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Our Ref: TS/INL/E4445/17769

03rd December 2020

Spelthorne Borough Council
Planning Department
C/O
Litchfields Limited

By Email

Dear Sirs

RE: 20/01199/FUL – THE OLD TELEPHONE EXCHANGE, EMSLEIGH ROAD, STAINES SURREY, TW18 4PN

In response to the comments raised by Surrey County Council (LLFA) per their letter dated 4 November 2020 (LLFA-SP-20-0845), we note that the LLFA are not satisfied that the drainage strategy meets the requirements of the NPPF, PPG as well as the Non-Statutory Technical Standards.

With respects to the NPPF and PPG, developments are required to demonstrate that the risk of flooding is not increased elsewhere nor a risk for the future occupants of the scheme.

The proposed run off from the site is designed to be restricted to the existing one-year brownfield run-off rate. Whilst this matches the existing flow rates for the one-year event for all other events (i.e. 1 in 30 and 1 in 100 plus CC) the run-off is still restricted to the one-year rate and thus greatly reduces the peak run-off from this site during these more severe events and hence provides a betterment in terms of reducing flood risk downstream. Furthermore, onsite attenuation provides temporary storage of the surface water on site whilst it is discharged at restricted rates. Hydraulic calculations are provided in Append H of the FRA which demonstrates that the onsite surface network can safety accommodate all storm events up to an including the 1 in 100-year event plus climate change. This follows the principles of flood risk mitigation in accordance with the NPPF and PPG.

With respects to the Non-Statutory Standards and seeking to meet the aspirations of reducing the run-off to the greenfield rates, this is not practical or feasible on this Brownfield site when considering the balance of meeting the built development and there would not be sufficient space to provide further attenuation to meet greenfield run-off rate restrictions. The

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reduction of the discharge rate to the one-year brownfield rate is in compliance with the requirements of the Non-Statutory standards.

A copy of the intrusive investigations has been included in this response which demonstrates that infiltration drainage techniques are not suitable for this site.

With reference to the query over page 20 of the FRA, no infiltration techniques are proposed on this site. Treatment of run-off is proposed through the implementation of green roofs and rain gardens as per the SuDS Hierarchy.

We trust this addresses the queries; please do not hesitate to contact the undersigned should you require any further supporting information

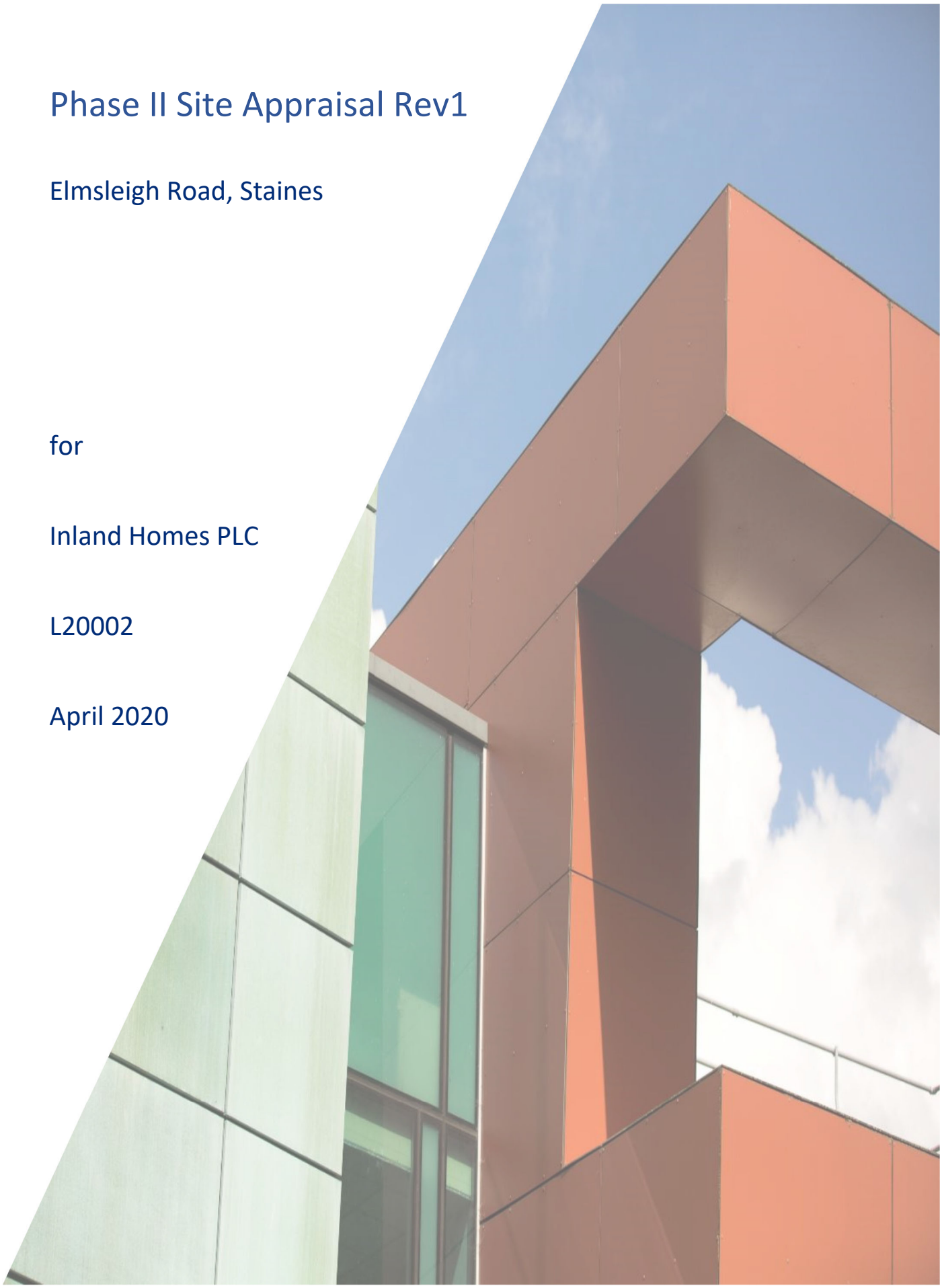
Yours sincerely

TERRY SEYMOUR
ENGINEERING DIRECTOR

PATRICK PARSONS

Phase II Site Appraisal Rev1

Elmsleigh Road, Staines



for

Inland Homes PLC

L20002

April 2020

Phase II Site Appraisal Rev1

Elmsleigh Road, Staines

for

Inland Homes PLC

Revision	Date of issue	Comments	Prepared By	Checked By
0	30/04/2020	Draft Issue	HA	CIK / CRS
1	23/09/2020	Updated to include new layout and final gas risk assessment	CRS	CRS

Should you have any queries relating to this document please contact:

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Summary of Recommendations for Elmsleigh Road, Staines	
Risk to End-Users	Exceedances have been recorded across the site. Significant remediation is not required, however, 300mm clean capping is required in areas soft landscaping.
Risk to Controlled Waters	Moderate risk to controlled waters. Further assessment will be made on receipt of groundwater laboratory data.
Ground Gases	Gas protection measures are required for the communal areas on the ground floor, no protection measures required below ground floor parking areas.
Concrete Specification	FND2 concrete should be suitable for the proposed development.
Water Pipe Specification	Standard PVC (not PE) water pipes should be suitable for the proposed development, subject to confirmation from the utility provider.
Engineering Ground Treatment	Not required.
Likely Foundation Types	Piled foundation solution will be required for the proposed development.
Likely Foundation Depths	Piled foundations.
Bearing Strata	Stiff London Clay Formation (piles).
Allowable Bearing Pressure	85N/m^2 - Langley Silt and 100kN/m^2 - Shepperton Gravel for strip and pad foundations respectively. Targeted investigation recommended to confirm ground and groundwater conditions.
Volume Change Potential	Low volume change potential. (Shallow cohesive soils), High Volume change potential (London Clay).
Tree Influence	Localised deepening for trees and heave precautions may be required subject to completion of tree survey and within the influence of shrinkable soils.
Floor Slabs	Suspended floors required.
Slope Stability Risk	None.
Retaining Walls	Will be required in areas of subsurface construction and areas where levels are being raised.
SUDs	High groundwater, deep made ground and location within Flood risk zone preclude the use of traditional soakaway drainage.
Roads	Variable CBRs 2.6% to 39% in the made ground suggested by the laboratory testing. CBRs should be confirmed by in-situ testing.
Likely Waste Classification	Likely to be non-hazardous subject to confirmation from the receiving landfill. Natural soils likely to be inert.
Other Comments	None

The above summary should not be used in isolation and reference should be made the full report which provides a detailed assessment of the risks affecting the development.

PATRICK PARSONS

Contents

1.0 Introduction

1.1 Commission

Patrick Parsons (PP) have been appointed by Inland Homes PLC (client) to produce a Phase II Site Appraisal for a site known as Elmsleigh Road, Staines. The proposed development area (hereby referred to as 'the site') extends to an area of approximately 0.53 hectares and presently comprises a mix of surface car parking, a former Masonic hall and an area of undeveloped land to the north and east. A site location plan is presented in Appendix A.

1.2 Proposed Development

Current development proposals indicate that the site is to be redeveloped with two twelve to fourteen storey residential apartment blocks with areas of public open space, soft landscaping, private car parking and an access road. A proposed development layout plan is presented in Appendix A.

1.3 Limitations

This report has been prepared for the client and their appointed agents only and should not be relied upon by any third party without the written permission of PP.

If any unauthorised third party comes into possession of this report, they rely on it at their own risk and the authors do not owe them any Duty of Care or Skill. It is based on and limited to an assessment of the information and ground conditions identified here. PP is not responsible for ground conditions not revealed during investigations or undertaken by third parties and have reviewed any information presented in good faith.

1.4 Aim of Phase II Site Appraisal

The client's specific requirements were to undertake a Phase II Site Appraisal. The principal objectives are as follows:

- Obtain information about the soil and groundwater conditions within the area of the site.
- Determine the ground related geotechnical and contamination hazards within the site boundaries that may affect the proposed development.
- Define the Phase I conceptual model (from a previous desk study – see 1.5) and refine to form a Phase II conceptual model.
- Provide development recommendations.
- Provide advice on further works if required.

1.5 Information Sources

This Phase II Site Appraisal is based on the findings of the investigation, chemical analysis and geotechnical testing undertaken during the course of the assessment. The results have been used to refine the conceptual model and initial recommendations outlined in the Phase I Geoenvironmental Desk Study report undertaken by Mott MacDonald in May 2014. The

information included within the report helped to form the rationale for the design of this investigation.

1.5.1 The following reports have been reviewed as part of this report:

- Phase 1 Geoenvironmental Desk Study – Thames Street Quarter, Staines-Upon-Thames by Mott MacDonald. Ref. 330508/EVT/01/B. Dated May 2014

2.0 Summary of Phase I Site Appraisal

The following is a summary of the findings of the Phase I Geoenvironmental Desk Study completed by Mott MacDonald in May 2014 and should not be read in isolation. For full details reference should be made to the report outlined in section 1.5.2. In summary, the Phase I Desk Study highlighted the following:

- The site is roughly triangular in shape and covers an area of approximately 0.3 hectares. The OS grid reference for the site is 503623 171513. The site is in the area of postcode TW18 4PN. The principal access to the site is off Elmsleigh Road.

- The site lies in an urban area surrounded mostly by commercial properties. The site comprises a Masonic hall with associated car park to the south of the site. At the time of desk study report (2014) a telephone exchange building, car park and service yard in the north and east of the site (not present by time of this report). Use of the buildings was primarily for commercial purposes.

- The site topography was generally noted to be flat lying with levels varying no more than two metres across the site.

- The earliest historical mapping reviewed (1880) shows the site was occupied by number of buildings in the centre, the south west and the north of the site. From 1895 to 1899 a large building is present in the south of the site and another building in the south west. By 1914 to 1915 a large building is present in the south west corner of the site. From 1934 to 1935 small buildings are present within the footprint of the former building in the south west, a large building (telephone exchange) is present in the north east of the site and another building is present in the north. By 1963 a works building is present in the south eastern corner of the site. Between 1970 and 1978 the building in the south west corner and the works building in the south east corner no longer appear. Between 1979 and 1987 there is a road alongside the western boundary. From 1987 to 2014 no further changes are noted.

- Based on the earliest available maps, dated 1880, the surrounding land was largely woodlands to the south and the east of the site, with a residential area to the north and west. By 1895 to 1899 a new railway junction is built~200m to the east of the site. 1914 to 1915 mapping shows an industrial estate is present to the north of the site. From 1934 to 1935 residential houses, industrial works, bowling green and tennis court are present to the south of the site. An industrial building is noted to the north west of the site. By 1963 a car park is present directly to the west of the site, additionally there are further industrial developments to the east and the south of the site. Between 1970 and 1978 car parks replace the residential buildings and industrial works to the south west, south and east of the site. In 1979 – 1987 Elmsleigh Road is built alongside the southern and eastern boundaries of the site. An electrical substation is built approximately 15m to the east of the site. The Elmsleigh centre appears to the east of the site as well as a car park. By 2006 a small building is built to the west of the site. No further significant changes have been identified in the subsequent mapping.

- The site is recorded to be underlain by shallow superficial deposits of Langley Silt (Clay and Silt) overlying Shepperton Gravel Formation (Sand and Gravel). The underlying bedrock geology is recorded to be the London Clay Formation comprising blue grey clay weathering to a brown colour near surface when oxidised.

- Made ground is likely to be present across the site associated materials generated from previous building construction and demolition.

- The site does not lie within or in close proximity to a Coal Authority coal mining reporting area. However, one recorded mineral site is located 900m to the south of the site associated with the extraction of sand and gravel from the Shepperton Gravel Formation.

- A preliminary UXO risk assessment desk study has been obtained and the site is recorded to be within an area designated as a low risk for unexploded ordnance.

- The site is not recorded to be within a radon affected area and no radon protection measures are required for new development.

- The superficial geology of the Shepperton Gravel Formation is recorded as a Principal Aquifer, there are four recorded abstraction licences recorded within 1000m of the site the closest being 772m to the north west. The Langley Silt and the solid bedrock geology of the London Clay Formation are recorded to be unproductive strata.

- The site is recorded to be within a Source Protection Zone III. There are four abstraction wells within 1000m of the site the closest being 772m north west.

- The nearest surface water feature is the River Thames which is approx. 150m south west of the site.

- There are no surface water abstraction licences within 500m of the site.

- There are eight recorded licensed discharge consents within 500m of the site, these consents are to discharge sewage effluent, trade effluent and other matters to freshwater stream.

- The site is recorded to be within a flood plain and is located within a flood zone 3.

- There is one reported current or historic landfill sites within 250m of the site. This landfill site is recorded to lie 165m to the south east and was noted to have received inert waste from March 1980 to December 1980.

- There is one recorded substantiated pollution incident located 442m to the south east of the site. This incident was designated as category 2 (significant to water), category 4 (no impact to air) and category 3 (minor to land), the pollutant was not identified.

- The site is located within an Area of High Archaeological Potential (A24). Based upon this classification, a full archaeological investigation and recording of the site and subsequent publication of the results is likely to be required by the Borough Council. It is considered the possibility of archaeological features located under the existing and former building as well as hard standing could be high. If any are found, a full archaeological excavation of at least one metre below existing made ground level could be required.

It is considered that limited extents and thicknesses of made ground will be present at the site associated with the construction and demolition of the current and former onsite buildings. Contaminants of concern are likely to include heavy metals, PAHs, hydrocarbons and asbestos.

3.0 Phase I Conceptual Model

The preceding information has been assessed and a conceptual model produced following current relevant guidance. The site is being considered for residential development with no private garden areas and limited soft landscaping, as such a future residential without plant uptake end-use is considered appropriate. The site has predominantly been used for various commercial land uses including a telephone exchange and Masonic hall as recorded from the available historical mapping. It is therefore considered that the risk of potential contamination is low to moderate and deposits of made ground are likely, associated with the construction and demolition of the existing and former onsite buildings. The contaminants of concern are considered to be heavy metals, polyaromatic hydrocarbons (PAHs), TPHs and asbestos associated with any site derived or imported made ground materials.

In terms of human health, the primary receptors are end-users of the site and construction workers, the pathways include direct contact with contaminated soil and soil dust, ingestion of contaminated soil and dust and the indoor/outdoor inhalation of soil vapour. Given the site history, the features noted and the proposed end use, it is considered that soil contamination at the site poses a low risk to end users and to construction workers.

In terms of risk to human health associated with ground gases, the primary receptors are the end users, the main pathway is inhalation. It is likely that thicknesses of made ground will be present on site associated with the construction and demolition of onsite former and existing buildings and will represent a limited source of ground gas. The proposed development is residential and includes two twelve to fourteen storey apartment blocks with under croft parking and as such the risk to end users will be very low.

In terms of controlled waters, the site is located within a source protection zone with four abstraction licences located within 1000m of the site. The Shepperton Gravel Formation underlying the site is recorded as a Principal Aquifer and the nearest water course, the River Thames, is located approximately 150m to the south west. As such the risk to controlled waters is considered to be moderate. The Phase I conceptual model is illustrated below.

Human Health		
Source	**Pathway**	**Receptor**
Made ground: Contaminants of concern include; hydrocarbons, heavy metals, PAHs and asbestos	Indoor and outdoor inhalation of soil vapours, the ingestion of contaminated soil and soil dust, and direct contact with contaminated soil and soil dust	End users of the completed residential development
Made ground: Contaminants of concern include; hydrocarbons, heavy metals, PAHs and asbestos	Indoor and outdoor inhalation of ground gas and soil vapours, the ingestion of contaminated soil and soil dust and direct contact with contaminated soil and soil dust	Construction workers
Ground gas associated with onsite made ground.	Inhalation	End users of the completed residential development
Controlled Waters		
Made ground: Contaminants of concern include; hydrocarbons, heavy metals and PAHs.	Leaching and lateral migration, vertical migration and surface run off	Principal Aquifer (Shepperton Gravel Formation) Surface Water (River Thames)

4.0 Phase II Ground Investigation

4.1 Fieldwork

The ground investigation (including fieldwork, sampling and laboratory analysis) has been designed to identify and assess potential ground related problems and to allow cost-effective solutions to be advised. It has been planned on the basis of the desk study and site inspection. All fieldwork and soil descriptions were carried out in general accordance with relevant British Standards.

The exploratory holes have been positioned to determine the general ground/groundwater conditions across the proposed development area. Representative samples have been obtained for geotechnical and environmental laboratory analysis. The resultant exploratory hole density is considered to be commensurate with the complexity of the site conditions revealed in the desk study and detail of information required for this phase of the investigation.

The ground investigation was undertaken between 10th March 2020 and 18th March 2020. The investigation comprised a two cable percussion boreholes to a maximum depth of 35.00m begl (below existing ground level) (BH01 and BH03), one cable percussion borehole to a maximum depth of 25.00m begl (BH02), six window sample boreholes to a maximum depth of 4.00m begl (WS02, WS03 and WS05) and two hand-dug foundation pits. Boreholes WS01 and WS03A were discontinued due to buried obstructions (concrete) encountered at a depth of 2.30m begl and 0.65m begl respectively. The exploratory hole location plan and exploratory hole logs are presented in Appendix B.

4.2 Ground Conditions

Concrete obstructions were recorded at the locations of WS01 and WS03A to a maximum depth of 2.30m begl (WS01). The buried obstruction encountered within WS01 is assumed to be the basement floor of the former BT exchange building.

Exploratory holes generally encountered a surface cover of tarmac, concrete or rough ground over made ground.

Made ground was generally recorded to maximum depths of up to 2.80m begl (BH03) . Made ground was typically recorded as either dark grey slightly clayey slightly gravelly sand of concrete, red brick and quartzite or dark grey slightly sandy slightly gravelly clay with concrete and quartzite. The majority of the site recorded the granular made ground material.

Superficial soils underlying the made ground included the Langley Silt and Shepperton Gravel Formation.

The Langley Silt, comprising pale brown sandy silty clay or gravelly silty sand was recorded to a maximum depth of 4.00m begl (WS05) and was also encountered in BH01, WS03 and WS05.

The Shepperton Gravel Formation was encountered underlying the made ground or Langley Silt and was typically recorded as pale greyish yellow sand and gravel, gravelly sand or sandy

gravel of fine to coarse subangular flint and quartzite to a maximum depth of 7.90m begl (BH01). The maximum depth of the Shepperton Gravel was not proven in the window sample boreholes.

Firm to stiff soils of the London Clay Formation were encountered from a minimum depths of 6.80m begl (BH02) and a maximum proven depth of 35.00m begl (BH01 and BH03) becoming very stiff at depths of between 9.50m begl (BH01) and 10.50m begl (BH02 and BH03) to the base of all deep exploratory holes (BH01-BH03).

Corrected SPT N60 values within the made ground ranged from 0 to 27 at 1m begl and 16 at 2m begl. A refusal was also recorded at 2.0m begl in WS01.

Corrected SPT N60 values within the Langley Silt ranged from 6 to 7 at 1m begl; 0 to 11 at 2m begl; 10 to 21 at 3m begl and 16 at 4m begl.

Corrected SPT N60 values within the Shepperton Gravel ranged from 11 to 29 at 3m begl; 16 to 38 at 4m begl; 16 to 26 at 5m begl; 21 to 25 at 6m begl and 12 at 7m begl. A loose horizon was recorded at depths between 5.4m begl and 7.3m begl within BH03 where SPT N60 values of 5 and 7 were recorded.

Corrected SPT N60 values within the London Clay generally ranged from 24 to 49 in the depth range 7m begl and 21m begl to 28m begl and a general trend of increasing SPT N60 was observed with depth. A corrected SPT N60 value of 10 was recorded in the London Clay at a depth of 8.5m begl in BH01. Refusals were recorded in all cable percussion boreholes at depths of 31.5m begl and 35m begl (BH01); at 25m begl (BH02 and at 27.5m begl, 29.5m begl and 35m begl (BH03).

Existing Building Foundation Depth and Design

Foundation Pit Location	Observed Foundation Width (m)	Foundation Maximum Depth (m)	Comments
TP01	0.40	0.60	None
TP02	0.35	0.75	None

Foundation cross sections have been included in Appendix B for reference.

4.3 Groundwater

Groundwater was encountered in all boreholes at depths of between 2.3m begl and 2.8m begl, with the exception of WS01 and WS03a, which were terminated at depths of 2.3m begl and 0.65m begl respectively. Subsequent monitoring of the wells installed in BH01, BH02, WS02, WS03 and WS04 recorded groundwater levels at between 2m begl and 2.54m begl.

4.4 Contamination Observations

No visual or olfactory evidence of potential contamination was recorded on-site during the investigation.

4.5 Chemical Analysis

Chemical laboratory analyses were selected to provide the parameters necessary to make an assessment of the suitability for the re-use of soils on the site as well as to inform risk assessment for end users and controlled waters. The choice of contamination testing was based on commonly occurring potential contaminants and on-site visual observations of contaminated soils. The chemical analysis results are presented in Appendix D. In summary the following testing has been completed:

- 10no. samples of made ground and natural soils for a general suite of contaminants - metals, inorganics, PAH and asbestos.
- 10no. samples for speciated TPH testing.
- 6no sample of made ground and natural soils for leachate testing.

4.6 Geotechnical Testing

Geotechnical soils testing has been undertaken as part of the ground investigation to provide the parameters necessary for the budgetary design of the development. The geotechnical test results are presented in Appendix E. In summary the following testing has been completed:

- 7no. samples for BRE SD1 tests (pH and water-soluble sulphates).
- 8no. samples for Atterberg Limit tests.
- 9no. samples for Quick Undrained Triaxial Tests.
- 5no. samples for Hand Shear Vane testing.
- 2no. samples for Remoulded Laboratory CBR Tests.

5.0 Human Health Risk Assessment (Ground Gas)

5.1 Introduction

Five gas/groundwater monitoring standpipes have been installed across the site (BH01, BH02, WS02, WS03 and WS04). The response zones have been designed to target both made ground and natural strata.

The monitoring programme comprised four visits over a minimum two-month period using a GA5000 Multi-Function Gas Analyser; the results of this visit are presented in Appendix C.

The monitoring has recorded a maximum and steady carbon dioxide concentration of 11.90% v/v, a minimum oxygen concentration of 1.90% v/v and a maximum methane concentration of 0.70%. Traces of carbon monoxide up to 3ppm were detected but no hydrogen sulphide was recorded during the monitoring. A maximum flow rate of 0.2l/hr was recorded.

In accordance with BS 8485:2019 the Gas Screening Values (GSV) for the site has been calculated. Using the maximum steady flow rate of 0.1 l/hr, maximum steady carbon dioxide concentration of 11.90% v/v and a methane concentration of 0.7% v/v the GSVs of 0.0238 l/hr for carbon dioxide and 0.0021 l/hr for methane have been calculated. This equates to Characteristic Situation 1 (CS1). However, as the maximum carbon dioxide level is >5% the guidance states that consideration has to be given to increasing the gas classification; the 5% threshold has been breached in multiple standpipes on at least three occasions, this along with the fact that the maximum concentration recorded is 11.90% is sufficient cause to raise the gas classification for the site to CS2. The required gas protection measures are outlined in section 10.2.

The gas monitoring results to date are presented in Appendix C.

6.0 Human Health Risk Assessment (Soil)

6.1 Introduction

Current development proposals indicate that the site is to be redeveloped with two twelve to fourteen storey residential apartment blocks with very limited areas of public open space, soft landscaping, car parking (under croft) and access roads.

The Phase II investigation works has revealed the presence of thicknesses of made ground across the site. It is considered that this may pose a potential, but low risk of contamination to end users of the proposed development and construction workers and a moderate risk to controlled waters.

Representative samples of all strata encountered were collected for further examination and/or potential testing.

The Generic Assessment Criteria (GAC) used by Patrick Parsons are presented in Appendix F. For this site the chemical analysis results are being compared against the GAC for residential end-use without plant uptake with a soil organic matter (SOM) content of 1%, this is considered to be the most appropriate GAC based on the most sensitive end-use for the proposed development.

6.2 Risk to End-Users

The chemical analyses of the made ground and natural soils show the following exceedances compared against the GAC for a residential without plant uptake end-use. No other samples have displayed exceedances of GAC values for any of the determinands analysed. The exceedances to the relevant GACs and their respective locations are tabulated below.

Determinand	GAC (mg/kg)	Exceedance (mg/kg)	Location (Exploratory Hole)
Asbestos Fibres	Presence	0.040 (%)	WS03 – 0.60m
Asbestos Fibres	Presence	0.005 (%)	BH01 – 0.50m
Asbestos Fibres	Presence	0.001 (%)	WS03A – 0.50m
Lead	310	350	WS02 – 0.60m
Dibenz (a,h) anthracene	0.31	0.43	WS03 – 0.60m
Dibenz (a,h) anthracene	0.31	0.34	WS03A – 0.50m

The chemical analyses have recorded exceedances of a single PAH species in the locations of WS03 and WS03A, as well as an exceedance of Lead in WS02 at 0.60m begl when compared to the relevant screening values. The chemical analysis has not identified exceedances at any other locations tested when compared against the GAC. None of the natural soils tested exceeded even the most stringent GAC values for a residential with plant uptake end use. Three locations (WS03, WS03A and BH01) recorded a presence of Asbestos fibres (Chrysotile and Amosite), quantification testing was undertaken on confirmation of fibres with a maximum quantity of 0.040% within WS03 at 0.60m begl.

Whilst the chemical analysis has identified a number of areas where GAC values are exceeded, it is considered that due to the nature of the proposed development, comprising primarily hard standing areas with minimal areas of soft landscaped public open space that the source-pathway-receptor model is broken in areas of hard standing and the building footprint and remediation will not be required in these areas.

In soft landscaping areas, it is considered that a pathway will still exist between source and receptor (end user) and therefore all soft landscaping areas will likely require remediation in the form of 300mm clean capping (see section 10 for details).

Full results of chemical analysis are presented in Appendix D.

6.3 Risk to Construction Workers

Construction workers have a much shorter exposure time and as such the GAC used to assess the long-term exposure risk to end users are considered unnecessarily conservative. Although minimal risk from asbestos fibres is present on site the presence of asbestos fibres should be included in the groundworkers risk assessment and method statement.

Low oxygen concentrations were encountered during the gas monitoring in all monitoring wells (BH01, BH02, WS02, WS03 and WS04) and consideration should be given to enclosed space working in the ground workers risk assessments.

A preliminary UXO risk assessment has been undertaken by First line dated December 2019. The risk assessment determined that the risk to the site posed by UXO is low.

7.0 Controlled Waters Risk Assessment

7.1 Introduction

The soil leachate chemical analysis identified exceedances of Arsenic and Lead in two locations (WS02 and WS03) across the site within the made ground.

A Principal Aquifer has been identified in the underlying Shepperton Gravel formation, with four recorded extractions listed within 1km of the site, the site area is listed as a Groundwater source protection zone III.

Testing conducted on groundwater samples obtained from the monitoring wells during the most recent visit are currently being analysed, results of this testing will be reported in a revised report.

Based on the presence of a potential source within the onsite soils, a credible migratory pathway and a sensitive receptor at shallow depth within the Shepperton Gravel Formation the site at this present time does pose a moderate risk to controlled waters. The impact on the controlled waters receptor will be assessed on receipt of the groundwater test results.

8.0 Construction Materials Risk Assessment

8.1 Water Supply Pipes

The chemical analysis results have been compared against UK Water Industry Research (UKWIR) Contamination Thresholds for sub-surface water pipes.

Based on the site history and the chemical analysis completed, it considered that the site will be suitable for standard PVC, not PE water pipes. Confirmation from the utility provider will be required.

8.2 Buried Concrete

Based on the maximum recorded water-soluble sulphate (between 0-1400g/l) and pH (>6.5) the made ground and natural soils below the site (assuming mobile groundwater conditions) may be assumed as DS-2 and the ACEC Class as AC-2 (in accordance with BRE Special Digest 1 (2005)). This equates to a DC-2 classification and as such in accordance with BS 8500 FND2 concrete would be suitable for unreinforced and reinforced concrete.

