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Proposed redevelopment
Meadow High School
Uxbridge

Ground Investigation Report

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UB8 3QU**

GROUND INVESTIGATION REPORT

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Aerial photograph of site



The site boundary is shown in red.

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Report status and format

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		Revision	Comments
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B1	Insitu testing in	Details of standard penetration tests (SPT)	
B2	boreholes / trial pits	Details of pocket penetrometer testing	
C	Trial pits	Hand excavated to expose foundations	
D1	Borehole / probing	Driven tube sampling	
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J1	Waste characterisation	Hazardous waste classification spreadsheet	
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1 Executive summary

General

We recommend the following executive summary is not read in isolation to the main report which follows.

Site description, history and development proposals

At the time of our investigation the site comprised Meadow High School, located within a predominantly residential area of Uxbridge. The main school buildings are located towards the centre of the site, with parking and a turning area located to the east and a playing field to the west.

With reference to the Phase II report produced by Opus, the site was undeveloped until the 1970s when the main school building and school house were constructed. Surrounding land was gradually developed for residential housing from the 1930s. Gravel pits were recorded to the south of the site, with the closest located 200m from the site. A sewage works was recorded 400m west of the site until the 1960s.

We understand the scheme will comprise the construction of a new sports hall, library, general classrooms, assembly hall, entrance lobby and exterior MUGA all with associated services ancillary rooms and associated external access ways.

Ground conditions encountered

Each excavation encountered a similar profile considered to be Made Ground, generally to 0.50m but locally to 1.35m overlying Langley Silt Member and Lynch Hill Gravel Member. Groundwater was encountered within the Lynch Hill Gravel and had a standing level between 2.8m and 3m depth on completion of boreholes.

Chemical and gaseous contamination

Based on the findings and recommendations of the Opus report, we have scheduled additional contamination testing of soils in order to refine the original assessment. The original findings identified elevated PAH in two samples. Further testing and statistical analysis confirmed the PAHs do not exceed relevant guideline values and therefore no remediation is considered necessary.

Gas monitoring was previously undertaken at the site and classified the site as characteristic situation 2 by virtue of a high flow recorded in one borehole on the first visit. Six further monitoring visits have been scheduled to refine the assessment. At the time of writing, three visits have been undertaken. Carbon dioxide in excess of 5% has been recorded during two of the visits and a similar high flow rate has been noted during a period of low atmospheric pressure. On this basis, the site can still be classified as CS2. Further comment will be made on completion of gas monitoring.

Landfill classification

Made Ground has been classified as inert based on laboratory testing. The Langley Silt Member and Lynch Hill Gravel Member can also be classified as inert based on being of natural origin and unaffected by artificial contamination.

2 Introduction

2.1	Objectives
2.2	Status of this report
2.3	Client instructions and confidentiality
2.4	Site location and scheme proposals
2.5	Report format and investigation standards
2.6	Report distribution
2.7	Soiltechnics liability

2.1 Objectives

2.1.1 This report describes a ground investigation carried out for a redevelopment at Meadow High School, Royal Lane, Uxbridge, UB8 3QU.

2.1.2 The following investigations have previously been undertaken at the site

- Phase I desk study was undertaken by Mott McDonald. Report ref: PSBP2/EVT/WGEP/102462/A dated July 2015. (this report has not been supplied to Soiltechnics).
- Phase II ground investigation undertaken by Opus. Report ref: J-M3932.12 dated February 2017.

2.1.2 This ground investigation is supplementary to the Opus ground investigation. The objectives were as follows:

- Undertake additional boreholes and trial pits to confirm ground conditions and determine the nature of existing building foundations, undertake additional testing (classification and sulphates) and provision of a factual report.
- Additional laboratory testing and gas monitoring and provision of an updated assessment of chemical and gaseous contamination.
- investigations and testing to allow classification of soils at the site to be disposed of to landfill.

2.2 Status of this report

2.2.1 This report is preliminary and will be updated on completion of gas monitoring.

2.3 Client instructions and confidentiality

2.3.1 The investigation was carried out in June 2020 and reported in August 2020 acting on instructions received from Galliford Try.

2.3.2 This report has been prepared for the sole benefit of our above named instructing client, but this report, and its contents, remains the property of Soiltechnics Limited until payment in full of our invoices in connection with production of this report.

- 2.3.3 Our original investigation proposals were outlined in our correspondence to Galliford Try dated 10th June 2020 (ref. QS10246-rev200). The investigation generally followed our original investigation proposals. The investigation process was also determined to maintain as far as possible the original investigation budget costs.

2.4 Site location

- 2.4.1 The National Grid reference for the site is 506504,181686. A plan showing the location of the site is presented on Drawing 01.
- 2.4.2 We understand the scheme will comprise the construction of a new sports hall, library, general classrooms, assembly hall, entrance lobby and exterior MUGA all with associated services ancillary rooms and associated external access ways.
- 2.4.3 We have received layout drawings of the proposed scheme with the layout presented on Drawing 03.

2.5 Report format and investigation standards

- 2.5.1 Sections 2 to 6 of this report describe the factual aspects of the investigation with Section 7 providing a supplementary risk assessment of chemical contamination the previous ground investigation report and additional laboratory testing. Section 8 provides a similar risk assessment in relation to gaseous contamination. Section 9 provides a classification of waste soils for off-site disposal under the waste acceptance criteria.

2.5.2 Geotechnical aspects

- 2.5.2.1 Geotechnical investigations were carried out generally, and where practical following the recommendations of BS EN 1997:2 2007 '*Eurocode 7 – Geotechnical Design – Part 2: Ground Investigation and Testing*'. From a geotechnical viewpoint this is deemed to be a Ground Investigation Report (GIR) as set out in BS EN 1997:2. This report does not constitute a Geotechnical Design Report as defined in section 2.8 of BS EN 1997-1:2004+A1:2013 '*Eurocode 7 – Geotechnical Design – Part 1: General Rules*' and in particular will exclude assessment of lifetime actions to buildings from geotechnical influences.

2.5.3 Geo-environmental aspects

- 2.5.3.1 The investigation process also followed the principles of BS 10175:2011+A2:2017 '*Investigation of potentially Contaminated Sites – Code of Practice*'. A desk study report for this project was produced in 2015 by Mott MacDonald ref: PSBP2/EVT/WGEP/102462/A, but was not made available to us for review. The salient points of that desk study were reiterated in the Opus report dated 2017 ref: J-M3932.12_R03. Both Mott MacDonald and Opus reports should be read in conjunction with our report for full details of investigations undertaken at this site.

- 2.5.3.2 This investigation has been carried out and reported based on our understanding of best practice. Improved practices, technology, new information and changes in legislation may necessitate an alteration to the report in whole or part after publication. Hence, should the development commence after expiry of one year from the publication date of this report then we would recommend the report be referred back to Soiltechnics for reassessment. Equally, if the nature of the development changes, Soiltechnics should be advised and a reassessment carried out if considered appropriate.

2.6 Report distribution

- 2.6.1 This report has been prepared to assist in the design and planning process of the development and normally will require distribution to the following parties, subject to Soiltechnics liabilities defined below, although this list may not be exhaustive:

Table summarising parties likely to require information contained in this report

Party	Reason
Client	For information/reference and cost planning
Developer/Contractor/project manager	To ensure procedures are implemented, programmed and costed
Planning department	Potentially to discharge planning conditions
Environment Agency	If ground controlled waters are affected and obtain approvals to any remediation strategies
Independent inspectors such as Building Control	To ensure procedures are implemented and compliance with building regulations
Project design team	To progress the design
Principal Designer (PD)	To advise in construction risk identification and management under the Construction (Design and Management) Regulations
Waste recycling operators	For recycling or reducing hazardous properties

Table 2.6.1

2.7 Soiltechnics liability

- 2.7.1 Soiltechnics disclaims any responsibility to our Client and others in respect of any matters outside the scope of this report. This report has been prepared with reasonable skill, care and diligence in accordance with the terms of our contract, taking account of the manpower, resources, investigations and testing devoted to it by agreement with our Client. This report is confidential to our Client and Soiltechnics accepts no responsibility of whatsoever nature to third parties to whom this report or any part thereof is made known. Any such party relies upon the report at their own risk.

3 Desk study information and site observations

3.1	General
3.2	Description of the site
3.3	History of the site
3.4	Geology of the area

3.1 General

- 3.1.1 A desk study report for the site was produced by Mott McDonald dated July 2015. We have not been provided with a copy of this report, however, the following provides a brief summary of the site, it's history and local geology.

3.2 Description of the site

- 3.2.1 At the time of our investigation the site comprised Meadow High School, located within a predominantly residential area of Uxbridge. The site is access via Royal Lane which runs along the eastern boundary of the site.
- 3.2.2 The main school buildings are located towards the centre of the site, with parking and a turning area located to the east and a playing field to the west. The buildings are 1-2 storey masonry buildings. A number of temporary classrooms were located to the south.
- 3.2.3 A plan showing observed site features and location of exploratory points is presented on Drawing 02.

3.3 History of the site

- 3.3.1 The site history was summarised in the Opus 2017 report. Essentially, the site was undeveloped until the 1970s when the main school building and school house were constructed. Surrounding land was gradually developed for residential housing from the 1930s. Gravel pits were recorded to the south of the site, with the closest located 200m from the site. A sewage works was recorded 400m west of the site until the 1960s.

3.4 Geology of the area

- 3.4.1 We have reviewed geological mapping of the produced by the British Geological Survey (BGS) at a scale of 1: 50,000. The maps record the site is underlain by Langley Silt Member (superficial), Lynch Hill Gravel (superficial) with the London Clay Formation (bedrock) beneath.
- 3.4.2 The investigations undertaken by Opus confirmed these ground conditions with the exception of a unit of Alluvium recorded in one location. Although we believe the site to be underlain by Lynch Hill Gravel based on geological maps, the Opus report refers to the gravels as Boyn Hill Gravel. Both deposits are River Terrace Gravels.

4 Fieldwork

4.1	General
4.2	Site restrictions
4.3	Exploratory trial pits
4.4	Driven tube sampling
4.5	Dynamic probing
4.6	Measurement of landfill type gases in gas monitoring standpipes
4.7	Sampling strategy

4.1 General

4.1.1 Fieldwork was undertaken on 25th June 2020 and comprised the following:

- Formation of four hand excavated trial pits
- Formation of three driven tube sampler boreholes.
- Dynamic probing in three locations.

4.1.2 A plan of the site showing observed site features and position of exploratory points is presented on Drawing 02. The position of exploratory points relative to site development proposals is presented on Drawing 03. The position of exploratory points shown on these plans is approximate only.

4.1.3 The extent of fieldwork activities and position of exploratory points were defined by the Client/Client's Engineer and agreed on site. Prior to excavation third party utilities survey personnel cleared all positions using cable avoidance tools and ground penetrating radar.

4.1.4 All soils exposed in excavations were described in accordance with BS EN ISO 14688 '*Identification and Classification of soil*' and BS EN ISO 14689 '*Identification and classification of rock*'.

4.2 Site restrictions

4.2.1 Several positions were adjusted slightly to account for the presence of services, available space and to allow the school to continue operating with minimal disruption. All adjustments were agreed with the client on site.

4.3 Exploratory trial pits

4.3.1 Trial pits TP101 to TP104 were excavated to expose existing foundation arrangements using hand tools to a maximum depth of 1.30m.

4.3.2 Trial pits exposed foundation arrangements to existing buildings. The trial pit excavations were backfilled with excavated material, which was compacted using hand-held ramming tools. The surface was reinstated to match the original surroundings. A Geotechnical Engineer supervised the excavations.

4.3.3 Trial pit records are presented in Appendix C.

4.4 Boreholes formed using driven tube sampling techniques

4.4.1 Boreholes WS101 to WS103 were formed using driven tube sampling equipment. Driven tube sampling comprises driving 1m long steel sample tubes which are screw coupled together or coupled to extension rods and fitted with a screw on cutting edge. The sample tubes are of various diameters, generally commencing with 100mm and reducing, with depth, to 50mm and include a disposable plastic liner which is changed between sampling locations in order to limit the risk of cross contamination. On completion of excavation the liner containing the sample is cut open and the soil sample logged by a geo-environmental engineer. The sample tubes are considered thick walled with reference to BS EN ISO 22475-1:2006 clause 3.3.11.

4.4.2 Samples for determination concentration of chemical contaminants are taken from samples obtained in the disposable tubes as sub-samples.

4.4.3 Soil samples for subsequent laboratory 'classification' testing were taken from samples obtained in the disposable tubes. The sample was placed in a plastic bag and subsequently sealed and labelled. Samples for determination of water content were placed in sealable tubs and appropriately labelled. These samples were obtained with a view to achieve category B sampling methods to meet quality class 3 (for fine grained soils only) as described in BS EN ISO 22475-1: 2006 (table 3). Sample sizes were appropriate for the laboratory test being considered.

4.4.4 Where required, surface asphaltic concrete was cored prior to excavation of the borehole.

4.4.5 Standard Penetration Testing (SPT) was carried out at regular frequencies in the borehole. The test was carried out in accordance with BS EN ISO 22476-3:2005. Key details of the test, as required by BS EN ISO 22476-3 are recorded in Appendix B1. Where SPTs were carried out using a solid 60° cone, the test is reported as SPT(C). Summary of standard penetration testing is recorded on borehole logs.

4.4.6 A pocket penetrometer was used in cohesive soils and is deemed to measure the apparent ultimate shear strength of the soil under test. The pocket penetrometer is calibrated in kg/m². The reading can be approximately converted to an equivalent undrained shear strength by multiplying the result by a factor of 50. Tests were carried out on 'intact' samples recovered from the cutting shoe. Details of pocket penetrometer determinations are tabulated in Appendix B2. An average of measurements taken at a specific depth are recorded on borehole records. The pocket penetrometer is not covered by British Standards.

4.4.7 Combined gas and groundwater monitoring standpipes were installed in boreholes WS101 and WS103. The standpipes were installed following the recommendations of BS EN ISO 22475-1:2006 '*Geotechnical Investigation and Testing – Sampling methods and groundwater measurements – Part 1: Technical Principles for execution*' (figure 6) and BS8576:2013 '*Guidance on investigations for ground gas – Permanent gases and Volatile Organic Compounds (VOCs)*' (figure 7). Details of the standpipe installation are presented on the borehole logs in Appendix D1.

4.4.8 Water levels in the standpipes have been measured during a return visit to the site. The water level was measured using a measuring tape calibrated in 1mm intervals with an electronic end piece, which emits an alarm sound in contact with water. Water levels are measured from ground levels at the borehole position. Records of water levels are presented in Section 6.

4.4.9 A description of measurement of landfill type gases in gas monitoring standpipes is provided in subsequent report paragraphs below.

4.5 Dynamic probing

4.5.1 Dynamic probing was carried out in three locations. Dynamic probing consists of driving a 50mm diameter, 90° cone into the ground, via an anvil and extension rods with successive blows of a freefall hammer. The number of blows required to drive the cone each successive 100mm (N10) is recorded.

4.5.2 Dynamic probing was carried out following BS EN ISO 22476-2:2005 and the apparatus used was categorised as 'Super heavy' (DPSH-B) in accordance with the standard.

4.5.3 Dynamic probing results are presented in Appendix D2.

4.6 Measurement of landfill type gases in gas monitoring standpipes

4.6.1 The concentrations of landfill type gases collected within gas monitoring standpipes installed in boreholes WS101 and WS103 and the previously installed WS1, WS4, BH2 and BH4, was measured using a portable infra-red gas analyser (model GA2000 plus or GA5000, manufactured by Geotechnical Instruments). Initially the gas analyser was connected to the gas valve on the top of the standpipe to allow the flow rate to be measured. Essentially this is a measurement of gas pressure produced in the standpipe, which is compared with atmospheric pressure at the time of measurement to produce an equivalent gas 'flow' in l/hr. The equipment used is capable of measuring to an accuracy of 0.1l/hr; below this the gas analyser records zero flow. Following BS8485:2015 '*Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings*' (clause 6.3.4), we assume flows of 0.1l/hr when the gas analyser reads zero, thus producing a pessimistic gas flow rate in our assessment of ground gases.

4.6.2 Following measurement of 'flow' the gas analyser pumps gases contained in the standpipe through the analyser. Initial readings of gas concentrations are noted manually, followed by subsequent recordings at regular time periods until 'steady state' concentrations are achieved. The analyser records 'peak' and 'steady' concentrations of the following gases:

- Methane (CH₄)
- Carbon dioxide (CO₂)
- Oxygen (O₂)

4.6.3 The ambient atmospheric temperature and barometric pressure was also recorded at the site. To determine if the atmospheric pressure is rising or falling we interrogate the internet on a daily basis.

4.6.4 Methane in concentrations of between 5 to 15% in air is potentially explosive. The 5% methane concentration in air is defined as the Lower Explosive Limited (LEL). The gas analyser measures a percentage of the LEL. For example, 10% LEL equates to 10% of 5%, i.e. 0.5% methane concentration in air.

4.6.5 Records of gas monitoring data are presented in Appendix I.

4.7 Sampling strategies

4.7.1 Geotechnical

4.7.1.1 In general we adopted a judgemental sampling strategy in relation to geotechnical aspects of the investigation. The location and frequency of sampling was carried out in consideration of the following:

- i) Topography
- ii) Geology (including Made Ground)
- iii) Nature of development proposals

4.7.2 Environmental

4.7.2.1 Details of sampling with respect to contamination issues are described in Section 8.

4.7.3 Sample retention

4.7.3.1 Samples are stored for a period of one month following issue of this report, unless otherwise requested.

5 Laboratory testing

5.1	Classification testing
5.2	Chemical testing

5.1 Classification testing

5.1.1 Laboratory testing was carried out on samples retrieved from site. The method of testing is recorded on the laboratory test certificates (Appendix E). The following table summarises the classification testing scheduled;

Table summarising classification testing			
Exploratory point	Depth (m)	Soil type	Testing scheduled (determination of)
TP101	1.20	Langley Silt Member	Atterberg and Moisture Content
TP102	0.60		
WS101	1.35		
WS103	1.50	Lynch Hill Gravel	Particle Size Distribution
WS101	2.70		
WS102	2.25		
WS103	2.50-3.0		

Table 5.1.1

5.2 Chemical testing

5.2.1 Chemical testing was carried out based on ground conditions and with reference to the recommendations in the previous ground investigation report. The test methods are recorded on the chemical test certificates. The following table summarises the chemical testing scheduled with certificates presented in Appendix F;

Table summarising chemical testing			
Exploratory point	Depth (m)	Medium/soil type	Testing scheduled (Refer to Appendix A for details).
TP101	0.30	Made Ground	Suite 1
TP102	0.30		Asbestos screening
WS103	0.50	Langley Silt Member	Suite 7
WS102	0.50	Made Ground	Suite 1
TP104	0.68	Langley Silt Member	
TP103	1.0		
WS102	0.20	Made Ground	Suite 1 (soil)
TP103	0.30	Made Ground	Asbestos screening
TP104	0.20		Asbestos Screening
WS101	0.60		
WAC01	-	Made Ground	Two stage WAC testing
WAC02	-		
WAC03	-		

Table 5.2.1

6 Ground conditions encountered

6.1	Soils
6.2	Groundwater
6.3	Evidence of contamination
6.4	Obstructions and instability

6.1 Soils

6.1.1 Each exploratory excavation encountered a similar profile of soils considered to be Made Ground overlying Langley Silt Member onto Lynch Hill Gravel Member.

6.1.2 Made Ground

6.1.2.1 WS101, WS102 and TP102 comprise asphaltic concrete over a gravel sub-base to a maximum depth of 0.35m. TP103 comprised rubber aggregate onto a similar sub-base. The remaining locations comprised gravel, timber chippings or grass onto Made Ground. The Made Ground within the boreholes generally comprised dark grey and brown slightly sandy clay with gravel consisting of chalk and flint (likely reworked Langley Silt Member). The Made Ground extended between 0.2m and 1.35m. Within the trial pits, the Made Ground included fragments of anthropogenic material including brick, glass, clinker and concrete. The Made Ground extended between 0.3-0.5m.

6.1.3 Langley Silt Member

6.1.3.1 Langley Silt Member was fully penetrated in WS101 to WS103 at depths of between 1.60m and 2.20m. The Langley Silt Member generally comprised firm orangish brown and brown mottled grey slightly gravelly sandy clay. The gravel consisted of flint and chalk.

6.1.4 Lynch Hill Gravel Member

6.1.4.1 Lynch Hill Gravel Member extended beyond the termination depth of the boreholes and generally comprised orangish brown gravelly sand or sandy gravel. The gravel consisted of fine to coarse well-rounded flint.

6.2 Groundwater

6.2.1 Groundwater inflows were observed in some of the exploratory excavations during excavation. We have also measured water levels within standpipes (both those installed as part of this investigation and those previously installed by Opus). Water level monitoring is ongoing and this table will be updated on completion. A summary of our observations is tabulated below:

Table summarising groundwater observations			
Exploratory point	Date of observation	Depth (m) below ground levels	Observations
WS101	25.06.20	2.90	Strike at 3.00m standing at 2.80m in 15 minutes
	24.07.20	1.44	Standing water level – monitoring visit
	06.08.20	1.47	
	17.08.20	0.31	
WS102	25.06.20	2.80	Strike at 2.95m standing at 2.80m in 15 minutes
WS103	25.06.20	-	Borehole collapsed before observation
	24.07.20	1.2	Standing water level – monitoring visit
	06.08.20	1.17	
WS01	24.07.20	DRY	Monitoring visit
	06.08.20	DRY	
WS04	24.07.20	DRY	Monitoring visit
	06.08.20	DRY	
BH2	24.07.20	1.54	Standing water level – monitoring visit
	06.08.20	1.77	
	17.08.20	0.83	
BH4	24.07.20	1.86	Standing water level – monitoring visit
	06.08.20	1.87	
	17.08.20	1.34	

Table 6.2.1

6.2.2 It should be noted that water levels will vary depending generally on recent weather conditions and only long-term monitoring of levels in standpipes will provide a measure of seasonal variations in groundwater levels.

6.3 Evidence of contamination

6.3.1 During the excavation of our exploratory points, no evidence of significant contamination was noted.

6.4 Obstructions and instability

6.4.1 No in-ground obstructions were encountered during our intrusive works, although the gravel deposits were too dense to successfully penetrate with driven tube methods. However, instability was encountered within WS103 during our site investigations, collapsing to 2.50m on completion of the borehole.

7 Chemical contamination

7.1	General
7.2	Supplementary laboratory testing
7.3	Evaluation of test data
7.4	Final conceptual model
7.5	Statement with respect to National Planning Policy Framework
7.6	On site monitoring

7.1 General

- 7.1.1 The previous ground investigation undertaken by Opus includes a phase II contamination assessment. The report identified elevated concentrations of PAH within WS01 at 0.5m and WS02 at 0.3m, with the Made Ground. Six further samples did not contain elevated concentrations of PAH. The report suggested that either proposed soft landscaped areas be capped or a Detailed Quantitative Risk Assessment be undertaken.
- 7.1.2 No significantly elevated concentrations of contaminants were identified within groundwater and measured leachate concentrations were also below guideline values. However, the report recommended further sampling and testing to determine the risk to groundwater from the PAHs identified within the Made Ground soils.

7.2 Supplementary laboratory testing

7.2.1 Testing regime

- 7.2.1.1 In order to further refine the assessment of the site, a further four samples of Made Ground and three samples of the underlying Langley Silt Member have been tested for a range of commonly occurring inorganic and organic contaminants including speciated PAH and speciated TPH. We have also undertaken asbestos screening on seven samples.
- 7.2.1.2 Obviously, additional testing (quantity and types) would allow a more accurate risk assessment to be made. The results of laboratory determination of concentration of chemical contaminants are presented in Appendix F.

7.2.2 Criteria for assessment of test data – Human receptors

- 7.2.2.1 Assessment of laboratory test data has been carried out with reference to current nationally recognised documents listed in the final page of Appendix A. Due to changes in guidance on contaminated land, items 6-8 and item 10 in the document listing above have been withdrawn. In the absence of alternative guidance however we have used these documents. Where new guidance is available, this has been followed in preference to superseded guidance.

- 7.2.2.2 The Land Quality Management (LQM) and the Chartered Institute of Environmental Health (CIEH) have derived Suitable for Use Levels (S4ULs) which are presented in *'The LQM/CIEH S4ULs for Human Health Risk Assessment'* (2015). S4ULs have been used as a screening tool to assess the risks posed to the health of humans from exposure to soil contamination in relation to appropriate land uses. Where published S4ULs are not available, we have adopted C4SLs (Category 4 Screening Levels) produced by DEFRA or SGVs (Soil Guideline Values) as appropriate. In the absence of any of these criteria we have adopted Soil Screening Values (SSV) derived by Soiltechnics and by Atkins (SSV^{ATK}). The CLEA model used to derive SSVs has been used with toxicology data presented by the EA, LQM/CIEH and Atkins (in that order of preference). SSVs produced by Atkins are presented on their ATRISK^{SOIL} website.
- 7.2.2.3 S4ULs, C4SLs, SGVs, SSVs and SSV^{ATK}s represent 'intervention values'; indications to an assessor that soil concentrations above these levels might present an unacceptable risk to the health of site users. These guideline values have been produced using conceptual exposure models, which use assumptions and are applied to differing end uses of land. If the values are exceeded, it does not necessarily imply there is an actual risk to health and site-specific circumstances should be taken into account. Conversely, where a critical pathway or chemical form of the contaminant has not been evaluated, a risk may be present even if the adopted guideline value has not been exceeded.
- 7.2.2.4 For evaluation of test data in relation to polycyclic aromatic hydrocarbon (PAH), phenols and total petroleum hydrocarbon (TPH) contamination, we have compared measured concentrations with corresponding S4ULs. The S4UL fractions are dependent on the Soil Organic Matter (SOM) content of the soils. We have adopted the relevant guideline values based on SOM testing.
- 7.2.2.5 We have followed procedures outlined by the CIEH to compare measured concentrations of metals and PAH contaminants against guideline values. TPH contamination results are compared directly with the relevant guideline values. The guidance presents an approach to data analysis and includes the examination of data for potential outliers, assessment of the normality of the test data and the calculation of a 95% Upper Confidence Limit (UCL). The UCL provides an estimate of the population mean, based on test data, with a 95% confidence that the actual mean does not exceed this value. The UCL is compared to the guideline value for the site.
- 7.2.2.6 We have adopted a residential without home-grown produce as a conservative land use for current and proposed end users of the site in line with the Opus report. However, it is considered that a public open space (residential or park) land use may be more appropriate in the absence of specific guideline values for schools. In the absence of guidelines we have adopted industrial guideline values for assessment of construction operatives.

