Client Name: AECOM
Reference: 60569745
Location: VP1 (TLOR)
Contact: Alex Freeman

SVOC Report : **Liquid**

J E Job No.	18/7222	18/7222	18/7222	18/7222									
J E Sample No.	22-28	29-35	36-42	43-49									
Sample ID	WS03	WS04	WS05	WS06									
Depth											Please see attached notes for all abbreviations and acronyms		
COC No / misc													
Containers	V H HN HCL P G	V H HN HCL P G	V H HN HCL P G	V H HN HCL P G									
Sample Date	10/05/2018	10/05/2018	10/05/2018	10/05/2018									
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water									
Batch Number	1	1	1	1									
Date of Receipt	12/05/2018	12/05/2018	12/05/2018	12/05/2018									
SVOC MS													
Other SVOCs													
1,2-Dichlorobenzene #	<1	<1	<1	<1							<1	ug/l	TM16/PM30
1,2,4-Trichlorobenzene #	<1	<1	<1	<1							<1	ug/l	TM16/PM30
1,3-Dichlorobenzene #	<1	<1	<1	<1							<1	ug/l	TM16/PM30
1,4-Dichlorobenzene #	<1	<1	<1	<1							<1	ug/l	TM16/PM30
2-Nitroaniline	<1	<1	<1	<1							<1	ug/l	TM16/PM30
2,4-Dinitrotoluene #	<0.5	<0.5	<0.5	<0.5							<0.5	ug/l	TM16/PM30
2,6-Dinitrotoluene	<1	<1	<1	<1							<1	ug/l	TM16/PM30
3-Nitroaniline	<1	<1	<1	<1							<1	ug/l	TM16/PM30
4-Bromophenylphenylether #	<1	<1	<1	<1							<1	ug/l	TM16/PM30
4-Chloroaniline	<1	<1	<1	<1							<1	ug/l	TM16/PM30
4-Chlorophenylphenylether #	<1	<1	<1	<1							<1	ug/l	TM16/PM30
4-Nitroaniline	<0.5	<0.5	<0.5	<0.5							<0.5	ug/l	TM16/PM30
Azobenzene #	<0.5	<0.5	<0.5	<0.5							<0.5	ug/l	TM16/PM30
Bis(2-chloroethoxy)methane #	<0.5	<0.5	<0.5	<0.5							<0.5	ug/l	TM16/PM30
Bis(2-chloroethyl)ether #	<1	<1	<1	<1							<1	ug/l	TM16/PM30
Carbazole #	<0.5	<0.5	<0.5	<0.5							<0.5	ug/l	TM16/PM30
Dibenzofuran #	<0.5	<0.5	<0.5	<0.5							<0.5	ug/l	TM16/PM30
Hexachlorobenzene #	<1	<1	<1	<1							<1	ug/l	TM16/PM30
Hexachlorobutadiene #	<1	<1	<1	<1							<1	ug/l	TM16/PM30
Hexachlorocyclopentadiene	<1	<1	<1	<1							<1	ug/l	TM16/PM30
Hexachloroethane #	<1	<1	<1	<1							<1	ug/l	TM16/PM30
Isophorone #	<0.5	<0.5	<0.5	<0.5							<0.5	ug/l	TM16/PM30
N-nitrosodi-n-propylamine #	<0.5	<0.5	<0.5	<0.5							<0.5	ug/l	TM16/PM30
Nitrobenzene #	<1	<1	<1	<1							<1	ug/l	TM16/PM30
Surrogate Recovery 2-Fluorobiphenyl	122	118	113	115							<0	%	TM16/PM30
Surrogate Recovery p-Terphenyl-d14	130	125	129	129							<0	%	TM16/PM30

Client Name: AECOM
Reference: 60569745
Location: VP1 (TLOR)
Contact: Alex Freeman

VOC Report : **Solid**

J E Job No.	18/5166	18/5166	18/5333	18/5333	18/5333	18/5384	18/5384	18/5384	18/5455	18/5775			
J E Sample No.	4-6	13-15	16-18	22-24	28-29	1-3	7-9	13-15	1-3	4-6			
Sample ID	BH01	WS01	WS02	WS05	WS03	TP06	TP01	TP02	BH02	BH05			
Depth	0.45-0.70	1.00-1.25	0.00-0.50	0.50-1.00	0.00-1.20	0.40-0.60	0.70-0.90	0.30-0.50	0.60-1.00	1.80-2.25	Please see attached notes for all abbreviations and acronyms		
COC No / misc													
Containers	V J B	V J B	V J B	V J B	V B	V J B	V J B	V J B	V J B	V J B			
Sample Date	05/04/2018	06/04/2018	10/04/2018	10/04/2018	10/04/2018	10/04/2018	11/04/2018	11/04/2018	11/04/2018	17/04/2018			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	07/04/2018	07/04/2018	11/04/2018	11/04/2018	11/04/2018	12/04/2018	12/04/2018	12/04/2018	13/04/2018	18/04/2018	LOD/LOR	Units	Method No.
VOC MS													
Dichlorodifluoromethane	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/kg	TM15/PM10
Methyl Tertiary Butyl Ether #M	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	ug/kg	TM15/PM10
Chloromethane #	<3	<3	<3	<3	<3	<3	<3	<3	5	<3	<3	ug/kg	TM15/PM10
Vinyl Chloride	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/kg	TM15_A/PM10
Bromomethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/kg	TM15/PM10
Chloroethane #M	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	ug/kg	TM15/PM10
Trichlorofluoromethane #M	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
1,1-Dichloroethene (1,1 DCE) #M	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	ug/kg	TM15/PM10
Dichloromethane (DCM) #	<30	<30	<30	<30	<30	<30	78	41	<30	<30	<30	ug/kg	TM15/PM10
trans-1-2-Dichloroethene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
1,1-Dichloroethane #M	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	ug/kg	TM15/PM10
cis-1-2-Dichloroethene #M	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	ug/kg	TM15/PM10
2,2-Dichloropropane	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
Bromochloromethane #M	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
Chloroform #M	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM15/PM10
1,1,1-Trichloroethane #M	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM15/PM10
1,1-Dichloropropene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
Carbon tetrachloride #M	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
1,2-Dichloroethane #M	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM15/PM10
Benzene #M	46	47	<5	<5	<5	<5	45	60	28	<5	<5	ug/kg	TM15/PM10
Trichloroethene (TCE) #M	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM15/PM10
1,2-Dichloropropane #M	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
Dibromomethane #M	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
Bromodichloromethane #M	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
cis-1-3-Dichloropropene	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
Toluene #M	7	15	<3	<3	<3	<3	5	19	6	<3	<3	ug/kg	TM15/PM10
trans-1-3-Dichloropropene	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
1,1,2-Trichloroethane #M	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
Tetrachloroethene (PCE) #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
1,3-Dichloropropane #M	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
Dibromochloromethane #M	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM15/PM10
1,2-Dibromoethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
Chlorobenzene #M	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
1,1,1,2-Tetrachloroethane #M	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM15/PM10
Ethylbenzene #M	60	31	<3	<3	<3	<3	39	121	24	<3	<3	ug/kg	TM15/PM10
p/m-Xylene #M	114	89	<4	<4	9	<4	213	115	78	<4	<4	ug/kg	TM15/PM10
o-Xylene #M	36	31	<4	<4	<4	<4	49	54	23	<4	<4	ug/kg	TM15/PM10
Styrene	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15_A/PM10
Bromoform	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
Isopropylbenzene #	24	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
1,1,2,2-Tetrachloroethane #M	263	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
Bromobenzene	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/kg	TM15/PM10
1,2,3-Trichloropropane #M	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
Propylbenzene #	56	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
2-Chlorotoluene	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
1,3,5-Trimethylbenzene #	20	<3	<3	<3	<3	<3	44	51	<3	<3	<3	ug/kg	TM15/PM10
4-Chlorotoluene	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/kg	TM15/PM10
tert-Butylbenzene #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM15/PM10
1,2,4-Trimethylbenzene #	315	111	<6	<6	<6	<6	606	833	91	<6	<6	ug/kg	TM15/PM10
sec-Butylbenzene #	203	<4	<4	<4	<4	<4	50	<4	<4	<4	<4	ug/kg	TM15/PM10
4-Isopropyltoluene #	92	<4	<4	<4	<4	<4	75	1185	<4	<4	<4	ug/kg	TM15/PM10
1,3-Dichlorobenzene #M	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
1,4-Dichlorobenzene #	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
n-Butylbenzene #	<4	<4	<4	<4	<4	<4	63	<4	<4	<4	<4	ug/kg	TM15/PM10
1,2-Dichlorobenzene #M	<4	<4	<4	<4	<4	<4	<4	926	<4	<4	<4	ug/kg	TM15/PM10
1,2-Dibromo-3-chloropropane #	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
1,2,4-Trichlorobenzene #	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	ug/kg	TM15/PM10
Hexachlorobutadiene	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/kg	TM15/PM10
Naphthalene	<27	<27	<27	<27	<27	<27	66	252	<27	<27	<27	ug/kg	TM15/PM10
1,2,3-Trichlorobenzene #	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	ug/kg	TM15/PM10
Surrogate Recovery Toluene D8	57	57	93	92	78	85	52	52	51	111	<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	59	55	86	77	64	74	58	54	51	103	<0	%	TM15/PM10

Client Name: AECOM
Reference: 60569745
Location: VP1 (TLOR)
Contact: Alex Freeman

VOC Report : **Liquid**

J E Job No.	18/7222	18/7222	18/7222	18/7222									
J E Sample No.	22-28	29-35	36-42	43-49									
Sample ID	WS03	WS04	WS05	WS06									
Depth											Please see attached notes for all abbreviations and acronyms		
COC No / misc													
Containers	V H HN HCL P G	V H HN HCL P G	V H HN HCL P G	V H HN HCL P G									
Sample Date	10/05/2018	10/05/2018	10/05/2018	10/05/2018									
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water									
Batch Number	1	1	1	1									
Date of Receipt	12/05/2018	12/05/2018	12/05/2018	12/05/2018									
											LOD/LOR	Units	Method No.
VOC MS													
Dichlorodifluoromethane	<2	<2	<2	<2							<2	ug/l	TM15/PM10
Methyl Tertiary Butyl Ether #	<0.1	2.8	<0.2 AA	<0.1							<0.1	ug/l	TM15/PM10
Chloromethane #	<3	<3	<3	<3							<3	ug/l	TM15/PM10
Vinyl Chloride #	<0.1	<0.1	<0.1	<0.1							<0.1	ug/l	TM15/PM10
Bromomethane	<1	<1	<1	<1							<1	ug/l	TM15/PM10
Chloroethane #	<3	<3	<3	<3							<3	ug/l	TM15/PM10
Trichlorofluoromethane #	<3	<3	<3	<3							<3	ug/l	TM15/PM10
1,1-Dichloroethene (1,1 DCE) #	<3	<3	<3	<3							<3	ug/l	TM15/PM10
Dichloromethane (DCM) #	<5	<5	<5	<5							<5	ug/l	TM15/PM10
trans-1-2-Dichloroethene #	<3	<3	<3	<3							<3	ug/l	TM15/PM10
1,1-Dichloroethane #	<3	<3	<3	<3							<3	ug/l	TM15/PM10
cis-1-2-Dichloroethene #	<3	<3	<3	<3							<3	ug/l	TM15/PM10
2,2-Dichloropropane	<1	<1	<1	<1							<1	ug/l	TM15/PM10
Bromochloromethane #	<2	<2	<2	<2							<2	ug/l	TM15/PM10
Chloroform #	<2	<2	<2	<2							<2	ug/l	TM15/PM10
1,1,1-Trichloroethane #	<2	<2	<2	<2							<2	ug/l	TM15/PM10
1,1-Dichloropropene #	<3	<3	<3	<3							<3	ug/l	TM15/PM10
Carbon tetrachloride #	<2	<2	<2	<2							<2	ug/l	TM15/PM10
1,2-Dichloroethane #	<2	<2	<2	<2							<2	ug/l	TM15/PM10
Benzene #	<0.5	<0.5	<0.5	<0.5							<0.5	ug/l	TM15/PM10
Trichloroethene (TCE) #	<3	<3	<3	<3							<3	ug/l	TM15/PM10
1,2-Dichloropropane #	<2	<2	<2	<2							<2	ug/l	TM15/PM10
Dibromomethane #	<3	<3	<3	<3							<3	ug/l	TM15/PM10
Bromodichloromethane #	<2	<2	<2	<2							<2	ug/l	TM15/PM10
cis-1-3-Dichloropropene	<2	<2	<2	<2							<2	ug/l	TM15/PM10
Toluene #	<5	<5	<5	<5							<5	ug/l	TM15/PM10
trans-1-3-Dichloropropene	<2	<2	<2	<2							<2	ug/l	TM15/PM10
1,1,2-Trichloroethane #	<2	<2	<2	<2							<2	ug/l	TM15/PM10
Tetrachloroethene (PCE) #	<3	<3	<3	<3							<3	ug/l	TM15/PM10
1,3-Dichloropropane #	<2	<2	<2	<2							<2	ug/l	TM15/PM10
Dibromochloromethane #	<2	<2	<2	<2							<2	ug/l	TM15/PM10
1,2-Dibromoethane #	<2	<2	<2	<2							<2	ug/l	TM15/PM10
Chlorobenzene #	<2	<2	<2	<2							<2	ug/l	TM15/PM10
1,1,1,2-Tetrachloroethane #	<2	<2	<2	<2							<2	ug/l	TM15/PM10
Ethylbenzene #	<1	<1	<1	<1							<1	ug/l	TM15/PM10
p/m-Xylene #	<2	<2	<2	<2							<2	ug/l	TM15/PM10
o-Xylene #	<1	<1	<1	<1							<1	ug/l	TM15/PM10
Styrene	<2	<2	<2	<2							<2	ug/l	TM15/PM10
Bromoform #	<2	<2	<2	<2							<2	ug/l	TM15/PM10
Isopropylbenzene #	<3	<3	<3	<3							<3	ug/l	TM15/PM10
1,1,2,2-Tetrachloroethane	<4	<4	<4	<4							<4	ug/l	TM15/PM10
Bromobenzene #	<2	<2	<2	<2							<2	ug/l	TM15/PM10
1,2,3-Trichloropropane #	<3	<3	<3	<3							<3	ug/l	TM15/PM10
Propylbenzene #	<3	<3	<3	<3							<3	ug/l	TM15/PM10
2-Chlorotoluene #	<3	<3	<3	<3							<3	ug/l	TM15/PM10
1,3,5-Trimethylbenzene #	<3	<3	<3	<3							<3	ug/l	TM15/PM10
4-Chlorotoluene #	<3	<3	<3	<3							<3	ug/l	TM15/PM10
tert-Butylbenzene #	<3	<3	<3	<3							<3	ug/l	TM15/PM10
1,2,4-Trimethylbenzene #	<3	<3	<3	<3							<3	ug/l	TM15/PM10
sec-Butylbenzene #	<3	<3	<3	<3							<3	ug/l	TM15/PM10
4-Isopropyltoluene #	<3	<3	<3	<3							<3	ug/l	TM15/PM10
1,3-Dichlorobenzene #	<3	<3	<3	<3							<3	ug/l	TM15/PM10
1,4-Dichlorobenzene #	<3	<3	<3	<3							<3	ug/l	TM15/PM10
n-Butylbenzene #	<3	<3	<3	<3							<3	ug/l	TM15/PM10
1,2-Dichlorobenzene #	<3	<3	<3	<3							<3	ug/l	TM15/PM10
1,2-Dibromo-3-chloropropane	<2	<2	<2	<2							<2	ug/l	TM15/PM10
1,2,4-Trichlorobenzene	<3	<3	<3	<3							<3	ug/l	TM15/PM10
Hexachlorobutadiene	<3	<3	<3	<3							<3	ug/l	TM15/PM10
Naphthalene	<2	<2	<2	<2							<2	ug/l	TM15/PM10
1,2,3-Trichlorobenzene	<3	<3	<3	<3							<3	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	95	96	98	96							<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	96	96	100	101							<0	%	TM15/PM10

Job number: 18/5166
Sample number: 4
Sample identity: BH01
Sample depth: 0.45-0.70
Sample Type: Soil
Units: ug/kg

Method: VOC
Matrix: Solid

Note: Only samples with TICs (if requested) are reported. If TICs were requested but no compounds found they are not reported.

CAS No.	Tentative Compound Identification	Retention Time (minutes)	% Match	Concentration
565-59-3	Pentane, 2,3-dimethyl-	4.035	90	163
16883-48-0	Cyclopentane, 1,2,4-trimethyl-, (1.alpha.,2.beta.,4.alpha.)-	4.626	91	139
565-75-3	Pentane, 2,3,4-trimethyl-	4.689	80	299
560-21-4	Pentane, 2,3,3-trimethyl-	4.746	80	291
2207-01-4	Cyclohexane, 1,2-dimethyl-, cis-	5.029 - 5.348	87,91	341
6876-23-9	Cyclohexane, 1,2-dimethyl-, trans-	5.105	97	350
2234-75-5	Cyclohexane, 1,2,4-trimethyl-	5.394	80	461
7667-60-9	Cyclohexane, 1,2,4-trimethyl-, (1.alpha.,2.beta.,4.beta.)-	5.493	95	340
3114-55-4	Chlorobenzene-d5	5.621	91	1372
5911-04-6	Nonane, 3-methyl-	5.956	90	820
506-51-4	n-Tetracosanol-1	6.459	80	623
2425-77-6	1-Decanol, 2-hexyl-	6.627	90	890
1678-81-5	Cyclohexane, 1,2,3-trimethyl-, (1.alpha.,2.beta.,3.alpha.)-	6.789	89	372
933-98-2	Benzene, 1-ethyl-2,3-dimethyl-	7.109	90	1034
76089-59-3	1,3-Cyclopentadiene, 1,2,3,4-tetramethyl-5-methylene-	7.344	80	396
2958-76-1	Naphthalene, decahydro-2-methyl-	7.382	86	876

Job number: 18/5384
Sample number: 7
Sample identity: TP01
Sample depth: 0.70-0.90
Sample Type: Soil
Units: ug/kg

Method: VOC
Matrix: Solid

Note: Only samples with TICs (if requested) are reported. If TICs were requested but no compounds found they are not reported.

CAS No.	Tentative Compound Identification	Retention Time (minutes)	% Match	Concentration
-	trans-Decalin, 2-methyl-	7.270	89	357
2958-76-1	Naphthalene, decahydro-2-methyl-	7.384	83	292

Job number: 18/5384
Sample number: 13
Sample identity: TP02
Sample depth: 0.30-0.50
Sample Type: Soil
Units: ug/kg

Method: VOC
Matrix: Solid

Note: Only samples with TICs (if requested) are reported. If TICs were requested but no compounds found they are not reported.