9.0 Phase II Conceptual Model

The preceding information has been used to revise the conceptual model.

The chemical analysis has identified elevated levels of PAHs, Lead and Asbestos fibres within the shallow made ground compared to GAC values for a residential without plant uptake land use. The elevated levels of contaminants has been identified in areas of the proposed building hardstanding and limited areas of soft landscaped public open space. In areas of proposed hard standing and the building footprints remediation will not be required since the pathway to the receptor will be broken. However, in areas of soft landscaping it is considered that remediation to protect end-users will be required. Full results of the chemical analysis are presented in Appendix D.

Based on the results of the first ground gas monitoring visit it is considered that the site does not require ground gas precautions; however, confirmed recommendations will not be provided until the completion of the ground gas monitoring programme. A final gas risk assessment will be compiled on completion of the four monitoring visits.

There is no requirement for radon precautions.

In terms of controlled waters, the site has recorded a limited number of potential sources within the made ground as identified within the chemical analysis. Potential receptors have also been recognised within the Shepperton Gravel Formation being a designated Principal Aquifer and the site is also within a Source Protection Zone 3. Additionally, leachate testing has indicated that contamination has the potential to leach from the onsite soils. Results from the water monitoring visits have not been received to date but analysis of whether the elevated contaminants are migrating into the underlying principal aquifer will be assessed on receipt of these results. Thus, at this stage there is low but demonstrable risk to controlled waters posed from the site.

The Phase II conceptual model is illustrated below.

Human Health		
Source	**Pathway**	**Receptor**
Made ground: elevated PAHs, Lead and Asbestos	Indoor and outdoor inhalation of soil vapours, the ingestion of contaminated soil and soil dust, and direct contact with contaminated soil and soil dust	End users of the completed residential development
Made ground: elevated PAHs, Lead and Asbestos. Depleted concentrations of oxygen	Indoor and outdoor inhalation of ground gas and soil vapours, the ingestion of contaminated soil and soil dust and direct contact with contaminated soil and soil dust	Construction workers
Ground gases	Inhalation	End users of the completed residential development
Controlled Waters		
Elevated concentrations of Lead and Arsenic in Made Ground Leachate testing	Vertical migration Lateral migration	Principal Aquifer (Shepperton Gravel Member) Surface Water (River Thames)

10.0 Remediation

10.1 Protection of End-Users

The chemical analysis has revealed exceedances of PAHs within the made ground encountered WS03 and WS03A as well as an exceedance of Lead in the made ground in WS02 when compared against the GAC for residential end-use without plant uptake. Asbestos fibres (chrysotile and amosite) were detected in WS03, WS03A and BH01. It is considered that due to the nature of the proposed development, comprising primarily hard standing and apartment blocks with no private garden areas, there is limited risk to the end user and widespread remediation is not required. However, in areas of soft landscaped public open space the use of 300mm clean topsoil / sub soil capping should be adopted to ensure the potential linkages between source and receptor are broken as a precautionary approach. Additionally, a watching brief to identify any visible potential Asbestos material is advised during any intrusive groundwork activities.

Made ground arisings may be re-used on the site as general non-structural fill material provided that they are capped by hard standing, buildings or 300mm of clean soils capping. Natural ground arisings may be re-used on site as clean soils capping. Subject to additional assessment the natural gravels may be suitable for use as a compacted fill beneath pathways and parking areas. Made ground and natural soil arisings should be segregated for this purpose if required.

Should additional topsoil be required for any areas of proposed soft landscaping this will need to be imported. Imported topsoil will need to be chemically validated to ensure it is suitable for a residential with plant uptake end-use. All imported soils should be chemically validated at the rates shown in the table below:

Source and Validation Rate	**Chemical Analysis Suite**		
	General Soil Suite	Asbestos	Hydrocarbons (TPHCWG)
Greenfield Source 1 per 150m³	✓		
Brownfield Source 1 per 100m³	✓	✓	✓
Generated Soil 1 per 50m³	✓	✓	✓

The results of the chemical validation should be compared to the GACs for a residential with plant uptake end-use as included in Appendix F and should comply with BS3882 specification for topsoil.

10.2 Human Health - Ground Gas

The ground gas monitoring programme comprised four visits over a five-month period, during varying atmospheric conditions. Whilst the calculated GSVs suggest a CS1 gas classification it is considered that due to consistently elevated levels of carbon dioxide that as CS2 classification is adopted.

As the proposed development comprises a residential apartment block with only car parking and communal areas on the ground floor it is considered that the development comprises 'Type C' in accordance with table 3 of BS8485:2015 and as such set out in table 4 of the same document a gas protection score of 2.5 will need to be achieved; this will only apply to the communal areas on the ground floor, the areas of car parking will not gas protection measures due to the high levels of ventilation required to vent car exhaust fumes.

To achieve the 2.5 points for the communal areas the following measures are recommended:

Gas Protection Element	**Score**
Cast in situ monolithic reinforced ground bearing raft or reinforced cast in situ suspended floor slab with minimal penetrations	1 - 1.5
Gas resistant membrane meeting all of the following criteria: • sufficiently impervious to the gases with a methane gas transmission rate <40.0 ml/day/m2/atm (average) for sheet and joints (tested in accordance with BS ISO 15105-1 manometric method); • sufficiently durable to remain serviceable for the anticipated life of the building and duration of gas emissions; • sufficiently strong to withstand in-service stresses (e.g. settlement if placed below a floor slab); • sufficiently strong to withstand the installation process and following trades until covered (e.g. penetration from steel fibres in fibre reinforced concrete, penetration of reinforcement ties, tearing due to working above it, dropping tools, etc); • capable, after installation, of providing a complete barrier to the entry of the relevant gas; and • verified in accordance with CIRIA C735 [N1]	2
Total	**3 – 3.5**

It should be noted that achieve the 1.5 points for the ground floor slab it would need to be suitably reinforced to prevent cracking. Also to achieve the 2 points for the membrane it will need to be validated by an independent 3rd party.

Radon precautions are not required.

The above recommendations are subject to approval from the Local Authority.

10.3 Protection of Construction Workers

Specific remediation to protect construction workers with regard to soil contamination is not required. However, as standard, suitable personal protective equipment (PPE) in line with the ground workers risk assessment should be adopted, additionally the potential presence of asbestos fibres on site should be included in the groundworkers risk assessment and method statement, these recommendations should account for the results of the soils contamination testing.

The risk to the site from UXO is considered to be low and as such, no further actions need to be taken.

The monitoring has recorded depleted oxygen concentrations and as such this should be considered in the risk assessment for any excavation where person-entry is required or relevant enclosed space working.

10.4 Protection of Controlled Waters

The site is considered to pose a potential moderate risk to controlled waters. Recommendations on whether any further actions will need to be taken will be finalised on receipt of the groundwater laboratory test results.

10.5 Protection of Construction Materials

It is anticipated that PVC (not PE) pipework for domestic water supply will be required, subject to approval from the utility provider. In accordance with BS 8500:2016 FND2 concrete would be suitable for unreinforced and reinforced concrete respectively.

10.6 Waste Disposal Classification

At this stage, based on the results of the chemical analysis it is considered that should any material, excluding tarmac surfacing, require removal from site it likely be suitable for disposal as non-hazardous subject to confirmation by the receiving landfill site. Natural soils are likely to be suitable for disposal as inert and therefore segregation of the natural and made ground soils is recommended.

11.0 Geotechnical Appraisal

11.1 Introduction

Current development proposals indicate that the site is to be redeveloped with two twelve to fourteen storey residential apartment blocks with areas of soft landscaping, car parking and access roads.

11.2 Excavation conditions

Excavation of the soils encountered during the ground investigation should be easily achieved using conventional hydraulic equipment. Concrete obstructions were encountered in two of the shallow window sample boreholes and breaking out of sub surface concrete may be required. Trench support will be required in areas where made ground or shallow granular soils are encountered. Full support should be provided to any excavation where person entry is required.

Based on monitoring to date groundwater is expected to be encountered at shallow depth at between 2.00 and 2.80m begl. Should water be encountered during the excavation of material, de-watering via sump pumping will be required to control any ingress within excavations and depress the groundwater to below the base of excavations.

Where excavations are deeper and significant de-watering could be required, consideration needs to be given to the stability of adjacent structures.

11.3 Subsurface Structures

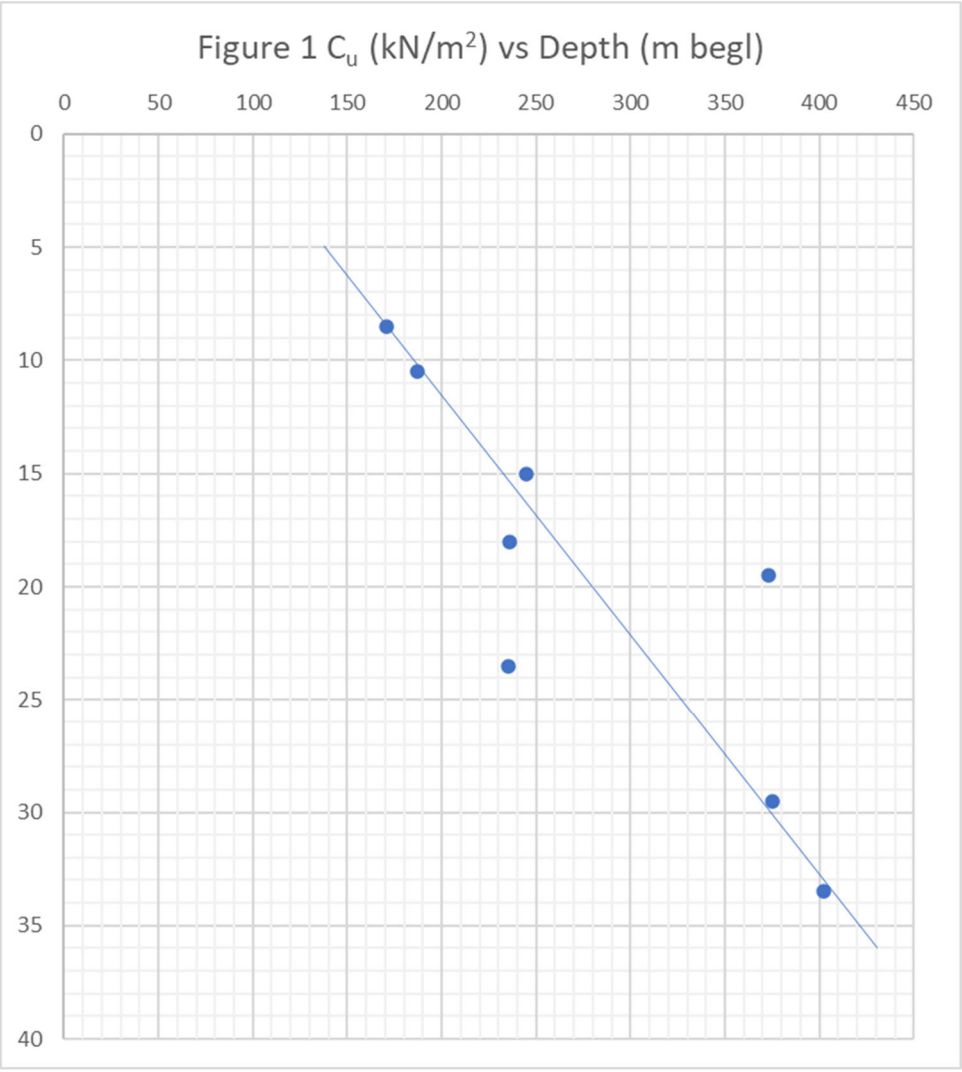
Buried concrete obstructions were recorded in the locations of WS01 and WS03A, encountered at a depth of 2.30m and 0.65m begl respectively. It is likely that these obstructions relate to the presence of previous foundations or slabs from historic structures or former basement structures.

A piled foundation solution will be required for all the proposed structures due to the height and expected loadings. Piled foundations must be progressed into the Stiff London Clay Formation underlying the Shepperton Gravel Formation natural strata .

The laboratory test results have confirmed that the cohesive soils at shallow depth are of low-volume change potential and soils of the deeper London clay are of high-volume change potential, as such, in accordance with NHBC Chapter 4.2 localised deepening of foundations due to tree influence may be required, however, low volume change soils may be assumed.

Pile type and depth should be confirmed by a specialist piling contractor; however, preliminary calculations using published methods indicate the following capacities for CFA piles:

Pile Diameter / Pile Depth	450mm	600mm	750mm
10m	190kN	431kN	598kN
15m	484kN	703kN	952kN
20m	840kN	1190kN	1578kN
25m	1246kN	1744kN	2284kN
30m	1726kN	2397kN	3116kN



The above have been calculated assuming average shear strengths along the length of the pile embedded within the London Clay and undrained shear strength at the base of the pile based on the trendline of the shear strengths and shear strengths determined from N60 values vs depth presented in the graph, figure 1. Skin friction from the made ground and Langley Silt has been ignored and potential negative skin friction has not been included in the calculations, the skin friction from the Shepperton Gravels has been added. Limiting factors associated with the material strength of the piles have not been taken into account.

It should be noted that the above figures only give a rough estimation of pile capacities and prior to any detailed design of foundations or sub-structures likely pile capacities should be confirmed by a specialist piling contractor as their in-house design methods in most cases can provide higher safe working loads than can be calculated using published methods.

Even where piles and ground beams are adopted potential heave associated with existing trees will need be considered during foundation and floor slab design. Where new substructures are within the potential heave zone associated with existing trees heave protection will be required under floor slabs, under all ground beams and on the inside face of external ground beams.

Shallow traditional spread footings should not be founded within the made ground. Allowable bearing capacities of 85kN/m^2 should be assumed for pads or strip footings founded within the Langley Silt. Allowable bearing capacities of 100kN/m^2 should be assumed for strip or pad footings bearing onto the Shepperton Gravels. However, the depth to Langley Silts and Shepperton Gravels is variable across the site and groundwater level relatively shallow. Also localised very loose conditions exist which would result in unacceptable differential settlements. It is recommended that specific ground investigation is carried out once any areas that require shallow spread footings have been finalised to confirm the ground conditions and bearing capacities.

Foundations, including piles and ground beams, as well as floor slabs, should be designed to account for tree influence and potential heave associated with existing trees.

If proposed structures have basements these features should be designed to resist potential uplift forces (heave) associated with removal of surcharge loading provided by the removed soil. As ground water levels are relatively shallow below the site any basement structures would need to consider potential buoyancy.

11.4 Floor slabs

Based on the recorded thicknesses of made ground it is considered the use of ground bearing floor slabs for the proposed development will be precluded.

11.5 New Access Roads and Car Parking

The proposed development includes parking areas and access roads. The near-surface made ground was subject to laboratory CBR testing. The results suggest variable CBRs within the made ground, ranging from 2.6% to 39%. Areas of soft/loose made ground were encountered during the investigation and these may require proof rolling to identify and remove soft spots if they are not improved by rolling.

11.6 Soakaway Drainage

Based on the presence of shallow ground water recorded within the boreholes, the thickness of made ground and the site locality within a zone 3 Groundwater flood risk zone the site is unsuitable for traditional soakaway drainage.

11.7 Slope Stability

Based on the current site gradients it is considered unlikely that the site will present any slope stability issues.

11.8 Retaining Structures

Given the existing topography in the areas of proposed development it is considered that no significant retaining structures are likely to be required. Retaining structures will be required in areas of proposed subsurface development and parking areas. Retaining structures for any subsurface structures or changes in site levels across the site should be Engineer designed.

12.0 Further Investigation

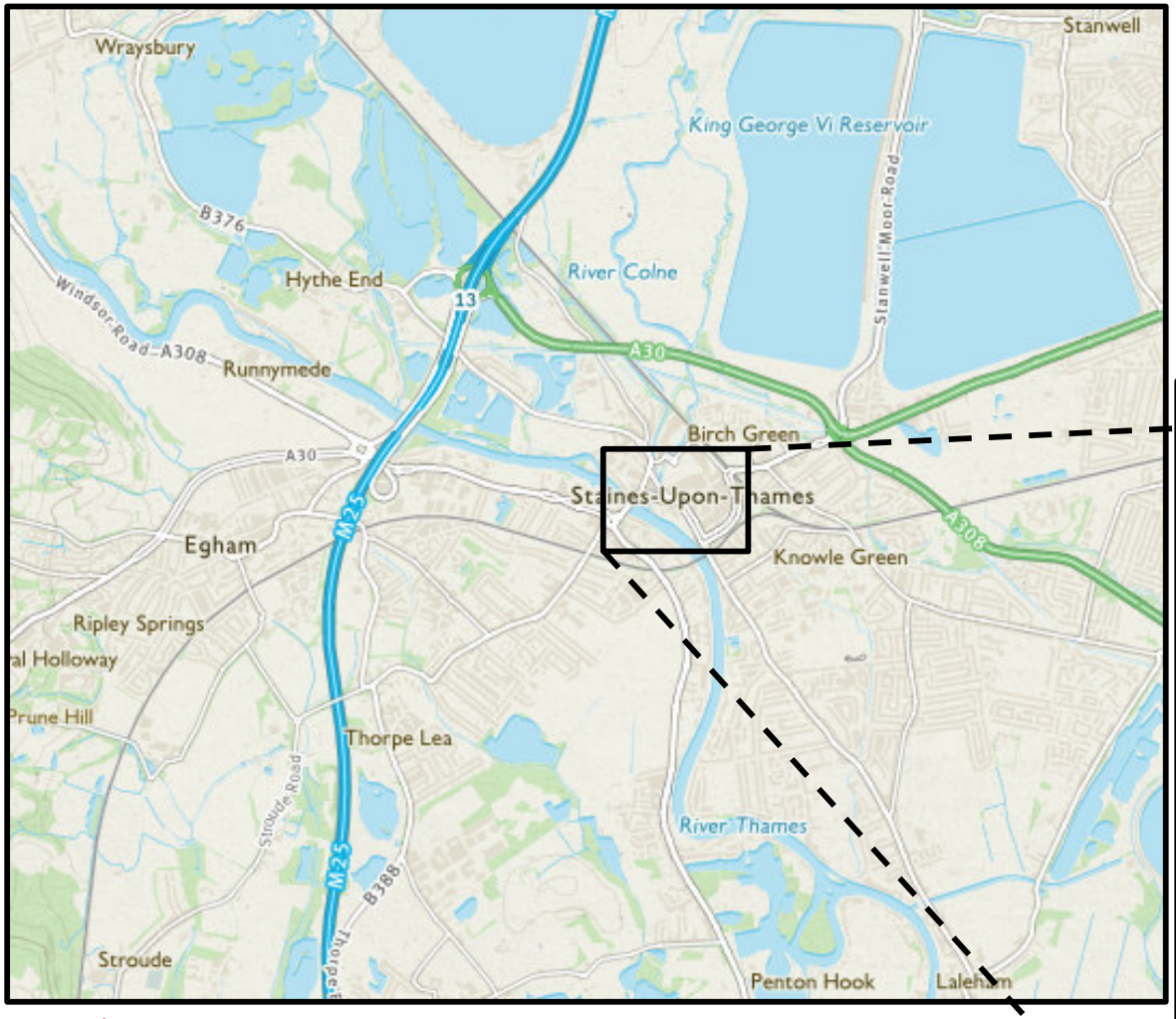
Based on the ground conditions encountered in the site investigation it is considered that following further works are required:

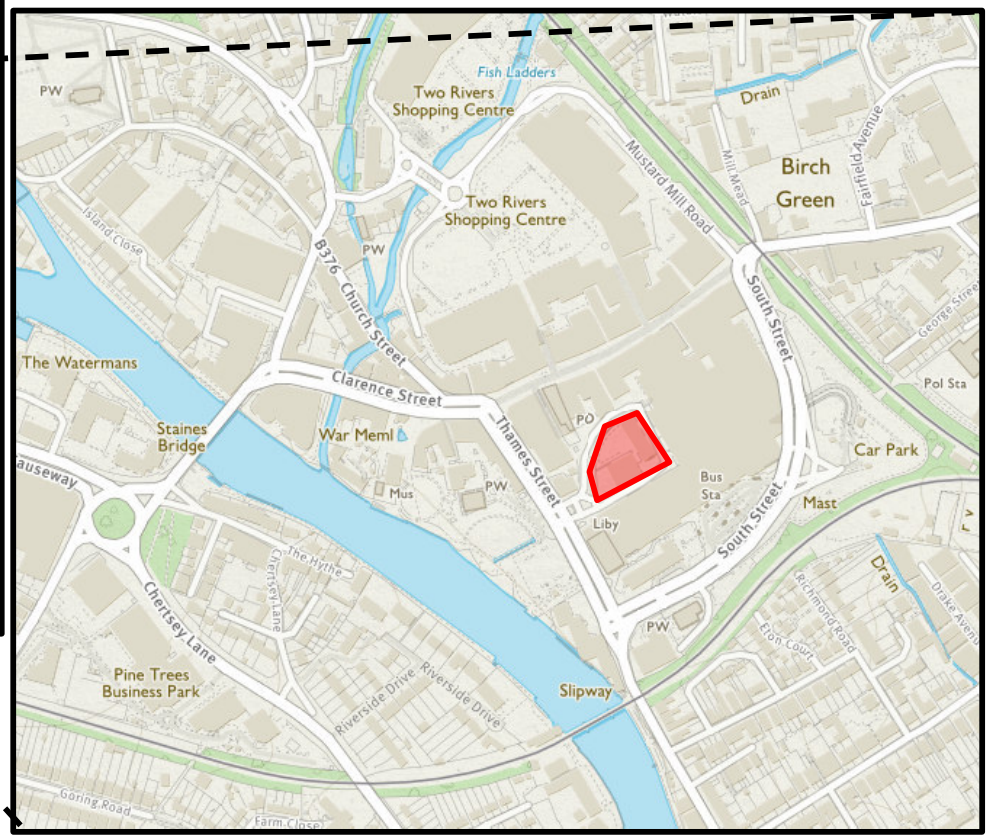
- Targeted investigation to determine local bearing capacities for shallow spread foundations if required.

Following review of this report a copy of it should be submitted to the Local Authority planning department prior to any development works as this is often a condition of planning.

Appendix A

Figures





= Approximate site boundary

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Client: Inland Homes PLC	Project No.: L20002	Scales: Not to scale	Issue: 0
Project: Elmsleigh Road, Staines	Title: Site Location Plan	Design/drawn: HA	Checked: JPB
		Drawing no: L20002-701	Rev. 0

0m 1m 3m 5m 10m

N

NOTES

- To be read in conjunction with Design and Access Statement and consultant reports.
- Site ownership taken from relevant title deed plans.
- Context taken from OS data.
- All layouts to suit design brief.
- Private and balcony provision as per design brief.
- Spatial requirements to suit relevant nationally described housing standards.
- External landscape design by others.
- All structure, external and internal walls shown in black.
- Refer to compliance plans for furniture and flat layouts. To suit relevant Part M requirements.
- Structure indicative only and subject to change

Boundary Key

- Site Boundary
- Application Boundary

General notes

All setting out must be checked on site
All levels must be checked on site and refer to Ordnance Datum Newlyn unless alternative Datum given
All fixings and weatherings must be checked on site
All dimensions must be checked on site
This drawing must not be scaled
This drawing must be read in conjunction with all other relevant drawings, specification clauses and current design risk register
This drawing must not be used for land transfer purposes
Calculated areas in accordance with Assael Architecture's Definition of Areas for Schedule of Areas
This drawing must not be used on site unless issued for construction
Subject to survey, consultation and approval from all statutory Authorities

Revision Status:
P=Preliminary
C=Contract

Drawing notes

Electronic file reference

AA A3445 200 Plans

Status R:	Revision	Date	DRN	CHK	CDM
9	Design Freeze	21/08/2020	DS	MR	
10	Issued for Design Freeze	28/08/2020	DS	MR	
11	Application boundary	15/09/2020	MR	JL	

Purpose of information

The purpose of the information on this drawing is for:

- Planning ☐
- Information ☒
- Comment ☐
- Client approval ☐
- Construction ☐

All information on this drawing is not for construction unless it is marked for construction.

Client

Inland Homes

Project title

A3445 - Elmsleigh Road Staines-Upon-Thames

Drawing title

Ground Floor Proposed

Scale @ A1 size: **1:200**

Date: **Jan '20**

Drawing Nº

ERS-ASA-ALL-00-DR-A-0200

Status & Revision

P11

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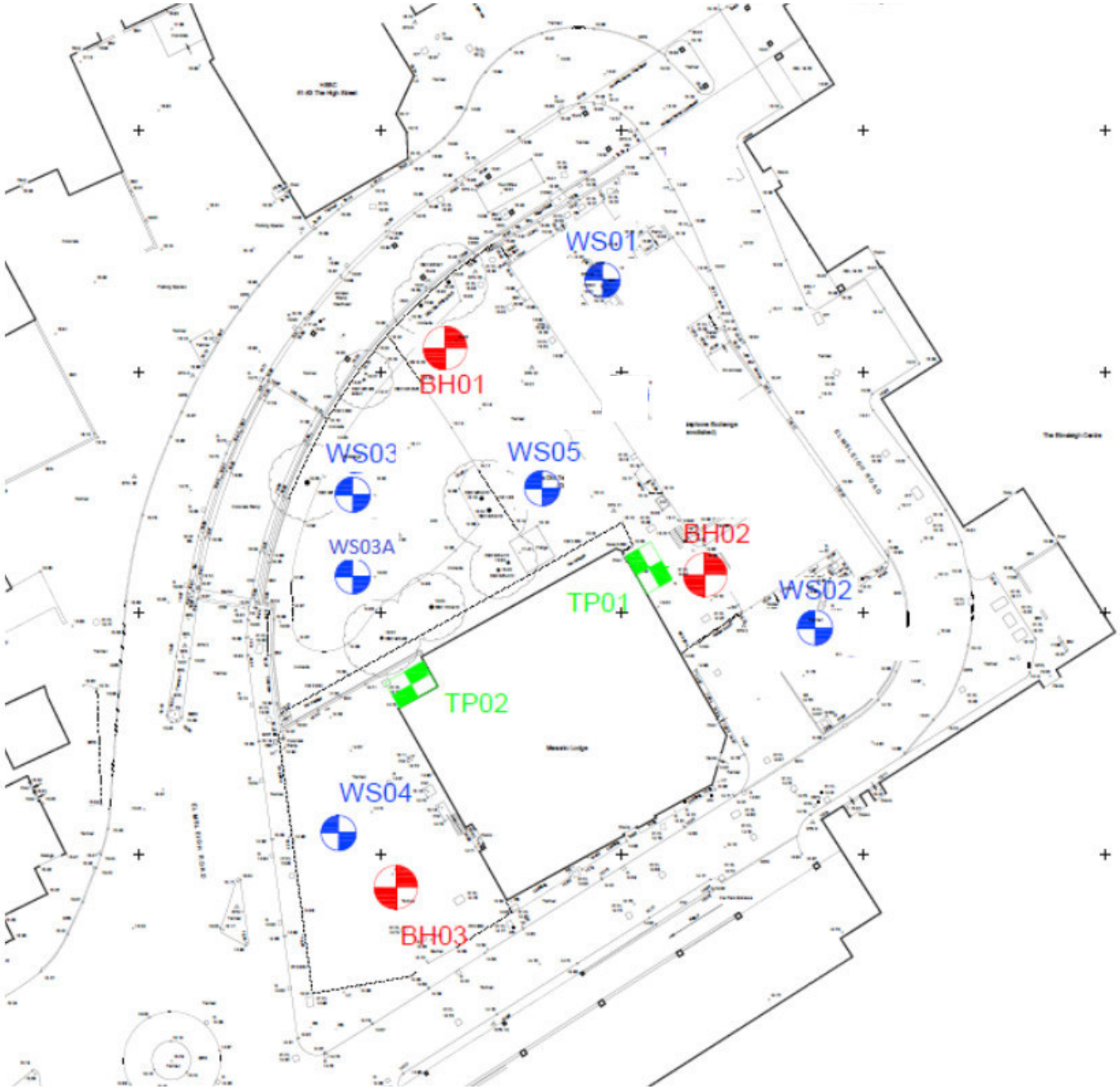

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Client: Inland Homes PLC	Project No.: L20002	Scales: Not to scale	Issue: 0
Project: Elmsleigh Road, Staines	Title: Exploratory Hole Location Plan	Design/drawn: HA	Checked: JPB
		Drawing no: L20002-704	Rev. 0

Appendix B

Exploratory Hole Logs and Field Data

PATRICKPARSONS

Cable Percussive Borehole Log

Borehole No. **BH01**

Sheet 1 of 4

Project Name: Elmsleigh Road, Staines	Project No. L20002	Co-ords:	Hole Type CP
Location: Elmsleigh Road, Staines		Level:	Scale 1:50
Client: Inland Homes PLC		Dates: 11/03/2020	Logged By HA

