

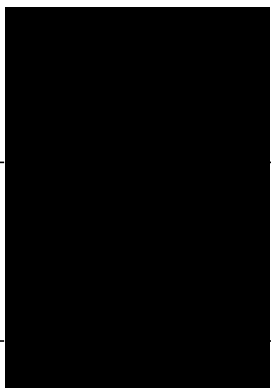
**REPORT ON
GROUND INVESTIGATION
AT
LEIGH ROAD, EASTLEIGH**



REPORT STATUS SHEET

Client:	Hendy Ford
Report Title:	Report on Ground Investigation at Leigh Road, Eastleigh
Report Number:	AG3386-22-AO16
Report Status:	Validated Issue 1
Date:	March 2022



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1.0 INTRODUCTION

1.1 Objectives and Scope of Investigation

An area of land adjacent to Leigh Road in Eastleigh (the site) is being considered for redevelopment by Hendy Ford (the Client). The proposals for the site comprise the construction of a car dealership with workshop, car wash, car deck and parking.

This report is based on a ground investigation report prepared by Applied Geology in 2018 (report ref. AG2834-18-AE63, Issue 3) and has been produced following a change in the proposed end use and for a new Client. The proposed development formerly comprised a four-storey office building, with associated undercroft ground floor parking and perimeter parking. We understand that the new Client has reliance on the data in the original report. This report has been prepared to satisfy environmental Planning Conditions 3 and 4 for the new development, which require a desk study and ground investigation to be carried out, with remediation if deemed necessary (Planning Application Ref. F/21/91786).

The original desk study/Phase I assessment and Phase II ground investigation was undertaken in order to:

- assess the potential for hazardous substances or conditions to exist at the site that might warrant mitigation or remediation appropriate to the intended end use proposed by the Client at that time.
- establish geological conditions and geotechnical parameters to assist in the safe and economic engineering design of the proposed development.

The terms of reference/brief for the current works were mutually developed between Lambert Smith Hampton (the Client's Project Manager) and Applied Geology and are outlined in our proposal email of the 10th February 2022.

The scope of works undertaken by Applied Geology comprised:

- A new site inspection and walkover survey in 2022.
- A review of the following desk study sources from 2018:
 - ❑ WYG Environment (WYG) – Desk Study Report (September 2015) – incomplete copy of report supplied.
 - ❑ British Geological Survey (BGS) - published information & on-line borehole database.
 - ❑ Multi-Agency Geographical Information for the Countryside (MAGIC) on-line database.
 - ❑ Environment Agency Web Site.
- Ground investigation together with sampling, monitoring and a programme of laboratory testing undertaken in 2018.
- Updated assessment and reporting of the results of the works.

Underground service plans for the site were obtained by Applied Geology on 27th March 2018 prior to the fieldwork. A topographical survey was not available at the time of the ground investigation.

1.2 Report Layout

This report presents a brief description of the site, the desk study data and the factual results of the intrusive investigations carried out. An interpretation of the ground conditions and a discussion/assessment of the findings is presented in the later report text sections. The main text of the report has been produced in a concise format, including the use of data tables to summarise key information where possible. The report should be read in conjunction with the general procedures detailed in Appendix E and General Notes given at the end of the main text, which provide details of investigation techniques, assessment methodology and standards, health & safety and limitations and exceptions of the report. Drawings and factual data including exploratory hole records, laboratory testing results and desk study records are presented in the other Appendices.

2.0 SITE DESCRIPTION AND PROPOSALS

2.1 Site Description

The site is located off Leigh Road in Eastleigh. The Ordnance Survey grid reference for the centre of the site is 444248, 119339 as shown on the Site Location Plan (AG3386-22-01) in Appendix A. It should be noted that the site area is slightly larger than during the original investigation, incorporating roads in the west and south.

The site is roughly rectangular with dimensions of approximately 120m by 85m (around 1ha) and generally slopes gently down towards the south.

A site inspection/walkover was undertaken by Applied Geology on the 25th February 2022. The site was accessed off Leigh Road and based on the Proposed Site Plan by PRC (Dwg No. 11331/PL_004, Rev P5), comprised Villeneuve St George's Way in the far west, Kornwestheim Way and some landscaping in the far south, some landscaping in the northeast, with the majority of the site fenced off with hoarding.

The main (hoarded) part of the site was accessible from Villeneuve St George's Way and Kornwestheim Way. The northern half was grassed with some weeds and daffodils. There were several grass-covered mounds, possibly of soil, and evidence of trees having been felled with remnant stumps, sawn tree trunks and chippings. Localised areas were waterlogged following recent heavy rainfall. Sporadic piles of bricks, some on pallets, some remnant parts of walls and some loose, concrete rubble, asphalt, wood and cones were present. The bricks and concrete may have been placed/fly-tipped on site or may represent a small former building. A former borehole installation was noted, with the pipe partially pulled out of the ground. The southern half of this area had a gravel surface with a narrow grassed boarder around the perimeter. Some bricks and Heras fence panels were noted, together with a sewer manhole cover in the far south. There was standing water in slightly depressed areas.



Northern half of hoarded part of the site, looking west



Southern half of hoarded part of the site, looking east

There were mature trees in landscaped areas in the far south of the site and a small tree stump and bushes were noted in the landscaped area in the northeast. Further mature trees were present adjacent to the north of the site, together with an electricity substation.



Landscaped area in the northeast, with Fleming Court Business Centre (outside of site boundary) beyond, looking south

To the north of the site was Leigh Road, to the east Fleming Court Business Centre, to the south west by Villeneuve St. Georges Way, to the south a large grassed area, possibly part of Places Leisure Eastleigh further south and to the west by car dealerships, the closest being Hendy Honda.

2.2 Site Proposals

The proposals for the site comprise the construction of a car showroom and workshop building, together with a two-storey car deck, car wash and car and van parking. The proposals are shown on the Proposed Site Plan (Dwg No. 11331/PL_004, Rev P5) dated 7/1/22 by PRC, included in Appendix A.

3.0 DESK STUDY INFORMATION

A copy of the WYG Environment Desk Study Report (Report Ref: A093731, dated September 2015) was provided to Applied Geology by the then Client in 2018. The report includes an area of land adjacent to the west of the site, formerly occupied by the Magistrates court and this has been taken into account in the summary below. Applied Geology has been advised that whilst the desk study data is over 6 years old, Eastleigh Borough Council have been contacted by others and confirm that its use in this report is acceptable.

3.1 Summary of WYG Environment Desk Study

Site History	• 1867-1869 – Site is agricultural and occupied by Home Farm, with associated buildings in the east of the site. Monks Brook is located 125m to the southwest and flows south. A pond is located 70m to the west, railway line 260m to the north and several wells around the surrounding area. • 1896-1897 – A footpath is shown to bisect the site. • 1909 – Additional buildings associated with the farm are shown on the site. A pond is located 10m to the south. • 1910-1911 – A gas holder station is located 500m to the southeast of the site. • 1933 – Northend road bounds the site to the north. Fleming Park is shown to the southeast of the site. • 1950 – The buildings and footpath on site are no longer shown. The road to the north is now 'Leigh Road'. A confectionary works is located 130m north and engineering works and sheet metal craft works is located 180m northeast of the site. An electricity substation is located 55m north. • 1962 – Schools and works buildings are shown to the north of Leigh Road. Residential development has taken place around the surrounding area. • 1965-1969 – Engineering and metal works are located 100m northeast. • 1969 - The M3 motorway is located 130m west, with associated slip road off Leigh Road. • 1978 – The site is now occupied by council offices with associated car parking. No further significant changes to 2015. The buildings on-site were since demolished.
Anticipated Geology and Ground Conditions	• Published BGS Map indicates the site to be initially underlain by Superficial River Terrace Deposits, followed by solid geology of the Wittering Formation, comprising greyish brown laminated clay; sand interbedded with clay and glauconitic sand. • Nearest BGS archive borehole (20m to north) indicates Topsoil/Made Ground to a depth of 0.75m, underlain by River Terrace Deposits

	(comprising medium dense gravel) with the Wittering Formation (firm grey silty clay, laminated with fine sandy silt) encountered from a depth of 4.5m bgl. Groundwater was encountered at 2.5m bgl. Site is not in a radon affected area, with <1% of homes above the Action Level. No radon protection measures are therefore considered necessary for new properties.
Mining/Quarrying	- Site not indicated to be within an area of underground coal or other mining. - Site indicated to have a moderate hazard rating of natural ground movement through shrinking or swelling clay. - Site indicated to be approximately 90m east of an area designated to have a moderate potential for compressible ground stability hazards.
Hydrology	- Nearest surface watercourse is Monks Brook, 125m south, which is classified as a primary river. - Monks Brook was assigned a River Quality Grade of B in the year 2000. - There are no surface water abstractions within 500m of the site. - One licensed discharge consent within 500m of the site, located 296m from the site, related to the release of trade discharge/process water into a local watercourse. - The site is within 250m of a zone 2 and zone 3 flood plain
Hydrogeology	- River Terrace Deposits and Wittering Formation are indicated to be Secondary A Aquifers. - Nearest groundwater abstraction license is located c.800m from the site and used for industrial/commercial non-evaporative cooling. - Site is not located within a Source Protection Zone. - Likely groundwater flow direction is to the south, following the topography.
Other Environmental data	- No landfills or licensed waste sites within 250m. - Two current industrial land usages within 250m, a car dealer and an oven cleaning business. - No recorded petrol/fuel sites within 250m. - One recorded pollution incident within 250m of the site and related to the melting of non-ferrous metals, 28m east.

3.2 Conceptual Site Model

A Conceptual Site Model (CSM) for the site was developed as part of the WYG Desk Study and is summarised below.

Sources of potential contamination:

- Former Civic Offices and historic farm buildings (asbestos);
- Made Ground on site (hydrocarbons & heavy metals);
- Chimney – offsite associated with the Magistrates Court to the west (hydrocarbons and heavy metals);
- Shipping containers (solvents and hydrocarbons);
- Ground gas off site (organic deposits from watercourse and Alluvium).

Pathways:

- Dermal contact;
- Ingestion of soil;
- Inhalation of gases, vapours or dust;
- Leaching and migration;
- Migration of gases;
- Exposure of plants to soil contaminants.

Receptors:

- Human Health – end users and neighbouring sites;
- Construction workers;

- Groundwater – Secondary A Aquifers (River Terrace Deposits and Wittering Formation);
- Surface Water – Drain to the west of the site;
- Vegetation.

The WYG preliminary risk ratings for the above receptors were generally considered to be 'very low', with the exception of the risk to construction workers and groundwater, which were rated as 'low'.

4.0 GROUND INVESTIGATION WORKS

4.1 Fieldwork

The following scope of fieldwork was undertaken by Applied Geology between 16th and 23rd April 2018:

- 6No 150mm diameter Cable Percussion boreholes (ref. BH1 to BH6) to depths of between 14.80m and 14.95m below ground level (bgl);
- 8No Machine Excavated Trial Pits (ref. TP1 to TP8) to depths of between 1.05m and 3.90m bgl;
- 2No Soakaway infiltration tests in trial pits TP1 and TP6;
- 5No TRL DCP tests (ref TRL1 to TRL5) to depths of between 856mm and 904mm bgl.

The borehole and trial pit records are included in Appendix B, along with the SPT calibration certificate and SPT summary sheet. The in-situ test results are included in Appendix C.

The soakaway tests were undertaken in accordance with BRE 365 methodology. The tests were carried out in the excavated trial pits of measured dimensions, which were subsequently backfilled with single sized flint gravel to allow the pits to remain stable and safe for undertaking three fills. The tests were undertaken in the River Terrace Deposits. The pits were filled with clean water and the water levels observed over the duration of each test.

The investigation was limited to the current hoarded area of the site, this being the former site extent. The locations of the exploratory holes were selected and set out on site by Applied Geology Limited and these were constrained by parked cars in the south of the site and the presence of underground services, particularly in the east of the site. The boreholes were located across the proposed footprint of the former proposed office building for geotechnical purposes, with the trial pits spread across the site for contamination testing. It is noted that the previously proposed building is in a similar location to the current proposed building.

Testing was undertaken using a Transport Research Laboratory Dynamic Cone Penetrometer (TRL DCP) in order to determine approximate in-situ CBR parameters at locations of former proposed car parking, around the perimeter of the hoarded area in areas of current proposed vehicle parking. The results are plotted as number of blows versus depth with equivalent CBR values calculated for individual layers in accordance with IAN 73/06 Revision 1 (2009) and are presented in Appendix C.

The co-ordinates of the boreholes and trial pits were obtained by Midland Survey Ltd and the locations are presented on an updated Exploratory Hole Location Plan (Drawing No. AG3386-22-02) based on the new proposed layout, a copy of which is included in Appendix A.

4.2 Instrumentation and Monitoring

On completion of boring, 50mm diameter standpipes were installed in selected boreholes as follows, with further details included on the relevant borehole logs in Appendix B:

- BH1, 3.0 to 6.0m bgl, in River Terrace Deposits & Wittering Formation;
- BH3, 3.0 to 5.0m bgl, in River Terrace Deposits;
- BH4, 4.0 to 7.0m bgl, in River Terrace Deposits & Wittering Formation;
- BH6, 1.0 to 5.0m bgl, in River Terrace Deposits.

Washed silica gravel (6-10mm) was used as the filter medium and each standpipe was fitted with a push-in bung, single gas tap and a flush metal cover concreted in place. A metre length of plain 50mm diameter pipe was added to the base of the standpipe to form a silt trap.

No sources of ground gas were noted on site, with only a limited thickness of Made Ground recorded. All standpipes were therefore installed within natural strata for subsequent groundwater level monitoring and possible sampling. Given that the WYG desk study report identified ground gas as a potential source both on and off site, confirmatory ground gas monitoring was undertaken along with the groundwater monitoring on four occasions between the 24th April and 15th May 2018. The monitoring results are included in Appendix C.

4.3 Laboratory Testing

Geotechnical laboratory testing was undertaken on selected samples and comprised the following:

- 6No natural moisture content tests;
- 6No Atterberg limit tests;
- 7No particle size distribution tests;
- 6No quick undrained triaxial tests;
- 2No one dimensional consolidation tests;
- 9No BRE SD1 suite tests;
- 6No BRE SD1 with pyrite suite tests.

Chemical testing was undertaken based upon the desk study, walkover in 2018 and site observations during the fieldwork. Three samples of Topsoil, four samples of Made Ground and one sample of River Terrace Deposits were analysed for the following suite of contaminants:

- Selected metals suite [arsenic, cadmium, chromium (total, trivalent and hexavalent), copper, mercury, nickel, lead, zinc, selenium] (8 samples);
- Speciated (16 US EPA) Polycyclic Aromatic Hydrocarbons (PAH) (8 samples);
- Phenols (total) (8 samples);

- Total Petroleum Hydrocarbons Criteria Working Group (TPH CWG) (8 samples);
- pH (8 samples);
- Soluble sulphate (8 samples);
- Organic matter (8 samples);
- Asbestos Containing Material (ACM) (8 samples);
- Volatile Organic Compounds (VOCs) (4 samples);
- Semi-Volatile Organic Compounds (SVOCs) (4 samples).

In addition, a sample taken from TP7 was tested for polychlorinated biphenyl (PCB), given the proximity to the electricity substation adjacent to the north of the site.

Three groundwater samples obtained during the final monitoring visit were tested for the following:

- Selected metals suite [arsenic, cadmium, chromium (total, trivalent and hexavalent), copper, mercury, nickel, lead, zinc, selenium];
- Speciated (16 US EPA) Polycyclic Aromatic Hydrocarbons (PAH);
- TPH (CWG) and BTEX/MTBE;
- VOCs;
- SVOCs;
- Phenols (total);
- pH;
- Hardness;
- Soluble sulphate;
- Total Organic Carbon.

Laboratory test results are included in Appendix D.

5.0 GROUND CONDITIONS

5.1 Strata Encountered

Up to 0.7m of Made Ground was recorded across the site, but was absent along the north, northwest and southwestern margins, where up to 0.9m of Topsoil was encountered. River Terrace Deposits were encountered beneath the Topsoil or Made Ground, with the Wittering Formation encountered below. Full details of the strata encountered are given on the borehole and trial pit records presented in Appendix B. A generalised ground profile is presented below to summarise the information.

Stratum	Depth to Top of Strata (m bgl)	Thickness (range) (m)	Comments
Topsoil	GL	0.0 – 0.9	Encountered in the north, northwest and southwest of the site
Made Ground	GL – 0.45	0.3 – 0.7	Not encountered in BH6 and TP3-TP6
River Terrace Deposits	0.1 – 1.1	4.0 – 5.45	Encountered consistently across the site, generally as sand and gravel mixtures of varying proportions

Stratum	Depth to Top of Strata (m bgl)	Thickness (range) (m)	Comments
Wittering Formation	4.5 – 6.0	>10.45	Encountered in the boreholes only, as a series of interbedded layers of silt, fine sand and sandy clay

5.2 Topsoil and Made Ground

Topsoil was encountered along the north, northwest and southwest perimeters of the current hoarded area (in BH6 and TP3-7) from ground level to depths of between 0.1m and 0.9m bgl. The Topsoil generally comprised soft dark brown slightly gravelly clay with the gravel comprising fine to coarse subangular to angular flint and with occasional rootlets noted.

Shallow Made Ground was encountered across the majority of the current hoarded area, generally where Topsoil was absent, from ground level to depths of between 0.3m and 0.7m bgl. However, in TP7 the Made Ground was recorded beneath the Topsoil from 0.45m to 1.1m bgl. The Made Ground generally comprised greyish brown/brown sandy gravel, with the gravel comprising fine to coarse subangular to angular flint, with occasional demolition/construction materials (brick and concrete fragments).

5.3 River Terrace Deposits

Strata considered to represent River Terrace Deposits were consistently encountered at all locations across the current hoarded area, either below the Topsoil or Made Ground and proven to a depth of between 4.5m and 6.0m bgl. In many of the exploratory holes the strata initially comprised a horizon of medium dense light brown/yellowish brown slightly clayey gravelly fine to coarse sand, which graded with depth to a medium dense sand and gravel (or sandy gravel) by between 2.2m and 3.2m bgl. The gravel comprised fine to coarse subangular to angular flint. Although almost exclusively granular, the strata did include a thin initial horizon (0.2m thick) of soft gravelly clay in TP4.

The results of a number of particle size distribution tests undertaken on the River Terrace Deposits at depths of between 0.9m and 4.2m bgl have indicated the following proportions: 64% to 93% gravel, 4% to 22% sand and 1% to 12% fines (clay and silt).

Standard Penetration Tests undertaken in the River Terrace Deposits recorded SPT 'N' values of generally between 10 and 32, indicating the strata to be medium dense to dense, with localised loose conditions recorded in BH1 and BH4 between 2m and 3m bgl. A higher extrapolated SPT 'N' value of 67 was recorded in BH4 at 5.4m, indicating very dense strata and may be a result of the SPT undertaken across the boundary to the underlying Wittering Formation. An SPT 'N' value against depth plot is presented in Appendix A and shows a general increase in strength with depth.

5.4 Wittering Formation

Strata considered to represent the Wittering Formation were encountered in the boreholes beneath the River Terrace Deposits to the base of the boreholes

(maximum depth of 14.95m bgl). The strata typically comprised medium dense, becoming dense and very dense with depth, greyish green and greenish grey silty fine to medium sand, with bands of sandy clay and sandy silt.

Standard Penetration Tests undertaken in the Wittering Formation recorded SPT 'N' values of between 33 and 70 (extrapolated), indicating the strata to be dense to very dense. The SPT 'N' value against depth plot shows a general increase in strength with depth.

Of the six Atterberg limit tests undertaken on the Wittering Formation, five tests returned non-plastic results, however, within each test, 100% of the material passed the 425µm sieve. This suggests that the samples tested predominantly comprised silt/fine sand as described above. The remaining sample, taken from BH6 at 9.0m to 9.45m bgl, recorded a plasticity index of 22%, indicating the soil to be of medium shrinkability as defined by NHBC Standards. A liquid limit of 41% and plastic limit of 19% were also recorded during the test, indicating medium plasticity. Moisture contents from the six tests ranged between 25.3% and 29.0%.

Six quick undrained triaxial tests have been carried out on 'undisturbed' samples of the more 'cohesive' Wittering Formation taken at depths of between 8.5m and 14.5m bgl. These laboratory tests recorded undrained shear strengths of between 61kN/m² and 90kN/m² (medium to high strength). The tests have returned results lower than would have been expected, which is likely to be due to the granular content in the samples tested.

5.5 Groundwater and Soakaway Tests

Groundwater was recorded in the form of seepages during the drilling of all boreholes and excavation of the majority of the trial pits at depths of between 2.3m and 4.3m bgl, within the River Terrace Deposits. The seepages were recorded as slow and medium inflows and rose by between 0.3m and 1.2m over 20 minutes.

Relatively stable standing groundwater levels were recorded during the subsequent monitoring visits, at depths of between 2.26m and 2.97m bgl (12.98m and 13.61m AOD) and indicate a flow direction to the southeast.

Soakaway tests were carried out in the granular River Terrace Deposits in TP1 and TP6. Three fills were undertaken in each pit and the water fully drained away on each occasion over the duration of between 6.5 and 18.5 minutes, with the duration steadily increasing over the three tests. Infiltration rates of 3x10⁻⁴m/s for TP1 and 2x10⁻⁴m/s for TP6 were derived, indicating medium permeability and good drainage characteristics.

5.6 Contamination

There was no obvious visual or olfactory evidence of any significant contamination observed in the boreholes or trial pits.

5.7 Ground Gas

No source of ground gas was identified in the boreholes. Confirmatory ground gas monitoring was undertaken during the groundwater monitoring visits. Methane concentrations were recorded below detection limits, together with low (generally

<5%) concentrations of carbon dioxide. This is consistent with the absence of a source of ground gas. VOC concentrations were very low, ranging between <0.1ppm and 0.9ppm.

6.0 GEOENVIRONMENTAL ASSESSMENT

6.1 Human Health Risk Assessment

The results of the chemical testing on soils have been assessed as described in Appendix E. The results have not been reassessed as part of this report, as the relevant published screening values have not changed since 2018 and the end use is similar (commercial/industrial).

- Proposed end-use – car showroom and workshop, car and van parking and limited landscaping;
- Screening criteria – commercial/industrial, assuming 1% SOM;
- Assuming a single dataset based on the size of the site, the site's history, current land-use and the proposed redevelopment.

The spreadsheet summarising the laboratory results and relevant screening values is presented in Appendix D. The spreadsheet shows that none of the results of the testing for the proposed development exceed the relevant human health screening criteria.

Where PAHs have been tested twice (USEPA speciated suite and also as part of the SVOC suite), only the results from the USEPA suite have been reported for consistency with other samples without SVOC suites. The results of the PAH tests were all below their relevant screening criteria and generally below the laboratory detection limits.

TPH concentrations were generally recorded below the laboratory detection limit, with the exception of Made Ground samples obtained from TP1 at 0.3m bgl and TP2 at 0.2m in the southeast and south respectively and in the River Terrace Deposits in TP3 at 0.3m in the southwest. The concentrations are confined to the carbon fraction C12-C35 and are still substantially below screening values.

The results of the VOC, SVOC, BTEX, MTBE, phenol and PCB testing were all below laboratory detection limits.

The asbestos screening tests did not detect the presence of any ACM.

Based on the above assessments, it is considered that the risks to human health from the proposed development of the site are negligible.

6.2 Controlled Waters Risk Assessment

The Secondary A Aquifers beneath the site (River Terrace Deposits and Wittering Formation) are considered to be the key Controlled Waters receptors. Therefore, screening values have been based on the UK Drinking Water Standards (DWS), with the Water Framework Directive Environmental Standards 2010 (WFD ES) used where no DWS exists. The results have not been reassessed as part of this report, as the relevant published screening values have not changed since 2018.

All determinants were recorded below the relevant screening criteria and all organic compounds (phenol, PAH, TPH, BTEX, MTBE, VOC and SVOC suites) were below the laboratory detection limits.

Given the absence of elevated concentrations of contaminants in either soils or groundwater, the site is considered to present a negligible risk to Controlled Waters.

6.3 Conclusions and Recommendations

The above risk assessments have identified a negligible risk to Human Health and Controlled Waters receptors, lower than the WYG risk rating of very low to low. It is therefore considered that no further assessment or remedial actions are warranted for this development.

Issues with respect to ground gas and potential effects of contaminants on buried concrete and water supply pipework are included in Section 7.0.

7.0 GEOTECHNICAL ASSESSMENT

7.1 General

The proposals for the site comprise the construction of a car showroom and workshop building, together with a two-storey car deck, car wash and car and van parking. Whilst anticipated loadings of the showroom and workshop building were not available at the time of writing this report, we were advised by Lambert Smith Hampton that the car deck will be a light two-storey steel-framed structure not more than 4m high. The following sections should be reviewed once loading details are known.

The investigation has identified a thin layer of Made Ground across most of the hoarded area of the site, except along the western and northern margins. River Terrace Deposits were encountered beneath, with the Wittering Formation below. Groundwater levels were monitored to be standing at depths of between 2.3m and 3.0m bgl.

7.2 Foundation Design

Foundations for the buildings and car deck should be placed below any Made Ground, disturbed ground or any loose or soft natural materials. It will be necessary to embed the foundations in the in-situ medium dense (or better) River Terrace Deposits beneath, which are considered suitable strata to support conventional spread foundations, dependant on final proposed loads.

The exploratory hole data suggests founding depths of circa 0.75m to 1.5m bgl should be appropriate for shallow foundations.

Pad foundations up to 2.5m x 2.5m or strip footings up to 1m wide competently designed to the above requirements may adopt an allowable bearing pressure of up to 250kNm² whilst limiting total settlement to <25mm. This is based on a Ø' of 35° for a medium dense sandy gravel using traditional methods of bearing capacity calculations e.g. as set out in Tomlinson 7th Edition and a factor of safety of 3 against bearing capacity failure.

Should a higher bearing capacity be required, a piled foundation solution may be required.

If conditions, significantly at variance to those described herein are encountered, specialist geotechnical advice should be sought to make appropriate assessment and recommendations.

7.3 Floor Slab and Gas Protection

The Made Ground encountered at the site is not considered suitable founding stratum to support a ground bearing floor slab, unless it is excavated and re-engineered (or replaced by suitable granular fill). A ground bearing floor slab can then be cast onto a competently designed granular mattress.

As no source of ground gas was identified, no gas protection measures are considered necessary for the proposed development.

7.4 Excavations

Excavations for underground services and foundations are likely to be in a combination of Made Ground materials and granular River Terrace Deposits (encountered to a depth of between 4.5m and 6.0m). These materials are anticipated to be unstable and so trench support is anticipated to be required. Groundwater was recorded at depths of c.2.3m to 3.0m bgl. It is recommended, however, that some provision for obtaining sump pumping equipment is made to control any minor seepage and run off in wet weather conditions.

7.5 Pavement Design

The results of in-situ TRL DCP tests undertaken across the site have indicated CBR values of between 8% and 19% for the Made Ground and between 5% and 40% for the River Terrace Deposits. However, due to the inherent variability of Made Ground, an equilibrium CBR value of 2% is normally recommended for this stratum. This may be improved following removal of any soft/deleterious material and proof rolling.

Based on the classification tests, the River Terrace Deposits, together with the Made Ground, should be regarded as frost susceptible and should therefore be kept to a minimum of 450mm below finished pavement and roadway levels.

7.6 Soakaways

The results of the soakaway testing undertaken in the upper horizons of the River Terrace Deposits have indicated high permeability strata. It is therefore considered that the ground conditions at the site would be favourable for shallow conventional soakaways. It should be noted that standing groundwater was recorded at depths of between 2.3m and 3.0m bgl during the subsequent monitoring visits and may vary seasonally/due to rainfall. Soakaways would therefore need to be designed and installed above these depths, in accordance with BRE 365.

7.7 Buried Concrete and Services

As defined by BRE Special Digest 1, Concrete Aggressive Ground, 2005 the Design Sulphate Class and the Aggressive Chemical Environment for Concrete (ACEC) has been assessed for each of the strata encountered. Following the results of the geotechnical and chemical testing, the characteristic values for each stratum and groundwater have been determined and are detailed in the table below.

Strata	Soluble Sulphate (g/l) ^{*1}	Total Potential Sulphate (%)	pH	Design Sulphate Class	ACEC ^{*2}
Made Ground	1.2	-	7.5	DS-2	AC-1s
River Terrace Deposits	0.09	-	7.2	DS-1	AC-1s
Wittering Formation	0.52	2.4	7.2	DS-4	AC-4
Groundwater	0.09	-	8.7	DS-1	AC-1

Notes:

*1: Characteristic values are rounded to the nearest 0.01g/l.

*2: Assumes static groundwater for shallow foundations and mobile groundwater at depth.

All of the six samples tested from the Wittering Formation were found to be potentially pyritic and the Design Sulphate class has therefore been based on the total potential sulphate for this stratum. For shallow foundations founded through the Made Ground and into the River Terrace Deposits, sulphate resisting concrete appropriate to DS-2 and AC-1s should be suitable. Should the Made Ground be removed beneath proposed buildings and structures, foundations would not require sulphate resisting concrete. Any deep buried concrete in the Wittering Formation would require concrete appropriate to DS-4 and AC-4 conditions.

Further reference should be made to BRE Special Digest 1 for requirements in respect of types of cement and aggregate to be used and variations in type of concrete construction.

No evidence of hydrocarbons was noted during the ground investigation and only trace concentrations of some heavier TPH fractions were detected during the laboratory testing. It should be noted that the full suite of testing required by the UKWIR guidance has not been undertaken as part of this investigation and such testing may be required by the Water Authority once routes of proposed water supply pipes are known. Further guidance on this subject is included within Appendix E.