CAS No.	Tentative Compound Identification	Retention Time (minutes)	% Match	Concentration
96-14-0	Pentane, 3-methyl-	3.174	90	334
108-08-7	Pentane, 2,4-dimethyl-	3.646	83	154
565-59-3	Pentane, 2,3-dimethyl-	4.034	94	828
589-34-4	Hexane, 3-methyl-	4.079	94	783
1638-26-2	Cyclopentane, 1,1-dimethyl-	4.108	86	352
872-56-0	Isopropylcyclobutane	4.233	93	432
2815-58-9	Cyclopentane, 1,2,4-trimethyl-	4.626	91	957
589-53-7	Heptane, 4-methyl-	4.778	91	955
2207-01-4	Cyclohexane, 1,2-dimethyl-, cis-	5.023	81	1512
6876-23-9	Cyclohexane, 1,2-dimethyl-, trans-	5.105	97	2017
2207-03-6	Cyclohexane, 1,3-dimethyl-, trans-	5.153	93	1110
2234-75-5	Cyclohexane, 1,2,4-trimethyl-	5.336	83	664
3073-66-3	Cyclohexane, 1,1,3-trimethyl-	5.394	94	4705
619-99-8	Hexane, 3-ethyl-	5.446	80	2024
2216-33-3	Octane, 3-methyl-	5.539	80	1413
3728-57-2	Cyclopentane, 1-methyl-2-propyl-	5.707	93	1148
6236-88-0	Cyclohexane, 1-ethyl-4-methyl-, trans-	5.739	91	2325
19398-86-8	cis-3-Decene	5.810	81	425
15869-94-0	Octane, 3,6-dimethyl-	5.955	91	3026
2847-72-5	Decane, 4-methyl-	6.512	83	3218
-	Oxalic acid, cyclobutyl heptadecyl ester	6.627	80	1626
7058-01-7	Cyclohexane, (1-methylpropyl)-	6.680	81	1990
105-05-5	Benzene, 1,4-diethyl-	6.871	84	754
527-84-4	o-Cymene	7.109	94	1704
-	trans-Decalin, 2-methyl-	7.274	87	2398
95-93-2	Benzene, 1,2,4,5-tetramethyl-	7.344	94	623
2958-76-1	Naphthalene, decahydro-2-methyl-	7.383	92	1088

Job number: 18/5455
Sample number: 1
Sample identity: BH02
Sample depth: 0.60-1.00
Sample Type: Soil
Units: ug/kg

Method: **VOC**
Matrix: **Solid**

Note: Only samples with TICs (if requested) are reported. If TICs were requested but no compounds found they are not reported.

CAS No.	Tentative Compound Identification	Retention Time (minutes)	% Match	Concentration
463-58-1	Carbonyl sulfide	1.274	90	186

Job number: 18/5166
Sample number: 5
Sample identity: BH01
Sample depth: 0.45-0.70
Sample Type: Soil
Units: ug/kg

Method: **SVOC**
Matrix: **Solid**

Note: Only samples with TICs (if requested) are reported. If TICs were requested but no compounds found they are not reported.

CAS No.	Tentative Compound Identification	Retention Time (minutes)	% Match	Concentration
638-36-8	Hexadecane, 2,6,10,14-tetramethyl-	10.545	95	1411

Job number: 18/5166
Sample number: 14
Sample identity: WS01
Sample depth: 1.00-1.25
Sample Type: Soil
Units: ug/kg

Method: **SVOC**
Matrix: **Solid**

Note: Only samples with TICs (if requested) are reported. If TICs were requested but no compounds found they are not reported.

CAS No.	Tentative Compound Identification	Retention Time (minutes)	% Match	Concentration
3891-98-3	Dodecane, 2,6,10-trimethyl-	10.545	94	1528

Job number: 18/5384
Sample number: 8
Sample identity: TP01
Sample depth: 0.70-0.90
Sample Type: Soil
Units: ug/kg

Method: **SVOC**
Matrix: **Solid**

Note: Only samples with TICs (if requested) are reported. If TICs were requested but no compounds found they are not reported.

CAS No.	Tentative Compound Identification	Retention Time (minutes)	% Match	Concentration
493-02-7	Naphthalene, decahydro-, trans-	5.805	90	1122
-	trans-Decalin, 2-methyl-	6.326	97	1050
2958-76-1	Naphthalene, decahydro-2-methyl-	6.473	95	2269
62199-51-3	Cyclopentane, 1-pentyl-2-propyl-	7.673	86	1382
90-12-0	Naphthalene, 1-methyl-	7.738	93	3064
3891-98-3	Dodecane, 2,6,10-trimethyl-	8.265	90	2465
13360-61-7	1-Pentadecene	8.387	83	3966
581-42-0	Naphthalene, 2,6-dimethyl-	8.465	97	788
582-16-1	Naphthalene, 2,7-dimethyl-	8.569	93	1403
2131-42-2	Naphthalene, 1,4,6-trimethyl-	9.194	96	4316
2245-38-7	Naphthalene, 1,6,7-trimethyl-	9.293	97	2204
13187-99-0	2-Bromo dodecane	9.775	89	3906
529-05-5	Chamazulene	9.931	93	2686
7350-72-3	1,4-Methanonaphthalene,1,4-dihydro-9-((1-methylethylidene)-	10.004	93	4447
55045-07-3	Dodecane, 2-methyl-8-propyl-	10.064	86	6256
832-69-9	Phenanthrene, 1-methyl-	10.923	86	6045
832-64-4	Phenanthrene, 4-methyl-	11.002	90	5121
89816-75-1	2,6-Dimethyldibenzothiophene	11.262	80	5352
2381-21-7	Pyrene, 1-methyl-	12.528	89	2957
2175-90-8	6,6-Diphenylfulvene	13.086	91	1926
64401-21-4	Pyrene, 1,3-dimethyl-	13.206	90	2930
288246-53-7	Pyridine-3-carboxamide, oxime, N-(2-trifluoromethylphenyl)-	13.865	91	2246
54482-31-4	D-Homoandrostane, (5.alpha.,13.alpha.)-	14.822	90	1244
98496-82-3	Antra-9,10-quinone, 1-(3-hydrohy-3-phenyl-1-triazenyl)-	17.032	86	3885

Job number: 18/5384
Sample number: 14
Sample identity: TP02
Sample depth: 0.30-0.50
Sample Type: Soil
Units: ug/kg

Method: **SVOC**
Matrix: **Solid**

Note: Only samples with TICs (if requested) are reported. If TICs were requested but no compounds found they are not reported.

CAS No.	Tentative Compound Identification	Retention Time (minutes)	% Match	Concentration
15869-94-0	Octane, 3,6-dimethyl-	4.547	90	1479
14676-29-0	Heptane, 3-ethyl-2-methyl-	4.635	81	1611
2847-72-5	Decane, 4-methyl-	5.500	83	2762
1678-93-9	Cyclohexane, butyl-	5.581	83	657
493-02-7	Naphthalene, decahydro-, trans-	5.804	93	2381
527-84-4	o-Cymene	5.918	92	2969
933-98-2	Benzene, 1-ethyl-2,3-dimethyl-	6.159	90	1224
95-93-2	Benzene, 1,2,4,5-tetramethyl-	6.305	97	1971
-	trans-Decalin, 2-methyl-	6.326	98	246
13150-81-7	2,6-Dimethyldecane	6.389	89	2040
1758-85-6	Benzene, 2,4-diethyl-1-methyl-	6.609	86	868
53172-84-2	Benzene, (1-methyl-1-butenyl)-	7.438	90	2858
75163-97-2	Octadecane, 2,6-dimethyl-	7.594	90	2717
62199-51-3	Cyclopentane, 1-pentyl-2-propyl-	7.673	90	2810
2613-76-5	1H-Indene, 2,3-dihydro-1,1,3-trimethyl-	7.843	89	7319
3891-98-3	Dodecane, 2,6,10-trimethyl-	8.272	94	7253
582-16-1	Naphthalene, 2,7-dimethyl-	8.465	97	11515
2131-42-2	Naphthalene, 1,4,6-trimethyl-	8.953	96	4000
2245-38-7	Naphthalene, 1,6,7-trimethyl-	9.194	98	7282
829-26-5	Naphthalene, 2,3,6-trimethyl-	9.293	98	7932
3892-00-0	Pentadecane, 2,6,10-trimethyl-	9.775	93	8945
529-05-5	Chamazulene	9.859	94	1926
1921-70-6	Pentadecane, 2,6,10,14-tetramethyl-	10.064	96	17326
7350-72-3	1,4-Methanonaphthalene,1,4-dihydro-9-((1-methylethylidene)-	10.112	86	3154
51282-56-5	Ethyl 5-chloro-2-nitrobenzoate	10.232	92	1565
638-36-8	Hexadecane, 2,6,10,14-tetramethyl-	10.545	96	19194
67388-11-8	4-Methylnaphtho[1,2-b]thiophene	10.803	95	6863
832-64-4	Phenanthrene, 4-methyl-	10.903	90	3804
610-48-0	Anthracene, 1-methyl-	10.923	95	8606
2531-84-2	Phenanthrene, 2-methyl-	11.012	95	9265

Job number: 18/5384
Sample number: 14
Sample identity: TP02
Sample depth: 0.30-0.50
Sample Type: Soil
Units: ug/kg

Method: **SVOC**
Matrix: **Solid**

Note: Only samples with TICs (if requested) are reported. If TICs were requested but no compounds found they are not reported.

CAS No.	Tentative Compound Identification	Retention Time (minutes)	% Match	Concentration
89816-75-1	2,6-Dimethyldibenzothiophene	11.262	96	4651
31317-19-8	2,7-Dimethyldibenzothiophene	11.371	93	5853
2789-88-0	di-p-Tolylacetylene	11.511	93	6689
85385-68-8	[14]Annulene, 1,6:8,13-bis(methano)-, syn	11.531	93	6356
4443-60-1	Cyclohexane, (1-hexyltetradecyl)-	11.700	81	3109
2380-32-7	Octadecanoic acid, 17-oxo-, methyl ester	12.199	90	519
25186-71-4	3-Chloro-1-anthraquinonecarboxylic acid	13.985	91	1725
288246-53-7	Pyridine-3-carboxamide, oxime, N-(2-trifluoromethylphenyl)-	14.324	91	2517
98496-82-3	Antra-9,10-quinone, 1-(3-hydrohy-3-phenyl-1-triazenyl)-	15.905	86	1164
112-95-8	Eicosane	16.039	90	2080
62016-79-9	Heptacosane, 1-chloro-	16.996	97	12910

All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: AECOM
Reference: 60569745
Location: VP1 (TLOR)
Contact: Alex Freeman

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Jones Environmental Laboratory consultant, Jones Environmental Laboratory cannot be responsible for inaccurate or unrepresentative sampling.

Signed on behalf of Jones Environmental Laboratory:

Ryan Butterworth
Asbestos Team Leader

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Date Of Analysis	Analysis	Result
18/5166	1	BH06	0.40-0.70	3	11/04/2018	**General Description (Bulk Analysis)**	soil-stones
					11/04/2018	**Asbestos Fibres**	NAD
					11/04/2018	**Asbestos Fibres (2)**	NAD
					11/04/2018	**Asbestos ACM**	NAD
					11/04/2018	**Asbestos ACM (2)**	NAD
					11/04/2018	**Asbestos Type**	NAD
					11/04/2018	**Asbestos Type (2)**	NAD
					11/04/2018	**Asbestos Level Screen**	NAD
18/5166	1	BH01	0.45-0.70	6	11/04/2018	**General Description (Bulk Analysis)**	Soil/Stones
					11/04/2018	**Asbestos Fibres**	Fibre Bundles
					11/04/2018	**Asbestos ACM**	NAD
					11/04/2018	**Asbestos Type**	Chrysotile
					11/04/2018	**Asbestos Level Screen**	less than 0.1%
					30/04/2018	**Total ACM Gravimetric Quantification (% Asb)**	<0.001 (mass %)
					30/04/2018	**Total Detailed Gravimetric Quantification (% Asb)**	<0.001 (mass %)
					30/04/2018	**Total Gravimetric Quantification (ACM + Detailed) (% Asb)**	<0.001 (mass %)
					30/04/2018	**Asbestos PCOM Quantification (Fibres)**	<0.001 (mass %)
					30/04/2018	**Asbestos Gravimetric & PCOM Total**	<0.001 (mass %)
18/5166	1	TT03	0.00-1.40	9	11/04/2018	**General Description (Bulk Analysis)**	Soil/Stones
					11/04/2018	**Asbestos Fibres**	NAD
					11/04/2018	**Asbestos Fibres (2)**	NAD
					11/04/2018	**Asbestos ACM**	NAD
					11/04/2018	**Asbestos ACM (2)**	NAD
					11/04/2018	**Asbestos Type**	NAD
					11/04/2018	**Asbestos Type (2)**	NAD
					11/04/2018	**Asbestos Level Screen**	NAD
18/5166	1	TT02	0.50-1.20	12	11/04/2018	**General Description (Bulk Analysis)**	soil/stones
					11/04/2018	**Asbestos Fibres**	NAD
					11/04/2018	**Asbestos Fibres (2)**	NAD
					11/04/2018	**Asbestos ACM**	NAD
					11/04/2018	**Asbestos ACM (2)**	NAD
					11/04/2018	**Asbestos Type**	NAD
					11/04/2018	**Asbestos Type (2)**	NAD
					11/04/2018	**Asbestos Level Screen**	NAD

Client Name: AECOM
Reference: 60569745
Location: VP1 (TLOR)
Contact: Alex Freeman

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Date Of Analysis	Analysis	Result
18/5166	1	WS01	1.00-1.25	15	11/04/2018	**General Description (Bulk Analysis)**	soil/stones
					11/04/2018	**Asbestos Fibres**	Fibre Bundles
					11/04/2018	**Asbestos ACM**	NAD
					11/04/2018	**Asbestos Type**	Chrysotile
					11/04/2018	**Asbestos Level Screen**	less than 0.1%
					30/04/2018	**Total ACM Gravimetric Quantification (% Asb)**	<0.001 (mass %)
					30/04/2018	**Total Detailed Gravimetric Quantification (% Asb)**	<0.001 (mass %)
					30/04/2018	**Total Gravimetric Quantification (ACM + Detailed) (% Asb)**	<0.001 (mass %)
					30/04/2018	**Asbestos PCOM Quantification (Fibres)**	<0.001 (mass %)
					30/04/2018	**Asbestos Gravimetric & PCOM Total**	<0.001 (mass %)
18/5166	1	WS04	0.50	18	11/04/2018	**General Description (Bulk Analysis)**	soil/stones
					11/04/2018	**Asbestos Fibres**	NAD
					11/04/2018	**Asbestos Fibres (2)**	NAD
					11/04/2018	**Asbestos ACM**	NAD
					11/04/2018	**Asbestos ACM (2)**	NAD
					11/04/2018	**Asbestos Type**	NAD
					11/04/2018	**Asbestos Type (2)**	NAD
					11/04/2018	**Asbestos Level Screen**	NAD
18/5166	1	TP10	0.40-0.60	21	11/04/2018	**General Description (Bulk Analysis)**	soil/stones
					11/04/2018	**Asbestos Fibres**	NAD
					11/04/2018	**Asbestos Fibres (2)**	NAD
					11/04/2018	**Asbestos ACM**	NAD
					11/04/2018	**Asbestos ACM (2)**	NAD
					11/04/2018	**Asbestos Type**	NAD
					11/04/2018	**Asbestos Type (2)**	NAD
					11/04/2018	**Asbestos Level Screen**	NAD
18/5333	1	TT01	1.70-1.90	3	16/04/2018	**General Description (Bulk Analysis)**	Soil/Stone
					16/04/2018	**Asbestos Fibres**	NAD
					16/04/2018	**Asbestos Fibres (2)**	NAD
					16/04/2018	**Asbestos ACM**	NAD
					16/04/2018	**Asbestos ACM (2)**	NAD
					16/04/2018	**Asbestos Type**	NAD
					16/04/2018	**Asbestos Type (2)**	NAD
					16/04/2018	**Asbestos Level Screen**	NAD
18/5333	1	TP09	0.30-0.40	6	16/04/2018	**General Description (Bulk Analysis)**	Soil/Stone
					16/04/2018	**Asbestos Fibres**	NAD
					16/04/2018	**Asbestos Fibres (2)**	NAD
					16/04/2018	**Asbestos ACM**	NAD
					16/04/2018	**Asbestos ACM (2)**	NAD
					16/04/2018	**Asbestos Type**	NAD
					16/04/2018	**Asbestos Type (2)**	NAD
					16/04/2018	**Asbestos Level Screen**	NAD
18/5333	1	TP07	1.30-1.60	9	16/04/2018	**General Description (Bulk Analysis)**	Soil/Stone
					16/04/2018	**Asbestos Fibres**	NAD
					16/04/2018	**Asbestos Fibres (2)**	NAD
					16/04/2018	**Asbestos ACM**	NAD
					16/04/2018	**Asbestos ACM (2)**	NAD
					16/04/2018	**Asbestos Type**	NAD

Client Name: AECOM
Reference: 60569745
Location: VP1 (TLOR)
Contact: Alex Freeman

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Date Of Analysis	Analysis	Result
18/5333	1	TP07	1.30-1.60	9	16/04/2018	**Asbestos Type (2)**	NAD
					16/04/2018	**Asbestos Level Screen**	NAD
18/5333	1	TP08	0.20-0.50	15	16/04/2018	**General Description (Bulk Analysis)**	soil.stones
					16/04/2018	**Asbestos Fibres**	NAD
					16/04/2018	**Asbestos Fibres (2)**	NAD
					16/04/2018	**Asbestos ACM**	NAD
					16/04/2018	**Asbestos ACM (2)**	NAD
					16/04/2018	**Asbestos Type**	NAD
					16/04/2018	**Asbestos Type (2)**	NAD
					16/04/2018	**Asbestos Level Screen**	NAD
18/5333	1	WS02	0.00-0.50	18	16/04/2018	**General Description (Bulk Analysis)**	Soil/Stone
					16/04/2018	**Asbestos Fibres**	NAD
					16/04/2018	**Asbestos Fibres (2)**	NAD
					16/04/2018	**Asbestos ACM**	NAD
					16/04/2018	**Asbestos ACM (2)**	NAD
					16/04/2018	**Asbestos Type**	NAD
					16/04/2018	**Asbestos Type (2)**	NAD
					16/04/2018	**Asbestos Level Screen**	NAD
18/5333	1	TP05	0.50-0.70	21	16/04/2018	**General Description (Bulk Analysis)**	Soil/Stone
					16/04/2018	**Asbestos Fibres**	NAD
					16/04/2018	**Asbestos Fibres (2)**	NAD
					16/04/2018	**Asbestos ACM**	NAD
					16/04/2018	**Asbestos ACM (2)**	NAD
					16/04/2018	**Asbestos Type**	NAD
					16/04/2018	**Asbestos Type (2)**	NAD
					16/04/2018	**Asbestos Level Screen**	NAD
18/5333	1	WS05	0.50-1.00	24	16/04/2018	**General Description (Bulk Analysis)**	Soil/Stone
					16/04/2018	**Asbestos Fibres**	NAD
					16/04/2018	**Asbestos Fibres (2)**	NAD
					16/04/2018	**Asbestos ACM**	NAD
					16/04/2018	**Asbestos ACM (2)**	NAD
					16/04/2018	**Asbestos Type**	NAD
					16/04/2018	**Asbestos Type (2)**	NAD
					16/04/2018	**Asbestos Level Screen**	NAD
18/5333	1	TP04	0.80-1.00	27	16/04/2018	**General Description (Bulk Analysis)**	Soil/Stone
					16/04/2018	**Asbestos Fibres**	NAD
					16/04/2018	**Asbestos Fibres (2)**	NAD
					16/04/2018	**Asbestos ACM**	NAD
					16/04/2018	**Asbestos ACM (2)**	NAD
					16/04/2018	**Asbestos Type**	NAD
					16/04/2018	**Asbestos Type (2)**	NAD
					16/04/2018	**Asbestos Level Screen**	NAD
18/5333	1	WS03	0.00-1.20	29	16/04/2018	**General Description (Bulk Analysis)**	soil.stones
					16/04/2018	**Asbestos Fibres**	NAD
					16/04/2018	**Asbestos Fibres (2)**	NAD
					16/04/2018	**Asbestos ACM**	NAD
					16/04/2018	**Asbestos ACM (2)**	NAD

