Geo-Environmental Interpretative Report (GIR) – HS2 Diversion Works - LON-41024 The Greenway Sewer

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1.0 INTRODUCTION

1.1 BACKGROUND AND PROPOSED WORKS

An assessment has been made of the ground conditions and potential geo-environmental issues following completion of two phases of ground investigation at The Greenway, Ickenham, namely Phase 1 and Phase 2. Geotechnical aspects are to be reported separately.

The ground investigations were conducted in relation to the proposed construction of a 527m long and 1200mm internal diameter foul sewer required to mitigate the impacts of the proposed High Speed 2 (HS2) line upon the existing Ruislip Sewer Branch foul sewer (namely Option 4B). The sewer is proposed to be constructed using trenchless techniques, with open excavation for shafts.

The proposed works consist of the following:

- Replacement and diversion of the existing 1143mm concrete sewer with a DN1200mm precast concrete pipe using trenchless pipe jacking technologies.
- Installation of four new manholes, two of which are on the existing 1143mm sewer.
- Abandonment of existing manholes MH9101, MH9011, MH0907 and MH9705. MH9705 will be replaced with the new MH4.

The ground investigation was split into two phases. The first phase of ground investigation (Phase 1) was competed in January / February 2020 and investigated an approximate 250m length of proposed sewer north of the existing Chiltern railway line. This section of sewer is proposed to be constructed at an invert depth of between approximately 8.2m and 8.8m below ground level (bgl) and will include three shafts.

The second phase of ground investigation (Phase 2) investigated the remaining sewer length to the south of the railway line in May / June 2020. This section of sewer is proposed to be constructed at an invert depth of between approximately 10.7m and 11.7m bgl and will include two shafts. The groundwater and ground gas monitoring programme was conducted across all boreholes between June and August 2020.

The Phase 1 ground investigation works have already been reported in a Geo-Environmental Technical Memo (eight20, May 2020), however, for completeness this information has also been included herein along with the monitoring data from these boreholes.

1.2 SITE LOCATION AND LAYOUT

The site is located approximately 500m west of West Ruislip train station in Ickenham at National Grid Reference 508002E 187187N. The new route runs in a southerly direction from a connection to the existing Ruislip Branch sewer located in Ruislip Golf Course, conveying flows in a southerly direction beneath the Chiltern railway mainline embankment, houses and residential gardens of The Greenway before reconnecting with the Ruislip Branch sewer at a connection situated to the west of allotment gardens. The elevation across the north and south of the site varies between 40.85m AoD (Phase 1) and 43.18m AoD (Phase 2).

A plan and section of the proposed new sewer and original shaft locations is reproduced in drawing ref. H582_05-ABTS001304-101-DR-C-0014 dated August 2019 in **Appendix A.1.1**. A Final design Gravity Sewer Settlement Plan shows final shaft locations, drawing ref. H582_05-AB-TS001304-101-DR-C-01 dated February 2020 is also provided in **Appendix A.1.2**.

2.0 SITE SETTING

A Geo-Environmental and Geotechnical desk study was completed for the new sewer scheme in November 2019 and should be read in conjunction with this report (eight2O, 2019). The desk study included a review of all the available geotechnical and geo-environmental data relevant to the proposed solution "Option 4B"; the site history; geology; hydrology; hydrogeology; and potential sources of contamination (PSCs) at the site, namely the railway embankments present since c.1914. The desk study recommended that a ground investigation be undertaken to establish the engineering and groundwater characteristics of the subsurface in the vicinity of the proposed works, in addition to assessing for potential contamination. Key information on the site setting as detailed in the 2019 eight2O desk study is summarised below.

2.1 GEOLOGY

The British Geological Survey (BGS) geological map of the area (BGS, 2005) and online Geology of Britain Viewer (BGS, 2020) shows that the site is underlain by London Clay Formation (firm to very stiff clay and silt, with sand) and Harwich Formation (firm to very stiff clay and silt) over the Lambeth Group (firm to very stiff clay and silt, and dense sand). The Lambeth Group is shown as outcropping to the north and west of the site. All underlain by Chalk at greater depth. No superficial deposits are indicated at the site.

There is no artificial ground shown on the geological map within 250m of the site, though the railway is on an embankment.

2.2 HYDROGEOLOGY

The London Clay Formation is classified as an unproductive stratum, which are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow. The Lambeth Group is classified as a Secondary A Aquifer which are permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. The underlying Chalk is a Principal Aquifer which means it provides a high level of water storage and may support water supply and/or river base flow on a strategic scale. There is no designation for the Harwich Formation, but it is commonly grouped with the London Clay Formation as part of the Thames Group (MAGIC, 2020).

The majority of the proposed sewer diversion is within a merged groundwater Source Protection Zone (SPZ 1, 2 and 3), likely for abstraction from the Chalk. The south-eastern tip of the site beyond the railway line and The Greenway is outside of the SPZ (Groundsure_io, 2020). The site is not located within a Drinking Water Safeguard Zone for Groundwater (Environment Agency, 2020).

2.3 HYDROLOGY

A drain (the Ickenham Canal Feeder) runs through the golf course and is culverted under the railway. Beyond the railway to the south, The Greenway (approximately at the location of house number 111) forms the eastern boundary of the allotments. Manhole 4, where the diversion connects back into the sewer, is located approximately 20m to the west of this channel in the allotment land. The golf course is located within a Drinking Water Safeguard Zone for Surface Water (Environment Agency, 2020).

Structural Soils report that numerous drainage ditches run across the north of the site, with access across provided via small bridges comprising railway sleepers (Structural Soils Ltd, August 2020).

2.4 POTENTIAL SOURCES OF CONTAMINATION (PSCS)

The review of current and historic land uses in the eight2O 2019 desk study identified the railway tracks on an embankment on site since c.1914. Potential contaminants associated with the identified PSC include petroleum hydrocarbons, polycyclic aromatic hydrocarbons (PAHS), metals, polychlorinated biphenyls (PCBs), pesticides and asbestos. In addition, there is a potential for ground gas generation (i.e. methane and carbon dioxide) from the railway embankment. HS2 boreholes suggest Made Ground material may have been used during the development of the golf course to the north of the railway line. No site walkover was completed as part of this scope of work.

2.5 PREVIOUS GROUND INVESTIGATION (HS2 DATA, 2017)

The eight2O 2019 desk study reported on HS2's ground investigation on site and in the vicinity, including one cable percussive borehole ML203-CP009 drilled within the Ruislip golf course, approximately 20m from the proposed sewer route (Fugro, 2017). All other boreholes are considered at too great a distance from the area of proposed works.

Encountered ground conditions in borehole ML203-CP009 comprised 0.50m of Topsoil/Made Ground, over reworked London Clay Formation to 1.80m below ground level (bgl), over London Clay Formation to 3.10m bgl, over Harwich Formation to 5.90m bgl over Lambeth Group to the base of the borehole (10.95m bgl). Groundwater was encountered during drilling 1.55m bgl within the reworked London Clay Formation. One sample of possible reworked London Clay Formation, one sample of Harwich formation and one sample of Lambeth Group (Lower Mottled Clay) were collected and subject to chemical testing. Review of these results showed the following:

- No exceedances of human health soil GACs were detected for a Public Open Space (Parks) scenario.
- Asbestos was not detected in the sample of possible reworked London Clay Formation subject to an asbestos screen.
- Soil leachate tests for metals and total cyanide did not record any exceedances of corresponding groundwater generic assessment criteria (GAC).
- Hazardous properties were not detected in the three soil samples.

Ground gas and groundwater monitoring / sampling was not completed from this borehole. Further detail on the above is presented in the desk study.

3.0 GROUND INVESTIGATION RESULTS AND INTERPRETATION (PHASES 1 AND 2)

3.1 FIELD WORK

Structural Soils Ltd carried out the first phase of ground investigation on land at Ruislip Golf Course (north of the railway line) between the 15th January and 14th February 2020, in accordance with eight2O's Ground Investigation Specification (eight2O, 2019). The ground investigation comprised four cable percussion exploratory holes (BH1 to BH4) sunk to a maximum depth of 23.1m bgl. Boreholes BH1, BH3 and BH4 were positioned to target the three proposed shaft locations.

The second phase of works (BH5 to BH8) was completed on land south of the railway line between the 27th May and 8th June 2020, also in accordance with eight2O's Ground Investigation Specification (eight2O, 2019). The ground investigation comprised four cable percussion exploratory holes (BH5 to BH8) sunk to a maximum depth of 20.67m bgl (BH5). BH5 was drilled in a roadway opposite No. 61 The Greenway, on the eastbound side of the street. The remaining holes were drilled at intervals along a footpath to the south of The Greenway which passes between local allotments and the back of houses lining Oak Avenue. Boreholes BH6 and BH8 were positioned to target the two proposed shaft locations. Proposed boreholes BH9 and BH10, which were to be a shallow borehole for a proposed temporary bridge, were both removed from the works due to accessibility issues. It was considered that sufficient coverage of the site for geotechnical and geo-environmental testing purposes could still be achieved with a reduced number of locations. A revised Ground Investigation Specification was not reissued to reflect this change. A copy of Structural Soils Borehole Location Plan is provided in **Appendix A.1.3**.

Prior to the commencement of any exploratory hole all positions were checked for buried services by a specialist utility surveyor using a cable avoidance tool (CAT), signal generator ('genny'), and ground penetrating radar (GPR). The survey was carried out by RSK SafeGround.

Groundwater and ground gas monitoring was completed on four separate occasions between 15-16th June 2020 and 4th August 2020.

The ground investigation works described above have been reported by Structural Soils Ltd in their combined Phase 1 and Phase 2 Ground Investigation Factual Report (Structural Soils Ltd, August 2020). A copy of this report is provided in **Appendix B.1.1**.

A summary of ground conditions encountered is provided in the Table 1 and following sections below.

3.2 ENCOUNTERED GROUND AND GROUNDWATER CONDITIONS

The encountered ground conditions are in line with the geological conditions as anticipated from the geological maps. It is noted in this area that the Lambeth Group consists of the Undivided Mottled Beds and the Upnor Formation.

In summary, encountered ground conditions within BH1 to BH8 were as follows:

Table 1: Encountered ground conditions in The Greenway GI boreholes 2020

Strata	Typical Description	Structural Soils Investigation (2020)							
		Borehole Reference							
		BH1	BH2	BH3	BH4	BH5	BH6	BH7	BH8
Ground Level (mOD)		+40.92	+40.85	+41.32	+41.48	+42.51	+42.80	+43.20	+43.18
Approximate distance from proposed sewer route (m)		10	10	10	15	10	10	10	10
		Level of top of strata (mOD)							
Made Ground	Topsoil composed of very silty sand with occasional rootlets	+40.92	+40.85	+41.32	+41.48	-	-	-	-
	Asphalt	-	-	-	-	+42.51	-	-	-
	Reinforced concrete	-	-	-	-	+42.46	-	-	-
	Soft to firm Clay with fragments of concrete, asphalt, flint and brick	-	-	-	-	+42.31	-	-	-
	Slightly sandy slightly gravelly SILT	-	-	-	-	-	+42.80	+43.20	+43.18
Reworked London Clay Formation	Variably soft through to very stiff slightly sandy silty gravelly clay with rare nodules of calcrete[1] and roots. Gravel composed of flint	+40.67	+40.80	-	+41.43	-	+42.50 (no gravel)	-	-
Thames Group - London Clay Formation	Very stiff slightly sandy silty brown Clay with occasional nodules/pockets of pyrite, lignite and calcrete[2] and sandy partings	+38.02	+40.35	+40.92	+39.73	+41.71 (noted as soft becoming firm)	+42.30	+42.80 (noted as soft to firm)	+42.78

Strata	Typical Description	Structural Soils Investigation (2020) Borehole Reference BH1	BH2	BH3	BH4	BH5	BH6	BH7	BH8
Thames Group -Harwich Formation	Firm to very stiff slightly sandy clay with shell fragments (occasional to frequent)	+37.52	+37.45	-	-	-	+39.25?? (no shells)	-	-
	Firm slightly sandy gravelly clay with shell fragments. Gravel composed of fine to coarse rounded black flint. Abundant selenite noted in RC007	-	-	Description mixed with overlying LCF	-	-	-	-	-
	Stiff sandy silt	-	+35.90	-	-	+38.51 (noted as soft to firm)	-	-	-
Lambeth Group – Undivided Reading Formation	Firm becoming very stiff mottled silty clay. Sandy in part. Fissured in part, with variably rare to frequent nodules of calcrete and partings	+34.17	+34.25	+38.02	+38.18	+37.51	+38.85	+39.80 (very silty band between 36.2 and 36mOD)	+39.18
	Very stiff very sandy clay	-	-	-	-	-	-	-	-
	Very stiff sandy silt with occasional nodules of calcrete, shells	-	-	+31.92	-	-	-		-
	Very dense Silty Sand	+31.17	+31.10		+30.90	-	+29.80	+30.20	+29.38 (driller notes as "blowing")
	Very stiff fissured mottled Clay with variably rare to frequent extremely week calcrete nodules	+29.62	+30.25	+30.12	+30.80??	-	-	-	-
	Sand, locally silty	+25.92	+29.15	+27.92	+27.98	-	-	-	-
	Very stiff silty clay	-	-	+27.82	-	-	-	-	-
	Very stiff sandy silt thinly laminated	-	-	-	+27.48	-	-	-	-
	Stiff, silty sandy CLAY thinly to thickly interlaminated with fine to coarse sand	-	-	-	-	+27.51	-	-	-
	Very stiff fissured silty clay	+24.57	+25.05	-	+26.88	-	+26.20	+26.00	+24.68

Strata	Typical Description	Structural Soils Investigation (2020)							
		Borehole Reference							
		BH1	BH2	BH3	BH4	BH5	BH6	BH7	BH8
	Silty clayey sand	+22.92	+23.65	-	-	-	-	-	-
	Very stiff silty sandy clay	+21.67	+23.05	-	-	+23.31	-	-	-
	Very dense silty fine to coarse sand	+19.92	+22.65	+25.82	-	-	-	-	-
	Very dense brownish grey silty clay	+19.32	-	+22.57	-	-	-	-	-
Lambeth Group – Upnor Formation (NB Boundary with overlying Mottled Beds is diffuse)	Very stiff thinly laminated grey and black silty glauconitic clay	-	-	-	-	-	-	-	-
	Black gravelly Clay and clayey Gravel.	+18.62	+22.15	+21.32	+24.28	-	+24.70	-	-
White Chalk Subgroup	Very weak medium to high density chalk	+17.92	+21.95	+21.22	+23.98	+22.01	+23.80	+24.00	+23.78
Depth of borehole (m bgl)		23.10 (+17.82)	20.45 (+20.40)	20.95 (+20.37)	17.60 (+23.88)	20.67 (+21.84)	19.10 (+23.70)	19.45 (+23.75)	19.66 (+23.52)
Groundwater depth (m bgl)		• Water struck at 11.0m and rose to 9.0m • Water struck at 15.0m and rose to 8.0m • Water struck at 19.0m and rose to 11.5m	• Struck 9.50m and rose to 6.50m in 20 mins • Overnight with BH at 20.45 water rose to 4.60m	• Seepage at 0.40m • Struck 13.50m and rose to 8.30m in 20 mins • Overnight with BH at 9.0m water rose to 4.10m	• Water struck at 13.50m and noted as standing at approx. 6.80m	• Water struck at 15.00and rose to approximately 13.50m • Water struck at 20.50 and rose to approximately 16.75m	• Water struck at 13.00m but no rise recorded	• Water struck at 10.50 and rose to 8.00m • Water struck at 13.50 and rose to 10.40m	• Water struck at 13.70 and rose to 8.80m

Note: 1 Considered to be claystone and not calcrete
2. Zone of core loss at potential sand horizo

There were no obvious signs of visual or olfactory contamination noted on the borehole logs. The groundwater is typically associated with the sand horizons within the Lambeth Group. The boreholes recorded groundwater to rise between 2 and 8m noted over a period of 20 minutes.

Copies of the borehole logs which provide strata descriptions and further information on groundwater strikes are provided in the Structural Soils factual report in **Appendix B.1.1**.

3.3 BOREHOLE INSTALLATIONS

Standpipes were installed into all boreholes, with the response zones across London Clay Formation (LCF) and Lambeth Group (LG), as detailed in Table 2. Depths to groundwater were measured in each of the monitoring standpipes on up to four occasions (15-16/06/2020, 23/06/2020, 07/07/2020 and 04/08/2020), also summarised in Table 2.

Table 2: Standpipe Installation Response Zone Details and Monitored Groundwater Levels

BH ID	Standpipe Diameter (mm)	Response Zone (m bgl)	Depths to Groundwater range during monitoring (m bgl)
BH1	19	9.75-12.30m (LG)	2.98m* (07/07/2020) to 4.52m bgl* (15/06/2020)
	42	1.00-2.00 (reworked LCF)	0.05m bgl* (07/07/2020 to 2.79m bgl (04/08/2020)
BH2	19	11.70-15.80 (LG)	-0.08m bgl* (15/06/2020) to 3.96m bgl* (04/08/2020)
BH3	19	13.50-17.00 (LG)	3.95m bgl (07/07/2020) to 4.60m bgl (04/08/2020)
BH4	19	13.00-15.00 (LG)	2.00m bgl* (15/06/2020) to 4.40m bgl* (23/06/2020 and 07/07/2020)
BH5	19	15.00-19.00 (LG)	4.97m bgl* (15/06/2020) to 8.35m bgl* (07/07/20)
BH6	19	13.00-16.50 (LG)	3.25m bgl* (07/07/2020) and 4.77m bgl* (04/08/2020)
	42	1.00-5.00 (LCF / LG)	4.50m bgl (07/07/2020) to 4.70m bgl (23/06/2020)
BH7	19	13.00-17.00 (LG)	4.70m bgl* (23/06/2020) to 5.20m bgl* (15/06/2020)
BH8	19	13.50-18.50 (LG)	6.37m bgl* (23/06/2020 and 07/07/2020) to 8.43m bgl* (15/06/2020)
	42	1.00-5.00 (LCF / LG)	1.90m bgl (23/06/2020) to 2.77m bgl (07/07/2020)

*Groundwater risen above response zone

3.4 GEO-ENVIRONMENTAL ASSESSMENT

This section assesses geo-environmental data collected from the boreholes drilled as part of the Phase 1 and Phase 2 ground investigations, in addition to the follow-up groundwater and ground gas monitoring rounds. The laboratory results are provided in **Appendix B.** A Land Quality Results

Screening Summary sheet summarising the results is included as **Appendix C.1.1** along with the Hazardous Properties Assessments in **Appendix C.1.2**.

3.4.1 Soil Analytical Results

3.4.1.1 Geo-Environmental Testing

In total, 13 soil samples collected as part of the Phase 1 and Phase 2 ground investigations were submitted to Envirolab's UKAS accredited laboratories for chemical analyses, comprising two samples of topsoil (BH1 and BH3 from the golf course), four samples of Made Ground, six samples of London Clay and one sample of Lambeth Group.

The samples were subject to the following chemical testing suite for the assessment of contamination:

- Metals (arsenic, boron (water soluble), cadmium, chromium, copper, lead, mercury, nickel, selenium and zinc), pH, sulphate (acid soluble), sulphide, total cyanide, soil organic matter (SOM), total organic carbon (TOC), Loss on Ignition (LoI), total and speciated polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), extractable petroleum hydrocarbons (EPH) C10-C40, benzene, toluene, ethylbenzene and xylenes (BTEX), methyl tertiary butyl ether (MTBE), phenols (phenol, cresols, xylenols and resorcinol) and total moisture.
- Asbestos screening was undertaken on the two samples of Topsoil and four samples of Made Ground.
- Selected samples were subject to pesticides and TPH-CWG testing.

3.4.1.2 Assessment of Potential Risks to Human Health Receptors

To evaluate potential risks to human health receptors (including construction workers and future site users of the golf course and the footpath south of the allotments), the soil analytical results have been assessed against generic assessment criteria (GAC), as follows:

- LQM's and CIEH's Suitable for Use Values (S4ULs) (Nathanail et al, 2015) for a Commercial and Public Open Space (POS) (park) land use assuming a 1% soil organic matter (SOM) value.
- As a S4UL for lead is unavailable, lead has been compared against the respective Defra Category 4 Screening Level (C4SL) for a commercial and POS (park) end use, adopting a 1% SOM value (Defra, 2014).
- There are no current S4ULs, or C4SLs for cyanide, therefore the Stantec-derived GAC based on the former UK guidance on Updated Technical Background to the contaminated land exposure assessment (CLEA) Model (EA, 2009) and Contaminants in Soil: Collation of Toxicological Data and Intake Values for Humans are adopted as the screening values.

No exceedances of the corresponding Commercial or POS (park) S4ULs, C4SL (lead only) or Stantec GAC (total cyanide only) were detected. Asbestos was not detected in the two samples of topsoil and four samples of Made Ground subject to a screen.

Sample deviations were noted during the chemical testing and may affect the results. The laboratory reported the temperature of the cool boxes received on 24/01/2020 as 9.9ºC and 9.6 ºC on samples (BH1 at 0.1-0.2m bgl and BH4 at 0.9-1.0m bgl). Soil samples BH7 at 0.30m and 2.70m bgl, and BH8 at 0.20m bgl are reported to be deviating for exceeding the holding time for sulphide.

3.4.2 Excavated Materials (Waste) Management

The results of the waste classification are summarised in the sections below.

3.4.2.1 Hazardous Properties

Soil analytical results for the 13 soil samples described in Section 3.4.1.1 have been screened for hazardous properties as identified in Technical Guidance WM3 – Waste Classification – Guidance on the classification and assessment of waste (1st Edition 2015) (EA, 2018). This screen was carried out using the Hazwaste Online tool (One Touch Data, 2020). A copy of the HazWasteOnline reports for Phase 1 (BH1 to BH4) and Phase 2 (BH5 to BH8) are provided in **Appendix C.1.2**.

No hazardous properties were detected, i.e. these soil samples are classified as Non-Hazardous for waste disposal purposes.

3.4.2.2 Landfill Waste Acceptance Criteria (WAC) Testing

All 13 soil samples underwent analysis for waste acceptance criteria (WAC) testing to inform on landfill disposal.

The solid suite comprised:

- pH, acid neutralisation capacity (ANC), loss on ignition (LOI), poly-chlorinated biphenyls (PCBs), TPH (mineral oil), total organic carbon (TOC) and Total PAH (WAC-17) and BTEX.

The WAC eluate suite comprised:

- Arsenic, barium, cadmium, chromium, copper, mercury, molybdenum, nickel, lead, antimony, selenium, zinc, chloride, fluoride, sulphate, total dissolved solids (TDS), phenol index and dissolved organic carbon (DOC).

The following exceedances of Inert Waste Landfill Limits were detected, indicating that these soils would require disposal as Non-Hazardous waste:

<u>Lead - Inert limit 0.5 mg/kg</u>

- BH1 (proposed shaft location) at 0.10-0.20m bgl (Topsoil): 0.58 mg/kg

<u>TOC – Inert limit 3%</u>

- BH6 (proposed shaft location) at 0.20m bgl (Made Ground): 3.49%
- BH7 (proposed tunnel location) at 0.30m bgl (proposed shaft location) (Made Ground): 7.55%

<u>Fluoride – Inert limit 10 mg/kg</u>

- BH3 (proposed shaft location) at 0.90-1.00m bgl (London Clay Formation): 10 mg/kg (equals fluoride limit)
- BH7 (proposed tunnel location) at 2.70m bgl (Weathered London Clay Formation): 12 mg/kg
- BH8 (proposed shaft location) at 5.00-5.50m bgl (Lambeth Group): 10 mg/kg (equals fluoride limit)

Note: Given the marginal exceedances of fluoride and that these samples are from natural ground with no further exceedances of other determinands, disposal as Inert waste may be permissible pending the confirmation of the landfill operator.

3.5 GROUNDWATER MONITORING AND SAMPLING

A single groundwater sample was collected from each of the eight monitoring standpipes installed in BH1 to BH8 and subject to chemical testing on the 23rd June 2020[1]. In the dual installation boreholes, a groundwater sample was not collected from BH1 (42mm standpipe, shallow), BH6 (42mm standpipe, shallow) or BH8 (19mm standpipe, deep).

Groundwater samples were tested for the following determinands at Envirolab's UKAS accredited laboratories:

- pH, metals (arsenic, boron, cadmium, chromium, copper, lead, mercury, nickel, selenium, zinc), total sulphur as sulphate, ammoniacal nitrogen, sulphide, chloride, phenols (total phenols), cyanide (free and total), PAH (USEPA 16), total and speciated TPH and BTEX.
- Two samples were tested for volatile organic compounds (VOCs) (BH4 and BH5 positioned closest to the railway line).
- Three samples were tested for pesticides (BH2 within the golf course, BH4 close to the railway and BH7 close to the allotments).

The groundwater results have been compared against both Default EQS for Groundwater GAC[2] (due to the underlying Secondary A Aquifer (Lambeth Group) and merged groundwater SPZ 1 (SPZ 1, 2 and 3), and Groundwater Inland Surface Water Receptor GAC[3] (due to a drain and Ickenham Canal Feeder, running through the golf course and under the railway).

Exceedances of Default EQS for Groundwater

The following exceedances of the Default EQS for Groundwater GAC[4] were detected:

- Nickel in BH8 (42mm standpipe, shallow): 42 µg/l (GAC 15 µg/l)
- Sulphate in BH7 (19mm standpipe, deep): 320,000 µg/l (GAC 250,000 µg/l)

TPH compounds detected at concentrations above the GAC of 10 µg/l in groundwater are summarised in Table 3.

[1] Samples were retrieved on 23/06/2020. A 1 litre glass bottle of groundwater from both BH2 and BH3 smashed during transit; the EPH testing on these two samples could not be completed. A second groundwater sample was retrieved on the 7th July 2020 from each location and subject to EPH testing.
[2] Default Environmental Quality Standards (EQS) for Groundwater GAC derived from Water Supply (Water Quality) Regulations 1989, UKTAG (2013) and Drinking Water Standard (DWS) (2000) Regulations.
[3] Groundwater Inland Water Receptor (short term) standards derived by EU WFD 2015 and UK TAG 2013.
[4] The laboratory MDL's exceeded the Default EQS GAC for Groundwater for mercury, cadmium, benzene, selected VOCs and pesticides.

Table 3: Exceedances of Default EQS for Groundwater GAC for TPH (10 µg/l) in Groundwater

	BH1	**BH2**	**BH3**	**BH4**	**BH5**	**BH6**
	19mm deep	19mm deep	19mm deep	19mm deep	19mm deep	19mm deep
TPH Compounds	**Concentration (µg/l)**					
TPH Aromatic >C_8-C_{10}	17	51	**214**	**297**	<5	**10**
TPH Aromatic >C_{10}-C_{12}	7	**37**	**161**	**219**	<5	9
TPH Aromatic >C_{12}-C_{16}	9	**33**	**19**	**36**	<5	**11**
TPH Aromatic >C_{16}-C_{21}	9	**32**	**14**	**14**	6	9
TPH Aromatic >C_{21}-C_{35}	**20**	**39**	**38**	**14**	<10	<10
TPH Aliphatic >C_8-C_{10}	**14**	8	**149**	**220**	<5	<5
TPH Aliphatic >C_{10}-C_{12}	<5	<5	**122**	**53**	<5	<5
TPH Aliphatic >C_{21}-C_{34}	<5	**11**	**97**	**19**	<5	<5
Total Aro/Ali >C_5-C_{35}	**76**	**211**	**828**	**874**	**12**	**54**

Bold: Concentration exceeds the Default EQS GAC of 10 µg/l.

Exceedances of the Groundwater Inland Surface Water Receptor GAC

The following exceedances of the Groundwater Inland Surface Water Receptor GAC[5] were detected:

- Nickel in BH8 (42mm standpipe): 42 µg/l (GAC 34 µg/l)

No other exceedances of the groundwater GAC were detected in the samples. Concentrations of pesticides were not detected above the laboratory method detection limit (MDL) in the three samples subject to analysis (BH2, BH4 and BH7). Furthermore, with the exception of carbon disulphide detected at 1 µg/l in the groundwater of BH4, no VOC compounds were detected above the laboratory MDL in the two samples subject to this analysis (BH2 and BH4).

[5] The laboratory MDL for mercury in groundwater (0.1 µg/l) exceeded the Groundwater Inland Surface Water Receptor GAC of 0.07 µg/l. The MDL for benzo(g,h,i)perylene in groundwater (0.01 µg/l) exceeded the Groundwater Inland Surface Water Receptor GAC of 0.0082 µg/l. These may not be true exceedances and therefore have not been included as such above.

Note: Groundwater sample BH2 collected on 7th July 2020 is reported to be deviating as a HNO_3 preserved bottle was not provided. This may have affected the results for dissolved metals.

3.6 GROUND GAS MONITORING DATA

Ground gas and vapour concentrations were measured from each of the standpipes installed in BH1 to BH8 (response zones in London Clay Formation (LCF) and Lambeth Group (LG)) on four separate occasions (16/06/2020, 23/06/2020, 07/07/2020 and 04/08/2020). An infrared gas meter was used to measure concentrations of carbon dioxide, methane and oxygen in percentage by volume, whilst hydrogen sulphide and carbon monoxide were recorded in parts per million. Initial and steady state concentrations were recorded. An integral flow meter was used to measure borehole flow rates (initial and steady state) in litres per hour (l/hr). In addition, the atmospheric pressure before and during monitoring. The results are summarised in Table 4.

Table 4: Summary of Gas Monitoring Data Results (revised data issued 23/09/2020)

BH ID	Response Zone	Max. Methane	Max. Carbon Dioxide	Min. Oxygen	Max. Hydrogen Sulphide	Max. Carbon Monoxide	Max. PID reading	Max. Gas Flow
	(m bgl)	(% vol)	(% vol)	(% vol)	(ppm)	(ppm)	(ppm)	(l/hr)
Boreholes north of the railway								
BH1 (19mm)	9.75-12.30m (LG)	**0.2** (04/08/20)	1.0 (16/06/20)	15.1 (16/06/20)	0.0 (all occasions)	27.0 (16/06/20)	0.0 (all occasions)	**8.4** (23/06/20)
BH1 (42mm)	1.00-2.00 (reworked LCF)	0.0 (all occasions)	0.5 (04/08/20)	20.3 (04/08/20)	0.0 (all occasions)	4.0 (23/06/20)	0.0 (all occasions)	1.5 (04/08/20)
BH2 (19mm)	11.70-15.80 (LG)	0.0 (all occasions)	0.6 (04/08/20)	8.1 (04/08/20)	**3.0** (16/06/20)	**435** (16/06/20)	1.5 (04/08/2020)	0.0 (all occasions)
BH3 (19mm)[1]	13.50-17.00 (LG)	0.0 (all occasions)	0.1 (07/07/20 & 04/08/20)	20.2 (23/06/20)	1.0 (23/06/20)	6.0 (23/06/20)	0.0 (all occasions)	0.2 (07/07/20)
BH4 (19mm)[2]	13.00-15.00 (LG)	0.0 (all occasions)	0.1 (07/07/20)	20.8 (23/06/20	0.0 (all occasions)	3.0 (23/06/20 & 04/08/20)	0.0 (all occasions)	0.2 (07/07/20)
Boreholes south of the railway								
BH5 (19mm)[3]	15.00-19.00 (LG)	0.0 (all occasions)	0.4 (04/08/20)	19.5 (07/07/20)	2.0 (04/08/20)	324.0 (04/08/20)	**14.4 (04/08/20)**	4.6 (07/07/20)
BH6 (19mm)	13.00-16.50 (LG)	0.0 (all occasions)	0.2 (23/06/20 & 07/07/2020)	19.5 (07/07/20)	1.0 (23/06/20 & 07/07/20)	191.0 (23/06/20)	0.0 (all occasions)	2.1 (23/06/20)
BH6 (42mm)	1.00-5.00 (LCF / LG)	0.1 (16/06/20)	5.8 (07/07/20)	9.5 (23/06/20)	0.0 (all occasions)	33.0 (16/06/20)	0.0 (all occasions)	0.2 (07/07/20 & 04/08/20)
BH7 (19mm)	13.00-17.00 (LG)	0.0 (all occasions)	0.5 (04/08/20)	16.8 (23/06/20)	0.0 (all occasions)	286.0 (16/06/20)	0.0 (all occasions)	0.0 (all occasions)
BH8 (19mm)	13.50-18.50 (LG)	0.1 (all occasions)	0.1 (23/06/20)	20.9 (23/06/20)	0.0 (all occasions)	59.0 (16/06/20)	0.0 (all occasions)	0.1 (23/06/20, & 04/08/20)
BH8 (42mm)	1.00-5.00 (LCF / LG)	0.0 (all occasions)	**6.5 (04/08/20)**	**0.2 (07/07/20)**	**3.0 (16/06/20)**	5.0 (07/07/20)	0.0 (all occasions)	0.1 (07/07/20)

Bold: Max concentration of all standpipes monitored across the site.
Date: Monitoring round the highest concentration was detected.
Readings of 0.0% or 0ppm recorded by Structural Soils (i.e. not monitoring equipment MDL).
[1] Remark made in Structural Soils Factual report - no gas monitoring on 16/06/20 at BH3 (19mm) due to removal of bung and pipe silted up
[2] Remark made in Structural Soils Factual report - no gas monitoring on 16/06/20 at BH4 (19mm) due to damaged bung
[3] Remark made in Structural Soils Factual report - no gas monitoring on 16/06/20 at BH5 (19mm) has headworks were flooded

In summary, the gas data shows:

- Detectable concentrations of carbon dioxide in all monitoring standpipes, with a maximum concentration of 6.5% vol in BH8 (42mm standpipe, shallow), coupled with a very low oxygen concentration of 0.2% vol in BH8 (42mm standpipe, shallow).
- Low oxygen concentrations (<20% vol) were detected in all standpipes except for BH1 (42mm standpipe, shallow), BH3 (19mm standpipe, deep), BH4 (19mm standpipe, deep) and BH8 (19mm standpipe, deep).
- Methane concentrations were recorded below detection limit in the majority of all standpipes with a maximum concentration of 0.2% vol in BH1 (19mm standpipe, deep).
- Carbon monoxide was detected at a maximum concentration of 435ppm in BH2 (19mm standpipe, deep), with other significant maximum concentrations of 324ppm in BH5 (19mm standpipe, deep), 286ppm in BH7 (19mm standpipe, deep) and 191 ppm in BH6 (19mm standpipe, deep) also detected[6]. The results show that the concentrations remained high in BH5 (19mm) and BH7 (19mm) during all monitoring rounds. It is noted that although the maximum concentration of 435ppm was detected in BH2, the concentration range during the other 3 monitoring rounds was between 3ppm and 40 ppm.
- Hydrogen sulphide concentrations ranged between 0ppm and a maximum detectable concentration of 3ppm in BH8 (42mm standpipe, shallow) and BH2 (19mm, deep) detected at both locations on the first monitoring round (16/06/20).
- Vapour readings, measured using a photoioniser detector (PID), were detected at a maximum concentration of 14.4 ppm in BH5 (19mm standpipe, deep).
- The maximum gas flow readings were 8.4 l/hr in BH1 (19mm standpipe, deep) on 23rd June 2020, 4.6 l/hr and 2.6 l/hr in BH5 (19mm standpipe, deep) on the 7h July 2020 and 4th August 2020 respectively, and 1.5 l/hr in BH1 (42 mm standpipe, shallow) on the 4th August 2020. Gas flow readings on other monitoring occasions from these and other standpipes did not exceed 0.2 l/hr. A notable negative flow of -3.3 l/hr was detected in BH8 (42mm standpipe) on one occasion.
- Atmospheric pressure ranged between 1,009 mB (16/06/2020) to 1,021mB (23/06/2020) over the course of the four monitoring events.

The presence of carbon dioxide, methane, hydrogen sulphide, very low oxygen and carbon monoxide in additional to occasional detectable gas flow readings requires health and safety measures to be in place to mitigate risks to groundworkers during construction (see Section 4.1.2 for further details).Further monitoring would be recommended to confirm the gas concentrations at these locations.

[6] Stantec queried the unusually high carbon monoxide results with Structural Soils who confirmed that the gas monitoring device was calibrated before each monitoring event. Following this query, the results of the field gas monitoring data have been updated and revised by Structural Soils on 23 September 2020. These revised results are presented in **Appendix B1.3** and supersede the results in the Structural Soils Factual Report (**Appendix B1.1**).

4.0 GEO-ENVIRONMENTAL CONSIDERATIONS FOR CONSTRUCTION

4.1 HEALTH AND SAFETY CONSIDERATIONS FOR GROUNDWORKERS

4.1.1 Watching Brief for Contamination

As detailed in Section 3.4.1, no exceedances of the corresponding commercial S4ULs, C4SL (lead only) or Stantec GAC (total and free cyanide only) for a commercial site or public open space (POS) (Park) site were detected in soils sampled. Furthermore, asbestos was not identified. Hazardous properties (for waste classification) were not detected in any of the soil samples.

Appropriate tool-box talks and safe working practices should be adopted. A watching brief should be maintained throughout construction. Should visual and/ or olfactory indicators of contamination be encountered (including potential asbestos containing materials (ACMs)) works should cease in that area and advice sought from a suitably qualified Geo-Environmental Engineer in accordance with the Client's guidelines / good practice. A Geo-Environmental Engineer should be contacted to assess if further testing is required.

4.1.2 Ground Gas

Detectable concentrations of ground gases (maximum concentrations of 6.5% vol carbon dioxide and 0.2% vol methane) coupled the presence of low oxygen (minimum concentration 0.2% vol) were recorded within the proposed works area. Carbon monoxide, a poisonous gas, was detected in several boreholes at concentrations of up to 435 ppm. Hydrogen sulphide (maximum concentration of 3ppm) and vapours (maximum concentration of 14.4ppm) were also detected. The sources of these ground gases cannot be attributed to a likely source although may be associated with the artesian conditions in the standpipes. A pattern of occurrence or distribution of ground gas concentrations has not been identified from the data set thus far.

To provide a better understanding of the ground gas regime, in particular in relation to the presence of carbon monoxide and risks to ground workers, it is recommended that an additional three rounds of ground gas monitoring be completed from the standpipes prior to construction and assessed.

During construction, suitable risk assessments, method statements and ground gas monitoring using a monitoring device with alarm must be carried out. The Principal Contractor's Health and Safety Plan should address the potential ground gas risks.

Ground gas monitoring (including detection of carbon monoxide) must be undertaken during construction by a competent person using a calibrated and tested ground gas monitor with audible and visual alarm for protection of the groundworkers. Special requirements will likely be necessary if working in confined spaces.

4.2 EXCAVATED MATERIALS (WASTE) MANAGEMENT

4.2.1 Hazardous Properties

As detailed in Section 3.4.2.1, soil samples across the site did not record any determinands at concentrations in excess of corresponding hazardous properties thresholds and are therefore classified as Non-Hazardous.

4.2.2 Landfill Disposal

A review of the WAC data, as detailed in Section 3.4.2.2 indicates that the majority of soils would likely be suitable for disposal as Inert waste. The following soils would require disposal at a Non-Hazardous waste landfill, unless additional testing and statistical analysis is undertaken to prove otherwise; Shallow Made Ground from the areas of BH6 and BH7 (south of the railway) due to concentrations of TOC above the Inert waste landfill limits, and Topsoil from BH1 (north of the railway) due to a concentration of lead marginally above the Inert waste landfill limit.

Three samples of natural soils equalled or marginally exceeded the Inert waste landfill limit of 10 mg/kg for fluoride. However, given the samples are from natural ground with no further exceedances of other determinands, disposal as Inert waste may be permissible pending the confirmation of the landfill operator.

Suitability of waste for disposal at a facility should always be confirmed with the facility operator in advance.

4.2.3 Excavated Material Re-use

It is understood that there is no intention for material to be re-used on site as a viable re-use option has not been identified. Re-use of excavated soil on site may require further soil testing and risk assessment to confirm suitability.

If any surplus material is to be removed off-site it may be possible to re-use these on another site under a Permit or by applying the CL:AIRE Code of Practice, with savings in disposal costs. The re-use of inert waste as an aggregate is also possible when following an Environment Agency Quality Protocol.

4.3 DEWATERING

Groundwater is likely to be encountered in sand horizons within the Lambeth Group given the artesian conditions recorded during the GI and in the monitoring wells. Where groundwater is encountered during the works, the corresponding chemical analysis for BH1 to BH8 detailed herein should be sent to the responsible authority / wastewater undertaker to agree which disposal route (e.g. storm drains to surface waters / sewers) would be permitted. It is noted that hydrocarbons were detected in the majority of groundwater samples at concentrations that may pose a risk to controlled water receptors.

5.0 REFERENCES

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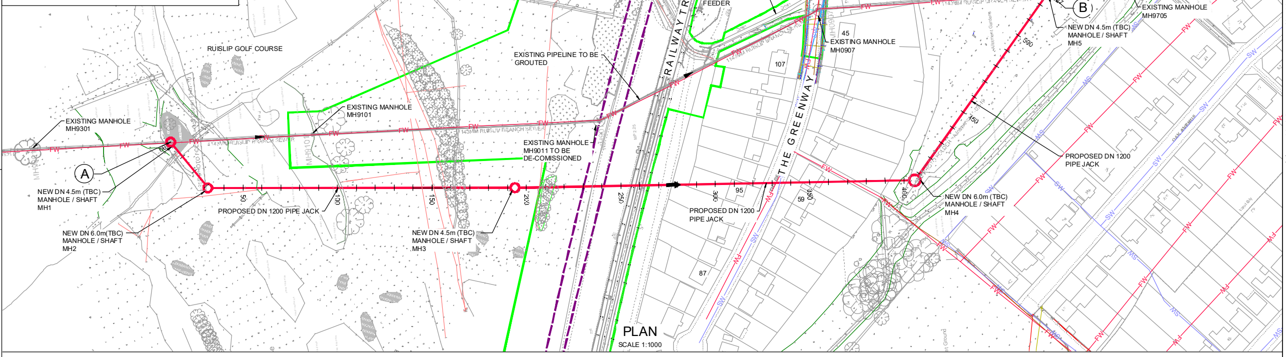
APPENDICES

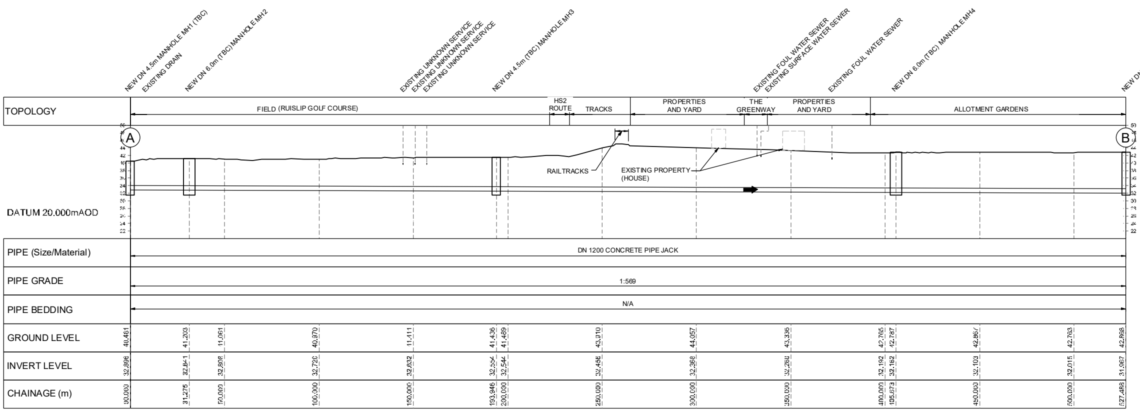
Appendix A - FIGURES

A.1.1 Plan and Section of the Proposed New Sewer and Original Shaft Location Reproduced in Drawing ref. H582_05-ABTS001304-101-DR-C-0014 dated August 2019.

DISCLAIMER

THE INFORMATION CONTAINED ON THIS DRAWING HAS BEEN COMPILED DURING THE COURSE OF THE DESIGN AND IS OFFERED TO ASSIST THE CONTRACTOR IN THE PLANNING AND CONSTRUCTION OF THE WORK. MUCH OF THE INFORMATION HAS BEEN COMPILED FROM DATA RECEIVED FROM UTILITY COMPANIES AND OTHER BODIES AND HAS NOT BEEN CHECKED. THERE COULD BE ERRORS IN THE DATA RECEIVED OR IN THE INTERPRETATION OF THE DATA WHEN TRANSFERRING IT TO THIS DRAWING. UP TO DATE UTILITIES DRAWINGS MUST BE OBTAINED BY THE CONTRACTOR FROM THE UTILITIES SUPPLIER.





PIPELINE PROFILE

SCALE : (HORIZONTAL 1:1000 AND VERTICAL 1:500)

DO NOT SCALE - IF IN DOUBT ASK

CLEARWATER COURT
VASTERN ROAD
READING
RG1 8DB

NOTES
1. ALL DIMENSIONS IN MILLIMETRES AND ALL LEVELS IN METRES UNLESS SHOWN OTHERWISE.
2. HS2 DETAILS AVAILABLE FOR NETWORK RAIL, PORTAL AND HYBRID BILL WORKING AREAS ARE NOT GEO REFERENCED AND ARE TO BE CONFIRMED BY HS2 DESIGNERS.