7.3 Evaluation of test data

7.3.1 Site users

- 7.3.1.1 Tables summarising and analysing test data are presented in Appendix G. The following paragraphs detail the outcome of the analyses.
- 7.3.1.2 In addition, no asbestos was detected in any of the samples screened.
- 7.3.1.3 With reference to tables 1 to 3 in Appendix G, laboratory testing has not identified any measured concentrations of contaminants which exceed current guideline values for human receptors with the exception of lead. A concentration of 457mg/kg was measured in a sample of Made Ground taken from TP101. However, both the mean concentration and UCL for lead are below the guideline value and no elevated concentrations were identified in the previous investigation. On this basis, lead within the Made Ground is not considered to be a significant risk to end users of the site.
- 7.3.1.4 The previous investigation identified elevated naphthalene, benzo(b)fluoranthene and dibenzo(a,h)anthracene within two samples of Made Ground. While the naphthalene was considered an outlier, the report suggested the remaining PAHs were representative of the Made Ground. Table 4 presents a summary of PAH concentrations measured within Made Ground samples undertaken as part of the both investigations. Samples of Topsoil and Langley Silt have been excluded. The analysis suggests that the mean concentration and UCL for all PAHs are below guideline values with the exception of the UCL for benzo(a)pyrene. This has been calculated as 3.3mg/kg compared to a guideline value of 3.2mg/kg.
- 7.3.1.5 In our opinion, the adopted model of residential without plant uptake is highly conservative based on the current use as a high school and the calculated UCL is only marginally above the guideline value. Comparison with guideline values for residential public open space, which may be a more accurate representation of a school environment indicate all measured concentrations are below this value. Overall, in our opinion, the marginally elevated UCL for benzo(a)pyrene is not considered to be significant enough to warrant remediation.
- 7.3.1.6 In addition to the above, a general review of the test results suggests that the previously identified elevated concentrations were present in samples from WS01 and WS02. These concentrations appear significantly higher than those measured elsewhere within the Made Ground. With reference to Drawing 03, these positions are located beneath proposed buildings/hardstandings, which will sever the pathway between the two areas of more contaminated Made Ground and end users. This will further reduce the risk.

7.3.2 Controlled waters

- 7.3.2.1 Although the previous report by Opus suggested that further testing of groundwater should be undertaken to determine the risk from elevated PAHs in the Made Ground, in our opinion, the concentrations encountered are relatively low. There is no evidence of any former uses on or adjacent to the site, which could pose a risk to groundwater or be a significant source of PAH. The elevated PAHs are therefore considered to be associated with ash, clinker and bituminous fragments in the Made Ground and are likely to be of low leachability.
- 7.3.2.2 Groundwater was encountered within the Terrace Gravels during both investigations. Langley silt, generally comprising fine-grained soils is present between the Made Ground and the Terrace Gravels and is likely to provide an impermeable barrier between water percolating through Made Ground and the underlying groundwater.
- 7.3.2.3 Based on the above, we do not consider there to be a significant risk to groundwater and no further testing is considered necessary.

7.4 Final conceptual model

- 7.4.1 Opus produced an initial conceptual site model following their intrusive investigation. Having now completed analysis of laboratory testing, we can now provide an updated conceptual model which is presented in Appendix H.
- 7.4.2 Based on the above and our final conceptual model none of the assessed risks exceed the low category and, on this basis, no remedial action is considered necessary at this stage to render the site fit for purpose.

7.5 Statement with respect to National Planning Policy Framework

- 7.5.1 Based on investigations completed to date with respect to chemical contamination, we are of the opinion the proposed development will be safe and suitable for use for the purpose for which it is intended (without the need for any remedial action) thus meeting the requirements of the National Planning Policy Framework section 178, and compliant with the Building Regulations Part C, *'Site preparation and resistance to contaminants and moisture'*

7.6 On Site Monitoring

- 7.6.1 We have attempted to identify the potential for chemical contamination on the site, however, areas, which have not been investigated at this stage, may exhibit higher levels of contamination. If such areas are exposed at any time during construction we will be pleased to re-attend site to assess what action is required to allow the development of safely proceed.

8 Gaseous contamination

8.1	General
8.2	Development categorisation
8.3	Initial monitoring observations
8.4	Interim classification of site characteristic gas situation
8.5	Interim assessment of gas protective measures

8.1 General

8.1.1 A gaseous contamination risk assessment was undertaken by Opus and is presented in their report. In summary, the site was considered to be a negligible risk due to the low levels of biodegradable matter within the soils on site and the lack of any ground gas source in the area. However, it should be noted that BGS geological maps record a large area of worked/Made Ground some 200m to the south of the site.

8.1.2 Opus carried out three gas monitoring visits within four monitoring wells and recorded the following:

- CO₂ concentrations between <0.1 and 2.3%
- CH₄ was not recorded at concentrations above the limit of detection (<0.1%)
- Gas flow was recorded at 0.0l/hr in three of the boreholes. However, a flow of 10.2l/hr was recorded in WS01 during the first visit.

8.1.3 Based on the above, the gas screening value (GSV) was calculated as 0.24 for carbon dioxide resulting in a characteristic situation 2 classification.

8.1.4 It was noted that the elevated flow rate encountered in WS01 could be anomalous and that further gas monitoring should be undertaken to refine the assessment.

8.1.5 On this basis, as part of these supplementary works, two further gas monitoring standpipes have been installed at the site in accordance with BS8576:2013, Section 9 and a supplementary monitoring regime undertaken. The results are detailed in the following Sections.

8.2 Development categorisation

8.2.1 With reference to BS 8485:2015+A1:2019 (table 3), the proposed building type would be classified as *'Type B - Private or commercial/public, possibly multiple'*.

8.3 Initial monitoring observations

8.3.1 Following BS8576:2013 (Figure 6) and CIRIA Report C665 (Tables 5.5a and 5.5b) we have provisionally assessed the site as low risk of generation potential of source ideally requiring six monitoring visits across a three month period.

- 8.3.2 We have returned to site for three of the six proposed monitoring visits to obtain measurements of landfill type gases at atmospheric conditions in the range of 1002 to 1019 mb and temperatures in the range of 18°C to 24°C. Essentially, we detected concentrations of methane in the range of 0.0 to 0.2% and concentrations of carbon dioxide measured in the range of 0.0% to 5.5%.
- 8.3.3 If flows were detected during our monitoring visits then these are recorded, but where no flow is detected then we have assumed flow at the detection limit of the monitoring equipment at 0.1l/s. It should be noted that generally flow was between 0.0 and 1.8l/hr. However, during our monitoring visit on the 17th August, during a period of lower atmospheric pressure, flows between 1.9 and 12.5l/hr were recorded in all boreholes.
- 8.3.4 Gas monitoring results are summarised in Appendix I.

8.4 Interim classification of site characteristic gas situation

- 8.4.1 Using test data obtained to date, and with reference to Table 4 of BS 8485:2015+A1:2019, the site would be classified as characteristic gas situation CS2. Clearly this is an interim classification based on observations to date and can only be confirmed following additional monitoring visits. It should be noted however, that there is a significant possibility of higher flow measurements being recorded during low atmospheric conditions, which may increase the classification of the site requiring more onerous gas protective measures.

8.5 Interim assessment of gas protective measures

- 8.5.1 Based on monitoring observations to date, development categorisation (section 8.6 above), and the interim site characteristic gas situation (section 8.8 above) and with reference to Table 4 of BS 8485:2015+A1:2019, the development requires gas protective measures which would achieve a '*gas protection score*' of 3.5. Lists of protective measures which each produce a score value are produced in Tables 5, 6 and 7 of BS 8485:2015+A1:2019. Clearly this is an interim assessment based on observations to date and can only be confirmed following additional monitoring visits. It should be noted however, that there is a significant possibility of higher flow measurements being recorded during low atmospheric conditions which may increase the classification of the site requiring more onerous gas protective measures.

9 Waste characterisation

9.1	The Landfill Directive
9.2	Characterisation of soil types
9.3	Waste characterisation procedure
9.4	Hazardous waste classification
9.5	Landfill waste acceptance criteria
9.6	Naturally deposited soils not affected by artificial contaminants
9.7	Basic characterisation
9.8	Treatment of waste
9.9	Reuse of soils - Materials Management Plans

9.1 The Landfill Directive

- 9.1.1 The Landfill Directive represents an important change in the way we dispose of waste. It encourages waste minimisation by promoting increased levels of recycling and recovery. The Landfill Directive became law in 1999 and was transcribed into the Landfill (England and Wales) Regulations which came into force in 2002. These Regulations were amended in 2005 by introducing criteria to classify soils for disposal to landfill. It is the duty of the waste producer (the client) to classify the soils for this purpose.

9.2 Characterisation of soil types

- 9.2.1 Our investigations consider two soil types which may be generated as wastes as part of construction operations, potentially contaminated soil and uncontaminated soil. A full hazard assessment and subsequent testing for waste acceptance criteria is undertaken on soils which are not considered to be naturally deposited or are likely to be affected by artificial contamination. For soils that are unlikely to be affected by artificial contamination (such as natural soils), specific testing in relation to the classification process is not necessary.

9.3 Waste characterisation procedure

- 9.3.1 The Environment Agency publication, '*Waste Sampling and Testing for Disposal to Landfill*' (2013), provides an appropriate procedure for establishing if the soils are hazardous or non-hazardous and for determining the appropriate landfill class. This guidance applies to soils that are identified as potentially contaminated. Uncontaminated, natural soils are considered separately (see Section 9.6).

9.3.2 Hazardous waste classification

9.3.2.1 The first stage for characterising a potentially 'contaminated' soil for disposal to landfill is to establish its chemical status by first identifying potential sources/types of chemical contamination (desk study) followed by intrusive site investigations to obtain samples for undefined testing of soil samples to measure concentrations of chemical contaminants. Such data provides information to partly complete a basic characterisation.

9.3.2.2 Laboratory test data is then compared with the Environment Agency publication '*Guidance on the classification and assessment of waste. Technical Guidance WM3 (2018, version 1.1)*'. With reference to this document a hazard assessment has been carried out to enable classification of the material as hazardous or non-hazardous and to subsequently establish the European Waste Catalogues (EWC) code (ref Section 9.3.4).

9.3.3 Landfill waste acceptance criteria

9.3.3.1 The second stage for characterising a potentially 'contaminated' soil for disposal to landfill is by determining the appropriate landfill class. If the soil is deemed hazardous then measurement of organic contaminants and leachable inorganic contaminants is necessary for comparison with values listed in the Environment Agency publication '*Waste Sampling and Testing for Disposal to Landfill (2013) Table 5.3*. Similarly should the soil be deemed as non-hazardous then such testing may also be undertaken to determine if it is potentially inert. This document also provides guidance on sampling materials and frequency as well as test procedures and quality assurance of testing.

9.3.3.2 The above procedures are described with respect to the subject site in Sections 9.4 (hazardous waste classification) and 9.5 (landfill waste acceptance criteria), leading to the basic characterisation of soils for disposal. Subject to the results of the characterisation and anticipated development methodology, consideration should be given by the developer to reduce volumes of disposal or treatment to allow reclassification.

9.3.4 European Waste Catalogues (EWC) coding

9.3.4.1 The EWC 2002 is a catalogue of all wastes, grouped according to generic industry, process or waste type. It is divided into twenty main chapters, each with a two digit code between 01 and 20. Following the EWC, in our opinion, soils considered as part of this investigation would be categorised within 'Group 17' of the EWC catalogue, which comprises 'Construction and Demolition Wastes (including excavated soils from contaminated sites)'.

9.3.4.2 The Catalogue further categorises the waste, such that soils considered as part of this investigation would be classified as either 17 05 04 defined as '*soil and stones (other than those mentioned in 17 05 03)*'; or 17 05 03* defined as soil or stones containing dangerous substances (where hazardous wastes are described by entries followed by an asterisk).

9.4 Hazardous waste classification

9.4.1 Soil types

- 9.4.1.1 Based on soils exposed in exploratory excavations, in combination with anticipated construction works, we assume soils requiring off-site disposal will comprise Made Ground, Langley Silt Member and Lynch Hill Gravel Member derived from general site clearance and foundation/service trench excavations.

9.4.2 Classification as hazardous or non-hazardous waste

- 9.4.2.1 The Environment Agency publication '*Waste Sampling and Testing for Disposal to Landfill*' (March 2013) provides the following procedure for establishing if the soils are hazardous or non-hazardous. The first stage in classifying a potentially 'contaminated' soil for disposal is to establish its chemical status by first identifying potential sources/types of chemical contamination (desk study) followed by intrusive site investigations to obtain samples for laboratory testing of soil samples to measure concentrations of chemical contaminants.
- 9.4.2.2 An assessment of potential source of contamination is presented in the Opus report. Laboratory testing has been set as deemed appropriate to the previously undertaken source assessment.
- 9.4.2.3 We have carried out an analysis of test data for each chemical contaminant considered in this investigation. A conservative approach has been adopted for the analysis whereby the maximum test value for each contaminant has been adopted as a preliminary screening process to determine if the soils are hazardous or non-hazardous. Should the analysis indicate potentially hazardous properties then a process of zoning by further analysing the site history, geological conditions and analytical data may be undertaken.
- 9.4.2.4 Laboratory test data measures the concentration of anions, which are unlikely to exist in the pure metallic form in the soil, but probably exist as a compound. Following guidance provided in the Environment Agency Technical Guidance WM3 '*Guidance on the classification and assessment of waste*' (2018), we have reviewed a variety of compounds for each of the metallic and semi-metallic elements we have tested.
- 9.4.2.5 To determine the hazardous waste properties for each element, we have reviewed chemical compounds listed in Table 3.2 of Annex VI of the European Regulation (1272/2008) for Classification, Labelling and Packaging (CLP) of chemicals which has now superseded the Approved Supply List (Published by the Health and Safety Executive) for the classification of hazardous chemicals in the UK. In order to provide a 'worst case' scenario, initially we adopt the most severe hazardous properties (risk phrases) associated with the various compounds for each element under review. If measured concentrations produce a hazardous outcome then the element or elements are reassessed on a site specific basis. For review of organic contamination, we have directly adopted the threshold concentrations for the appropriate organic compounds listed in Table 3.2.

- 9.4.2.6 The compound or compounds adopted for each element is used to convert the measured metallic concentration to the substance concentration using their respective molecular weights. This derived conversion factor is then used in the threshold concentration spreadsheet (refer paragraph 9..2.8).
- 9.4.2.7 Our assessment of each of the chemical substances is maintained on our files and is available for confidential review/audit by the Environment Agency.
- 9.4.2.8 A spreadsheet detailing the hazard assessment is presented in Appendix J1.
- 9.4.2.9 The spreadsheet indicates the soils are **non-hazardous**.

9.5 Landfill waste acceptance criteria

- 9.5.1 We have scheduled testing of three samples to measure the parameters listed in Table 5.3 (landfill waste acceptance criteria) included in '*Waste Sampling and Testing for Disposal to Landfill*' (2013). A copy of the test result certificates are presented in Appendix G. The source of the composite sample(s) is detailed below:

Composition of soil samples for classification testing		
Sample	Source	Soil Type
WAC01	TP101, WS103	Gravelly Clay
WAC02	TP102, TP103	
WAC03	WS101, WS102	
Table 9.5.1		

- 9.5.2 The samples were deemed representative of Made Ground as described in Section 6. The samples were formed by combining individual samples taken from exploratory excavations within the Made Ground. The combined sample was then quartered in the laboratory to produce a representative sample for subsequent testing.
- 9.5.3 Laboratory test data has been compared with the landfill waste acceptable criteria to allow the assessment to be completed. A tabulated copy this comparison is presented in Appendix J2.
- 9.5.4 Comparison of test data with landfill waste acceptance criteria indicates that Made Ground soils are suitable for disposal at **an inert waste** landfill site.

9.6 Naturally deposited soils not affected by artificial contaminants

- 9.6.1 With reference to the Environment Agency's publications *Waste Sampling and Testing for Disposal to Landfill* (2013) and *Waste acceptance at landfills* (2010), naturally occurring soils not likely to be affected by contamination can be classified as inert waste, with a EWC code of 17 05 04. Should any of the naturally deposited soils be suspected to contain contamination (by virtue of visual or olfactory evidence) upon excavation, then such soils should be stockpiled appropriately and additional testing carried out as considered necessary. Based on evidence obtained during our investigations, we are of the opinion that the Langley Silt Member and Lynch Hill Gravel Member underlying the site are not likely to be affected by chemical contamination and thus can be classified as **inert waste**.

9.7 Basic characterisation

- 9.7.1 Based on the preceding assessment, we have produced **three** basic characterisation schedules relating to the Made Ground, Langley Silt Member and Lynch Hill Gravel Member, which are presented in Appendix J3. These schedules should be provided together with a copy of this report to an appropriately licensed landfill facility to demonstrate the material can be deposited at this facility.
- 9.7.2 We understand that some landfill sites have licences which have restrictions on concentrations of chemical contaminants and thus we recommend this report is provided to the selected landfill facility to confirm (or otherwise) it can accept the waste. Please be aware that landfill sites are obligated to undertake in house quality assurance tests and thus may require further WAC testing for any soils encountered as part of this investigation. There is no obligation on any landfill operator to accept waste if they choose not to and waste operators may require additional testing of untested waste soils prior to acceptance at landfill in accordance with the landfill regulations.

9.8 Treatment of waste

- 9.8.1 Treatment of wastes prior to disposal is now a requirement of the landfill directive applied by the Landfill (England and Wales) Regulations 2002. Landfill cannot accept untreated waste (be it hazardous or non-hazardous), thus waste producers have the choice of treating it themselves on site or treating it elsewhere prior to disposal to landfill. The regulations require:

'10 – (1) The operator of a landfill shall ensure that the landfill is only used for landfilling waste which is subject to prior treatment unless:

- a) It is inert waste for which treatment is not technically feasible; or*
- b) It is waste other than inert waste and treatment would not reduce its quantity or the hazards which it poses to human health or the environment.'*

9.8.2 Regulation 2 defines treatment as: *'physical, thermal, chemical or biological processes (including sorting) that change the characteristics of waste in order to reduce its volume or hazardous nature, facilitate its handling or enhance recovery.'*

9.8.3 A treatment option must comply with the definition of treatment. This involves a 'three point test' against which treatment is assessed i.e.

1. It must be a physical, thermal, chemical or biological process including sorting
2. It must change the characteristics of the waste: and
3. It must do so in order to:
 - a) Reduce its volume: or
 - b) Reduce its hazardous nature: or
 - c) Facilitate its handling: or
 - d) Enhance its recovery.

9.8.4 Treatment of inert wastes

9.8.4.1 Inert waste does not need to be treated if it is not technically feasible however treatment should reduce the amount of waste which goes to landfill and enhance its recovery (by re-use or recycling). Inert wastes are often suitable for recycling, for example as an aggregate or an engineering fill material. A fact sheet on treatment of inert wastes is available on the following website www.environment-agency.gov.uk

9.8.4.2 Clearly, excavations in the Langley Silt Member and Lynch Hill Gravel Member will generate inert wastes which could be reused on site or off site for bulk filling, subject of course to maintenance of an acceptable water content and provided that it is fit for its intended purpose.

9.8.5 Landfill operators

9.8.5.1 It is a requirement of the landfill operator to check if the waste soils taken to the facility have been treated.

9.9 Reuse of Soils - Materials Management Plans

9.9.1 Where soils are to be moved and reused onsite, or are to be imported to the site, a Waste Exemption or an Environmental Permit is required.

9.9.2 An alternative is the use of a Materials Management Plan (MMP) to determine where soils are and are not considered to be a waste. By following *'The Definition of Waste: Development Industry Code of Practice'* published by CL:AIRE (produced in 2008 and revised in March 2011), soils that are suitable for reuse without the need for remediation (either chemical or geotechnical) and have a certainty of use, are not considered to be waste and therefore do not fall under waste regulations. In addition, following this guidance may present an opportunity to transfer suitable material between sites, without the need for Waste Exemptions or Environmental Permits.

- 9.9.3 MMPs offering numerous benefits, including maximising the use of soils onsite, minimising soils going to landfill and reducing costs and time involved in liaising with waste regulators.
- 9.9.4 We can provide further advice on this and provide fees for producing a Materials Management Plan on further instructions.

10 Further investigations

10.1	Further investigations
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- 10.1 At this stage we do not consider further investigations to be necessary. However, this report will require updating on completion of gas monitoring and a remediation strategy/statement will likely be required with respect to gas protection measures.



Site location

Title

Site location plan

Scale

Not to scale

Drawing number

01



Key



Approximate location of borehole formed by Windowless Sampling techniques



Approximate location of trial pit excavation



Approximate location of Dynamic Probing



Approximate location of historic OPUS Window Sample borehole (December 2016)



Approximate location of historic OPUS Window Sample borehole (December 2016) with gas monitoring installation



Approximate location of historic OPUS Cable percussive borehole (December 2016)



Approximate location of historic OPUS Cable percussive borehole (December 2016) with ground water and gas monitoring installation



Approximate location of historic OPUS dynamic cone penetration (December 2016)



Approximate site boundary



A	First issue	KD	MG	KB	21.08.2020
REV	DESCRIPTION	PRODUCED BY	CHECKED BY	REVIEWED BY	DATE

soiltechnics

environmental • geotechnical • building fabric

PROJECT

Meadow High School, Uxbridge

TITLE

Plan showing existing site features and location of exploratory points

PROJECT NO.

STS5093

SCALE AT A3

1:750

DRAWING NO.

02



Key



Approximate location of borehole formed by Windowless Sampling techniques



Approximate location of trial pit excavation



Approximate location of Dynamic Probing



Approximate location of historic OPUS Window Sample borehole (December 2016)



Approximate location of historic OPUS Window Sample borehole (December 2016) with gas monitoring installation



Approximate location of historic OPUS Cable percussive borehole (December 2016)



Approximate location of historic OPUS Cable percussive borehole (December 2016) with ground water and gas monitoring installation



Approximate location of historic OPUS dynamic cone penetration (December 2016)



Approximate site boundary



A	First issue	KD	KB	KB	26.08.2020
REV	DESCRIPTION	PRODUCED BY	CHECKED BY	REVIEWED BY	DATE

soiltechnics
environmental • geotechnical • building fabric

PROJECT
Meadow High School, Uxbridge

TITLE
Plan showing proposed site features and location of exploratory points

PROJECT NO. STS5093	SCALE AT A3 1:750	DRAWING NO. 03
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Definition of geo-environmental terms used in this report

Conceptual model

Textual and/or schematic hypothesis of the nature and sources of contamination, potential migration pathways (including description of the ground and groundwater) and potential receptors, developed on the basis of the information obtained from the investigatory process.

Contamination

Presence of a substance which is in, on or under land, and which has the potential to cause harm or to cause pollution of controlled water.

Controlled water

Inland freshwater (any lake, pond or watercourse above the freshwater limit), water contained in underground strata and any coastal water between the limit of highest tide or the freshwater line to the three mile limit of territorial waters.

Harm

Adverse effect on the health of living organisms, or other interference with ecological systems of which they form part, and, in the case of humans, including property.

Pathway

Mechanism or route by which a contaminant comes into contact with, or otherwise affects, a receptor.

Receptor

Persons, living organisms, ecological systems, controlled waters, atmosphere, structures and utilities that could be adversely affected by the contaminant(s).

Risk

Probability of the occurrence of, and magnitude of the consequences of, an unwanted adverse effect on a receptor.

Risk assessment

Process of establishing, to the extent possible, the existence, nature and significance of risk.

Definition of environmental risk/hazard terms used in this report

Based on CIRIA report C552 '*Contaminated land risk assessment – A guide to good practice*'.

Potential hazard severity definition

Category	Definition
Severe	Acute risks to human health, catastrophic damage to buildings/property, major pollution of controlled waters
Medium	Chronic risk to human health, pollution of sensitive controlled waters, significant effects on sensitive ecosystems or species, significant damage to buildings or structures
Mild	Pollution of non-sensitive waters, minor damage to buildings or structures
Minor	Requirement for protective equipment during site works to mitigate health effects, damage to non-sensitive ecosystems or species

Probability of risk definition

Category	Definition
High likelihood	Pollutant linkage may be present, and risk is almost certain to occur in long term, or there is evidence of harm to the receptor
Likely	Pollutant linkage may be present, and it is probable that the risk will occur over the long term
Low likelihood	Pollutant linkage may be present, and there is a possibility of the risk occurring, although there is no certainty that it will do so
Unlikely	Pollutant linkage may be present, but the circumstances under which harm would occur are improbable

Level of risk for potential hazard definition

Probability of risk	Potential severity			
	Severe	Medium	Mild	Minor
High likelihood	Very high	High	Moderate	Low/Moderate
Likely	High	Moderate	Low/Moderate	Low
Low likelihood	Moderate	Low/Moderate	Low	Very low
Unlikely	Low/Moderate	Low	Very low	Very low

See below for definitions of 'very high' to 'very low'

Definition of environmental risk/hazard terms used in this report

Based on CIRIA report C552 '*Contaminated land risk assessment – A guide to good practice*'.

Risk classifications and likely action required:

Very high risk

High probability that severe harm could arise to a designated receptor from an identified hazard OR there is evidence that severe harm to a designated receptor is currently happening. This risk, if realised is likely to result in substantial liability. Urgent investigation and remediation are likely to be required.

