Landfill Gas Risk Assessment

Meridian Water Waste Recovery Permit Application

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Waterman Infrastructure & Environment Ltd
Pickford's Wharf, Clink Street, London SE1 9DG
www.watermangroup.com

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This document has been prepared and checked in accordance with
Waterman Group's IMS (BS EN ISO 9001: 2015, BS EN ISO 14001: 2015 and BS EN ISO 45001:2018)

Issue	Date	Prepared by	Checked by	Approved by
31-3-1	March 2024	Robbie J Moore Senior Consultant	Freddie Alcock Technical Director	Freddie Alcock Technical Director

Comments

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Contents

Figures

Appendices

Glossary

- The permitted site – this refers to the proposed permitted area as defined in Plan D-ESSD1C.
- Meridian Water Strategic Infrastructure Works (SIW) – the enabling works required in advance of the construction of Phase 2 of the Meridian Water Development. The works will occur across two adjacent areas termed Phase 1 SIW and Phase 2 SIW – collectively 'the SIW site' for the purposes of the EP application documents.
- Development Zones (DZ) – specific areas in Phase 2 Meridian Water Development referred to in planning documents. As shown on Plan D-ESSD1D. Edmonton Marshes flood relief storage basins – to be excavated at the eastern end of the site as part of the SIW in DZLV1. The waste the subject of this EP application will arise from excavation into the former Lee Valley Trading Estate landfill to create part of the flood relief storage basins.

1. Introduction

1.1 The Brief

Waterman Infrastructure & Environment Limited ("Waterman") is instructed by Taylor Woodrow Construction, the civil engineering arm of Vinci Construction UK Limited ("the applicant" and "the operator") to prepare an application for an Environmental Permit (EP). The EP application is to authorise the permanent deposit of waste on land as a recovery activity. The waste recovery is for previously deposited (waste) soil and stones to be used in the Strategic Infrastructure Works at Meridian Water, Enfield, London (the "Permitted Site").

To support this EP application, a landfill gas risk assessment (LGRA) has been prepared detailing the potential for recovery of the waste to create a potential source for ground gas with risks to future site users and visitors at the completed area.

1.2 Context

The Meridian Water scheme is a regeneration project led by the London Borough of Enfield (LBE). The permitted site is one small part of the wider Meridian Water scheme. The permitted site is centred at approximate National Grid Reference 535601 191831.

Overall, the Meridian Water scheme will deliver:

- 10,000 new homes;
- 6,000 high quality jobs, a further 10,000 construction jobs;
- new train station;
- schools, healthcare provisions and other local services; and
- naturalisation of the Pymmes Brook and improved waterside public green spaces.

The first phase of the scheme ("Meridian One") was granted full planning permission and is underway. The new Meridian Water station opened in 2019, the first new school in 2017 and the first 950 homes are scheduled for completion in 2026 at Willoughby Lane.

LBE is now bringing forward Phase 2 of the Meridian Water scheme. Phase 2 is a residential led mixed use scheme including up to 2,300 new homes, various non- residential uses including workspace and a new school. To enable Phase 2, the SIW are required to prepare the development area including the implementation of flood mitigation measures.

Earthworks material will be excavated from various locations across the SIW site where the level needs to be lowered to provide flood storage basins or to create a suitable development platform level. Some material will be suitable for reuse in earthworks without treatment, other material will require remediation (regulated by separate mobile treatment plant permit). Material confirmed to be suitable for reuse will be moved to various locations in the SIW site where levels need to be raised. The cut and fill locations are shown on plan D-ESSD4.

Most of the material to be excavated and / or treated will be reused in accordance with the Definition of Waste: Development Industry Code of Practice (DoWCoP). However, some excavation will be necessary in an area that is considered by the Environment Agency (EA) to be an historic landfill site (Lee Valley Trading Estate Landfill located at the eastern end of the SIW site and shown on plan D-ESSD2E).

The waste recovery green line boundary is shown on plan D-ESSD1C, with the SIW site boundary on plan D-ESSD1A. The actual locations where waste will be deposited will depend on the detailed sequencing of the works (so dependent on factors including progress of remediation works) and the time taken by the EA to determine the EP application. The balance of fill placed in the waste recovery areas will be placed in accordance with the DoWCoP.

Treatment of waste will be limited to sorting at the point of excavation to separately remove any gross contamination or large lumps of hard materials. Waste suitable for recovery will be stored in stockpiles, until required for use in earthworks in the permitted site. Waste may also be treated with lime or cement for moisture control and / or creation of capping material. Both applications will be for geotechnical improvement so should not require waste regulatory controls. However, should the EA disagree, the treatment will be carried out under mobile treatment plant permit and the relevant List of Waste codes included for in the waste recovery EP application.

1.3 Report Structure and Scope

The EP application requires a LGRA. This has been developed using relevant EA guidance,[1] and the template provided[2]. Any sections that are not applicable to the activity have been included for completeness with an explanation of why they are not relevant.

The conceptual model in its entirety is included in the Conceptual Site Model, Environmental Setting and Site Design (ESSD) report completed separately to this report and should be read in conjunction and referred to in addition to this document. A summary of the conceptual site model with a focus on ground gas is included within this document.

Technical information prepared for the Meridian Water Development Area has been utilised where appropriate, including but not limited to that prepared for:

- the planning applications for the scheme;
- documents required to fulfil planning conditions (e.g. Construction Environmental Management Plan (CEMP);
- data and analysis from ground investigation;
- waste classification analysis of samples collected from the former landfill area;
- specification for materials suitable for reuse in the earthworks; and
- detailed design (highways, drainage, landscaping).

Taylor Woodrow's general and environmental management policies and procedures are in place for the SIW construction site, and will be applied as appropriate to the permitted activities. Taylor Woodrow documents referred to are included elsewhere in the application bundle.

The LGRA will form part of the environmental management system (EMS) to be operated by the applicant for the lifetime of the EP. A copy of the LGRA and EMS will be kept in Taylor Woodrow's site office at Phase 1 SIW.

Where EA templates have been used to structure the report, any sections that are not applicable to the activity have been included for completeness. With an explanation of why they are not relevant.

Plans and drawings referred to in this report are to be found in the "ESSD drawings and information bundle" submitted as part of the EP application. In the text of this report the plans may be referred to in full or by abbreviated reference e.g. D-ESSD1A.

This report should be read alongside the "Conceptual Site Model, Environmental Setting and Site Design Report" (ESSD report) prepared by Waterman and included in the EP application.

[1] https://www.gov.uk/government/publications/management-of-landfill-gas-lftgn-03 (accessed 30/05/2022).
[2] https://www.gov.uk/government/publications/landfill-gas-risk-assessment-report-template (accessed 30/05/2022).

1.4 Limitations and Constraints

Waterman has endeavoured to assess all information provided to them during the preparation of this document. But makes no guarantees or warranties as to the accuracy or completeness of this information.

The conclusions resulting from this report are not necessarily indicative of future conditions or operating practices at or adjacent to the Permitted Site.

2. Conceptual Site Model - Landfill Gas

2.1 Ground Gas Risk

As identified throughout available guidance including the CL:AIRE RB17 A Pragmatic Approach to Ground Gas Risk Assessment 2012 guidance document and CIRIA C665 document “Assessing Risks Posed by Hazardous Ground Gases to Buildings”, ground gases only pose a risk when the following can be satisfied:

- an accumulation of a large volume of gas in the ground in or near the receptor (source).
- a pathway that allows gas to migrate through and/or out of the ground into a building or other structure sufficiently quickly to allow it to build up inside (pathway).
- a confined space within the building or structure where gas can build up to unacceptable levels (receptor).

In order for a risk from ground gases a source – pathway – receptor linkage needs to be present. This requires a sufficient quantity of gas to pose a hazard and one or more pathways by which it may cause significant harm to people and vegetation. For sustained gas migration to occur gas must be replenished at the source to negate the effects of attenuating factors such as oxidation of the methane to carbon dioxide in the aerobic zone or low permeability soils decreasing the migration potential. Therefore, sustained high levels of gas generation is required for ground gas to migrate via advective or diffusive flow and cause high ground gas concentrations at the surface/within built structures.

Critically it is the volume of ground gas which is the principal factor which should be considered rather than the ground gas concentration (or monitoring well concentration), which is commonly mistaken as posing a risk to future site users. The assessment of ground gas volume is based on a review of both ground gas flow data and ground gas concentration data. A risk will only be existent where sufficient flow is present in addition to high gas concentrations. Assessment of the risk based solely on gas concentrations is an outdated and incorrect methodology in determining whether a possible ground gas source poses a risk. A high gas concentration present without the ability to be emitted at the surface/receptor would not pose a risk.

2.2 Sources

2.2.1 Ground Gas Characteristics of Waste to be Recovered

For the purposes of this LGRA, excavation arisings from construction of the Edmonton Marshes flood relief storage basins in DZLV1, in the area to be agreed by the project remediation contractor with the EA to be historic landfill, will be the waste the subject of this waste recovery EP application. The maximum of extent is the area of historic landfill shown on plan D-ESSD2E. Data arising from the area shown on plan D-ESSD2E is discussed in its entirety.

Further detail on the historical development of the former “Lee Valley Trading Estate Landfill”, and assessment of ground investigation data from DZLV1 is set out in the ESSD. No new sources of contamination are being introduced to the Permitted Site given that the former landfill is within the SIW boundary.

The area comprises material deposited during the land raising undertaken between the 1930s and 1950s. The waste encountered during previous ground investigations can be described as:

- in-situ natural soils including alluvium, sands and gravels but excluding highly compressible and degradable soils such as peat;
- previously placed reworked natural soils comprising principally natural soils and stones; and
- soils described as Made Ground but comprising principally natural soils.

An exploratory hole location plan for the source of waste area is included at Appendix A. Exploratory hole logs from previous ground investigation works across the source of waste area are included in Appendix B.

Chemically, the waste contains lower levels of contamination relative to land elsewhere in Phase 2 Meridian Water. Slightly elevated levels of some contaminants (lead, zinc, TPH and PAH) were recorded in the waste, however levels were not unusual for an urban setting. A summary of the laboratory data gathered during previous investigations is included in the Waste Acceptance Procedures (WAP) document included in the EP application bundle. Figure 1 shows typical ground conditions encountered by Arup during ground investigations of the historic landfill area[3].

Figure 1: Typical Landfilled Waste

Left: Natural alluvium at the base of the trial pit. Right: layers of Made Ground within the mound including yellow brown sandy gravel and brown sand with grey sandy clay.

Ground gas monitoring was undertaken in two wells (DZLV1_BH2073 and DZLV1_BH2076) installed in undisturbed waste (Arup SIW ground investigation (2020) [4]. Ground gas monitoring wells are shown on Arup drawing No. 260636 Rev F1 (drawing 6) in the Arup SIW ground investigation report and Appendix A. DZLV1_BH2073 was installed in the Made Ground with a response zone between 0.50 and 1.80m bgl. Made Ground at this location was described as including high proportion of masonry material including concrete and brick gravels and cobbles as well as gravelly clay with brick, concrete and flint. Evidence of a landfill was not encountered. Six monitoring rounds were completed.

DZLV1_BH2076 was installed in the Alluvium with a response zone between 2.00 and 3.50m bgl. Two monitoring rounds were completed.

[3] Arup (2021), Meridian Water SIW, Lee Valley Trading Estate Landfill - Technical Note (001).
[4] Arup (2020), Strategic Infrastructure Work, Meridian Water - Ground Contamination Risk Assessment (REP/260637/CL/001).

Ground gas monitoring concentrations recorded from DZLV1_BH2073 did not identify a significant ground gas regime (Characteristic Situation 1). Flow rate and methane concentrations were below instrument detection limits and carbon dioxide concentrations were low (below 4.3%). DZLV1_BH2076 recorded a peak methane concentration of 23.5% and low oxygen concentrations (0.5%). Carbon dioxide concentrations of 3.7% and 8.3% were recorded. The flow rates (0.7l/hour) and high methane concentration equate to a Characteristic Situation 2 ground gas regime.

Ground gas baseline measurements collected during previous investigation works at the source of waste area are collated in Appendix C. Generic Assessment Criteria (GAC) used to assess the ground gas regime are included in Appendix D.

The absence of measurable sustained gas flow rates is typical of material in which only a low volume of organic content is present. Generally, where waste material with the potential to generate methane and other ground gases has been emplaced and remained undisturbed in place for a significant period of time (i.e. more than 20 years), aerobic digestion of organic material present (such as plant matter) occurs. This process produces methane and carbon dioxide which outflows to the surface until all oxygen within the waste is depleted. Following this, the remaining organic material is degraded anaerobically to produce carbon dioxide. However, once the anaerobic digestion commences, production of methane is significantly reduced and gas volumes outflowing to surface levels decrease. After the anaerobic digestion phase commences, gas outflows to surface generally occur at such low rates that they are not emitted at quantities sufficient to pose a risk to receptors, with the ground gas effectively entrained in the soil matrix and oxidising prior to being emitted at surface level.

The waste to be used primarily comprises clayey and sandy natural soils excavated to facilitate re-alignment of nearby waterways and construction of reservoirs. As such, the organic content of this material is lower than that of conventional 'landfill' material, which will contain organic matter such as plant and food waste, paper and waste wood. Testing for total organic carbon (TOC) on soil samples from the undisturbed waste recorded mean TOC concentrations of 1.75%. This indicates the material does not have a high organic carbon content which is consistent with the low ground gas generation potential of the waste.

The ground gas monitoring provides a body of quantitative evidence that the waste has a negligible ground gas generation potential, owing to the low quantity of readily degradable organic material present in the soil matrix. During the excavation and stockpiling of the waste prior to final placement, the residual low quantities of stabilised organic material will be exposed to aerobic conditions. The aerobic conditions will temporarily increase the biodegradation of the organic material further decreasing the quantum of organic material present post placement, further decreasing the wastes ground gas generation potential.

2.2.2 Ground Gas Characteristics of Existing Soils at Meridian Water

Phase 1

Ground gas monitoring within the SIW Phase 1 area was completed in 2020 as part of the Arup Detailed Quantitative Risk Assessment (SIW Phase 1)[5], and by BWB[6] at plots DZ6 and DZ7.

As part of the SIW investigation, six monitoring wells were included in the ground gas monitoring network within DZ6, DZ7 and DZLV1. A maximum GSV of 21.6l/hr was calculated based on a maximum methane concentration of 81% and a flow rate of 26.7l/hr in DZLV1_BH2076 (which screens the Alluvium). The PID reading on this monitoring round was 1.8ppm suggesting these methane concentrations cannot be attributed to high vapour concentrations. On the following monitoring visit (9th March 2021) a methane concentration of 44%v/v and flow rate of 9.9l/hr were recorded resulting in a GSV of 4.40l/hr.

[5] Arup (2022) Strategic Infrastructure Works, Meridian Water - Detailed Quantitative Risk Assessment – SIW - Phase 1 (260637/REP/CL/003)
6 BWB (March 2020) Phase 2 Geo-Environmental Risk Assessment (MWD-BWB-ZZ-XX-YE-RP-0001_Ph2)

It should be noted this location screens the Alluvium which is logged as 1.9m thickness of gravelley clay underlain by 0.7m of dark brown peat which may be acting as a localised ground gas source. Outside of this location, the maximum gas Characteristic Situation is CS2 recorded in DZ7_BH2059a with a maximum flow rate of 11.2l/hr and maximum carbon dioxide concentration of 0.9%.

The BWB investigation recorded the DZ6 and DZ7 areas as a CS1 due to only slightly elevated gas levels and negligible flows.

Phase 2

Ground gas monitoring in wells outside the landfill area and in the SIW Phase 2 area (DZ4 and DZ5) was undertaken as part of the Arup SIW ground investigation (2020). Twenty-three boreholes were installed with six rounds of monitoring completed in nine locations, and between five and three rounds in the remaining fourteen locations. The majority of monitoring standpipes were installed in Made Ground and Alluvium. These results, along with results of previous monitoring completed by the SLR Meridian Water ground investigation (2019)[7] recorded the following.

- Concentrations of carbon dioxide were above 5% at multiple locations over several rounds. Carbon dioxide concentrations ranged typically between 0.2% and 20.6%. A peak value of 71% v/v was recorded in DZ4_WS1007 (SLR, 2019), however, the steady state value for this monitoring round was 0.4% v/v and maximum peak level on previous rounds was 13.9% v/v.
- Methane recorded predominantly at low concentrations or below the equipment's limit of detection during Arup ground gas monitoring. Concentrations above 1% were recorded in two locations: DZ4_BH2042 (1.1% v/v and 1.3% v/v on two occasions) and DZ5_BH2018 (3.1% v/v and 24.5% v/v). However, DZ5_BH2018 targeted the Kempton Park Gravels and the screened section was entirely submerged, therefore the data was considered not to be reflective of potential gas risk at the proposed development. During SLR ground gas monitoring, methane concentrations above 1% were recorded in fourteen out of nineteen boreholes and a maximum concentration of 18.5% v/v was recorded in DZ4_BH1005.
- Flow rates were generally below the equipment's detection limit (0.1l/hr). Flow readings greater than 0.1l/hr were recorded in nine locations and ranged between 0.71l/hr and 6.6l/hr, recorded in DZ4_BH2018. However, as discussed above, the data was considered not to be reflective of potential gas risk at the proposed development.

All investigation locations including ground gas monitoring wells are presented on plan in Appendix A. The gas monitoring dataset considered is included in Appendix C.

The background ground gas concentrations identify the Made Ground and natural soils at the Phase 2 SIW area outside the former landfill as having a low risk from ground gas that requires only low levels of protection (CS2). The SLR (2019) assessment identified slightly higher risks (CS3) in the south of DZ4, however, this was based on a very conservative interpretation of the data. The background ground gas concentrations provide further evidence that significant volumes of ground gas are not being generated by the undisturbed waste.

The Made Ground across the wider Phase 2 Meridian Water site has a low concentration of organic matter and given its age since deposition (at least 70 years) it is expected to have a negligible ground gas generation potential. Previous ground gas monitoring (as detailed in Section 2.2.2) does not identify any significant ground gas concentrations including the lateral migration of ground gas from deposits outside the waste.

[7] SLR (2019), Meridian Water, IKEA Clear Site - Ground Investigation Interpretative Report (409.05569.00004).

2.2.3 Odour

Previous ground investigations[8] recorded the following information with regards to odour in the waste:

- In localised pockets the waste identified as Made Ground was recorded as having a distinct hydrocarbon odour (GTS-9-250 between 0.35m and 0.60m, DZLV1_TT2006 at 0.40m).
- Soil headspace analysis of soil samples recorded low concentrations with a peak concentration of 4ppm.
- Soil laboratory analysis of sixty-nine samples from twenty-three exploratory locations was undertaken in the former landfill. Samples were predominantly from the Made Ground (70%) and generally recorded low volatile contaminant concentrations.

  Aliphatic C5-C6: <0.01mg/kg - 0.0181mg/kg;

  Aliphatic C6-C8: <0.01mg/kg - 0.0952mg/kg;

  Aliphatic C8-C10: <0.01mg/kg - 0.108mg/kg;

  Aliphatic C10-C12: <1mg/kg except for one sample (DZLV1_TP2038) where concentration of 1.83mg/kg was recorded;

  Aromatic C6-C7: <0.01mg/kg

  Aromatic C7-C8: <0.01mg/kg

  Aromatic C8-C10: <0.01mg/kg - 0.0869mg/kg;

  Aromatic C10-C12: <1mg/kg except for two samples: DZLV1_TP2038 (2.78mg/kg) and DZLV1_TP2047 (11.9mg/kg);

  Aromatic C12-C16: <1mg/kg - 6.54mg/kg excluding one sample (DZLV1_TP2047) where concentration of 47.5mg/kg was recorded;

  Naphthalene: <0.009mg/kg - 0.504mg/kg; and

  Chlorinated Solvents and BTEX: <0.4mg/kg - <0.8mg/kg.
- Ground gas monitoring in boreholes installed within the undisturbed former landfill recorded hydrogen sulphide below the equipment's limit of detection on all occasions.
- The above confirms the waste has a negligible odour component. In addition, as part of the excavation process material in which gross visual or olfactory evidence for contamination will be excluded from being used at the Permitted Site and will require disposal off-site.

2.3 Pathways

As discussed previously for a risk from ground gas risk there must be sufficient flow from the ground gas in the sub-surface environment into an enclosed space or vegetation root zone. The permeability of soil should therefore be considered when determining the potential for ground gas to reach the surface and migrate into a building.

The waste will be used below roads, footpaths and development plots in the completed development. Soils derived from the waste will be used under soft and hard landscaping at the Brooks Park naturalisation scheme and at Edmonton Marshes. Potential pathways to human health receptors in the completed development and emissions to atmosphere include:

- vertical migration into confined spaces (i.e. manhole chambers, service channels or small temporary structures above ground) where placed below building plots and public squares;
- lateral migration through preferential pathways such as service/utility ducts or through the surrounding soil matrix; and

[8] Arup (2021), Meridian Water SIW, Lee Valley Trading Estate Landfill - Technical Note (001).

- vertical migration through cracks in the overlying hardstanding, or through soft landscaping for direct emission to the atmosphere.

Ground conditions outside the Permitted Site will comprise material placed under the DoWCoP regime during the proposed developments enabling works. This material will be rolled to compact it and provide a suitable development platform. The compacted Made Ground will have a low total porosity and effective porosity substantially restricting lateral migration of ground gases through it. The migration potential and emission risk of ground gases will be further restricted by the absence of a significant volume of ground gas.

There will be drainage runs within the deposited waste which could act as a preferential pathway for the migration of ground gases. However, given the expected low volume of ground gases (given the wastes low ground gas generation potential) and restricted migration potential within the waste due to its compaction, a significant volume of ground gas is not expected to accumulate within the drainage runs and migrate off-site.

Ground investigations undertaken by Arup[9] have classified the ground gas regime as CS2, with basic ground gas protection measures to be installed in the completed development to restrict ground gas migration. The ground gas protection measures will include ground gas membrane and suspended reinforced concrete slab to create a physical barrier. Services will be sealed where they gain entry to built structures in line with the requirements of CS2 classification. These protection measures will work to further break the pathway for ground gases to migrate through and accumulate in confined spaces in the completed development.

Receptors

Potential receptors identified in the Meridian Water Development Area include:

During the Works:

- construction workers encountering ground gas while excavating service trenches on-site;
- migration of greenhouse gas to atmosphere contributing to global warming;
- exposure of nearby workers and the public neighbouring the site to odour.

At Completed Development:

- damage to vegetation and ecosystems from ground gas emissions; and
- future site users including maintenance workers, future residential occupants and commercial users and users of public open space from ground gas accumulation in confined spaces within structures; and
- future buildings and structures from ingress of potentially explosive gases.

Human health receptors including construction workers and future residents / workers have an acute risk and therefore highest sensitivity to ground gas, whereas the global climate is a long-term risk and has a lower sensitivity than the risk to people posed by ground gas.

[9] Arup (2020), Strategic Infrastructure Work, Meridian Water - Ground Contamination Risk Assessment (REP/260637/CL/001).

3. Landfill Gas Risk Assessment

3.1 The Nature of the Landfill Gas Risk Assessment

The recovery of waste will involve the excavation of material already present at the SIW area in which the Permitted Site is located, and its use on the Permitted Site. A new potential ground gas generating source will not be introduced to the Meridian Water site. As evidenced by the qualitative and quantitative assessment of the waste prior to excavation and use, it has a low ground gas generation potential and is unlikely to pose a significant risk to identified receptors. This includes both from a bulk ground gas or odour perspective once in-situ.

The sensitivity of potential receptors is predominantly low on account of being predominantly roadways, footpaths and landscaped areas, however, areas of high sensitivity (new structures on development plots) are included within the proposed development to be constructed on the Permitted Site. Whilst the sensitivity of potential receptors is considered high, the low ground gas generation potential of the waste, absence of new ground gas source, and restriction of pathways means a detailed quantitative risk assessment would not be required and a qualitative assessment will instead be undertaken.

Given the low expected low ground gas generation potential of the material, significant quantities of ground gas will not be produced, and ground gas extraction and utilisation will not be required. Similarly, containment, collection and / or treatment systems would not be required.

3.2 The Proposed Assessment Scenarios

3.2.1 Lifecycle Phases

The deposition of the waste will occur in phases as development progresses. Backfill will comprise placement of the material in layers with which will be compacted to the required density. Waste may also be treated with lime or cement for moisture control and / or creation of capping material. Waste with visual and / or olfactory signs of gross contamination will not be used in the earthworks.

A tracking system will be used to record the location and depth of placed material including confirmation it has passed chemical and geotechnical re-use criteria and is non-hazardous waste. Details of the tracking system used are set out in the WAP included in the EP application.

As identified in Section 2.2**,** the waste in situ has been demonstrated to have low organic matter content and therefore a low ground gas generation potential. During its excavation and stockpiling the creation of aerobic conditions will catalyse the degradation of residual organic matter resulting in a lower organic matter and ground gas generation potential upon its deposition in the Permitted Site. The volume of ground gas created following placement already considered to be negligible will therefore be even lower and steadily decrease over time as residual organic matter degrades or becomes unavailable for degradation (trapped in soil pores) (referred to as stabilised organic matter).

The presence of high methane/carbon dioxide concentrations is not uncommon from recently placed engineered material, and that this effect is pronounced should the material be saturated with groundwater and/or an anaerobic zone exists. Gas is generated in these occasions from small residual quantities of organic material that would be present even in natural soils / inert fill. The volume of gas generated is low. Therefore, a risk of being emitted at the surface also low.

Post placement ground gas monitoring is not a requirement of the planning process for this site.

3.3 Accidents and their Consequences

Earthworks across the SIW site will be undertaken using waste within the Permitted Site and non-waste elsewhere placed in accordance with the DoWCoP. Whilst tracking systems will be in place, the potential exists for the accidental placing of non-waste in the Permitted Site. Given the ground gas data available for the SIW site more generally (see Section 2.2.2) the accidental introduction of non-waste soils is unlikely to introduce a new ground gas generation source.

Visually or olfactorily grossly contaminated material will not be used. This will primarily be controlled through visual screening at excavation, a second check will be carried out during placement of the waste. If undetected pockets of household waste or asbestos containing materials for example are present within the former landfill, it will be easily identifiable in comparison to the typical waste, therefore the likelihood of a rogue load of waste being used is low.

Owing to the low ground gas generation potential and incomplete pollutant linkages to controlled waters receptors as set out in the Hydrogeological Risk Assessment included in the EP application, neither a landfill gas management system nor a leachate containment / management system will be required. The degradation of such systems has therefore not been considered.

3.4 Generated Gases to be Modelled

This section is not applicable. No modelling is proposed given the low potential for ground gas generation.

3.5 Numerical Modelling

3.5.1 Justification for Modelling Approach and Software

This section is not applicable. No modelling is proposed given the low potential for ground gas generation.

3.5.2 Model Parameterisation

This section is not applicable. No modelling is proposed given the low potential for ground gas generation.

3.5.3 Sensitivity Analysis

This section is not applicable. No modelling is proposed given the low potential for ground gas generation.

3.5.4 Model Validation

This section is not applicable. No modelling is proposed given the low potential for ground gas generation.

3.6 Risks to the Environment and Human Health

3.6.1 Landfill Gas Emissions

As identified in Section 2.2, the waste has a low ground gas generation potential which will be further reduced during excavation and stockpiling. Ground gas emissions from the waste in situ have been found to be negligible, and following use and emplacement is anticipated to further decrease over time as residual organic matter degrades or becomes unavailable for degradation (for example through gas capture within soil pores, referred to as stabilised organic matter). At no point following its deposition will significant ground gas emissions occur, with an overall decline following deposition anticipated.

3.6.2 Sub-Surface Migration and Vegetation Stress

For sustained ground gas migration to occur and a risk to receptors be present, a significant volume of ground gas is required to sustain the ground gas migration and replace the gas that has migrated. As evidenced in Section 2.2, the waste has a low ground gas generation potential which will decrease following deposition. A negligible volume of ground gas will therefore exist in the soil pore space following deposition which will not support sustained migration and a risk to on and off-site receptors.

The sub-surface migration (lateral and vertical) of ground gas will also be inhibited by the following aspects:

The waste material following deposition will be emplaced above cohesive Made Ground. The deposited waste material is anticipated to have a lower ground gas generation potential than the undisturbed Made Ground and would not therefore increase the ground gas risk.

New built structures in the completed development will incorporate CS2 protection measures which are to be determined by the plot developer. Potential measures include a ground gas membrane or suspended reinforced concrete slab to create a physical barrier.

New service ducts at the proposed development will be appropriately sealed where they gain entry to built structures in line with the requirements of CS2 classification to prevent them acting as preferential pathways for the migration of ground gases.

Given the above a negligible risk of ground gas migration and impact to receptors will exist.

3.6.3 Atmospheric Dispersion and Odour

Significant ground gas emissions including odour are not expected given the materials low ground gas generation potential and observations on the potential for odour as set out in Section 2.2.3. A landfill gas management plan will therefore not be required, and this section is not applicable.

3.6.4 Exposure

Significant ground gas emissions (including odour) are not expected given the low ground gas generation potential of the waste, in conjunction with the migration pathway inhibitors. A low level of exposure to receptors from ground gases generated from the waste will exist.

3.6.5 Global Atmospheric Impact

Significant ground gas emissions from the waste will not occur due to the low ground gas generation potential of the waste.

Where residual methane is present, monitoring of the waste in situ indicates the gas generation rates are at levels where methane will oxidise to oxygen and water vapour in the aerobic sub-surface environment prior to emission at surface level. This will further restrict the likely global atmospheric impact.

3.7 Landfill Gas Completion Criteria

As identified in Section 2.2 the waste has a low ground gas generation potential. During excavation and stockpiling, oxygen will be introduced into the waste and residual organic matter catalysing its breakdown and further reducing the ground gas generation potential. The volume of ground gas created following placement will therefore be even lower and steadily decrease over time as residual organic matter degrades or becomes unavailable for degradation (trapped in soil pores) referred to as stabilised organic matter. The waste will therefore not pose a ground gas risk (pressure driven or diffusive flow) to the environment or human health receptors at any point in the waste life cycle and would therefore be considered as being ‘completed’ immediately after its deposition.

4. Landfill Gas Management

4.1 Control Measures

The waste has low ground gas generation potential, and therefore landfill gas control measures are not required.

4.2 Chemical Sampling Ahead of Emplacement

As part of the Waste Acceptance Procedures (WAP), chemical quality sampling of the waste will be undertaken including TOC testing. The results of this TOC testing will represent an initial indicator for the potential for the used waste to generate ground gas after emplacement. Waste which exceeds the acceptability criteria for TOC will not be used.

4.3 Gas Monitoring

Ground gas monitoring is not required to satisfy the planning process.

Environment Agency guidance for waste recovery details that gas monitoring is required where a risk of gas is identified, and where waste is to be deposited more than two metres below the surrounding ground surface. Due to the nature of the waste with low potential to generate ground gas, and TOC screening measures to prevent potential gas-generating waste from being used, monitoring of the waste post-emplacement is not proposed.

5. Conclusions

The EP will only allow the use of waste excavated from historic landfill present in DZVL1 within the Meridian Water Development Area, as shown on plans in the ESSD drawings bundle. Therefore, there will be no change to the ground gas regime and risk to off-site receptors.

The waste has been demonstrated during previous ground investigations through ground gas monitoring and assessment of its TOC concentration as having a negligible ground gas generation potential. This ground gas generation potential will decrease further during excavation and temporary stockpiling, in which the residual organic matter will be exposed to aerobic conditions catalysing its degradation. During and post completion of the waste deposition significant volumes of ground gas will not be produced and a risk to human health receptors on the wider Meridian Water Development Area and off-site will not occur.

Given the negligible ground gas generation of the waste significant surface emissions will also not occur which could impact the global atmosphere. Given the negligible risk to human health receptors and the global atmosphere, specific ground gas control measures to control the accumulation of ground gases would not be required.

Confirmatory TOC sampling will be undertaken for the waste pre-emplacement as part of Waste Acceptance Procedures. Should sampling identify elevated TOC concentrations above the acceptance criteria within sections of the waste, this material will be separated out and will not be used. This will ensure that material with the potential to generate ground gas is not used, and therefore gas monitoring will not be necessary.

Furthermore, Condition 16 for the Meridian Water Phase 2 planning application (MWP2 19-02718-RE3) requires that *"prior to each phase of development approved by this planning permission no development shall commence until a remediation strategy to deal with the risks associated with contamination of the site in respect to the development hereby permitted, has been submitted to, and approved in writing by, the local planning authority".* Development on each plot will be subject to ground gas protection measures dependant on the gas regime identified. Previous ground investigations classified the ground gas regime on the wider Meridian Water Development Area as being CS2 where basic ground gas protection measures will be required in the completed development. These protection measures will work to further break the pathway for ground gases to migrate through and accumulate in confined spaces in the completed development.