Client Name: AECOM
Reference: 60569745
Location: VP1 (TLOR)
Contact: Alex Freeman

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Date Of Analysis	Analysis	Result
18/5333	1	WS03	0.00-1.20	29	16/04/2018	**Asbestos Type**	NAD
					16/04/2018	**Asbestos Type (2)**	NAD
					16/04/2018	**Asbestos Level Screen**	NAD
18/5384	1	TP06	0.40-0.60	3	17/04/2018	**General Description (Bulk Analysis)**	Soil/Stone
					17/04/2018	**Asbestos Fibres**	Fibre Bundles
					17/04/2018	**Asbestos ACM**	NAD
					17/04/2018	**Asbestos Type**	Chrysotile
					17/04/2018	**Asbestos Level Screen**	less than 0.1%
					26/04/2018	**Total ACM Gravimetric Quantification (% Asb)**	<0.001 (mass %)
					26/04/2018	**Total Detailed Gravimetric Quantification (% Asb)**	<0.001 (mass %)
					26/04/2018	**Total Gravimetric Quantification (ACM + Detailed) (% Asb)**	<0.001 (mass %)
					26/04/2018	**Asbestos PCOM Quantification (Fibres)**	<0.001 (mass %)
					26/04/2018	**Asbestos Gravimetric & PCOM Total**	<0.001 (mass %)
18/5384	1	TP01	0.70-0.90	9	17/04/2018	**General Description (Bulk Analysis)**	Soil/Stone
					17/04/2018	**Asbestos Fibres**	Fibre Bundles
					17/04/2018	**Asbestos ACM**	NAD
					17/04/2018	**Asbestos Type**	Chrysotile
					17/04/2018	**Asbestos Level Screen**	less than 0.1%
					26/04/2018	**Total ACM Gravimetric Quantification (% Asb)**	<0.001 (mass %)
					26/04/2018	**Total Detailed Gravimetric Quantification (% Asb)**	<0.001 (mass %)
					26/04/2018	**Total Gravimetric Quantification (ACM + Detailed) (% Asb)**	<0.001 (mass %)
					26/04/2018	**Asbestos PCOM Quantification (Fibres)**	<0.001 (mass %)
					26/04/2018	**Asbestos Gravimetric & PCOM Total**	<0.001 (mass %)
18/5384	1	TP02	0.30-0.50	15	17/04/2018	**General Description (Bulk Analysis)**	Soil/Stone
					17/04/2018	**Asbestos Fibres**	Fibre Bundles
					17/04/2018	**Asbestos ACM**	NAD
					17/04/2018	**Asbestos Type**	Chrysotile
					17/04/2018	**Asbestos Level Screen**	less than 0.1%
					26/04/2018	**Total ACM Gravimetric Quantification (% Asb)**	<0.001 (mass %)
					26/04/2018	**Total Detailed Gravimetric Quantification (% Asb)**	<0.001 (mass %)
					26/04/2018	**Total Gravimetric Quantification (ACM + Detailed) (% Asb)**	<0.001 (mass %)
					26/04/2018	**Asbestos PCOM Quantification (Fibres)**	<0.001 (mass %)
					26/04/2018	**Asbestos Gravimetric & PCOM Total**	<0.001 (mass %)
18/5384	1	WS06	0.00-1.20	21	17/04/2018	**General Description (Bulk Analysis)**	Soil/Stone
					17/04/2018	**Asbestos Fibres**	NAD
					17/04/2018	**Asbestos Fibres (2)**	NAD
					17/04/2018	**Asbestos ACM**	NAD
					17/04/2018	**Asbestos ACM (2)**	NAD
					17/04/2018	**Asbestos Type**	NAD
					17/04/2018	**Asbestos Type (2)**	NAD
					17/04/2018	**Asbestos Level Screen**	NAD
18/5384	1	BH03	1.50-2.00	24	17/04/2018	**General Description (Bulk Analysis)**	Soil/Stone
					17/04/2018	**Asbestos Fibres**	NAD
					17/04/2018	**Asbestos Fibres (2)**	NAD
					17/04/2018	**Asbestos ACM**	NAD
					17/04/2018	**Asbestos ACM (2)**	NAD
					17/04/2018	**Asbestos Type**	NAD
					17/04/2018	**Asbestos Type (2)**	NAD

Client Name: AECOM
Reference: 60569745
Location: VP1 (TLOR)
Contact: Alex Freeman

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Date Of Analysis	Analysis	Result
18/5384	1	BH03	1.50-2.00	24	17/04/2018	**Asbestos Level Screen**	NAD
18/5384	1	WS07	0.30-0.80	27	17/04/2018	**General Description (Bulk Analysis)**	Soil/Stone
					17/04/2018	**Asbestos Fibres**	NAD
					17/04/2018	**Asbestos Fibres (2)**	NAD
					17/04/2018	**Asbestos ACM**	NAD
					17/04/2018	**Asbestos ACM (2)**	NAD
					17/04/2018	**Asbestos Type**	NAD
					17/04/2018	**Asbestos Type (2)**	NAD
					17/04/2018	**Asbestos Level Screen**	NAD
18/5384	1	WS08	0.00-1.20	30	17/04/2018	**General Description (Bulk Analysis)**	Soil/Stone
					17/04/2018	**Asbestos Fibres**	NAD
					17/04/2018	**Asbestos Fibres (2)**	NAD
					17/04/2018	**Asbestos ACM**	NAD
					17/04/2018	**Asbestos ACM (2)**	NAD
					17/04/2018	**Asbestos Type**	NAD
					17/04/2018	**Asbestos Type (2)**	NAD
					17/04/2018	**Asbestos Level Screen**	NAD
18/5455	1	BH02	0.60-1.00	3	18/04/2018	**General Description (Bulk Analysis)**	soil/stones
					18/04/2018	**Asbestos Fibres**	Fibre Bundles
					18/04/2018	**Asbestos ACM**	NAD
					18/04/2018	**Asbestos Type**	Chrysotile
					18/04/2018	**Asbestos Level Screen**	less than 0.1%
					26/04/2018	**Total ACM Gravimetric Quantification (% Asb)**	<0.001 (mass %)
					26/04/2018	**Total Detailed Gravimetric Quantification (% Asb)**	<0.001 (mass %)
					26/04/2018	**Total Gravimetric Quantification (ACM + Detailed) (% Asb)**	<0.001 (mass %)
					26/04/2018	**Asbestos PCOM Quantification (Fibres)**	<0.001 (mass %)
					26/04/2018	**Asbestos Gravimetric & PCOM Total**	<0.001 (mass %)
18/5775	1	BH04	0.50-1.20	3	24/04/2018	**General Description (Bulk Analysis)**	Soil/Stone
					24/04/2018	**Asbestos Fibres**	NAD
					24/04/2018	**Asbestos Fibres (2)**	NAD
					24/04/2018	**Asbestos ACM**	NAD
					24/04/2018	**Asbestos ACM (2)**	NAD
					24/04/2018	**Asbestos Type**	NAD
					24/04/2018	**Asbestos Type (2)**	NAD
					24/04/2018	**Asbestos Level Screen**	NAD
18/5775	1	BH05	1.80-2.25	6	24/04/2018	**General Description (Bulk Analysis)**	Soil/Stone
					24/04/2018	**Asbestos Fibres**	NAD
					24/04/2018	**Asbestos Fibres (2)**	NAD
					24/04/2018	**Asbestos ACM**	NAD
					24/04/2018	**Asbestos ACM (2)**	NAD
					24/04/2018	**Asbestos Type**	NAD
					24/04/2018	**Asbestos Type (2)**	NAD
					24/04/2018	**Asbestos Level Screen**	NAD

Client Name: AECOM **Matrix : Solid**
Reference: 60569745
Location: VP1 (TLOR)
Contact: Alex Freeman

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	NDP Reason
18/5166	1	BH01	0.45-0.70	4-6	Asbestos detected in sample
18/5166	1	WS01	1.00-1.25	13-15	Asbestos detected in sample
18/5384	1	TP06	0.40-0.60	1-3	Asbestos detected in sample
18/5384	1	TP01	0.70-0.90	7-9	Asbestos detected in sample
18/5384	1	TP02	0.30-0.50	13-15	Asbestos detected in sample
18/5455	1	BH02	0.60-1.00	1-3	Asbestos detected in sample

Client Name: AECOM

Reference: 60569745

Location: VP1 (TLOR)

Contact: Alex Freeman

Matrix : Liquid

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Analysis	Reason

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.

Only analyses which are accredited are recorded as deviating if set criteria are not met.

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa.
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
++	Result outside calibration range, results should be considered as indicative only and are not accredited.
*	Analysis subcontracted to an Exova Jones Environmental approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range
AA	x2 Dilution
AB	x10 Dilution

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Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM0	Not available	PM0	No preparation is required.				
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.	PM0	No preparation is required.				
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes	Yes	AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM12/PM16/PM30	please refer to PM16/PM30 and PM12 for method details	Yes			
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details	Yes		AR	Yes
PM13	A visual examination of the solid sample is carried out to ascertain sample make up, colour and any other inclusions. This is not a geotechnical description.	PM0	No preparation is required.			AR	
TM15	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.				

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Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM15	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM15	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM15	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM15	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes	Yes	AR	Yes
TM16	Modified USEPA 8270. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM16	Modified USEPA 8270. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM16	Modified USEPA 8270. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM16	Modified USEPA 8270. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes	Yes	AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.			AD	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM14	Analysis of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for dissolved metals and acidified if required.				

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Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM14	Analysis of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for dissolved metals and acidified if required.	Yes			
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes	Yes	AD	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM62	Acid digestion of as received solid samples using Aqua Regia refluxed at 112.5 °C.			AR	Yes
TM31	Modified USEPA 8015B. Determination of Methyltertbutylether, Benzene, Toluene, Ethylbenzene and Xylene by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes	Yes	AR	Yes
TM37	Modified methods USEPA 160.2, EN872:2005 and SMWW 2540D. Gravimetric determination of Total Suspended Solids. Sample is filtered through a 1.5um pore size glass fibre filter and the resulting residue is dried and weighed.	PM0	No preparation is required.	Yes			

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Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods 325.2 (Chloride), 375.4 (Sulphate), 365.2 (o-Phosphate), 353.1 (TON), 354.1 (Nitrite), 350.1 (NH4+), 7196A (Hex Cr)	PM0	No preparation is required.				
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods 325.2 (Chloride), 375.4 (Sulphate), 365.2 (o-Phosphate), 353.1 (TON), 354.1 (Nitrite), 350.1 (NH4+), 7196A (Hex Cr)	PM0	No preparation is required.	Yes			
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods 325.2 (Chloride), 375.4 (Sulphate), 365.2 (o-Phosphate), 353.1 (TON), 354.1 (Nitrite), 350.1 (NH4+), 7196A (Hex Cr)	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.			AD	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods 325.2 (Chloride), 375.4 (Sulphate), 365.2 (o-Phosphate), 353.1 (TON), 354.1 (Nitrite), 350.1 (NH4+), 7196A (Hex Cr)	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes	Yes	AD	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods 325.2 (Chloride), 375.4 (Sulphate), 365.2 (o-Phosphate), 353.1 (TON), 354.1 (Nitrite), 350.1 (NH4+), 7196A (Hex Cr)	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.			AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods 325.2 (Chloride), 375.4 (Sulphate), 365.2 (o-Phosphate), 353.1 (TON), 354.1 (Nitrite), 350.1 (NH4+), 7196A (Hex Cr)	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods 325.2 (Chloride), 375.4 (Sulphate), 365.2 (o-Phosphate), 353.1 (TON), 354.1 (Nitrite), 350.1 (NH4+), 7196A (Hex Cr)	PM60	As received solid samples are extracted with deionised water in a 2:1 ratio of water to solid.			AR	Yes
TM48	Determination of Ferrous Iron by reaction with Sodium Carbonate and Morfamquat Sulphate which is analysed spectrophotometrically.	PM0	No preparation is required.				
TM50	Acid soluble sulphate (Total Sulphate) analysed by ICP-OES	PM29	Dried and ground solid sample is boiled with dilute hydrochloric acid, the resulting liquor is then analysed.	Yes	Yes	AD	Yes
TM50	Acid soluble sulphate (Total Sulphate) analysed by ICP-OES	PM29	Dried and ground solid sample is boiled with dilute hydrochloric acid, the resulting liquor is then analysed.			AR	Yes

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Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM60	TC/TOC analysis of Waters by High Temperature Combustion followed by NDIR detection. Based on the following modified standard methods: USEPA 9060, APHA Standard Methods for Examination of Water and Wastewater 5310B, ASTM D 7573, and USEPA 415.1.	PM0	No preparation is required.	Yes			
TM65	Asbestos Bulk Identification method based on HSG 248.	PM42	Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 and 9045D and BS1377:1990. Determination of pH by Metrohm automated probe analyser.	PM0	No preparation is required.	Yes			
TM73	Modified US EPA methods 150.1 and 9045D and BS1377:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes	Yes	AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes	Yes	AD	Yes
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM61	As received solid samples are extracted with hot water in a 20:1 ratio of water to soil ready for analysis by ICP.			AR	Yes
TM75	Modified US EPA method 310.1. Determination of Alkalinity by Metrohm automated titration analyser.	PM0	No preparation is required.	Yes			
TM107	Determination of Sulphide/Thiocyanate by Skalar Continuous Flow Analyser	PM119	As received solid samples are extracted with 1M NaOH by orbital shaker for Sulphide and Thiocyanate analysis.			AR	Yes
TM131	Quantification of Asbestos Fibres and ACM, based on HSG248 and SCA method.	PM42	Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	Yes
TM173	Analysis of fluoride by ISE (Ion Selective Electrode) using modified ISE method 340.2	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.			AR	Yes

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Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
NONE	No Method Code	NONE	No Method Code				
NONE	No Method Code	NONE	No Method Code			AR	Yes
TM15_A	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds, Vinyl Chloride & Styrene by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes

Appendix D Gas and Groundwater Monitoring Results

		Ground Water Monitoring								Gas monitoring									
Hole ID	Date	Depth to base (m)	Depth to water (m)	Height of well casing from ground level (m)	pH	Temperature (°C)	Specific Conductivity (µS/cm)	RDO concentration (mg/L)	ORP (mV)	Pressure (mb)	Peak Flow (L/hr)	Steady Flow(L/hr)	CO_2 peak (%)	CO_2 stable (%)	O_2 minium (%)	O_2 stable (%)	CH_4 peak (%)	CH_4 stable (%)
WS01	11/05/2018	2.57	2.16	0.35	-	-	-	-	-	1011	0	0	1	0.7	19.6	19.6	0	0
WS02	11/05/2018	1.46	1.37	1.57	-	-	-	-	-	1012	0	0	0.4	0.1	20.1	20.2	0	0
WS03	11/05/2018	3.8	1.4	0.29	8.92	10.08	3247.9	0.05	-42	1012	0	0	0.1	0.1	20.5	20.5	0	0
WS04	11/05/2018	1.88	0.99	0.37	8.97	11.48	5176.8	0.02	-16.1	1012	0	0	0.2	0.2	20.2	20.4	0	0
WS05	11/05/2018	4.38	1	0.28	8.63	10.97	3124.5	0.16	-66.9	1012	0	0	0	0	20.7	20.7	0	0
WS06	11/05/2018	3.75	1.59	0.25	9.07	10.83	1359.6	0.05	-110.2	1017	0	0	0.1	0.1	20.6	20.7	0	0
WS07	11/05/2018	3.74	1.83	0.44	9.29	11.5	1302.9	1.18	-70.6	1016	0.4	0.2	0.4	0.2	20.6	20.9	0	0
WS08	11/05/2018	4.55	3.86	0.4	-	-	-	-	-	1017	4.8	0	0.7	0.5	20.4	20.6	0	0
BH01	11/05/2018	14.82	3.97	0.28	9.17	11.62	751.68	2.32	107.3	1012	0	0	0.4	0.2	20.1	20.3	0	0
BH02	11/05/2018	15.26	2.87	0.42	8.46	17.55	424.14	2.22	37.9	1012	0	0	0.2	0.2	20.5	20.5	0	0
BH03	11/05/2018	28.91	2.75	0.3	9.11	12.86	692.92	0.35	-36.9	*	*	*	*	*	*	*	*	*
BH04	11/05/2018	>30	1.56	-	-	-	-	-	-	1017	0	0	0.1	0.1	20.7	20.7	0	0
BH05	11/05/2018	17.91	2.04	-	-	-	-	-	-	1017	0	0	0.4	0.1	20.1	20.5	0	0
BH06	11/05/2018	>30	2.33	0.45	-	-	-	-	-	1017	0	0	0.1	0.1	20.6	20.9	0	0

Note:
Pressure in the morning 1011, peaking at 1017 with the last recording of 1016 taken at the end of the day.
Measurements taken from top of well casing.
Well BH04 and 06 were too deep for the interface probe (30m)
Gas readings for BH03 absent due to gas tap being off
Gas tap dropped down well side of WS08
Water samples from WS06 were very silty and the hole began to run dry during sampling
WS07 ran dry before sampling could take palce
Duplicate water sample of BH03 collected

	Ground Water Monitoring			Gas monitoring								
Hole ID	Date	Depth to w	Depth to base (m)	Pressure (mb)	Peak Flow (L/hr)	Steady Flow(L/hr)	CO_2 peak (%)	CO_2 stable (%)	O_2 minium (%)	O_2 stable (%)	CH_4 peak (%)	CH_4 stable (%)
WS01	23/05/2018	2.085	2.475	1025	0	0	0.1	0.1	20.3	20.3	0	0
WS02	23/05/2018	1.32	1.465	1026	-17	0	3.9	0.1	14.4	20.3	0	0
WS03	23/05/2018	1.525	3.72	1025	7.3	0	0.3	0.2	20.3	20.3	0	0
WS04	23/05/2018	0.96	1.7	1026	0	0	0.1	0.1	20.3	20.3	0	0
WS05	23/05/2018	0.98	4.165	1026	0	0	0.1	0.1	20.3	20.3	0	0
WS06	23/05/2018	1.61	3.62	1025	0	0	0.2	0.1	20.3	20.4	0	0
WS07	23/05/2018	1.835	3.61	1025	0	0	0.4	0.1	20.2	20.3	0	0
WS08	23/05/2018	3.485	4.5	1026	4.8	0	0.2	0	20.4	20.4	0	0
BH01	23/05/2018	3.705	14.265	1026	5.3	0	0.6	0.4	19.8	19.9	0	0
BH02	23/05/2018	2.66	15.13	1025	0	0	0.1	0.1	20.4	20.4	0	0
BH03	23/05/2018	2.57	28.84	1026	0	0	0.8	0.1	20.3	20.4	0	0
BH04	23/05/2018	1.31	35.03	1025	0	0	0.1	0.1	20.3	20.3	0	0
BH05	23/05/2018	1.865	17.795	1026	0	0	0.2	0.1	20.3	20.3	0	0
BH06	23/05/2018	2.195	35.03	1025	0	0	0.1	0.1	20.4	20.4	0	0