REFERENCES

H582_05-AB-TS001304-101-DR-C-0013 OPTION 4B DIVERSION SEWER

LEGEND

INDICATIVE HS2 LINE
PROPOSED SOLUTION - OPTION 4B
EXISTING FOUL WATER SEWER
EXISTING SURFACE WATER SEWER
HYBRID BILL LIMITS
PROPOSED MANHOLE / SHAFT
EXISTING MANHOLES
FLOW DIRECTION
PROPOSED FLOW DIRECTION

SCALE 1 : 500
SCALE 1 : 1000

NOT FOR CONSTRUCTION

CURRENT REVISION INFORMATION
-

Revision	Status	Suitability Description	Authored	Checked	Reviewed	Date
P01	S2	For Information	VD	MT	BW	13.03.19

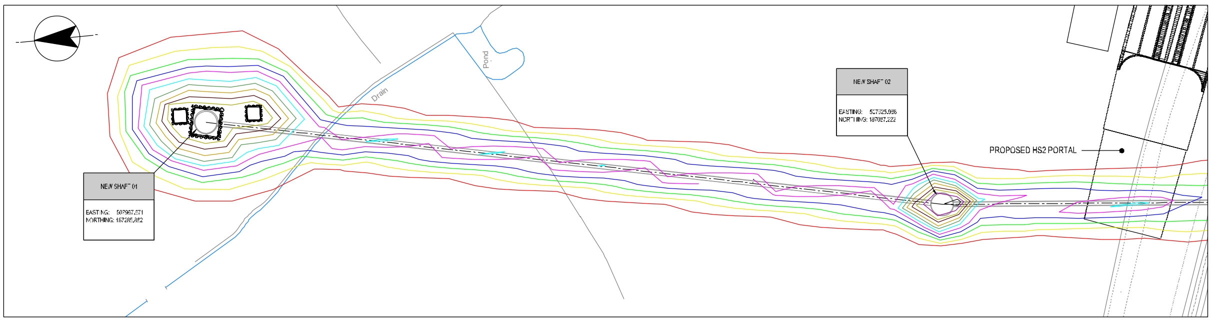
Thames Water Utilities

Clearwater Court
Vastern Road, Reading RG1 8DB

Location Code: TS001304
OS Reference: TQ0787
Security Reference: UBR
Project Group: WWI
Sub Process: N/A
Location/Town: THE GREENWAY, ICKENHAM, UXBRIDGE, UB10 8LS.
Site Name: TS001304 - RUISLIP_BR_TS001
Project Name: H582_05 - GREENWAY
Drawing Title: OPTION 4B DIVERSION SEWER PLAN AND PIPELINE PROFILE
Scale: AS SHOWN
Sheet Size: A1
Status: S2
Drawing Number: H582_05-AB-TS001304-101-DR-C-0014
Revision: P01

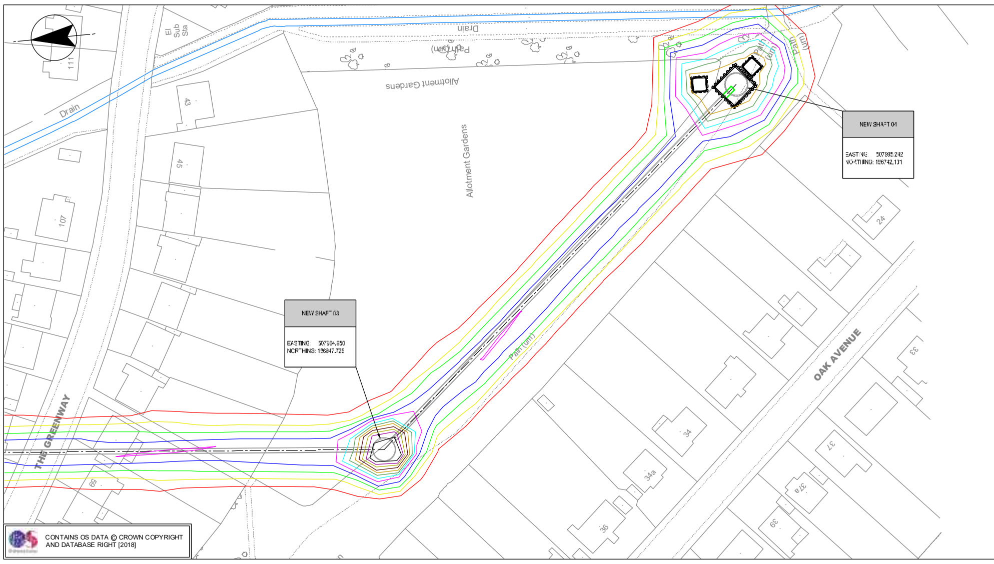
A.1.2 Final design Gravity Sewer Settlement Plan shows final shaft locations, drawing ref. H582_05-AB-TS001304-101-DR-C-01 dated February 2020.

1 | 2 | 3 | 4 | 5 | 6



PREDICTED SETTLEMENT CONTOUR PLAN (MH01 - MH02)

SCALE 1:500



KEY

1mm SETTLEMENT
2mm SETTLEMENT
3mm SETTLEMENT
4mm SETTLEMENT
5mm SETTLEMENT
6mm SETTLEMENT
7mm SETTLEMENT
8mm SETTLEMENT
9mm SETTLEMENT
10mm SETTLEMENT
11mm SETTLEMENT
12mm SETTLEMENT

SIGNIFICANT DESIGNER'S IDENTIFIED HAZARDS	
HAZ01	STRIKING BURIED SERVICES
HAZ03	UNKNOWN GROUND CONDITIONS
HAZ15	IMPACT ON TRACK GEOMETRY LEADING TO INCREASED RISK OF SETTLEMENT AND TO TUNNELING INDUCED SETTLEMENT AND / OR HEAVE
HAZ16	DAMAGE TO EXISTING INFRASTRUCTURE DUE TO INAPPROPRIATE METHOD OF CONSTRUCTION
HAZ17	COLLAPSE OF TUNNEL FACE
HAZ18	OBSTRUCTIONS IN THE TUNNEL HORIZON
HAZ19	HEAVE OF NEW SEWER DUE TO FUTURE REMOVAL OF OVERBURDEN (IF TOPOGRAPHY IS AMENDED)
HAZ20	BUILDING DAMAGE DUE TO SETTLEMENT INDUCED TUNNELING (IN GREENWAY)

- FOR MORE DETAILED INFORMATION ON THE HIGHLIGHTED HAZARDS, REFER TO COWI UK LIMITED DESIGNER'S RISK ASSESSMENT FOR THIS PROJECT.
- 'EVERYDAY' LOW RISK HAZARDS AND THOSE HAZARDS WHICH SHOULD BE OBVIOUS TO A COMPETENT CONTRACTOR HAVE NOT BEEN INDICATED ON THIS DRAWING.
- SHOULD ANY ADDITIONAL HAZARDS BE IDENTIFIED DURING THE COURSE OF THE WORKS, THE CONTRACTOR SHALL NOTIFY ALL RELEVANT MEMBERS OF THE PROJECT TEAM.

PREDICTED SETTLEMENT CONTOUR PLAN (MH03 - MH04)

SCALE 1:500

10m 0 10m 20m 30m 40m 50m

Scale 1:500

DO NOT SCALE - IF IN DOUBT ASK

CLEARWATER COURT
VASTERN ROAD
READING
RG1 8DB

NOTES

1. ALL DIMENSIONS IN MILLIMETRES AND ALL LEVELS IN METRES RELATING TO ORDNANCE DATUM UNLESS SHOWN OTHERWISE
2. DO NOT SCALE FROM THIS DRAWING.
   DO NOT TAKE DIGITAL DIMENSIONS OFF THIS DRAWING WORK TO FIGURED DIMENSIONS ONLY - IF IN DOUBT ASK!
3. HS2 DETAILS AVAILABLE FOR NETWORK RAIL, PORTAL AND HYBRID BILL WORKING AREAS ARE NOT GEO REFERENCED AND ARE TO BE CONFIRMED BY HS2 DESIGNERS.
4. ALL WORKS CARRIED OUT IN ACCORDANCE WITH THE FOLLOWING DOCUMENTS:-
   - AM-DES-CIV-C01-SEC1 CIVIL DESIGN STANDARD. THAMES WATER UTILITIES LTD.
   - AM-DES-CIV-C03-SEC1 TUNNELLING DESIGN STANDARD. THAMES WATER UTILITIES LTD.
   - AM-DES-CIV-C04-SEC1 TUNNELLING SPECIFICATION. THAMES WATER UTILITIES LTD.
   - THE SPECIFICATION FOR TUNNELLING BTS & ICE 2015
   - BS 6164 : 2011 : CODE OF PRACTICE FOR HEALTH & SAFETY IN TUNNELLING IN THE CONSTRUCTION INDUSTRY
   - CESWI 7th EDITION
   - THE REQUIREMENTS OF SEWERS FOR ADOPTION, 7TH EDITION
5. FOR CONSTRUCTION METHODOLOGY, REFER TO THE CONTRACTOR'S SPECIFIC METHOD STATEMENT FOR THE WORKS
6. THE CONTRACTOR IS TO CONFIRM ALL LEVELS AND SETTING OUT PRIOR TO COMMENCEMENT OF THE WORKS
7. TOPOGRAPHICAL SURVEY INFORMATION WAS BASED ON LIDAR DATA COURTESY OF THE ENVIRONMENT AGENCY AND A PROPOSED GROUND MODEL PROVIDED BY STANTEC.
8. THE UNDERGROUND SERVICES INFORMATION HAS BEEN PROVIDED BY STANTEC. THE DERIVATION OF THIS INFORMATION IS UNKNOWN AT THIS TIME. COWI ACCEPTS NO LIABILITY WITH REGARDS TO THE ACCURACY OF THE INFORMATION. CONTRACTOR TO VERIFY THIS INFORMATION PRIOR TO COMMENCEMENT OF WORKS.
9. FINAL GROUND LEVELS IN THE GOLF COURSE AND AROUND THE HS2 TUNNEL PORTAL STRUCTURE ARE TO BE CONFIRMED BY HS2
10. FOR GEOLOGICAL LONGITUDINAL SECTION REFER TO DRG: H582_05-AB-TS001304-101-DR-C-0104
11. SETTLEMENT CONTOURS FOR THE PIPE JACK ARE BASED ON A VOLUME LOSS OF 3.5% AND A BORE DIAMETER OF 1456mm
12. SETTLEMENT CONTOURS FOR THE PIT ARE BASED ON A α VALUE OF 0.006 (BASED ON CONSTRUCTION IN STIFF CLAY) AND ADDRESSED USING: NEW & BOWERS (1994) - PITS, O' REILLY AND NEW (1982) AND O'REILLY (1991) BORES
13. SETTLEMENTS HAVE BEEN ESTIMATED BT EMPIRICAL METHOD AND ASSUMED PARAMETERS. ACTUAL SETTLEMENT MAY VARY SIGNIFICANTLY
14. MONITORING FREQUENCY AND TRIGGER LEVELS TO BE PREPARED BY OTHERS

NOT FOR CONSTRUCTION

CURRENT REVISION INFORMATION

Revision	Status	Revision Description	Authored	Checked	Reviewed	Date
P01	S1	ISSUED FOR APPROVAL	TEMO	PAEI	KEMS	14.03.2020

Thames Water Utilities

Clearwater Court
Vastern Road, Reading RG1 8DB

Location Code: TS001304	OS Reference: TQ0787	Security Reference: UBR
Project Group: WWI	Sub Process: N/A	
Location/Town: THE GREENWAY, ICKENHAM, UXBRIDGE, UB10 8LS.		
Site Name: TS001304 - RUISLIP_BR_TS001		
Project Name: H582_05 - GREENWAY		
Drawing Title: GRAVITY SEWER SETTLEMENT PLAN SHEET 1 OF 2		
Scale: AS SHOWN	Sheet Size: A1	Status: S1
Drawing Number: H582_05-AB-TS001304-101-DR-C-0101		Revision: P01

A.1.3 Structural Soils Borehole Location Plan

LEGEND

Borehole Location

REV	DATE	DESCRIPTION	BY	CHD	APR
00	25.02.2020	-	NP	GJ	-

DIMENSION	SCALE	ORIGIN SIZE
m	1:4000	A4

STRUCTURAL SOILS

The Old School
Stillhouse Lane
Bedminster
Bristol BS3 4EB

Tel: 0117 947 1000
ask@soils.co.uk
www.soils.co.uk

CLIENT

SMB JV

PROJECT

Greenway

TITLE

EXPLORATORY HOLE LOCATION PLAN

JOB NO	FIGURE
563166	2
DRAWING STATUS	REV
-	00

SCALE BAR

0 40 80 120 160 200m

APPENDIX B - FACTUAL GI REPORTS

B.1.1 Structural Soils Ltd Factual Report on Ground Investigation, August 2020

The Greenway

Factual Report on Ground Investigation

Report No: 563166-01 (03)

Client: SMB JV

AUGUST 2020

STRUCTURAL SOILS LTD

DOCUMENT ISSUE RECORD

Project No.:	563166
Report No.:	563166-01 (03)
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REVISION RECORD

Revision	Date	Description of revisions	Prepared by
00	19/03/2020	Draft (BH4 testing incomplete)	GRJ
01	29/04/2020	Complete draft	TP
02	21/07/2020	Draft Inclusion of Phase 2 works	SAJ
03	14/08/2020	Draft including monitoring	GRJ

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CONTENTS

1 INTRODUCTION

This investigation was carried out by Structural Soils Ltd (SSL) on the instructions and on behalf of SMB JV (the Client) at the site of The Greenway, near Ruislip. The purpose of the work was to obtain geotechnical and geoenvironmental information to assist with the design and construction of a diversion for the West Ruislip Sewer.

The works included cable percussive drilling, laboratory testing and the preparation of this report. The report contains a description of the site and the works carried out, the exploratory hole logs, in-situ and laboratory testing results.

The ground investigation has been carried out in accordance with the contract specification, and the general requirements of BS 5930:2015, BS 10175:2011+A2:2017, BS EN 1997-2 (2007), BS EN ISO 22475-1 (2006) and other relevant standards as identified below.

This report presents the factual records of the fieldwork carried out and laboratory testing. Whilst every attempt is made to record full details of the strata encountered in the exploratory holes, techniques of hole formation and sampling will inevitably lead to disturbance, mixing or loss of material in some soils and rocks. All information given in this report is based on the ground conditions encountered during the site work, and on the results of laboratory and field tests performed during the investigation. However, there may be conditions at the site that have not been taken into account, such as unpredictable soil strata, contaminant concentrations, and water conditions between or below exploratory holes.

This report was prepared by SSL for the sole and exclusive use of SMB JV in response to particular instructions. Any other parties using the information contained in this report do so at their own risk and any duty of care to those parties is excluded. No liability will be accepted after a period of 6 years from the date of the report.

2 SITE DESCRIPTION

2.1 Location and Topography

The site is divided into 2 distinct areas which will be undertaken in separate phases;

Phase 1 covers the northern section of the site which is located on the West Ruislip Golf Course.

Phase 2 is approximately 400 m to the south of the northern area, with the Chiltern Main Line which runs south east to north west bisecting the two site areas. This area comprises an allotment area, and the residential road, the Greenway.

This report covers both Phase 1 and the Phase 2 sites (see Site Location Map in Appendix A). The British National Grid References of Phase 1 and Phase 2 sits are TQ 077872, and TQ 079867 respectively.

Phase 1 site is approximately 50 m by 200 m in size (see Exploratory Hole Location Plan in Appendix A). The site is predominantly level, with clusters and linear areas of copse, including established trees separating the golf course greens. Numerous drainage ditches run across the site, with access across provided via small bridges comprised of railway sleepers, some of which were observed to be in state of disrepair. The area is bounded to the south by the Chiltern Main Line. To the north, east and west by the golf course. There is public access across the entire site, which is popular with dog walkers.

Phase 2 site is located to the south of the Phase 1 site on the opposite side of the Chiltern Main Line. BH5 is located opposite No. 61 on The Greenway, on the eastbound side of the street. The remaining holes are located at intervals along the footpath to the south of The Greenway which passes between the local allotments and the back of houses lining Oak Avenue.

The elevation across the two sites varies between 40.85m AoD (in BH2) and 43.18m AoD (in BH8).

2.2 Geology

Information on the geology of the site was obtained from the following sources published by the British Geological Survey (BGS):

- BGS map (sheet 255, scale 1:50,000, published 2005).
- The BGS digital geology map, which utilises the most up to date names for geological units (www.bgs.ac.uk/data).
- The BGS Lexicon of Named Rock Units, which provides typical descriptions for most geological units (www.bgs.ac.uk/lexicon).

The site is shown to be underlain by the following descending sequence of strata:

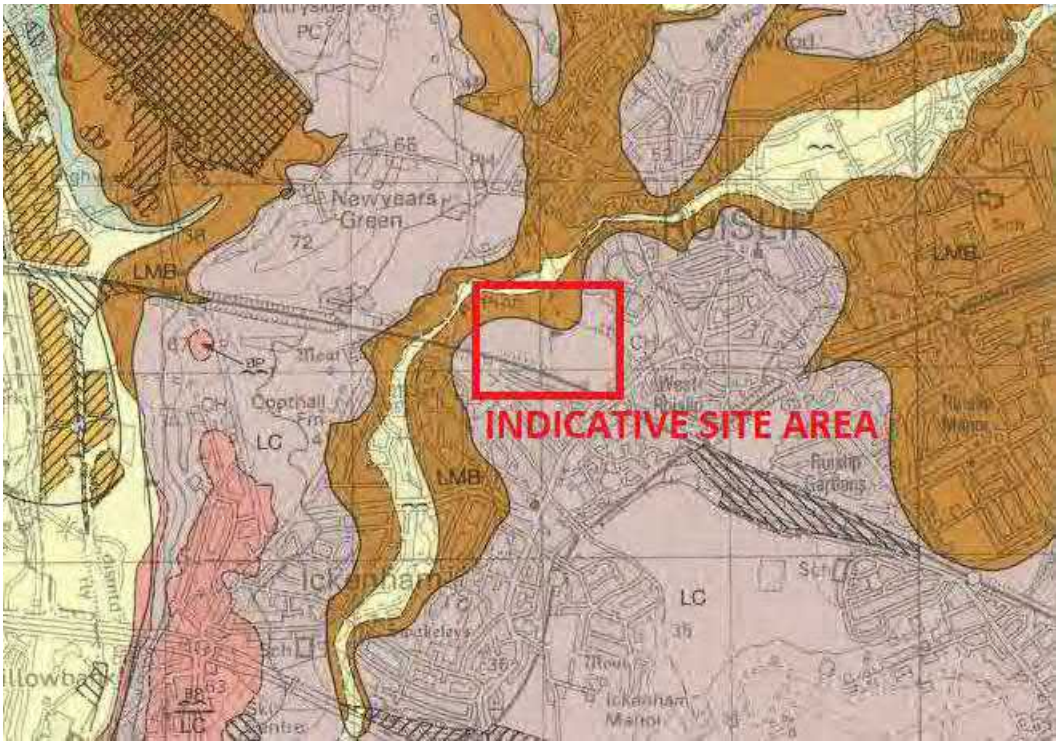
TABLE 1 : SUMMARY OF EXPECTED SITE GEOLOGY	
Geological Unit Name	**Description**
ANTHROPOGENIC GROUND	
Artificial Ground shown	None Shown. Some element of groundworks can be anticipated to be associated with the golf course landscaping.
DRIFT DEPOSITS	
Alluvium	Normally soft to firm consolidated, compressible silty clay, but can contain layers of silt, sand, peat and basal gravel. A stronger, desiccated surface zone may be present.
SOLID GEOLOGY	
London Clay Formation	Bioturbated or poorly laminated, blue-grey or grey-brown, slightly calcareous, silty to very silty clay, clayey silt and sometimes silt, with some layers of sandy clay. It commonly contains thin courses of carbonate concretions ('cementstone nodules') and disseminated pyrite. It also includes a few thin beds of shells and fine sand partings or pockets of sand, which commonly increase towards the base and towards the top of the formation. At the base, and at some other levels, thin beds of black rounded flint gravel occurs in places. Glauconite is present in some of the sands and in some clay beds, and white mica occurs at some levels.
Lambeth Group	Vertically and laterally variable sequences mainly of clay, some silty or sandy, with some sands and gravels, minor limestones and lignites and occasional sandstone and conglomerate.
Chalk	Firm white chalk with conspicuous semi-continuous nodular and tabular flint seams. Hardgrounds and thin marls are known from the lowest beds. Some flint nodules are large to very large.

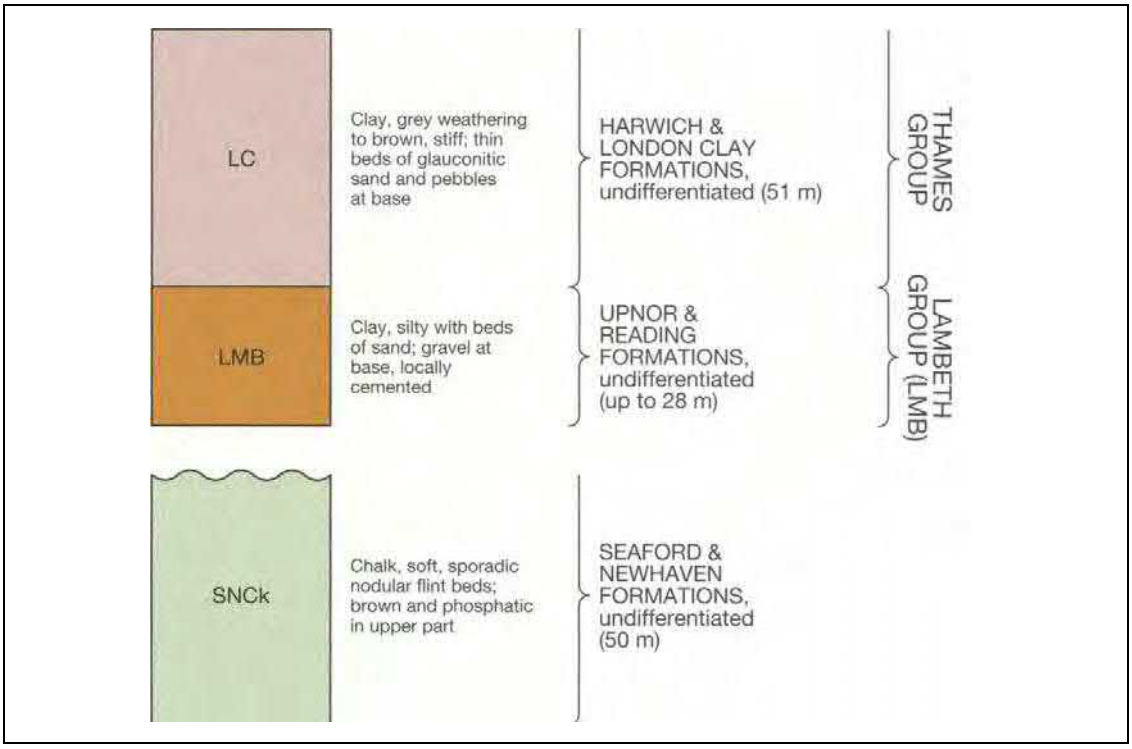
Note: Information obtained from BGS digital records © NERC.

The BGS online maps portal provides access to scans of almost all maps produced by the BGS since 1932. An extract of the most recent available scanned map for the site is included below:

No made ground is shown to be expected on site, though some reworking of existing material and landscaping can be expected due to the nature of the site. A thin channel of alluvium is shown to follow the western and northern boundary of the golf course. This is

shown to be underlain by London Clay Formation and the Lambeth Group. To the western and northern extents of the site, only the Lambeth Group is shown.





Note: Above images contain British Geological Survey materials ©NERC [2018].

3 FIELDWORK

3.1 General

The ground investigation was carried out by SSL between 15 January and 14 February (for phase 1) and between 27 May and 8 June 2020 (for phase 2) . The investigation was supervised by an engineer from SSL. The scope of works and positions were selected by SMB JV, set out by SSL and adjusted where necessary to take account of buried or overhead services, or other restrictions. The exploratory holes and the in-situ test locations are shown on the Exploratory Hole Location Plan in Appendix A.

3.2 Exploratory Holes

The exploratory holes are listed in the following table.

TABLE 2 :SCOPE OF INTRUSIVE WORKS			
Quantity	**Exploratory Hole Type**	**Maximum depth (m)**	**Hole / Test Numbers**
8	Cable Percussion Boreholes.	23.10	BH01, BH2, BH3, BH4, BH5, BH6, BH7 and BH8

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

The holes were logged by an engineer in general accordance with the recommendations of BS 5930:2015 (which incorporates the requirements of BS EN ISO 14688-1, 14688-2 and 14689-1). Detailed descriptions, together with relevant comments, are given on the logs.

Prior to the commencement of any exploratory hole all positions were checked for buried services by a specialist utility surveyor using a cable avoidance tool (CAT), signal generator (‘genny’), and ground penetrating radar (GPR). The survey was carried out by RSK SafeGround.

Inspection pits were hand dug at exploratory locations where noted on the relevant exploratory hole logs or in-situ test results.

On completion of the works, a survey of the exploratory hole locations was undertaken using specialist Global Positioning System (GPS) equipment. The coordinates of each exploratory hole were measured relative to British National Grid, and the level relative to Ordnance Datum. These are shown on the exploratory hole logs contained in Appendix B which have been printed with a reduced level column.

The as-built coordinates and elevation measured using the GPS equipment have been reported in full, however due to the limitations of this type of survey a nominal accuracy of +/- 0.05 m should be assumed.

3.3 Backfill and Instrumentation

On completion, 42 mm diameter groundwater monitoring wells and 19 mm diameter standpipe piezometers were installed in selected exploratory holes, the design having been decided by SMB JV. The installation details are shown on the exploratory hole logs and on a summary table presented within Appendix B.

3.4 In-Situ Testing

The in-situ tests are listed in the following table. The test methods used are detailed on the test result sheets included in Appendix C, unless otherwise noted.

TABLE 3 : SCOPE OF IN-SITU TESTING

Quantity	In-situ Test	Remarks
73	Standard Penetration Tests (SPT).	Carried out in boreholes; test results included on exploratory hole logs presented in Appendix B. SPT calibration certificates included in Appendix G.
8 Sets of 3	Hand Vane (HV). *1. British Standard Vane	Carried out on samples from the boreholes; test results included on exploratory hole logs presented in Appendix B. HV calibration certificates included in Appendix G.
84	Hand Penetrometer (HP).	

Note: *1. All hand vane tests we completed using a hand vane tester which report a direct measurement of undrained shear strength based on a mathematical relationship between the applied torque and the cross-sectional area of the soil surface sheared in the test.

3.5 Monitoring and Post Fieldwork Environmental Sampling

Groundwater levels were recorded in the monitoring wells on the 15 June, 23 June, 7 July and 4 August by SSL engineers.

The results together with the temporal (weather) conditions are tabulated in Appendix F. Ground gas monitoring was carried out over the same 4 monitoring rounds. An infrared gas meter was used to measure concentrations of carbon dioxide (CO2), methane (CH4) and oxygen (O2) in percentage by volume, whilst hydrogen sulphide (H2S) and carbon monoxide (CO) were recorded in parts per million. Initial and steady state concentrations were recorded. An integral flow meter was used to measure borehole flow rates (initial and steady state) in litres per hour (l/hr). In addition the atmospheric pressure before and during monitoring. It should be noted that groundwater levels, gas concentrations and

gas flows usually vary due to seasonal, atmospheric and/or other effects and may at times differ to those measured during the investigation.

The calibration certificate for the gas analyser and PID used are contained in Appendix G.

4 LABORATORY TESTING

Samples for potential geotechnical testing were returned to one of the Company's UKAS accredited laboratories, and those for potential geoenvironmental testing were sent to a sister company Envirolab Limited, a MCERTS and UKAS accredited testing laboratory. Laboratory tests were scheduled by SMB JV. Tests carried out in accordance with MCERTS/UKAS standards where noted on the results sheets.

4.1 Geotechnical Laboratory Testing

Geotechnical laboratory testing was generally carried out in accordance with the relevant part of BS1377: 1990, *Methods of Test for Soils for Civil Engineering Purposes*, or, where superseded, by the relevant part of BS EN ISO 17892:2014+ *Geotechnical investigation and testing – Laboratory Testing of Soil*.

The number of tests completed and the test methods used are summarised below. Where non-standard procedures have been undertaken, this is recorded on the report sheet. The results are reported in tabular and/or graphical form and included as Appendix D of this report.

TABLE 4 :SUMMARY OF GEOTECHNICAL TESTING		
Number of tests	**Test**	**Remarks**
Classification Tests		
53	Moisture content.	
39	Liquid and plastic (Atterberg) limits.	
8	Particle size distribution by sieving.	
14	Particle size distribution by sedimentation.	
Compressibility, Permeability and Durability Tests		
3	One-dimensional consolidation test.	
Shear Strength - Total Stress		
39	Single stage unconsolidated undrained triaxial compression tests without the measurement of pore pressure.	6 more due from BH04
Chemical Tests: Soil*		
16	Water soluble sulphate, total (acid soluble) sulphate and total sulphur contents and pH value.	

Note:* Test(s) carried out to method approved in BRE Special Digest 1.

4.2 Geoenvironmental Laboratory Testing

The geoenvironmental testing carried out is summarised in the following table. The results are included as Appendix E of this report and include details of the test method.

TABLE 5 : SUMMARY OF GEOENVIRONMENTAL LABORATORY TESTING		
Numbers of tests	**Description**	**Notes**
SOIL		
8	Suite 1	Comprises arsenic, cadmium, chromium (total), lead, mercury, selenium, copper, nickel, zinc, speciated polycyclic aromatic hydrocarbons (PAH), total petroleum hydrocarbons (TPHCWG (speciated)), soluble organic matter, soluble sulphate and pH.
8	Second Stage Assessment of WAC	Comprises arsenic, cadmium, chromium (total), lead, mercury, selenium, copper, nickel, zinc, speciated polycyclic aromatic hydrocarbons (PAH), total petroleum hydrocarbons (TPH banded 1 with ID), soluble organic matter, soluble sulphate and pH.
2	Asbestos Identification	
2	Asbestos Quantification	

5 REFERENCES

5.1 BS 5930:2015 *Code of practice for ground investigations*

5.2 BS EN 1997-1:2004 *Eurocode 7 — Geotechnical Design Part 1 - General Rules* incorporating corrigendum Feb 2009 and Amemdment A1 2013

5.3 BS EN 1997-2:2007 Eurocode 7 — *Geotechnical design Part 2: Ground Investigation and testing*

5.4 BS 10175:2011 *Investigation of potentially contaminated sites: Code of practice*, including amendment A2 2017

5.5 British Geological Survey sheet 255 scale 1:50,000, published 2005

5.6 British Geological Survey online digital geological map, www.bgs.ac.uk/data

5.7 British Geological Survey Lexicon of Named Rock Units, www.bgs.ac.uk/lexicon

5.8 BS EN ISO 14688-1:2018 Geotechnical investigation and testing – Identification and classification of soil: Part 1: Identification and description (REMOVE IF USING OLD STANDARD)

5.9 BS EN ISO 14688-2:2018 Geotechnical investigation and testing – Identification and classification of soil: Part 2: Principles for a classification

5.10 BS EN ISO 14689-1:2018 Geotechnical investigation and testing – Identification and classification of rock: Part 1: Identification and description

5.11 BS EN ISO 22475-1:2006 *Geotechnical Investigation and Testing – Sampling methods and groundwater measurements, Part 1 Technical principals for execution*

5.12 BS EN ISO 22476-3:2005 (updated February 2007) *Geotechnical Investigation and Testing – Field Testing Part 3: Standard Penetration Test*, including Amendment A1 (2011)

5.13 CIRIA Report R143 (1995) *The Standard Penetration Test (SPT) - Methods and Use*

5.14 BS 1377:1990 *Method of Test for Soils for Civil Engineering Purposes*

5.15 BS EN ISO 17892:2014 *Geotechnical investigation and testing – Laboratory Testing of Soil*

APPENDIX A -
PLANS AND DRAWINGS

(i) Site Location Plan

(ii) Exploratory Hole Location Plan

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REV.	DATE	DESCRIPTION	BY	CHD.	APR.
00	24.02.2020	-	NP	GJ	-

DIMENSION	SCALE	DRAWING STATUS
m	1:25,000	-

CLIENT: SMB JV

PROJECT: Greenway

TITLE: SITE LOCATION MAP

JOB NO	GRID REF	SCALE BAR	ORIGIN SIZE	FIGURE
563166	TQ 077 872	0 250 500 750 1,000m	A4	1

LEGEND

Borehole Location

REV	DATE	DESCRIPTION	BY	CHD	APR
00	25.02.2020	-	NP	GJ	-

DIMENSION	SCALE	ORIGIN SIZE
m	1:4000	A4

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CLIENT

SMB JV

PROJECT

Greenway

TITLE

EXPLORATORY HOLE LOCATION PLAN

JOB NO	FIGURE
563166	2
DRAWING STATUS	REV
-	00

SCALE BAR

0 40 80 120 160 200m

APPENDIX B -
EXPLORATORY HOLE RECORDS

(i) Key to Exploratory Hole Logs

(ii) Borehole Logs

(iii) Standpipe Summary Table

KEY TO EXPLORATORY HOLE LOGS - SUMMARY OF ABBREVIATIONS

SAMPLING

Sample type codes

B	=	Bulk disturbed sample.
D	=	Small disturbed sample.
DSPT	=	Small disturbed sample originating from SPT test.
ES	=	Soil sample for environmental testing.
ExU	=	Extruded undisturbed sample remnants.
U	=	Undisturbed driven tube sample - Number of blows indicated. % recovery reported.
UT100	=	Undisturbed sample UT100

IN-SITU TESTING

$SPT_{(c)}$	=	Standard Penetration Test using a solid 60 degree cone.
SPT	=	Standard Penetration Test using split spoon sampler. ($_{(NR)}$ indicates 'No Sample Recovery').
	=	* denotes extrapolated N value. NP denotes 'No Penetration'.
HP	=	Hand Penetrometer Test. Value given as shear strength c_u, in kPa.
V	=	Field Vane Test. Peak value (c_u) & Residual value (c_r), given as shear strength in kPa.

ADDITIONAL NOTES

1. All soil and rock descriptions and legends in general accordance with BS EN ISO 14688-1, 14688-2, 14689-1, and BS5930:2015.
2. Material types divided by a broken line (- - -) indicates an unclear boundary.
3. The data on any sheet within the report showing the AGS icon is available in the AGS format.

GINT_LIBRARY_V8_07.GLB|GrfcText G - LEGEND - 1 OF 2 | 563166_GREENWAY.GPJ - v8_07 | 13/03/20 - 13:59 | GRJ1
Structural Soils Ltd, Head Office - Bristol: The Old School, Stillhouse Lane, Bedminster, Bristol, BS3 4EB. Tel: 0117-947-1000, Fax: 0117-947-1004, Web: www.soils.co.uk, Email:admin@soils.co.uk.

STRUCTURAL SOILS

Contract Reference: **563166**

KEY TO EXPLORATORY HOLE LOGS - SUMMARY OF GRAPHIC SYMBOLS

WATER COLUMN SYMBOLS

First water strike, second water strike etc.

Standing water level following first strike, standing water level following second strike etc.

Seepage.

Standing water level recorded at documented date.

MATERIAL GRAPHIC LEGENDS


Chalk


Clayey SAND


Sandy clayey GRAVEL


MADE GROUND


Sandy silty CLAY


Silty sandy CLAY


Sandy gravelly silty CLAY


Sandy clayey SILT


Topsoil


Silty CLAY


Silty SAND


Silty sandy GRAVEL

INSTRUMENTATION SYMBOLS


Bentonite seal


Concrete


Gravel filter


Flush cover


Plain pipe


Slotted pipe

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BOREHOLE LOG

Contract:	Client:	Borehole:
Greenway	**Skanska MWH Balfour Beatty JV**	**BH1**

Contract Ref:	Start:	Ground Level (m AOD):	National Grid Co-ordinate:	Sheet:
563166	**28.01.20** End: **03.02.20**	**40.92**	**E:507954.5 N:187246.9**	**1** of **4**

Samples and In-situ Tests				Water	Backfill & Instru-mentation	Description of Strata	Reduced Level	Depth (Thick ness)	Material Graphic Legend
Depth	No	Type	Results						
0.10-0.20	101	ES				Grass over soft dark brown slightly sandy slightly clayey SILT with frequent rootlets and rare plastic fragments (golf tees). (TOPSOIL)	40.67	0.25	
0.20	1	D							
0.50	2	D				Soft to firm yellowish brown sandy silty CLAY with occasional rootlets. Sand is fine to coarse. (LONDON CLAY FORMATION)		(0.55)	
0.50-0.60	102	ES							
0.50		HP	c_u=37/50/62				40.12	0.80	
0.90-1.00	103	ES				Soft to firm yellowish brown mottled orangish brown and grey sandy silty CLAY with rare rootlets. Sand is fine to coarse. (LONDON CLAY FORMATION)			
1.00	3	D						(0.60)	
							39.52	1.40	
1.50-1.95	4	UT100	100% recovery			Soft to firm brown mottled orangish brown and black sandy silty CLAY. Sand is fine to coarse. (LONDON CLAY FORMATION)			
2.00-2.10	5	D						(1.50)	
2.15		HP	c_u=50/50/65						
2.25		V	c_u=40/50/50						
2.35		HP	c_u=50/37/50						
2.50-2.95	6	SPT	N=5						
2.50-2.95	6	DSPT					38.02	2.90	
3.00-3.10	7	D				Firm to stiff brown mottled dark greyish brown sandy locally slightly sandy silty CLAY. Sand is fine to coarse. Locally slightly sandy. (LONDON CLAY FORMATION)		(0.50)	
							37.52	3.40	
3.50-3.95	8	UT100	100% recovery			Firm to stiff dark greyish brown slightly sandy silty CLAY with frequent shell fragments. Sand is fine to coarse. (LONDON CLAY FORMATION)			
4.00-4.10	9	D							
4.00		HP	c_u=75/75/100						
4.50-4.95	10	SPT	N=11						
4.50-4.95	10	DSPT							
5.00-5.10	11	D						(3.35)	
5.50-5.60	12	D							

Boring Progress and Water Observations					
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth
28/01/20	08:30	1.20	-		Dry
28/01/20	17:00	6.95	6.00	200	-
29/01/20	08:30	6.95	6.00	200	3.30
29/01/20	16:30	14.00	13.00	200	-
30/01/20	08:00	14.00	13.00	200	3.40
30/01/20	17:30	17.00	17.00	200	-
31/01/20	08:30	17.00	17.00	200	-
31/01/20	16:30	21.00	21.00	150	-

Chiselling / Slow Progress		
From	To	Duration (hh:mm)
13.00	15.00	00:45
18.00	19.50	03:30
20.50	21.00	02:00
22.40	23.10	04:00

General Remarks

1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation.
2. Inspection pit hand dug to 1.20m depth.
3. No visual or olfactory evidence of contamination.
4. 19mm diameter gas/groundwater monitoring well complete with flush protective cover installed to 12.30m depth on completion. Response zone 19.75m to 12.30m depth.
5. 42mm diameter gas/groundwater monitoring well complete with flush protective cover installed to 2.00m depth on completion. Response zone 1.00m to 2.00m depth.

All dimensions in metres | Scale: **1:33**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Inspection pit + Cable percussion	**Dando 2000**	**Kevin Simms**	**DPellatt**	

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BOREHOLE LOG

Contract:	Client:	Borehole:
Greenway	**Skanska MWH Balfour Beatty JV**	**BH1**

Contract Ref:	Start:	Ground Level (m AOD):	National Grid Co-ordinate:	Sheet:
563166	End: **03.02.20**	**40.92**	**E:507954.5 N:187246.9**	**2** of **4**

Samples and In-situ Tests				Water	Backfill & Instrumentation	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
6.00-6.45	13	UT100	100% recovery			Firm to stiff dark greyish brown slightly sandy silty CLAY with frequent shell fragments. Sand is fine to coarse. (LONDON CLAY FORMATION) *(stratum copied from 3.40m from previous sheet)*			
6.50-6.95	14	SPT	N=15						
6.50-6.95	14	DSPT							
6.50		HP	c_u=150/100/125				34.17	6.75	
7.00-7.10	15	D				Very stiff bluish grey slightly sandy silty CLAY. Sand is fine to coarse. (LAMBETH GROUP) . . . below 7.00m mottled orange.		(0.65)	
7.20		HP	c_u=200/200/>225				33.52	7.40	
7.50-7.95	16	UT100	100% recovery			Very stiff multicolored (bluish grey, purple, orangish brown, white and brown) slightly gravelly slightly sandy silty CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine of calcrete. (LAMBETH GROUP)			
8.00-8.10	17	D		2					
8.25		V	c_u=>240/>240/>240						
8.50-8.95	18	SPT	N=40					(2.34)	
8.50-8.95	18	DSPT							
9.00-9.10	19	D		1					
9.50-9.95	20	UT100	100% recovery				31.18	9.74	
10.00-10.10	21	D				Bluish grey clayey fine to medium SAND. (LAMBETH GROUP)			
10.50-10.95	22	SPT	N=50					(1.56)	
10.50-10.95	22	DSPT							
11.00-11.10	23	B		1			29.62	11.30	
11.50-11.95	24	UT100	100% recovery	3		Very stiff brown mottled bluish grey sandy silty CLAY. Sand is fine to medium. (LAMBETH GROUP)		(1.20)	

Boring Progress and Water Observations					
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth
03/02/20	08:00	21.00	21.00	150	-
03/02/20	16:30	23.10	21.00	150	-

Chiselling / Slow Progress		
From	To	Duration (hh:mm)

General Remarks

6. Permit to dig issued by Eight20 prior to excavation.
7. SPT hammer AR1322-2019 (E_r = 66.00%) used.

All dimensions in metres | Scale: **1:33**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Inspection pit + Cable percussion	**Dando 2000**	**Kevin Simms**	**DPellatt**	

STRUCTURAL SOILS

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BOREHOLE LOG

Contract:	Client:	Borehole:
Greenway	**Skanska MWH Balfour Beatty JV**	**BH1**

Contract Ref:	Start:	Ground Level (m AOD):	National Grid Co-ordinate:	Sheet:
563166	**28.01.20** End: **03.02.20**	**40.92**	**E:507954.5 N:187246.9**	**3** of **4**

Samples and In-situ Tests				Water	Backfill & Instrumentation	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
12.00-12.10	25	D				Very stiff brown mottled bluish grey sandy silty CLAY. Sand is fine to medium. (LAMBETH GROUP) *(stratum copied from 11.30m from previous sheet)*	28.42	12.50	
12.50-12.60	26	B				Very stiff brown mottled grey slightly gravelly slightly sandy silty CLAY. Sand is fine to medium. Gravel is sugangular to subrounded fine of calcrete. (LAMBETH GROUP)			
13.00-13.10	27	D							
13.50-13.95	28	UT100	100% recovery					(2.50)	
14.00-14.10	29	D							
14.50-14.95	30	SPT	N=50						
14.50-14.95	30	DSPT		2			25.92	15.00	
15.00-15.10	31	B				Brown mottled grey silty fine to coarse SAND. (LAMBETH GROUP)		(1.00)	
16.00-16.10	32	B					24.92	16.00	
16.00-16.45	33	SPT	N=50			Very stiff brown mottled grey sandy silty CLAY. Sand is fine to medium. (LAMBETH GROUP)		(0.35)	
							24.57	16.35	
17.00-17.10	34	D				Very stiff brown mottled reddish brown and grey slightly gravelly slightly sandy silty CLAY. Sand is fine to medium. Gravel is sugangular to subrounded fine of calcrete. (LAMBETH GROUP)			
17.50-17.95	35	SPT	N=38						
17.50-17.95	35	DSPT							

Boring Progress and Water Observations					
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth

Chiselling / Slow Progress		
From	To	Duration (hh:mm)

General Remarks

All dimensions in metres | Scale: **1:33**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Inspection pit + Cable percussion	**Dando 2000**	**Kevin Simms**	**DPellatt**	

STRUCTURAL SOILS

DRAFT

BOREHOLE LOG

Contract:	Client:	Borehole:
Greenway	**Skanska MWH Balfour Beatty JV**	**BH1**

Contract Ref:	Start:	Ground Level (m AOD):	National Grid Co-ordinate:	Sheet:
563166	**28.01.20** End: **03.02.20**	**40.92**	**E:507954.5 N:187246.9**	**4** of **4**

Samples and In-situ Tests				Water	Backfill & Instru-mentation	Description of Strata	Reduced Level	Depth (Thick ness)	Material Graphic Legend
Depth	No	Type	Results						
18.00-18.10	36	D				Very stiff brown mottled reddish brown and grey slightly gravelly slightly sandy silty CLAY. Sand is fine to medium. Gravel is sugangular to subrounded fine of calcrete. (LAMBETH GROUP) *(stratum copied from 16.35m from previous sheet)*		(4.65)	
19.00-19.10	37	D							
19.00-19.45	38	SPT	N=50			. . . at 19.10m depth 100 - 150 mm thick band of silty sand.			
20.00-20.10	39	D							
20.45-20.90	40	SPT	N=46				19.92	21.00	
21.00-21.45	41	DSPT				Grey silty fine to coarse SAND. (LAMBETH GROUP)	19.32	(0.60) 21.60	
22.00-22.10	42	D				Very stiff brownish grey silty CLAY. (LAMBETH GROUP)		(0.70)	
22.00-22.45	43	SPT	N=50				18.62	22.30	
22.50-22.60	43	B				Multicolored (black, cream, and red) slightly sandy silty subangular to rounded fine to coarse GRAVEL of flint. (LAMBETH GROUP)	17.92	(0.70) 23.00	
23.00-23.10	44	D				Probably medium density bluish white CHALK recovered as weak to strong angular cobbles with some slightly sandy angluar medium to coarse gravel. (SEAFORD CHALK FORMATION)	17.82	23.10	
						Borehole terminated at 23.10m on client instruction.			

Boring Progress and Water Observations					
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth

Chiselling / Slow Progress		
From	To	Duration (hh:mm)

General Remarks

All dimensions in metres | Scale: **1:33**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Inspection pit + Cable percussion	**Dando 2000**	**Kevin Simms**	**DPellatt**	

STRUCTURAL SOILS

DRAFT

BOREHOLE LOG

Contract:	Client:	Borehole:
Greenway	**Skanska MWH Balfour Beatty JV**	**BH2**

Contract Ref:	Start: **04.02.20**	Ground Level (m AOD):	National Grid Co-ordinate:	Sheet:
563166	End: **07.02.20**	**40.85**	**E:507932.7 N:187225.4**	**1** of **3**

Samples and In-situ Tests				Water	Backfill & Instru-mentation	Description of Strata	Reduced Level	Depth (Thick ness)	Material Graphic Legend
Depth	No	Type	Results						
						Soft dark brown slightly sandy slightly clayey SILT with frequent rootlets and rare plastic fragments (golf tees). (TOPSOIL)	40.80	0.05	
0.20-0.30	1	D						(0.40)	
0.20-0.30	101	ES					40.40	0.45	
						Soft greyish brown slightly sandy clayey SILT with frequent rootlets. Sand is fine to coarse. (LONDON CLAY FORMATION)			
0.50-0.60	2	B							
0.50-0.60	102	ES							
0.50		HP	c_u=50/62/75						
						Firm yellowish brown mottled orangish brown slightly sandy silty CLAY with occasional rootlets. (LONDON CLAY FORMATION)		(0.95)	
0.90-1.00	103	ES							
1.00-1.10	3	D					39.45	1.40	
						Firm becoming stiff brown mottled orangish brown slightly gravelly slightly sandy silty CLAY. Sand is fine to coarse with black specks. Gravel is fine to coarse subangular to subrounded of claystone. (LONDON CLAY FORMATION)			
1.45		HP	c_u=87/100/100						
1.50-1.95	4	UT100	50 blows 90% recovery						
2.00-2.10	5	D							
2.00		HP	c_u=112/125/125						
2.25		V	c_u=150/150/160			. . . at 2.25m locally very stiff.		(2.00)	
2.50-2.95	6	SPT	N=17						
2.50-2.95	6	DSPT							
3.00-3.10	7	D							
3.20		V	c_u=130/120/130				37.45	3.40	
						Stiff brownish grey speckled white and yellowish brown slightly sandy silty CLAY with frequent shell fragments. Sand is fine to coarse. (LONDON CLAY FORMATION)			
3.50-3.95	8	UT100	50 blows 100% recovery						
4.00-4.10	9	D							
4.00		HP	c_u=125/137/150					(1.55)	
4.20		HP	c_u=150/150/162						
4.50-4.95	10	SPT	N=23						
4.50-4.95	10	DSPT					35.90	4.95	
						. . . At 4.90 band of subangular to rounded fine to medium gravel of flint.			
5.00-5.10	11	D							
5.20		HP	c_u=125/135/125			Stiff grey slightly sandy silty CLAY with occasional shell fragments. Sand is fine to coarse. (LONDON CLAY FORMATION)			
5.50-5.95	12	UT100	60 blows 100% recovery					(1.65)	
6.00-6.10	13	D							
6.00		HP	c_u=150/137/150						
6.50-6.95	14	SPT	N=27				34.25	6.60	
6.50-6.95	14	DSPT				*Description on next sheet*			

Boring Progress and Water Observations

Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth
20/01/20	13:41	0.00	-		-
04/02/20	08:00	0.00	-		-
04/02/20	16:00	4.95	5.00	200	-
05/02/20	08:00	4.95	5.00	200	-
05/02/20	17:00	16.00	16.00	200	-
06/02/20	08:30	16.00	16.00	200	8.20
06/02/20	17:00	20.45	20.45	200	-
07/02/20	09:00	20.45	20.00	200	4.60

Chiselling / Slow Progress

From	To	Duration (hh:mm)

General Remarks

1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation.
2. Inspection pit hand dug to 1.20m depth.
3. No visual or olfactory evidence of contamination.
4. 19mm diameter standpipe piezometer (complete with flush protective cover) installed to 15.80m depth on completion. Response zone 11.70m to 15.80m depth.
5. Groundwater struck at 9.50m depth, rising to 6.35m depth after 20 minutes.
6. Permit to dig issued by Eight20 prior to excavation.