7.8 Conclusions and Recommendations

Subject to confirmation of the final loads for the proposed development, traditional shallow foundations may be adopted in the medium dense (or better) River Terrace Deposits.

A ground floor slab may be adopted, provided the Made Ground is excavated and re-engineered or replaced with a suitable granular fill. No gas protection measures are considered necessary for the current proposed development.

Buried concrete placed in or through the Made Ground would require sulphate resisting concrete appropriate to DS-2 and AC-1s conditions.

Conventional soakaways installed above groundwater levels in the River Terrace Deposits may be suitable.

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GENERAL NOTES

- A) The assessment made in this report is based on the site terrain and ground conditions revealed by the various field investigations undertaken and also any other relevant data for the site including previous site investigation reports (if available) and desk study data. There may be special conditions appertaining to the site, however, which have not been revealed by the investigation and which have not, therefore, been taken into account in the report. The assessment may be subject to amendment in the light of additional information becoming available. It must be recognised that many of the Environmental Searches obtained during the course of the desk study are often lengthy. Applied Geology have, where appropriate and in the interests of simplicity, only reproduced the summary of the searches within the report. A full copy of all the search data is held at the Applied Geology office and is available for inspection if required.
- B) The services provided are defined within our proposal and are carried out in line with the terms of appointment between Applied Geology and the Client.
- C) Where any data supplied by the Client or other external source, including that from previous site investigations, has been used it has been assumed that the information is correct. No responsibility can be accepted by Applied Geology for inaccuracies within this data.
- D) Whilst the report may express an opinion on possible configurations of strata between or beyond the exploratory locations, or on the possible presence of features based on either visual, verbal or published evidence this is for guidance only and no liability can be accepted for the accuracy.
- E) Comments on groundwater (and landfill gas) conditions are based on observations made during the course of the present and past investigations or with reference to published data unless otherwise stated. It should be noted, however, that groundwater (and landfill gas) levels vary due to seasonal (or atmospheric conditions) or other effects.
- F) The copyright of this report and other plans (and documents prepared by Applied Geology) is owned by Applied Geology and no such report, plan or document may be reproduced, published or adapted without the written consent of Applied Geology. Complete copies of the report may, however, be made and distributed by the Client as an expedient in dealing with matters related to its submission.
- G) This report is prepared and written in the context of the proposals stated in the introduction to the report and should not be used in a differing context. Furthermore, new information, improved practices and legislation may necessitate an alteration to the report in whole or in part after its submission. Therefore with any change in circumstances or after the expiry of one year from the date of the report, the report should be referred to Applied Geology for re-assessment and if necessary, re-appraisal.
- H) The survey was conducted and this report was prepared for the sole internal use and reliance of the Client. This report shall not be relied upon or transferred to any other parties without the express written authorisation of Applied Geology. If an unauthorised third party comes into possession of this report they rely on it at their peril and Applied Geology owes them no duty of care and skill.
- I) Ground conditions should be monitored during the construction of the works and the recommendations of the report re-evaluated in the light of this data by the supervising geotechnical or geo-environmental engineers.
- J) Unless specifically stated, the investigation has not taken into account the possible effects of mineral extraction.
- K) The works performed are not a comprehensive site characterisation and should not be construed as being such.
- L) The findings of the geo-environmental risk assessment are based on information obtained from a variety of sources which Applied Geology believe to be correct. Applied Geology cannot and does not guarantee the authenticity or reliability of the information it has relied upon.
- M) The report represents the findings and opinions of experienced geo-environmental consultants. Applied Geology does not provide legal advice and the advice of lawyers may be required.
- N) Conditions at the site are subject to change from the time of the site inspection.
- O) It is possible that researches carried out by Applied Geology, whilst fully appropriate for a phase 1 desk study, failed to indicate the existence of important information sources. Assuming such indicators actually exist, their information could not have been considered in the formulation of Applied Geology findings and opinions.
- P) The economic viability of the proposals referred to in the report, or of the solutions put forward to any problems encountered, depends on very many factors in addition to geotechnical considerations and hence its evaluation is outside the scope of this report.
- Q) Applied Geology operates as a Consultancy and does not operate it's own laboratory for soil testing, this work being sub contracted to known and respected, generally UKAS accredited, laboratories. Applied Geology can therefore not be held responsible for the testing carried out.

LIST OF REFERENCES COMMONLY USED BY APPLIED GEOLOGY IN REPORTS

SECTION/TITLE	AUTHOR/PUBLICATION
LABORATORY TESTING	
BS 1377-1:2016 Method of Test for Soils for Civil Engineering Purposes	BSI
SITE WORK	
Guidelines for Combined Geoenvironmental and Geotechnical Investigations. Issue 2, March 2006.	AGS
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BS 10175:2011 & A1:2013 Code of Practice for the Investigation of Potentially Contaminated Sites	BSI
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BS 8485:2015 Code of Practice for the Design of Protective Measures for Methane and Carbon Dioxide Ground Gases for New Buildings.	BSI
Guidance on Evaluation of Development Proposals on Sites Where Methane and Carbon Dioxide are Present, 4 th Ed, 2007	NHBC & RSK Group
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GROUNDWATER	
BRE DG 365: Soakaway Design, 2016.	BRE
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CONTAMINATION ASPECTS (Soil & Groundwater)	
Environmental Protection Act 1990: Part 2A Contaminated Land Statutory Guidance, 2012.	DEFRA
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The UK Approach for Evaluating Human Health Risks from Petroleum Hydrocarbons in Soils, February 2005.	Environment Agency
The Environment Agency's Approach to Groundwater Protection, V1, 2017.	Environment Agency
Remedial Targets Methodology, Hydrogeological Risk Assessment for Land Contamination, 2006.	Environment Agency
Guidance for the Safe Development of Housing on Land Affected by Contamination	NHBC
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ATRISK ^{soil} Soil Screening Values, 2017.	Atkins
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Piling & Penetrative Ground Improvement Methods on Land Affected by Contamination: Guidance on Pollution Prevention. 2001.	Environment Agency
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Waste Sampling and Testing for Disposal to Landfill. 2013.	Environment Agency
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PAVEMENT DESIGN	
Interim Advice Note 73/06 Rev 1, 2009. Design Guidance for Road Pavement Foundations (Draft HD25)	Highways Agency
PLANNING	
DCLG:2012 National Planning Policy Framework and Practice Guidance	Department for Communities and Local Government
HEALTH & SAFETY ASPECTS	
A Guide for Safe Working on Contaminated Sites (Report 132)	CIRIA
Protection of Workers and the General Public During the Development of Contaminated Land (HSG66)	Health & Safety Executive
Construction (Design & Management) Regulations 2015 (CDM)	Health & Safety Executive
Control of Substances Hazardous to Health Regulations 2002	Health & Safety Executive
Workplace Exposure Limits. EH40/2005	Health & Safety Executive
Trenching Practice. Guidance on Groundwater Control (Report 97)	CIRIA
Control of Groundwater for Temporary Works (Report 113)	CIRIA
Asbestos in Soil and Made Ground: A Guide to Understanding and Managing Risks. C733. 2014.	CIRIA

APPENDIX A



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APPLIED GEOLOGY

The Old Barn at Church Farm
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Client:

HENDY FORD

Project:

LEIGH ROAD, EASTLEIGH

Drawn By:

FD

Checked By:

NL

Paper Size:

A4

Scale:

1:50,000

Date:

11.03.2022

NGR:

444248 119339

Title:

SITE LOCATION PLAN

Drawing No:

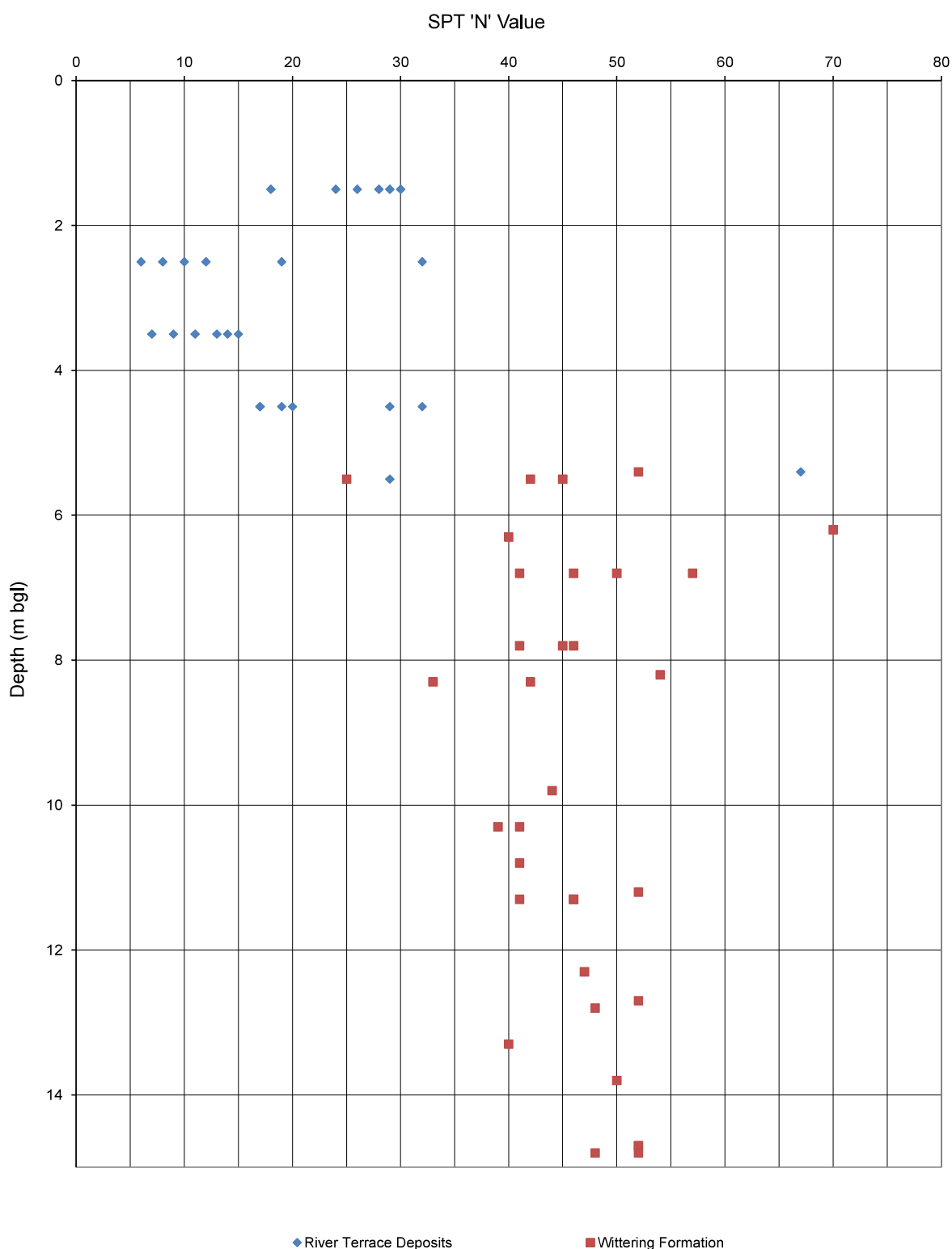
AG3386-22-01

Revision:

0



Uncorrected SPT 'N' Value versus depth



Notes:

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Project:	Leigh Road, Eastleigh	
Project No.	AG2834-18	

APPENDIX B

BOREHOLE LOG - CABLE PERCUSSION

BH1

Project Leigh Road, Eastleigh **Project No.** AG2834-18
Client Eastleigh Borough Council **Sheet** 1 of 2
Start 16/04/2018 **Coordinates** E 444259.40 N 119324.23 **Scale** 1:50
End 17/04/2018 **Ground Level** 15.47m AOD **Total Depth** 14.95m

Sample / Test Type	Depth (m)	Result	Casing Depth (m)	Level (mAOD)	Strata Depth (thickness) (m)	Description of Strata	Legend	GW	Install
B	0.10				(0.40)	Brown gravelly fine to coarse SAND. Gravel is fine to coarse subangular to angular flint with occasional concrete and brick fragments.			
B	0.40			15.07	0.40	(MADE GROUND)			
						Light brown slightly clayey gravelly fine to coarse SAND. Gravel is fine to coarse subangular to angular flint.			
						(RIVER TERRACE DEPOSITS)			
B	1.20								
C	1.20	N = 24				From 1.20m bgl: medium dense.			
					(2.80)				
B	2.20								
C	2.20	N = 8				From 2.20m bgl: loose.			
B	3.20			12.27	3.20				
C	3.20	N = 9	3.20			Loose light brown SAND and GRAVEL. Gravel is fine to coarse subangular to angular flint.			
						(RIVER TERRACE DEPOSITS)			
B	4.20				(2.10)				
C	4.20	N = 19	4.20			From 4.20m bgl: medium dense.			
B	5.20			10.17	5.30				
C	5.20	N = 25	5.20		(0.70)	Firm greenish brown sandy SILT with occasional fine to medium subangular to angular flint gravel.			
						(WITTERING FORMATION)			
D	6.00			9.47	6.00				
S	6.00	N >50	6.00			Very dense light grey and greenish grey silty fine to medium SAND.			
						(WITTERING FORMATION)			
D	7.00				(2.00)	From 7.00m to 7.50m bgl: firm greenish brown sandy silt.			
D	7.50								
S	7.50	N = 45	7.50						
B	8.00			7.47	8.00				
						Dense greenish grey silty fine to medium SAND with bands of soft to firm sandy clay.			
UT	8.50	(40)				(WITTERING FORMATION)			
						From 8.50m bgl: stiff.			
D	9.00								
D	9.50					At 9.50m bgl: band of firm sandy silt.			
D	10.00								

Continued next sheet

Chiselling			Groundwater Strikes					Drilled: GAP Drilling Services Ltd
From	To	Duration (hh:mm)	Depth Strike	Rose to	Remarks	Cased	Sealed	
			2.80	2.35		1.50		Logged: FHJ
								Checked: AP

Remarks: Hand dug service inspection pit excavated to 1.20m bgl.

Installation: 50mm diameter standpipe installed to 7.00m bgl.

Diameter: 150mm to 14.95m

Exploratory hole logs should be read in conjunction with key sheets

APPLIED GEOLOGY

BOREHOLE LOG - CABLE PERCUSSION

BH1

Project Leigh Road, Eastleigh **Project No.** AG2834-18
Client Eastleigh Borough Council **Sheet** 2 of 2
Start 16/04/2018 **Coordinates** E 444259.40 N 119324.23 **Scale** 1:50
End 17/04/2018 **Ground Level** 15.47m AOD **Total Depth** 14.95m

Sample / Test Type	Depth (m)	Result	Casing Depth (m)	Level (mAoD)	Strata Depth (thickness) (m)	Description of Strata	Legend	GW	Install
S	10.00	N = 39	9.00			Dense greenish grey silty fine to medium SAND with bands of soft to firm sandy clay. (WITTERING FORMATION) <i>From 10.00m bgl: thinly laminated.</i>			
D	11.00								
UT	11.50	(60)			(6.95)				
D	12.00								
D	12.50								
D	13.00								
S	13.00	N = 40	13.00						
D	14.00								
UT	14.50	(60)				<i>From 14.50m bgl: very dense.</i>			
D	14.95			0.52	14.95	End of Borehole at 14.95m			

Chiselling			Groundwater Strikes					Drilled: GAP Drilling Services Ltd Logged: FHJ Checked: AP
From	To	Duration (hh:mm)	Depth Strike	Rose to	Remarks	Cased	Sealed	
			2.80	2.35		1.50		

Remarks: Hand dug service inspection pit excavated to 1.20m bgl.

Installation: 50mm diameter standpipe installed to 7.00m bgl.

Diameter: 150mm to 14.95m

Exploratory hole logs should be read in conjunction with key sheets

APPLIED GEOLOGY

BOREHOLE LOG - CABLE PERCUSSION

BH2

Project Leigh Road, Eastleigh **Project No.** AG2834-18
Client Eastleigh Borough Council **Sheet** 1 of 2
Start 18/04/2018 **Coordinates** E 444244.65 N 119351.72 **Scale** 1:50
End 19/04/2018 **Ground Level** 15.47m AOD **Total Depth** 14.80m

Sample / Test Type	Depth (m)	Result	Casing Depth (m)	Level (mAoD)	Strata Depth (thickness) (m)	Description of Strata	Legend	GW	Install
B	0.10				(0.70)	Brown gravelly fine to coarse SAND. Gravel is fine to coarse subangular to angular flint and occasional concrete and brick fragments. (MADE GROUND)			
B	0.70			14.77	0.70	Medium dense light brown slightly clayey gravelly fine to coarse SAND. Gravel is fine to coarse subangular to angular flint. (RIVER TERRACE DEPOSITS)			
B	1.20	N = 18							
C	1.20				(2.50)				
B	2.20	N = 10							
C	2.20								
B	3.20	N = 14		12.27	3.20	Medium dense light brown sandy GRAVEL. Gravel is fine to coarse subangular to angular flint. (RIVER TERRACE DEPOSITS)			
C	3.20								
B	4.20	N = 29	4.20		(2.60)				
C	4.20								
B	5.20	N = 29	5.20						
C	5.20								
B	5.80			9.67	5.80	Greenish brown sandy SILT. (WITTERING FORMATION)			
D	6.50	N > 50	6.50	8.97	6.50	Very dense light grey and bluish grey silty fine to medium SAND. (WITTERING FORMATION)			
S	6.50				(1.00)				
D	7.50			7.97	7.50	Dense grey and bluish grey silty fine to medium SAND with bands of stiff sandy clay. (WITTERING FORMATION)			
D	8.00	N = 33	8.00						
S	8.00								
D	9.00								
UT	9.50	(50)							
D	10.00								

Continued next sheet

Chiselling			Groundwater Strikes					Drilled: GAP Drilling Services Ltd
From	To	Duration (hh:mm)	Depth Strike	Rose to	Remarks	Cased	Sealed	
			3.50	2.90				Logged: FHJ
								Checked: AP

Remarks: Hand dug service inspection pit excavated to 1.20m bgl. Borehole backfilled with arisings on completion.

Installation:

Diameter: 150mm to 14.95m

Exploratory hole logs should be read in conjunction with key sheets

APPLIED GEOLOGY

BH2

AG2834-18

2 of 2

1:50

14.80m

Chiselling			Groundwater Strikes					Drilled: GAP Drilling Services Ltd Logged: FHJ Checked: AP
From	To	Duration (hh:mm)	Depth Strike	Rose to	Remarks	Cased	Sealed	
			3.50	2.90				

Diameter: 150mm to 14.95m

APPLIED GEOLOGY

BOREHOLE LOG - CABLE PERCUSSION

BH3

Project Leigh Road, Eastleigh

Project No.

AG2834-18

Client Eastleigh Borough Council

Sheet

1 of 2

Start 19/04/2018

Coordinates E 444234.10 N 119344.36

Scale

1:50

End 20/04/2018

Ground Level 15.47m AOD

Total Depth

14.95m

Sample / Test Type	Depth (m)	Result	Casing Depth (m)	Level (mAoD)	Strata Depth (thickness) (m)	Description of Strata	Legend	GW	Install
B	0.10					Brown gravelly fine to coarse SAND. Gravel is fine to coarse subangular to angular flint and occasional concrete and brick fragments.			
ES	0.30				(0.60)				
B	0.60			14.87	0.60	(MADE GROUND)			
						Light brown slightly clayey gravelly fine to coarse SAND. Gravel is fine to coarse subangular to angular flint.			
						(RIVER TERRACE DEPOSITS)			
						<i>From 1.20m bgl: medium dense.</i>			
B	1.20								
C	1.20	N = 29			(1.60)				
B	2.20			13.27	2.20	Medium dense light brown SAND and GRAVEL. Gravel is fine to coarse subangular to angular flint.			
C	2.20	N = 12				(RIVER TERRACE DEPOSITS)			
B	3.20								
C	3.20	N = 11	3.20						
					(3.30)				
B	4.20								
C	4.20	N = 20	4.20						
B	5.20								
C	5.20	N = 42	5.20						
				9.97	5.50	Very stiff greyish green sandy SILT. (WITTERING FORMATION)			
					(1.80)				
D	6.50								
S	6.50	N = 50	6.50						
				8.17	7.30	Dense greenish grey silty fine to medium SAND with bands of firm sandy clay. (WITTERING FORMATION)			
D	7.50								
D	8.00								
S	8.00	N = 42	8.00						
D	9.00								
UT	9.50	(50)				<i>From 9.50m to 10.50m bgl: band of firm greenish grey sandy silty.</i>			
D	10.00								

Continued next sheet

Chiselling			Groundwater Strikes					Drilled: GAP Drilling Services Ltd
From	To	Duration (hh:mm)	Depth Strike	Rose to	Remarks	Cased	Sealed	
			3.50	2.30	Slow inflow			Logged: FHJ
								Checked: AP

Remarks: Hand dug service inspection pit excavated to 1.20m bgl. Water added to aid drilling from 2.20m to 3.50m bgl.

Installation: 50mm diameter standpipe installed to 6.00m bgl.

Diameter: 150mm to 14.95m

Exploratory hole logs should be read in conjunction with key sheets

APPLIED GEOLOGY

BH3

AG2834-18

2 of 2

1:50

14.95m

Chiselling			Groundwater Strikes					Drilled: GAP Drilling Services Ltd Logged: FHJ Checked: AP
From	To	Duration (hh:mm)	Depth Strike	Rose to	Remarks	Cased	Sealed	
			3.50	2.30	Slow inflow			

Diameter: 150mm to 14.95m

BOREHOLE LOG - CABLE PERCUSSION

BH4

Project Leigh Road, Eastleigh	Project No. AG2834-18	
Client Eastleigh Borough Council	Sheet 1 of 2	
Start 17/04/2018	Coordinates E 444269.12 N 119352.82	Scale 1:50
End 18/04/2018	Ground Level 15.61m AOD	Total Depth 14.95m

Sample / Test Type	Depth (m)	Result	Casing Depth (m)	Level (mAoD)	Strata Depth (thickness) (m)	Description of Strata	Legend	GW	Install
B	0.10				(0.55)	Brown gravelly fine to coarse SAND. Gravel is fine to coarse subangular to angular flint with occasional concrete and brick fragments.			
B	0.55			15.06	0.55	(MADE GROUND)			
B	1.20					Light brown slightly clayey gravelly fine to coarse SAND. Gravel is fine to coarse subangular to angular flint.			
C	1.20	N = 30			(1.65)	(RIVER TERRACE DEPOSITS) <i>From 1.20m bgl: dense.</i>			
B	2.20			13.41	2.20				
C	2.20	N = 6				Loose light brown slightly clayey SAND and GRAVEL. Gravel is fine to coarse subangular to angular flint.			
						(RIVER TERRACE DEPOSITS)			
B	3.20								
C	3.20	N = 7	3.10		(2.40)				
B	4.20								
C	4.20	N = 17	4.20			<i>From 4.20m bgl: medium dense.</i>			
B	4.60			11.01	4.60				
						Medium dense brownish green silty fine to medium SAND with rare fine to medium subangular to angular flint gravel.			
						(RIVER TERRACE DEPOSITS)			
D	5.20								
S	5.20	N > 50			(1.40)	<i>At 5.20m bgl: very dense.</i>			
D	6.00			9.61	6.00				
						Firm greenish grey sandy SILT.			
						(WITTERING FORMATION)			
D	6.50								
S	6.50	N = 41	6.50			<i>From 6.50m bgl: stiff.</i>			
					(2.00)				
D	7.50								
D	8.00			7.61	8.00				
S	8.00	N > 50	8.00			Very dense brownish grey and greenish grey silty fine to medium SAND with bands of firm sandy clay.			
						(WITTERING FORMATION)			
D	9.00								
UT	9.50	(45)							

Continued next sheet

Chiselling			Groundwater Strikes					Drilled: GAP Drilling Services Ltd
From	To	Duration (hh:mm)	Depth Strike	Rose to	Remarks	Cased	Sealed	
			3.80	2.90	Slow inflow	3.80		Logged: FHJ
								Checked: AP

Remarks: Hand dug service inspection pit excavated to 1.20m bgl. Water added to aid drilling from 2.70m to 3.20m bgl.

Installation: 50mm diameter standpipe installed to 8.00m bgl.

Diameter: 150mm to 14.95m

Exploratory hole logs should be read in conjunction with key sheets

APPLIED GEOLOGY

BH4

AG2834-18

2 of 2

1:50

14.95m

Chiselling			Groundwater Strikes					Drilled: GAP Drilling Services Ltd Logged: FHJ Checked: AP
From	To	Duration (hh:mm)	Depth Strike	Rose to	Remarks	Cased	Sealed	
			3.80	2.90	Slow inflow	3.80		

Diameter: 150mm to 14.95m

APPLIED GEOLOGY

BOREHOLE LOG - CABLE PERCUSSION

BH5

Project Leigh Road, Eastleigh

Project No.

AG2834-18

Client Eastleigh Borough Council

Sheet

1 of 2

Start 20/04/2018

Coordinates E 444264.83 N 119372.15

Scale

1:50

End 23/04/2018

Ground Level 15.48m AOD

Total Depth

14.95m

Sample / Test Type	Depth (m)	Result	Casing Depth (m)	Level (mAoD)	Strata Depth (thickness) (m)	Description of Strata	Legend	GW	Install
B	0.10				(0.50)	Brown gravelly fine to coarse SAND. Gravel is fine to coarse subangular to angular flint and occasional concrete and brick fragments.			
B	0.50			14.98	0.50	(MADE GROUND)			
					(0.70)	Light brown slightly clayey gravelly fine to coarse SAND. Gravel is fine to coarse subangular to angular flint. (RIVER TERRACE DEPOSITS)			
B	1.20			14.28	1.20				
C	1.20	N = 26				medium dense slightly clayey SAND and GRAVEL. Gravel is fine to coarse subangular to angular flint. (RIVER TERRACE DEPOSITS)			
B	2.20								
C	2.20	N = 19							
					(3.30)				
B	3.20								
C	3.20	N = 13	3.00			From 3.20m bgl: SAND and GRAVEL.			
B	4.20								
C	4.20	N = 32	4.20						
				10.98	4.50	Dense greenish brown and grey SAND. (Driller's description)			
					(0.70)				
D	5.20								
S	5.20	N >50	5.20	10.28	5.20	Very stiff light greenish grey slightly sandy silty CLAY. (WITTERING FORMATION)			
					(0.80)				
D	6.00								
S	6.00	N = 40	6.00	9.48	6.00	Dense greenish grey silty fine to coarse SAND. (WITTERING FORMATION)			
					(1.50)				
D	7.00					Below 7.00m bgl: greenish grey sandy silt.			
D	7.50								
S	7.50	N = 41	7.50	7.98	7.50	Dense greenish grey silty fine to medium SAND with bands of firm sandy clay. (WITTERING FORMATION)			
D	8.50								
B	9.00								
UT	9.00	(50)							
D	9.50								
S	9.50	N = 44	9.00						
						Continued next sheet			

Chiselling			Groundwater Strikes					Drilled: GAP Drilling Services Ltd
From	To	Duration (hh:mm)	Depth Strike	Rose to	Remarks	Cased	Sealed	
			4.00	3.50		3.80		Logged: FHJ
								Checked: AP

Remarks: Hand dug service inspection pit excavated to 1.20m bgl. Water added to aid drilling from 3.00m to 3.50m bgl. Borehole backfilled with arisings on completion.

Installation:

Diameter: 150mm to 14.50m

Exploratory hole logs should be read in conjunction with key sheets

APPLIED GEOLOGY

BOREHOLE LOG - CABLE PERCUSSION

BH5

Project

Leigh Road, Eastleigh

Project No.

AG2834-18

Client

Eastleigh Borough Council

Sheet

2 of 2

Start

20/04/2018

Coordinates

E 444264.83 N 119372.15

Scale

1:50

End

23/04/2018

Ground Level

15.48m AOD

Total Depth

14.95m

Sample / Test Type	Depth (m)	Result	Casing Depth (m)	Level (mAoD)	Strata Depth (thickness) (m)	Description of Strata	Legend	GW	Install
D	10.50					Dense greenish grey silty fine to medium SAND with bands of firm sandy clay. (WITTERING FORMATION)			
D	11.00								
S	11.00	N >50	11.00		(7.45)	From 11.00m bgl: very dense.			
D	12.00								
D	12.50								
S	12.50	N >50	12.50						
D	13.50					At 13.50m bgl: band of greenish grey silt.			
B	14.00								
UT	14.00	(50)							
D	14.50								
S	14.50	N >50	14.50						
				0.53	14.95	End of Borehole at 14.95m			

Chiselling			Groundwater Strikes					Drilled: GAP Drilling Services Ltd Logged: FHJ Checked: AP
From	To	Duration (hh:mm)	Depth Strike	Rose to	Remarks	Cased	Sealed	
			4.00	3.50		3.80		

Remarks: Hand dug service inspection pit excavated to 1.20m bgl. Water added to aid drilling from 3.00m to 3.50m bgl. Borehole backfilled with arisings on completion.

Installation:

Diameter: 150mm to 14.50m

Exploratory hole logs should be read in conjunction with key sheets

APPLIED GEOLOGY

BOREHOLE LOG - CABLE PERCUSSION

BH6

Project Leigh Road, Eastleigh

Project No.