Note:
Pressure in the morning 1026, peaking at 1026 with the last recording of 1026 taken at the end of the day.
Measurements taken from top of well casing.
Gas readings from WS02 fluctuated a lot, up and down by approximately 6% for a while before it stabilsed
New gas tap placed on WS08

	Ground Water Monitoring		Gas monitoring									
Hole ID	Depth to water (m)	Depth to base (m)	Date	Pressure (mb)	Peak Flow (L/hr)	Steady Flow(L/hr)	CO_2 peak (%)	CO_2 stable (%)	O_2 minium (%)	O_2 stable (%)	CH_4 peak (%)	CH_4 stable (%)
WS01	2.11	2.491	01/06/2016	1018	0	0	0.5	0.2	20.2	20.4	0	0
WS02	1.367	1.451	01/06/2016	1018	0	0	1.3	0.1	19.4	20.6	0	0
WS03	1.482	3.703	01/06/2016	1018	5.4	0	0.3	0.3	20.4	20.6	0	0
WS04	0.967	1.676	01/06/2016	1018	0	0	0.1	0.1	20.6	20.6	0	0
WS05	1.03	4.417	01/06/2016	1017	0	0	0.1	0.1	20.4	20.4	0	0
WS06	1.64	3.622	01/06/2016	1017	0	0	0.1	0.1	20.7	20.7	0	0
WS07	1.866	3.599	01/06/2016	1017	0	0	0.1	0.1	20.7	20.8	0	0
WS08	3.332	4.5	01/06/2016	1016	1.3	0	0.5	0	20.7	20.8	0	0
BH01	3.783	14.285	01/06/2016	1018	-1	0	0.7	0.5	19.9	20	0	0
BH02	2.775	15.182	01/06/2016	1017	0	0	0.1	0.1	20.6	20.7	0	0
BH03	2.656	28.915	01/06/2016	1017	6	0	0.1	0.1	20.4	20.7	0	0
BH04	1.438	35.033	01/06/2016	1016	0	0	0.1	0	20.7	20.8	0	0
BH05	1.955	17.838	01/06/2016	1016	0	0	0	0	20.7	20.7	0	0
BH06	2.271	34.99	01/06/2016	1017	0	0	0.1	0.1	20.7	20.8	0	0

Note:
Pressure in the morning 1018, peaking at 1026 with the last recording of 1016 taken at the end of the day.
Measurements taken from top of well casing.