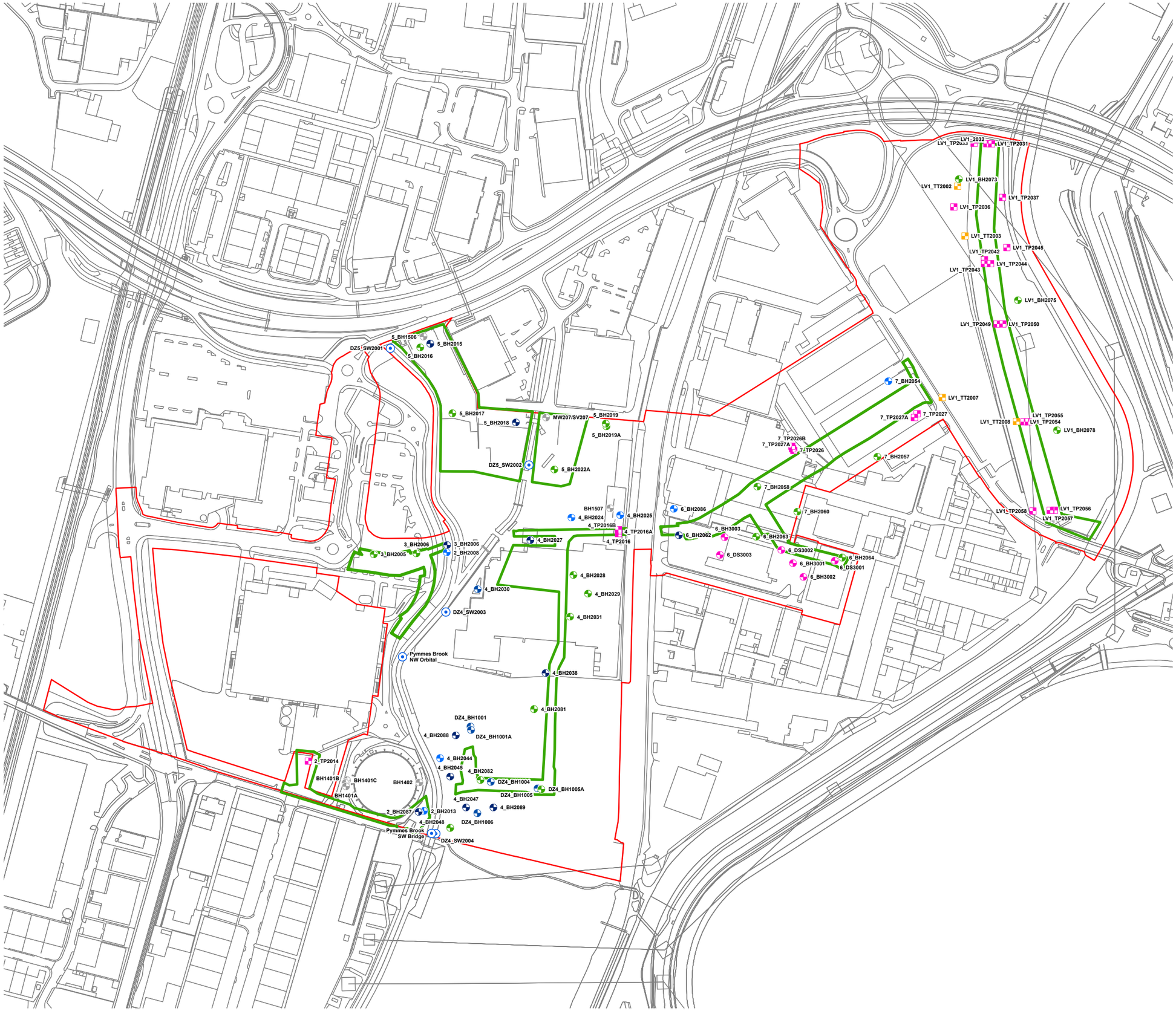
5.1 Compliance with the Landfill Directive 1999

The waste will be used under a recovery activity EP, compliance with the 1999 Landfill Directive would therefore not be applicable.

APPENDICES

A. Site Plans

- Previous Ground Investigation Locations Relevant to the SIW
- Exploratory Hole Location Plan for the Source of Waste Area



SIW Boundary

Wider SIte Boundary

Previous Ground Investigation

- Chalk Installation
- BWB KPGR & Lambeth Group Installation
- KPGR Installation
- KPGR & Lambeth Group Installation
- SLR Borehole
- Existing Borehole
- Surface Water Monitoring Location
- Trial Pit
- Trial Trench

N

0 50 100 200 m

Project Details	WIE16279-300: Meridian Water SIW
Figure Title	Figure A1: Previous Ground Investigation Locations relevant to SIW
Figure Ref	WIE116279-300_GIS_LGRA_1A
Date	March 2024
File Location	N:\Projects\WIE16279-300\9_GIS\WIE16279-300_GIS_LQD

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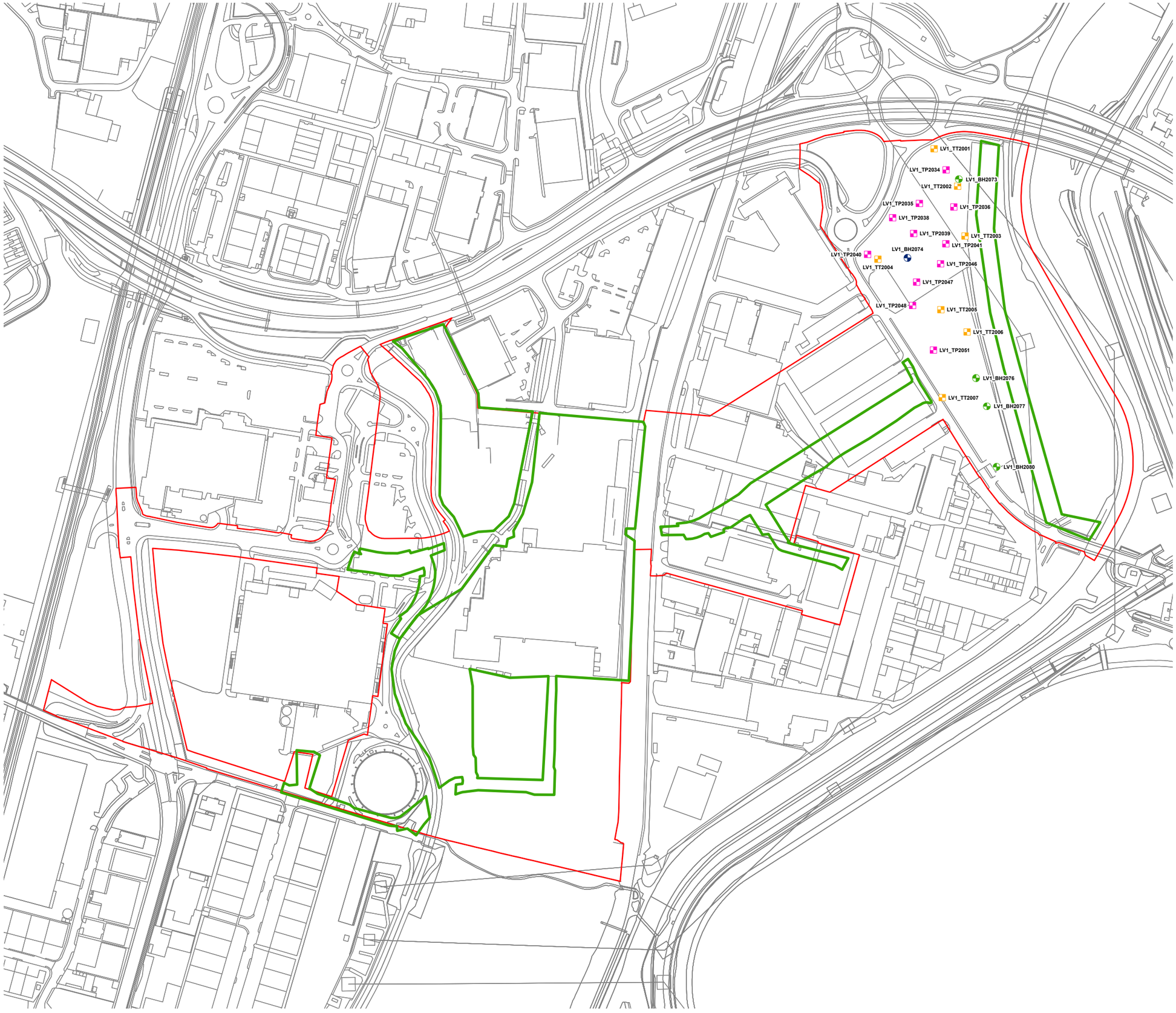

SIW Boundary

Environmental Permit Boundary

Previous Ground Investigation

Chalk Installation

KPGR Installation

Trial Pit

Trial Trench

N

0 50 100 200 m

Project Details	WIE16279-300: Meridian Water SIW
Figure Title	Figure B1: Previous investigation locations with soil chemical quality data completed within the historical landfill area
Figure Ref	WIE116279-300_GIS_HRA_2B
Date	March 2024
File Location	N:\Projects\WIE16279-300\9_GIS\WIE16279-300_GIS_LQD

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B. Exploratory Hole Logs for Source of Waste Area

A3

Legend

SIW investigation locations

- Chalk installation
- KPGR + Thanet Formation installations
- KPGR + Lambeth Group installations
- Lambeth Group installation
- KPGR installation
- Trial Pit
- Trial Trench

Other investigations

- SLR locations (boreholes only)
- BWB (all KPGR/ MG)
- Meridian Water Studios (all KPGR/MG)
- Existing borehole - Chalk
- Existing borehole - Lambeth Group
- Existing borehole - KPGR

- Surface water monitoring point
- Historic Chalk Borehole

River Lea Upstream

DZ5_SW2001

DZ5_SW2002

DZ4_SW2003

DZ4_SW2004

Pymmes Brook NW Orbital

Pymmes Brook SW bridge

River Lea NE bank

River Lea SE bank

GTS Phase 1

GTS Phase 2

SLR boreholes

BWB locations

Meridian Water Studios

Exisiting BH SIW monitoring

Surface water monitoring

Historic Chalk well

Metres

0 40 80 160

Coordinate System: British National Grid

F1	2021-07 -27	RH	NB	NB

Rev	Date	By	Chkd	Appd

ARUP

13 Fitzroy Street
London W1T 4BQ
Tel +44 20 7636 1531 Fax +44 20 7580 3924
www.arup.com

Client

London Borough of Enfield

Project Title

Meridian Water Remediation Framework Report

Drawing Title

Exploratory locations in or in proximity to the SIW site boundary

Scale at A3

1:3,400

Role

Suitability

For Issue

Arup Job No

260637

Rev

F1

Name

Drawing 1

02/07/2021 14:27:24

© Arup

Shallow Borehole Log

Project Name: Meridian Water HIF and Infrastructure Ground Investigation	Client: London Borough of Enfield	Date: 27/02/2020 - 02/03/2020
Location: Meridian Water, Enfield	Engineer: Ground Technology Services Limited	Co-ords: E536050.11 N192230.19
Project No. : GTS-19-250	Crew Name: AE	Drilling Equipment: Hand tools | Dando 2000

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
GI_DZLV1_BH2073	CP	10.69m AOD	AW | JJ	1:50	Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
		0.00 - 0.10	D					Vegetation over dark brown slightly clayey slightly sandy SILT with occasional gravel and occasional rootlets. Sand is fine and medium. Gravel is subangular to subrounded fine to coarse concrete and flint. [MADE GROUND]
		0.00 - 0.50	B					
		0.50 - 0.60	ES					
		0.80	D		0.80	10.69		
		0.80 - 0.90	ES					Greyish brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse concrete and flint. [MADE GROUND]
		0.80 - 1.20	B					
		1.20 - 1.65	UT	Ublow = 10 Rec. = 100%				
		1.65 - 1.70	D					
		1.70 - 2.15	UT	Ublow = 13 Rec. = 100%	1.80	8.89		Soft orangish brown sandy CLAY with rootlets. Sand is fine and medium. [ALLUVIUM]
		1.80	D					
		1.80 - 1.90	ES		2.20	8.49		Very soft grey mottled brownish grey slightly sandy CLAY with occasional rootlets. Sand is fine and medium. [ALLUVIUM]
		2.15 - 2.20	D					
		2.20	D					
	▼	2.20 - 2.65	UT	Ublow = 15 Rec. = 100%	2.70	7.99		Medium dense greyish brown multicoloured very sandy GRAVEL. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse flint. [KEMPTON PARK GRAVEL FORMATION]
		2.65 - 2.70	D					
		2.70 - 3.00	B					
		3.00 - 3.45	D					
		3.00 - 3.50	B					
		3.00	SPT	N=10 (2,2/2,2,3,3)				
		3.75	EW					
		3.75	EW					
		3.75	EW					
		3.75	EW					
		4.00 - 4.45	D					
		4.00 - 4.50	B					
		4.00	SPT	N=19 (3,4/4,4,5,6)				
		4.80	D		4.80	5.89		Stiff dark grey slightly sandy silty CLAY. Sand is fine and medium. [LONDON CLAY FORMATION]
		4.80 - 5.25	UT	Ublow = 48 Rec. = 100%				
		5.25 - 5.30	D					
		5.30 - 5.75	UT	Ublow = 45 Rec. = 100%				
		5.75 - 5.80	D					
		5.80 - 6.25	D					
		5.80	SPT	N=16 (2,3/3,4,4,5)				
					6.25	4.44		End of Borehole at 6.25m

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation
2.50 6.25	250 200	2.50 5.30	250 200								

Remarks

1. Position CAT scanned prior to digging. 2. Position hand dug to 1.20 m bgl - clear of services. 3. Position cored using 300 mm bit. 4. Water encountered at 2.70 m bgl. 5. Environmental seal installed at 1.30 m to 2.30 m. 6. Borehole terminated at 6.25 m bgl. 7. Dual 50 mm standpipe installation - response zone from 0.5 m to 1.80 mbgl and 3.00 m to 4.50 m with gravel filter pack. 8. Borehole back filled with bentonite.

Deep Borehole Log

Project Name: Meridian Water HIF and Infrastructure Ground Investigation	Client: London Borough of Enfield	Date: 13/02/2020 - 25/02/2020
Location: Meridian Water, Enfield	Contractor: Ground Technology Services Limited	Co-ords: E535994.44 N192145.22
Project No. : GTS-19-250	Crew Name: AE	Drilling Equipment: Beretta T41 | Dando 4000 | Hand tools

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
GI_DZLV1_BH2074	RC	15.91m AOD	AW | JJ	1:25	Sheet 1 of 10

Well	Water Strikes	Sample and In Situ Testing			Coring			Legend	Depth (Level)	Stratum Description
		Depth (m)	Type	Results	TCR	SCR	RQD			
		0.00 - 1.00	B							Brown and light grey slightly clayey silty sandy GRAVEL with occasional fragments of metal plastic and glass. Sand is fine to coarse. Gravel is angular to subangular fine to coarse brick concrete and flint. [MADE GROUND]
		0.50 - 0.60	ES							
		0.50 - 0.60	ES							
		0.50	PID	PID = 0 ppm						
		1.00 - 2.00	B							*1.00 m to 1.50 m occasional soft clay pockets*
		1.50 - 1.60	ES							
		1.50 - 1.60	ES							
		1.50	PID	PID = 0 ppm						
		2.00 - 2.10	D							
		2.50	D						2.50 (15.91)	Brown gravely sandy CLAY. Sand is fine to coarse. Gravel is angular to subangular fine to coarse flint concrete and brick. [MADE GROUND]
		2.50 - 2.60	ES							
		2.50 - 2.60	ES							
		2.50 - 3.00	B							
		2.50	PID	PID = 0 ppm						
		3.00 - 3.45	D							
		3.00 - 3.50	B							
		3.00	SPT	N=4 (1,1/1,1,1,1)						
		3.60	D						3.60 (13.41)	Dark grey and brown gravelly CLAY with rare wood fibres. Gravel is angular to subangular fine and medium flint. [MADE GROUND]
		3.60 - 3.70	ES							
		3.60 - 3.70	ES							
		3.60 - 4.00	B							
		3.60	PID	PID = 0 ppm						
		4.00 - 4.45	D							
		4.00 - 4.50	B							
		4.00	SPT	N=7 (1,1/1,2,2,2)						
		4.50	ES							
		4.50 - 4.60	ES							
		4.50 - 4.95	UT	Ublow = 12 Rec. = 100%						
		4.50	PID	PID = 0 ppm						
		4.95 - 5.00	D							

Hole Diameter		Casing Diameter		Chiselling				Drilling Flush					
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top (m)	Depth Base (m)	Flush Type	Flush Colour	Min (%)	Max (%)

Remarks

1. Position CAT scanned prior to digging. 2. Position hand dug to 1.20 m bgl - clear of services. 3. Position cored using 300 mm bit. 4. Water encountered at 8.30 m bgl. 5. Environmental seal installed at 6.20 m to 7.20 m and 10.20 m to 11.20 m. 6. Borehole terminated at 49.45 m bgl. 7. Single 50 mm standpipe installation - response zone from 44.00 m to 49.00 m bgl with gravel filter pack. 8. Borehole back filled with cement grout and bentonite. 9. Cable percussion drilling to 12.20 with Rotary drilling to base of the borehole.

Deep Borehole Log

Project Name: Meridian Water HIF and Infrastructure Ground Investigation	Client: London Borough of Enfield	Date: 13/02/2020 - 25/02/2020
Location: Meridian Water, Enfield	Contractor: Ground Technology Services Limited	Co-ords: E535994.44 N192145.22
Project No. : GTS-19-250	Crew Name: AE	Drilling Equipment: Beretta T41 | Dando 4000 | Hand tools

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
GI_DZLV1_BH2074	RC	15.91m AOD	AW | JJ	1:25	Sheet 2 of 10

Well	Water Strikes	Sample and In Situ Testing			Coring			Legend	Depth (Level)	Stratum Description
		Depth (m)	Type	Results	TCR	SCR	RQD			
		5.00 - 5.45	UT	Ublow = 26 Rec. = 100%						Dark grey and brown gravelly CLAY with rare wood fibres. Gravel is angular to subangular fine and medium flint. [MADE GROUND]
		5.45 - 5.50	D							
		5.50 - 5.60	ES							
		5.50 - 5.60	ES							
		5.50 - 5.95	UT	Ublow = 28 Rec. = 100%						
		5.50	PID	PID = 0 ppm						
		5.95 - 6.00	D							
		6.00 - 6.45	UT	Ublow = 10 Rec. = 100%						
		6.45 - 6.50	D							
		6.50 - 6.60	ES							
		6.50 - 6.60	ES							
		6.50 - 6.95	UT	Ublow = 16 Rec. = 100%					6.70 (12.31)	
		6.50	PID	PID = 0 ppm						Soft brownish grey mottled greenish grey silty CLAY. [ALLUVIUM]
		6.95	D							
		7.00 - 7.45	UT	Ublow = 25 Rec. = 100%						
		7.45 - 7.50	D							
		7.50 - 7.60	ES							
		7.50 - 7.60	ES							
		7.50 - 7.95	UT	Ublow = 32 Rec. = 100%						
		7.50	PID	PID = 0 ppm					7.80 (9.21)	Soft to firm brown very sandy CLAY. Sand is fine to coarse. [ALLUVIUM]
		7.95 - 8.00	D						8.00 (8.11)	
		8.00 - 8.45	D							Loose multicoloured very clayey very sandy GRAVEL. Sand is fine to coarse. Gravel is subrounded to subangular fine and medium flint. [KEMPTON PARK GRAVEL FORMATION]
		8.00 - 8.50	B							
	▼	8.00	SPT	N=8 (1,1/2,2,2,2)						
		9.50 - 10.00	B							
		9.50 - 9.95	D							
		9.50	SPT	N=11 (1,2/2,2,3,4)						

Hole Diameter		Casing Diameter		Chiselling				Drilling Flush					
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top (m)	Depth Base (m)	Flush Type	Flush Colour	Min (%)	Max (%)
8.00	250	8.00	250										

Remarks

1. Position CAT scanned prior to digging. 2. Position hand dug to 1.20 m bgl - clear of services. 3. Position cored using 300 mm bit. 4. Water encountered at 8.30 m bgl. 5. Environmental seal installed at 6.20 m to 7.20 m and 10.20 m to 11.20 m. 6. Borehole terminated at 49.45 m bgl. 7. Single 50 mm standpipe installation - response zone from 44.00 m to 49.00 m bgl with gravel filter pack. 8. Borehole back filled with cement grout and bentonite. 9. Cable percussion drilling to 12.20 with Rotary drilling to base of the borehole.

Deep Borehole Log

Project Name: Meridian Water HIF and Infrastructure Ground Investigation	Client: London Borough of Enfield	Date: 13/02/2020 - 25/02/2020
Location: Meridian Water, Enfield	Contractor: Ground Technology Services Limited	Co-ords: E535994.44 N192145.22
Project No. : GTS-19-250	Crew Name: AE	Drilling Equipment: Beretta T41 | Dando 4000 | Hand tools

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
GI_DZLV1_BH2074	RC	15.91m AOD	AW | JJ	1:25	Sheet 3 of 10

Well	Water Strikes	Sample and In Situ Testing			Coring			Legend	Depth (Level)	Stratum Description
		Depth (m)	Type	Results	TCR	SCR	RQD			
										Loose multicoloured very clayey very sandy GRAVEL. Sand is fine to coarse. Gravel is subrounded to subangular fine and medium flint. [KEMPTON PARK GRAVEL FORMATION]
		10.70	D						10.70 (7.91)	
		10.70 - 11.15	UT	Ublow = 25 Rec. = 100%						Very stiff brown fissured slightly sandy micaceous CLAY. Sand is fine and medium. Fissures are randomly orientated extremely closely spaced predominantly undulating rough with occasional planar smooth. [LONDON CLAY FORMATION]
		11.15 - 11.20	D							
		11.20 - 11.65	UT	Ublow = 30 Rec. = 100%						
		11.65 - 11.70	D							
		11.70 - 12.15	D							
		11.70 - 12.20	B							
		11.70	SPT	N=19 (2,3/4,4,5,6)						
		12.20 - 13.00	C							
		12.20	PP	PP = 1.9 kg/cm²						
		12.50 - 12.60	ES							
		12.50	PP	PP = 1.6 kg/cm²	100					
		12.50	PID	PID = 0 ppm						
		12.80	PP	PP = 1.5 kg/cm²						
		13.00 - 13.50	B							
		13.00 - 14.50	C							
		13.10	PP	PP = 1.8 kg/cm²						
		13.40	PP	PP = 0.9 kg/cm²						
		13.70	PP	PP = 1.1 kg/cm²	100					
		14.00 - 14.50	D							
		14.00	PP	PP = 1.2 kg/cm²						
		14.30	PP	PP = 1.2 kg/cm²						
		14.50 - 14.95	D							
		14.50 - 16.00	C							
		14.50	SPT	N=18 (2,3/3,4,5,6)						
		14.60	PP	PP = 1.1 kg/cm²						
		14.90	PP	PP = 1.2 kg/cm²						

Hole Diameter		Casing Diameter		Chiselling				Drilling Flush					
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top (m)	Depth Base (m)	Flush Type	Flush Colour	Min (%)	Max (%)
12.20	200	12.20	200										

Remarks

1. Position CAT scanned prior to digging. 2. Position hand dug to 1.20 m bgl - clear of services. 3. Position cored using 300 mm bit. 4. Water encountered at 8.30 m bgl. 5. Environmental seal installed at 6.20 m to 7.20 m and 10.20 m to 11.20 m. 6. Borehole terminated at 49.45 m bgl. 7. Single 50 mm standpipe installation - response zone from 44.00 m to 49.00 m bgl with gravel filter pack. 8. Borehole back filled with cement grout and bentonite. 9. Cable percussion drilling to 12.20 with Rotary drilling to base of the borehole.

Deep Borehole Log

Project Name: Meridian Water HIF and Infrastructure Ground Investigation	Client: London Borough of Enfield	Date: 13/02/2020 - 25/02/2020
Location: Meridian Water, Enfield	Contractor: Ground Technology Services Limited	Co-ords: E535994.44 N192145.22
Project No. : GTS-19-250	Crew Name: AE	Drilling Equipment: Beretta T41 | Dando 4000 | Hand tools

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
GI_DZLV1_BH2074	RC	15.91m AOD	AW | JJ	1:25	Sheet 4 of 10

Well	Water Strikes	Sample and In Situ Testing			Coring			Legend	Depth (Level)	Stratum Description
		Depth (m)	Type	Results	TCR	SCR	RQD			
		15.20	PP	PP = 2.6 kg/cm²						Very stiff brown fissured slightly sandy micaceous CLAY. Sand is fine and medium. Fissures are randomly orientated extremely closely spaced predominantly undulating rough with occasional planar smooth. [LONDON CLAY FORMATION]
		15.50	PP	PP = 2.4 kg/cm²	100					
		15.80	PP	PP = 2.6 kg/cm²						
		16.00 - 16.10	D							
		16.00 - 16.45	D							
		16.00 - 17.50	C							
		16.00	SPT	N=19 (1,3/3,5,5,6)						
		16.10	PP	PP = 2.4 kg/cm²						
		16.40	PP	PP = 2.4 kg/cm²						
		16.70	PP	PP = 2.4 kg/cm²	100					
		17.00 - 17.50	B							
		17.00	PP	PP = 2.5 kg/cm²						
		17.30	PP	PP = 2.5 kg/cm²						
		17.50 - 17.95	D							
		17.50 - 19.00	C							
		17.50	SPT	N=46 (4,7/11,13,11,11)						
		17.60	PP	PP = 2.6 kg/cm²						
		17.90	PP	PP = 2.5 kg/cm²						
		18.20	PP	PP = 2.5 kg/cm²	87					
		18.50	PP	PP = 2.6 kg/cm²						
		18.80	PP	PP = 2.7 kg/cm²						
		18.90 - 19.00	D							
		19.00 - 19.35	D							
		19.00 - 20.50	C							
		19.00	PP	PP = 0.4 kg/cm²						
		19.00	SPT	50 (5,13/50 for 195mm)						
		19.30	PP	PP = 1.2 kg/cm²	100				19.40 (5.21)	Very stiff to hard brownish blue mottled red slightly sandy CLAY. Sand is fine and medium. [LAMBETH GROUP]
		19.60	PP	PP = 2.8 kg/cm²						
		19.70 - 19.80	ES							
		19.70	PID	PID = 0 ppm						
		19.90	PP	PP = 3.0 kg/cm²						
		20.00 - 20.10	D							

Hole Diameter		Casing Diameter		Chiselling				Drilling Flush					
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top (m)	Depth Base (m)	Flush Type	Flush Colour	Min (%)	Max (%)

Remarks

1. Position CAT scanned prior to digging. 2. Position hand dug to 1.20 m bgl - clear of services. 3. Position cored using 300 mm bit. 4. Water encountered at 8.30 m bgl. 5. Environmental seal installed at 6.20 m to 7.20 m and 10.20 m to 11.20 m. 6. Borehole terminated at 49.45 m bgl. 7. Single 50 mm standpipe installation - response zone from 44.00 m to 49.00 m bgl with gravel filter pack. 8. Borehole back filled with cement grout and bentonite. 9. Cable percussion drilling to 12.20 with Rotary drilling to base of the borehole.

Deep Borehole Log

Project Name: Meridian Water HIF and Infrastructure Ground Investigation	Client: London Borough of Enfield	Date: 13/02/2020 - 25/02/2020
Location: Meridian Water, Enfield	Contractor: Ground Technology Services Limited	Co-ords: E535994.44 N192145.22
Project No. : GTS-19-250	Crew Name: AE	Drilling Equipment: Beretta T41 | Dando 4000 | Hand tools

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
GI_DZLV1_BH2074	RC	15.91m AOD	AW | JJ	1:25	Sheet 5 of 10

Well	Water Strikes	Sample and In Situ Testing			Coring			Legend	Depth (Level)	Stratum Description	
		Depth (m)	Type	Results	TCR	SCR	RQD				
		20.10 - 20.50	B							Very stiff to hard brownish blue mottled red slightly sandy CLAY. Sand is fine and medium. [LAMBETH GROUP]	
		20.20	PP	PP = 3.1 kg/cm²							
		20.50 - 20.95	D								
		20.50 - 22.00	C								
		20.50	PP	PP = 2.8 kg/cm²							
		20.50	SPT	N=31 (3,5/6,8,8,9)							
		20.80	PP	PP = 2.7 kg/cm²							
		21.00 - 21.10	D								21
		21.10	PP	PP = 2.6 kg/cm²							
		21.20 - 22.00	B		100						
		21.40	PP	PP = 2.1 kg/cm²							
		21.70	PP	PP = 2.1 kg/cm²							
		22.00 - 22.27	D								22
		22.00 - 23.50	C								
		22.00	PP	PP = 2.0 kg/cm²							
		22.00	SPT	50 (3,8/50 for 122mm)							
		22.30	PP	PP = 2.1 kg/cm²							
		22.60	PP	PP = 2.3 kg/cm²						*22.50 m to 23.35 m becoming very sandy. Sand is fine and medium*	
		22.90 - 23.00	D		100						
		22.90	PP	PP = 2.0 kg/cm²							23
		23.20	PP	PP = 2.6 kg/cm²							
		23.50 - 23.67	D						23.35 (-3.49)	Very dense bluish light green silty SAND. Sand is fine and medium. [LAMBETH GROUP]	
		23.50 - 25.00	C								
		23.50	SPT	50 (8,17/50 for 127mm)							
		24.00 - 25.00	B								24
					100						
		25.00 - 25.38	D						25.00		25

Hole Diameter		Casing Diameter		Chiselling				Drilling Flush					
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top (m)	Depth Base (m)	Flush Type	Flush Colour	Min (%)	Max (%)

Remarks

1. Position CAT scanned prior to digging. 2. Position hand dug to 1.20 m bgl - clear of services. 3. Position cored using 300 mm bit. 4. Water encountered at 8.30 m bgl. 5. Environmental seal installed at 6.20 m to 7.20 m and 10.20 m to 11.20 m. 6. Borehole terminated at 49.45 m bgl. 7. Single 50 mm standpipe installation - response zone from 44.00 m to 49.00 m bgl with gravel filter pack. 8. Borehole back filled with cement grout and bentonite. 9. Cable percussion drilling to 12.20 with Rotary drilling to base of the borehole.

Deep Borehole Log

Project Name: Meridian Water HIF and Infrastructure Ground Investigation	Client: London Borough of Enfield	Date: 13/02/2020 - 25/02/2020
Location: Meridian Water, Enfield	Contractor: Ground Technology Services Limited	Co-ords: E535994.44 N192145.22
Project No. : GTS-19-250	Crew Name: AE	Drilling Equipment: Beretta T41 | Dando 4000 | Hand tools

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
GI_DZLV1_BH2074	RC	15.91m AOD	AW | JJ	1:25	Sheet 6 of 10

Well	Water Strikes	Sample and In Situ Testing			Coring			Legend	Depth (Level)	Stratum Description	
		Depth (m)	Type	Results	TCR	SCR	RQD				
		25.00 - 26.50 25.00	C SPT	50 (4,11/50 for 230mm)					(-7.44)	Very dense dark grey slightly silty SAND. Sand is fine and medium. [THANET SAND FORMATION]	
		25.30 - 25.40 25.30	ES PID	PID = 0 ppm							
					33						
		26.00 - 27.00	B								26
		26.50 - 26.74	D								
		26.50 - 28.00 26.50	C SPT	50 (6,18/50 for 86mm)	60						
		27.00 - 27.10	D								27
					100						
					100						
		28.00 - 28.31	D								28
		28.00 - 29.00	B								
		28.00 - 29.50 28.00	C SPT	50 (2,10/50 for 156mm)							
					100						29
		29.50 - 29.95	D								
		29.50 - 31.00 29.50	C SPT	N=50 (3,5/8,11,13,18)							
		30.00 - 30.10	D								30

Hole Diameter		Casing Diameter		Chiselling				Drilling Flush					
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top (m)	Depth Base (m)	Flush Type	Flush Colour	Min (%)	Max (%)

Remarks

1. Position CAT scanned prior to digging. 2. Position hand dug to 1.20 m bgl - clear of services. 3. Position cored using 300 mm bit. 4. Water encountered at 8.30 m bgl. 5. Environmental seal installed at 6.20 m to 7.20 m and 10.20 m to 11.20 m. 6. Borehole terminated at 49.45 m bgl. 7. Single 50 mm standpipe installation - response zone from 44.00 m to 49.00 m bgl with gravel filter pack. 8. Borehole back filled with cement grout and bentonite. 9. Cable percussion drilling to 12.20 with Rotary drilling to base of the borehole.

Deep Borehole Log

Project Name: Meridian Water HIF and Infrastructure Ground Investigation	Client: London Borough of Enfield	Date: 13/02/2020 - 25/02/2020
Location: Meridian Water, Enfield	Contractor: Ground Technology Services Limited	Co-ords: E535994.44 N192145.22
Project No. : GTS-19-250	Crew Name: AE	Drilling Equipment: Beretta T41 | Dando 4000 | Hand tools

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
GI_DZLV1_BH2074	RC	15.91m AOD	AW | JJ	1:25	Sheet 7 of 10

Well	Water Strikes	Sample and In Situ Testing			Coring			Legend	Depth (Level)	Stratum Description
		Depth (m)	Type	Results	TCR	SCR	RQD			
					100					Very dense dark grey slightly silty SAND. Sand is fine and medium. [THANET SAND FORMATION]
		31.00 - 31.45 31.00 - 32.50 31.00	D C SPT	N=53 (2,4/9,11,14,19)	73				31	
		32.50 - 32.91 32.50 - 34.00 32.50	D C SPT	N=50 (3,5/50 for 255mm)	0				32	
		33.00 - 33.10	D		100				33	
		34.00 - 34.24 34.00 - 35.00 34.00 - 35.50 34.00	D B C SPT	50 (4,7/50 for 90mm)	100				34	
					100				35	

Hole Diameter		Casing Diameter		Chiselling				Drilling Flush					
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top (m)	Depth Base (m)	Flush Type	Flush Colour	Min (%)	Max (%)

Remarks

1. Position CAT scanned prior to digging. 2. Position hand dug to 1.20 m bgl - clear of services. 3. Position cored using 300 mm bit. 4. Water encountered at 8.30 m bgl. 5. Environmental seal installed at 6.20 m to 7.20 m and 10.20 m to 11.20 m. 6. Borehole terminated at 49.45 m bgl. 7. Single 50 mm standpipe installation - response zone from 44.00 m to 49.00 m bgl with gravel filter pack. 8. Borehole back filled with cement grout and bentonite. 9. Cable percussion drilling to 12.20 with Rotary drilling to base of the borehole.