AG2834-18

Client Eastleigh Borough Council

Sheet

1 of 2

Start 23/04/2018

Coordinates E 444246.86 N 119377.52

Scale

1:50

End 23/04/2018

Ground Level 16.35m AOD

Total Depth

14.95m

Sample / Test Type	Depth (m)	Result	Casing Depth (m)	Level (mAoD)	Strata Depth (thickness) (m)	Description of Strata	Legend	GW	Install
B	0.10				(0.90)	Grass over soft dark brown slightly gravelly CLAY with occasional rootlets. Gravel is fine to coarse subangular to angular flint. (TOPSOIL)			
B	0.90			15.45	0.90	Light brown slightly clayey gravelly fine to coarse SAND. Gravel is fine to coarse subangular to angular flint. (RIVER TERRACE DEPOSITS)			
B	1.20								
C	1.20	N = 28			(1.30)	From 1.20m bgl: medium dense.			
B	2.20			14.15	2.20	Dense light brown SAND and GRAVEL. Gravel is fine to coarse subangular to angular flint. (RIVER TERRACE DEPOSITS)			
C	2.20	N = 32							
B	3.20								
C	3.20	N = 15	3.00		(3.10)	From 3.20m bgl: medium dense.			
B	4.20								
C	4.20	N = 17	4.20						
B	5.20								
C	5.20	N = 45	5.20	11.05	5.30	Stiff greyish green sandy SILT with rare fine subangular to angular flint gravel. (WITTERING FORMATION)			
B	6.00								
UT	6.00	(50)			(2.20)				
D	6.50								
S	6.50	N = 46	6.50			At 6.50m bgl: band of firm greenish grey clay.			
D	7.00								
D	7.50								
S	7.50	N = 46	7.50	8.85	7.50	Dense greenish grey silty fine to coarse SAND. (WITTERING FORMATION)			
D	8.50				(2.00)	At 8.50m bgl: band of greenish grey SILT.			
UT	9.00	(40)							
D	9.50			6.85	9.50	Dense greenish grey silty fine to medium SAND with bands of firm sandy clay. (WITTERING FORMATION)			
D	10.00					Continued next sheet			

Chiselling			Groundwater Strikes					Drilled: GAP Drilling Services Ltd
From	To	Duration (hh:mm)	Depth Strike	Rose to	Remarks	Cased	Sealed	
			4.50	4.20		4.50		Logged: FHJ
								Checked: AP

Remarks: Hand dug service inspection pit excavated to 1.20m bgl. Water added to aid drilling from 3.00m to 4.00m bgl.

Installation: 50mm diameter standpipe installed to 6.00m bgl.

Diameter: 150mm to 14.95m

Exploratory hole logs should be read in conjunction with key sheets

APPLIED GEOLOGY

BOREHOLE LOG - CABLE PERCUSSION

BH6

Project	Leigh Road, Eastleigh	Project No.	AG2834-18
Client	Eastleigh Borough Council	Sheet	2 of 2
Start	23/04/2018	Coordinates	E 444246.86 N 119377.52
End	23/04/2018	Scale	1:50
	Ground Level	16.35m AOD	Total Depth
			14.95m

Sample / Test Type	Depth (m)	Result	Casing Depth (m)	Level (mAOD)	Strata Depth (thickness) (m)	Description of Strata	Legend	GW	Install
D	10.50					Dense greenish grey silty fine to medium SAND with bands of firm sandy clay.			
S	10.50	N = 41	10.50			(WITTERING FORMATION) <i>From 10.50m bgl: stiff.</i>			
D	11.50								
D	12.00								
S	12.00	N = 47	12.00		(5.45)	<i>From 12.00m bgl: thinly laminated.</i>			
D	13.00					<i>At 13.00m bgl: band of soft green-grey sandy silt.</i>			
D	13.50								
S	13.50	N = 50	13.50			<i>From 13.50m bgl: very dense.</i>			
D	14.50					<i>At 14.50m bgl: band of soft green-grey sandy silt.</i>			
D	14.95			1.40	14.95				
S	14.95	N >50	13.50			End of Borehole at 14.95m			

Chiselling			Groundwater Strikes					Drilled: GAP Drilling Services Ltd Logged: FHJ Checked: AP
From	To	Duration (hh:mm)	Depth Strike	Rose to	Remarks	Cased	Sealed	
			4.50	4.20		4.50		

Remarks: Hand dug service inspection pit excavated to 1.20m bgl. Water added to aid drilling from 3.00m to 4.00m bgl.

Installation: 50mm diameter standpipe installed to 6.00m bgl.

Diameter: 150mm to 14.95m

SPT Hammer Energy Test Report

in accordance with BSEN ISO 22476-3:2005

SPT Hammer Ref: DD15

Test Date: 02/10/2017

Report Date:

File Name: DD15.spt

Test Operator: MS

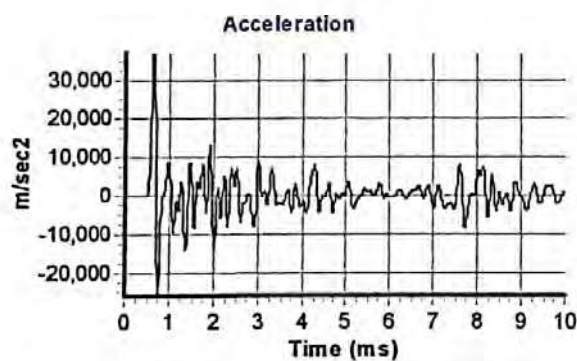
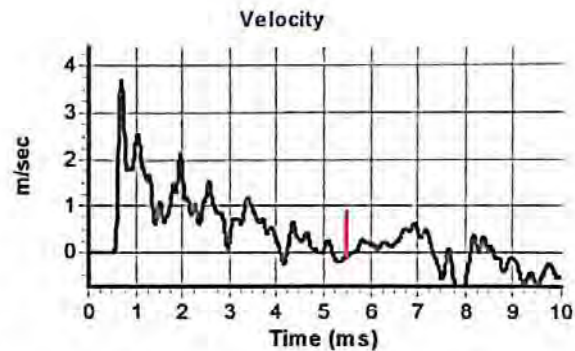
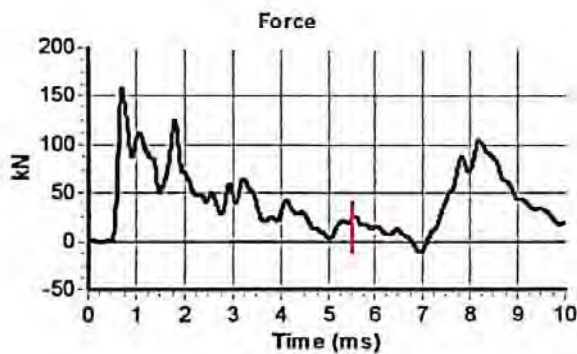
Instrumented Rod Data

Diameter d_r (mm): 54
Wall Thickness t_r (mm): 7.4
Assumed Modulus E_a (GPa): 208
Accelerometer No.1: 9603
Accelerometer No.2: 9786

SPT Hammer Information

Hammer Mass m (kg): 63.6
Falling Height h (mm): 760
SPT String Length L (m): 16.0

Comments / Location



Calculations

Area of Rod A (mm²): 1083
Theoretical Energy E_{theor} (J): 473
Measured Energy E_{meas} (J): 371

Energy Ratio E_r (%): **78**

The recommended calibration interval is 12 months

Sign
Title

SPT SUMMARY SHEET

Project: Leigh Road, Eastleigh
Client: Eastleigh Borough Council
Project No: AG2834-18

Borehole No.	Borehole depth (m)	Bottom depth (m)	Casing depth (m)	Water Level (m)	Equipment ref.	Seating Drive		Test Drive					Test Type	N Value
						Blows	Pen (mm)	Blows		Pen (mm)		Total Pen (mm)		
BH1	1.20	1.65		Dry	DD15	2 2	75 75	4 5 7 8	75 75 75 75	300	C	24		
BH1	2.20	2.65		Dry	DD15	2 2	75 75	1 2 2 3	75 75 75 75	300	C	8		
BH1	3.20	3.65	3.20	2.80	DD15	1 1	75 75	2 2 3 2	75 75 75 75	300	C	9		
BH1	4.20	4.65	4.20	2.30	DD15	3 4	75 75	5 5 4 5	75 75 75 75	300	C	19		
BH1	5.20	5.65	5.20	4.80	DD15	2 3	75 75	4 5 7 9	75 75 75 75	300	C	25		
BH1	6.00	6.45	6.00	3.50	DD15	4 6	75 75	9 9 14 18	75 75 75 70	295	S	>50		
BH1	7.50	7.95	7.50	3.60	DD15	4 6	75 75	8 10 12 15	75 75 75 75	300	S	45		
BH1	10.00	10.45	9.00	7.50	DD15	4 5	75 75	7 9 11 12	75 75 75 75	300	S	39		
BH1	13.00	13.45	13.00	11.70	DD15	4 6	75 75	8 10 10 12	75 75 75 75	300	S	40		
BH2	1.20	1.65		Dry	DD15	2 3	75 75	3 3 5 7	75 75 75 75	300	C	18		
BH2	2.20	2.65		Dry	DD15	1 1	75 75	2 2 3 3	75 75 75 75	300	C	10		
BH2	3.20	3.65	2.93.20		DD15	1 2	75 75	2 3 4 5	75 75 75 75	300	C	14		
BH2	4.20	4.65	4.20	2.30	DD15	3 4	75 75	6 6 7 10	75 75 75 75	300	C	29		
BH2	5.20	5.65	5.20	2.40	DD15	5 5	75 75	6 9 7 7	75 75 75 75	300	C	29		
BH2	6.50	6.91	6.50	3.0	DD15	6 8	75 75	10 13 17 10	75 75 75 35	260	S	>50		
BH2	8.00	8.45	8.00	2.90	DD15	3 3	75 75	5 8 10 10	75 75 75 75	300	S	33		
BH2	11.00	11.45	11.00	5.60	DD15	4 5	75 75	9 11 11 15	75 75 75 75	300	S	46		
BH2	14.50	14.94	13.50	6.10	DD15	6 8	75 75	10 13 15 12	75 75 75 60	285	S	>50		
BH3	1.20	1.65		Dry	DD15	3 4	75 75	6 6 8 9	75 75 75 75	300	C	29		
BH3	2.20	2.65		Dry	DD15	1 3	75 75	3 3 3 3	75 75 75 75	300	C	12		
BH3	3.20	3.65	3.20	Damp	DD15	1 1	75 75	3 3 2 3	75 75 75 75	300	C	11		
BH3	4.20	4.65	4.20	3.30	DD15	2 4	75 75	5 5 5 5	75 75 75 75	300	C	20		
BH3	5.20	5.65	5.20	3.40	DD15	3 5	75 75	8 9 11 14	75 75 75 75	300	C	42		
BH3	6.50	6.95	6.50	3.0	DD15	4 6	75 75	8 11 14 17	75 75 75 75	300	S	50		
BH3	8.00	8.45	8.00	4.50	DD15	3 5	75 75	8 10 11 13	75 75 75 75	300	S	42		
BH3	10.00	10.45	10.00	5.20	DD15	4 5	75 75	8 10 11 12	75 75 75 75	300	S	41		
BH3	11.00	11.45	11.00	3.0	DD15	4 6	75 75	8 9 11 13	75 75 75 75	300	S	41		
BH3	12.50	12.95	12.00	4.70	DD15	5 7	75 75	9 11 12 16	75 75 75 75	300	S	48		
BH4	1.20	1.65		Dry	DD15	4 4	75 75	5 7 9 9	75 75 75 75	300	C	30		
BH4	2.20	2.65		Dry	DD15	1 1	75 75	1 1 2 2	75 75 75 75	300	C	6		
BH4	3.20	3.65	3.10	3.20	DD15	1 3	75 75	1 2 2 2	75 75 75 75	300	C	7		
BH4	4.20	4.65	4.20	3.20	DD15	1 2	75 75	5 5 4 3	75 75 75 75	300	C	17		
BH4	5.20	5.58			DD15	3 11	75 75	11 17 22	75 75 75	225	S	>50		
BH4	6.50	6.95	6.50	4.80	DD15	4 5	75 75	7 10 11 13	75 75 75 75	300	S	41		

Notes:

1. Test carried out in general accordance with BS EN ISO 22476-3:2005
2. N values have not been subjected to any correction.
3. Test carried out using split spoon S, or solid cone C.

SPT SUMMARY SHEET

Project: Leigh Road, Eastleigh
Client: Eastleigh Borough Council
Project No: AG2834-18

Borehole No.	Borehole depth (m)	Bottom depth (m)	Casing depth (m)	Water Level (m)	Equipment ref.	Seating Drive		Test Drive					Test Type	N Value
						Blows	Pen (mm)	Blows		Pen (mm)		Total Pen (mm)		
BH4	8.00	8.35	8.00	5.30	DD15	4 6	75 75	8 16 18 16	75 75 50	200	S	>50		
BH4	11.00	11.45	11.00	9.10	DD15	5 8	75 75	9 10 12 15	75 75 75 75	300	S	46		
BH4	14.50	14.95	13.50	5.70	DD15	6 7	75 75	9 11 13 15	75 75 75 75	300	S	48		
BH5	1.20	1.65		Dry	DD15	2 3	75 75	5 7 7 7	75 75 75 75	300	C	26		
BH5	2.20	2.65		Dry	DD15	1 2	75 75	4 5 5 5	75 75 75 75	300	C	19		
BH5	3.20	3.65	3.00	Damp	DD15	1 1	75 75	3 4 3 3	75 75 75 75	300	C	13		
BH5	4.20	4.65	4.20	3.50	DD15	2 3	75 75	6 7 9 10	75 75 75 75	300	C	32		
BH5	5.20	5.64	5.20	4.0	DD15	4 9	75 75	10 13 16 11	75 75 75 65	290	S	>50		
BH5	6.00	6.45	6.00	4.0	DD15	3 5	75 75	7 9 10 14	75 75 75 75	300	S	40		
BH5	7.50	7.95	7.50	3.80	DD15	4 5	75 75	7 9 12 13	75 75 75 75	300	S	41		
BH5	9.50	9.95	9.00	6.0	DD15	4 5	75 75	8 10 12 14	75 75 75 75	300	S	44		
BH5	11.00	11.45	11.00	6.70	DD15	4 7	75 75	9 13 15 14	75 75 75 70	295	S	>50		
BH5	12.50	12.95	12.50	4.20	DD15	5 7	75 75	9 12 14 15	75 75 75 70	295	S	>50		
BH5	14.50	14.95	14.50	4.50	DD15	3 7	75 75	8 13 14 15	75 75 75 70	295	S	>50		
BH6	1.20	1.65		Dry	DD15	3 4	75 75	5 7 7 9	75 75 75 75	300	C	28		
BH6	2.20	2.65		Dry	DD15	4 4	75 75	6 9 9 8	75 75 75 75	300	C	32		
BH6	3.20	3.65	3.00	Damp	DD15	4 5	75 75	4 4 3 4	75 75 75 75	300	C	15		
BH6	4.20	4.65	4.20	4.0	DD15	1 1	75 75	3 4 5 5	75 75 75 75	300	C	17		
BH6	5.20	5.65	5.20	4.30	DD15	3 6	75 75	8 10 12 15	75 75 75 75	300	C	45		
BH6	6.50	6.95	6.50	4.80	DD15	5 6	75 75	9 10 12 15	75 75 75 75	300	S	46		
BH6	7.50	7.95	7.50	5.0	DD15	3 6	75 75	8 10 13 15	75 75 75 75	300	S	46		
BH6	10.50	10.95	10.50	5.70	DD15	3 6	75 75	8 9 11 13	75 75 75 75	300	S	41		
BH6	12.00	12.45	12.00	6.70	DD15	5 7	75 75	8 11 13 15	75 75 75 75	300	S	47		
BH6	13.50	13.95	13.50	6.50	DD15	3 5	75 75	8 9 15 18	75 75 75 75	300	S	50		
BH6	14.95	15.40	13.50	6.50	DD15	4 7	75 75	9 11 14 16	75 75 75 70	295	S	>50		

Notes:

1. Test carried out in general accordance with BS EN ISO 22476-3:2005
2. N values have not been subjected to any correction.
3. Test carried out using split spoon S, or solid cone C.

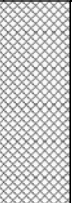
TRIAL PIT LOG

TP1

Project Leigh Road, Eastleigh
Client Eastleigh Borough Council
Date 16/04/2018

Project No. AG2834-18
Sheet 1 of 1
Scale 1:25

Ground Level 15.45m AOD **Coordinates** E 444287.54 N 119317.83 **Total Depth** 2.30m

Sample / Test Type	Depth (m)	Result	Level (mAoD)	Strata Depth (thickness) (m)	Ease of Dig	Description of Strata	Legend	GW
ES	0.30			(0.70)	H	Brown sandy GRAVEL. Gravel is fine to coarse subangular to angular brick, concrete and flint. (MADE GROUND) <i>At 0.20m bgl: fabric membrane.</i>		
B	1.00		14.75	0.70		Yellowish brown and orangish brown slightly sandy clayey GRAVEL. Gravel is fine to coarse subangular to angular flint. (RIVER TERRACE DEPOSITS)		
D	1.40			(1.60)	M	<i>From 1.30m bgl: occasional pockets of firm orangish brown gravelly clay. Gravel is fine to coarse subangular to angular flint.</i>		
B	2.00		13.15	2.30		End of Trial Pit at 2.30m		

Method: Backhoe excavator

Groundwater: Seepage at 2.30m bgl.

Stability: Collapsing on both long sides from 0.80m bgl.

Remarks: 50mm standpipe installed and trial pit backfilled with single sized 40mm flint gravel for subsequent soakaway testing. One inch yellow possible redundant gas pipe encountered at 0.65m bgl.

Length:	2.80m
Width:	0.70m
Logged:	FHJ
Checked:	AP

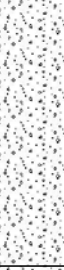
TRIAL PIT LOG

TP2

Project Leigh Road, Eastleigh
Client Eastleigh Borough Council
Date 17/04/2018

Project No. AG2834-18
Sheet 1 of 1
Scale 1:25

Ground Level 15.52m AOD **Coordinates** E 444238.10 N 119307.20 **Total Depth** 2.50m

Sample / Test Type	Depth (m)	Result	Level (mAoD)	Strata Depth (thickness) (m)	Ease of Dig	Description of Strata	Legend	GW
ES	0.20		15.22	(0.30)	H	Greyish brown sandy GRAVEL. Gravel is fine to coarse subangular to angular flint, brick and concrete. (MADE GROUND) <i>From 0.20m bgl: occasional whole bricks.</i>		
D	0.40		15.02	(0.20)	E	Soft to firm light grey and yellowish brown sandy silty CLAY. (RIVER TERRACE DEPOSITS)		
B	0.80			(0.90)	M	Orangish brown clayey SAND and GRAVEL. Gravel is fine to coarse subangular to angular flint. (RIVER TERRACE DEPOSITS)		
D	1.60		14.12	1.40		Yellowish brown SAND and GRAVEL. Gravel is fine to coarse subangular to angular flint. (RIVER TERRACE DEPOSITS)		
				(1.10)	M			
			13.02	2.50		End of Trial Pit at 2.50m		

Method: Backhoe excavator

Groundwater: Water at 2.45m bgl.

Stability: Collapse on long walls from 0.50m bgl. Following excavation collapse on both sides to 1.80m bgl.

Remarks: Trial pit backfilled with arisings on completion.

Length:	2.70m
Width:	0.70m
Logged:	FHJ
Checked:	AP

TRIAL PIT LOG

TP3

Project Leigh Road, Eastleigh
Client Eastleigh Borough Council
Date 17/04/2018

Project No. AG2834-18
Sheet 1 of 1
Scale 1:25

Ground Level 15.48m AOD **Coordinates** E 444214.26 N 119315.28 **Total Depth** 2.50m

Sample / Test Type	Depth (m)	Result	Level (mAoD)	Strata Depth (thickness) (m)	Ease of Dig	Description of Strata	Legend	GW
ES	0.30		15.38	(0.10) 0.10	E	Grass over soft slightly gravelly CLAY with rootlets. Gravel is fine to coarse subangular to angular flint. (TOPSOIL)		
				(0.60)	M	Orangish brown and light brown slightly clayey gravelly fine to coarse SAND. Gravel is fine to coarse subangular to angular flint. (RIVER TERRACE DEPOSITS)		
B	0.90		14.78	0.70		Yellowish brown SAND and GRAVEL. Gravel is fine to coarse subangular to angular flint. (RIVER TERRACE DEPOSITS)		
D	1.50			(1.60)	M	From 1.50m bgl: occasional pockets of soft to firm sandy clay.		
D	2.40		13.18	2.30 (0.20)	M	Light brown clayey GRAVEL. Gravel is fine to coarse, subangular to angular flint. (RIVER TERRACE DEPOSITS)		▼
			12.98	2.50		End of Trial Pit at 2.50m		

Method: Backhoe excavator

Groundwater: Water at 2.30m bgl.

Stability: Collapsing on long sides from 1.50m bgl. On completion collapsed to 2.20m bgl.

Remarks: Trial pit backfilled with arisings on completion.

Length:	2.40m
Width:	0.70m
Logged:	FHJ
Checked:	AP

TRIAL PIT LOG

TP4

Project Leigh Road, Eastleigh
Client Eastleigh Borough Council
Date 17/04/2018

Project No. AG2834-18
Sheet 1 of 1
Scale 1:25

Ground Level 16.74m AOD **Coordinates** E 444243.14 N 119388.25 **Total Depth** 3.90m

Sample / Test Type	Depth (m)	Result	Level (mAoD)	Strata Depth (thickness) (m)	Ease of Dig	Description of Strata	Legend	GW
ES	0.30			(0.60)	E	Grass over brown clayey, slightly gravelly fine to coarse SAND, with roots and rootlets. Gravel is fine to coarse, subangular to angular flint. (TOPSOIL)		
D	0.70		16.14	0.60 (0.20)	E	Soft orangish brown gravelly CLAY. Gravel is fine to coarse, subangular to angular flint. (RIVER TERRACE DEPOSITS)		
			15.94	0.80	E	Light brown gravelly fine to coarse SAND. Gravel is fine to coarse, subangular to angular flint. (RIVER TERRACE DEPOSITS)		
B	1.20			(0.80)	M			
			15.14	1.60		Orangish brown slightly clayey SAND and GRAVEL. Gravel is fine to coarse, subangular to angular flint. (RIVER TERRACE DEPOSITS)		
				(1.50)				
D	2.50				M			
			13.64	3.10		Light brown clayey slightly sandy GRAVEL. Gravel is fine to coarse, subangular to angular flint. (RIVER TERRACE DEPOSITS)		
				(0.80)	M	From 3.40m bgl: damp		
D	3.50							
			12.84	3.90		End of Trial Pit at 3.90m		

Method: Backhoe excavator
Groundwater: Seepage at 3.40m bgl.
Stability: Collapse from 1.70m bgl on both sides. Collapsed to 3.20m bgl on completion.
Remarks: Trial pit backfilled with arisings on completion.

Length:	2.60m
Width:	0.70m
Logged:	FHJ
Checked:	AP

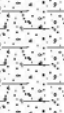
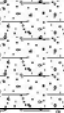
TRIAL PIT LOG

TP5

Project Leigh Road, Eastleigh
Client Eastleigh Borough Council
Date 17/04/2018

Project No. AG2834-18
Sheet 1 of 1
Scale 1:25

Ground Level 16.06m AOD **Coordinates** E 444231.03 N 119373.39 **Total Depth** 3.30m

Sample / Test Type	Depth (m)	Result	Level (mAoD)	Strata Depth (thickness) (m)	Ease of Dig	Description of Strata	Legend	GW
ES	0.30		15.66	(0.40)	E	Grass over soft dark brown CLAY with rootlets. Gravel is fine to coarse, subangular to angular flint. (TOPSOIL)		
D	0.60		15.26	(0.40)	E	Light brown clayey slightly gravelly fine to coarse SAND. Gravel is fine to coarse, subangular to angular flint. (RIVER TERRACE DEPOSITS)		
D	1.20			0.80		Orangish brown slightly clayey SAND and GRAVEL. Gravel is fine to coarse, subangular to angular flint. (RIVER TERRACE DEPOSITS)		
D	1.80			(1.60)	M	From 1.70m bgl: yellowish brown		
D	2.50		13.66	2.40		Greyish brown clayey GRAVEL. Gravel is fine to coarse, subangular to angular flint. (RIVER TERRACE DEPOSITS)		
D	3.00			(0.90)	M	From 2.90m bgl: orangish brown and wet.		
			12.76	3.30		End of Trial Pit at 3.30m		

Method: Backhoe excavator
Groundwater: Water at 3.00m bgl.
Stability: Collapsing on sides from 1.60m bgl. Pit collapsed to 2.90m bgl.
Remarks: Trial pit backfilled with arisings on completion.

Length:	2.80m
Width:	0.70m
Logged:	FHJ
Checked:	AP

TRIAL PIT LOG

TP6

Project Leigh Road, Eastleigh
Client Eastleigh Borough Council
Date 16/04/2018

Project No. AG2834-18
Sheet 1 of 1
Scale 1:25

Ground Level 16.07m AOD **Coordinates** E 444267.93 N 119383.99 **Total Depth** 2.40m

Sample / Test Type	Depth (m)	Result	Level (mAoD)	Strata Depth (thickness) (m)	Ease of Dig	Description of Strata	Legend	GW
D	1.15		15.57	(0.50)	E	Grass over soft dark brown, slightly gravelly CLAY with rootlets. Gravel is fine to coarse, subangular to angular flint. (TOPSOIL)		
				0.50	M	Brown slightly clayey gravelly fine to coarse SAND. Gravel is fine to coarse, subangular to angular flint. (RIVER TERRACE DEPOSITS)		
				(0.40)				
D	1.70		15.17	0.90	M	Yellowish brown and orangish brown, clayey SAND and GRAVEL. Gravel is fine to coarse, subangular to angular flint. (RIVER TERRACE DEPOSITS) <i>Between 1.10m and 1.20m bgl: band of soft yellowish brown sandy silt.</i>		
				(1.50)		From 1.60m bgl: occasional pockets of firm orangish brown gravelly CLAY. Gravel is fine to coarse, subangular to angular flint.		
				2.40		End of Trial Pit at 2.40m		
			13.67					

Method: Backhoe excavator

Groundwater: Groundwater not encountered.

Stability: Collapsing on both sides from 1.30m bgl.

Remarks: 50mm standpipe installed and trial pit backfilled with single sized 40mm flint gravel for subsequent soakaway testing.

Length:	2.20m
Width:	0.60m
Logged:	FHJ
Checked:	AP

TRIAL PIT LOG

TP7

Project Leigh Road, Eastleigh
Client Eastleigh Borough Council
Date 17/04/2018

Project No. AG2834-18
Sheet 1 of 1
Scale 1:25

Ground Level 15.30m AOD **Coordinates** E 444280.95 N 119380.56 **Total Depth** 2.30m

Sample / Test Type	Depth (m)	Result	Level (mAoD)	Strata Depth (thickness) (m)	Ease of Dig	Description of Strata	Legend	GW
ES	0.60		14.85	(0.45)	E	Grass over dark brown slightly clayey, gravelly fine to coarse SAND with roots and rootlets. Gravel is fine to coarse, subangular to angular flint. (TOPSOIL)		
				0.45		Soft brown slightly gravelly sandy CLAY. Gravel is fine to coarse, subangular to angular flint with occasional brick fragments and roots. (MADE GROUND)		
D	1.20		14.35	(0.50)	M			
				0.95 (0.15)	H	Reddish brown sandy GRAVEL. Gravel is fine to coarse, subangular to angular brick fragments. (MADE GROUND)		
D	1.90		14.20	1.10		Light brown slightly clayey gravelly fine to coarse SAND. Gravel is fine to coarse, subangular to angular flint. (RIVER TERRACE DEPOSITS)		
				(0.70)	M			
B	2.20		13.50	1.80		Light grey and greyish brown slightly clayey gravelly fine to coarse SAND. (RIVER TERRACE DEPOSITS)		
				(0.20)	M			
B	2.20		13.30	2.00		Orangish brown slightly clayey SAND and GRAVEL. Gravel is fine to coarse, subangular to angular flint. (RIVER TERRACE DEPOSITS)		
				(0.30)	M			
			13.00	2.30		End of Trial Pit at 2.30m		

Method: Backhoe excavator
Groundwater: Water at 2.20m bgl.
Stability: Collapse on long sides from 1.20m bgl. Collapsed to 1.80m bgl.
Remarks: Trial pit backfilled with arisings on completion.

Length:	2.50m
Width:	0.70m
Logged:	FHJ
Checked:	AP

TRIAL PIT LOG

TP8

Project Leigh Road, Eastleigh
Client Eastleigh Borough Council
Date 17/04/2018

Project No. AG2834-18
Sheet 1 of 1
Scale 1:25

Ground Level 15.56m AOD **Coordinates** E 444273.92 N 119352.83 **Total Depth** 1.05m

Sample / Test Type	Depth (m)	Result	Level (mAoD)	Strata Depth (thickness) (m)	Ease of Dig	Description of Strata	Legend	GW
ES	0.40			(0.60)	H	Grey sandy GRAVEL. Gravel is fine to coarse, subangular to angular flint with rare brick. (MADE GROUND)		
D	0.80		14.96	0.60				
				(0.45)	M	Light brown slightly clayey SAND and GRAVEL. Gravel is fine to coarse, subangular to angular flint. (RIVER TERRACE DEPOSITS)		
			14.51	1.05		End of Trial Pit at 1.05m		

Method: Backhoe excavator

Groundwater: Groundwater not encountered.

Stability: Continual collapse from surface

Remarks: Pit abandoned on encountering natural soils due to pit collapse and three inch pipe encountered at 0.60m bgl in north of pit. Trial pit backfilled with arisings.