High risk

Harm is likely to arise to a designated receptor from an identified hazard. This risk, if realised, is likely to result in substantial liability. Urgent investigation is required and remedial works may be necessary in the short term and are likely over the long term.

Moderate risk

It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that any such harm would be severe, or if any harm were to occur it is likely that the harm would be relatively mild. Investigation is normally required to clarify risks and to determine potential liability. Some remedial works may be required in the long term.

Low risk

It is possible that harm could arise to a designated receptor from an identified hazard but it is likely that this harm, if realised, would at worst normally be mild.

Very low risk

It is a low possibility that harm could arise to a designated receptor. On the event of such harm being realised it is not likely to be severe.

List of documents used in assessment of chemical contamination

No.	Title	Publication reference / publisher
1	Human health toxicological assessment of contaminants in soil	EA Science Report – SC050021/SR2
2	Updated technical background to the CLEA model	EA Science Report – SC050021/SR3
3	CLEA Software (Version 1.03 beta) Handbook	EA Science Report - SC050021/SR4
4	Guidance on comparing Soil Contamination Data with a Critical Concentration	CIEH
5	The LQM/CIEH S4ULs for Human Health Risk Assessment (2015)	LQM/CIEH
6	Assessment of Risks to Human Health from Land Contamination: An overview of the development of soil guideline values and related research	R&D Publication, Contaminated Land Report CLR 7
7	Contaminants of Soil: Collation of Toxicological Data and Intake Values for Humans	R&D Publication, Contaminated Land Report CLR 9
8	The Contaminated Land Exposure Assessment Model (CLEA): Technical Basis and Algorithms	R&D Publication, Contaminated Land Report CLR 10
9	Model Procedures for the Management of Land Contamination	R&D Publication, Contaminated Land Report CLR 11
10	Contaminants in Soil: Collection of Toxicological Data and Intake Values for Human Values	R&D Publications, Tox. 6
11	Soil Guideline Values for Contamination (2002)	R&D Publications, SGV 10
12	Soil Guideline Values (2009)	EA Science Reports – SC050021
13	Atkins ATRISK ^{SOIL} (2011)	http://www.atrisksoil.co.uk
14	Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination (September 2014)	CL:AIRE

CIEH Chartered institute of Environmental Health
 LQM Land Quality Management
 EA Environment Agency
 CL:AIRE Contaminated Land: Applications in Real Environments

Testing suite summary

Table summarising testing suites		
Suite	Parameters	Medium
Suite 1	Arsenic, beryllium, boron, cadmium, chromium (total and VI), copper, lead, mercury, nickel, selenium, vanadium zinc, cyanide (free, total and complex), organic matter content, PAH (16 speciated), pH, phenol (total), TOC	Soil
Suite 2	Arsenic, boron (water soluble), beryllium, cadmium, chromium (total), copper, lead, mercury, nickel, selenium, vanadium, zinc, cyanide (free, total and complex, PAH (16 speciated), pH, phenol (total), sulfate (water soluble), sulfide, nitrate	Leachate
Suite 3	Arsenic, boron (water soluble), beryllium, cadmium, chromium (total), copper, lead, mercury, nickel, selenium, vanadium, zinc, cyanide (free, total and complex, PAH (16 speciated), pH, phenol (total), sulfate (water soluble), sulfide, nitrate	Water
Suite 4	TPH Texas Banding Aliphatic/Aromatic Split, BTEX, MTBE, PAH (16 speciated), organic matter	Soil
Suite 5	TPH Texas Banding Aliphatic/Aromatic Split, BTEX, MTBE, PAH (16 speciated)	Leachate
Suite 6	TPH Texas Banding Aliphatic/Aromatic Split, BTEX, MTBE, PAH (16 speciated)	Water
Suite 7	TPH Texas Banding Aliphatic/Aromatic Split, BTEX, TOC, organic matter	Soil
Suite 8	Sulphur (total), sulphate (water and acid soluble), pH	Soil
Suite 9	Sulphate, ammoniacal nitrogen, dissolved magnesium, pH	Water
Suite 10	VOC, SVOC, TOC, organic matter	Soil
Suite 11	VOC, SVOC	Leachate
Suite 12	VOC, SVOC	Water
Suite 13	Organotins dibutyltin/ tributyl-tin/tetrabutyltin/triphenyl-tin, tetraethyl-lead/tetramethyl-lead	Soil
Suite 14	Organotin	Leachate
Suite 15	Organotin	Water
Suite 16	TPH Texas Banding Aliphatic/Aromatic Split, BTEX, VOC, SVOC	Soil, water, leachate
Suite 17	TPH Texas Banding Aliphatic/Aromatic Split, BTEX, SVOC, VOC, arsenic, boron (water soluble), beryllium, cadmium, chromium (total), copper, lead, mercury, nickel, selenium, vanadium, zinc, cyanide (free, total and complex, pH, phenol (total), sulfate (water soluble), sulfide, nitrate	Soil, water, leachate
Concrete BRE suite	pH, sulphate (water and acid soluble), magnesium (water soluble), ammonia (water soluble), chloride, nitrate	Soil

Table summarising Standard Penetration Test (SPT) results

Location	Start Depth (m)	Penetration (mm)					
		Seating 1-2	Main 1-4	Total Seating	Total Main	Total Seating	Total Main
WS101	1.00	1/3	8/12/10/9	4	39	150	300
WS101	3.00	14/11	14/19/17	25	50	110	225
WS102	2.00	10/13	15/18/17	23	50	150	220
WS102	3.00	17/8	14/16/16/4	25	50	100	225
WS103	1.00	1/1	2/3/5/8	2	18	150	300
WS103	2.00	13/12	16/19/19	25	54	130	180

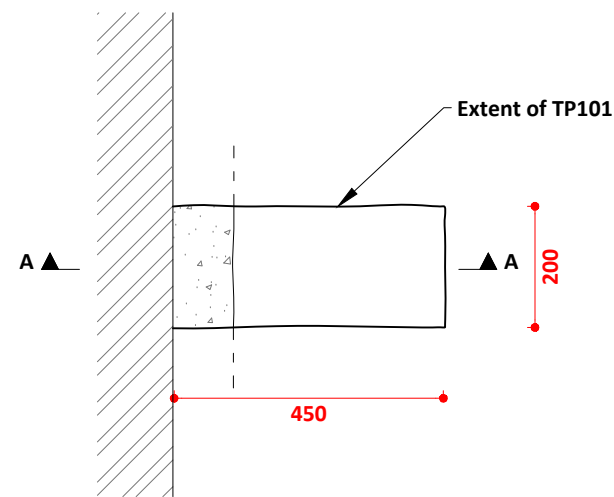
Table summarising Pocket Penetrometer results

* Signifies that instrument limit reached.

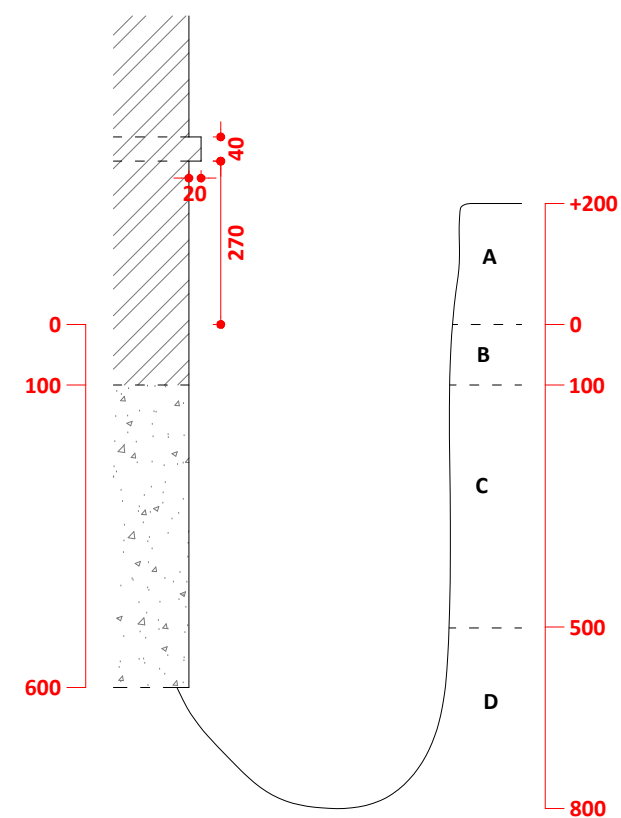
Location	Start Depth (m)	Results 1-3	Average	Undrained Shear Strength (kN/m ²)
WS101	0.80	2.25/2.25/2	2.17	108
WS101	1.20	1.5/1.5/1.5	1.50	75
WS101	1.80	1.75/1.75/1.75	1.75	88
WS102	0.40	2.25/2/2	2.08	104
WS102	0.80	2/2.25/1.5	1.92	96
WS102	1.30	3.5/4/3.5	3.67	183
WS102	1.85	1.25/1.25/1.5	1.33	67
WS103	0.30	4/3/3	3.33	167
WS103	0.80	2/2/2.5	2.17	108
WS103	1.30	2/2.25/2	2.08	104



Plan



Section A-A



Photographic records



Key

- A. WOOD CHIPPINGS (MADE GROUND)
- B. Ornamental COBBLE surface (MADE GROUND)
- C. Firm brown sandy gravelly CLAY with occasional cobbles of angular brick. Gravel consists of fine to coarse angular brick, flint, concrete, clinker and glass. (MADE GROUND)
- D. Firm orangish brown and mottled brown slightly sandy slightly gravelly CLAY. Gravel consists of fine to medium well-rounded flint and chalk with occasional fine sandstone. (LANGLEY SILT MEMBER)

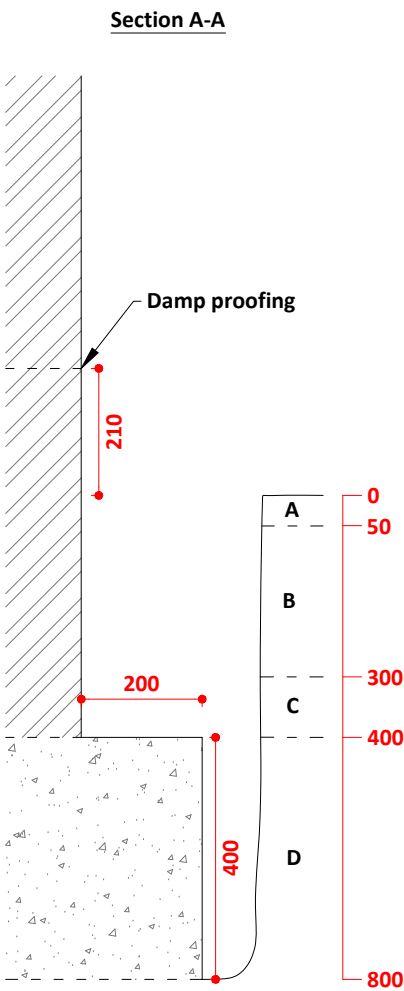
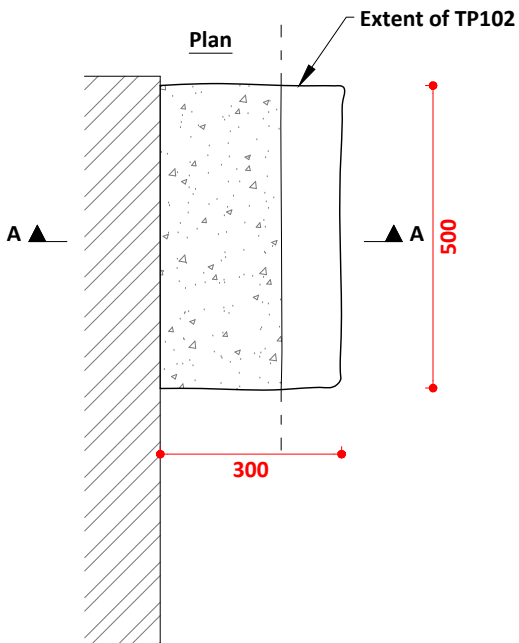
— Observed features
- - - Assumed features

 Denotes brickwork  Denotes concrete

Notes

- All dimensions shown in millimetres
- Disturbed samples taken from 0.3m, 0.6m and 1.2m depths
- Trial pit sides remained upright and stable
- Membrane at 0.2m depth

Method of excavation	Title	Location reference
Hand tools	Trial pit record	TP101
Dimensions	Date of works	Location plan on drawing number
As shown	25.06.2020	02
Groundwater observations	Scale	Appendix
No groundwater observed	1:12.5 at A3	C



Photographic records



Key

- A. ASPHALTIC CONCRETE (MADE GROUND)
- B. Cream slightly sandy BRICK cobbles (MADE GROUND)
- C. Firm brownish grey becoming grey slightly gravelly sandy CLAY. Gravel consists of fine to coarse angular crushed brick and flint (MADE GROUND)
- D. Firm brown slightly gravelly sandy CLAY. Gravel consists of fine well-rounded flint. (LANGLEY SILT MEMBER)

Observed features

Assumed features

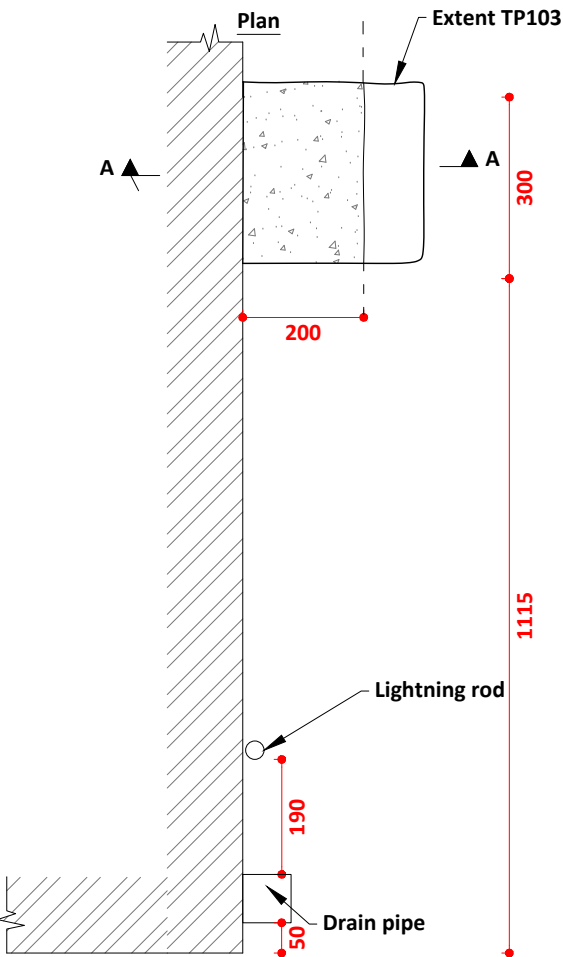
 Denotes brickwork

 Denotes concrete

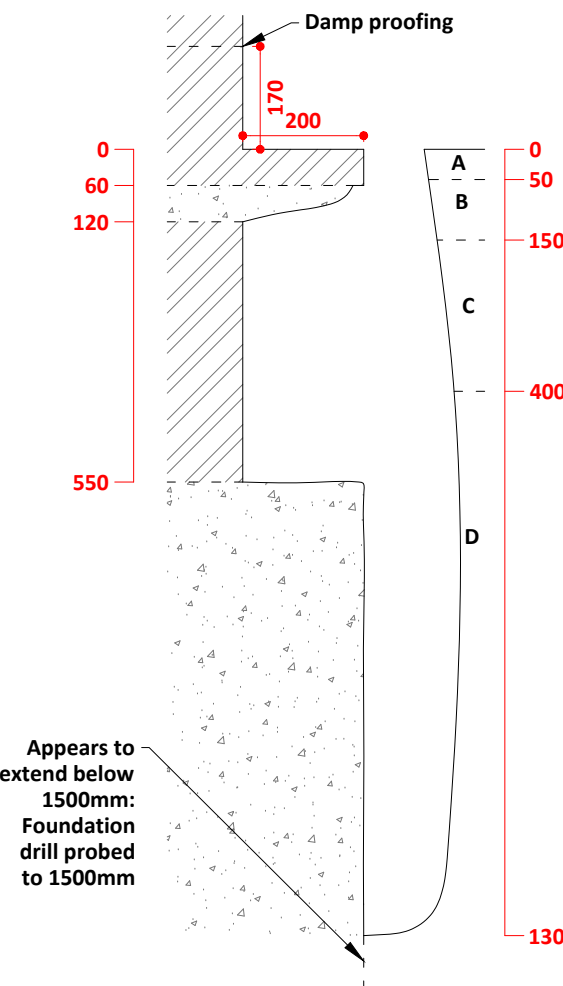
Notes

1. All dimensions shown in millimetres
2. Disturbed samples taken from 0.3m and 0.6m depths
3. Trial pit sides remained upright and stable

Method of excavation	Title	Location reference
Hand tools	Trial pit record	TP102
Dimensions	Date of works	Location plan on drawing number
As shown	25.06.2020	02
Groundwater observations	Scale	Appendix
No groundwater observed	1:12.5 at A3	C



Section A-A



Photographic records



Key

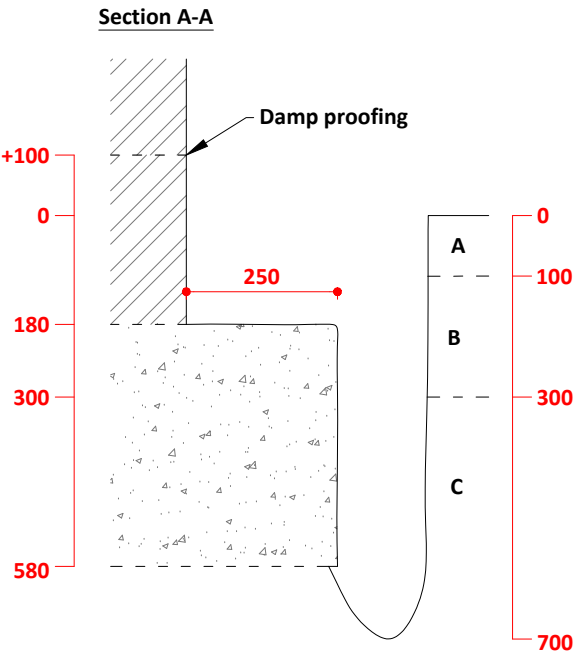
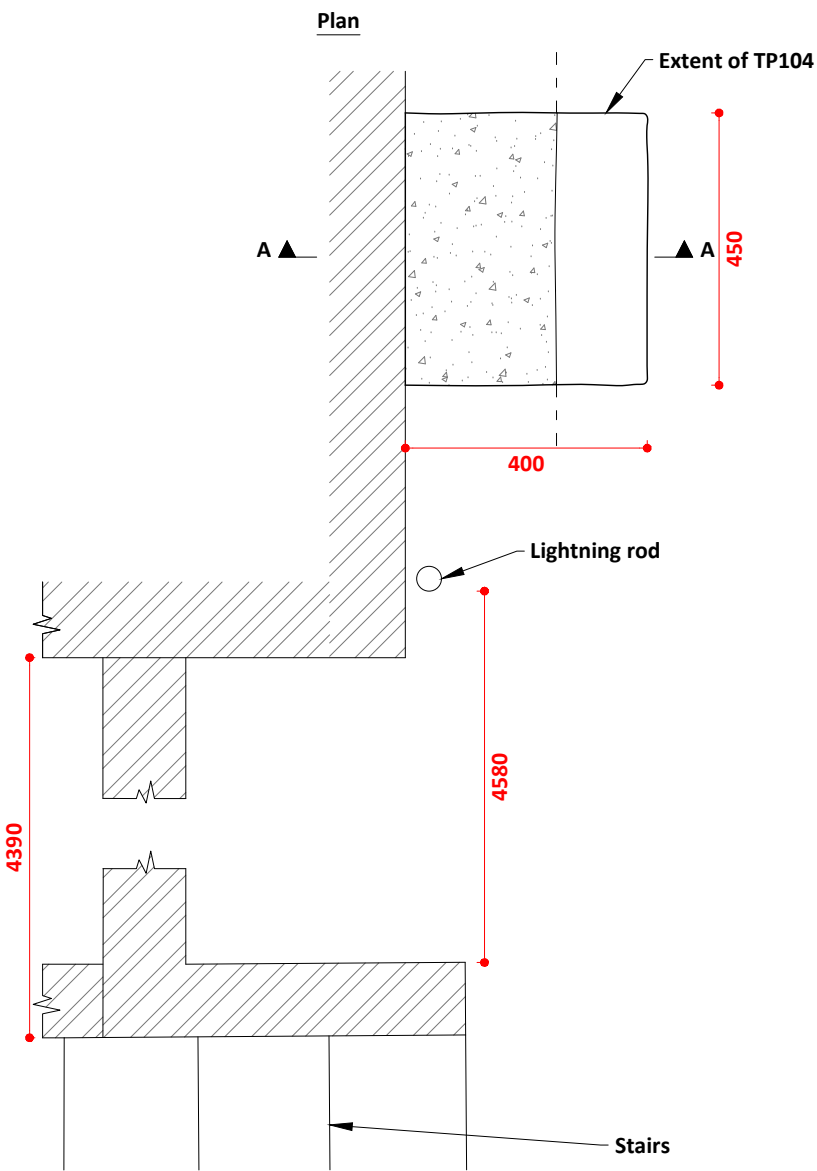
- A. RUBBER AGGREGATE. (MADE GROUND)
- B. Grey slightly sandy GRAVEL consisting of limestone. (MADE GROUND)
- C. Very soft dark greyish brown sandy gravelly CLAY. Gravel consists of fine to coarse angular to sub-rounded clinker, brick and flint. (MADE GROUND)
- D. Firm orangish brown slightly gravelly sandy CLAY. Gravel consists of fine well-rounded flint. (LANGLEY SILT MEMBER)

- Observed features
- Assumed features
- Denotes brickwork
- Denotes concrete

Notes

1. All dimensions shown in millimetres
2. Disturbed samples taken from 0.3m and 1.0m depths
3. Trial pit sides remained upright and stable
4. Fabric membrane at 0.15m depth

Method of excavation	Title	Location reference
Hand tools	Trial pit record	TP103
Dimensions	Date of works	Location plan on drawing number
As shown	25.06.2020	02
Groundwater observations	Scale	Appendix
No groundwater observed	1:12.5 at A3	C



Photographic records



Key

- A. Grass onto very stiff greyish brown very sandy silty CLAY. (MADE GROUND)
- B. Very stiff sandy gravelly CLAY. Gravel consists of fine to coarse brick, flint, chalk and mortar (MADE GROUND)
- C. Stiff becoming firm slightly gravelly sandy CLAY. Gravel consists of fine well-rounded flint (LANGLEY SILT MEMBER)

— Observed features
- - - Assumed features

Denotes brickwork Denotes concrete

Notes

- 1. All dimensions shown in millimetres
- 2. Disturbed samples taken from 0.2m and 0.68m depths
- 3. Trial pit sides remained upright and stable

Method of excavation	Title	Location reference
Hand tools	Trial pit record	TP104
Dimensions	Date of works	Location plan on drawing number
As shown	22.06.2020	02
Groundwater observations	Scale	Appendix
No groundwater observed	1:12.5 at A3	C

Key to legends

Composite materials, soils and lithology

	Topsoil		Made Ground		Boulders
	Chalk		Clay		Coal
	Cobbles		Cobbles & Boulders		Concrete
	Gravel		Limestone		Mudstone
	Peat		Sand		Sand and Gravel
	Sandstone		Silt		Silt / Clay
					Siltstone

Note: Composite soil types are signified by combined symbols.

Key to 'test results' and 'sampling' columns

Test result		Sampling	
Depth	Records depth that the test was carried out (i.e.: at 2.10m or between 2.10m and 2.55m)	From (m) To (m)	Records depth of sampling
Result	PP – Pocket penetrometer result (kN/m ²)	D	Disturbed sample
	SV – Hand held shear vane result (kN/m ²)	B	Bulk disturbed sample
	PP result converted to an equivalent undrained shear strength by applying a factor of 50. Where at least 3 results obtained at same depth then an average value may be reported.	ES	Environmental sample comprising plastic and/or glass container
	SPT – Standard Penetration Test result (uncorrected) ^{1,2,3}	W	Water sample
	SPT(c) – Standard Penetration Test result (solid cone) (uncorrected) ^{1,2,3}	UT	Undisturbed sample 100mm diameter sampler
	UT – Undisturbed sample 100mm diameter sampler with number of blows of driving equipment required to obtain sample		

Water observations

Described at foot of log and shown in the 'water strike' column.

 = water level observed after specified delay in drilling

 = water strike

Standpipe details

	Gravel filter		Arisings
	Bentonite		
	Slotted pipe		
	Unslotted pipe		

Density

Density recorded in brackets inferred from density testing and soil descriptions from across the site (i.e.: [Medium dense]).