Deep Borehole Log

Project Name: Meridian Water HIF and Infrastructure Ground Investigation	Client: London Borough of Enfield	Date: 13/02/2020 - 25/02/2020
Location: Meridian Water, Enfield	Contractor: Ground Technology Services Limited	Co-ords: E535994.44 N192145.22
Project No. : GTS-19-250	Crew Name: AE	Drilling Equipment: Beretta T41 | Dando 4000 | Hand tools

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
GI_DZLV1_BH2074	RC	15.91m AOD	AW | JJ	1:25	Sheet 8 of 10

Well	Water Strikes	Sample and In Situ Testing			Coring			Legend	Depth (Level)	Stratum Description	
		Depth (m)	Type	Results	TCR	SCR	RQD				
					100					Very dense dark grey slightly silty SAND. Sand is fine and medium. [THANET SAND FORMATION]	
		35.50 - 35.73	D								
		35.50 - 37.00	C								
		35.50	SPT	50 (4,12/50 for 82mm)							
		36.00 - 36.10	D		100						36
		37.00 - 37.25	D								37
		37.00 - 37.50	B								
		37.00 - 38.50	C								
		37.00	SPT	50 (4,11/50 for 95mm)							
		38.00 - 38.10	D		100						38
		38.50 - 38.80	D								
		38.50 - 40.00	C								
		38.50	SPT	50 (4,10/50 for 151mm)							
		39.00 - 39.10	D		100						39
		40.00 - 40.29	D								40

Hole Diameter		Casing Diameter		Chiselling				Drilling Flush					
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top (m)	Depth Base (m)	Flush Type	Flush Colour	Min (%)	Max (%)

Remarks

1. Position CAT scanned prior to digging. 2. Position hand dug to 1.20 m bgl - clear of services. 3. Position cored using 300 mm bit. 4. Water encountered at 8.30 m bgl. 5. Environmental seal installed at 6.20 m to 7.20 m and 10.20 m to 11.20 m. 6. Borehole terminated at 49.45 m bgl. 7. Single 50 mm standpipe installation - response zone from 44.00 m to 49.00 m bgl with gravel filter pack. 8. Borehole back filled with cement grout and bentonite. 9. Cable percussion drilling to 12.20 with Rotary drilling to base of the borehole.

Deep Borehole Log

Project Name: Meridian Water HIF and Infrastructure Ground Investigation	Client: London Borough of Enfield	Date: 13/02/2020 - 25/02/2020
Location: Meridian Water, Enfield	Contractor: Ground Technology Services Limited	Co-ords: E535994.44 N192145.22
Project No. : GTS-19-250	Crew Name: AE	Drilling Equipment: Beretta T41 | Dando 4000 | Hand tools

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
GI_DZLV1_BH2074	RC	15.91m AOD	AW | JJ	1:25	Sheet 9 of 10

Well	Water Strikes	Sample and In Situ Testing			Coring			Legend	Depth (Level)	Stratum Description	
		Depth (m)	Type	Results	TCR	SCR	RQD				
		40.00 - 41.50 40.00	C SPT	50 (2,6/50 for 135mm)	100					Very dense dark grey slightly silty SAND. Sand is fine and medium. [THANET SAND FORMATION]	
		41.00 - 41.10	D								41
		41.50 - 41.85 41.50 - 43.00 41.50	D C SPT	48 (3,10/48 for 202mm)							
		42.00 - 42.50	B		100						42
		43.00 - 43.38 43.00 - 44.50 43.00 43.30 - 43.40 43.30	D C SPT ES PID	50 (4,10/50 for 230mm) PID = 0 ppm	100	87	87		43.00 (-9.09)	Weak, medium density, off white CHALK. Fractures are medium spaced, sub horizontal to vertical tight planar rough clean. (CIRIA Grade A?2). [WHITE CHALK GROUP - UNDIFFERENTIATED]	43
		44.00 - 44.50	B								44
		44.50 - 44.95 44.50 - 46.00 44.50	D C SPT	N=31 (3,5/6,8,8,9)							
		45.00 - 45.10	D								45

Hole Diameter		Casing Diameter		Chiselling				Drilling Flush					
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top (m)	Depth Base (m)	Flush Type	Flush Colour	Min (%)	Max (%)
								12.20	43.00	Water	Grey	100	100

Remarks

1. Position CAT scanned prior to digging. 2. Position hand dug to 1.20 m bgl - clear of services. 3. Position cored using 300 mm bit. 4. Water encountered at 8.30 m bgl. 5. Environmental seal installed at 6.20 m to 7.20 m and 10.20 m to 11.20 m. 6. Borehole terminated at 49.45 m bgl. 7. Single 50 mm standpipe installation - response zone from 44.00 m to 49.00 m bgl with gravel filter pack. 8. Borehole back filled with cement grout and bentonite. 9. Cable percussion drilling to 12.20 with Rotary drilling to base of the borehole.

Deep Borehole Log

Project Name: Meridian Water HIF and Infrastructure Ground Investigation	Client: London Borough of Enfield	Date: 13/02/2020 - 25/02/2020
Location: Meridian Water, Enfield	Contractor: Ground Technology Services Limited	Co-ords: E535994.44 N192145.22
Project No. : GTS-19-250	Crew Name: AE	Drilling Equipment: Beretta T41 | Dando 4000 | Hand tools

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
GI_DZLV1_BH2074	RC	15.91m AOD	AW | JJ	1:25	Sheet 10 of 10

Well	Water Strikes	Sample and In Situ Testing			Coring			Legend	Depth (Level)	Stratum Description
		Depth (m)	Type	Results	TCR	SCR	RQD			
					100	96	96			Weak, medium density, off white CHALK. Fractures are medium spaced, sub horizontal to vertical tight planar rough clean. (CIRIA Grade A?2). [WHITE CHALK GROUP - UNDIFFERENTIATED]
		46.00	EW							
		46.00 - 46.45	D							
		46.00 - 47.50	C							
		46.00	SPT	N=33 (4,6/6,8,8,11)						
		46.50	EW							
					100	73	73			
		47.50 - 47.89	D							
		47.50 - 49.00	C							
		47.50	SPT	50 (5,7/50 for 235mm)						
					100	53	53			
		49.00 - 49.45	D							
		49.00	SPT	N=40 (5,8/8,10,10,12)						
									49.45 (-27.09)	End of Borehole at 49.45m

Hole Diameter		Casing Diameter		Chiselling				Drilling Flush					
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top (m)	Depth Base (m)	Flush Type	Flush Colour	Min (%)	Max (%)
49.00	146							43.00	47.50	Water	No return	0	0
								47.50	49.00	Water	White	30	30

Remarks

1. Position CAT scanned prior to digging. 2. Position hand dug to 1.20 m bgl - clear of services. 3. Position cored using 300 mm bit. 4. Water encountered at 8.30 m bgl. 5. Environmental seal installed at 6.20 m to 7.20 m and 10.20 m to 11.20 m. 6. Borehole terminated at 49.45 m bgl. 7. Single 50 mm standpipe installation - response zone from 44.00 m to 49.00 m bgl with gravel filter pack. 8. Borehole back filled with cement grout and bentonite. 9. Cable percussion drilling to 12.20 with Rotary drilling to base of the borehole.

Shallow Borehole Log

Project Name: Meridian Water HIF and Infrastructure Ground Investigation	Client: London Borough of Enfield	Date: 28/01/2020 - 04/02/2020
Location: Meridian Water, Enfield	Engineer: Ground Technology Services Limited	Co-ords: E536068.97 N192015.95
Project No. : GTS-19-250	Crew Name: MS	Drilling Equipment: Hand Tools | Dando 2000

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
GI_DZLV1_BH2076	WS	11.80m AOD	JJ	1:25	Sheet 1 of 2

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description	
		0.15 - 0.33	B		0.18	11.80		Strong light grey CONCRETE. 10-20 % aggregate of subrounded to subrounded fine to medium flint gravel. 10-20 % small voids. [MADE GROUND]	
		0.20	D						
		0.20 - 0.30	ES		0.33	11.62		Yellowish brown sandy clayey GRAVEL with some cobble content. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse of concrete brick and flint. Cobble is angular and subangular of concrete. [MADE GROUND]	
		0.20	PID	PID = 0 ppm					
		0.30 - 0.80	B						
		0.40 - 0.50	ES						
		0.40	PID	PID = 0 ppm					
		0.50	D						
		0.80 - 1.20	B					Soft dark grey slightly sandy gravelly silty CLAY with low cobble content. Sand is medium. Gravel is angular to subrounded medium to coarse of concrete brick and flint. Cobble is angular to subangular of concrete [MADE GROUND]	
		0.90 - 1.00	ES						
		0.90	PID	PID = 0 ppm					
		1.00	D						1
		1.20	cSPT	N=3 (1,0/1,1,0,1)					
		1.65	D		1.90	11.47			
		2.00 - 2.45	UT	Ublow = 19 Rec. = 100%				Soft silty slightly gravelly CLAY with bands of soft light grey sandy clay with shell fragments. Sand is fine to medium. Gravel is subrounded to rounded fine to medium of flint. [ALLUVIUM]	2
		2.45	D						
		2.70 - 3.00	B						
		3.00 - 3.45	UT	Ublow = 18 Rec. = 100%					3
		3.45	D						
		3.70 - 3.80	B						
		3.70 - 3.80	B		3.80	9.90			
		3.80 - 4.00	B					Soft dark brown and black silty pseudo-fibrous PEAT. [ALLUVIUM]	
		4.00 - 4.45	UT	Ublow = 19 Rec. = 100%					4
		4.45	D		4.50	8.00			
								Medium dense grey sandy GRAVEL. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse flint. [KEMPTON PARK GRAVEL FORMATION]	
	▼	5.00	cSPT	N=19 (2,4/4,5,5,5)					5

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation
5.00	250	5.00	250								

Remarks

1. Position cored and inspection pit dug to 1.20 m using hand tools - position clear of services. 2. Hole advanced to 8.00 m using cable percussive drilling techniques 3. Environmental seal installed from 4.00 m to 5.00 m. 4. Dual install with 50 mm pipe. Response zones from 2.00 m to 3.50 m and 5.00 m to 7.70 m.

Shallow Borehole Log

Project Name: Meridian Water HIF and Infrastructure Ground Investigation	Client: London Borough of Enfield	Date: 28/01/2020 - 04/02/2020
Location: Meridian Water, Enfield	Engineer: Ground Technology Services Limited	Co-ords: E536068.97 N192015.95
Project No. : GTS-19-250	Crew Name: MS	Drilling Equipment: Hand Tools | Dando 2000

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
GI_DZLV1_BH2076	WS	11.80m AOD	JJ	1:25	Sheet 2 of 2

Well	Water Strikes	Sample and In Situ Testing Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
		5.45	D					Medium dense grey sandy GRAVEL. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse flint. [KEMPTON PARK GRAVEL FORMATION]
		5.60 - 6.00	B					
		6.00	cSPT	N=22 (5,6/5,6,6,5)				
		6.35	EW					
		6.45	D					
		7.00	cSPT	N=23 (6,5/5,6,6,6)				
		7.45	D					
		7.70	EW		7.70	7.30		
		7.70 - 8.00	B					Firm to stiff brownish grey fissured CLAY. Fissures are randomly orientated extremely closely spaced predominantly undulating rough with occasional planar smooth. [LONDON CLAY FORMATION]
		8.00 - 8.45	UT	Ublow = 28 Rec. = 100%				
		8.45	D					
		8.50 - 8.95	UT	Ublow = 29 Rec. = 100%				
		8.95 - 9.40	D					
		8.95	SPT	N=21 (4,5/5,5,5,6)				
					9.40	4.10		End of Borehole at 9.40m

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation
9.40	200	8.00	200								

Remarks

1. Position cored and inspection pit dug to 1.20 m using hand tools - position clear of services. 2. Hole advanced to 8.00 m using cable percussive drilling techniques 3. Environmental seal installed from 4.00 m to 5.00 m. 4. Dual install with 50 mm pipe. Response zones from 2.00 m to 3.50 m and 5.00 m to 7.70 m.

Deep Borehole Log

Project Name: Meridian Water HIF and Infrastructure Ground Investigation	Client: London Borough of Enfield	Date: 10/02/2020 - 05/03/2020
Location: Meridian Water, Enfield	Contractor: Ground Technology Services Limited	Co-ords: E536079.63 N191985.60
Project No. : GTS-19-250	Crew Name: AR+MS	Drilling Equipment: Fraste PLG | Hand tools | Dando 2000

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
GI_DZLV1_BH2077	RC	11.90m AOD	AW | JJ	1:25	Sheet 1 of 8

Well	Water Strikes	Sample and In Situ Testing Depth (m)	Type	Results	Coring TCR	SCR	RQD	Legend	Depth (Level)	Stratum Description
		0.31 - 0.85	B						0.31 (11.90)	Strong light grey CONCRETE. 45-55 % aggregate subangular to subrounded fine and medium flint gravel. 10 % small voids. [MADE GROUND]
		0.40 - 0.50	ES							Brown sandy GRAVEL. Sand is fine to coarse. Gravel is angular to subangular fine to coarse concrete brick and flint. [MADE GROUND]
		0.50	D							
		0.50	ES							
		0.50	PID	PID = 0 ppm						
		0.85 - 1.20	B						0.85 (11.59)	Grey silty slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subrounded to rounded fine to coarse flint brick and concrete. [MADE GROUND]
		0.90 - 1.00	ES							
		0.90	PID	PID = 0 ppm						
		1.00	D							
		1.20 - 1.65	D							
		1.20	cSPT	N=2 (1,0/1,0,1,0)						
		1.50 - 1.60	ES							
		1.50	PID	PID = 2 ppm						
		1.60	D						1.60 (11.05)	Low strength, stiff slightly sandy slightly gravelly CLAY with occasional organic debris. Sand is fine and medium. Gravel is subrounded to rounded fine and medium flint. [ALLUVIUM]
		1.60 - 2.00	B							
		2.00 - 2.45	UT	Ublow = 12 Rec. = 100%						
		2.45	D							
		2.75	EW							
		3.00 - 3.45	UT	Ublow = 15 Rec. = 100%						
		3.45	D							
		4.00 - 4.45	UT	Ublow = 9 Rec. = 100%						
		4.40 - 4.60	B							
		4.45	D							
		4.60 - 5.00	B							
		5.00	SPT	N=13 (2,3/3,3,3,4)					4.90 (10.30)	Medium dense multicoloured sandy GRAVEL.

Hole Diameter		Casing Diameter		Chiselling				Drilling Flush					
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top (m)	Depth Base (m)	Flush Type	Flush Colour	Min (%)	Max (%)
2.00	250	2.00	250										

Remarks

1. Position CAT scanned prior to digging. 2. Position hand dug to 1.20 m bgl - clear of services. 3. Position cored using 300 mm bit. 4. Water encountered at 2.80 m bgl. 5. Environmental seal installed at 1.10 m to 2.10 m and 5.70 m to 6.70 m. 6. Borehole terminated at 35.27 m bgl. 7. Dual 50 mm standpipe installation - response zone from 1.50 m to 4.00 m, and 5.00 m to 6.50 m bgl with gravel filter pack. 9. Borehole back filled with cement grout and bentonite. 10. Cable percussion drilling to 7.45 with Rotary drilling to base of the borehole.

Deep Borehole Log

Project Name: Meridian Water HIF and Infrastructure Ground Investigation		Client: London Borough of Enfield	Date: 10/02/2020 - 05/03/2020
Location: Meridian Water, Enfield		Contractor: Ground Technology Services Limited	Co-ords: E536079.63 N191985.60
Project No. : GTS-19-250		Crew Name: AR+MS	Drilling Equipment: Fraste PLG | Hand tools | Dando 2000
Borehole Number: **GI_DZLV1_BH2077**	Hole Type: RC	Level: 11.90m AOD	Logged By: AW | JJ
Scale: 1:25	Page Number: Sheet 2 of 8		

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Coring: TCR	SCR	RQD	Legend	Depth (Level)	Stratum Description
		5.45	D							Medium dense multicoloured sandy GRAVEL. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse flint. [KEMPTON PARK GRAVEL FORMATION]
		5.75	EW							
		6.00	SPT	N=14 (3,4/3,4,4,3)						
		6.20 - 6.50	B						6.20 (7.00)	
		6.45	D							High strength, very stiff brown fissured slightly gravelly slightly sandy micaceous CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine and medium flint. Fissures are randomly orientated extremely closely spaced predominantly undulating rough with occasional planar smooth. [LONDON CLAY FORMATION]
		6.50 - 6.95	UT	Ublow = 24 Rec. = 100%						
		6.50 - 8.00	B							
		6.50 - 8.00	C							
		6.80	ES							
		6.80	PID	PID = 0 ppm						
		6.95	D							
		7.00 - 7.45	UT	Ublow = 26 Rec. = 100%						
		7.10	PP	PP = 2.6 kg/cm²						
		7.10	PP	PP = 2.6 kg/cm²	77					
		7.45	D							
		7.45	SPT	N=16 (3,3/4,4,4,4)						
		7.60	PP	PP = 2.6 kg/cm²						
		7.60	PP	PP = 2.6 kg/cm²						
		7.90	PP	PP = 2.4 kg/cm²						
		7.90	PP	PP = 2.4 kg/cm²						
		8.00 - 8.50	D							
		8.00 - 9.50	C							
		8.00	SPT	N=7 (1,2/1,2,2,2)						
		8.20	PP	PP = 2.6 kg/cm²						
		8.20	PP	PP = 2.6 kg/cm²						
		8.50 - 8.60	D							
		8.60	PP	PP = 2.7 kg/cm²						
		8.60	PP	PP = 2.7 kg/cm²	100					
		9.00	PP	PP = 2.6 kg/cm²						
		9.00	PP	PP = 2.6 kg/cm²						
		9.50 - 10.02	D							*9.50 m rare subrounded gravel. Gravel is fine and medium*
		9.50 - 11.00	B							
		9.50 - 11.00	C							
		9.50	PP	PP = 2.6 kg/cm²						
		9.50	PP	PP = 2.6 kg/cm²						
		9.50	SPT	N=10 (1,2/2,2,2,4)						

Hole Diameter: Depth Base	Hole Diameter: Diameter	Casing Diameter: Depth Base	Casing Diameter: Diameter
		7.00	200

Chiselling: Depth Top	Depth Base	Duration	Tool

Drilling Flush: Depth Top (m)	Depth Base (m)	Flush Type	Flush Colour	Min (%)	Max (%)

Remarks

1. Position CAT scanned prior to digging. 2. Position hand dug to 1.20 m bgl - clear of services. 3. Position cored using 300 mm bit. 4. Water encountered at 2.80 m bgl. 5. Environmental seal installed at 1.10 m to 2.10 m and 5.70 m to 6.70 m. 6. Borehole terminated at 35.27 m bgl. 7. Dual 50 mm standpipe installation - response zone from 1.50 m to 4.00 m, and 5.00 m to 6.50 m bgl with gravel filter pack. 9. Borehole back filled with cement grout and bentonite. 10. Cable percussion drilling to 7.45 with Rotary drilling to base of the borehole.

Deep Borehole Log

Project Name: Meridian Water HIF and Infrastructure Ground Investigation	Client: London Borough of Enfield	Date: 10/02/2020 - 05/03/2020
Location: Meridian Water, Enfield	Contractor: Ground Technology Services Limited	Co-ords: E536079.63 N191985.60
Project No. : GTS-19-250	Crew Name: AR+MS	Drilling Equipment: Fraste PLG | Hand tools | Dando 2000

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
GI_DZLV1_BH2077	RC	11.90m AOD	AW | JJ	1:25	Sheet 3 of 8

Well	Water Strikes	Sample and In Situ Testing			Coring			Legend	Depth (Level)	Stratum Description
		Depth (m)	Type	Results	TCR	SCR	RQD			
					93					High strength, very stiff brown fissured slightly gravelly slightly sandy micaceous CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine and medium flint. Fissures are randomly orientated extremely closely spaced predominantly undulating rough with occasional planar smooth. [LONDON CLAY FORMATION]
		11.00 - 11.52	D						11	
		11.00 - 12.50	C							
		11.00	SPT	N=13 (2,2/2,3,4,4)						
					100				12	
		12.50 - 12.95	D							
		12.50 - 14.00	C							
		12.50	PP	PP = 1.6 kg/cm²						
		12.50	SPT	N=14 (2,2/3,3,4,4)						
		12.80	PP	PP = 1.5 kg/cm²						
		13.00 - 13.50	B						13	
		13.10	PP	PP = 1.8 kg/cm²						
					100					
		13.40	PP	PP = 0.9 kg/cm²						
		13.70	PP	PP = 1.1 kg/cm²						
		14.00 - 14.52	D						14	
		14.00 - 15.50	C							
		14.00	PP	PP = 1.2 kg/cm²						
		14.00	SPT	N=22 (3,5/5,5,6,6)						
		14.30	PP	PP = 1.2 kg/cm²						
					100					
		14.60	PP	PP = 1.1 kg/cm²						
		14.90	PP	PP = 1.2 kg/cm²						
		15.00 - 15.10	D						15	

Hole Diameter		Casing Diameter		Chiselling				Drilling Flush					
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top (m)	Depth Base (m)	Flush Type	Flush Colour	Min (%)	Max (%)
								6.50	14.00	Water	Grey	80	80

Remarks

1. Position CAT scanned prior to digging. 2. Position hand dug to 1.20 m bgl - clear of services. 3. Position cored using 300 mm bit. 4. Water encountered at 2.80 m bgl. 5. Environmental seal installed at 1.10 m to 2.10 m and 5.70 m to 6.70 m. 6. Borehole terminated at 35.27 m bgl. 7. Dual 50 mm standpipe installation - response zone from 1.50 m to 4.00 m, and 5.00 m to 6.50 m bgl with gravel filter pack. 9. Borehole back filled with cement grout and bentonite. 10. Cable percussion drilling to 7.45 with Rotary drilling to base of the borehole.

Deep Borehole Log

Project Name: Meridian Water HIF and Infrastructure Ground Investigation	Client: London Borough of Enfield	Date: 10/02/2020 - 05/03/2020
Location: Meridian Water, Enfield	Contractor: Ground Technology Services Limited	Co-ords: E536079.63 N191985.60
Project No. : GTS-19-250	Crew Name: AR+MS	Drilling Equipment: Fraste PLG | Hand tools | Dando 2000

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
GI_DZLV1_BH2077	RC	11.90m AOD	AW | JJ	1:25	Sheet 4 of 8

Well	Water Strikes	Sample and In Situ Testing			Coring			Legend	Depth (Level)	Stratum Description
		Depth (m)	Type	Results	TCR	SCR	RQD			
		15.10	PP	PP = 2.6 kg/cm²						High strength, very stiff brown fissured slightly gravelly slightly sandy micaceous CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine and medium flint. Fissures are randomly orientated extremely closely spaced predominantly undulating rough with occasional planar smooth. [LONDON CLAY FORMATION]
		15.40	PP	PP = 2.4 kg/cm²						
		15.50 - 15.95	D							
		15.50 - 17.00	C							
		15.50	SPT	N=22 (2,3/3,5,7,7)						
		15.70	PP	PP = 2.6 kg/cm²						
		16.00 - 16.50	B							
		16.00	PP	PP = 2.4 kg/cm²						
		16.30	PP	PP = 2.4 kg/cm²	100					
		16.60	PP	PP = 2.4 kg/cm²						
		16.90	PP	PP = 2.5 kg/cm²						
		17.00 - 17.42	D							
		17.00 - 18.50	C							
		17.00	SPT	N=52 (7,8/52 for 250mm)						
		17.10	PP	PP = 2.5 kg/cm²						
		17.40	PP	PP = 2.6 kg/cm²						
		17.50 - 17.60	D						17.50 (5.70)	Very high strength, very stiff brown fissured slightly sandy CLAY. Sand is fine. [LONDON CLAY FORMATION]
		17.70	PP	PP = 2.5 kg/cm²	100					
		18.00 - 18.10	D							
		18.00	PP	PP = 2.5 kg/cm²						
		18.30 - 18.50	CS							
		18.30	PP	PP = 2.6 kg/cm²						
		18.50 - 18.95	D						18.50 (-5.60)	Very stiff bluish light grey mottled orangish red slightly sandy silty CLAY. Sand is fine and medium. [LAMBETH GROUP]
		18.50 - 20.00	C							
		18.50	PP	PP = 1.0 kg/cm²						
		18.50	SPT	N=26 (3,4/5,6,8,7)						
		18.80 - 18.90	ES							
		18.80	PP	PP = 1.1 kg/cm²						
		18.80	PID	PID = 0 ppm						
		19.00 - 19.50	B							
		19.10	PP	PP = 1.5 kg/cm²	100					
		19.40	PP	PP = 2.2 kg/cm²						
		19.70	PP	PP = 1.4 kg/cm²						
		20.00 - 20.45	D							

Hole Diameter		Casing Diameter		Chiselling				Drilling Flush					
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top (m)	Depth Base (m)	Flush Type	Flush Colour	Min (%)	Max (%)
								14.00	17.00	Water	Grey	70	70

Remarks

1. Position CAT scanned prior to digging. 2. Position hand dug to 1.20 m bgl - clear of services. 3. Position cored using 300 mm bit. 4. Water encountered at 2.80 m bgl. 5. Environmental seal installed at 1.10 m to 2.10 m and 5.70 m to 6.70 m. 6. Borehole terminated at 35.27 m bgl. 7. Dual 50 mm standpipe installation - response zone from 1.50 m to 4.00 m, and 5.00 m to 6.50 m bgl with gravel filter pack. 9. Borehole back filled with cement grout and bentonite. 10. Cable percussion drilling to 7.45 with Rotary drilling to base of the borehole.

Deep Borehole Log

Project Name: Meridian Water HIF and Infrastructure Ground Investigation		Client: London Borough of Enfield	Date: 10/02/2020 - 05/03/2020
Location: Meridian Water, Enfield		Contractor: Ground Technology Services Limited	Co-ords: E536079.63 N191985.60
Project No. : GTS-19-250		Crew Name: AR+MS	Drilling Equipment: Fraste PLG | Hand tools | Dando 2000
Borehole Number: **GI_DZLV1_BH2077**	Hole Type: RC	Level: 11.90m AOD	Logged By: AW | JJ
Scale: 1:25	Page Number: Sheet 5 of 8		

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Coring: TCR	SCR	RQD	Legend	Depth (Level)	Stratum Description	
		20.00 - 21.50	C							Very stiff bluish light grey mottled orangish red slightly sandy silty CLAY. Sand is fine and medium. [LAMBETH GROUP]	
		20.00	PP	PP = 1.1 kg/cm²							
		20.00	SPT	N=24 (4,5/5,6,6,7)							
		20.30	PP	PP = 1.8 kg/cm²							
		20.60	PP	PP = 0.9 kg/cm²	100						
		20.90	PP	PP = 1.1 kg/cm²							
		21.00 - 21.10	D								21
		21.20	PP	PP = 1.2 kg/cm²							
		21.50 - 21.86	D								
		21.50 - 23.00	C								
		21.50	PP	PP = 1.2 kg/cm²							
		21.50	SPT	50 (6,8/50 for 205mm)							
		21.80	PP	PP = 1.1 kg/cm²							
		22.00 - 22.10	D								22
		22.10	PP	PP = 1.2 kg/cm²							
		22.40	PP	PP = 2.6 kg/cm²	100						
		22.70	PP	PP = 2.4 kg/cm²							
		23.00 - 23.36	D						23.00 (-6.60)		23
		23.00 - 24.50	C							Very dense slightly silty SAND. Sand is fine and medium. [THANET SAND FORMATION]	
		23.00	PP	PP = 2.6 kg/cm²							
		23.00	SPT	50 (5,5/50 for 280mm)							
		23.30 - 23.40	ES								
		23.30	PP	PP = 2.4 kg/cm²							
		23.30	PID	PID = 0 ppm							
		23.60	PP	PP = 2.4 kg/cm²	67						
		23.90	PP	PP = 2.6 kg/cm²							
		24.00 - 24.50	B								24
		24.20	PP	PP = 2.4 kg/cm²							
		24.50 - 24.85	D								
		24.50 - 26.00	C								
		24.50	PP	PP = 2.6 kg/cm²							
		24.50	SPT	50 (4,7/50 for 200mm)							
		24.80	PP	PP = 2.4 kg/cm²							
		25.00 - 25.10	D								25

Hole Diameter: Depth Base	Hole Diameter: Diameter	Casing Diameter: Depth Base	Casing Diameter: Diameter

Chiselling: Depth Top	Depth Base	Duration	Tool

Drilling Flush: Depth Top (m)	Depth Base (m)	Flush Type	Flush Colour	Min (%)	Max (%)
17.00	21.50	Water	Grey	80	80
21.50	24.00	Water	Grey	70	70
23.00	24.50	Water	Grey	85	85

Remarks

1. Position CAT scanned prior to digging. 2. Position hand dug to 1.20 m bgl - clear of services. 3. Position cored using 300 mm bit. 4. Water encountered at 2.80 m bgl. 5. Environmental seal installed at 1.10 m to 2.10 m and 5.70 m to 6.70 m. 6. Borehole terminated at 35.27 m bgl. 7. Dual 50 mm standpipe installation - response zone from 1.50 m to 4.00 m, and 5.00 m to 6.50 m bgl with gravel filter pack. 9. Borehole back filled with cement grout and bentonite. 10. Cable percussion drilling to 7.45 with Rotary drilling to base of the borehole.

Deep Borehole Log

Project Name: Meridian Water HIF and Infrastructure Ground Investigation	Client: London Borough of Enfield	Date: 10/02/2020 - 05/03/2020
Location: Meridian Water, Enfield	Contractor: Ground Technology Services Limited	Co-ords: E536079.63 N191985.60
Project No. : GTS-19-250	Crew Name: AR+MS	Drilling Equipment: Fraste PLG | Hand tools | Dando 2000

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
GI_DZLV1_BH2077	RC	11.90m AOD	AW | JJ	1:25	Sheet 6 of 8

Well	Water Strikes	Sample and In Situ Testing			Coring			Legend	Depth (Level)	Stratum Description	
		Depth (m)	Type	Results	TCR	SCR	RQD				
		25.10	PP	PP = 2.4 kg/cm²						Very dense slightly silty SAND. Sand is fine and medium. [THANET SAND FORMATION]	
		25.40	PP	PP = 2.4 kg/cm²	40						
		25.70	PP	PP = 2.5 kg/cm²							
		26.00 - 26.45 26.00 - 27.50 26.00	D C SPT	N=36 (5,6/5,9,10,12)	100						26
		27.00 - 27.10	D		100						27
		27.50 - 27.95 27.50 - 29.00 27.50	D C SPT	N=32 (4,5/6,8,9,9)							
		28.00 - 28.10	D		53						28
		29.00 - 29.45 29.00 - 29.50 29.00 - 30.50 29.00	D B C SPT	N=44 (5,6/6,8,15,15)	80						29
											30

Hole Diameter		Casing Diameter		Chiselling				Drilling Flush					
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top (m)	Depth Base (m)	Flush Type	Flush Colour	Min (%)	Max (%)
								24.50	27.50	Water	Grey	80	80

Remarks

1. Position CAT scanned prior to digging. 2. Position hand dug to 1.20 m bgl - clear of services. 3. Position cored using 300 mm bit. 4. Water encountered at 2.80 m bgl. 5. Environmental seal installed at 1.10 m to 2.10 m and 5.70 m to 6.70 m. 6. Borehole terminated at 35.27 m bgl. 7. Dual 50 mm standpipe installation - response zone from 1.50 m to 4.00 m, and 5.00 m to 6.50 m bgl with gravel filter pack. 9. Borehole back filled with cement grout and bentonite. 10. Cable percussion drilling to 7.45 with Rotary drilling to base of the borehole.

Deep Borehole Log

Project Name: Meridian Water HIF and Infrastructure Ground Investigation	Client: London Borough of Enfield	Date: 10/02/2020 - 05/03/2020
Location: Meridian Water, Enfield	Contractor: Ground Technology Services Limited	Co-ords: E536079.63 N191985.60
Project No. : GTS-19-250	Crew Name: AR+MS	Drilling Equipment: Fraste PLG | Hand tools | Dando 2000

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
GI_DZLV1_BH2077	RC	11.90m AOD	AW | JJ	1:25	Sheet 7 of 8

Well	Water Strikes	Sample and In Situ Testing			Coring			Legend	Depth (Level)	Stratum Description
		Depth (m)	Type	Results	TCR	SCR	RQD			
		30.50 - 30.86	D							Very dense slightly silty SAND. Sand is fine and medium. [THANET SAND FORMATION]
		30.50 - 32.00 30.50	C SPT	50 (6,13/50 for 210mm)						
		31.00 - 31.10	D		73					31
		32.00 - 32.30	D							32
		32.00 - 33.50 32.00	C SPT	N=50 (6,14/50 for 150mm)	0					33
		33.50 - 33.82	D							
		33.50 - 34.25 33.50	C SPT	N=50 (6,18/50 for 170mm)	67					
		34.00 - 34.10	D							34
		34.25 - 35.00	C		93					
		35.00 - 35.27	D							35

Hole Diameter		Casing Diameter		Chiselling				Drilling Flush					
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top (m)	Depth Base (m)	Flush Type	Flush Colour	Min (%)	Max (%)
35.00	146							27.50	30.50	Water	Grey	60	60
								30.50	33.50	Water	Grey	20	20
								33.50	34.25	Water	Grey	30	30
								34.25	35.00	Water	Grey	10	10

Remarks

1. Position CAT scanned prior to digging. 2. Position hand dug to 1.20 m bgl - clear of services. 3. Position cored using 300 mm bit. 4. Water encountered at 2.80 m bgl. 5. Environmental seal installed at 1.10 m to 2.10 m and 5.70 m to 6.70 m. 6. Borehole terminated at 35.27 m bgl. 7. Dual 50 mm standpipe installation - response zone from 1.50 m to 4.00 m, and 5.00 m to 6.50 m bgl with gravel filter pack. 9. Borehole back filled with cement grout and bentonite. 10. Cable percussion drilling to 7.45 with Rotary drilling to base of the borehole.

Deep Borehole Log

Project Name: Meridian Water HIF and Infrastructure Ground Investigation	Client: London Borough of Enfield	Date: 10/02/2020 - 05/03/2020
Location: Meridian Water, Enfield	Contractor: Ground Technology Services Limited	Co-ords: E536079.63 N191985.60
Project No. : GTS-19-250	Crew Name: AR+MS	Drilling Equipment: Fraste PLG | Hand tools | Dando 2000

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
GI_DZLV1_BH2077	RC	11.90m AOD	AW | JJ	1:25	Sheet 8 of 8

Well	Water Strikes	Sample and In Situ Testing			Coring			Legend	Depth (Level)	Stratum Description
		Depth (m)	Type	Results	TCR	SCR	RQD			
		35.00	SPT	50 (7,18/50 for 120mm)					35.27 (-11.10)	Very dense slightly silty SAND. Sand is fine and medium. [THANET SAND FORMATION]
										End of Borehole at 35.27m

36
37
38
39
40

Hole Diameter		Casing Diameter		Chiselling				Drilling Flush					
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top (m)	Depth Base (m)	Flush Type	Flush Colour	Min (%)	Max (%)

Remarks

1. Position CAT scanned prior to digging. 2. Position hand dug to 1.20 m bgl - clear of services. 3. Position cored using 300 mm bit. 4. Water encountered at 2.80 m bgl. 5. Environmental seal installed at 1.10 m to 2.10 m and 5.70 m to 6.70 m. 6. Borehole terminated at 35.27 m bgl. 7. Dual 50 mm standpipe installation - response zone from 1.50 m to 4.00 m, and 5.00 m to 6.50 m bgl with gravel filter pack. 9. Borehole back filled with cement grout and bentonite. 10. Cable percussion drilling to 7.45 with Rotary drilling to base of the borehole.