Length:	1.70m
Width:	0.70m
Logged:	FHJ
Checked:	AP

Exploratory Hole Log Key Sheet

Sample Notation		Backfill Symbols		Legend Symbols	
D	Small Disturbed sample		Sand		Topsoil
B	Bulk Disturbed sample		Gravel		Made Ground
ES	Environmental sample		Concrete		Concrete
U	Undisturbed U100 sample		Bentonite		Clay
UT	Undisturbed UT100 sample		Arising		Silt
C	Core sample		Grout		Sand
W	Water sample				Gravel
In Situ Test Notation		Installation Symbols			Peat
S	Standard Penetration Test		Plain Standpipe		Cobbles
S (C)	Standard Penetration Test (cone)		Slotted Standpipe		Boulders
HV	Hand Shear Vane Test		Piezometer		Mudstone
PID	Photoionization Detector Test		Vibrating Wire Piezometer		Siltstone
MEXE	Mexecone Cone Penetrometer Test		Inclinometer		Sandstone
PP	Pocket Penetrometer Test		Extensometer (with magnet locations)		Limestone
K	Permeability Test				Chalk
Results Notation		Groundwater (GW)			Coal
Cu	Shear Strength		Rise		Breccia
N	SPT N Value		Groundwater Strike - with Recorded Rise		Conglomerate
PID	VOC Concentration		Strike		Shale
()	U/UT Blow Count		Groundwater Strike - No Recorded Rise		Igneous Rock
Rotary Core Notation					Metamorphic Rock
TCR	Total Core Recovery				No Recovery
SCR	Solid Core Recovery				
RQD	Rock Quality Designation				
FI	Fracture Index				
If	Fracture Spacing				
NI	Non Intact				
NR	No Recovery				
NA	Not Applicable				
Ease of Dig					
VE	Very Easy				
E	Easy				
M	Moderate				
H	Hard				
VH	Very Hard				
General Notes					
1. Details of the standpipe/piezometer are given on the log. The 'Install' column shows a graphical representation of the installed including depth of instruments including slotted section or piezometer depth, and backfill details. 2. Standard Penetration Test is defined in BS EN ISO 17892. Total N value is shown on the logs, full details of the test increments, equipment references, water and casing levels shown on the SPT Summary Sheet.					
Note: Most soils comprise a mixture of particle sizes. The soil type is graphically represented on the log and may be a combination of these symbols.					

APPENDIX C

Ground Gas Monitoring and Flow Results

Project/Site Name

Leigh Road, Eastleigh

Date and Time of Monitoring

24/04/18 8.00am

Project Number

AG2834-18

Phase of Monitoring

1 of 4

BH No.	Ground Level m (AOD)	Flow Range (litres/hr over 3 mins)			Differential Pressure (pa)	Methane % v/v		Methane % LEL		Carbon dioxide % v/v		Oxygen % v/v		
		Max	Min	Avg		Peak	Steady	Peak	Steady	Peak	Steady	Min	Steady	
BH1	15.468	*	*	*	*	*	*	*	*	*	*	*	*	
BH3	15.472	0.1	-0.1	<0.1	<1	<0.1	<0.1	<0.1	<0.1	0.3	0.3	18.8	18.8	
BH4	15.613	-0.1	-0.1	-0.1	0.02	<0.1	<0.1	<0.1	<0.1	0.7	0.7	18.5	18.5	
BH6	16.349	-0.1	-0.1	-0.1	0.03	<0.1	<0.1	<0.1	<0.1	0.4	0.4	18.3	18.3	

Meterological Data

Site Data

General Notes

Atmospheric Pressure (mb)	1014
Pressure Rising or Falling	Rising
Weather Conditions	Dry, Cloudy (50%), cool
Atmospheric Oxygen (% vol)	20.7
Wind Speed & Direction	14 mph Northeast
Ambient Air Temperature (°C)	12

Monitoring Personnel	Frankie Hadley-Jones		
GPS Instrument			
Equipment Used	Gasmeter	PID	Flowmeter
Equipment Serial Number	G505383	110423-K3	G505383
Ground Conditions (vegetation stress, visual contamination)			

Instrument specification sheet *BH1- Could not be tested
AP

Issue 6
28.03.17

Ground Gas Monitoring and Flow Results

Project/Site Name

Leigh Road, Eastleigh

Date and Time of Monitoring

30/04/18 8.00am

Project Number

AG2834-18

Phase of Monitoring

2 of 4

BH No.	Ground Level m (AOD)	Flow Range (litres/hr over 3 mins)			Differential Pressure (pa)	Methane % v/v		Methane % LEL		Carbon dioxide % v/v		Oxygen % v/v		
		Max	Min	Avg		Peak	Steady	Peak	Steady	Peak	Steady	Min	Steady	
BH1	15.468	*	*	*	*	*	*	*	*	*	*	*	*	
BH3	15.472	-0.3	-0.3	-0.3	-1	<0.1	<0.1	<0.1	<0.1	0.3	0.3	20.2	20.4	
BH4	15.613	-0.1	-0.2	-0.1	-1	<0.1	<0.1	<0.1	<0.1	0.6	0.5	20.7	20.8	
BH6	16.349	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.1	<0.1	5.8	5.8	13.3	13.3	

Meterological Data

Site Data

General Notes

Atmospheric Pressure (mb)	1003
Pressure Rising or Falling	Falling
Weather Conditions	Overcast
Atmospheric Oxygen (% vol)	21.2
Wind Speed & Direction	Moderate Breeze - N
Ambient Air Temperature (°C)	5

Monitoring Personnel	Alex Aitken		
GPS Instrument			
Equipment Used	Gasmeter	PID	Flowmeter
Equipment Serial Number	G503948	110423-K3	G503948
Ground Conditions (vegetation stress, visual contamination)			

Instrument specification sheet *BH1- Could not be tested
AP

Ground Gas Monitoring and Flow Results

Project/Site Name

Leigh Road, Eastleigh

Date and Time of Monitoring 08/05/18 8.00am

Project Number

AG2834-18

Phase of Monitoring 3 of 4

[illegible]

Meteorological Data

Site Data

General Notes

Atmospheric Pressure (mb)	1008
Pressure Rising or Falling	Falling
Weather Conditions	Clear Skies
Atmospheric Oxygen (% vol)	20.6
Wind Speed & Direction	Light Air - WSW
Ambient Air Temperature (°C)	16

Monitoring Personnel	Alex Aitken		
GPS Instrument			
Equipment Used	Gasmeter	PID	Flowmeter
Equipment Serial Number	G503948	109598-K1	G503948
Ground Conditions (vegetation stress, visual contamination)			

Instrument specification sheet. Standpipe

AP

Issue 6
28.03.17

Ground Gas Monitoring and Flow Results

Project/Site Name

Leigh Road, Eastleigh

Date and Time of Monitoring 15/05/18 9.00am

Project Number

AG2834-18

Phase of Monitoring 4 of 4

[illegible]

Meteorological Data

Site Data

General Notes

Atmospheric Pressure (mb)	1021
Pressure Rising or Falling	Steady
Weather Conditions	Sunny
Atmospheric Oxygen (% vol)	20.9
Wind Speed & Direction	13 mph North
Ambient Air Temperature (°C)	15

Monitoring Personnel	Felicity Downing		
GPS Instrument			
Equipment Used	Gasmeter	PID	Flowmeter
Equipment Serial Number	G505383	110423-K3	G505383
Ground Conditions (vegetation stress, visual contamination)			

Instrument specification sheet

AP

Issue 6
28.03.17

Gas Monitoring Equipment Specification and Accuracy Details

Instrument Specifications

Instrument	Atmospheric Pressure Range	Temperature Range	Flow Range	Flow Resolution	
GFM 430 GA5000	800 to 1200 mbar+/- 1m bar	-10°C to + 40°C	-30 to +30 l/hr	0.1l/hr	
	500-1500 mb +/- 5 mb	-10°C to + 50°C	0-20 lt/hr +/- 0.3 l/hr	0.1l/hr	
Pro Check Tiger	-	-20 to + 60°C (Certified to -15 to + 45°C)	-	-	

Instrument Accuracy

Instrument		Methane	Lower Explosive Limit	Carbon Dioxide	Oxygen	Volatile Organics
GFM430	Detection Range	0-100%	0-100%	0 -100%	0-25%	N/A
	Detection Accuracy	+/- 0.2% @ 5% 1.0% @30% 3.0% @ 100% Response 20 secs	+/-4% of LEL Response 40 secs	Accuracy 0.1% @10% 3.0% @40% 3% @ 100% Response 20 Secs	+/- 0.5% Response 20 secs	N/A
GA5000	Detection Range	0-100%	-	0 -100%	0-25%	N/A
	Detection Accuracy	./+/- 0.5% @ 0 to 70%, +/-1.5% @ 70 to 100% Response < 10 secs	N/A	./+/- 0.5% @ 0 to 60%, +/-1.5% @ 60 to 100% Response < 10 secs	./+/- 1.0% @ 0 to 25%, Response < 20 secs	N/A
Pro Check Tiger	Detection Range	N/A	N/A	N/A	N/A	1 ppb - 1000 ppb
	Detection Accuracy	N/A	N/A	N/A	N/A	+/- 1ppb +/- 5% of actual value digit Response

Calibration Frequency

Equipment Serial Numbers

Instruments are calibrated annually. Details of the instrument calibration certificates and service records are available if required.		APPLIED TECHNICAL SERVICES
	GA5000 (G503948)	
	GFM430 - (10072, 10347)	
	Pro Check Tiger - (T-108308, T-109597, T-109598, T-110423)	

TRL DYNAMIC CONE PENETROMETER TEST RESULT

Test Location

TRL1

Date

24/04/2018

Operator

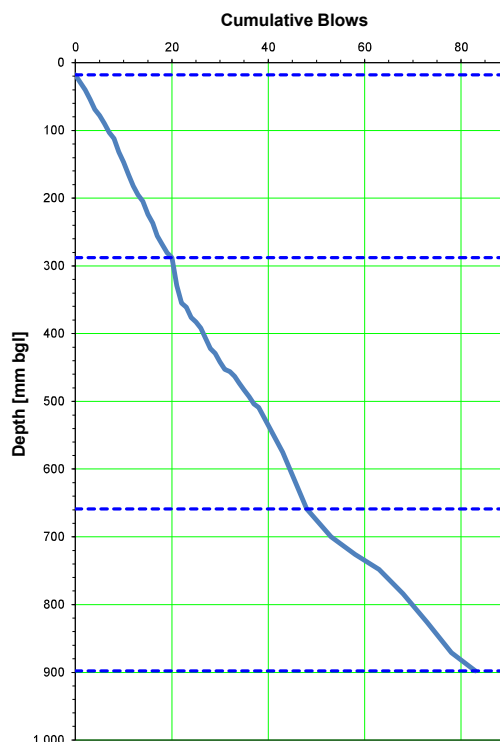
FHJ

Start Depth (mm bgl)

Ground Level

Checked by: SD

Layer	No of Blows	Cumulative Blows	CBR [%]	Layer Thickness [mm]	Total Depth [mm]
					18
Layer 2	20	20	19	270	288
Layer 3	28	48	20	371	659
Layer 4	35	83	40	239	898



Notes: TRL Equation : $\text{Log}_{10}(\text{CBR}) = 2.480 - 1.057 \times \text{Log}_{10}(\text{mm/blow})$ from IAN 73/06 Revision 1 (2009)
Tested in accordance with in house method, based upon TRL Road Note 31 & 8

Surface materials / condition:

Sandy gravel

Remarks:

18mm self-weight penetration

Client:	Eastleigh Borough Council	APPLIED GEOLOGY Unit 23 Abbey Park, Stareton, Kenilworth, CV8 2LY Tel. 02476 511822 email: admin@appliedgeology.co.uk www.appliedgeology.co.uk
Project:	Leigh Road, Eastleigh	
Project No.	AG2834-18	

TRL DYNAMIC CONE PENETROMETER TEST RESULT

Test Location

TRL2

Date

24/04/2018

Operator

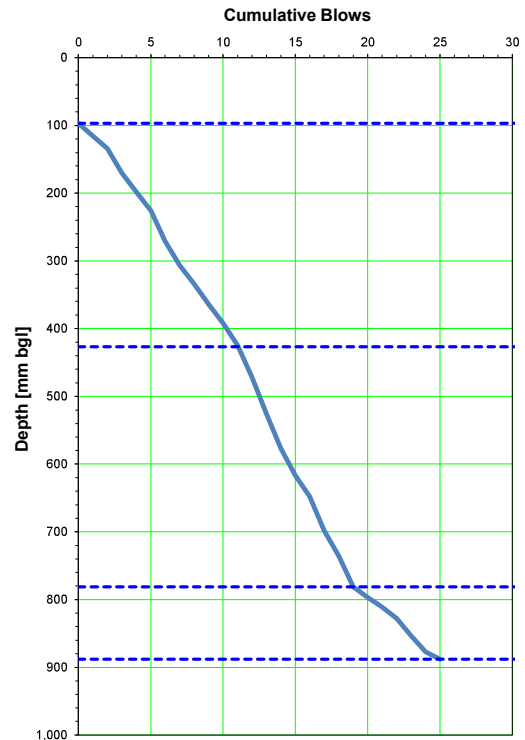
FHJ

Start Depth (mm bgl)

Ground Level

Checked by: SD

Layer	No of Blows	Cumulative Blows	CBR [%]	Layer Thickness [mm]	Total Depth [mm]
					97
Layer 2	11	11	8	330	427
Layer 3	8	19	5	354	781
Layer 4	6	25	14	107	888



Notes: TRL Equation : $\text{Log}_{10}(\text{CBR}) = 2.480 - 1.057 \times \text{Log}_{10}(\text{mm/blow})$ from IAN 73/06 Revision 1 (2009)
Tested in accordance with in house method, based upon TRL Road Note 31 & 8

Surface materials / condition:

Topsoil

Remarks:

97mm self weight penetration

Client:	Eastleigh Borough Council	APPLIED GEOLOGY Unit 23 Abbey Park, Stareton, Kenilworth, CV8 2LY Tel. 02476 511822 email: admin@appliedgeology.co.uk www.appliedgeology.co.uk
Project:	Leigh Road, Eastleigh	
Project No.	AG2834-18	

TRL DYNAMIC CONE PENETROMETER TEST RESULT

Test Location

TRL3

Date

24/04/2018

Operator

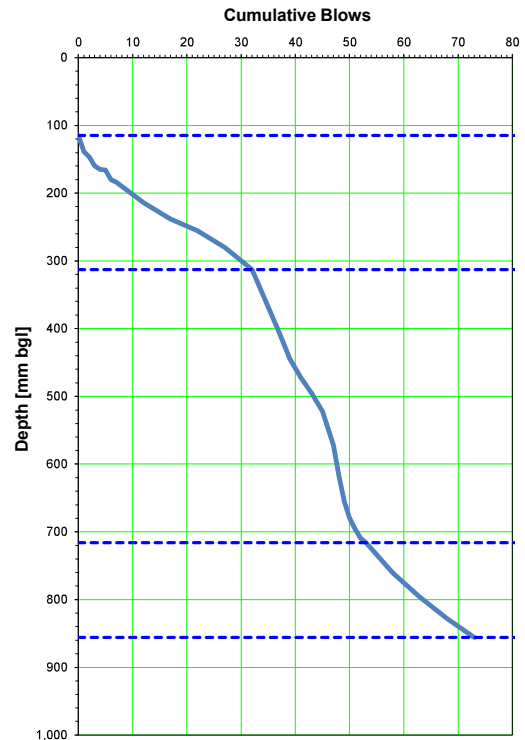
FHJ

Start Depth (mm bgl)

Ground Level

Checked by: SD

Layer	No of Blows	Cumulative Blows	CBR [%]	Layer Thickness [mm]	Total Depth [mm]
					115
Layer 2	32	32	44	198	313
Layer 3	21	53	13	403	716
Layer 4	20	73	39	140	856



Notes: TRL Equation : $\text{Log}_{10}(\text{CBR}) = 2.480 - 1.057 \times \text{Log}_{10}(\text{mm/blow})$ from IAN 73/06 Revision 1 (2009)
Tested in accordance with in house method, based upon TRL Road Note 31 & 8

Surface materials / condition:

Topsoil

Remarks:

115mm self-weight penetration

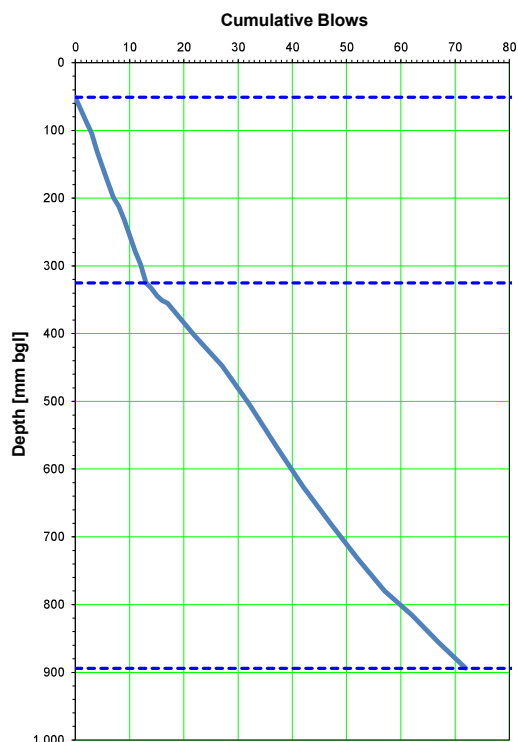
Client:	Eastleigh Borough Council	APPLIED GEOLOGY Unit 23 Abbey Park, Stareton, Kenilworth, CV8 2LY Tel. 02476 511822 email: admin@appliedgeology.co.uk www.appliedgeology.co.uk
Project:	Leigh Road, Eastleigh	
Project No.	AG2834-18	

TRL DYNAMIC CONE PENETROMETER TEST RESULT

Start Depth (mm bgl)

TRL4
24/04/2018
FHJ
Ground Level

Checked by: SD

[illegible]

Notes: TRL Equation : $\text{Log}_{10}(\text{CBR}) = 2.480 - 1.057 \times \text{Log}_{10}(\text{mm/blow})$ from IAN 73/06 Revision 1 (2009)
Tested in accordance with in house method, based upon TRL Road Note 31 & 8

Surface materials / condition:

Topsoil

Remarks:

51mm self-weight penetration

Client:	Eastleigh Borough Council	 Unit 23 Abbey Park, Stareton, Kenilworth, CV8 2LY Tel. 02476 511822 email: admin@appliedgeology.co.uk www.appliedgeology.co.uk
Project:	Leigh Road, Eastleigh	
Project No.	AG2834-18	

TRL DYNAMIC CONE PENETROMETER TEST RESULT

Test Location

TRL5

Date

24/04/2018

Operator

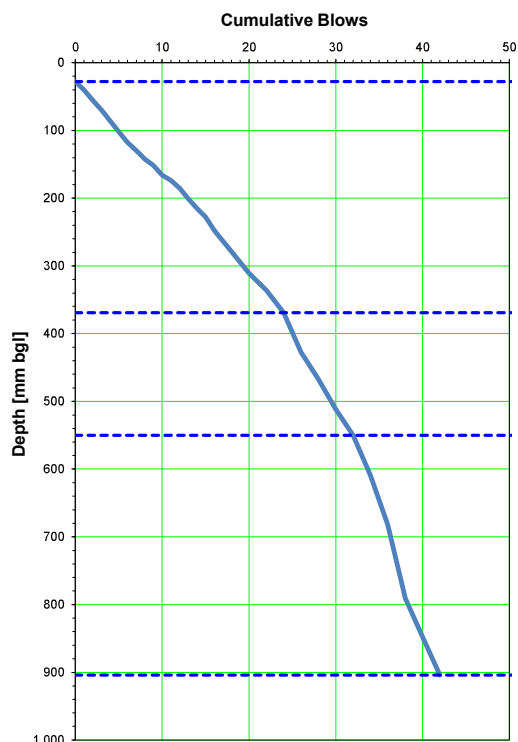
FHJ

Start Depth (mm bgl)

Ground Level

Checked by: SD

Layer	No of Blows	Cumulative Blows	CBR [%]	Layer Thickness [mm]	Total Depth [mm]
					28
Layer 2	24	24	18	341	369
Layer 3	8	32	11	181	550
Layer 4	10	42	7	354	904



Notes: TRL Equation : $\text{Log}_{10}(\text{CBR}) = 2.480 - 1.057 \times \text{Log}_{10}(\text{mm/blow})$ from IAN 73/06 Revision 1 (2009)
Tested in accordance with in house method, based upon TRL Road Note 31 & 8

Surface materials / condition:

Gravel

Remarks:

28mm self-weight penetration

Client:	Eastleigh Borough Council	APPLIED GEOLOGY Unit 23 Abbey Park, Stareton, Kenilworth, CV8 2LY Tel. 02476 511822 email: admin@appliedgeology.co.uk www.appliedgeology.co.uk
Project:	Leigh Road, Eastleigh	
Project No.	AG2834-18	

Filling	1 of 3
Trial Pit Length (m)	2.80
Trial Pit Width (m)	0.60
Trial Pit Depth (m)	2.29
Amount of Backfill placed (m)	2.29
Assumed Backfill Void Ratio	0.4

Figure 1 is a line graph showing Depth (m bgl) on the Y-axis versus Time (minutes) on the X-axis. The Y-axis ranges from 0.90 to 2.30 m bgl, and the X-axis ranges from 0.00 to 7.00 minutes. The graph displays a blue line with markers representing the depth profile. The depth starts at 1.00 m bgl at 0.00 minutes and decreases over time, reaching 2.30 m bgl at approximately 6.50 minutes. Horizontal lines indicate key depth levels: Max effective depth (0.90 m bgl), 75% (1.30 m bgl), 25% (1.90 m bgl), and Empty (2.30 m bgl).

Time (minutes)	Depth (m bgl)
0.00	1.00
0.20	1.10
0.40	1.20
0.60	1.25
0.80	1.30
1.00	1.35
1.20	1.45
1.40	1.50
1.60	1.55
1.80	1.60
2.00	1.65
2.20	1.75
2.40	1.80
2.60	1.85
2.80	1.90
3.00	1.95
3.20	2.00
3.40	2.05
3.60	2.10
3.80	2.15
4.00	2.20
4.20	2.25
4.40	2.28
4.60	2.30
4.80	2.32
5.00	2.34
5.20	2.35
5.40	2.36
5.60	2.37
5.80	2.38
6.00	2.39
6.20	2.40
6.40	2.40
6.50	2.40

Soil Infiltration Rate (m/s)	4.86E-04
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Project No.	AG2834-18
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www.appliedgeology.co.uk

Filling	2 of 3
Trial Pit Length (m)	2.80
Trial Pit Width (m)	0.60
Trial Pit Depth (m)	2.30
Amount of Backfill placed (m)	2.3
Assumed Backfill Void Ratio	0.4

Figure 1 is a line graph showing the relationship between Depth (m bgl) and Time (minutes) for a 100% depth penetration test. The y-axis represents Depth (m bgl) ranging from 1.10 to 2.30, and the x-axis represents Time (minutes) ranging from 0.00 to 10.00. The graph includes a blue line with markers representing the depth penetration over time, and four horizontal reference lines indicating specific depth levels: Max effective depth (1.20 m bgl), 75% (1.45 m bgl), 25% (2.00 m bgl), and Empty (2.30 m bgl).

Time (minutes)	Depth (m bgl)
0.00	1.20
0.20	1.25
0.40	1.30
0.60	1.35
0.80	1.40
1.00	1.45
1.20	1.50
1.40	1.55
1.60	1.60
1.80	1.65
2.00	1.70
2.20	1.75
2.40	1.80
2.60	1.85
2.80	1.90
3.00	1.95
3.20	1.98
3.40	2.00
3.60	2.02
3.80	2.05
4.00	2.08
4.20	2.10
4.40	2.12
4.60	2.15
4.80	2.18
5.00	2.20
5.20	2.22
5.40	2.23
5.60	2.24
5.80	2.25
6.00	2.26
6.20	2.27
6.40	2.28
6.60	2.29
6.80	2.30
7.00	2.31
7.20	2.32
7.40	2.33
7.60	2.34
7.80	2.35
8.00	2.36
8.20	2.37
8.40	2.38
8.60	2.39
8.80	2.40
9.00	2.41
9.20	2.42
9.40	2.43
9.60	2.44
9.80	2.45
10.00	2.46

Soil Infiltration Rate (m/s)	3.81E-04
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Project No.	AG2834-18
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Filling		3 of 3
Trial Pit Length (m)	2.80	
Trial Pit Width (m)	0.60	
Trial Pit Depth (m)	2.30	
Amount of Backfill placed (m)	2.3	
Assumed Backfill Void Ratio	0.4	

Figure 1 is a line graph showing the relationship between Depth (m bgl) and Time (minutes). The y-axis represents Depth (m bgl) ranging from 0.80 to 2.40. The x-axis represents Time (minutes) ranging from 0.00 to 14.00. A blue line with diamond markers shows the depth decreasing over time. Three horizontal lines are drawn across the graph, labeled on the right: 'Max effective depth' at 0.80 m bgl (purple), '75%' at 1.20 m bgl (red), and '25%' at 2.00 m bgl (green). The blue line starts at approximately 0.85 m bgl at 0.00 minutes, crosses the 1.20 m bgl line at approximately 1.5 minutes, and crosses the 2.00 m bgl line at approximately 4.5 minutes. The line continues to decrease, reaching approximately 2.30 m bgl at 14.00 minutes.

Soil Infiltration Rate (m/s)

3.73E-04

Client:	Eastleigh Borough Council
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Project:	Leigh Road, Eastleigh
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Project No.	AG2834-18
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APPLiED GEOLOGY

Unit 23 Abbey Park, Stareton, Kenilworth, Warwickshire. CV8 2LY
Tel. 02476 511822

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Filling	1 of 3
Trial Pit Length (m)	2.20
Trial Pit Width (m)	0.60
Trial Pit Depth (m)	2.48
Amount of Backfill placed (m)	2.48
Assumed Backfill Void Ratio	0.4

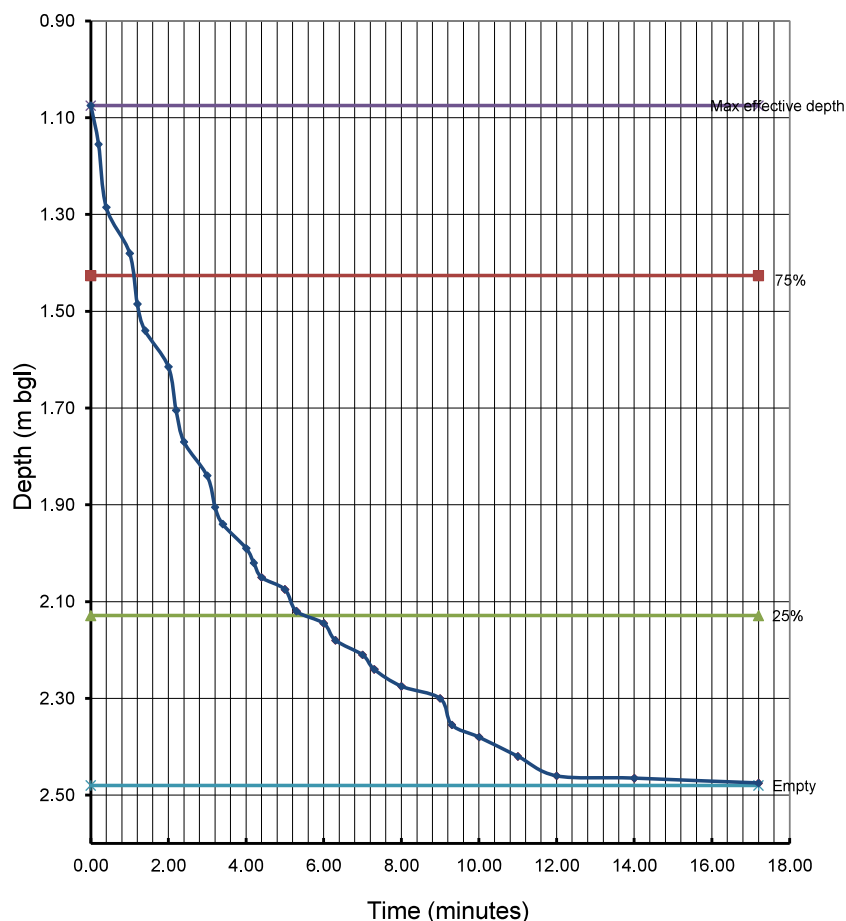
Figure 10 is a line graph showing the relationship between Depth (m bgl) and Time (minutes) for a 100% depth penetration test. The y-axis represents Depth (m bgl) ranging from 0.80 to 2.60, and the x-axis represents Time (minutes) ranging from 0.00 to 14.00. The graph includes a blue curve representing the penetration depth over time, and four horizontal lines indicating specific depth levels: Max effective depth (0.90 m bgl), 75% (1.28 m bgl), 25% (2.08 m bgl), and Empty (2.48 m bgl).