All dimensions in metres | Scale: **1:39**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Inspection pit + Cable percussion	**Dando 2000**	**Kevin Simms**	**DPellatt**	

STRUCTURAL SOILS

DRAFT

BOREHOLE LOG

Contract:	Client:	Borehole:
Greenway	**Skanska MWH Balfour Beatty JV**	**BH2**

Contract Ref:	Start: **04.02.20**	Ground Level (m AOD):	National Grid Co-ordinate:	Sheet:
563166	End: **07.02.20**	**40.85**	**E:507932.7 N:187225.4**	**2** of **3**

Samples and In-situ Tests				Water	Backfill & Instru-mentation	Description of Strata	Reduced Level	Depth (Thick ness)	Material Graphic Legend
Depth	No	Type	Results						
7.00-7.10	15	D				Very stiff to hard light bluish grey mottled orangish brown slightly sandy silty CLAY. Sand is fine to medium. (LAMBETH GROUP) *(stratum copied from 6.60m from previous sheet)*		(1.15)	
7.00		V	c_u=210/>250/>250						
7.25		HP	c_u=200/200/200						
7.50-7.95	16	UT100	85 blows 100% recovery	≈			33.10	7.75	
						. . . Change occurs within UT sample.			
8.00-8.10	17	D				Very stiff multicolored (light bluish grey, orangish brown and purple) slightly sandy slightly gravelly silty CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine of calcrete. (LAMBETH GROUP)		(1.00)	
8.00		HP	c_u=225/>225/>225						
8.50-8.95	18	SPT	N=38						
8.50-8.95	18	DSPT					32.10	8.75	
9.00-9.10	19	D				Very stiff light bluish grey mottled orangish brown sandy silty CLAY. Sand is fine to medium. (LAMBETH GROUP)		(1.00)	
9.50-9.95	20	UT100	100 blows 100% recovery	≈			31.10	9.75	
						. . . Change occurs within UT sample.			
10.00-10.10	21	D				Brown silty fine to coarse SAND. (LAMBETH GROUP)		(0.75)	
							30.35	10.50	
10.50-10.95	22	SPT	N=50			Very stiff brown slightly sandy silty CLAY. Sand is fine to medium. (LAMBETH GROUP)			
10.50-10.95	22	D							
11.00-11.10	23	D						(1.20)	
11.50-11.95	24	SPT	N=50						
11.50-11.95	24	UT100	100 blows 100% recovery				29.15	11.70	
12.00-12.10	25	D				Bluish grey silty fine to medium SAND. (LAMBETH GROUP)			
12.50-12.95	26	DSPT							
13.00-13.10	27	B							
13.50-13.95	28	UT100	100 blows 100% recovery					(4.10)	

Boring Progress and Water Observations					
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth

Chiselling / Slow Progress		
From	To	Duration (hh:mm)

General Remarks

7. SPT hammer AR1322-2019 (E_r = 66.00%) used.

All dimensions in metres | Scale: **1:39**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Inspection pit + Cable percussion	**Dando 2000**	**Kevin Simms**	**DPellatt**	

STRUCTURAL SOILS

DRAFT

BOREHOLE LOG

Contract:	Client:	Borehole:
Greenway	**Skanska MWH Balfour Beatty JV**	**BH2**

Contract Ref:	Start: **04.02.20**	Ground Level (m AOD):	National Grid Co-ordinate:	Sheet:
563166	End: **07.02.20**	**40.85**	**E:507932.7 N:187225.4**	**3** of **3**

Samples and In-situ Tests				Water	Backfill & Instru-mentation	Description of Strata	Reduced Level	Depth (Thick ness)	Material Graphic Legend
Depth	No	Type	Results						
14.00-14.10	29	D				Bluish grey silty fine to medium SAND. (LAMBETH GROUP) *(stratum copied from 11.70m from previous sheet)*			
14.50-14.95	30	SPT	N=50			. . . below 14.50m becoming very silty.			
14.50-14.95	30	DSPT							
15.00-15.10	31	B					25.05	15.80	
16.00-16.10	32	D				Very stiff brown mottled cream and grey slightly sandy gravelly silty CLAY with black specks. Sand is fine to coarse. Gravel is subangular to rounded fine of calcrete and flint. (LAMBETH GROUP)			
16.00-16.45	33	SPT	N=50					(1.10)	
16.50-16.95	33	DSPT					23.95	16.90	
17.00-17.10	34	D				Very stiff brown mottled grey slightly sandy silty CLAY. Sand is fine to coarse. (LAMBETH GROUP)	23.65	17.20	
17.50-17.95	35	SPT	N=41			Bluish grey silty fine to coarse SAND. (LAMBETH GROUP)		(0.60)	
17.50-17.95	35	DSPT					23.05	17.80	
18.00-18.10	36	B				Very stiff bluish grey slightly sandy silty CLAY. Sand is fine to coarse. (LAMBETH GROUP)	22.65	18.20	
						Greyish brown silty fine to coarse SAND. (LAMBETH GROUP)		(0.50)	
							22.15	18.70	
						Black mottled cream and greyish brown slightly sandy clayey GRAVEL of flint and chert. Sand is fine to coarse. (LAMBETH GROUP)	21.95	18.90	
19.00-19.10	37	B							
19.00-19.45	38	SPT(c)	N=36			White mottled black and cream CHALK recovered as while mottled black and cream slightly sandy gravelly silt. Sand is fine to coarse. Gravel is subangular to rounded fine to coarse of chalk and flint. (SEAFORD CHALK FORMATION)		(1.10)	
19.00-19.45	39	B					20.85	20.00	
20.00-20.10	38	B				White CHALK recovered as putified chalk. (SEAFORD CHALK FORMATION)		(0.45)	
20.00	40	D							
20.00-20.45	41	SPT	N=50				20.40	20.45	
						Borehole terminated at 20.45m on client instruction.			

Boring Progress and Water Observations					
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth

Chiselling / Slow Progress		
From	To	Duration (hh:mm)

General Remarks

All dimensions in metres | Scale: **1:39**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Inspection pit + Cable percussion	**Dando 2000**	**Kevin Simms**	**DPellatt**	

STRUCTURAL SOILS

DRAFT

BOREHOLE LOG

Contract:	Client:	Borehole:
Greenway	**Skanska MWH Balfour Beatty JV**	**BH3**

Contract Ref:	Start: **15.01.20**	Ground Level (m AOD):	National Grid Co-ordinate:	Sheet:
563166	End: **24.01.20**	**41.32**	**E:507927.9 N:187152.5**	**1** of **4**

Samples and In-situ Tests				Water	Backfill & Instru-mentation	Description of Strata	Reduced Level	Depth (Thick ness)	Material Graphic Legend
Depth	No	Type	Results						
0.30	1	B				Grass over brown slightly sandy slightly gravelly clayey SILT with frequent roots. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse of ceramic, brick and flint. (TOPSOIL)	40.92	(0.40) 0.40	
0.30-0.35	101	ES				Soft becoming soft to firm yellowish brown mottled greyish brown and orangish brown slightly sandy slightly gravelly silty CLAY with frequent rootlets. Sand is fine to coarse. Gravel is subangular to rounded fine of calcrete, disseminated pyrite and shell fragments. (LONDON CLAY FORMATION)			
0.50	2	B							
0.50-0.55	102	ES							
0.90-1.00	103	ES							
1.00	3	B							
1.40-1.50	104	ES							
1.50-1.95	4	SPT	N=11			. . . below 1.50m rootlets no longer present.		(2.90)	
1.50	4	DSPT							
2.00	5	D				. . . between 2.00m and 3.00m with occasional subrounded to rounded fine to medium gravel of flint.			
2.00		V	c_u=40/40/40						
2.50-2.95	6	D							
2.50		V	c_u=40/60/40						
3.00	7	D					38.02	3.30	
3.40		V	c_u=200/180/200			Very stiff multicolored (yellowish brown, bluish grey, and purple) slightly sandy slightly gravelly silty CLAY. Sand is fine to coarse. Gravel is subrounded to rounded fine of calcrete. (LAMBETH GROUP)			
3.50-4.00	8	UT100	20% recovery						
3.50-3.95	8	U	65 blows 100% recovery						
4.00	9	D							
4.05		HP	c_u=150/175/150						
4.30		HP	c_u=175/175/200						
4.50-4.95	10	SPT	N=13					(2.50)	
4.50	10	DSPT							
5.00	11	D							
5.10		HP	c_u=>225/>225/>225						
5.50-5.95	12	UT100	22% recovery						
5.50-5.95	12	U	100 blows 100% recovery				35.52	5.80	
						Description on next sheet			

Boring Progress and Water Observations					
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth
14/01/20	08:00	0.00	-		-
15/01/20	08:00	0.00	-		-
15/01/20	16:30	1.20	-		-
16/01/20	08:00	1.20	1.20	200	0.70
16/01/20	17:00	9.00	4.00	200	Dry
17/01/20	09:00	9.00	4.00	200	4.10
17/01/20	16:00	14.00	12.00	200	8.30
23/01/20	08:00	14.00	12.00	200	0.80

Chiselling / Slow Progress		
From	To	Duration (hh:mm)
17.90	20.95	05:30

General Remarks

1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation.
2. Inspection pit hand dug to 1.20 m depth.
3. Water seepage at 0.40 m depth.
4. No visual or olfactory evidence of contamination.
5. Groundwater struck at 13.5 m depth, rising to

All dimensions in metres | Scale: **1:33**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Inspection pit + Cable percussion	**Dando 2000**	**Kevin Simms**	**DPellatt**	

STRUCTURAL SOILS

DRAFT

BOREHOLE LOG

Contract:	Client:	Borehole:
Greenway	**Skanska MWH Balfour Beatty JV**	**BH3**

Contract Ref:	Start: **15.01.20**	Ground Level (m AOD):	National Grid Co-ordinate:	Sheet:
563166	End: **24.01.20**	**41.32**	**E:507927.9 N:187152.5**	**2** of **4**

Samples and In-situ Tests				Water	Backfill & Instru-mentation	Description of Strata	Reduced Level	Depth (Thick ness)	Material Graphic Legend
Depth	No	Type	Results						
6.00	13	D				Very stiff bluish grey speckled brown sandy silty CLAY. Sand is fine to medium. (LAMBETH GROUP) *(stratum copied from 5.80m from previous sheet)*		(0.80)	
6.50-6.95	14	SPT	N=50				34.72	6.60	
6.50	14	DSPT				Very stiff multicolored (yellowish brown, brown, bluish grey, and purple) slightly sandy slightly gravelly silty CLAY. Sand is fine to coarse. Gravel is subrounded to rounded fine of calcrete. (LAMBETH GROUP)			
7.00	15	D							
7.50-7.95	16	UT100	22% recovery						
7.50-7.95	16	U	100 blows 100% recovery						
8.00	17	D						(2.80)	
8.50-8.95	18	SPT	N=34						
8.50	18	DSPT							
9.00	19	D					31.92	9.40	
9.50-9.95	20	UT100	22% recovery			Thinly interbedded brown speckled grey clayey fine to medium SAND and very stiff multicolored (yellowish brown, brown, bluish grey, and purple) slightly sandy slightly gravelly silty CLAY. Sand is fine to coarse. Gravel is subrounded to rounded fine of calcrete. Beds are approximately 100 - 150 mm thick. (LAMBETH GROUP)			
9.50-9.95	20	U	100 blows 100% recovery						
10.00	21	D						(1.80)	
10.50-10.95	22	SPT	N=50						
10.50	22	DSPT							
11.00	23	D					30.12	11.20	
11.50-11.95	24	UT100	11% recovery			Very stiff brown mottled grey slightly sandy silty CLAY. Sand is fine to medium. (LAMBETH GROUP)			
11.50-11.95	24	U							

Boring Progress and Water Observations

Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth
23/01/20	16:00	17.95	17.00	200	-
24/01/20	08:00	17.95	17.00	200	1.30
24/01/20	16:00	20.50	17.00	200	-
27/01/20	08:00	20.50	17.00	200	1.30

Chiselling / Slow Progress

From	To	Duration (hh:mm)

General Remarks

8.3 m depth after 20 minutes.
6. 19 mm diameter standpipe piezometer (complete with flush protective cover) installed to 17.0 m depth on completion. Response zone 13.5 m to 17.0 m depth.
7. Permit to dig issued by Eight20.
8. SPT hammer AR1322-2019 (E_r = 66.00%)

All dimensions in metres | Scale: **1:33**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Inspection pit + Cable percussion	**Dando 2000**	**Kevin Simms**	**DPellatt**	

STRUCTURAL SOILS

DRAFT

BOREHOLE LOG

Contract:	Client:	Borehole:
Greenway	**Skanska MWH Balfour Beatty JV**	**BH3**

Contract Ref:	Start: **15.01.20**	Ground Level (m AOD):	National Grid Co-ordinate:	Sheet:
563166	End: **24.01.20**	**41.32**	**E:507927.9 N:187152.5**	**3** of **4**

Samples and In-situ Tests				Water	Backfill & Instru-mentation	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
12.00	25	D				Very stiff brown mottled grey slightly sandy silty CLAY. Sand is fine to medium. (LAMBETH GROUP) *(stratum copied from 11.20m from previous sheet)* . . . between 12.20m and 12.30m locally clayey SILT.		(2.20)	
12.50-12.88	26	SPT	10,15/20,21,9 for 75mm						
12.50	26	DSPT							
13.00	27	D					27.92	13.40	
13.50-13.95	28	B	0% recovery			Brown speckled grey sandy SILT. Sand is fine to medium. (LAMBETH GROUP)		(0.60)	
13.50-13.95	28	U	100 blows						
13.50-13.80	29	B					27.32	14.00	
14.00-14.10	29	D				Very stiff brown mottled grey sandy silty CLAY. Sand is fine to medium. (LAMBETH GROUP)		(0.50)	
14.00	30	D					26.82	14.50	
14.50-14.95	31	SPT	N=50			Brown slightly gravelly sandy SILT . Sand is fine to coarse. Gravel is subangular to subrounded coarse of calcrete. (LAMBETH GROUP)		(3.25)	
14.50	31	DSPT							
15.00	31	B							
15.00	32	B							
16.00	32	B							
16.00-16.45	34	SPT	N=50						
16.00	34	DSPT							
16.50-16.95	33	DSPT							
17.00	34	B							
17.00	35	B							
17.50-17.95	36	SPT	N=50						
17.50	36	DSPT					23.57	17.75	
						Description on next sheet			

Boring Progress and Water Observations					
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth

Chiselling / Slow Progress		
From	To	Duration (hh:mm)

General Remarks

used.

All dimensions in metres | Scale: **1:33**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Inspection pit + Cable percussion	**Dando 2000**	**Kevin Simms**	**DPellatt**	

STRUCTURAL SOILS

DRAFT

BOREHOLE LOG

Contract:	Client:	Borehole:
Greenway	**Skanska MWH Balfour Beatty JV**	**BH3**

Contract Ref:	Start: **15.01.20**	Ground Level (m AOD):	National Grid Co-ordinate:	Sheet:
563166	End: **24.01.20**	**41.32**	**E:507927.9 N:187152.5**	**4** of **4**

Samples and In-situ Tests				Water	Backfill & Instru-mentation	Description of Strata	Reduced Level	Depth (Thick ness)	Material Graphic Legend
Depth	No	Type	Results						
18.00-18.10	36	D				Very stiff multicolored (dark brown, black, grey and brown) slightly sandy silty CLAY. Sand is fine and coarse. (LAMBETH GROUP) *(stratum copied from 17.75m from previous sheet)*		(2.25)	
18.00	37	B							
19.00-19.10	37	D							
19.00	38	B							
19.00-19.45	38	UT100	11% recovery						
19.00-19.45	39	U	100 blows 50% recovery						
19.50		HP	c_u=>225/>225/>225				21.32	20.00	
20.00	39	B				Very stiff black mottled dark grey and cream slightly sandy gravelly silty CLAY. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse of flint. (LAMBETH GROUP)	21.22	20.10	
20.00	40	B							
20.10	40	D							
20.50-20.95	41	SPT	N=50			Probably medium density bluish white CHALK recovered as weak to strong angular cobbles with some slightly sandy angluar medium to coarse gravel. (SEAFORD CHALK FORMATION)		(0.85)	
20.50	41	DSPT					20.37	20.95	
						Borehole terminated at 20.95m on client instruction.			

Boring Progress and Water Observations					
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth

Chiselling / Slow Progress		
From	To	Duration (hh:mm)

General Remarks

All dimensions in metres | Scale: **1:33**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Inspection pit + Cable percussion	**Dando 2000**	**Kevin Simms**	**DPellatt**	AGS

STRUCTURAL SOILS

DRAFT

BOREHOLE LOG

Contract:	Client:	Borehole:
Greenway	**Skanska MWH Balfour Beatty JV**	**BH4**

Contract Ref:	Start: **10.02.20**	Ground Level (m AOD):	National Grid Co-ordinate:	Sheet:
563166	End: **17.02.20**	**41.48**	**E:507911.0 N:187089.0**	**1** of **3**

Samples and In-situ Tests				Water	Backfill & Instru-mentation	Description of Strata	Reduced Level	Depth (Thick ness)	Material Graphic Legend
Depth	No	Type	Results						
						Soft dark brown slightly sandy SILT with frequent rootlets and rare plastic fragments (golf tees). (TOPSOIL)	41.43	0.05	
0.20-0.30	1	D							
0.20-0.30	101	ES					41.08	0.40	
						Soft greyish brown slightly sandy clayey SILT with frequent rootlets. Sand is fine to coarse. (LONDON CLAY FORMATION)			
0.50-0.60	2	B							
0.50-0.60	102	ES							
0.50		HP	c_u=37/42/37						
						Soft to firm yellowish brown mottled orangish brown slightly sandy silty CLAY with occasional rootlets. (LONDON CLAY FORMATION)		(1.35)	
0.90-1.00	103	ES							
1.00-1.10	3	D							
1.50-1.95	4	UT100	20 blows 100% recovery			. . . from 1.50m rootlets no longer present.	39.73	1.75	
						Firm becoming stiff brown mottled grey slightly sandy slightly gravelly silty CLAY with black specks. Sand is fine to coarse. Gravel is angular to subrounded fine of limestone and calcrete. (LONDON CLAY FORMATION)		(0.65)	
2.00-2.10	5	D							
2.00		HP	c_u=62/62/75						
2.30		HP	c_u=75/75/100				39.08	2.40	
						Stiff brown slightly sandy silty CLAY. (LONDON CLAY FORMATION)			
2.50-2.95	6	SPT	N=16						
2.50-2.95	6	DSPT						(1.00)	
3.00-3.10	7	D							
3.30		HP	c_u=75/87/87				38.08	3.40	
						Stiff becoming very stiff bluish grey mottled orangish brown slightly sandy silty CLAY. Sand is fine to coarse. (LAMBETH GROUP - READING FORMATION)			
3.50-3.95	8	UT100	35 blows 90% recovery						
4.00-4.10	9	D						(1.35)	
4.00		HP	c_u=150/175/200						
4.50-4.95	10	SPT	N=20						
4.50-4.95	10	DSPT					36.73	4.75	
						Very stiff to hard multicolored (brown, yellowish brown, bluish grey, and purple) slightly sandy slightly gravelly silty CLAY. Sand is fine to medium. Gravel is subangular fine to medium of calcrete. (LAMBETH GROUP - READING FORMATION)			
5.00-5.10	11	D							
5.50-5.95	12	UT100	100 blows 74% recovery						
6.00-6.10	13	D							
6.00		HP	c_u=>225/>225/>225						
6.50-6.95	14	SPT	N=50					(3.65)	
6.50-6.95	14	DSPT							

Boring Progress and Water Observations					
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth
10/02/20	08:00	0.00	-		-
10/02/20	13:50	0.50	9.00	300	0.50
10/02/20	14:00	4.00	4.00	200	0.40
11/02/20	09:15	4.00	4.00	200	2.50
11/02/20	15:20	9.50	9.00	200	9.50
12/02/20	08:00	9.50	9.00	200	-
12/02/20	10:16	10.00	9.00	200	8.40
12/02/20	13:50	11.40	10.50	200	11.40

Chiselling / Slow Progress		
From	To	Duration (hh:mm)

General Remarks

1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation.
2. Inspection pit hand dug to 1.20m depth.
3. No visual or olfactory evidence of contamination.
4. 19mm diameter standpipe piezometer (complete with flush protective cover) installed to 15.00m

All dimensions in metres | Scale: **1:39**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Inspection pit + Cable percussion	**Dando 2000**	**Kevin Simms**	**DPellatt**	

STRUCTURAL SOILS

DRAFT

BOREHOLE LOG

Contract:	Client:	Borehole:
Greenway	**Skanska MWH Balfour Beatty JV**	**BH4**

Contract Ref:	Start: **10.02.20**	Ground Level (m AOD):	National Grid Co-ordinate:	Sheet:
563166	End: **17.02.20**	**41.48**	**E:507911.0 N:187089.0**	**2** of **3**

Samples and In-situ Tests				Water	Backfill & Instru-mentation	Description of Strata	Reduced Level	Depth (Thick ness)	Material Graphic Legend
Depth	No	Type	Results						
7.00-7.10	15	D				Very stiff to hard multicolored (brown, yellowish brown, bluish grey, and purple) slightly sandy slightly gravelly silty CLAY. Sand is fine to medium. Gravel is subangular fine to medium of calcrete. (LAMBETH GROUP - READING FORMATION) *(stratum copied from 4.75m from previous sheet)*			
7.50-7.95	16	UT100	100 blows 74% recovery						
8.00-8.10	17	D					33.08	8.40	
8.50-8.95	18	SPT	N=50			Very stiff brown mottled bluish grey slightly sandy slightly gravelly silty CLAY. Sand is fine to medium. Gravel is subangular to subrounded fine of calcrete. Mottling is veins of calcrete. (LAMBETH GROUP - READING FORMATION)			
8.50-8.95	18	DSPT							
9.00-9.10	19	D							
9.50-9.95	20	UT100	100 blows 74% recovery	≈					
10.00-10.10	21	D							
10.50-10.95	22	SPT	N=48			. . . at 10.40m with grey mottling		(5.10)	
10.50-10.95	22	DSPT							
11.00-11.10	23	D							
11.50-11.95	24	UT100	100 blows 50% recovery	≈		. . . at 11.40m with a band of brown fine to medium sand			
12.00-12.10	25	D							
12.50-12.95	26	SPT	N=50						
12.50-12.95	26	DSPT							
13.00-13.10	27	D		▼1			27.98	13.50	
13.50-13.95	28	UT100	20 blows 0% recovery			Brownish grey fine to coarse very silty SAND. (LAMBETH GROUP - READING FORMATION)	27.48	(0.50) 14.00	

Boring Progress and Water Observations

Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth
12/02/20	16:30	14.00	14.00	200	-
13/02/20	09:00	14.00	14.00	200	4.80
13/02/20	16:30	17.60	17.50	200	-
14/02/20	08:00	17.60	-	200	-
17/02/20	08:00	17.60	-	200	-

Chiselling / Slow Progress

From	To	Duration (hh:mm)

General Remarks

depth on completion. Response zone 13.00m to 15.00m depth.
5. Water strike at 13.50m depth.
6. Permit to dig issued by Eight20 prior to excavation.
7. SPT hammer AR1322-2019 (E_r = 66.00%) used.

All dimensions in metres | Scale: **1:39**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Inspection pit + Cable percussion	**Dando 2000**	**Kevin Simms**	**DPellatt**	

STRUCTURAL SOILS

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BOREHOLE LOG

Contract:	Client:	Borehole:
Greenway	**Skanska MWH Balfour Beatty JV**	**BH4**

Contract Ref:	Start:	Ground Level (m AOD):	National Grid Co-ordinate:	Sheet:
563166	**10.02.20** End: **17.02.20**	**41.48**	**E:507911.0 N:187089.0**	**3** of **3**

Samples and In-situ Tests				Water	Backfill & Instru-mentation	Description of Strata	Reduced Level	Depth (Thick ness)	Material Graphic Legend
Depth	No	Type	Results						
14.00-14.10	29	D				Stiff greyish brown sandy clayey SILT. Sand is fine to coarse. (LAMBETH GROUP - READING FORMATION)		(0.60)	
14.50-14.95	30	SPT	N=50				26.88	14.60	
14.50-14.95	30	DSPT				Very stiff grey mottled greyish brown slightly sandy silty CLAY. Sand is fine to coarse. (LAMBETH GROUP - READING FORMATION)			
15.00-15.10	31	D						(2.60)	
16.00-16.45	32	DSPT							
16.00-16.45	33	SPT	N=50						
17.00-17.10	33	D					24.28	17.20	
17.40-17.50	34	D				Very stiff grey mottled brownish grey and black slightly sandy gravelly silty CLAY. Sand is fine to coarse. Gravel is angular to rounded fine to coarse of flint. (LAMBETH GROUP - READING FORMATION)	23.98	17.50	
17.50-17.60	35	D				Probably medium density bluish white CHALK recovered as weak to strong angular cobbles with some slightly sandy angluar medium to coarse gravel. (SEAFORD CHALK FORMATION)	23.88	17.60	
						Borehole terminated at 17.60m on client instruction.			

Boring Progress and Water Observations					
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth

Chiselling / Slow Progress		
From	To	Duration (hh:mm)

General Remarks

All dimensions in metres | Scale: **1:39**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Inspection pit + Cable percussion	**Dando 2000**	**Kevin Simms**	**DPellatt**	

STRUCTURAL SOILS

DRAFT

BOREHOLE LOG

Contract:	Client:	Borehole:
Greenway	**Skanska MWH Balfour Beatty JV**	**BH5**

Contract Ref:	Start:	Ground Level (m AOD):	National Grid Co-ordinate:	Sheet:
563166	**27.05.20** End: **29.05.20**	**42.51**	**E:507905.1 N:186946.8**	**1** of **4**

Depth (m)	Samples & Testing: No	Type	Results	Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
						MADE GROUND: ASPHALT	42.46	0.05	
						MADE GROUND: CONCRETE . . . At 0.10 m: 4 no. 8 mm rebar rods on 100 mm spacings passing through pit	42.31	0.20	
0.40-0.80 0.50 0.50	1 101	B ES	c_u=62/62/62			MADE GROUND: Soft to firm yellowish brown mottled orangish brown slightly sandy slightly gravelly silty CLAY with black specks. Sand is fine to coarse. Gravel is subangular to subrounded fine to medium of concrete, flint, asphalt and brick.	41.71	(0.60) 0.80	
0.80-1.20 0.90	2 102	B ES				Soft becoming firm with depth yellowish brown mottled orangish brown slightly sandy silty CLAY with black specks. Sand is fine to coarse. (WEATHERED LONDON CLAY FORMATION)			
1.50-1.95 1.50-2.00	3 4	SPT B	N=4						
2.00	5	D						(3.20)	
2.50-2.95	6	SPT	N=7						
3.00	7	D							
3.50-3.95	8	SPT	N=16				38.51	4.00	
4.00-4.50 4.00	10 9	B D				Soft to firm brown mottled grey slightly sandy clayey SILT. Sand is fine to coarse. (LONDON CLAY FORMATION)			
4.50-4.95	11	SPT	N=21					(1.00)	
							37.51	5.00	
5.00-5.50 5.00 5.00-5.50	103 12 13	ES D B				Brown mottled bluish grey and purple slightly sandy silty CLAY with frequent fine gravel sized clasts of white calcrete. Sand is fine to coarse. (LAMBETH GROUP - READING FORMATION)			
5.50-5.95	14	SPT	N=31						

Boring Progress and Water Observations

Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth
27/05/20	16:30	7.00	7.00	200	Dry
28/05/20	08:00	7.00	7.00	200	Dry
28/05/20	16:30	16.50	16.50	150	10.20
29/05/20	08:00	16.50	16.50	150	6.90
29/05/20	16:30	20.50	20.50	150	-

Chiselling / Slow Progress

From	To	Duration (hh:mm)

General Remarks

1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation.
2. Permit to dig issued by SMBJV
3. Inspection pit hand dug to 1.20 m depth.
4. No visual or olfactory evidence of contamination.
5. 19 mm diameter standpipe with 300mm piezometer (complete with flush protective cover) installed to 19.00m depth on completion. Response zone 15.0 m to 19.0 m depth.

All dimensions in metres | Scale: **1:33**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Cable Percussion	**Dando 2000 Mark 2**	**Steve Wray**	**DPellatt**	

STRUCTURAL SOILS

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BOREHOLE LOG

Contract:	Client:	Borehole:
Greenway	**Skanska MWH Balfour Beatty JV**	**BH5**

Contract Ref:	Start:	Ground Level (m AOD):	National Grid Co-ordinate:	Sheet:
563166	End: **29.05.20**	**42.51**	**E:507905.1 N:186946.8**	**2** of **4**

Depth (m)	Samples & Testing: No	Type	Results	Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
6.00	15	D				Brown mottled bluish grey and purple slightly sandy silty CLAY with frequent fine gravel sized clasts of white calcrete. Sand is fine to coarse. (LAMBETH GROUP - READING FORMATION) *(stratum copied from 5.00m from previous sheet)*			
6.50-6.95	16	SPT	N=31						
7.00	17	D							
7.50-7.95	18	SPT	N=39						
8.00	19	D							
8.50-8.95	20	SPT	N=43						
9.00	21	D							
9.50-9.95	22	SPT	N=41						
10.00	23	D						(10.00)	
10.50-10.95	24	SPT	N=44						
11.00	25	D							
11.50-11.95	26	SPT	N=50						

Boring Progress and Water Observations					
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth

Chiselling / Slow Progress		
From	To	Duration (hh:mm)

General Remarks

All dimensions in metres | Scale: **1:33**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Cable Percussion	**Dando 2000 Mark 2**	**Steve Wray**	**DPellatt**	

STRUCTURAL SOILS

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BOREHOLE LOG

Contract:	Client:	Borehole:
Greenway	**Skanska MWH Balfour Beatty JV**	**BH5**

Contract Ref:	Start:	Ground Level (m AOD):	National Grid Co-ordinate:	Sheet:
563166	End: **29.05.20**	**42.51**	**E:507905.1 N:186946.8**	**3** of **4**

Depth (m)	Samples & Testing: No	Type	Results	Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
12.00	27	D				Brown mottled bluish grey and purple slightly sandy silty CLAY with frequent fine gravel sized clasts of white calcrete. Sand is fine to coarse. (LAMBETH GROUP - READING FORMATION) *(stratum copied from 5.00m from previous sheet)*			
12.50-12.95	28	SPT	N=48						
13.00	29	D							
13.50-13.85	30	SPT	6,9/15,20,15 for 45mm		2				
14.00	31	D							
14.50-14.95	32	SPT	7,7/10,13,14,13 for 70mm		2		27.51	15.00	
15.00	33	D				Stiff light grey slightly sandy silty CLAY, interlaminated with greyish brown fine to coarse sand. Laminations 5-10mm. (LAMBETH GROUP - READING FORMATION)			
15.50-15.85	34	SPT	9,10/14,19,17 for 45mm						
16.00	35	D							
16.50-16.80	36	SPT	9,12/17,33 for 75mm		3				
17.00	37	D						(4.20)	

Boring Progress and Water Observations					
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth

Chiselling / Slow Progress		
From	To	Duration (hh:mm)

General Remarks

All dimensions in metres | Scale: **1:33**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Cable Percussion	**Dando 2000 Mark 2**	**Steve Wray**	**DPellatt**	

STRUCTURAL SOILS

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BOREHOLE LOG

Contract:	Client:	Borehole:
Greenway	**Skanska MWH Balfour Beatty JV**	**BH5**

Contract Ref:	Start:	Ground Level (m AOD):	National Grid Co-ordinate:	Sheet:
563166	End: **29.05.20**	**42.51**	**E:507905.1 N:186946.8**	**4** of **4**

Depth (m)	Samples & Testing: No	Type	Results	Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
18.00	38	D				Stiff light grey slightly sandy silty CLAY, interlaminated with greyish brown fine to coarse sand. Laminations 5-10mm. (LAMBETH GROUP - READING FORMATION) *(stratum copied from 15.00m from previous sheet)*			
18.00-18.33	39	SPT	8,8/12,27,11 for 30mm						
19.00	40	D					23.31	19.20	
19.50-19.95	41	SPT	N=45			Very stiff brown mottled dark grey slightly sandy silty CLAY. Sand is fine to coarse. (LAMBETH GROUP - READING FORMATION)		(1.30)	
20.00	42	D					22.01	20.50	
20.50	43	D				Probably medium density bluish white CHALK recovered as week to medium strong angular to subangular fine to medium sandy gravel. Sand is fine to coarse. (SEAFORD CHALK FORMATION)	21.84	20.67	
20.50-20.67	44	SPT(c)	22,3/34,16 for 10mm			Borehole terminated at 20.67m depth in agreement with client.			

Boring Progress and Water Observations					
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth

Chiselling / Slow Progress		
From	To	Duration (hh:mm)

General Remarks

All dimensions in metres | Scale: **1:33**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Cable Percussion	**Dando 2000 Mark 2**	**Steve Wray**	**DPellatt**	

STRUCTURAL SOILS

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BOREHOLE LOG

Contract:	Client:	Borehole:
Greenway	**Skanska MWH Balfour Beatty JV**	**BH6**

Contract Ref:	Start:	Ground Level (m AOD):	National Grid Co-ordinate:	Sheet:
563166	End: **28.05.20**	**42.80**	**E:507883.6 N:186866.2**	**1** of **4**

Depth (m)	Samples & Testing: No	Type	Results	Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
0.20	101	ES	1xT+1xJ+1xV			MADE GROUND: Grass over friable dark greyish brown slightly sandy slightly gravelly SILT with frequent rootlets. Sand is fine to coarse. Gravel is subangular to subrounded fine to medium of charcoal and grey limestone.	42.50	0.30	
0.30	1	B							
0.40	102	ES	1xT+1xJ+1xV			Soft yellowish brown mottled orangish brown slightly sandy clayey SILT with frequent rootlets. Sand is fine to coarse. (WEATHERED LONDON CLAY FORMATION)	42.30	0.50	
0.50	2	B							
0.70	103	ES	1xT+1xJ+1xV			Firm brown mottled greyish brown slightly sandy silty CLAY with occasional rootlets. Sand is fine to coarse. (WEATHERED LONDON CLAY FORMATION)			
1.00	3	B							
1.50-1.95	4	UT100	100% recovery					(2.45)	
2.00	5	D							
2.50-2.95	6	SPT	N=9				39.85	2.95	
3.00	104	ES	1xT+1xJ+1xV			Firm greyish brown mottled orangish brown slightly sandy silty CLAY. Sand is fine to coarse. (LONDON CLAY FORMATION)			
3.00	7	D							
3.50-3.95	8	UT100	100% recovery					(1.00)	
							38.85	3.95	
4.00	9	D				Firm becoming very stiff brown mottled bluish grey and purple slightly sandy silty CLAY with frequent fine gravel sized clasts of white calcrete. Sand is fine to coarse. (LAMBETH GROUP - READING FORMATION)			
4.50-4.95	10	SPT	N=28						
5.00	11	D							
5.50-5.95	12	UT100	100% recovery						

Boring Progress and Water Observations

Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth
28/05/20	16:30	6.95	6.00	200	Dry
29/05/20	08:00	6.95	6.00	200	-
29/05/20	16:30	13.00	13.00	200	-
01/06/20	08:00	13.00	13.00	200	8.20
01/06/20	16:00	14.00	14.00	150	9.70
02/06/20	08:00	14.00	14.00	150	6.30
02/06/20	16:00	19.10	19.00	150	10.70

Chiselling / Slow Progress

From	To	Duration (hh:mm)

General Remarks

1. Permit to dig issued by Eight20 prior to excavation.
2. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation.
3. Inspection pit hand dug to 1.20 m depth.
4. No visual or olfactory evidence of contamination.

All dimensions in metres | Scale: **1:33**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Inspection pit + Cable Percussion	**Dando 2000 Mark 2**	**Kevin Simms**	**DPellatt**	

STRUCTURAL SOILS

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BOREHOLE LOG

Contract:	Client:	Borehole:
Greenway	**Skanska MWH Balfour Beatty JV**	**BH6**

Contract Ref:	Start:	Ground Level (m AOD):	National Grid Co-ordinate:	Sheet:
563166	**28.05.20** End: **28.05.20**	**42.80**	**E:507883.6 N:186866.2**	**2** of **4**

Depth (m)	Samples & Testing: No	Type	Results	Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
6.00	13	D				Firm becoming very stiff brown mottled bluish grey and purple slightly sandy silty CLAY with frequent fine gravel sized clasts of white calcrete. Sand is fine to coarse. (LAMBETH GROUP - READING FORMATION) *(stratum copied from 3.95m from previous sheet)*			
6.50-6.95	14	SPT	N=24			. . . between 6.60m and 6.80m locally fine clayey silty sand.			
7.00	15	D							
7.50-7.95	16	UT100	100% recovery						
8.00	17	D							
8.50-8.95	18	SPT	N=50					(9.05)	
9.00	19	D							
10.00	20	D							
10.50-10.95	21	UT100	89% recovery						
11.00	22	D							
11.50-11.95	23	SPT	N=50						

Boring Progress and Water Observations					
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth

Chiselling / Slow Progress		
From	To	Duration (hh:mm)

General Remarks

5. 19 mm diameter standpipe with 300mm piezometer (complete with flush protective cover) installed to 16.0 m depth on completion. Response zone 13.0 m to 16.5 m depth.
6. 42 mm diameter gas/groundwater monitoring well complete with flush protective cover installed to 5.0 m depth on completion.

All dimensions in metres | Scale: **1:33**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Inspection pit + Cable Percussion	**Dando 2000 Mark 2**	**Kevin Simms**	**DPellatt**	

STRUCTURAL SOILS

DRAFT

BOREHOLE LOG

Contract:	Client:	Borehole:
Greenway	**Skanska MWH Balfour Beatty JV**	**BH6**

Contract Ref:	Start:	Ground Level (m AOD):	National Grid Co-ordinate:	Sheet:
563166	End: **28.05.20**	**42.80**	**E:507883.6 N:186866.2**	**3** of **4**

Depth (m)	Samples & Testing: No	Type	Results	Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
12.00	24	D				Firm becoming very stiff brown mottled bluish grey and purple slightly sandy silty CLAY with frequent fine gravel sized clasts of white calcrete. Sand is fine to coarse. (LAMBETH GROUP - READING FORMATION) *(stratum copied from 3.95m from previous sheet)*			
12.50-12.95	25	UT100	84% recovery						
					1.1		29.80	13.00	
13.00	105	ES	1xT+1xJ+1xV			Dense to very dense brown fine to coarse silty SAND. (Driller noted occasional pockets of soft clay.) (LAMBETH GROUP - READING FORMATION)			
13.00	26	B							
13.50-13.95	27	SPT	N=50						
14.00	28	B							
14.50-14.95	29	SPT	N=50					(3.60)	
15.00	30	B							
16.00	31	B					26.20	16.60	
16.00-16.45	32	SPT	N=50			Very stiff grey silty CLAY with fissures and horizontal laminations. (LAMBETH GROUP - READING FORMATION)			
17.00	106	ES	1xT+1xJ+1xV						
17.00	33	D						(1.50)	
17.50-17.95	34	UT100	60% recovery						

Boring Progress and Water Observations

Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth

Chiselling / Slow Progress

From	To	Duration (hh:mm)

General Remarks

Response zone 1.0 m to 5.0 m depth.

All dimensions in metres | Scale: **1:33**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Inspection pit + Cable Percussion	**Dando 2000 Mark 2**	**Kevin Simms**	**DPellatt**	

STRUCTURAL SOILS

DRAFT

BOREHOLE LOG

Contract:	Client:	Borehole:
Greenway	**Skanska MWH Balfour Beatty JV**	**BH6**

Contract Ref:	Start:	Ground Level (m AOD):	National Grid Co-ordinate:	Sheet:
563166	**28.05.20** End: **28.05.20**	**42.80**	**E:507883.6 N:186866.2**	**4** of **4**

Depth (m)	Samples & Testing: No	Type	Results	Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
18.00	35	D					24.70	18.10	
18.20	107	ES	1xT+1xJ+1xV			Very stiff grey slightly sandy slightly gravelly silty CLAY with fissures and horizontal laminations. Sand is fine to coarse. Gravel is angular to rounded fine to coarse of flint. (LAMBETH GROUP - READING FORMATION)		(0.90)	
							23.80	19.00	
19.00-19.10	36	D				Strong bluish white CHALK recovered as: black and white angular to rounded fine to coarse gravel of chalk with flint. (SEAFORD CHALK FORMATION)	23.70	19.10	
						Borehole terminated at 19.10m in agreement with client.			

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)	

All dimensions in metres | Scale: **1:33**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Inspection pit + Cable Percussion	**Dando 2000 Mark 2**	**Kevin Simms**	**DPellatt**	

STRUCTURAL SOILS

DRAFT

BOREHOLE LOG

Contract:	Client:	Borehole:
Greenway	**Skanska MWH Balfour Beatty JV**	**BH7**

Contract Ref:	Start: **04.06.20**	Ground Level (m AOD):	National Grid Co-ordinate:	Sheet:
563166	End: **08.06.20**	**43.20**	**E:507932.3 N:186805.9**	**1** of **4**

Depth (m)	Samples & Testing: No	Type	Results	Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
0.30	1	B				MADE GROUND: Grass over brown slightly sandy slightly gravelly SILT with frequent rootlets. Sand is fine to coarse. Gravel is angular to subrounded fine to medium of asphalt, pottery, concrete, and rare plastic fragments.	42.80	(0.40) 0.40	
0.30	101	ES	1xT+1xJ+1xV			Friable orangish brown mottled grey slightly sandy silty CLAY with frequent rootlets. (WEATHERED LONDON CLAY FORMATION)			
0.50	102	ES	1xT+1xJ+1xV						
0.50	2	B						(0.80)	
1.00	103	ES	1xT+1xJ+1xV						
1.00	3	B					42.00	1.20	
1.50-1.95	4	SPT	N=8			Soft to firm orangish brown mottled grey slightly sandy silty CLAY. (WEATHERED LONDON CLAY FORMATION)			
1.50-1.95	4	DSPT							
1.70	104	ES	1xT+1xJ+1xV			. . . By 1.50 m rootlets no longer present.			
1.70		HP	c_u=75/62/62						
2.00	5	D							
								(2.20)	
2.50-2.95	6	SPT	N=15						
2.50-2.95	6	DSPT							
2.70	105	ES	1xT+1xJ+1xV						
2.70		HP	c_u=125/125/150						
3.00	7	B					39.80	3.40	
3.50-3.95	8	SPT	N=23			Firm becoming very stiff multicolored (bluish grey, brown and purple) slightly sandy slightly gravelly CLAY. Sand is fine. Gravel is subangular to subrounded fine of calcrete. Silt content is localised within bluish grey clasts. (LONDON CLAY FORMATION)			
3.50-3.95	8	DSPT							
4.00	9	D							
4.50-4.95	10	UT100	0% recovery						
5.00	11	D							
5.00		HP	c_u=200/200/225						
5.50-5.95	12	SPT	N=24						
5.50-5.95	12	DSPT							

Boring Progress and Water Observations

Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth
04/06/20	16:30	11.00	4.50	200	Dry
05/06/20	08:00	11.00	4.50	200	Dry
05/06/20	16:30	19.20	18.00	150	Dry
08/06/20	08:00	19.20	18.00	150	6.40

Chiselling / Slow Progress

From	To	Duration (hh:mm)

General Remarks

1. Permit to dig issued by Eight20 prior to excavation.
2. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation.
3. Inspection pit hand dug to 1.20 m depth.
4. No visual or olfactory evidence of contamination.

All dimensions in metres | Scale: **1:33**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Cable Percussion	**Dando 2000 Mark 2**	**Kevin Simms**	**DPellatt**	

STRUCTURAL SOILS

DRAFT

BOREHOLE LOG

Contract:	Client:	Borehole:
Greenway	**Skanska MWH Balfour Beatty JV**	**BH7**

Contract Ref:	Start: **04.06.20**	Ground Level (m AOD):	National Grid Co-ordinate:	Sheet:
563166	End: **08.06.20**	**43.20**	**E:507932.3 N:186805.9**	**2** of **4**

Depth (m)	Samples & Testing: No	Type	Results	Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
6.00	13	D				Firm becoming very stiff multicolored (bluish grey, brown and purple) slightly sandy slightly gravelly CLAY. Sand is fine. Gravel is subangular to subrounded fine of calcrete. Silt content is localised within bluish grey clasts. (LONDON CLAY FORMATION) *(stratum copied from 3.40m from previous sheet)*			
6.50-6.95	14	UT100	100% recovery						
7.00	15	D				. . . Between 7.00 - 7.20 m, band with increased silt content.			
7.05		HP	c_u=>225/>225/>22						
7.50-7.95	16	SPT	N=50						
7.50-7.95	16	DSPT			1				
8.00	17	D						(9.60)	
8.50-8.95	18	UT100	90% recovery						
9.00	19	D							
9.05		HP	c_u=>225/>225/>22						
9.50-9.95	20	SPT	N=50						
9.50-9.95	20	DSPT							
10.00		B				. . . Between 10.0 and 10.4 m, increased sand content.			
					2 / 1				
10.50-10.95	22	UT100	100% recovery						
11.00	23	D							
11.50-11.95	24	B							

Boring Progress and Water Observations

Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth

Chiselling / Slow Progress

From	To	Duration (hh:mm)

General Remarks

5. 19 mm diameter standpipe with 300mm piezometer tip (complete with flush protective cover) installed to 17.0 m depth on completion. Response zone 17.2 m to 13.00 m depth.
6. Water strike at 10.50m rising to 8.00m after 20 min. A second water strike at 13.50m rising to 10.40m.