Well	Water Strikes	Sample and In Situ Testing Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
					0.30			MADE GROUND: Pale grey slightly silty sandy gravel. Gravel is fine to coarse subangular concrete, red brick and quartzite.
					0.50			MADE GROUND: Pale grey sandy gravel. Gravel is fine to medium subangular compacted concrete.
G								MADE GROUND: Pale brown slightly sandy slightly gravelly clay. Gravel is fine to coarse subangular concrete, red brick and quartzite.
		1.50	D		1.50			
		1.50	SPT	N=7 (1,0/1,2,2,2)				MADE GROUND: Brown slightly silty slightly sandy reworked CLAY.
					1.80			Light brown sandy silty CLAY.
		2.00	B					
		2.00	D					
	▼	2.50	D					
		2.50	SPT	N=7 (1,0/0,3,2,2)				
		3.00	D					
		3.50	D					
		3.50	SPT	N=12 (2,3/3,3,3,3)	3.60			Medium dense brown SAND and GRAVEL. Gravel is fine to coarse subangular flint and quartzite.
		4.00	B					
		4.50	B					
		4.50	SPT	N=33 (1,2/4,9,9,11)				
		5.00	D					
		5.50	B					
		5.50	SPT	N=15 (2,1/2,3,4,6)				
		6.00	D					
		6.50	B					
		6.50	SPT	N=20 (2,3/4,4,5,7)				
		7.00	B					
		7.00	D					
		7.50	D					
		7.50	SPT	N=11 (2,3/2,2,3,4)				
		8.00	B		7.90			Firm to stiff grey slightly silty CLAY.
		8.50	D					
		8.50	SPT	N=9 (1,2/2,2,2,3)				
		9.00	D					
		9.50	D					
		9.50	SPT	N=31 (4,6/7,7,8,9)				*below 9.50m begl becomes very stiff.*
		10.00	D					

Continued on Next Sheet

Remarks

1. Borehole installed with gas and groundwater monitoring standpipe on completion. 2. Borehole completed at 35.00m begl.

AGS

PATRICKPARSONS

Cable Percussive Borehole Log

Borehole No. **BH01**

Sheet 2 of 4

Project Name: Elmsleigh Road, Staines	Project No. L20002	Co-ords:	Hole Type CP
Location: Elmsleigh Road, Staines		Level:	Scale 1:50
Client: Inland Homes PLC		Dates: 11/03/2020	Logged By HA

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		10.50	U100	Ublow=65					
		11.00	D						11
		12.00	D						12
		12.00	SPT	N=31 (5,5/6,7,9,9)					
		13.00	D						13
		13.50	D						
		13.50	SPT	N=30 (4,5/6,7,8,9)					
		14.00	D						14
		15.00	U100	Ublow=85					15
		15.50	D						
		16.00	D						16
		16.50	D						
		16.50	SPT	N=33 (5,6/9,7,8,9)					
		17.00	B						17
		18.00	D						18
		18.00	SPT	N=35 (6,6/9,8,9,9)					
		18.50	D						
		19.00	D						19
		19.50	D						
		20.00	U100	Ublow=100					20

Continued on Next Sheet

Remarks

1. Borehole installed with gas and groundwater monitoring standpipe on completion. 2. Borehole completed at 35.00m begl.

AGS

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Cable Percussive Borehole Log

Borehole No. **BH01**

Sheet 3 of 4

Project Name: Elmsleigh Road, Staines	Project No. L20002	Co-ords:	Hole Type CP
Location: Elmsleigh Road, Staines		Level:	Scale 1:50
Client: Inland Homes PLC		Dates: 11/03/2020	Logged By HA

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		21.00	D						21
		21.50	D						
		21.50	SPT	N=47 (6,7/9,12,12,14)					
		22.00	D						22
		23.00	D						23
		23.50	D						
		23.50	SPT	N=43 (6,8/8,11,12,12)					
		24.00	D						24
		25.00	D	Ublow=100					25
		25.50	U100						
		26.00	D						26
		27.00	D						27
		27.50	D						
		27.50	SPT	N=46 (7,9/11,11,12,12)					
		28.00	D						28
		29.00	D						29
		29.50	U100	Ublow=100					
		29.95	D					*between 29.00m and 29.50m band of black rounded flint gravels.*	
								Continued on Next Sheet	30

Remarks

1. Borehole installed with gas and groundwater monitoring standpipe on completion. 2. Borehole completed at 35.00m begl.

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Cable Percussive Borehole Log

Borehole No. **BH01**

Sheet 4 of 4

Project Name: Elmsleigh Road, Staines	Project No. L20002	Co-ords:	Hole Type CP
Location: Elmsleigh Road, Staines		Level:	Scale 1:50
Client: Inland Homes PLC		Dates: 11/03/2020	Logged By HA

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		31.00	D					
		31.50	D					
		31.50	SPT	50 (27 for 140mm/50 for 160mm)				
		32.00	D					
		33.00	D					
		33.50	U100	Ublow=100				
		33.70	D					
		35.00	D		35.00			End of Borehole at 35.00m
		35.00	SPT	N=50 (8,9/50 for 290mm)				

31 32 33 34 35 36 37 38 39 40

Remarks

1. Borehole installed with gas and groundwater monitoring standpipe on completion. 2. Borehole completed at 35.00m begl.

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Cable Percussive Borehole Log

Borehole No. **BH02**

Sheet 1 of 3

Project Name: Elmsleigh Road, Staines	Project No. L20002	Co-ords:	Hole Type CP
Location: Elmsleigh Road, Staines		Level:	Scale 1:50
Client: Inland Homes PLC		Dates: 17/03/2020	Logged By HA

Well	Water Strikes	Sample and In Situ Testing Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
		0.20	B		0.20			MADE GROUND: Asphalt.
		0.50	D					MADE GROUND: Brown slightly sandy gravelly clay with low cobble content. Gravel is fine to coarse subangular concrete, red brick, metal, glass and quartzite. Cobbles of concrete.
G		1.00	B					
		1.50	B		1.50			MADE GROUND: Greyish brown slightly silty sandy clay with rare fine subangular concrete and red brick.
	▼	2.50	B		2.50			Medium dense to dense brown SAND and GRAVEL. Gravel is fine to coarse subangular flint and quartzite.
		3.50	B					
		3.50	SPT	N=10 (2,1/3,2,3,2)				
		4.50	B					
		4.50	SPT	N=14 (2,3/3,4,4,3)				
		5.50	B					
		5.50	SPT	N=25 (2,4/6,6,7,6)				
		6.50	B					
		6.50	SPT	N=24 (2,4/4,6,7,7)				
		7.00	B		6.80			Stiff grey slightly silty slightly sandy CLAY.
		7.50	D					
		7.50	SPT	N=29 (3,4/6,7,8,8)				
		8.50	D					
		8.50	SPT	N=26 (3,5/6,6,6,8)				
		9.50	U100	Ublow=65				
		10.00	D					

Continued on Next Sheet

Remarks

1. Borehole drilled through excavated trial pit at 2.50m begl to avoid buried obstructions. 2. Borehole installed with gas and groundwater monitoring standpipe on completion. 3. Borehole completed at 25.00m begl.

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Cable Percussive Borehole Log

Borehole No. **BH02**

Sheet 2 of 3

Project Name: Elmsleigh Road, Staines	Project No. L20002	Co-ords:	Hole Type CP
Location: Elmsleigh Road, Staines		Level:	Scale 1:50
Client: Inland Homes PLC		Dates: 17/03/2020	Logged By HA

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		10.50	D					*at 10.50m begl becomes very stiff.*
		10.50	SPT	N=32 (4,5/7,7,8,10)				
		11.50	D					
		12.00	D					
		12.00	SPT	N=34 (4,7/7,8,9,10)				
		12.50	D					
		13.50	D					
		13.50	SPT	N=29 (5,6/6,7,8,8)				
		14.50	D					
		15.00	U100	Ublow=100				
		15.50	D					
		16.50	D					
		16.50	SPT	N=38 (5,7/8,9,10,11)				
		17.50	D					
		18.00	D					
		18.00	SPT	N=37 (6,6/8,10,9,10)				
		18.50	D					
		19.50	U100	Ublow=100				
		20.00	D					

Continued on Next Sheet

Remarks

1. Borehole drilled through excavated trial pit at 2.50m begl to avoid buried obstructions. 2. Borehole installed with gas and groundwater monitoring standpipe on completion. 3. Borehole completed at 25.00m begl.

AGS

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Cable Percussive Borehole Log

Borehole No. **BH02**

Sheet 3 of 3

Project Name: Elmsleigh Road, Staines	Project No. L20002	Co-ords:	Hole Type CP
Location: Elmsleigh Road, Staines		Level:	Scale 1:50
Client: Inland Homes PLC		Dates: 17/03/2020	Logged By HA

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		20.50	D					
		21.50	D					
		21.50	SPT	N=46 (6,9/9,11,13,13)				
		22.50	D					
		23.50	U100	Ublow=100				
		24.00	D					
		24.50	D					
		25.00	D		25.00			End of Borehole at 25.00m
		25.00	SPT	N=50 (6,7/50 for 295mm)				

21 22 23 24 25 26 27 28 29 30

Remarks

1. Borehole drilled through excavated trial pit at 2.50m begl to avoid buried obstructions. 2. Borehole installed with gas and groundwater monitoring standpipe on completion. 3. Borehole completed at 25.00m begl.

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Cable Percussive Borehole Log

Borehole No. **BH03**

Sheet 1 of 4

Project Name: Elmsleigh Road, Staines	Project No. L20002	Co-ords:	Hole Type CP
Location: Elmsleigh Road, Staines		Level:	Scale 1:50
Client: Inland Homes PLC		Dates: 13/03/2020	Logged By HA

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.05			MADE GROUND: Asphalt.
		0.50	B		0.50			MADE GROUND: Reddish brown sand and gravel. Gravel is fine to coarse subangular concrete, red brick, quartzite and mortar.
		1.00	B					MADE GROUND: Brown slightly silty slightly gravelly sandy clay. Gravel is fine to coarse subangular red brick, concrete and quartzite.
		1.50 1.50	D SPT	N=26 (4,7/6,7,6,7)				
		2.00	B		1.90			MADE GROUND: Dark greyish brown slightly silty sandy slightly gravelly clay. Gravel is fine to coarse quartzite and red brick.
	▼	2.50 2.50	B SPT	N=15 (3,2/3,2,4,6)				
		3.00	B		2.80			Medium dense yellowish brown SAND and GRAVEL. Gravel is fine to coarse subangular flint and quartzite.
		3.50 3.50	B SPT	N=28 (3,4/4,6,9,9)				
		4.50 4.50	B SPT	N=36 (4,5/7,9,9,11)				
		5.50 5.50	B SPT	N=8 (3,3/2,2,2,2)	5.40			Loose reddish orange sandy GRAVEL. Gravel is fine to coarse subangular to subrounded flint and quartzite.
		6.50 6.50	B SPT	N=6 (2,2/0,2,2,2)				
		7.50 7.50	D SPT	N=23 (4,5/4,5,7,7)	7.30			Stiff dark grey slightly silty CLAY.
		8.00	B					
		8.50	U100	Ublow=75				
		9.00	D					
		9.50 9.50	D SPT	N=27 (4,4/6,6,7,8)				

Continued on Next Sheet

Remarks

1. Borehole backfilled with arisings on completion. 2. Borehole completed at 35.00m begl.

AGS

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Cable Percussive Borehole Log

Borehole No. **BH03**

Sheet 2 of 4

Project Name: Elmsleigh Road, Staines	Project No. L20002	Co-ords:	Hole Type CP
Location: Elmsleigh Road, Staines		Level:	Scale 1:50
Client: Inland Homes PLC		Dates: 13/03/2020	Logged By HA

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		10.50	D					*at 10.50m begl becomes very stiff.*
		10.50	SPT	N=33 (6,7/7,9,8,9)				
		11.50	D					
		12.00	D					
		12.00	SPT	N=37 (6,7/8,9,9,11)				
		12.50	D					
		13.50	D					
		14.00	D					
		14.50	D					
		15.00	D					
		15.00	SPT	N=35 (5,7/9,8,9,9)				
		15.50	D					
		16.50	D					
		16.50	SPT	N=36 (6,7/9,8,10,9)				
		17.50	D					
		18.00	U100	Ublow=100				
		18.50	D					
		19.50	D					
		19.50	SPT	N=36 (5,6/7,9,9,11)				

Continued on Next Sheet

11 12 13 14 15 16 17 18 19 20

Remarks

1. Borehole backfilled with arisings on completion. 2. Borehole completed at 35.00m begl.

AGS

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Cable Percussive Borehole Log

Borehole No. **BH03**

Sheet 3 of 4

Project Name: Elmsleigh Road, Staines	Project No. L20002	Co-ords:	Hole Type CP
Location: Elmsleigh Road, Staines		Level:	Scale 1:50
Client: Inland Homes PLC		Dates: 13/03/2020	Logged By HA

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		20.50	D					
		21.50	D					
		21.50	SPT	N=46 (6,9/8,13,12,13)				
		22.50	D					
		23.50	D					
		23.50	SPT	N=47 (6,8/9,12,12,14)				
		24.50	D					
		25.50	U100	Ublow=100				
		26.00	D					
		26.50	D					
		27.50	D					
		27.50	SPT	N=50 (6,10/50 for 235mm)				
		28.50	D					
		29.50	D					
		29.50	SPT	N=50 (7,11/50 for 290mm)				

21 22 23 24 25 26 27 28 29 30

Continued on Next Sheet

Remarks

1. Borehole backfilled with arisings on completion. 2. Borehole completed at 35.00m begl.

AGS

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Cable Percussive Borehole Log

Borehole No. **BH03**

Sheet 4 of 4

Project Name: Elmsleigh Road, Staines	Project No. L20002	Co-ords:	Hole Type CP
Location: Elmsleigh Road, Staines		Level:	Scale 1:50
Client: Inland Homes PLC		Dates: 13/03/2020	Logged By HA

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		30.50	D					
		31.50	U100	Ublow=100				
		31.90	D					
		32.50	D					
		33.50	D					
		34.00	D					
		34.50	D					
		35.00	D		35.00			
		35.00	SPT	N=50 (8,11/50 for 240mm)				End of Borehole at 35.00m

31 32 33 34 35 36 37 38 39 40

Remarks

1. Borehole backfilled with arisings on completion. 2. Borehole completed at 35.00m begl.

AGS

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Borehole Log

Borehole No.
WS01
Sheet 1 of 1

Project Name: Elmsleigh Road, Staines	Project No. L20002	Co-ords:	Hole Type WS
Location: Elmsleigh Road, Staines		Level:	Scale 1:25
Client: Inland Homes PLC		Dates: 11/03/2020	Logged By HA

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		1.00 1.00	D SPT	N=7 (1,1/2,2,1,2)				MADE GROUND: Pale yellowish brown slightly silty sandy gravel with medium cobble content. Gravel is fine to coarse subangular concrete, red brick, quartzite, tile and rare metal. Cobbles are concrete and red brick.
		2.00	SPT	50 (1,5/50 for 10mm)				
					2.30			End of Borehole at 2.30m

1
2
3
4
5

Remarks
1. Borehole terminated on suspected former building concrete basement at 2.30m begl.

AGS

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Borehole Log

Borehole No. **WS02**

Sheet 1 of 1

Project Name: Elmsleigh Road, Staines	Project No. L20002	Co-ords:	Hole Type WS
Location: Elmsleigh Road, Staines		Level:	Scale 1:25
Client: Inland Homes PLC		Dates: 11/03/2020	Logged By HA

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.12			MADE GROUND: Asphalt.
					0.35			MADE GROUND: Concrete Slab.
					0.45			MADE GROUND: Yellowish brown slightly clayey slightly gravelly sand. Gravel is fine to coarse subangular red brick, concrete and quartzite.
		0.60	ES					MADE GROUND: Dark grey slightly sandy slightly gravelly clay. Gravel is medium to coarse subangular concrete and quartzite.
					0.80			Soft (becoming firm below 2.00m begl) yellowish brown sandy CLAY.
		1.00	SPT	N=4 (0,1/1,1,1,1)				
		2.00	SPT	N=8 (1,1/2,2,2,2)				
	▼				2.20			Loose to medium dense yellowish brown slightly silty slightly gravelly SAND. Gravel is fine to coarse subangular quartzite.
		3.00	SPT	N=15 (3,1/2,5,5,3)	3.00			*between 2.90m and 3.00 begl very gravelly.*
								No Recovery
					4.00			End of Borehole at 4.00m

Remarks

1. Borehole collapse between 4.00m begl and 2.90m begl. 2. Groundwater encountered at 2.30m begl. 3. Gas and groundwater monitoring standpipe installed on completion.

AGS

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Borehole Log

Borehole No.
WS03
Sheet 1 of 1

Project Name: Elmsleigh Road, Staines	Project No. L20002	Co-ords:	Hole Type WS
Location: Elmsleigh Road, Staines		Level:	Scale 1:25
Client: Inland Homes PLC		Dates: 11/03/2020	Logged By HA

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.20			MADE GROUND: Pale grey slightly silty gravelly sand. Gravel is fine to coarse subangular concrete, red brick and quartzite.
		0.60	ES					MADE GROUND: Dark grey slightly gravelly clayey sand. Gravel is fine to coarse subangular concret, red brick, glass, tile and quartzite.
G		1.00	SPT	N=4 (1,1/1,1,1,1)				
		1.10	D					
					1.50			Loose pale greyish yellow clayey silty SAND.
		1.80	D					
		2.00	SPT	N=0 (1,0/0,0,0,0)				*below 2.00m begl becomes silty sand.*
	▼							
		3.00	SPT	N=12 (3,5/3,3,3,3)	3.00			Medium dense yellowish brown sandy GRAVEL. Gravel is fine to coarse subangular quartzite.
								below 3.30m begl becomes slightly sandy.
		4.00	SPT	N=11 (3,2/2,3,3,3)	4.00			End of Borehole at 4.00m

Remarks
1. Groundwater encountered at 2.50m begl.

AGS

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Borehole Log

Borehole No.
WS03A
Sheet 1 of 1

Project Name: Elmsleigh Road, Staines	Project No. L20002	Co-ords:	Hole Type WS
Location: Elmsleigh Road, Staines		Level:	Scale 1:25
Client: Inland Homes PLC		Dates: 11/03/2020	Logged By HA

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.50	ES		0.30			MADE GROUND: Pale grey slightly silty gravelly sand. Gravel is fine to coarse subangular concrete, red brick and quartzite.
					0.65			MADE GROUND: Dark grey slightly gravelly clayey sand. Gravel is fine to coarse subangular concret, red brick, glass, tile and quartzite.
								End of Borehole at 0.65m

1
2
3
4
5

Remarks
1. Borehole terminated on concrete slab at 0.65m begl.

AGS

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Borehole Log

Borehole No. **WS04**

Sheet 1 of 1

Project Name: Elmsleigh Road, Staines	Project No. L20002	Co-ords:	Hole Type WS
Location: Elmsleigh Road, Staines		Level:	Scale 1:25
Client: Inland Homes PLC		Dates: 11/03/2020	Logged By HA

Well	Water Strikes	Sample and In Situ Testing Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
					0.05			MADE GROUND: Asphalt.
								MADE GROUND: Reddish brown slightly silty sandy gravel. Gravel is fine to coarse subangular red brick and concrete.
					0.60			MADE GROUND: Concrete.
					0.80			MADE GROUND: Dark grey slightly silty slightly gravelly sand. Gravel is fine to coarse subangular concrete and red brick.
G		1.00	ES		1.00			MADE GROUND: Orangish brown slightly clayey gravelly sand. Gravel is fine to coarse subangular red brick.
		1.00	SPT	N=0 (1,1/0,0,0,0)				
					1.30			MADE GROUND: Dark grey clayey sand with large tree roots upto 6cm in diameter.
					1.60			MADE GROUND: Dark grey slightly clayey slightly gravelly sand. Gravel is fine subangular red brick.
		1.80	D					
		2.00	SPT	N=25 (4,6/6,6,6,7)				
	▼				2.30			Medium dense pale grey silty gravelly SAND. Gravel is fine to coarse subangular flint and quartzite.
		3.00	SPT	N=20 (3,4/4,6,5,5)	3.00			End of Borehole at 3.00m

Remarks

1. Groundwater encountered at 2.60m begl.

AGS

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Borehole Log

Borehole No. **WS05**

Sheet 1 of 1

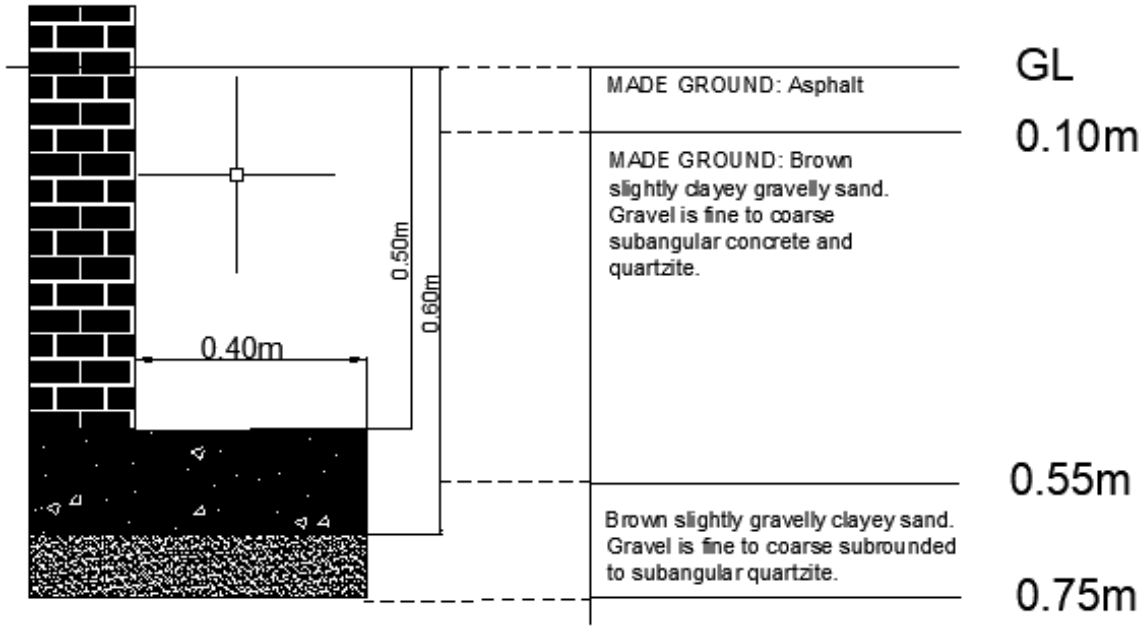
Project Name: Elmsleigh Road, Staines	Project No. L20002	Co-ords:	Hole Type WS
Location: Elmsleigh Road, Staines		Level:	Scale 1:25
Client: Inland Homes PLC		Dates: 11/03/2020	Logged By HA

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								MADE GROUND: Concrete slab.
					0.25			
					0.30			MADE GROUND: Pale creamy grey slightly sandy gravel. Gravel is medium to coarse subangular limestone and concrete subbase.
		0.40	ES		0.50			MADE GROUND: Dark grey slightly gravelly sandy clay. Gravel is fine to coarse subangular red brick and concrete.
								Loose pale greyish yellow slightly gravelly silty SAND. Gravel is fine subrounded quartzite.
		1.00	SPT	N=4 (0,0/1,1,1,1)				
		2.00	SPT	N=4 (1,0/1,1,1,1)				*below 2.00m begl becomes less gravelly.*
	▼							
		3.00	SPT	N=7 (1,2/2,1,2,2)				*below 3.00m begl becomes medium dense.*
		4.00	SPT	N=12 (1,2/3,2,3,4)	4.00			End of Borehole at 4.00m

Remarks

1. Groundwater encountered at 2.60m begl.

AGS



= Concrete Foundations

= Brick Foundations

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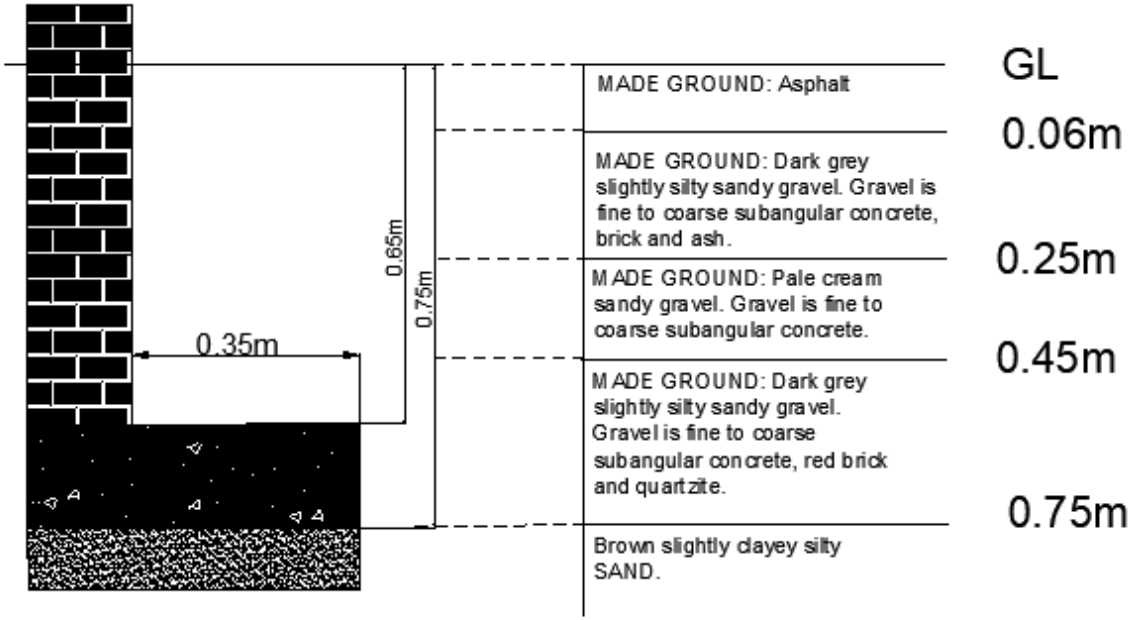
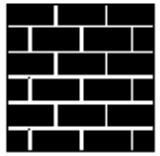
Client: Inland Homes PLC	Project No.: L20002	Scales: Not to scale	Issue: 0
Project: Elmsleigh Road, Staines	Title: Cross Section TP01	Design/drawn: HA	Checked: JPB
		Drawing no: L20002-706	Rev. 0



= Concrete Foundations



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Client: Inland Homes PLC	Project No.: L20002	Scales: Not to scale	Issue: 0
Project: Elmsleigh Road, Staines	Title: Cross Section TP02	Design/drawn: HA	Checked: JPB
		Drawing no: L20002-706	Rev. 0

Appendix C

Gas Monitoring Results

Ground Gas and Groundwater Monitoring Record Sheet

JOB DETAILS:

Client: Inland Homes PLC **Job No:** L20002
Site: Elmsleigh Road, Staines **Visit No:** 1 **of** 4
Date: 27/04/2020 **Operator:** HA **Project Manager:** CRS

	GAS CONCENTRATIONS												VOCs		GAS FLOWS				WELL AND GROUNDWATER DATA					Comments
Monitoring Point	Methane (%v/v)		%LEL		Carbon dioxide (%v/v)		Carbon monoxide (ppm)		Hydrogen sulphide (ppm)		Oxygen (%v/v)		PID Peak (ppm)	Product thickness (mm)	Flow rate (l/hr)		Differential borehole Pressure (Pa)	Time for flow to equalise (secs)	Water level (mbgl)	Depth of well (m)	Reduced level (mAOD)	Water level (mAOD)	Response Zone	
	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Min.	Steady			Peak	Steady								
BH01	0.2	0.2	4	4	2.1	2.1	1	1	0	0	14.7	14.7			0.1	0.1			2.54	8.92	-	-		
BH02	0.1	0.1	2	2	3.9	3.9	0	0	0	0	16.2	16.2			0.0	0.0			2.40	10.33	-	-		
WS02	0.1	0.1	2	2	1.2	1.2	0	0	0	0	18.4	18.4			0.0	0.0			2.15	2.50	-	-		
WS03	0.1	0.1	2	2	2.3	2.3	0	0	0	0	16.5	16.5			0.1	0.1			2.20	2.65				
WS04	0.1	0.1	2	2	3.1	3.1	0	0	0	0	15.8	15.8			0.1	0.1			2.00	2.30				
Max	**0.2**	**0.2**	**4**	**4**	**3.9**	**3.9**	**1**	**1**	**0**	**0**	**18.4**	**18.4**			**0.1**	**0.1**			**2.20**	**10.33**				
Min	**0.1**	**0.1**	**2**	**2**	**1.2**	**1.2**	**0**	**0**	**0**	**0**	**14.7**	**14.7**			**0.1**	**0.1**			**2.00**	**2.30**				
GSV (l/hr)	**0.0002**	**0.0002**			**0.0039**	**0.0039**																		

METEOROLOGICAL AND SITE INFORMATION:

(Select correct box with X or enter data, as applicable)

State of ground:	x	Dry		Moist		Wet		Snow		Frozen
Wind:		Calm	x	Light		Moderate		Strong		
Cloud cover:		None	x	Slight		Cloudy		Overcast		
Preciptation:	x	None		Slight		Moderate		Heavy		
Barometric pressure (mbar):			1006	Before			1006	After		
Pressure trend:				Falling	x	Steady		Rising		
Air Temperature (Deg. C):			10	Before			10	After		

Ground Gas and Groundwater Monitoring Record

JOB DETAILS:

Client: Inland Homes PLC **Job No:** L20002
Site: Elmsleigh Road, Staines **Visit No:** 2 **of** 4
Date: 18/08/2020 **Operator:** TW **Project Manager:** CRS