Time (minutes)	Depth (m bgl)
0.00	0.90
0.50	1.05
1.00	1.20
1.50	1.32
2.00	1.45
2.50	1.55
3.00	1.68
3.50	1.78
4.00	1.90
4.50	2.00
5.00	2.05
6.00	2.15
7.00	2.25
8.00	2.32
9.00	2.38
10.00	2.42
11.00	2.45
12.00	2.47
13.00	2.48
14.00	2.48

2.45E-04

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Filling	2 of 3
Trial Pit Length (m)	2.20
Trial Pit Width (m)	0.60
Trial Pit Depth (m)	2.48
Amount of Backfill placed (m)	2.48
Assumed Backfill Void Ratio	0.4



Soil Infiltration Rate (m/s)	2.50E-04
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Filling		3 of 3
Trial Pit Length (m)	2.20	
Trial Pit Width (m)	0.60	
Trial Pit Depth (m)	2.48	
Amount of Backfill placed (m)	2.48	
Assumed Backfill Void Ratio	0.4	

The graph plots Depth (m bgl) on the y-axis (from 1.00 to 2.60) against Time (minutes) on the x-axis (from 0.00 to 20.00). A blue curve shows the depth profile over time. Horizontal reference lines are drawn at 1.10m (Max effective depth), 1.45m (75%), 2.15m (25%), and 2.48m (Empty). The blue curve starts at approximately 1.12m at 0 minutes, drops sharply to about 1.80m by 3 minutes, then more gradually to about 2.48m by 18 minutes.

Time (minutes)	Depth (m bgl)
0.00	1.12
1.00	1.40
2.00	1.60
3.00	1.80
4.00	1.95
5.00	2.10
6.00	2.15
7.00	2.20
8.00	2.25
9.00	2.28
10.00	2.30
11.00	2.35
12.00	2.40
13.00	2.45
14.00	2.48
15.00	2.48
16.00	2.48
17.00	2.48
18.00	2.48

Soil Infiltration Rate (m/s)	2.85E-04
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Client:	Eastleigh Borough Council
Project:	Leigh Road, Eastleigh
Project No.	AG2834-18

APPLIED GEOLOGY
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APPENDIX D

SOIL CHEMICAL RESULTS COMPARED AGAINST

Site: Leigh Road, Eastleigh
Job No: AG2835-18
Land Use: Commercial / Industrial
Dataset: All results
Soil Organic Matter (%): 1.0 %

Exploratory Hole Reference		TP1	TP2	TP3	TP4	TP5
Depth (m)		0.30	0.20	0.30	0.30	0.30
Strata		MG	MG	RTD	TS	TS
	Units					
Organic Matter (%)	%	1.0	0.81	1.3	1.2	1.7
pH		11.5	11.6	7.8	5.8	8.1
Arsenic	mg/kg	19	18	10	7.0	11
Cadmium	mg/kg	0.22	0.14	0.1	0.11	0.1
Chromium	mg/kg	21	31	18	18	16
Chromium (Hexavalent)	mg/kg	0.5	0.5	0.5	0.5	0.5
Copper	mg/kg	21	430	21	16	15
Lead	mg/kg	36	100	37	43	58
Mercury	mg/kg	0.1	0.1	0.1	0.1	0.1
Nickel	mg/kg	14	22	13	11	9.5
Selenium	mg/kg	0.2	0.2	0.46	0.41	0.34
Zinc	mg/kg	70	89	44	52	48
Naphthalene	mg/kg	0.1	0.1	0.1	0.1	0.1
Acenaphthylene	mg/kg	0.1	0.1	0.1	0.1	0.1
Acenaphthene	mg/kg	0.1	0.1	0.1	0.1	0.1
Fluorene	mg/kg	0.1	0.1	0.1	0.1	0.1
Phenanthrene	mg/kg	0.1	0.1	0.1	0.1	0.1
Anthracene	mg/kg	0.1	0.1	0.1	0.1	0.1
Fluoranthene	mg/kg	0.78	0.87	0.1	0.1	0.17
Pyrene	mg/kg	0.82	0.94	0.1	0.1	0.25
Benzo[a]anthracene	mg/kg	0.1	0.1	0.1	0.1	0.1
Chrysene	mg/kg	0.1	0.1	0.1	0.1	0.1
Benzo[b]fluoranthene	mg/kg	0.1	0.1	0.1	0.1	0.1
Benzo[k]fluoranthene	mg/kg	0.1	0.1	0.1	0.1	0.1
Benzo[a]pyrene	mg/kg	0.1	0.1	0.1	0.1	0.1
Dibenzo[a,h]anthracene	mg/kg	0.1	0.1	0.1	0.1	0.1
Indeno[1,2,3-cd]pyrene	mg/kg	0.1	0.1	0.1	0.1	0.1
Benzo[g,h,i]perylene	mg/kg	0.1	0.1	0.1	0.1	0.1
Total of 16 PAHs	mg/kg	2	2	2	2	2
Phenols (Total)	mg/kg	0.3	0.3	0.3	0.3	0.3
Benzene	mg/kg	0.001	0.001	0.001	0.001	0.001
Toluene	mg/kg	0.001	0.001	0.001	0.001	0.001
Ethylbenzene	mg/kg	0.001	0.001	0.001	0.001	0.001
m&p Xylene	mg/kg	0.001	0.001	0.001	0.001	0.001
o-Xylene	mg/kg	0.001	0.001	0.001	0.001	0.001
Aliphatic TPH >C5-C6	mg/kg	1	1	1	1	1
Aliphatic TPH >C6-C8	mg/kg	1	1	1	1	1
Aliphatic TPH >C8-C10	mg/kg	1	1	1	1	1
Aliphatic TPH >C10-C12	mg/kg	1	1	1	1	1
Aliphatic TPH >C12-C16	mg/kg	4.1	1	1	1	1
Aliphatic TPH >C16-C21	mg/kg	20	1	1	1	1
Aliphatic TPH >C21-C35	mg/kg	140	1	51	1	1
Aliphatic TPH >C35-C44	mg/kg	1	1	1	1	1
Total Aliphatic Hydrocarbons	mg/kg	160	5	51	5	5
Aromatic TPH >C5-C7	mg/kg	1	1	1	1	1
Aromatic TPH >C7-C8	mg/kg	1	1	1	1	1
Aromatic TPH >C8-C10	mg/kg	1	1	1	1	1
Aromatic TPH >C10-C12	mg/kg	1	1	1	1	1
Aromatic TPH >C12-C16	mg/kg	6.9	1	5.1	1	1
Aromatic TPH >C16-C21	mg/kg	35	6.3	1	1	1
Aromatic TPH >C21-C35	mg/kg	240	12	39	1	1
Aromatic TPH >C35-C44	mg/kg	1	1	1	1	1
Total Aromatic Hydrocarbons	mg/kg	280	18	44	5	5
Total Petroleum Hydrocarbons	mg/kg	440	18	96	10	10

Note
 All VOC, SVOC and PCB concentrations were below laboratory detection limits and have therefore been omitted from the table for brevity.

Key -
 Value within sample set exceeds screening value
 Statistical value exceeds screening value

LQM/CIEH S4UL Reference No. S4UL3159 (2015)
 Values in **bold** are reported at the laboratory limit of detection

SUMMARY OF GROUNDWATER TEST RESULTS

Site
Job Number
Type of Water

Leigh Road, Eastleigh
AG2834-18
Groundwater

Determinand	Limit of Detection	Hazardous or Non-Hazardous^	Sample Identity Depth Sampled Date	BH1	BH3	BH4	No. of samples (n)	Waters Screening Value	Source & Justification
				15-May-2018	15-May-2018	15-May-2018			
Hardness		-	mg L ⁻¹	300	290	310	3	-	-
pH		-	-	9.2	8.8	8.7	3	-	-
TOC		-	mg L ⁻¹	22	20	21	3	-	-
Arsenic		Haz	µg L ⁻¹	1.1	1.5	1.3	3	10	UK Drinking Water Stan
Cadmium		Non Haz	µg L ⁻¹	0.08	0.08	0.08	3	0.25	WFD Environmental Sta
Chromium (Total)		Non Haz	µg L ⁻¹	1	2.5	3.1	3	50	UK Drinking Water Stan
Chromium (III)		Non Haz	µg L ⁻¹	20	20	20	3	50	UK Drinking Water Stan
Chromium (VI)		Haz	µg L ⁻¹	20	20	20	3	20	Detection Lim
Copper		Non Haz	µg L ⁻¹	1	1	1	3	1	Detection Lim
Lead		Haz	µg L ⁻¹	1	1	1	3	1	Detection Lim
Mercury		Haz	µg L ⁻¹	0.5	0.5	0.5	3	0.5	Detection Lim
Nickel		Non Haz	µg L ⁻¹	1.4	1.3	1.8	3	20	WFD Environmental Sta
Selenium		Non Haz	µg L ⁻¹	2.2	1.9	1.6	3	10	UK Drinking Water Stan
Zinc		Non Haz	µg L ⁻¹	3.1	2.2	2.7	3	125	WFD Environmental Sta
Boron		Non Haz	µg L ⁻¹	440	300	580	3	1000	UK Drinking Water Stan
Beryllium		Non Haz	µg L ⁻¹	1	1	1	3	-	Not of health concern at the levels
Vanadium		Non Haz	µg L ⁻¹	1	1	1	3	1	UK Drinking Water Stan
Sulphate		Non Haz	mg L ⁻¹	81	86	59	3	250	UK Drinking Water Stan
Phenol		Non Haz	µg L ⁻¹	0.03	0.03	0.03	3	7.7	WFD Environmental Sta
Napthalene		Non Haz	µg L ⁻¹	0.5	0.5	0.5	3	0.5	Detection Lim
Acenaphthylene		Haz	µg L ⁻¹	0.5	0.5	0.5	3	0.5	Detection Lim
Acenaphthene		Haz	µg L ⁻¹	0.5	0.5	0.5	3	0.5	Detection Lim
Fluorene		Haz	µg L ⁻¹	0.5	0.5	0.5	3	0.5	Detection Lim
Phenanthrene		Haz	µg L ⁻¹	0.5	0.5	0.5	3	0.5	Detection Lim
Anthracene		Haz	µg L ⁻¹	0.5	0.5	0.5	3	0.5	Detection Lim
Fluoranthene		Haz	µg L ⁻¹	0.5	0.5	0.5	3	0.5	Detection Lim
Pyrene		Haz	µg L ⁻¹	0.5	0.5	0.5	3	0.5	Detection Lim
Benzo[a]anthracene		Haz	µg L ⁻¹	0.5	0.5	0.5	3	0.5	Detection Lim
Chrysene		Haz	µg L ⁻¹	0.5	0.5	0.5	3	0.5	Detection Lim
Benzo[b]fluoranthene		Haz	µg L ⁻¹	0.5	0.5	0.5	3	0.5	Detection Lim
Benzo[k]fluoranthene		Haz	µg L ⁻¹	0.5	0.5	0.5	3	0.5	Detection Lim
Benzo[a]pyrene		Haz	µg L ⁻¹	0.5	0.5	0.5	3	0.5	Detection Lim
Dibenz[a,h]anthracene		Haz	µg L ⁻¹	0.5	0.5	0.5	3	0.5	Detection Lim
Indeno[1,2,3-c,d]Pyrene		Haz	µg L ⁻¹	0.5	0.5	0.5	3	0.5	Detection Lim
Benzo[g,h,i]perylene		Haz	µg L ⁻¹	0.5	0.5	0.5	3	0.5	Detection Lim
Benzene		Haz	µg L ⁻¹	1	1	1	3	1	Detection Lim
Toluene		Haz	µg L ⁻¹	1	1	1	3	1	Detection Lim
Ethylbenzene		Haz	µg L ⁻¹	1	1	1	3	1	Detection Lim
m & p-Xylene		Haz	µg L ⁻¹	1	1	1	3	1	Detection Lim
o-Xylene		Haz	µg L ⁻¹	1	1	1	3	1	Detection Lim
TPH									
Aliphatic TPH >C5-C8		Haz	µg L ⁻¹	0.1	0.1	0.1	3	0.1	Detection Lim
Aliphatic TPH >C8-C8		Haz	µg L ⁻¹	0.1	0.1	0.1	3	0.1	Detection Lim
Aliphatic TPH >C8-C10		Haz	µg L ⁻¹	0.1	0.1	0.1	3	0.1	Detection Lim
Aliphatic TPH >C10-C12		Haz	µg L ⁻¹	0.1	0.1	0.1	3	0.1	Detection Lim
Aliphatic TPH >C12-C16		Haz	µg L ⁻¹	0.1	0.1	0.1	3	0.1	Detection Lim
Aliphatic TPH >C16-C21		Haz	µg L ⁻¹	0.1	0.1	0.1	3	0.1	Detection Lim
Aliphatic TPH >C21-C35		Haz	µg L ⁻¹	0.1	0.1	0.1	3	0.1	Detection Lim
Aliphatic TPH >C35-C44		Haz	µg L ⁻¹	0.1	0.1	0.1	3	0.1	Detection Lim
Total Aliphatic Hydrocarbons		Haz	µg L ⁻¹	5	5	5	3	-	
Aromatic TPH >C5-C7		Haz	µg L ⁻¹	0.1	0.1	0.1	3	0.1	Detection Lim
Aromatic TPH >C7-C8		Haz	µg L ⁻¹	0.1	0.1	0.1	3	0.1	Detection Lim
Aromatic TPH >C8-C10		Haz	µg L ⁻¹	0.1	0.1	0.1	3	0.1	Detection Lim
Aromatic TPH >C10-C12		Haz	µg L ⁻¹	0.1	0.1	0.1	3	0.1	Detection Lim
Aromatic TPH >C12-C16		Haz	µg L ⁻¹	0.1	0.1	0.1	3	0.1	Detection Lim
Aromatic TPH >C16-C21		Haz	µg L ⁻¹	0.1	0.1	0.1	3	0.1	Detection Lim
Aromatic TPH >C21-C35		Haz	µg L ⁻¹	0.1	0.1	0.1	3	0.1	Detection Lim
Aromatic TPH >C35-C44		Haz	µg L ⁻¹	0.1	0.1	0.1	3	0.1	Detection Lim
Total Aromatic Hydrocarbons		Haz	µg L ⁻¹	5	5	5	3	-	
Total Petroleum Hydrocarbons		Haz	µg L ⁻¹	10	10	10	3	10	Detection Lim

^ Note:
All VOC and SVOC concentrations were below laboratory detection limits and have therefore been omitted from the table for clarity.

^ Note: Hazardous and non-hazardous substances determined by JAGDAG (Jan 2017) and published at <http://www.wfduk.org/sites/default/files/Media/170116%20Substances%20List.pdf>. Substances marked in bold. For substances not assessed by JAGDAG, Applied Geology has assumed a determination based on our understanding of the behaviour of the chemicals highlighted in yellow.

Key-

Result exceeds test Detection Limit (for Haz determinands)
Result exceeds Screening Value (for Non Haz determinands)
Values in bold at the limit of detection



Final Report

Report No.: 18-11054-1

Initial Date of Issue: 30-Apr-2018

Client Applied Geology

Client Address: Unit 23, Abbey Park
Stareton
Kenilworth
Warwickshire
CV8 2LY

Contact(s): Frankie Hadley Jones
Lab Results

Project AG2834-18 - Leigh Road, Eastleigh

Quotation No.: Q17-09497

Date Received: 24-Apr-2018

Order No.: 12822

Date Instructed: 24-Apr-2018

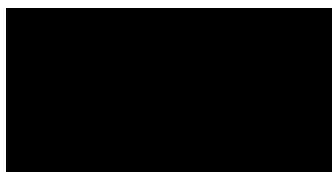
No. of Samples: 8

Turnaround (Wkdays): 5

Results Due: 30-Apr-2018

Date Approved: 30-Apr-2018

Approved By:



Robert Monk, Technical Manager

Client: Applied Geology	Chemtest Job No.:				18-11054	18-11054	18-11054	18-11054	18-11054	18-11054
Quotation No.: Q17-09497	Chemtest Sample ID.:				611625	611626	611627	611628	611629	611630
Order No.: 12822	Client Sample Ref.:				TP1	TP2	TP3	TP4	TP5	TP6
	Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):				0.30	0.20	0.30	0.30	0.30	0.30
	Bottom Depth (m):				0.30	0.20	0.30	0.30	0.30	0.30
	Date Sampled:				16-Apr-2018	17-Apr-2018	17-Apr-2018	17-Apr-2018	17-Apr-2018	17-Apr-2018
	Asbestos Lab:				COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	Accred.	SOP	Units	LOD						
Organic Matter	M	2625	%	0.40	1.0	0.81	1.3	1.2	1.7	1.7
Arsenic	M	2450	mg/kg	1.0	19	18	10	7.0	11	11
Cadmium	M	2450	mg/kg	0.10	0.22	0.14	< 0.10	0.11	< 0.10	< 0.10
Chromium	M	2450	mg/kg	1.0	21	31	18	18	16	16
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Chromium (Trivalent)	N	2490	mg/kg	1.0	21	31	18	18	16	16
Copper	M	2450	mg/kg	0.50	21	430	21	16	15	15
Lead	M	2450	mg/kg	0.50	36	100	37	43	58	58
Magnesium (Water Soluble)	N	2120	g/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Mercury	M	2450	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Nickel	M	2450	mg/kg	0.50	14	22	13	11	9.5	9.5
Selenium	M	2450	mg/kg	0.20	< 0.20	< 0.20	0.46	0.41	0.34	0.34
Zinc	M	2450	mg/kg	0.50	70	89	44	52	48	48
Naphthalene	M	2790	mg/kg	0.50	< 0.50		< 0.50			
Naphthalene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthylene	M	2790	mg/kg	0.50	< 0.50		< 0.50			
Acenaphthylene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	M	2790	mg/kg	0.50	< 0.50		< 0.50			
Acenaphthene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	M	2790	mg/kg	0.50	< 0.50		< 0.50			
Fluorene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	M	2790	mg/kg	0.50	1.1		< 0.50			
Phenanthrene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene	M	2790	mg/kg	0.50	< 0.50		< 0.50			
Anthracene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	M	2790	mg/kg	0.50	2.0		< 0.50			
Fluoranthene	M	2700	mg/kg	0.10	0.78	0.87	< 0.10	< 0.10	0.17	0.17
Pyrene	M	2790	mg/kg	0.50	1.6		< 0.50			
Pyrene	M	2700	mg/kg	0.10	0.82	0.94	< 0.10	< 0.10	0.25	0.25
Benzo[a]anthracene	M	2790	mg/kg	0.50	0.93		< 0.50			
Benzo[a]anthracene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene	M	2790	mg/kg	0.50	0.88		< 0.50			
Chrysene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	M	2790	mg/kg	0.50	1.3		< 0.50			
Benzo[b]fluoranthene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	M	2790	mg/kg	0.50	< 0.50		< 0.50			
Benzo[k]fluoranthene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[a]pyrene	M	2790	mg/kg	0.50	0.84		< 0.50			

Client: Applied Geology	Chemtest Job No.:				18-11054	18-11054	18-11054	18-11054	18-11054	18-11054
Quotation No.: Q17-09497	Chemtest Sample ID.:				611625	611626	611627	611628	611629	611630
Order No.: 12822	Client Sample Ref.:				TP1	TP2	TP3	TP4	TP5	TP6
	Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):				0.30	0.20	0.30	0.30	0.30	0.30
	Bottom Depth (m):				0.30	0.20	0.30	0.30	0.30	0.30
	Date Sampled:				16-Apr-2018	17-Apr-2018	17-Apr-2018	17-Apr-2018	17-Apr-2018	17-Apr-2018
	Asbestos Lab:				COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	Accred.	SOP	Units	LOD						
Benzo[a]pyrene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Dibenz(a,h)Anthracene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Indeno(1,2,3-c,d)Pyrene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[g,h,i]perylene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Of 16 PAH's	M	2700	mg/kg	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Phenol	M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Phenol	M	2920	mg/kg	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Resorcinol	M	2920	mg/kg	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Cresols	M	2920	mg/kg	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
1-Naphthol	N	2920	mg/kg	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Trimethylphenols	M	2920	mg/kg	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Total Phenols	M	2920	mg/kg	0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30
Benzene	M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene	M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C8-C10	M	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C10-C12	M	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C12-C16	M	2680	mg/kg	1.0	4.1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C16-C21	M	2680	mg/kg	1.0	20	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C21-C35	M	2680	mg/kg	1.0	140	< 1.0	51	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	160	< 5.0	51	< 5.0	< 5.0	< 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C8-C10	M	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C10-C12	M	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C12-C16	M	2680	mg/kg	1.0	6.9	< 1.0	5.1	< 1.0	< 1.0	< 1.0
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0	35	6.3	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C21-C35	M	2680	mg/kg	1.0	240	12	39	< 1.0	< 1.0	< 1.0
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	280	18	44	< 5.0	< 5.0	< 5.0

Client: Applied Geology	Chemtest Job No.:					18-11054	18-11054	18-11054	18-11054	18-11054	18-11054
Quotation No.: Q17-09497	Chemtest Sample ID.:					611625	611626	611627	611628	611629	611630
Order No.: 12822	Client Sample Ref.:					TP1	TP2	TP3	TP4	TP5	TP6
	Sample Type:					SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):					0.30	0.20	0.30	0.30	0.30	0.30
	Bottom Depth (m):					0.30	0.20	0.30	0.30	0.30	0.30
	Date Sampled:					16-Apr-2018	17-Apr-2018	17-Apr-2018	17-Apr-2018	17-Apr-2018	17-Apr-2018
	Asbestos Lab:					COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	Accred.	SOP	Units	LOD							
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	440	18	96	< 10	< 10		
Sulphate (2:1 Water Soluble) as SO4	M	2120	g/l	0.010	1.2	0.82	0.044	< 0.010	0.029		
ACM Type	U	2192		N/A	-	-	-	-	-		
Asbestos Identification	U	2192	%	0.001	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Moisture	N	2030	%	0.020	13	9.9	13	13	14		
Soil Colour	N	2040		N/A	brown	brown	brown	brown	brown		
Other Material	N	2040		N/A	stones	stones	stones	stones	stones		
Soil Texture	N	2040		N/A	sand	sand	clay	clay	sand		
pH	M	2010		N/A	11.5	11.6	7.8	5.8	8.1		
Boron	N	2450	mg/kg	0.40	17	32	5.5	4.6	5.7		
Beryllium	U	2450	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0		
Vanadium	U	2450	mg/kg	5.0	31	30	26	22	24		
Dichlorodifluoromethane	N	2760	µg/kg	1.0	< 1.0		< 1.0				
Chloromethane	M	2760	µg/kg	1.0	< 1.0		< 1.0				
Vinyl Chloride	M	2760	µg/kg	1.0	< 1.0		< 1.0				
Bromomethane	M	2760	µg/kg	20	< 20		< 20				
Chloroethane	N	2760	µg/kg	2.0	< 2.0		< 2.0				
Trichlorofluoromethane	M	2760	µg/kg	1.0	< 1.0		< 1.0				
1,1-Dichloroethene	M	2760	µg/kg	1.0	< 1.0		< 1.0				
Trans 1,2-Dichloroethene	M	2760	µg/kg	1.0	< 1.0		< 1.0				
1,1-Dichloroethane	M	2760	µg/kg	1.0	< 1.0		< 1.0				
cis 1,2-Dichloroethene	M	2760	µg/kg	1.0	< 1.0		< 1.0				
Bromochloromethane	N	2760	µg/kg	5.0	< 5.0		< 5.0				
Trichloromethane	M	2760	µg/kg	1.0	< 1.0		< 1.0				
1,1,1-Trichloroethane	M	2760	µg/kg	1.0	< 1.0		< 1.0				
Tetrachloromethane	M	2760	µg/kg	1.0	< 1.0		< 1.0				
1,1-Dichloropropene	N	2760	µg/kg	1.0	< 1.0		< 1.0				
1,2-Dichloroethane	M	2760	µg/kg	2.0	< 2.0		< 2.0				
Trichloroethene	M	2760	µg/kg	1.0	< 1.0		< 1.0				
1,2-Dichloropropane	M	2760	µg/kg	1.0	< 1.0		< 1.0				
Dibromomethane	M	2760	µg/kg	1.0	< 1.0		< 1.0				
Bromodichloromethane	M	2760	µg/kg	5.0	< 5.0		< 5.0				
cis-1,3-Dichloropropene	N	2760	µg/kg	10	< 10		< 10				
Trans-1,3-Dichloropropene	N	2760	µg/kg	10	< 10		< 10				
1,1,2-Trichloroethane	M	2760	µg/kg	10	< 10		< 10				
Tetrachloroethene	M	2760	µg/kg	1.0	< 1.0		< 1.0				
1,3-Dichloropropane	N	2760	µg/kg	2.0	< 2.0		< 2.0				

Client: Applied Geology	Chemtest Job No.:					18-11054	18-11054	18-11054	18-11054	18-11054	18-11054
Quotation No.: Q17-09497	Chemtest Sample ID.:					611625	611626	611627	611628	611629	611630
Order No.: 12822	Client Sample Ref.:					TP1	TP2	TP3	TP4	TP5	TP6
	Sample Type:					SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):					0.30	0.20	0.30	0.30	0.30	0.30
	Bottom Depth (m):					0.30	0.20	0.30	0.30	0.30	0.30
	Date Sampled:					16-Apr-2018	17-Apr-2018	17-Apr-2018	17-Apr-2018	17-Apr-2018	17-Apr-2018
	Asbestos Lab:					COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	Accred.	SOP	Units	LOD							
Dibromochloromethane	N	2760	µg/kg	10	< 10			< 10			
1,2-Dibromoethane	M	2760	µg/kg	5.0	< 5.0			< 5.0			
Chlorobenzene	M	2760	µg/kg	1.0	< 1.0			< 1.0			
1,1,1,2-Tetrachloroethane	M	2760	µg/kg	2.0	< 2.0			< 2.0			
Styrene	M	2760	µg/kg	1.0	< 1.0			< 1.0			
Tribromomethane	N	2760	µg/kg	1.0	< 1.0			< 1.0			
Isopropylbenzene	M	2760	µg/kg	1.0	< 1.0			< 1.0			
Bromobenzene	M	2760	µg/kg	1.0	< 1.0			< 1.0			
1,2,3-Trichloropropane	N	2760	µg/kg	50	< 50			< 50			
N-Propylbenzene	N	2760	µg/kg	1.0	< 1.0			< 1.0			
2-Chlorotoluene	M	2760	µg/kg	1.0	< 1.0			< 1.0			
1,3,5-Trimethylbenzene	M	2760	µg/kg	1.0	< 1.0			< 1.0			
4-Chlorotoluene	N	2760	µg/kg	1.0	< 1.0			< 1.0			
Tert-Butylbenzene	N	2760	µg/kg	1.0	< 1.0			< 1.0			
1,2,4-Trimethylbenzene	M	2760	µg/kg	1.0	< 1.0			< 1.0			
Sec-Butylbenzene	N	2760	µg/kg	1.0	< 1.0			< 1.0			
1,3-Dichlorobenzene	M	2760	µg/kg	1.0	< 1.0			< 1.0			
4-Isopropyltoluene	N	2760	µg/kg	1.0	< 1.0			< 1.0			
1,4-Dichlorobenzene	M	2760	µg/kg	1.0	< 1.0			< 1.0			
N-Butylbenzene	N	2760	µg/kg	1.0	< 1.0			< 1.0			
1,2-Dichlorobenzene	M	2760	µg/kg	1.0	< 1.0			< 1.0			
1,2-Dibromo-3-Chloropropane	N	2760	µg/kg	50	< 50			< 50			
1,2,4-Trichlorobenzene	M	2760	µg/kg	1.0	< 1.0			< 1.0			
Hexachlorobutadiene	N	2760	µg/kg	1.0	< 1.0			< 1.0			
1,2,3-Trichlorobenzene	N	2760	µg/kg	2.0	< 2.0			< 2.0			
Methyl Tert-Butyl Ether	M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
N-Nitrosodimethylamine	M	2790	mg/kg	0.50	< 0.50			< 0.50			
2-Chlorophenol	M	2790	mg/kg	0.50	< 0.50			< 0.50			
Bis-(2-Chloroethyl)Ether	M	2790	mg/kg	0.50	< 0.50			< 0.50			
1,3-Dichlorobenzene	M	2790	mg/kg	0.50	< 0.50			< 0.50			
1,4-Dichlorobenzene	N	2790	mg/kg	0.50	< 0.50			< 0.50			
1,2-Dichlorobenzene	M	2790	mg/kg	0.50	< 0.50			< 0.50			
2-Methylphenol	M	2790	mg/kg	0.50	< 0.50			< 0.50			
Bis(2-Chloroisopropyl)Ether	M	2790	mg/kg	0.50	< 0.50			< 0.50			
Hexachloroethane	N	2790	mg/kg	0.50	< 0.50			< 0.50			
N-Nitrosodi-n-propylamine	M	2790	mg/kg	0.50	< 0.50			< 0.50			
4-Methylphenol	M	2790	mg/kg	0.50	< 0.50			< 0.50			
Nitrobenzene	M	2790	mg/kg	0.50	< 0.50			< 0.50			

Client: Applied Geology	Chemtest Job No.:					18-11054	18-11054	18-11054	18-11054	18-11054	18-11054
Quotation No.: Q17-09497	Chemtest Sample ID.:					611625	611626	611627	611628	611629	611630
Order No.: 12822	Client Sample Ref.:					TP1	TP2	TP3	TP4	TP5	TP6
	Sample Type:					SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):					0.30	0.20	0.30	0.30	0.30	0.30
	Bottom Depth (m):					0.30	0.20	0.30	0.30	0.30	0.30
	Date Sampled:					16-Apr-2018	17-Apr-2018	17-Apr-2018	17-Apr-2018	17-Apr-2018	17-Apr-2018
	Asbestos Lab:					COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	Accred.	SOP	Units	LOD							
Isophorone	M	2790	mg/kg	0.50	< 0.50			< 0.50			
2-Nitrophenol	N	2790	mg/kg	0.50	< 0.50			< 0.50			
2,4-Dimethylphenol	N	2790	mg/kg	0.50	< 0.50			< 0.50			
Bis(2-Chloroethoxy)Methane	M	2790	mg/kg	0.50	< 0.50			< 0.50			
2,4-Dichlorophenol	M	2790	mg/kg	0.50	< 0.50			< 0.50			
1,2,4-Trichlorobenzene	M	2790	mg/kg	0.50	< 0.50			< 0.50			
4-Chloroaniline	N	2790	mg/kg	0.50	< 0.50			< 0.50			
Hexachlorobutadiene	M	2790	mg/kg	0.50	< 0.50			< 0.50			
4-Chloro-3-Methylphenol	M	2790	mg/kg	0.50	< 0.50			< 0.50			
2-Methylnaphthalene	M	2790	mg/kg	0.50	< 0.50			< 0.50			
4-Nitrophenol	N	2790	mg/kg	0.50	< 0.50			< 0.50			
Hexachlorocyclopentadiene	N	2790	mg/kg	0.50	< 0.50			< 0.50			
2,4,6-Trichlorophenol	M	2790	mg/kg	0.50	< 0.50			< 0.50			
2,4,5-Trichlorophenol	M	2790	mg/kg	0.50	< 0.50			< 0.50			
2-Chloronaphthalene	M	2790	mg/kg	0.50	< 0.50			< 0.50			
2-Nitroaniline	M	2790	mg/kg	0.50	< 0.50			< 0.50			
Dimethylphthalate	M	2790	mg/kg	0.50	< 0.50			< 0.50			
2,6-Dinitrotoluene	M	2790	mg/kg	0.50	< 0.50			< 0.50			
3-Nitroaniline	N	2790	mg/kg	0.50	< 0.50			< 0.50			
Dibenzofuran	M	2790	mg/kg	0.50	< 0.50			< 0.50			
4-Chlorophenylphenylether	M	2790	mg/kg	0.50	< 0.50			< 0.50			
2,4-Dinitrotoluene	M	2790	mg/kg	0.50	< 0.50			< 0.50			
Diethyl Phthalate	M	2790	mg/kg	0.50	< 0.50			< 0.50			
4-Nitroaniline	M	2790	mg/kg	0.50	< 0.50			< 0.50			
2-Methyl-4,6-Dinitrophenol	N	2790	mg/kg	0.50	< 0.50			< 0.50			
Azobenzene	M	2790	mg/kg	0.50	< 0.50			< 0.50			
4-Bromophenylphenyl Ether	M	2790	mg/kg	0.50	< 0.50			< 0.50			
Hexachlorobenzene	M	2790	mg/kg	0.50	< 0.50			< 0.50			
Pentachlorophenol	N	2790	mg/kg	0.50	< 0.50			< 0.50			
Carbazole	M	2790	mg/kg	0.50	< 0.50			< 0.50			
Di-N-Butyl Phthalate	M	2790	mg/kg	0.50	< 0.50			< 0.50			
Butylbenzyl Phthalate	M	2790	mg/kg	0.50	< 0.50			< 0.50			
Bis(2-Ethylhexyl)Phthalate	N	2790	mg/kg	0.50	< 0.50			< 0.50			
Di-N-Octyl Phthalate	M	2790	mg/kg	0.50	< 0.50			< 0.50			
PCB 28	M	2815	mg/kg	0.010							
PCB 52	M	2815	mg/kg	0.010							
PCB 90+101	M	2815	mg/kg	0.010							
PCB 118	M	2815	mg/kg	0.010							

Client: Applied Geology	Chemtest Job No.:				18-11054	18-11054	18-11054	18-11054	18-11054	18-11054
Quotation No.: Q17-09497	Chemtest Sample ID.:				611625	611626	611627	611628	611629	611630
Order No.: 12822	Client Sample Ref.:				TP1	TP2	TP3	TP4	TP5	TP6
	Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):				0.30	0.20	0.30	0.30	0.30	0.30
	Bottom Depth (m):				0.30	0.20	0.30	0.30	0.30	0.30
	Date Sampled:				16-Apr-2018	17-Apr-2018	17-Apr-2018	17-Apr-2018	17-Apr-2018	17-Apr-2018
	Asbestos Lab:				COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	Accred.	SOP	Units	LOD						
PCB 153	M	2815	mg/kg	0.010						
PCB 138	M	2815	mg/kg	0.010						
PCB 180	M	2815	mg/kg	0.010						
Total PCBs (7 Congeners)	N	2815	mg/kg	0.10						
Xylenols	M	2920	mg/kg	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2450	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenzo[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2790	Semi-Volatile Organic Compounds (SVOCs) in Soils by GC-MS	Semi-volatile organic compounds(cf. USEPA Method 8270)	Acetone/Hexane extraction / GC-MS
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.