Appendix E Contamination Assessments

Analyte	Human Health GAC	I.D.	BH01	BH02	TP01	TP02	TP04	TP05	TP06	TP07	WS01	WS02	WS03	WS04	WS05	Number of Result	Number of Detects	Minimum Concentration	Minimum Detect	Maximum Concentration	Maximum Detect	Average Concentration	Median Concentration	Standard Deviation	Number of Guideline	Number of Guideline Exceedances
		Depth (m)	0.575	0.8	0.8	0.4	0.9	0.6	0.5	1.45	1.125	0.25	0.6	0.5	0.75											
		Date	05/04/2018	11/04/2018	11/04/2018	11/04/2018	10/04/2018	10/04/2018	10/04/2018	09/04/2018	06/04/2018	10/04/2018	10/04/2018	06/04/2018	10/04/2018											
VOC																										
1,1,1,2-tetrachloroethane	120[#18]		<0.005	<0.005	<0.005	<0.005	-	-	<0.005	-	<0.005	<0.005	<0.005	-	<0.005	9	0	<0.005	ND	<0.005	ND	0.005	0.005	0	9	0
1,1,2,2-tetrachloroethane	260[#18]		**0.263**	<0.003	<0.003	<0.003	-	-	<0.003	-	<0.003	<0.003	<0.003	-	<0.003	9	1	<0.003	0.263	0.263	0.263	0.032	0.003	0.087	9	1
1,1-dichloropropene			<0.003	<0.003	<0.003	<0.003	-	-	<0.003	-	<0.003	<0.003	<0.003	-	<0.003	9	0	<0.003	ND	<0.003	ND	0.003	0.003	0	0	0
1,2,3-trichloropropane	0.11[#11]		<0.004	<0.004	<0.004	<0.004	-	-	<0.004	-	<0.004	<0.004	<0.004	-	<0.004	9	0	<0.004	ND	<0.004	ND	0.004	0.004	0	9	0
1,2,4-trimethylbenzene	46.6[#19]		0.315	0.091	0.606	**0.833**	-	-	<0.006	-	0.111	<0.006	<0.006	-	<0.006	9	5	<0.006	0.091	0.833	0.833	0.22	0.091	0.31	1	1
1,2-dibromo-3-chloropropane	0.064[#11]		<0.004	<0.004	<0.004	<0.004	-	-	<0.004	-	<0.004	<0.004	<0.004	-	<0.004	9	0	<0.004	ND	<0.004	ND	0.004	0.004	0	9	0
1,2-dichloroethane	0.42[#18]		<0.005	<0.005	<0.005	<0.005	-	-	<0.005	-	<0.005	<0.005	<0.005	-	<0.005	9	0	<0.005	ND	<0.005	ND	0.005	0.005	0	9	0
1,2-Dichloroethene			<0.01	0.005	<0.01	<0.01	-	-	<0.01	-	<0.01	0.005	0.005	-	0.005	9	4	0.005	0.005	<0.01	0.005	0.0078	0.01	0.0026	0	0
1,2-dichloropropane	2.65[#19]		<0.004	<0.004	<0.004	<0.004	-	-	<0.004	-	<0.004	<0.004	<0.004	-	<0.004	9	0	<0.004	ND	<0.004	ND	0.004	0.004	0	0	0
1,3,5-trimethylbenzene	1 500[#11]		0.02	<0.003	0.044	0.051	-	-	<0.003	-	<0.003	<0.003	<0.003	-	<0.003	9	3	<0.003	0.02	0.051	0.051	0.015	0.003	0.019	0	0
1,3-dichloropropane	23 000[#11]		<0.004	<0.004	<0.004	<0.004	-	-	<0.004	-	<0.004	<0.004	<0.004	-	<0.004	9	0	<0.004	ND	<0.004	ND	0.004	0.004	0	0	0
2,2-dichloropropane			<0.004	<0.004	<0.004	<0.004	-	-	<0.004	-	<0.004	<0.004	<0.004	-	<0.004	9	0	<0.004	ND	<0.004	ND	0.004	0.004	0	0	0
Bromochloromethane	630[#11]		<0.004	<0.004	<0.004	<0.004	-	-	<0.004	-	<0.004	<0.004	<0.004	-	<0.004	9	0	<0.004	ND	<0.004	ND	0.004	0.004	0	0	0
Bromodichloromethane	1.3[#11]		<0.004	<0.004	<0.004	<0.004	-	-	<0.004	-	<0.004	<0.004	<0.004	-	<0.004	9	0	<0.004	ND	<0.004	ND	0.004	0.004	0	0	0
Bromoform	730[#19]		<0.004	<0.004	<0.004	<0.004	-	-	<0.004	-	<0.004	<0.004	<0.004	-	<0.004	9	0	<0.004	ND	<0.004	ND	0.004	0.004	0	0	0
Chlorodibromomethane	39[#11]		<0.005	<0.005	<0.005	<0.005	-	-	<0.005	-	<0.005	<0.005	<0.005	-	<0.005	9	0	<0.005	ND	<0.005	ND	0.005	0.005	0	0	0
cis-1,3-dichloropropene			<0.004	<0.004	<0.004	<0.004	-	-	<0.004	-	<0.004	<0.004	<0.004	-	<0.004	9	0	<0.004	ND	<0.004	ND	0.004	0.004	0	0	0
Cyclohexane, 1,1,3-trimethyl-			-	-	-	4.705	-	-	-	-	-	-	-	-	-	1	1	4.705	4.705	4.705	4.705		4.705		0	0
Cyclohexane, ethyl-			-	-	-	2.325	-	-	-	-	-	-	-	-	-	1	1	2.325	2.325	2.325	2.325		2.325		0	0
Dibromomethane	99[#11]		<0.004	<0.004	<0.004	<0.004	-	-	<0.004	-	<0.004	<0.004	<0.004	-	<0.004	9	0	<0.004	ND	<0.004	ND	0.004	0.004	0	9	0
Dodecane, 2,6,10-trimethyl-			-	-	2.465	7.253	-	-	-	-	1.528	-	-	-	-	3	3	1.528	1.528	7.253	7.253	3.7	2.465	3.1	0	0
Hexachlorobutadiene	33[#18]		<0.004	<0.004	<0.004	<0.004	-	-	<0.004	-	<0.004	<0.004	<0.004	-	<0.004	9	0	<0.004	ND	<0.004	ND	0.004	0.004	0	0	0
Isopropylbenzene	1 540[#19]		0.024	<0.003	<0.003	<0.003	-	-	<0.003	-	<0.003	<0.003	<0.003	-	<0.003	9	1	<0.003	0.024	0.024	0.024	0.0053	0.003	0.007	0	0
Naphthalene, decahydro-2-methyl-			0.876	-	0.292 - 2.269	1.088	-	-	-	-	-	-	-	-	-	3	3	0.292	0.292	2.269	2.269	1.1	1.088	0.2	0	0
n-butylbenzene	58 000[#11]		<0.004	<0.004	0.063	<0.004	-	-	<0.004	-	<0.004	<0.004	<0.004	-	<0.004	9	1	<0.004	0.063	0.063	0.063	0.011	0.004	0.02	0	0
n-propylbenzene	4 530[#19]		0.056	<0.004	<0.004	<0.004	-	-	<0.004	-	<0.004	<0.004	<0.004	-	<0.004	9	1	<0.004	0.056	0.056	0.056	0.0098	0.004	0.017	0	0
p-isopropyltoluene			0.092	<0.004	0.075	1.185	-	-	<0.004	-	<0.004	<0.004	<0.004	-	<0.004	9	3	<0.004	0.075	1.185	1.185	0.15	0.004	0.39	0	0
sec-butylbenzene	120 000[#11]		0.203	<0.004	0.05	<0.004	-	-	<0.004	-	<0.004	<0.004	<0.004	-	<0.004	9	2	<0.004	0.05	0.203	0.203	0.031	0.004	0.066	0	0
Styrene	3 550[#19]		<0.003	<0.003	<0.003	<0.003	-	-	<0.003	-	<0.003	<0.003	<0.003	-	<0.003	9	0	<0.003	ND	<0.003	ND	0.003	0.003	0	0	0
tert-butylbenzene	120 000[#11]		<0.005	<0.005	<0.005	<0.005	-	-	<0.005	-	<0.005	<0.005	<0.005	-	<0.005	9	0	<0.005	ND	<0.005	ND	0.005	0.005	0	0	0
trans-1,3-dichloropropene			<0.003	<0.003	<0.003	<0.003	-	-	<0.003	-	<0.003	<0.003	<0.003	-	<0.003	9	0	<0.003	ND	<0.003	ND	0.003	0.003	0	0	0
trans-Decalin, 2-methyl-			-	-	0.357 - 1.05	0.246 - 2.398	-	-	-	-	-	-	-	-	-	2	2	0.246	0.246	2.398	2.398		1.01275		0	0
Trihalomethanes			<0.018	0.009	<0.018	<0.018	-	-	<0.018	-	<0.018	0.009	0.009	-	0.009	9	4	0.009	0.009	<0.018	0.009	0.014	0.018	0.0047	0	0
Chlorinated Hydrocarbons																										
1,1,1-trichloroethane	640[#18]		<0.005	<0.005	<0.005	<0.005	-	-	<0.005	-	<0.005	<0.005	<0.005	-	<0.005	9	0	<0.005	ND	<0.005	ND	0.005	0.005	0	0	0
1,1,2-trichloroethane	89.7[#19]		<0.004	<0.004	<0.004	<0.004	-	-	<0.004	-	<0.004	<0.004	<0.004	-	<0.004	9	0	<0.004	ND	<0.004	ND	0.004	0.004	0	9	0
1,1-dichloroethane	208[#19]		<0.006	<0.006	<0.006	<0.006	-	-	<0.006	-	<0.006	<0.006	<0.006	-	<0.006	9	0	<0.006	ND	<0.006	ND	0.006	0.006	0	9	0
1,1-dichloroethene	22.6[#19]		<0.006	<0.006	<0.006	<0.006	-	-	<0.006	-	<0.006	<0.006	<0.006	-	<0.006	9	0	<0.006	ND	<0.006	ND	0.006	0.006	0	0	0
Carbon tetrachloride	3[#18]		<0.004	<0.004	<0.004	<0.004	-	-	<0.004	-	<0.004	<0.004	<0.004	-	<0.004	9	0	<0.004	ND	<0.004	ND	0.004	0.004	0	0	0
Chloroethane	640[#19]		<0.006	<0.006	<0.006	<0.006	-	-	<0.006	-	<0.006	<0.006	<0.006	-	<0.006	9	0	<0.006	ND	<0.006	ND	0.006	0.006	0	0	0
Chloroform	81[#18]		<0.005	<0.005	<0.005	<0.005	-	-	<0.005	-	<0.005	<0.005	<0.005	-	<0.005	9	0	<0.005	ND	<0.005	ND	0.005	0.005	0	9	0
Chloromethane	0.573[#19]		<0.003	0.005	<0.003	<0.003	-	-	<0.003	-	<0.003	<0.003	<0.003	-	<0.003	9	1	<0.003	0.005	0.005	0.005	0.0032	0.003	0.00067	0	0
cis-1,2-dichloroethene	11.3[#19]		<0.007	<0.007	<0.007	<0.007	-	-	<0.007	-	<0.007	<0.007	<0.007	-	<0.007	9	0	<0.007	ND	<0.007	ND	0.007	0.007	0	0	0
Dichloromethane	162[#19]		<0.03	<0.03	***0.078***	***0.041***	-	-	<0.03	-	<0.03	<0.03	<0.03	-	<0.03	9	2	<0.03	0.041	0.078	0.078	0.037	0.03	0.016	9	2
PCE+TCE+DCE+VC			<0.026	0.013	<0.026	<0.026	-	-	<0.026	-	<0.026	0.013	0.013	-	0.013	9	4	0.013	0.013	<0.026	0.013	0.02	0.026	0.0069	0	0
Sum of PCE and TCE			<0.008	0.004	<0.008	<0.008	-	-	<0.008	-	<0.008	0.004	0.004	-	0.004	9	4	0.004	0.004	<0.008	0.004	0.0062	0.008	0.0021	0	0
TCE+DCE+VC			<0.023	0.0115	<0.023	<0.023	-	-	<0.023	-	<0.023	0.0115	0.0115	-	0.0115	9	4	0.0115	0.0115	<0.023	0.0115	0.018	0.023	0.0061	0	0
Tetrachloroethene	19[#18]		<0.003	<0.003	<0.003	<0.003	-	-	<0.003	-	<0.003	<0.003	<0.003	-	<0.003	9	0	<0.003	ND	<0.003	ND	0.003	0.003	0	0	0
trans-1,2-dichloroethene	18.9[#19]		<0.003	<0.003	<0.003	<0.003	-	-	<0.003	-	<0.003	<0.003	<0.003	-	<0.003	9	0	<0.003	ND	<0.003	ND	0.003	0.003	0	0	0
Trichloroethene	1.2[#18]		<0.005	<0.005	<0.005	<0.005	-	-	<0.005	-	<0.005	<0.005	<0.005	-	<0.005	9	0	<0.005	ND	<0.005	ND	0.005	0.005	0	0	0
Vinyl chloride	0.04[#18]		<0.002	<0.002	<0.002	<0.002	-	-	<0.002	-	<0.002	<0.002	<0.002	-	<0.002	9	0	<0.002	ND	<0.002	ND	0.002	0.002	0	9	0
Halogenated Benzenes																										
1,2,3-trichlorobenzene	110[#18]		<0.007	<0.007	<0.007	<0.007	-	-	<0.007	-	<0.007	<0.007	<0.007	-	<0.007	9	0	<0.007	ND	<0.007	ND	0.007	0.007	0	9	0
1,2,4-trichlorobenzene	240[#18]		<0.007	<0.007	<0.007	<0.007	-	-	<0.007	-	<0.007	<0.007	<0.007	-	<0.007	9	0	<0.007	ND	<0.007	ND	0.007	0.007	0	9	0
1,2-dichlorobenzene	2 200[#18]		<0.004	<0.004	<0.004	<0.01 - 0.926	-	-	<0.004	-	<0.004	<0.004	<0.004	-	<0.004	9	1	<0.004	ND	0.926	0.926	0.056	0.004	0.15	0	0
1,3-dichlorobenzene	34[#18]		<0.004	<0.004	<0.004	<0.004	-	-	<0.004	-	<0.004	<0.004	<0.004	-	<0.004	9	0	<0.004	ND	<0.004	ND	0.004	0.004	0	0	0
1,4-dichlorobenzene	4 800[#18]		<0.004	<0.004	<0.004	<0.004	-	-	<0.004	-	<0.004	<0.004	<0.004	-	<0.004	9	0	<0.004	ND	<0.004	ND	0.004	0.004	0	0	0
2-chlorotoluene	23 000[#11]		<0.003	<0.003	<0.003	<0.003	-	-	<0.003	-	<0.003	<0.003	<0.003	-	<0.003	9	0	<0.003	ND	<0.003	ND	0.003	0.003	0	0	0
4-chlorotoluene	23 000[#11]		<0.003	<0.003	<0.003	<0.003	-	-	<0.003	-	<0.003	<0.003	<0.003	-	<0.003	9	0	<0.003	ND	<0.003	ND	0.003	0.003	0	0	0
Bromobenzene	105[#19]		<0.002	<0.002	<0.002	<0.002	-	-	<0.002	-	<0.002	<0.002	<0.002	-	<0.002	9	0	<0.002	ND	<0.002	ND	0.002	0.002	0	0	0
Chlorobenzene	59[#18]		**<0.004 - 1.372**	<0.004	<0.004	<0.004	-	-	<0.004	-	<0.004	<0.004	<0.004	-	<0.004	9	1	<0.004	ND	1.372	1.372	0.08	0.004	0.23	1	1
Hexachlorobenzene	110[#18]		<0.1	<0.1	<0.01	<0.01	-	-	<0.01	-	<0.1	<0.01	<0.01	-	<0.01	9	0	<0.01	ND	<0.1	ND	0.04	0.01	0.045	3	0
Trichlorobenzene (total)			<0.014	0.007	<0.014	<0.014	-	-	<0.014	-	<0.014	0.007	0.007	-	0.007	9	4	0.007	0.007	<0.014	0.007	0.011	0.014	0.0037	0	0
Halogenated Hydrocarbons																										
1,2-dibromoethane	0.16[#11]		<0.003	<0.003	<0.003	<0.003	-	-	<0.003	-	<0.003	<0.003	<0.003	-	<0.003	9	0	<0.003	ND	<0.003	ND	0.003	0.003	0	9	0
Bromomethane	30[#11]		<0.001	<0.001	<0.001	<0.001	-	-	<0.001	-	<0.001	<0.001	<0.001	-	<0.001	9	0	<0.001	ND	<0.001	ND	0.001	0.001	0	0	0
Dichlorodifluoromethane	370[#11]		<0.002	<0.002	<0.002	<0.002	-	-	<0.002	-	<0.002	<0.002	<0.002	-	<0.002	9	0	<0.002	ND	<0.002	ND	0.002	0.002	0	0	0
Trichlorofluoromethane	350 000[#11]		<0.003	<0.003	<0.003	<0.003	-	-	<0.003	-	<0.003	<0.003	<0.003	-	<0.003	9	0	<0.003	ND	<0.003	ND	0.003	0.003	0	0	0
PAH																										
Acenaphthene	90 000[#18]		<0.1	<0.1	<0.01	**1.651**	-	-	<0.01	-	<0.1	<0.01	<0.01	-	<0.01	9	1	<0.01	1.651	1.651	1.651	0.22	0.01	0.54	1	1
Acenaphthylene	90 000[#18]		<0.1	<0.1	<0.01	<0.01	-	-	<0.01	-	<0.1	<0.01	<0.01	-	<0.01	9	0	<0.01	ND	<0.1	ND	0.04	0.01	0.045	0	0
Anthracene	530 000[#18]		<0.1	<0.1	*0.603*	*1.072*	-	-	*0.05*	-	<0.1	<0.01	*0.046*	-	*0.041*	9	5	<0.01	0.041	1.072	1.072	0.24	0.1	0.36	9	5
Benz(a)anthracene	170[#18]		<0.1	<0.1	0.662	1.52	-	-	0.072	-	<0.1	<0.01	0.089	-	0.056	9	5	<0.01	0.056	1.52	1.52	0.3	0.1	0.5	0	0
Benzo(a) pyrene	36[#18]		<0.1	<0.1	***0.938***	***1.089***	-	-	***0.096***	-	<0.1	<0.01	***0.089***	-	***0.105***	9	5	<0.01	0.089	1.089	1.089	0.29	0.1	0.41	9	5
Benzo(b)&(k)fluoranthene			<0.1	<0.1	0.796	1.19	-	-	0.158	-	<0.1	<0.01	0.18	-	0.159	9	5	<0.01	0.158	1.19	1.19	0.31	0.158	0.4	0	0
Benzo(b)fluoranthene	45[#18]		<0.1	<0.1	*0.573*	*0.857*	-	-	*0.114*	-	<0.1	<0.01	*0.13*	-	*0.114*	9	5	<0.01	0.114	0.857	0.857	0.23	0.114	0.28	8	5
Benzo(g,h,i)perylene	4 000[#18]		<0.1	<0.1	*0.581*	*0.591*	-	-	*0.105*	-	<0.1	<0.01	*0.114*	-	*0.104*	9	5	<0.01	0.104	0.591	0.591	0.2	0.104	0.22	9	5
benzo(g,h,i)perylene + indeno(1,2,3-cd)pyrene			<0.2	0.1	0.818	0.854	-	-	0.145	-	<0.2	0.01	0.151	-	0.151	9	7	0.01	0.01	0.854	0.854	0.29	0.151	0.31	0	0
Benzo(k)fluoranthene	1 200[#18]		<0.1	<0.1	*0.223*	*0.333*	-	-	*0.044*	-	<0.1	<0.01	*0.05*	-	*0.045*	9	5	<0.01	0.044	0.333	0.333	0.11	0.1	0.1	8	5
Chrysene	350[#18]		<0.1	<0.1	2.415	3.179	-	-	0.258	-	<0.1	<0.01	0.318	-	0.288	9	5	<0.01	0.258	3.179	3.179	0.75	0.258	1.2	0	0
Dibenz(a,h)anthracene	3.6[#18]		<0.1	<0.1	**0.255**	**0.346**	-	-	0.05	-	<0.1	<0.01	0.04	-	0.038	9	5	<0.01	0.038	0.346	0.346	0.12	0.1	0.11	2	2
Fluoranthene	23 000[#18]		<0.1	<0.1	<0.01	***1.569***	-	-	*0.023*	-	<0.1	<0.01	*0.026*	-	*0.029*	9	4	<0.01	0.023	1.569	1.569	0.22	0.029	0.51	9	4
Fluorene	66 000[#18]		<0.1	<0.1	<0.01	**2.305**	-	-	<0.01	-	<0.1	<0.01	<0.01	-	<0.01	9	1	<0.01	2.305	2.305	2.305	0.3	0.01	0.76	1	1
Indeno(1,2,3-c,d)pyrene	510[#18]		<0.1	<0.1	0.237	0.263	-	-	0.04	-	<0.1	<0.01	0.037	-	0.047	9	5	<0.01	0.037	0.263	0.263	0.1	0.1	0.089	0	0
Naphthalene	220[#18]		<0.027	<0.027	***0.066 - 0.601***	***0.252 - 1.36***	-	-	<0.01	-	<0.027	<0.01	<0.01	-	<0.01	9	2	<0.01	0.066	1.36	1.36	0.14	0.027	0.27	5	2
PAHs (sum of 4)			<0.4	0.2	1.614	2.044	-	-	0.303	-	<0.4	0.02	0.331	-	0.31	9	7	0.02	0.02	2.044	2.044	0.62	0.331	0.7	0	0
Phenanthrene	22 000[#18]		<0.1	<0.1	**1.872**	**7.6**	-	-	0.11	-	<0.1	<0.01	0.13	-	0.124	9	5	<0.01	0.11	7.6	7.6	1.1	0.11	2.5	2	2
Pyrene	54 000[#18]		<0.1	**2.817**	**2.469**	**4.18**	-	-	0.091	-	<0.1	<0.01	0.11	-	0.171	9	6	<0.01	0.091	4.18	4.18	1.1	0.11	1.6	3	3
Phenolics																										
2,4-dimethylphenol	20 000[#19]		<0.1	<0.1	<0.01	<0.01	-	-	<0.01	-	<0.1	<0.01	<0.01	-	<0.01	9	0	<0.01	ND	<0.1	ND	0.04	0.01	0.045	0	0
2-chloronaphthalene	460[#19]		<0.1	<0.1	<0.01	<0.01	-	-	<0.01	-	<0.1	<0.01	<0.01	-	<0.01	9	0	<0.01	ND	<0.1	ND	0.04	0.01	0.045	0	0
2-methylphenol	41 000[#11]		<0.1	<0.1	<0.01	<0.01	-	-	<0.01	-	<0.1	<0.01	<0.01	-	<0.01	9	0	<0.01	ND	<0.1	ND	0.04	0.01	0.045	0	0
2-nitrophenol			<0.1	<0.1	<0.01	<0.01	-	-	<0.01	-	<0.1	<0.01	<0.01	-	<0.01	9	0	<0.01	ND	<0.1	ND	0.04	0.01	0.045	0	0
4-chloro-3-methylphenol	82 000[#11]		<0.1	<0.1	<0.01	<0.01	-	-	<0.01	-	<0.1	<0.01	<0.01	-	<0.01	9	0	<0.01	ND	<0.1	ND	0.04	0.01	0.045	0	0
4-methylphenol	82 000[#11]		<0.1	<0.1	<0.01	<0.01	-	-	<0.01	-	<0.1	<0.01	<0.01	-	<0.01	9	0	<0.01	ND	<0.1	ND	0.04	0.01	0.045	0	0
4-nitrophenol			<0.1	<0.1	<0.01	<0.01	-	-	<0.01	-	<0.1	<0.01	<0.01	-	<0.01	9	0	<0.01	ND	<0.1	ND	0.04	0.01	0.045	0	0
Phenol	620[#18]		<0.1	<0.1	<0.01	<0.01	-	-	<0.01	-	<0.1	<0.01	<0.01	-	<0.01	9	0	<0.01	ND	<0.1	ND	0.04	0.01	0.045	9	0
Halogenated Phenols																										
2,4,5-trichlorophenol	82 000[#11]		<0.1	<0.1	<0.01	<0.01	-	-	<0.01	-	<0.1	<0.01	<0.01	-	<0.01	9	0	<0.01	ND	<0.1	ND	0.04	0.01	0.045	0	0
2,4,6-trichlorophenol	210[#11]		<0.1	<0.1	<0.01	<0.01	-	-	<0.01	-	<0.1	<0.01	<0.01	-	<0.01	9	0	<0.01	ND	<0.1	ND	0.04	0.01	0.045	0	0
2,4-dichlorophenol	2 500[#11]		<0.1	<0.1	<0.01	<0.01	-	-	<0.01	-	<0.1	<0.01	<0.01	-	<0.01	9	0	<0.01	ND	<0.1	ND	0.04	0.01	0.045	9	0
2-chlorophenol	5 800[#11]		<0.1	<0.1	<0.01	<0.01	-	-	<0.01	-	<0.1	<0.01	<0.01	-	<0.01	9	0	<0.01	ND	<0.1	ND	0.04	0.01	0.045	0	0
Pentachlorophenol	400[#18]		<0.1	<0.1	<0.01	<0.01	-	-	<0.01	-	<0.1	<0.01	<0.01	-	<0.01	9	0	<0.01	ND	<0.1	ND	0.04	0.01	0.045	9	0
Phthalates																										
Bis(2-ethylhexyl) phthalate	85 800[#19]		<1	<1	***1.926***	***3.119***	-	-	<0.1	-	<1	<0.1	<0.1	-	<0.1	9	2	<0.1	1.926	3.119	3.119	0.94	1	1	9	2
Butyl benzyl phthalate	944 000[#19]		<1	<1	<0.1	<0.1	-	-	<0.1	-	<1	<0.1	<0.1	-	<0.1	9	0	<0.1	ND	<1	ND	0.4	0.1	0.45	9	0
Di-n-butyl phthalate	15 400[#19]		<1	<1	<0.1	<0.1	-	-	<0.1	-	<1	<0.1	<0.1	-	<0.1	9	0	<0.1	ND	<1	ND	0.4	0.1	0.45	3	0
Di-n-octyl phthalate	89 100[#19]		<1	<1	<0.1	<0.1	-	-	<0.1	-	<1	<0.1	<0.1	-	<0.1	9	0	<0.1	ND	<1	ND	0.4	0.1	0.45	0	0
Diethylphthalate	182 000[#19]		<1	<1	<0.1	<0.1	-	-	<0.1	-	<1	<0.1	<0.1	-	<0.1	9	0	<0.1	ND	<1	ND	0.4	0.1	0.45	3	0
Dimethyl phthalate			<1	<1	<0.1	<0.1	-	-	<0.1	-	<1	<0.1	<0.1	-	<0.1	9	0	<0.1	ND	<1	ND	0.4	0.1	0.45	3	0
TICS																										
2-Bromododecane (TIC)			-	-	3.906	-	-	-	-	-	-	-	-	-	-	1	1	3.906	3.906	3.906	3.906		3.906		0	0
Octane, 3-methyl-			-	-	-	1.413	-	-	-	-	-	-	-	-	-	1	1	1.413	1.413	1.413	1.413		1.413		0	0
288246-53-7			-	-	2.246	2.517	-	-	-	-	-	-	-	-	-	2	2	2.246	2.246	2.517	2.517		2.3815		0	0
Heptacosane			-	-	-	12.91	-	-	-	-	-	-	-	-	-	1	1	12.91	12.91	12.91	12.91		12.91		0	0
TPH																										
>C5-C6 Aliphatics	3 300[#18]		<0.1	<0.1	<0.1	<0.1	-	-	<0.1	-	<0.1	<0.1	<0.1	-	<0.1	9	0	<0.1	ND	<0.1	ND	0.1	0.1	0	0	0
>C6-C8 Aliphatics	9 200[#18]		<0.1	<0.1	<0.1	1.3	-	-	<0.1	-	0.2	<0.1	<0.1	-	<0.1	9	2	<0.1	0.2	1.3	1.3	0.24	0.1	0.4	0	0
>C8-C10 Aliphatics	2 500[#18]		1	<0.1	0.3	5.6	-	-	<0.1	-	1.1	<0.1	<0.1	-	<0.1	9	4	<0.1	0.3	5.6	5.6	0.94	0.1	1.8	0	0
>C10-C12 Aliphatics	12 000[#18]		588.8	23.2	154.5	325.9	-	-	<0.2	-	51.8	<0.2	9.7	-	4.9	9	7	<0.2	4.9	588.8	588.8	129	23.2	203	0	0
>C12-C16 Aliphatics	66 000[#18]		1,627	251	789	925	-	-	<4	-	343	9	101	-	52	9	8	<4	9	1627	1627	456	251	553	0	0
>C16-C21 Aliphatics			2,885	858	1,715	1,534	-	-	<7	-	977	26	367	-	256	9	8	<7	26	2885	2885	958	858	952	0	0
>C16-C35 Aliphatics	1 600 000[#18]		8,057	2,985	5,129	4,535	-	-	<14	-	3,500	108	1,243	-	931	9	8	<14	108	8057	8057	2945	2985	2677	0	0
>C21-C35 Aliphatics			5,172	2,127	3,414	3,001	-	-	<7	-	2,523	82	876	-	675	9	8	<7	82	5172	5172	1986	2127	1733	0	0
>C5-C35 Aliphatics			10,274	3,259	6,073	5,793	-	-	<19	-	3,896	117	1,354	-	988	9	8	<19	117	10274	10274	3530	3259	3399	0	0
>EC5-EC7 Aromatics	23 000[#18]		<0.1	<0.1	<0.1	<0.1	-	-	<0.1	-	<0.1	<0.1	<0.1	-	<0.1	9	0	<0.1	ND	<0.1	ND	0.1	0.1	0	9	0
>EC7-EC8 Aromatics	58 000[#18]		<0.1	<0.1	<0.1	<0.1	-	-	<0.1	-	<0.1	<0.1	<0.1	-	<0.1	9	0	<0.1	ND	<0.1	ND	0.1	0.1	0	0	0
>EC8-EC10 Aromatics	4 300[#18]		<0.1	<0.1	<0.1	<0.1	-	-	<0.1	-	<0.1	<0.1	<0.1	-	<0.1	9	0	<0.1	ND	<0.1	ND	0.1	0.1	0	0	0
>EC10-EC12 Aromatics	19 000[#18]		**92.9**	<0.2	**33.9**	**103.8**	-	-	<0.2	-	**10.3**	<0.2	<0.2	-	<0.2	9	4	<0.2	10.3	103.8	103.8	27	0.2	42	4	4
>EC12-EC16 Aromatics	37 000[#18]		**809**	<4	**358**	**688**	-	-	<4	-	**104**	<4	**37**	-	**32**	9	6	<4	32	809	809	227	37	318	6	6
>EC16-EC21 Aromatics	28 000[#18]		**3,404**	<7	**1,663**	**1,953**	-	-	<7	-	**629**	**17**	**357**	-	**322**	9	7	<7	17	3404	3404	929	357	1174	7	7
>EC21-EC35 Aromatics	28 000[#18]		**8,205**	40	**5,036**	**5,372**	-	-	<7	-	**3,203**	**158**	**1,790**	-	**1,581**	9	8	<7	40	8205	8205	2821	1790	2870	7	7
>EC5-EC35 Aromatics			12,511	40	7,091	8,117	-	-	<19	-	3,946	175	2,184	-	1,935	9	8	<19	40	12511	12511	4002	2184	4368	0	0
>C5-C35 Aliphatics & Aromatics			22,785	3,299	13,164	13,910	-	-	<38	-	7,842	292	3,538	-	2,923	9	8	<38	292	22785	22785	7532	3538	7655	0	0
TPH Hazard Indicies	1		0	0	0	0	-	-	0	-	0	0	0	-	0											
BTEX																										
Benzene	24[#18]		***0.046***	***0.028***	***0.045 - 1.926***	***0.06 - 0.868***	-	-	<0.005	-	***0.047***	<0.005	<0.005	-	<0.005	9	5	<0.005	0.028	1.926	1.926	0.18	0.028	0.34	9	5
Toluene	58 000[#18]		0.007	0.006	0.005	0.019	-	-	<0.003	-	0.015	<0.003	<0.003	-	<0.003	9	5	<0.003	0.005	0.019	0.019	0.0071	0.005	0.0059	0	0
Ethylbenzene	6 200[#18]		0.06	0.024	0.039	*0.121*	-	-	<0.003	-	0.031	<0.003	<0.003	-	<0.003	9	5	<0.003	0.024	0.121	0.121	0.032	0.024	0.039	1	1
Xylene (m & p)			0.114	0.078	0.213	0.115	-	-	<0.004	-	0.089	<0.004	0.009	-	<0.004	9	6	<0.004	0.009	0.213	0.213	0.07	0.078	0.072	0	0
Xylene Total	6 400[#18]		*0.15*	0.101	*0.262*	*0.169*	-	-	<0.008	-	0.12	0.004	0.011	-	0.004	9	8	0.004	0.004	0.262	0.262	0.092	0.101	0.092	3	3
Xylene (o)	7 200[#18]		0.036	0.023	0.049	0.054	-	-	<0.004	-	0.031	<0.004	<0.004	-	<0.004	9	5	<0.004	0.023	0.054	0.054	0.023	0.023	0.02	0	0
Total BTEX			0.263	0.159	2.232	1.177	-	-	<0.019	-	0.213	0.0095	0.0165	-	0.0095	9	8	0.0095	0.0095	2.232	2.232	0.46	0.159	0.76	0	0
Oxygenates																										
MTBE	5 740[#19]		<0.006	<0.006	<0.006	<0.006	-	-	<0.006	-	<0.006	<0.006	<0.006	-	<0.006	9	0	<0.006	ND	<0.006	ND	0.006	0.006	0	0	0