All dimensions in metres | Scale: **1:33**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Cable Percussion	**Dando 2000 Mark 2**	**Kevin Simms**	**DPellatt**	

STRUCTURAL SOILS

DRAFT

BOREHOLE LOG

Contract:	Client:	Borehole:
Greenway	**Skanska MWH Balfour Beatty JV**	**BH7**

Contract Ref:	Start:	Ground Level (m AOD):	National Grid Co-ordinate:	Sheet:
563166	End: **08.06.20**	**43.20**	**E:507932.3 N:186805.9**	**3** of **4**

Depth (m)	Samples & Testing: No	Type	Results	Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
12.00	25	D				Firm becoming very stiff multicolored (bluish grey, brown and purple) slightly sandy slightly gravelly CLAY. Sand is fine. Gravel is subangular to subrounded fine of calcrete. Silt content is localised within bluish grey clasts. (LONDON CLAY FORMATION) *(stratum copied from 3.40m from previous sheet)*			
12.50-12.95	26	UT100	50% recovery						
							30.20	13.00	
13.00	27	D				Medium dense becoming dense fine to coarse clayey silty SAND with black specks and occasional bands of brown silty clay. (LAMBETH GROUP - READING FORMATION)			
13.50-13.95	28	SPT	N=32						
14.00		B							
14.00	106	ES	1xT+1xJ+1xV						
14.50-14.95	30	SPT	N=50			. . . At 14.50m: becoming dense.			
15.00	31	D						(4.20)	
16.00	32	D							
16.00-16.45	33	SPT	N=50						
17.00	34	B					26.00	17.20	
17.40	107	ES	1xT+1xJ+1xV			Very stiff grey mottled brownish grey slightly sandy silty CLAY with fissures. (LAMBETH GROUP - UPNOR FORMATION)			
17.50-17.95	35	UT100	100% recovery						

Boring Progress and Water Observations					
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth

Chiselling / Slow Progress		
From	To	Duration (hh:mm)

General Remarks

All dimensions in metres | Scale: **1:33**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Cable Percussion	**Dando 2000 Mark 2**	**Kevin Simms**	**DPellatt**	

STRUCTURAL SOILS

DRAFT

BOREHOLE LOG

Contract:	Client:	Borehole:
Greenway	**Skanska MWH Balfour Beatty JV**	**BH7**

Contract Ref:	Start:	Ground Level (m AOD):	National Grid Co-ordinate:	Sheet:
563166	End: **08.06.20**	**43.20**	**E:507932.3 N:186805.9**	**4** of **4**

Depth (m)	Samples & Testing: No	Type	Results	Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
18.00	36	D				Very stiff grey mottled brownish grey slightly sandy silty CLAY with fissures. (LAMBETH GROUP - UPNOR FORMATION) *(stratum copied from 17.20m from previous sheet)*		(2.00)	
19.00	37	D							
19.00-19.45	38	SPT	N=17				24.00	19.20	
19.20	39	D				Weak CHALK recovered as white angular to subrounded fine to coarse gravel. (SEAFORD CHALK FORMATION)	23.75	19.45	
						Borehole terminated at 19.45m as per the clients instruction.			

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)	

All dimensions in metres | Scale: **1:33**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Cable Percussion	**Dando 2000 Mark 2**	**Kevin Simms**	**DPellatt**	

STRUCTURAL SOILS

DRAFT

BOREHOLE LOG

Contract:	Client:	Borehole:
Greenway	**Skanska MWH Balfour Beatty JV**	**BH8**

Contract Ref:	Start:	Ground Level (m AOD):	National Grid Co-ordinate:	Sheet:
563166	End: **01.06.20**	**43.18**	**E:507977.4 N:186746.5**	**1** of **4**

Depth (m)	Samples & Testing: No	Type	Results	Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
0.00-0.40	1	B				MADE GROUND: Grass over soft greyish brown slightly sandy slightly gravelly clayey SILT with frequent rootlets and low cobble content. Sand is fine to coarse. Gravel is subangular to rounded fine to coarse of flint, cobbles, concrete and limestone.		(0.40)	
0.20	101	ES	1xT+1xJ+1xV				42.78	0.40	
0.40-1.00	2	B				Soft becoming stiff orangish brown mottled grey slightly sandy silty CLAY with occasional rootlets. (WEATHERED LONDON CLAY FORMATION)			
0.60	102	ES	1xT+1xJ+1xV			. . . by 0.70 m rootlets no longer present.		(1.10)	
1.00	3	D					41.68	1.50	
1.50-1.95	4	UT100	100% recovery			Firm to tiff orangish brown mottled grey slightly sandy silty CLAY with occasional rootlets. (LONDON CLAY FORMATION)			
1.50-1.95	10	SPT	N=14						
2.00	5	D							
2.05		HP	c_u=75/100/112						
2.50-2.95	6	SPT	N=8					(2.50)	
3.00	7	D							
3.50-3.95	8	UT100	90% recovery						
							39.18	4.00	
4.00	9	D				Stiff to very stiff multicoloured (orangish brown, bluish grey and purple) slightly sandy silty CLAY. Sand is fine. Increased silt content in blue coloured pockets. (LAMBETH GROUP - READING FORMATION)			
4.05		HP	c_u=150/162/175						
4.50-5.00	11	B							
5.00	12	D							
5.25	103	ES	1xT+1xJ+1xV						
5.25		HP	c_u=>225/>225/>22						
5.50-5.95	13	UT100	90% recovery						

Boring Progress and Water Observations

Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth
01/06/20	16:30	3.00	3.00	200	Dry
02/06/20	08:00	3.00	3.00	200	Dry
02/06/20	16:30	10.50	3.00	200	Dry
03/06/20	08:00	10.50	3.00	200	Dry
03/06/20	16:30	19.40	19.40	150	17.30
04/06/20	08:30	19.40	19.40	150	8.90
04/06/20	16:30	19.40	None	150	

Chiselling / Slow Progress

From	To	Duration (hh:mm)

General Remarks

1. Permit to dig issued by Eight20.
2. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation.
3. Inspection pit hand dug to 1.20 m depth.
4. No visual or olfactory evidence of contamination.
5. Water strike at 13.70m rising to 8.80m.

All dimensions in metres | Scale: **1:33**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Inspection pit + Cable Percussion	**Dando 2000 Mark 2**	**Steve Wray**	**DPellatt**	

STRUCTURAL SOILS

DRAFT

BOREHOLE LOG

Contract:	Client:	Borehole:
Greenway	**Skanska MWH Balfour Beatty JV**	**BH8**

Contract Ref:	Start:	Ground Level (m AOD):	National Grid Co-ordinate:	Sheet:
563166	End: **01.06.20**	**43.18**	**E:507977.4 N:186746.5**	**2** of **4**

Depth (m)	Samples & Testing: No	Type	Results	Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
6.00	14	D				Stiff to very stiff multicoloured (orangish brown, bluish grey and purple) slightly sandy silty CLAY. Sand is fine. Increased silt content in blue coloured pockets. (LAMBETH GROUP - READING FORMATION) *(stratum copied from 4.00m from previous sheet)*			
6.50-6.95	15	SPT	N=21						
7.00	16	D							
7.50-7.95	17	UT100	90% recovery						
8.00	18	D							
8.50-8.95	19	SPT	N=32		1			(9.80)	
9.00	20	D							
9.50-9.95	21	UT100	90% recovery						
10.00	22	D							
10.50-10.95	23	SPT	N=41						
11.00	24	D							
11.50-11.95	25	UT100	50% recovery						

Boring Progress and Water Observations

Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth

Chiselling / Slow Progress

From	To	Duration (hh:mm)

General Remarks

6. 19 mm diameter standpipe with 300mm piezometer installed at 18.00m depth. on completion. Response zone 13.50 m to 18.50 m depth. 5. 42 mm diameter gas/groundwater monitoring well complete with flush protective cover installed to 5.0 m depth on completion. Response zone 1.0 m to 5.0 m depth.

All dimensions in metres | Scale: **1:33**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Inspection pit + Cable Percussion	**Dando 2000 Mark 2**	**Steve Wray**	**DPellatt**	

STRUCTURAL SOILS

DRAFT

BOREHOLE LOG

Contract:	Client:	Borehole:
Greenway	**Skanska MWH Balfour Beatty JV**	**BH8**

Contract Ref:	Start:	Ground Level (m AOD):	National Grid Co-ordinate:	Sheet:
563166	End: **01.06.20**	**43.18**	**E:507977.4 N:186746.5**	**3** of **4**

Depth (m)	Samples & Testing: No	Type	Results	Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
12.00	26	D				Stiff to very stiff multicoloured (orangish brown, bluish grey and purple) slightly sandy silty CLAY. Sand is fine. Increased silt content in blue coloured pockets. (LAMBETH GROUP - READING FORMATION) *(stratum copied from 4.00m from previous sheet)*			
12.50-12.95	27	SPT	N=44			. . . between 12.50 and 13.80 m depth, increasing sand content.			
13.00	28	D							
13.50-13.95	29	UT100	70% recovery		1		29.38	13.80	
14.00	104	ES	1xT+1xJ+1xV			Brown fine to coarse clayey silty SAND with black specks. (Sands noted as blowing by driller.) (LAMBETH GROUP - READING FORMATION)			
14.00	30	D							
14.00-14.50	31	B							
14.50-14.82	32	SPT	7,10/19,22,9 for 20mm						
15.00	33	D							
15.50-15.81	34	SPT	9,10/22,23,5 for 10mm						
16.00	35	D						(4.70)	
17.00	36	D							
17.00-17.25	37	SPT	10,12/33,17 for 20mm						

Boring Progress and Water Observations					
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth

Chiselling / Slow Progress		
From	To	Duration (hh:mm)

General Remarks

All dimensions in metres | Scale: **1:33**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Inspection pit + Cable Percussion	**Dando 2000 Mark 2**	**Steve Wray**	**DPellatt**	

STRUCTURAL SOILS

DRAFT

BOREHOLE LOG

Contract:	Client:	Borehole:
Greenway	**Skanska MWH Balfour Beatty JV**	**BH8**

Contract Ref:	Start:	Ground Level (m AOD):	National Grid Co-ordinate:	Sheet:
563166	**01.06.20**	**43.18**	**E:507977.4 N:186746.5**	**4** of **4**
	End: **01.06.20**			

Depth (m)	Samples & Testing: No	Type	Results	Backfill & Instrumentation	Water	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
18.00	38	D				Brown fine to coarse clayey silty SAND with black specks. (Sands noted as blowing by driller.) (LAMBETH GROUP - READING FORMATION) *(stratum copied from 13.80m from previous sheet)*	24.68	18.50	
18.50-18.95	39	UT100	90% recovery			Very stiff grey mottled dark grey silty CLAY with fissures. (LAMBETH GROUP - UPNOR FORMATION)		(0.90)	
18.50-19.00	43	B							
19.00	105	ES	1xT+1xJ+1xV				23.78	19.40	
19.00	40	D							
19.40	41	D				Weak CHALK recovered as: white and black angular to rounded fine to coarse gravel of flint and chalk. (SEAFORD CHALK FORMATION)	23.52	19.66	
19.50-19.66	42	SPT(c)	22,3/38,12 for 10mm			Borehole terminated at 19.66m depth as per clients instructions.			

Boring Progress and Water Observations						Chiselling / Slow Progress			General Remarks
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter (mm)	Water Depth	From	To	Duration (hh:mm)	

All dimensions in metres | Scale: **1:33**

Method Used:	Plant Used:	Drilled By:	Logged By:	Checked By:
Inspection pit + Cable Percussion	**Dando 2000 Mark 2**	**Steve Wray**	**DPellatt**	

SUMMARY OF INSTALLATION AND PIEZOMETER CHARACTERISTICS

Exploratory Position ID	Pipe Caption	Cover Level	Pipe Top Level (m)	Ground Level	Length of Pipe (m)	Piezo meter Depth (m)	Response Zone Top (m)	Response Zone Base (m)	Slotted Pipe Top (m)	Slotted Pipe Base (m)	Pipe Internal Diameter (mm)	Exploratory Position Coordinates (Easting, Northing) (m)	Ground Level (mAOD)	Coordinate Status
BH1	Deep	---	---	40.92	12.30	---	9.75	12.30	9.75	12.30	19	(507954.465 , 187246.885)	40.922	
BH1	Shallow	---	---	40.92	2.00	---	1.00	2.00	1.00	2.00	42	(507954.465 , 187246.885)	40.922	
BH2	Deep	---	---	40.85	15.80	---	11.70	15.80	11.70	15.80	19	(507932.702 , 187225.447)	40.854	
BH3	Deep	---	---	41.32	17.00	---	13.50	17.00	13.50	17.00	19	(507927.892 , 187152.510)	41.317	
BH4	Deep	---	---	41.48	15.00	---	13.00	15.00	13.00	15.00	19	(507910.970 , 187089.006)	41.477	
BH5	Deep	---	---	42.51	19.00	---	18.70	19.00	---	---	19	(507905.073 , 186946.763)	42.505	
BH6	Deep	---	---	42.80	16.00	---	15.70	16.00	---	---	19	(507883.604 , 186866.230)	42.795	
BH6	Shallow	---	---	42.80	5.00	---	1.00	5.00	1.00	5.05	42	(507883.604 , 186866.230)	42.795	
BH7	Deep	---	---	43.20	17.00	---	16.70	17.00	---	---	19	(507932.262 , 186805.931)	43.202	
BH8	---	---	---	43.18	5.00	---	1.00	5.00	1.00	5.05	32	(507977.367 , 186746.493)	43.177	

STRUCTURAL SOILS
The Old School
Stillhouse Lane
Bedminster
Bristol BS3 4EB

Compiled By		Date	Contract Ref:
HPerry-Smith	**HPERRY-SMITH**	**20.07.20**	**563166**
Contract: **Greenway**			Page: **1** of **2**

SUMMARY OF INSTALLATION AND PIEZOMETER CHARACTERISTICS

Exploratory Position ID	Pipe Caption	Cover Level	Pipe Top Level (m)	Ground Level	Length of Pipe (m)	Piezo meter Depth (m)	Response Zone Top (m)	Response Zone Base (m)	Slotted Pipe Top (m)	Slotted Pipe Base (m)	Pipe Internal Diameter (mm)	Exploratory Position Coordinates (Easting, Northing) (m)	Ground Level (mAOD)	Coordinate Status
BH8	---	---	---	43.18	18.50	---	13.50	18.50	---	---	19	(507977.367 , 186746.493)	43.177	

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HPerry-Smith	**HPERRY-SMITH**	**20.07.20**	**563166**
Contract: **Greenway**			Page: **2** of **2**

APPENDIX C -
IN-SITU TESTING

(i) Standard Penetration Test (SPT) Summary Sheet

(ii) SPT N value versus Elevation Plot

STANDARD PENETRATION TEST SUMMARY TABLE

Exploratory Position ID	Depth (m)	Hole Dia (mm)	Casing Depth (m)	Water Depth (m)	Seating Drive		Test Drive			Hammer ID	Calibration Date	Energy Ratio (%)	Comments
					Blows	Pen (mm)	Blows	R (mm)	Result				
BH1	2.50	200	2.00	Dry	2,2	150	2,1,1,1		N=5	AR1322-2019	15/07/2019	66	
	4.50	200	4.00	Dry	1,2	150	3,3,2,3		N=11	AR1322-2019	15/07/2019	66	
	6.50	200	5.50	Dry	2,3	150	3,3,4,5		N=15	AR1322-2019	15/07/2019	66	
	8.50	200	8.00	Dry	5,6	150	6,12,10,12		N=40	AR1322-2019	15/07/2019	66	
	10.50	200	10.00	Dry	6,8	150	11,16,18,5		N=50	AR1322-2019	15/07/2019	66	
	14.50	200	13.00	14.00	7,12	150	15,30,5,0		N=50	AR1322-2019	15/07/2019	66	
	16.00	200	15.00	15.10	13,12	150	27,21,2,0		N=50	AR1322-2019	15/07/2019	66	
	17.50	200	17.00	15.10	6,9	150	8,9,9,12		N=38	AR1322-2019	15/07/2019	66	
	19.00	200	18.00	11.60	14,11	150	19,21,10,0		N=50	AR1322-2019	15/07/2019	66	
	20.45	200	20.00	6.30	7,11	150	9,11,12,14		N=46	AR1322-2019	15/07/2019	66	
	22.00	150	21.00	6.30	9,15	150	14,20,16,0		N=50	AR1322-2019	15/07/2019	66	
BH2	2.50	200	2.00	Dry	2,2	150	3,4,4,6		N=17	AR1322-2019	15/07/2019	66	
	4.50	200	4.00	Dry	3,5	150	5,6,6,6		N=23	AR1322-2019	15/07/2019	66	
	6.50	200	6.00	Dry	3,4	150	6,6,6,9		N=27	AR1322-2019	15/07/2019	66	
	8.50	200	8.00	Dry	3,5	150	7,8,9,14		N=38	AR1322-2019	15/07/2019	66	
	10.50	200	10.00	Dry	4,8	150	16,15,19,0		N=50	AR1322-2019	15/07/2019	66	
	11.50	200	11.00	Dry	4,5	150	9,11,15,15		N=50	AR1322-2019	15/07/2019	66	

Notes:
1. Tests carried out in general accordance with BS EN ISO 22476-3:2005, including amendment A1 (2011).
2. Reported blows are for 75mm penetration unless indicated "+".
3. Where full test drive was not achieved, actual penetration (R) and total test drive blows are reported.
4. Tests carried out using a split spoon sampler unless noted as SPT(c) (denotes use of solid cone method) in the comments column.
5. Entries in the water depth column reflects the measured water depth at time of test.

N_{60} = (Measured hammer energy ratio / 60) x N value

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STANDARD PENETRATION TEST SUMMARY TABLE

Exploratory Position ID	Depth (m)	Hole Dia (mm)	Casing Depth (m)	Water Depth (m)	Seating Drive		Test Drive			Hammer ID	Calibration Date	Energy Ratio (%)	Comments
					Blows	Pen (mm)	Blows	R (mm)	Result				
BH2	14.50	200	14.00	Dry	11,14	150	19,31,0,0		N=50	AR1322-2019	15/07/2019	66	
	16.00	200	16.00	8.10	10,11	150	11,17,21,1		N=50	AR1322-2019	15/07/2019	66	
	17.50	150	17.00	6.80	9,9	150	9,10,11,11		N=41	AR1322-2019	15/07/2019	66	
	19.00	150	19.00	6.30	10,11	150	13,9,8,6		N=36	AR1322-2019	15/07/2019	66	SPT(c)
	20.00	150	19.50	4.10	5,17	150	22,28,0,0		N=50	AR1322-2019	15/07/2019	66	
BH3	1.50	200	0.00	Dry	1,1	150	2,3,3,3		N=11	AR1322-2019	15/07/2019	66	
	4.50	200	4.00	Dry	2,2	150	3,3,3,4		N=13	AR1322-2019	15/07/2019	66	
	6.50	200	4.00	Dry	5,9	150	11,12,12,15		N=50	AR1322-2019	15/07/2019	66	
	8.50	200	4.00	Dry	5,7	150	8,8,9,9		N=34	AR1322-2019	15/07/2019	66	
	10.50	200	10.00	Dry	4,6	150	11,12,16,11		N=50	AR1322-2019	15/07/2019	66	
	12.50	200	12.00	Dry	10,15	150	20,21,9	225	10,15/20,21,9	AR1322-2019	15/07/2019	66	
									for 75mm				
	14.50	200	14.00	10.90	7,10	150	11,14,19,6		N=50	AR1322-2019	15/07/2019	66	
	16.00	200	15.50	11.20	15,10	150	41,9,0,0		N=50	AR1322-2019	15/07/2019	66	
	17.50	200	17.00	10.40	7,12	150	14,21,15,0		N=50	AR1322-2019	15/07/2019	66	
	20.50	150	17.00	12.70	17,8	150	13,14,14,9		N=50	AR1322-2019	15/07/2019	66	

Notes:
1. **Tests carried out in general accordance with BS EN ISO 22476-3:2005, including amendment A1 (2011).**
2. **Reported blows are for 75mm penetration unless indicated "+".**
3. **Where full test drive was not achieved, actual penetration (R) and total test drive blows are reported.**
4. **Tests carried out using a split spoon sampler unless noted as SPT(c) (denotes use of solid cone method) in the comments column.**
5. **Entries in the water depth column reflects the measured water depth at time of test.**

N_{60} = (Measured hammer energy ratio / 60) x N value

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STANDARD PENETRATION TEST SUMMARY TABLE

Exploratory Position ID	Depth (m)	Hole Dia (mm)	Casing Depth (m)	Water Depth (m)	Seating Drive		Test Drive			Hammer ID	Calibration Date	Energy Ratio (%)	Comments
					Blows	Pen (mm)	Blows	R (mm)	Result				
BH4	2.50	200	1.50	Dry	2,3	150	2,4,5,5		N=16	AR1322-2019	15/07/2019	66	
	4.50	200	4.00	Dry	3,4	150	4,5,5,6		N=20	AR1322-2019	15/07/2019	66	
	6.50	200	6.00	Dry	4,11	150	10,14,14,12		N=50	AR1322-2019	15/07/2019	66	
	8.50	200	8.00	Dry	4,5	150	11,11,18,10		N=50	AR1322-2019	15/07/2019	66	
	10.50	200	10.00	9.50	5,12	150	12,13,13,10		N=48	AR1322-2019	15/07/2019	66	
	12.50	200	12.00	12.30	8,11	150	13,12,13,12		N=50	AR1322-2019	15/07/2019	66	
	14.50	200	14.00	14.60	5,9	150	11,13,12,14		N=50	AR1322-2019	15/07/2019	66	
	16.00	200	15.80	13.10	5,9	150	12,14,14,10		N=50	AR1322-2019	15/07/2019	66	
BH5	1.50				1,1	150	1,1,1,1		N=4				
	2.50				1,2	150	2,1,2,2		N=7				
	3.50				2,3	150	4,4,4,4		N=16				
	4.50				3,4	150	5,5,5,6		N=21				
	5.50				3,5	150	7,7,8,9		N=31				
	6.50				3,7	150	7,8,8,8		N=31				
	7.50				5,5	150	6,10,10,13		N=39				
	8.50				6,8	150	8,11,11,13		N=43				
	9.50				6,6	150	6,9,12,14		N=41				

Notes:
1. Tests carried out in general accordance with BS EN ISO 22476-3:2005, including amendment A1 (2011).
2. Reported blows are for 75mm penetration unless indicated "+".
3. Where full test drive was not achieved, actual penetration (R) and total test drive blows are reported.
4. Tests carried out using a split spoon sampler unless noted as SPT(c) (denotes use of solid cone method) in the comments column.
5. Entries in the water depth column reflects the measured water depth at time of test.

N_{60} = (Measured hammer energy ratio / 60) x N value

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Contract: **Greenway**			Page: **3** of **6**

STANDARD PENETRATION TEST SUMMARY TABLE

Exploratory Position ID	Depth (m)	Hole Dia (mm)	Casing Depth (m)	Water Depth (m)	Seating Drive		Test Drive			Hammer ID	Calibration Date	Energy Ratio (%)	Comments
					Blows	Pen (mm)	Blows	R (mm)	Result				
BH5	10.50				6,6	150	7,10,12,15		N=44				
	11.50				7,9	150	11,13,13,13		N=50				
	12.50				6,10	150	10,11,13,14		N=48				
	13.50				6,9	150	15,20,15+	195	6,9/15,20,15				
									for 45mm				
	14.50				7,7	150	10,13,14,13+	295	7,7/10,13,14,13				
									for 70mm				
	15.50				9,10	150	14,19,17+	195	9,10/14,19,17				
									for 45mm				
	16.50				9,12	150	17,33	150	9,12/17,33				
									for 75mm				
	18.00				8,8	150	12,27,11+	180	8,8/12,27,11				
									for 30mm				
	19.50				6,8	150	10,10,12,13		N=45				
	20.50				22,3	80	34,16+	85	22,3/34,16				SPT(c)
									for 10mm				
BH6	2.50				1,2	150	2,2,3,2		N=9				
	4.50				4,6	150	6,6,7,9		N=28				

Notes:
1. Tests carried out in general accordance with BS EN ISO 22476-3:2005, including amendment A1 (2011).
2. Reported blows are for 75mm penetration unless indicated "+".
3. Where full test drive was not achieved, actual penetration (R) and total test drive blows are reported.
4. Tests carried out using a split spoon sampler unless noted as SPT(c) (denotes use of solid cone method) in the comments column.
5. Entries in the water depth column reflects the measured water depth at time of test.

N_{60} = (Measured hammer energy ratio / 60) x N value

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STANDARD PENETRATION TEST SUMMARY TABLE

Exploratory Position ID	Depth (m)	Hole Dia (mm)	Casing Depth (m)	Water Depth (m)	Seating Drive		Test Drive			Hammer ID	Calibration Date	Energy Ratio (%)	Comments
					Blows	Pen (mm)	Blows	R (mm)	Result				
BH6	6.50				4,4	150	5,6,6,7		N=24				
	8.50				6,8	150	8,11,15,16		N=50				
	11.50				10,12	150	14,16,17,3		N=50				
	13.50				6,9	150	10,16,16,8		N=50				
	14.50				5,10	150	28,22,0,0		N=50				
	16.00				25,0	150	50,0,0,0		N=50				
BH7	1.50				1,2	150	2,2,2,2		N=8				
	2.50				2,3	150	3,4,4,4		N=15				
	3.50				4,5	150	5,6,6,6		N=23				
	5.50				4,4	150	5,5,7,7		N=24				
	7.50				7,9	150	12,12,16,10		N=50				
	9.50				8,8	150	13,16,21,0		N=50				
	13.50				4,6	150	6,6,9,11		N=32				
	14.50				3,3	150	6,10,16,18		N=50				
	16.00				15,10	150	50,0,0,0		N=50				
	19.00				25,33	150	17,0,0,0		N=17				

Notes:
1. **Tests carried out in general accordance with BS EN ISO 22476-3:2005, including amendment A1 (2011).**
2. **Reported blows are for 75mm penetration unless indicated "+".**
3. **Where full test drive was not achieved, actual penetration (R) and total test drive blows are reported.**
4. **Tests carried out using a split spoon sampler unless noted as SPT(c) (denotes use of solid cone method) in the comments column.**
5. **Entries in the water depth column reflects the measured water depth at time of test.**

N_{60} = (Measured hammer energy ratio / 60) x N value

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STANDARD PENETRATION TEST SUMMARY TABLE

Exploratory Position ID	Depth (m)	Hole Dia (mm)	Casing Depth (m)	Water Depth (m)	Seating Drive		Test Drive			Hammer ID	Calibration Date	Energy Ratio (%)	Comments
					Blows	Pen (mm)	Blows	R (mm)	Result				
BH8	1.50				3,3	150	3,4,4,3		N=14				
	2.50				2,1	150	2,2,2,2		N=8				
	6.50				3,4	150	5,5,5,6		N=21				
	8.50				6,7	150	8,8,7,9		N=32				
	10.50				5,8	150	9,10,11,11		N=41				
	12.50				6,9	150	11,11,10,12		N=44				
	14.50				7,10	150	19,22,9+	170	7,10/19,22,9				
									for 20mm				
	15.50				9,10	150	22,23,5+	160	9,10/22,23,5				
									for 10mm				
	17.00				10,12	150	33,17+	95	10,12/33,17				
									for 20mm				
	19.50				22,3	76	38,12+	85	22,3/38,12				SPT(c)
									for 10mm				

Notes:
1. **Tests carried out in general accordance with BS EN ISO 22476-3:2005, including amendment A1 (2011).**
2. **Reported blows are for 75mm penetration unless indicated "+".**
3. **Where full test drive was not achieved, actual penetration (R) and total test drive blows are reported.**
4. **Tests carried out using a split spoon sampler unless noted as SPT(c) (denotes use of solid cone method) in the comments column.**
5. **Entries in the water depth column reflects the measured water depth at time of test.**

N_{60} = (Measured hammer energy ratio / 60) x N value

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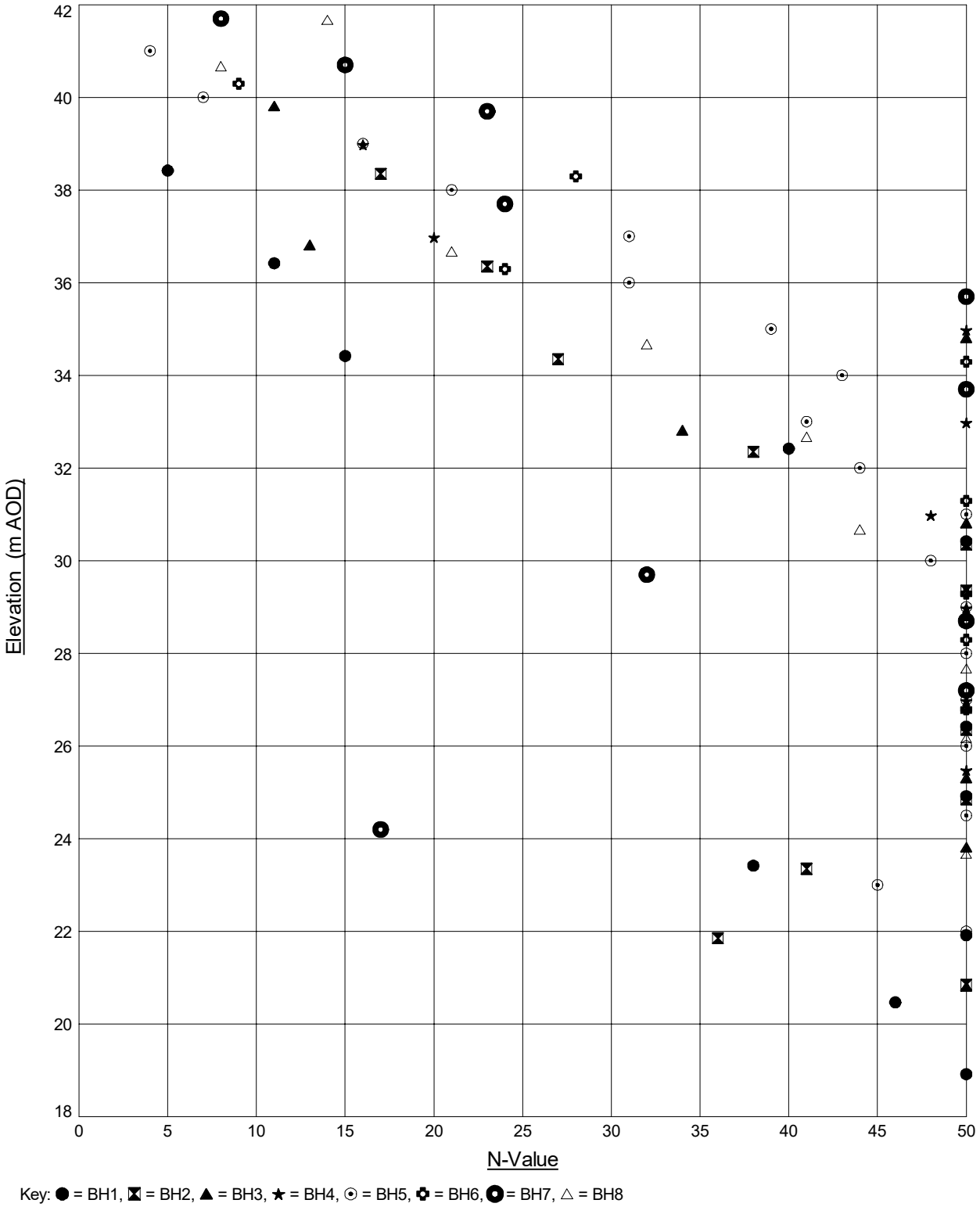
STANDARD PENETRATION TEST (SPT N-Value) vs ELEVATION



Key: ● = BH1, ⊠ = BH2, ▲ = BH3, ★ = BH4, ⊙ = BH5, ✿ = BH6, ◉ = BH7, △ = BH8

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Contract	Date	Compiled By
Greenway	**20.07.20**	KJ
Client	Contract Ref:	
Skanska MWH Balfour Beatty JV	**563166**	AGS

APPENDIX D - GEOTECHNICAL LABORATORY TESTING

(i) Laboratory Test Verification Sheet

(ii) Laboratory Test Results

TESTING VERIFICATION CERTIFICATE

1774

The test results included in this report are certified as:-

ISSUE STATUS: **FINAL**

In accordance with the Structural Soils Ltd Laboratory Quality Management System, results sheets and summaries of results issued by the laboratory are checked by an approved signatory. The integrity of the test data and results are ensured by control of the computer system employed by the laboratory as part of the Software Verification Program as detailed in the Laboratory Quality Manual.

This testing verification certificate covers all testing compiled on or before the following datetime: **21/04/2020 08:18:11**.

Testing reported after this date is not covered by this Verification Certificate.

Approved Signatory
Alan Frost (Data Quality Manager)

(Head Office)
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HP3 9RT

Tonbridge Laboratory
Anerley Court, Half Moon Lane
Hildenborough
Tonbridge
TN11 9HU

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TESTING VERIFICATION CERTIFICATE

1774

The test results included in this report are certified as:-

ISSUE STATUS: **FINAL**

In accordance with the Structural Soils Ltd Laboratory Quality Management System, results sheets and summaries of results issued by the laboratory are checked by an approved signatory. The integrity of the test data and results are ensured by control of the computer system employed by the laboratory as part of the Software Verification Program as detailed in the Laboratory Quality Manual.

This testing verification certificate covers all testing compiled on or before the following datetime: **10/07/2020 09:20:39**.

Testing reported after this date is not covered by this Verification Certificate.

Approved Signatory
Alan Frost (Data Quality Manager)

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STRUCTURAL SOILS LTD	Contract: **Greenway**	Job No: **563166**

SUMMARY OF SOIL CLASSIFICATION TESTS

In accordance with clauses 3.2,4.3,4.4,5.3,5.4,7.2,8.2,8.3 of BS1377:Part 2:1990

Exploratory Position ID	Sample Ref	Sample Type	Depth (m)	Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity Index	% <425µm	Description of Sample
BH1	4	UT100	1.50	22	35	15	20	100	Orangish brown mottled greenish grey sandy CLAY
BH1	8	UT100	3.50	28	51	20	31	100	Dark greyish brown slightly sandy CLAY
BH1	13	UT100	6.00	24	39	18	21	100	Dark greyish brown slightly sandy silty CLAY
BH1	16	UT100	7.55	18	59	18	41	100	Orangish brown mottled purple and bluish grey slightly sandy CLAY
BH1	20	UT100	9.50	15	39	17	22	100	Bluish grey very clayey SAND
BH1	24	UT100	11.50	15	32	18	14	100	Brown mottled bluish grey sandy CLAY
BH1	28	UT100	13.50	20					Brown mottled grey slightly sandy CLAY
BH2	4	UT100	1.50	28					Dark brown slightly sandy CLAY

SUMMARY OF SOIL CLASSIFICATION TESTS

In accordance with clauses 3.2,4.3,4.4,5.3,5.4,7.2,8.2,8.3 of BS1377:Part 2:1990

Exploratory Position ID	Sample Ref	Sample Type	Depth (m)	Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity Index	% <425µm	Description of Sample
BH2	8	UT100	3.50	22	51	21	30	100	Dark brownish grey slightly sandy CLAY
BH2	12	UT100	5.50	23	38	18	20	100	Dark grey slightly sandy silty CLAY
BH2	16	UT100	7.50	23					Bluish grey mottled purple slightly sandy CLAY
BH2	20	UT100	9.50	19					Orangish brown sandy silty CLAY
BH2	22	D	10.50	24	34	16	18	100	Yellowish brown sandy silty CLAY
BH2	24	UT100	11.50	21					Yellowish brown sandy silty CLAY
BH2	28	UT100	13.50	19					Brown clayey SAND
BH3	12	UT100	5.50	19	52	19	33	100	Bluish grey mottled purple and yellowish brown slightly sandy CLAY

SUMMARY OF SOIL CLASSIFICATION TESTS

In accordance with clauses 3.2,4.3,4.4,5.3,5.4,7.2,8.2,8.3 of BS1377:Part 2:1990

Exploratory Position ID	Sample Ref	Sample Type	Depth (m)	Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity Index	% <425µm	Description of Sample
BH3	16	UT100	7.50	16	36	18	18	100	Bluish grey mottled brown slightly sandy silty CLAY
BH3	20	UT100	9.50	20	33	15	18	100	Yellowish brown mottled bluish grey sandy silty CLAY
BH3	24	UT100	11.50	20	57	21	36	100	Brown mottled grey slightly sandy CLAY
BH3	28	B	13.50	32					Orangish brown sandy SILT
BH3	31	DSPT	14.50	22					Brown slightly gravelly sandy silty CLAY

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Contract: **Greenway**

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SUMMARY OF SOIL CLASSIFICATION TESTS

In accordance with clauses 3.2,4.3,4.4,5.3,5.4,7.2,8.2,8.3 of BS1377:Part 2:1990

Exploratory Position ID	Sample Ref	Sample Type	Depth (m)	Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity Index	% <425µm	Description of Sample
BH4	4	UT100	1.50	24	51	21	30	99	Brown slightly gravelly slightly sandy silty CLAY
BH4	8	UT100	3.50	27	67	28	39	90	Bluish grey mottled orangish brown slightly gravelly slightly sandy silty CLAY
BH4	12	UT100	5.50	17	45	19	26	100	Bluish grey mottled purple and yellowish brown slightly sandy silty CLAY
BH4	16	UT100	7.50	16	40	18	22	100	Bluish grey mottled brown slightly sandy silty CLAY
BH4	20	UT100	9.50	17	53	22	31	100	Brown mottled grey slightly sandy silty CLAY
BH4	24	UT100	11.50	19					Light brown slightly sandy silty CLAY
BH4	29	D	14.00	16	38	16	22	100	Dark greyish brown sandy CLAY
BH4	32	DSPT	16.00	22	74	27	47	100	Dark grey slightly sandy CLAY

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Contract: **Greenway**

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SUMMARY OF SOIL CLASSIFICATION TESTS

In accordance with clauses 3.2,4.3,4.4,5.3,5.4,7.2,8.2,8.3 of BS1377:Part 2:1990

Exploratory Position ID	Sample Ref	Sample Type	Depth (m)	Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity Index	% <425µm	Description of Sample
BH5	5	D	2.00	28	54	20	34	98	Dark yellowish brown slightly gravelly slightly sandy silty CLAY
BH5	10	B	4.00	28	40	20	20	100	Brown mottled grey slightly sandy silty CLAY
BH5	17	D	7.00	16	40	18	22	100	Brown mottled bluish grey slightly sandy silty CLAY
BH5	19	D	8.00	16	56	21	35	100	Brown mottled bluish grey slightly sandy silty CLAY
BH5	21	D	9.00	15	57	23	34	100	Brown mottled bluish grey slightly sandy silty CLAY
BH5	23	D	10.00	14	47	18	29	100	Brown mottled bluish grey slightly sandy silty CLAY
BH5	25	D	11.00	14	51	20	31	100	Brown slightly sandy silty CLAY
BH6	1	B	0.30	15	44	21	23	97	Yellowish brown slightly gravelly slightly sandy silty CLAY

SUMMARY OF SOIL CLASSIFICATION TESTS

In accordance with clauses 3.2,4.3,4.4,5.3,5.4,7.2,8.2,8.3 of BS1377:Part 2:1990

Exploratory Position ID	Sample Ref	Sample Type	Depth (m)	Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity Index	% <425µm	Description of Sample
BH6	4	UT100	1.50	20	41	19	22	79	Yellowish brown slightly gravelly slightly sandy silty CLAY
BH6	8	UT100	3.50	16	60	17	43	99	Greyish brown mottled orangish brown slightly gravelly slightly sandy silty CLAY
BH6	12	UT100	5.50	23					Brown mottled bluish grey slightly sandy silty CLAY
BH6	16	UT100	7.50	17	55	21	34	100	Brown mottled bluish grey and purple slightly sandy silty CLAY
BH6	21	UT100	10.50	18					Yellowish brown slightly sandy silty CLAY
BH6	25	UT100	12.50	14	49	19	30	100	Brown mottled bluish grey slightly sandy silty CLAY
BH6	34	UT100	17.50	22	58	23	35	100	Dark grey silty CLAY
BH7	18	UT100	8.50	17	55	21	34	100	Brown slightly sandy CLAY

SUMMARY OF SOIL CLASSIFICATION TESTS

In accordance with clauses 3.2,4.3,4.4,5.3,5.4,7.2,8.2,8.3 of BS1377:Part 2:1990

Exploratory Position ID	Sample Ref	Sample Type	Depth (m)	Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity Index	% <425µm	Description of Sample
BH7	22	UT100	10.50	21	58	22	36	90	Reddish brown mottled bluish grey slightly gravelly slightly sandy CLAY
BH7	26	UT100	12.50	17	37	18	19	100	Brown mottled grey slightly sandy silty CLAY
BH8	4	UT100	1.50	24	47	20	27	91	Orangish brown slightly gravelly slightly sandy silty CLAY
BH8	8	UT100	3.50	28					Orangish brown mottled grey slightly sandy silty CLAY
BH8	13	UT100	5.50	22	66	24	42	100	Orangish brown mottled bluish grey and purple slightly sandy silty CLAY
BH8	17	UT100	7.50	19					Brown mottled bluish grey slightly sandy silty CLAY
BH8	21	UT100	9.50	20	56	22	34	99	Brown mottled bluish grey slightly gravelly slightly sandy silty CLAY
BH8	25	UT100	11.50	16					Orangish brown mottled bluish grey slightly sandy silty CLAY

STRUCTURAL SOILS LTD

Contract: **Greenway**

Contract Ref: **563166**

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SUMMARY OF MOISTURE CONTENT TESTS

In accordance with clause 3.2 of BS1377:Part 2

Exploratory Position ID	Sample Ref	Depth (m)	Sample Type	Moisture Content %	Lab
BH1	**28**	**13.50**	**UT100**	**20**	**B**
BH2	**4**	**1.50**	**UT100**	**28**	**B**
BH2	**16**	**7.50**	**UT100**	**23**	**B**
BH2	**20**	**9.50**	**UT100**	**19**	**B**
BH2	**24**	**11.50**	**UT100**	**21**	**B**
BH2	**28**	**13.50**	**UT100**	**19**	**B**
BH3	**28**	**13.50**	**B**	**32**	**B**
BH3	**31**	**14.50**	**DSPT**	**22**	**B**

Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NJ), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)

STRUCTURAL SOILS
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Compiled By		Date
	CONNEL MCLAUGHLIN	**12/03/20**
Contract: **Greenway**	Contract Ref: **563166**	

SUMMARY OF MOISTURE CONTENT TESTS

In accordance with clause 3.2 of BS1377:Part 2

Exploratory Position ID	Sample Ref	Depth (m)	Sample Type	Moisture Content %	Lab
BH4	**24**	**11.50**	**UT100**	**19**	**B**

Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NJ), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)

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Compiled By		Date
D. Richards	**DAISY RICHARDS**	**21/04/20**
Contract: **Greenway**	Contract Ref: **563166**	

SUMMARY OF MOISTURE CONTENT TESTS

In accordance with clause 3.2 of BS1377:Part 2

Exploratory Position ID	Sample Ref	Depth (m)	Sample Type	Moisture Content %	Lab
BH6	**12**	**5.50**	**UT100**	**23**	**B**
BH6	**21**	**10.50**	**UT100**	**18**	**B**
BH8	**8**	**3.50**	**UT100**	**28**	**B**
BH8	**17**	**7.50**	**UT100**	**19**	**B**
BH8	**25**	**11.50**	**UT100**	**16**	**B**

Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NJ), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)

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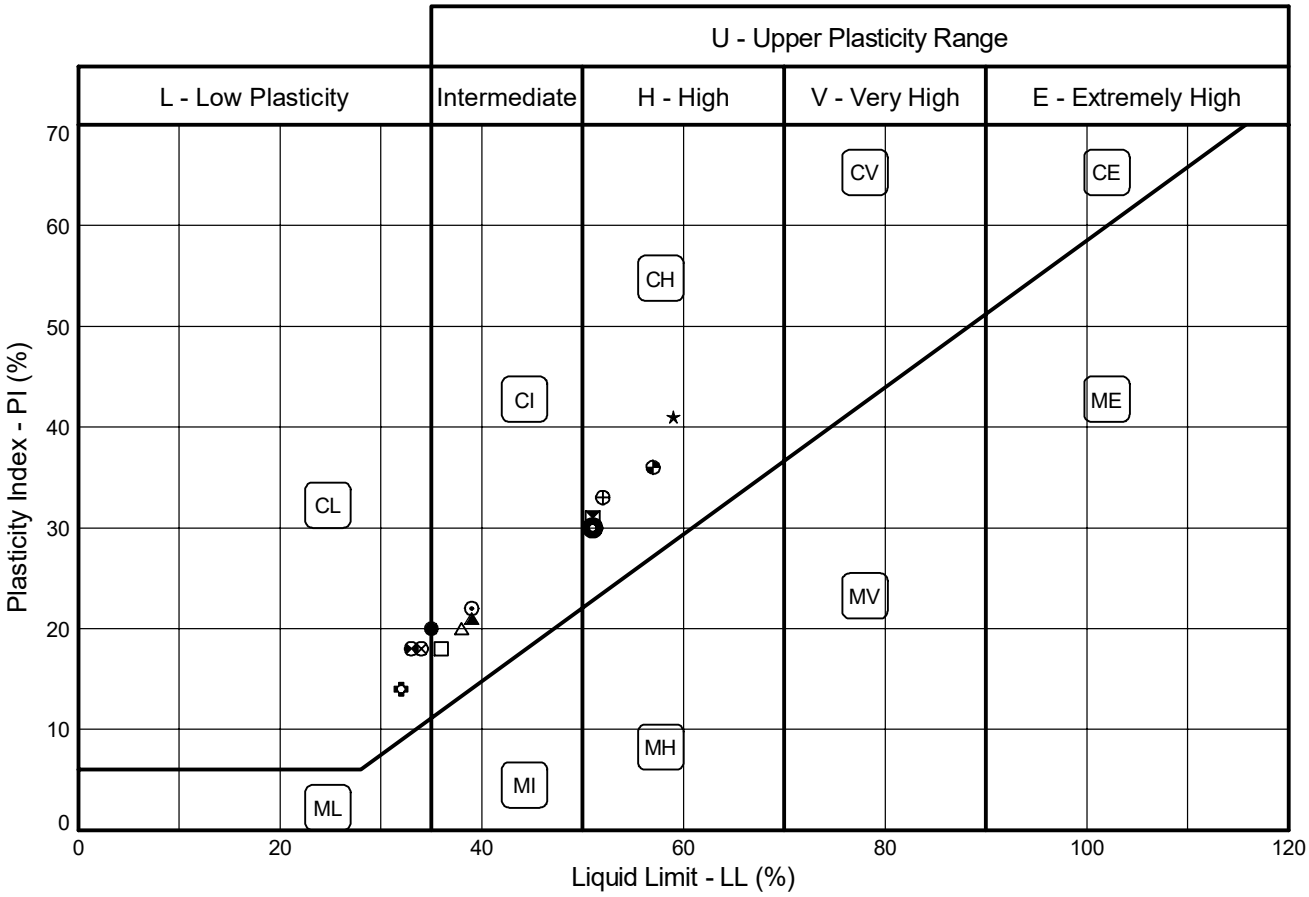
Compiled By		Date
TRB	**THOMAS DAVIES**	**30/06/20**

Contract:	Contract Ref:
Greenway	**563166**

PLASTICITY CHART - PI Vs LL

In accordance with BS5930:2015
Testing in accordance with BS1377-2:1990



Sample Identification				BS Test Method #	Preparation Method +	MC	LL	PL	PI	<425µm	Lab location	Notes
	Exploratory Position ID	Sample	Depth (m)			%	%	%	%	%		
●	BH1	4UT100	1.50	3.2/4.4/5.3/5.4	4.2.3	22	35	15	20	100	B	
⊠	BH1	8UT100	3.50	3.2/4.4/5.3/5.4	4.2.3	28	51	20	31	100	B	
▲	BH1	13UT100	6.00	3.2/4.4/5.3/5.4	4.2.3	24	39	18	21	100	B	
★	BH1	16UT100	7.55	3.2/4.4/5.3/5.4	4.2.3	18	59	18	41	100	B	
⊙	BH1	20UT100	9.50	3.2/4.4/5.3/5.4	4.2.3	15	39	17	22	100	B	
✿	BH1	24UT100	11.50	3.2/4.4/5.3/5.4	4.2.3	15	32	18	14	100	B	
●	BH2	8UT100	3.50	3.2/4.4/5.3/5.4	4.2.3	22	51	21	30	100	B	
△	BH2	12UT100	5.50	3.2/4.4/5.3/5.4	4.2.3	23	38	18	20	100	B	
⊗	BH2	22D	10.50	3.2/4.4/5.3/5.4	4.2.3	24	34	16	18	100	B	
⊕	BH3	12UT100	5.50	3.2/4.4/5.3/5.4	4.2.3	19	52	19	33	100	B	
□	BH3	16UT100	7.50	3.2/4.4/5.3/5.4	4.2.3	16	36	18	18	100	B	
⊜	BH3	20UT100	9.50	3.2/4.4/5.3/5.4	4.2.3	20	33	15	18	100	B	
◍	BH3	24UT100	11.50	3.2/4.4/5.3/5.4	4.2.3	20	57	21	36	100	B	

Tested in accordance with the following clauses of BS1377-2:1990.