Report Information

Key

- U UKAS accredited
- M MCERTS and UKAS accredited
- N Unaccredited
- S This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
- SN This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
- T This analysis has been subcontracted to an unaccredited laboratory
- I/S Insufficient Sample
- U/S Unsuitable Sample
- N/E not evaluated
- < "less than"
- > "greater than"

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

- A - Date of sampling not supplied
- B - Sample age exceeds stability time (sampling to extraction)
- C - Sample not received in appropriate containers
- D - Broken Container
- E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.co.uk



Final Report

Report No.: 18-13761-1

Initial Date of Issue: 23-May-2018

Client Applied Geology

Client Address: Unit 23, Abbey Park
Stareton
Kenilworth
Warwickshire
CV8 2LY

Contact(s): Frankie Hadley Jones

Project AG2834-18 - Leigh Road, Eastleigh

Quotation No.: Q17-09497 **Date Received:** 17-May-2018

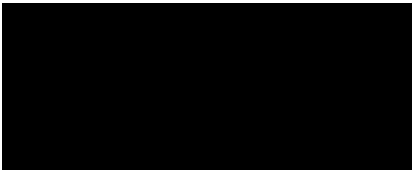
Order No.: 12906 **Date Instructed:** 17-May-2018

No. of Samples: 3

Turnaround (Wkdays): 5 **Results Due:** 23-May-2018

Date Approved: 23-May-2018

Approved By:

 Robert Monk, Technical Manager

Client: Applied Geology	Chemtest Job No.:				18-13761	18-13761	18-13761
Quotation No.: Q17-09497	Chemtest Sample ID.:				623731	623732	623733
Order No.: 12906	Client Sample Ref.:				BH1	BH3	BH4
	Sample Type:				WATER	WATER	WATER
	Date Sampled:				15-May-2018	15-May-2018	15-May-2018
Determinand	Accred.	SOP	Units	LOD			
Arsenic (Dissolved)	U	1450	µg/l	1.0	1.1	1.5	1.3
Cadmium (Dissolved)	U	1450	µg/l	0.080	< 0.080	< 0.080	< 0.080
Chromium (Dissolved)	U	1450	µg/l	1.0	< 1.0	2.5	3.1
Chromium (Hexavalent)	U	1490	µg/l	20	< 20	< 20	< 20
Chromium (Trivalent)	N	1490	µg/l	20	< 20	< 20	< 20
Copper (Dissolved)	U	1450	µg/l	1.0	< 1.0	< 1.0	< 1.0
Lead (Dissolved)	U	1450	µg/l	1.0	< 1.0	< 1.0	< 1.0
Mercury (Dissolved)	U	1450	µg/l	0.50	< 0.50	< 0.50	< 0.50
Nickel (Dissolved)	U	1450	µg/l	1.0	1.4	1.3	1.8
Selenium (Dissolved)	U	1450	µg/l	1.0	2.2	1.9	1.6
Zinc (Dissolved)	U	1450	µg/l	1.0	3.1	2.2	2.7
Naphthalene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Naphthalene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10
Acenaphthylene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Acenaphthylene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Acenaphthene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10
Fluorene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Fluorene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Phenanthrene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10
Anthracene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Anthracene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Fluoranthene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10
Pyrene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Pyrene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10
Benzo[a]anthracene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Benzo[a]anthracene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10
Chrysene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Chrysene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Benzo[b]fluoranthene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Benzo[k]fluoranthene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10
Benzo[a]pyrene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Benzo[a]pyrene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Dibenz(a,h)Anthracene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Indeno(1,2,3-c,d)Pyrene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10

Client: Applied Geology	Chemtest Job No.:				18-13761	18-13761	18-13761
Quotation No.: Q17-09497	Chemtest Sample ID.:				623731	623732	623733
Order No.: 12906	Client Sample Ref.:				BH1	BH3	BH4
	Sample Type:				WATER	WATER	WATER
	Date Sampled:				15-May-2018	15-May-2018	15-May-2018
Determinand	Accred.	SOP	Units	LOD			
Benzo[g,h,i]perylene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Benzo[g,h,i]perylene	U	1700	µg/l	0.10	< 0.10	< 0.10	< 0.10
Total Of 16 PAH's	U	1700	µg/l	2.0	< 2.0	< 2.0	< 2.0
Phenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Total Phenols	U	1920	mg/l	0.030	< 0.030	< 0.030	< 0.030
Benzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
Toluene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
o-Xylene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
Aliphatic TPH >C5-C6	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C6-C8	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C8-C10	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C10-C12	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C12-C16	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C16-C21	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C21-C35	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C35-C44	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Total Aliphatic Hydrocarbons	N	1675	µg/l	5.0	< 5.0	< 5.0	< 5.0
Aromatic TPH >C5-C7	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C7-C8	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C8-C10	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C10-C12	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C12-C16	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C16-C21	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C21-C35	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C35-C44	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Total Aromatic Hydrocarbons	N	1675	µg/l	5.0	< 5.0	< 5.0	< 5.0
Total Petroleum Hydrocarbons	N	1675	µg/l	10	< 10	< 10	< 10
Sulphate	U	1220	mg/l	1.0	81	86	59
pH	U	1010		N/A	9.2	8.8	8.7
Magnesium	U	1415	mg/l	0.50	8.3	7.0	11
Total Hardness as CaCO3	U	1270	mg/l	15	300	290	310
Boron (Dissolved)	U	1450	µg/l	20	440	300	580
Beryllium (Dissolved)	U	1450	µg/l	1.0	< 1.0	< 1.0	< 1.0
Vanadium (Dissolved)	U	1450	µg/l	1.0	< 1.0	< 1.0	< 1.0
Total Organic Carbon	U	1610	mg/l	2.0	22	20	21
Dichlorodifluoromethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
Chloromethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
Vinyl Chloride	N	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
Bromomethane	U	1760	µg/l	5.0	< 5.0	< 5.0	< 5.0

Client: Applied Geology	Chemtest Job No.:				18-13761	18-13761	18-13761
Quotation No.: Q17-09497	Chemtest Sample ID.:				623731	623732	623733
Order No.: 12906	Client Sample Ref.:				BH1	BH3	BH4
	Sample Type:				WATER	WATER	WATER
	Date Sampled:				15-May-2018	15-May-2018	15-May-2018
Determinand	Accred.	SOP	Units	LOD			
Chloroethane	U	1760	µg/l	2.0	< 2.0	< 2.0	< 2.0
Trichlorofluoromethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
Trans 1,2-Dichloroethene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
cis 1,2-Dichloroethene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
Bromochloromethane	U	1760	µg/l	5.0	< 5.0	< 5.0	< 5.0
Trichloromethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
Tetrachloromethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	U	1760	µg/l	2.0	< 2.0	< 2.0	< 2.0
Trichloroethene	N	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
Dibromomethane	U	1760	µg/l	10	< 10	< 10	< 10
Bromodichloromethane	U	1760	µg/l	5.0	< 5.0	< 5.0	< 5.0
cis-1,3-Dichloropropene	N	1760	µg/l	10	< 10	< 10	< 10
Trans-1,3-Dichloropropene	N	1760	µg/l	10	< 10	< 10	< 10
1,1,2-Trichloroethane	U	1760	µg/l	10	< 10	< 10	< 10
Tetrachloroethene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane	U	1760	µg/l	2.0	< 2.0	< 2.0	< 2.0
Dibromochloromethane	U	1760	µg/l	10	< 10	< 10	< 10
1,2-Dibromoethane	U	1760	µg/l	5.0	< 5.0	< 5.0	< 5.0
Chlorobenzene	N	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane	U	1760	µg/l	2.0	< 2.0	< 2.0	< 2.0
Styrene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
Tribromomethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
Bromobenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichloropropane	N	1760	µg/l	50	< 50	< 50	< 50
N-Propylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
2-Chlorotoluene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
4-Chlorotoluene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
Tert-Butylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
Sec-Butylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
1,3-Dichlorobenzene	N	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
4-Isopropyltoluene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
1,4-Dichlorobenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
N-Butylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0

Client: Applied Geology	Chemtest Job No.:				18-13761	18-13761	18-13761
Quotation No.: Q17-09497	Chemtest Sample ID.:				623731	623732	623733
Order No.: 12906	Client Sample Ref.:				BH1	BH3	BH4
	Sample Type:				WATER	WATER	WATER
	Date Sampled:				15-May-2018	15-May-2018	15-May-2018
Determinand	Accred.	SOP	Units	LOD			
1,2-Dichlorobenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-Chloropropane	U	1760	µg/l	50	< 50	< 50	< 50
1,2,4-Trichlorobenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene	U	1760	µg/l	2.0	< 2.0	< 2.0	< 2.0
Methyl Tert-Butyl Ether	N	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
N-Nitrosodimethylamine	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
2-Chlorophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Bis-(2-Chloroethyl)Ether	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
1,3-Dichlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
1,4-Dichlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
1,2-Dichlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
2-Methylphenol (o-Cresol)	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Bis(2-Chloroisopropyl)Ether	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Hexachloroethane	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
N-Nitrosodi-n-propylamine	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
4-Methylphenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Nitrobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Isophorone	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
2-Nitrophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
2,4-Dimethylphenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Bis(2-Chloroethoxy)Methane	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
2,4-Dichlorophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
1,2,4-Trichlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
4-Chloroaniline	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Hexachlorobutadiene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
4-Chloro-3-Methylphenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
2-Methylnaphthalene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Hexachlorocyclopentadiene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
2,4,6-Trichlorophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
2,4,5-Trichlorophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
2-Chloronaphthalene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
2-Nitroaniline	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Dimethylphthalate	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
2,6-Dinitrotoluene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
3-Nitroaniline	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Dibenzofuran	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
4-Chlorophenylphenylether	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
2,4-Dinitrotoluene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Diethyl Phthalate	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
4-Nitroaniline	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50

Client: Applied Geology	Chemtest Job No.:				18-13761	18-13761	18-13761
Quotation No.: Q17-09497	Chemtest Sample ID.:				623731	623732	623733
Order No.: 12906	Client Sample Ref.:				BH1	BH3	BH4
	Sample Type:				WATER	WATER	WATER
	Date Sampled:				15-May-2018	15-May-2018	15-May-2018
Determinand	Accred.	SOP	Units	LOD			
2-Methyl-4,6-Dinitrophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Azobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
4-Bromophenylphenyl Ether	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Hexachlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Pentachlorophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Carbazole	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Di-N-Butyl Phthalate	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Butylbenzyl Phthalate	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Bis(2-Ethylhexyl)Phthalate	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Di-N-Octyl Phthalate	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
4-Nitrophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH	pH Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1270	Total Hardness of Waters	Total hardness	Calculation applied to calcium and magnesium results, expressed as mg l ⁻¹ CaCO ₃ equivalent.
1415	Cations in Waters by ICP-MS	Sodium; Potassium; Calcium; Magnesium	Direct determination by inductively coupled plasma - mass spectrometry (ICP-MS).
1450	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1490	Hexavalent Chromium in Waters	Chromium [VI]	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1675	TPH Aliphatic/Aromatic split in Waters by GC-FID(cf. Texas Method 1006 / TPH CWG)	Aliphatics: >C5–C6, >C6–C8, >C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35–C44 Aromatics: >C5–C7, >C7–C8, >C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35–C44	Pentane extraction / GCxGC FID detection
1700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenzo[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Pentane extraction / GC FID detection
1760	Volatile Organic Compounds (VOCs) in Waters by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics. (cf. USEPA Method 8260)	Automated headspace gas chromatographic (GC) analysis of water samples with mass spectrometric (MS) detection of volatile organic compounds.
1790	Semi-Volatile Organic Compounds (SVOCs) in Waters by GC-MS	Semi-volatile organic compounds	Solvent extraction / GCMS detection
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.

Report Information

Key

- U UKAS accredited
- M MCERTS and UKAS accredited
- N Unaccredited
- S This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
- SN This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
- T This analysis has been subcontracted to an unaccredited laboratory
- I/S Insufficient Sample
- U/S Unsuitable Sample
- N/E not evaluated
- < "less than"
- > "greater than"

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

- A - Date of sampling not supplied
- B - Sample age exceeds stability time (sampling to extraction)
- C - Sample not received in appropriate containers
- D - Broken Container
- E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.co.uk

GEOLABS Limited
Unit D3 HRS Business Park
Granby Avenue
Birmingham
B33 0SJ

Applied Geology

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06 June 2018

Report No : GEO/27463/01

Page 1 of 1

For the attention of Mr F Hadley-Jones

Dear Sirs

Date samples received 16/05/2018

Date written instructions received 16/05/2018

Our ref **GEO / 27463**

Date testing commenced 17/05/2018

Your Ref **AG2834-18**

Project **LEIGH ROAD, EASTLEIGH**

Further to your instructions we have pleasure in enclosing the results of the tests you requested in the attached figures.

LABORATORY TEST REPORT

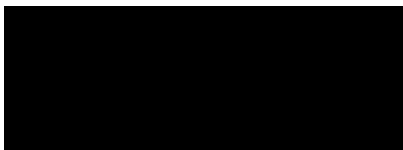
Item No	Test Quantity	Description
1	~	Geotechnical Test Summary
~	6	Water Content
2	~	Geochemical Test Summary
~	9	BRE SD1 Suite A - Natural ground
~	6	BRE SD1 Suite B - Natural ground + pyrite
3	6	Liquid & Plastic Limits
4	7	Particle Size Distribution
5	2	One Dimensional Consolidation
6	6	Unconsolidated Undrained Triaxial Compression

Any opinions or interpretations expressed herein are outside the scope of UKAS accreditation. All results contained in this report are provisional unless signed by an approved signatory. The results contained in this report relate only to samples received in the laboratory. This report should not be reproduced except in full without the written permission of the laboratory.

All the necessary data required by the documented test procedures has been recorded and will be stored for a period of no less than 6 years. This data will be issued to yourselves at your request. All samples will be disposed of after a period of 28 days from the date of this report. Written confirmation will be required to retain the samples beyond this period and a storage charge may be applied.

We trust that the above meets your requirements and should you require any further information or assistance, please do not hesitate to contact us.

Yours faithfully



Laboratory Manager



SUMMARY OF GEOTECHNICAL TESTING

Sample details					Classification Tests					Density Tests		Undrained Triaxial Compression				
Borehole / Trial Pit	Sample Ref	Depth (m)	Type	Description	WC (%)	LL (%)	PL (%)	PI (%)	<425 µm (%)	Bulk Mg/m³	Dry Mg/m³	Condition	Cell Pressure kPa	Deviator Stress kPa	Shear Stress kPa	
BH1		2.20-2.20	B	Dark brown clayey sandy fine to coarse GRAVEL.												8
BH1		6.00-6.00	D													7
BH1		8.50-8.95	UT	Dense dark grey silty fine SAND.	26.6		NP		100	1.99	1.57	Undisturbed	140	122	61	
BH1		11.50-11.95	UT	Soft grey slightly clayey SAND.	29.0		NP		100	1.99	1.54	Undisturbed	200	181	90	
BH2		3.20-3.20	B	Dark brown slightly clayey sandy fine to coarse GRAVEL.												
BH2		4.20-4.20	B													8
BH2		8.00-8.00	D													7
BH2		9.50-9.95	UT	Soft grey clayey SAND.	28.2		NP		100	1.98	1.54	Undisturbed	140	172	86	
BH3		3.20-3.20	B													8
BH3		9.00-9.00	D													7

Sample type: B (Bulk disturb.) BLK (Block) C (Core) D (Disturbed) LB (Large Bulk dist.) U (Undisturbed) NP=Non Plastic

Checked and Approved by	Project Number:	GEO / 27463
	Project Name:	LEIGH ROAD, EASTLEIGH
06/06/2018		AG2834-18

SUMMARY OF GEOTECHNICAL TESTING

Sample details					Classification Tests					Density Tests		Undrained Triaxial Compression			
Borehole / Trial Pit	Sample Ref	Depth (m)	Type	Description	WC (%)	LL (%)	PL (%)	PI (%)	<425 µm (%)	Bulk Mg/m³	Dry Mg/m³	Condition	Cell Pressure kPa	Deviator Stress kPa	Shear Stress kPa
BH3		14.50-14.95	UT	Grey slightly clayey SAND.	28.3		NP		100	2.00	1.56	Undisturbed	240	142	71
BH4		4.60-4.60	B												8
BH4		6.50-6.50	D												7
BH4		9.50-9.95	UT	Soft grey slightly clayey SAND.	25.3		NP		100	1.99	1.59	Undisturbed	160	125	63
BH5		2.20-2.20	B												9
BH5		11.00-11.00	D												7
BH6		1.20-1.20	B												7
BH6		4.20-4.20	B	Orangish brown slightly clayey sandy fine to coarse GRAVEL.											
BH6		7.00-7.00	D												8
BH6		9.00-9.45	UT	Grey very sandy CLAY.	25.9	41	19	22	100	1.99	1.58	Undisturbed	160	151	76

Sample type: B (Bulk disturb.) BLK (Block) C (Core) D (Disturbed) LB (Large Bulk dist.) U (Undisturbed) NP=Non Plastic

Checked and Approved by

Project Number:

GEO / 27463

Project Name:

LEIGH ROAD, EASTLEIGH

AG2834-18

J A Reynolds - Laboratory Manager
06/06/2018

SUMMARY OF GEOTECHNICAL TESTING

Sample details					Classification Tests					Density Tests		Undrained Triaxial Compression				
Borehole / Trial Pit	Sample Ref	Depth (m)	Type	Description	WC (%)	LL (%)	PL (%)	PI (%)	<425 µm (%)	Bulk Mg/m³	Dry Mg/m³	Condition	Cell Pressure kPa	Deviator Stress kPa	Shear Stress kPa	p
TP1		1.00-1.00	B	Orangish brown sandy CLAY with much gravel. Gravel is fine to coarse.												
TP1		2.00-2.00	B	Orangish brown sandy CLAY with much gravel. Gravel is fine to coarse.												
TP2		0.40-0.40	D													7
TP3		0.90-0.90	B	Orangish brown slightly clayey sandy fine to coarse GRAVEL.												
TP4		0.70-0.70	D													8
TP6		1.00-1.00	B	Dark brown sandy CLAY with much gravel. Gravel is fine to coarse.												
TP7		1.20-1.20	D													7

Sample type: B (Bulk disturb.) BLK (Block) C (Core) D (Disturbed) LB (Large Bulk dist.) U (Undisturbed) NP=Non Plastic

Checked and Approved by	Project Number:	GEO / 27463
	Project Name:	
06/06/2018		LEIGH ROAD, EASTLEIGH AG2834-18

SUMMARY OF CHEMICAL TESTS ON SOIL

Borehole / Trial Pit	Depth m	Sample Ref	Sample Type	pH Value	Total Acid Soluble Sulphate as SO ₄ %	Water Soluble Sulphate as SO ₄ 2:1 Water:Soil Extract g/l	Total Sulphur %	Water Soluble Chloride g/l	Water Soluble Nitrate g/l	Magnesium g/l	Organic Content %	Mass Loss on Ignition %	Carbonate Content %
BH1	2.20-2.20		B	8.6		0.01							
BH1	6.00-6.00		D	7.4	0.07	0.25	0.27						
BH2	4.20-4.20		B	8.5		<0.01							
BH2	8.00-8.00		D	7.1	0.11	0.43	0.40						
BH3	3.20-3.20		B	8.6		0.03							
BH3	9.00-9.00		D	7.5	0.12	0.52	0.83						
BH4	4.60-4.60		B	8.3		0.09							
BH4	6.50-6.50		D	7.9	0.03	0.16	0.29						
BH5	2.20-2.20		B	9.1		0.08							
BH5	11.00-11.00		D	7.3	0.01	0.51	0.77						
BH6	1.20-1.20		B	7.1		<0.01							
BH6	7.00-7.00		D	8.2	0.02	0.07	0.27						
TP2	0.40-0.40		D	7.3		<0.01							
TP4	0.70-0.70		D	8.2		<0.01							
TP7	1.20-1.20		D	7.8		<0.01							

Tested by Chemtest Ltd : UKAS No 2183

Checked and Approved by:

Project Number:

GEO / 27463

Project Name:

**LEIGH ROAD, EASTLEIGH
AG2834-18****GEOLABS®**

06/06/2018

Preparation :	Sample as received	
Water Content : (BS EN ISO 17892-1:2014)		26.6 %
Percentage passing 425µm sieve :		100 %
Liquid Limit :		Not Determined
Plastic Limit :		Non-Plastic
Equivalent Water Content of material passing 425µm sieve :		27 %
Sample was determined to be Non-Plastic after preparation		



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BS1377 : Part 2 : 1990 Clauses 4 & 5
LIQUID AND PLASTIC LIMITS

BH / TP	BH1
Depth (m)	11.50
Sample Type	UT

Description:

Soft grey slightly clayey SAND.

Preparation : Sample as received

Water Content : (BS EN ISO 17892-1:2014) 29.0 %

Percentage passing 425µm sieve : 100 %

Liquid Limit : Not Determined

Plastic Limit : Non-Plastic

Equivalent Water Content of material passing 425µm sieve : 29 %

Sample was determined to be Non-Plastic after preparation

Checked and Approved by:

Project Number:

GEO / 27463

Project Name:

**LEIGH ROAD, EASTLEIGH
AG2834-18****GEOLABS**J A Reynolds - Laboratory Manager
06/06/2018

Preparation :	Sample as received	
Water Content : (BS EN ISO 17892-1:2014)		28.2 %
Percentage passing 425µm sieve :		100 %
Liquid Limit :		Not Determined
Plastic Limit :		Non-Plastic
Equivalent Water Content of material passing 425µm sieve :		28 %
Sample was determined to be Non-Plastic after preparation		

Project Number:

**LEIGH ROAD, EASTLEIGH
AG2834-18**



BS1377 : Part 2 : 1990 Clauses 4 & 5

LIQUID AND PLASTIC LIMITS

BH / TP	BH3	Description: Grey slightly clayey SAND.
Depth (m)	14.50	
Sample Type	UT	

Preparation : Sample as received

Water Content : (BS EN ISO 17892-1:2014) 28.3 %

Percentage passing 425µm sieve : 100 %

Liquid Limit : Not Determined

Plastic Limit : _____ Non-Plastic _____

Equivalent Water Content of material passing 425µm sieve : 28 %

Sample was determined to be Non-Plastic after preparation

Checked and Approved by:

Project Number:

GEO / 27463

Project Name:

**LEIGH ROAD, EASTLEIGH
AG2834-18**

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13/11/2017

Description:

Soft grey slightly clayey SAND.

Preparation : Sample as received

Water Content : (BS EN ISO 17892-1:2014) 25.3 %

Percentage passing 425µm sieve : 100 %

Liquid Limit : Not Determined

Plastic Limit : _____ Non-Plastic _____

Equivalent Water Content of material passing 425µm sieve : 25 %

Sample was determined to be Non-Plastic after preparation

Checked and Approved by:

Project Number:

GEO / 27463

Name: _____

**LEIGH ROAD, EASTLEIGH
AG2834-18**

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J A Reynolds - Laboratory Manager
06/06/2018

BS1377 : Part 2 : 1990 Clauses 4.4 & 5

LIQUID AND PLASTIC LIMITS

BH / TP BH6
Depth (m) 9.00
Sample Type UT

Description:

Grey very sandy CLAY.