Deep Borehole Log

Project Name: Meridian Water HIF and Infrastructure Ground Investigation	Client: London Borough of Enfield	Date: 04/02/2020 - 26/02/2020
Location: Meridian Water, Enfield	Contractor: Ground Technology Services Limited	Co-ords: E536090.69 N191921.12
Project No. : GTS-19-250	Crew Name: AR+MS+BS	Drilling Equipment: Fraste PLG | Hand tools | Dando 2000

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
GI_DZLV1_BH2080	RC	10.57m AOD	AW | JJ	1:25	Sheet 1 of 7

Well	Water Strikes	Sample and In Situ Testing Depth (m)	Type	Results	Coring TCR	SCR	RQD	Legend	Depth (Level)	Stratum Description
		0.18 - 0.42	B						0.18 (10.57)	Strong grey CONCRETE. 50-60 % aggregate subangular to subrounded fine to coarse flint gravel. 20 % small voids. [MADE GROUND]
		0.20 - 0.30	ES							
		0.20	PID	PID = 0 ppm						
		0.30	D						0.42 (10.39)	Black and grey sandy gravelly CLAY with medium cobble content. Sand is medium and coarse. Gravel is angular to subangular fine to coarse concrete brick and flint. Cobbles are angular to subangular red brick and concrete. [MADE GROUND]
		0.42 - 1.20	B							
		0.45 - 0.60	ES							
		0.45	PID	PID = 0 ppm						
		1.00	D							Grey dark grey and black silty sandy slightly gravelly CLAY with burnt wood fragments. Sand is fine and medium. Gravel is subangular to subrounded fine and medium flint and brick [MADE GROUND]
		1.20 - 1.65	D							1
		1.20	SPT	N=8 (2 for 2mm/1,2,3,2)						
		1.60	B						1.60 (10.15)	Soft to firm grey slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse flint. [ALLUVIUM]
		2.00 - 2.45	UT	Ublow = 16 Rec. = 100%					2.00 (8.97)	Loose to medium dense multicoloured clayey very sandy GRAVEL. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse flint. [KEMPTON PARK GRAVEL FORMATION]
		2.00 - 2.60	B							2
		2.45	D							
		2.60 - 3.00	B							
		3.00	cSPT	N=7 (1,0/1,2,2,2)						3
		3.45	D							
		4.00	EW							4
		4.00	cSPT	N=14 (2,2/3,3,4,4)						
		4.45	D							
		4.50	EW							
		4.50	EW							
		4.87	EW							
		5.00	cSPT	N=17 (3,4/4,4,4,5)						5

Hole Diameter		Casing Diameter		Chiselling				Drilling Flush					
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top (m)	Depth Base (m)	Flush Type	Flush Colour	Min (%)	Max (%)
		1.60	250										

Remarks

1. Position CAT scanned prior to digging. 2. Position hand dug to 1.20 m bgl - clear of services. 3. Position cored using 300 mm bit. 4. Water encountered at 2.10 m bgl. 5. Environmental seal installed at 1.10 m to 2.10 m and 6.10 m to 7.10 m. 6. Borehole terminated at 31.82 m bgl. 7. Dual 50 mm standpipe installation - response zone from 3.00 m to 5.00 m, and 17.60 m to 19.60 m bgl with gravel filter pack. 8. Borehole back filled with cement grout and bentonite. 9. Cable percussion drilling to 8.40 with Rotary drilling to base of the borehole.

Deep Borehole Log

Project Name: Meridian Water HIF and Infrastructure Ground Investigation	Client: London Borough of Enfield	Date: 04/02/2020 - 26/02/2020
Location: Meridian Water, Enfield	Contractor: Ground Technology Services Limited	Co-ords: E536090.69 N191921.12
Project No. : GTS-19-250	Crew Name: AR+MS+BS	Drilling Equipment: Fraste PLG | Hand tools | Dando 2000

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
GI_DZLV1_BH2080	RC	10.57m AOD	AW | JJ	1:25	Sheet 2 of 7

Well	Water Strikes	Sample and In Situ Testing			Coring			Legend	Depth (Level)	Stratum Description
		Depth (m)	Type	Results	TCR	SCR	RQD			
		5.45	D							Loose to medium dense multicoloured clayey very sandy GRAVEL. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse flint. [KEMPTON PARK GRAVEL FORMATION]
		6.00	cSPT	N=19 (4,4/5,4,5,5)						
		6.45	D							
		6.60 - 7.00	B							
		7.00 - 7.45	UT	Ublow = 27 Rec. = 100%					7.00 (8.57)	
		7.45	D							High strength, very stiff brown fissured slightly micaceous CLAY. Sand is fine and medium. Fissures are randomly orientated extremely closely spaced predominantly undulating rough with occasional planar smooth. [LONDON CLAY FORMATION]
		7.50 - 7.95	UT	Ublow = 29 Rec. = 100%						
		7.60	C							
		7.60 - 9.10	B							
		7.60	PP	PP = 3.0 kg/cm²						
		7.90 - 8.00	ES							
		7.90	PP	PP = 3.0 kg/cm²						
		7.90	PID	PID = 0 ppm						
		7.95	D							
		7.95	SPT	N=18 (3,4/4,4,5,5)						
		8.20	PP	PP = 3.0 kg/cm²	100					
		8.50	PP	PP = 3.0 kg/cm²						
		8.80	PP	PP = 3.0 kg/cm²						
		9.10 - 10.60	C							
		9.10 - 9.55	D							
		9.10	PP	PP = 2.9 kg/cm²						
		9.10	SPT	N=20 (3,3/20 for 0mm)						
		9.40	PP	PP = 3.0 kg/cm²	100					
		9.70	PP	PP = 2.9 kg/cm²						
		10.00	PP	PP = 2.9 kg/cm²						

Hole Diameter		Casing Diameter		Chiselling				Drilling Flush					
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top (m)	Depth Base (m)	Flush Type	Flush Colour	Min (%)	Max (%)
7.50	200	8.40	200										

Remarks

1. Position CAT scanned prior to digging. 2. Position hand dug to 1.20 m bgl - clear of services. 3. Position cored using 300 mm bit. 4. Water encountered at 2.10 m bgl. 5. Environmental seal installed at 1.10 m to 2.10 m and 6.10 m to 7.10 m. 6. Borehole terminated at 31.82 m bgl. 7. Dual 50 mm standpipe installation - response zone from 3.00 m to 5.00 m, and 17.60 m to 19.60 m bgl with gravel filter pack. 8. Borehole back filled with cement grout and bentonite. 9. Cable percussion drilling to 8.40 with Rotary drilling to base of the borehole.

Deep Borehole Log

Project Name: Meridian Water HIF and Infrastructure Ground Investigation	Client: London Borough of Enfield	Date: 04/02/2020 - 26/02/2020
Location: Meridian Water, Enfield	Contractor: Ground Technology Services Limited	Co-ords: E536090.69 N191921.12
Project No. : GTS-19-250	Crew Name: AR+MS+BS	Drilling Equipment: Fraste PLG | Hand tools | Dando 2000

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
GI_DZLV1_BH2080	RC	10.57m AOD	AW | JJ	1:25	Sheet 3 of 7

Well	Water Strikes	Sample and In Situ Testing			Coring			Legend	Depth (Level)	Stratum Description
		Depth (m)	Type	Results	TCR	SCR	RQD			
		10.30	PP	PP = 3.1 kg/cm²						High strength, very stiff brown fissured slightly micaceous CLAY. Sand is fine and medium. Fissures are randomly orientated extremely closely spaced predominantly undulating rough with occasional planar smooth. [LONDON CLAY FORMATION]
		10.42 - 10.52	D							
		10.60 - 11.05	D							
		10.60 - 12.10	C							
		10.60	PP	PP = 3.1 kg/cm²						
		10.60	SPT	N=22 (2,3/22 for 0mm)	97					
		12.10 - 12.65	D							
		12.10 - 13.60	B							
		12.10 - 13.60	C							
		12.10	SPT	N=29 (4,5/29 for 0mm)	100					
		13.60 - 14.05	D							
		13.60 - 15.10	C							
		13.60	PP	PP = 2.6 kg/cm²						
		13.60	SPT	N=31 (5,5/31 for 0mm)						
		13.90	PP	PP = 2.5 kg/cm²						
		14.20	PP	PP = 3.0 kg/cm²	100					
		14.50	PP	PP = 2.9 kg/cm²						
		14.70 - 14.80	D							

Hole Diameter		Casing Diameter		Chiselling				Drilling Flush					
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top (m)	Depth Base (m)	Flush Type	Flush Colour	Min (%)	Max (%)
13.60	146							7.60	13.60	Water	Brown	100	100

Remarks

1. Position CAT scanned prior to digging. 2. Position hand dug to 1.20 m bgl - clear of services. 3. Position cored using 300 mm bit. 4. Water encountered at 2.10 m bgl. 5. Environmental seal installed at 1.10 m to 2.10 m and 6.10 m to 7.10 m. 6. Borehole terminated at 31.82 m bgl. 7. Dual 50 mm standpipe installation - response zone from 3.00 m to 5.00 m, and 17.60 m to 19.60 m bgl with gravel filter pack. 8. Borehole back filled with cement grout and bentonite. 9. Cable percussion drilling to 8.40 with Rotary drilling to base of the borehole.

Deep Borehole Log

Project Name: Meridian Water HIF and Infrastructure Ground Investigation	Client: London Borough of Enfield	Date: 04/02/2020 - 26/02/2020
Location: Meridian Water, Enfield	Contractor: Ground Technology Services Limited	Co-ords: E536090.69 N191921.12
Project No. : GTS-19-250	Crew Name: AR+MS+BS	Drilling Equipment: Fraste PLG | Hand tools | Dando 2000

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
GI_DZLV1_BH2080	RC	10.57m AOD	AW | JJ	1:25	Sheet 4 of 7

Well	Water Strikes	Sample and In Situ Testing			Coring			Legend	Depth (Level)	Stratum Description
		Depth (m)	Type	Results	TCR	SCR	RQD			
		15.10 - 15.55	D							High strength, very stiff brown fissured slightly micaceous CLAY. Sand is fine and medium. Fissures are randomly orientated extremely closely spaced predominantly undulating rough with occasional planar smooth. [LONDON CLAY FORMATION]
		15.10 - 16.60	B							
		15.10 - 16.60	C							
		15.10	PP	PP = 3.1 kg/cm²						
		15.10	SPT	N=41 (4,5/8,10,10,13)						
		15.40	PP	PP = 2.7 kg/cm²						
		15.70	PP	PP = 3.0 kg/cm²						
					100					
		16.00	PP	PP = 3.0 kg/cm²						
		16.30	PP	PP = 3.3 kg/cm²						
		16.60 - 16.84	D							
		16.60 - 18.10	C							
		16.60	PP	PP = 3.2 kg/cm²						
		16.60	SPT	50 (6,10/50 for 85mm)						
		16.90	PP	PP = 3.1 kg/cm²						
		17.10	EW							
		17.20	PP	PP = 3.0 kg/cm²						
					93					
		17.50	PP	PP = 2.8 kg/cm²						
		17.80	PP	PP = 3.1 kg/cm²						
		18.10	EW						18.10 (3.57)	Very stiff to hard light blue mottled red slightly sandy CLAY. Sand is fine and medium. [LAMBETH GROUP]
		18.10 - 18.55	D							
		18.10 - 19.60	B							
		18.10 - 19.60	C							
		18.10	PP	PP = 3.0 kg/cm²						
		18.10	SPT	N=36 (4,5/6,9,10,11)						
		18.40 - 18.50	ES							
		18.40	PP	PP = 2.5 kg/cm²						
		18.40	PID	PID = 0 ppm						
		18.60	EW							
		18.70	PP	PP = 2.7 kg/cm²						
		19.00	PP	PP = 2.7 kg/cm²						
		19.50	PP	PP = 2.9 kg/cm²						
		19.60 - 19.98	D						19.60 (-7.53)	Very dense grey slightly silty SAND. Sand is fine to coarse. [THANET SAND FORMATION]
		19.60 - 21.00	B							
		19.60 - 21.10	C							
		19.60	SPT	N=50 (4,7/50 for 230mm)						
		19.90 - 20.00	ES							
		19.90	PID	PID = 0 ppm						

Hole Diameter		Casing Diameter		Chiselling			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool

Drilling Flush					
Depth Top (m)	Depth Base (m)	Flush Type	Flush Colour	Min (%)	Max (%)
13.60	15.10	Water	Grey	80	80
15.10	18.10	Water	Grey	80	80
18.10	19.60	Water	Grey	90	90

Remarks

1. Position CAT scanned prior to digging. 2. Position hand dug to 1.20 m bgl - clear of services. 3. Position cored using 300 mm bit. 4. Water encountered at 2.10 m bgl. 5. Environmental seal installed at 1.10 m to 2.10 m and 6.10 m to 7.10 m. 6. Borehole terminated at 31.82 m bgl. 7. Dual 50 mm standpipe installation - response zone from 3.00 m to 5.00 m, and 17.60 m to 19.60 m bgl with gravel filter pack. 8. Borehole back filled with cement grout and bentonite. 9. Cable percussion drilling to 8.40 with Rotary drilling to base of the borehole.

Deep Borehole Log

Project Name: Meridian Water HIF and Infrastructure Ground Investigation	Client: London Borough of Enfield	Date: 04/02/2020 - 26/02/2020
Location: Meridian Water, Enfield	Contractor: Ground Technology Services Limited	Co-ords: E536090.69 N191921.12
Project No. : GTS-19-250	Crew Name: AR+MS+BS	Drilling Equipment: Fraste PLG | Hand tools | Dando 2000

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
GI_DZLV1_BH2080	RC	10.57m AOD	AW | JJ	1:25	Sheet 5 of 7

Well	Water Strikes	Sample and In Situ Testing			Coring			Legend	Depth (Level)	Stratum Description
		Depth (m)	Type	Results	TCR	SCR	RQD			
					7					Very dense grey slightly silty SAND. Sand is fine to coarse. [THANET SAND FORMATION]
		21.10 - 21.29 21.10 - 22.60 21.10	D C SPT	50 (25 for 90mm/50 for 100mm)					21	
		21.90 - 22.00	D		7				22	
		22.60 - 23.05 22.60 - 24.10 22.60 - 24.10 22.60	D B C SPT	N=50 (6,13/50 for 295mm)	80				23	
					85				24	
		24.10 - 24.50 24.10 - 25.60 24.10	D C SPT	N=50 (5,8/50 for 250mm)	100					
		25.00 - 25.10	D						25	

Hole Diameter		Casing Diameter		Chiselling				Drilling Flush					
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top (m)	Depth Base (m)	Flush Type	Flush Colour	Min (%)	Max (%)
								19.60	22.60	Water	Orange	90	90

Remarks

1. Position CAT scanned prior to digging. 2. Position hand dug to 1.20 m bgl - clear of services. 3. Position cored using 300 mm bit. 4. Water encountered at 2.10 m bgl. 5. Environmental seal installed at 1.10 m to 2.10 m and 6.10 m to 7.10 m. 6. Borehole terminated at 31.82 m bgl. 7. Dual 50 mm standpipe installation - response zone from 3.00 m to 5.00 m, and 17.60 m to 19.60 m bgl with gravel filter pack. 8. Borehole back filled with cement grout and bentonite. 9. Cable percussion drilling to 8.40 with Rotary drilling to base of the borehole.

Deep Borehole Log

Project Name: Meridian Water HIF and Infrastructure Ground Investigation	Client: London Borough of Enfield	Date: 04/02/2020 - 26/02/2020
Location: Meridian Water, Enfield	Contractor: Ground Technology Services Limited	Co-ords: E536090.69 N191921.12
Project No. : GTS-19-250	Crew Name: AR+MS+BS	Drilling Equipment: Fraste PLG | Hand tools | Dando 2000

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
GI_DZLV1_BH2080	RC	10.57m AOD	AW | JJ	1:25	Sheet 6 of 7

Well	Water Strikes	Sample and In Situ Testing			Coring			Legend	Depth (Level)	Stratum Description
		Depth (m)	Type	Results	TCR	SCR	RQD			
		25.60 - 25.94 25.60 - 27.10 25.60	D C SPT	50 (7,10/50 for 190mm)	90					Very dense grey slightly silty SAND. Sand is fine to coarse. [THANET SAND FORMATION]
		27.10 - 27.44 27.10 - 28.60 27.10	D C SPT	50 (8,10/50 for 185mm)	78					
		28.60 - 29.01 28.60 - 30.10 28.60 - 30.10 28.60	D B C SPT	N=50 (5,7/50 for 255mm)	67					

26 27 28 29 30

Hole Diameter		Casing Diameter		Chiselling				Drilling Flush					
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top (m)	Depth Base (m)	Flush Type	Flush Colour	Min (%)	Max (%)

Remarks

1. Position CAT scanned prior to digging. 2. Position hand dug to 1.20 m bgl - clear of services. 3. Position cored using 300 mm bit. 4. Water encountered at 2.10 m bgl. 5. Environmental seal installed at 1.10 m to 2.10 m and 6.10 m to 7.10 m. 6. Borehole terminated at 31.82 m bgl. 7. Dual 50 mm standpipe installation - response zone from 3.00 m to 5.00 m, and 17.60 m to 19.60 m bgl with gravel filter pack. 8. Borehole back filled with cement grout and bentonite. 9. Cable percussion drilling to 8.40 with Rotary drilling to base of the borehole.

Deep Borehole Log

Project Name: Meridian Water HIF and Infrastructure Ground Investigation	Client: London Borough of Enfield	Date: 04/02/2020 - 26/02/2020
Location: Meridian Water, Enfield	Contractor: Ground Technology Services Limited	Co-ords: E536090.69 N191921.12
Project No. : GTS-19-250	Crew Name: AR+MS+BS	Drilling Equipment: Fraste PLG | Hand tools | Dando 2000

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
GI_DZLV1_BH2080	RC	10.57m AOD	AW | JJ	1:25	Sheet 7 of 7

Well	Water Strikes	Sample and In Situ Testing			Coring			Legend	Depth (Level)	Stratum Description
		Depth (m)	Type	Results	TCR	SCR	RQD			
		30.10 - 30.29 30.10 - 31.60 30.10	D C SPT	50 (25 for 130mm/50 for 60mm)	87					Very dense grey slightly silty SAND. Sand is fine to coarse. [THANET SAND FORMATION]
		31.60 - 31.82 31.60	D SPT	50 (3.21/50 for 65mm)					31.82 (-9.03)	End of Borehole at 31.82m

31
32
33
34
35

Hole Diameter		Casing Diameter		Chiselling				Drilling Flush					
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top (m)	Depth Base (m)	Flush Type	Flush Colour	Min (%)	Max (%)
31.60	146							22.60	31.60	Water	Grey	90	90

Remarks

1. Position CAT scanned prior to digging. 2. Position hand dug to 1.20 m bgl - clear of services. 3. Position cored using 300 mm bit. 4. Water encountered at 2.10 m bgl. 5. Environmental seal installed at 1.10 m to 2.10 m and 6.10 m to 7.10 m. 6. Borehole terminated at 31.82 m bgl. 7. Dual 50 mm standpipe installation - response zone from 3.00 m to 5.00 m, and 17.60 m to 19.60 m bgl with gravel filter pack. 8. Borehole back filled with cement grout and bentonite. 9. Cable percussion drilling to 8.40 with Rotary drilling to base of the borehole.

Trial Pit Log

Project Name: Meridian Water HIF and Infrastructure Ground Investigation	Client: London Borough of Enfield	Date: 25/02/2020
Location: Meridian Water, Enfield	Engineer: Ground Technology Services Limited	Co-ords: E536036.51 N192241.08
Project No. : GTS-19-250	Crew Name: DP	Equipment: 140LC-7

Location Number	Location Type	Level	Logged By	Scale	Page Number
GI_DZLV1_TP2034	TP	14.49m AOD	JT	1:25	Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.50 - 0.60 0.50 0.60 - 1.00	ES PID B	PID=0.10				Brown slightly gravelly sandy CLAY. Gravel is angular to subrounded fine to coarse flint red brick macadam and concrete. Sand is fine to coarse. [MADE GROUND]
		1.40 - 1.60 1.40 1.60 - 2.00	ES PID B	PID=0.00				
					2.00	14.49		Brown slightly gravelly sandy CLAY with low cobble content. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse flint red brick concrete and macadam. Cobbles are subrounded to subangular flint brick and concrete. [MADE GROUND]
	▼	2.20 - 2.40 2.20 - 2.70 2.20	ES B PID	PID=0.00				
					3.00	12.49		Dark grey slightly sandy slightly gravelly CLAY. Sand is fine and medium. Gravel is angular to subrounded fine to coarse flint ceramic brick and concrete. [MADE GROUND]
		3.40 - 3.60 3.40 - 3.90 3.40	ES B PID	PID=0.00				
					4.00	11.49		End of Trial Pit at 4.00m

Dimensions		Orientation	Trench Support and Comment			Pumping Data		
Pit Length (m)	Pit Width (m)	Orientation (deg)	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
4.00	1.00	45	Stable	Not required				
Weather: Fair and dry								

Remarks

1. Position CAT scanned prior to digging. 2. Water encountered at 2.50 m bgl. 3. Trial pit terminated at 4.00 m bgl. 4. Trial pit back filled with arisings and compacted in 300 mm layers.

GROUND TECHNOLOGY
Victory Park, Attleborough
Norfolk, NR17 1ZA
Tel: 01953 459462

Photographic Report

GI_DZLV1_TP2034

Project:	Meridian Water HIF and Infrastructure Ground Investigation
Project ID:	GTS-19-250

TP2034_4.00 m_Side_A

TP2034_4.00 m_Side_C

TP2034_4.00 m_Side_D

TP2034_4.00 m_stockpile

GROUND TECHNOLOGY
Victory Park, Attleborough
Norfolk, NR17 1ZA
Tel: 01953 459462

Photographic Report

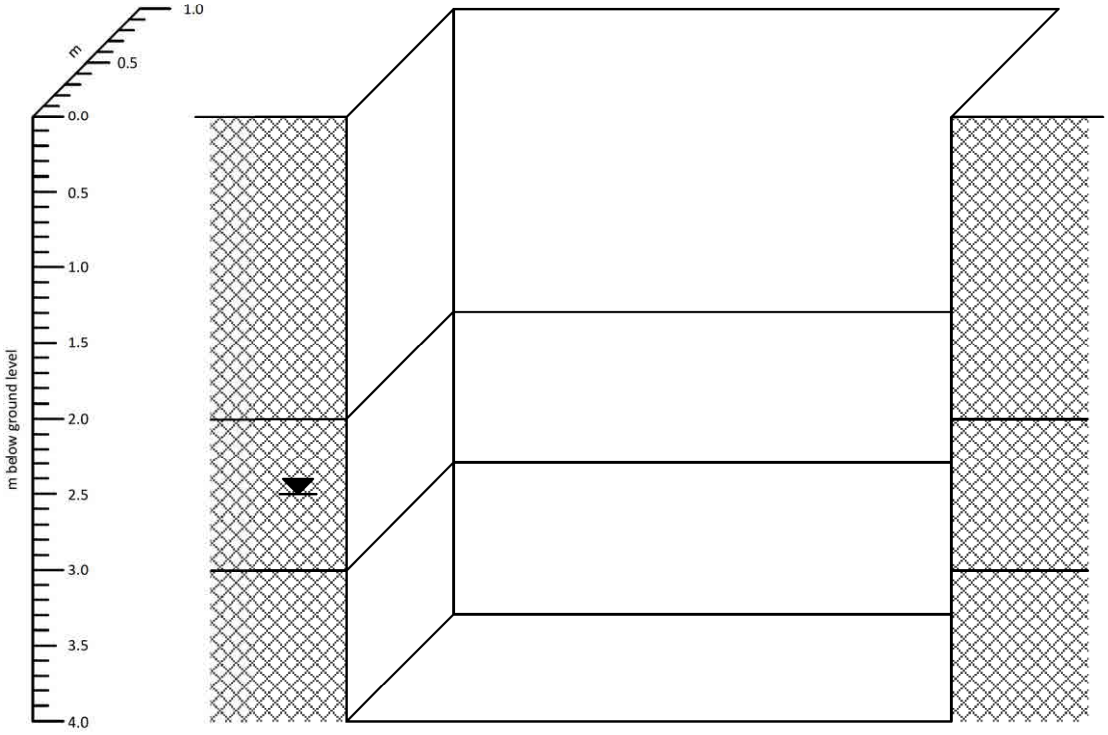
GI_DZLV1_TP2034

Project:	Meridian Water HIF and Infrastructure Ground Investigation
Project ID:	GTS-19-250

TT2034_4.00 m_Side_B

Trial Pit Section

Project Name: Meridian Water HIF and Infrastructure Ground Investigation		Client: London Borough of Enfield		Date: 25/02/2020	
Location: Meridian Water, Enfield		Engineer: Ground Technology Services Limited		Co-ords: E536036.51 N192241.05	
Project No.: GTS-19-250		Crew Name: PH		Equipment: JCB 3CX	
Location Number **GI_DZLV1_TP2034**	Location Type TP	Level 14.49m aOD	Drawn By AB	Scale 1:50	Page Number Sheet 2 of 2



Width (m) 1.00	Remarks:
Length (m) 4.00	1. Location CAT scanned prior to excavation. 2. Trial pit backfilled with arisings compacted in 300 mm layers.
Depth (m) 4.00	
Orientation (°) 045	

Trial Pit Log

Project Name: Meridian Water HIF and Infrastructure Ground Investigation	Client: London Borough of Enfield	Date: 24/02/2020
Location: Meridian Water, Enfield	Engineer: Ground Technology Services Limited	Co-ords: E536007.55 N192204.76
Project No. : GTS-19-250	Crew Name: PH	Equipment: JCB 3CX

Location Number	Location Type	Level	Logged By	Scale	Page Number
GI_DZLV1_TP2035	TP	14.57m AOD	AW	1:25	Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.40 - 0.50 0.40 0.50 - 1.00	ES PID B	PID=0.00				Brown slightly sandy gravelly CLAY with occasional fragments of wire and rubber. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse red brick concrete and macadam. [MADE GROUND]
		1.30 - 1.40 1.30 1.40 - 2.00	ES PID B	PID=0.00				
		2.40 - 2.60 2.40 2.60 - 3.00	ES PID B	PID=0.10				
					3.00	14.57		End of Trial Pit at 3.00m

1 2 3 4 5

Dimensions		Orientation	Trench Support and Comment			Pumping Data		
Pit Length (m)	Pit Width (m)	Orientation (deg)	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
3.00	1.00	330	Stable	Not required				

Weather: Dry and sunny

Remarks

1. Position CAT scanned prior to digging. 2. No ground water encountered. 3. Trial pit terminated at 3.00 m bgl. 4. Trial pit back filled with arisings and compacted in 300 mm layers.

GROUND TECHNOLOGY
Victory Park, Attleborough
Norfolk, NR17 1ZA
Tel: 01953 459462

Photographic Report

GI_DZLV1_TP2035

Project: Meridian Water HIF and Infrastructure Ground Investigation

Project ID: GTS-19-250

TP2035_3.00 m_Side_A

TP2035_3.00 m_Side_B

TP2035_3.00 m_Side_C

TP2035_3.00 m_Stockpile

GROUND TECHNOLOGY
Victory Park, Attleborough
Norfolk, NR17 1ZA
Tel: 01953 459462

Photographic Report

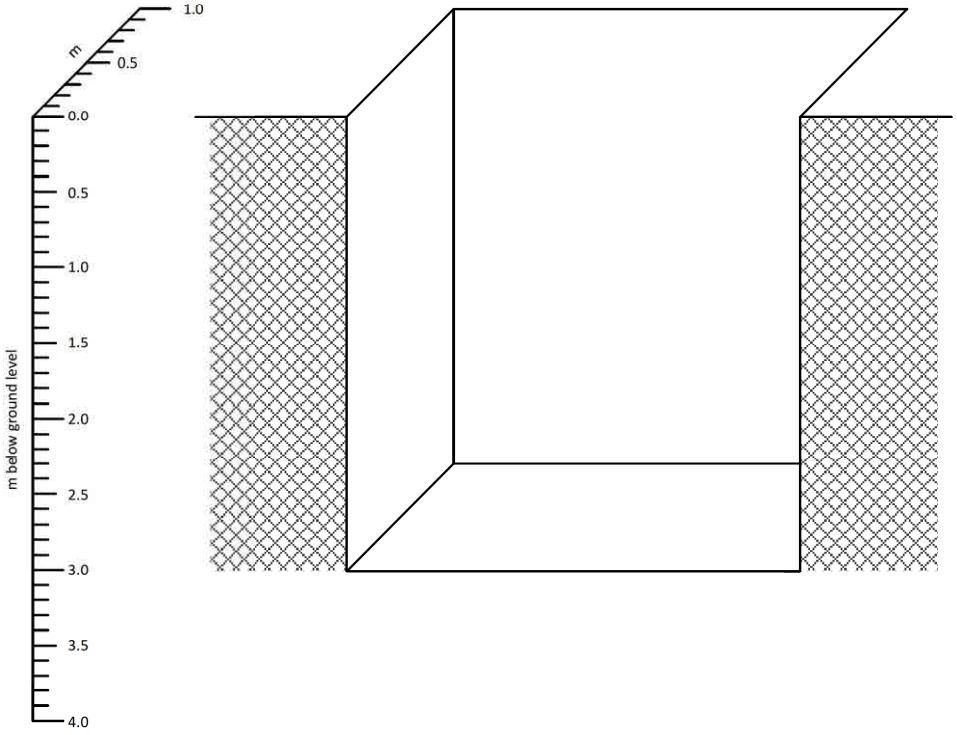
GI_DZLV1_TP2035

Project:	Meridian Water HIF and Infrastructure Ground Investigation
Project ID:	GTS-19-250

TP2036_3.00 m_Side_D

Trial Pit Section

Project Name: Meridian Water HIF and Infrastructure Ground Investigation		Client: London Borough of Enfield		Date: 24/02/2020	
Location: Meridian Water, Enfield		Engineer: Ground Technology Services Limited		Co-ords: E536007.50 N192204.66	
Project No.: GTS-19-250		Crew Name: PH		Equipment: JCB 3CX	
Location Number **GI_DZLV1_TP2035**	Location Type TP	Level 14.57m aOD	Drawn By AB	Scale 1:50	Page Number Sheet 2 of 2



Width (m) 1.00	Remarks:
Length (m) 3.00	1. Location CAT scanned prior to excavation. 2. Trial pit backfilled with arisings compacted in 300 mm layers.
Depth (m) 3.00	
Orientation (°) 330	

Trial Pit Log

Project Name: Meridian Water HIF and Infrastructure Ground Investigation	Client: London Borough of Enfield	Date: 18/03/2020
Location: Meridian Water, Enfield	Engineer: Ground Technology Services Limited	Co-ords: E536007.55 N192204.76
Project No. : GTS-19-250	Crew Name: PH	Equipment: JCB 3CX

Location Number	Location Type	Level	Logged By	Scale	Page Number
GI_DZLV1_TP2035A	TP	14.57m AOD	WL	1:25	Sheet 1 of 2

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Brown slightly sandy gravelly CLAY with occasional fragments of wire and rubber. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse red brick concrete and macadam. [MADE GROUND]
					3.00	14.57		Dark grey gravelly sandy CLAY. Sand is fine to coarse. Gravel is angular to rounded fine to coarse flint brick and concrete. [MADE GROUND]
		3.50 - 3.60	ES					
		4.50 - 4.60	ES					
		4.50 - 5.00	B					
		5.00 - 5.60	B		5.00	11.57		

Dimensions		Orientation	Trench Support and Comment			Pumping Data		
Pit Length (m)	Pit Width (m)	Orientation (deg)	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
3.00	0.60	330	Stable	Not required				

Weather: Overcast

Remarks

1. Position CAT scanned prior to digging. 2. No ground water encountered. 3.Trial pit terminated at 5.60 m bgl. 4. Trial pit back filled with arisings and compacted in 300 mm layers.

Trial Pit Log

Project Name: Meridian Water HIF and Infrastructure Ground Investigation	Client: London Borough of Enfield	Date: 18/03/2020
Location: Meridian Water, Enfield	Engineer: Ground Technology Services Limited	Co-ords: E536007.55 N192204.76
Project No. : GTS-19-250	Crew Name: PH	Equipment: JCB 3CX

Location Number	Location Type	Level	Logged By	Scale	Page Number
GI_DZLV1_TP2035A	TP	14.57m AOD	WL	1:25	Sheet 2 of 2

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		5.50 - 5.60	ES		5.60	9.57		Light to dark grey gravelly sandy CLAY. Sand is fine to coarse. Gravel is angular to rounded flint and brick. [MADE GROUND]
								End of Trial Pit at 5.60m

Dimensions		Orientation	Trench Support and Comment			Pumping Data		
Pit Length (m)	Pit Width (m)	Orientation (deg)	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
3.00	0.60	330	Stable	Not required				

Weather: Overcast

Remarks

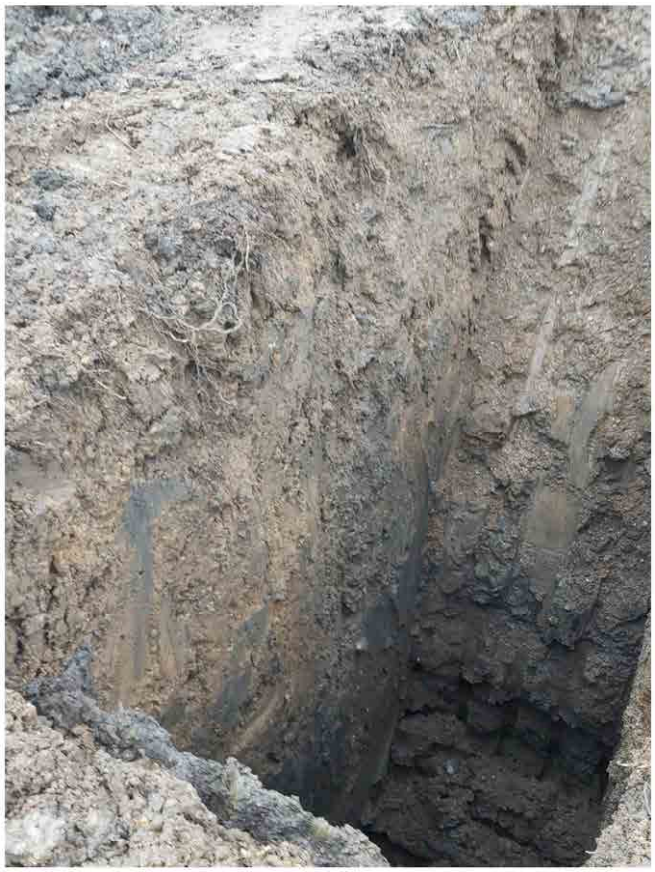
1. Position CAT scanned prior to digging. 2. No ground water encountered. 3.Trial pit terminated at 5.60 m bgl. 4. Trial pit back filled with arisings and compacted in 300 mm layers.