3.2 - Moisture Content
4.3 - Cone Penetrometer Method
4.4 - One Point Cone Penetrometer Method
4.6 - One Point Casagrande Method
5.3 - Plastic Limit Method
5.4 - Plasticity Index

+ Tested in accordance with the following clauses of BS1377-2:1990.

4.2.3 - Natural State
4.2.4 - Wet Sieved

Key: * = Non-standard test, NP = Non plastic.

Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NJ), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)

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Compiled By		Date
	CONNEL MCLAUGHLIN	12/03/20

Contract	Contract Ref:
Greenway	563166

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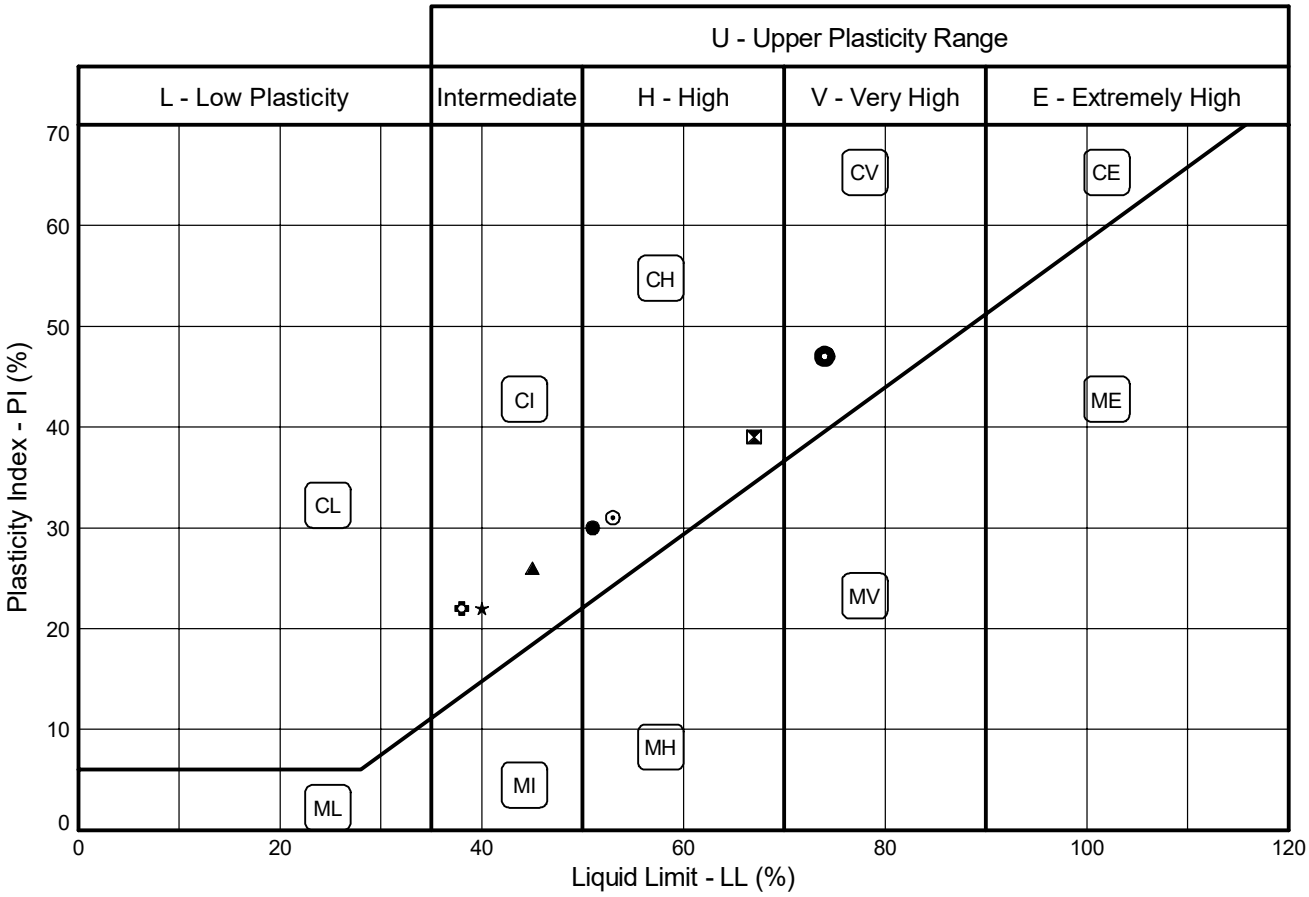
PLASTICITY CHART - PI Vs LL

In accordance with BS5930:2015
Testing in accordance with BS1377-2:1990



Sample Identification				BS Test Method #	Preparation Method +	MC	LL	PL	PI	<425µm	Lab location	Notes
	Exploratory Position ID	Sample	Depth (m)			%	%	%	%	%		
●	BH4	4UT100	1.50	3.2/4.4/5.3/5.4	4.2.3	24	51	21	30	99	B	
⊠	BH4	8UT100	3.50	3.2/4.4/5.3/5.4	4.2.3	27	67	28	39	90	B	
▲	BH4	12UT100	5.50	3.2/4.4/5.3/5.4	4.2.3	17	45	19	26	100	B	
★	BH4	16UT100	7.50	3.2/4.4/5.3/5.4	4.2.3	16	40	18	22	100	B	
⊙	BH4	20UT100	9.50	3.2/4.4/5.3/5.4	4.2.3	17	53	22	31	100	B	
✿	BH4	29D	14.00	3.2/4.4/5.3/5.4	4.2.3	16	38	16	22	100	B	
●	BH4	32DSPT	16.00	3.2/4.4/5.3/5.4	4.2.3	22	74	27	47	100	B	

Tested in accordance with the following clauses of BS1377-2:1990.

3.2 - Moisture Content
4.3 - Cone Penetrometer Method
4.4 - One Point Cone Penetrometer Method
4.6 - One Point Casagrande Method
5.3 - Plastic Limit Method
5.4 - Plasticity Index

+ Tested in accordance with the following clauses of BS1377-2:1990.

4.2.3 - Natural State
4.2.4 - Wet Sieved

Key: * = Non-standard test, NP = Non plastic.

Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NJ), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)

STRUCTURAL SOILS
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Compiled By		Date
D. Richards	DAISY RICHARDS	21/04/20

Contract	Contract Ref:
Greenway	563166

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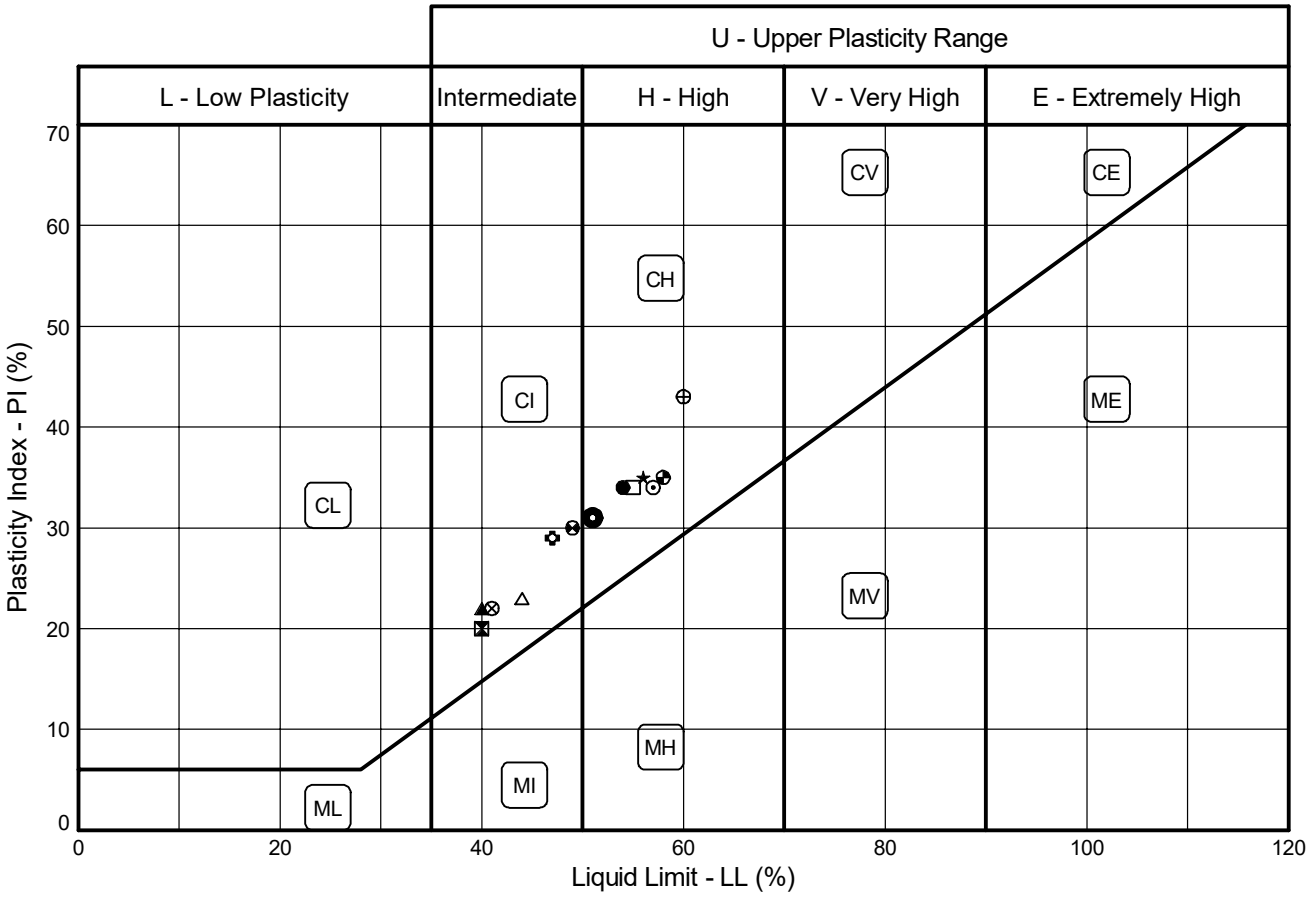
PLASTICITY CHART - PI Vs LL

In accordance with BS5930:2015
Testing in accordance with BS1377-2:1990



Sample Identification				BS Test Method #	Preparation Method +	MC	LL	PL	PI	<425µm	Lab location	Notes
	Exploratory Position ID	Sample	Depth (m)			%	%	%	%	%		
●	BH5	5D	2.00	3.2/4.4/5.3/5.4	4.2.3	28	54	20	34	98	B	
⊠	BH5	10B	4.00	3.2/4.4/5.3/5.4	4.2.3	28	40	20	20	100	B	
▲	BH5	17D	7.00	3.2/4.4/5.3/5.4	4.2.3	16	40	18	22	100	B	
★	BH5	19D	8.00	3.2/4.4/5.3/5.4	4.2.3	16	56	21	35	100	B	
⊙	BH5	21D	9.00	3.2/4.4/5.3/5.4	4.2.3	15	57	23	34	100	B	
✿	BH5	23D	10.00	3.2/4.4/5.3/5.4	4.2.3	14	47	18	29	100	B	
◉	BH5	25D	11.00	3.2/4.4/5.3/5.4	4.2.3	14	51	20	31	100	B	
△	BH6	1B	0.30	3.2/4.4/5.3/5.4	4.2.3	15	44	21	23	97	B	
⊗	BH6	4UT100	1.50	3.2/4.4/5.3/5.4	4.2.3	20	41	19	22	79	B	
⊕	BH6	8UT100	3.50	3.2/4.4/5.3/5.4	4.2.3	16	60	17	43	99	B	
□	BH6	16UT100	7.50	3.2/4.4/5.3/5.4	4.2.3	17	55	21	34	100	B	
⊛	BH6	25UT100	12.50	3.2/4.4/5.3/5.4	4.2.3	14	49	19	30	100	B	
◍	BH6	34UT100	17.50	3.2/4.4/5.3/5.4	4.2.3	22	58	23	35	100	B	

Tested in accordance with the following clauses of BS1377-2:1990.

3.2 - Moisture Content
4.3 - Cone Penetrometer Method
4.4 - One Point Cone Penetrometer Method
4.6 - One Point Casagrande Method
5.3 - Plastic Limit Method
5.4 - Plasticity Index

+ Tested in accordance with the following clauses of BS1377-2:1990.

4.2.3 - Natural State
4.2.4 - Wet Sieved

Key: * = Non-standard test, NP = Non plastic.

Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NJ), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)

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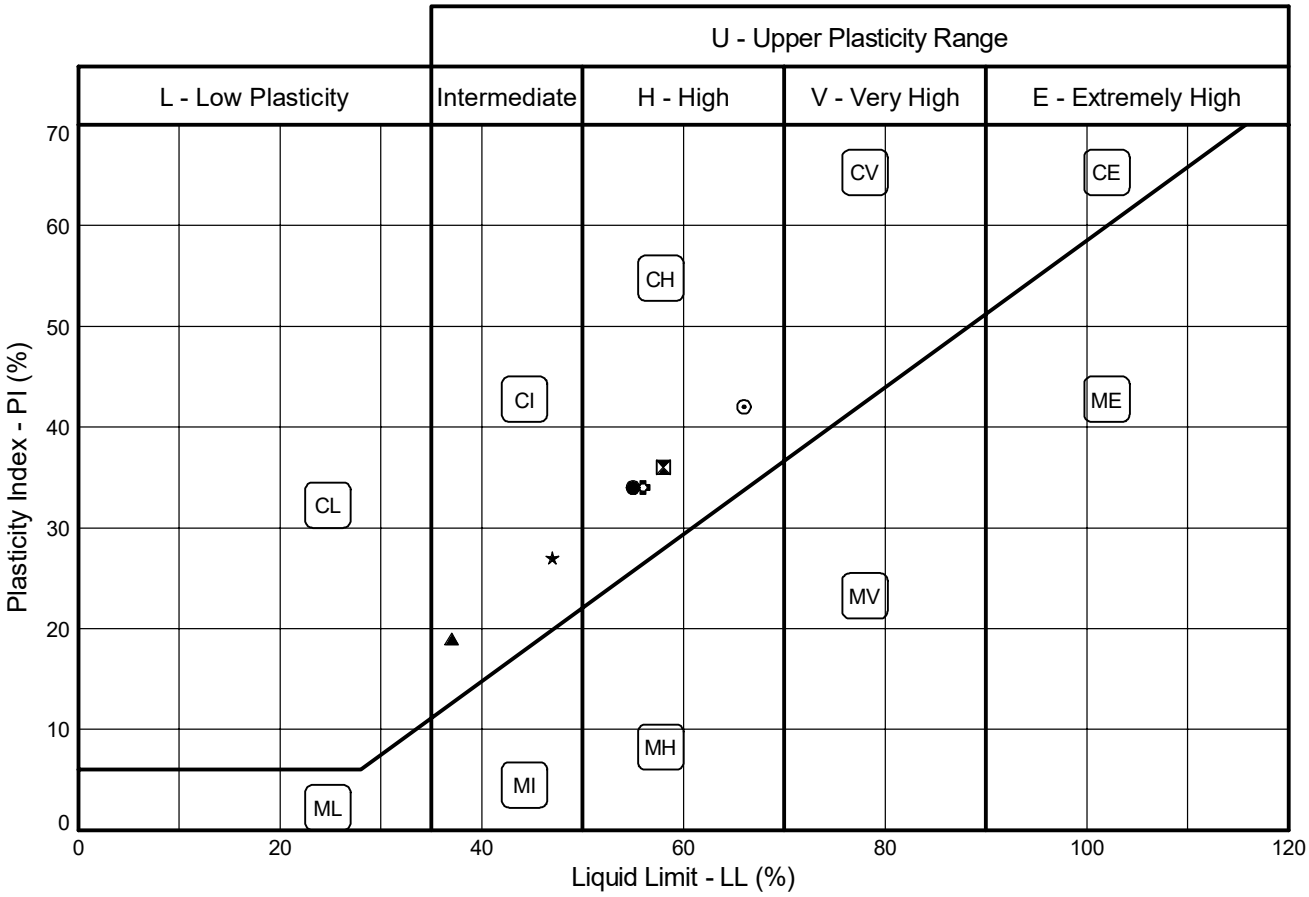
	THOMAS DAVIES	30/06/20

Contract	Contract Ref:
Greenway	563166

PLASTICITY CHART - PI Vs LL

In accordance with BS5930:2015
Testing in accordance with BS1377-2:1990



Sample Identification				BS Test Method #	Preparation Method +	MC	LL	PL	PI	<425µm	Lab location	Notes
	Exploratory Position ID	Sample	Depth (m)			%	%	%	%	%		
●	BH7	18UT100	8.50	3.2/4.4/5.3/5.4	4.2.3	17	55	21	34	100	B	
⊠	BH7	22UT100	10.50	3.2/4.4/5.3/5.4	4.2.3	21	58	22	36	90	B	
▲	BH7	26UT100	12.50	3.2/4.4/5.3/5.4	4.2.3	17	37	18	19	100	B	
★	BH8	4UT100	1.50	3.2/4.4/5.3/5.4	4.2.3	24	47	20	27	91	B	
⊙	BH8	13UT100	5.50	3.2/4.4/5.3/5.4	4.2.3	22	66	24	42	100	B	
✿	BH8	21UT100	9.50	3.2/4.4/5.3/5.4	4.2.3	20	56	22	34	99	B	

Tested in accordance with the following clauses of BS1377-2:1990.

3.2 - Moisture Content
4.3 - Cone Penetrometer Method
4.4 - One Point Cone Penetrometer Method
4.6 - One Point Casagrande Method
5.3 - Plastic Limit Method
5.4 - Plasticity Index

+ Tested in accordance with the following clauses of BS1377-2:1990.

4.2.3 - Natural State
4.2.4 - Wet Sieved

Key: * = Non-standard test, NP = Non plastic.

Lab location: B = Bristol (BS3 4AG), C = Castleford (WF10 1NJ), H = Hemel Hempstead (HP3 9RT), T = Tonbridge (TN11 9HU)

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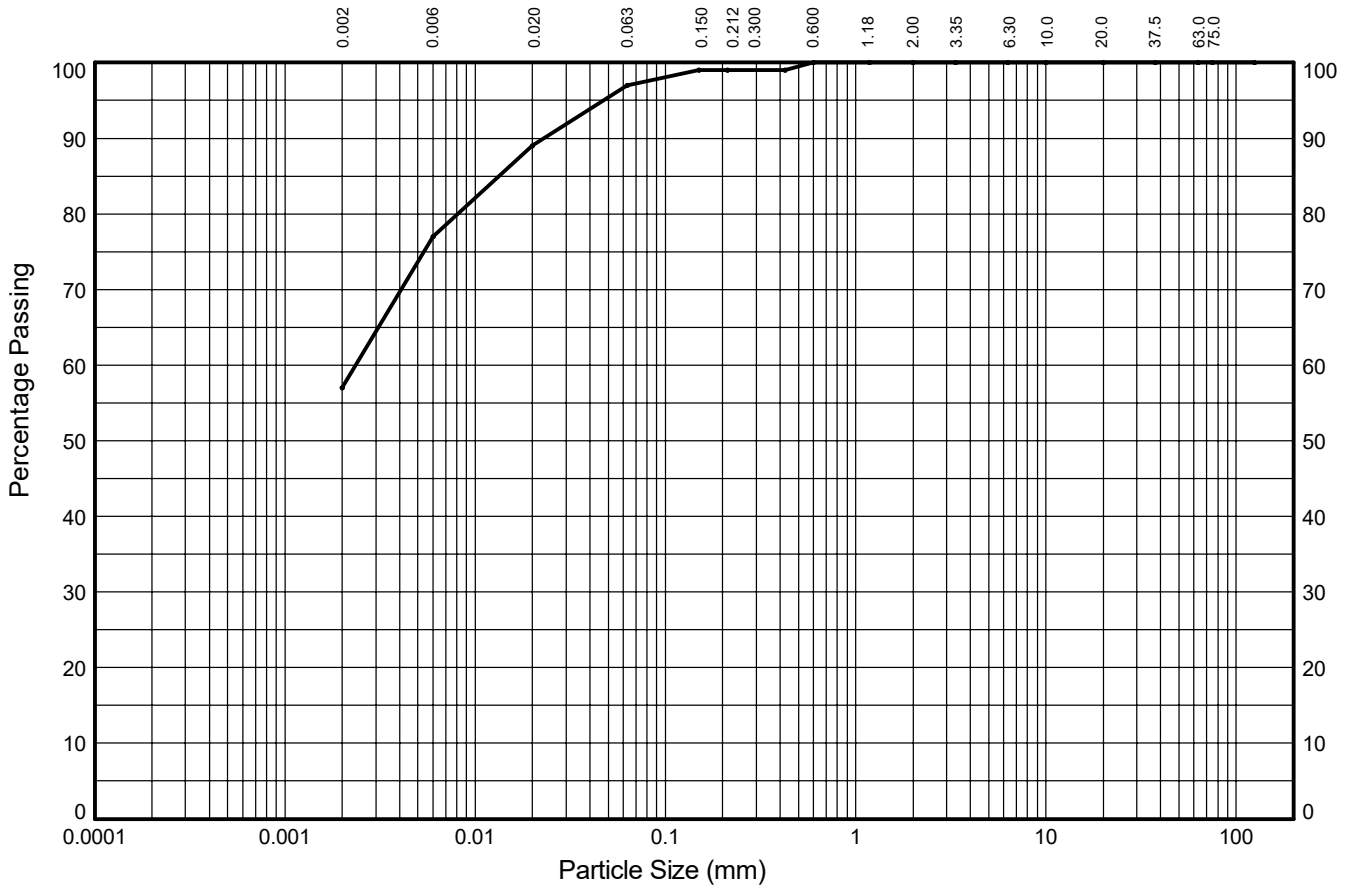
Compiled By		Date
	THOMAS DAVIES	30/06/20

Contract	Contract Ref:
Greenway	563166

PARTICLE SIZE DISTRIBUTION TEST

In accordance with clauses 9.2, 9.5 of BS1377:Part 2:1990

Borehole: **BH1** Sample Ref: **28** Sample Type: **UT100** Depth (m): **13.50**



CLAY	fine	medium	coarse	fine	medium	coarse	fine	medium	coarse	COBBLES
	20%	12%	8%	2%	1%	0%	0%	0%	0%	
	SILT			SAND			GRAVEL			
57%	40%			3%			0%			0%

Test Sieve (mm)	Percent Passing (%)
125.0	**100**
75.0	**100**
63.0	**100**
37.5	**100**
20.0	**100**
10.0	**100**
6.30	**100**
3.35	**100**
2.00	**100**
1.18	**100**
0.600	**100**
0.425	**99**
0.212	**99**
0.150	**99**
0.063	**97**

Particle Diameter (mm)	Percent Passing (%)
0.02	**89**
0.006	**77**
0.002	**57**

Sedimentation sample was pre-treated

Coefficients	
D_{10} (mm)	**NA**
D_{15} (mm)	**NA**
D_{30} (mm)	**NA**
D_{50} (mm)	**NA**
D_{60} (mm)	**0.002**
D_{85} (mm)	**0.013**
D_{90} (mm)	**0.023**
C_U	**NA**
C_C	**NA**

Soil Description:

Brown mottled grey slightly sandy CLAY

Key: C_U = Uniformity coefficient. C_C = Coefficient of curvature as defined in BS EN ISO 14688-2

STRUCTURAL SOILS
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Compiled By	Date
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Greenway	**563166**

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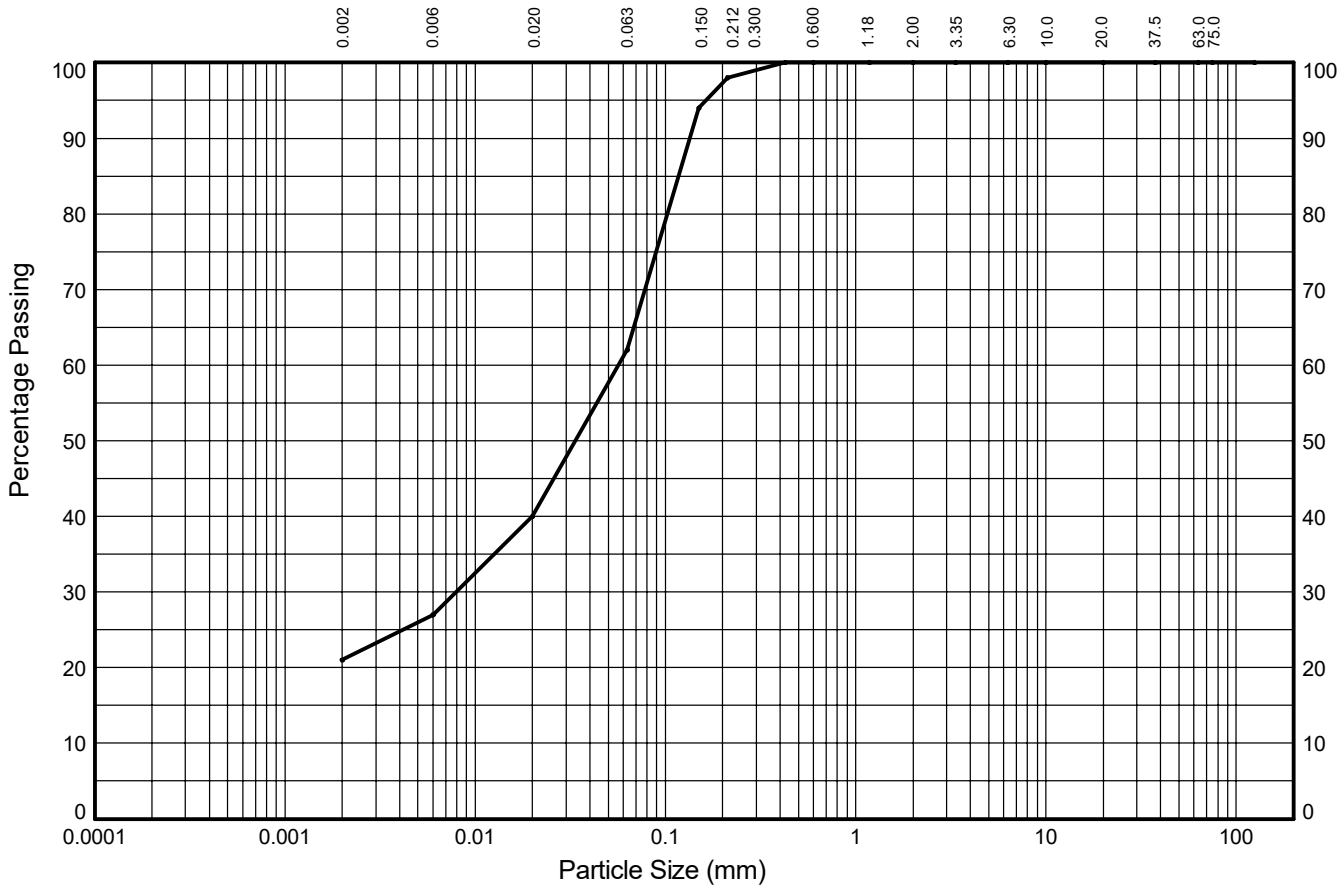
PARTICLE SIZE DISTRIBUTION TEST

In accordance with clauses 9.2, 9.5 of BS1377:Part 2:1990

Borehole: **BH1** Sample Ref: **32** Sample Type: **B** Depth (m): **16.00**



CLAY	fine	medium	coarse	fine	medium	coarse	fine	medium	coarse	COBBLES
	6%	13%	22%	35%	3%	0%	0%	0%	0%	
	SILT			SAND			GRAVEL			
21%	41%			38%			0%			0%

Test Sieve (mm)	Percent Passing (%)
125.0	**100**
75.0	**100**
63.0	**100**
37.5	**100**
20.0	**100**
10.0	**100**
6.30	**100**
3.35	**100**
2.00	**100**
1.18	**100**
0.600	**100**
0.425	**100**
0.212	**98**
0.150	**94**
0.063	**62**

Particle Diameter (mm)	Percent Passing (%)
0.02	**40**
0.006	**27**
0.002	**21**

Sedimentation sample was not pre-treated

Coefficients	
D_{10} (mm)	**NA**
D_{15} (mm)	**NA**
D_{30} (mm)	**0.008**
D_{50} (mm)	**0.034**
D_{60} (mm)	**0.057**
D_{85} (mm)	**0.118**
D_{90} (mm)	**0.135**
C_U	**NA**
C_C	**NA**

Soil Description:

Brown mottled grey sandy silty CLAY

Key: C_U = Uniformity coefficient. C_C = Coefficient of curvature as defined in BS EN ISO 14688-2

STRUCTURAL SOILS
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Compiled By	Date
DAISY RICHARDS	**12/03/20**

Contract	Contract Ref:
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PARTICLE SIZE DISTRIBUTION TEST

In accordance with clauses 9.2, 9.5 of BS1377:Part 2:1990

Borehole: **BH2** Sample Ref: **12** Sample Type: **UT100** Depth (m): **5.50**

CLAY	fine	medium	coarse	fine	medium	coarse	fine	medium	coarse	COBBLES
	8%	11%	23%	32%	1%	0%	0%	0%	0%	
	SILT			SAND			GRAVEL			
25%	42%			33%			0%			0%

Test Sieve (mm)	Percent Passing (%)
125.0	**100**
75.0	**100**
63.0	**100**
37.5	**100**
20.0	**100**
10.0	**100**
6.30	**100**
3.35	**100**
2.00	**100**
1.18	**100**
0.600	**100**
0.425	**100**
0.212	**99**
0.150	**99**
0.063	**67**

Particle Diameter (mm)	Percent Passing (%)
0.02	**44**
0.006	**33**
0.002	**25**

Sedimentation sample was pre-treated

Coefficients	
D_{10} (mm)	**NA**
D_{15} (mm)	**NA**
D_{30} (mm)	**0.004**
D_{50} (mm)	**0.027**
D_{60} (mm)	**0.044**
D_{85} (mm)	**0.103**
D_{90} (mm)	**0.118**
C_U	**NA**
C_C	**NA**

Soil Description:

Dark grey slightly sandy silty CLAY

Key: C_U = Uniformity coefficient. C_C = Coefficient of curvature as defined in BS EN ISO 14688-2

STRUCTURAL SOILS
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Compiled By	Date
DAISY RICHARDS	**12/03/20**

Contract	Contract Ref:
Greenway	**563166**

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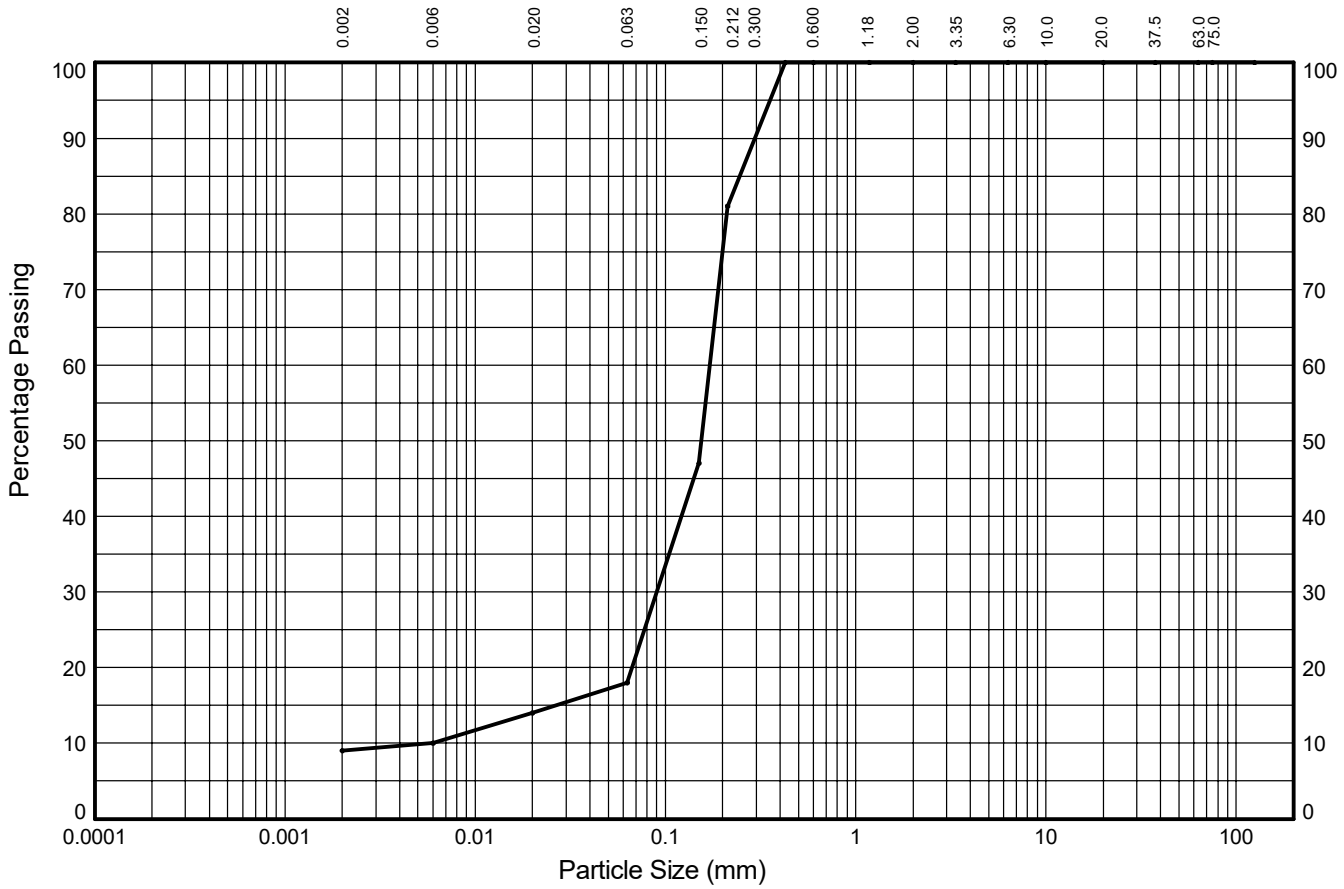
PARTICLE SIZE DISTRIBUTION TEST

In accordance with clauses 9.2, 9.5 of BS1377:Part 2:1990

Borehole: **BH2** Sample Ref: **26** Sample Type: **DSPT** Depth (m): **12.50**



CLAY	fine	medium	coarse	fine	medium	coarse	fine	medium	coarse	COBBLES
	1%	4%	4%	56%	26%	0%	0%	0%	0%	
	SILT			SAND			GRAVEL			
9%	9%			82%			0%			0%

Test Sieve (mm)	Percent Passing (%)
125.0	**100**
75.0	**100**
63.0	**100**
37.5	**100**
20.0	**100**
10.0	**100**
6.30	**100**
3.35	**100**
2.00	**100**
1.18	**100**
0.600	**100**
0.425	**100**
0.212	**81**
0.150	**47**
0.063	**18**

Particle Diameter (mm)	Percent Passing (%)
0.02	**14**
0.006	**10**
0.002	**9**

Sedimentation sample was not pre-treated

Coefficients	
D_{10} (mm)	**0.006**
D_{15} (mm)	**0.027**
D_{30} (mm)	**0.090**
D_{50} (mm)	**0.155**
D_{60} (mm)	**0.171**
D_{85} (mm)	**0.245**
D_{90} (mm)	**0.295**
C_U	**29**
C_C	**8**

Soil Description:

Brown clayey SAND

Key: C_U = Uniformity coefficient. C_C = Coefficient of curvature as defined in BS EN ISO 14688-2

STRUCTURAL SOILS
1a Princess Street
Bedminster
Bristol
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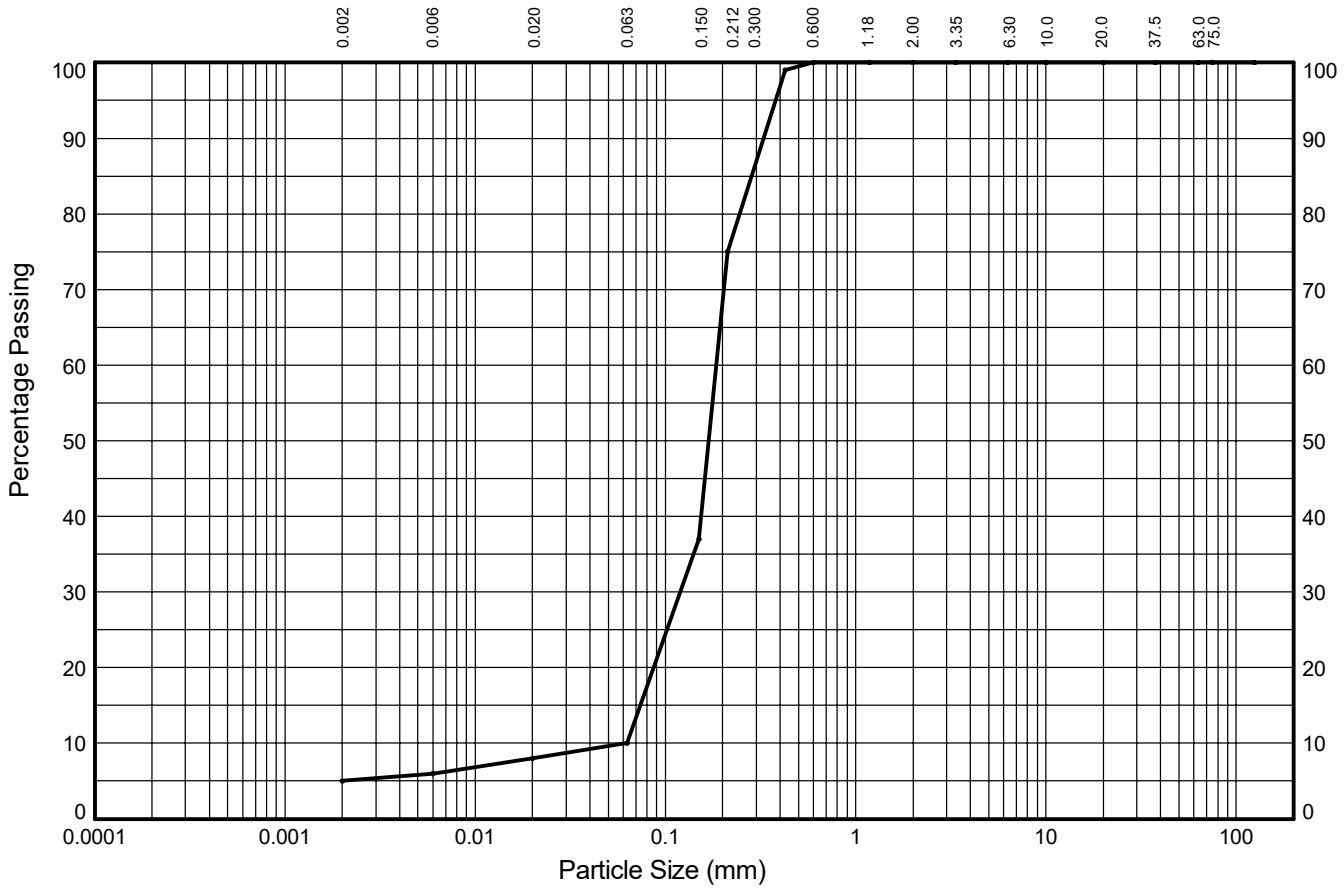
Compiled By	Date
DAISY RICHARDS	**12/03/20**

Contract	Contract Ref:
Greenway	**563166**

PARTICLE SIZE DISTRIBUTION TEST

In accordance with clauses 9.2, 9.5 of BS1377:Part 2:1990

Borehole: **BH2** Sample Ref: **28** Sample Type: **UT100** Depth (m): **13.50**



CLAY	fine	medium	coarse	fine	medium	coarse	fine	medium	coarse	COBBLES
	1%	2%	2%	58%	32%	0%	0%	0%	0%	
	SILT			SAND			GRAVEL			
5%	5%			90%			0%			0%

Test Sieve (mm)	Percent Passing (%)
125.0	**100**
75.0	**100**
63.0	**100**
37.5	**100**
20.0	**100**
10.0	**100**
6.30	**100**
3.35	**100**
2.00	**100**
1.18	**100**
0.600	**100**
0.425	**99**
0.212	**75**
0.150	**37**
0.063	**10**

Particle Diameter (mm)	Percent Passing (%)
0.02	**8**
0.006	**6**
0.002	**5**

Sedimentation sample was pre-treated

Coefficients	
D_{10} (mm)	**0.063**
D_{15} (mm)	**0.074**
D_{30} (mm)	**0.120**
D_{50} (mm)	**0.169**
D_{60} (mm)	**0.185**
D_{85} (mm)	**0.283**
D_{90} (mm)	**0.327**
C_U	**2.9**
C_C	**1.2**

Soil Description:

Brown clayey SAND

Key: C_U = Uniformity coefficient. C_C = Coefficient of curvature as defined in BS EN ISO 14688-2

STRUCTURAL SOILS
1a Princess Street
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BS3 4AG

Compiled By	Date
DAISY RICHARDS	**12/03/20**

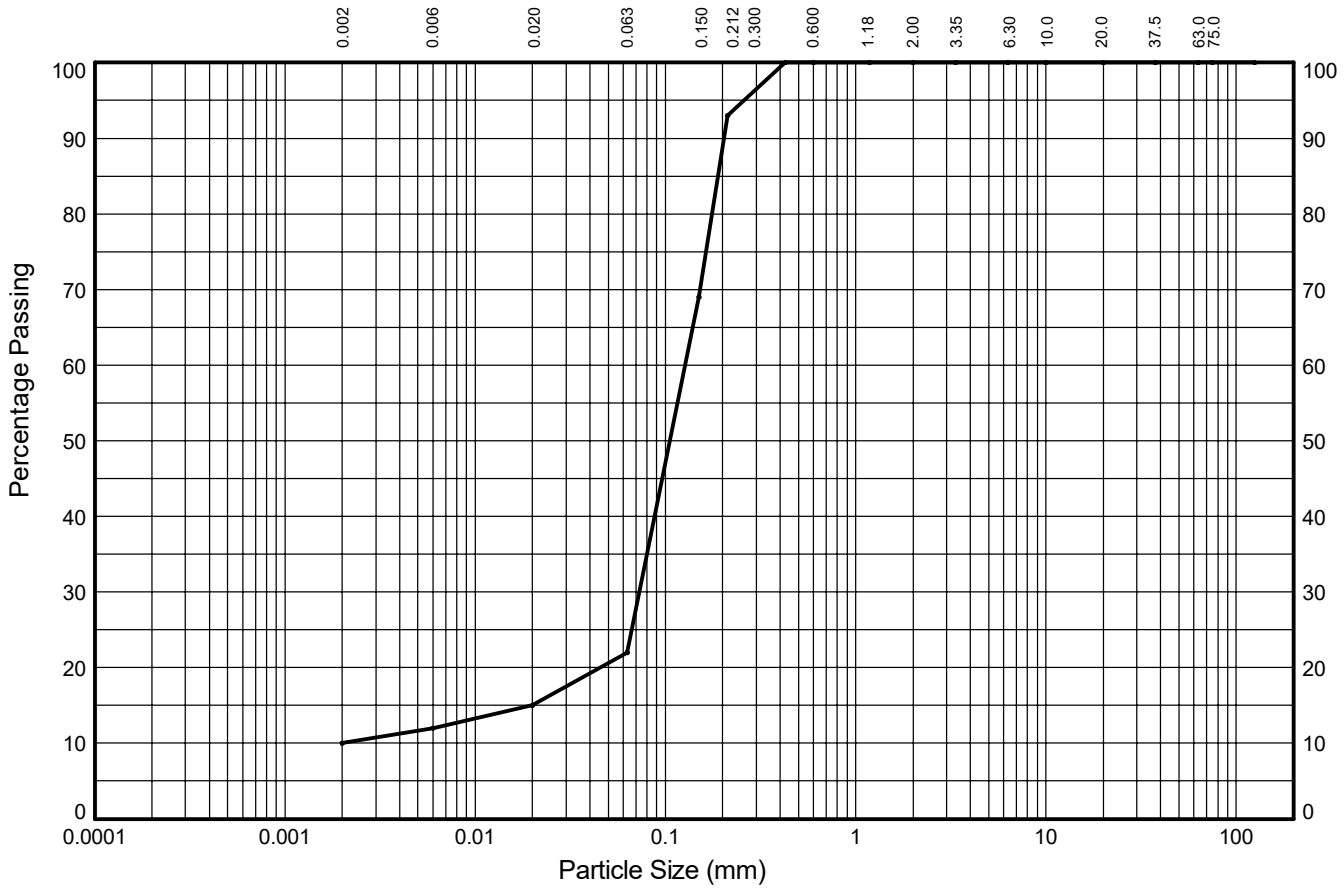
Contract	Contract Ref:
Greenway	**563166**

AGS

PARTICLE SIZE DISTRIBUTION TEST

In accordance with clauses 9.2, 9.5 of BS1377:Part 2:1990

Borehole: **BH2** Sample Ref: **30** Sample Type: **DSPT** Depth (m): **14.50**



CLAY	fine	medium	coarse	fine	medium	coarse	fine	medium	coarse	COBBLES
	2%	3%	7%	66%	12%	0%	0%	0%	0%	
	SILT			SAND			GRAVEL			
10%	12%			78%			0%			0%

Test Sieve (mm)	Percent Passing (%)
125.0	**100**
75.0	**100**
63.0	**100**
37.5	**100**
20.0	**100**
10.0	**100**
6.30	**100**
3.35	**100**
2.00	**100**
1.18	**100**
0.600	**100**
0.425	**100**
0.212	**93**
0.150	**69**
0.063	**22**

Particle Diameter (mm)	Percent Passing (%)
0.02	**15**
0.006	**12**
0.002	**10**

Sedimentation sample was not pre-treated

Coefficients	
D_{10} (mm)	**0.002**
D_{15} (mm)	**0.020**
D_{30} (mm)	**0.073**
D_{50} (mm)	**0.106**
D_{60} (mm)	**0.127**
D_{85} (mm)	**0.189**
D_{90} (mm)	**0.203**
C_U	**64**
C_C	**21**

Soil Description:

Brown very clayey SAND

Key: C_U = Uniformity coefficient. C_C = Coefficient of curvature as defined in BS EN ISO 14688-2

STRUCTURAL SOILS
1a Princess Street
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DAISY RICHARDS	**12/03/20**