Preparation : Sample as received

Water Content : (BS EN ISO 17892-1:2014) 25.9 %

Percentage passing 425µm sieve : 100 %

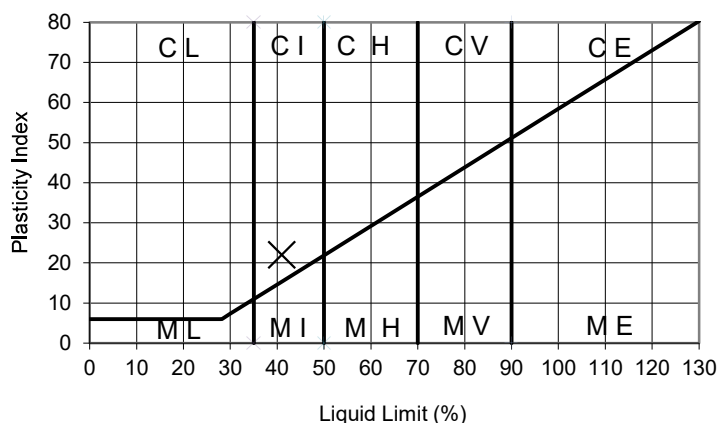
Liquid Limit : 41 %

Plastic Limit : 19 %

Plasticity Index : 22

Equivalent Water Content of material passing 425µm sieve : 26 %

Liquidity Index : 0.31



Checked and Approved by:

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GEO / 27463

Project Name:

LEIGH ROAD, EASTLEIGH
AG2834-18

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J A Reynolds - Laboratory Manager
06/06/2018

PARTICLE SIZE DISTRIBUTION

BH / TP No.
Depth (m)
Sample Type

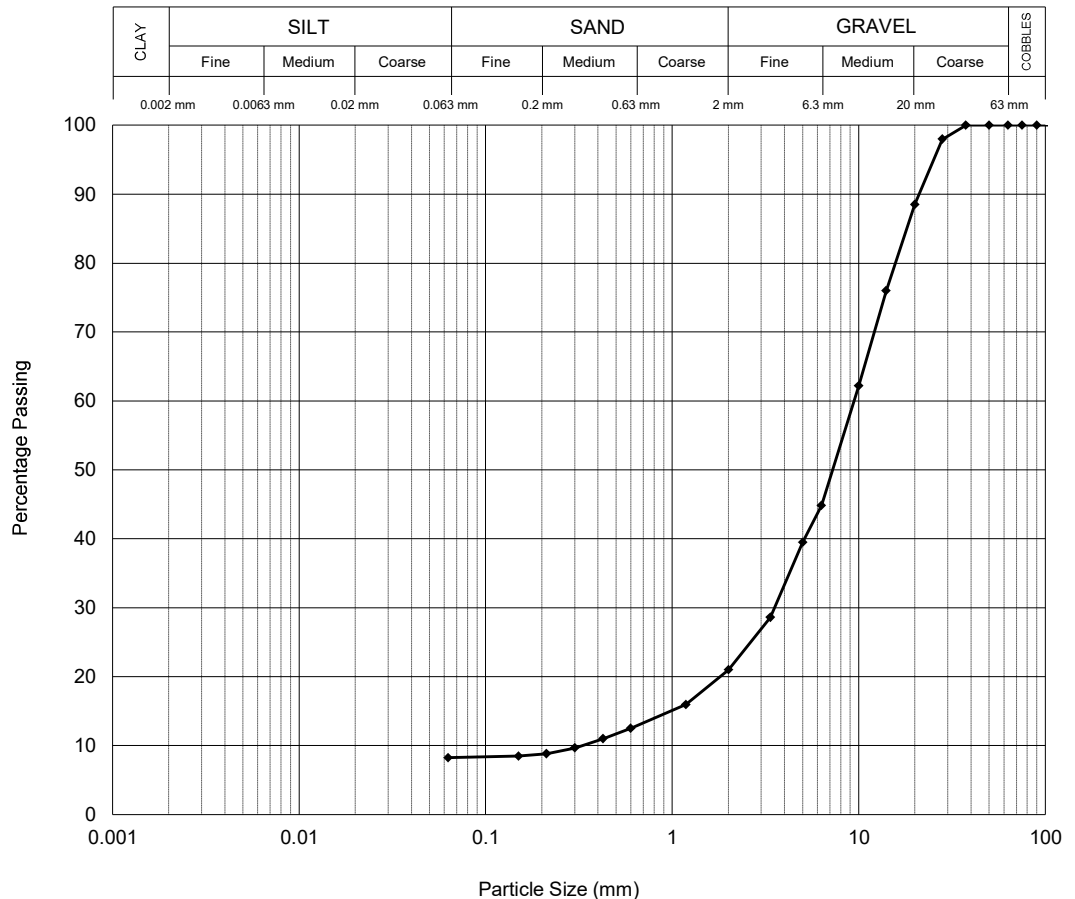
BH1
2.20-2.20
B

Description

Dark brown clayey sandy fine to coarse GRAVEL.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	98
20.0 mm	89
14.0 mm	76
10.0 mm	62
6.30 mm	45
5.00 mm	40
3.35 mm	29
2.00 mm	21
1.18 mm	16
600 µm	13
425 µm	11
300 µm	10
212 µm	9
150 µm	8
63 µm	8



Particle Proportions	
Cobbles	0
Gravel	79
Sand	13
Silt & Clay	8

Checked and Approved by

Project Number:

GEO / 27463

Project Name:

LEIGH ROAD, EASTLEIGH
AG2834-18

GEOLABS

PARTICLE SIZE DISTRIBUTION

BH / TP No.
Depth (m)
Sample Type

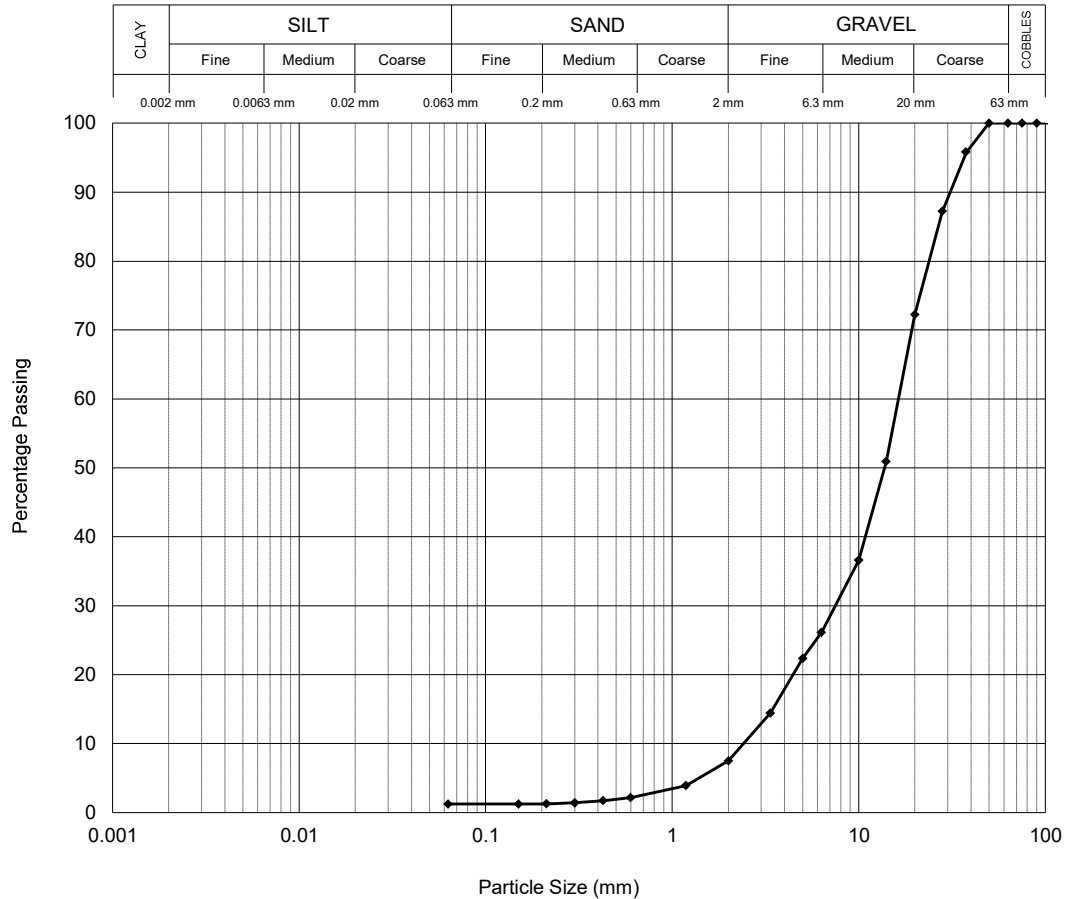
BH2
3.20-3.20
B

Description

Dark brown slightly clayey sandy fine to coarse GRAVEL.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	96
28.0 mm	87
20.0 mm	72
14.0 mm	51
10.0 mm	37
6.30 mm	26
5.00 mm	22
3.35 mm	14
2.00 mm	7
1.18 mm	4
600 µm	2
425 µm	2
300 µm	1
212 µm	1
150 µm	1
63 µm	1



Particle Proportions	
Cobbles	0
Gravel	93
Sand	6
Silt & Clay	1

Checked and Approved by

Project Number:

GEO / 27463

ct Name:

LEIGH ROAD, EASTLEIGH
AG2834-18

J A Reynolds - Laboratory Manager
06/06/2018

Test Report By: GEOLABS Limited Unit D3 HRS Business Park, Granby Avenue, Birmingham, B33 0SJ
Client : Applied Geology, Unit 23, Abbey Park, Stareton, Kenilworth, Warwickshire, CV8 2LY

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Page 1 of 1
(Ref 1528299929)

PARTICLE SIZE DISTRIBUTION

BH / TP No.
Depth (m)
Sample Type

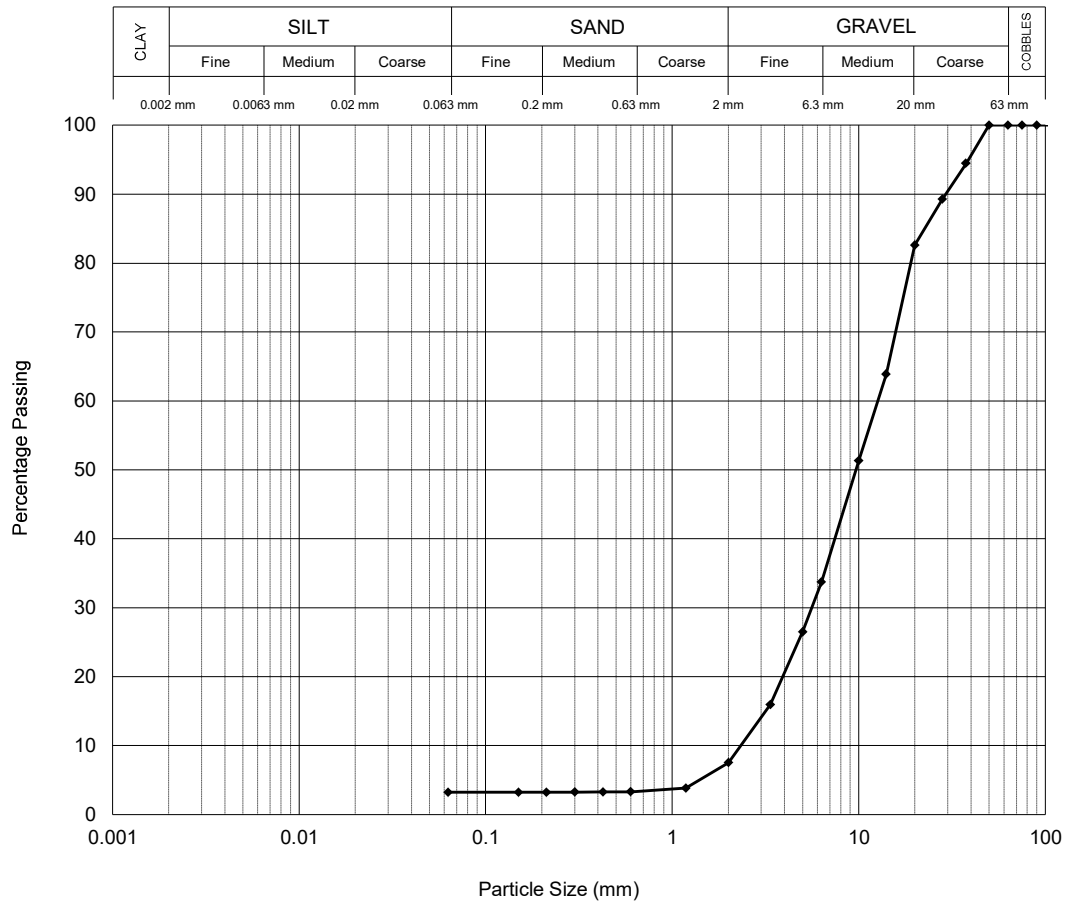
BH6
4.20-4.20
B

Description

Orangish brown slightly clayey sandy fine to coarse GRAVEL.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	94
28.0 mm	89
20.0 mm	83
14.0 mm	64
10.0 mm	51
6.30 mm	34
5.00 mm	27
3.35 mm	16
2.00 mm	8
1.18 mm	4
600 µm	3
425 µm	3
300 µm	3
212 µm	3
150 µm	3
63 µm	3



Particle Proportions	
Cobbles	0
Gravel	92
Sand	4
Silt & Clay	4

Checked and Approved by

Project Number:

GEO / 27463

Name:

LEIGH ROAD, EASTLEIGH
AG2834-18

J A Reynolds - Laboratory Manager
06/06/2018

Test Report By: GEOLABS Limited Unit D3 HRS Business Park, Granby Avenue, Birmingham, B33 0SJ
Client : Applied Geology, Unit 23, Abbey Park, Stareton, Kenilworth, Warwickshire, CV8 2LY



PARTICLE SIZE DISTRIBUTION

BH / TP No.
Depth (m)
Sample Type

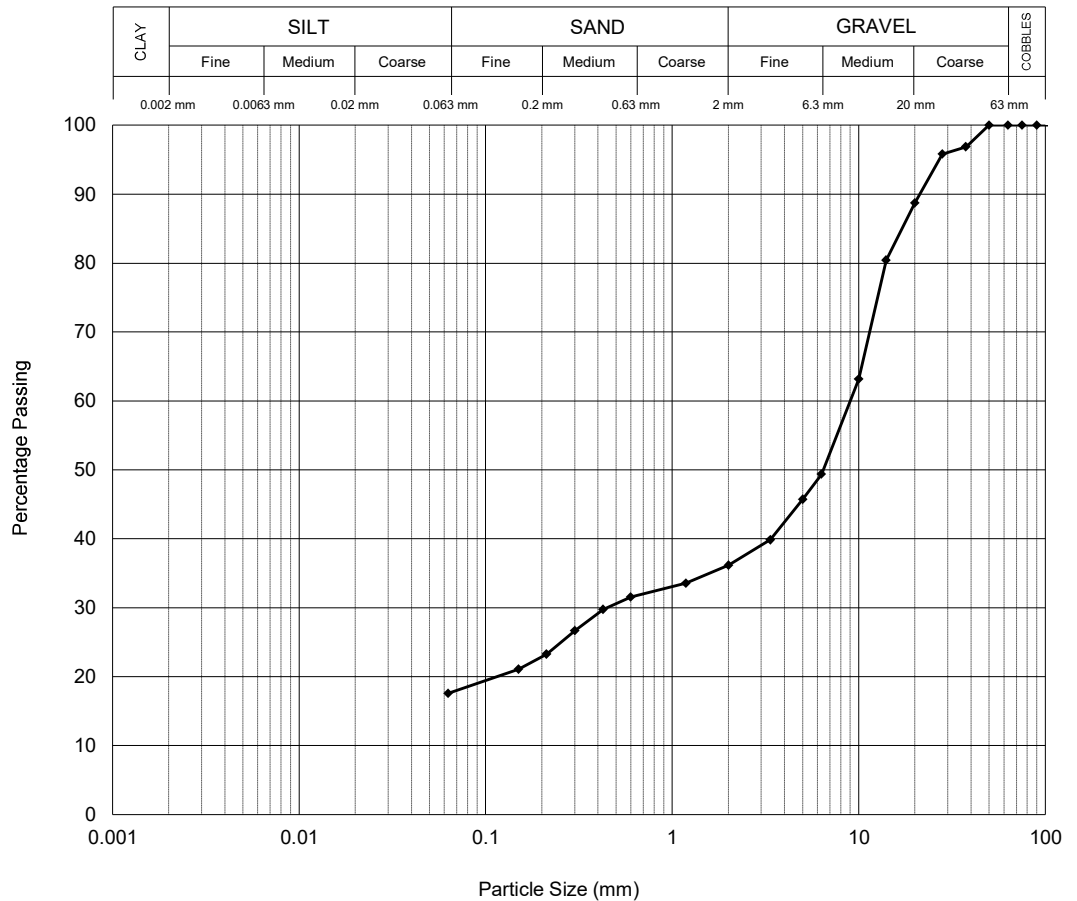
TP1
1.00-1.00
B

Description

Orangish brown sandy CLAY with much gravel. Gravel is fine to coarse.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	97
28.0 mm	96
20.0 mm	89
14.0 mm	80
10.0 mm	63
6.30 mm	49
5.00 mm	46
3.35 mm	40
2.00 mm	36
1.18 mm	34
600 µm	32
425 µm	30
300 µm	27
212 µm	23
150 µm	21
63 µm	18



Particle Proportions	
Cobbles	0
Gravel	64
Sand	19
Silt & Clay	17

Checked and Approved by

Project Number:

GEO / 27463

Project Name:

LEIGH ROAD, EASTLEIGH
AG2834-18

J A Reynolds - Laboratory Manager
06/06/2018

Test Report By: GEOLABS Limited Unit D3 HRS Business Park, Granby Avenue, Birmingham, B33 0SJ
Client : Applied Geology, Unit 23, Abbey Park, Stareton, Kenilworth, Warwickshire, CV8 2LY

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(Ref 1528299941)

PARTICLE SIZE DISTRIBUTION

BH / TP No.
Depth (m)
Sample Type

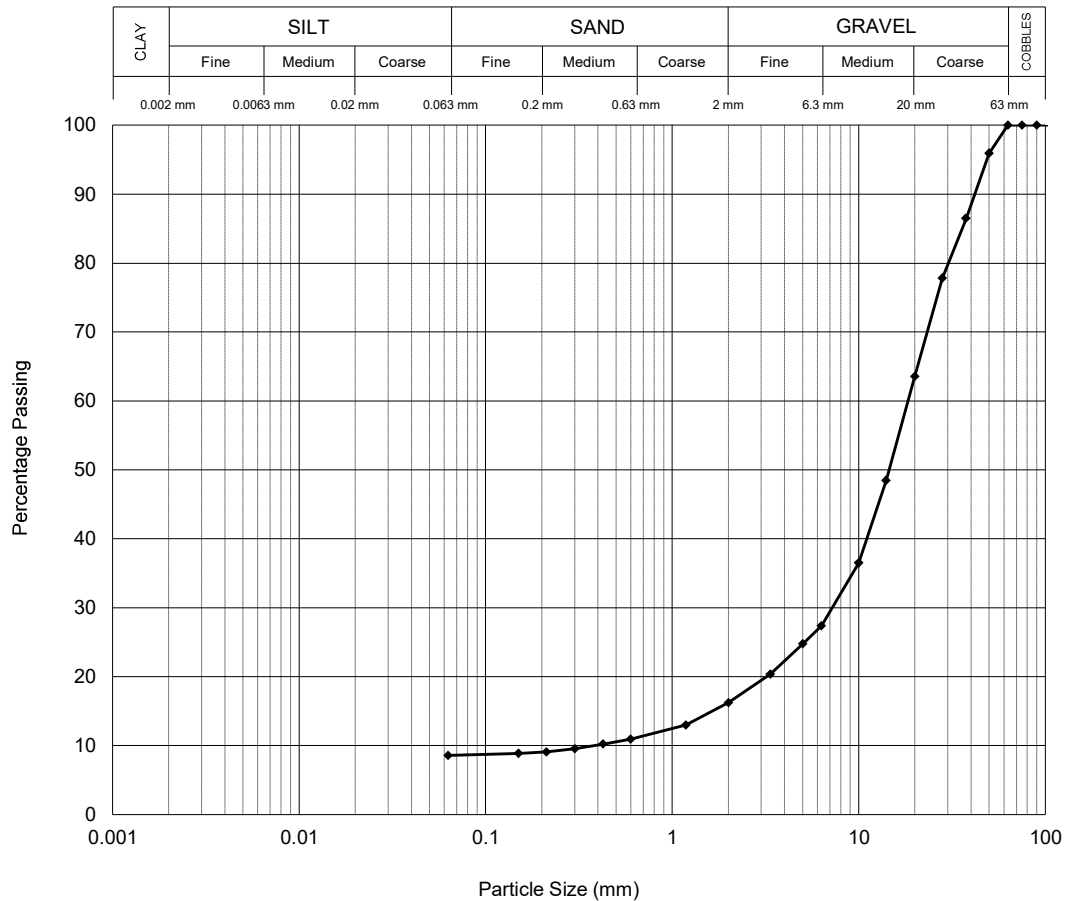
TP1
2.00-2.00
B

Description

Orangish brown sandy CLAY with much gravel. Gravel is fine to coarse.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	96
37.5 mm	87
28.0 mm	78
20.0 mm	64
14.0 mm	48
10.0 mm	37
6.30 mm	27
5.00 mm	25
3.35 mm	20
2.00 mm	16
1.18 mm	13
600 µm	11
425 µm	10
300 µm	10
212 µm	9
150 µm	9
63 µm	9



Particle Proportions	
Cobbles	0
Gravel	84
Sand	8
Silt & Clay	8

Checked and Approved by

Project Number:

GEO / 27463

Project Name:

LEIGH ROAD, EASTLEIGH
AG2834-18

J A Reynolds - Laboratory Manager
06/06/2018

Test Report By: GEOLABS Limited Unit D3 HRS Business Park, Granby Avenue, Birmingham, B33 0SJ

Client : Applied Geology, Unit 23, Abbey Park, Stareton, Kenilworth, Warwickshire, CV8 2LY

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Page 1 of 1
(Ref 1528299946)

PARTICLE SIZE DISTRIBUTION

BH / TP No.
Depth (m)
Sample Type

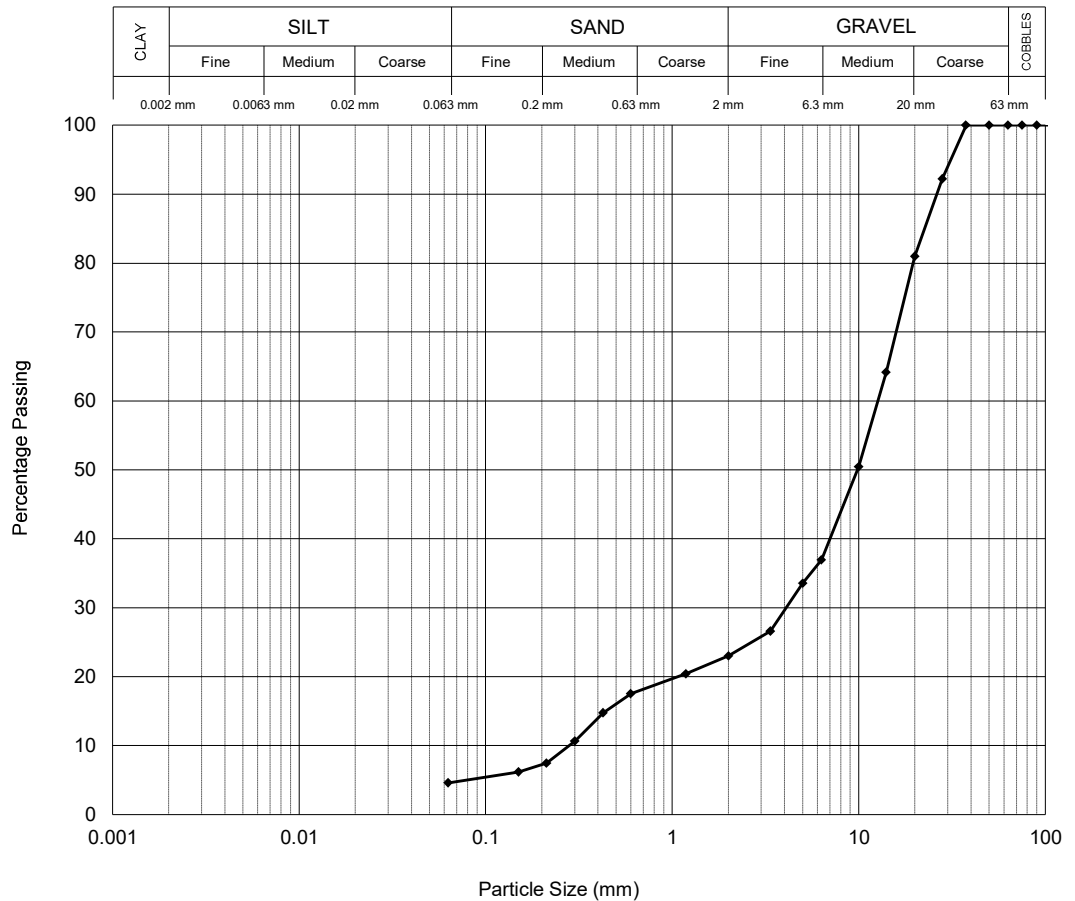
TP3
0.90-0.90
B

Description

Orangish brown slightly clayey sandy fine to coarse GRAVEL.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	92
20.0 mm	81
14.0 mm	64
10.0 mm	50
6.30 mm	37
5.00 mm	34
3.35 mm	27
2.00 mm	23
1.18 mm	20
600 µm	18
425 µm	15
300 µm	11
212 µm	7
150 µm	6
63 µm	5



Particle Proportions	
Cobbles	0
Gravel	77
Sand	18
Silt & Clay	5

Checked and Approved by

Project Number:

GEO / 27463

Project Name:

LEIGH ROAD, EASTLEIGH
AG2834-18

J A Reynolds - Laboratory Manager
06/06/2018

Test Report By: GEOLABS Limited Unit D3 HRS Business Park, Granby Avenue, Birmingham, B33 0SJ
Client : Applied Geology, Unit 23, Abbey Park, Stareton, Kenilworth, Warwickshire, CV8 2LY



PARTICLE SIZE DISTRIBUTION

BH / TP No.
Depth (m)
Sample Type

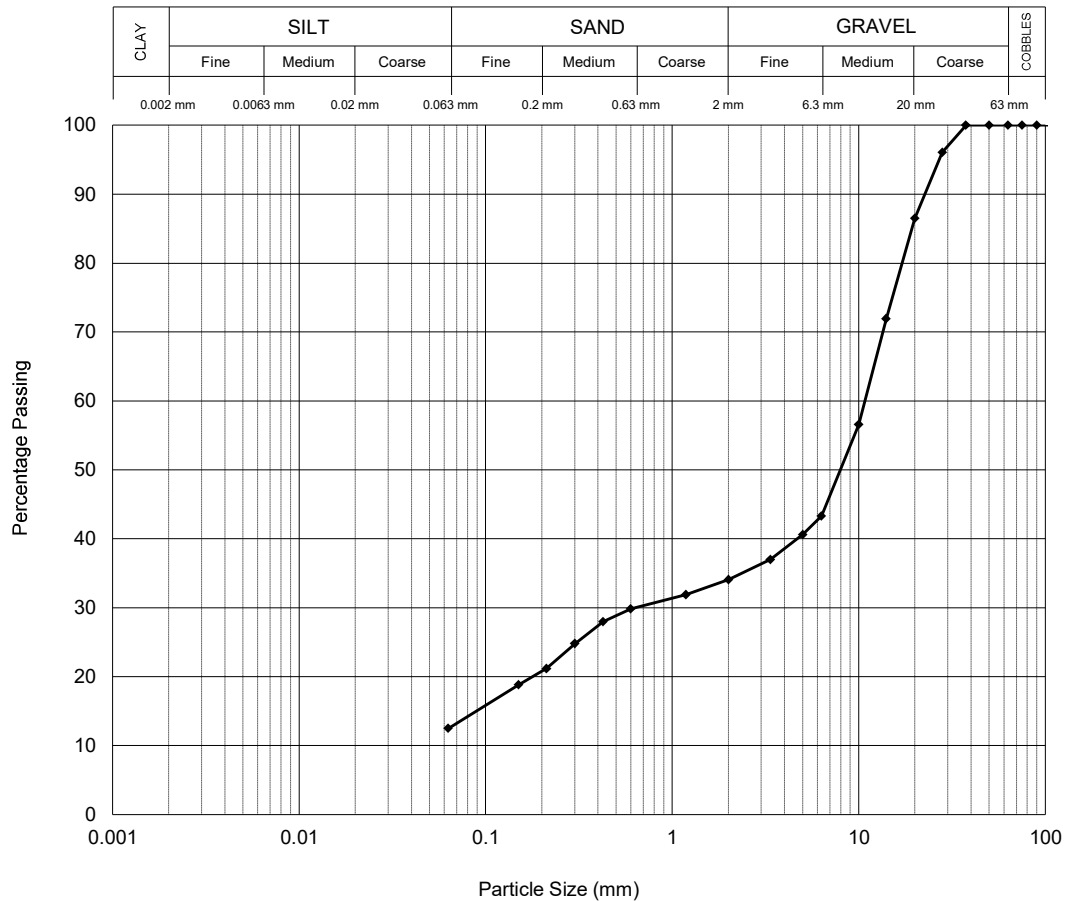
TP6
1.00-1.00
B

Description

Dark brown sandy CLAY with much gravel. Gravel is fine to coarse.