	GAS CONCENTRATIONS												VOCs		GAS FLOWS				WELL AND GROUNDWATER DATA					Comments
Monitoring Point	Methane (%v/v)		%LEL		Carbon dioxide (%v/v)		Carbon monoxide (ppm)		Hydrogen sulphide (ppm)		Oxygen (%v/v)		PID Peak (ppm)	Product thickness (mm)	Flow rate (l/hr)		Differential borehole Pressure (Pa)	Time for flow to equalise (secs)	Water level (mbgl)	Depth of well (m)	Reduced level (mAOD)	Water level (mAOD)	Response Zone	
	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Min.	Steady			Peak	Steady								
BH01	0.3	0.1			4.7	2.1	1	0	1	1	14.7	14.7	-	-	0.2	0.2	0.02	60	2.55	8.92	-	-		
BH02	0.5	0.5			7.3	5.6	0	0	2	1	9.3	15.2	-	-	0.1	0.1	0.03	60	2.40	10.33	-	-		
WS02	0.3	0.3			4.2	4.1	1	0	1	1	7.8	7.8	-	-	0.0	0.0	0	60	2.48	2.50	-	-		
WS03	0.1	0.1			4.9	4.9	1	0	2	2	8.9	8.9			0.0	0.0	0.02	60	2.22	2.65				
WS04	0.4	0.2			9.7	9.7	3	1	2	1	6.5	6.5			0.3	0.2	0.03	60	2.08	2.30				
Max	**0.5**	**0.5**	**0**	**0**	**9.7**	**9.7**	**3**	**1**	**2**	**2**	**14.7**	**15.2**			**0.3**	**0.2**			**2.55**	**10.33**				
Min	**0.1**	**0.1**	**0**	**0**	**4.2**	**2.1**	**0**	**0**	**1**	**1**	**6.5**	**6.5**			**0.0**	**0.0**			**2.08**	**2.30**				
GSV (l/hr)	**0.0015**	**0.001**			**0.0291**	**0.0194**																		

METEOROLOGICAL AND SITE INFORMATION:

(Select correct box with X or enter data, as applicable)

State of ground:	X	Dry		Moist		Wet		Snow		Frozen
Wind:		Calm	X	Light		Moderate		Strong		
Cloud cover:		None	X	Slight		Cloudy		Overcast		
Preciptation:	X	None		Slight		Moderate		Heavy		
Barometric pressure (mbar):			1110	Before			1110	After		
Pressure trend:				Falling	X	Steady		Rising		
Air Temperature (Deg. C):			21	Before			21	After		

Ground Gas and Groundwater Monitoring Record

JOB DETAILS:

Client: Inland Homes PLC
Site: Elmsleigh Road, Staines
Date: 25/06/2020
Job No: L20002
Visit No: 3 **of** 4
Operator: TW
Project Manager: CRS

	GAS CONCENTRATIONS												VOCs		GAS FLOWS				WELL AND GROUNDWATER DATA					Comments
Monitoring Point	Methane (%v/v)		%LEL		Carbon dioxide (%v/v)		Carbon monoxide (ppm)		Hydrogen sulphide (ppm)		Oxygen (%v/v)		PID Peak (ppm)	Product thickness (mm)	Flow rate (l/hr)		Differential borehole Pressure (Pa)	Time for flow to equalise (secs)	Water level (mbgl)	Depth of well (m)	Reduced level (mAOD)	Water level (mAOD)	Response Zone	
	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Min.	Steady			Peak	Steady								
BH01	0.1	0.1			4.6	2.2	0	0	0	0	15.9	15.9	-		0.1	0.1	0.05	60	2.65	8.92	-	-		
BH02	0.4	0.4			7.4	5.8	0	0	0	0	5.5	14.3			0.0	0.0	0.9	75	2.43	10.33	-	-		
WS02	0.6	0.6			11.9	11.9	1	0	0	0	2.1	2.1			0.2	0.2	0.03	75	2.12	2.50	-	-		
WS03	0.6	0.5			6.2	4.4	0	0	0	0	8.3	8.3			0.1	0.1	0.04	75	2.25	2.65				
WS04	0.7	0.7			10.6	10.6	1	1	0	0	5.4	5.4			0.1	0.1	0.05	60	1.92	2.30				
Max	**0.7**	**0.7**	**0**	**0**	**11.9**	**11.9**	**1**	**1**	**0**	**0**	**15.9**	**15.9**			**0.2**	**0.2**			**2.65**	**10.33**				
Min	**0.1**	**0.1**	**0**	**0**	**4.6**	**2.2**	**0**	**0**	**0**	**0**	**2.1**	**2.1**			**0.0**	**0.0**			**1.92**	**2.30**				
GSV (l/hr)	**0.0014**	**0.001**			**0.0238**	**0.0238**																		

METEOROLOGICAL AND SITE INFORMATION:

(Select correct box with X or enter data, as applicable)

State of ground:		Dry		Moist	X	Wet		Snow		Frozen
Wind:		Calm	X	Light		Moderate		Strong		
Cloud cover:		None		Slight	X	Cloudy		Overcast		
Preciptation:		None	X	Slight		Moderate		Heavy		
Barometric pressure (mbar):			1000	Before			1000	After		
Pressure trend:				Falling	X	Steady		Rising		
Air Temperature (Deg. C):			17	Before			17	After		

Ground Gas and Groundwater Monitoring Record

JOB DETAILS:

Client: Inland Homes PLC **Job No:** L20002
Site: Elmsleigh Road, Staines **Visit No:** 4 **of** 4
Date: 16/09/2020 **Operator:** TW **Project Manager:** CRS

	GAS CONCENTRATIONS												VOCs		GAS FLOWS				WELL AND GROUNDWATER DATA					Comments
Monitoring Point	Methane (%v/v)		%LEL		Carbon dioxide (%v/v)		Carbon monoxide (ppm)		Hydrogen sulphide (ppm)		Oxygen (%v/v)		PID Peak (ppm)	Product thickness (mm)	Flow rate (l/hr)		Differential borehole Pressure (Pa)	Time for flow to equalise (secs)	Water level (mbgl)	Depth of well (m)	Reduced level (mAOD)	Water level (mAOD)	Response Zone	
	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Min.	Steady			Peak	Steady								
BH01	0.5	0.5			4.5	2.1	0	0	0	0	15.1	15.3	-	-	-0.1	-0.1	2.08	60	2.66	8.92	-	-		
BH02	0.4	0.4			9.3	4.5	0	0	1	0	5.4	15.6	-	-	0.1	0.1	0.07	60	2.51	10.33	-	-		
WS02	0.4	0.4			11.1	11.1	0	0	1	0	1.9	1.9	-	-	0.2	0.2	0.14	80	2.12	2.50	-	-		
WS03	0.5	0.5			6.1	6.1	0	0	1	1	10.7	10.7			0.1	0.1	0.02	75	2.38	2.65				
WS04	0.5	0.5			8.4	8.4	0	0	0	0	9.1	9.1			0.2	0.2	0.05	75	2.06	2.30				
Max	**0.5**	**0.5**	**0**	**0**	**11.1**	**11.1**	**0**	**0**	**1**	**1**	**15.1**	**15.6**			**0.2**	**0.2**			**2.66**	**10.33**				
Min	**0.4**	**0.4**	**0**	**0**	**4.5**	**2.1**	**0**	**0**	**0**	**0**	**1.9**	**1.9**			**-0.1**	**-0.1**			**2.06**	**2.30**				
GSV (l/hr)	**0.001**	**0.001**			**0.0222**	**0.0222**																		

METEOROLOGICAL AND SITE INFORMATION:

(Select correct box with X or enter data, as applicable)

State of ground:	X	Dry		Moist		Wet		Snow		Frozen
Wind:		Calm	X	Light		Moderate		Strong		
Cloud cover:		None		Slight	X	Cloudy		Overcast		
Preciptation:	X	None		Slight		Moderate		Heavy		
Barometric pressure (mbar):			1022	Before			1024	After		
Pressure trend:				Falling		Steady	X	Rising		
Air Temperature (Deg. C):			20	Before			20	After		

Appendix D

Laboratory Test Results - Chemical

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Analytical Report Number : 20-95458

Project / Site name:	Elmsleigh Road, Staines	**Samples received on:**	30/03/2020
Your job number:	L20002	**Samples instructed on:**	01/04/2020
Your order number:		**Analysis completed by:**	07/04/2020
Report Issue Number:	1	**Report issued on:**	07/04/2020
Samples Analysed:	1 leachate sample - 3 soil samples		

Signed: A. Czerwińska

Agnieszka Czerwińska

Technical Reviewer (Reporting Team)
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 20-95458

Project / Site name: Elmsleigh Road, Staines

Lab Sample Number				1488138	1488139	1488140		
Sample Reference				BH01	BH02	BH02		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				0.50	0.20	1.00		
Date Sampled				17/03/2020	17/03/2020	17/03/2020		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1		
Moisture Content	%	N/A	NONE	17	12	9.0		
Total mass of sample received	kg	0.001	NONE	1.2	1.2	1.1		
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	Chrysotile	-	-		
Asbestos in Soil	Type	N/A	ISO 17025	Detected	Not-detected	Not-detected		
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	0.005	-	-		
Asbestos Quantification Total	%	0.001	ISO 17025	0.005	-	-		
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	9.0	10.5	11.2		
Total Sulphate as SO_4	%	0.005	MCERTS	0.067	1.27	1.34		
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	290	2000	260		
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.15	0.98	0.13		
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	146	983	130		
Total Organic Carbon (TOC)	%	0.1	MCERTS	1.0	0.2	0.4		
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	0.37	1.1		
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.22		
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.85	1.3		
Pyrene	mg/kg	0.05	MCERTS	< 0.05	0.78	1.2		
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	0.63	0.86		
Chrysene	mg/kg	0.05	MCERTS	< 0.05	0.67	0.80		
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.91	0.92		
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.58	0.55		
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.78	0.81		
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.44	0.44		
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	0.59	0.66		
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	6.60	8.85		
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	7.4	14	9.9		
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	0.7	< 0.2		
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2		
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	17	31	26		
Copper (aqua regia extractable)	mg/kg	1	MCERTS	27	51	22		
Lead (aqua regia extractable)	mg/kg	1	MCERTS	71	47	70		
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3		
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	15	15	13		
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	84	130	200		

Analytical Report Number: 20-95458

Project / Site name: Elmsleigh Road, Staines

Lab Sample Number				1488138	1488139	1488140		
Sample Reference				BH01	BH02	BH02		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				0.50	0.20	1.00		
Date Sampled				17/03/2020	17/03/2020	17/03/2020		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001		
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001		
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001		
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	3.1	< 2.0		
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	11	15		
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	59	120		
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	74	140		

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001		
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001		
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001		
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	3.7	2.1		
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	26	26		
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	130	150		
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	160	180		

Analytical Report Number: 20-95458

Project / Site name: Elmsleigh Road, Staines

Lab Sample Number				1488141				
Sample Reference				BH02				
Sample Number				None Supplied				
Depth (m)				1.00				
Date Sampled				17/03/2020				
Time Taken				None Supplied				
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
General Inorganics								
pH	pH Units	N/A	ISO 17025	11.9				
Speciated PAHs								
Naphthalene	µg/l	0.01	ISO 17025	< 0.01				
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01				
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01				
Fluorene	µg/l	0.01	ISO 17025	< 0.01				
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01				
Anthracene	µg/l	0.01	ISO 17025	< 0.01				
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Pyrene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01				
Chrysene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01				
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01				
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01				
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01				
Total PAH								
Total EPA-16 PAHs	µg/l	0.2	NONE	< 0.2				
Heavy Metals / Metalloids								
Arsenic (dissolved)	µg/l	1.1	ISO 17025	< 1.1				
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08				
Chromium (hexavalent)	µg/l	5	ISO 17025	30				
Chromium (dissolved)	µg/l	0.4	ISO 17025	35				
Copper (dissolved)	µg/l	0.7	ISO 17025	15				
Lead (dissolved)	µg/l	1	ISO 17025	1.3				
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5				
Nickel (dissolved)	µg/l	0.3	ISO 17025	3.5				
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0				
Zinc (dissolved)	µg/l	0.4	ISO 17025	3.7				

Analytical Report Number : 20-95458

Project / Site name: Elmsleigh Road, Staines

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1488138	BH01	None Supplied	0.50	Brown clay and sand.
1488139	BH02	None Supplied	0.20	Light brown sand with rubble and gravel.
1488140	BH02	None Supplied	1.00	Light brown sand with rubble and gravel.

Analytical Report Number: 20-95458
Project / Site name: Elmsleigh Road, Staines
Your Order No:

Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

The samples were analysed qualitatively for asbestos by polarising light and dispersion staining as described by the Health and Safety Executive in HSG 248.

Quantitative Analysis

The analysis was carried out using our documented in-house method A006-PL based on HSE Contract Research Report No: 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies et al, 1996) and HSG 248. Our method includes initial examination of the entire representative sample, then fractionation and detailed analysis of each fraction, with quantification by hand picking and weighing.

The limit of detection (reporting limit) of this method is 0.001 %.

The method has been validated using samples of at least 100 g, results for samples smaller than this should be interpreted with caution.

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample
1488138	BH01	0.50	144	Hard/Cement Type Material	**Chrysotile**	0.005	**0.005**

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

Analytical Report Number : 20-95458

Project / Site name: Elmsleigh Road, Staines

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in house method based on references.	HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft).	A006-PL	D	ISO 17025
BS EN 12457-2 (10:1) Leachate Prep	10:1 (as recieved, moisture adjusted) end over end extraction with water for 24 hours. Eluate filtered prior to analysis.	In-house method based on BSEN12457-2.	L043-PL	W	NONE
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Hexavalent chromium in leachate	Determination of hexavalent chromium in leachate by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	ISO 17025
Hexavalent chromium in soil (Lower Level)	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
pH at 20oC in leachate	Determination of pH in leachate by electrometric measurement.	In house method.	L005-PL	W	ISO 17025
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Speciated EPA-16 PAHs in leachate	Determination of PAH compounds in leachate by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L102B-PL	W	NONE
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS

Analytical Report Number : 20-95458

Project / Site name: Elmsleigh Road, Staines

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
Total Sulphate in soil as %	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Sample ID	Other_ID	Sample Type	Job	Sample Number	Sample Deviation Code	test_name	test_ref	Test Deviation code
BH01		S	20-95458	1488138	c	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	c
BH02		S	20-95458	1488139	c	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	c
BH02		S	20-95458	1488140	c	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	c

Key: a - No sampling date b - Incorrect container
c - Holding time d - Headspace e - Temperature

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Analytical Report Number : 20-95381

Project / Site name:	Elmsleigh Road, Staines	**Samples received on:**	30/03/2020
Your job number:	L20002	**Samples instructed on:**	01/04/2020
Your order number:	SH006	**Analysis completed by:**	15/04/2020
Report Issue Number:	1	**Report issued on:**	15/04/2020
Samples Analysed:	7 soil samples		

Signed: Karolina Marek

Karolina Marek
PL Head of Reporting Team

For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 20-95381

Project / Site name: Elmsleigh Road, Staines
Your Order No: SH006

Lab Sample Number				1487675	1487676	1487677	1487678	1487679
Sample Reference				BH01	BH01	BH02	BH02	BH03
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				3.00	6.00	3.50	11.50	6.50
Date Sampled				Deviating	Deviating	Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	61
Moisture Content	%	N/A	NONE	19	2.9	4.7	17	1.9
Total mass of sample received	kg	0.001	NONE	0.80	0.80	1.2	0.80	0.80
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.3	8.6	8.5	7.8	8.7
Total Sulphate as SO_4	%	0.005	MCERTS	0.029	0.015	0.011	0.123	0.008
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.032	0.0095	0.013	0.58	0.0096
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	1.3	3.7	3.0	34	1.8
Total Sulphur	%	0.005	MCERTS	0.016	0.013	0.016	0.076	0.010
Water Soluble Nitrate (2:1) as N (leachate equivalent)	mg/l	2	NONE	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Heavy Metals / Metalloids								
Magnesium (water soluble)	mg/kg	5	NONE	7.3	< 5.0	5.0	87	5.5
Magnesium (leachate equivalent)	mg/l	2.5	NONE	3.7	< 2.5	2.5	44	2.7

* Despite repeating Total Sulphate and Water Soluble Sulphate analysis, the results remain contradictory.

Analytical Report Number: 20-95381

Project / Site name: Elmsleigh Road, Staines
Your Order No: SH006

Lab Sample Number				1487680	1487681			
Sample Reference				BH03	BH03			
Sample Number				None Supplied	None Supplied			
Depth (m)				18.50	29.50			
Date Sampled				Deviating	Deviating			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1			
Moisture Content	%	N/A	NONE	19	14			
Total mass of sample received	kg	0.001	NONE	0.80	0.80			
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.1	7.9			
Total Sulphate as SO_4	%	0.005	MCERTS	0.057*	0.084*			
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.44*	0.49*			
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	14	22			
Total Sulphur	%	0.005	MCERTS	1.11	0.762			
Water Soluble Nitrate (2:1) as N (leachate equivalent)	mg/l	2	NONE	< 2.0	< 2.0			
Heavy Metals / Metalloids								
Magnesium (water soluble)	mg/kg	5	NONE	52	55			
Magnesium (leachate equivalent)	mg/l	2.5	NONE	26	28			

* Despite repeating Total Sulphate and Water Soluble Sulphate analysis, the results remain contradictory.

Analytical Report Number : 20-95381

Project / Site name: Elmsleigh Road, Staines

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1487675	BH01	None Supplied	3.00	Brown clay and sand with gravel.
1487676	BH01	None Supplied	6.00	Brown clay and sand with gravel.
1487677	BH02	None Supplied	3.50	Brown clay and sand with gravel and stones.
1487678	BH02	None Supplied	11.50	Grey clay.
1487679	BH03	None Supplied	6.50	Brown sand with gravel and stones.
1487680	BH03	None Supplied	18.50	Grey clay.
1487681	BH03	None Supplied	29.50	Grey clay.

The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 20-95381

Project / Site name: Elmsleigh Road, Staines

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Chloride, water soluble, in soil	Determination of Chloride colorimetrically by discrete analyser.	In house method.	L082-PL	D	MCERTS
Magnesium, water soluble, in soil	Determination of water soluble magnesium by extraction with water followed by ICP-OES.	In-house method based on TRL 447	L038-PL	D	NONE
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Total Sulphate in soil as %	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Total Sulphur in soil as %	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Water Soluble Nitrate (2:1) as N in soil	Determination of nitrate by reaction with sodium salicylate and colorimetry.	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08, 2:1 extraction.	L078-PL	W	NONE

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Sample ID	Other_ID	Sample Type	Job	Sample Number	Sample Deviation Code	test_name	test_ref	Test Deviation code
BH01		S	20-95381	1487675	a			
BH01		S	20-95381	1487676	a			
BH02		S	20-95381	1487677	a			
BH02		S	20-95381	1487678	a			
BH03		S	20-95381	1487679	a			
BH03		S	20-95381	1487680	a			
BH03		S	20-95381	1487681	a			

Key: a - No sampling date b - Incorrect container
c - Holding time d - Headspace e - Temperature

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Analytical Report Number : 20-94538

Project / Site name:	Elmsleigh Road, Staines	**Samples received on:**	24/03/2020
Your job number:	L20002	**Samples instructed on:**	25/03/2020
Your order number:		**Analysis completed by:**	31/03/2020
Report Issue Number:	1	**Report issued on:**	31/03/2020
Samples Analysed:	5 leachate samples - 7 soil samples		

Signed: A. Czerwińska

Agnieszka Czerwińska

Technical Reviewer (Reporting Team)
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 20-94538

Project / Site name: Elmsleigh Road, Staines

Lab Sample Number				1483079	1483080	1483081	1483082	1483083
Sample Reference				WS02	WS03	WS03A	WS04	WS05
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.60	0.60	0.50	1.00	0.40
Date Sampled				11/03/2020	11/03/2020	11/03/2020	11/03/2020	11/03/2020
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	11	8.2	11	10	15
Total mass of sample received	kg	0.001	NONE	0.90	1.1	1.1	1.2	1.0
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	Chrysotile & Amosite	Chrysotile & Amosite	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Detected	Detected	Not-detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	0.040	0.001	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	0.040	0.001	-	-
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.1	8.9	8.0	8.2	8.0
Total Sulphate as SO_4	%	0.005	MCERTS	0.072	0.157	0.075	0.051	0.054
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	180	600	83	220	56
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.091	0.30	0.042	0.11	0.028
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	90.9	300	41.6	109	28.2
Total Organic Carbon (TOC)	%	0.1	MCERTS	1.7	1.5	2.2	0.6	1.3
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	0.41	0.22	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	0.40	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	0.78	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	1.3	4.6	0.89	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	0.36	1.3	0.30	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	2.5	6.4	3.0	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	2.1	5.5	2.7	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	1.7	3.7	2.2	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	1.6	2.9	1.8	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	1.5	2.8	2.2	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.82	2.3	1.5	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	1.3	3.0	2.1	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.62	1.4	1.1	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.22	0.43	0.34	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.69	1.8	1.3	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	14.5	37.8	19.7	< 0.80	< 0.80
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	13	11	16	7.7	9.0
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	0.3	0.4	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	250	26	21	15	20
Copper (aqua regia extractable)	mg/kg	1	MCERTS	85	39	44	11	28
Lead (aqua regia extractable)	mg/kg	1	MCERTS	350	180	290	62	170
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	2.8	0.8	1.9	0.4	0.9
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	21	19	23	15	15
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	2.3	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	240	170	150	38	74

Analytical Report Number: 20-94538

Project / Site name: Elmsleigh Road, Staines

Lab Sample Number				1483079	1483080	1483081	1483082	1483083
Sample Reference				WS02	WS03	WS03A	WS04	WS05
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.60	0.60	0.50	1.00	0.40
Date Sampled				11/03/2020	11/03/2020	11/03/2020	11/03/2020	11/03/2020
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	14	26	13	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	44	79	36	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	59	110	49	< 10	< 10

Analytical Report Number: 20-94538

Project / Site name: Elmsleigh Road, Staines

Lab Sample Number				1483084	1483085			
Sample Reference				BH03	BH03			
Sample Number				None Supplied	None Supplied			
Depth (m)				0.50	1.00			
Date Sampled				17/03/2020	17/03/2020			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1			
Moisture Content	%	N/A	NONE	7.4	10			
Total mass of sample received	kg	0.001	NONE	1.3	1.5			
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-			
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected			
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-			
Asbestos Quantification Total	%	0.001	ISO 17025	-	-			
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.6	8.2			
Total Sulphate as SO_4	%	0.005	MCERTS	0.026	0.049			
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	120	58			
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.060	0.029			
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	59.5	29.0			
Total Organic Carbon (TOC)	%	0.1	MCERTS	0.4	0.3			
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0			
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Phenanthrene	mg/kg	0.05	MCERTS	1.3	1.5			
Anthracene	mg/kg	0.05	MCERTS	0.33	0.27			
Fluoranthene	mg/kg	0.05	MCERTS	3.0	3.2			
Pyrene	mg/kg	0.05	MCERTS	2.6	2.8			
Benzo(a)anthracene	mg/kg	0.05	MCERTS	1.8	1.9			
Chrysene	mg/kg	0.05	MCERTS	1.7	1.4			
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	1.8	1.7			
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	1.2	0.77			
Benzo(a)pyrene	mg/kg	0.05	MCERTS	1.6	1.5			
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.83	0.72			
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.24	0.18			
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.96	0.80			
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	17.3	16.5			
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	12	13			
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2			
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2			
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	20	25			
Copper (aqua regia extractable)	mg/kg	1	MCERTS	23	11			
Lead (aqua regia extractable)	mg/kg	1	MCERTS	130	30			
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	1.2	< 0.3			
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	17	19			
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0			
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	55	46			

Analytical Report Number: 20-94538

Project / Site name: Elmsleigh Road, Staines

Lab Sample Number				1483084	1483085			
Sample Reference				BH03	BH03			
Sample Number				None Supplied	None Supplied			
Depth (m)				0.50	1.00			
Date Sampled				17/03/2020	17/03/2020			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0			
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0			
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0			
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0			
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0			
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0			

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0			
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0			
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0			
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0			
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10			

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0			
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	2.7	< 2.0			
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	17	16			
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	31	28			
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	51	44			

Analytical Report Number: 20-94538

Project / Site name: Elmsleigh Road, Staines

Lab Sample Number				1483086	1483087	1483088	1483089	1483090
Sample Reference				WS02	WS03	WS04	WS05	BH03
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.60	0.60	1.00	0.40	0.50
Date Sampled				11/03/2020	11/03/2020	11/03/2020	11/03/2020	17/03/2020
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
General Inorganics								
pH	pH Units	N/A	ISO 17025	7.9	9.1	7.5	7.6	8.0
Speciated PAHs								
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Total PAH								
Total EPA-16 PAHs	µg/l	0.2	NONE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Heavy Metals / Metalloids								
Arsenic (dissolved)	µg/l	1.1	ISO 17025	5.1	27	4.2	6.9	2.8
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chromium (dissolved)	µg/l	0.4	ISO 17025	13	2.4	1.2	0.8	0.9
Copper (dissolved)	µg/l	0.7	ISO 17025	31	19	7.8	9.0	5.8
Lead (dissolved)	µg/l	1	ISO 17025	24	14	6.9	9.6	5.3
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Nickel (dissolved)	µg/l	0.3	ISO 17025	5.0	4.4	1.6	2.3	1.0
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Zinc (dissolved)	µg/l	0.4	ISO 17025	21	16	6.5	11	4.3

Analytical Report Number: 20-94538
Project / Site name: Elmsleigh Road, Staines
Your Order No:

Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

The samples were analysed qualitatively for asbestos by polarising light and dispersion staining as described by the Health and Safety Executive in HSG 248.

Quantitative Analysis

The analysis was carried out using our documented in-house method A006-PL based on HSE Contract Research Report No: 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies et al, 1996) and HSG 248. Our method includes initial examination of the entire representative sample, then fractionation and detailed analysis of each fraction, with quantification by hand picking and weighing.

The limit of detection (reporting limit) of this method is 0.001 %.

The method has been validated using samples of at least 100 g, results for samples smaller than this should be interpreted with caution.

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample
1483080	WS03	0.60	165	Loose Fibres & Sheeting/Board Debris	**Chrysotile & Amosite**	0.040	**0.040**
1483081	WS03A	0.50	162	Loose Fibres & Sheeting/Board Debris	**Chrysotile & Amosite**	0.001	**0.001**

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 20-94538

Project / Site name: Elmsleigh Road, Staines

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1483079	WS02	None Supplied	0.60	Brown loam and clay with gravel and vegetation.
1483080	WS03	None Supplied	0.60	Brown loam and clay with gravel and vegetation.
1483081	WS03A	None Supplied	0.50	Brown loam and clay with gravel and vegetation.
1483082	WS04	None Supplied	1.00	Brown loam and clay with gravel and vegetation.
1483083	WS05	None Supplied	0.40	Brown loam and clay with gravel and vegetation.
1483084	BH03	None Supplied	0.50	Brown clay and sand with gravel and vegetation.
1483085	BH03	None Supplied	1.00	Brown clay and loam with gravel and vegetation.