GROUND TECHNOLOGY
Victory Park, Attleborough
Norfolk, NR17 1ZA
Tel: 01953 459462

Photographic Report

GI_DZLV1_TP2035A

Project:	Meridian Water HIF and Infrastructure Ground Investigation
Project ID:	GTS-19-250



TP2035A_3.00-5.60 m_Side_C

TP2035A_3.00-5.60_side_C

TP2035A_3.0-5.60 m_Side_A_and_D

TP2035A_Marker

GROUND TECHNOLOGY
Victory Park, Attleborough
Norfolk, NR17 1ZA
Tel: 01953 459462

Photographic Report

GI_DZLV1_TP2035A

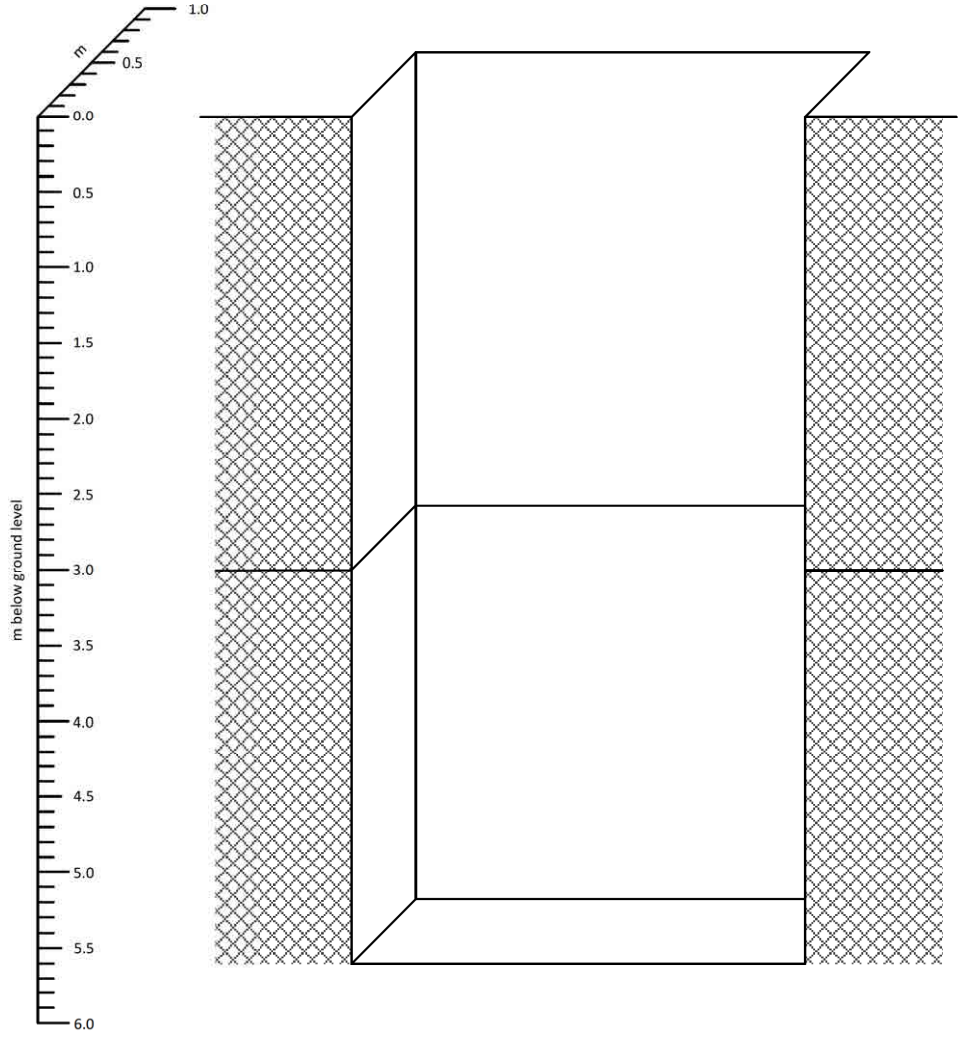
Project:	Meridian Water HIF and Infrastructure Ground Investigation
Project ID:	GTS-19-250

TP2035A3.00-5.60 m_Side_B2

TP3025A_3.00-5.60 m_Side_B

Trial Pit Section

Project Name: Meridian Water HIF and Infrastructure Ground Investigation		Client: London Borough of Enfield		Date: 18/03/2020	
Location: Meridian Water, Enfield		Engineer: Ground Technology Services Limited		Co-ords: E536007.50 N192204.66	
Project No.: GTS-19-250		Crew Name: PH		Equipment: JCB 3CX	
Location Number **GI_DZLV1_TP2035A**	Location Type TP	Level 14.57m aOD	Drawn By AB	Scale 1:50	Page Number Sheet 2 of 2



Width (m) 0.60	Remarks:
Length (m) 3.00	1. Location CAT scanned prior to excavation. 2. Trial pit backfilled with arisings compacted in 300 mm layers.
Depth (m) 5.60	
Orientation (°) 330	

Trial Pit Log

Project Name: Meridian Water HIF and Infrastructure Ground Investigation	Client: London Borough of Enfield	Date: 24/02/2020
Location: Meridian Water, Enfield	Engineer: Ground Technology Services Limited	Co-ords: E536044.48 N192200.29
Project No. : GTS-19-250	Crew Name: PH	Equipment: JCB 3CX

Location Number	Location Type	Level	Logged By	Scale	Page Number
GI_DZLV1_TP2036	TP	14.45m AOD	AW	1:25	Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.50 - 0.60 0.50 0.60 - 1.00	ES PID B	PID=0.00				Brown slightly sandy gravelly CLAY with occasional fragments of wire plastic rubber and ceramic. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse brick and concrete. [MADE GROUND]
		1.20 - 1.30 1.20 1.30 - 2.00	ES PID B	PID=0.00				
					2.00	14.45		Dark grey slightly gravelly laminated CLAY. Gravel is subangular to subrounded, fine to coarse flint. [ALLUVIUM]
		2.30 - 2.80	B					*2.00 m to 3.00 m occasional thin grey laminations*
		2.40 - 2.60 2.40	ES PID	PID=0.10				
					3.00	12.45		End of Trial Pit at 3.00m

Dimensions		Orientation	Trench Support and Comment			Pumping Data		
Pit Length (m)	Pit Width (m)	Orientation (deg)	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
3.00	1.00	60	Stable	Not required				

Weather: Dry and sunny

Remarks

1. Position CAT scanned prior to digging. 2. No ground water encountered. 3. Trial pit terminated at 3.00 m bgl. 4. Trial pit back filled with arisings and compacted in 300 mm layers.

GROUND TECHNOLOGY
Victory Park, Attleborough
Norfolk, NR17 1ZA
Tel: 01953 459462

Photographic Report

GI_DZLV1_TP2036

Project: Meridian Water HIF and Infrastructure Ground Investigation

Project ID: GTS-19-250

TP2036_3.00 m_Side_A

TP2036_3.00 m_Side_B

TP2036_3.00 m_Side_C

TP2036_3.00 m_Side_D

GROUND TECHNOLOGY
Victory Park, Attleborough
Norfolk, NR17 1ZA
Tel: 01953 459462

Photographic Report

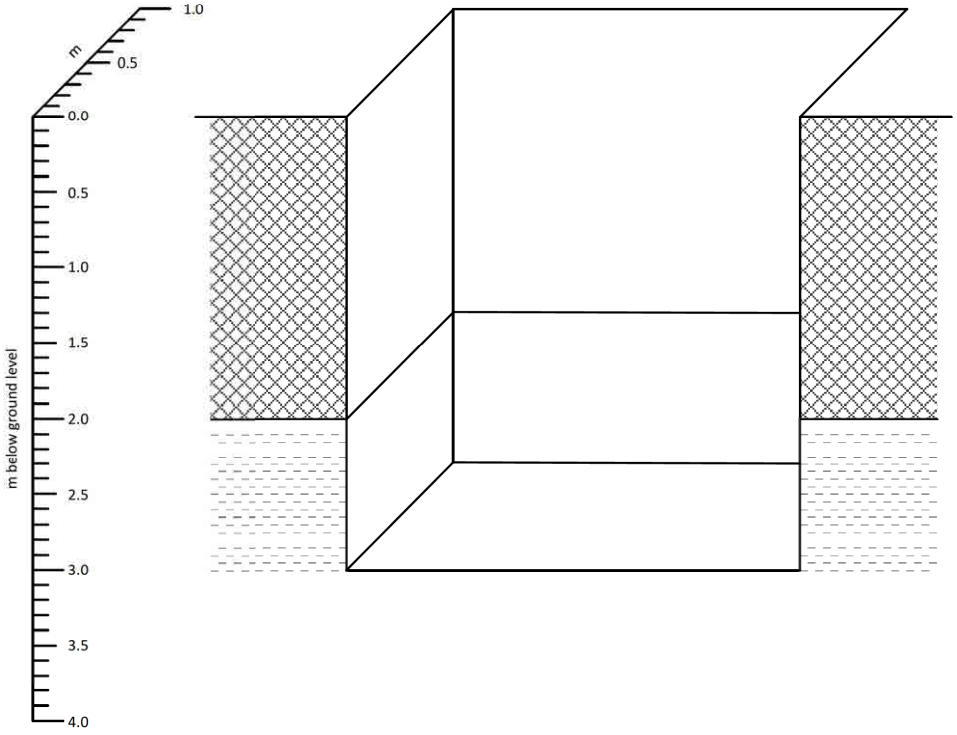
GI_DZLV1_TP2036

Project:	Meridian Water HIF and Infrastructure Ground Investigation
Project ID:	GTS-19-250

TP2036_3.00 m_Stockpile

Trial Pit Section

Project Name: Meridian Water HIF and Infrastructure Ground Investigation		Client: London Borough of Enfield		Date: 24/02/2020	
Location: Meridian Water, Enfield		Engineer: Ground Technology Services Limited		Co-ords: E536044.42 N192200.37	
Project No.: GTS-19-250		Crew Name: PH		Equipment: JCB 3CX	
Location Number **GI_DZLV1_TP2036**	Location Type TP	Level 14.45m aOD	Drawn By AB	Scale 1:50	Page Number Sheet 2 of 2



Width (m) 1.00	Remarks:
Length (m) 3.00	1. Location CAT scanned prior to excavation. 2. Trial pit backfilled with arisings compacted in 300 mm layers.
Depth (m) 3.00	
Orientation (°) 060	

Trial Pit Log

Project Name: Meridian Water HIF and Infrastructure Ground Investigation	Client: London Borough of Enfield	Date: 02/03/2020
Location: Meridian Water, Enfield	Engineer: Ground Technology Services Limited	Co-ords: E536044.48 N192200.29
Project No. : GTS-19-250	Crew Name: PH	Equipment: JCB 3CX

Location Number	Location Type	Level	Logged By	Scale	Page Number
GI_DZLV1_TP2036A	TP	14.45m AOD	WL	1:25	Sheet 1 of 2

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Brown slightly sandy gravelly CLAY with occasional fragments of wire plastic rubber and ceramic. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse brick and concrete. [MADE GROUND]
					2.00	14.45		Dark grey slightly gravelly laminated CLAY. Gravel is subangular to subrounded fine to coarse flint. [MADE GROUND]
					3.00	12.45		Light to dark grey gravelly sandy CLAY. Sand is fine to coarse. Gravel is angular to rounded fine to coarse flint brick and concrete. [MADE GROUND]
		3.50 - 3.60	ES					
		3.50 - 5.00	B					
		4.50 - 4.60	ES					
		4.50 - 5.00	B					
		5.00 - 6.00	B		5.00	11.45		

Dimensions		Orientation	Trench Support and Comment			Pumping Data		
Pit Length (m)	Pit Width (m)	Orientation (deg)	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
3.00	0.60	60	Stable	Not required				

Weather: Overcast

Remarks

1. Position CAT scanned prior to digging. 2. No ground water encountered. 3. Trial pit terminated at 5.60 m bgl. 4. Trial pit back filled with arisings and compacted in 300 mm layers.

Trial Pit Log

Project Name: Meridian Water HIF and Infrastructure Ground Investigation	Client: London Borough of Enfield	Date: 02/03/2020
Location: Meridian Water, Enfield	Engineer: Ground Technology Services Limited	Co-ords: E536044.48 N192200.29
Project No. : GTS-19-250	Crew Name: PH	Equipment: JCB 3CX

Location Number	Location Type	Level	Logged By	Scale	Page Number
GI_DZLV1_TP2036A	TP	14.45m AOD	WL	1:25	Sheet 2 of 2

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		5.50	ES					Light to dark grey CLAY with rare gravel. Gravel is angular to rounded fine to coarse flint and brick. [MADE GROUND]
		5.60	ES		5.60	9.45		End of Trial Pit at 5.60m

Dimensions		Orientation	Trench Support and Comment			Pumping Data		
Pit Length (m)	Pit Width (m)	Orientation (deg)	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
3.00	0.60	60	Stable	Not required				

Weather: Overcast

Remarks

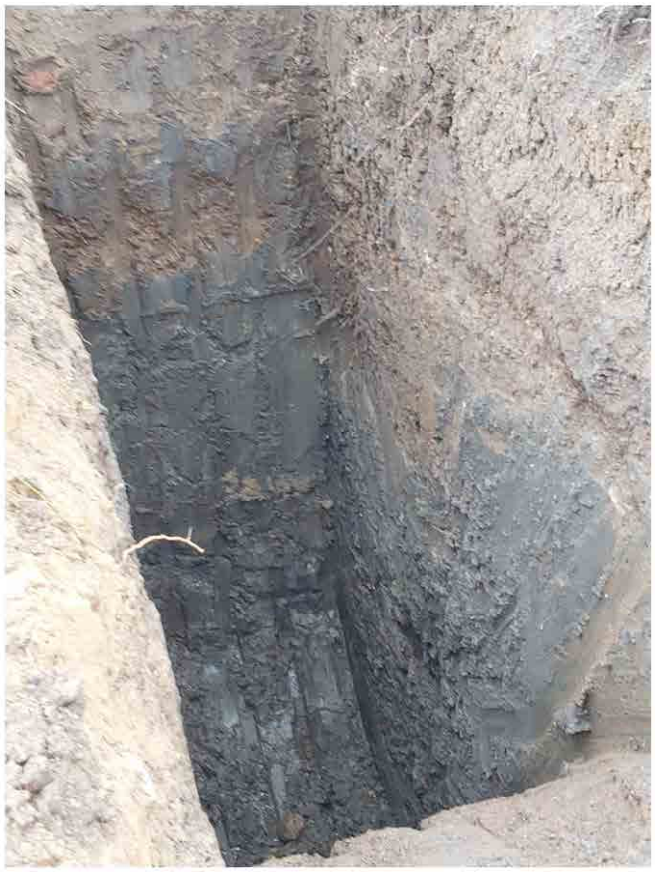
1. Position CAT scanned prior to digging. 2. No ground water encountered. 3. Trial pit terminated at 5.60 m bgl. 4. Trial pit back filled with arisings and compacted in 300 mm layers.

GROUND TECHNOLOGY
Victory Park, Attleborough
Norfolk, NR17 1ZA
Tel: 01953 459462

Photographic Report

GI_DZLV1_TP2036A

Project:	Meridian Water HIF and Infrastructure Ground Investigation
Project ID:	GTS-19-250



TP2035A_3.0-5.60 m_Side_B_and_C

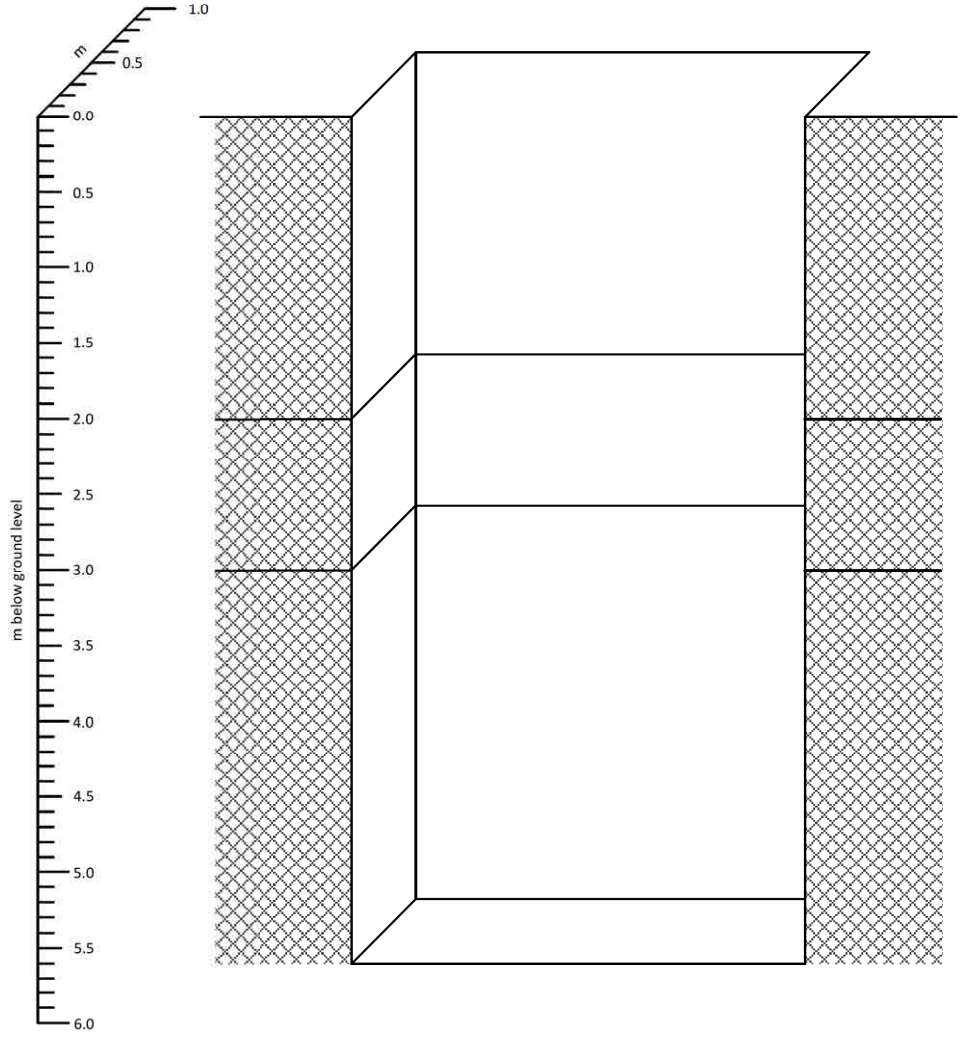
TP2035A_3.0-5.60 m_Side_C_and D

TP2035A_3.0-5.60 m_Side_D

TP2036A_Stockpile

Trial Pit Section

Project Name: Meridian Water HIF and Infrastructure Ground Investigation		Client: London Borough of Enfield		Date: 02/03/2020	
Location: Meridian Water, Enfield		Engineer: Ground Technology Services Limited		Co-ords: E536044.42 N192200.37	
Project No.: GTS-19-250		Crew Name: PH		Equipment: JCB 3CX	
Location Number **GI_DZLV1_TP2036A**	Location Type TP	Level 14.45m aOD	Drawn By AB	Scale 1:50	Page Number Sheet 2 of 2



Width (m) 0.60	Remarks:
Length (m) 3.00	1. Location CAT scanned prior to excavation. 2. Trial pit backfilled with arisings compacted in 300 mm layers.
Depth (m) 5.60	
Orientation (°) 060	

Trial Pit Log

Project Name: Meridian Water HIF and Infrastructure Ground Investigation	Client: London Borough of Enfield	Date: 05/03/2020
Location: Meridian Water, Enfield	Engineer: Ground Technology Services Limited	Co-ords: E535978.44 N192189.85
Project No. : GTS-19-250	Crew Name: DP	Equipment: 140LC-7

Location Number	Location Type	Level	Logged By	Scale	Page Number
GI_DZLV1_TP2038	TP	12.19m AOD	JT	1:25	Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
		0.00 - 0.30	B					Greyish brown clayey gravelly SAND. Sand is fine and medium. Gravel is angular to subangular fine to coarse flint. [MADE GROUND]
		0.00 - 0.30	D					
		0.00 - 0.30	ES					
		0.30	ES		0.30	12.19		
					0.35	11.89		Weak black MACADAM. 75-85 % aggregate angular medium and coarse granite and flint. 5 % small and medium voids. (BINDER COURSE). [MADE GROUND]
					0.40	11.84		
		0.60 - 1.00	B		0.60	11.79		Greyish brown SAND and GRAVEL. Sand is fine to coarse. Gravel is angular to subangular fine to coarse flint. [MADE GROUND]
		0.60 - 1.00	D					
		0.60 - 1.00	ES					
		1.00	ES					Moderately strong light grey CONCRETE. 40-60% aggregate subangular to angular fine to coarse flint and granite gravel. 10 % small voids and 5 % medium voids. [MADE GROUND]
					1.10	11.59		
								Yellowish grey slightly silty gravelly SAND. Sand is fine to coarse. Gravel is angular to subangular fine to coarse flint. [MADE GROUND]
		1.50 - 1.60	B					
		1.50 - 1.60	D					
		1.50 - 1.60	ES					Grey sandy gravelly CLAY. Sand is fine to coarse gravel is angular to subrounded fine to coarse flint. [MADE GROUND]
		1.60	ES					
		2.50 - 2.60	B					
		2.50 - 2.60	D					
		2.50 - 2.60	ES					
		2.60	ES					
					3.00	11.09		Soft to firm grey CLAY. [ALLUVIUM]
		3.20 - 3.50	B					
		3.20 - 3.50	D					
		3.20 - 3.50	ES					
		4.00 - 4.60	B		4.00	9.19		Greenish grey slightly gravelly calcareous SAND with numerous shell fragments. Sand is medium and coarse. Gravel is subangular to subrounded fine to coarse flint [ALLUVIUM]
		4.00 - 4.60	D					
		4.00 - 4.60	ES					
	▼	4.60	ES		4.60	8.19		Brownish grey gravelly SAND. Sand is fine and medium. Gravel is angular to subrounded, fine to coarse of flint. [KEMPTON PARK GRAVEL FORMATION]
		4.60 - 4.90	B					
		4.60 - 4.90	D					
		4.60 - 4.90	ES					
		4.90	ES		4.90	7.59		End of Trial Pit at 4.90m

Dimensions		Orientation	Trench Support and Comment			Pumping Data		
Pit Length (m)	Pit Width (m)	Orientation (deg)	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
3.50	1.00	240	Stable	Not required				

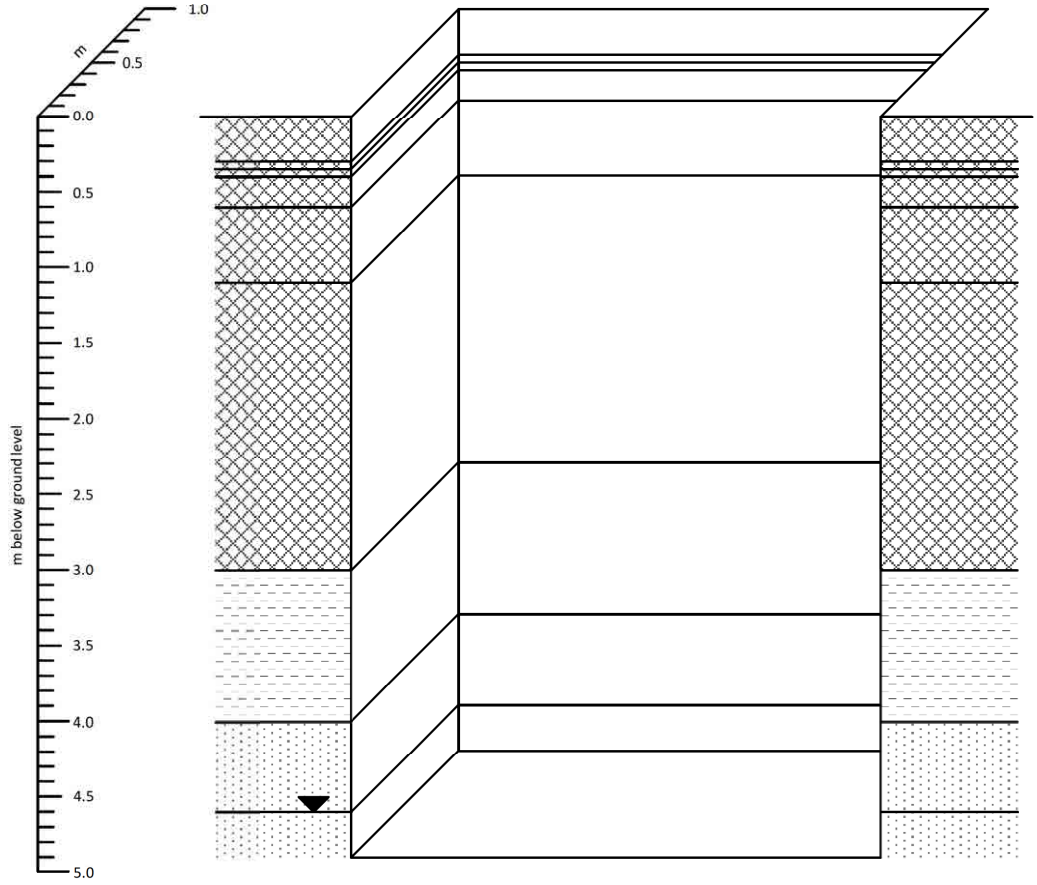
Weather: Overcast

Remarks

1. Position CAT scanned prior to digging. 2. Water encountered at 4.60 m bgl. 3. Trial pit terminated at 4.90 m bgl. 4. Trial pit back filled with arisings and compacted in 300 mm layers.

Trial Pit Section

Project Name: Meridian Water HIF and Infrastructure Ground Investigation		Client: London Borough of Enfield		Date: 05/03/2020	
Location: Meridian Water, Enfield		Engineer: Ground Technology Services Limited		Co-ords: E535977.02 N192190.66	
Project No.: GTS-19-250		Crew Name: PH		Equipment: 140LC-7	
Location Number **GI_DZLV1_TP2038**	Location Type TP	Level 12.19m aOD	Drawn By AB	Scale 1:50	Page Number Sheet 2 of 2



Width (m) 1.00	Remarks:
Length (m) 3.00	1. Position scanned using a CAT prior to digging. 2. Trial pit back filled with arising and compacted in 300 mm layers.
Depth (m) 4.90	
Orientation (°) 240	

Trial Pit Log

Project Name: Meridian Water HIF and Infrastructure Ground Investigation	Client: London Borough of Enfield	Date: 27/02/2020
Location: Meridian Water, Enfield	Engineer: Ground Technology Services Limited	Co-ords: E536001.12 N192172.08
Project No. : GTS-19-250	Crew Name: DP	Equipment: 140LC-7

Location Number	Location Type	Level	Logged By	Scale	Page Number
GI_DZLV1_TP2039	TP	14.60m AOD	WL	1:25	Sheet 1 of 2

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.50 - 0.60	ES					Reddish brown sandy gravelly CLAY with localised lenses of orange fine and medium sand. Sand is fine to coarse. Gravel is angular to rounded fine to coarse flint red brick concrete plastic and glass. [MADE GROUND]
					1.00	14.60		
		1.50 - 1.60	ES					Grey to dark grey slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is angular to rounded fine to coarse flint red brick and concrete. [MADE GROUND]
					2.00	13.60		
		2.50 - 2.60	ES					Dark grey slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is angular to rounded fine and medium flint red brick and concrete. [MADE GROUND]
		3.50 - 3.60	ES					
		4.50 - 4.60	ES					

1 2 3 4 5

Dimensions		Orientation	Trench Support and Comment			Pumping Data		
Pit Length (m)	Pit Width (m)	Orientation (deg)	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
3.00	0.60	120	Stable	Not required				

Weather: Dry and sunny

Remarks

1. Position CAT scanned prior to digging. 2. No ground water encountered. 3. Trial pit terminated at 5.60 m bgl. 4. Trial pit back filled with arisings and compacted in 300 mm layers.

Trial Pit Log

Project Name: Meridian Water HIF and Infrastructure Ground Investigation	Client: London Borough of Enfield	Date: 27/02/2020
Location: Meridian Water, Enfield	Engineer: Ground Technology Services Limited	Co-ords: E536001.12 N192172.08
Project No. : GTS-19-250	Crew Name: DP	Equipment: 140LC-7

Location Number	Location Type	Level	Logged By	Scale	Page Number
GI_DZLV1_TP2039	TP	14.60m AOD	WL	1:25	Sheet 2 of 2

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		5.50 - 5.60	ES		5.60	12.60		Dark grey slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is angular to rounded fine and medium flint red brick and concrete. [MADE GROUND]
								End of Trial Pit at 5.60m

6
7
8
9
10

Dimensions		Orientation	Trench Support and Comment			Pumping Data		
Pit Length (m)	Pit Width (m)	Orientation (deg)	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
3.00	0.60	120	Stable	Not required				

Weather: Dry and sunny

Remarks

1. Position CAT scanned prior to digging. 2. No ground water encountered. 3. Trial pit terminated at 5.60 m bgl. 4. Trial pit back filled with arisings and compacted in 300 mm layers.

GROUND TECHNOLOGY
Victory Park, Attleborough
Norfolk, NR17 1ZA
Tel: 01953 459462

Photographic Report

GI_DZLV1_TP2039

Project:	Meridian Water HIF and Infrastructure Ground Investigation
Project ID:	GTS-19-250

BH2039_5.60 m_side_A

BH2039_5.60 m_side_B1

BH2039_5.60 m_side_B2

BH2039_5.60 m_side_C

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Norfolk, NR17 1ZA
Tel: 01953 459462

Photographic Report

GI_DZLV1_TP2039

Project: Meridian Water HIF and Infrastructure Ground Investigation

Project ID: GTS-19-250

BH2039_5.60 m_side_D1

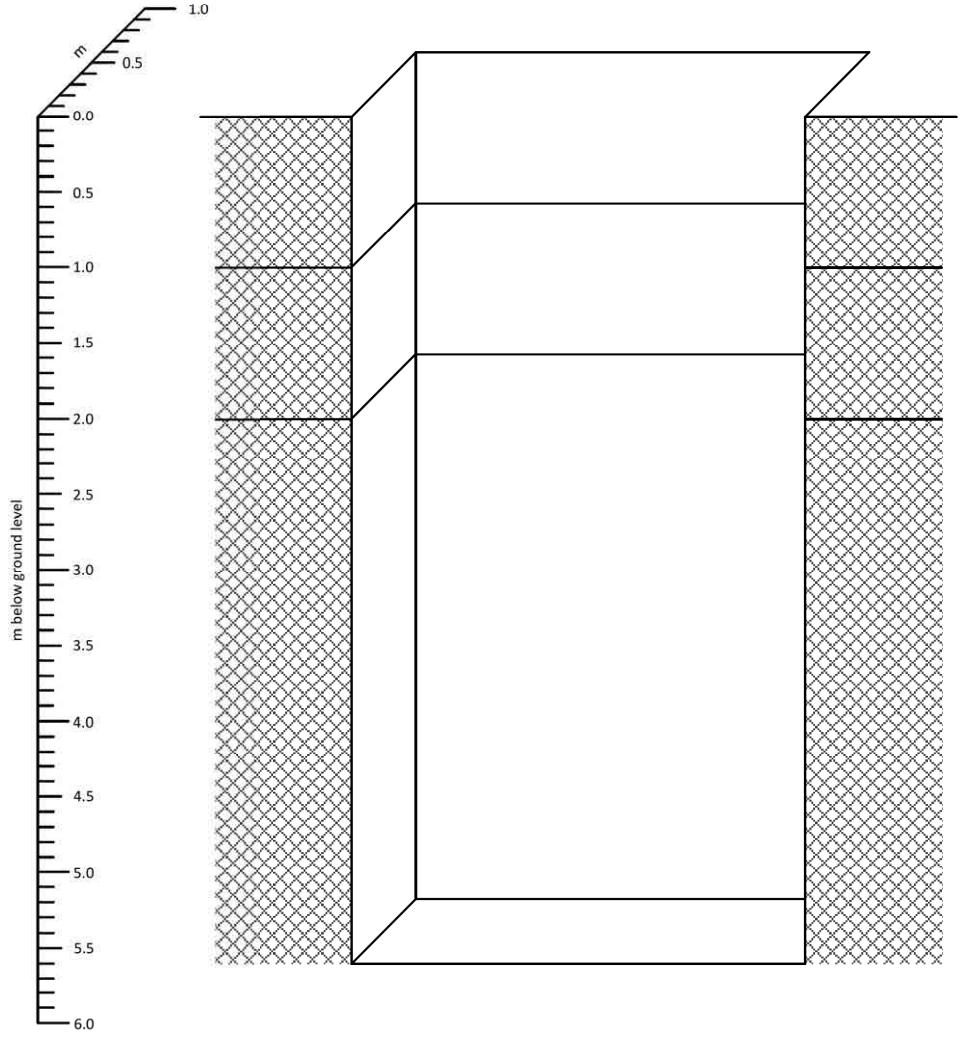
BH2039_5.60 m_side_D2

BH2039_5.60 m_side_D3

BH2039_5.60 m_stockpile_a

Trial Pit Section

Project Name: Meridian Water HIF and Infrastructure Ground Investigation		Client: London Borough of Enfield		Date: 27/02/2020	
Location: Meridian Water, Enfield		Engineer: Ground Technology Services Limited		Co-ords: E536001.27 N192172.15	
Project No.: GTS-19-250		Crew Name: PH		Equipment: 140LC-7	
Location Number **GI_DZLV1_TP2039**	Location Type TP	Level 14.16m aOD	Drawn By AB	Scale 1:50	Page Number Sheet 2 of 2



Width (m) 0.60	Remarks:
Length (m) 3.00	1. Location CAT scanned prior to excavation. 2. Trial pit backfilled with arisings compacted in 300 mm layers.
Depth (m) 5.60	
Orientation (°) 120	

Trial Pit Log

Project Name: Meridian Water HIF and Infrastructure Ground Investigation	Client: London Borough of Enfield	Date: 06/03/2020
Location: Meridian Water, Enfield	Engineer: Ground Technology Services Limited	Co-ords: E535952.55 N192150.23
Project No. : GTS-19-250	Crew Name: PH	Equipment: JCB 3CX

Location Number	Location Type	Level	Logged By	Scale	Page Number
GI_DZLV1_TP2040	TP	11.36m AOD	JT	1:25	Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
		0.10 - 0.40	B		0.10	11.36		Dark brown silty slightly gravelly SAND. Sand is fine and medium. Gravel is angular to subangular fine to coarse flint [MADE GROUND]
		0.10 - 0.40	D					
		0.10 - 0.40	ES					
					0.75	11.26		Brownish grey clayey gravelly SAND with low cobble content. Sand is fine to coarse. Gravel is angular to rounded fine to coarse flint and brick. Cobbles are angular concrete. [MADE GROUND]
					0.95	10.61		Strong light grey CONCRETE. 40-60 % aggregate angular to subangular fine and medium flint gravel. 10 % small voids. [MADE GROUND]
		1.10 - 1.20	B					Yellowish grey silty very gravelly SAND with medium cobble content and low boulder content. Sand is fine to coarse. Gravel is angular to subangular fine to coarse flint brick and concrete. Cobbles and boulders are subrounded to subangular. [MADE GROUND]
		1.10 - 1.20	D		1.20	10.41		
		1.10 - 1.20	ES					
		1.50 - 1.70	B					Light grey silty gravelly SAND. Sand is medium and coarse. Gravel is angular to subrounded fine and medium concrete and brick. [MADE GROUND]
		1.50 - 1.70	D					
		1.50 - 1.70	ES					
								1.80 m to 2.30 m brick cobbles
		2.30	PP	83.33	2.30	10.16		Very stiff brownish grey with brown staining silty CLAY. With very few very fine roots. [ALLUVIUM]
		2.40 - 2.50	B					
		2.40 - 2.50	D					
		2.40 - 2.50	ES					
		2.70 - 3.20	B		2.70	9.06		Stiff grey and light grey silty gravelly SAND. Sand is medium and coarse. Gravel is angular to subrounded fine and medium chalk. [ALLUVIUM]
		2.70 - 3.20	D					
		2.70 - 3.20	ES					
		2.70	PP	33.33				
▼								
					3.50	8.66		End of Trial Pit at 3.50m

Dimensions		Orientation	Trench Support and Comment			Pumping Data		
Pit Length (m)	Pit Width (m)	Orientation (deg)	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
3.30	1.30	315	Stable	Not required				

Weather: Dry and sunny

Remarks

1.. Position CAT scanned prior to digging. 2. Water encountered at 3.30 m bgl. 3. Trial pit terminated at 3.50 m bgl. 4. Trial pit back filled with arisings and compacted in 300 mm layers.