[illegible]

Notes Borehole remained upright and stable.	Title Driven tube sampler record			Date(s) 25/06/2020	
	Recovery details		Method	Logged by	Sheet number
	Range (m)	Recovery (%)	Driven tube sampler	MG	Sheet 1 of 1
Groundwater observations Groundwater encountered at 3m depth, filling borehole to 2.9m in 15 minutes.	0.00 - 1.00	90	Level (m OD)	Compiled by	Revision
	1.00 - 2.00	90	-	KD	0
	2.00 - 3.00	100	Co-ordinates	Checked by	WS101
			-	KB	

INSTALL	STRATA				WATER STRIKES	DYNAMIC PROBING					SPT TESTING				OTHER IN SITU TESTING		SAMPLING		
	DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		0 10 20 30 40 50					TYPE / DEPTH (m)	RESULT	CASING DEPTH (m)	WATER LEVEL (m)	TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
	ASPHALTIC CONCRETE. (MADE GROUND)	0.10															0.20		ES
	Grey slightly gravelly SAND. Gravel consists of sub-angular to rounded fine to coarse limestone, flint and brick. (MADE GROUND)	0.30													PP 0.40	PP=104			ES
	Firm dark grey becoming brown grey slightly sandy CLAY. (MADE GROUND)	0.60															0.50		
	...between 0.3m and 0.6m depth, grey staining.																		
	Firm orangish brown slightly gravelly sandy CLAY. Gravel consists of fine well-rounded flint. (LANGLEY SILT MEMBER)	1.00													PP 0.80	PP=96	0.75		D
	Firm orangish brown very gravelly CLAY. Gravel consists of fine to medium sub-angular to sub-rounded flint. (LANGLEY SILT MEMBER)	1.60													PP 1.30	PP=183	1.25		D
	...at 1.3m depth, gravel content increasing with depth.																		
	Firm orangish brown mottled dark grey slightly gravelly sandy CLAY. Gravel consists of fine well-rounded flint and chalk. (LANGLEY SILT MEMBER)	2.20													PP 1.85	PP=67	1.75		D
	...between 1.7m and 1.8m depth, very gravelly. Gravel consists of fine to medium well-rounded flint.																		
	Medium dense becoming dense orangish brown slightly sandy GRAVEL. Gravel consists of fine to coarse well-rounded to angular flint. (LYNCH HILL GRAVER MEMBER)	2.60															2.25		D
	...at 2.6m depth, sand content increasing with depth.																2.50		D
	BOREHOLE TERMINATED AT 3.00m	3.00																	

Notes Borehole remained upright and stable.	Title Driven tube sampler record			Date(s) 25/06/2020	
	Recovery details		Method Driven tube sampler	Logged by MG	Sheet number Sheet 1 of 1
Groundwater observations Groundwater encountered at 2.95m depth, filling borehole to 2.8m in 15 minutes.	Range (m) 0.00 - 1.00 1.00 - 2.00 2.00 - 3.00	Recovery (%) 100 95 95	Level (m OD) -	Compiled by KD	Revision 0
			Co-ordinates -	Checked by KB	WS102

INSTALL	STRATA				WATER STRIKES	DYNAMIC PROBING	SPT TESTING				OTHER IN SITU TESTING		SAMPLING		
	DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND			TYPE / DEPTH (m)	RESULT	CASING DEPTH (m)	WATER LEVEL (m)	TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
	GRAVEL surfacing onto firm dark grey becoming brown grey slightly sandy CLAY. (MADE GROUND)	0.20					C 1.00 - 1.45	(2) 18	1.00		PP 0.30	PP=167	0.50		ES
	Firm orangish brown slightly gravelly sandy CLAY. Gravel consists of fine well-rounded flint. (LANGLEY SILT MEMBER)														
	Firm orangish brown mottled dark grey slightly gravelly sandy CLAY. Gravel consists of fine well-rounded flint and chalk. (LANGLEY SILT MEMBER)	1.00													
	Orangish brown and grey slightly sandy GRAVEL. Gravel consists of fine to coarse angular to rounded flint. (LYNCH HILL GRAVER MEMBER)	1.60													
	Dense orangish brown slightly sandy GRAVEL. Gravel consists of fine to coarse angular to well-rounded flint. (LYNCH HILL GRAVER MEMBER)	1.90					C 2.00 - 2.31	(25/130mm) 54/180mm	1.00	2.00		PP 1.30	PP=104	1.20	D
	...from 2.6m depth, becoming slightly clayey.														
	BOREHOLE TERMINATED AT 3.00m	3.00											2.50	3.00	D

Notes Borehole collapsed to 2.5m depth upon completion.	Title Driven tube sampler record			Date(s) 25/06/2020	
	Recovery details		Method Driven tube sampler	Logged by MG	Sheet number Sheet 1 of 1
	Range (m)	Recovery (%)			
	0.00 - 1.00	90	Level (m OD) -	Compiled by KD	Revision 0
	1.00 - 2.00	100			
Groundwater observations Borehole collapsed before observation taken.	2.00 - 3.00	40	Co-ordinates -	Checked by KB	WS103

Summary log for dynamic probing

Dynamic Probing Test Number: WS103

Easting: -

Northing: -

Ground level (mAOD): -

Date of test: 25/06/2020

Cone type: Fixed

Anvil type: Fixed

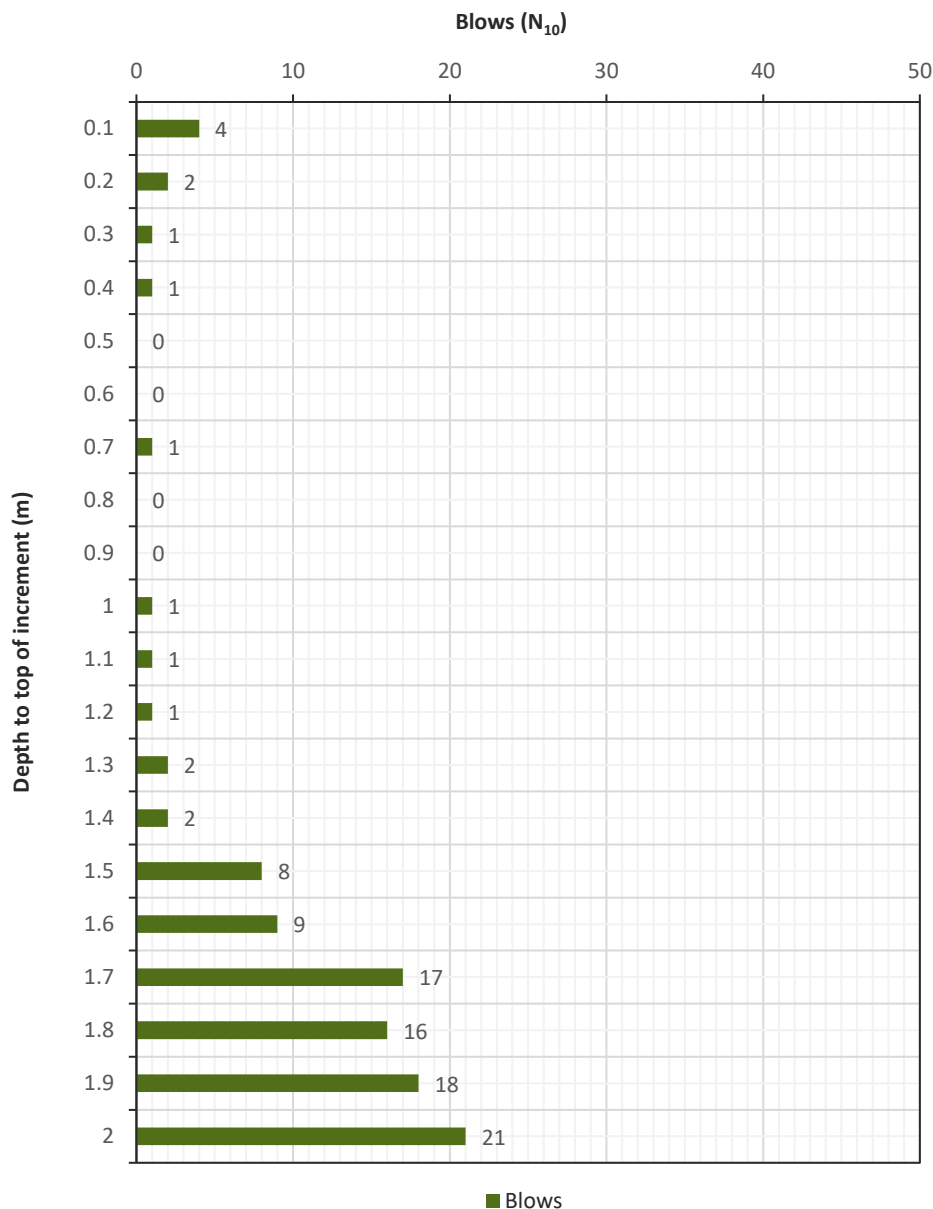
Type of dynamic probing: DPSH-B

Manufacturer: Dando

Model: Dando Terrier

Model Number: DT/15164

Equipment checked and in accordance with EN ISO 22476-2, 5.1: Yes



Title

Summary of dynamic probing log for location WS103

Appendix

D



TEST CERTIFICATE

Liquid and Plastic Limits

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



Environmental Science

4041

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

Client: Soiltechnics Limited
Client Address: Cedar Barn, White Lodge,
Walgrave, Northampton,
NN6 9PY
Contact: Alexa Band
Site Address: Meadow High School, Uxbridge

Client Reference: STS5093
Job Number: 20-18840
Date Sampled: 25/06/2020
Date Received: 09/07/2020
Date Tested: 21/07/2020
Sampled By: Not Given

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

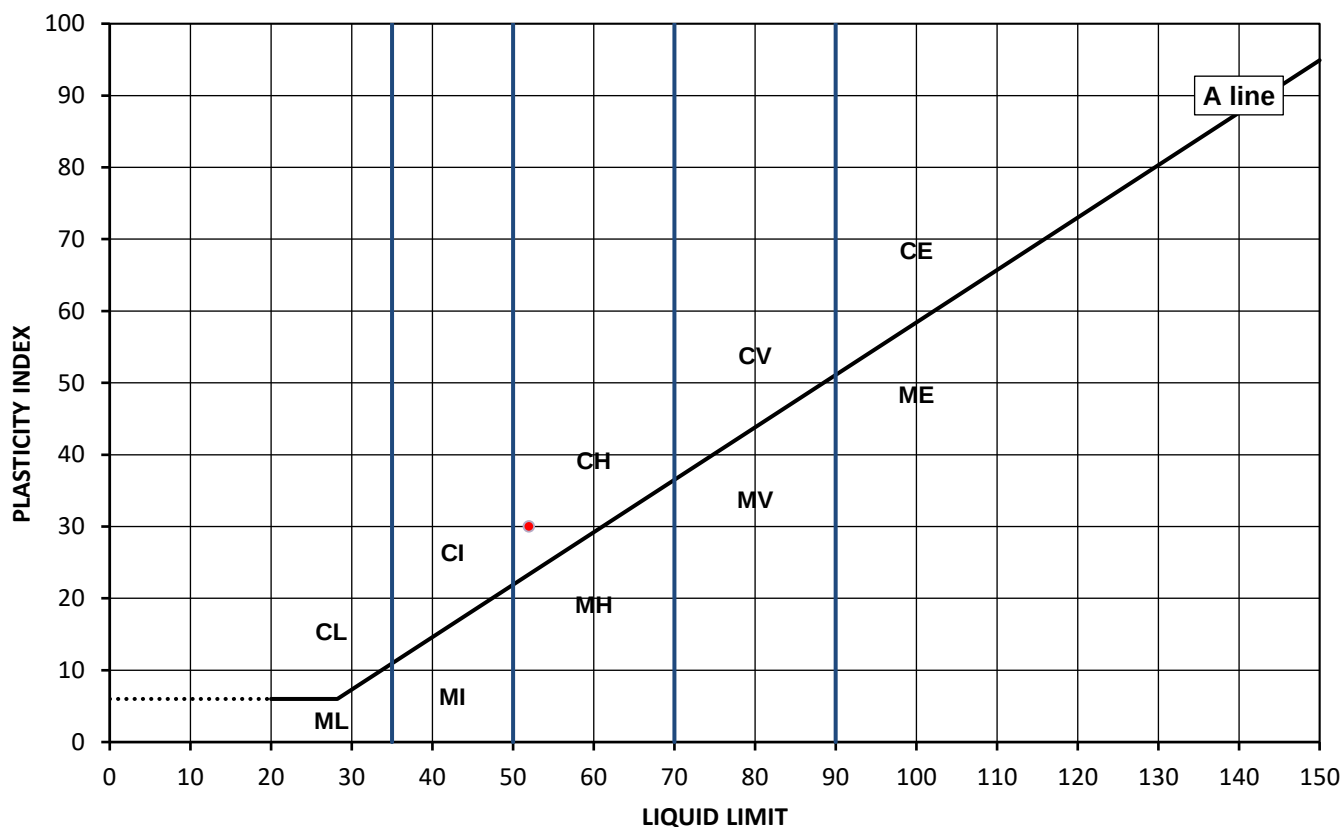
Test Results:

Laboratory Reference: 1559001
Hole No.: TP101
Sample Reference: 3
Soil Description: Brown slightly gravelly slightly sandy CLAY

Depth Top [m]: 1.20
Depth Base [m]: Not Given
Sample Type: D

Sample Preparation: Tested after washing to remove >425um

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
23	52	22	30	93



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

C	Clay	Plasticity	Liquid Limit
M	Silt	L	Low
		I	Medium
		H	High
		V	Very high
		E	Extremely high
			below 35
			35 to 50
			50 to 70
			70 to 90
			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:

Aleksandra Jurochnik
PL Technical Reviewer
for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Liquid and Plastic Limits

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



Environmental Science

4041

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

Client: Soiltechnics Limited
Client Address: Cedar Barn, White Lodge,
Walgrave, Northampton,
NN6 9PY
Contact: Alexa Band
Site Address: Meadow High School, Uxbridge

Client Reference: STS5093
Job Number: 20-18840
Date Sampled: 22/06/2020
Date Received: 09/07/2020
Date Tested: 22/07/2020
Sampled By: Not Given

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

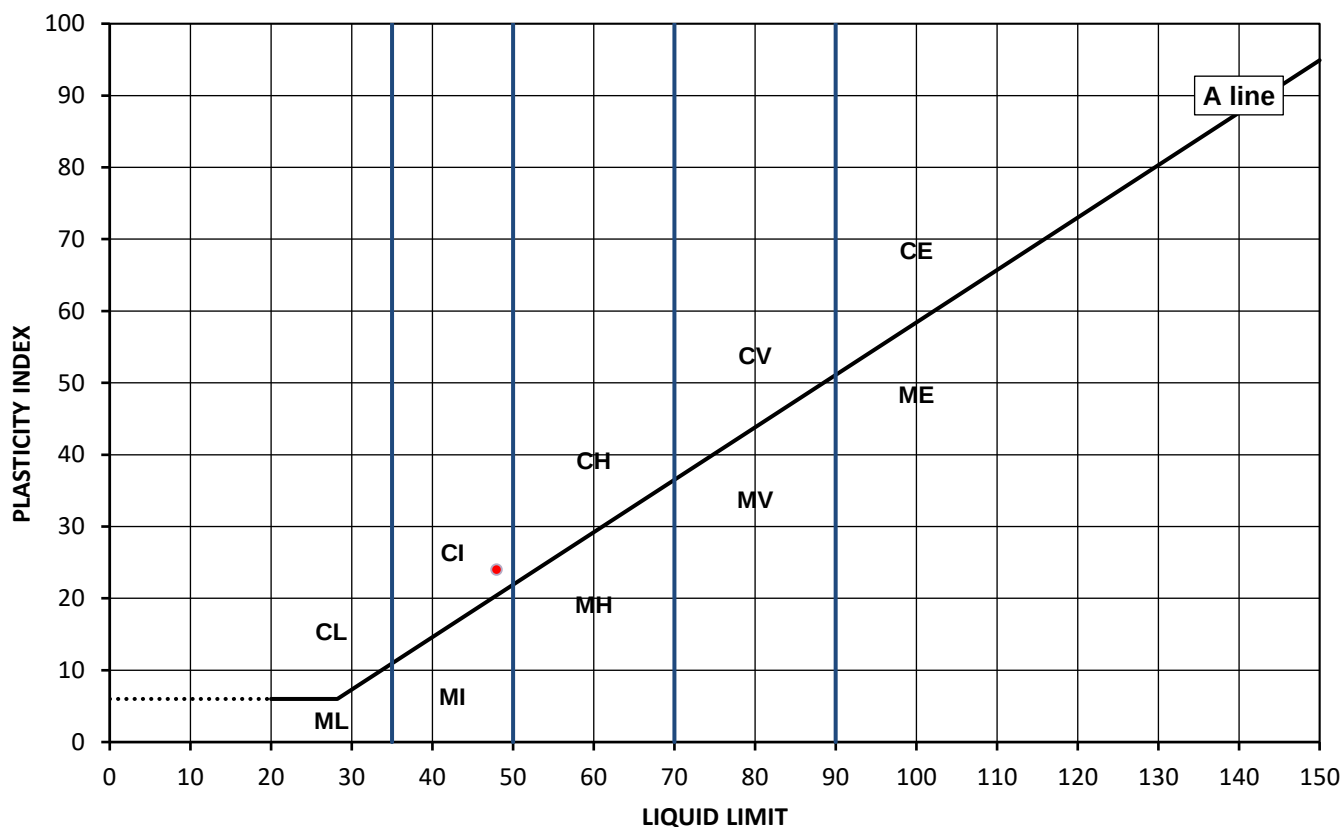
Test Results:

Laboratory Reference: 1559002
Hole No.: TP102
Sample Reference: 2
Soil Description: Brown slightly gravelly slightly sandy CLAY

Depth Top [m]: 0.60
Depth Base [m]: Not Given
Sample Type: D

Sample Preparation: Tested after >425um removed by hand

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
25	48	24	24	98



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

C	Clay	Plasticity	Liquid Limit
M	Silt	L	Low
		I	Medium
		H	High
		V	Very high
		E	Extremely high
			below 35
			35 to 50
			50 to 70
			70 to 90
			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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PL Technical Reviewer
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TEST CERTIFICATE

Liquid and Plastic Limits

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



Environmental Science

4041

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

Client: Soiltechnics Limited
Client Address: Cedar Barn, White Lodge,
Walgrave, Northampton,
NN6 9PY
Contact: Alexa Band
Site Address: Meadow High School, Uxbridge

Client Reference: STS5093
Job Number: 20-18840
Date Sampled: 25/06/2020
Date Received: 09/07/2020
Date Tested: 22/07/2020
Sampled By: Not Given

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

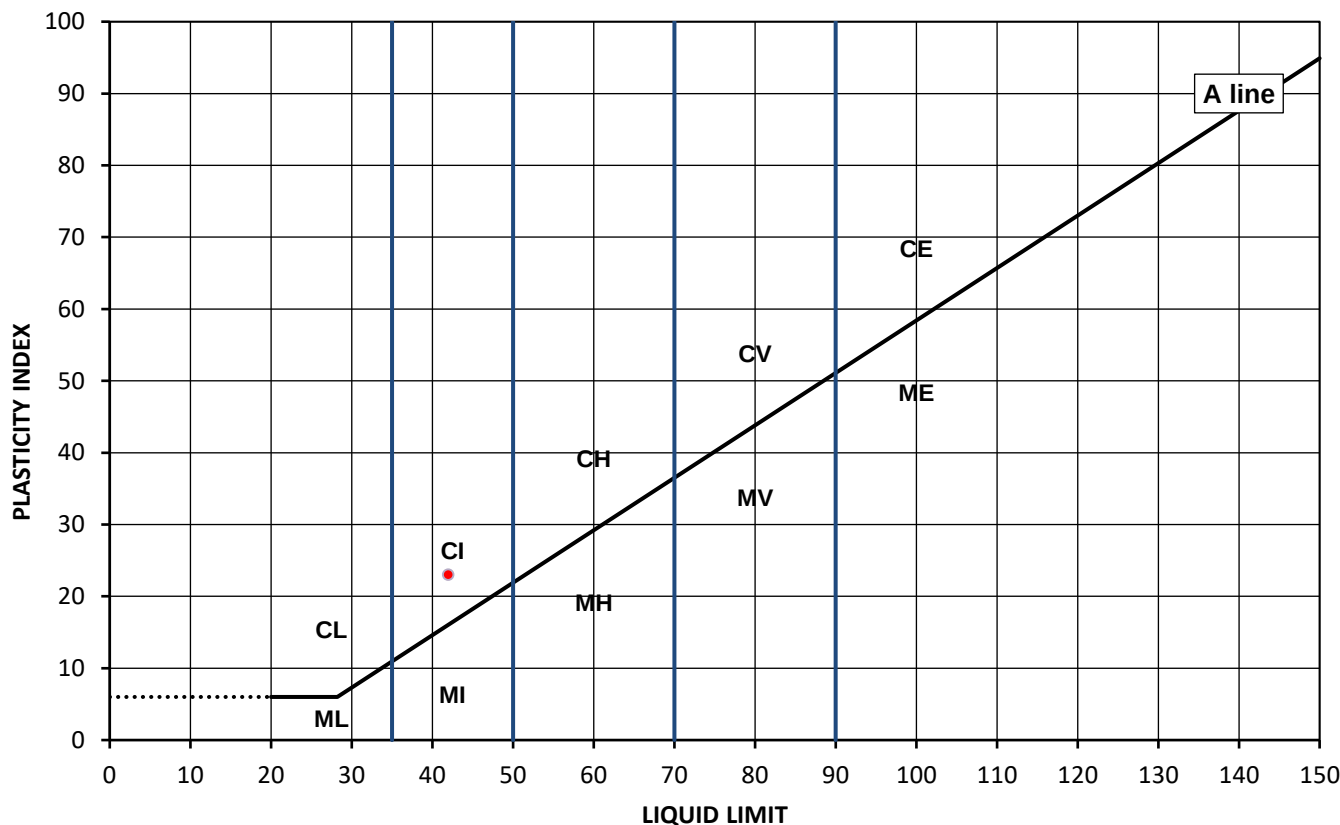
Test Results:

Laboratory Reference: 1559003
Hole No.: WS101
Sample Reference: 4
Soil Description: Dark brown very gravelly sandy CLAY

Depth Top [m]: 1.35
Depth Base [m]: Not Given
Sample Type: D

Sample Preparation: Tested after >425um removed by hand

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
7.8	42	19	23	33



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

C	Clay	Plasticity	Liquid Limit
M	Silt	L	Low
		I	Medium
		H	High
		V	Very high
		E	Extremely high
			below 35
			35 to 50
			50 to 70
			70 to 90
			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 Technical Reviewer
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TEST CERTIFICATE

Liquid and Plastic Limits

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



Environmental Science

4041

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

Client: Soiltechnics Limited
Client Address: Cedar Barn, White Lodge,
Walgrave, Northampton,
NN6 9PY
Contact: Alexa Band
Site Address: Meadow High School, Uxbridge

Client Reference: STS5093
Job Number: 20-18840
Date Sampled: 22/06/2020
Date Received: 09/07/2020
Date Tested: 22/07/2020
Sampled By: Not Given

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

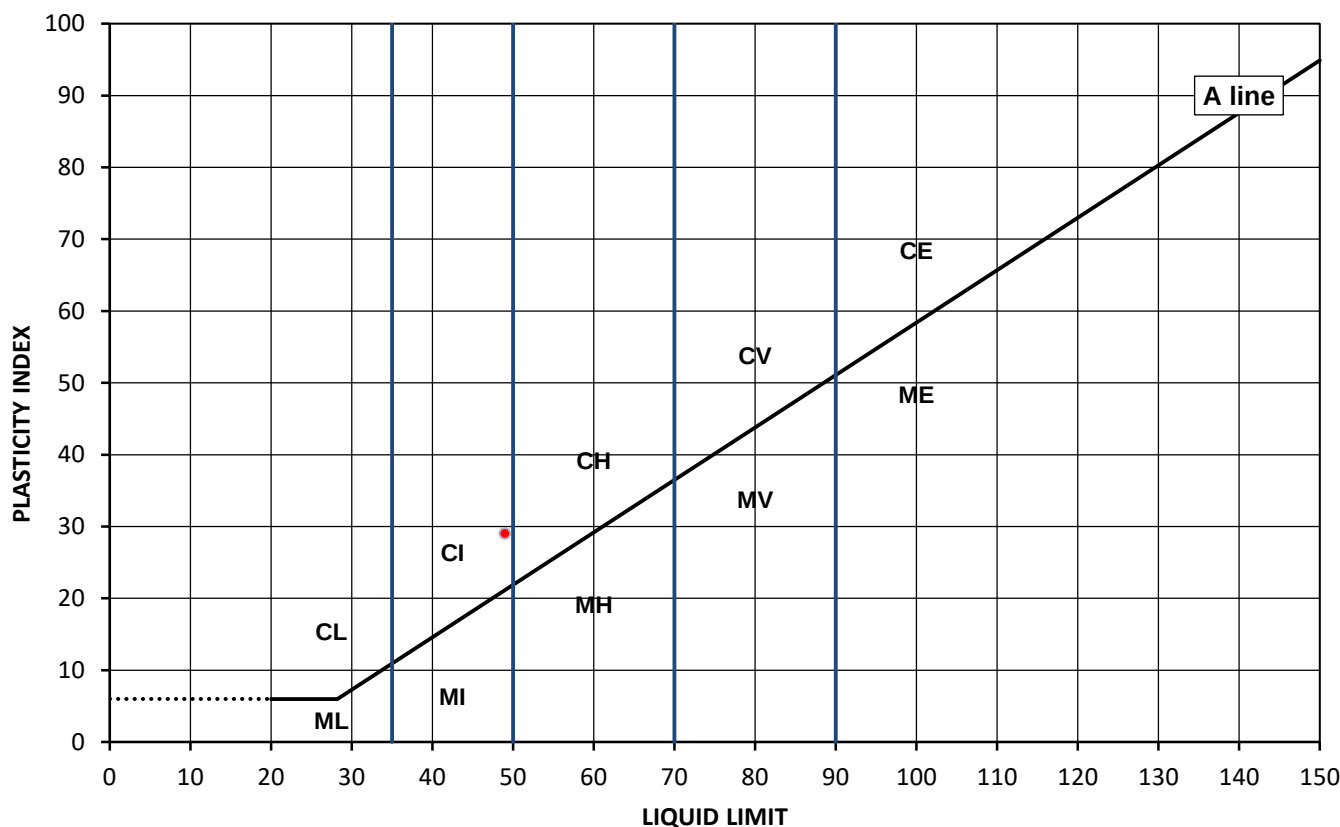
Test Results:

Laboratory Reference: 1559006
Hole No.: WS103
Sample Reference: 2
Soil Description: Light brown gravelly slightly sandy CLAY