Analytical Report Number : 20-94538

Project / Site name: Elmsleigh Road, Staines

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in house method based on references.	HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft).	A006-PL	D	ISO 17025
BS EN 12457-2 (10:1) Leachate Prep	10:1 (as recieved, moisture adjusted) end over end extraction with water for 24 hours. Eluate filtered prior to analysis.	In-house method based on BSEN12457-2.	L043-PL	W	NONE
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Hexavalent chromium in leachate	Determination of hexavalent chromium in leachate by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	ISO 17025
Hexavalent chromium in soil (Lower Level)	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
pH at 20oC in leachate	Determination of pH in leachate by electrometric measurement.	In house method.	L005-PL	W	ISO 17025
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Speciated EPA-16 PAHs in leachate	Determination of PAH compounds in leachate by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L102B-PL	W	NONE
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS

Analytical Report Number : 20-94538

Project / Site name: Elmsleigh Road, Staines

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
Total Sulphate in soil as %	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Appendix E

Laboratory Test Results – Geotechnical

TEST CERTIFICATE

Liquid and Plastic Limits

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

4041

Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

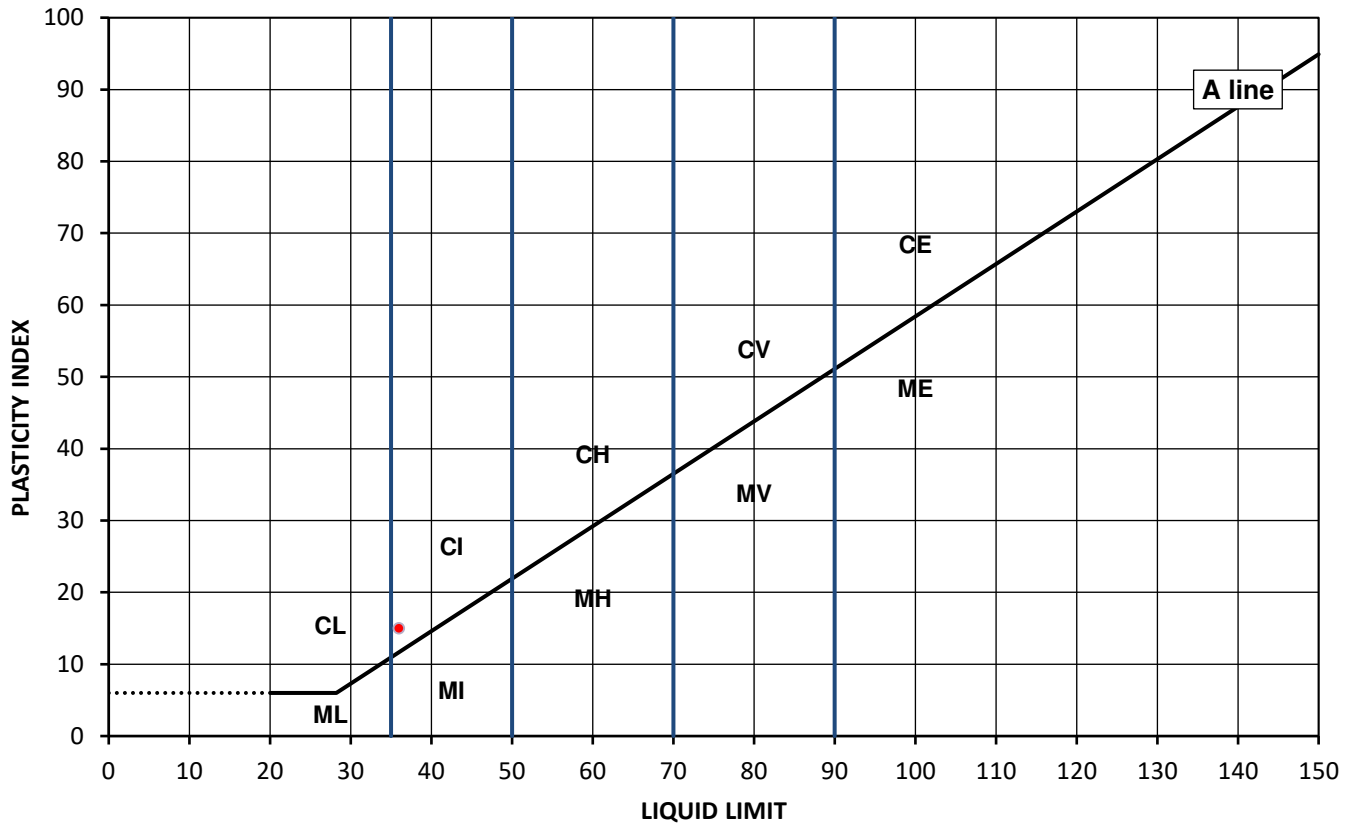
Client:	JSA Consulting Engineers Ltd T/A Patrick P	Client Reference:	L20002
Client Address:		Job Number:	20-95380
	40 St Pauls Square, B3 7FQ	Date Sampled:	Not Given
		Date Received:	30/03/2020
Contact:	Hugh Alder	Date Tested:	06/04/2020
Site Address:	Elmsleigh Road, Staines	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	1487666	Depth Top [m]:	2.00
Hole No.:	BH01	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Soil Description:	Yellowish brown slightly gravelly sandy CLAY		
Sample Preparation:	Tested after washing to remove >425um		

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
26	36	21	15	95



Legend, based on BS 5930:2015 Code of practice for site investigations

		Plasticity		Liquid Limit
C	Clay	L	Low	below 35
M	Silt	I	Medium	35 to 50
		H	High	50 to 70
		V	Very high	70 to 90
		E	Extremely high	exceeding 90
	Organic	O	append to classification for organic material (eg CHO)	

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Date Reported: 16/04/2020

GF 232.8

TEST CERTIFICATE

Liquid and Plastic Limits

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

4041

Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

Client:	JSA Consulting Engineers Ltd T/A Patrick P	Client Reference:	L20002
Client Address:		Job Number:	20-95380
	40 St Pauls Square, B3 7FQ	Date Sampled:	Not Given
		Date Received:	30/03/2020
Contact:	Hugh Alder	Date Tested:	06/04/2020
Site Address:	Elmsleigh Road, Staines	Sampled By:	Not Given

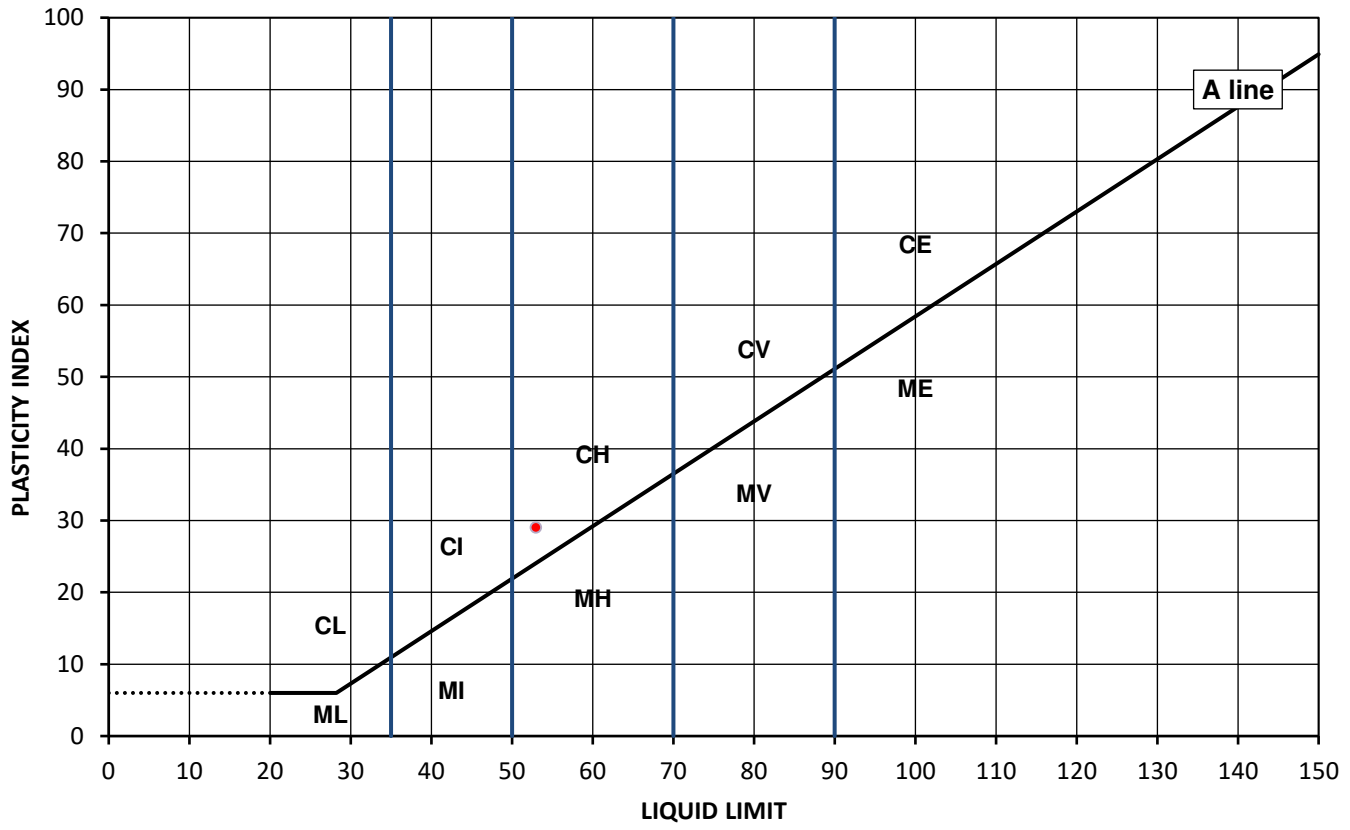
Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	1487667	Depth Top [m]:	8.50
Hole No.:	BH01	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Soil Description:	Dark grey slightly sandy CLAY		

Sample Preparation: Tested in natural condition

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
24	53	24	29	100



Legend, based on BS 5930:2015 Code of practice for site investigations

		Plasticity		Liquid Limit
C	Clay	L	Low	below 35
M	Silt	I	Medium	35 to 50
		H	High	50 to 70
		V	Very high	70 to 90
		E	Extremely high	exceeding 90
	Organic	O	append to classification for organic material (eg CHO)	

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Date Reported: 16/04/2020

GF 232.8

TEST CERTIFICATE

Liquid and Plastic Limits

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

4041

Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

Client:	JSA Consulting Engineers Ltd T/A Patrick P	Client Reference:	L20002
Client Address:		Job Number:	20-95380
	40 St Pauls Square, B3 7FQ	Date Sampled:	Not Given
		Date Received:	30/03/2020
Contact:	Hugh Alder	Date Tested:	06/04/2020
Site Address:	Elmsleigh Road, Staines	Sampled By:	Not Given

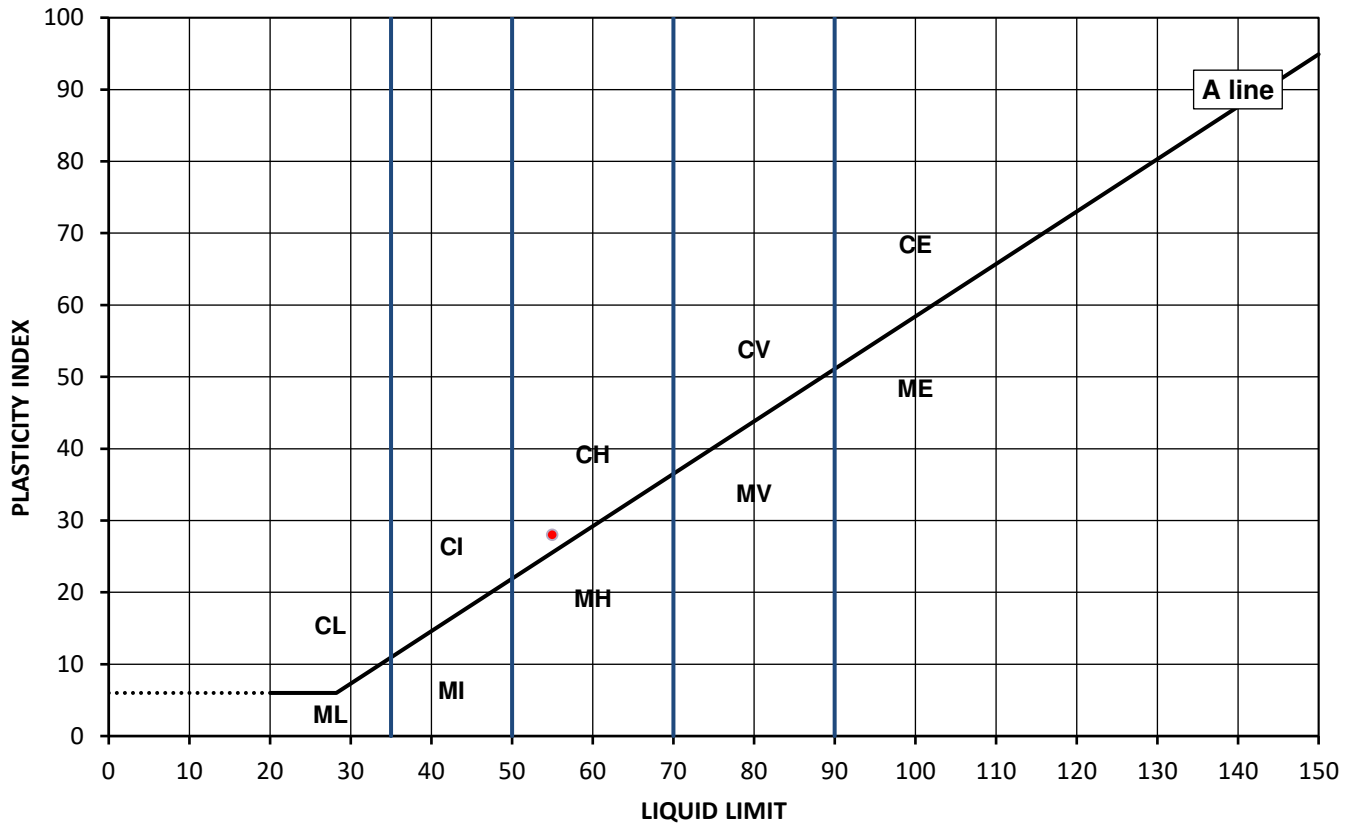
Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	1487668	Depth Top [m]:	33.70
Hole No.:	BH01	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Soil Description:	Dark brown slightly sandy CLAY		

Sample Preparation: Tested in natural condition

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
20	55	27	28	100



Legend, based on BS 5930:2015 Code of practice for site investigations

		Plasticity		Liquid Limit
C	Clay	L	Low	below 35
M	Silt	I	Medium	35 to 50
		H	High	50 to 70
		V	Very high	70 to 90
		E	Extremely high	exceeding 90
	Organic	O	append to classification for organic material (eg CHO)	

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Date Reported: 16/04/2020

GF 232.8

TEST CERTIFICATE

Liquid and Plastic Limits

i2 Analytical Ltd
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Brackmills Industrial Estate
Northampton NN4 7EB

4041

Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

Client:	JSA Consulting Engineers Ltd T/A Patrick P	Client Reference:	L20002
Client Address:		Job Number:	20-95380
	40 St Pauls Square, B3 7FQ	Date Sampled:	Not Given
		Date Received:	30/03/2020
Contact:	Hugh Alder	Date Tested:	06/04/2020
Site Address:	Elmsleigh Road, Staines	Sampled By:	Not Given

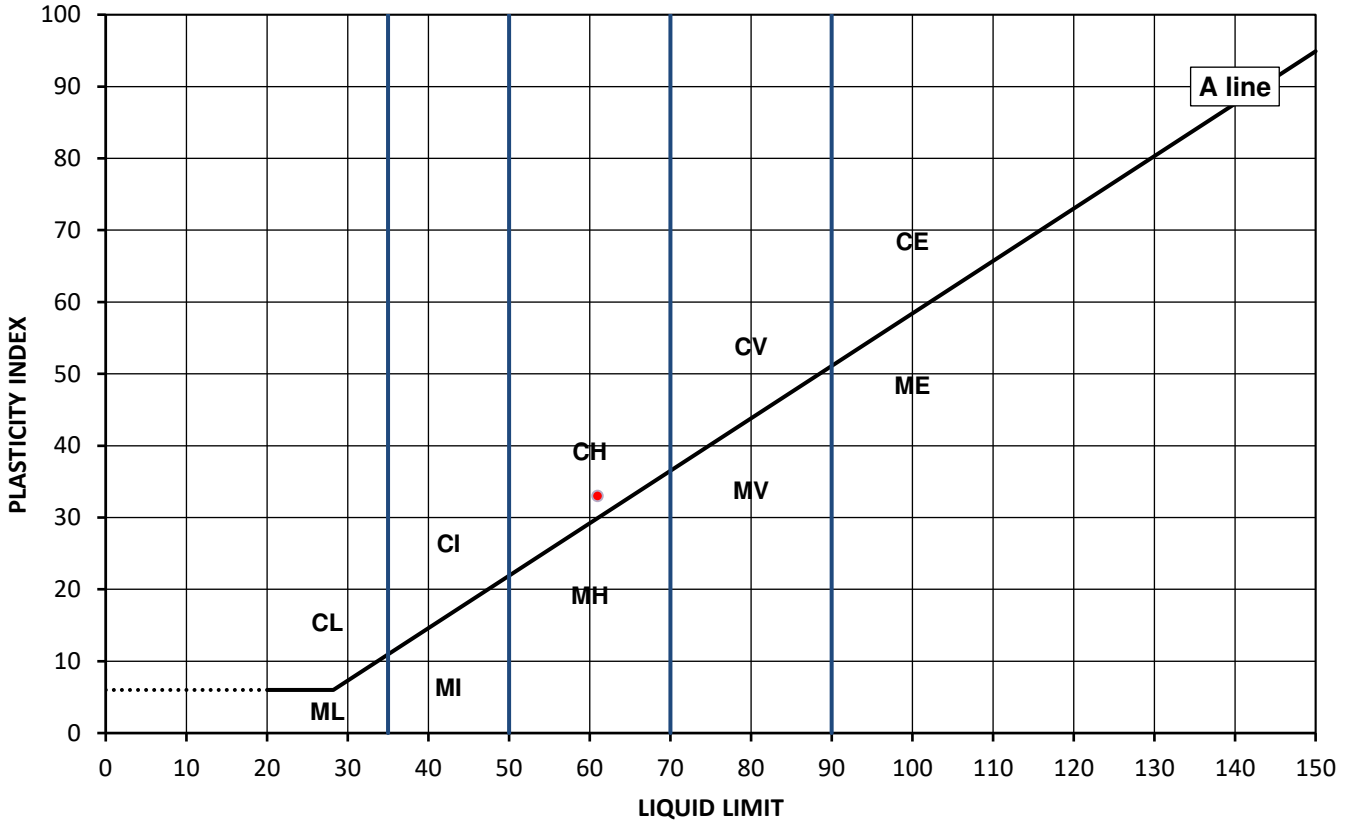
Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	1487670	Depth Top [m]:	14.50
Hole No.:	BH03	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Soil Description:	Dark brown CLAY		

Sample Preparation: Tested in natural condition

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
22	61	28	33	100



Legend, based on BS 5930:2015 Code of practice for site investigations

		Plasticity		Liquid Limit
C	Clay	L	Low	below 35
M	Silt	I	Medium	35 to 50
		H	High	50 to 70
		V	Very high	70 to 90
		E	Extremely high	exceeding 90
	Organic	O	append to classification for organic material (eg CHO)	

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

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PL Deputy Head of Geotechnical Section
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Date Reported: 16/04/2020

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Liquid and Plastic Limits

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Northampton NN4 7EB

4041

Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

Client:	JSA Consulting Engineers Ltd T/A Patrick P	Client Reference:	L20002
Client Address:		Job Number:	20-95380
	40 St Pauls Square, B3 7FQ	Date Sampled:	Not Given
		Date Received:	30/03/2020
Contact:	Hugh Alder	Date Tested:	06/04/2020
Site Address:	Elmsleigh Road, Staines	Sampled By:	Not Given

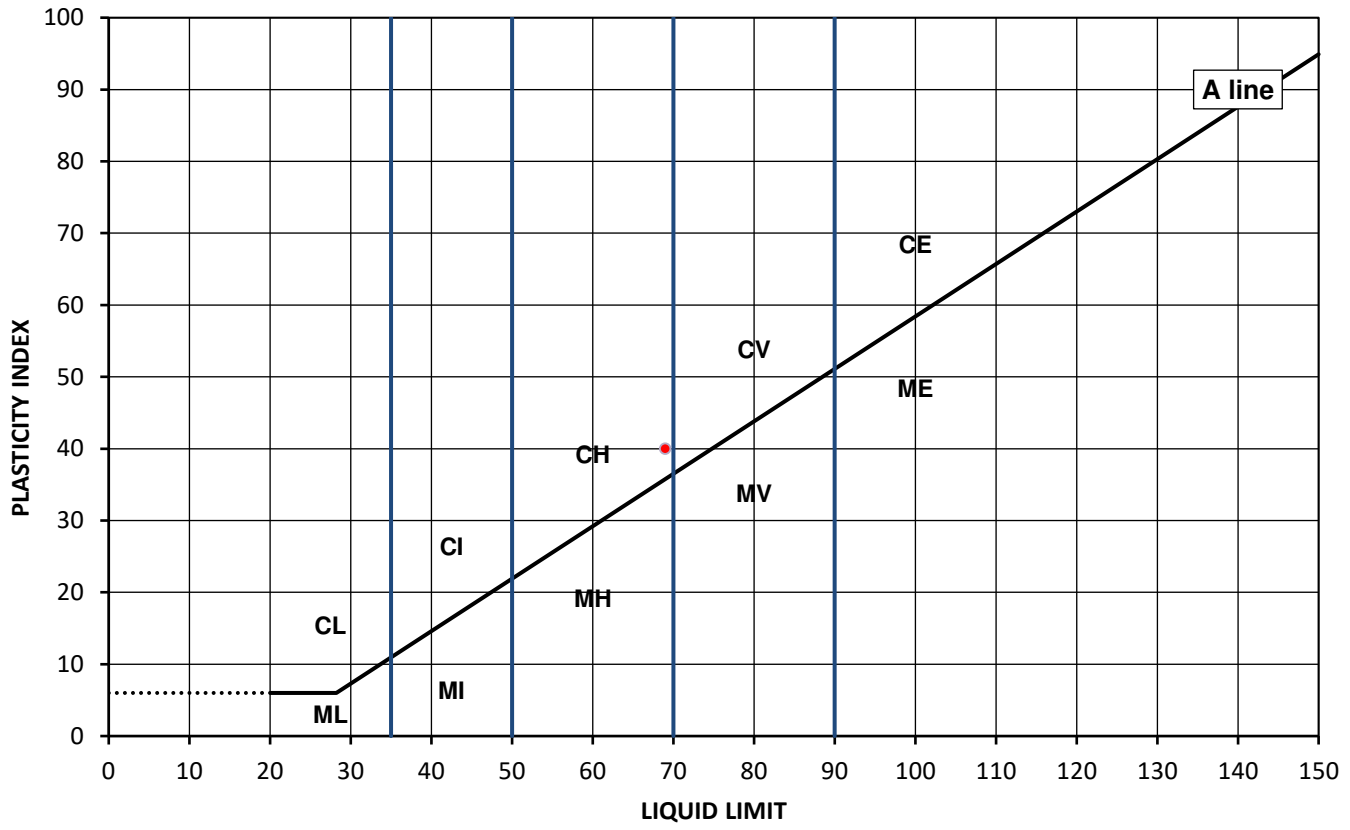
Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	1487671	Depth Top [m]:	22.50
Hole No.:	BH02	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Soil Description:	Dark brown CLAY		

Sample Preparation: Tested in natural condition

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
23	69	29	40	100



Legend, based on BS 5930:2015 Code of practice for site investigations

		Plasticity		Liquid Limit
C	Clay	L	Low	below 35
M	Silt	I	Medium	35 to 50
		H	High	50 to 70
		V	Very high	70 to 90
		E	Extremely high	exceeding 90
	Organic	O	append to classification for organic material (eg CHO)	

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

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Date Reported: 16/04/2020

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4041

Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

Client:	JSA Consulting Engineers Ltd T/A Patrick P	Client Reference:	L20002
Client Address:		Job Number:	20-95380
	40 St Pauls Square, B3 7FQ	Date Sampled:	Not Given
		Date Received:	30/03/2020
Contact:	Hugh Alder	Date Tested:	06/04/2020
Site Address:	Elmsleigh Road, Staines	Sampled By:	Not Given

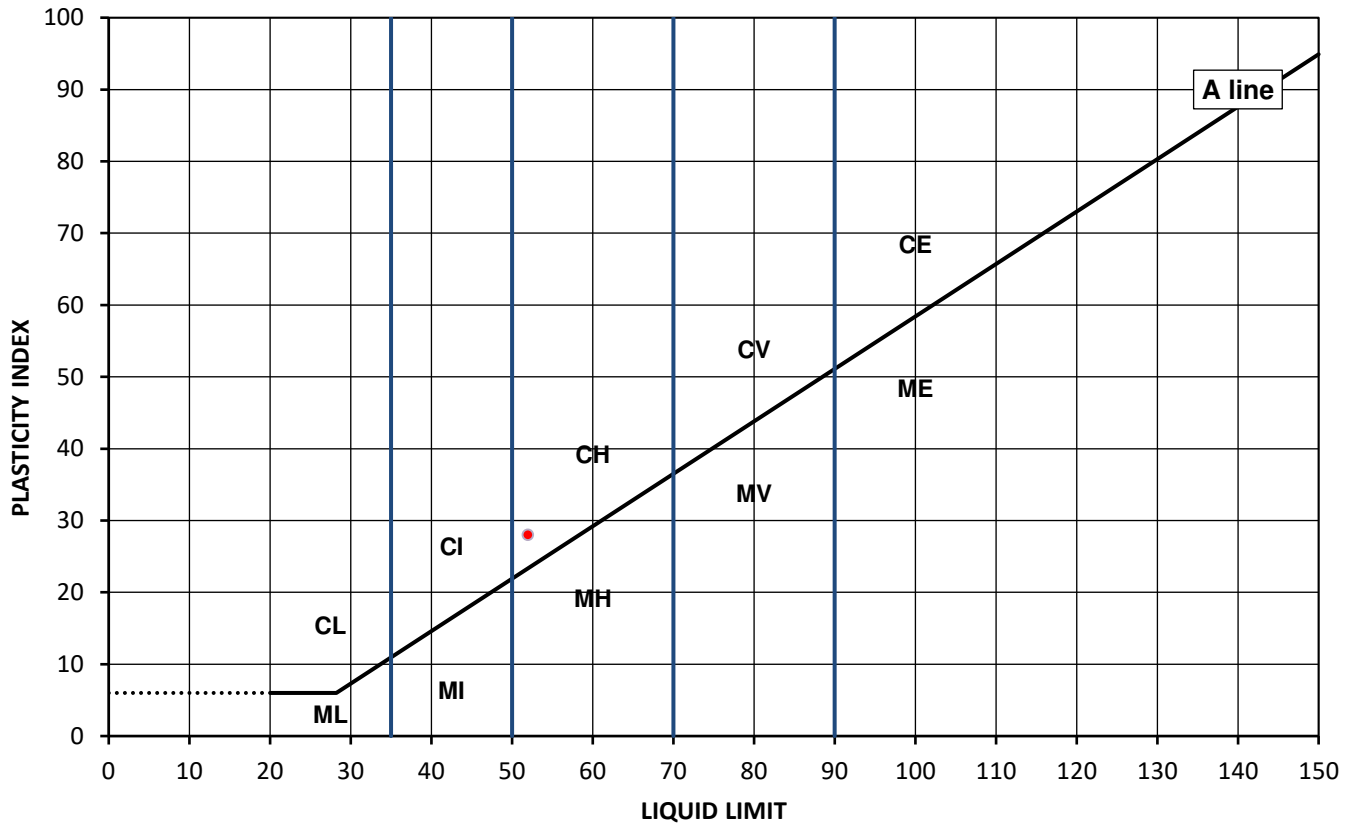
Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	1487672	Depth Top [m]:	10.50
Hole No.:	BH03	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Soil Description:	Dark brown slightly sandy CLAY		

Sample Preparation: Tested in natural condition

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
25	52	24	28	100



Legend, based on BS 5930:2015 Code of practice for site investigations

		Plasticity		Liquid Limit
C	Clay	L	Low	below 35
M	Silt	I	Medium	35 to 50
		H	High	50 to 70
		V	Very high	70 to 90
		E	Extremely high	exceeding 90
	Organic	O	append to classification for organic material (eg CHO)	

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Date Reported: 16/04/2020

GF 232.8

TEST CERTIFICATE

Liquid and Plastic Limits

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Northampton NN4 7EB

4041

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Client:	JSA Consulting Engineers Ltd T/A Patrick P	Client Reference:	L20002
Client Address:		Job Number:	20-95380
	40 St Pauls Square, B3 7FQ	Date Sampled:	Not Given
		Date Received:	30/03/2020
Contact:	Hugh Alder	Date Tested:	06/04/2020
Site Address:	Elmsleigh Road, Staines	Sampled By:	Not Given

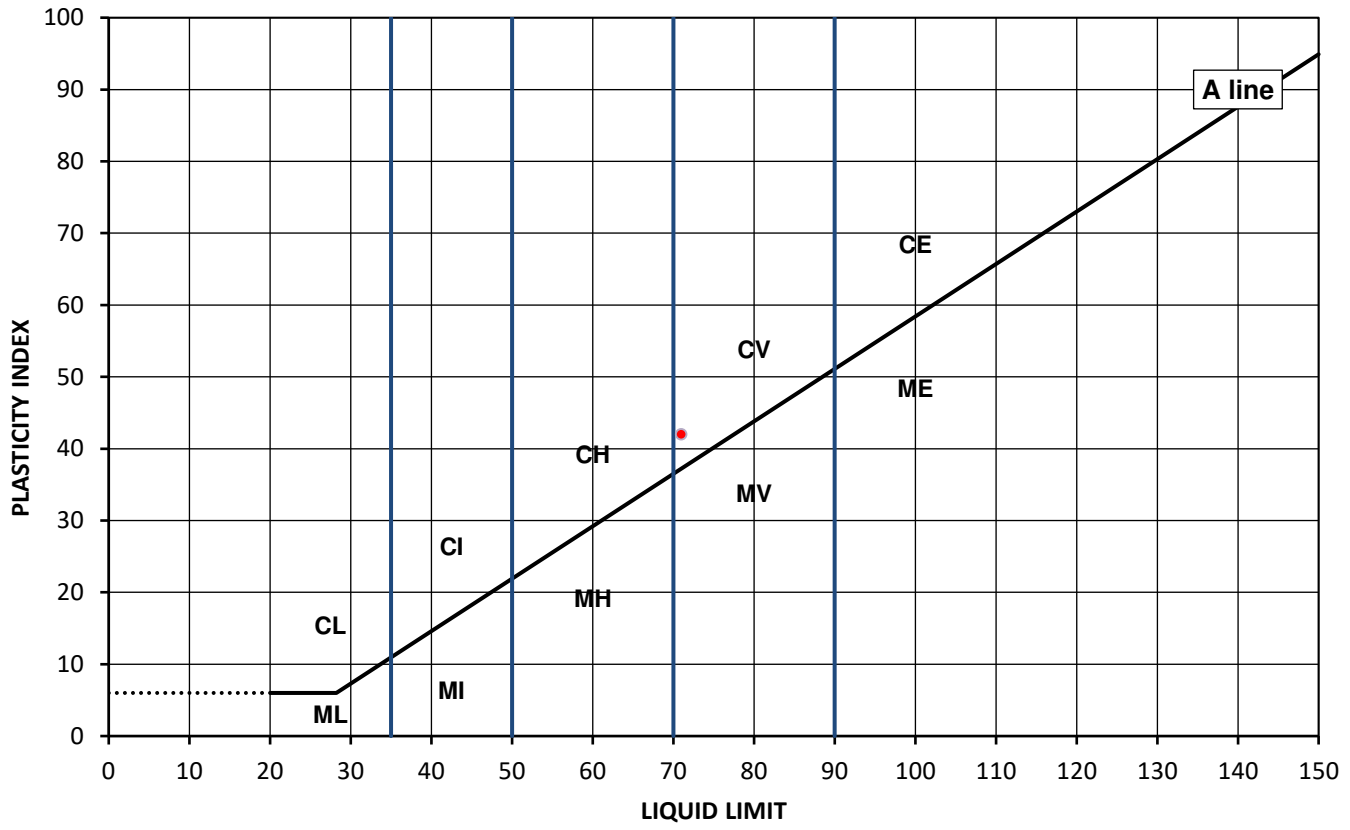
Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	1487673	Depth Top [m]:	17.50
Hole No.:	BH03	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Soil Description:	Dark grey CLAY		

Sample Preparation: Tested in natural condition

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
24	71	29	42	100



Legend, based on BS 5930:2015 Code of practice for site investigations

		Plasticity		Liquid Limit
C	Clay	L	Low	below 35
M	Silt	I	Medium	35 to 50
		H	High	50 to 70
		V	Very high	70 to 90
		E	Extremely high	exceeding 90
	Organic	O	append to classification for organic material (eg CHO)	