GROUND TECHNOLOGY
Victory Park, Attleborough
Norfolk, NR17 1ZA
Tel: 01953 459462

Photographic Report

GI_DZLV1_TP2040

Project:	Meridian Water HIF and Infrastructure Ground Investigation
Project ID:	GTS-19-250

TP2040_3.50 m_Side_A_1

TP2040_3.50 m_Side_A_2

TP2040_3.50 m_Side_B_2

TP2040_3.50 m_Side_C_1

GROUND TECHNOLOGY
Victory Park, Attleborough
Norfolk, NR17 1ZA
Tel: 01953 459462

Photographic Report

GI_DZLV1_TP2040

Project: Meridian Water HIF and Infrastructure Ground Investigation

Project ID: GTS-19-250

TP2040_3.50 m_Side_C_2

TP2040_3.50 m_Side_D_1

TP2040_3.50 m_Side_D_2

TP2040_3.50 m_Stockpile_1

GROUND TECHNOLOGY
Victory Park, Attleborough
Norfolk, NR17 1ZA
Tel: 01953 459462

Photographic Report

GI_DZLV1_TP2040

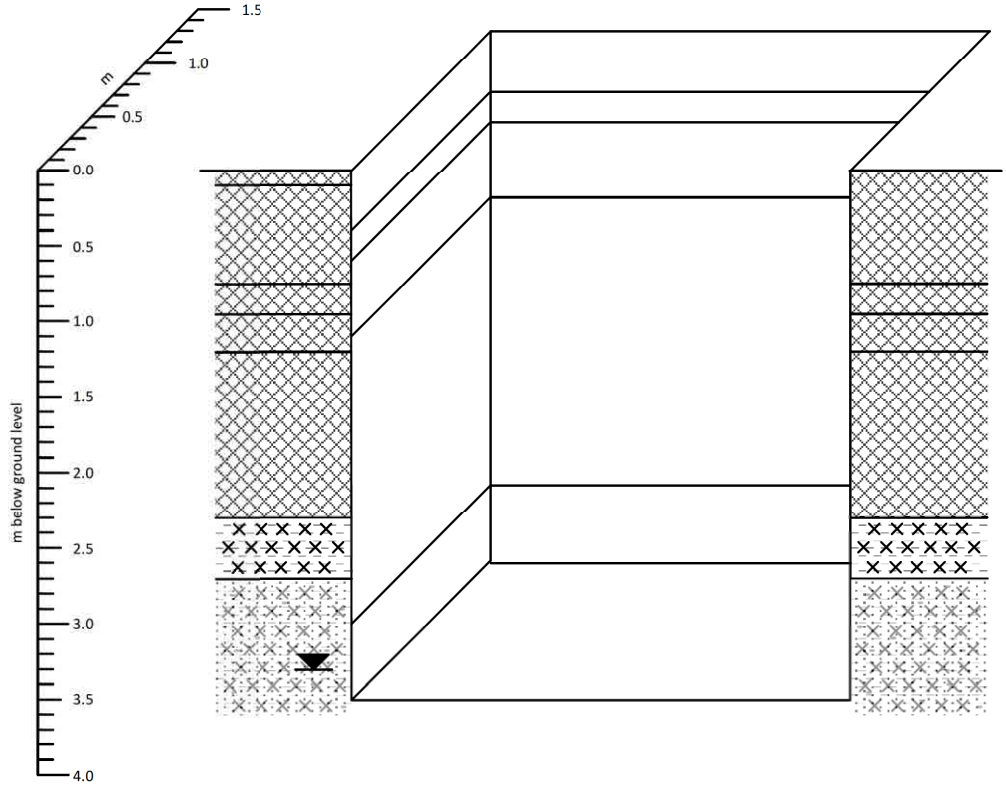
Project:	Meridian Water HIF and Infrastructure Ground Investigation
Project ID:	GTS-19-250

TP2040_3.50 m_stockpile_2

TP2040_3.50_m _Side_B_1

Trial Pit Section

Project Name: Meridian Water HIF and Infrastructure Ground Investigation		Client: London Borough of Enfield		Date: 06/03/2020	
Location: Meridian Water, Enfield		Engineer: Ground Technology Services Limited		Co-ords: E535951.64 N192149.51	
Project No.: GTS-19-250		Crew Name: PH		Equipment: JCB 3CX	
Location Number **GI_DZLV1_TP2040**	Location Type TP	Level 11.3m aOD	Drawn By AB	Scale 1:50	Page Number Sheet 2 of 2



Width (m) 1.30	Remarks: 1. Position scanned using a CAT prior to digging. 2. Trial pit back filled with arising and compacted in 300 mm layers.
Length (m) 3.30	
Depth (m) 3.50	
Orientation (°) 315	

Trial Pit Log

Project Name: Meridian Water HIF and Infrastructure Ground Investigation	Client: London Borough of Enfield	Date: 26/02/2020
Location: Meridian Water, Enfield	Engineer: Ground Technology Services Limited	Co-ords: E536036.26 N192161.33
Project No. : GTS-19-250	Crew Name: DP	Equipment: 140LC-7

Location Number	Location Type	Level	Logged By	Scale	Page Number
GI_DZLV1_TP2041	TP	14.70m AOD	WL	1:25	Sheet 1 of 2

Well	Water Strikes	Sample and In Situ Testing Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
		0.50 - 0.70	ES					Reddish brown gravelly CLAY with frequent fragments of wire plastic metal pipes and sheet ACM. Gravel is angular to subrounded fine to coarse flint red brick concrete and macadam. [MADE GROUND]
		1.50 - 1.70	ES					
		2.50 - 2.70	ES					
					3.00	14.70		
		3.20 - 3.40	ES					Light grey to grey slightly gravelly CLAY. Gravel is subangular to rounded fine to coarse flint with rare brick and concrete. [MADE GROUND]
	▼	4.50 - 4.70	ES					
					5.00	11.70		

1 2 3 4 5

Dimensions		Orientation	Trench Support and Comment			Pumping Data		
Pit Length (m)	Pit Width (m)	Orientation (deg)	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
4.00	0.60	90	Stable	Not required				

Weather: Overcast

Remarks

1. Position CAT scanned prior to digging. 2. Water encountered at 4.60 m bgl. 3. Trial pit terminated at 5.60 m bgl. 4. Trial pit back filled with arisings and compacted in 300 mm layers.

Trial Pit Log

Project Name: Meridian Water HIF and Infrastructure Ground Investigation	Client: London Borough of Enfield	Date: 26/02/2020
Location: Meridian Water, Enfield	Engineer: Ground Technology Services Limited	Co-ords: E536036.26 N192161.33
Project No. : GTS-19-250	Crew Name: DP	Equipment: 140LC-7

Location Number	Location Type	Level	Logged By	Scale	Page Number
GI_DZLV1_TP2041	TP	14.70m AOD	WL	1:25	Sheet 2 of 2

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		5.50 - 5.60	ES		5.60	9.70		Grey gravelly CLAY. Gravel is angular to subrounded fine to coarse flint with rare sandstone ceramic and glass. [MADE GROUND]
								End of Trial Pit at 5.60m

Dimensions		Orientation	Trench Support and Comment			Pumping Data		
Pit Length (m)	Pit Width (m)	Orientation (deg)	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
4.00	0.60	90	Stable	Not required				

Weather: Overcast

Remarks

1. Position CAT scanned prior to digging. 2. Water encountered at 4.60 m bgl. 3. Trial pit terminated at 5.60 m bgl. 4. Trial pit back filled with arisings and compacted in 300 mm layers.

GROUND TECHNOLOGY
Victory Park, Attleborough
Norfolk, NR17 1ZA
Tel: 01953 459462

Photographic Report

GI_DZLV1_TP2041

Project: Meridian Water HIF and Infrastructure Ground Investigation

Project ID: GTS-19-250

TP2041_5.60 m_side_A

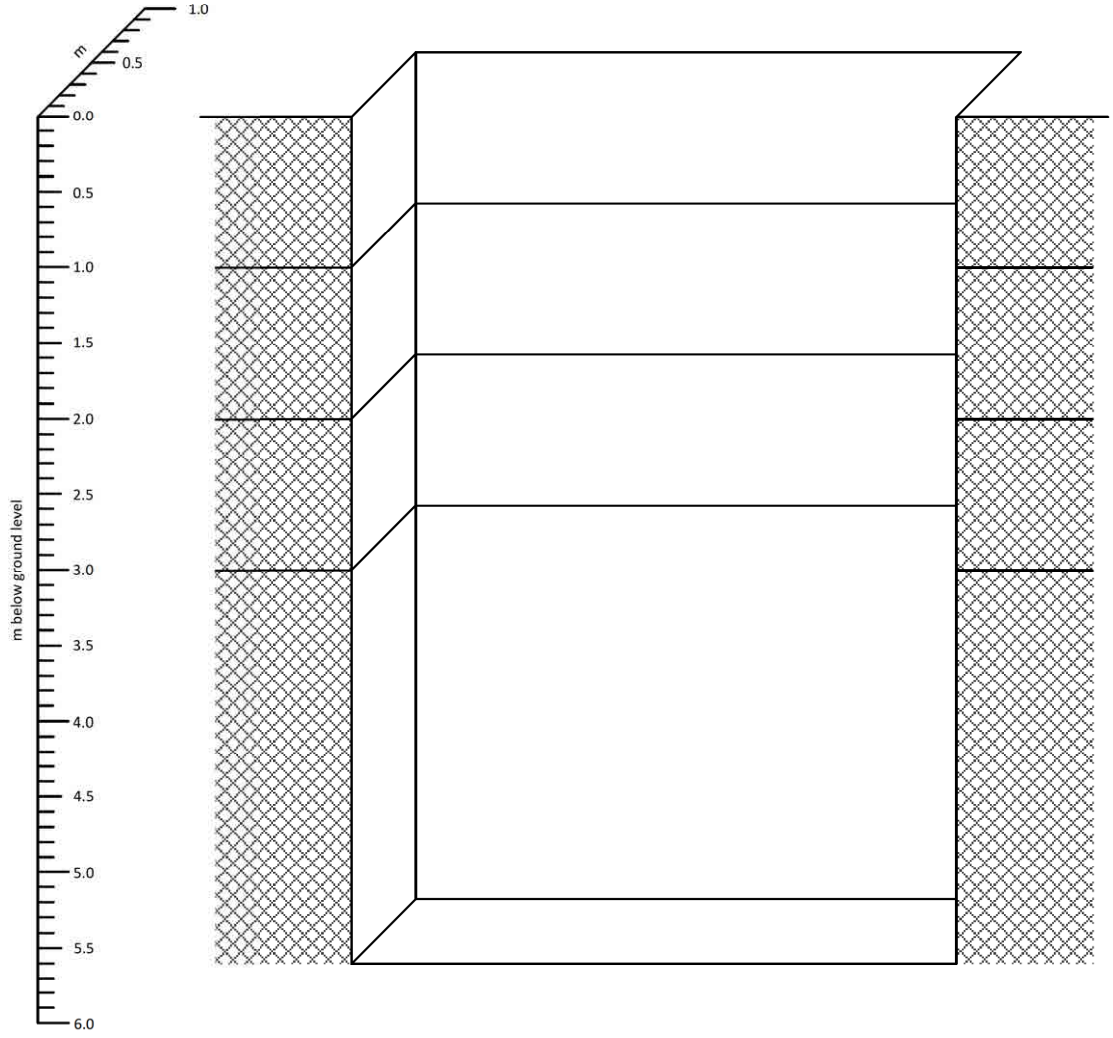
TP2041_5.60 m_side_B

TP2041_5.60 m_side_D

TP2041_5.60_side_C

Trial Pit Section

Project Name: Meridian Water HIF and Infrastructure Ground Investigation		Client: London Borough of Enfield		Date: 26/02/2020	
Location: Meridian Water, Enfield		Engineer: Ground Technology Services Limited		Co-ords: E536036.20 N192161.35	
Project No.: GTS-19-250		Crew Name: PH		Equipment: 140LC-7	
Location Number **GI_DZLV1_TP2041**	Location Type TP	Level 14.70m aOD	Drawn By AB	Scale 1:50	Page Number Sheet 2 of 2



Width (m) 0.60	Remarks:
Length (m) 4.00	1. Location CAT scanned prior to excavation. 2. Trial pit backfilled with arisings compacted in 300 mm layers.
Depth (m) 5.60	
Orientation (°) 090	

Trial Pit Log

Project Name: Meridian Water HIF and Infrastructure Ground Investigation	Client: London Borough of Enfield	Date: 27/02/2020
Location: Meridian Water, Enfield	Engineer: Ground Technology Services Limited	Co-ords: E536029.81 N192139.55
Project No. : GTS-19-250	Crew Name: DP	Equipment: 140LC-7

Location Number	Location Type	Level	Logged By	Scale	Page Number
GI_DZLV1_TP2046	TP	14.55m AOD	WL	1:25	Sheet 1 of 2

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.10 - 0.40	B					Greyish brown clayey gravelly SAND with medium cobble and low boulder content and frequent fragments of wood. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse flint brick and concrete and rare glass and pottery. Cobbles and boulders are angular concrete and brick. [MADE GROUND]
		0.10 - 0.40	D					
		0.10 - 0.40	ES					
		0.50 - 0.60	ES					
		1.00 - 1.40	B		1.00	14.55		Light reddish brown gravelly sandy CLAY with frequent fragments of wire and glass. Sand is fine and medium. Gravel is angular to subrounded fine to coarse flint red brick cement. [MADE GROUND]
		1.00 - 1.40	D					
		1.00 - 1.40	ES					
		1.50 - 1.60	ES					
		2.00 - 2.40	B		2.00	13.55		Yellowish grey and greyish brown gravelly SAND with medium cobble content and occasional fragments of wood metal plastic and sheet ACM. Sand is fine to coarse. Gravel is angular to subangular fine to coarse flint brick and concrete. Cobbles are angular brick and concrete. [MADE GROUND]
		2.00 - 2.40	D					
		2.00 - 2.40	ES					
		2.50 - 2.60	ES					
		3.00 - 3.10	B					*3.10 m to 3.60 m frequent pockets of dark grey silty gravelly sand with a moderate organic odour*
		3.00 - 3.10	D					
		3.00 - 3.10	ES					
		3.50 - 3.60	ES					
		3.60	PP	45.00	3.60	12.55		Firm greenish grey slightly sandy slightly gravelly CLAY and dark brown plant debris. Sand is fine and medium. Gravel is angular to subangular fine to coarse flint. [MADE GROUND]
		3.90 - 4.40	B					
		3.90 - 4.40	D					
		3.90 - 4.40	ES		4.00	10.95		Dark grey silty SAND and GRAVEL. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse flint. [ALLUVIUM]
		4.00 - 4.40	B					
		4.00 - 4.40	D					
		4.00 - 4.40	ES					
		4.40	PP	50.00	4.40	10.55		Firm grey and greenish grey CLAY with a very few fine semi decayed roots and root channels. Slight organic odour. [ALLUVIUM]
		4.50 - 4.60	ES					
		4.50 - 4.90	B					
		4.50 - 4.90	D					

Dimensions		Orientation	Trench Support and Comment			Pumping Data		
Pit Length (m)	Pit Width (m)	Orientation (deg)	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
3.00	0.60	135	Stable	Not required				

Weather: Dry and sunny

Remarks

1. Position CAT scanned prior to digging. 2. No ground water encountered. 3. Trial pit terminated at 5.60 m bgl. 4. Trial pit back filled with arisings and compacted in 300 mm layers.

Trial Pit Log

Project Name: Meridian Water HIF and Infrastructure Ground Investigation	Client: London Borough of Enfield	Date: 27/02/2020
Location: Meridian Water, Enfield	Engineer: Ground Technology Services Limited	Co-ords: E536029.81 N192139.55
Project No. : GTS-19-250	Crew Name: DP	Equipment: 140LC-7

Location Number	Location Type	Level	Logged By	Scale	Page Number
GI_DZLV1_TP2046	TP	14.55m AOD	WL	1:25	Sheet 2 of 2

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		5.50 - 5.60	ES		5.60	10.15		Firm grey and greenish grey CLAY with a very few fine semi decayed roots and root channels. Slight organic odour. [ALLUVIUM]
								End of Trial Pit at 5.60m

6
7
8
9
10

Dimensions		Orientation	Trench Support and Comment			Pumping Data		
Pit Length (m)	Pit Width (m)	Orientation (deg)	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
3.00	0.60	135	Stable	Not required				

Weather: Dry and sunny

Remarks

1. Position CAT scanned prior to digging. 2. No ground water encountered. 3. Trial pit terminated at 5.60 m bgl. 4. Trial pit back filled with arisings and compacted in 300 mm layers.

GROUND TECHNOLOGY
Victory Park, Attleborough
Norfolk, NR17 1ZA
Tel: 01953 459462

Photographic Report

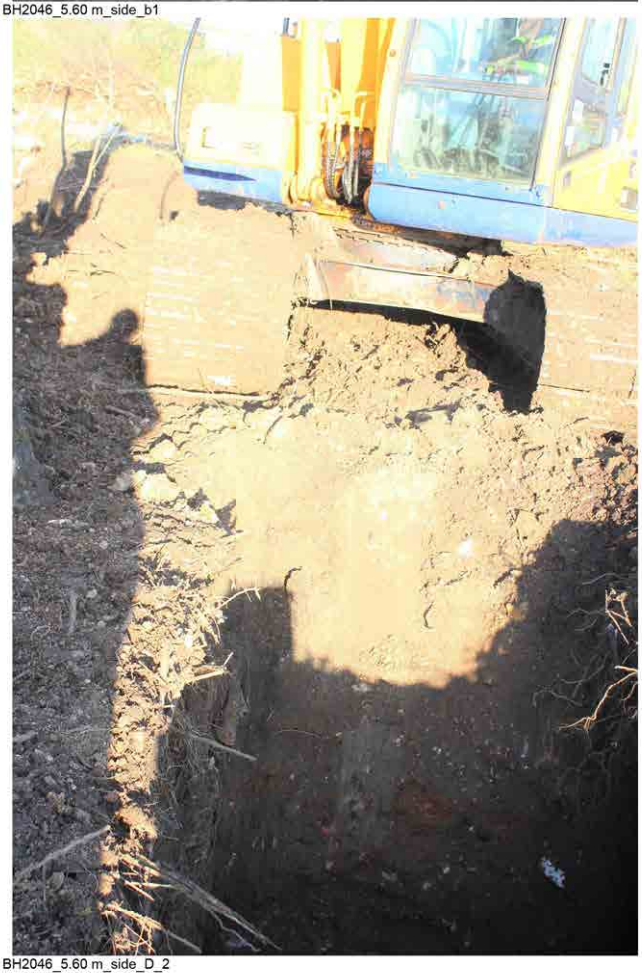
GI_DZLV1_TP2046

Project:	Meridian Water HIF and Infrastructure Ground Investigation
Project ID:	GTS-19-250

BH2_046_5.60 m_side_A

BH2046_5.60 m_side_b1

BH2046_5.60 m_side_D_1



BH2046_5.60 m_side_D_2

GROUND TECHNOLOGY
Victory Park, Attleborough
Norfolk, NR17 1ZA
Tel: 01953 459462

Photographic Report

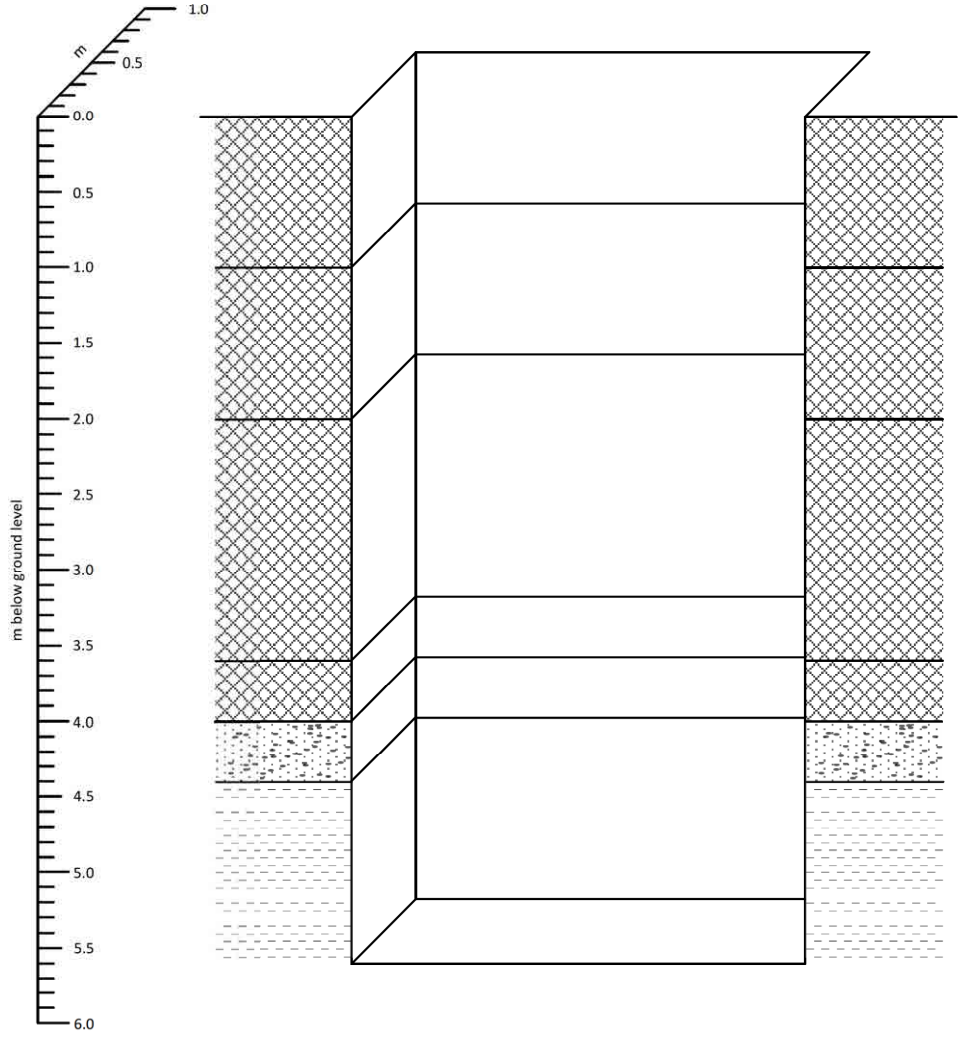
GI_DZLV1_TP2046

Project:	Meridian Water HIF and Infrastructure Ground Investigation
Project ID:	GTS-19-250

BH2046_5.60 m_sideB_2

Trial Pit Section

Project Name: Meridian Water HIF and Infrastructure Ground Investigation		Client: London Borough of Enfield		Date: 27/02/2020	
Location: Meridian Water, Enfield		Engineer: Ground Technology Services Limited		Co-ords: E536029.74 N192136.49	
Project No.: GTS-19-250		Crew Name: PH		Equipment: 140LC-7	
Location Number **GI_DZLV1_TP2046**	Location Type TP	Level 14.55m aOD	Drawn By AB	Scale 1:50	Page Number Sheet 2 of 2



Width (m) 0.60	Remarks:
Length (m) 3.00	1. Location CAT scanned prior to excavation. 2. Trial pit backfilled with arisings compacted in 300 mm layers.
Depth (m) 5.60	
Orientation (°) 135	

Trial Pit Log

Project Name: Meridian Water HIF and Infrastructure Ground Investigation	Client: London Borough of Enfield	Date: 03/03/2020
Location: Meridian Water, Enfield	Engineer: Ground Technology Services Limited	Co-ords: E536004.30 N192120.20
Project No. : GTS-19-250	Crew Name: DP	Equipment: 140LC-7

Location Number	Location Type	Level	Logged By	Scale	Page Number
GI_DZLV1_TP2047	TP	14.56m AOD	AB	1:25	Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.00 - 0.10	D					Yellowish brown slightly clayey very gravelly SAND with high cobble content. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse flint brick and concrete. Cobbles are subangular brick and concrete. Car axle in pit and 30 mm dia. Steel cable. [MADE GROUND]
		0.00 - 0.50	B					
		0.10 - 0.20	ES					
		0.10	PID	PID=0.00				
		1.00 - 1.10	D					
		1.00 - 1.50	B					
		1.10 - 1.20	ES					
		1.10	PID	PID=0.00				
		2.00 - 2.10	D					
		2.00 - 2.40	B					
		2.10 - 2.20	ES					
		2.10	PID	PID=0.00				
					2.70	14.56		Dark grey slightly gravelly slightly sandy slightly silty CLAY. Sand is medium and coarse. Gravel is angular to subangular fine to coarse flint. [MADE GROUND]
	▼	3.10 - 3.20	B					
		3.10 - 3.20	D					
		3.10 - 3.20	ES					
					3.60	11.86		Firm grey with brown staining silty CLAY. [ALLUVIUM]
		3.80	PP	50.00				
		4.00 - 4.50	B					
		4.10	D					*4.10 m tree trunk obstruction.*
		4.10 - 4.20	ES					
					4.20	10.96		End of Trial Pit at 4.20m

Dimensions		Orientation	Trench Support and Comment			Pumping Data		
Pit Length (m)	Pit Width (m)	Orientation (deg)	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
3.80	1.00	150	Stable	Not required				

Weather: Dry and sunny

Remarks

1. Position CAT scanned prior to digging. 2. Water encountered at 3.00 m bgl. 3. Trial pit terminated at 4.20 m bgl. 4. Trial pit back filled with arisings and compacted in 300 mm layers.

GROUND TECHNOLOGY
Victory Park, Attleborough
Norfolk, NR17 1ZA
Tel: 01953 459462

Photographic Report

GI_DZLV1_TP2047

Project: Meridian Water HIF and Infrastructure Ground Investigation

Project ID: GTS-19-250

TP2047_4.10 m_Side_A

TP2047_4.10 m_Side_B

TP2047_4.10 m_Side_C

TP2047_4.10 m_side_D

GROUND TECHNOLOGY
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Tel: 01953 459462

Photographic Report

GI_DZLV1_TP2047

Project:	Meridian Water HIF and Infrastructure Ground Investigation
Project ID:	GTS-19-250

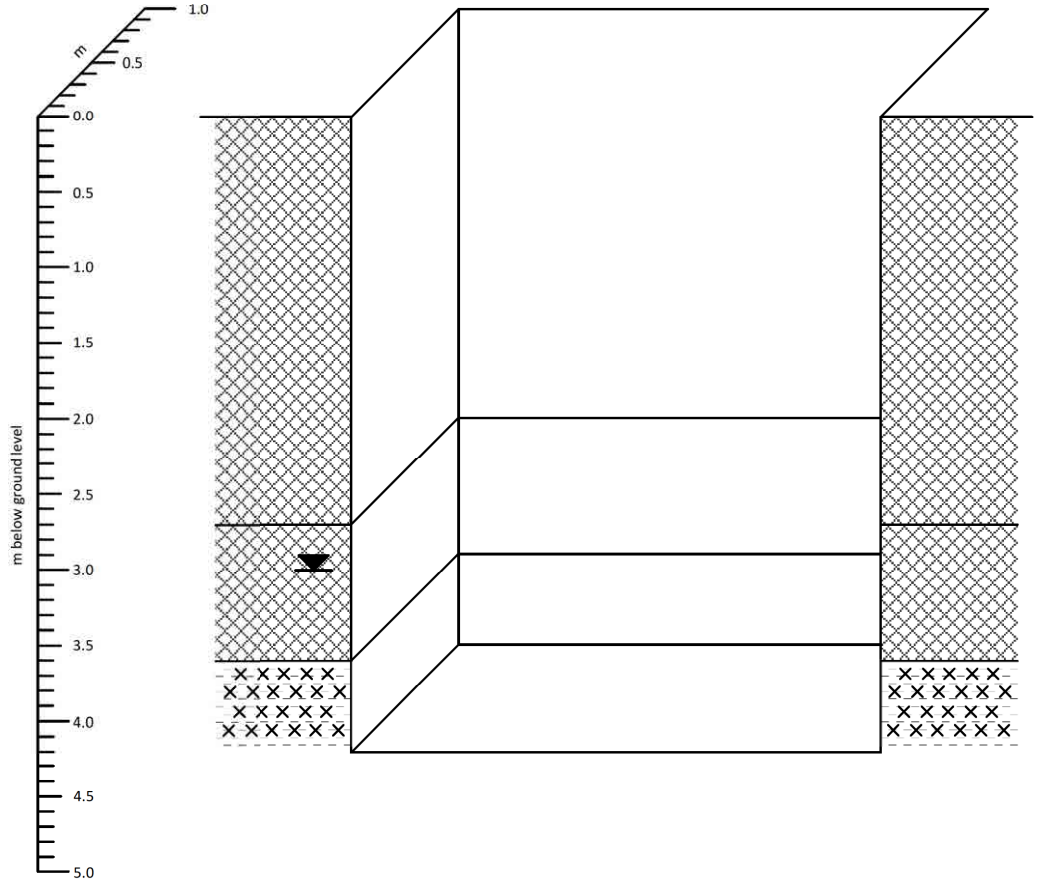
TP2047_4.10 m_side_D2

TP2047_4.10 m_Stockpile2

TP2047_5.60 m_Stockpile

Trial Pit Section

Project Name: Meridian Water HIF and Infrastructure Ground Investigation		Client: London Borough of Enfield		Date: 03/03/2020	
Location: Meridian Water, Enfield		Engineer: Ground Technology Services Limited		Co-ords: E536004.34 N192119.98	
Project No.: GTS-19-250		Crew Name: PH		Equipment: 140LC-7	
Location Number **GI_DZLV1_TP2047**	Location Type TP	Level 14.56m aOD	Drawn By AB	Scale 1:50	Page Number Sheet 2 of 2



Width (m) 1.00	Remarks: 1. Position scanned using a CAT prior to digging. 2. Trial pit back filled with arising and compacted in 300 mm layers.
Length (m) 3.80	
Depth (m) 4.20	
Orientation (°) 150	

Trial Pit Log

Project Name: Meridian Water HIF and Infrastructure Ground Investigation	Client: London Borough of Enfield	Date: 07/02/2020
Location: Meridian Water, Enfield	Engineer: Ground Technology Services Limited	Co-ords: E536000.26 N192094.68
Project No. : GTS-19-250	Crew Name: PH	Equipment: JCB 3CX

Location Number	Location Type	Level	Logged By	Scale	Page Number
GI_DZLV1_TP2048	TP	11.72m AOD	AW	1:25	Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.25 - 0.40	B					Strong light grey CONCRETE. 40-50 % aggregate subrounded to rounded fine to coarse flint gravel. 10 % small voids. [MADE GROUND]
		0.35 - 0.45	D		0.32	11.72		
		0.35 - 0.45	ES					Orange brown slightly silty sandy GRAVEL. Sand is fine to coarse. Gravel is subrounded to rounded fine to coarse flint. [MADE GROUND]
		0.35	PID	PID=0.00	0.49	11.40		
		0.50 - 0.60	D					Brown slightly sandy gravelly CLAY with medium cobble and boulder content. Sand is fine and medium. Gravel is subrounded fine to coarse brick and flint. Cobbles and boulders are angular to subangular brick and concrete. [MADE GROUND]
		0.50 - 0.60	ES					
		0.50 - 0.70	B		0.71	11.23		
		0.50	PID	PID=0.00				
		0.72 - 1.20	B					
		0.75 - 0.80	ES					
		0.75	PID	PID=0.00				
		0.80 - 0.90	D					
		1.00	PP	10.00				Soft grey slightly sandy slightly gravelly CLAY with occasional pockets of grey sand and rare roots (<10 mm diameter). Sand is fine. Gravel is subrounded fine and medium flint. [ALLUVIUM]
		1.70 - 1.80	D					
		1.70 - 1.80	ES					
		1.70 - 2.20	B					
		1.70	PID	PID=0.00				
		1.90	PP	10.00				
	▼							
		2.70 - 2.80	D					
		2.70 - 2.80	ES					
		2.70 - 3.00	B					
		2.70	PID	PID=0.00				
		3.00	PP	15.00	3.00	11.01		End of Trial Pit at 3.00m

1 2 3 4 5

Dimensions		Orientation	Trench Support and Comment			Pumping Data		
Pit Length (m)	Pit Width (m)	Orientation (deg)	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
3.60	1.10	194	Stable	Not required				

Weather: Dry and sunny

Remarks

1. Position CAT scanned prior to digging. 2. Water encountered at 2.50 m bgl. 3. Trial pit terminated at 3.00 m bgl. 4. Trial pit back filled with arisings and compacted in 300 mm layers and reinstated with concrete.