Depth Top [m]: 1.50
Depth Base [m]: Not Given
Sample Type: D

Sample Preparation: Tested after >425um removed by hand

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
16	49	20	29	67



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

C	Clay	Plasticity	Liquid Limit
M	Silt	L	Low
		I	Medium
		H	High
		V	Very high
		E	Extremely high
			below 35
			35 to 50
			50 to 70
			70 to 90
			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:

Aleksandra Jurochnik
PL Technical Reviewer
for and on behalf of i2 Analytical Ltd

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4041

Client: Soiltechnics Limited
 Client Address: Cedar Barn, White Lodge,
 Walgrave, Northampton,
 NN6 9PY

Contact: Alexa Band
 Site Address: Meadow High School, Uxbridge

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

SUMMARY REPORT

Summary of Classification Test Results

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

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



Environmental Science

Client Reference: STS5093

Job Number: 20-18840

Date Sampled: 22/06 - 25/06/2020

Date Received: 09/07/2020

Date Tested: 21/07 - 22/07/2020

Sampled By: Not Given

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															
1559001	TP101	3	1.20	Not Given	D	Brown slightly gravelly slightly sandy CLAY	Atterberg 1 Point	23		93	52	22	30						
1559002	TP102	2	0.60	Not Given	D	Brown slightly gravelly slightly sandy CLAY	Atterberg 1 Point	25		98	48	24	24						
1559003	WS101	4	1.35	Not Given	D	Dark brown very gravelly sandy CLAY	Atterberg 1 Point	7.8		33	42	19	23						
1559006	WS103	2	1.50	Not Given	D	Light brown gravelly slightly sandy CLAY	Atterberg 1 Point	16		67	49	20	29						

Note: # Non accredited; NP - Non plastic

Comments:

Signed:

Aleksandra Jurochnik
 PL Technical Reviewer
 for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Particle Size Distribution

Tested in Accordance with: BS 1377-2: 1990

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

Client: Soiltechnics Limited
Client Address: Cedar Barn, White Lodge,
Walgrave, Northampton,
NN6 9PY
Contact: Alexa Band
Site Address: Meadow High School, Uxbridge

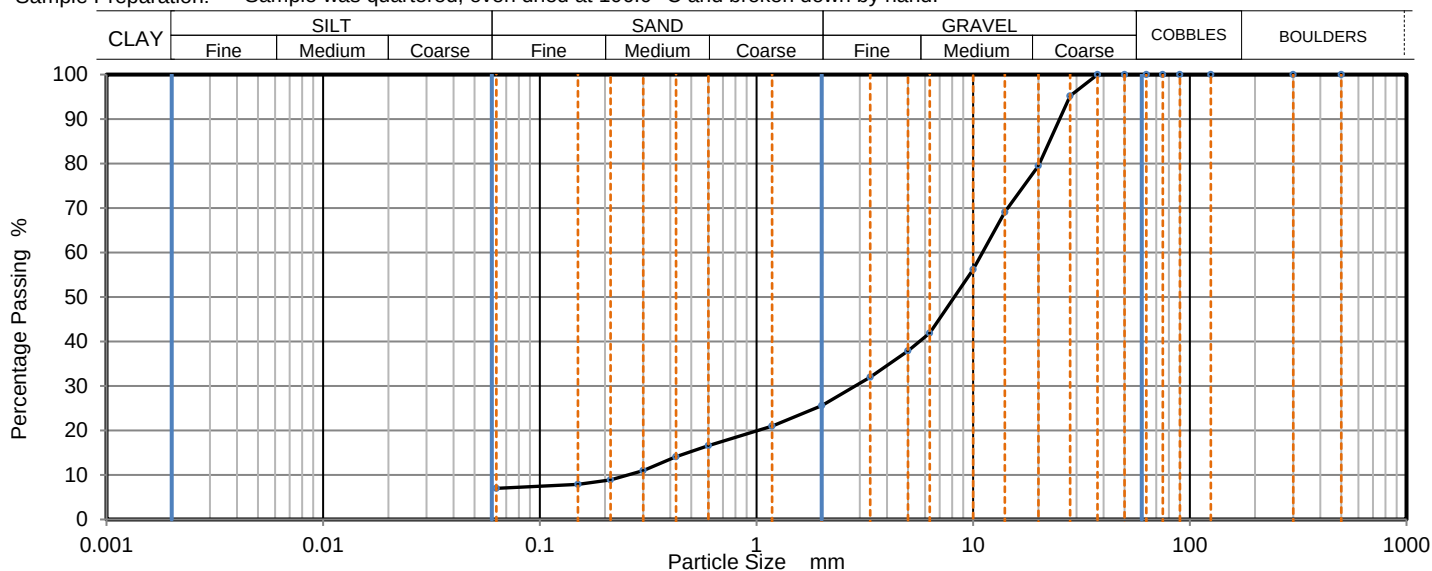
Client Reference: STS5093
Job Number: 20-18840
Date Sampled: 25/06/2020
Date Received: 09/07/2020
Date Tested: 22/07/2020
Sampled By: Not Given

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

Test Results:

Laboratory Reference: 1559004
Hole No.: WS101
Sample Reference: 7
Sample Description: Light brown slightly clayey sandy GRAVEL
Sample Preparation: Sample was quartered, oven dried at 106.0 °C and broken down by hand.

Depth Top [m]: 2.70
Depth Base [m]: Not Given
Sample Type: D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	95		
20	80		
14	69		
10	56		
6.3	42		
5	38		
3.35	32		
2	26		
1.18	21		
0.6	17		
0.425	14		
0.3	11		
0.212	9		
0.15	8		
0.063	7		

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	74.40
Sand	18.50
Fines <0.063mm	7.10

Grading Analysis		
D100	mm	37.5
D60	mm	11.1
D30	mm	2.85
D10	mm	0.254
Uniformity Coefficient		44
Curvature Coefficient		2.9

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks: The material submitted - fails to meet the minimum mass requirements as stated in BS1377 Part 2 Table 3

Signed:

Aleksandra Jurochnik
PL Technical Reviewer
for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Particle Size Distribution

Tested in Accordance with: BS 1377-2: 1990

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

Client: Soiltechnics Limited
Client Address: Cedar Barn, White Lodge,
Walgrave, Northampton,
NN6 9PY
Contact: Alexa Band
Site Address: Meadow High School, Uxbridge

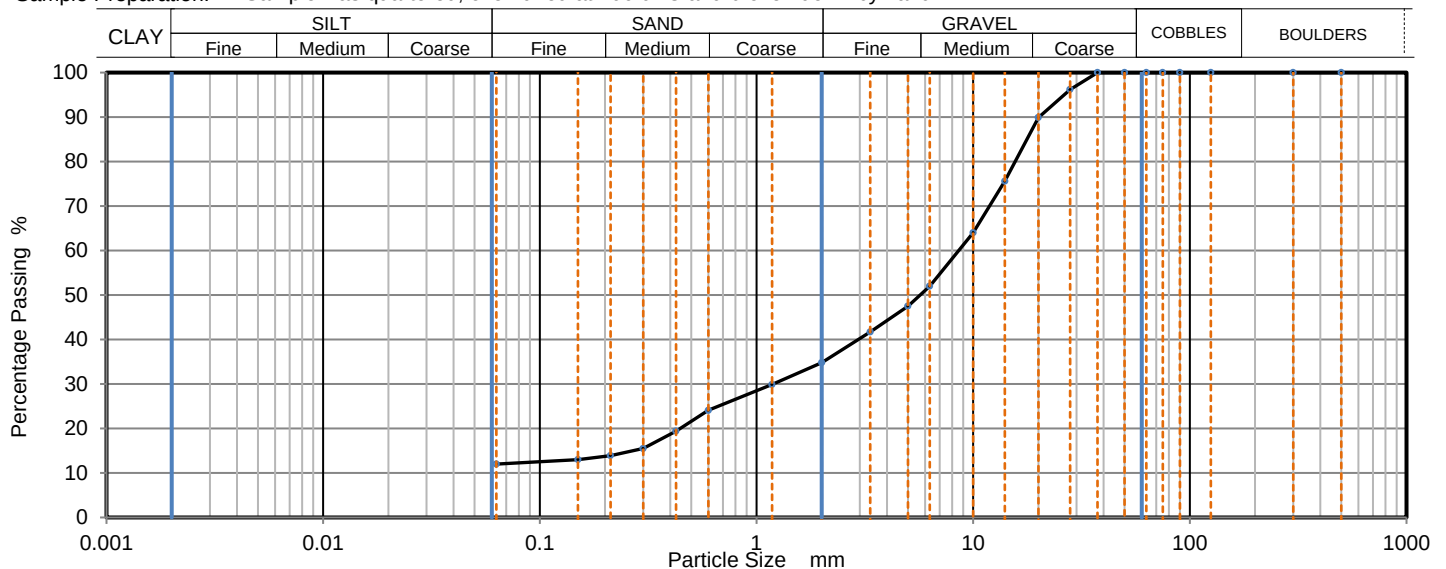
Client Reference: STS5093
Job Number: 20-18840
Date Sampled: 25/06/2020
Date Received: 09/07/2020
Date Tested: 22/07/2020
Sampled By: Not Given

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

Test Results:

Laboratory Reference: 1559005
Hole No.: WS102
Sample Reference: 6
Sample Description: Brown sandy clayey GRAVEL
Sample Preparation: Sample was quartered, oven dried at 106.0 °C and broken down by hand.

Depth Top [m]: 2.25
Depth Base [m]: Not Given
Sample Type: D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	96		
20	90		
14	76		
10	64		
6.3	52		
5	48		
3.35	42		
2	35		
1.18	30		
0.6	24		
0.425	19		
0.3	16		
0.212	14		
0.15	13		
0.063	12		

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	65.20
Sand	22.80
Fines <0.063mm	12.00

Grading Analysis		
D100	mm	37.5
D60	mm	8.56
D30	mm	1.2
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks: The material submitted - fails to meet the minimum mass requirements as stated in BS1377 Part 2 Table 3

Signed:

Aleksandra Jurochnik
PL Technical Reviewer
for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Particle Size Distribution

Tested in Accordance with: BS 1377-2: 1990

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

Client: Soiltechnics Limited
Client Address: Cedar Barn, White Lodge,
Walgrave, Northampton,
NN6 9PY
Contact: Alexa Band
Site Address: Meadow High School, Uxbridge

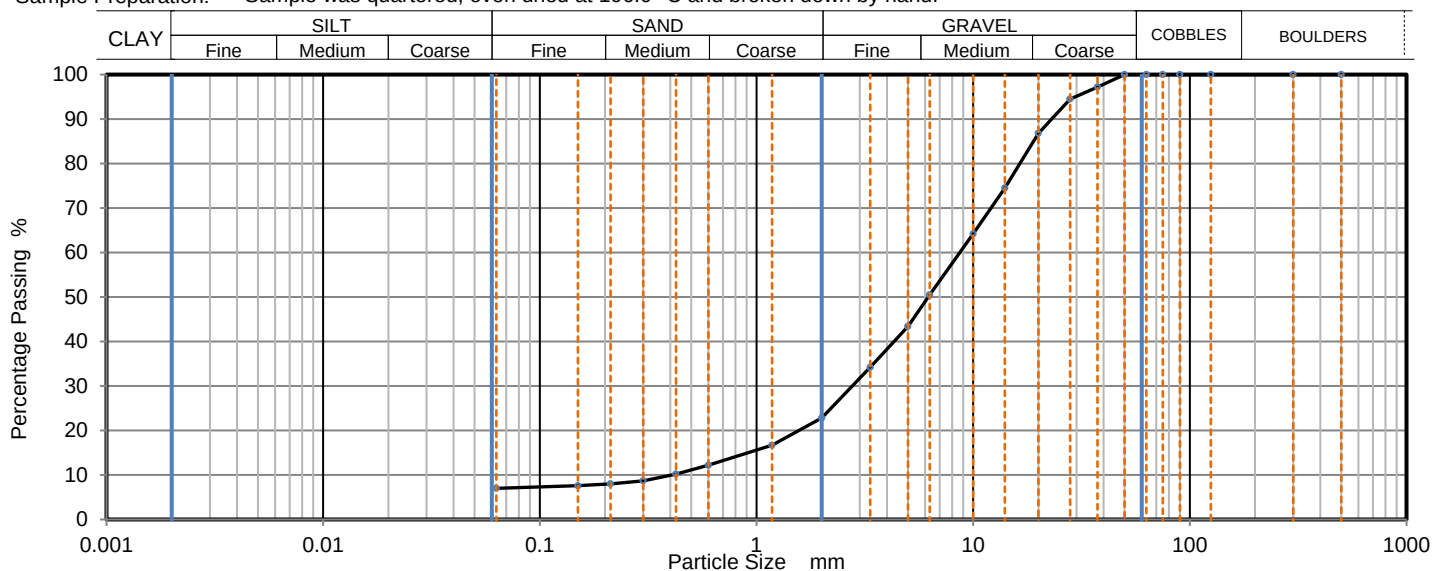
Client Reference: STS5093
Job Number: 20-18840
Date Sampled: 22/06/2020
Date Received: 09/07/2020
Date Tested: 22/07/2020
Sampled By: Not Given

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

Test Results:

Laboratory Reference: 1559007
Hole No.: WS103
Sample Reference: 1
Sample Description: Brown slightly clayey sandy GRAVEL
Sample Preparation: Sample was quartered, oven dried at 106.0 °C and broken down by hand.

Depth Top [m]: 2.50
Depth Base [m]: 3.00
Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	97		
28	95		
20	87		
14	75		
10	64		
6.3	51		
5	43		
3.35	34		
2	23		
1.18	17		
0.6	12		
0.425	10		
0.3	9		
0.212	8		
0.15	8		
0.063	7		

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	77.20
Sand	15.40
Fines <0.063mm	7.40

Grading Analysis		
D100	mm	50
D60	mm	8.68
D30	mm	2.77
D10	mm	0.41
Uniformity Coefficient		21
Curvature Coefficient		2.2

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks:

Signed:

Aleksandra Jurochnik
PL Technical Reviewer
for and on behalf of i2 Analytical Ltd

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.



Lauren Wenham
Soiltechnics Ltd
White Lodge
Cedar Barn
Walgrave
NN6 9PY

DETS Ltd
Unit 1
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Rose Lane
Lenham Heath
Kent
ME17 2JN
t: 01622 850410

DETS Report No: 20-07551

Site Reference: Meadow High School, Uxbridge

Project / Job Ref: STS5093-D-1

Order No: POR008263

Sample Receipt Date: 10/07/2020

Sample Scheduled Date: 10/07/2020

Report Issue Number: 1

Reporting Date: 20/07/2020

Authorised by:

Dave Ashworth
Technical Manager

Dates of laboratory activities for each tested analyte are available upon request.

Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.



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Soil Analysis Certificate					
DETS Report No: 20-07551	Date Sampled	25/06/20	22/06/20	22/06/20	22/06/20
Soiltechnics Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Meadow High School, Uxbridge	TP / BH No	TP1010.301	TP1020.301	TP1030.301	TP1031.002
Project / Job Ref: STS5093-D-1	Additional Refs	TP01	TP02	TP03	TP03
Order No: POR008263	Depth (m)	0.30	0.30	0.30	1.00
Reporting Date: 20/07/2020	DETS Sample No	485912	485913	485914	485915

Determinand	Unit	RL	Accreditation					
Asbestos Screen ^(S)	N/a	N/a	ISO17025	Not Detected	Not Detected	Not Detected		Not Detected
pH	pH Units	N/a	MCERTS	9.0	7.6		7.8	
Total Cyanide	mg/kg	< 2	NONE	< 2	< 2		< 2	
Complex Cyanide	mg/kg	< 2	NONE	< 2	< 2		< 2	
Free Cyanide	mg/kg	< 2	NONE	< 2	< 2		< 2	
Organic Matter	%	< 0.1	MCERTS	1.7	2.1		0.5	
Total Organic Carbon (TOC)	%	< 0.1	MCERTS	1	1.2			
Loss on Ignition @ 450°C	%	< 0.01	NONE	4.60	3.60		2.20	
Arsenic (As)	mg/kg	< 2	MCERTS	14	7		11	
Beryllium (Be)	mg/kg	< 0.5	MCERTS	1.6	0.8		1	
W/S Boron	mg/kg	< 1	NONE	< 1	< 1		< 1	
Cadmium (Cd)	mg/kg	< 0.2	MCERTS	0.7	< 0.2		< 0.2	
Chromium (Cr)	mg/kg	< 2	MCERTS	23	20		29	
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2	< 2		< 2	
Copper (Cu)	mg/kg	< 4	MCERTS	144	19		14	
Lead (Pb)	mg/kg	< 3	MCERTS	457	54		14	
Mercury (Hg)	mg/kg	< 1	MCERTS	< 1	< 1		< 1	
Nickel (Ni)	mg/kg	< 3	MCERTS	31	12		16	
Selenium (Se)	mg/kg	< 2	MCERTS	< 3	< 3		< 3	
Vanadium (V)	mg/kg	< 1	MCERTS	49	34		49	
Zinc (Zn)	mg/kg	< 3	MCERTS	225	48		42	
Total Phenols (monohydric)	mg/kg	< 2	NONE	< 2	< 2		< 2	

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Samples Descriptions page describes if the test is performed on the dried or as-received portion
Subcontracted analysis (S)



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Soil Analysis Certificate					
DETS Report No: 20-07551	Date Sampled	22/06/20	25/06/20	25/06/20	25/06/20
Soiltechnics Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Meadow High School, Uxbridge	TP / BH No	TP1040.682	WS1010.602	WS1020.201	WS1020.502
Project / Job Ref: STS5093-D-1	Additional Refs	TP04	WS101	WS102	WS102
Order No: POR008263	Depth (m)	0.68	0.60	0.20	0.50
Reporting Date: 20/07/2020	DETS Sample No	485917	485921	485922	485923

Determinand	Unit	RL	Accreditation					
Asbestos Screen ^(S)	N/a	N/a	ISO17025		Not Detected	Not Detected		Not Detected
pH	pH Units	N/a	MCERTS	8.0		8.1	8.0	7.9
Total Cyanide	mg/kg	< 2	NONE	< 2		< 2	< 2	< 2
Complex Cyanide	mg/kg	< 2	NONE	< 2		< 2	< 2	< 2
Free Cyanide	mg/kg	< 2	NONE	< 2		< 2	< 2	< 2
Organic Matter	%	< 0.1	MCERTS	1.5		1.8	0.7	0.5
Total Organic Carbon (TOC)	%	< 0.1	MCERTS					0.3
Loss on Ignition @ 450°C	%	< 0.01	NONE	2.70		1.50	1.80	1.40
Arsenic (As)	mg/kg	< 2	MCERTS	10		6	13	12
Beryllium (Be)	mg/kg	< 0.5	MCERTS	0.9		< 0.5	1.1	1.1
W/S Boron	mg/kg	< 1	NONE	< 1		< 1	< 1	< 1
Cadmium (Cd)	mg/kg	< 0.2	MCERTS	< 0.2		0.5	< 0.2	< 0.2
Chromium (Cr)	mg/kg	< 2	MCERTS	25		14	31	28
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2		< 2	< 2	< 2
Copper (Cu)	mg/kg	< 4	MCERTS	18		11	15	15
Lead (Pb)	mg/kg	< 3	MCERTS	43		19	16	12
Mercury (Hg)	mg/kg	< 1	MCERTS	< 1		< 1	< 1	< 1
Nickel (Ni)	mg/kg	< 3	MCERTS	15		8	22	18
Selenium (Se)	mg/kg	< 2	MCERTS	< 3		< 3	< 3	< 3
Vanadium (V)	mg/kg	< 1	MCERTS	42		19	52	47
Zinc (Zn)	mg/kg	< 3	MCERTS	50		87	52	44
Total Phenols (monohydric)	mg/kg	< 2	NONE	< 2		< 2	< 2	< 2

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Samples Descriptions page describes if the test is performed on the dried or as-received portion
Subcontracted analysis (S)



DETS Ltd
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Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410



Soil Analysis Certificate - Speciated PAHs

DETS Report No: 20-07551	Date Sampled	25/06/20	22/06/20	22/06/20	22/06/20	25/06/20
Soiltechnics Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Meadow High School, Uxbridge	TP / BH No	TP1010.301	TP1020.301	TP1031.002	TP1040.682	WS1020.201
Project / Job Ref: STS5093-D-1	Additional Refs	TP01	TP02	TP03	TP04	WS102
Order No: POR008263	Depth (m)	0.30	0.30	1.00	0.68	0.20
Reporting Date: 20/07/2020	DETS Sample No	485912	485913	485915	485917	485922

Determinand	Unit	RL	Accreditation					
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	0.11
Phenanthrene	mg/kg	< 0.1	MCERTS	0.30	< 0.1	< 0.1	0.15	0.30
Anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	0.14
Fluoranthene	mg/kg	< 0.1	MCERTS	0.71	0.24	< 0.1	0.31	0.96
Pyrene	mg/kg	< 0.1	MCERTS	0.77	0.21	< 0.1	0.28	1.19
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	0.34	< 0.1	< 0.1	< 0.1	0.46
Chrysene	mg/kg	< 0.1	MCERTS	0.36	< 0.1	< 0.1	< 0.1	0.45
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	0.61	0.14	< 0.1	0.19	0.64
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	0.22	< 0.1	< 0.1	< 0.1	0.32
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	0.46	< 0.1	< 0.1	0.15	0.55
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	0.35	< 0.1	< 0.1	< 0.1	0.31
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	0.35	< 0.1	< 0.1	< 0.1	0.34
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	4.5	< 1.6	< 1.6	< 1.6	5.8



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Soil Analysis Certificate - Speciated PAHs

DETS Report No: 20-07551	Date Sampled	25/06/20	22/06/20			
Soiltechnics Ltd	Time Sampled	None Supplied	None Supplied			
Site Reference: Meadow High School, Uxbridge	TP / BH No	WS1020.502	WS1030.504			
Project / Job Ref: STS5093-D-1	Additional Refs	WS102	WS103			
Order No: POR008263	Depth (m)	0.50	0.50			
Reporting Date: 20/07/2020	DETS Sample No	485923	485924			

Determinand	Unit	RL	Accreditation					
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Acenaphthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Fluorene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Phenanthrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Chrysene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	< 1.6	< 1.6			



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Maidstone
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Soil Analysis Certificate - TPH CWG Banded						
DETS Report No: 20-07551	Date Sampled	25/06/20	22/06/20	22/06/20		
Soiltechnics Ltd	Time Sampled	None Supplied	None Supplied	None Supplied		
Site Reference: Meadow High School, Uxbridge	TP / BH No	TP1010.301	TP1020.301	WS1030.504		
Project / Job Ref: STS5093-D-1	Additional Refs	TP01	TP02	WS103		
Order No: POR008263	Depth (m)	0.30	0.30	0.50		
Reporting Date: 20/07/2020	DETS Sample No	485912	485913	485924		

Determinand	Unit	RL	Accreditation				
Aliphatic >C5 - C6	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01	
Aliphatic >C6 - C8	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05	
Aliphatic >C8 - C10	mg/kg	< 2	MCERTS	< 2	< 2	< 2	
Aliphatic >C10 - C12	mg/kg	< 2	MCERTS	< 2	< 2	< 2	
Aliphatic >C12 - C16	mg/kg	< 3	MCERTS	< 3	< 3	< 3	
Aliphatic >C16 - C21	mg/kg	< 3	MCERTS	< 3	< 3	< 3	
Aliphatic >C21 - C34	mg/kg	< 10	MCERTS	< 10	< 10	< 10	
Aliphatic (C5 - C34)	mg/kg	< 21	NONE	< 21	< 21	< 21	
Aromatic >C5 - C7	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01	
Aromatic >C7 - C8	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05	
Aromatic >C8 - C10	mg/kg	< 2	MCERTS	< 2	< 2	< 2	
Aromatic >C10 - C12	mg/kg	< 2	MCERTS	< 2	< 2	< 2	
Aromatic >C12 - C16	mg/kg	< 2	MCERTS	< 2	< 2	< 2	
Aromatic >C16 - C21	mg/kg	< 3	MCERTS	< 3	< 3	< 3	
Aromatic >C21 - C35	mg/kg	< 10	MCERTS	< 10	56	< 10	
Aromatic (C5 - C35)	mg/kg	< 21	NONE	< 21	56	< 21	
Total >C5 - C35	mg/kg	< 42	NONE	< 42	56	< 42	



DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410



Soil Analysis Certificate - BTEX / MTBE

DETS Report No: 20-07551	Date Sampled	25/06/20	22/06/20	22/06/20		
Soiltechnics Ltd	Time Sampled	None Supplied	None Supplied	None Supplied		
Site Reference: Meadow High School, Uxbridge	TP / BH No	TP1010.301	TP1020.301	WS1030.504		
Project / Job Ref: STS5093-D-1	Additional Refs	TP01	TP02	WS103		
Order No: POR008263	Depth (m)	0.30	0.30	0.50		
Reporting Date: 20/07/2020	DETS Sample No	485912	485913	485924		

Determinand	Unit	RL	Accreditation					
Benzene	ug/kg	< 2	MCERTS	< 2	< 2	< 2		
Toluene	ug/kg	< 5	MCERTS	< 5	< 5	< 5		
Ethylbenzene	ug/kg	< 2	MCERTS	< 2	< 2	< 2		
p & m-xylene	ug/kg	< 2	MCERTS	< 2	< 2	< 2		
o-xylene	ug/kg	< 2	MCERTS	< 2	< 2	< 2		
MTBE	ug/kg	< 5	MCERTS	< 5	< 5	< 5		



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Lenham Heath
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Tel : 01622 850410