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Date Reported: 16/04/2020

GF 232.8

TEST CERTIFICATE

Liquid and Plastic Limits

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

4041

Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

Client:	JSA Consulting Engineers Ltd T/A Patrick P	Client Reference:	L20002
Client Address:		Job Number:	20-95380
	40 St Pauls Square, B3 7FQ	Date Sampled:	Not Given
		Date Received:	30/03/2020
Contact:	Hugh Alder	Date Tested:	06/04/2020
Site Address:	Elmsleigh Road, Staines	Sampled By:	Not Given

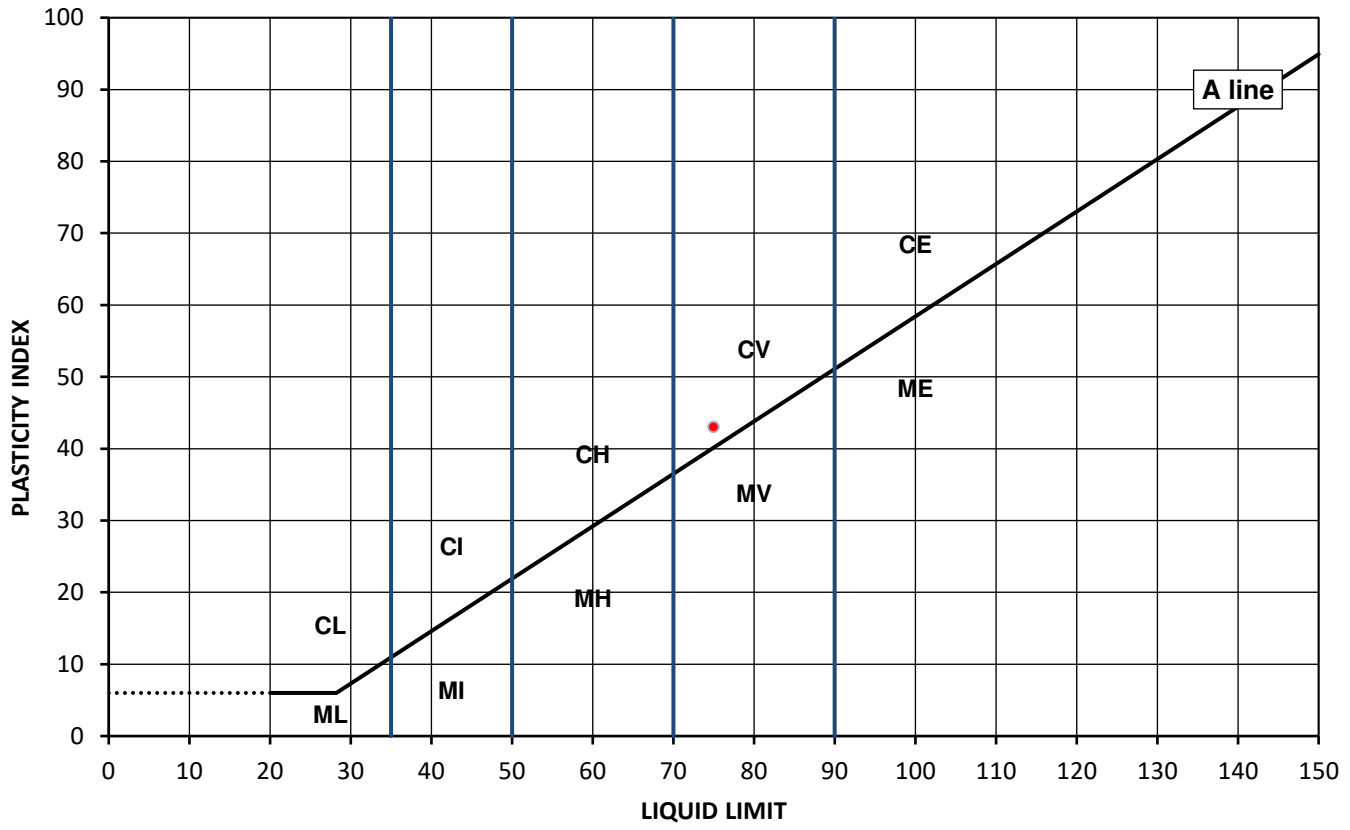
Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	1487674	Depth Top [m]:	28.50
Hole No.:	BH03	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Soil Description:	Brown CLAY		

Sample Preparation: Tested in natural condition

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
26	75	32	43	100



Legend, based on BS 5930:2015 Code of practice for site investigations

		Plasticity		Liquid Limit
C	Clay	L	Low	below 35
M	Silt	I	Medium	35 to 50
		H	High	50 to 70
		V	Very high	70 to 90
		E	Extremely high	exceeding 90
	Organic	O	append to classification for organic material (eg CHO)	

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Date Reported: 16/04/2020

GF 232.8

SUMMARY REPORT

Summary of Classification Test Results

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

4041

Tested in Accordance with:

MC by BS 1377-2: 1990: Clause 3.2; WC by BS EN 17892-1: 2014; Atterberg by BS 1377-2: 1990: Clause 4.3, Clause 4.4 and 5; PD by BS 1377-2: 1990: Clause 8.2

Client: JSA Consulting Engineers Ltd T/A Patrick P

Client Address: 40 St Pauls Square, B3 7FQ

Contact: Hugh Alder

Site Address: Elmsleigh Road, Staines

Client Reference: L20002
Job Number: 20-95380
Date Sampled: Not Given
Date Received: 30/03/2020
Date Tested: 06/04/2020
Sampled By: Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	MC	WC	Atterberg				Density			Total Porosity#		
		Reference	Depth Top	Depth Base	Type					% Passing 425um	LL	PL	PI	bulk	dry	PD			
			m	m				%	%	%	%	%	%	Mg/m3	Mg/m3	Mg/m3	%		
1487666	BH01	Not Given	2.00	Not Given	D	Yellowish brown slightly gravelly sandy CLAY	Atterberg 1 Point	26		95	36	21	15						
1487667	BH01	Not Given	8.50	Not Given	D	Dark grey slightly sandy CLAY	Atterberg 1 Point	24		100	53	24	29						
1487668	BH01	Not Given	33.70	Not Given	D	Dark brown slightly sandy CLAY	Atterberg 1 Point	20		100	55	27	28						
1487671	BH02	Not Given	22.50	Not Given	D	Dark brown CLAY	Atterberg 1 Point	23		100	69	29	40						
1487672	BH03	Not Given	10.50	Not Given	D	Dark brown slightly sandy CLAY	Atterberg 1 Point	25		100	52	24	28						
1487670	BH03	Not Given	14.50	Not Given	D	Dark brown CLAY	Atterberg 1 Point	22		100	61	28	33						
1487673	BH03	Not Given	17.50	Not Given	D	Dark grey CLAY	Atterberg 1 Point	24		100	71	29	42						
1487674	BH03	Not Given	28.50	Not Given	D	Brown CLAY	Atterberg 1 Point	26		100	75	32	43						

Note: # Non accredited; NP - Non plastic

Comments:

Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Date Reported: 16/04/2020

GF 234.10

TEST CERTIFICATE

Determination of California Bearing Ratio

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

4041

Tested in Accordance with: BS 1377-4: 1990: Clause 7

Client:	JSA Consulting Engineers Ltd T/A Patrick P	Client Reference:	L20002
Client Address:		Job Number:	20-95380
	40 St Pauls Square, B3 7FQ	Date Sampled:	Not Given
		Date Received:	30/03/2020
Contact:	Hugh Alder	Date Tested:	15/04/2020
Site Address:	Elmsleigh Road, Staines	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

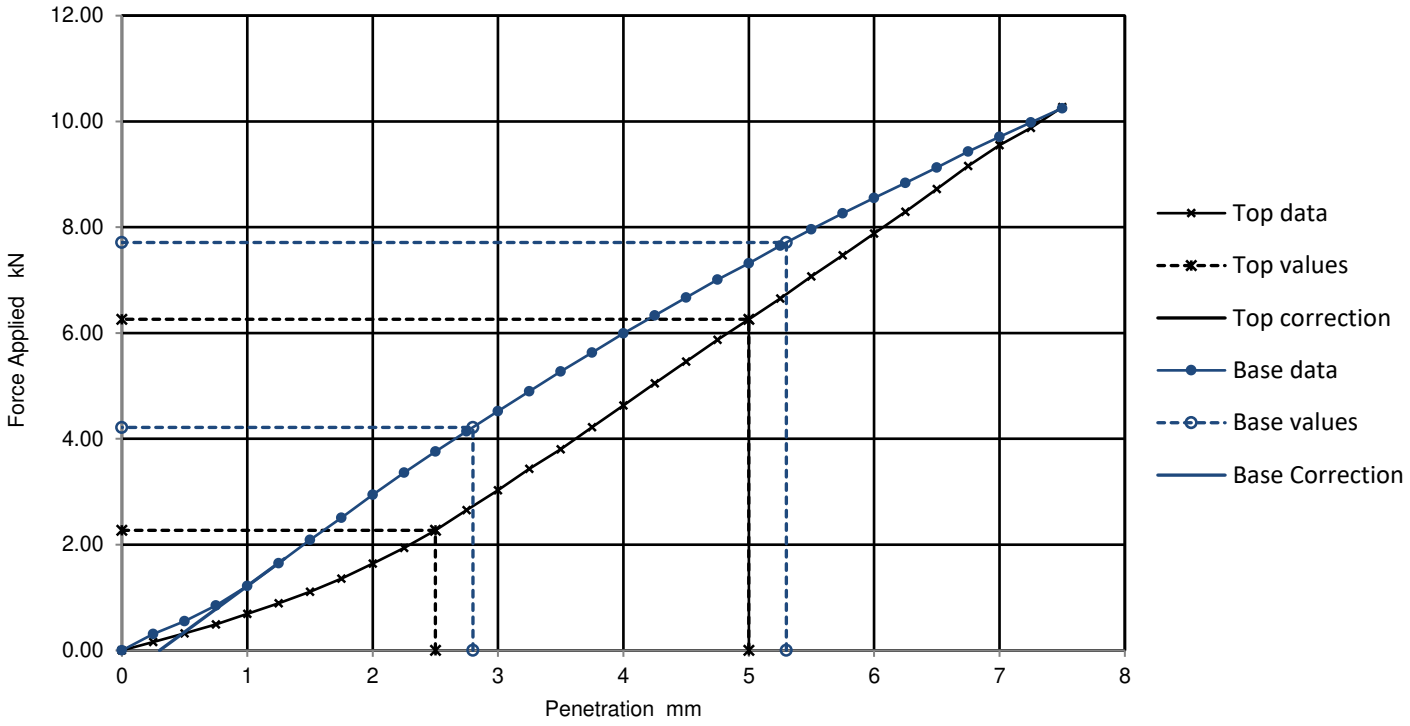
Laboratory Reference:	1487650	Depth Top [m]:	0.20
Hole No.:	BH02	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	B
Sample Description:	Light brown gravelly SAND		

Specimen Preparation:

Condition	Remoulded	Soaking details	Not soaked
Details	Recompacted with specified standard effort using 2.5kg rammer	Period of soaking	days
		Time to surface	days
		Amount of swell recorded	mm
Material retained on 20mm sieve removed	18 %	Dry density after soaking	Mg/m3

Initial Specimen details	Bulk density	1.87	Mg/m3	Surcharge applied	8 kg
	Dry density	1.57	Mg/m3		4.9 kPa
	Moisture content	19	%		

Force v Penetration Plots



Results

	Curve correction applied	CBR Values, % 2.5mm	5mm	Highest	Average	Moisture Content %
TOP	No	17.0	31.0	31.0		20
BASE	Yes	32.0	39.0	39.0		20

Remarks:

Test/ Specimen specific remarks:

Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Date Reported: 16/04/2020

GF 108.14

TEST CERTIFICATE

Determination of California Bearing Ratio

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

4041

Tested in Accordance with: BS 1377-4: 1990: Clause 7

Client:	JSA Consulting Engineers Ltd T/A Patrick P	Client Reference:	L20002
Client Address:		Job Number:	20-95380
	40 St Pauls Square, B3 7FQ	Date Sampled:	Not Given
		Date Received:	30/03/2020
Contact:	Hugh Alder	Date Tested:	15/04/2020
Site Address:	Elmsleigh Road, Staines	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

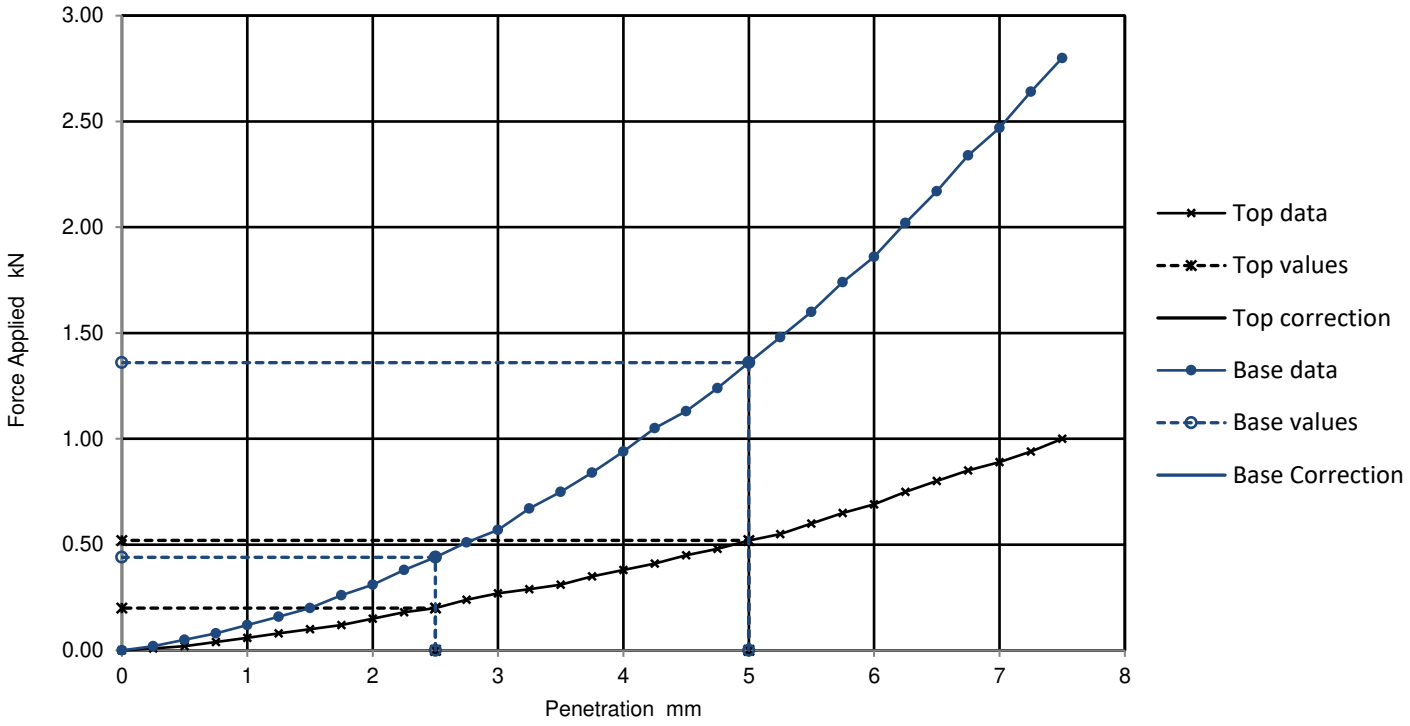
Laboratory Reference:	1487651	Depth Top [m]:	0.50
Hole No.:	BH03	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	B
Sample Description:	Brown slightly clayey gravelly SAND		

Specimen Preparation:

Condition	Remoulded	Soaking details	Not soaked
Details	Recompacted with specified standard effort using 2.5kg rammer	Period of soaking	days
		Time to surface	days
		Amount of swell recorded	mm
Material retained on 20mm sieve removed	20 %	Dry density after soaking	Mg/m3

Initial Specimen details	Bulk density	2.21	Mg/m3	Surcharge applied	8 kg
	Dry density	1.96	Mg/m3		4.9 kPa
	Moisture content	13	%		

Force v Penetration Plots



Results

	Curve correction applied	CBR Values, % 2.5mm	5mm	Highest	Average	Moisture Content %
TOP	No	1.5	2.6	2.6		13
BASE	No	3.3	6.8	6.8		12

Remarks:

Test/ Specimen specific remarks:

Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Date Reported: 16/04/2020

GF 108.14

SUMMARY REPORT

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

Environmental Science

Summary of Undrained Shear Strength Using Hand Vane Apparatus Test Results

Tested in Accordance with: In-house Method G074
Guideline for Hand Held Shear Vane Test, New Zealand
Geotechnical Society INC, August 2001

Client: JSA Consulting Engineers Ltd T/A Patrick P
Client Address:
40 St Pauls Square, B3 7FQ

Contact: Hugh Alder
Site Address: Elmsleigh Road, Staines

Client Reference: L20002
Job Number: 20-95380
Date Sampled: Not Given
Date Received: 30/03/2020
Date Tested: 10/04/2020
Sampled By: Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	Shear Vane Reading 1	Shear Vane Reading 2	Shear Vane Reading 3	Shear Vane Reading 4	Shear Vane Reading Average	Tv						
		Reference	Depth Top	Depth Base	Type														
			m	m				kPa	kPa	kPa	kPa	kPa	kPa						
1487653	BH01	Not Given	15.00	Not Given	U	Dark brown CLAY		130<	130<	130<	130<	130<							
1487655	BH01	Not Given	25.50	Not Given	U	Dark brown CLAY		UTP	UTP	UTP	UTP	UTP							
1487658	BH02	Not Given	9.50	Not Given	U	Brownish grey CLAY		86	78	122	110	99							
1487660	BH02	Not Given	19.50	Not Given	U	Brown CLAY		130<	130<	130<	130<	130<							
1487664	BH03	Not Given	25.50	Not Given	U	Dark brown CLAY		130<	130<	130<	130<	130<							

Note: UTP - Unable To Penetrate

Comments:

Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Date Reported: 16/04/2020

GF 150.12

TEST CERTIFICATE

Unconsolidated Undrained

Triaxial Compression

Tested in Accordance with:
BS 1377-7: 1990: Clause 8

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

UKAS TESTING 4041

Environmental Science

Client:	JSA Consulting Engineers Ltd T/A Patrick P	Client Reference:	L20002
Client Address:		Job Number:	20-95380
	40 St Pauls Square, B3 7FQ	Date Sampled:	Not Given
		Date Received:	30/03/2020
Contact:	Hugh Alder	Date Tested:	08/04/2020
Site Address:	Elmsleigh Road, Staines	Sampled By:	Not Given

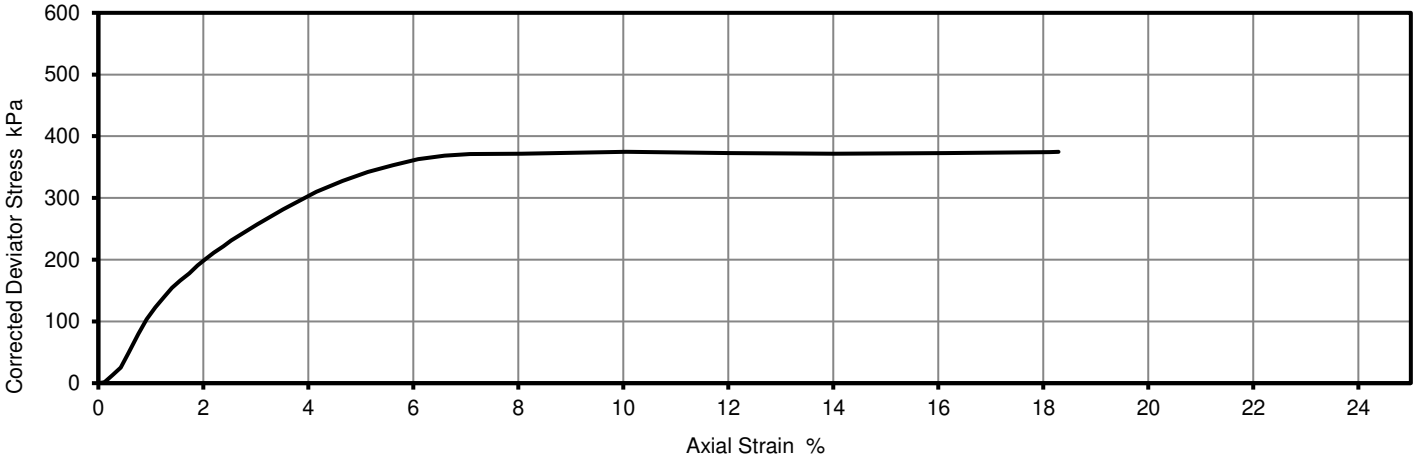
Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

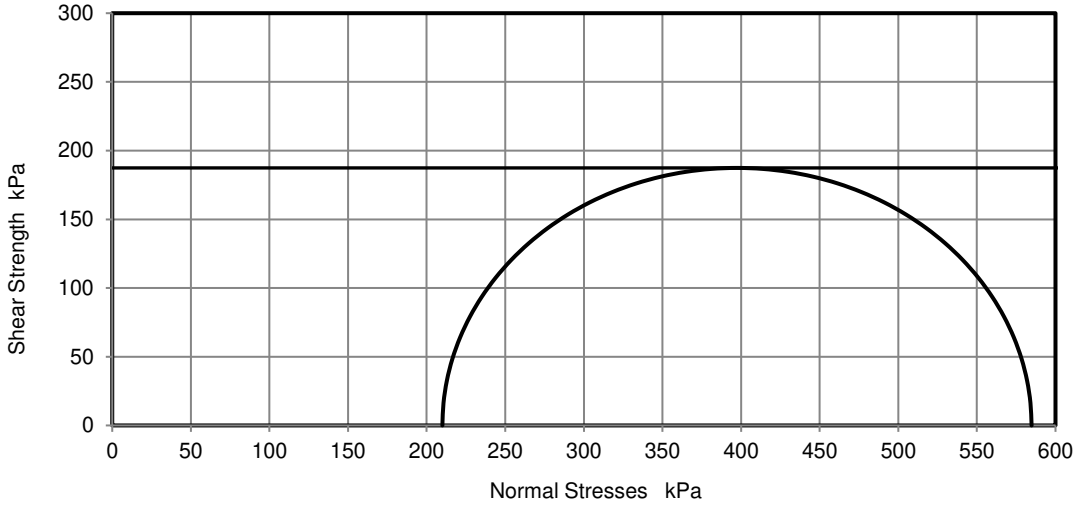
Laboratory Reference:	1487652	Depth Top [m]:	10.50
Hole No.:	BH01	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	U
Sample Description:	Brownish grey silty CLAY		

Test Number	1		Rate of Strain	2.00	%/min	
Length	194.27	mm	Cell Pressure	210	kPa	
Diameter	102.33	mm	Axial Strain at failure	18.3	%	
Bulk Density	2.06	Mg/m3	Deviator Stress, (σ1 - σ3)f	375	kPa	
Moisture Content	26	%	Undrained Shear Strength, cu	187	kPa	½(σ1 - σ3)f
Dry Density	1.64	Mg/m3	Mode of Failure	Compound		
Membrane Correction	0.80	kPa	Membrane thickness	0.23	mm	

Deviator Stress v Axial Strain



Mohr Circles



Position within sample

Note: Deviator stress corrected for area change and membrane effects. Mohr circles and their interpretation is not covered by BS1377. This is provided for information only.

Remarks:

Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Date Reported: 16/04/2020

GF 184.10

TEST CERTIFICATE

Unconsolidated Undrained

Triaxial Compression

Tested in Accordance with:
BS 1377-7: 1990: Clause 8

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

UKAS TESTING 4041

Environmental Science

Client:	JSA Consulting Engineers Ltd T/A Patrick P	Client Reference:	L20002
Client Address:		Job Number:	20-95380
	40 St Pauls Square, B3 7FQ	Date Sampled:	Not Given
		Date Received:	30/03/2020
Contact:	Hugh Alder	Date Tested:	08/04/2020
Site Address:	Elmsleigh Road, Staines	Sampled By:	Not Given

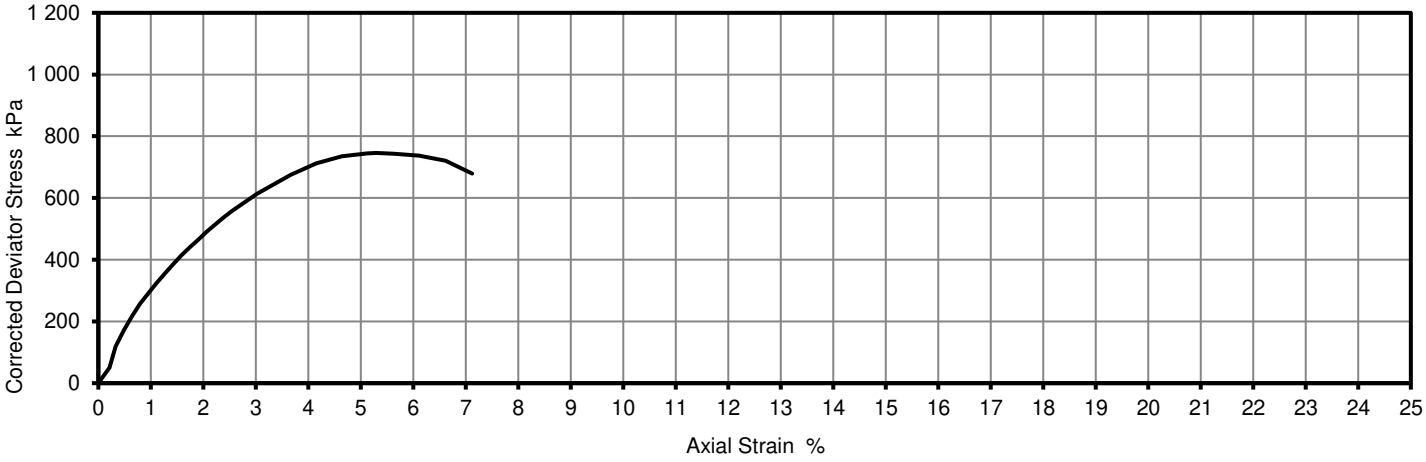
Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

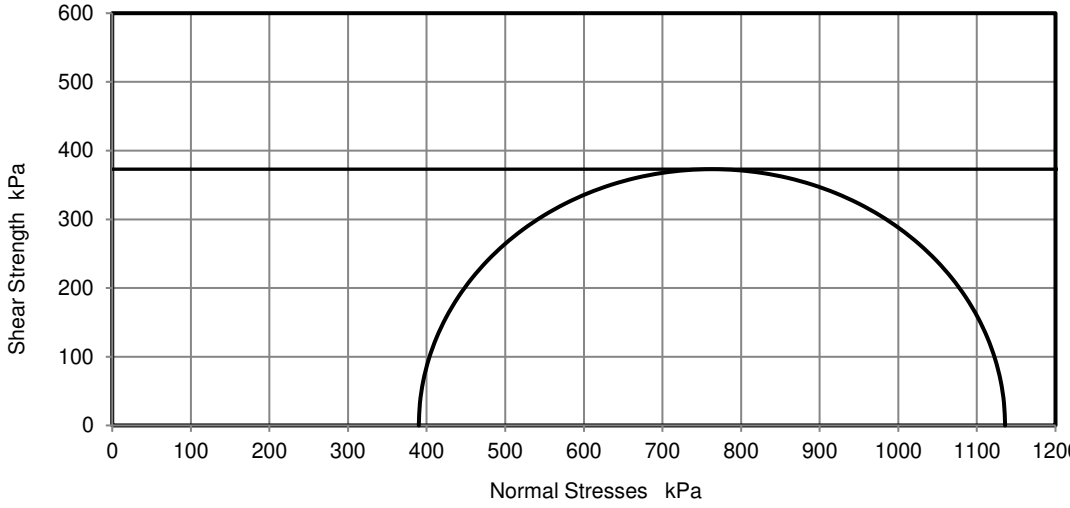
Laboratory Reference:	1487654	Depth Top [m]:	19.50
Hole No.:	BH01	Depth Base [m]:	19.95
Sample Reference:	Not Given	Sample Type:	U
Sample Description:	Brownish grey slightly silty CLAY		

Test Number	1		Rate of Strain	2.00	%/min	
Length	191.29	mm	Cell Pressure	390	kPa	
Diameter	101.96	mm	Axial Strain at failure	5.3	%	
Bulk Density	2.03	Mg/m3	Deviator Stress, (σ1 - σ3)f	746	kPa	
Moisture Content	24	%	Undrained Shear Strength, cu	373	kPa	½(σ1 - σ3)f
Dry Density	1.64	Mg/m3	Mode of Failure	Brittle		
Membrane Correction	0.34	kPa	Membrane thickness	0.24	mm	

Deviator Stress v Axial Strain



Mohr Circles



Position within sample

Note: Deviator stress corrected for area change and membrane effects. Mohr circles and their interpretation is not covered by BS1377. This is provided for information only.