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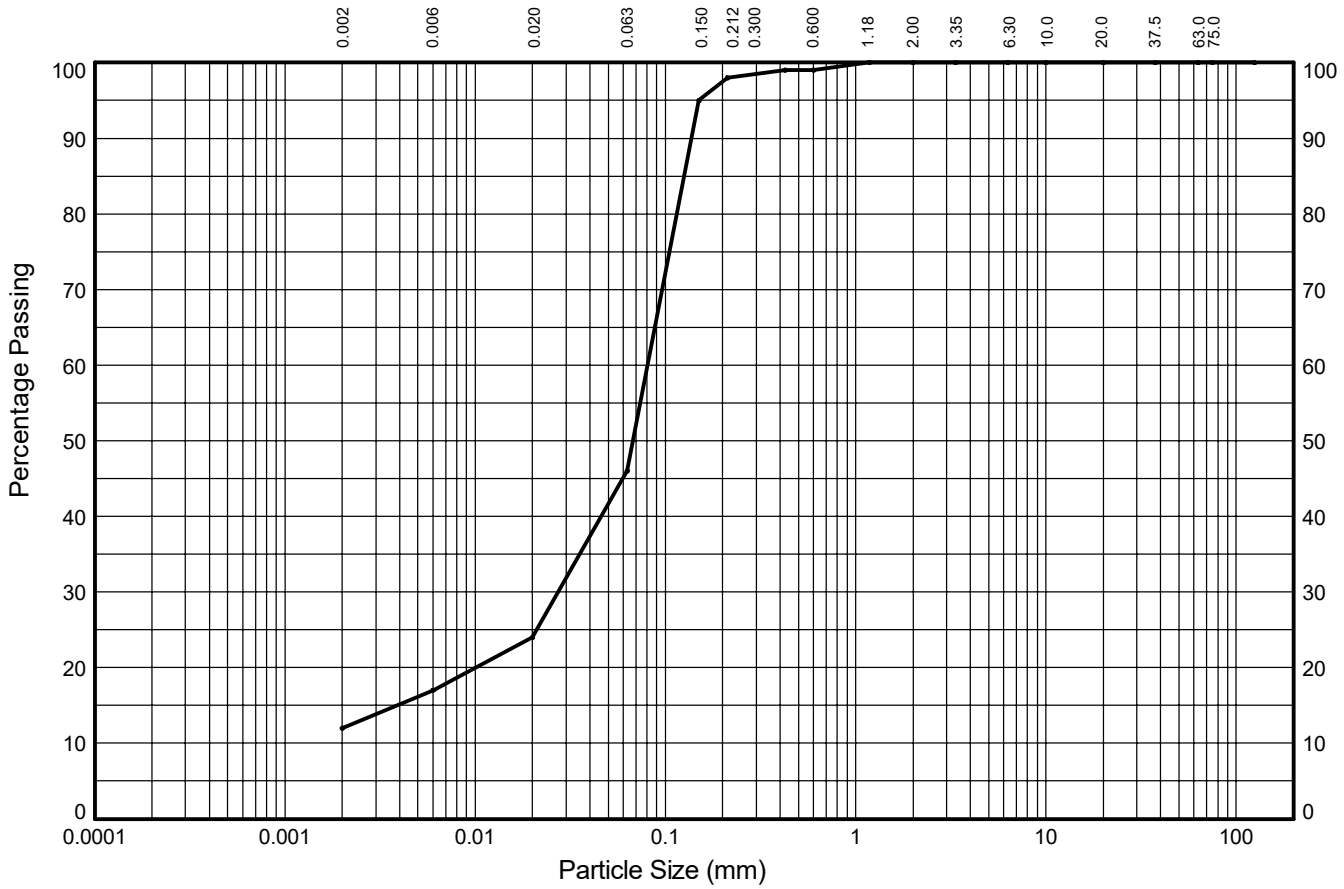
PARTICLE SIZE DISTRIBUTION TEST

In accordance with clauses 9.2, 9.5 of BS1377:Part 2:1990

Borehole: **BH3** Sample Ref: **28** Sample Type: **B** Depth (m): **13.50**



CLAY	fine	medium	coarse	fine	medium	coarse	fine	medium	coarse	COBBLES
	5%	7%	22%	51%	2%	1%	0%	0%	0%	
	SILT			SAND			GRAVEL			
12%	34%			54%			0%			0%

Test Sieve (mm)	Percent Passing (%)
125.0	**100**
75.0	**100**
63.0	**100**
37.5	**100**
20.0	**100**
10.0	**100**
6.30	**100**
3.35	**100**
2.00	**100**
1.18	**100**
0.600	**99**
0.425	**99**
0.212	**98**
0.150	**95**
0.063	**46**

Particle Diameter (mm)	Percent Passing (%)
0.02	**24**
0.006	**17**
0.002	**12**

Sedimentation sample was not pre-treated

Coefficients	
D_{10} (mm)	**NA**
D_{15} (mm)	**0.004**
D_{30} (mm)	**0.027**
D_{50} (mm)	**0.068**
D_{60} (mm)	**0.081**
D_{85} (mm)	**0.126**
D_{90} (mm)	**0.137**
C_U	**NA**
C_C	**NA**

Soil Description:

Orangish brown sandy SILT

Key: C_U = Uniformity coefficient. C_C = Coefficient of curvature as defined in BS EN ISO 14688-2

STRUCTURAL SOILS
1a Princess Street
Bedminster
Bristol
BS3 4AG

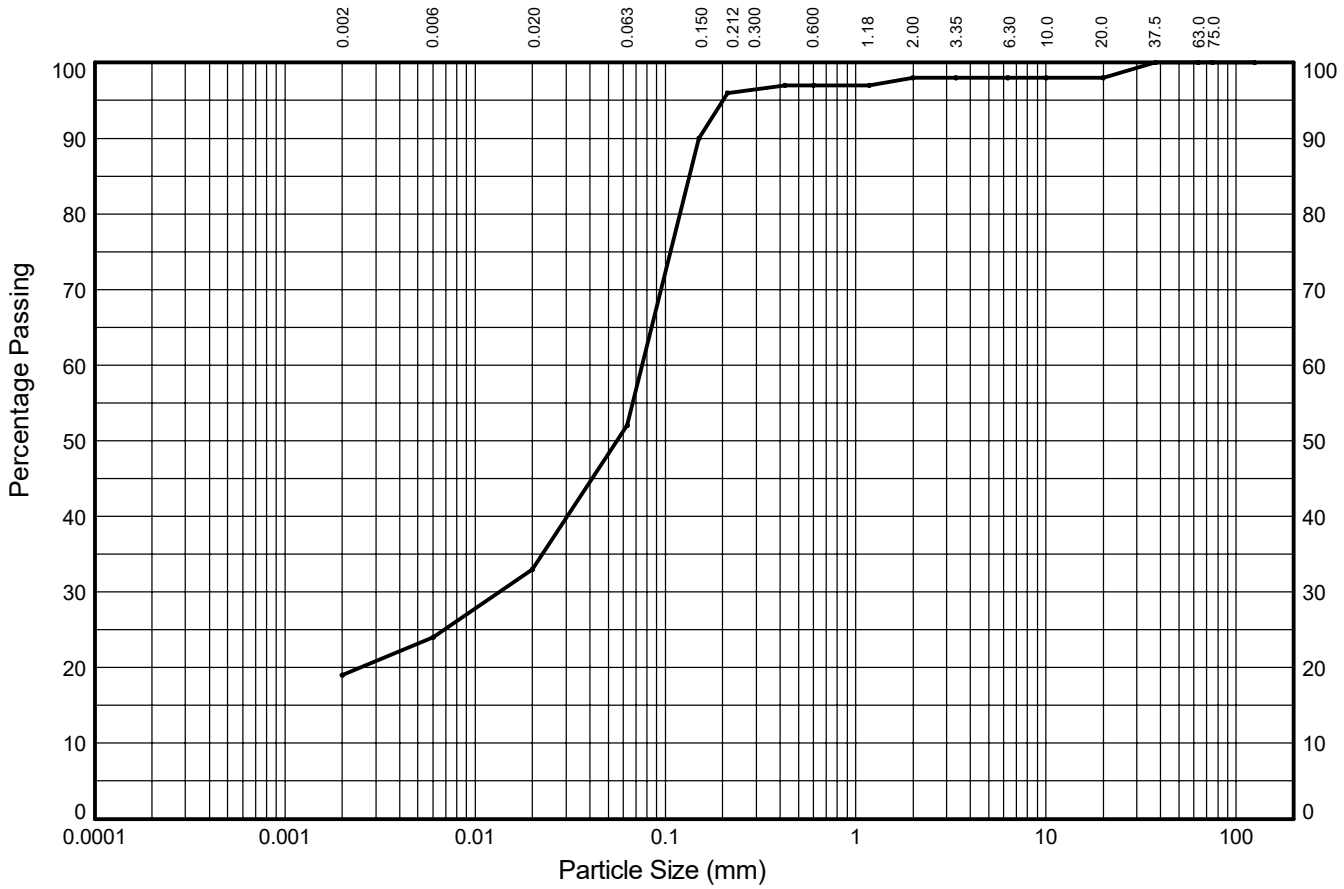
Compiled By		Date
Francesca Bennett	**FRANCESCA BENNETT**	**12/03/20**

Contract	Contract Ref:
Greenway	**563166**

PARTICLE SIZE DISTRIBUTION TEST

In accordance with clauses 9.2, 9.5 of BS1377:Part 2:1990

Borehole: **BH3** Sample Ref: **31** Sample Type: **DSPT** Depth (m): **14.50**



CLAY	fine	medium	coarse	fine	medium	coarse	fine	medium	coarse	COBBLES
	5%	9%	19%	43%	2%	1%	0%	0%	2%	
	SILT			SAND			GRAVEL			
19%	33%			46%			2%			0%

Test Sieve (mm)	Percent Passing (%)
125.0	**100**
75.0	**100**
63.0	**100**
37.5	**100**
20.0	**98**
10.0	**98**
6.30	**98**
3.35	**98**
2.00	**98**
1.18	**97**
0.600	**97**
0.425	**97**
0.212	**96**
0.150	**90**
0.063	**52**

Particle Diameter (mm)	Percent Passing (%)
0.02	**33**
0.006	**24**
0.002	**19**

Sedimentation sample was not pre-treated

Coefficients	
D_{10} (mm)	**NA**
D_{15} (mm)	**NA**
D_{30} (mm)	**0.013**
D_{50} (mm)	**0.056**
D_{60} (mm)	**0.076**
D_{85} (mm)	**0.134**
D_{90} (mm)	**0.150**
C_U	**NA**
C_C	**NA**

Soil Description:

Brown slightly gravelly sandy silty CLAY

Key: C_U = Uniformity coefficient. C_C = Coefficient of curvature as defined in BS EN ISO 14688-2

STRUCTURAL SOILS
1a Princess Street
Bedminster
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BS3 4AG

Compiled By	Date
DAISY RICHARDS	12/03/20

Contract	Contract Ref:
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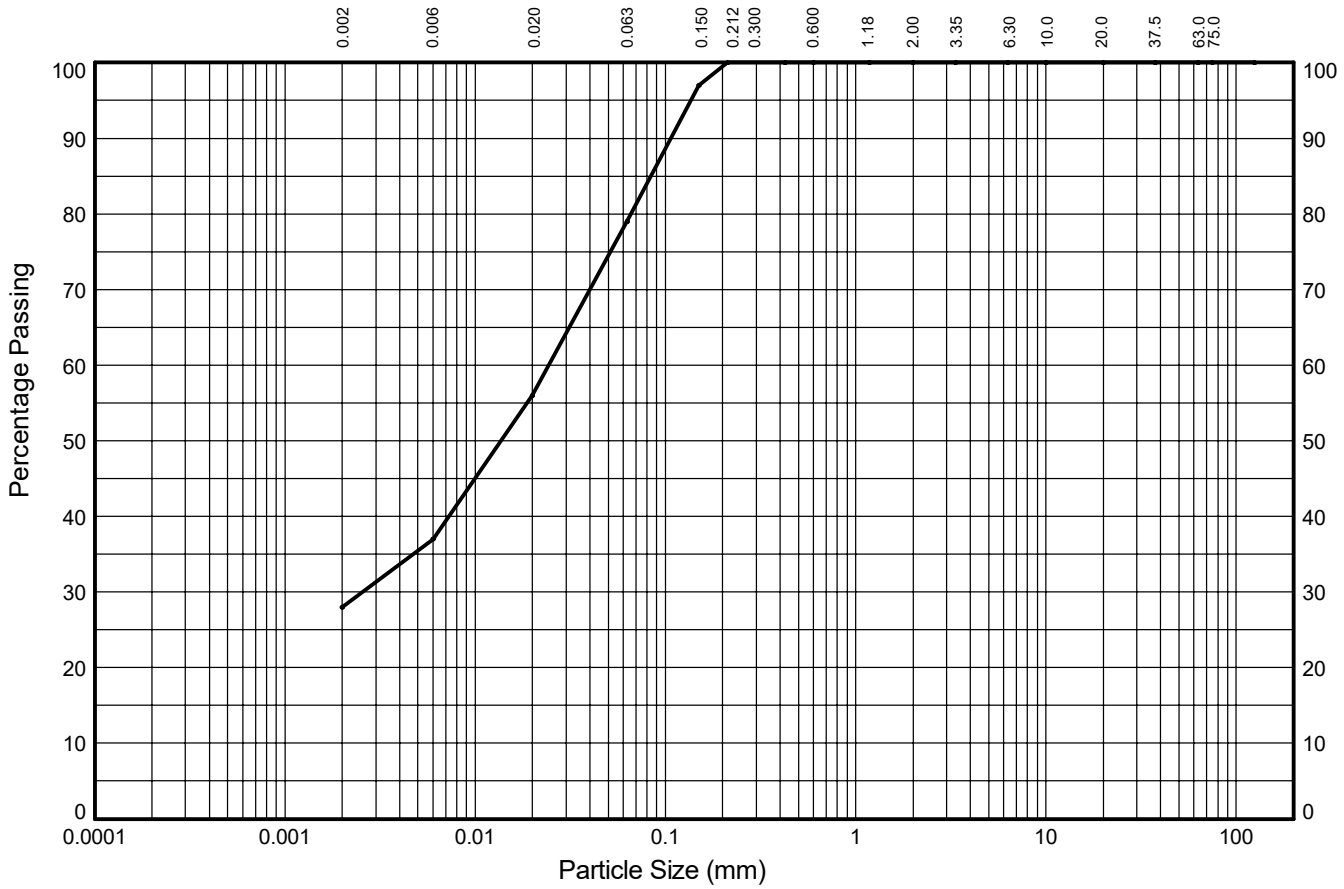
PARTICLE SIZE DISTRIBUTION TEST

In accordance with clauses 9.2, 9.5 of BS1377:Part 2:1990

Borehole: **BH5** Sample Ref: **33** Sample Type: **D** Depth (m): **15.00**



CLAY	fine	medium	coarse	fine	medium	coarse	fine	medium	coarse	COBBLES
	9%	19%	23%	20%	1%	0%	0%	0%	0%	
	SILT			SAND			GRAVEL			
28%	51%			21%			0%			0%

Test Sieve (mm)	Percent Passing (%)
125.0	**100**
75.0	**100**
63.0	**100**
37.5	**100**
20.0	**100**
10.0	**100**
6.30	**100**
3.35	**100**
2.00	**100**
1.18	**100**
0.600	**100**
0.425	**100**
0.212	**100**
0.150	**97**
0.063	**79**

Particle Diameter (mm)	Percent Passing (%)
0.02	**56**
0.006	**37**
0.002	**28**

Sedimentation sample was not pre-treated

Coefficients	
D_{10} (mm)	**NA**
D_{15} (mm)	**NA**
D_{30} (mm)	**0.003**
D_{50} (mm)	**0.014**
D_{60} (mm)	**0.024**
D_{85} (mm)	**0.084**
D_{90} (mm)	**0.107**
C_U	**NA**
C_C	**NA**

Soil Description:

Brown mottled bluish grey slightly sandy silty CLAY

Key: C_U = Uniformity coefficient. C_C = Coefficient of curvature as defined in BS EN ISO 14688-2

STRUCTURAL SOILS
1a Princess Street
Bedminster
Bristol
BS3 4AG

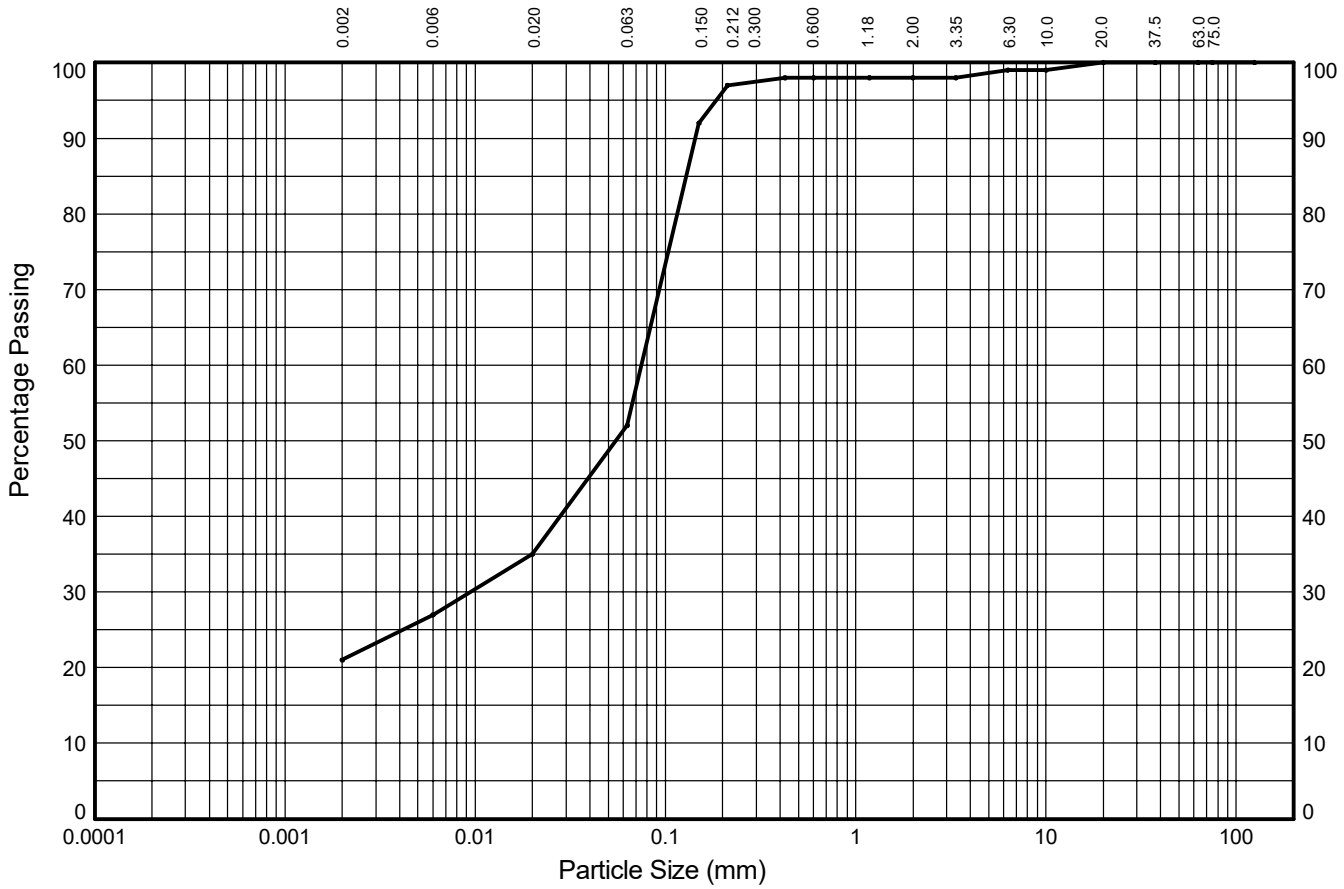
Compiled By		Date
Francesca Bennett	**FRANCESCA BENNETT**	**30/06/20**

Contract	Contract Ref:
Greenway	**563166**

PARTICLE SIZE DISTRIBUTION TEST

In accordance with clauses 9.2, 9.5 of BS1377:Part 2:1990

Borehole: **BH5** Sample Ref: **37** Sample Type: **D** Depth (m): **17.00**



CLAY	fine	medium	coarse	fine	medium	coarse	fine	medium	coarse	COBBLES
	6%	8%	17%	44%	2%	0%	1%	1%	0%	
	SILT			SAND			GRAVEL			
21%	31%			46%			2%			0%

Test Sieve (mm)	Percent Passing (%)
125.0	**100**
75.0	**100**
63.0	**100**
37.5	**100**
20.0	**100**
10.0	**99**
6.30	**99**
3.35	**98**
2.00	**98**
1.18	**98**
0.600	**98**
0.425	**98**
0.212	**97**
0.150	**92**
0.063	**52**

Particle Diameter (mm)	Percent Passing (%)
0.02	**35**
0.006	**27**
0.002	**21**

Sedimentation sample was not pre-treated

Coefficients	
D_{10} (mm)	**NA**
D_{15} (mm)	**NA**
D_{30} (mm)	**0.009**
D_{50} (mm)	**0.055**
D_{60} (mm)	**0.075**
D_{85} (mm)	**0.129**
D_{90} (mm)	**0.144**
C_U	**NA**
C_C	**NA**

Soil Description:

Greyish brown slightly gravelly sandy silty CLAY

Key: C_U = Uniformity coefficient. C_C = Coefficient of curvature as defined in BS EN ISO 14688-2

STRUCTURAL SOILS
1a Princess Street
Bedminster
Bristol
BS3 4AG

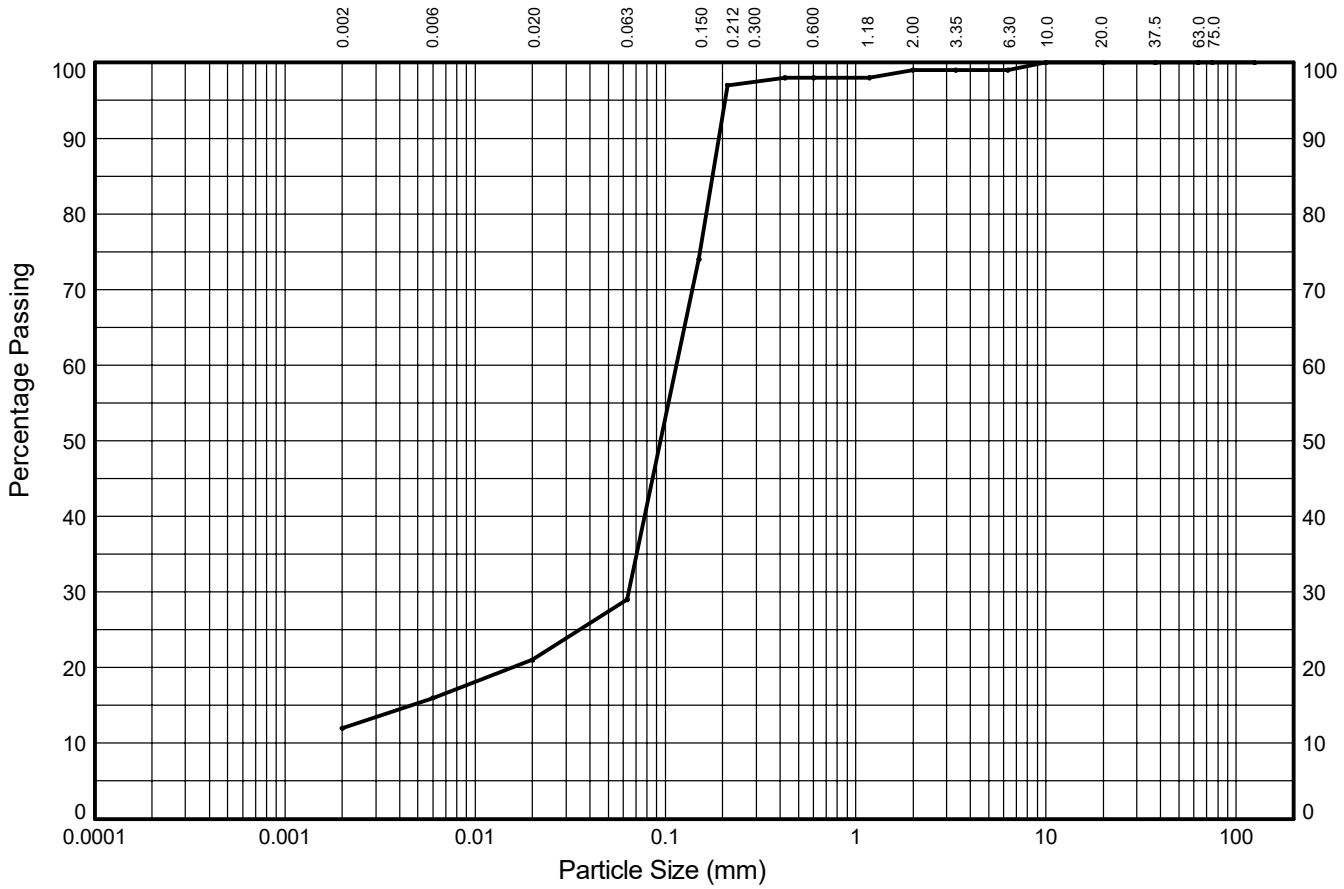
Compiled By		Date
Francesca Bennett	**FRANCESCA BENNETT**	**30/06/20**

Contract	Contract Ref:
Greenway	**563166**

PARTICLE SIZE DISTRIBUTION TEST

In accordance with clauses 9.2, 9.5 of BS1377:Part 2:1990

Borehole: **BH6** Sample Ref: **26** Sample Type: **B** Depth (m): **13.00**



CLAY	fine	medium	coarse	fine	medium	coarse	fine	medium	coarse	COBBLES
	4%	5%	8%	64%	5%	1%	0%	1%	0%	
	SILT			SAND			GRAVEL			
12%	17%			70%			1%			0%

Test Sieve (mm)	Percent Passing (%)
125.0	**100**
75.0	**100**
63.0	**100**
37.5	**100**
20.0	**100**
10.0	**100**
6.30	**99**
3.35	**99**
2.00	**99**
1.18	**98**
0.600	**98**
0.425	**98**
0.212	**97**
0.150	**74**
0.063	**29**

Particle Diameter (mm)	Percent Passing (%)
0.02	**21**
0.006	**16**
0.002	**12**

Sedimentation sample was not pre-treated

Coefficients	
D_{10} (mm)	**NA**
D_{15} (mm)	**0.005**
D_{30} (mm)	**0.064**
D_{50} (mm)	**0.094**
D_{60} (mm)	**0.115**
D_{85} (mm)	**0.177**
D_{90} (mm)	**0.191**
C_U	**NA**
C_C	**NA**

Soil Description:

Brown mottled grey slightly gravelly very clayey SAND

Key: C_U = Uniformity coefficient. C_C = Coefficient of curvature as defined in BS EN ISO 14688-2

STRUCTURAL SOILS
1a Princess Street
Bedminster
Bristol
BS3 4AG

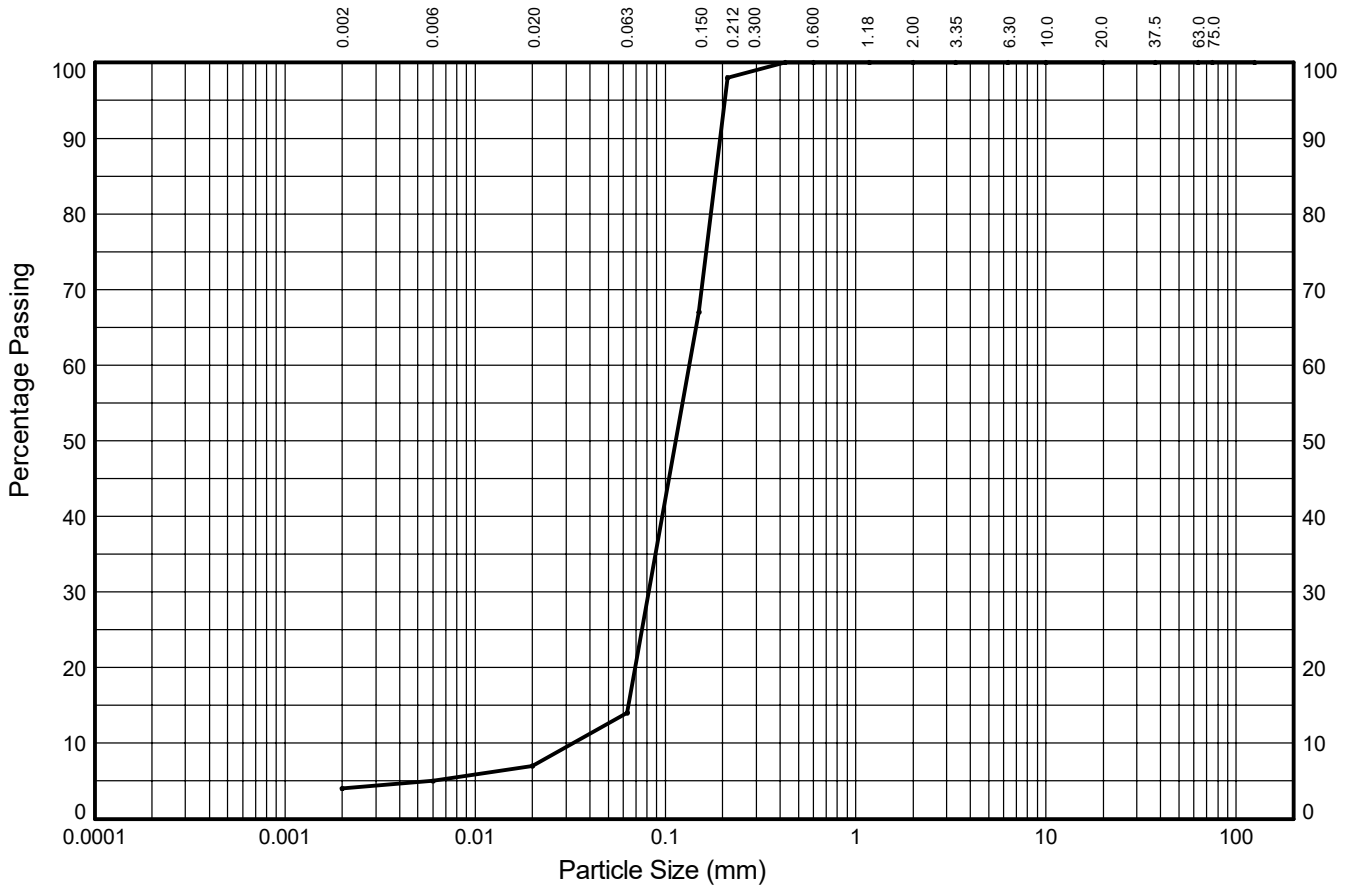
Compiled By		Date
	CONNEL MCLAUGHLIN	**30/06/20**

Contract	Contract Ref:
Greenway	**563166**

PARTICLE SIZE DISTRIBUTION TEST

In accordance with clauses 9.2, 9.5 of BS1377:Part 2:1990

Borehole: **BH6** Sample Ref: **28** Sample Type: **B** Depth (m): **14.00**



CLAY	fine	medium	coarse	fine	medium	coarse	fine	medium	coarse	COBBLES
	1%	2%	7%	78%	8%	0%	0%	0%	0%	
	SILT			SAND			GRAVEL			
4%	10%			86%			0%			0%

Test Sieve (mm)	Percent Passing (%)
125.0	**100**
75.0	**100**
63.0	**100**
37.5	**100**
20.0	**100**
10.0	**100**
6.30	**100**
3.35	**100**
2.00	**100**
1.18	**100**
0.600	**100**
0.425	**100**
0.212	**98**
0.150	**67**
0.063	**14**

Particle Diameter (mm)	Percent Passing (%)
0.02	**7**
0.006	**5**
0.002	**4**

Sedimentation sample was not pre-treated

Coefficients	
D_{10} (mm)	**0.033**
D_{15} (mm)	**0.064**
D_{30} (mm)	**0.082**
D_{50} (mm)	**0.114**
D_{60} (mm)	**0.134**
D_{85} (mm)	**0.183**
D_{90} (mm)	**0.194**
C_U	**4.1**
C_C	**1.5**

Soil Description:

Brown silty SAND

Key: C_U = Uniformity coefficient. C_C = Coefficient of curvature as defined in BS EN ISO 14688-2

STRUCTURAL SOILS
1a Princess Street
Bedminster
Bristol
BS3 4AG

Compiled By		Date
	CONNEL MCLAUGHLIN	**30/06/20**

Contract	Contract Ref:
Greenway	**563166**

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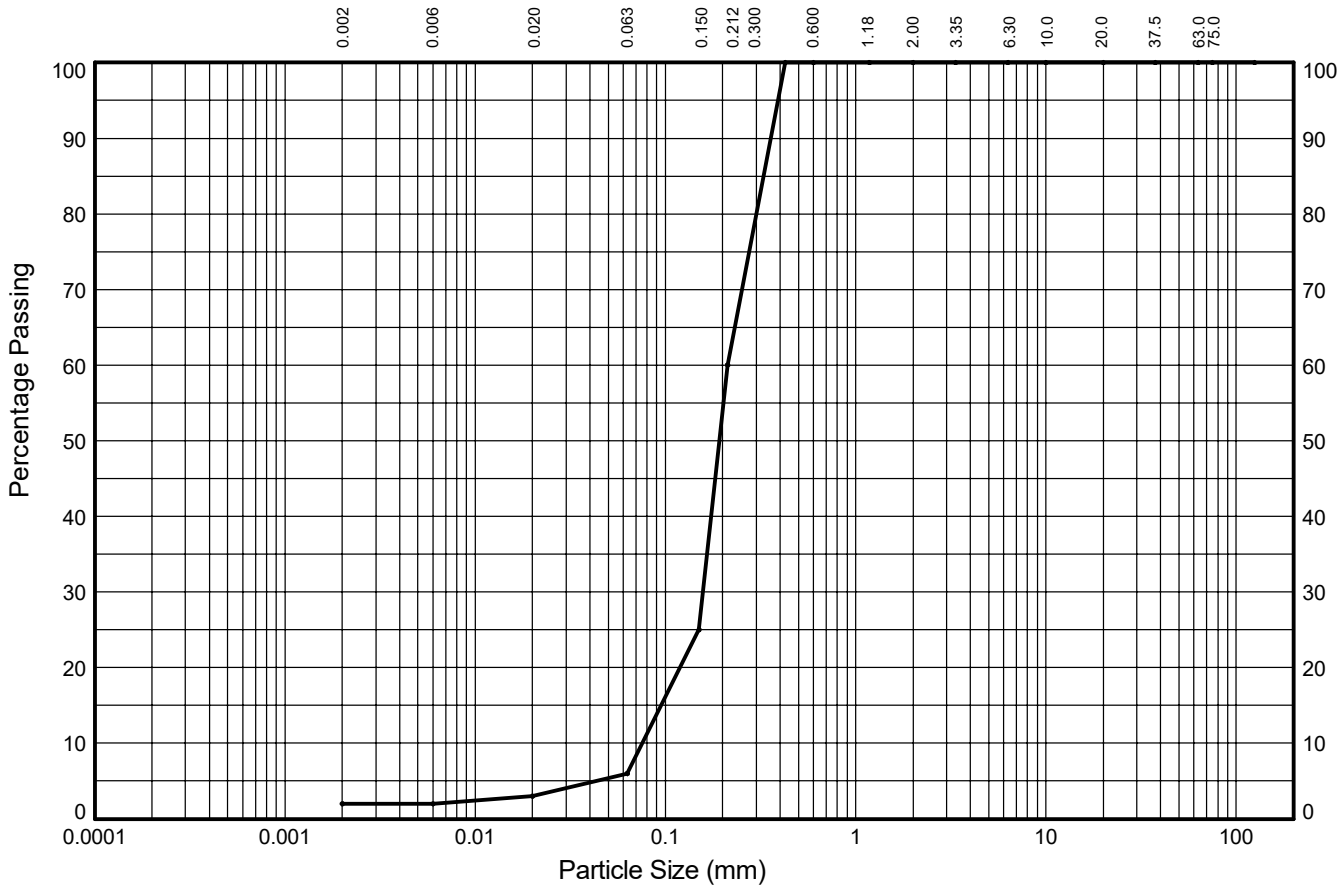
PARTICLE SIZE DISTRIBUTION TEST

In accordance with clauses 9.2, 9.5 of BS1377:Part 2:1990

Borehole: **BH6** Sample Ref: **30** Sample Type: **B** Depth (m): **15.00**



CLAY	fine	medium	coarse	fine	medium	coarse	fine	medium	coarse	COBBLES
	0%	1%	3%	47%	47%	0%	0%	0%	0%	
	SILT			SAND			GRAVEL			
2%	4%			94%			0%			0%

Test Sieve (mm)	Percent Passing (%)
125.0	**100**
75.0	**100**
63.0	**100**
37.5	**100**
20.0	**100**
10.0	**100**
6.30	**100**
3.35	**100**
2.00	**100**
1.18	**100**
0.600	**100**
0.425	**100**
0.212	**60**
0.150	**25**
0.063	**6**

Particle Diameter (mm)	Percent Passing (%)
0.02	**3**
0.006	**2**
0.002	**2**

Sedimentation sample was pre-treated

Coefficients	
D_{10} (mm)	**0.076**
D_{15} (mm)	**0.095**
D_{30} (mm)	**0.158**
D_{50} (mm)	**0.192**
D_{60} (mm)	**0.212**
D_{85} (mm)	**0.327**
D_{90} (mm)	**0.357**
C_U	**2.8**
C_C	**1.5**

Soil Description:

Brown silty SAND

Key: C_U = Uniformity coefficient. C_C = Coefficient of curvature as defined in BS EN ISO 14688-2

STRUCTURAL SOILS
1a Princess Street
Bedminster
Bristol
BS3 4AG

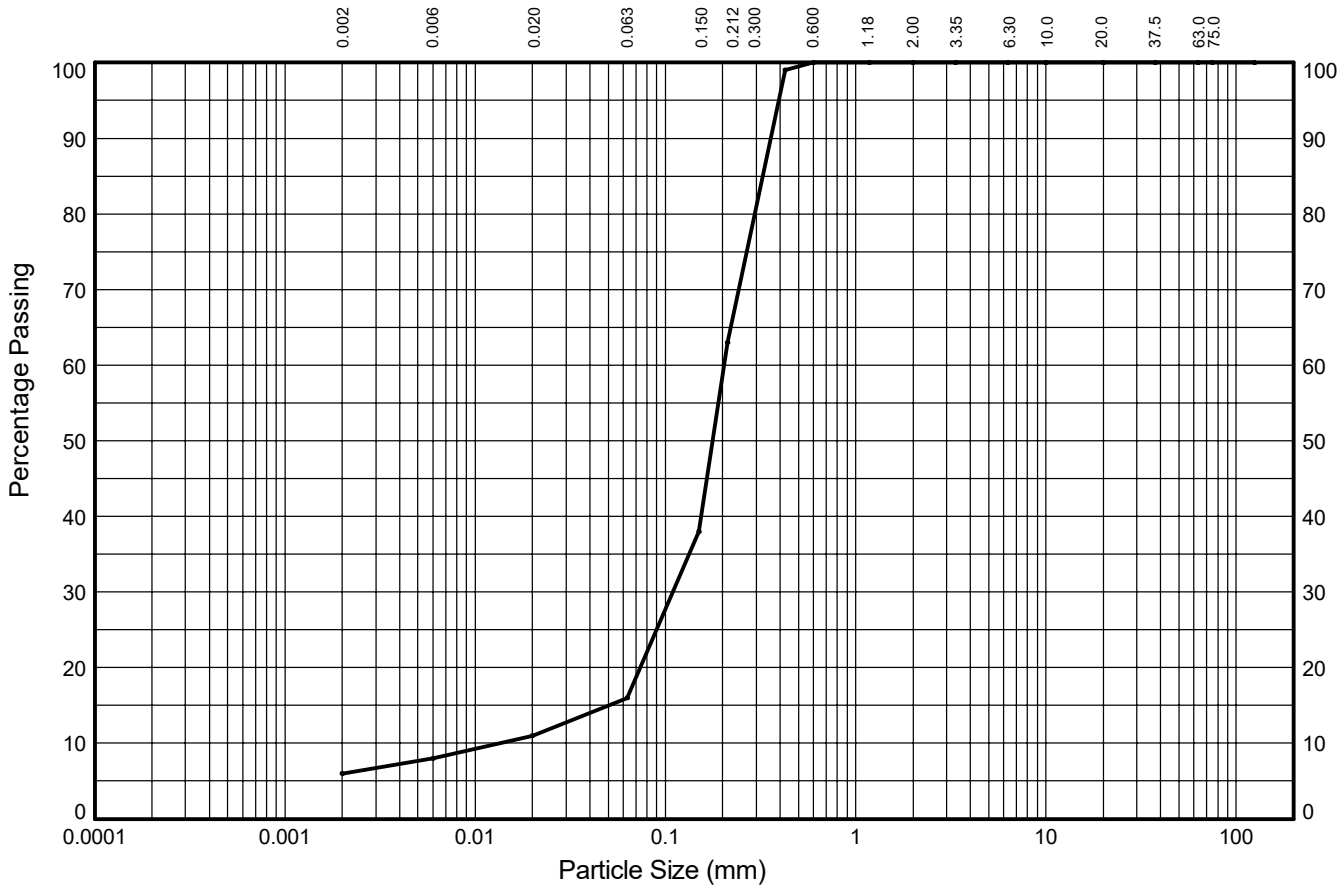
Compiled By	Date
THOMAS DAVIES	**30/06/20**

Contract	Contract Ref:
Greenway	**563166**

PARTICLE SIZE DISTRIBUTION TEST

In accordance with clauses 9.2, 9.5 of BS1377:Part 2:1990

Borehole: **BH6** Sample Ref: **31** Sample Type: **B** Depth (m): **16.00**



CLAY	fine	medium	coarse	fine	medium	coarse	fine	medium	coarse	COBBLES
	2%	3%	5%	42%	42%	0%	0%	0%	0%	
	SILT			SAND			GRAVEL			
6%	10%			84%			0%			0%

Test Sieve (mm)	Percent Passing (%)
125.0	**100**
75.0	**100**
63.0	**100**
37.5	**100**
20.0	**100**
10.0	**100**
6.30	**100**
3.35	**100**
2.00	**100**
1.18	**100**
0.600	**100**
0.425	**99**
0.212	**63**
0.150	**38**
0.063	**16**

Particle Diameter (mm)	Percent Passing (%)
0.02	**11**
0.006	**8**
0.002	**6**

Sedimentation sample was not pre-treated

Coefficients	
D_{10} (mm)	**0.013**
D_{15} (mm)	**0.050**
D_{30} (mm)	**0.109**
D_{50} (mm)	**0.177**
D_{60} (mm)	**0.203**
D_{85} (mm)	**0.324**
D_{90} (mm)	**0.357**
C_U	**15**
C_C	**4**

Soil Description:

Brown mottled grey clayey SAND

Key: C_U = Uniformity coefficient. C_C = Coefficient of curvature as defined in BS EN ISO 14688-2

STRUCTURAL SOILS
1a Princess Street
Bedminster
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Compiled By		Date
	CONNEL MCLAUGHLIN	**30/06/20**

Contract	Contract Ref:
Greenway	**563166**

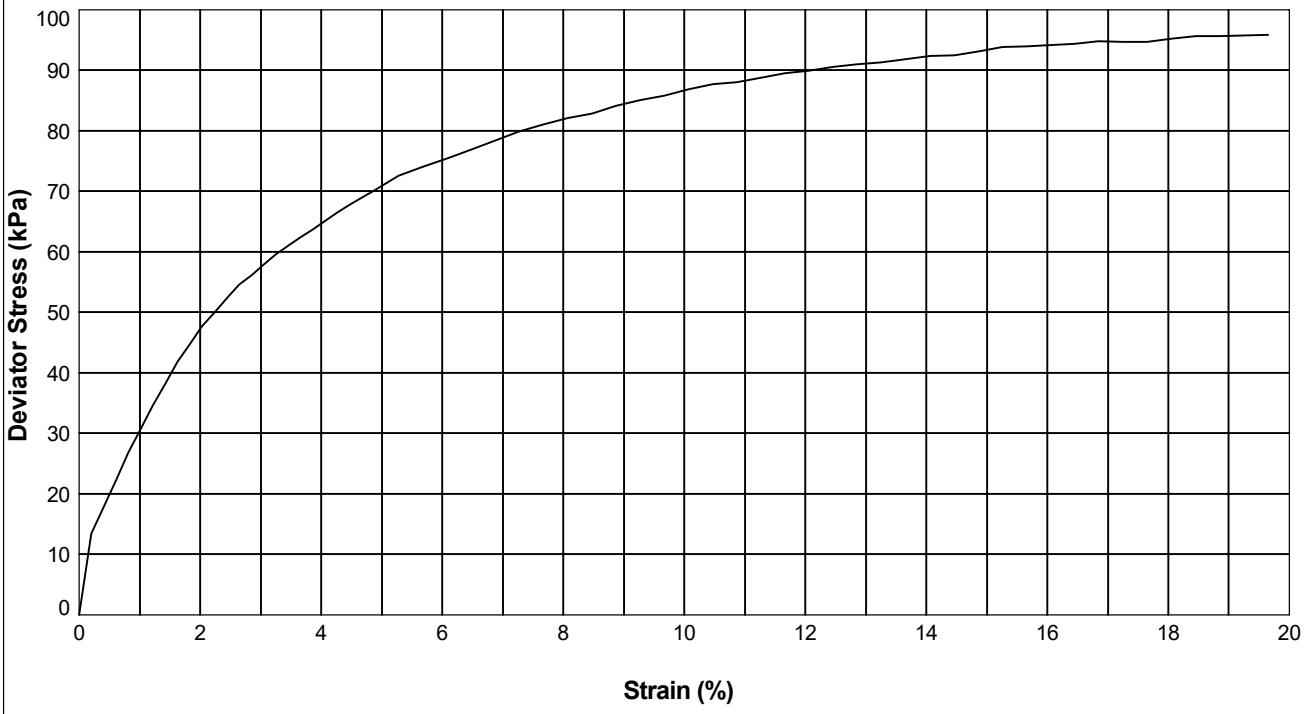
UNCONSOLIDATED QUICK UNDRAINED (SINGLE STAGE) TRIAXIAL COMPRESSION TEST

In accordance with BS1377 Part 7 Clause 8

Borehole: **BH1** Sample Ref: **4** Sample Type: **UT100** Depth (m): **1.60**

Description : **Orangish brown mottled greenish grey sandy CLAY**

STAGE NUMBER			1	2	3
SAMPLE DETAILS	Sample Condition		Undisturbed		
	Orientation of sample		Vertical		
	Diameter	(mm)	103.55		
	Height	(mm)	201.77		
	Moisture Content	(%)	20		
	Bulk Density	(Mg/m^3)	2.08		
	Dry Density	(Mg/m^3)	1.74		
TEST DETAILS	Membrane Thickness	(mm)	0.38		
	Rate of Axial Displacement	(%/min)	1.34		
	Cell Pressure	(kPa)	30		
	Membrane Correction	(kPa)	1.38		
	Corrected Deviator Stress	(kPa)	96		
	Undrained Shear Strength	(kPa)	48		
	Strain at Failure	(%)	19.6		
	Mode of Failure		Plastic		