Waste Acceptance Criteria Analytical Certificate - BS EN 12457/3																																				
DETS Report No: 20-07551		Date Sampled	25/06/20			Landfill Waste Acceptance Criteria Limits <table border="1"> <thead> <tr> <th>Inert Waste Landfill</th> <th>Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill</th> <th>Hazardous Waste Landfill</th> </tr> </thead> <tbody> <tr> <td>3%</td> <td>5%</td> <td>6%</td> </tr> <tr> <td>--</td> <td>--</td> <td>10%</td> </tr> <tr> <td>6</td> <td>--</td> <td>--</td> </tr> <tr> <td>1</td> <td>--</td> <td>--</td> </tr> <tr> <td>500</td> <td>--</td> <td>--</td> </tr> <tr> <td>100</td> <td>--</td> <td>--</td> </tr> <tr> <td>--</td> <td>>6</td> <td>--</td> </tr> <tr> <td>--</td> <td>To be evaluated</td> <td>To be evaluated</td> </tr> </tbody> </table>				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill	3%	5%	6%	--	--	10%	6	--	--	1	--	--	500	--	--	100	--	--	--	>6	--	--	To be evaluated	To be evaluated
Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill																																		
3%	5%	6%																																		
--	--	10%																																		
6	--	--																																		
1	--	--																																		
500	--	--																																		
100	--	--																																		
--	>6	--																																		
--	To be evaluated	To be evaluated																																		
Soiltechnics Ltd		Time Sampled	None Supplied																																	
Site Reference: Meadow High School, Uxbridge		TP / BH No	WAC010.0001																																	
Project / Job Ref: STS5093-D-1		Additional Refs	WAC01																																	
Order No: POR008263		Depth (m)	0.00 - 1.00																																	
Reporting Date: 20/07/2020		DETS Sample No	485918																																	
Determinand	Unit	MDL																																		
TOC ^{MU}	%	< 0.1	2.8																																	
Loss on Ignition	%	< 0.01	11.80																																	
BTEX ^{MU}	mg/kg	< 0.05	< 0.05																																	
Sum of PCBs	mg/kg	< 0.1	< 0.1																																	
Mineral Oil ^{MU}	mg/kg	< 10	< 10																																	
Total PAH ^{MU}	mg/kg	< 1.7	6.2																																	
pH ^{MU}	pH Units	N/a	7.9																																	
Acid Neutralisation Capacity	mol/kg (+/-)	< 1	< 1																																	
Eluate Analysis			2:1 mg/l	8:1 mg/l		Cumulative 10:1 mg/kg	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg (mg/kg)																													
Arsenic ^U		< 0.01	< 0.01		< 0.2	0.5	2	25																												
Barium ^U		0.02	< 0.02		< 0.1	20	100	300																												
Cadmium ^U		< 0.0005	< 0.0005		< 0.02	0.04	1	5																												
Chromium ^U		< 0.005	< 0.005		< 0.20	0.5	10	70																												
Copper ^U		0.01	0.01		< 0.5	2	50	100																												
Mercury ^U		< 0.0005	< 0.0005		< 0.005	0.01	0.2	2																												
Molybdenum ^U		0.001	0.001		< 0.1	0.5	10	30																												
Nickel ^U		< 0.007	< 0.007		< 0.2	0.4	10	40																												
Lead ^U		< 0.005	< 0.005		< 0.2	0.5	10	50																												
Antimony ^U		< 0.005	< 0.005		< 0.05	0.06	0.7	5																												
Selenium ^U		< 0.005	< 0.005		< 0.05	0.1	0.5	7																												
Zinc ^U		0.013	0.011		< 0.2	4	50	200																												
Chloride ^U		23	8		87	800	15000	25000																												
Fluoride ^U		0.6	0.9		8.8	10	150	500																												
Sulphate ^U		103	17		231	1000	20000	50000																												
TDS		264	90		1021	4000	60000	100000																												
Phenol Index		< 0.01	< 0.01		< 0.5	1	-	-																												
DOC		10.2	6.8		70.1	500	800	1000																												
Leach Test Information																																				
Sample Mass (kg)			0.21																																	
Dry Matter (%)			84.7																																	
Moisture (%)			18.2																																	
Stage 1																																				
Volume Eluate L2 (litres)			0.32																																	
Filtered Eluate VE1 (litres)			0.12																																	

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Samples Descriptions page describes if the test is performed on the dried or as-received portion
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Waste Acceptance Criteria Analytical Certificate - BS EN 12457/3																																							
DETS Report No: 20-07551		Date Sampled	25/06/20			<table border="1"> <thead> <tr> <th colspan="3">Landfill Waste Acceptance Criteria Limits</th> </tr> <tr> <th>Inert Waste Landfill</th> <th>Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill</th> <th>Hazardous Waste Landfill</th> </tr> </thead> <tbody> <tr> <td>3%</td> <td>5%</td> <td>6%</td> </tr> <tr> <td>--</td> <td>--</td> <td>10%</td> </tr> <tr> <td>6</td> <td>--</td> <td>--</td> </tr> <tr> <td>1</td> <td>--</td> <td>--</td> </tr> <tr> <td>500</td> <td>--</td> <td>--</td> </tr> <tr> <td>100</td> <td>--</td> <td>--</td> </tr> <tr> <td>--</td> <td>>6</td> <td>--</td> </tr> <tr> <td>--</td> <td>To be evaluated</td> <td>To be evaluated</td> </tr> </tbody> </table>				Landfill Waste Acceptance Criteria Limits			Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill	3%	5%	6%	--	--	10%	6	--	--	1	--	--	500	--	--	100	--	--	--	>6	--	--	To be evaluated	To be evaluated
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Soiltechnics Ltd		Time Sampled	None Supplied																																				
Site Reference: Meadow High School, Uxbridge		TP / BH No	WAC020.0001																																				
Project / Job Ref: STS5093-D-1		Additional Refs	WAC02																																				
Order No: POR008263		Depth (m)	0.00 - 1.00																																				
Reporting Date: 20/07/2020		DETS Sample No	485919																																				
Determinand	Unit	MDL																																					
TOC ^{MU}	%	< 0.1	0.5																																				
Loss on Ignition	%	< 0.01	2.10																																				
BTEX ^{MU}	mg/kg	< 0.05	< 0.05																																				
Sum of PCBs	mg/kg	< 0.1	< 0.1																																				
Mineral Oil ^{MU}	mg/kg	< 10	< 10																																				
Total PAH ^{MU}	mg/kg	< 1.7	< 1.7																																				
pH ^{MU}	pH Units	N/a	7.9																																				
Acid Neutralisation Capacity	mol/kg (+/-)	< 1	< 1																																				
Eluate Analysis			2:1 mg/l	8:1 mg/l		Cumulative 10:1 mg/kg	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg (mg/kg)																																
Arsenic ^U		< 0.01	< 0.01		< 0.2	0.5	2	25																															
Barium ^U		0.03	< 0.02		0.1	20	100	300																															
Cadmium ^U		< 0.0005	< 0.0005		< 0.02	0.04	1	5																															
Chromium ^U		< 0.005	< 0.005		< 0.20	0.5	10	70																															
Copper ^U		< 0.01	< 0.01		< 0.5	2	50	100																															
Mercury ^U		< 0.0005	< 0.0005		< 0.005	0.01	0.2	2																															
Molybdenum ^U		0.005	0.004		< 0.1	0.5	10	30																															
Nickel ^U		< 0.007	< 0.007		< 0.2	0.4	10	40																															
Lead ^U		< 0.005	< 0.005		< 0.2	0.5	10	50																															
Antimony ^U		< 0.005	< 0.005		< 0.05	0.06	0.7	5																															
Selenium ^U		< 0.005	< 0.005		< 0.05	0.1	0.5	7																															
Zinc ^U		< 0.005	< 0.005		< 0.2	4	50	200																															
Chloride ^U		12	5		53	800	15000	25000																															
Fluoride ^U		0.7	0.7		7	10	150	500																															
Sulphate ^U		32	9		110	1000	20000	50000																															
TDS		174	81		906	4000	60000	100000																															
Phenol Index		< 0.01	< 0.01		< 0.5	1	-	-																															
DOC		16.2	8.5		92.8	500	800	1000																															
Leach Test Information																																							
Sample Mass (kg)			0.20																																				
Dry Matter (%)			85.6																																				
Moisture (%)			16.8																																				
Stage 1																																							
Volume Eluate L2 (litres)			0.32																																				
Filtered Eluate VE1 (litres)			0.18																																				

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Soiltechnics Ltd		Time Sampled	None Supplied																																				
Site Reference: Meadow High School, Uxbridge		TP / BH No	WAC030.0001																																				
Project / Job Ref: STS5093-D-1		Additional Refs	WAC03																																				
Order No: POR008263		Depth (m)	0.00 - 1.00																																				
Reporting Date: 20/07/2020		DETS Sample No	485920																																				
Determinand	Unit	MDL																																					
TOC ^{MU}	%	< 0.1	0.4																																				
Loss on Ignition	%	< 0.01	1.80																																				
BTEX ^{MU}	mg/kg	< 0.05	< 0.05																																				
Sum of PCBs	mg/kg	< 0.1	< 0.1																																				
Mineral Oil ^{MU}	mg/kg	< 10	43																																				
Total PAH ^{MU}	mg/kg	< 1.7	< 1.7																																				
pH ^{MU}	pH Units	N/a	8.1																																				
Acid Neutralisation Capacity	mol/kg (+/-)	< 1	< 1																																				
Eluate Analysis				2:1 mg/l	8:1 mg/l	Cumulative 10:1 mg/kg	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg (mg/kg)																																
Arsenic ^U		< 0.01	< 0.01		< 0.2	0.5	2	25																															
Barium ^U		0.02	< 0.02		0.1	20	100	300																															
Cadmium ^U		< 0.0005	< 0.0005		< 0.02	0.04	1	5																															
Chromium ^U		< 0.005	< 0.005		< 0.20	0.5	10	70																															
Copper ^U		< 0.01	< 0.01		< 0.5	2	50	100																															
Mercury ^U		< 0.0005	< 0.0005		< 0.005	0.01	0.2	2																															
Molybdenum ^U		< 0.001	0.003		< 0.1	0.5	10	30																															
Nickel ^U		< 0.007	< 0.007		< 0.2	0.4	10	40																															
Lead ^U		< 0.005	< 0.005		< 0.2	0.5	10	50																															
Antimony ^U		< 0.005	< 0.005		< 0.05	0.06	0.7	5																															
Selenium ^U		< 0.005	< 0.005		< 0.05	0.1	0.5	7																															
Zinc ^U		0.010	0.012		< 0.2	4	50	200																															
Chloride ^U		12	4		52	800	15000	25000																															
Fluoride ^U		1	1		10	10	150	500																															
Sulphate ^U		11	3		40	1000	20000	50000																															
TDS		143	77		841	4000	60000	100000																															
Phenol Index		< 0.01	< 0.01		< 0.5	1	-	-																															
DOC		4.9	5.3		52.4	500	800	1000																															
Leach Test Information																																							
Sample Mass (kg)				0.20																																			
Dry Matter (%)				86.1																																			
Moisture (%)				16.2																																			
Stage 1																																							
Volume Eluate L2 (litres)				0.32																																			
Filtered Eluate VE1 (litres)				0.19																																			

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Samples Descriptions page describes if the test is performed on the dried or as-received portion
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Soil Analysis Certificate - Sample Descriptions

DETS Report No: 20-07551

Soiltechnics Ltd

Site Reference: Meadow High School, Uxbridge

Project / Job Ref: STS5093-D-1

Order No: POR008263

Reporting Date: 20/07/2020

DETS Sample No	TP / BH No	Additional Refs	Depth (m)	Moisture Content (%)	Sample Matrix Description
\$ 485912	TP1010.301	TP01	0.30	6	Brown sandy gravel with brick and concrete
\$ 485913	TP1020.301	TP02	0.30	20.9	Brown loamy clay
\$ 485915	TP1031.002	TP03	1.00	17.8	Orange sandy clay
\$ 485917	TP1040.682	TP04	0.68	13.8	Brown sandy clay with vegetation
\$ 485918	WAC010.0001	WAC01	0.00 - 1.00	15.3	Brown loamy sand with brick and concrete
\$ 485919	WAC020.0001	WAC02	0.00 - 1.00	14.4	Brown sandy clay with stones
\$ 485920	WAC030.0001	WAC03	0.00 - 1.00	13.9	Brown sandy clay with stones
\$ 485922	WS1020.201	WS102	0.20	4.2	Brown sandy gravel with concrete
\$ 485923	WS1020.502	WS102	0.50	18.7	Light brown clay
\$ 485924	WS1030.504	WS103	0.50	17.3	Light brown clay

Moisture content is part of procedure E003 & is not an accredited test

Insufficient Sample ^{U/S}

Unsuitable Sample ^{U/S}

\$ samples exceeded recommended holding times



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Soil Analysis Certificate - Methodology & Miscellaneous Information

DETS Report No: 20-07551

Soiltechnics Ltd

Site Reference: Meadow High School, Uxbridge

Project / Job Ref: STS5093-D-1

Order No: POR008263

Reporting Date: 20/07/2020

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Soil	D	Boron - Water Soluble	Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES	E012
Soil	AR	BTEX	Determination of BTEX by headspace GC-MS	E001
Soil	D	Cations	Determination of cations in soil by aqua-regia digestion followed by ICP-OES	E002
Soil	D	Chloride - Water Soluble (2:1)	Determination of chloride by extraction with water & analysed by ion chromatography	E009
Soil	AR	Chromium - Hexavalent	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphénylcarbazide followed by colorimetry	E016
Soil	AR	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E015
Soil	D	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through extraction with cyclohexane	E011
Soil	AR	Diesel Range Organics (C10 - C24)	Determination of hexane/acetone extractable hydrocarbons by GC-FID	E004
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement	E022
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of water followed by electrometric measurement	E023
Soil	D	Elemental Sulphur	Determination of elemental sulphur by solvent extraction followed by GC-MS	E020
Soil	AR	EPH (C10 - C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH Product ID	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS	E004
Soil	D	Fluoride - Water Soluble	Determination of Fluoride by extraction with water & analysed by ion chromatography	E009
Soil	D	FOC (Fraction Organic Carbon)	Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	D	Loss on Ignition @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace	E019
Soil	D	Magnesium - Water Soluble	Determination of water soluble magnesium by extraction with water followed by ICP-OES	E025
Soil	D	Metals	Determination of metals by aqua-regia digestion followed by ICP-OES	E002
Soil	AR	Mineral Oil (C10 - C40)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge	E004
Soil	AR	Moisture Content	Moisture content; determined gravimetrically	E003
Soil	D	Nitrate - Water Soluble (2:1)	Determination of nitrate by extraction with water & analysed by ion chromatography	E009
Soil	D	Organic Matter	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	PAH - Speciated (EPA 16)	Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards	E005
Soil	AR	PCB - 7 Congeners	Determination of PCB by extraction with acetone and hexane followed by GC-MS	E008
Soil	D	Petroleum Ether Extract (PEE)	Gravimetrically determined through extraction with petroleum ether	E011
Soil	AR	pH	Determination of pH by addition of water followed by electrometric measurement	E007
Soil	AR	Phenols - Total (monohydric)	Determination of phenols by distillation followed by colorimetry	E021
Soil	D	Phosphate - Water Soluble (2:1)	Determination of phosphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Total	Determination of total sulphate by extraction with 10% HCl followed by ICP-OES	E013
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of sulphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of water soluble sulphate by extraction with water followed by ICP-OES	E014
Soil	AR	Sulphide	Determination of sulphide by distillation followed by colorimetry	E018
Soil	D	Sulphur - Total	Determination of total sulphur by extraction with aqua-regia followed by ICP-OES	E024
Soil	AR	SVOC	Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS	E006
Soil	AR	Thiocyanate (as SCN)	Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry	E017
Soil	D	Toluene Extractable Matter (TEM)	Gravimetrically determined through extraction with toluene	E011
Soil	D	Total Organic Carbon (TOC)	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	TPH CWG (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS	E004
Soil	AR	TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS	E004
Soil	AR	VOCs	Determination of volatile organic compounds by headspace GC-MS	E001
Soil	AR	VPH (C6-C8 & C8-C10)	Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID	E001

D Dried
AR As Received

Parameter	Matrix Type	Suite Reference	Expanded Uncertainty Measurement	Unit
TOC	Soil	BS EN 12457	13.49	%
Loss on Ignition	Soil	BS EN 12457	17	%
BTEX	Soil	BS EN 12457	14	%
Sum of PCBs	Soil	BS EN 12457	23	%
Mineral Oil	Soil	BS EN 12457	9	%
Total PAH	Soil	BS EN 12457	20	%
pH	Soil	BS EN 12457	0.399	Units
Acid Neutralisation Capacity	Soil	BS EN 12457	18	%
Arsenic	Leachate	BS EN 12457	16.63	%
Barium	Leachate	BS EN 12457	14.29	%
Cadmium	Leachate	BS EN 12457	14.44	%
Chromium	Leachate	BS EN 12457	18.06	%
Copper	Leachate	BS EN 12457	21.27	%
Mercury	Leachate	BS EN 12457	24.13	%
Molybdenum	Leachate	BS EN 12457	12.55	%
Nickel	Leachate	BS EN 12457	20.08	%
Lead	Leachate	BS EN 12457	13.43	%
Antimony	Leachate	BS EN 12457	18.85	%
Selenium	Leachate	BS EN 12457	18.91	%
Zinc	Leachate	BS EN 12457	13.71	%
Chloride	Leachate	BS EN 12457	16	%
Fluoride	Leachate	BS EN 12457	19.4	%
Sulphate	Leachate	BS EN 12457	19.63	%
TDS	Leachate	BS EN 12457	12	%
Phenol Index	Leachate	BS EN 12457	14	%
DOC	Leachate	BS EN 12457	10	%
Clay Content	Soil	BS 3882: 2015	15	%
Silt Content	Soil	BS 3882: 2015	14	%
Sand Content	Soil	BS 3882: 2015	13	%
Loss on Ignition	Soil	BS 3882: 2015	17	%
pH	Soil	BS 3882: 2015	0.399	Units
Carbonate	Soil	BS 3882: 2015	16	%
Total Nitrogen	Soil	BS 3882: 2015	12	%
Phosphorus (Extractable)	Soil	BS 3882: 2015	24	%
Potassium (Extractable)	Soil	BS 3882: 2015	20	%
Magnesium (Extractable)	Soil	BS 3882: 2015	26	%
Zinc	Soil	BS 3882: 2015	14.9	%
Copper	Soil	BS 3882: 2015	16	%
Nickel	Soil	BS 3882: 2015	17.7	%
Available Sodium	Soil	BS 3882: 2015	23	%
Available Calcium	Soil	BS 3882: 2015	23	%
Electrical Conductivity	Soil	BS 3882: 2015	10	%



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Cedar Barn
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DETS Report No: 20-07551

Site Reference: Meadow High School, Uxbridge

Project / Job Ref: STS5093-D-1

Order No: POR008263

Sample Receipt Date: 10/07/2020

Sample Scheduled Date: 10/07/2020

Report Issue Number: 2

Reporting Date: 05/08/2020

Authorised by:

Dave Ashworth
Technical Manager

Dates of laboratory activities for each tested analyte are available upon request.

This report supersedes 20-07551, issue no.1.

Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.



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Soil Analysis Certificate						
DETS Report No: 20-07551	Date Sampled	25/06/20	22/06/20	22/06/20	22/06/20	22/06/20
Soiltechnics Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Meadow High School, Uxbridge	TP / BH No	TP1010.301	TP1020.301	TP1030.301	TP1031.002	TP1040.201
Project / Job Ref: STS5093-D-1	Additional Refs	TP101	TP102	TP103	TP103	TP104
Order No: POR008263	Depth (m)	0.30	0.30	0.30	1.00	0.20
Reporting Date: 05/08/2020	DETS Sample No	485912	485913	485914	485915	485916

Determinand	Unit	RL	Accreditation					
Asbestos Screen ^(S)	N/a	N/a	ISO17025	Not Detected	Not Detected	Not Detected		Not Detected
pH	pH Units	N/a	MCERTS	9.0	7.6		7.8	
Total Cyanide	mg/kg	< 2	NONE	< 2	< 2		< 2	
Complex Cyanide	mg/kg	< 2	NONE	< 2	< 2		< 2	
Free Cyanide	mg/kg	< 2	NONE	< 2	< 2		< 2	
Organic Matter	%	< 0.1	MCERTS	1.7	2.1		0.5	
Total Organic Carbon (TOC)	%	< 0.1	MCERTS	1	1.2			
Loss on Ignition @ 450°C	%	< 0.01	NONE	4.60	3.60		2.20	
Arsenic (As)	mg/kg	< 2	MCERTS	14	7		11	
Beryllium (Be)	mg/kg	< 0.5	MCERTS	1.6	0.8		1	
W/S Boron	mg/kg	< 1	NONE	< 1	< 1		< 1	
Cadmium (Cd)	mg/kg	< 0.2	MCERTS	0.7	< 0.2		< 0.2	
Chromium (Cr)	mg/kg	< 2	MCERTS	23	20		29	
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2	< 2		< 2	
Copper (Cu)	mg/kg	< 4	MCERTS	144	19		14	
Lead (Pb)	mg/kg	< 3	MCERTS	457	54		14	
Mercury (Hg)	mg/kg	< 1	MCERTS	< 1	< 1		< 1	
Nickel (Ni)	mg/kg	< 3	MCERTS	31	12		16	
Selenium (Se)	mg/kg	< 2	MCERTS	< 3	< 3		< 3	
Vanadium (V)	mg/kg	< 1	MCERTS	49	34		49	
Zinc (Zn)	mg/kg	< 3	MCERTS	225	48		42	
Total Phenols (monohydric)	mg/kg	< 2	NONE	< 2	< 2		< 2	

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Samples Descriptions page describes if the test is performed on the dried or as-received portion
 Subcontracted analysis (S)



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Soil Analysis Certificate						
DETS Report No: 20-07551	Date Sampled	22/06/20	25/06/20	25/06/20	25/06/20	22/06/20
Soiltechnics Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Meadow High School, Uxbridge	TP / BH No	TP1040.682	WS1010.602	WS1020.201	WS1020.502	WS1030.504
Project / Job Ref: STS5093-D-1	Additional Refs	TP104	WS101	WS102	WS102	WS103
Order No: POR008263	Depth (m)	0.68	0.60	0.20	0.50	0.50
Reporting Date: 05/08/2020	DETS Sample No	485917	485921	485922	485923	485924

Determinand	Unit	RL	Accreditation				
Asbestos Screen ^(S)	N/a	N/a	ISO17025		Not Detected	Not Detected	Not Detected
pH	pH Units	N/a	MCERTS	8.0		8.1	8.0
Total Cyanide	mg/kg	< 2	NONE	< 2		< 2	< 2
Complex Cyanide	mg/kg	< 2	NONE	< 2		< 2	< 2
Free Cyanide	mg/kg	< 2	NONE	< 2		< 2	< 2
Organic Matter	%	< 0.1	MCERTS	1.5		1.8	0.7
Total Organic Carbon (TOC)	%	< 0.1	MCERTS				0.3
Loss on Ignition @ 450°C	%	< 0.01	NONE	2.70		1.50	1.80
Arsenic (As)	mg/kg	< 2	MCERTS	10		6	13
Beryllium (Be)	mg/kg	< 0.5	MCERTS	0.9		< 0.5	1.1
W/S Boron	mg/kg	< 1	NONE	< 1		< 1	< 1
Cadmium (Cd)	mg/kg	< 0.2	MCERTS	< 0.2		0.5	< 0.2
Chromium (Cr)	mg/kg	< 2	MCERTS	25		14	31
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2		< 2	< 2
Copper (Cu)	mg/kg	< 4	MCERTS	18		11	15
Lead (Pb)	mg/kg	< 3	MCERTS	43		19	16
Mercury (Hg)	mg/kg	< 1	MCERTS	< 1		< 1	< 1
Nickel (Ni)	mg/kg	< 3	MCERTS	15		8	22
Selenium (Se)	mg/kg	< 2	MCERTS	< 3		< 3	< 3
Vanadium (V)	mg/kg	< 1	MCERTS	42		19	52
Zinc (Zn)	mg/kg	< 3	MCERTS	50		87	52
Total Phenols (monohydric)	mg/kg	< 2	NONE	< 2		< 2	< 2

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Samples Descriptions page describes if the test is performed on the dried or as-received portion
 Subcontracted analysis (S)



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Soil Analysis Certificate - Speciated PAHs						
DETS Report No: 20-07551	Date Sampled	25/06/20	22/06/20	22/06/20	22/06/20	25/06/20
Soiltechnics Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Meadow High School, Uxbridge	TP / BH No	TP1010.301	TP1020.301	TP1031.002	TP1040.682	WS1020.201
Project / Job Ref: STS5093-D-1	Additional Refs	TP101	TP102	TP103	TP104	WS102
Order No: POR008263	Depth (m)	0.30	0.30	1.00	0.68	0.20
Reporting Date: 05/08/2020	DETS Sample No	485912	485913	485915	485917	485922

Determinand	Unit	RL	Accreditation					
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	0.11
Phenanthrene	mg/kg	< 0.1	MCERTS	0.30	< 0.1	< 0.1	0.15	0.30
Anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	0.14
Fluoranthene	mg/kg	< 0.1	MCERTS	0.71	0.24	< 0.1	0.31	0.96
Pyrene	mg/kg	< 0.1	MCERTS	0.77	0.21	< 0.1	0.28	1.19
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	0.34	< 0.1	< 0.1	< 0.1	0.46
Chrysene	mg/kg	< 0.1	MCERTS	0.36	< 0.1	< 0.1	< 0.1	0.45
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	0.61	0.14	< 0.1	0.19	0.64
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	0.22	< 0.1	< 0.1	< 0.1	0.32
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	0.46	< 0.1	< 0.1	0.15	0.55
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	0.35	< 0.1	< 0.1	< 0.1	0.31
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	0.35	< 0.1	< 0.1	< 0.1	0.34
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	4.5	< 1.6	< 1.6	< 1.6	5.8