Remarks:

Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Date Reported: 16/04/2020

GF 184.10

TEST CERTIFICATE

Unconsolidated Undrained

Triaxial Compression

Tested in Accordance with:
BS 1377-7: 1990: Clause 8

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

UKAS TESTING 4041

Environmental Science

Client:	JSA Consulting Engineers Ltd T/A Patrick P	Client Reference:	L20002
Client Address:		Job Number:	20-95380
	40 St Pauls Square, B3 7FQ	Date Sampled:	Not Given
		Date Received:	30/03/2020
Contact:	Hugh Alder	Date Tested:	08/04/2020
Site Address:	Elmsleigh Road, Staines	Sampled By:	Not Given

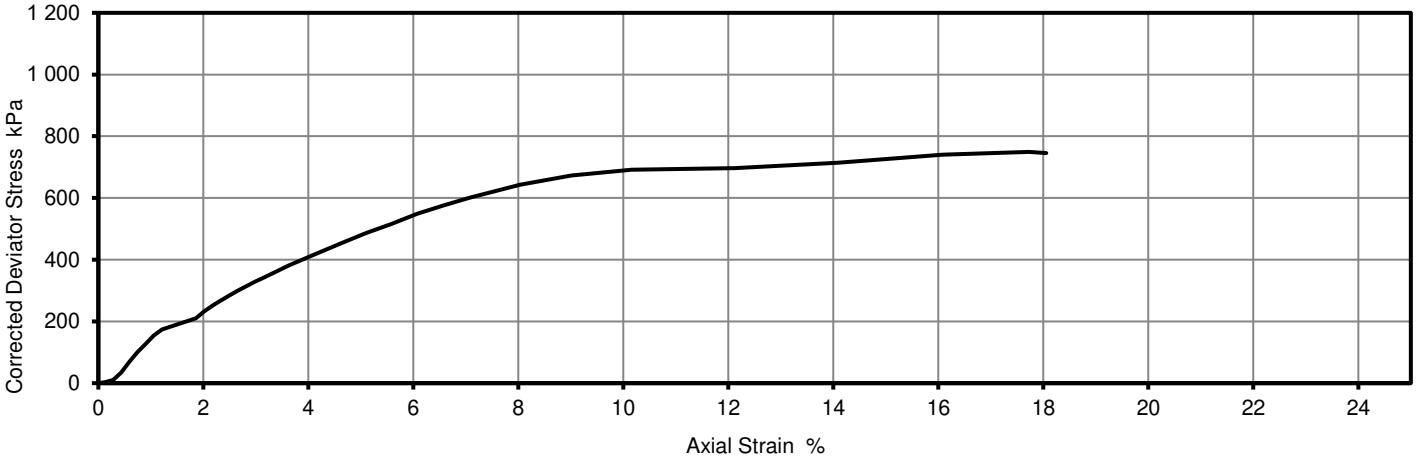
Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

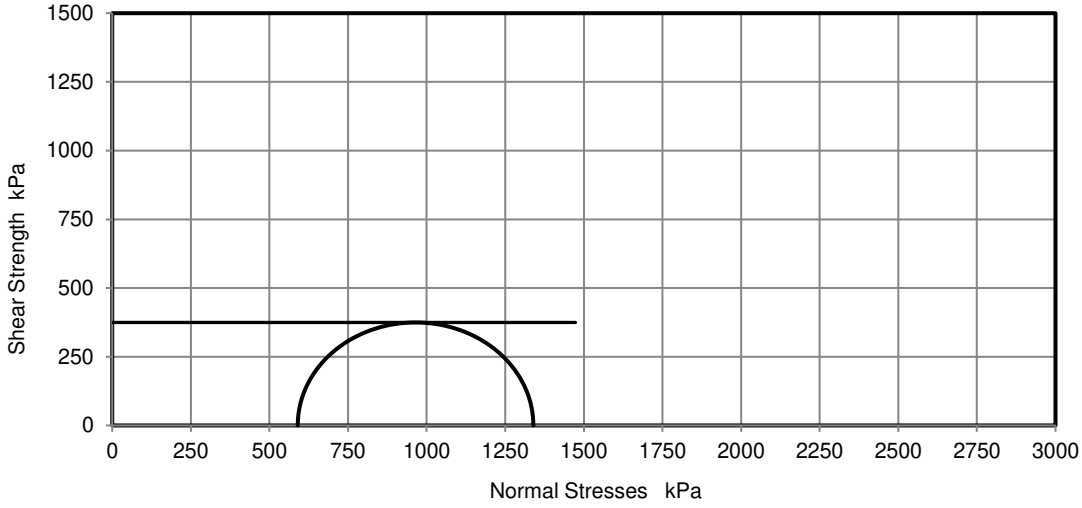
Laboratory Reference:	1487656	Depth Top [m]:	29.50
Hole No.:	BH01	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	U
Sample Description:	Brownish grey silty CLAY		

Test Number	1		Rate of Strain	2.00	%/min	
Length	195.57	mm	Cell Pressure	590	kPa	
Diameter	101.92	mm	Axial Strain at failure	17.7	%	
Bulk Density	2.07	Mg/m3	Deviator Stress, (σ1 - σ3)f	749	kPa	
Moisture Content	20	%	Undrained Shear Strength, cu	375	kPa	½(σ1 - σ3)f
Dry Density	1.72	Mg/m3	Mode of Failure	Compound		
Membrane Correction	0.75	kPa	Membrane thickness	0.22	mm	

Deviator Stress v Axial Strain



Mohr Circles



Position within sample

Note: Deviator stress corrected for area change and membrane effects. Mohr circles and their interpretation is not covered by BS1377. This is provided for information only.

Remarks:

Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Date Reported: 16/04/2020

GF 184.10

TEST CERTIFICATE

Unconsolidated Undrained

Triaxial Compression

Tested in Accordance with:
BS 1377-7: 1990: Clause 8

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

UKAS TESTING 4041

Environmental Science

Client:	JSA Consulting Engineers Ltd T/A Patrick P	Client Reference:	L20002
Client Address:		Job Number:	20-95380
	40 St Pauls Square, B3 7FQ	Date Sampled:	Not Given
		Date Received:	30/03/2020
Contact:	Hugh Alder	Date Tested:	08/04/2020
Site Address:	Elmsleigh Road, Staines	Sampled By:	Not Given

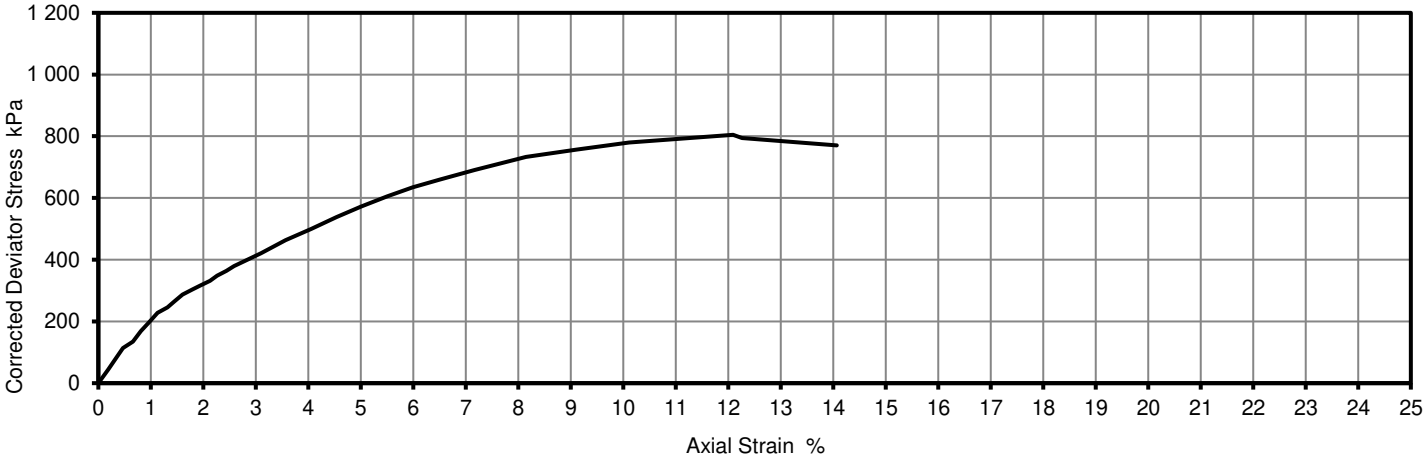
Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

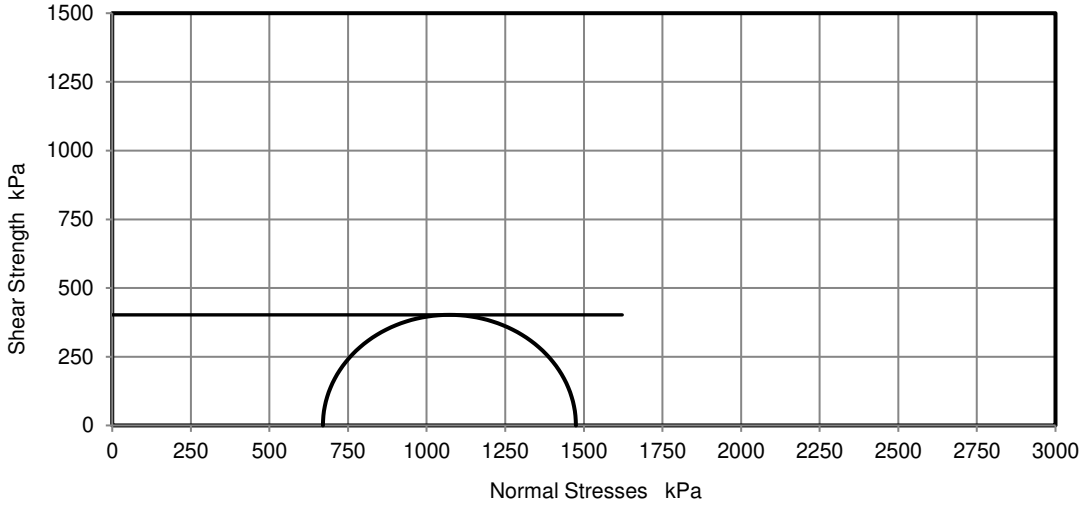
Laboratory Reference:	1487657	Depth Top [m]:	33.50
Hole No.:	BH01	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	U
Sample Description:	Brownish grey silty CLAY		

Test Number	1		Rate of Strain	2.00	%/min	
Length	74.29	mm	Cell Pressure	670	kPa	
Diameter	37.30	mm	Axial Strain at failure	12.1	%	
Bulk Density	2.01	Mg/m3	Deviator Stress, (σ1 - σ3)f	805	kPa	
Moisture Content	20	%	Undrained Shear Strength, cu	402	kPa	½(σ1 - σ3)f
Dry Density	1.68	Mg/m3	Mode of Failure	Compound		
Membrane Correction	1.44	kPa	Membrane thickness	0.21	mm	

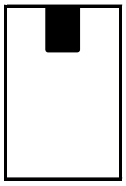
Deviator Stress v Axial Strain



Mohr Circles



Position within sample



Note: Deviator stress corrected for area change and membrane effects. Mohr circles and their interpretation is not covered by BS1377. This is provided for information only.

Remarks:

Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Date Reported: 16/04/2020

GF 184.10

TEST CERTIFICATE

Unconsolidated Undrained

Triaxial Compression

Tested in Accordance with:
BS 1377-7: 1990: Clause 8

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

UKAS TESTING 4041

Environmental Science

Client:	JSA Consulting Engineers Ltd T/A Patrick P	Client Reference:	L20002
Client Address:		Job Number:	20-95380
	40 St Pauls Square, B3 7FQ	Date Sampled:	Not Given
		Date Received:	30/03/2020
Contact:	Hugh Alder	Date Tested:	08/04/2020
Site Address:	Elmsleigh Road, Staines	Sampled By:	Not Given

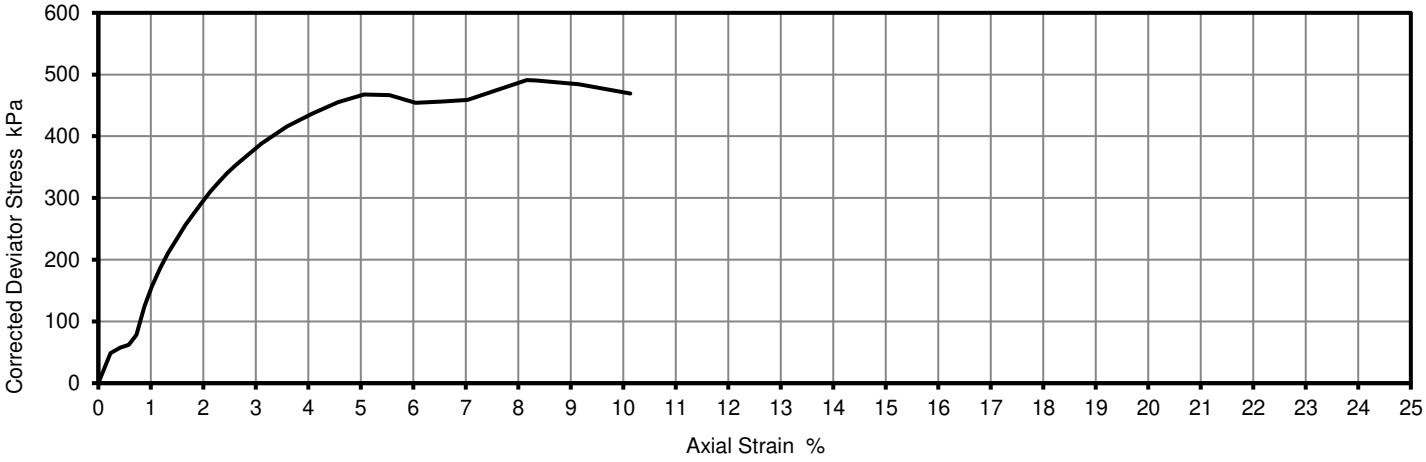
Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

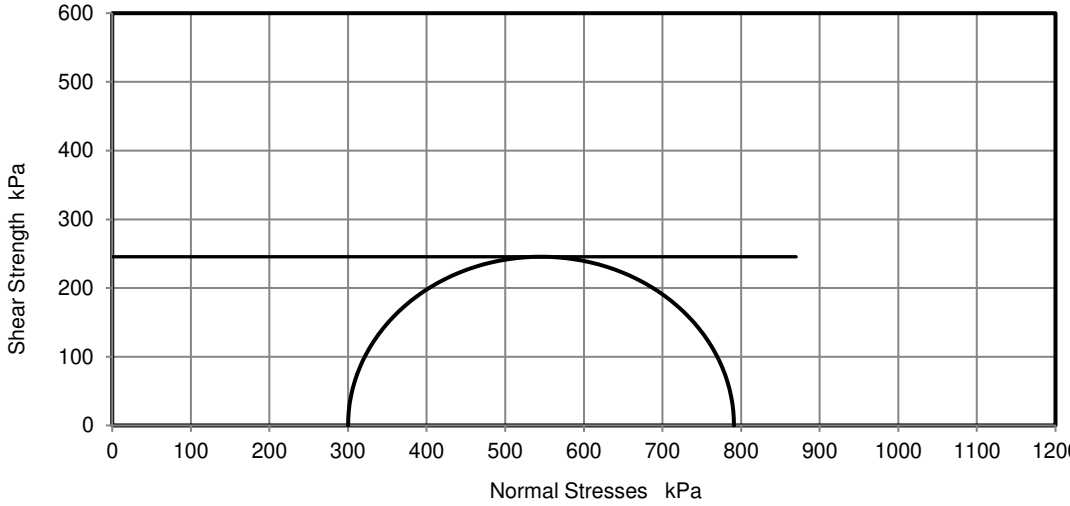
Laboratory Reference:	1487659	Depth Top [m]:	15.00
Hole No.:	BH02	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	U
Sample Description:	Brownish grey CLAY		

Test Number	1		Rate of Strain	2.00	%/min	
Length	197.67	mm	Cell Pressure	300	kPa	
Diameter	102.30	mm	Axial Strain at failure	8.2	%	
Bulk Density	2.06	Mg/m3	Deviator Stress, (σ1 - σ3)f	491	kPa	
Moisture Content	23	%	Undrained Shear Strength, cu	245	kPa	½(σ1 - σ3)f
Dry Density	1.67	Mg/m3	Mode of Failure	Brittle		
Membrane Correction	0.40	kPa	Membrane thickness	0.21	mm	

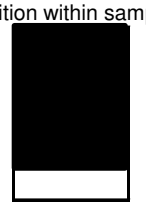
Deviator Stress v Axial Strain



Mohr Circles



Position within sample



Note: Deviator stress corrected for area change and membrane effects. Mohr circles and their interpretation is not covered by BS1377. This is provided for information only.

Remarks:

Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Date Reported: 16/04/2020

GF 184.10

TEST CERTIFICATE

Unconsolidated Undrained

Triaxial Compression

Tested in Accordance with:
BS 1377-7: 1990: Clause 8

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

UKAS TESTING 4041

Environmental Science

Client:	JSA Consulting Engineers Ltd T/A Patrick P	Client Reference:	L20002
Client Address:		Job Number:	20-95380
	40 St Pauls Square, B3 7FQ	Date Sampled:	Not Given
		Date Received:	30/03/2020
Contact:	Hugh Alder	Date Tested:	08/04/2020
Site Address:	Elmsleigh Road, Staines	Sampled By:	Not Given

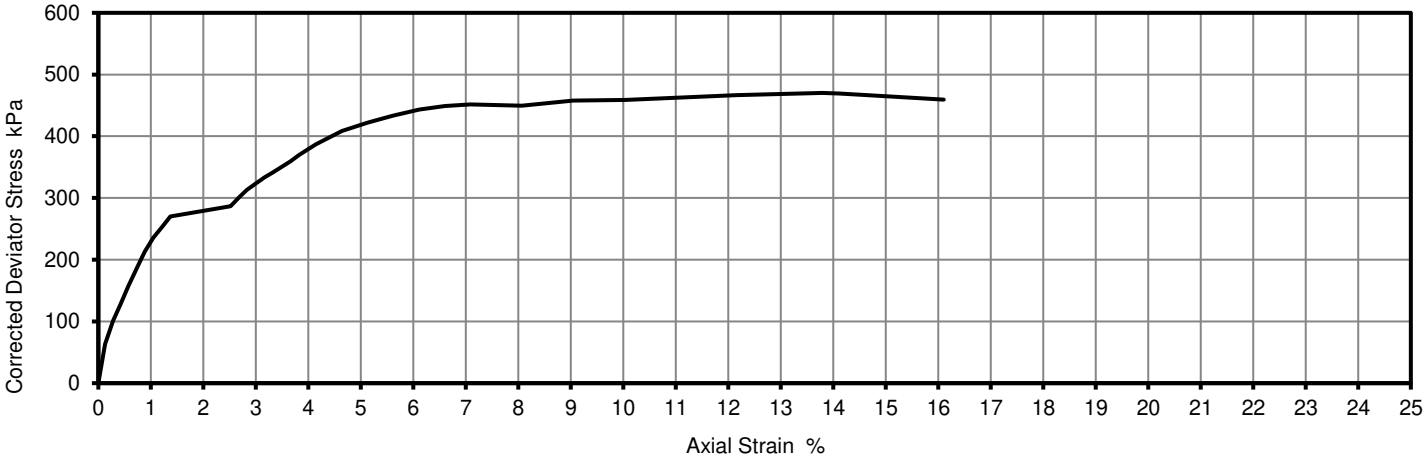
Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

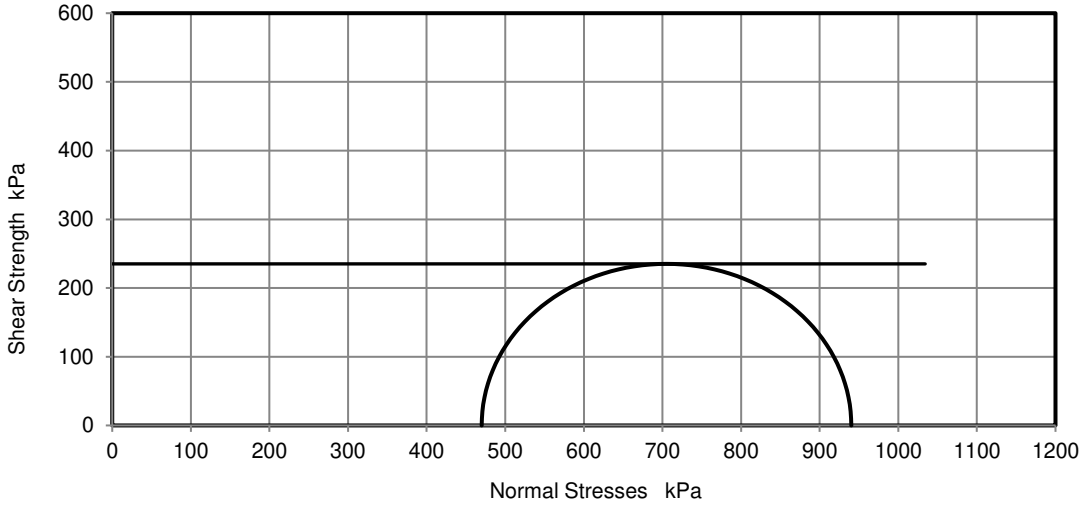
Laboratory Reference:	1487661	Depth Top [m]:	23.50
Hole No.:	BH02	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	U
Sample Description:	Brownish grey slightly silty CLAY		

Test Number	1		Rate of Strain	2.00	%/min
Length	199.90	mm	Cell Pressure	470	kPa
Diameter	103.00	mm	Axial Strain at failure	13.8	%
Bulk Density	2.01	Mg/m3	Deviator Stress, (σ1 - σ3)f	470	kPa
Moisture Content	25	%	Undrained Shear Strength, cu	235	kPa ½(σ1 - σ3)f
Dry Density	1.61	Mg/m3	Mode of Failure	Brittle	
Membrane Correction	0.63	kPa	Membrane thickness	0.23	mm

Deviator Stress v Axial Strain



Mohr Circles



Position within sample

Note: Deviator stress corrected for area change and membrane effects. Mohr circles and their interpretation is not covered by BS1377. This is provided for information only.

Remarks:

Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Date Reported: 16/04/2020

GF 184.10

TEST CERTIFICATE

Unconsolidated Undrained

Triaxial Compression

Tested in Accordance with:
BS 1377-7: 1990: Clause 8

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

UKAS TESTING 4041

Environmental Science

Client:	JSA Consulting Engineers Ltd T/A Patrick P	Client Reference:	L20002
Client Address:		Job Number:	20-95380
	40 St Pauls Square, B3 7FQ	Date Sampled:	Not Given
		Date Received:	30/03/2020
Contact:	Hugh Alder	Date Tested:	08/04/2020
Site Address:	Elmsleigh Road, Staines	Sampled By:	Not Given

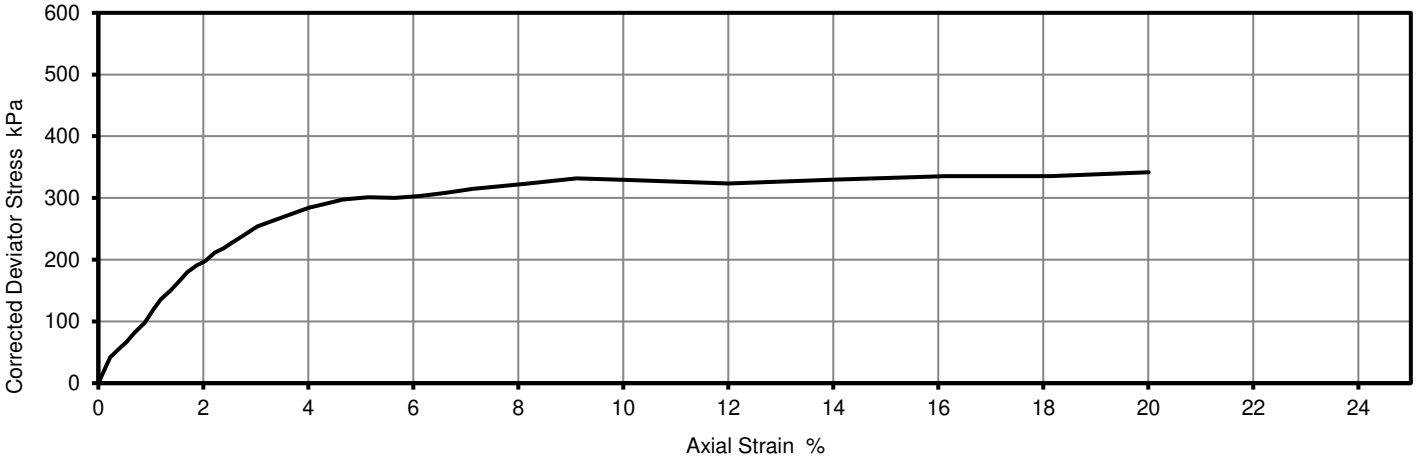
Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

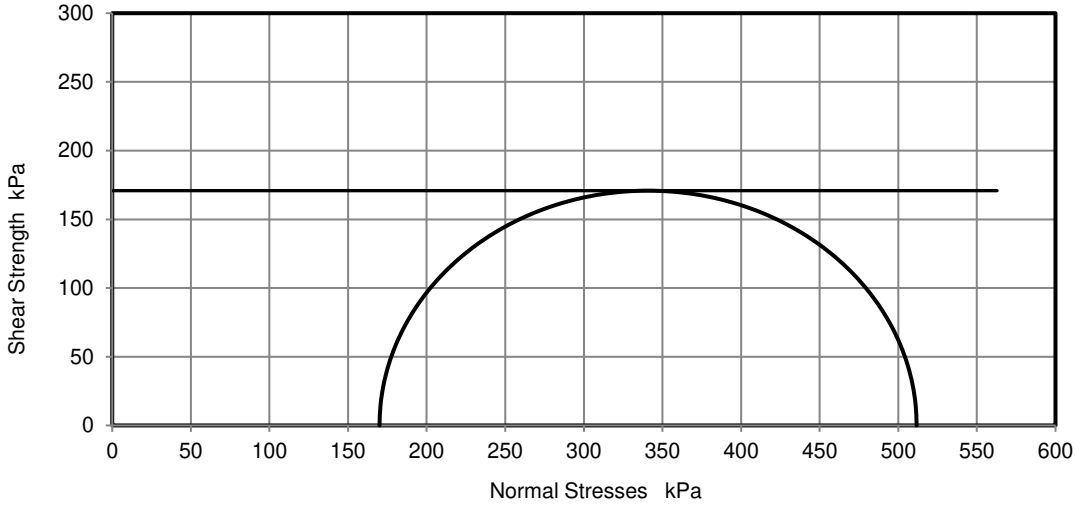
Laboratory Reference:	1487662	Depth Top [m]:	8.50
Hole No.:	BH03	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	U
Sample Description:	Brownish grey silty CLAY		

Test Number	1		Rate of Strain	2.00	%/min	
Length	74.88	mm	Cell Pressure	170	kPa	
Diameter	36.99	mm	Axial Strain at failure	20.0	%	
Bulk Density	2.02	Mg/m3	Deviator Stress, (σ1 - σ3)f	342	kPa	
Moisture Content	22	%	Undrained Shear Strength, cu	171	kPa	½(σ1 - σ3)f
Dry Density	1.65	Mg/m3	Mode of Failure	Brittle		
Membrane Correction	2.18	kPa	Membrane thickness	0.21	mm	

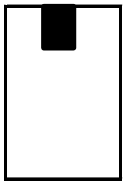
Deviator Stress v Axial Strain



Mohr Circles



Position within sample



Note: Deviator stress corrected for area change and membrane effects. Mohr circles and their interpretation is not covered by BS1377. This is provided for information only.

Remarks:

Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Date Reported: 16/04/2020

GF 184.10

TEST CERTIFICATE

Unconsolidated Undrained

Triaxial Compression

Tested in Accordance with:
BS 1377-7: 1990: Clause 8

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

UKAS TESTING
4041

Environmental Science

Client:	JSA Consulting Engineers Ltd T/A Patrick P	Client Reference:	L20002
Client Address:		Job Number:	20-95380
	40 St Pauls Square, B3 7FQ	Date Sampled:	Not Given
		Date Received:	30/03/2020
Contact:	Hugh Alder	Date Tested:	08/04/2020
Site Address:	Elmsleigh Road, Staines	Sampled By:	Not Given

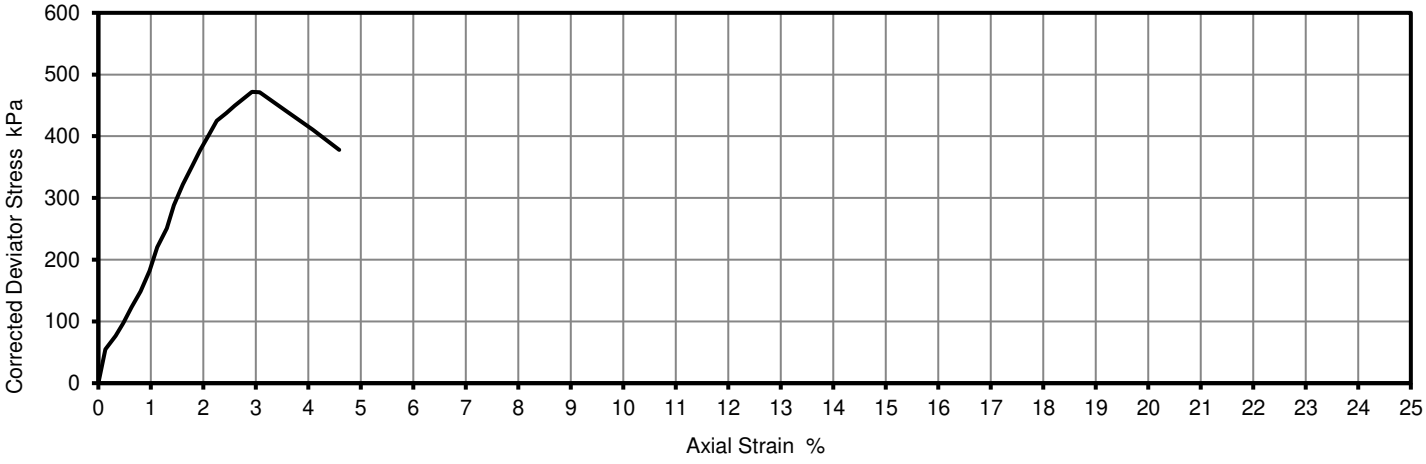
Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

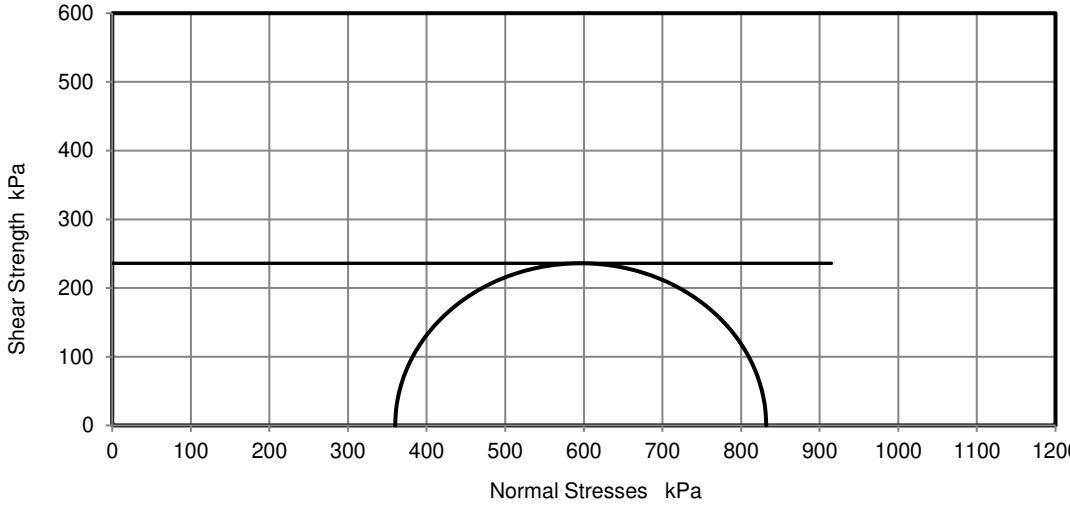
Laboratory Reference:	1487663	Depth Top [m]:	18.00
Hole No.:	BH03	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	U
Sample Description:	Brownish grey slightly silty CLAY		

Test Number	1		Rate of Strain	2.00	%/min
Length	75.84	mm	Cell Pressure	360	kPa
Diameter	37.31	mm	Axial Strain at failure	2.9	%
Bulk Density	1.96	Mg/m3	Deviator Stress, (σ1 - σ3)f	472	kPa
Moisture Content	24	%	Undrained Shear Strength, cu	236	kPa ½(σ1 - σ3)f
Dry Density	1.58	Mg/m3	Mode of Failure	Brittle	
Membrane Correction	0.45	kPa	Membrane thickness	0.21	mm

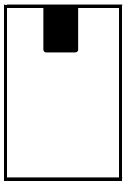
Deviator Stress v Axial Strain



Mohr Circles



Position within sample



Note: Deviator stress corrected for area change and membrane effects. Mohr circles and their interpretation is not covered by BS1377. This is provided for information only.