Analyte	Human Health GAC	I.D.	BH01	BH02	TP01	TP02	TP04	TP05	TP06	TP07	WS01	WS02	WS03	WS04	WS05	Number of Result	Number of Detects	Minimum Concentration	Minimum Detect	Maximum Concentration	Maximum Detect	Average Concentration	Median Concentration	Standard Deviation	Number of Guideline	Number of Guideline Exceedances
		Depth (m)	0.575	0.8	0.8	0.4	0.9	0.6	0.5	1.45	1.125	0.25	0.6	0.5	0.75											
		Date	05/04/2018	11/04/2018	11/04/2018	11/04/2018	10/04/2018	10/04/2018	10/04/2018	09/04/2018	06/04/2018	10/04/2018	10/04/2018	06/04/2018	10/04/2018											
SVOC																										
2-methylnaphthalene	3,000[#11]		**1.998**	**1.136**	**2.857**	**4.537**	-	-	<0.01	-	<0.1	0.127	0.053	-	0.044	9	7	<0.01	0.044	4.537	4.537	1.2	0.127	1.6	4	4
4-bromophenyl phenyl ether			<0.1	<0.1	<0.01	<0.01	-	-	<0.01	-	<0.1	<0.01	<0.01	-	<0.01	9	0	<0.01	ND	<0.1	ND	0.04	0.01	0.045	0	0
4-chlorophenyl phenyl ether			<0.1	<0.1	<0.01	<0.01	-	-	<0.01	-	<0.1	<0.01	<0.01	-	<0.01	9	0	<0.01	ND	<0.1	ND	0.04	0.01	0.045	0	0
Azobenzene	26[#11]		<0.1	<0.1	<0.01	<0.01	-	-	<0.01	-	<0.1	<0.01	<0.01	-	<0.01	9	0	<0.01	ND	<0.1	ND	0.04	0.01	0.045	9	0
Bis(2-chloroethoxy) methane	2,500[#11]		<0.1	<0.1	<0.01	<0.01	-	-	<0.01	-	<0.1	<0.01	<0.01	-	<0.01	9	0	<0.01	ND	<0.1	ND	0.04	0.01	0.045	9	0
Bis(2-chloroethyl)ether	1[#11]		<0.1	<0.1	<0.01	<0.01	-	-	<0.01	-	<0.1	<0.01	<0.01	-	<0.01	9	0	<0.01	ND	<0.1	ND	0.04	0.01	0.045	9	0
Carbazole			<0.1	<0.1	<0.01	<0.01	-	-	<0.01	-	<0.1	<0.01	<0.01	-	<0.01	9	0	<0.01	ND	<0.1	ND	0.04	0.01	0.045	0	0
Dibenzofuran	1,000[#11]		<0.1	<0.1	<0.01	**0.818**	-	-	<0.01	-	<0.1	<0.01	<0.01	-	<0.01	9	1	<0.01	0.818	0.818	0.818	0.13	0.01	0.26	1	1
Hexachlorocyclopentadiene	7.5[#11]		<0.1	<0.1	<0.01	<0.01	-	-	<0.01	-	<0.1	<0.01	<0.01	-	<0.01	9	0	<0.01	ND	<0.1	ND	0.04	0.01	0.045	0	0
Hexachloroethane	24.5[#11]		<0.1	<0.1	<0.01	<0.01	-	-	<0.01	-	<0.1	<0.01	<0.01	-	<0.01	9	0	<0.01	ND	<0.1	ND	0.04	0.01	0.045	9	0
1-Methylnaphthalene	75[#11]		-	-	**3.064**	-	-	-	-	-	-	-	-	-	-	1	1	3.064	3.064	3.064	3.064		3.064		1	1
Benzoic Acid	3,300,000[#11]		-	-	-	1.725	-	-	-	-	-	-	-	-	-	1	1	1.725	1.725	1.725	1.725		1.725		0	0
Phenanthrene, 1-methyl-			-	-	6.045	-	-	-	-	-	-	-	-	-	-	1	1	6.045	6.045	6.045	6.045		6.045		0	0
Anthracene, 1-methyl-			-	-	-	8.606	-	-	-	-	-	-	-	-	-	1	1	8.606	8.606	8.606	8.606		8.606		0	0
Benzene, 1-ethyl-2,3-dimethyl-			1.034	-	-	1.224	-	-	-	-	-	-	-	-	-	2	2	1.034	1.034	1.224	1.224		1.129		0	0
Hexane, 3-methyl-			-	-	-	0.783	-	-	-	-	-	-	-	-	-	1	1	0.783	0.783	0.783	0.783		0.783		0	0
1-Methyl-4-ethyl 2-phenylsuccinate			-	-	-	6.689	-	-	-	-	-	-	-	-	-	1	1	6.689	6.689	6.689	6.689		6.689		0	0
Pyrene, 1-methyl-			-	-	2.957	-	-	-	-	-	-	-	-	-	-	1	1	2.957	2.957	2.957	2.957		2.957		0	0
Phenanthrene, 2-methyl-			-	-	-	9.265	-	-	-	-	-	-	-	-	-	1	1	9.265	9.265	9.265	9.265		9.265		0	0
Azulene, 7-ethyl-1,4-dimethyl-			-	-	2.686	1.926	-	-	-	-	-	-	-	-	-	2	2	1.926	1.926	2.686	2.686		2.306		0	0
Pyrene, 1,3-dimethyl-			-	-	2.93	-	-	-	-	-	-	-	-	-	-	1	1	2.93	2.93	2.93	2.93		2.93		0	0
Phenanthrene, 4-methyl-			-	-	5.121	3.804	-	-	-	-	-	-	-	-	-	2	2	3.804	3.804	5.121	5.121		4.4625		0	0
1,3-Cyclopentadiene, 1,2,3,4-tetramethyl-			0.396	-	-	-	-	-	-	-	-	-	-	-	-	1	1	0.396	0.396	0.396	0.396		0.396		0	0
Benzene, (1-methyl-1-butenyl)-			-	-	-	2.858	-	-	-	-	-	-	-	-	-	1	1	2.858	2.858	2.858	2.858		2.858		0	0
Cyclohexane, butyl-			-	-	-	0.657	-	-	-	-	-	-	-	-	-	1	1	0.657	0.657	0.657	0.657		0.657		0	0
Pentadecane, 2,6,10-trimethyl-			-	-	-	8.945	-	-	-	-	-	-	-	-	-	1	1	8.945	8.945	8.945	8.945		8.945		0	0
D-Homoandrostane, (5.alpha.,13.alpha.)-			-	-	1.244	-	-	-	-	-	-	-	-	-	-	1	1	1.244	1.244	1.244	1.244		1.244		0	0
Amino Aliphatics																										
N-nitrosodi-n-propylamine	0.35[#11]		<0.1	<0.1	<0.01	<0.01	-	-	<0.01	-	<0.1	<0.01	<0.01	-	<0.01	9	0	<0.01	ND	<0.1	ND	0.04	0.01	0.045	9	0
Anilines																										
2-nitroaniline	8,000[#11]		<0.1	<0.1	<0.01	<0.01	-	-	<0.01	-	<0.1	<0.01	<0.01	-	<0.01	9	0	<0.01	ND	<0.1	ND	0.04	0.01	0.045	0	0
3-nitroaniline			<0.1	<0.1	<0.01	<0.01	-	-	<0.01	-	<0.1	<0.01	<0.01	-	<0.01	9	0	<0.01	ND	<0.1	ND	0.04	0.01	0.045	0	0
4-chloroaniline	11[#11]		<0.1	<0.1	<0.01	<0.01	-	-	<0.01	-	<0.1	<0.01	<0.01	-	<0.01	9	0	<0.01	ND	<0.1	ND	0.04	0.01	0.045	9	0
4-nitroaniline	110[#11]		<0.1	<0.1	<0.01	<0.01	-	-	<0.01	-	<0.1	<0.01	<0.01	-	<0.01	9	0	<0.01	ND	<0.1	ND	0.04	0.01	0.045	9	0
Explosives																										
2,4-Dinitrotoluene	3.76[#10]		<0.1	<0.1	<0.01	<0.01	-	-	<0.01	-	<0.1	<0.01	<0.01	-	<0.01	9	0	<0.01	ND	<0.1	ND	0.04	0.01	0.045	9	0
2,6-dinitrotoluene	1.89[#10]		<0.1	<0.1	<0.01	<0.01	-	-	<0.01	-	<0.1	<0.01	<0.01	-	<0.01	9	0	<0.01	ND	<0.1	ND	0.04	0.01	0.045	9	0
Nitrobenzene	55[#11]		<0.1	<0.1	<0.01	<0.01	-	-	<0.01	-	<0.1	<0.01	<0.01	-	<0.01	9	0	<0.01	ND	<0.1	ND	0.04	0.01	0.045	0	0
Solvents																										
Cyclohexane	77,000[#11]		0.461	-	-	1.11 - 3.109	-	-	-	-	-	-	-	-	-	2	2	0.461	0.461	3.109	3.109		1.28525		0	0
Decane			-	-	-	0.425 - 2.04	-	-	-	-	-	-	-	-	-	1	1	0.425	0.425	2.04	2.04		1.2325		0	0
Heptane			-	-	-	0.955 - 1.611	-	-	-	-	-	-	-	-	-	1	1	0.955	0.955	1.611	1.611		1.283		0	0
Hexane	2,500[#11]		-	-	-	2.024	-	-	-	-	-	-	-	-	-	1	1	2.024	2.024	2.024	2.024		2.024		0	0
Isophorone	2,400[#11]		<0.1	<0.1	<0.01	<0.01	-	-	<0.01	-	<0.1	<0.01	<0.01	-	<0.01	9	0	<0.01	ND	<0.1	ND	0.04	0.01	0.045	3	0
Octane			-	-	-	1.479 - 3.026	-	-	-	-	-	-	-	-	-	1	1	1.479	1.479	3.026	3.026		2.2525		0	0
Pentane	3,400[#11]		0.299	-	-	-	-	-	-	-	-	-	-	-	-	1	1	0.299	0.299	0.299	0.299		0.299		0	0
Metals																										
Arsenic	640[#18]		***0 - 21***	***0 - 35.8***	***26.3***	***21.6***	***7.4***	***9***	***10.3***	***9.4***	***0 - 16.3***	***11.4***	***7.3***	***8.9***	***10.5***	13	13	0		7.3	35.8	35.8	12	10.3	5.9	13	13
Barium	22,100[#19]		**0 - 504**	**0 - 350**	**369**	**337**	**116**	**162**	**118**	**127**	**0 - 310**	**121**	**169**	**169**	**147**	13	13	0		116	504	504	186	162	82	13	13
Beryllium	12[#18]		0 - 2.1	0 - 2.3	1.9	1.8	1.1	1.3	1.3	1.3	0 - 1.9	1.3	1.5	1.3	1.5	13	13	0		1.1	2.3	2.3	1.3	1.3	0.28	0	0
Boron	240,000[#18]		0 - 2.9	0 - 4.2	3.4	3.6	1.5	1.6	4.4	1	0 - 2.6	1.8	3.4	2.1	2.2	13	13	0		1	4.4	4.4	2.3	2.1	1.1	0	0
Cadmium	190[#18]		***0 - 3.1***	***0 - 1.7***	***1.8***	***0.8***	*0.2*	*0.2*	*0.3*	*0.2*	***0 - 1.6***	*0.3*	*0.2*	<0.1	*0.4*	13	12	0		0.2	3.1	3.1	0.59	0.3	0.55	13	12
Chromium (hexavalent)	33[#18]		<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	13	0	<0.3	ND	<0.3	ND	0.3	0.3	0	13	0
Chromium (III+VI)	8,600[#18]		0 - 79.8	0 - 82.2	75.1	63.4	64	60.4	36	69	0 - 68.7	60	65.2	85.2	71.5	13	13	0		36	85.2	85.2	59	63.4	16	0	0
Chromium (Trivalent)	8,600[#18]		0 - 79.8				64	60.4	0	69	0 - 68.7	60	65.2	85.2	71.5	11	11	0		60	85.2	85.2	50	60.4	28	0	0
Copper	68,000[#18]		*0 - 148*	***0 - 291***	***205***	*158*	*11*	*15*	*18*	*9*	*0 - 113*	*20*	*45*	*15*	*28*	13	13	0		9	291	291	62	62	28	13	13
Lead	2,300[#15]		***0 - 124***	***0 - 126***	***103***	***71***	*9*	*11*	***28***	*15*	***0 - 73***	*22*	***42***	*16*	***34***	13	13	0		9	126	126	39	34	28	13	13
Mercury	1,100[#18]		0 - 1.7	<0.1 - 0	2.3	1.7	<0.1	<0.1	<0.1	<0.1	<0.1 - 0	<0.1	0.2	<0.1	<0.1	13	6	0		0.2	2.3	2.3	0.45	0.1	0.73	0	0
Nickel	980[#18]		***0 - 163.1***	***0 - 111.9***	***121.9***	***81.6***	***26.5***	***28.2***	***29.7***	***28.6***	***0 - 92.4***	***36.1***	***45.8***	***30.1***	***29.8***	13	13	0		26.5	163.1	163.1	49	36.1	29	13	13
Selenium	12,000[#18]		**0 - 10**	**0 - 4**	**4**	**4**	***2***	***2***	<1	***2***	**0 - 4**	**1**	<1	***2***	***2***	13	11	0		1	10	10	2.3	2	1.3	13	11
Vanadium	9,000[#18]		***0 - 338***	***0 - 227***	***275***	***186***	***39***	***45***	***58***	***46***	***0 - 231***	***67***	***87***	***54***	***69***	13	13	0		39	338	338	102	69	70	13	13
Zinc	730,000[#18]		***0 - 1,275***	***0 - 937***	***947***	***623***	*50*	*56*	*84*	*62*	***0 - 663***	*131*	***231***	*67*	*149*	13	13	0		50	1275	1275	295	149	289	13	13
Organics																										
Organic Matter (%)			0	0	-	-	0.6	1	0	0.8	0	2	7.9	1	3.9	11	11	0		0.6	7.9	7.9	1.6	0.8	2.4	0	0
Inorganics																										
Ammoniacal Nitrogen as N			-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	99999	ND	0	ND				0	0
Ammoniacal Nitrogen as NH4			39.3	12.8	41.7	13.5	<0.6	<0.6	8.3	<0.6	30.5	2.6	20.2	<0.6	14.2	13	9	<0.6	2.6	41.7	41.7	14	12.8	15	0	0
Chloride			0 - 39	0 - 11	-	-	-	-	-	-	0 - 89	1,582	58	-	54	6	6	0		54	1582	1582	294	49.25	631	0	0
Fluoride	47,000[#11]		4.5	11.2	8	16.4	-	-	6.9	-	3.7	0.9	2.3	-	3.7	9	9	0.9	0.9	16.4	16.4	6.4	4.5	4.9	0	0
Nitrate (as N)			<2.5 - 0	<2.5 - 0	-	-	-	-	-	-	-	-	-	-	-	1	1	2.5	ND	0	ND		1.25		0	0
Nitrate (as NO3-)	1,900,000[#11]		<2.5 - 0	-	<2.5	<2.5	-	-	<2.5 - 0	-	<2.5 - 0	<2.5	<2.5	-	<2.5	8	3	<2.5	ND	<2.5	ND	2	2.5	0.65	0	0
pH (Lab) (pH units)			7.31	7.17	7.22	7.67	8.09	8.52	7.67	8.25	7.29	7.52	7.34	8.5	7.55	13	13	7.17	7.17	8.52	8.52	7.7	7.55	0.48	0	0
Sulphide			53	<10	30	21	-	-	<10	-	25	<10	53	-	<100	9	5	<10	21	<100	53	35	25	30	0	0
Total Sulphate			0 - 8,841	0 - 44,355	16,251	6,783	-	-	856	-	0 - 10,971	701	6,510	-	2,252	9	9	0		701	44355	44355	7271	5485.5	7284	0	0
Asbestos																										
Asbestos Type			Chrysotile	Chrysotile	Chrysotile	Chrysotile	NAD	NAD	Chrysotile	NAD	Chrysotile	NAD	NAD	NAD	NAD	0	0	99999	ND	0	ND				0	0
Asbestos Level			<0.1	<0.1	<0.1	<0.1	NAD	NAD	<0.1	NAD	<0.1	NAD	NAD	NAD	NAD	6	0	<0.1	ND	<0.1	ND	0.1	0.1	0	0	0
Asbestos Gravimetric & PCOM Total			<0.001	-	<0.001	<0.001	-	-	<0.001	-	<0.001	-	-	-	-	5	0	<0.001	ND	<0.001	ND	0.001	0.001	0	0	0
Asbestos Gravimetric Quantification (ACMs)			<0.001	-	<0.001	<0.001	-	-	<0.001	-	<0.001	-	-	-	-	5	0	<0.001	ND	<0.001	ND	0.001	0.001	0	0	0
Asbestos fibres			Fibre bundles	Fibre bundles	Fibre bundles	Fibre bundles	NAD	NAD	Fibre bundles	NAD	Fibre bundles	NAD	NAD	NAD	NAD	0	0	99999	ND	0	ND				0	0
Other																										
1,4-Methanonaphthalene			-	-	4.447	3.154	-	-	-	-	-	-	-	-	-	2	2	3.154	3.154	4.447	4.447		3.8005		0	0
1H-Indene, 2,3-dihydro-1,6-dimethyl-			-	-	-	7.319	-	-	-	-	-	-	-	-	-	1	1	7.319	7.319	7.319	7.319		7.319		0	0
3-Methylpentane			-	-	-	0.334	-	-	-	-	-	-	-	-	-	1	1	0.334	0.334	0.334	0.334		0.334		0	0
Antra-9,10-quinone			-	-	3.885	1.164	-	-	-	-	-	-	-	-	-	2	2	1.164	1.164	3.885	3.885		2.5245		0	0
Carbonyl Sulphide	280[#11]		-	0.186	-	-	-	-	-	-	-	-	-	-	-	1	1	0.186	0.186	0.186	0.186		0.186		0	0
Cyclohexane, 1,2,3-trimethyl-, (1.a.,2.b.,3.a.)-			0.372	-	-	-	-	-	-	-	-	-	-	-	-	1	1	0.372	0.372	0.372	0.372		0.372		0	0
Cyclohexane, 1,2,4-trimethyl-, (1.a.,2.b.,4.b.)-			0.34	-	-	0.664	-	-	-	-	-	-	-	-	-	2	2	0.34	0.34	0.664	0.664		0.502		0	0
Cyclohexane, 1,2-dimethyl-, trans-			0.35	-	-	2.017	-	-	-	-	-	-	-	-	-	2	2	0.35	0.35	2.017	2.017		1.1835		0	0
Cyclopentane, 1,2,4-trimethyl-			-	-	-	0.957	-	-	-	-	-	-	-	-	-	1	1	0.957	0.957	0.957	0.957		0.957		0	0
Dibenzothiophene (µg/kg)	17,000,000[#11]		-	-	5,352	5,853	-	-	-	-	-	-	-	-	-	2	2	5352	5352	5853	5853		5602.5		0	0
Dodecane			-	-	6.256	-	-	-	-	-	-	-	-	-	-	1	1	6.256	6.256	6.256	6.256		6.256		0	0
Eicosane			-	-	-	2.08	-	-	-	-	-	-	-	-	-	1	1	2.08	2.08	2.08	2.08		2.08		0	0
Ethyl 2-Chloro Acetoacetate			-	-	-	1.565	-	-	-	-	-	-	-	-	-	1	1	1.565	1.565	1.565	1.565		1.565		0	0
Natural Moisture Content (%)			0	0	-	-	17.6	23.8	-	13.7	0	20.7	34.3	17.5	22	10	10	0	13.7	34.3	34.3	15	17.55	12	0	0
Nonane	72[#11]		0.82	-	-	-	-	-	-	-	-	-	-	-	-	1	1	0.82	0.82	0.82	0.82		0.82		0	0
Octadecane			-	-	-	2.717	-	-	-	-	-	-	-	-	-	1	1	2.717	2.717	2.717	2.717		2.717		0	0
Octadecanoic Acid			-	-	-	0.519	-	-	-	-	-	-	-	-	-	1	1	0.519	0.519	0.519	0.519		0.519		0	0
Pentane, 2,3-dimethyl			0.163	-	-	0.828	-	-	-	-	-	-	-	-	-	2	2	0.163	0.163	0.828	0.828		0.4955		0	0
Pentane, 2,4-dimethyl-			-	-	-	0.154	-	-	-	-	-	-	-	-	-	1	1	0.154	0.154	0.154	0.154		0.154		0	0
Tetracosane			0.623	-	-	-	-	-	-	-	-	-	-	-	-	1	1	0.623	0.623	0.623	0.623		0.623		0	0