GROUND TECHNOLOGY
Victory Park, Attleborough
Norfolk, NR17 1ZA
Tel: 01953 459462

Photographic Report

GI_DZLV1_TP2048

Project: Meridian Water HIF and Infrastructure Ground Investigation

Project ID: GTS-19-250

TP2048_ (21) m_Side D

TP2048_ (23) m_Spoil

TP2048_0.25 m_Base

TP2048_0.49 m_Base

GROUND TECHNOLOGY
Victory Park, Attleborough
Norfolk, NR17 1ZA
Tel: 01953 459462

Photographic Report

GI_DZLV1_TP2048

Project:	Meridian Water HIF and Infrastructure Ground Investigation
Project ID:	GTS-19-250

TP2048_0.49 m_Spoil

TP2048_1.30 m_Side_D

TP2048_1.30 m_Spoil

TP2048_3.00 m Base

GROUND TECHNOLOGY
Victory Park, Attleborough
Norfolk, NR17 1ZA
Tel: 01953 459462

Photographic Report

GI_DZLV1_TP2048

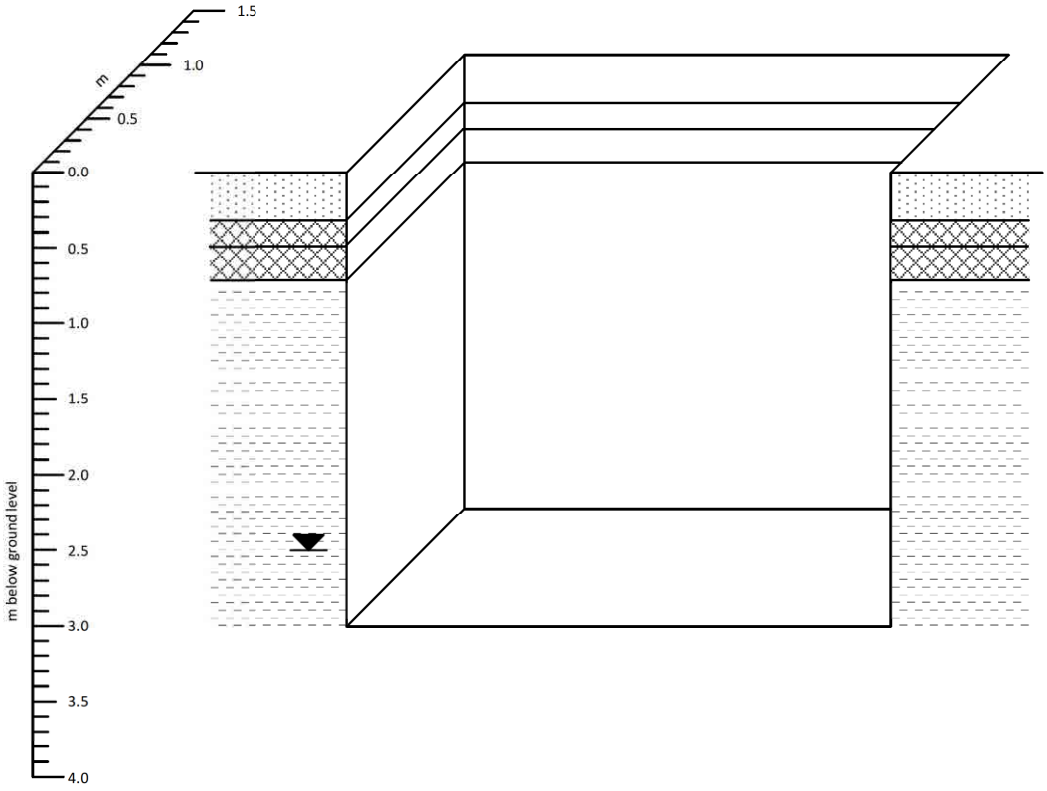
Project:	Meridian Water HIF and Infrastructure Ground Investigation
Project ID:	GTS-19-250

TP2048_3.00 m_Side D

TP2048_3.00_Spoil

Trial Pit Section

Project Name: Meridian Water HIF and Infrastructure Ground Investigation		Client: London Borough of Enfield		Date: 07/02/2020	
Location: Meridian Water, Enfield		Engineer: Ground Technology Services Limited		Co-ords: E535996.61 N192089.15	
Project No.: GTS-19-250		Crew Name: PH		Equipment: JCB 3CX	
Location Number **GI_DZLV1_TP2048**	Location Type TP	Level 11.72m aOD	Drawn By AB	Scale 1:50	Page Number Sheet 2 of 2



Width (m) 1.10	Remarks: 1. Position scanned using a CAT prior to digging. 2. Trial pit back filled with arising and compacted in 300 mm layers.
Length (m) 3.60	
Depth (m) 3.00	
Orientation (°) 194	

Trial Pit Log

Project Name: Meridian Water HIF and Infrastructure Ground Investigation	Client: London Borough of Enfield	Date: 10/02/2020
Location: Meridian Water, Enfield	Engineer: Ground Technology Services Limited	Co-ords: E536022.42 N192046.43
Project No. : GTS-19-250	Crew Name: PH	Equipment: JCB 3CX

Location Number	Location Type	Level	Logged By	Scale	Page Number
GI_DZLV1_TP2051	TP	11.84m AOD	AW	1:25	Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.15 - 0.30	B		0.15	11.84		Strong light grey CONCRETE. 40-50 % aggregate subangular to subrounded fine to coarse flint gravel. 10 % small voids. [MADE GROUND]
		0.20 - 0.30	D					
		0.20 - 0.30	ES		0.31	11.69		
		0.20	PID	PID=0.00				Orangish brown sandy GRAVEL. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse flint brick and concrete. [MADE GROUND]
		0.35 - 0.45	B		0.45	11.53		
		0.35 - 0.45	D					
		0.35 - 0.45	ES					
		0.35	PID	PID=0.60				Dark grey sandy GRAVEL with medium cobble content and frequent soft clay pockets. Sand is fine to coarse. Gravel is angular to subangular fine to coarse flint and brick. Cobbles are angular brick. [MADE GROUND]
		0.50 - 0.60	D					
		0.50 - 0.60	ES					
		0.50 - 1.00	B					
		0.50	PID	PID=0.00				Soft to firm dark grey slightly gravelly sandy CLAY. Sand is light grey fine to coarse and occurs in pockets and streaks. Gravel is subrounded fine to coarse flint. [ALLUVIUM]
		1.60	PP	75.00				
		1.80 - 1.90	D					
		1.80 - 1.90	ES					
		1.80 - 2.00	B					
		1.80	PID	PID=0.00				
		2.80 - 3.00	B					
		2.80 - 3.00	D					
		2.80 - 3.00	ES					
		2.80	PID	PID=0.00	3.00	11.39		End of Trial Pit at 3.00m
		3.00	PP	141.67				

1 2 3 4 5

Dimensions		Orientation	Trench Support and Comment			Pumping Data		
Pit Length (m)	Pit Width (m)	Orientation (deg)	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
3.50	1.10	54	Stable	Not required				

Weather: Fair and dry

Remarks

1. Position CAT scanned prior to digging. 2. No ground water encountered. 3. Trial pit terminated at 3.00 m bgl. 4. Trial pit back filled with arisings and compacted in 300 mm layers and reinstated with concrete.

GROUND TECHNOLOGY
Victory Park, Attleborough
Norfolk, NR17 1ZA
Tel: 01953 459462

Photographic Report

GI_DZLV1_TP2051

Project:	Meridian Water HIF and Infrastructure Ground Investigation
Project ID:	GTS-19-250

TP2051_0.15 m_Base

TP2051_0.30 m_Spoil

TP2051_0.45 m_Spoil

TP2051_0.90 m_Base

GROUND TECHNOLOGY
Victory Park, Attleborough
Norfolk, NR17 1ZA
Tel: 01953 459462

Photographic Report

GI_DZLV1_TP2051

Project:	Meridian Water HIF and Infrastructure Ground Investigation
Project ID:	GTS-19-250

TP2051_0.90 m_Side B

TP2051_0.90 m_Side_D

TP2051_0.90 m_Spoil

TP2051_1.80 m_Side_B

GROUND TECHNOLOGY
Victory Park, Attleborough
Norfolk, NR17 1ZA
Tel: 01953 459462

Photographic Report

GI_DZLV1_TP2051

Project:	Meridian Water HIF and Infrastructure Ground Investigation
Project ID:	GTS-19-250

TP2051_1.80 m_Side_D

TP2051_1.80 m_Spoil

TP2051_1.80 mBase

TP2051_3.00 m_Base

GROUND TECHNOLOGY
Victory Park, Attleborough
Norfolk, NR17 1ZA
Tel: 01953 459462

Photographic Report

GI_DZLV1_TP2051

Project: Meridian Water HIF and Infrastructure Ground Investigation

Project ID: GTS-19-250

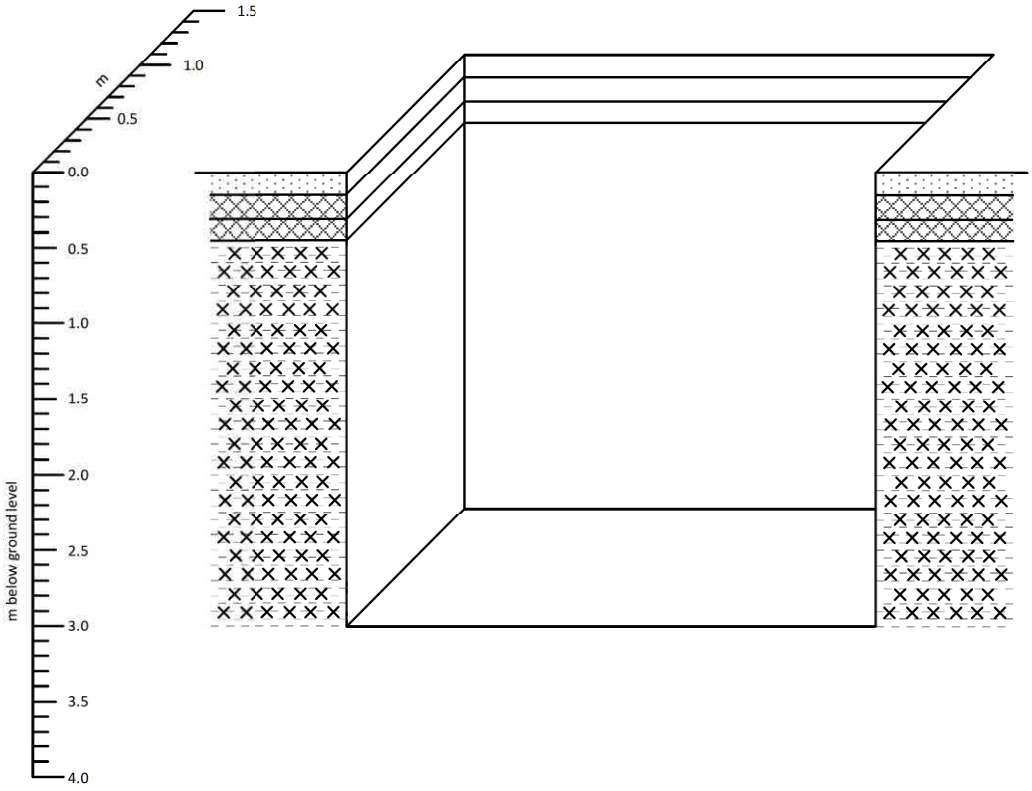
TP2051_3.00 m_Side D

TP2051_3.00 m_Side_B

TP2051_3.00 m_Spoil

Trial Pit Section

Project Name: Meridian Water HIF and Infrastructure Ground Investigation		Client: London Borough of Enfield		Date: 10/02/2020	
Location: Meridian Water, Enfield		Engineer: Ground Technology Services Limited		Co-ords: E536015.06 N192036.37	
Project No.: GTS-19-250		Crew Name: PH		Equipment: JCB 3CX	
Location Number **GI_DZLV1_TP2051**	Location Type TP	Level 11.84m aOD	Drawn By AB	Scale 1:50	Page Number Sheet 2 of 2



Width (m) 1.10	Remarks: 1. Position scanned using a CAT prior to digging. 2. Trial pit back filled with arising and compacted in 300 mm layers.
Length (m) 3.50	
Depth (m) 3.00	
Orientation (°) 054	

Trial Pit Log

Project Name: Meridian Water HIF and Infrastructure Ground Investigation	Client: London Borough of Enfield	Date: 24/02/2020
Location: Meridian Water, Enfield	Engineer: Ground Technology Services Limited	Co-ords: E536023.48 N192264.08
Project No. : GTS-19-250	Crew Name: PH	Equipment: JCB 3CX

Location Number	Location Type	Level	Logged By	Scale	Page Number
GI_DZLV1_TT2001	TP	10.76m AOD	AW	1:25	Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.50 - 0.60	ES					Brown slightly sandy gravelly CLAY with frequent fragments of wire and plastic. Sand is fine to coarse. Gravel is angular fine to coarse brick and concrete. [MADE GROUND]
		0.50 - 0.60	ES					
		0.60	ES					
		0.60 - 1.00	B					
		0.60	PID	PID=0.00				
		1.20 - 2.00	ES					
		1.30	ES					
		1.30	PID	PID=0.10				
		1.40 - 2.00	B					
	▼				2.00	10.76		Pale yellow to orange SAND and GRAVEL. Sand is fine to coarse. Gravel is subrounded to round fine to coarse flint brick and concrete. [KEMPTON PARK GRAVEL FORMATION]
		2.20 - 3.20	ES					
		2.20	PID	PID=0.00				
		2.30 - 2.80	B					
					3.00	8.76		End of Trial Pit at 3.00m

1 2 3 4 5

Dimensions		Orientation	Trench Support and Comment			Pumping Data		
Pit Length (m)	Pit Width (m)	Orientation (deg)	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
3.00	1.00	330	Unstable	Not required				
Weather: Dry and sunny								

Remarks

1. Position CAT scanned prior to digging. 2. Water encountered at 2.00 m bgl. 3. Trial pit terminated at 3.00 m bgl. 4. Trial pit back filled with arisings and compacted in 300 mm layers.

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Tel: 01953 459462

Photographic Report

GI_DZLV1_TT2001

Project:	Meridian Water HIF and Infrastructure Ground Investigation
Project ID:	GTS-19-250

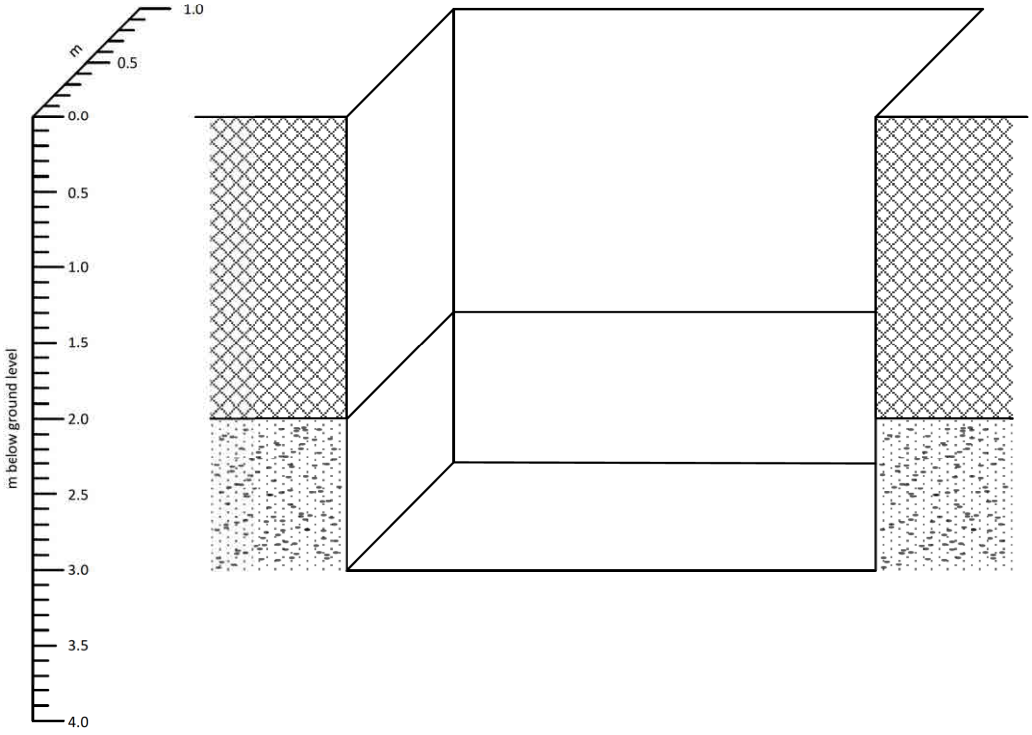
TT2001_3.00 m_Side_A_B

TT2001_3.00 m_Side_B_C

TT2001_3.00 m_Side_D

Trial Trench Section

Project Name: Meridian Water HIF and Infrastructure Ground Investigation		Client: London Borough of Enfield		Date: 24/02/2020	
Location: Meridian Water, Enfield		Engineer: Ground Technology Services Limited		Co-ords: E536014.82 N192247.61	
Project No.: GTS-19-250		Crew Name: PH		Equipment: JCB 3CX	
Location Number **GI_DZLV1_TT2001**	Location Type TT	Level 10.76m aOD	Drawn By AB	Scale 1:50	Page Number Sheet 2 of 2



Width (m) 1.10	Remarks: 1. Position scanned using a CAT prior to digging. 2. Trial pit back filled with arising and compacted in 300 mm layers.
Length (m) 3.00	
Depth (m) 3.00	
Orientation (°) 330	

Trial Pit Log

Project Name: Meridian Water HIF and Infrastructure Ground Investigation	Client: London Borough of Enfield	Date: 19/02/2020
Location: Meridian Water, Enfield	Engineer: Ground Technology Services Limited	Co-ords: E536048.70 N192223.46
Project No. : GTS-19-250	Crew Name: DP	Equipment: 140LC-7

Location Number	Location Type	Level	Logged By	Scale	Page Number
GI_DZLV1_TT2002	TP	10.61m AOD	AW	1:25	Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.40 - 0.50	D					Brown sandy gravelly CLAY with low cobble content and rare fragments of metal and sheet ACM. Sand is fine to coarse. Gravel is angular to rounded fine to coarse concrete brick and flint. Cobbles are angular concrete and brick. [MADE GROUND]
		0.40 - 0.50	ES					
		0.40 - 0.90	B					
		0.40	PID	PID=0.00				
		1.20 - 1.70	B		1.20	10.61		Firm grey silty slightly sandy CLAY. Sand is fine and medium. [ALLUVIUM]
		1.30 - 1.40	D					
		1.30 - 1.40	ES					
		1.30	PID	PID=0.00				
		1.70	PP	191.67	1.70	9.41		End of Trial Pit at 1.70m

Dimensions		Orientation	Trench Support and Comment			Pumping Data		
Pit Length (m)	Pit Width (m)	Orientation (deg)	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
10.00	1.40	82	Stable	Not required				

Weather: Fair and dry

Remarks

1. Position CAT scanned prior to digging. 2. No ground water encountered. 3. Trial pit terminated at 1.70 m bgl. 4. Trial pit back filled with arisings and compacted in 300 mm layers.

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Photographic Report

GI_DZLV1_TT2002

Project:	Meridian Water HIF and Infrastructure Ground Investigation
Project ID:	GTS-19-250

TT2002_1.40 m_Side_C

TT2002_1.40 m_Side_D

TT2002_1.40 m_Spoil

TT2002_3.00 m_Side_B

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Victory Park, Attleborough
Norfolk, NR17 1ZA
Tel: 01953 459462

Photographic Report

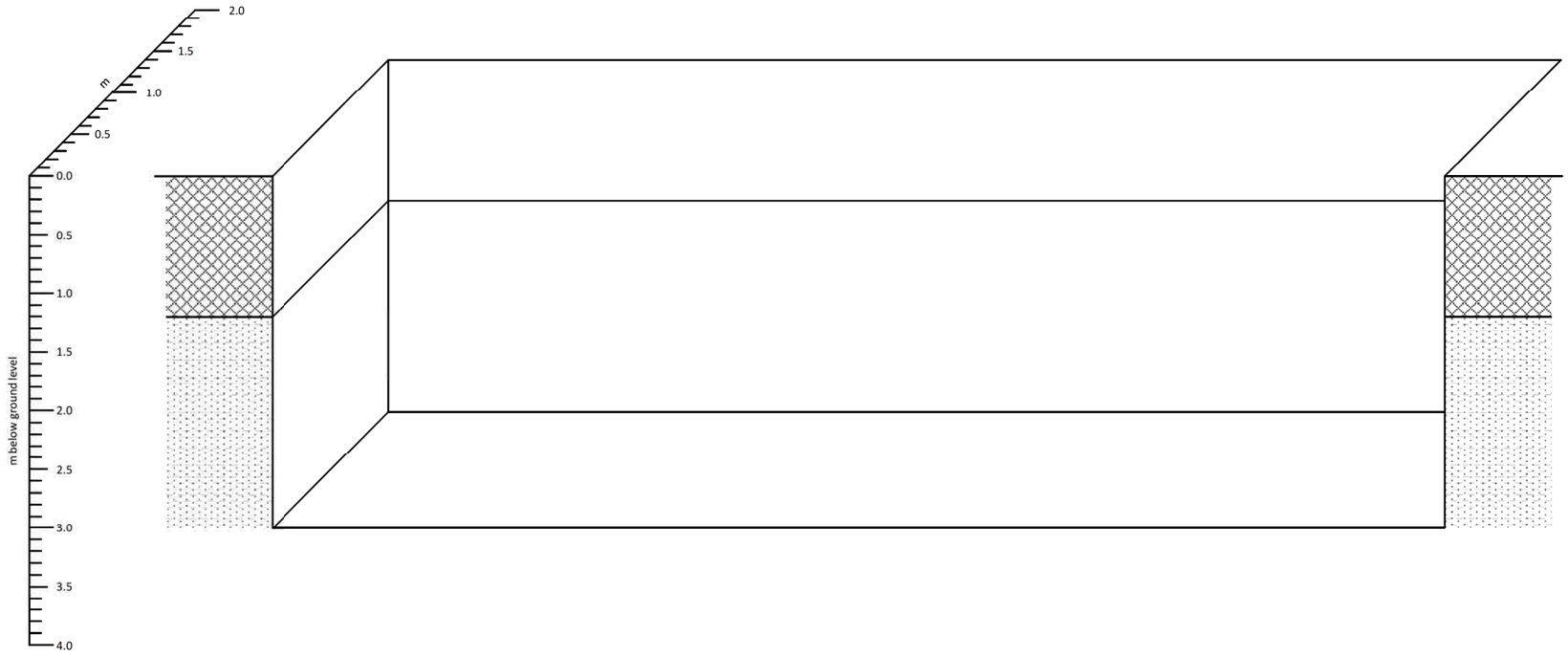
GI_DZLV1_TT2002

Project:	Meridian Water HIF and Infrastructure Ground Investigation
Project ID:	GTS-19-250

TT2002_3.00 m_Spoil

Trial Trench Section

Project Name: Meridian Water HIF and Infrastructure Ground Investigation		Client: London Borough of Enfield		Date: 19/02/2020	
Location: Meridian Water, Enfield		Engineer: Ground Technology Services Limited		Co-ords: E536041.49 N192220.94	
Project No.: GTS-19-250		Crew Name: PH		Equipment: 140LC-7	
Location Number **GI_DZLV1_TT2002**	Location Type TT	Level 10.61m aOD	Drawn By AB	Scale 1:50	Page Number Sheet 2 of 2



Width (m) 1.40	Remarks: 1. Position scanned using a CAT prior to digging. 2. Trial pit back filled with arising and compacted in 300 mm layers.
Length (m) 10.00	
Depth (m) 3.00	
Orientation (°) 082	

Trial Pit Log

Project Name: Meridian Water HIF and Infrastructure Ground Investigation	Client: London Borough of Enfield	Date: 05/03/2020
Location: Meridian Water, Enfield	Engineer: Ground Technology Services Limited	Co-ords: E536056.54 N192169.57
Project No. : GTS-19-250	Crew Name: DP	Equipment: 140LC-7

Location Number	Location Type	Level	Logged By	Scale	Page Number
GI_DZLV1_TT2003	TP	11.20m AOD	JT	1:25	Sheet 1 of 2

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.00 - 0.10	ES					Greyish brown silty very gravelly SAND with medium cobble content and medium boulder content and fragments of wood metal plastic glass pottery and sheet ACM. Sand is fine to coarse. Gravel is angular fine to coarse brick concrete and flint. Cobbles and boulders are angular brick and concrete. [MADE GROUND]
		0.40 - 0.58	B					
		0.40 - 0.58	D					
		0.40 - 0.58	ES					
		1.40 - 1.50	B					
		1.40 - 1.50	D					
		1.40 - 1.50	ES					*1.50 m to 1.90 m yellowish brown sandy gravel. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse flint*
		2.20 - 2.40	B		2.20	11.20		Brownish grey clayey gravelly SAND with frequent lenses of grey sandy gravelly clay. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse flint. (Reworked alluvium?) [MADE GROUND]
		2.20 - 2.40	D					
		2.20 - 2.40	ES					
		3.00 - 3.10	B		2.70	9.00		Brownish grey and greyish brown sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular to rounded fine to coarse flint. [MADE GROUND]
		3.00 - 3.10	D					
		3.00 - 3.10	ES					
		4.30 - 4.40	B		4.20	8.50		Firm to stiff mottled grey and blueish grey CLAY, with a very few very fine roots and root channels, rare fine subangular flint gravel and coarse sand sized fresh water shells. [ALLUVIUM]
		4.30 - 4.40	D					
		4.30 - 4.40	ES					*4.70 m to 5.20 m stiff mottled grey and yellowish grey*
		5.00 - 5.10	B					

Dimensions		Orientation	Trench Support and Comment			Pumping Data		
Pit Length (m)	Pit Width (m)	Orientation (deg)	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
5.50	1.00	35	Stable	Not required				

Weather: Light showers

Remarks

1. Position CAT scanned prior to digging. 2. No ground water encountered. 3. Trial pit terminated at 5.20 m bgl. 4. Trial pit back filled with arisings and compacted in 300 mm layers.

Trial Pit Log

Project Name: Meridian Water HIF and Infrastructure Ground Investigation	Client: London Borough of Enfield	Date: 05/03/2020
Location: Meridian Water, Enfield	Engineer: Ground Technology Services Limited	Co-ords: E536056.54 N192169.57
Project No. : GTS-19-250	Crew Name: DP	Equipment: 140LC-7

Location Number	Location Type	Level	Logged By	Scale	Page Number
GI_DZLV1_TT2003	TP	11.20m AOD	JT	1:25	Sheet 2 of 2

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		5.00 - 5.10	D		5.20	7.00		Firm to stiff mottled grey and blueish grey CLAY, with a very few very fine roots and root channels, rare fine subangular flint gravel and coarse sand sized fresh water shells. [ALLUVIUM]
								End of Trial Pit at 5.20m

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Dimensions		Orientation	Trench Support and Comment			Pumping Data		
Pit Length (m)	Pit Width (m)	Orientation (deg)	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
5.50	1.00	35	Stable	Not required				
Weather: Light showers								

Remarks

1. Position CAT scanned prior to digging. 2. No ground water encountered. 3. Trial pit terminated at 5.20 m bgl. 4. Trial pit back filled with arisings and compacted in 300 mm layers.

TT2003_5.2m_stockpile

TT2003_5.20m_Side_A

TT2003_5.20 m_stockpile1

TT2003_5.20m_Side_B

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Norfolk, NR17 1ZA
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Photographic Report

GI_DZLV1_TT2003

Project:	Meridian Water HIF and Infrastructure Ground Investigation
Project ID:	GTS-19-250

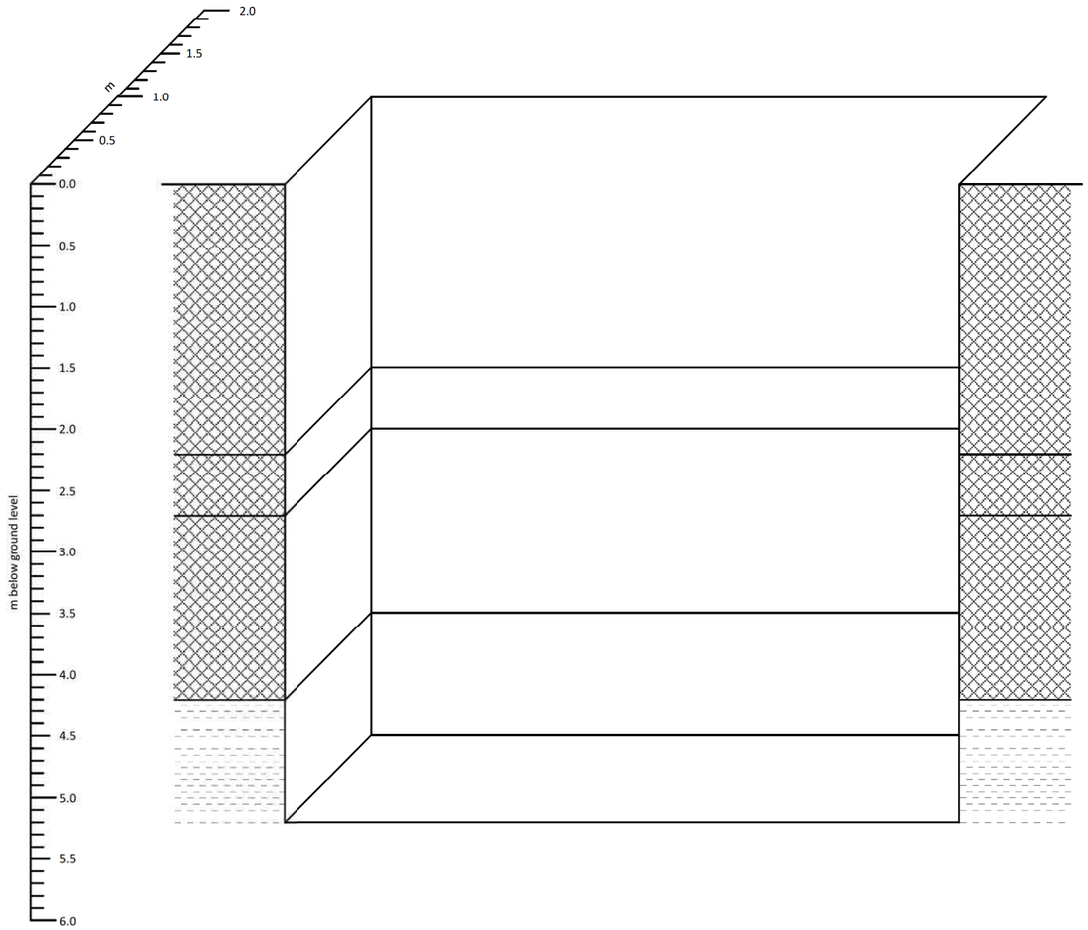
TT2003_5.20m_Side_C

TT2003_5.20m_Side_D1

TT2003_5.20m_Side_D2

Trial Trench Section

Project Name: Meridian Water HIF and Infrastructure Ground Investigation		Client: London Borough of Enfield		Date: 05/03/2020	
Location: Meridian Water, Enfield		Engineer: Ground Technology Services Limited		Co-ords: E536054.33 N192178.13	
Project No.: GTS-19-250		Crew Name: PH		Equipment: 140LC-7	
Location Number **GI_DZLV1_TT2003**	Location Type TT	Level 11.20m aOD	Drawn By AB	Scale 1:50	Page Number Sheet 2 of 2



Width (m) 1.00	Remarks: 1. Position scanned using a CAT prior to digging. 2. Trial pit back filled with arising and compacted in 300 mm layers.
Length (m) 5.50	
Depth (m) 5.20	
Orientation (°) 035	

Trial Pit Log

Project Name: Meridian Water HIF and Infrastructure Ground Investigation	Client: London Borough of Enfield	Date: 06/03/2020
Location: Meridian Water, Enfield	Engineer: Ground Technology Services Limited	Co-ords: E535962.82 N192145.03
Project No. : GTS-19-250	Crew Name: DP	Equipment: 140LC-7

Location Number	Location Type	Level	Logged By	Scale	Page Number
GI_DZLV1_TT2004	TP	12.51m AOD	JT	1:25	Sheet 1 of 2

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.30 - 0.50	B					Dark brown slightly clayey gravelly SAND with low cobble content and occasional fragments of metal and glass. Sand is fine to coarse. Gravel is angular fine to coarse flint brick and concrete. Cobbles are brick and concrete. [MADE GROUND]
		0.30 - 0.50	D					
		0.30 - 0.50	ES					
		1.50 - 1.60	B					
		1.50 - 1.60	D					
		1.50 - 1.60	ES					
		2.20 - 2.40	B		2.20	12.51		Brown silty gravelly fine to coarse SAND. Frequent gravel is angular to rounded fine to coarse flint. [MADE GROUND]
		2.20 - 2.40	D					*2.20 m to 3.20 m sandy slightly gravelly pockets. Sand is fine to coarse. Gravel is fine and medium*
		2.20 - 2.40	ES					
		3.50 - 3.70	B		3.40	10.31		Grey and brown CLAY. Clay is closely fissured with very few very fine roots. [MADE GROUND]
		3.50 - 3.70	D					*3.40 m to 4.00 m moderate organic odour*
		3.50 - 3.70	ES					
		3.60	PP	2.67				
					4.00	9.11		Firm to stiff grey and yellowish grey CLAY. [ALLUVIUM]
					4.70	8.51		Firm to stiff grey CLAY. [ALLUVIUM]
		4.90 - 5.00	B					
		4.90 - 5.00	D					
		5.00	PP	70.00				

Dimensions		Orientation	Trench Support and Comment			Pumping Data		
Pit Length (m)	Pit Width (m)	Orientation (deg)	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
4.50	1.30	45	Stable	Not required				

Weather: Light showers

Remarks

1. Position CAT scanned prior to digging. 2. No ground water encountered. 3. Trial pit terminated at 5.30 m bgl. 4. Trial pit back filled with arisings and compacted in 300 mm layers.