Remarks:

Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Date Reported: 16/04/2020

GF 184.10

TEST CERTIFICATE

Unconsolidated Undrained

Triaxial Compression

Tested in Accordance with:
BS 1377-7: 1990: Clause 8

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

UKAS TESTING 4041

Environmental Science

Client:	JSA Consulting Engineers Ltd T/A Patrick P	Client Reference:	L20002
Client Address:		Job Number:	20-95380
	40 St Pauls Square, B3 7FQ	Date Sampled:	Not Given
		Date Received:	30/03/2020
Contact:	Hugh Alder	Date Tested:	08/04/2020
Site Address:	Elmsleigh Road, Staines	Sampled By:	Not Given

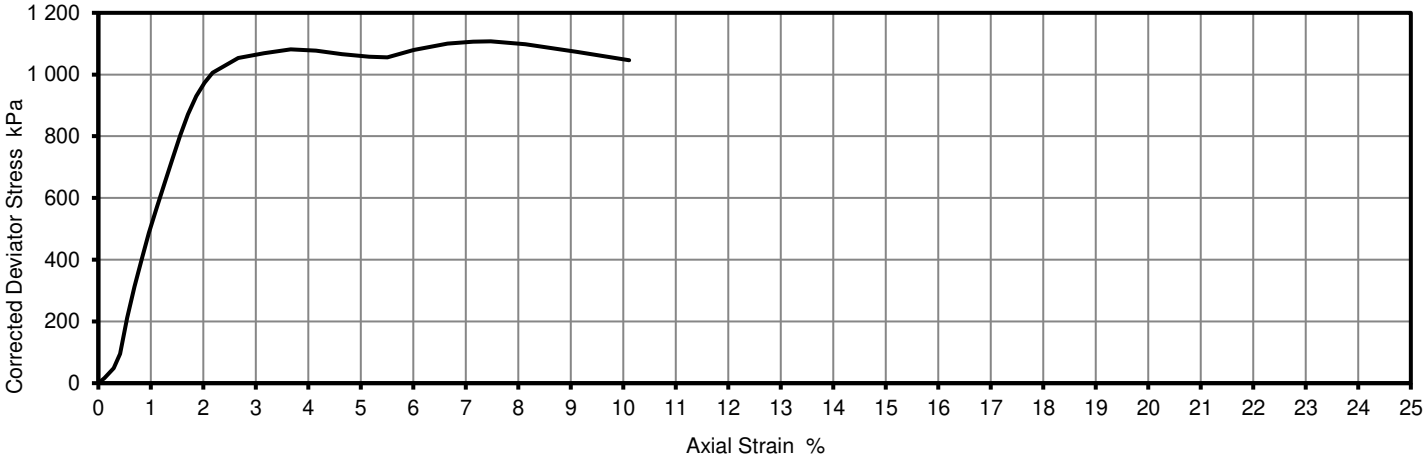
Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

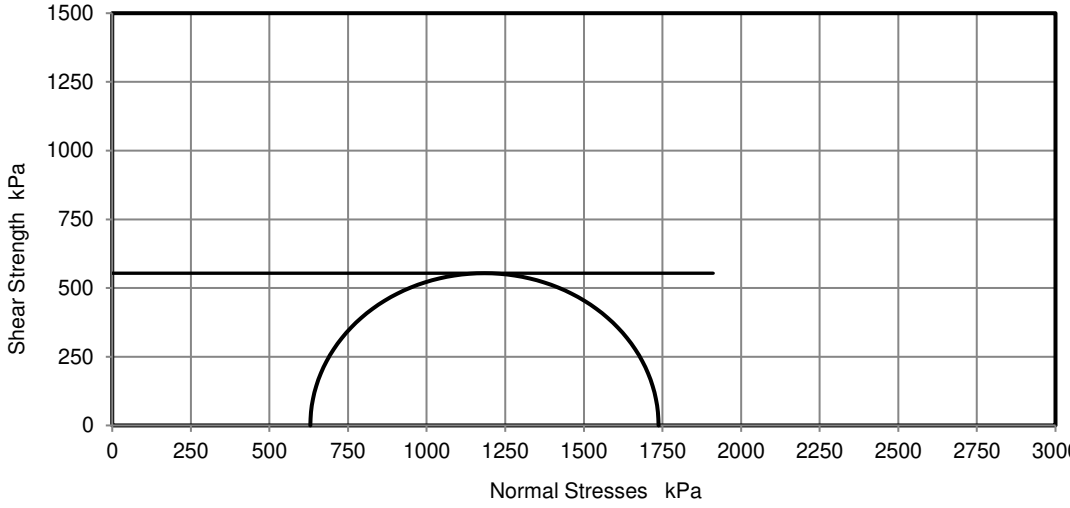
Laboratory Reference:	1487665	Depth Top [m]:	31.50
Hole No.:	BH03	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	U
Sample Description:	Brownish grey silty CLAY		

Test Number	1		Rate of Strain	2.00	%/min	
Length	195.83	mm	Cell Pressure	630	kPa	
Diameter	102.75	mm	Axial Strain at failure	7.5	%	
Bulk Density	2.11	Mg/m3	Deviator Stress, (σ1 - σ3)f	1108	kPa	
Moisture Content	18	%	Undrained Shear Strength, cu	554	kPa	½(σ1 - σ3)f
Dry Density	1.78	Mg/m3	Mode of Failure	Compound		
Membrane Correction	0.41	kPa	Membrane thickness	0.23	mm	

Deviator Stress v Axial Strain



Mohr Circles



Position within sample

Note: Deviator stress corrected for area change and membrane effects. Mohr circles and their interpretation is not covered by BS1377. This is provided for information only.

Remarks:

Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Date Reported: 16/04/2020

GF 184.10

Appendix F

Patrick Parsons Generic Assessment Criteria (GAC)

PATRICKPARSONS

* Non SOM dependent	Residential with Homegrown Produce			Residential without Homegrown Produce			Allotments			Commercial			Public Open Space Near Residential Housing			Public Open Space Park			Source
SOM %	1	2.5	6	1	2.5	6	1	2.5	6	1	2.5	6	1	2.5	6	1	2.5	6	
Metals and Inorganics																			
Antimony																			
Arsenic		37			40			43			640			79			170		7
Barium																			
Beryllium		1.7			1.7			35			12			2.2			63		7
Boron		290			11000			45			240000			21000			46000		7
Cadmium		11			85			1.9			190			120			555		7, 9
Chromium (III)		910			910			18000			8600			1500			33000		7
Chromium (VI) (Hexavalent)		6			6			1.8			33			7.7			220		7
Copper		2400			7100			520			68000			12000			44000		7
Cyanide (Free)																			
Elemental Mercury		1.2			1.2			21			58			16			30		7
Inorganic Mercury		40			56			19			1100			120			240		7
Methylmercury		11			15			6			320			40			68		7
Lead		200			310			80			2300			630			1300		8
Molybdenum																			
Nickel		130			180			53			980			230			800		11
Selenium		250			430			88			12000			1100			1800		7
Tin																			
Vanadium		410			1200			91			9000			2000			5000		7
Zinc		3700			40000			620			730000			81000			170000		7
Tributyltinoxide																			
Polyaromatic Hydrocarbons																			
Acenaphthene	210	510	1100	3000	4700	6000	34	85	200	84000	97000	100000	15000	15000	15000	29000	30000	30000	7
Acenaphthylene	170	420	920	2900	4600	6000	28	69	160	83000	97000	100000	15000	15000	15000	29000	30000	30000	7
Anthracene	2400	5400	11000	31000	35000	37000	380	950	2200	520000	540000	540000	74000	74000	74000	150000	150000	150000	7
Benzo[a]anthracene	7.2	11	13	11	14	15	2.9	6.5	13	170	170	180	29	29	29	49	56	62	7
Benzo[a]pyrene	2.2	2.7	3	3.2	3.2	3.2	0.97	2.0	3.5	35	35	36	5.7	5.7	5.7	11	12	13	7
Benzo[b]fluoranthene	2.6	3.3	3.7	3.9	4.0	4.0	0.99	2.1	3.9	44	44	45	7.1	7.2	7.2	13	15	16	7
Benzo[ghi]perylene	320	340	350	360	360	360	290	470	640	3900	4000	4000	640	640	640	1400	1500	1600	7
Benzo[k]fluoranthene	77	93	100	110	110	110	37	75	130	1200	1200	1200	190	190	190	370	410	440	7
Chrysene	15	22	27	30	31	32	4.1	9.4	19	350	350	350	57	57	57	93	110	120	7
Dibenz[ah]anthracene	0.24	0.28	0.3	0.31	0.32	0.32	0.14	0.27	0.43	3.5	3.6	3.6	0.57	0.57	0.58	1.1	1.3	1.4	7
Fluoranthene	280	560	890	1500	1600	1600	52	130	290	23000	23000	23000	3100	3100	3100	6300	6300	6400	7
Fluorene	170	400	860	2800	3800	4500	27	67	160	63000	68000	71000	9900	9900	9900	20000	20000	20000	7
Indeno[123-cd]pyrene	27	36	41	45	46	46	9.5	21	39	500	510	510	82	82	82	150	170	180	7
Naphthalene	2.3	5.6	13	2.3	5.6	13	4.1	10	24	190	460	1100	4900	4900	4900	1200	1900	3000	7
Phenanthrene	95	220	440	1300	1500	1500	15	38	90	22000	22000	23000	3100	3100	3100	6200	6200	6300	7
Pyrene	620	1200	2000	3700	3800	3800	110	270	620	54000	54000	54000	7400	7400	7400	15000	15000	15000	7
Coal Tar (B[a]P as surrogate marker)	0.79	0.98	1.1	1.2	1.2	1.2	0.32	0.67	1.2	15	15	15	2.2	2.2	2.2	4.4	4.7	4.8	7
Petroleum Hydrocarbons																			
Benzene	0.087	0.17	0.37	0.38	0.7	1.4	0.017	0.034	0.075	27	47	90	72	72	73	90	100	110	7
Toluene	130	290	660	880	1900	3900	22	51	120	56000	110000	180000	56000	56000	56000	87000	95000	100000	7
Ethylbenzene	47	110	260	83	190	440	16	39	91	5700	13000	27000	24000	24000	25000	17000	22000	27000	7
m-Xylene	59	140	320	82	190	450	31	74	170	6200	14000	31000	41000	42000	43000	17000	24000	32000	7
o-Xylene	60	140	330	88	210	480	28	67	160	6600	15000	33000	41000	42000	43000	17000	24000	33000	7
p-Xylene	56	130	310	79	180	430	29	69	160	5900	14000	30000	41000	42000	43000	17000	23000	31000	7
Methyl tert-butyl ether (MTBE)																			
1,2,4-Trimethylbenzene																			
iso-Propylbenzene																			
Propylbenzene																			
Styrene																			
Aliphatic EC 5-6	42	78	160	42	78	160	730	1700	3900	3200	5900	12000	570000	590000	600000	95000	130000	180000	7
Aliphatic EC >6-8	100	230	530	100	230	530	2300	5600	13000	7800	17000	40000	600000	610000	620000	150000	220000	320000	7
Aliphatic EC >8-10	27	65	150	27	65	150	320	770	1700	2000	4800	11000	13000	13000	13000	14000	18000	21000	7
Aliphatic EC >10-12	130	330	760	130	330	770	2200	4400	7300	9700	23000	47000	13000	13000	13000	21000	23000	24000	7
Aliphatic EC >12-16	1100	2400	4300	1100	2400	4400	11000	13000	13000	59000	82000	90000	13000	13000	13000	25000	25000	26000	7
Aliphatic EC >16-35	65000	92000	110000	65000	92000	110000	260000	270000	270000	1600000	1700000	1800000	250000	250000	250000	450000	480000	490000	7
Aliphatic EC >35-44	65000	92000	110000	65000	92000	110000	260000	270000	270000	1600000	1700000	1800000	250000	250000	250000	450000	480000	490000	7
Aromatic EC 5-7 (benzene)	70	140	300	370	690	1400	13	27	57	26000	46000	86000	56000	56000	56000	76000	84000	92000	7
Aromatic EC >7-8 (toluene)	130	290	660	860	1800	3900	22	51	120	56000	110000	180000	56000	56000	56000	87000	95000	100000	7
Aromatic EC >8-10	34	83	190	47	110	270	8.6	21	51	3500	8100	17000	5000	5000	5000	7200	8500	9300	7
Aromatic EC >10-12	74	180	380	250	590	1200	13	31	74	16000	28000	34000	5000	5000	5000	9200	9700	10000	7
Aromatic EC >12-16	140	330	660	1800	2300	2500	23	57	130	36000	37000	38000	5100	5100	5000	10000	10000	10000	7
Aromatic EC >16-21	260	540	930	1900	1900	1900	46	110	260	28000	28000	28000	3800	3800	3800	7600	7700	7800	7
Aromatic EC >21-35	1100	1500	1700	1900	1900	1900	370	820	1600	28000	28000	28000	3800	3800	3800	7800	7800	7900	7
Aromatic EC >35-44	1100	1500	1700	1900	1900	1900	370	820	1600	28000	28000	28000	3800	3800	3800	7800	7800	7900	7
Petroleum Hydrocarbons EC >44-70	1600	1800	1900	1900	1900	1900	1200	2100	3000	28000	28000	28000	3800	3800	3800	7800	7800	7900	7
Phenols																			
2,3,4,6-Tetrachlorophenol																			
2,4,6-Trichlorophenol																			
2,4-Dichlorophenol																			
2,4-Dimethylphenol																			
2-Chlorophenol																			
2-Methylphenol (o-cresol)																			
3-Methylphenol (m-cresol)																			
4-Methylphenol (p-cresol)																			
Pentachlorophenol																			
Phenol																			
Chlorinated Aliphatics																			
1,1,1-Trichloroethane																			
1,1,2,2-Tetrachlorethane																			
1,1,2-Trichloroethane																			
1,1-Dichloroethane																			
1,1-Dichloroethene																			
1,2-Dichloroethane																			
1,2-Dichloropropane																			
Chloroethane																			
Chloromethane																			
Cis 1,2 Dichloroethene																			
Dichloromethane																			
Hexachloroethane																			
Tetrachloroethene																			
Tetrachloromethane																			
Trans 1,2 Dichloroethene																			
Trichloroethene																			
Trichloromethane (Chloroform)																			
Vinyl Chloride																			
Explosives																			
Trinitrotoluene TNT																			
2,4-Dinitrotoluene																			
2,6-Dinitrotoluene																			
RDX																			
HMX																			
Pesticides																			
Aldrin																			
Dieldrin																			
Atrazine																			
Dichlorvos																			
Alpha-Endosulfan																			
Beta-Endosulfan																			
Alpha- Hexachlorocyclohexanes (including lindane)																			
Beta-Hexachlorohexanes (including lindane)																			
Gamma-Hexachlorohexanes (including lindane)																			
Chlorinated Aromatics																			
Chlorobenzene																			
1,2-dichlorobenzene																			
1,3-dichlorobenzene																			
1,4-dichlorobenzene																			
1,2,3-Trichlorobenzene																			
1,2,4-Trichlorobenzene																			
1,3,5-Trichlorobenzene																			
1,2,3,4-Tetrachlorobenzene																			
1,2,3,5-Tetrachlorobenzene																			
1,2,4,5-Tetrachlorobenzene																			
Pentachlorobenzene																			
Hexachlorobenzene																			
2-Chloronaphthalene																			
Phthalates																			
Bis (2-ethylhexyl) phthalate																			
Butyl benzyl phthalate																			
Di-*n* -butyl phthalate																			
Di-*n* -octyl phthalate																			
Diethyl Phthalate																			
Bromides																			
Bromobenzene																			
Bromodichloromethane																			
Bromoform (Tribromomethane)																			
Other																			
Carbon disulphide																			
Biphenyl																			
Hexachloro-1,3-butadiene																			

LOWER SATURATION LIMITS (shown in comments where applicable)

Where the S4UL exceeds the lower saturation limit and inhalation is an important contribution to exposure i.e. a red "traffic light" in the CLEA software) the modelled S4UL is reported but the lower saturation limit is also presented in brackets together with an indication of whether this was the solubility (sol) or vapour saturation (vap) limit. Risk assessors should use their judgement in adopting such values on a case-by-case basis.

PATRICK PARSONS consulting engineers

		England and Wales Drinking Water Standards		England Private Water Regulations		WFD (Eng+Wales): Specific Pollutants [Source 20]				WFD (Eng+Wales): Priority Substances [Source 21]				WFD (Eng+Wales) Threshold Values for Groundwater [Source 22]
						Freshwater		Saltwater		Inland Surface Water	Other Surface Water	Inland Surface Water	Other Surface Water	
						Annual Mean	95-Percentile	Annual Mean	95-Percentile	Annual Average EQS	Annual Average EQS	Max Allowable Conc EQS	Max Allowable Conc EQS	
		µg/l unless otherwise stated	Source	µg/l unless otherwise stated	Source	µg/l unless otherwise stated								
Metals and Inorganics	Aluminium	200	1	200	3									150
	Ammoniacal Nitrogen					See Table: Ammonia Sheet								0.29
	Ammonium	0.5 (mgNH4/l)	1	0.5 (mg/l)	3			21						
	Antimony	5	1	5	3									
	Arsenic	10	1	10	3									7.5
	Barium													
	Beryllium													
	Boron	1000	1	1000	3									750
	Bromate	10	1	10	3									0.0075
	Cadmium	5	1	5	3					See Cd Sheet	0.2	See Cd Sheet		3.75
	Chloride	250 (mg/l)	1	250 (mg/l)	3									188
	Chlorine					2	5		10					
	Chlorite													
	Chromium (III)					4.7	32							
	Chromium (VI)					3.4		0.6	32					
	Chromium (total)	50	1	50	3									37.5
	Copper	2000	1	2000	3	1		3.76						1500
	Cyanide	50	1	50	3	1	5	1	5					
	Cyanazine													0.075
	Fluoride	1500	1	1500	3									1130
	Iron	200	1	200	3	1		1						
	Lead (and its compounds)	10	1	10	3					1.2	1.3	14	14	7.5
	Manganese	50	1	50	3	123								
	Mercury (and its compounds)	1	1	1	3							0.07	0.07	0.75
	Molybdenum													
	Nickel	20	1	20	3									15
	Nitrate	50 (mgNO3/l)	1	50 (mg/l)	3									37500
	Nitrite	0.5(mgNO2/l)	1	0.5 (0.1 for treatment works) (mg/l)	3									
	Selenium	10	1	10	3									7.5
	Sodium	200 (mg/L)	1	200 (mg/l)	3									150000
	Sulphate	250 (mg/l)	1	250 (mg/l)	3									188000
	Vanadium													
	Tin													
	Tritium (for radioactivity)	100 (Bq/l)	1	100	3									
	Zinc					10.9		6.8						
	Tributlytin Compounds									0.0002	0.0002	0.0015	0.0015	
Polyaromatic Hydrocarbons	Polycyclic aromatic hydrocarbons	0.1	1	0.1	3									
	Benzo[a]anthracene													
	Benzo[b]fluoranthene											0.017	0.017	0.075
	Benzo[k]fluoranthene											0.017	0.017	
	Benzo[ghi]perylene											8.20E-03	8.20E-04	
	Indeno[123-cd]pyrene													
	Benzo[a]pyrene	0.01	1	0.01	3					1.70E-04	1.70E-04	0.27	0.027	0.0075
	Chrysene													
	Dibenz[ah]anthracene													
	Fluoranthene									0.0063	0.0063	0.12	0.12	0.075
	Indeno[123-cd]pyrene													
	Naphthalene									2	2	130	130	0.075
	Pyrene													
	Fluorene													
	Anthracene									0.3	0.3	0.7	0.7	
	Phenanthrene													
	Acenaphthylene													
	Acenaphthene													
Petroleum Hydrocarbons	Benzene	1	1	1	3					10	8	50	50	0.75
	Toluene					74	380	74	370					
	Ethylbenzene													
	m-Xylene													
	o-Xylene													
	p-Xylene													
	Methyl tert-butyl ether													
	1,2,4-Trimethylbenzene													
	iso-Propylbenzene													
	Propylbenzene													
	Styrene													
	Aliphatic EC >5-6													
	Aliphatic EC >6-8													
	Aliphatic EC >8-10													
	Aliphatic EC >10-12													
	Aliphatic EC >12-16													
	Aliphatic EC >16-35													
	Aliphatic EC >35-44													
	Aromatic EC >5-7													
	Aromatic EC >7-8													
	Aromatic EC >8-10													
	Aromatic EC >10-12													
	Aromatic EC >12-16													
	Aromatic EC >16-21													
	Aromatic EC >21-35													
	Aromatic EC >35-44													
	Petroleum Hydrocarbons EC >44-70													
Phenols	Phenol					7.7	46	7.7	46					
	Biphenyl													
	2-Chlorophenol													
	2,4-Dichlorophenol					4.2	140	0.42	6					
	2,4,6-Trichlorophenol													
	2,3,4,6-Tetrachlorophenol													
	Pentachloro-phenol									0.4	0.4	1	1	
	4-Chloro-3-Methyl-Phenol													
	2-Methylphenol (o-cresol)													
	3-Methylphenol (m-cresol)													
	4-Methylphenol (p-cresol)													
	2,4-Dimethylphenol													
	Octylphenol ((4-(1,1',3,3'-tetramethylbutyl)-phenol))									0.1	0.01			
	Nonylphenol (4-Nonylphenol)									0.3	0.3	2	2	
Chlorinated Aliphatics	Trihalomethanes (TOTAL)	100	1	100	3									
	Chloromethane													
	Dichloromethane									20	20			
	Trichloromethane (Chloroform)									2.5	2.5			
	Chloroethane													
	1,1-Dichloroethane			3	3					10	10			
	1,2-Dichloroethane													
	1,2-Dichloropropane													
	1,1,1-trichloroethane													
	1,1-Dichloroethene													
	Cis 1,2 Dichloroethene													
	Trans 1,2 Dichloroethene													
	Trichloroethene (ethylene)	10	1	10	3					10	10			
	Tetrachloroethene (ethylene)	10	1	10	3					10	10			7.5
	1,3-Dichloropropene													
	Tetrachloromethane	3	1	3	3									2.25
	Hexachloroethane													
	Hexachloro-cyclohexane									0.02	0.002	0.04	0.02	
	Trichloroethene													7.5
	Trichloromethane (Chloroform)													75
	Epichlorohydrin	0.1	1	0.1	3									
	Vinyl Chloride	0.5	1	0.5	3									
	Hexachloro-butadiene											0.6	0.6	
	C10-C13 Chloroalkanes									0.4	0.4	1.4	1.4	
	Dichloroacetonitrile													
	Monochloroacetate													
	Dichloroacetate													
	Trichloroacetate													
Oi	Formaldehyde													
Explosives	Trinitrotoluene TNT													
	2,4-Dinitrotoluene													
	2,6-Dinitrotoluene													
	Chloronitrotoluenes													
	RDX													

	HMX													
Pesticides	Pesticides (TOTAL)	0.5	1	0.5	3									
	TOTAL Aldrin, Dieldrin, Endrin									0.01	0.005			
	Other Pesticides	0.1	1	0.1	3									
	Alachlor									0.3	0.3	0.7	0.7	
	Aldrin	0.03	1	0.03	3									0.0225
	Atrazine									0.6	0.6	2	2	0.075
	Hydroxyatrazine													
	Dieldrin	0.03	1	0.03	3									0.025
	Endrin													
	Atrazine													
	Bentazone													0.075
	Chlorfenvinphos									0.1	0.1	0.3	0.3	
	Chlorpyrifos													
	Chlorotoluron									0.03	0.03	0.1	0.1	
	Cypermethrin					0.0001	0.0004	0.0001	0.0004	8E-05	8E-06	6E-04	6E-05	
	DDT									0.025	0.025			
	para-para-DDT									0.01	0.01			
	Diazinon					0.01	0.02	0.01	0.26					
	Dichlorprop					0.01								
	Dichlorvos									6E-04	6E-05	7E-04	7E-05	
	Dimethoate					0.48	4	0.48	4					
	Diruon (DCMU)													
	Epichlorohydrin													
	Fenitrothion													
	Fenoprop													
	Heptachlor	0.03	1	0.03	3					2E-07	1E-08	3E-04	3E-05	
	Heptachlor epoxide	0.03	1	0.03	3					2E-07	1E-08	3E-04	3E-05	
	Isoproturon													0.075
	Lindane													
	Linuron					0.5	0.9	0.5	0.9					
	Malathion													
	MCPA													0.075
	Mecoprop					18	187	18	187					0.075
	Metolachlor													
	Methoxychlor													
	Molinate													
	Pendimethalin					0.3	0.58							
	Permethrin					0.001	0.01	0.0002	0.001					
	Simazine									1	1	4	4	0.075
	Trifluralin									0.03	0.03			
	2,4-Dichlorophenoxyacetic acid (2,4-D)					0.3	1.3	0.3	1.3					
	2,4,5-Trichlorophenoxyacetic Acid (2,4,5-T)													
	2,4-DB													
	Alpha-Endosulfan													
	Beta-Endosulfan													
	Alpha- Hexachlorocyclohexanes (including lindane)													
	Beta-Hexachlorohexanes (including lindane)													
	Gamma-Hexachlorohexanes (including lindane)													
Chlorinated Aromatics	Chlorobenzene													
	1,2-dichlorobenzene													
	1,3-dichlorobenzene													
	1,4-dichlorobenzene													
	1,2,3-Trichlorobenzene													
	1,2,4-Trichlorobenzene													
	1,3,5-Trichlorobenzene													
	1,2,3,4-Tetrachlorobenzene													
	1,2,3,5-Tetrachlorobenzene													
	1,2,4,5-Tetrachlorobenzene													
	Trichlorobenzenes									0.4	0.4			
	Pentachloro-benzene									0.007	0.0007			
	Hexachloro-benzene											0.05	0.05	
	2-Chloronaphthalene													
Phthalates	Di(2-ethylhexyl) phthalate									1.3	1.3			
	Butyl benzyl phthalate					7.5	51	0.75	10					
	Di-*n*-butyl phthalate													
	Di-*n*-octyl phthalate													
	Diethyl Phthalate													
Brominated Compoun	Bibromoacetonitrile													
	Dibromochloromethane													
	1,2-Dibromo-3-chloropropane													
	1,2-Dibromomethane													
	Brominated diphenylether											0.14	0.014	
	Bromobenzene													
	Bromodichloromethane													
	Bromoform (Tribromomethane)													
	Acrylamide	0.1	1	0.1	3									
Other	1,4-Dioxane													
	Biphenyl													
	Carbon disulphide													
	EDTA													
	Microcystin-LR													
	Monochloroamine													
	N-Nitrosodimethylamine													
	Nitrilotriacetic acid													
	Cyanuric Acid													
	Sodium dichloroisocyanurate													
	Terbuthylzine													
Other	Colour	20 (mg/l Pt/Co)	1	20 (mg/l Pb/Co)	3									
	Conductivity	2500 (µS/cm at 20º)	1	2500 (µS/cm at 20º)	3									1880 (µS/cm at 20º)
	pH	6.5-9.5	1	6.5-9.5	3									
	Total Biochemical Oxygen Demand (BOD)													
	Total Chemical Oxygen Demand (COD)													
	Suspended Solids													
	Total Dissolved Solids													
	Turbidity	1 NTU	1	1 NTU	3									

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