All units are in mg/kg unless stated
All grey values were reported below the MDL
MDL-Method Detection Limit
NAD-No Asbestos Detected

Comments
#1 WS Regs 2016 (Eng/Wal)
#2 WHO Petroleum DWG 2008
#3 WHO DWG 2017
#4 WHO 2017 - Taste
#5 WHO 2017 - Odour
#6 WFD England/Wales. 2015 - Saltwater Standards
#7 WFD England/Wales. 2015 - MAC-EQS Trans./Coastal
#8 WFD England/Wales. 2015 - AA-EQS Trans./Coastal
#9 Water Env't Regs (Scotland) 2015. AA-EQS Coast
#10 USEPA RSL (tapwater) [June 2017]
#11 USEPA RSL (June 2017)
#12 SEPA WAT-SG-53 Marine EQS - MAC - 2015
#13 SEPA WAT-SG-53 Marine EQS - AA - 2015
#14 PNEC (EU REACH) - Coastal
#15 Defra C4SL 12/2014
#16 California Draft health protective concentration
#17 AECOM DWG (WHO method)
#18 AECOM (modified LQM/CIEH S4ULs)
#19 AECOM (modified EIC)
GAC: Generic Assessment Criteria
(blank): No assessment criteria available
- : Not analysed
DWS: Drinking Water Standard
EQS: Environmental Quality Standard
HH: Human Health

Key
XXX Exceedance of HH Soil. Commercial/Industrial. Sand. TOC >=1.45 to <3.48%

Analyte	Drinking Water Standard	Coastal Environmental Quality Standard	Location / Date	BH01 10/05/2018	BH02 10/05/2018	WS03 10/05/2018	WS04 10/05/2018	WS05 10/05/2018	WS06 10/05/2018	er of	Detects	Concentra	Detect	m	Detect	Concentra	Concentration	Deviation	of	Guideline
VOC																				
1,1,1,2-tetrachloroethane	0.57[#10]			-	-	<2	<2	<2	<2	4	0	<2	ND	<2	ND	2	2	0	4	0
1,1,2,2-tetrachloroethane	0.076[#10]			-	-	<4	<4	<4	<4	4	0	<4	ND	<4	ND	4	4	0	4	0
1,1-dichloropropene				-	-	<3	<3	<3	<3	4	0	<3	ND	<3	ND	3	3	0	0	0
1,2,3-trichloropropane	0.00075[#10]			-	-	<3	<3	<3	<3	4	0	<3	ND	<3	ND	3	3	0	4	0
1,2,4-trimethylbenzene	56[#10]			-	-	<3	<3	<3	<3	4	0	<3	ND	<3	ND	3	3	0	0	0
1,2-dibromo-3-chloropropane	1[#3]			-	-	<2	<2	<2	<2	4	0	<2	ND	<2	ND	2	2	0	4	0
1,2-dichloroethane	3[#1]	10[#8]		-	-	<2	<2	<2	<2	4	0	<2	ND	<2	ND	2	2	0	0	0
1,2-Dichloroethene	50[#3]			-	-	<6	<6	<6	<6	4	0	<6	ND	<6	ND	6	6	0	0	0
1,2-dichloropropane	40[#3]			-	-	<2	<2	<2	<2	4	0	<2	ND	<2	ND	2	2	0	0	0
1,3,5-trimethylbenzene	60[#10]			-	-	<3	<3	<3	<3	4	0	<3	ND	<3	ND	3	3	0	0	0
1,3-dichloropropane	370[#10]			-	-	<2	<2	<2	<2	4	0	<2	ND	<2	ND	2	2	0	0	0
2,2-dichloropropane				-	-	<1	<1	<1	<1	4	0	<1	ND	<1	ND	1	1	0	0	0
Bromochloromethane	83[#10]			-	-	<2	<2	<2	<2	4	0	<2	ND	<2	ND	2	2	0	0	0
Bromodichloromethane	100[#1]			-	-	<2	<2	<2	<2	4	0	<2	ND	<2	ND	2	2	0	0	0
Bromoform	100[#1]			-	-	<2	<2	<2	<2	4	0	<2	ND	<2	ND	2	2	0	0	0
Chlorodibromomethane	100[#1]			-	-	<2	<2	<2	<2	4	0	<2	ND	<2	ND	2	2	0	0	0
cis-1,3-dichloropropene				-	-	<2	<2	<2	<2	4	0	<2	ND	<2	ND	2	2	0	0	0
Dibromomethane	8.3[#10]			-	-	<3	<3	<3	<3	4	0	<3	ND	<3	ND	3	3	0	0	0
Hexachlorobutadiene	0.1[#1]	0.6[#7]		-	-	<1	<1	<1	<1	4	0	<1	ND	<1	ND	1	1	0	4	0
Isopropylbenzene	450[#10]			-	-	<3	<3	<3	<3	4	0	<3	ND	<3	ND	3	3	0	0	0
n-butylbenzene	1,000[#10]			-	-	<3	<3	<3	<3	4	0	<3	ND	<3	ND	3	3	0	0	0
n-propylbenzene	660[#10]			-	-	<3	<3	<3	<3	4	0	<3	ND	<3	ND	3	3	0	0	0
p-isopropyltoluene				-	-	<3	<3	<3	<3	4	0	<3	ND	<3	ND	3	3	0	0	0
sec-butylbenzene	2,000[#10]			-	-	<3	<3	<3	<3	4	0	<3	ND	<3	ND	3	3	0	0	0
Styrene	20[#3]	50[#12]		-	-	<2	<2	<2	<2	4	0	<2	ND	<2	ND	2	2	0	0	0
tert-butylbenzene	690[#10]			-	-	<3	<3	<3	<3	4	0	<3	ND	<3	ND	3	3	0	0	0
trans-1,3-dichloropropene				-	-	<2	<2	<2	<2	4	0	<2	ND	<2	ND	2	2	0	0	0
Trihalomethanes	100[#1]			-	-	<8	<8	<8	<8	4	0	<8	ND	<8	ND	8	8	0	0	0
VOC TICs				-	-	1	1	1	1	4	4	1	1	1	1	1	1	0	0	0
Chlorinated Hydrocarbons																				
1,1,1-trichloroethane	2,000[#3]	100[#12]		-	-	<2	<2	<2	<2	4	0	<2	ND	<2	ND	2	2	0	0	0
1,1,2-trichloroethane	0.28[#10]	300[#12]		-	-	<2	<2	<2	<2	4	0	<2	ND	<2	ND	2	2	0	4	0
1,1-dichloroethane	2.8[#10]			-	-	<3	<3	<3	<3	4	0	<3	ND	<3	ND	3	3	0	4	0
1,1-dichloroethene	140[#3]			-	-	<3	<3	<3	<3	4	0	<3	ND	<3	ND	3	3	0	0	0
Carbon tetrachloride	3[#1]	12[#8]		-	-	<2	<2	<2	<2	4	0	<2	ND	<2	ND	2	2	0	0	0
Chloroethane	21,000[#10]			-	-	<3	<3	<3	<3	4	0	<3	ND	<3	ND	3	3	0	0	0
Chloroform	100[#1]	2.5[#8]		-	-	<2	<2	<2	<2	4	0	<2	ND	<2	ND	2	2	0	0	0
Chloromethane	190[#10]			-	-	<3	<3	<3	<3	4	0	<3	ND	<3	ND	3	3	0	0	0
cis-1,2-dichloroethene	50[#3]			-	-	<3	<3	<3	<3	4	0	<3	ND	<3	ND	3	3	0	0	0
Dichloromethane	20[#3]	20[#8]		-	-	<5	<5	<5	<5	4	0	<5	ND	<5	ND	5	5	0	0	0
PCE+TCE+DCE+VC				-	-	<15.1	<15.1	<15.1	<15.1	4	0	<15.1	ND	<15.1	ND	15	15.1	0	0	0
Sum of PCE and TCE	10[#1]			-	-	<6	<6	<6	<6	4	0	<6	ND	<6	ND	6	6	0	0	0
TCE+DCE+VC				-	-	<12.1	<12.1	<12.1	<12.1	4	0	<12.1	ND	<12.1	ND	12	12.1	0	0	0
Tetrachloroethene	Use PCE + TCE[#1]	10[#8]		-	-	<3	<3	<3	<3	4	0	<3	ND	<3	ND	3	3	0	0	0
trans-1,2-dichloroethene	50[#3]			-	-	<3	<3	<3	<3	4	0	<3	ND	<3	ND	3	3	0	0	0
Trichloroethene	10[#1]	10[#8]		-	-	<3	<3	<3	<3	4	0	<3	ND	<3	ND	3	3	0	0	0
Vinyl chloride	0.5[#1]			-	-	<0.1	<0.1	<0.1	<0.1	4	0	<0.1	ND	<0.1	ND	0.1	0.1	0	0	0
Halogenated Benzenes																				
1,2,3-trichlorobenzene	0.1[#1]	0.4[#8]		-	-	<3	<3	<3	<3	4	0	<3	ND	<3	ND	3	3	0	4	0
1,2,4-trichlorobenzene	0.1[#1]	0.4[#8]		-	-	<1	<1	<1	<1	4	0	<1	ND	<1	ND	1	1	0	4	0
1,2-dichlorobenzene	1,000[#3]			-	-	<1	<1	<1	<1	4	0	<1	ND	<1	ND	1	1	0	0	0
1,3-dichlorobenzene				-	-	<1	<1	<1	<1	4	0	<1	ND	<1	ND	1	1	0	0	0
1,4-dichlorobenzene	300[#3]			-	-	<1	<1	<1	<1	4	0	<1	ND	<1	ND	1	1	0	0	0
2-chlorotoluene	240[#10]			-	-	<3	<3	<3	<3	4	0	<3	ND	<3	ND	3	3	0	0	0
4-chlorotoluene	250[#10]			-	-	<3	<3	<3	<3	4	0	<3	ND	<3	ND	3	3	0	0	0
Bromobenzene	62[#10]			-	-	<2	<2	<2	<2	4	0	<2	ND	<2	ND	2	2	0	0	0
Chlorobenzene	300[#3]			-	-	<2	<2	<2	<2	4	0	<2	ND	<2	ND	2	2	0	0	0
Hexachlorobenzene	0.1[#1]	0.05[#7]		-	-	<1	<1	<1	<1	4	0	<1	ND	<1	ND	1	1	0	4	0
Trichlorobenzene (total)	0.1[#1]	0.4[#8]		-	-	<4	<4	<4	<4	4	0	<4	ND	<4	ND	4	4	0	4	0
Halogenated Hydrocarbons																				
Dichlorodifluoromethane	200[#10]			-	-	<2	<2	<2	<2	4	0	<2	ND	<2	ND	2	2	0	0	0
Bromomethane	7.5[#10]			-	-	<1	<1	<1	<1	4	0	<1	ND	<1	ND	1	1	0	0	0
Trichlorofluoromethane	5,200[#10]			-	-	<3	<3	<3	<3	4	0	<3	ND	<3	ND	3	3	0	0	0
1,2-dibromoethane	0.4[#3]			-	-	<2	<2	<2	<2	4	0	<2	ND	<2	ND	2	2	0	4	0
PAH																				
Acenaphthene	18[#15]			-	-	<1	<1	<1	<1	4	0	<1	ND	<1	ND	1	1	0	0	0
Acenaphthylene	18[#15]			-	-	<0.5	<0.5	<0.5	<0.5	4	0	<0.5	ND	<0.5	ND	0.5	0.5	0	0	0
Anthracene	90[#15]	0.1[#8]		-	-	<0.5	<0.5	<0.5	<0.5	4	0	<0.5	ND	<0.5	ND	0.5	0.5	0	4	0
Benz(a)anthracene	3.5[#15]			-	-	<0.5	<0.5	<0.5	<0.5	4	0	<0.5	ND	<0.5	ND	0.5	0.5	0	0	0
Benzo(a) pyrene	0.01[#1]	0.00017[#8]		-	-	<1	<1	<1	<1	4	0	<1	ND	<1	ND	1	1	0	4	0
Benzo(b)&(k)fluoranthene				-	-	<1	<1	<1	<1	4	0	<1	ND	<1	ND	1	1	0	0	0
Benzo(g,h,i)perylene	0.1[#1]	0.00082[#7]		-	-	<0.5	<0.5	<0.5	<0.5	4	0	<0.5	ND	<0.5	ND	0.5	0.5	0	4	0
benzo(g,h,i)perylene + indeno(1,2,3-cd)pyrene				-	-	<1.5	<1.5	<1.5	<1.5	4	0	<1.5	ND	<1.5	ND	1.5	1.5	0	0	0
Chrysene	7[#15]			-	-	<0.5	<0.5	<0.5	<0.5	4	0	<0.5	ND	<0.5	ND	0.5	0.5	0	0	0
Dibenz(a,h)anthracene	0.07[#15]			-	-	<0.5	<0.5	<0.5	<0.5	4	0	<0.5	ND	<0.5	ND	0.5	0.5	0	4	0
Fluoranthene	4[#3]	0.0063[#8]		-	-	<0.5	<0.5	<0.5	<0.5	4	0	<0.5	ND	<0.5	ND	0.5	0.5	0	4	0
Fluorene	12[#15]			-	-	<0.5	<0.5	<0.5	<0.5	4	0	<0.5	ND	<0.5	ND	0.5	0.5	0	0	0
Indeno(1,2,3-c,d)pyrene	0.1[#1]			-	-	<1	<1	<1	<1	4	0	<1	ND	<1	ND	1	1	0	4	0
Naphthalene	6[#15]	2[#8]		-	-	<1	<1	<1	<1	4	0	<1	ND	<1	ND	1	1	0	0	0
PAHs (sum of 4)	0.1[#1]			-	-	<1.5	<1.5	<1.5	<1.5	4	0	<1.5	ND	<1.5	ND	1.5	1.5	0	4	0
Phenanthrene	4[#15]			-	-	<0.5	<0.5	<0.5	<0.5	4	0	<0.5	ND	<0.5	ND	0.5	0.5	0	0	0
Pyrene	9[#15]			-	-	<0.5	<0.5	<0.5	<0.5	4	0	<0.5	ND	<0.5	ND	0.5	0.5	0	0	0
Phenolics																				
2,4-dimethylphenol	360[#10]			-	-	<1	<1	<1	<1	4	0	<1	ND	<1	ND	1	1	0	0	0
2-chloronaphthalene	750[#10]			-	-	<1	<1	<1	<1	4	0	<1	ND	<1	ND	1	1	0	0	0
2-methylphenol	930[#10]			-	-	<0.5	<0.5	<0.5	<0.5	4	0	<0.5	ND	<0.5	ND	0.5	0.5	0	0	0
2-nitrophenol				-	-	<0.5	<0.5	<0.5	<0.5	4	0	<0.5	ND	<0.5	ND	0.5	0.5	0	0	0
4-chloro-3-methylphenol	1,400[#10]	40[#12]		-	-	<0.5	<0.5	<0.5	<0.5	4	0	<0.5	ND	<0.5	ND	0.5	0.5	0	0	0
4-methylphenol	1,900[#10]			-	-	<1	<1	<1	<1	4	0	<1	ND	<1	ND	1	1	0	0	0
4-nitrophenol				-	-	<10	<10	<10	<10	4	0	<10	ND	<10	ND	10	10	0	0	0
Phenol	5,800[#10]	7.7[#6]		-	-	<1	<1	<1	<1	4	0	<1	ND	<1	ND	1	1	0	0	0
Halogenated Phenols																				
2,4,5-trichlorophenol	1,200[#10]			-	-	<0.5	<0.5	<0.5	<0.5	4	0	<0.5	ND	<0.5	ND	0.5	0.5	0	0	0
2,4,6-trichlorophenol	200[#3]			-	-	<1	<1	<1	<1	4	0	<1	ND	<1	ND	1	1	0	0	0
2,4-dichlorophenol	46[#10]	0.42[#6]		-	-	<0.5	<0.5	<0.5	<0.5	4	0	<0.5	ND	<0.5	ND	0.5	0.5	0	4	0
2-chlorophenol	91[#10]	50[#12]		-	-	<1	<1	<1	<1	4	0	<1	ND	<1	ND	1	1	0	0	0
Pentachlorophenol	9[#3]	0.4[#8]		-	-	<1	<1	<1	<1	4	0	<1	ND	<1	ND	1	1	0	4	0
Phthalates																				
Bis(2-ethylhexyl) phthalate	8[#3]	1.3[#8]		-	-	<5	<5	<5	<5	4	0	<5	ND	<5	ND	5	5	0	4	0
Butyl benzyl phthalate	16[#10]	0.75[#6]		-	-	<1	<1	<1	<1	4	0	<1	ND	<1	ND	1	1	0	4	0
Diethylphthalate	15,000[#10]	200[#12]		-	-	<1	<1	<1	<1	4	0	<1	ND	<1	ND	1	1	0	0	0
Dimethyl phthalate		800[#12]		-	-	<1	<1	<1	<1	4	0	<1	ND	<1	ND	1	1	0	0	0
Di-n-butyl phthalate	900[#10]	8[#12]		-	-	<1.5	<1.5	<1.5	<1.5	4	0	<1.5	ND	<1.5	ND	1.5	1.5	0	0	0
Di-n-octyl phthalate	200[#10]	20[#12]		-	-	<1	<1	<1	<1	4	0	<1	ND	<1	ND	1	1	0	0	0
SVOC																				
2-methylnaphthalene	36[#10]			-	-	<1	<1	<1	<1	4	0	<1	ND	<1	ND	1	1	0	0	0
4-bromophenyl phenyl ether				-	-	<1	<1	<1	<1	4	0	<1	ND	<1	ND	1	1	0	0	0
4-chlorophenyl phenyl ether				-	-	<1	<1	<1	<1	4	0	<1	ND	<1	ND	1	1	0	0	0
Azobenzene	0.12[#10]			-	-	<0.5	<0.5	<0.5	<0.5	4	0	<0.5	ND	<0.5	ND	0.5	0.5	0	4	0
Bis(2-chloroethoxy) methane	59[#10]			-	-	<0.5	<0.5	<0.5	<0.5	4	0	<0.5	ND	<0.5	ND	0.5	0.5	0	0	0
Bis(2-chloroethyl)ether	0.014[#10]			-	-	<1	<1	<1	<1	4	0	<1	ND	<1	ND	1	1	0	4	0
Carbazole				-	-	<0.5	<0.5	<0.5	<0.5	4	0	<0.5	ND	<0.5	ND	0.5	0.5	0	0	0
Dibenzofuran	7.9[#10]			-	-	<0.5	<0.5	<0.5	<0.5	4	0	<0.5	ND	<0.5	ND	0.5	0.5	0	0	0
Hexachlorocyclopentadiene	0.41[#10]			-	-	<1	<1	<1	<1	4	0	<1	ND	<1	ND	1	1	0	4	0
Hexachloroethane	0.33[#10]			-	-	<1	<1	<1	<1	4	0	<1	ND	<1	ND	1	1	0	4	0
Amino Aliphatics																				
N-nitrosodi-n-propylamine	0.011[#10]			-	-	<0.5	<0.5	<0.5	<0.5	4	0	<0.5	ND	<0.5	ND	0.5	0.5	0	4	0
Anilines																				
2-nitroaniline	190[#10]			-	-	<1	<1	<1	<1	4	0	<1	ND	<1	ND	1	1	0	0	0
3-nitroaniline				-	-	<1	<1	<1	<1	4	0	<1	ND	<1	ND	1	1	0	0	0
4-chloroaniline	0.37[#10]			-	-	<1	<1	<1	<1	4	0	<1	ND	<1	ND	1	1	0	4	0
4-nitroaniline	3.8[#10]			-	-	<0.5	<0.5	<0.5	<0.5	4	0	<0.5	ND	<0.5	ND	0.5	0.5	0	0	0
Explosives																				
2,4-Dinitrotoluene	0.24[#10]			-	-	<0.5	<0.5	<0.5	<0.5	4	0	<0.5	ND	<0.5	ND	0.5	0.5	0	4	0
2,6-dinitrotoluene	0.049[#10]			-	-	<1	<1	<1	<1	4	0	<1	ND	<1	ND	1	1	0	4	0
Nitrobenzene	8 to 63[#3]			-	-	<1	<1	<1	<1	4	0	<1	ND	<1	ND	1	1	0	0	0
TPH																				
>C5-C6 Aliphatics	15,000[#2]			<10	<10	<10	<10	<10	<10	7	0	<10	ND	<10	ND	10	10	0	0	0
>C6-C8 Aliphatics	15,000[#2]			<10	<10	<10	<10	<10	<10	7	0	<10	ND	<10	ND	10	10	0	0	0
>C8-C10 Aliphatics	300[#2]			<10	<10	<10	<10	<10	<10	7	0	<10	ND	<10	ND	10	10	0	0	0
>C10-C12 Aliphatics	300[#2]			<5	<5	<5	<5	<5	<5	7	0	<5	ND	<5	ND	5	5	0	0	0
>C12-C16 Aliphatics	300[#2]			<10	<10	<10	<10	<10	<10	7	0	<10	ND	<10	ND	10	10	0	0	0
>C16-C21 Aliphatics	300[#2]			<10	<10	<10	<10	<10	<10	7	0	<10	ND	<10	ND	10	10	0	0	0
>C16-C35 Aliphatics				<20	<20	<20	<20	<20	<20	7	0	<20	ND	<20	ND	20	20	0	0	0
>C21-C35 Aliphatics	300[#2]			<10	<10	<10	<10	<10	<10	7	0	<10	ND	<10	ND	10	10	0	0	0
>C5-C35 Aliphatics				<10	<10	<10	<10	<10	<10	7	0	<10	ND	<10	ND	10	10	0	0	0
>EC5-EC7 Aromatics	1[#1]	8[#8]		<10	<10	<10	<10	<10	<10	7	0	<10	ND	<10	ND	10	10	0	7	0
>EC7-EC8 Aromatics	700[#2]	74[#6]		<10	<10	<10	<10	<10	<10	7	0	<10	ND	<10	ND	10	10	0	0	0
>EC8-EC10 Aromatics	300[#2]			<10	<10	<10	<10	<10	<10	7	0	<10	ND	<10	ND	10	10	0	0	0
>EC10-EC12 Aromatics	90[#2]			<5	<5	<5	<5	<5	<5	7	0	<5	ND	<5	ND	5	5	0	0	0
>EC12-EC16 Aromatics	90[#2]			<10	<10	<10	<10	<10	<10	7	0	<10	ND	<10	ND	10	10	0	0	0
>EC16-EC21 Aromatics	90[#2]			<10	<10	<10	<10	<10	<10	7	0	<10	ND	<10	ND	10	10	0	0	0
>EC21-EC35 Aromatics	90[#2]			<10	<10	<10	<10	<10	<10	7	0	<10	ND	<10	ND	10	10	0	0	0
>EC5-EC35 Aromatics				<10	<10	<10	<10	<10	<10	7	0	<10	ND	<10	ND	10	10	0	0	0
>C5-C35 Aliphatics & Aromatics				<10	<10	<10	<10	<10	<10	7	0	<10	ND	<10	ND	10	10	0	0	0
TPH Hazard Indicies	1			0	0	0	0	0	0											
BTEX																				
Benzene	1[#1]	8[#8]		<5	<5	<0.5	<0.5	<0.5	<0.5	7	0	<0.5	ND	<5	ND	2.4	0.5	2.4	3	0
Toluene	700[#3]	74[#6]		<5	<5	<5	<5	<5	<5	7	0	<5	ND	<5	ND	5	5	0	0	0
Ethylbenzene	300[#3]	20[#12]		<5	<5	<1	<1	<1	<1	7	0	<1	ND	<5	ND	2.7	1	2.1	0	0
Xylene (m & p)				<5	<5	<2	<2	<2	<2	7	0	<2	ND	<5	ND	3.3	2	1.6	0	0
Xylene Total	500[#3]	30[#12]		<10	<10	<3	<3	<3	<3	7	0	<3	ND	<10	ND	6	3	3.7	0	0
Xylene (o)	190[#10]			<5	<5	<1	<1	<1	<1	7	0	<1	ND	<5	ND	2.7	1	2.1	0	0
Total BTEX				<25	<25	<9.5	<9.5	<9.5	<9.5	7	0	<9.5	ND	<25	ND	16	9.5	8.3	0	0
Oxygenates																				
MTBE	1,800[#15]	260[#13]		<5	<5	<0.1	2.8	<0.2	<0.1	7	1	<0.1	2.8	<5	2.8	2.6	2.8	2.4	0	0
Solvents																				
Isophorone	78[#10]			-	-	<0.5	<0.5	<0.5	<0.5	4	0	<0.5	ND	<0.5	ND	0.5	0.5	0	0	0
Metals																				
Arsenic (Filtered)	10[#1]	25[#6]		<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	7	0	<2.5	ND	<2.5	ND	2.5	2.5	0	0	0
Barium (Filtered)	1,300[#3]			57	63	41	53	33	44	7	7	33	33	63	63	51	53	11	0	0
Beryllium (Filtered)	12[#3]			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	7	0	<0.5	ND	<0.5	ND	0.5	0.5	0	0	0
Boron (Filtered)	1,000[#1]	7,000[#12]		132	73	49	54	178	34	7	6	<12	34	178	178	76	54	59	0	0
Cadmium (Filtered)	5[#1]	0.2[#8]		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	7	0	<0.5	ND	<0.5	ND	0.5	0.5	0	7	0
Chromium (hexavalent)	50[#1]	0.6[#6]		<6	<6	<6	<6	<6	<6	7	0	<6	ND	<6	ND	6	6	0	7	0
Chromium (III+VI) (Filtered)	50[#1]			6.2	6.8	6.3	5.4	3.3	<1.5	7	6	<1.5	3.3	6.8	6.8	4.8	5.4	1.9	0	0
Chromium (Trivalent) (Filtered)	50[#1]			6	7	6	<6	<6	<6	7	4	<6	6	7	7	6.2	6	0.39	0	0
Copper (Filtered)	2,000[#1]	3.76[#6]		<7	<7	<7	<7	<7	<7	7	0	<7	ND	<7	ND	7	7	0	7	0
Ferrous Iron (Filtered)				<20	<20	100	260	1,630	150	7	5	<20	100	1630	1630	314	100	587	0	0
Lead (Filtered)	10[#1]	1.3[#8]		<5	<5	<5	<5	<5	<5	7	0	<5	ND	<5	ND	5	5	0	7	0
Mercury (Filtered)	1[#1]	0.07[#7]		<1	<1	<1	<1	<1	<1	7	0	<1	ND	<1	ND	1	1	0	7	0
Nickel (Filtered)	20[#1]	8.6[#8]		2	<2	4	3	8	4	7	6	<2	2	8	8	4	4	2.1	0	0
Selenium (Filtered)	10[#1]			<3	5	<3	<3	<3	<3	7	2	<3	5	16	16	4.2	3	2.4	1	1
Vanadium (Filtered)	86[#10]	100[#12]		<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	7	0	<1.5	ND	<1.5	ND	1.5	1.5	0	0	0
Zinc (Filtered)	6,000[#10]	6.8[#6]		12	6	<3	<3	10	6	7	5	<3	6	12	12	6.6	6	3.4	3	3
Organics																				
Dissolved Organic Carbon (mg/L)				<2	<2	6	9	38	3	7	4	<2	3	38	38	8.9	3	13	0	0
Inorganics																				
Sulphate (mg/L)	250[#4]			62.9	42.8	417.5	720.3	983.9	299.8	7	7	42.8	42.8	983.9	983.9	373	299.8	363	4	4
Chloride (mg/L)	250[#1]			24.3	18.2	563.4	1,280	304.2	69.2	7	7	18.2	18.2	1280	1280	327	69.2	467	3	3
Ortho Phosphate as P (mg/L)				0.19	0.15	0.12	<0.03	<0.03	<0.03	7	3	<0.03	0.12	0.19	0.19	0.083	0.03	0.069	0	0
Alkalinity (total) as CaCO3 (mg/L)				352	300	346	378	612	762	7	7	274	274	762	762	432	352	183	0	0
Nitrate (as N) (mg/L)				<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	7	0	<0.05	ND	<0.05	ND	0.05	0.05	0	0	0
Ammoniacal Nitrogen as N (mg/L)		21 (unionised ammonia)[#6]		0.42	0.27	0.06	0.09	0.87	0.05	7	7	0.05	0.05	0.87	0.87	0.26	0.09	0.3	0	0
pH (Lab) (pH units)				7.63	7.4	6.95	6.83	6.97	7.19	7	7	6.83	6.83	7.63	7.63	7.2	7.19	0.28	0	0
TSS (mg/L)				35	<10	10	14	21	1,787	7	6	<10	10	1787	1787	271	17	669	0	0