Trial Pit Log

Project Name: Meridian Water HIF and Infrastructure Ground Investigation	Client: London Borough of Enfield	Date: 06/03/2020
Location: Meridian Water, Enfield	Engineer: Ground Technology Services Limited	Co-ords: E535962.82 N192145.03
Project No. : GTS-19-250	Crew Name: DP	Equipment: 140LC-7

Location Number	Location Type	Level	Logged By	Scale	Page Number
GI_DZLV1_TT2004	TP	12.51m AOD	JT	1:25	Sheet 2 of 2

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		5.30	PP	28.33	5.30	7.81		Firm to stiff grey CLAY. [ALLUVIUM]
								End of Trial Pit at 5.30m

6
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Dimensions		Orientation	Trench Support and Comment			Pumping Data		
Pit Length (m)	Pit Width (m)	Orientation (deg)	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
4.50	1.30	45	Stable	Not required				

Weather: Light showers

Remarks

1. Position CAT scanned prior to digging. 2. No ground water encountered. 3. Trial pit terminated at 5.30 m bgl. 4. Trial pit back filled with arisings and compacted in 300 mm layers.

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Norfolk, NR17 1ZA
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Photographic Report

GI_DZLV1_TT2004

Project: Meridian Water HIF and Infrastructure Ground Investigation

Project ID: GTS-19-250

TT2004_Spoil

TT2004_Side A

TT2004_Side A

TT2004_Side B

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Tel: 01953 459462

Photographic Report

GI_DZLV1_TT2004

Project:	Meridian Water HIF and Infrastructure Ground Investigation
Project ID:	GTS-19-250

TT2004_Side C

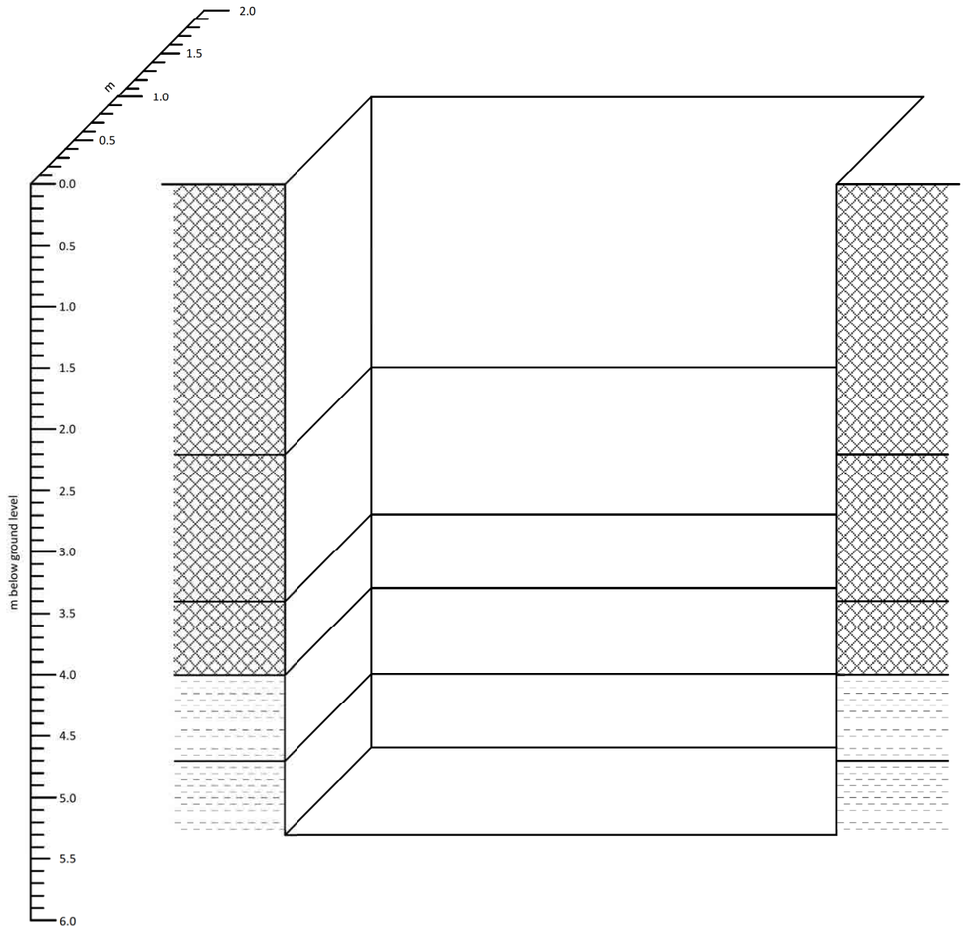
TT2004_Side C

TT2004_Side D

TT2004_Reinstatement

Trial Trench Section

Project Name: Meridian Water HIF and Infrastructure Ground Investigation		Client: London Borough of Enfield		Date: 06/03/2020	
Location: Meridian Water, Enfield		Engineer: Ground Technology Services Limited		Co-ords: E535981.16 N192133.63	
Project No.: GTS-19-250		Crew Name: PH		Equipment: 140LC-7	
Location Number **GI_DZLV1_TT2004**	Location Type TT	Level 12.51m aOD	Drawn By AB	Scale 1:50	Page Number Sheet 2 of 2



Width (m) 1.30	Remarks: 1. Position scanned using a CAT prior to digging. 2. Trial pit back filled with arising and compacted in 300 mm layers.
Length (m) 4.50	
Depth (m) 5.30	
Orientation (°) 045	

Trial Pit Log

Project Name: Meridian Water HIF and Infrastructure Ground Investigation	Client: London Borough of Enfield	Date: 07/02/2020
Location: Meridian Water, Enfield	Engineer: Ground Technology Services Limited	Co-ords: E536030.69 N192089.98
Project No. : GTS-19-250	Crew Name: PH	Equipment: JCB 3CX

Location Number	Location Type	Level	Logged By	Scale	Page Number
GI_DZLV1_TT2005	TP	11.78m AOD	AW	1:25	Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.30 - 0.40	D		0.30	11.78		Strong light grey CONCRETE. 40-50 % aggregate subrounded to rounded fine to coarse flint gravel. 15 % small voids. [MADE GROUND]
		0.30 - 0.40	ES					
		0.30 - 0.45	B					
		0.30	PID	PID=0.00				
		0.60 - 0.70	D		0.56	11.48		Brown slightly clayey sandy GRAVEL with medium cobble content and medium boulder content. Sand is fine to coarse. Gravel is angular to subangular fine to coarse concrete and brick. Cobbles and boulders are angular concrete and brick. [MADE GROUND]
		0.60 - 0.70	ES					
		0.60 - 0.80	B					
		0.60	PP	10.00				*0.4 m metal pipe (6 mm x 1000 mm) and wooden plank (80 mm x 600 mm)*
		0.60	PID	PID=0.00				*0.45 m becoming very clayey*
								Soft to firm grey and dark grey slightly sandy slightly gravelly silty CLAY with occasional peat clumps and occasional pockets of grey sand. Sand is fine to coarse. Gravel is subrounded fine to coarse flint. [ALLUVIUM]
								1.33 m becoming sandy. Sand is fine to coarse
		1.60 - 1.70	D					
		1.60 - 1.70	ES					
		1.60 - 1.80	B					
		1.60	PP	20.00				
		1.60	PID	PID=0.00				
		2.50 - 2.60	ES					
		2.50	PP	40.00				
		2.50	PID	PID=0.00				
		3.20	PP	80.00	3.20	11.22		End of Trial Pit at 3.20m

1 2 3 4 5

Dimensions		Orientation	Trench Support and Comment			Pumping Data		
Pit Length (m)	Pit Width (m)	Orientation (deg)	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
4.00	1.00	60	Stable	Not required				

Weather: Dry and sunny

Remarks

1. Position CAT scanned prior to digging. 2. No ground water encountered. 3. Trial pit terminated at 3.30 m bgl. 4. Trial pit back filled with arisings and compacted in 300 mm layers and reinstated with concrete.

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Photographic Report

GI_DZLV1_TT2005

Project:	Meridian Water HIF and Infrastructure Ground Investigation
Project ID:	GTS-19-250

TT2005_0.30 m_Base_side_D_A

TT2005_0.30 m_Spoil

TT2005_0.45 m_Spoil

TT2005_0.50 m_Base

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Tel: 01953 459462

Photographic Report

GI_DZLV1_TT2005

Project: Meridian Water HIF and Infrastructure Ground Investigation

Project ID: GTS-19-250

TT2005_1.50 m_Side_C

TT2005_1.50 m_Side_D_Base

TT2005_1.50 m_Spoil

TT2005_2.50 m_Side D

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Photographic Report

GI_DZLV1_TT2005

Project:	Meridian Water HIF and Infrastructure Ground Investigation
Project ID:	GTS-19-250

TT2005_3.20 m Spoil

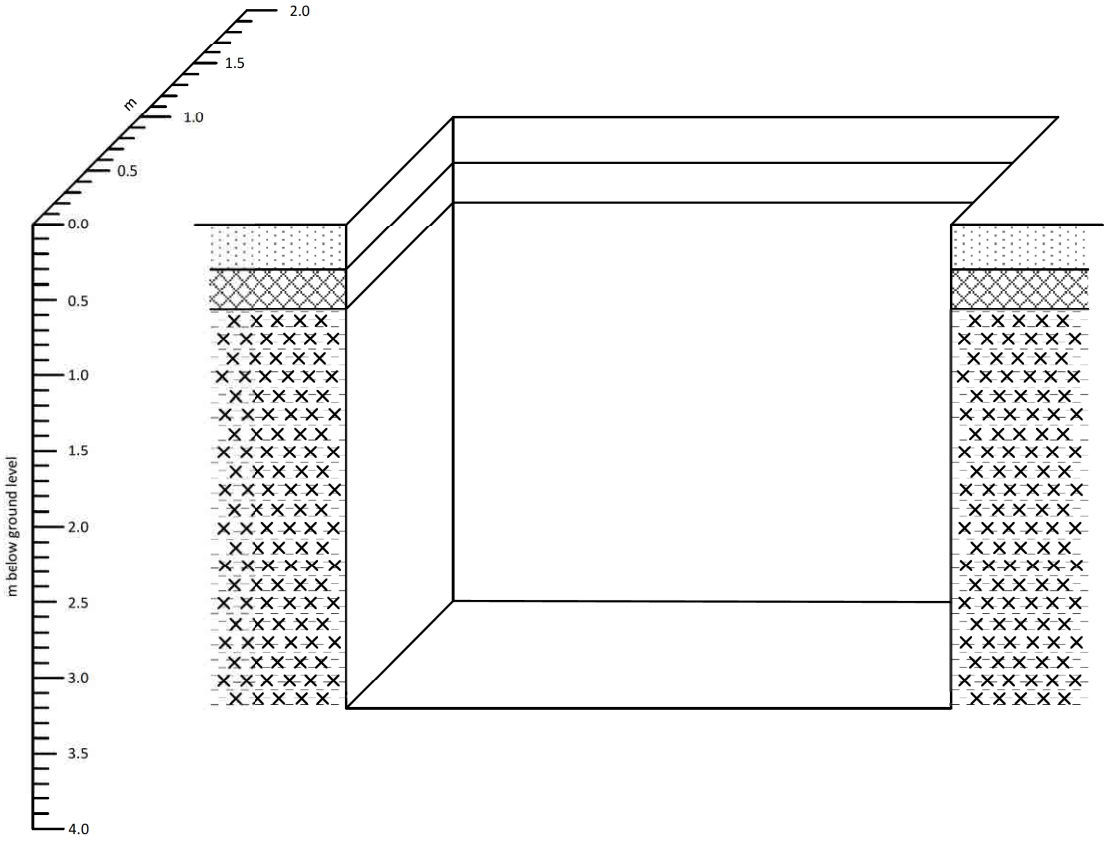
TT2005_3.20 m_Base

TT2005_3.20 m_Side_D

TT2005_Location

Trial Trench Section

Project Name: Meridian Water HIF and Infrastructure Ground Investigation		Client: London Borough of Enfield		Date: 07/03/2020	
Location: Meridian Water, Enfield		Engineer: Ground Technology Services Limited		Co-ords: E536028.11 N192097.53	
Project No.: GTS-19-250		Crew Name: PH		Equipment: JCB 3CX	
Location Number **GI_DZLV1_TT2005**	Location Type TT	Level 11.78m aOD	Drawn By AB	Scale 1:50	Page Number Sheet 2 of 2



Width (m) 1.00	Remarks:
Length (m) 4.00	1. Position scanned using a CAT prior to digging. 2. Trial pit back filled with arising and compacted in 300 mm layers.
Depth (m) 3.20	
Orientation (°) 060	

Trial Pit Log

Project Name: Meridian Water HIF and Infrastructure Ground Investigation	Client: London Borough of Enfield	Date: 12/02/2020
Location: Meridian Water, Enfield	Engineer: Ground Technology Services Limited	Co-ords: E536058.90 N192065.85
Project No. : GTS-19-250	Crew Name: PH	Equipment: JCB 3CX

Location Number	Location Type	Level	Logged By	Scale	Page Number
GI_DZLV1_TT2006	TP	11.84m AOD	AW	1:25	Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.25 - 0.35	B		0.25	11.84		Strong light grey CONCRETE. 50-60 % aggregate subrounded to subangular fine and medium flint gravel. 10-20 % small voids. [MADE GROUND]
		0.30 - 0.35	D		0.35	11.59		Yellowish brown sandy GRAVEL. Sand is medium and coarse. Gravel is subrounded to rounded fine to coarse flint. Distinct hydrocarbon odour. [MADE GROUND]
		0.30 - 0.35	ES					
		0.30	PID	PID=0.00				
		0.40 - 0.50	D		0.60	11.49		Dark grey slightly sandy gravelly CLAY with high cobble content and medium boulder content with rare fragments of metal rebar and occasional fragments of wood. Sand is fine to coarse. Gravel is angular to subangular fine to coarse concrete flint and brick. Cobble and boulders are angular of concrete and brick. [MADE GROUND]
		0.40 - 0.50	ES					
		0.40 - 0.60	B					
		0.40	PID	PID=3.80				
		0.70 - 1.70	B					
		1.60 - 1.70	D					Grey and light grey sandy gravelly CLAY with low cobble and boulder content. Sand is fine to coarse. Gravel is subangular to rounded fine to coarse flint concrete and brick. Cobble and boulder are angular and subrounded concrete and brick. [MADE GROUND]
		1.60 - 1.70	ES					
		1.60	PID	PID=0.00				
		2.60 - 2.70	B					
		2.60 - 2.70	D					
		2.60 - 2.70	ES					
		2.60	PID	PID=0.00				
					3.30	11.24		End of Trial Pit at 3.30m

1 2 3 4 5

Dimensions		Orientation	Trench Support and Comment			Pumping Data		
Pit Length (m)	Pit Width (m)	Orientation (deg)	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
1.50	1.00	65	Stable	Not required				
Weather: Overcast								

Remarks

1. Position CAT scanned prior to digging. 2. No ground water encountered. 3. Trial pit terminated at 3.30 m bgl. 4. Trial pit back filled with arisings and compacted in 300 mm layers and reinstated with concrete.

GROUND TECHNOLOGY
Victory Park, Attleborough
Norfolk, NR17 1ZA
Tel: 01953 459462

Photographic Report

GI_DZLV1_TT2006

Project: Meridian Water HIF and Infrastructure Ground Investigation

Project ID: GTS-19-250

TT2006_0.25 m_Base

TT2006_0.35 m_Base

TT2006_0.35 m_Spoil

TT2006_0.60 m Spoil

GROUND TECHNOLOGY
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Tel: 01953 459462

Photographic Report

GI_DZLV1_TT2006

Project: Meridian Water HIF and Infrastructure Ground Investigation

Project ID: GTS-19-250

TT2006_0.60 m_Base

TT2006_1.60 m_Side_D_Base

TT2006_1.60 m_Spoil

TT2006_3.30 m Side_C_D

GROUND TECHNOLOGY
Victory Park, Attleborough
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Tel: 01953 459462

Photographic Report

GI_DZLV1_TT2006

Project: Meridian Water HIF and Infrastructure Ground Investigation

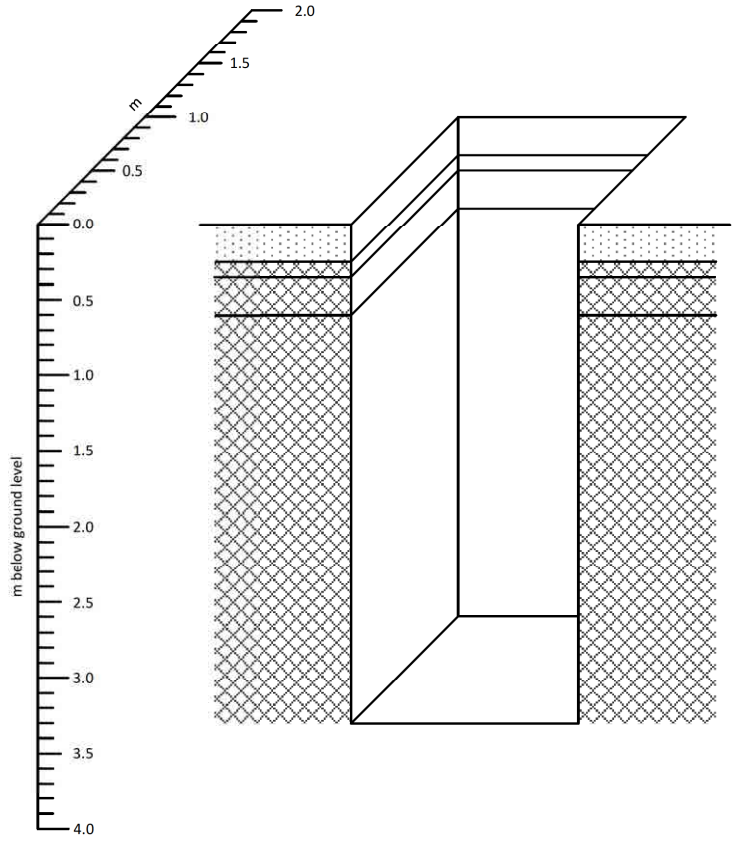
Project ID: GTS-19-250

TT2006_3.30 m_Base

TT2006_3.30 m_Side_D

Trial Trench Section

Project Name: Meridian Water HIF and Infrastructure Ground Investigation		Client: London Borough of Enfield		Date: 12/02/2020	
Location: Meridian Water, Enfield		Engineer: Ground Technology Services Limited		Co-ords: E536065.53 N192069.04	
Project No.: GTS-19-250		Crew Name: PH		Equipment: JCB 3CX	
Location Number **GI_DZLV1_TT2006**	Location Type TT	Level 11.84m aOD	Drawn By AB	Scale 1:50	Page Number Sheet 2 of 2



Width (m) 1.00	Remarks: 1. Position scanned using a CAT prior to digging. 2. Trial pit back filled with arising and compacted in 300 mm layers.
Length (m) 1.50	
Depth (m) 3.30	
Orientation (°) 065	

Trial Pit Log

Project Name: Meridian Water HIF and Infrastructure Ground Investigation	Client: London Borough of Enfield	Date: 09/03/2020
Location: Meridian Water, Enfield	Engineer: Ground Technology Services Limited	Co-ords: E536037.81 N192053.46
Project No. : GTS-19-250	Crew Name: PH	Equipment: JCB 3CX

Location Number	Location Type	Level	Logged By	Scale	Page Number
GI_DZLV1_TT2006A	TP	11.82m AOD	JT	1:25	Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
					0.16	11.82		Strong light grey CONCRETE. 40-50 % aggregate angular to subrounded fine to coarse flint and quartzite. 8 mm re-bar mesh at 70 mm. 30 mm tie bars into the adjacent slab. 10 % small voids. [MADE GROUND]
		0.20 - 0.40	B					
		0.20 - 0.40	D					
		0.20 - 0.40	ES		0.32	11.66		
		0.20	PID	PID=0.00				Reddish brown silty SAND and Gravel. Sand is medium and coarse. Gravel is angular to subangular fine to coarse flint brick and concrete. [MADE GROUND]
					0.45	11.50		
		0.50 - 0.70	B					
		0.50 - 0.70	D					
		0.50 - 0.70	ES					
		0.50	PP	81.67				
		0.50	PID	PID=0.00				
		0.70	PP	46.80				Grey and dark grey silty SAND and GRAVEL with medium cobble content. Sand is medium and coarse. Gravel is angular to subangular fine to coarse brick flint macadam and concrete. Cobbles are angular brick and concrete. Low wood fragment content up to 100 mm x 100 mm x 500 mm. [MADE GROUND]
					0.90	11.37		
		1.30 - 1.40	B					
		1.30 - 1.40	D					
		1.30 - 1.40	ES					
		1.30	PID	PID=0.00				
		1.40	PP	23.33				Greenish grey locally sandy CLAY with low cobble content and frequent dark brown organic silt pockets up to 150m mm x 150 mm x 200 mm. Cobbles are angular brick and concrete. [MADE GROUND]
					1.70	10.92		Greenish grey and grey slightly gravelly CLAY with frequent dark brown organic silt pockets up to 20 mm x 40 mm x 100 mm. Gravel is angular to subangular fine to coarse flint and brick. Frequent yellowish grey silty medium and coarse sand bands up to 20 mm thick. [MADE GROUND]
		1.80	PP	75.00				
		2.00 - 2.20	B					
		2.00 - 2.20	D					
		2.00 - 2.20	ES					
		2.00	PID	PID=0.00				Grey silty slightly gravelly CLAY with rare semi decayed plant debris. Gravel is subangular to subrounded fine to coarse flint. [MADE GROUND]
		2.40	PP	128.63				
					2.70	10.12		Stiff greenish grey silty CLAY with a very few very fine roots. Slight organic odour. [ALLUVIUM]
		2.90 - 3.10	B					
		2.90 - 3.10	D					
		2.90 - 3.10	ES					
		2.90	PP	138.33				
		2.90	PID	PID=0.00				
		3.30	PP	71.67	3.30	9.12		Firm to stiff grey and brownish grey silty CLAY. [ALLUVIUM]
		3.60 - 3.70	B					
		3.60 - 3.70	D					
					3.75	8.52		End of Trial Pit at 3.75m

Dimensions		Orientation	Trench Support and Comment			Pumping Data		
Pit Length (m)	Pit Width (m)	Orientation (deg)	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
5.00	0.60	60	Stable	Not required				

Weather: Dry and sunny

Remarks

1. Position CAT scanned prior to digging. 2. No ground water encountered. 3. Trial pit terminated at 3.75 m bgl. 4. Trial pit back filled with arisings and compacted in 300 mm layers and reinstated with concrete.

GROUND TECHNOLOGY
Victory Park, Attleborough
Norfolk, NR17 1ZA
Tel: 01953 459462

Photographic Report

GI_DZLV1_TT2006A

Project:	Meridian Water HIF and Infrastructure Ground Investigation
Project ID:	GTS-19-250

TT2006A_3.75 m_Side_A

TT2006A_3.75 m_Side_B_C

TT2006A_3.75 m_Side_D

TT2006A_3.75 m_Stockpile_1 - Copy

GROUND TECHNOLOGY
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Norfolk, NR17 1ZA
Tel: 01953 459462

Photographic Report

GI_DZLV1_TT2006A

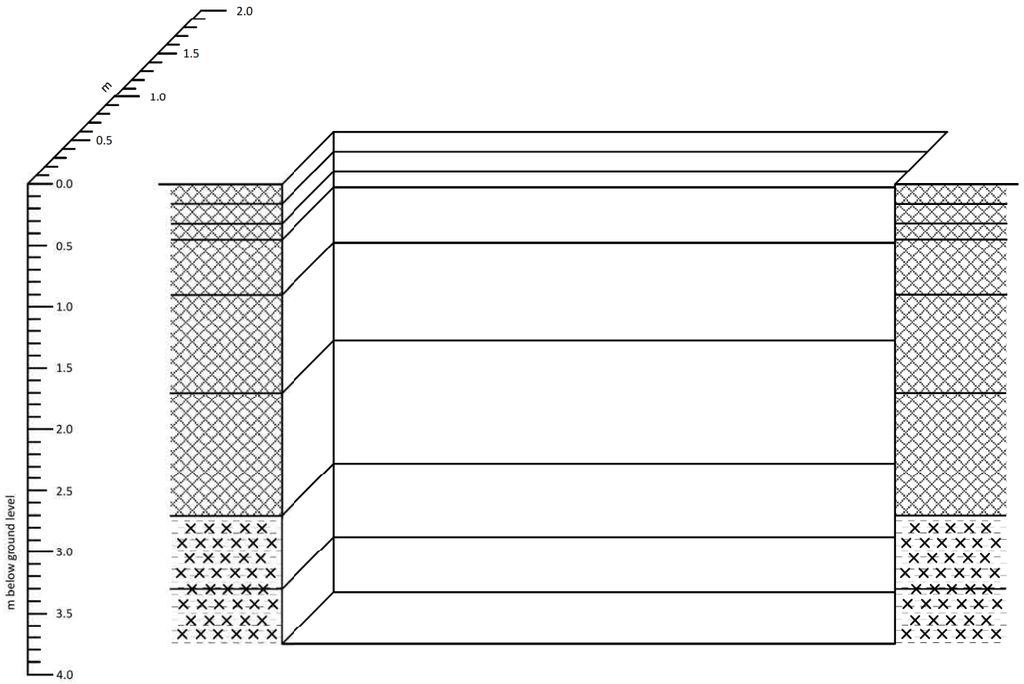
Project:	Meridian Water HIF and Infrastructure Ground Investigation
Project ID:	GTS-19-250

TT2006A_3.75 m_Stockpile_1

TT2006A_Stockpile_2 - Copy

Trial Trench Section

Project Name: Meridian Water HIF and Infrastructure Ground Investigation		Client: London Borough of Enfield		Date: 09/03/2020	
Location: Meridian Water, Enfield		Engineer: Ground Technology Services Limited		Co-ords: E536065.53 N192069.04	
Project No.: GTS-19-250		Crew Name: PH		Equipment: JCB 3CX	
Location Number **GI_DZLV1_TT2006A**	Location Type TT	Level 10.82m aOD	Drawn By AB	Scale 1:50	Page Number Sheet 2 of 2



Width (m) 0.60	Remarks: 1. Position scanned using a CAT prior to digging. 2. Trial pit back filled with arising and compacted in 300 mm layers.
Length (m) 5.00	
Depth (m) 3.75	
Orientation (°) 060	

Trial Pit Log

Project Name: Meridian Water HIF and Infrastructure Ground Investigation	Client: London Borough of Enfield	Date: 17/02/2020
Location: Meridian Water, Enfield	Engineer: Ground Technology Services Limited	Co-ords: E536031.92 N191995.39
Project No. : GTS-19-250	Crew Name: PH	Equipment: JCB 3CX

Location Number	Location Type	Level	Logged By	Scale	Page Number
GI_DZLV1_TT2007	TP	11.90m AOD	AW	1:25	Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
		0.18 - 0.30	B		0.18	11.90		Very strong light grey CONCRETE. 40-50 % aggregate angular to subangular fine to coarse flint gravel. 20 % small voids. [MADE GROUND]
		0.20 - 0.30	D					
		0.20 - 0.30	ES		0.31	11.72		
		0.20	PID	PID=0.00				Orange brown sandy GRAVEL with medium cobble content. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse brick concrete and flint. Cobbles are angular brick and concrete. [MADE GROUND]
		0.40 - 0.50	D					
	▼	0.40 - 0.50	ES					
		0.40 - 0.60	B		0.66	11.59		
		0.40	PID	PID=0.70				Dark grey slightly sandy gravelly clayey COBBLES with medium boulder content and rare fragments of wood. Sand is fine to coarse. Gravel is angular to subangular fine to coarse flint brick and concrete. Cobbles are angular concrete and brick. Boulders are angular concrete. [MADE GROUND]
		0.70 - 0.80	D					
		0.70 - 0.80	ES					
		0.70	PID	PID=0.00				*0.61 m 10 mm dia. black alkathene pipe*
		1.00 - 1.60	B					Soft to firm dark grey and grey slightly sandy slightly silty gravelly CLAY with occasional pockets of grey very sandy clay and rare pockets of organics. Sand is fine and medium. Gravel is subrounded to rounded fine to coarse flint. [ALLUVIUM]
		2.50 - 3.00	B					
		2.70 - 2.80	D					
		2.70 - 2.80	ES					
		2.70	PID	PID=0.00				
					3.00	11.24		End of Trial Pit at 3.00m

Dimensions		Orientation	Trench Support and Comment			Pumping Data		
Pit Length (m)	Pit Width (m)	Orientation (deg)	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
4.70	1.10	61	Stable	Not required				
Weather:	Fair and dry							

Remarks

1. Position CAT scanned prior to digging. 2. Water encountered at 0.60 m bgl. 3. Trial pit terminated at 3.00 m bgl. 4. Trial pit back filled with arisings and compacted in 300 mm layers and reinstated with concrete.

GROUND TECHNOLOGY
Victory Park, Attleborough
Norfolk, NR17 1ZA
Tel: 01953 459462

Photographic Report

GI_DZLV1_TT2007

Project: Meridian Water HIF and Infrastructure Ground Investigation

Project ID: GTS-19-250

TT2007_0.18 m_Base

TT2007_0.30 m_Base

TT2007_0.30 m_Spoil

TT2007_0.90 m_Base_Side_D

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Photographic Report

GI_DZLV1_TT2007

Project: Meridian Water HIF and Infrastructure Ground Investigation

Project ID: GTS-19-250

TT2007_0.90 m_Side_B

TT2007_0.90 m_Spoil

TT2007_1.60 m_Side_B

TT2007_1.60 m_Spoil

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Photographic Report

GI_DZLV1_TT2007

Project:	Meridian Water HIF and Infrastructure Ground Investigation
Project ID:	GTS-19-250

TT2007_3.00 m_Side B

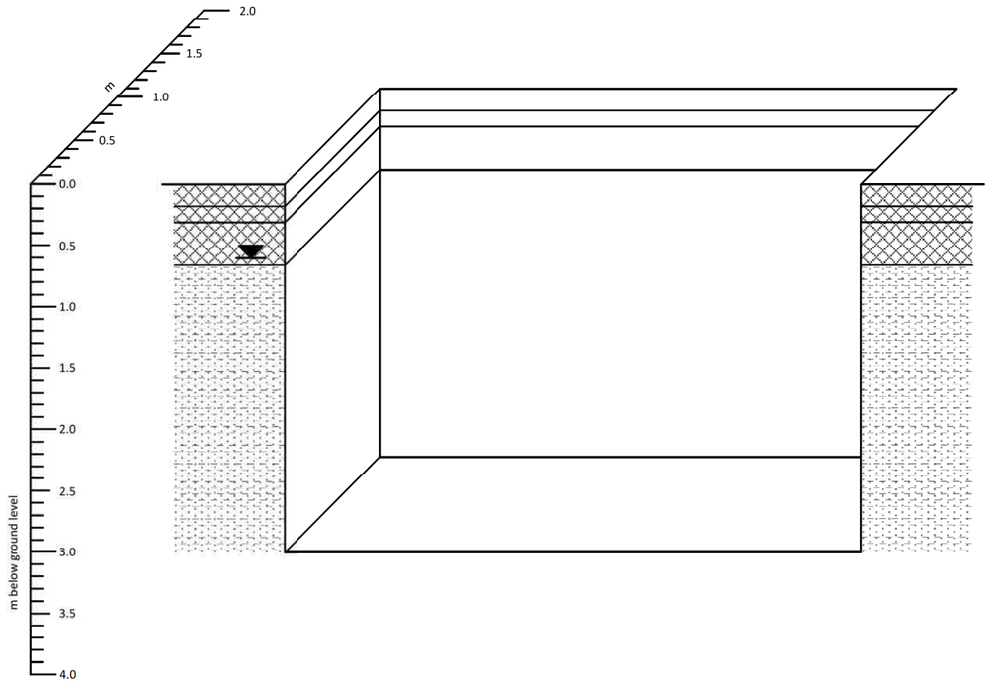
TT2007_3.00 m_Side_D

TT2007_3.00 m_Spoil

TT2007_3.00 m_Spoil_A

Trial Trench Section

Project Name: Meridian Water HIF and Infrastructure Ground Investigation		Client: London Borough of Enfield		Date: 17/02/2020	
Location: Meridian Water, Enfield		Engineer: Ground Technology Services Limited		Co-ords: E536040.24 N191997.82	
Project No.: GTS-19-250		Crew Name: PH		Equipment: JCB 3CX	
Location Number **GI_DZLV1_TT2007**	Location Type TT	Level 11.90m aOD	Drawn By AB	Scale 1:50	Page Number Sheet 2 of 2



Width (m) 1.10	Remarks: 1. Position scanned using a CAT prior to digging. 2. Trial pit back filled with arising and compacted in 300 mm layers.
Length (m) 4.70	
Depth (m) 3.00	
Orientation (°) 061	