STRUCTURAL SOILS
1a Princess Street
Bedminster
Bristol
BS3 4AG

Compiled By		Date
	CONNEL MCLAUGHLIN	12/03/20

Contract	Contract Ref:
Greenway	563166

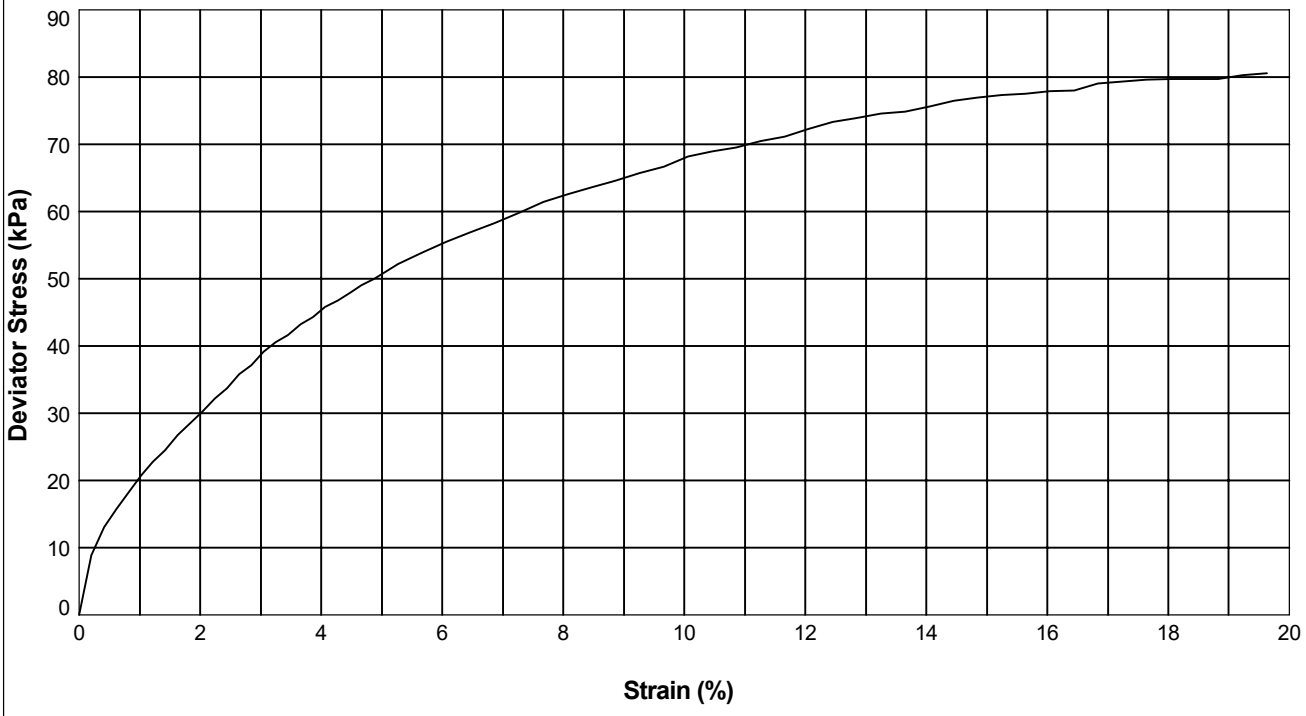
UNCONSOLIDATED QUICK UNDRAINED (SINGLE STAGE) TRIAXIAL COMPRESSION TEST

In accordance with BS1377 Part 7 Clause 8

Borehole: **BH1** Sample Ref: **8** Sample Type: **UT100** Depth (m): **3.60**

Description : **Dark greyish brown slightly sandy CLAY**

STAGE NUMBER			1	2	3
SAMPLE DETAILS	Sample Condition		Undisturbed		
	Orientation of sample		Vertical		
	Diameter	(mm)	103.39		
	Height	(mm)	201.92		
	Moisture Content	(%)	27		
	Bulk Density	(Mg/m^3)	2.03		
	Dry Density	(Mg/m^3)	1.60		
TEST DETAILS	Membrane Thickness	(mm)	0.31		
	Rate of Axial Displacement	(%/min)	1.34		
	Cell Pressure	(kPa)	70		
	Membrane Correction	(kPa)	1.13		
	Corrected Deviator Stress	(kPa)	80		
	Undrained Shear Strength	(kPa)	40		
	Strain at Failure	(%)	19.6		
	Mode of Failure		Plastic		



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Contract	Contract Ref:
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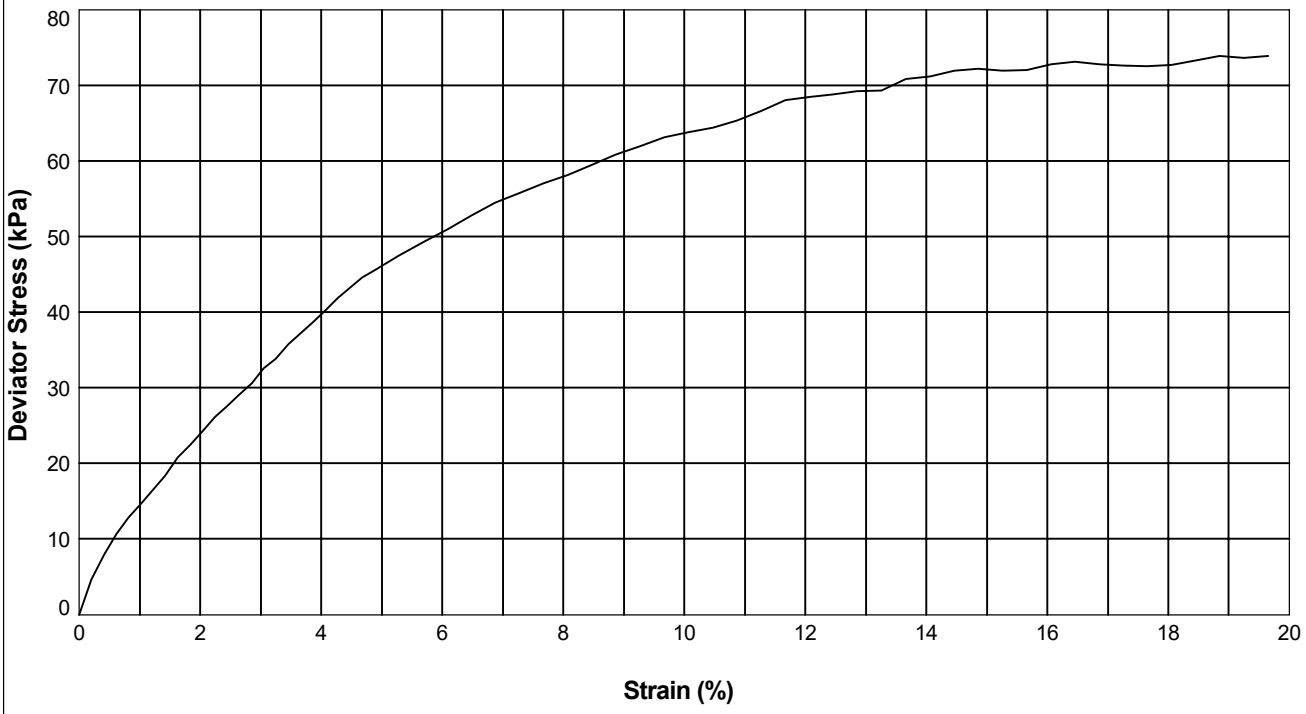
UNCONSOLIDATED QUICK UNDRAINED (SINGLE STAGE) TRIAXIAL COMPRESSION TEST

In accordance with BS1377 Part 7 Clause 8

Borehole: **BH1** Sample Ref: **13** Sample Type: **UT100** Depth (m): **6.05**

Description : **Dark greyish brown slightly sandy silty CLAY**

STAGE NUMBER			1	2	3
SAMPLE DETAILS	Sample Condition		Undisturbed		
	Orientation of sample		Vertical		
	Diameter	(mm)	102.96		
	Height	(mm)	201.73		
	Moisture Content	(%)	25		
	Bulk Density	(Mg/m^3)	2.02		
	Dry Density	(Mg/m^3)	1.62		
TEST DETAILS	Membrane Thickness	(mm)	0.30		
	Rate of Axial Displacement	(%/min)	1.34		
	Cell Pressure	(kPa)	120		
	Membrane Correction	(kPa)	1.06		
	Corrected Deviator Stress	(kPa)	74		
	Undrained Shear Strength	(kPa)	37		
	Strain at Failure	(%)	18.8		
	Mode of Failure		Plastic		



STRUCTURAL SOILS
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Francesca Bennett	FRANCESCA BENNETT	12/03/20

Contract	Contract Ref:
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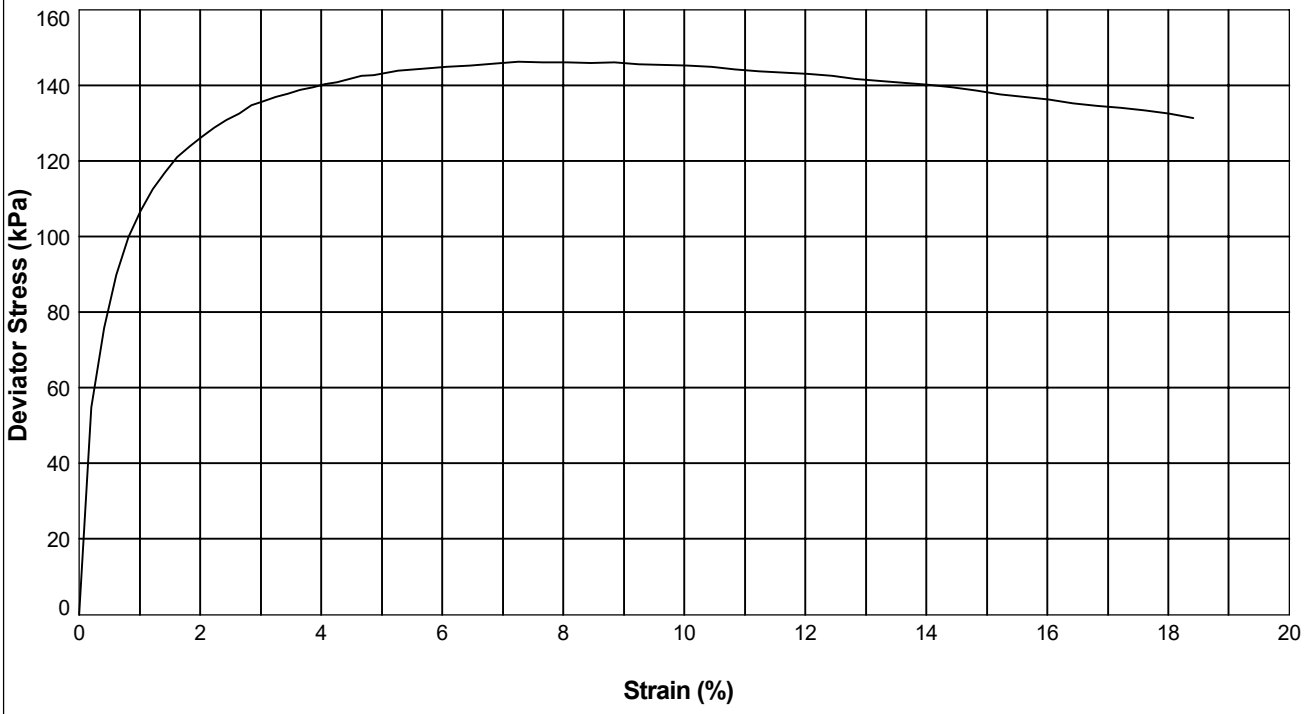
UNCONSOLIDATED QUICK UNDRAINED (SINGLE STAGE) TRIAXIAL COMPRESSION TEST

In accordance with BS1377 Part 7 Clause 8

Borehole: **BH1** Sample Ref: **16** Sample Type: **UT100** Depth (m): **7.60**

Description : **Orangish brown mottled purple and bluish grey slightly sandy CLAY**

STAGE NUMBER			1	2	3
SAMPLE DETAILS	Sample Condition		Undisturbed		
	Orientation of sample		Vertical		
	Diameter	(mm)	103.68		
	Height	(mm)	202.20		
	Moisture Content	(%)	23		
	Bulk Density	(Mg/m^3)	2.11		
	Dry Density	(Mg/m^3)	1.72		
TEST DETAILS	Membrane Thickness	(mm)	0.36		
	Rate of Axial Displacement	(%/min)	1.34		
	Cell Pressure	(kPa)	150		
	Membrane Correction	(kPa)	0.62		
	Corrected Deviator Stress	(kPa)	146		
	Undrained Shear Strength	(kPa)	73		
	Strain at Failure	(%)	7.3		
	Mode of Failure		Compound		



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Compiled By		Date
A.D. Frost	ALAN FROST	12/03/20

Contract	Contract Ref:
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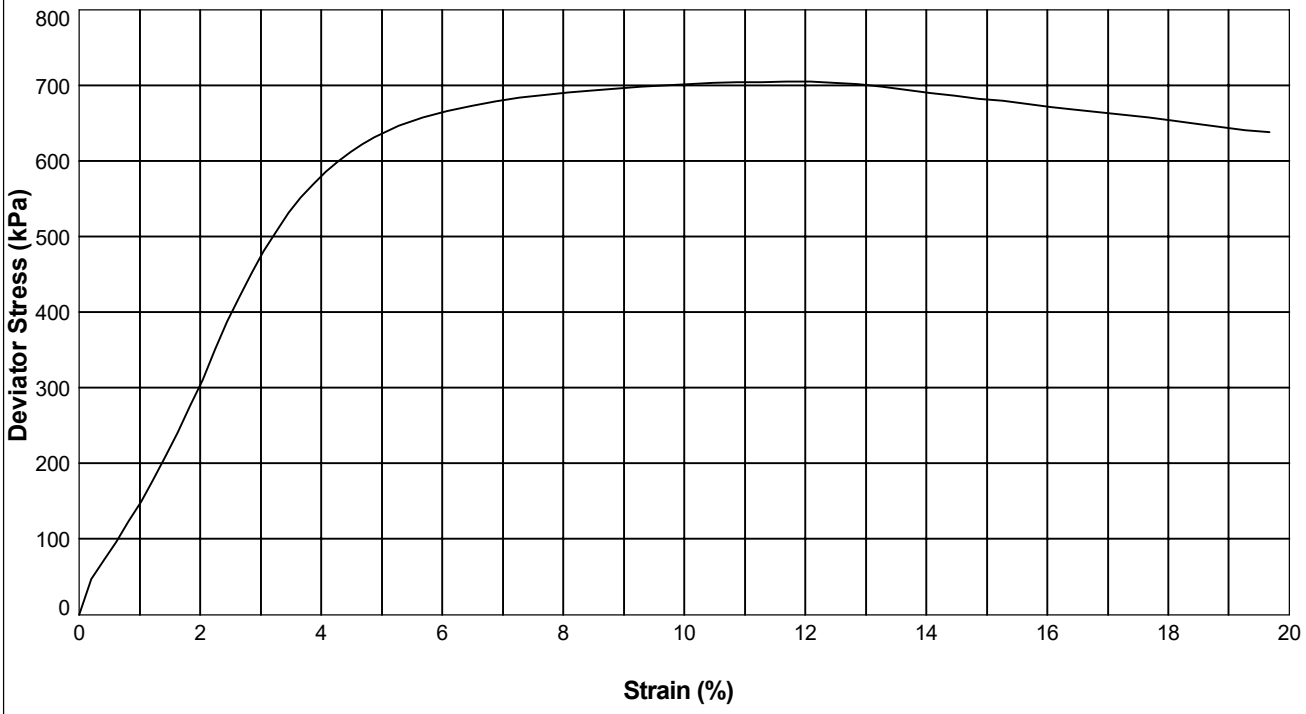
UNCONSOLIDATED QUICK UNDRAINED (SINGLE STAGE) TRIAXIAL COMPRESSION TEST

In accordance with BS1377 Part 7 Clause 8

Borehole: **BH1** Sample Ref: **20** Sample Type: **UT100** Depth (m): **9.52**

Description : **Bluish grey very clayey SAND**

STAGE NUMBER			1	2	3
SAMPLE DETAILS	Sample Condition		Undisturbed		
	Orientation of sample		Vertical		
	Diameter	(mm)	103.55		
	Height	(mm)	201.57		
	Moisture Content	(%)	14		
	Bulk Density	(Mg/m^3)	2.23		
	Dry Density	(Mg/m^3)	1.96		
TEST DETAILS	Membrane Thickness	(mm)	0.36		
	Rate of Axial Displacement	(%/min)	1.34		
	Cell Pressure	(kPa)	190		
	Membrane Correction	(kPa)	0.89		
	Corrected Deviator Stress	(kPa)	705		
	Undrained Shear Strength	(kPa)	352		
	Strain at Failure	(%)	11.7		
	Mode of Failure		Compound		



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Contract	Contract Ref:
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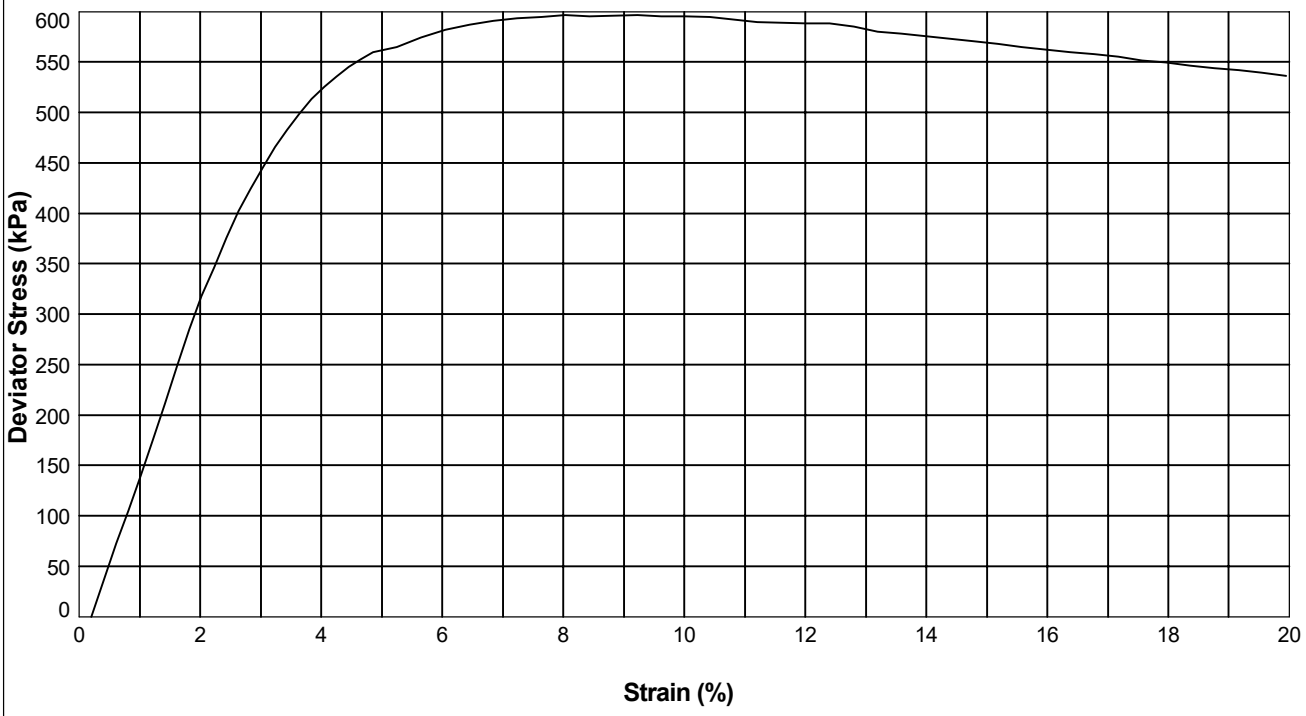
UNCONSOLIDATED QUICK UNDRAINED (SINGLE STAGE) TRIAXIAL COMPRESSION TEST

In accordance with BS1377 Part 7 Clause 8

Borehole: **BH1** Sample Ref: **24** Sample Type: **UT100** Depth (m): **11.71**

Description : **Brown mottled bluish grey sandy CLAY**

STAGE NUMBER			1	2	3
SAMPLE DETAILS	Sample Condition		Undisturbed		
	Orientation of sample		Vertical		
	Diameter	(mm)	104.19		
	Height	(mm)	202.74		
	Moisture Content	(%)	14		
	Bulk Density	(Mg/m^3)	2.19		
	Dry Density	(Mg/m^3)	1.92		
TEST DETAILS	Membrane Thickness	(mm)	0.28		
	Rate of Axial Displacement	(%/min)	1.33		
	Cell Pressure	(kPa)	230		
	Membrane Correction	(kPa)	0.58		
	Corrected Deviator Stress	(kPa)	597		
	Undrained Shear Strength	(kPa)	298		
	Strain at Failure	(%)	9.2		
	Mode of Failure		Compound		



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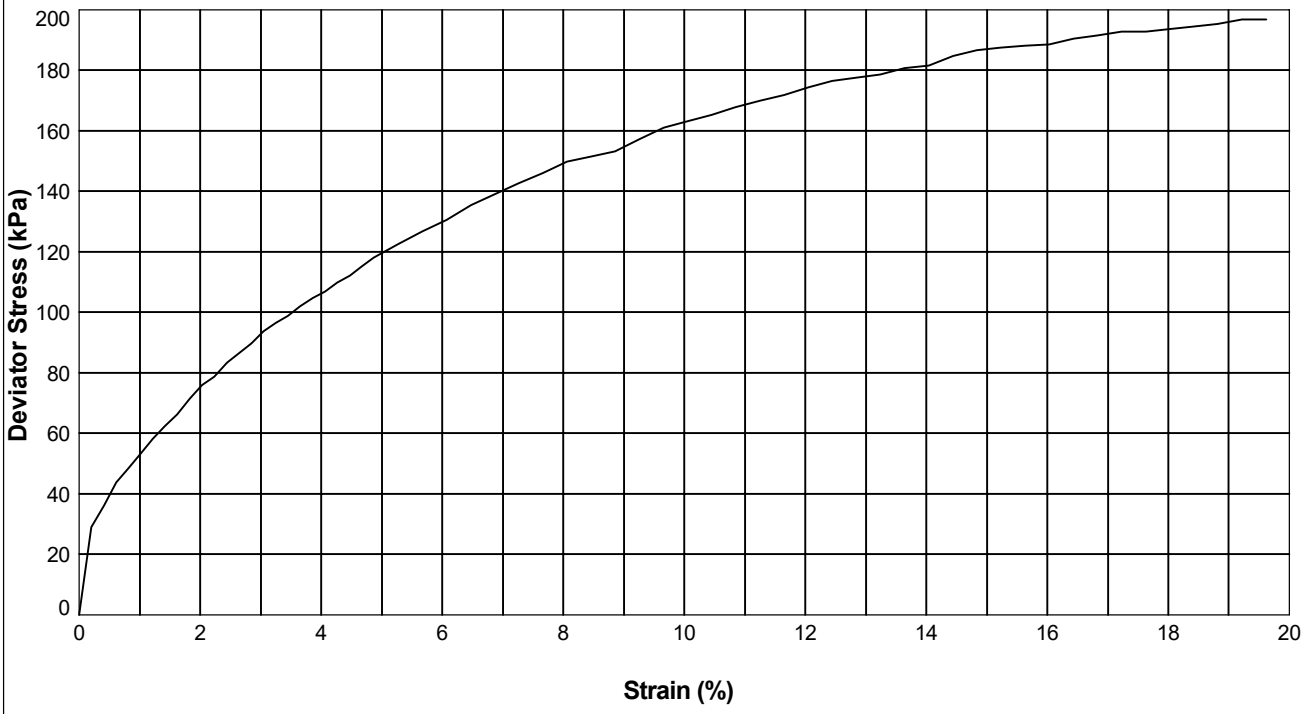
UNCONSOLIDATED QUICK UNDRAINED (SINGLE STAGE) TRIAXIAL COMPRESSION TEST

In accordance with BS1377 Part 7 Clause 8

Borehole: **BH1** Sample Ref: **28** Sample Type: **UT100** Depth (m): **13.52**

Description : **Brown mottled grey slightly sandy CLAY**

STAGE NUMBER			1	2	3
SAMPLE DETAILS	Sample Condition		Undisturbed		
	Orientation of sample		Vertical		
	Diameter	(mm)	103.73		
	Height	(mm)	202.06		
	Moisture Content	(%)	20		
	Bulk Density	(Mg/m^3)	2.13		
	Dry Density	(Mg/m^3)	1.77		
TEST DETAILS	Membrane Thickness	(mm)	0.38		
	Rate of Axial Displacement	(%/min)	1.34		
	Cell Pressure	(kPa)	270		
	Membrane Correction	(kPa)	1.38		
	Corrected Deviator Stress	(kPa)	197		
	Undrained Shear Strength	(kPa)	98		
	Strain at Failure	(%)	19.6		
	Mode of Failure		Compound		



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Compiled By		Date
D. Richards	DAISY RICHARDS	12/03/20

Contract	Contract Ref:
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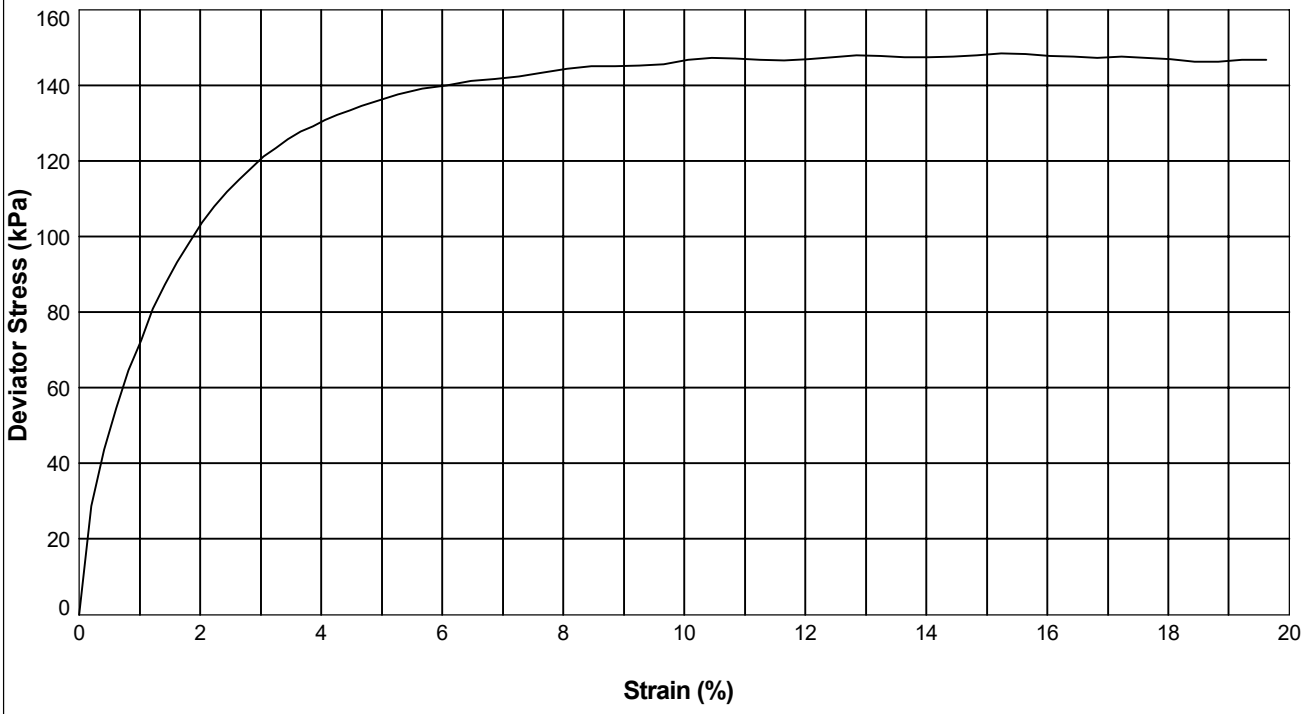
UNCONSOLIDATED QUICK UNDRAINED (SINGLE STAGE) TRIAXIAL COMPRESSION TEST

In accordance with BS1377 Part 7 Clause 8

Borehole: **BH2** Sample Ref: **4** Sample Type: **UT100** Depth (m): **1.60**

Description : **Dark brown slightly sandy CLAY**

STAGE NUMBER			1	2	3
SAMPLE DETAILS	Sample Condition		Undisturbed		
	Orientation of sample		Vertical		
	Diameter	(mm)	103.26		
	Height	(mm)	202.02		
	Moisture Content	(%)	28		
	Bulk Density	(Mg/m^3)	1.98		
	Dry Density	(Mg/m^3)	1.55		
TEST DETAILS	Membrane Thickness	(mm)	0.20		
	Rate of Axial Displacement	(%/min)	1.34		
	Cell Pressure	(kPa)	30		
	Membrane Correction	(kPa)	0.60		
	Corrected Deviator Stress	(kPa)	148		
	Undrained Shear Strength	(kPa)	74		
	Strain at Failure	(%)	15.2		
	Mode of Failure		Compound		



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	CONNEL MCLAUGHLIN	12/03/20

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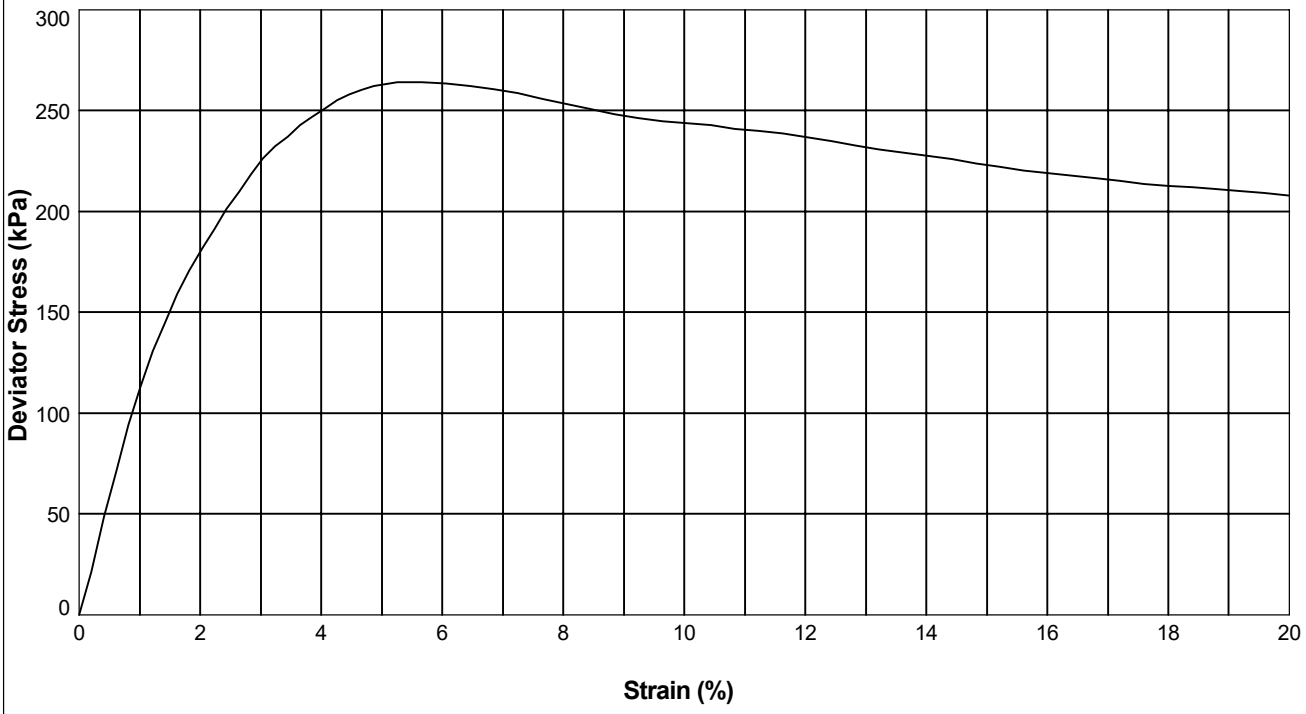
UNCONSOLIDATED QUICK UNDRAINED (SINGLE STAGE) TRIAXIAL COMPRESSION TEST

In accordance with BS1377 Part 7 Clause 8

Borehole: **BH2** Sample Ref: **8** Sample Type: **UT100** Depth (m): **3.60**

Description : **Dark brownish grey slightly sandy CLAY**

STAGE NUMBER			1	2	3
SAMPLE DETAILS	Sample Condition		Undisturbed		
	Orientation of sample		Vertical		
	Diameter	(mm)	103.78		
	Height	(mm)	202.34		
	Moisture Content	(%)	22		
	Bulk Density	(Mg/m^3)	2.07		
	Dry Density	(Mg/m^3)	1.70		
TEST DETAILS	Membrane Thickness	(mm)	0.42		
	Rate of Axial Displacement	(%/min)	1.33		
	Cell Pressure	(kPa)	70		
	Membrane Correction	(kPa)	0.57		
	Corrected Deviator Stress	(kPa)	264		
	Undrained Shear Strength	(kPa)	132		
	Strain at Failure	(%)	5.3		
	Mode of Failure		Compound		



STRUCTURAL SOILS
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Compiled By		Date
CMA	CONNEL MCLAUGHLIN	12/03/20

Contract	Contract Ref:
Greenway	563166

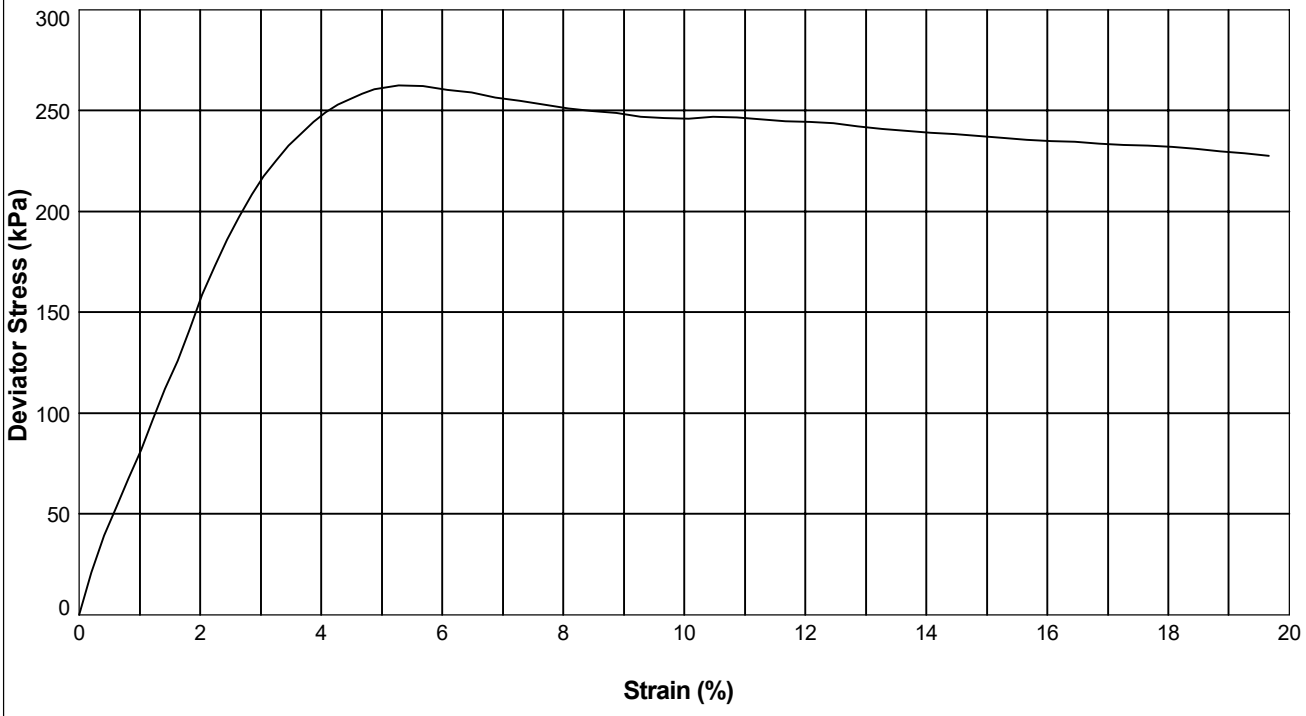
UNCONSOLIDATED QUICK UNDRAINED (SINGLE STAGE) TRIAXIAL COMPRESSION TEST

In accordance with BS1377 Part 7 Clause 8

Borehole: **BH2** Sample Ref: **12** Sample Type: **UT100** Depth (m): **5.53**

Description : **Dark grey slightly sandy silty CLAY**

STAGE NUMBER			1	2	3
SAMPLE DETAILS	Sample Condition		Undisturbed		
	Orientation of sample		Vertical		
	Diameter	(mm)	103.20		
	Height	(mm)	201.65		
	Moisture Content	(%)	23		
	Bulk Density	(Mg/m^3)	2.04		
	Dry Density	(Mg/m^3)	1.65		
TEST DETAILS	Membrane Thickness	(mm)	0.33		
	Rate of Axial Displacement	(%/min)	1.34		
	Cell Pressure	(kPa)	110		
	Membrane Correction	(kPa)	0.45		
	Corrected Deviator Stress	(kPa)	262		
	Undrained Shear Strength	(kPa)	131		
	Strain at Failure	(%)	5.3		
	Mode of Failure		Compound		



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BS3 4AG

Compiled By		Date
D. Richards	DAISY RICHARDS	12/03/20

Contract	Contract Ref:
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AGS

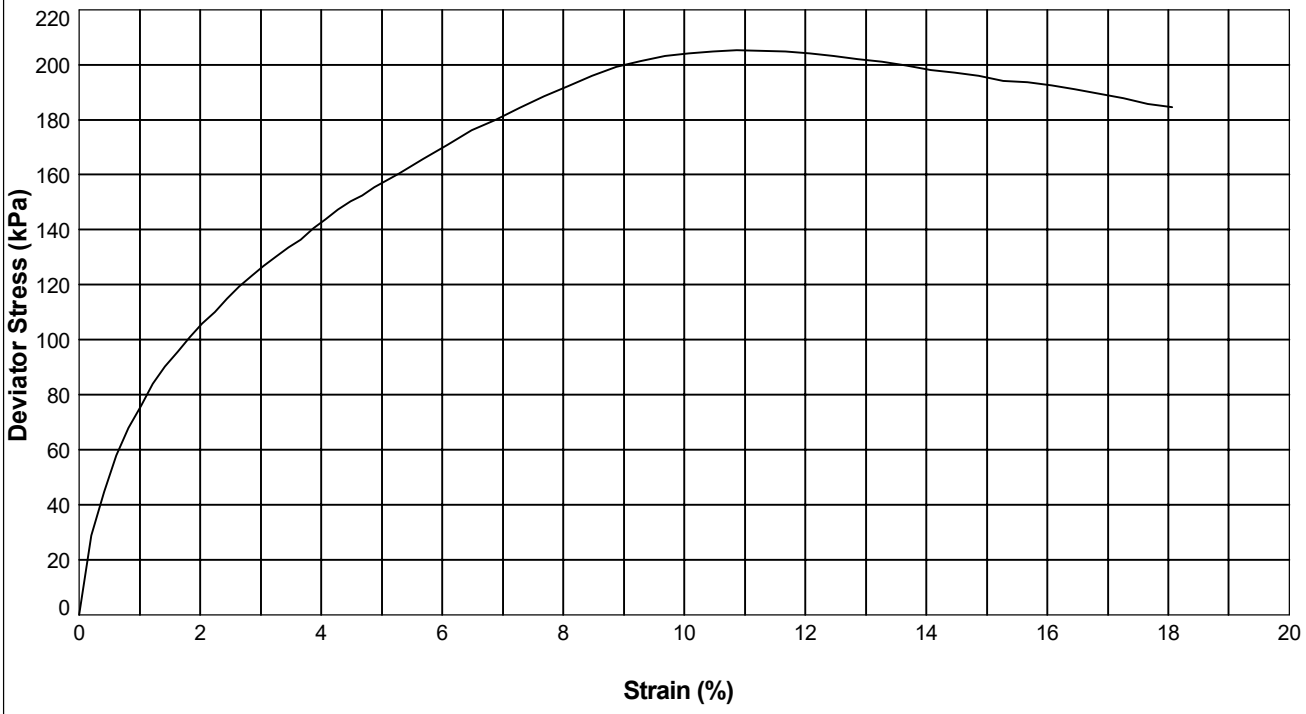
UNCONSOLIDATED QUICK UNDRAINED (SINGLE STAGE) TRIAXIAL COMPRESSION TEST

In accordance with BS1377 Part 7 Clause 8

Borehole: **BH2** Sample Ref: **16** Sample Type: **UT100** Depth (m): **7.60**

Description : **Bluish grey mottled purple slightly sandy CLAY**

STAGE NUMBER			1	2	3
SAMPLE DETAILS	Sample Condition		Undisturbed		
	Orientation of sample		Vertical		
	Diameter	(mm)	103.12		
	Height	(mm)	201.64		
	Moisture Content	(%)	23		
	Bulk Density	(Mg/m^3)	2.08		
	Dry Density	(Mg/m^3)	1.70		
TEST DETAILS	Membrane Thickness	(mm)	0.30		
	Rate of Axial Displacement	(%/min)	1.34		
	Cell Pressure	(kPa)	150		
	Membrane Correction	(kPa)	0.71		
	Corrected Deviator Stress	(kPa)	205		
	Undrained Shear Strength	(kPa)	103		
	Strain at Failure	(%)	10.9		
	Mode of Failure		Compound		



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Compiled By		Date
Francesca Bennett	FRANCESCA BENNETT	12/03/20

Contract	Contract Ref:
Greenway	563166

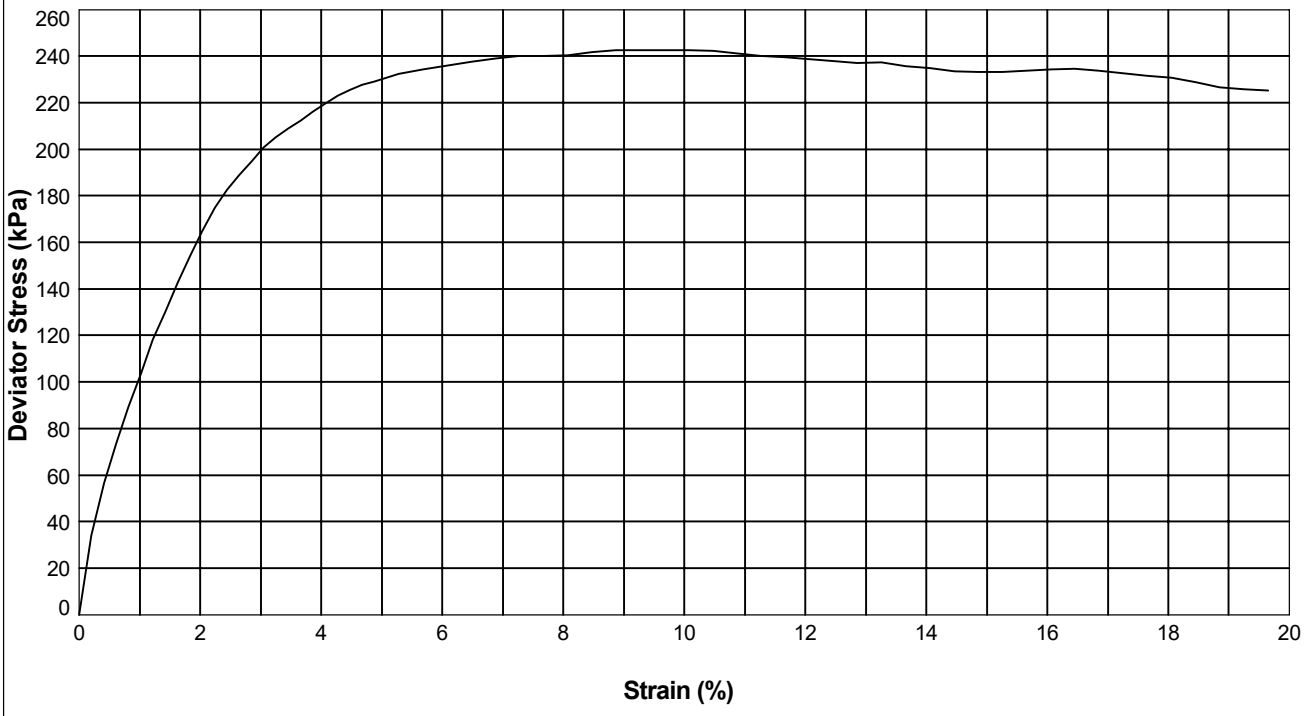
UNCONSOLIDATED QUICK UNDRAINED (SINGLE STAGE) TRIAXIAL COMPRESSION TEST

In accordance with BS1377 Part 7 Clause 8

Borehole: **BH2** Sample Ref: **20** Sample Type: **UT100** Depth (m): **9.53**

Description : **Orangish brown sandy silty CLAY**

STAGE NUMBER			1	2	3
SAMPLE DETAILS	Sample Condition		Undisturbed		
	Orientation of sample		Vertical		
	Diameter	(mm)	103.54		
	Height	(mm)	201.75		
	Moisture Content	(%)	19		
	Bulk Density	(Mg/m^3)	2.14		
	Dry Density	(Mg/m^3)	1.80		
TEST DETAILS	Membrane Thickness	(mm)	0.19		
	Rate of Axial Displacement	(%/min)	1.34		
	Cell Pressure	(kPa)	190		
	Membrane Correction	(kPa)	0.41		
	Corrected Deviator Stress	(kPa)	243		
	Undrained Shear Strength	(kPa)	121		
	Strain at Failure	(%)	9.7		
	Mode of Failure		Compound		



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Compiled By		Date
Francesca Bennett	FRANCESCA BENNETT	12/03/20

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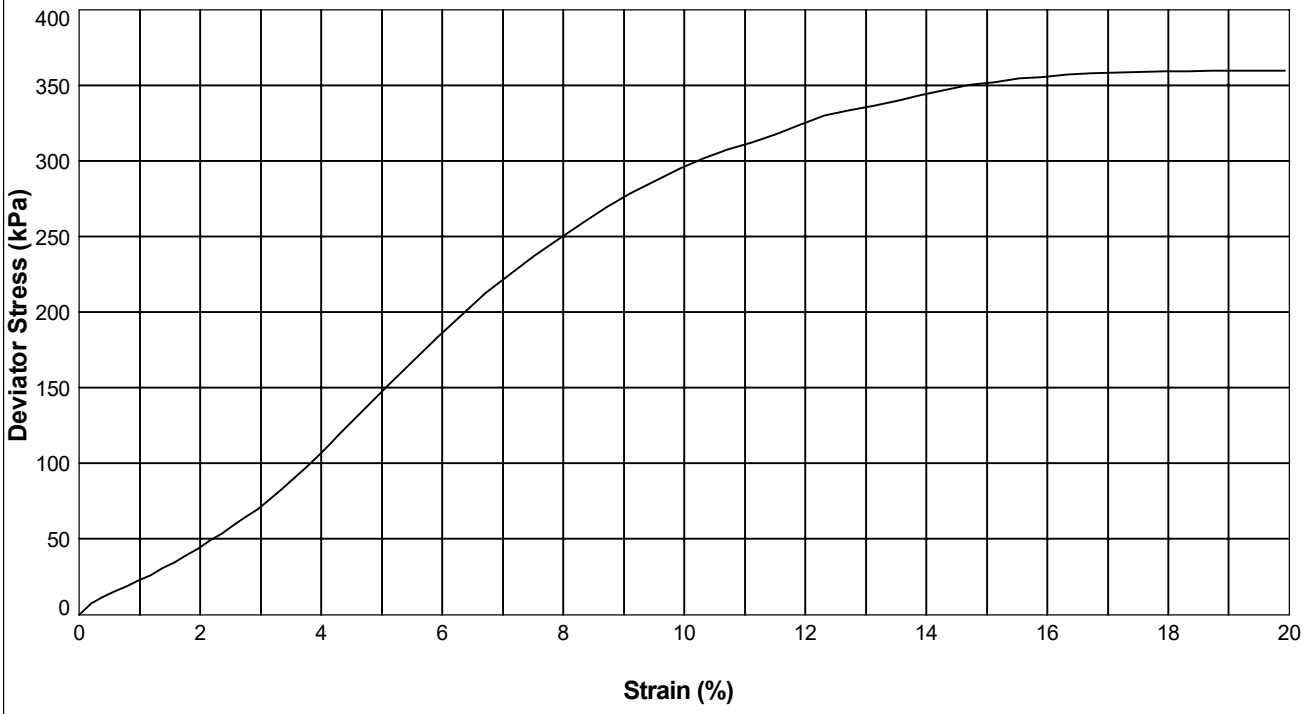
UNCONSOLIDATED QUICK UNDRAINED (SINGLE STAGE) TRIAXIAL COMPRESSION TEST