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Soil Analysis Certificate - Speciated PAHs						
DETS Report No: 20-07551	Date Sampled	25/06/20	22/06/20			
Soiltechnics Ltd	Time Sampled	None Supplied	None Supplied			
Site Reference: Meadow High School, Uxbridge	TP / BH No	WS1020.502	WS1030.504			
Project / Job Ref: STS5093-D-1	Additional Refs	WS102	WS103			
Order No: POR008263	Depth (m)	0.50	0.50			
Reporting Date: 05/08/2020	DETS Sample No	485923	485924			

Determinand	Unit	RL	Accreditation				
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1		
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1		
Acenaphthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1		
Fluorene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1		
Phenanthrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1		
Anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1		
Fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1		
Pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1		
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1		
Chrysene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1		
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1		
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1		
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1		
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1		
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1		
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1		
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	< 1.6	< 1.6		



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Soil Analysis Certificate - TPH CWG Banded

DETS Report No: 20-07551	Date Sampled	25/06/20	22/06/20	22/06/20		
Soiltechnics Ltd	Time Sampled	None Supplied	None Supplied	None Supplied		
Site Reference: Meadow High School, Uxbridge	TP / BH No	TP1010.301	TP1020.301	WS1030.504		
Project / Job Ref: STS5093-D-1	Additional Refs	TP101	TP102	WS103		
Order No: POR008263	Depth (m)	0.30	0.30	0.50		
Reporting Date: 05/08/2020	DETS Sample No	485912	485913	485924		

Determinand	Unit	RL	Accreditation					
Aliphatic >C5 - C6	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01		
Aliphatic >C6 - C8	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05		
Aliphatic >C8 - C10	mg/kg	< 2	MCERTS	< 2	< 2	< 2		
Aliphatic >C10 - C12	mg/kg	< 2	MCERTS	< 2	< 2	< 2		
Aliphatic >C12 - C16	mg/kg	< 3	MCERTS	< 3	< 3	< 3		
Aliphatic >C16 - C21	mg/kg	< 3	MCERTS	< 3	< 3	< 3		
Aliphatic >C21 - C34	mg/kg	< 10	MCERTS	< 10	< 10	< 10		
Aliphatic (C5 - C34)	mg/kg	< 21	NONE	< 21	< 21	< 21		
Aromatic >C5 - C7	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01		
Aromatic >C7 - C8	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05		
Aromatic >C8 - C10	mg/kg	< 2	MCERTS	< 2	< 2	< 2		
Aromatic >C10 - C12	mg/kg	< 2	MCERTS	< 2	< 2	< 2		
Aromatic >C12 - C16	mg/kg	< 2	MCERTS	< 2	< 2	< 2		
Aromatic >C16 - C21	mg/kg	< 3	MCERTS	< 3	< 3	< 3		
Aromatic >C21 - C35	mg/kg	< 10	MCERTS	< 10	56	< 10		
Aromatic (C5 - C35)	mg/kg	< 21	NONE	< 21	56	< 21		
Total >C5 - C35	mg/kg	< 42	NONE	< 42	56	< 42		



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Soil Analysis Certificate - BTEX / MTBE						
DETS Report No: 20-07551	Date Sampled	25/06/20	22/06/20	22/06/20		
Soiltechnics Ltd	Time Sampled	None Supplied	None Supplied	None Supplied		
Site Reference: Meadow High School, Uxbridge	TP / BH No	TP1010.301	TP1020.301	WS1030.504		
Project / Job Ref: STS5093-D-1	Additional Refs	TP101	TP102	WS103		
Order No: POR008263	Depth (m)	0.30	0.30	0.50		
Reporting Date: 05/08/2020	DETS Sample No	485912	485913	485924		

Determinand	Unit	RL	Accreditation					
Benzene	ug/kg	< 2	MCERTS	< 2	< 2	< 2		
Toluene	ug/kg	< 5	MCERTS	< 5	< 5	< 5		
Ethylbenzene	ug/kg	< 2	MCERTS	< 2	< 2	< 2		
p & m-xylene	ug/kg	< 2	MCERTS	< 2	< 2	< 2		
o-xylene	ug/kg	< 2	MCERTS	< 2	< 2	< 2		
MTBE	ug/kg	< 5	MCERTS	< 5	< 5	< 5		

Waste Acceptance Criteria Analytical Certificate - BS EN 12457/3											
DETS Report No: 20-07551		Date Sampled		25/06/20		Landfill Waste Acceptance Criteria Limits					
Soiltechnics Ltd		Time Sampled		None Supplied							
Site Reference: Meadow High School, Uxbridge		TP / BH No		WAC010.000 1							
Project / Job Ref: STS5093-D-1		Additional Refs		WAC01							
Order No: POR008263		Depth (m)		0.00 - 1.00							
Reporting Date: 05/08/2020		DETS Sample No		485918							
Determinand		Unit		MDL							
TOC ^{MU}		%		< 0.1		2.8					
Loss on Ignition		%		< 0.01		11.80					
BTEX ^{MU}		mg/kg		< 0.05		< 0.05					
Sum of PCBs		mg/kg		< 0.1		< 0.1					
Mineral Oil ^{MU}		mg/kg		< 10		< 10					
Total PAH ^{MU}		mg/kg		< 1.7		6.2					
pH ^{MU}		pH Units		N/a		7.9					
Acid Neutralisation Capacity		mol/kg (+/-)		< 1		< 1					
Eluate Analysis				2:1		8:1		Cumulative 10:1		Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg (mg/kg)	
				mg/l		mg/l		mg/kg			
Arsenic ^U				< 0.01		< 0.01		< 0.2		0.5	
Barium ^U				0.02		< 0.02		< 0.1		20	
Cadmium ^U				< 0.0005		< 0.0005		< 0.02		0.04	
Chromium ^U				< 0.005		< 0.005		< 0.20		0.5	
Copper ^U				0.01		0.01		< 0.5		2	
Mercury ^U				< 0.0005		< 0.0005		< 0.005		0.01	
Molybdenum ^U				0.001		0.001		< 0.1		0.5	
Nickel ^U				< 0.007		< 0.007		< 0.2		0.4	
Lead ^U				< 0.005		< 0.005		< 0.2		0.5	
Antimony ^U				< 0.005		< 0.005		< 0.05		0.06	
Selenium ^U				< 0.005		< 0.005		< 0.05		0.1	
Zinc ^U				0.013		0.011		< 0.2		4	
Chloride ^U				23		8		87		800	
Fluoride ^U				0.6		0.9		8.8		10	
Sulphate ^U				103		17		231		1000	
TDS				264		90		1021		4000	
Phenol Index				< 0.01		< 0.01		< 0.5		1	
DOC				10.2		6.8		70.1		500	
Leach Test Information											
Sample Mass (kg)				0.21							
Dry Matter (%)				84.7							
Moisture (%)				18.2							
Stage 1											
Volume Eluate L2 (litres)				0.32							
Filtered Eluate VE1 (litres)				0.12							

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Samples Descriptions page describes if the test is performed on the dried or as-received portion

Stated limits are for guidance only and DETS Ltd cannot be held responsible for any discrepancies with current legislation

M Denotes MCERTS accredited test

U Denotes ISO17025 accredited test

Waste Acceptance Criteria Analytical Certificate - BS EN 12457/3																																				
DETS Report No: 20-07551		Date Sampled		25/06/20		 Landfill Waste Acceptance Criteria Limits																														
Soiltechnics Ltd		Time Sampled		None Supplied																																
Site Reference: Meadow High School, Uxbridge		TP / BH No		WAC020.000 1																																
Project / Job Ref: STS5093-D-1		Additional Refs		WAC02																																
Order No: POR008263		Depth (m)		0.00 - 1.00																																
Reporting Date: 05/08/2020		DETS Sample No		485919																																
Determinand		Unit		MDL		<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 33%;">Inert Waste Landfill</th> <th style="width: 33%;">Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill</th> <th style="width: 33%;">Hazardous Waste Landfill</th> </tr> </thead> <tbody> <tr> <td>3%</td> <td>5%</td> <td>6%</td> </tr> <tr> <td>--</td> <td>--</td> <td>10%</td> </tr> <tr> <td>6</td> <td>--</td> <td>--</td> </tr> <tr> <td>1</td> <td>--</td> <td>--</td> </tr> <tr> <td>500</td> <td>--</td> <td>--</td> </tr> <tr> <td>100</td> <td>--</td> <td>--</td> </tr> <tr> <td>--</td> <td>>6</td> <td>--</td> </tr> <tr> <td>--</td> <td>To be evaluated</td> <td>To be evaluated</td> </tr> </tbody> </table>				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill	3%	5%	6%	--	--	10%	6	--	--	1	--	--	500	--	--	100	--	--	--	>6	--	--	To be evaluated	To be evaluated
Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill																																		
3%	5%	6%																																		
--	--	10%																																		
6	--	--																																		
1	--	--																																		
500	--	--																																		
100	--	--																																		
--	>6	--																																		
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BTEX ^{MU}		mg/kg		< 0.05 < 0.05																																
Sum of PCBs		mg/kg		< 0.1 < 0.1																																
Mineral Oil ^{MU}		mg/kg		< 10 < 10																																
Total PAH ^{MU}		mg/kg		< 1.7 < 1.7																																
pH ^{MU}		pH Units		N/a 7.9																																
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Arsenic ^U				< 0.01		< 0.01		< 0.2		0.5 2 25																										
Barium ^U				0.03		< 0.02		0.1		20 100 300																										
Cadmium ^U				< 0.0005		< 0.0005		< 0.02		0.04 1 5																										
Chromium ^U				< 0.005		< 0.005		< 0.20		0.5 10 70																										
Copper ^U				< 0.01		< 0.01		< 0.5		2 50 100																										
Mercury ^U				< 0.0005		< 0.0005		< 0.005		0.01 0.2 2																										
Molybdenum ^U				0.005		0.004		< 0.1		0.5 10 30																										
Nickel ^U				< 0.007		< 0.007		< 0.2		0.4 10 40																										
Lead ^U				< 0.005		< 0.005		< 0.2		0.5 10 50																										
Antimony ^U				< 0.005		< 0.005		< 0.05		0.06 0.7 5																										
Selenium ^U				< 0.005		< 0.005		< 0.05		0.1 0.5 7																										
Zinc ^U				< 0.005		< 0.005		< 0.2		4 50 200																										
Chloride ^U				12		5		53		800 15000 25000																										
Fluoride ^U				0.7		0.7		7		10 150 500																										
Sulphate ^U				32		9		110		1000 20000 50000																										
TDS				174		81		906		4000 60000 100000																										
Phenol Index				< 0.01		< 0.01		< 0.5		1 - -																										
DOC				16.2		8.5		92.8		500 800 1000																										
Leach Test Information																																				
										 Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg (mg/kg)																										
Sample Mass (kg)				0.20																																
Dry Matter (%)				85.6																																
Moisture (%)				16.8																																
Stage 1																																				
Volume Eluate L2 (litres)				0.32																																
Filtered Eluate VE1 (litres)				0.18																																

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Samples Descriptions page describes if the test is performed on the dried or as-received portion

Stated limits are for guidance only and DETS Ltd cannot be held responsible for any discrepancies with current legislation

M Denotes MCERTS accredited test

U Denotes ISO17025 accredited test

Waste Acceptance Criteria Analytical Certificate - BS EN 12457/3											
DETS Report No: 20-07551		Date Sampled		25/06/20		Inert Waste Landfill Stable Non- reactive HAZARDOUS waste in non- hazardous Landfill Hazardous Waste Landfill					
Soiltechnics Ltd		Time Sampled		None Supplied							
Site Reference: Meadow High School, Uxbridge		TP / BH No		WAC030.000 1							
Project / Job Ref: STS5093-D-1		Additional Refs		WAC03							
Order No: POR008263		Depth (m)		0.00 - 1.00							
Reporting Date: 05/08/2020		DETS Sample No		485920							
Determinand		Unit		MDL							
TOC ^{MU}		%		< 0.1		0.4					
Loss on Ignition		%		< 0.01		1.80					
BTEX ^{MU}		mg/kg		< 0.05		< 0.05					
Sum of PCBs		mg/kg		< 0.1		< 0.1					
Mineral Oil ^{MU}		mg/kg		< 10		43					
Total PAH ^{MU}		mg/kg		< 1.7		< 1.7					
pH ^{MU}		pH Units		N/a		8.1					
Acid Neutralisation Capacity		mol/kg (+/-)		< 1		< 1					
Eluate Analysis				2:1 mg/l		8:1 mg/l		Cumulative 10:1 mg/kg		Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg (mg/kg)	
Arsenic ^U				< 0.01		< 0.01		< 0.2		0.5 2 25	
Barium ^U				0.02		< 0.02		0.1		20 100 300	
Cadmium ^U				< 0.0005		< 0.0005		< 0.02		0.04 1 5	
Chromium ^U				< 0.005		< 0.005		< 0.20		0.5 10 70	
Copper ^U				< 0.01		< 0.01		< 0.5		2 50 100	
Mercury ^U				< 0.0005		< 0.0005		< 0.005		0.01 0.2 2	
Molybdenum ^U				< 0.001		0.003		< 0.1		0.5 10 30	
Nickel ^U				< 0.007		< 0.007		< 0.2		0.4 10 40	
Lead ^U				< 0.005		< 0.005		< 0.2		0.5 10 50	
Antimony ^U				< 0.005		< 0.005		< 0.05		0.06 0.7 5	
Selenium ^U				< 0.005		< 0.005		< 0.05		0.1 0.5 7	
Zinc ^U				0.010		0.012		< 0.2		4 50 200	
Chloride ^U				12		4		52		800 15000 25000	
Fluoride ^U				1		1		10		10 150 500	
Sulphate ^U				11		3		40		1000 20000 50000	
TDS				143		77		841		4000 60000 100000	
Phenol Index				< 0.01		< 0.01		< 0.5		1 - -	
DOC				4.9		5.3		52.4		500 800 1000	
Leach Test Information											
Sample Mass (kg)				0.20							
Dry Matter (%)				86.1							
Moisture (%)				16.2							
Stage 1											
Volume Eluate L2 (litres)				0.32							
Filtered Eluate VE1 (litres)				0.19							
Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Samples Descriptions page describes if the test is performed on the dried or as-received portion											
Stated limits are for guidance only and DETS Ltd cannot be held responsible for any discrepancies with current legislation											
M Denotes MCERTS accredited test											
U Denotes ISO17025 accredited test											



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Soil Analysis Certificate - Sample Descriptions

DETS Report No: 20-07551	
Soiltechnics Ltd	
Site Reference: Meadow High School, Uxbridge	
Project / Job Ref: STS5093-D-1	
Order No: POR008263	
Reporting Date: 05/08/2020	

DETS Sample No	TP / BH No	Additional Refs	Depth (m)	Moisture Content (%)	Sample Matrix Description
\$ 485912	TP1010.301	TP101	0.30	6	Brown sandy gravel with brick and concrete
\$ 485913	TP1020.301	TP102	0.30	20.9	Brown loamy clay
\$ 485915	TP1031.002	TP103	1.00	17.8	Orange sandy clay
\$ 485917	TP1040.682	TP104	0.68	13.8	Brown sandy clay with vegetation
\$ 485918	WAC010.0001	WAC01	0.00 - 1.00	15.3	Brown loamy sand with brick and concrete
\$ 485919	WAC020.0001	WAC02	0.00 - 1.00	14.4	Brown sandy clay with stones
\$ 485920	WAC030.0001	WAC03	0.00 - 1.00	13.9	Brown sandy clay with stones
\$ 485922	WS1020.201	WS102	0.20	4.2	Brown sandy gravel with concrete
\$ 485923	WS1020.502	WS102	0.50	18.7	Light brown clay
\$ 485924	WS1030.504	WS103	0.50	17.3	Light brown clay

Moisture content is part of procedure E003 & is not an accredited test

Insufficient Sample ^{U/S}

Unsuitable Sample ^{U/S}

\$ samples exceeded recommended holding times



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Soil Analysis Certificate - Methodology & Miscellaneous Information

DETS Report No: 20-07551

Soiltechnics Ltd

Site Reference: Meadow High School, Uxbridge

Project / Job Ref: STS5093-D-1

Order No: POR008263

Reporting Date: 05/08/2020

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Soil	D	Boron - Water Soluble	Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES	E012
Soil	AR	BTEX	Determination of BTEX by headspace GC-MS	E001
Soil	D	Cations	Determination of cations in soil by aqua-regia digestion followed by ICP-OES	E002
Soil	D	Chloride - Water Soluble (2:1)	Determination of chloride by extraction with water & analysed by ion chromatography	E009
Soil	AR	Chromium - Hexavalent	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazine followed by colorimetry	E016
Soil	AR	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E015
Soil	D	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through extraction with cyclohexane	E011
Soil	AR	Diesel Range Organics (C10 - C24)	Determination of hexane/acetone extractable hydrocarbons by GC-FID	E004
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement	E022
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of water followed by electrometric measurement	E023
Soil	D	Elemental Sulphur	Determination of elemental sulphur by solvent extraction followed by GC-MS	E020
Soil	AR	EPH (C10 - C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH Product ID	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS	E004
Soil	D	Fluoride - Water Soluble	Determination of Fluoride by extraction with water & analysed by ion chromatography	E009
Soil	D	FOC (Fraction Organic Carbon)	Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	D	Loss on Ignition @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace	E019
Soil	D	Magnesium - Water Soluble	Determination of water soluble magnesium by extraction with water followed by ICP-OES	E025
Soil	D	Metals	Determination of metals by aqua-regia digestion followed by ICP-OES	E002
Soil	AR	Mineral Oil (C10 - C40)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge	E004
Soil	AR	Moisture Content	Moisture content; determined gravimetrically	E003
Soil	D	Nitrate - Water Soluble (2:1)	Determination of nitrate by extraction with water & analysed by ion chromatography	E009
Soil	D	Organic Matter	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	PAH - Speciated (EPA 16)	Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards	E005
Soil	AR	PCB - 7 Congeners	Determination of PCB by extraction with acetone and hexane followed by GC-MS	E008
Soil	D	Petroleum Ether Extract (PEE)	Gravimetrically determined through extraction with petroleum ether	E011
Soil	AR	pH	Determination of pH by addition of water followed by electrometric measurement	E007
Soil	AR	Phenols - Total (monohydric)	Determination of phenols by distillation followed by colorimetry	E021
Soil	D	Phosphate - Water Soluble (2:1)	Determination of phosphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Total	Determination of total sulphate by extraction with 10% HCl followed by ICP-OES	E013
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of sulphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of water soluble sulphate by extraction with water followed by ICP-OES	E014
Soil	AR	Sulphide	Determination of sulphide by distillation followed by colorimetry	E018
Soil	D	Sulphur - Total	Determination of total sulphur by extraction with aqua-regia followed by ICP-OES	E024
Soil	AR	SVOC	Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS	E006
Soil	AR	Thiocyanate (as SCN)	Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry	E017
Soil	D	Toluene Extractable Matter (TEM)	Gravimetrically determined through extraction with toluene	E011
Soil	D	Total Organic Carbon (TOC)	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	TPH CWG (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS	E004
Soil	AR	TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS	E004
Soil	AR	VOCs	Determination of volatile organic compounds by headspace GC-MS	E001
Soil	AR	VPH (C6-C8 & C8-C10)	Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID	E001

D Dried
AR As Received

Parameter	Matrix Type	Suite Reference	Expanded Uncertainty Measurement	Unit
TOC	Soil	BS EN 12457	13.49	%
Loss on Ignition	Soil	BS EN 12457	17	%
BTEX	Soil	BS EN 12457	14	%
Sum of PCBs	Soil	BS EN 12457	23	%
Mineral Oil	Soil	BS EN 12457	9	%
Total PAH	Soil	BS EN 12457	20	%
pH	Soil	BS EN 12457	0.399	Units
Acid Neutralisation Capacity	Soil	BS EN 12457	18	%
Arsenic	Leachate	BS EN 12457	16.63	%
Barium	Leachate	BS EN 12457	14.29	%
Cadmium	Leachate	BS EN 12457	14.44	%
Chromium	Leachate	BS EN 12457	18.06	%
Copper	Leachate	BS EN 12457	21.27	%
Mercury	Leachate	BS EN 12457	24.13	%
Molybdenum	Leachate	BS EN 12457	12.55	%
Nickel	Leachate	BS EN 12457	20.08	%
Lead	Leachate	BS EN 12457	13.43	%
Antimony	Leachate	BS EN 12457	18.85	%
Selenium	Leachate	BS EN 12457	18.91	%
Zinc	Leachate	BS EN 12457	13.71	%
Chloride	Leachate	BS EN 12457	16	%
Fluoride	Leachate	BS EN 12457	19.4	%
Sulphate	Leachate	BS EN 12457	19.63	%
TDS	Leachate	BS EN 12457	12	%
Phenol Index	Leachate	BS EN 12457	14	%
DOC	Leachate	BS EN 12457	10	%
Clay Content	Soil	BS 3882: 2015	15	%
Silt Content	Soil	BS 3882: 2015	14	%
Sand Content	Soil	BS 3882: 2015	13	%
Loss on Ignition	Soil	BS 3882: 2015	17	%
pH	Soil	BS 3882: 2015	0.399	Units
Carbonate	Soil	BS 3882: 2015	16	%
Total Nitrogen	Soil	BS 3882: 2015	12	%
Phosphorus (Extractable)	Soil	BS 3882: 2015	24	%
Potassium (Extractable)	Soil	BS 3882: 2015	20	%
Magnesium (Extractable)	Soil	BS 3882: 2015	26	%
Zinc	Soil	BS 3882: 2015	14.9	%
Copper	Soil	BS 3882: 2015	16	%
Nickel	Soil	BS 3882: 2015	17.7	%
Available Sodium	Soil	BS 3882: 2015	23	%
Available Calcium	Soil	BS 3882: 2015	23	%
Electrical Conductivity	Soil	BS 3882: 2015	10	%

Analysis of test data in relation to concentrations of **inorganic** chemical contaminants

Adopted Model: Residential without plant uptake
Receptor: Current and proposed site user

Test procedure			Summary of test data					Initial comparison	Outlier test				Normality test			UCL		
Contaminant	Guideline source	Guideline value	No. of tests	Min.	Max.	Mean	No. of tests above guideline value	Initial screening				Concentration	Shapiro-Wilk Normality test	Probability plot test	Data normally distributed?	95% UCL of mean	Contaminant	
		mg/kg		mg/kg	mg/kg	mg/kg			Pass outlier test?	Number of outliers	Location of outlier					Depth		mg/kg
Arsenic	S4UL	40	8	6.0	15.0	11.0	0	Mean value below guideline				y		normal	normal	y	13.1	Arsenic
Beryllium	S4UL	1.7	8	0.5	1.6	0.9	0	Mean value below guideline				y		normal	normal	y	1.2	Beryllium
Boron	S4UL	11000	8	1.0	1.3	1.0	0	Mean value below guideline				n		not normal	not normal	n	1.2	Boron
Cadmium	S4UL	85	8	0.2	0.7	0.3	0	Mean value below guideline				n		not normal	not normal	n	0.6	Cadmium
Chromium (III)	S4UL	910	8	14.0	31.0	23.9	0	Mean value below guideline				y		normal	normal	y	27.6	Chromium (III)
Copper	S4UL	7100	8	11.0	144.0	32.3	0	Mean value below guideline				n		not normal	not normal	n	102.0	Copper
Cyanide (total)	ATK	34	7	2.0	2.0	2.0	0	Mean value below guideline				y		not normal	not normal	n	2.0	Cyanide (total)
Lead	C4SL	330	8	12.0	457.0	83.4	1	Mean value below guideline				n		not normal	not normal	n	317.6	Lead
Mercury#	S4UL	56	8	0.6	1.0	1.0	0	Mean value below guideline				y		not normal	not normal	n	1.2	Mercury#
Nickel	S4UL	180	8	8.0	31.0	16.9	0	Mean value below guideline				y		normal	normal	y	21.6	Nickel
Selenium	S4UL	430	8	1.0	3.0	2.8	0	Mean value below guideline				y		not normal	not normal	n	3.8	Selenium
Vanadium	S4UL	1200	8	19.0	52.0	40.4	0	Mean value below guideline				y		normal	normal	y	48.0	Vanadium
Zinc	S4UL	40000	8	42.0	225.0	74.5	0	Mean value below guideline				n		not normal	not normal	n	170.8	Zinc

S4UL Sutable for Use Level as published by LQM/CIEH
C4SL Category 4 Screening Level
C4SL (lower) (upper) Category 4 Screening Level for Lead at lower or upper bound of range
ATK Soil Screening Value derived by Atkins
BPG5 Guideline from BPG Note 5 as published by Forest Research

Assumed to be inorganic mercury as initial screening value

Title	Table number
Analysis of test data in relation to concentrations of inorganic chemical contaminants.	1

Analysis of test data in relation to concentrations of **organic** chemical contaminants

Adopted model: **Residential without plant uptake**
Receptor: **Current and proposed site user**