BS EN ISO 17892-4 : 2016 : Clause 5.2 - Wet Sieve

Sieve	
Size	% Pass
200.0 mm	100
125.0 mm	100
90.0 mm	100
75.0 mm	100
63.0 mm	100
50.0 mm	100
37.5 mm	100
28.0 mm	96
20.0 mm	87
14.0 mm	72
10.0 mm	57
6.30 mm	43
5.00 mm	41
3.35 mm	37
2.00 mm	34
1.18 mm	32
600 µm	30
425 µm	28
300 µm	25
212 µm	21
150 µm	19
63 µm	12



Particle Proportions	
Cobbles	0
Gravel	66
Sand	22
Silt & Clay	12

Checked and Approved by

Project Number:

GEO / 27463

Project Name:

LEIGH ROAD, EASTLEIGH
AG2834-18

J A Reynolds - Laboratory Manager
06/06/2018

Test Report By: GEOLABS Limited Unit D3 HRS Business Park, Granby Avenue, Birmingham, B33 0SJ

Client : Applied Geology, Unit 23, Abbey Park, Stareton, Kenilworth, Warwickshire, CV8 2LY

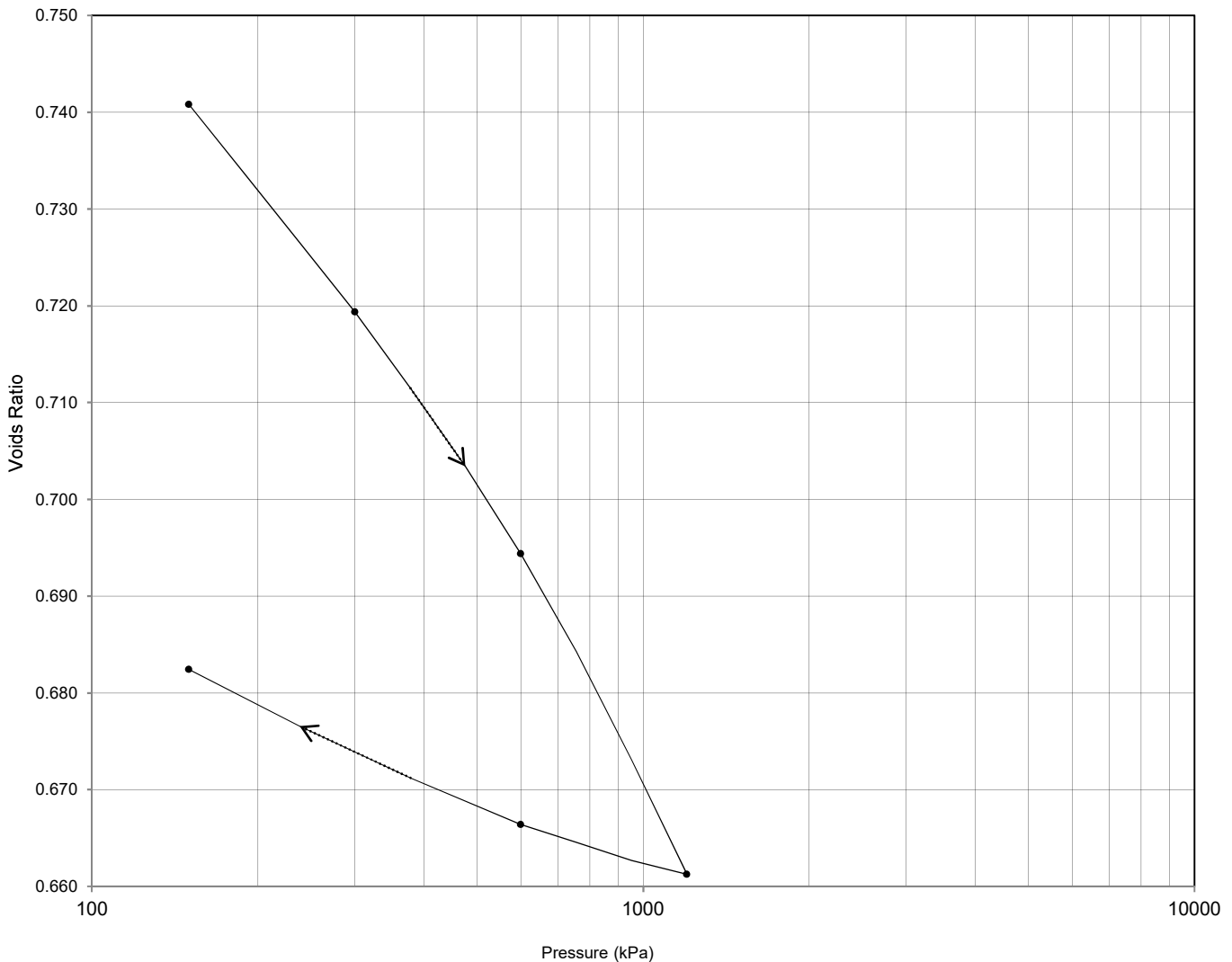
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INCREMENTAL LOADING OEDOMETER TEST

BH / TP	BH1
Depth (m)	8.50-8.95
Sample Type	UT
Depth within original (mm)	50
Orientation within original	Vertical
Specimen preparation	Undisturbed

Description:

Dense dark grey silty fine SAND.



Initial Conditions:

Height	(mm)	18.28	Water Content	(%)	29.3	(from trimmings)
Diameter	(mm)	76.08	Voids Ratio		0.785	
Area	(mm ²)	4546	Bulk Density	(Mg/m ³)	1.97	
Volume	(cm ³)	83.10	Dry Density	(Mg/m ³)	1.52	
Laboratory Temperature	(°C)	20.6	Particle density	(Mg/m ³)	2.72 (Assumed)	
			Degree of Saturation	(%)	101.4	

Results have been corrected for equipment deformation

Test Number:

GEO / 27463

Test Name:

LEIGH ROAD, EASTLEIGH
AG2834-18

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INCREMENTAL LOADING OEDOMETER TEST

BH / TP BH1
 Depth (m) 8.50-8.95
 Sample Type UT
 Depth within original (mm) 50
 Orientation within original Vertical
 Specimen preparation Undisturbed

Description:

Dense dark grey silty fine SAND.

Pressure Range (kPa)	m_v (m ² /MN)	c_v (m ² /year)	Time Fitting		Voids Ratio
			Method	minutes	
0 - 150	0.17	24	t90	1.50	0.741
150 - 300	0.082	25	t90	1.41	0.719
300 - 600	0.048	16	t90	2.08	0.694
600 - 1200	0.033	16	t90	2.00	0.661
1200 - 600	0.0052	5.1 (Sv)	t90	6.27	0.666
600 - 150	0.021	18 (Sv)	t90	1.80	0.682

Project Number:

GEO / 27463

Project Name:

LEIGH ROAD, EASTLEIGH
AG2834-18

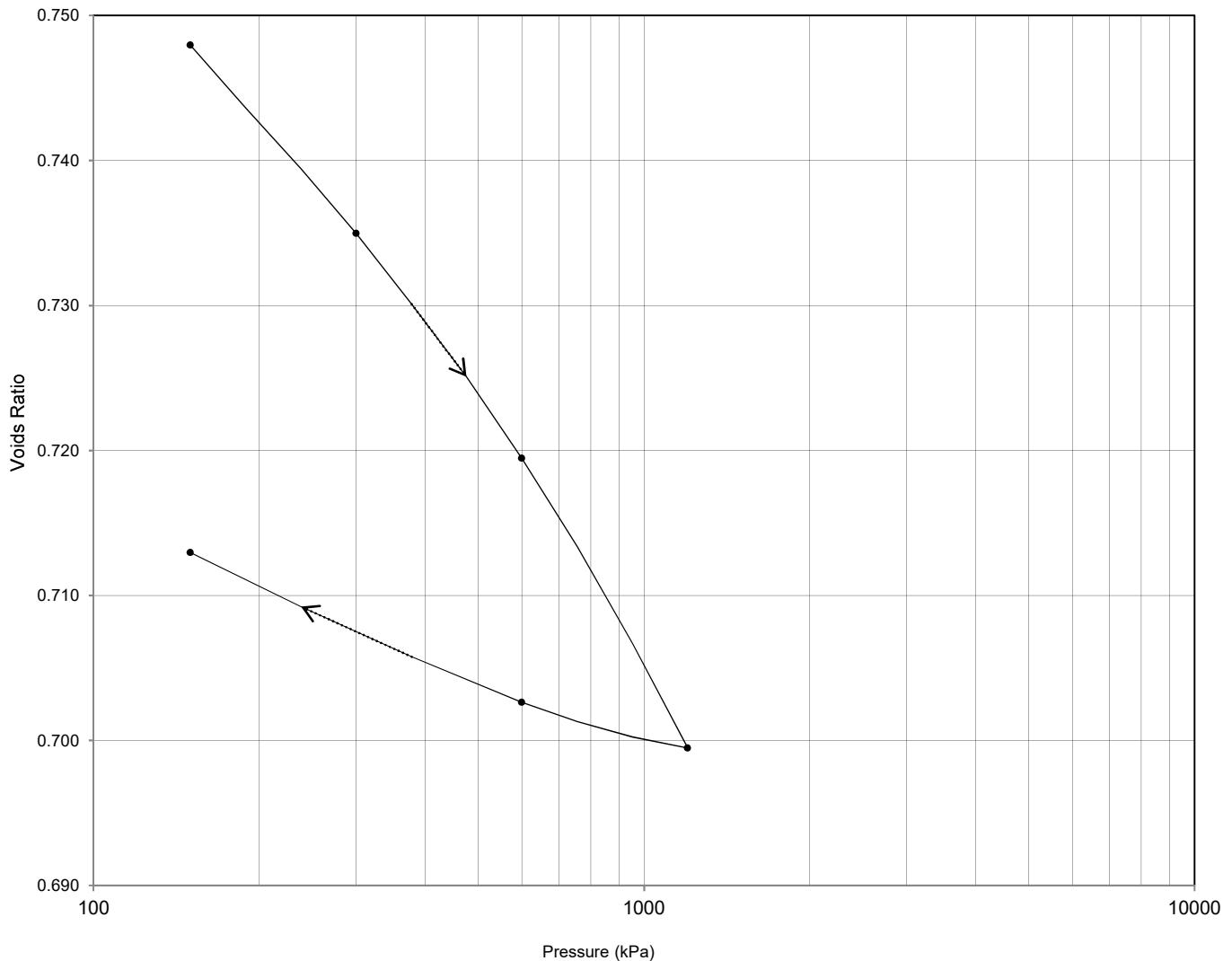
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INCREMENTAL LOADING OEDOMETER TEST

BH / TP	BH6
Depth (m)	9.00-9.45
Sample Type	UT
Depth within original (mm)	100
Orientation within original	Vertical
Specimen preparation	Undisturbed

Description:

Dense grey SILT.



Initial Conditions:

Height	(mm)	18.56	Water Content	(%)	26.2	(from trimmings)
Diameter	(mm)	76.23	Voids Ratio		0.785	
Area	(mm ²)	4564	Bulk Density	(Mg/m ³)	1.92	
Volume	(cm ³)	84.71	Dry Density	(Mg/m ³)	1.52	
Laboratory Temperature	(°C)	24.4	Particle density	(Mg/m ³)	2.72 (Assumed)	
			Degree of Saturation	(%)	90.8	

Results have been corrected for equipment deformation

Project Number:

GEO / 27463

Project Name:

LEIGH ROAD, EASTLEIGH
AG2834-18

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J Sturges - Operations Manager
 06/06/2018

INCREMENTAL LOADING OEDOMETER TEST

BH / TP BH6
 Depth (m) 9.00-9.45
 Sample Type UT
 Depth within original (mm) 100
 Orientation within original Vertical
 Specimen preparation Undisturbed

Description:

Dense grey SILT.

Pressure Range (kPa)	m_v (m ² /MN)	c_v (m ² /year)	Time Fitting		Voids Ratio
			Method	minutes	
0 - 150	0.14	70	t90	0.536	0.748
150 - 300	0.049	28	t90	1.30	0.735
300 - 600	0.030	37	t90	0.977	0.719
600 - 1200	0.019	51	t90	0.694	0.699
1200 - 600	0.0031	71 (Sv)	t90	0.493	0.703
600 - 150	0.014	89 (Sv)	t90	0.392	0.713

Checked and Approved by

Project Number:

GEO / 27463

Project Name:

LEIGH ROAD, EASTLEIGH
AG2834-18

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QUICK UNDRAINED TRIAXIAL COMPRESSION TEST

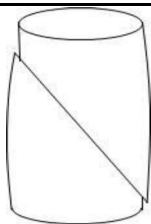
BH/TP No BH1
 Depth (m) 8.50-8.95
 Sample Type UT

Description:

Soft to firm grey clayey SAND.

Specimen Details

Specimen conditions		Undisturbed
Length	(mm)	202.3
Diameter	(mm)	103.2
Moisture Content	(%)	26.6
Bulk Density	(Mg/m ³)	1.99
Dry Density	(Mg/m ³)	1.57
Test Details		
Latex membrane thickness	(mm)	0.3
Membrane correction	(kPa)	1.1
Axial displacement rate	(%/min)	2.0
Cell pressure	(kPa)	140
Strain at failure	(%)	19.8
Maximum Deviator Stress	(kPa)	122
Shear Stress Cu	(kPa)	61

Mode of failure

Orientation of the sample	Vertical
Distance from top of tube mm	80

Checked and Approved by:



J A Reynolds - Laboratory Manager
 06/06/2018

Project Number:

GEO / 27463

Project Name:

LEIGH ROAD, EASTLEIGH
AG2834-18

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QUICK UNDRAINED TRIAXIAL COMPRESSION TEST

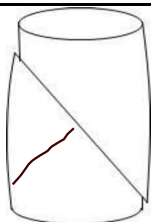
BH/TP No BH1
 Depth (m) 11.50-11.95
 Sample Type UT

Description:

Soft grey slightly clayey SAND.

Specimen Details

Specimen conditions		Undisturbed
Length	(mm)	202.3
Diameter	(mm)	103.3
Moisture Content	(%)	29.0
Bulk Density	(Mg/m ³)	1.99
Dry Density	(Mg/m ³)	1.55
Test Details		
Latex membrane thickness	(mm)	0.3
Membrane correction	(kPa)	1.1
Axial displacement rate	(%/min)	2.0
Cell pressure	(kPa)	200
Strain at failure	(%)	19.8
Maximum Deviator Stress	(kPa)	181
Shear Stress Cu	(kPa)	90

Mode of failure

Orientation of the sample	Vertical
Distance from top of tube mm	40

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J A Reynolds - Laboratory Manager
06/06/2018

Project Number:

GEO / 27463

Project Name:

**LEIGH ROAD, EASTLEIGH
AG2834-18**

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QUICK UNDRAINED TRIAXIAL COMPRESSION TEST

BH/TP No BH2
 Depth (m) 9.50-9.95
 Sample Type UT

Description:

Soft grey clayey SAND.

Specimen Details

Specimen conditions		Undisturbed
Length	(mm)	202.3
Diameter	(mm)	103.1
Moisture Content	(%)	29.8
Bulk Density	(Mg/m ³)	1.98
Dry Density	(Mg/m ³)	1.52
Test Details		
Latex membrane thickness	(mm)	0.3
Membrane correction	(kPa)	1.1
Axial displacement rate	(%/min)	2.0
Cell pressure	(kPa)	140
Strain at failure	(%)	19.8
Maximum Deviator Stress	(kPa)	172
Shear Stress Cu	(kPa)	86

Mode of failure

Orientation of the sample	Vertical
Distance from top of tube mm	30

Checked and Approved by:



J A Reynolds - Laboratory Manager
 06/06/2018

Project Number:

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Project Name:

LEIGH ROAD, EASTLEIGH
AG2834-18

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QUICK UNDRAINED TRIAXIAL COMPRESSION TEST

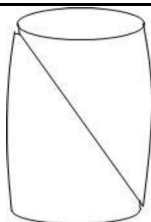
BH/TP No BH3
 Depth (m) 14.50-14.95
 Sample Type UT

Description:

Grey slightly clayey SAND.

Specimen Details

Specimen conditions		Undisturbed
Length	(mm)	202.7
Diameter	(mm)	103.3
Moisture Content	(%)	28.3
Bulk Density	(Mg/m ³)	2.00
Dry Density	(Mg/m ³)	1.56
Test Details		
Latex membrane thickness	(mm)	0.3
Membrane correction	(kPa)	1.1
Axial displacement rate	(%/min)	2.0
Cell pressure	(kPa)	240
Strain at failure	(%)	19.7
Maximum Deviator Stress	(kPa)	142
Shear Stress Cu	(kPa)	71

Mode of failure

Orientation of the sample	Vertical
Distance from top of tube mm	50

Checked and Approved by:



J A Reynolds - Laboratory Manager
 06/06/2018

Project Number:

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Project Name:

**LEIGH ROAD, EASTLEIGH
 AG2834-18**

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QUICK UNDRAINED TRIAXIAL COMPRESSION TEST

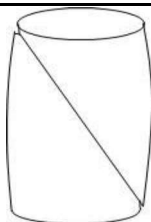
BH/TP No BH4
 Depth (m) 9.50-9.95
 Sample Type UT

Description:

Soft grey slightly clayey SAND.

Specimen Details

Specimen conditions		Undisturbed
Length	(mm)	202.3
Diameter	(mm)	103.2
Moisture Content	(%)	25.3
Bulk Density	(Mg/m ³)	1.99
Dry Density	(Mg/m ³)	1.59
Test Details		
Latex membrane thickness	(mm)	0.3
Membrane correction	(kPa)	1.1
Axial displacement rate	(%/min)	2.0
Cell pressure	(kPa)	160
Strain at failure	(%)	19.8
Maximum Deviator Stress	(kPa)	125
Shear Stress Cu	(kPa)	63

Mode of failure

Orientation of the sample	Vertical
Distance from top of tube mm	40

Checked and Approved by:



J A Reynolds - Laboratory Manager
 06/06/2018

Project Number:

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Project Name:

**LEIGH ROAD, EASTLEIGH
 AG2834-18**

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QUICK UNDRAINED TRIAXIAL COMPRESSION TEST

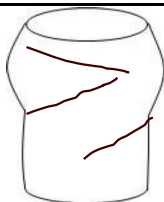
BH/TP No BH6
 Depth (m) 9.00-9.45
 Sample Type UT

Description:

Grey very sandy CLAY.

Specimen Details

Specimen conditions		Undisturbed
Length	(mm)	202.8
Diameter	(mm)	103.3
Moisture Content	(%)	28.9
Bulk Density	(Mg/m ³)	1.99
Dry Density	(Mg/m ³)	1.54
Test Details		
Latex membrane thickness	(mm)	0.3
Membrane correction	(kPa)	1.1
Axial displacement rate	(%/min)	2.0
Cell pressure	(kPa)	160
Strain at failure	(%)	19.7
Maximum Deviator Stress	(kPa)	151
Shear Stress Cu	(kPa)	76

Mode of failure

Orientation of the sample	Vertical
Distance from top of tube mm	40

Checked and Approved by:



J A Reynolds - Laboratory Manager
06/06/2018

Project Number:

GEO / 27463

Project Name:

**LEIGH ROAD, EASTLEIGH
AG2834-18**

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APPENDIX E

APPENDIX E

STANDARD FIELDWORK AND ASSESSMENT PROCEDURES

Scope of Work

The scope of work undertaken is defined in Section 1 of the Report. It should be noted that Applied Geology Limited does not provide arboricultural surveys, specialist surveys for the detection of invasive plant species (such as Japanese Knotweed) or protected species of wildlife. Information from environmental and ecological datasets is included from a review of the MAGIC (Multi-Agency Geographic Information for the Countryside) website, however, if a full assessment of Environmental or Ecological aspects is required, it is recommended that other specialists are consulted. Similarly, information on flood risk is included; obtained from the Environment Agency Web site and the GroundSure report; but this is not intended to be a full hydrological study and, if a flood risk assessment is needed, additional analysis by others is recommended to confirm this aspect of the development. Also, whilst our field staff have undergone asbestos awareness training, Applied Geology does not undertake asbestos surveys or provide specific advice relating to asbestos-containing materials. Any suspected asbestos-containing materials observed by our field staff will be mentioned in the report but further assessment by others may be required.

Fieldwork

Fieldwork is generally carried out in accordance with BS5930 (2015) "Code of Practice for Site Investigations" and BS10175 (2011) Investigation of Potentially Contaminated Sites, unless otherwise stated.

Prior to commencement on site, statutory services plans are generally obtained and verbal enquiries are also made regarding the positions of private or statutory services on site. Prior to excavation or drilling, locations are scanned with a cable avoidance tool (CAT) and service pits are generally excavated at borehole positions, where possible.

Descriptions and depths of the various strata recovered are presented on the exploratory hole records, reproduced in the report appendices, together with sample depths, the results of in-situ testing, comments on groundwater inflows, and any other pertinent information. The strata descriptions are in general accordance with BS5930:2015. Disturbed plastic pot and glass amber jar samples are recovered from the various strata and stored and transported in cool boxes, where relevant, for possible future laboratory testing.

Light cable percussion boreholes are generally drilled using a Pilcon Wayfarer or Dando rig and are advanced using equipment to bore 200/150mm diameter boreholes. Disturbed plastic pot samples are recovered from all deposits encountered to allow examination and laboratory testing. Certain strata are cased off due to their tendency to collapse, particularly in the presence of groundwater inflows and/or to reduce the risk of cross contamination. In situ Standard Penetration Tests, using Split Spoon (SPT) and Cone (CPT) are undertaken in the boreholes to provide a measure of the relative density of the granular (coarse grained) deposits or shear strength of the clay/chalk/ weathered rock deposits using industry recognised correlation guidelines of shear strength against SPT "N" value results. Within the fine grained (cohesive) deposits, "undisturbed" 100mm driven open tube samples were recovered from the various deposits to provide samples for examination and laboratory testing. On encountering groundwater, boring is usually suspended for 20 minutes while any rise in water level is recorded. Full details of the groundwater observations and monitoring results during boring operations are included on the borehole records. All boreholes without monitoring wells installed are usually backfilled with arisings upon completion, unless otherwise stated on the individual logs.

Unless otherwise stated on the relevant logs, trial pits are excavated using a wheeled backhoe excavator, usually with a 0.6m wide bucket. The excavations are logged from the ground surface by an Engineering Geologist / Geo-environmental Engineer and relevant field testing, appropriate to the soils encountered, is carried out on samples brought to the surface. Representative disturbed soil samples are collected from selected horizons for subsequent laboratory testing. The trial pits are

usually unshored and where reasonable, left open for a period of time to allow observations of pit stability and depth and inflow rate of any groundwater ingress. The excavations are backfilled with arisings prior to moving on to the next position. Any trial pits carried out as part of this or previous investigations may represent soft spots and conduits/sumps for groundwater or surface water. In excavations, such materials may also be loose and unstable.

Driven Continuous Sampling (DCS) boreholes are drilled using a track mounted Global mini-rig or similar using sampling tubes of varying diameter (decreasing with depth). Samples of the deposits encountered are recovered in 1m long clear plastic liners, which are logged and sub-sampled on site by an Engineering Geologist. Generally for geotechnical investigations, during the drilling process in-situ Standard Penetration Tests (SPTs) are undertaken at selected depths to provide a measure of the relative density of the granular (coarse grained) deposits or shear strength of the clay/chalk/ weathered rock deposits using industry recognised correlation guidelines of shear strength against SPT "N" value results. Groundwater seepages are noted during drilling if encountered. All boreholes without monitoring wells installed are usually backfilled with arisings upon completion.

Unless specifically stated in the report, exploratory hole locations should be regarded as approximate. Consideration should be given to accurate location of the exploratory holes where it is considered they may impact on proposed development.

It should be noted that groundwater levels at any particular site may fluctuate due to rainfall, seasonal variations etc and, therefore, levels may be different to those measured during the course of the fieldwork and monitoring period.

Laboratory Testing

The geotechnical testing was carried out in accordance with BS 1377:1990 Method of Tests for Soils for Civil Engineering Purposes and was undertaken by a UKAS accredited specialist laboratory. Chemical testing was undertaken by a UKAS accredited specialist chemical testing laboratory and MCERTS accredited methods, in accordance with Environment Agency recommendations, were specified where available.

Contamination Assessment – Human Health

Applied Geology Limited has followed the guidance given in the CLR 11 publication and other available guidance to assess the contaminant concentrations. Details of the methodology followed are briefly outlined below.

The available chemical data is sorted into appropriate datasets depending on sampling regime and ground conditions. An initial generic quantitative risk assessment is undertaken on this data using statistical tests, where appropriate, and relevant screening values. Risk to human health has been initially assessed by comparing soil results against various published screening criteria. These have been sourced from the following, in order of preference:

- DEFRA. Category 4 Screening Levels (C4SL), March 2014;
- LQM/CIEH S4UL for Human Health Risk Assessment (S4UL), 2015*;
- Environment Agency/DEFRA, Soil Guideline Values (SGV) published in 2009;
- EIC/AGS/CL:AIRE Soil Generic Assessment Criteria (GAC), 2010.

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Except for lead and benzo(a)pyrene, the assessments will be carried out by comparing results against the LQM/CIEH S4UL in the first instance, where these values are exceeded, then reference will be made to the C4SLs where such exist. Lead will only be compared to the C4SL because no S4UL exists for lead. For Benzo(a)pyrene, Applied Geology has chosen to adopt the approach presented by the C4SL committee rather than the approach proposed by LQM/CIEH. Further discussion on this is presented below.

It is our view, and the view of others in the industry, that the C4SL were derived for use in both the Part IIA system and through the planning system, as they allow identification of those sites that fall within Category 4 (not contaminated) and are therefore able to be developed with no further remedial action. The C4SLs are considered to represent a contamination level that is 'low' from a toxicological view point, which we therefore consider to be 'acceptable' under planning.

Historically, the level of contamination has been assessed with reference to SGV values which were derived to represent a 'minimal' level of contamination. The SGVs are still valid and can be used alongside C4SL, however both screening values are only intended to provide guidance as to the level of contamination and, where concentrations fall below these screening values, the site is not contaminated (and is within Category 4). Exceedance of a SGV/S4UL/C4SL does not automatically indicate that an 'unacceptable' risk exists at a site; simply that further consideration of that particular contaminant is required.

At this time, there are two toxicological methodologies that can be used in the derivation of screening criteria for PAHs; Relative Potency Factor (RPFs) or the Surrogate Marker approach. Applied Geology has chosen (based on the latest guidance from the Health Protection Agency (HPA) to use the surrogate marker approach proposed in the C4SL methodology, whereby benzo(a)pyrene can be used as a surrogate marker for all 'genotoxic' (gene damaging) PAHs. The surrogate marker approach estimates the toxicity of a mixture of PAHs in an environmental matrix by using data from toxicity studies in which a PAH mixture of known composition was tested. Exposure to the surrogate marker benzo(a)pyrene is assumed to represent exposure to all the PAHs in the environmental matrix. Thus, the level of toxicity ascribed to the surrogate represents the toxicity of the PAH mixture. This allows an assessment of the combined carcinogenic risk associated with genotoxic PAHs using only benzo(a)pyrene. In order to confirm that the mixture of genotoxic PAH in the soil is similar to the coal tar mixture used in the toxicological study, various PAH ratios are plotted and checked to see that they fall within the limits set in HPA, 2010.

Contamination Assessment – Water Quality

Risks to water quality has been assessed by following the Environment Agency guidance on groundwater protection (previously known as GP3), updated on their website in March 2017, see <https://www.gov.uk/government/policies/water-quality> and 'The Environment Agency's approach to groundwater protection' (March 2017 Version 1.0).

For hazardous substances, which should be prevented from entering groundwater, the screening criteria are initially set as the limit of detection, however, if groundwater has already been impacted, an appropriate environmental standard will then be used. For hazardous substances, background quality may also be taken into account.

For non-hazardous compounds, their release should not result in any pollution or significant risk of pollution in the future, as such comparison with UK DWS or EQS standards will allow determination of whether pollution could occur. Typically screening criteria will be sourced from the following:

- Environmental Standards (ES), which are defined in European legislation such as the Water Framework Directive (WFD) (2000/60/EC) and the Priority Substances Directive (PSD) (2008/105/EC) a daughter directive of the WFD.
- The River Basin Districts Typology, Standards and Groundwater Threshold Values (Water Framework Directive) (England and Wales) Direction, 2010.
- UK Water Supply (Water Quality) Regulations, 2010.
- UK quality standards for water to be used for direct abstraction to potable supply e.g. Surface Water (Abstraction for Drinking Water) (Classification) Regulations, 1996.
- World Health Organisation (WHO) Guidelines for Drinking Water Quality.

Re-use of Soils and Waste Soil Disposal

It is noted that if any excavated material is to be reused on site, a Waste Management Plan (WMP) and / or a Materials Management Plan (MMP) will probably be required. Any such materials must be suitable for re-use without further treatment, and only the quantity necessary for the specified works should be used. Any materials not within these definitions may need to be considered as waste whereby a Waste Management Licence Exemption may also be required.

A specific categorisation and assessment of potential waste soils arising from the proposed development has not been undertaken as part of the investigation, unless otherwise detailed in the report text. However, generic comments and advice are made below for the reader.

All waste soils should be sorted to prevent mixtures of waste types. Where possible, any waste soil should be recycled and the volume of soil to be disposed of should be minimised. Any excavated soil material and excess spoil disposed of off-site should be treated as Waste and classified as Inert, Non-hazardous or Hazardous, prior to removal from site, as required by the "Duty of Care" (Environmental Protection Act, 1990) legislation together with Annex II of Directive 1999/31/EC ("Landfill Directive"). Initially, Basic Characterisation of the waste is required whereby the material should be described and its source of origin recorded (a site plan, exploratory hole records and the certificates of chemical analysis in this report should be included). This should also include data on its composition and leaching behaviour, its European Waste Catalogue (EWC) code, and where relevant any hazardous properties according to Annex III of Directive 91/689/EEC. This information should be provided to the licensed waste contractor.

Soils excavated on many sites would generally fall under the EWC description "Soil and Stones", EWC code 17 05 04. Waste Acceptance Criteria (WAC) testing is required for many Inert wastes and generally for all Hazardous Waste but not for non-hazardous waste. There are certain restrictions for inert wastes regarding topsoil and peat. Any asbestos must be disposed of by suitably licensed contractors to a suitably licensed facility.

Health & Safety Aspects

As outlined within the HSE publication 'Successful Health and Safety Management - HSG65', this report should inform your development of safe systems of work and information as an input into the safety management system.

When developing risk control systems we suggest making reference to the CIRIA report 132 "A guide for safe working on contaminated sites" and the HSE document "Protection of workers and the general public during the development of contaminated land – HSG66". All risk control measures should be in accordance with the guidelines laid down within the Management of Health and Safety at Work Regulations 1999.

The contents of this report may be used to supplement the contents of the Health and Safety File as required under the Construction Design and Management (CDM) Regulations.

Where excavations are undertaken on site, trench support or the angle of batter should be designed by an appropriately qualified engineer or competent person to suit the required depth and the ground and groundwater conditions. Care should be taken when digging excavations to prevent undermining or causing loss of support to the foundations of the nearby adjoining structures. Surcharging such as from spoil or vehicle movements close to excavation sides should be avoided. Practical guidance on trench excavation is given in CIRIA Report 97 Trenching Practice. Guidance on groundwater control is given in CIRIA Report 113 Control of groundwater for temporary works. Temporary works should be designed by a suitably qualified engineer or a competent person particularly where personnel access is necessary, in accordance with the requirements of the Construction (Design and Management) (CDM) Regulations.