All units are in µg/L unless stated
All grey values are below the MDL
MDL-Method Detection Limit

Comments
#1 WS Regs 2016 (Eng/Wal)
#2 WHO Petroleum DWG 2008
#3 WHO DWG 2017
#4 WHO 2017 - Taste
#5 WHO 2017 - Odour
#6 WFD England/Wales. 2015 - Saltwater Standards
#7 WFD England/Wales. 2015 - MAC-EQS Trans./Coastal
#8 WFD England/Wales. 2015 - AA-EQS Trans./Coastal
#9 Water Env't Regs (Scotland) 2015. AA-EQS Coast
#10 USEPA RSL (tapwater) [June 2017]
#11 SEPA WAT-SG-53 Marine EQS - MAC - 2015
#12 SEPA WAT-SG-53 Marine EQS - AA - 2015
#13 PNEC (EU REACH) - Coastal
#14 California Draft health protective concentration
#15 AECOM DWG (WHO method)
GAC: Generic Assessment Criteria
(blank): No assessment criteria available
- : Not analysed
DWS: Drinking Water Standard
EQS: Environmental Quality Standard

Key

XXX	Exceedance of CW/WE Water. DWS - England/Wales
XXX	Exceedance of CW/WE Water. Aquatic Toxicity - England/Wales - Transitional/Coastal

Appendix F Ground Gas Assessment

Exploratory Hole	Stratum (Well screen)	Date	Barometric Pressure (mb)	Peak Flow rate (l/h)	Steady Flow	Peak CO_2 (% vol)	Peak CH_4 (% vol)	GSV	Characteristic Situation CO_2	GSV (l/hr)	Characteristic Situation CH_4	Min O_2 (% vol)
WS01	Made Ground (1.0-1.4m)	11/05/2018	1011.0	0.0	0.0	1.0	0.7	0	1	0	1	19.6
		23/05/2018	1025.0	0.0	0.0	0.1	0.1	0	1	0	1	20.3
		07/06/2018	1018.0	0.0	0.0	0.5	0.2	0	1	0	1	20.2
WS02	Made Ground (0.7-1.2m)	11/05/2018	1012.0	0.0	0.0	0.4	0.1	0	1	0	1	20.1
		23/05/2018	1026.0	-17.0	0.0	3.9	0.1	-0.663	1	0	1	14.4
		07/06/2018	1018.0	0.0	0.0	1.3	0.1	0	1	0	1	19.4
WS03	Glacial Deposits (2.5-3.5m)	11/05/2018	1012.0	0.0	0.0	0.1	0.1	0	1	0	1	20.5
		23/05/2018	1025.0	7.3	0.0	0.3	0.2	0.0219	1	0	1	20.3
		07/06/2018	1018.0	5.4	0.0	0.3	0.3	0.0162	1	0	1	20.4
WS04	Glacial Deposits (1.3-2.3m)	11/05/2018	1012.0	0.0	0.0	0.2	0.2	0	1	0	1	20.2
		23/05/2018	1026.0	0.0	0.0	0.1	0.1	0	1	0	1	20.3
		07/06/2018	1018.0	0.0	0.0	0.1	0.1	0	1	0	1	20.6
WS05	Glacial Deposits (3.3-4.3m)	11/05/2018	1012.0	0.0	0.0	0.0	0.0	0	1	0	1	20.7
		23/05/2018	1026.0	0.0	0.0	0.1	0.1	0	1	0	1	20.3
		07/06/2018	0.0	0.0	0.0	0.0	0.0	0	1	0	1	20.4

BH01	Glacial Deposits (12.60-15.00)	11/05/2018	1012.0	0.0	0.0	0.4	0.2	0	1	0	1	20.1
		23/05/2018	1026.0	5.3	0.0	0.6	0.4	0.0318	1	0.0212	1	19.8
		07/06/2018	1018.0	-1.0	0.0	0.7	0.5	-0.007	1	-0.005	1	19.9
BH02	Glacial Deposits (14..00 to 15.2)	11/05/2018	1012.0	0.0	0.0	0.2	0.2	0	1	0	1	20.5
		23/05/2018	1025.0	0.0	0.0	0.1	0.1	0	1	0	1	20.4
		07/06/2018	1017.0	0.0	0.0	0.1	0.1	0	1	0	1	20.6

Appendix G Managing Suspicious Ground Conditions

The exploratory holes carried out during previous fieldwork can only provide a general indication of site conditions. Evidence of potential contamination could still be encountered elsewhere on the Site which has not been previously revealed and a strategy should be in place in the event that such conditions are uncovered.

All groundworkers should stay vigilant for unforeseen or suspicious ground conditions. Initial identification will be based on visual and olfactory assessment.

General indicators of possible contamination could be arisings that quickly change appearance or appear inconsistent with the baseline conditions (see below). Examples could be oily (or free phase oil/fuel) pockets, fibrous materials, strong odours or vibrant colours associated with the soil itself, but also physical foreign objects such as cement asbestos sheet, ash, brick, concrete, metal, glass and disposed man made materials (rubbish).

G.1 Objective

Employ a Discovery Strategy to identify and manage potentially impacted soils and groundwater that may be discovered during groundworks.

G.2 General Approach (Management Sequence)

In the implementation of the Discovery Strategy, it is assumed the Contractor's actions are led by a suitably qualified and experienced person in the fields of ground investigation and remediation.

The following sequence should be adopted for managing suspicious ground conditions:

1. Suspicious ground conditions are identified during groundworks. Work in the vicinity is halted;
2. In accordance with their obligations under health and safety legislation and the CDM Regulations, the Contractor assesses the requirement for any additional safety, health and environmental management control measures and implements measures as necessary;
3. Contractor notifies its Geo-environmental specialist;
4. Contractor records the extent of 'contamination' and nature of stratigraphy using photographs, written notes and sketches, where necessary further localised investigations may be required to ascertain extent of affected area;
5. Findings are discussed with the Contractor's Geo-environmental specialist and a way forward is ascertained e.g. sampling and testing requirements; special measures required during excavation, etc.
6. Local Planning Authority notified in writing by the contractor of findings and proposed way forward;
7. Contractor implements the way forward, which may include delineation (as outlined in Section G.3) collecting samples and scheduling the agreed laboratory analysis;
8. Details of samples collected and tests scheduled are recorded;
9. Contractor provides the test results to it's Geo-environmental specialist for review and interpretation;
10. Remedial action, if necessary, and programming of the works are agreed in writing with the Local Planning Authority (may require submission of documentation);
11. Contractor is informed of the remedial action required;

12. Contractor prepares a Method Statement that details how the agreed remedial action will be carried out;
13. Method Statement is agreed by AECOM and works proceed; and
14. Evidence of work carried out is collated for inclusion in the Contractors Verification Report upon completion of the works.

G.3 General Approach (Delineation Exercise)

The following sequence outlines the approach to be adopted for a conventional delineation exercise, however, this may need to be updated depending on the nature of the contaminants encountered. This will be confirmed within the Method Statement detailing how the agreed remedial action will be carried out:

1. Strip the overlying soil that does not appear to be impacted ('clean') and stockpile separately in accordance with the Materials Management Plan;
2. Stockpiles should be positioned on hardstanding/impermeable membrane and controls for example as covering the stock pile should be put into place to prevent run, off cross contamination and migration of dust vapours and where required asbestos.
3. Continue the delineation exercise, appropriately separating the impacted soil from the 'clean' soil in accordance with the Materials Management Plan;
4. Upon exposing 'clean' soil at the extents of the excavation, halt the delineation;
5. From the 'clean' stockpile collect a minimum of one sample per 1000m^3 from the stockpile to advise reuse with a minimum of three samples. Type of laboratory analyses to be agreed with the Contractor's Geo-environmental specialist;
6. From the impacted stockpile collect one sample per 250m^3 from the stockpile to advise disposal with a minimum of three samples as confirmed with the waste receiving facility. Type of laboratory analyses to be agreed with the Contractor's Geo-environmental specialist;
7. From each exposed side of the excavation collect one sample within 1m above the impacted horizon (where possible), one sample at a similar depth to the impacted horizon, and one sample within 1m below depth of impacted horizon. Types of laboratory analyses to be agreed with the Contractors Geo-environmental specialist and waste receiving facility;
8. Across the base of the excavation collect one sample per 25m^2 (or part thereof). Type of laboratory analyses to be agreed with AECOM; and
9. All results and evidence of the work carried out should be collated for inclusion in the Contractor's Geo-environmental specialist Verification Report and submitted to the LPA by the Contractor.

G.4 Assessment Criteria

Soil acceptance criteria will determined by the Contractors Geo-environmental specialist

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