Test procedure			Summary of test data				Initial Screening		Outlier test				Normality test				UCL	
Contaminant	Guideline source	Guideline value*	No. of tests	Min.	Max.	Mean	No. of tests above guideline value	Initial screening	Pass outlier test?	Number of outliers	Location of outlier	Depth	Concentration	Shapiro-Wilk Normality test	Probability plot test	Data normally distributed?	95% UCL of mean	Contaminant
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg												
Acenaphthene	S4UL	3000	7	0.1	0.1	0.1	0	Mean value below guideline	y					not normal	not normal	n	0.1	Acenaphthene
Acenaphthylene	S4UL	2900	7	0.1	0.1	0.1	0	Mean value below guideline	y					not normal	not normal	n	0.1	Acenaphthylene
Anthracene	S4UL	31000	7	0.1	0.1	0.1	0	Mean value below guideline	n					not normal	not normal	n	0.1	Anthracene
Benzo(a)anthracene	S4UL	11	7	0.1	0.5	0.2	0	Mean value below guideline	y					not normal	not normal	n	0.4	Benzo(a)anthracene
Benzo(a)pyrene	S4UL	3.2	7	0.1	0.6	0.2	0	Mean value below guideline	y					not normal	not normal	n	0.5	Benzo(a)pyrene
Benzo(b)fluoranthene	S4UL	3.9	7	0.1	0.6	0.3	0	Mean value below guideline	y					not normal	not normal	n	0.7	Benzo(b)fluoranthene
Benzo(g,h,i)perylene	S4UL	360	7	0.1	0.4	0.2	0	Mean value below guideline	y					not normal	not normal	n	0.4	Benzo(g,h,i)perylene
Benzo(k)fluoranthene	S4UL	110	7	0.1	0.3	0.1	0	Mean value below guideline	n					not normal	not normal	n	0.3	Benzo(k)fluoranthene
Chrysene	S4UL	30	7	0.1	0.5	0.2	0	Mean value below guideline	y					not normal	not normal	n	0.4	Chrysene
Dibenzo(a,h)anthracene	S4UL	0.31	7	0.1	0.1	0.1	0	Mean value below guideline	y					not normal	not normal	n	0.1	Dibenzo(a,h)anthracene
Fluoranthene	S4UL	1500	7	0.1	1.0	0.4	0	Mean value below guideline	y					not normal	not normal	n	0.9	Fluoranthene
Fluorene	S4UL	2800	7	0.1	0.1	0.1	0	Mean value below guideline	n					not normal	not normal	n	0.1	Fluorene
Indeno(1,2,3-cd)pyrene	S4UL	45	7	0.1	0.4	0.2	0	Mean value below guideline	y					not normal	not normal	n	0.4	Indeno(1,2,3-cd)pyrene
Naphthalene	S4UL	2.3	7	0.1	0.1	0.1	0	Mean value below guideline	y					not normal	not normal	n	0.1	Naphthalene
Phenanthrene	S4UL	1300	7	0.1	0.3	0.2	0	Mean value below guideline	y					not normal	not normal	n	0.3	Phenanthrene
Phenols	S4UL	750	7	2.0	2.0	2.0	0	Mean value below guideline	y					not normal	not normal	n	2.0	Phenols
Pyrene	S4UL	3700	7	0.1	1.2	0.4	0	Mean value below guideline	y					not normal	not normal	n	1.1	Pyrene

Notes

S4UL
C4SL
SGV
SSV
ATK

Suitable for Use Level as published by LQM/CIEH
Category 4 Screening Level
Soil Guideline Value as published by the Environment Agency 2009
Soil Screening Value as derived by Soiltechnics
Soil Screening Value derived by Atkins

* Assuming a SOM of 1%

Summary of petroleum hydrocarbon test results

Model: Residential without plant uptake

BTEX (Red highlights indicate exceedance of guideline value)

Indicator	unit	S4UL (mg/kg)	Concentration		
			TP101 0.30	TP102 0.30	WS103 0.50
Benzene	mg/kg	0.38	< 0.002	< 0.002	< 0.002
Toluene	mg/kg	880	< 0.005	< 0.005	< 0.005
Ethylbenzene	mg/kg	83	< 0.002	< 0.002	< 0.002
o-Xylene	mg/kg	88	< 0.002	< 0.002	< 0.002
m,p-Xylene	mg/kg	79	< 0.002	< 0.002	< 0.002

Hydrocarbon banding (Red highlights indicate exceedance of guideline value)

Fraction	unit	S4UL (mg/kg)	Concentration		
			TP101 0.30	TP102 0.30	WS103 0.50
Aliphatic					
EC 5 - 6	mg/kg	42	< 0.01	< 0.01	< 0.01
EC >6 - 8	mg/kg	100	< 0.05	< 0.05	< 0.05
EC >8 - 10	mg/kg	27	< 2	< 2	< 2
EC >10 - 12	mg/kg	130	< 2	< 2	< 2
EC >12 - 16	mg/kg	1100	< 3	< 3	< 3
EC >16 - 35	mg/kg	65000	0	0	0
EC >35 - 44	mg/kg	65000	<21	<21	<21
Aromatic					
EC 5 - 7 (benzene)	mg/kg	370	< 0.01	< 0.01	< 0.01
EC >7 - 8 (toluene)	mg/kg	860	< 0.05	< 0.05	< 0.05
EC >8 - 10	mg/kg	47	< 2	< 2	< 2
EC >10 - 12	mg/kg	250	< 2	< 2	< 2
EC >12 - 16	mg/kg	1800	< 2	< 2	< 2
EC >16 - 21	mg/kg	1900	< 3	< 3	< 3
EC >21 - 35	mg/kg	1900	< 10	56	< 10
EC >35 - 44	mg/kg	1900	<42	56	<42
Total petroleum hydrocarbons			< 42	56	< 42

Title
Comparison of measured concentrations of
petroleum hydrocarbons with guideline values.

Table number
3

Analysis of test data in relation to concentrations of **organic** chemical contaminants (Made Ground)

Adopted model: **Residential without plant uptake**
Receptor: **Current and proposed site user**

Test procedure			Summary of test data				Initial Screening		Outlier test				Normality test				UCL	
Contaminant	Guideline source	Guideline value*	No. of tests	Min.	Max.	Mean	No. of tests above guideline value	Initial screening	Pass outlier test?	Number of outliers	Location of outlier	Depth	Concentration	Shapiro-Wilk Normality test	Probability plot test	Data normally distributed?	95% UCL of mean	Contaminant
		mg/kg		mg/kg	mg/kg	mg/kg							mg/kg					
Acenaphthene	S4UL	3000	11	0.1	0.4	0.1	0	Mean value below guideline	n					not normal	not normal	n	0.2	Acenaphthene
Acenaphthylene	S4UL	2900	11	0.1	0.4	0.1	0	Mean value below guideline	n					not normal	not normal	n	0.2	Acenaphthylene
Anthracene	S4UL	31000	11	0.1	0.8	0.2	0	Mean value below guideline	n					not normal	not normal	n	0.5	Anthracene
Benzo(a)anthracene	S4UL	11	11	0.1	2.1	0.6	0	Mean value below guideline	y					not normal	not normal	n	1.5	Benzo(a)anthracene
Benzo(a)pyrene	S4UL	3.2	11	0.1	5.0	1.0	2	Mean value below guideline	n					not normal	not normal	n	3.3	Benzo(a)pyrene
Benzo(b)fluoranthene	S4UL	3.9	11	0.1	4.1	0.9	1	Mean value below guideline	n					not normal	not normal	n	2.7	Benzo(b)fluoranthene
Benzo(g,h,i)perylene	S4UL	360	11	0.1	4.9	1.0	0	Mean value below guideline	y					not normal	not normal	n	3.4	Benzo(g,h,i)perylene
Benzo(k)fluoranthene	S4UL	110	11	0.1	2.5	0.6	0	Mean value below guideline	y					not normal	not normal	n	1.7	Benzo(k)fluoranthene
Chrysene	S4UL	30	11	0.1	2.3	0.6	0	Mean value below guideline	y					not normal	not normal	n	1.6	Chrysene
Dibenzo(a,h)anthracene	S4UL	0.31	11	0.1	0.4	0.2	2	Mean value below guideline	n					not normal	not normal	n	0.3	Dibenzo(a,h)anthracene
Fluoranthene	S4UL	1500	11	0.1	6.3	1.3	0	Mean value below guideline	n					not normal	not normal	n	3.9	Fluoranthene
Fluorene	S4UL	2800	11	0.1	0.7	0.2	0	Mean value below guideline	n					not normal	not normal	n	0.4	Fluorene
Indeno(1,2,3-cd)pyrene	S4UL	45	11	0.1	3.9	0.8	0	Mean value below guideline	n					not normal	not normal	n	2.6	Indeno(1,2,3-cd)pyrene
Naphthalene	S4UL	2.3	11	0.1	3.9	0.5	1	Mean value below guideline	n					not normal	not normal	n	2.0	Naphthalene
Phenanthrene	S4UL	1300	11	0.1	4.1	0.7	0	Mean value below guideline	n					not normal	not normal	n	2.3	Phenanthrene
Phenols	S4UL	750	5	2.0	2.0	2.0	0	Mean value below guideline	y					not normal	not normal	n	2.0	Phenols
Pyrene	S4UL	3700	11	0.1	7.3	1.5	0	Mean value below guideline	n					not normal	not normal	n	4.5	Pyrene

Notes

S4UL Suitable for Use Level as published by LQM/CIEH
C4SL Category 4 Screening Level
SGV Soil Guideline Value as published by the Environment Agency 2009
SSV Soil Screening Value as derived by Soiltechnics
ATK Soil Screening Value derived by Atkins

* Assuming a SOM of 1%

Title	Table number
Analysis of test data in relation to concentrations of organic chemical contaminants.	4

Final Conceptual Model (following supplementary testing)

Current site use

Proposed site use

residential without plant uptake

residential without plant uptake

Source	Pathway										Receptor	Risk assessment to CIRIA C552		
	Humans						Vegetation	Water				Consequence of risk occurring via most likely pathway		
	Ingestion of air-borne dusts	Ingestion of soil	Ingestion of vegetables and soil attached to vegetables	Inhalation of air-borne dusts	Inhalation of vapours	Dermal contact with soil and dust	Root uptake, deposition to shoots and foliage contact	Percolation of water through contaminated soils	Near-surface water run-off through contaminated	Saturation of contaminated soils by flood waters				
Soils														
Made Ground	Likely	Likely	Unlikely	Likely	Likely	Likely	-	-	-	-	Current and proposed site users	Child	Minor	Low
	Likely	Likely	Unlikely	Likely	Likely	Likely	-	-	-	-	Construction operatives	Adult	Minor	Low
	-	-	-	-	-	-	Likely	-	-	-	Vegetation (current & proposed)	-	Minor	Low
	-	-	-	-	-	-	-	Low likelihood	Likely	Unlikely	Water (current and proposed)	-	Minor	Low

Summary insitu gas monitoring results

	Methane, CH ₄ (%v/v) Chg		Carbon dioxide, CO ₂ (%v/v) Chg		Oxygen, O ₂ (%v/v)		Carbon Monoxide	Hydrogen Sulphide	Balance	Lower explosive limit	Gas flow (q)	Peak hazardous gas flow rate Qhgs		Steady hazardous gas flow rate Qhgs		Indicative CIRIA Characteristic Situation
	Peak	Steady	Peak	Steady	Minimum	Average	(ppm)	(ppm)	(%v/v)	(% LEL)	(l/Hr)	CH ₄	CO ₂	CH ₄	CO ₂	
Worst case scenario	0.3	0.2	5.5	5.5	1.4	1.4	1.0	0.0	92.9	4.0	12.5	0.04	0.69	0.03	0.69	TWO
Average site scenario	0.0	0.0	2.1	1.9	16.5	16.9	0.2	0.0	81.3	0.5	1.6	0.00	0.03	0.00	0.03	ONE

Additional considerations

Notes

- 1) The gas analyser is capable of measuring flow to an accuracy of 0.1l/h. Below this value the analyser records zero flow. Adopting a precautionary approach we have used a flow rate of 0.1l/h when the analyser records zero with this flow rate used to determine the gas screening value.
- 2) Atmospheric temperature (*) data sourced from local weather station data.
- 3) Gas Screening Value (GSV) derived by multiplying the gas concentration (%) by the steady flow rate (l/h).

Detailed insitu gas monitoring results

Location	Pipe Ref.	Date / Time of Reading	Instrument	Atmospheric pressure (mB)	Atmospheric Temperature (°C)	Methane, CH ₄ (%v/v) Chg		Carbon dioxide, CO ₂ (%v/v) Chg		Oxygen, O ₂ (%v/v)		Carbon Monoxide	Hydrogen Sulphide	Balance	Lower explosive limit	Gas flow (q)	Peak hazardous gas flow rate Qhgs		Steady hazardous gas flow rate Qhgs		Indicative CIRIA Characteristic Situation	Potentially explosive
						Peak	Steady	Peak	Steady	Minimum	Average	(ppm)	(ppm)	(%v/v)	(% LEL)	(l/Hr)	CH ₄	CO ₂	CH ₄	CO ₂		
BH2	1	24/07/2020 11:17:00	GA5000	1017	21*	0	0	1.5	1.3	19.1	19.5	0		79.2	0	-1.8	0.00	0.03	0.00	0.02	ONE	NO
BH2	1	06/08/2020 12:52:00	GA2000Plus	1013	24*	0	0	0.4	0	20.3	20.4	0	0	79.6	0	0	0.00	0.00	0.00	0.00	ONE	NO
BH2	1	17/08/2020 12:40:00	GA2000Plus	1002	18*	0	0	0.8	0.7	20.4	20.4	0	0	78.9	0	-3.6	0.00	0.03	0.00	0.03	ONE	NO
BH4	1	24/07/2020 10:59:00	GA5000	1017	20*	0	0	3.9	3.9	18.3	18.3	1		77.8	0	0	0.00	0.00	0.00	0.00	ONE	NO
BH4	1	06/08/2020 13:13:00	GA2000Plus	1013	24*	0	0	3.8	3.8	18.2	18.3	0	0	77.9	0	0	0.00	0.00	0.00	0.00	ONE	NO
BH4	1	17/08/2020 12:31:00	GA2000Plus	1002	18*	0	0	4.5	4.5	17.7	17.7	0	0	77.8	0	1.9	0.00	0.09	0.00	0.09	TWO	NO
WS01	1	24/07/2020 10:34:00	GA5000	1017	19*	0	0	1.5	1.5	19.7	19.7	1		78.8	0	0	0.00	0.00	0.00	0.00	ONE	NO
WS01	1	06/08/2020 13:50:00	GA2000Plus	1014	24*	0	0	1.3	1.2	19.4	19.4	0	0	79.4	0	0	0.00	0.00	0.00	0.00	ONE	NO
WS01	1	17/08/2020 13:24:00	GA2000Plus	1003	18*	0	0	1.9	1.9	19	18.4	0	0	79.7	0	11.7	0.00	0.22	0.00	0.22	TWO	NO
WS04	1	24/07/2020 09:53:00	GA5000	1019	19*	0.3	0.2	5.1	5	2.4	3.2	1		91.6	4	0	0.00	0.01	0.00	0.01	TWO	NO
WS04	1	06/08/2020 13:30:00	GA2000Plus	1014	24*	0.2	0.2	5.5	5.5	1.4	1.4	0	0	92.9	4	0	0.00	0.01	0.00	0.01	TWO	NO
WS04	1	17/08/2020 12:55:00	GA2000Plus	1002	18*	0	0	1.2	1.2	14.4	14.7	0	0	84.1	0	12.5	0.00	0.15	0.00	0.15	TWO	NO
WS101	1	24/07/2020 10:13:00	GA5000	1019	19*	0	0	0.5	0.1	19.6	20.3	0		79.6	0	0	0.00	0.00	0.00	0.00	ONE	NO
WS101	1	06/08/2020 13:40:00	GA2000Plus	1014	24*	0	0	1.4	0	16.5	20.3	0	0	79.7	0	0	0.00	0.00	0.00	0.00	ONE	NO
WS101	1	17/08/2020 13:10:00	GA2000Plus	1003	18*	0	0	0.8	0.7	13.8	13.8	0	0	85.5	0	7.3	0.00	0.06	0.00	0.05	ONE	NO
WS103	1	24/07/2020 09:28:00	GA5000	1019	19*	0	0	0.9	0.2	20.7	20.8	0		79	0	0	0.00	0.00	0.00	0.00	ONE	NO
WS103	1	06/08/2020 13:04:00	GA2000Plus	1013	24*	0	0	0.5	0	19.4	20.1	0	0	79.9	0	0	0.00	0.00	0.00	0.00	ONE	NO

Table comparing cumulative compound concentrations with hazardous waste threshold values

Category of danger		Irritant	Harmful	Toxic	Carcinogenic		Corrosive	Toxic for reproduction		Mutagenic		Ecotoxic		
												ΣN : R50-53/0.25	ΣN : 50-53	ΣN : 50-53
												+ΣN : R51-53/2.5	+ΣN : R50	+ΣN : 51-53
												+ΣN : R52-53/25		+ΣN : 52-53
Risk Phrase		Xi	Xn	T+	T	Carc Cat 1		Repr Cat 1 or		Muta Cat 2		Muta Cat 3		
Contaminant		H4	H5	H6	H6	H7	H7	H8	H8	H10	H10	H11	H11	H14
Highest concentration		(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	H14
Metals														
Arsenic	14.00			0.0018	0.0021	0.0021								0.5044
Beryllium	1.60	0.0004		0.0004	0.0004	0.0004								0.0004
Copper	144.00	0.0360	0.0360											0.0360
Cadmium	0.70		0.0001		0.0001	0.0001								0.0360
Chromium	31.00					0.0050								0.0050
Lead	457.00		0.0493							0.0493	0.0493			0.0493
Mercury	1.00			0.0001										0.0001
Nickel	31.00		0.0039				0.0039			0.0039				0.0039
Selenium	3.00				0.0003									0.0003
Zinc	225.00													0.0280
Vanadium	52.00	0.0076			0.0076					0.0076		0.0076		0.0076
PAH														
Naphthalene	0.10		0.0000											0.0000
Benzo(a)anthracene	0.46				0.0000	0.0000								0.0000
Chrysene	0.45				0.0000	0.0000						0.0000		0.0000
Benzo(b)fluoranthene	0.64				0.0001	0.0001								0.0001
Benzo(k)fluoranthene	0.32				0.0000	0.0000								0.0000
Benzo(a)pyrene	0.55					0.0001				0.0001		0.0001		0.0001
Dibenzo(a,h)anthracene	0.10				0.0000	0.0000								0.0000
TPH														
Hydrocarbon (C6 to C35)	56.00		0.0056			0.0056				0.0000	0.0056			0.0056
Total (or greatest)		0.0441	0.0949	0.0024	0.0108	(0.0056)	(0.0039)	0.0000	0.0000	(0.0493)	(0.0493)	(0.0056)	(0.0000)	0.5044
Threshold		1%	1%	0.10%	3%	0.10%	1%	5%	1%	0.50%	3%	0.10%	1%	1
Exceeded Y/N		N	N	N	N	N	N	N	N	N	N	N	N	N

Title	Table number
Hazard assessment spreadsheet	1 of 1

Landfill Waste Acceptance Criteria

Parameter	Inert waste landfill	Stable non-reactive hazardous waste in non-hazardous landfill	Hazardous waste landfill	Laboratory test data		
				WAC01	WAC02	WAC03
				0	0	0
Parameters determined on the waste						
Total organic carbon (w/w %)	3%	5%	6%*	2.8	0.5	0.4
Loss on ignition			10%*	11.8	2.1	1.8
BTEX (mg kg ⁻¹)	6			< 0.05	< 0.05	< 0.05
PCBs (7 congeners) (mg kg ⁻¹)	1			< 0.1	< 0.1	< 0.1
Mineral oil C ₁₀ - C ₄₀ (mg kg ⁻¹)	500			< 10	< 10	43
PAH (17 congeners)	100			6.2	< 1.7	< 1.7
pH		>6		7.9	7.9	8.1
Acid neutralisation capacity pH 6 (mol kg ⁻¹)		To be evaluated	To be evaluated	< 1	< 1	< 1
Acid neutralisation capacity pH 4 (mol kg ⁻¹)		To be evaluated	To be evaluated			
Limit values (mg kg ⁻¹) for compliance test using BN 12457-3 at L/S 10 l kg ⁻¹						
As (arsenic)	0.5	2	25	< 0.2	< 0.2	< 0.2
Ba (barium)	20	100	300	< 0.1	0.1	0.1
Cd (cadmium)	0.04	1	5	< 0.02	< 0.02	< 0.02
Cr (chromium (total))	0.5	10	70	< 0.20	< 0.20	< 0.20
Cu (Copper)	2	50	100	< 0.5	< 0.5	< 0.5
Hg (mercury)	0.01	0.2	2	< 0.005	< 0.005	< 0.005
Mo (molybdenum)	0.5	10	30	< 0.1	< 0.1	< 0.1
Ni (nickel)	0.4	10	40	< 0.2	< 0.2	< 0.2
Pb (lead)	0.5	10	50	< 0.2	< 0.2	< 0.2
Sb (antimony)	0.06	0.7	5	< 0.05	< 0.05	< 0.05
Se (selenium)	0.1	0.5	7	< 0.05	< 0.05	< 0.05
Zn (zinc)	4	50	200	< 0.2	< 0.2	< 0.2
Cl (chloride)	800	15,000	25,000	87	53	52
F (fluoride)	10	150	500	8.8	7	10
SO ₄ (sulphate)	1000#	20,000	50,000	231	110	40
Total Dissolved Solids (TDS) ⁺	4,000	60,000	100,000	1021	906	841
Phenol index	1			< 0.5	< 0.5	< 0.5
Dissolved organic carbon at own pH or pH 7.5-8.0 [@]	500	800	1000	70.1	92.8	52.4

Primary classification	NON-HAZARDOUS	NON-HAZARDOUS	NON-HAZARDOUS
Secondary classification	INERT	INERT	INERT

Key

* Either TOC or LOI must be used for hazardous waste.

If an inert waste does not meet the SO4 L/S10 limit, alternative limit values of 1500 mg l-1 SO4 at Co (initial eluate from the percolation test (prCEN/TS 14405:2003)) AND 6000 mg kg-1 SO4 at L/S10 (either from the percolation test or batch test BS EN 12457-3), can be used to

+ The value for TDS can be used instead of the values for Cl and SO4.

@ DOC at pH 7.5-8.0 abd L/S10 can be determined or eluate derived from a modified version of the pH dependence Test, prEN 14429, if the limit value at own pH (BS EN 12457 eluate) is not met.

x Stable non-reactive hazardous waste in non-hazardous landfill

Title	Table number
Comparison of test data to landfill waste acceptance criteria (Table 5.1) (Secondary classification)	1 of 1

Basic characterisation schedule for Langley Silt soils

Produced following the requirements of The Landfill (England and Wales) (Amendment)
Regulations 2004 Part 2 (5)

(a) *Source and origin of waste*

Proposed development at Meadow High School, Royal Lane, Uxbridge, UB 8 3QU

(b) *Process producing the waste*

Foundation and service trench excavations / general site clearance

(c) *Statement on waste treatment*

Refer to pre-treatment confirmation form

(d) *Composition of the waste*

Orangish brown or brown mottled grey sandy gravelly CLAY. Gravel of fine to medium flint

(e) *Appearance of the waste*

As above

(f) *European waste catalogue code*

17-05-04 (for non-hazardous waste)

(g) *Hazardous waste properties*

None

(h) *Is the waste prohibited under regulation 9?*

No

(i) *Landfill class*

Inert based on soils being of natural origin and unlikely to be affected by artificial contamination

(j) *Additional precautions required at landfill*

None

(k) *Can waste be recycled or recovered?*

Yes

(l) *Name and address of waste producer*

Galliford Try Construction Ltd, Cowley Business Park, Cowley Rod, Cowley, Uxbridge, Middlesex, UB8 2AL

(m) *Name and address of consultant*

Soiltechnics Limited, Cedar Barn, White Lodge, Walgrave, Northampton. NN6 9PY.

Tel: (01604) 781877

E-mail: mail@soiltechnics.net

Fax: (01604) 781007

Website: www.soiltechnics.net

Schedule Date:

signed

August 2020

Soiltechnics reference:

STS5093-G01

Martin Gill B.Sc. (Hons)., FGS., AMIEnvSc
Geo-environmental Engineer

Basic characterisation schedule for Lynch Hill Gravel

Produced following the requirements of The Landfill (England and Wales) (Amendment)
Regulations 2004 Part 2 (5)

(a) *Source and origin of waste*

Proposed development at Meadow High School, Royal Lane, Uxbridge, UB 8 3QU

(b) *Process producing the waste*

Foundation and service trench excavations

(c) *Statement on waste treatment*

Refer to pre-treatment confirmation form

(d) *Composition of the waste*

Orange brown sand and gravel. Gravel of fine to coarse well rounded flint.

(e) *Appearance of the waste*

As above

(f) *European waste catalogue code*

17-05-04 (for non-hazardous waste)

(g) *Hazardous waste properties*

None

(h) *Is the waste prohibited under regulation 9?*

No

(i) *Landfill class*

Inert based on soils being of natural origin and unlikely to be affected by artificial contamination

(j) *Additional precautions required at landfill*

None

(k) *Can waste be recycled or recovered?*

Yes

(l) *Name and address of waste producer*

Galliford Try Construction Ltd, Cowley Business Park, Cowley Rod, Cowley, Uxbridge, Middlesex, UB8 2AL

(m) *Name and address of consultant*

Soiltechnics Limited, Cedar Barn, White Lodge, Walgrave, Northampton. NN6 9PY.

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Schedule Date:

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August 2020

Soiltechnics reference:

STS5093

Martin Gill B.Sc. (Hons)., FGS., AMIEnvSc
Geo-environmental Engineer

Basic characterisation schedule for Made Ground soils

Produced following the requirements of The Landfill (England and Wales) (Amendment)
Regulations 2004 Part 2 (5)

(a) *Source and origin of waste*

Proposed development at Meadow High School, Royal Lane, Uxbridge, UB8 3QU

(b) *Process producing the waste*

Foundation and service trench excavations / general site clearance

(c) *Statement on waste treatment*

Refer to pre-treatment confirmation form

(d) *Composition of the waste*

Dark grey or brown slightly gravelly sandy clay. Gravel of limestone, flint and brick

(e) *Appearance of the waste*

As above

(f) *European waste catalogue code*

17-05-04 (for non-hazardous waste)

(g) *Hazardous waste properties*

None

(h) *Is the waste prohibited under regulation 9?*

No

(i) *Landfill class*

Inert based on laboratory testing

(j) *Additional precautions required at landfill*

None

(k) *Can waste be recycled or recovered?*

Yes

(l) *Name and address of waste producer*

Galliford Try Construction Ltd, Cowley Business Park, Cowley Road, Cowley, Uxbridge, Middlesex, UB8 2AL

(m) *Name and address of consultant*

Soiltechnics Limited, Cedar Barn, White Lodge, Walgrave, Northampton. NN6 9PY.

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