In accordance with BS1377 Part 7 Clause 8

Borehole: **BH2** Sample Ref: **24** Sample Type: **UT100** Depth (m): **11.60**

Description : **Yellowish brown sandy silty CLAY**

STAGE NUMBER			1	2	3
SAMPLE DETAILS	Sample Condition		Undisturbed		
	Orientation of sample		Vertical		
	Diameter	(mm)	104.01		
	Height	(mm)	201.11		
	Moisture Content	(%)	21		
	Bulk Density	(Mg/m^3)	2.14		
	Dry Density	(Mg/m^3)	1.77		
TEST DETAILS	Membrane Thickness	(mm)	0.27		
	Rate of Axial Displacement	(%/min)	1.34		
	Cell Pressure	(kPa)	190		
	Membrane Correction	(kPa)	0.99		
	Corrected Deviator Stress	(kPa)	360		
	Undrained Shear Strength	(kPa)	180		
	Strain at Failure	(%)	19.9		
	Mode of Failure		Compound		



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Francesca Bennett	FRANCESCA BENNETT	12/03/20
Contract: **Greenway**	Contract Ref: **563166**	

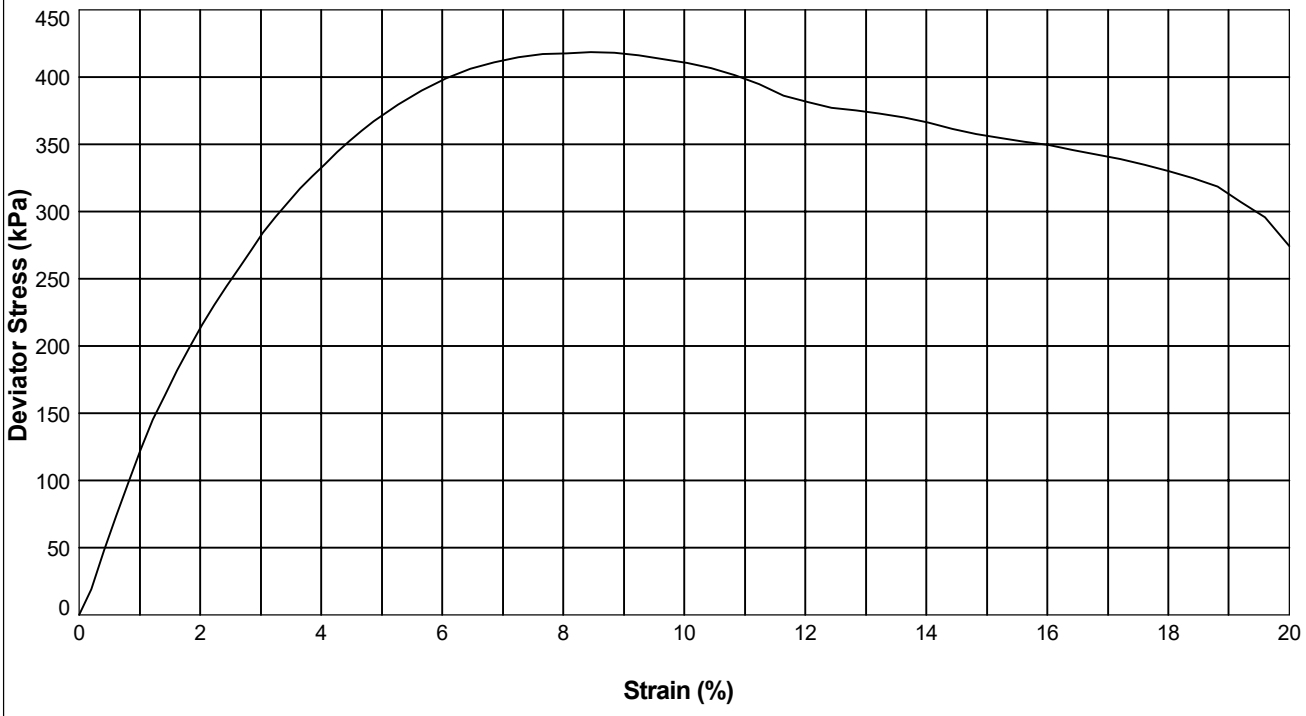
UNCONSOLIDATED QUICK UNDRAINED (SINGLE STAGE) TRIAXIAL COMPRESSION TEST

In accordance with BS1377 Part 7 Clause 8

Borehole: **BH3** Sample Ref: **12** Sample Type: **UT100** Depth (m): **5.56**

Description : **Bluish grey mottled purple and yellowish brown slightly sandy CLAY**

STAGE NUMBER			1	2	3
SAMPLE DETAILS	Sample Condition		Remoulded		
	Orientation of sample		Vertical		
	Diameter	(mm)	102.72		
	Height	(mm)	202.23		
	Moisture Content	(%)	17		
	Bulk Density	(Mg/m^3)	2.17		
	Dry Density	(Mg/m^3)	1.85		
TEST DETAILS	Membrane Thickness	(mm)	0.26		
	Rate of Axial Displacement	(%/min)	1.34		
	Cell Pressure	(kPa)	110		
	Membrane Correction	(kPa)	0.51		
	Corrected Deviator Stress	(kPa)	418		
	Undrained Shear Strength	(kPa)	209		
	Strain at Failure	(%)	8.4		
	Mode of Failure		Compound		



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Compiled By		Date
	CONNEL MCLAUGHLIN	12/03/20

Contract	Contract Ref:
Greenway	563166

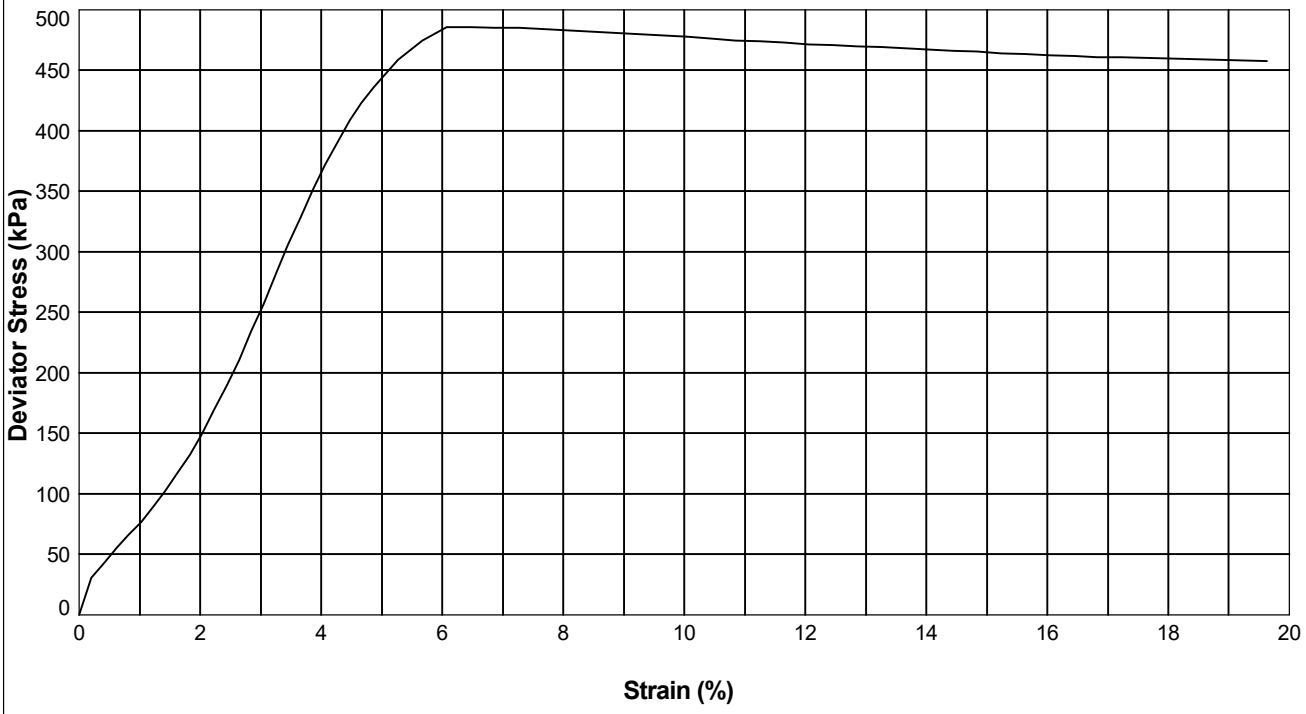
UNCONSOLIDATED QUICK UNDRAINED (SINGLE STAGE) TRIAXIAL COMPRESSION TEST

In accordance with BS1377 Part 7 Clause 8

Borehole: **BH3** Sample Ref: **16** Sample Type: **UT100** Depth (m): **7.52**

Description : **Bluish grey mottled brown slightly sandy silty CLAY**

STAGE NUMBER			1	2	3
SAMPLE DETAILS	Sample Condition		Undisturbed		
	Orientation of sample		Vertical		
	Diameter	(mm)	103.80		
	Height	(mm)	201.99		
	Moisture Content	(%)	16		
	Bulk Density	(Mg/m^3)	2.17		
	Dry Density	(Mg/m^3)	1.87		
TEST DETAILS	Membrane Thickness	(mm)	0.37		
	Rate of Axial Displacement	(%/min)	1.24		
	Cell Pressure	(kPa)	150		
	Membrane Correction	(kPa)	0.58		
	Corrected Deviator Stress	(kPa)	486		
	Undrained Shear Strength	(kPa)	243		
	Strain at Failure	(%)	6.5		
	Mode of Failure		Brittle		



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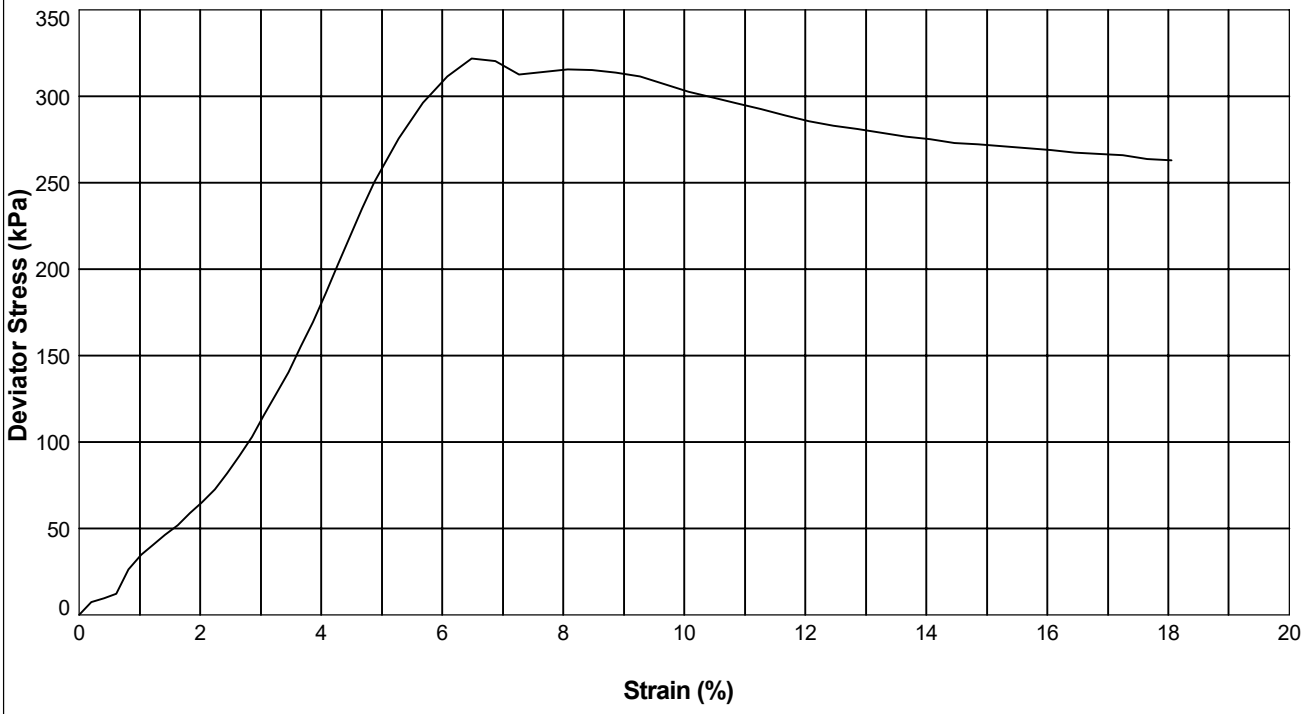
UNCONSOLIDATED QUICK UNDRAINED (SINGLE STAGE) TRIAXIAL COMPRESSION TEST

In accordance with BS1377 Part 7 Clause 8

Borehole: **BH3** Sample Ref: **20** Sample Type: **UT100** Depth (m): **9.53**

Description : **Yellowish brown mottled bluish grey sandy silty CLAY**

STAGE NUMBER			1	2	3
SAMPLE DETAILS	Sample Condition		Undisturbed		
	Orientation of sample		Vertical		
	Diameter	(mm)	103.29		
	Height	(mm)	201.75		
	Moisture Content	(%)	20		
	Bulk Density	(Mg/m^3)	2.08		
	Dry Density	(Mg/m^3)	1.73		
TEST DETAILS	Membrane Thickness	(mm)	0.41		
	Rate of Axial Displacement	(%/min)	1.34		
	Cell Pressure	(kPa)	190		
	Membrane Correction	(kPa)	0.65		
	Corrected Deviator Stress	(kPa)	322		
	Undrained Shear Strength	(kPa)	161		
	Strain at Failure	(%)	6.5		
	Mode of Failure		Brittle		



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Compiled By		Date
	CONNEL MCLAUGHLIN	12/03/20

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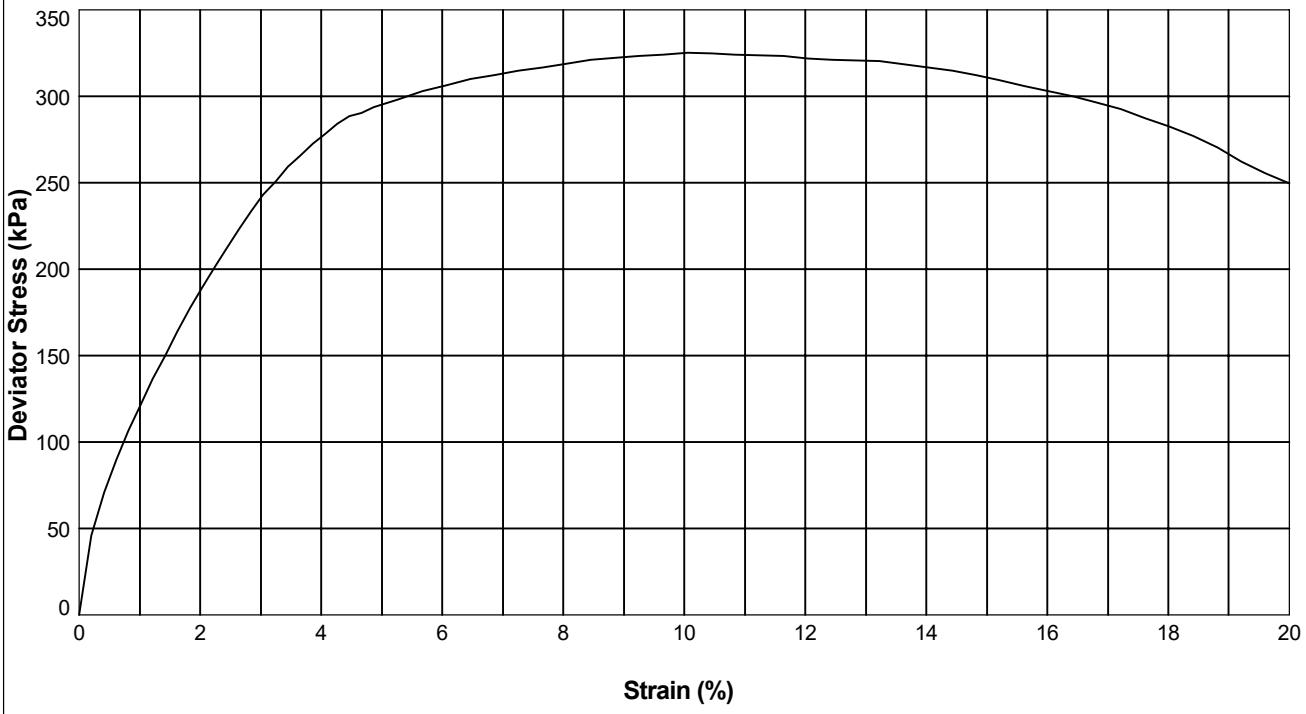
UNCONSOLIDATED QUICK UNDRAINED (SINGLE STAGE) TRIAXIAL COMPRESSION TEST

In accordance with BS1377 Part 7 Clause 8

Borehole: **BH3** Sample Ref: **24** Sample Type: **UT100** Depth (m): **11.53**

Description : **Brown mottled grey slightly sandy CLAY**

STAGE NUMBER			1	2	3
SAMPLE DETAILS	Sample Condition		Undisturbed		
	Orientation of sample		Vertical		
	Diameter	(mm)	103.58		
	Height	(mm)	202.20		
	Moisture Content	(%)	19		
	Bulk Density	(Mg/m^3)	2.16		
	Dry Density	(Mg/m^3)	1.82		
TEST DETAILS	Membrane Thickness	(mm)	0.24		
	Rate of Axial Displacement	(%/min)	1.34		
	Cell Pressure	(kPa)	230		
	Membrane Correction	(kPa)	0.54		
	Corrected Deviator Stress	(kPa)	325		
	Undrained Shear Strength	(kPa)	162		
	Strain at Failure	(%)	10.0		
	Mode of Failure		Brittle		



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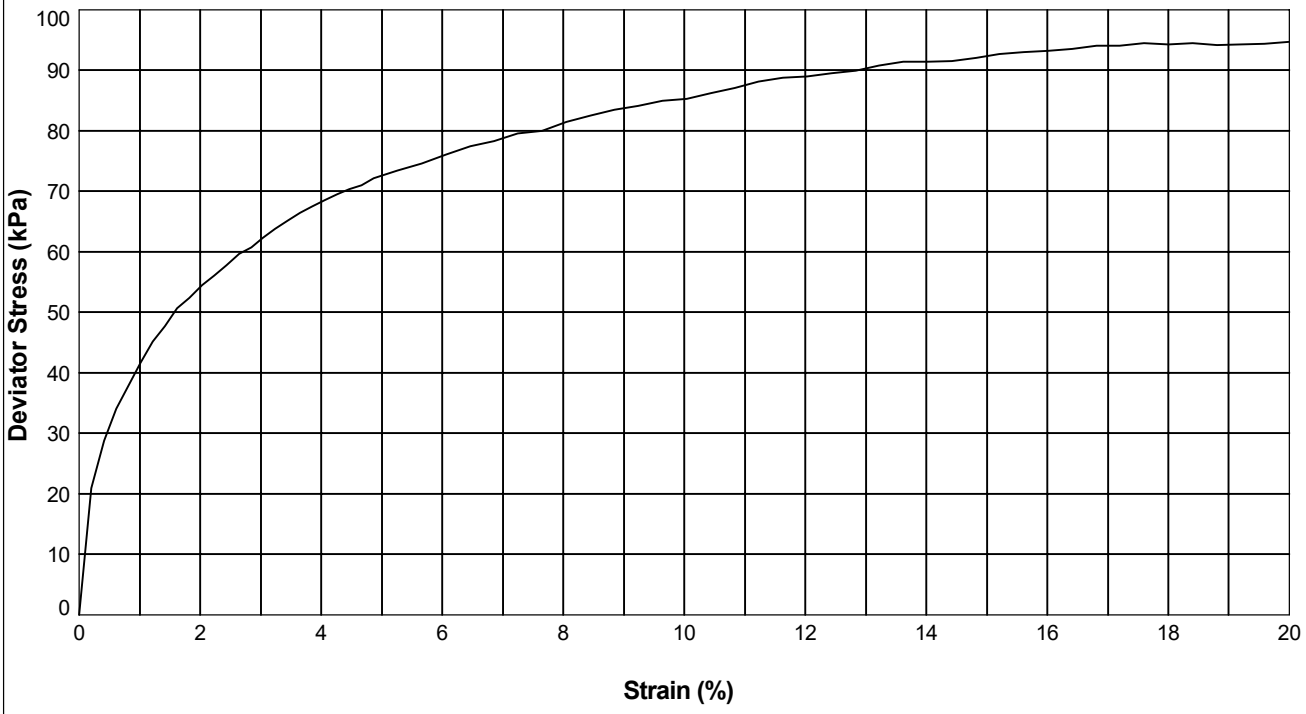
UNCONSOLIDATED QUICK UNDRAINED (SINGLE STAGE) TRIAXIAL COMPRESSION TEST

In accordance with BS1377 Part 7 Clause 8

Borehole: **BH4** Sample Ref: **4** Sample Type: **UT100** Depth (m): **1.53**

Description : **Brown slightly gravelly slightly sandy silty CLAY**

STAGE NUMBER			1	2	3
SAMPLE DETAILS	Sample Condition		Undisturbed		
	Orientation of sample		Vertical		
	Diameter	(mm)	103.49		
	Height	(mm)	202.34		
	Moisture Content	(%)	20		
	Bulk Density	(Mg/m^3)	2.02		
	Dry Density	(Mg/m^3)	1.68		
TEST DETAILS	Membrane Thickness	(mm)	0.20		
	Rate of Axial Displacement	(%/min)	1.33		
	Cell Pressure	(kPa)	30		
	Membrane Correction	(kPa)	0.74		
	Corrected Deviator Stress	(kPa)	95		
	Undrained Shear Strength	(kPa)	47		
	Strain at Failure	(%)	20.0		
	Mode of Failure		Plastic		



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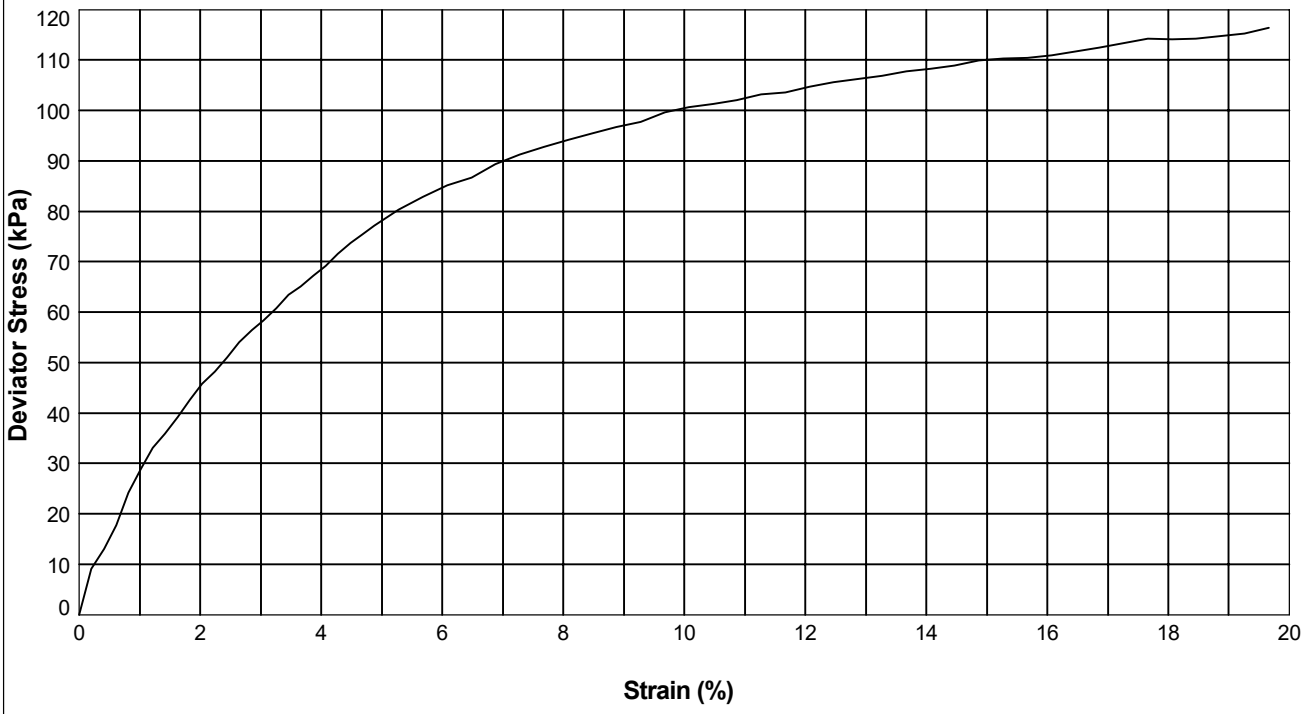
UNCONSOLIDATED QUICK UNDRAINED (SINGLE STAGE) TRIAXIAL COMPRESSION TEST

In accordance with BS1377 Part 7 Clause 8

Borehole: **BH4** Sample Ref: **8** Sample Type: **UT100** Depth (m): **3.54**

Description : **Bluish grey mottled orangish brown slightly gravelly slightly sandy silty CLAY**

STAGE NUMBER			1	2	3
SAMPLE DETAILS	Sample Condition		Undisturbed		
	Orientation of sample		Vertical		
	Diameter	(mm)	101.90		
	Height	(mm)	201.63		
	Moisture Content	(%)	31		
	Bulk Density	(Mg/m^3)	1.86		
	Dry Density	(Mg/m^3)	1.42		
TEST DETAILS	Membrane Thickness	(mm)	0.30		
	Rate of Axial Displacement	(%/min)	1.34		
	Cell Pressure	(kPa)	70		
	Membrane Correction	(kPa)	1.11		
	Corrected Deviator Stress	(kPa)	116		
	Undrained Shear Strength	(kPa)	58		
	Strain at Failure	(%)	19.7		
	Mode of Failure		Compound		



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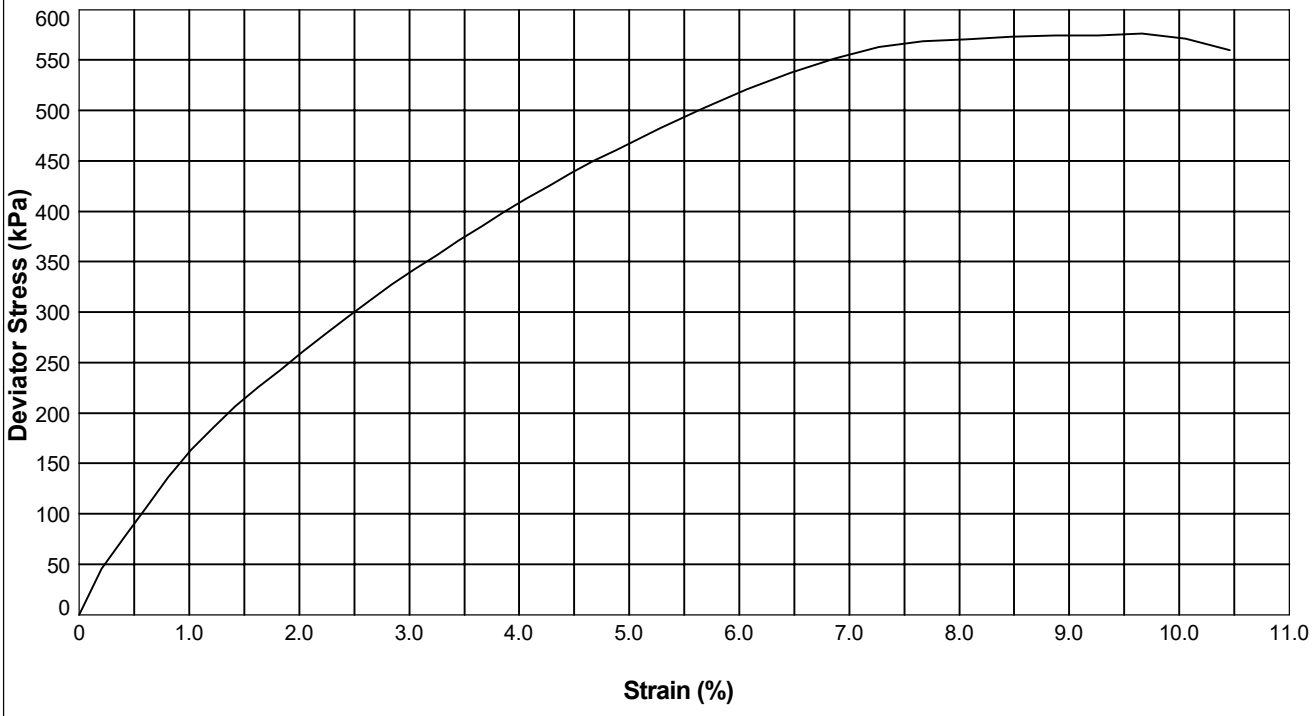
UNCONSOLIDATED QUICK UNDRAINED (SINGLE STAGE) TRIAXIAL COMPRESSION TEST

In accordance with BS1377 Part 7 Clause 8

Borehole: **BH4** Sample Ref: **12** Sample Type: **UT100** Depth (m): **5.54**

Description : **Bluish grey mottled purple and yellowish brown slightly sandy silty CLAY**

STAGE NUMBER			1	2	3
SAMPLE DETAILS	Sample Condition		Undisturbed		
	Orientation of sample		Vertical		
	Diameter	(mm)	103.62		
	Height	(mm)	201.88		
	Moisture Content	(%)	15		
	Bulk Density	(Mg/m^3)	2.21		
	Dry Density	(Mg/m^3)	1.92		
TEST DETAILS	Membrane Thickness	(mm)	0.40		
	Rate of Axial Displacement	(%/min)	1.34		
	Cell Pressure	(kPa)	110		
	Membrane Correction	(kPa)	0.86		
	Corrected Deviator Stress	(kPa)	576		
	Undrained Shear Strength	(kPa)	288		
	Strain at Failure	(%)	9.7		
	Mode of Failure		Brittle		



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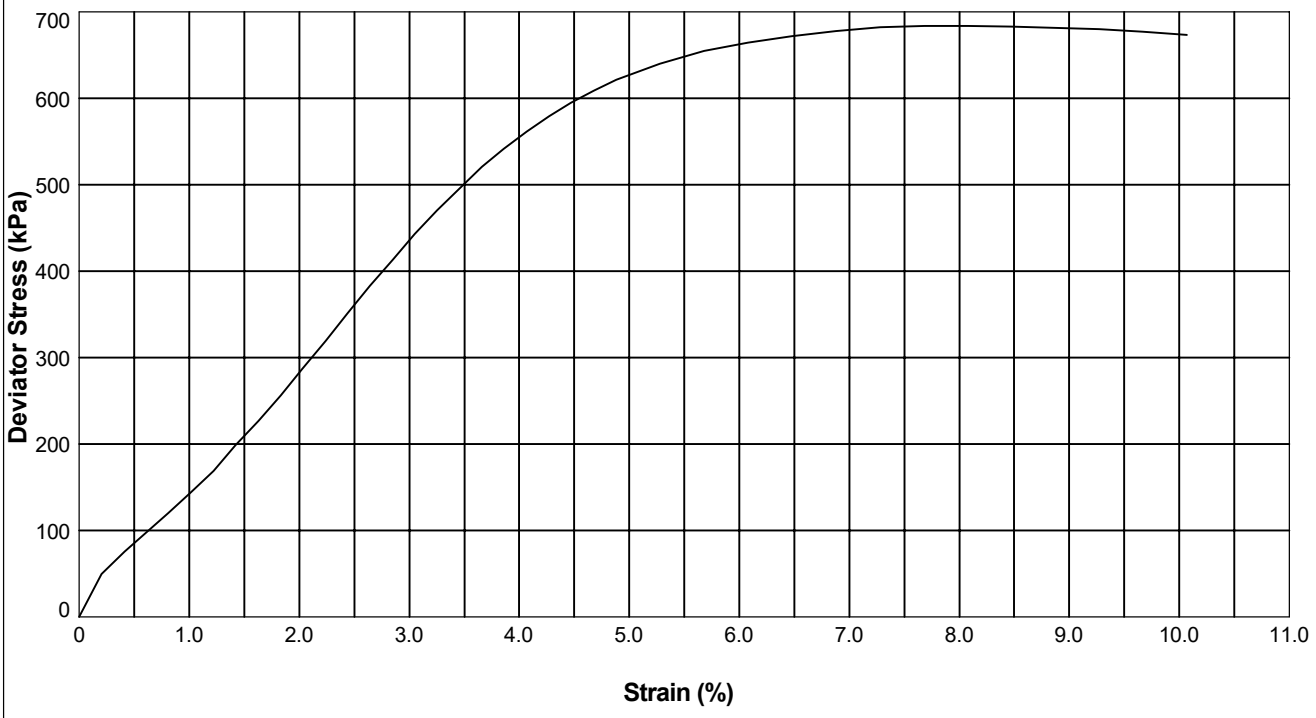
UNCONSOLIDATED QUICK UNDRAINED (SINGLE STAGE) TRIAXIAL COMPRESSION TEST

In accordance with BS1377 Part 7 Clause 8

Borehole: **BH4** Sample Ref: **16** Sample Type: **UT100** Depth (m): **7.60**

Description : **Bluish grey mottled brown slightly sandy silty CLAY**

STAGE NUMBER			1	2	3
SAMPLE DETAILS	Sample Condition		Undisturbed		
	Orientation of sample		Vertical		
	Diameter	(mm)	103.26		
	Height	(mm)	201.69		
	Moisture Content	(%)	15		
	Bulk Density	(Mg/m^3)	2.19		
	Dry Density	(Mg/m^3)	1.90		
TEST DETAILS	Membrane Thickness	(mm)	0.33		
	Rate of Axial Displacement	(%/min)	1.34		
	Cell Pressure	(kPa)	150		
	Membrane Correction	(kPa)	0.62		
	Corrected Deviator Stress	(kPa)	684		
	Undrained Shear Strength	(kPa)	342		
	Strain at Failure	(%)	8.1		
	Mode of Failure		Brittle		



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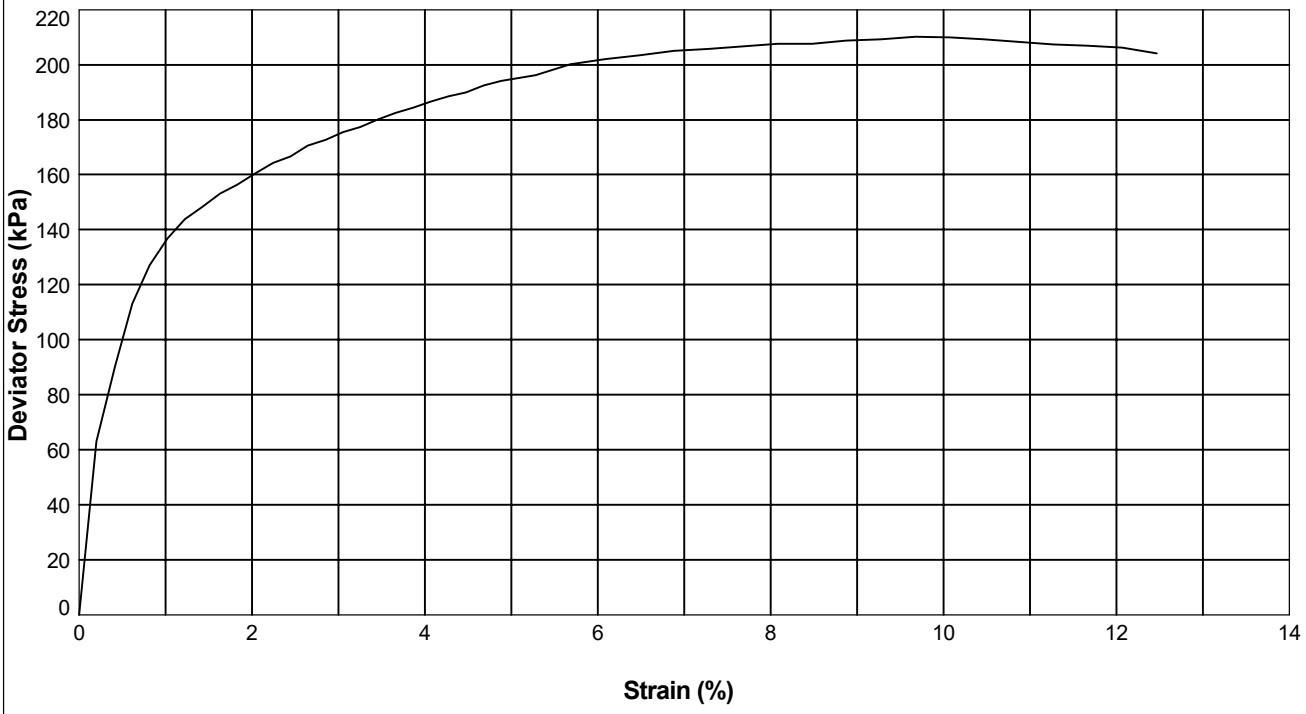
UNCONSOLIDATED QUICK UNDRAINED (SINGLE STAGE) TRIAXIAL COMPRESSION TEST

In accordance with BS1377 Part 7 Clause 8

Borehole: **BH4** Sample Ref: **20** Sample Type: **UT100** Depth (m): **9.53**

Description : **Brown mottled grey slightly sandy silty CLAY**

STAGE NUMBER			1	2	3
SAMPLE DETAILS	Sample Condition		Undisturbed		
	Orientation of sample		Vertical		
	Diameter	(mm)	103.46		
	Height	(mm)	201.69		
	Moisture Content	(%)	17		
	Bulk Density	(Mg/m^3)	2.20		
	Dry Density	(Mg/m^3)	1.88		
TEST DETAILS	Membrane Thickness	(mm)	0.38		
	Rate of Axial Displacement	(%/min)	0.99		
	Cell Pressure	(kPa)	190		
	Membrane Correction	(kPa)	0.82		
	Corrected Deviator Stress	(kPa)	210		
	Undrained Shear Strength	(kPa)	105		
	Strain at Failure	(%)	9.7		
	Mode of Failure		Compound		



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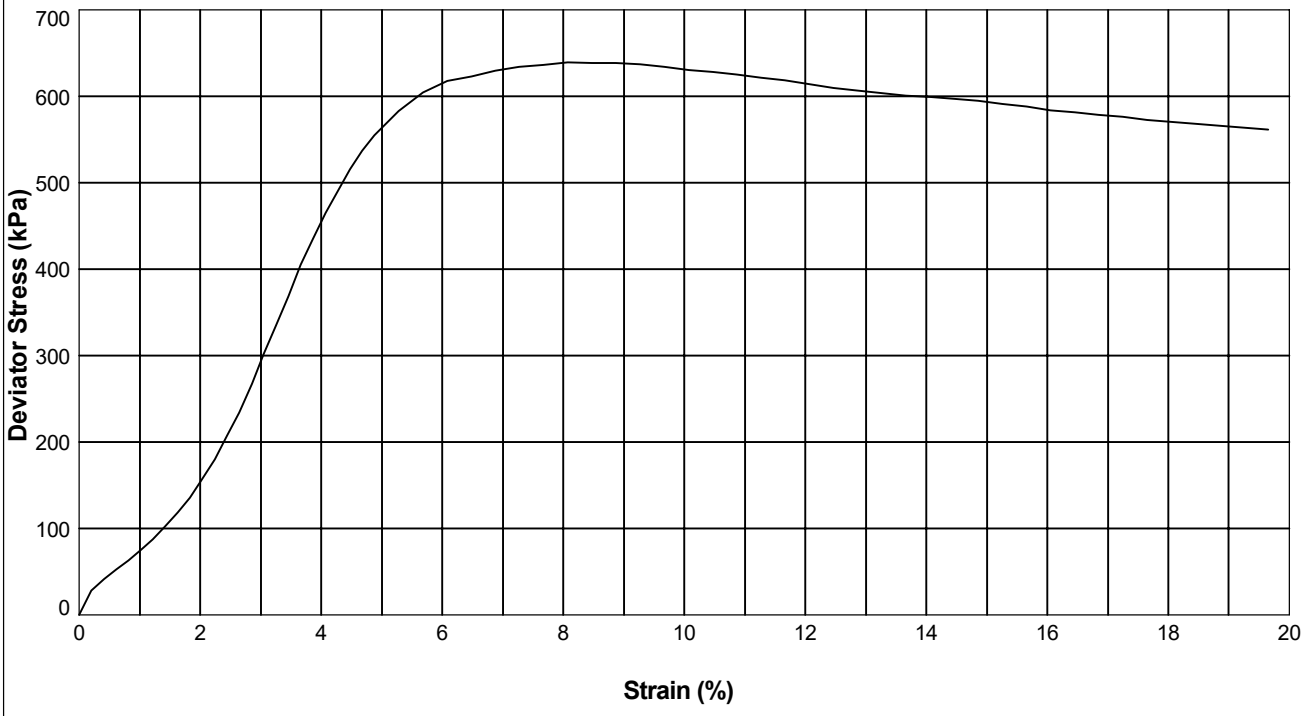
UNCONSOLIDATED QUICK UNDRAINED (SINGLE STAGE) TRIAXIAL COMPRESSION TEST

In accordance with BS1377 Part 7 Clause 8

Borehole: **BH4** Sample Ref: **24** Sample Type: **UT100** Depth (m): **11.60**

Description : **Light brown slightly sandy silty CLAY**

STAGE NUMBER			1	2	3
SAMPLE DETAILS	Sample Condition		Undisturbed		
	Orientation of sample		Vertical		
	Diameter	(mm)	103.44		
	Height	(mm)	201.77		
	Moisture Content	(%)	19		
	Bulk Density	(Mg/m^3)	2.14		
	Dry Density	(Mg/m^3)	1.79		
TEST DETAILS	Membrane Thickness	(mm)	0.31		
	Rate of Axial Displacement	(%/min)	0.99		
	Cell Pressure	(kPa)	230		
	Membrane Correction	(kPa)	0.58		
	Corrected Deviator Stress	(kPa)	639		
	Undrained Shear Strength	(kPa)	319		
	Strain at Failure	(%)	8.1		
	Mode of Failure		Brittle		



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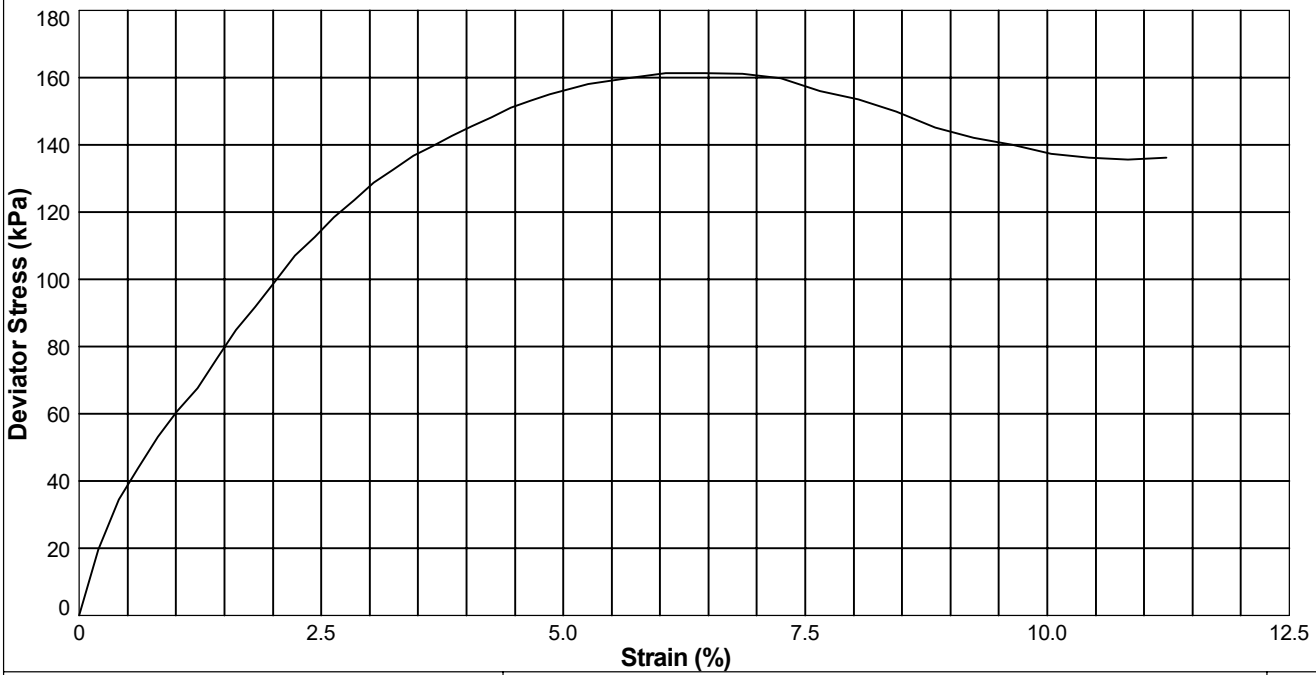
UNCONSOLIDATED QUICK UNDRAINED (SINGLE STAGE) TRIAXIAL COMPRESSION TEST

In accordance with BS1377 Part 7 Clause 8

Borehole: **BH6** Sample Ref: **4** Sample Type: **UT100** Depth (m): **1.54**

Description : **Yellowish brown slightly gravelly slightly sandy silty CLAY**

STAGE NUMBER			1	2	3
SAMPLE DETAILS	Sample Condition		Undisturbed		
	Orientation of sample		Vertical		
	Diameter	(mm)	103.15		
	Height	(mm)	202.42		
	Moisture Content	(%)	17		
	Bulk Density	(Mg/m^3)	1.98		
	Dry Density	(Mg/m^3)	1.69		
TEST DETAILS	Membrane Thickness	(mm)	0.27		
	Rate of Axial Displacement	(%/min)	1.33		
	Cell Pressure	(kPa)	30		
	Membrane Correction	(kPa)	0.41		
	Corrected Deviator Stress	(kPa)	161		
	Undrained Shear Strength	(kPa)	81		
	Strain at Failure	(%)	6.1		
	Mode of Failure		Brittle		



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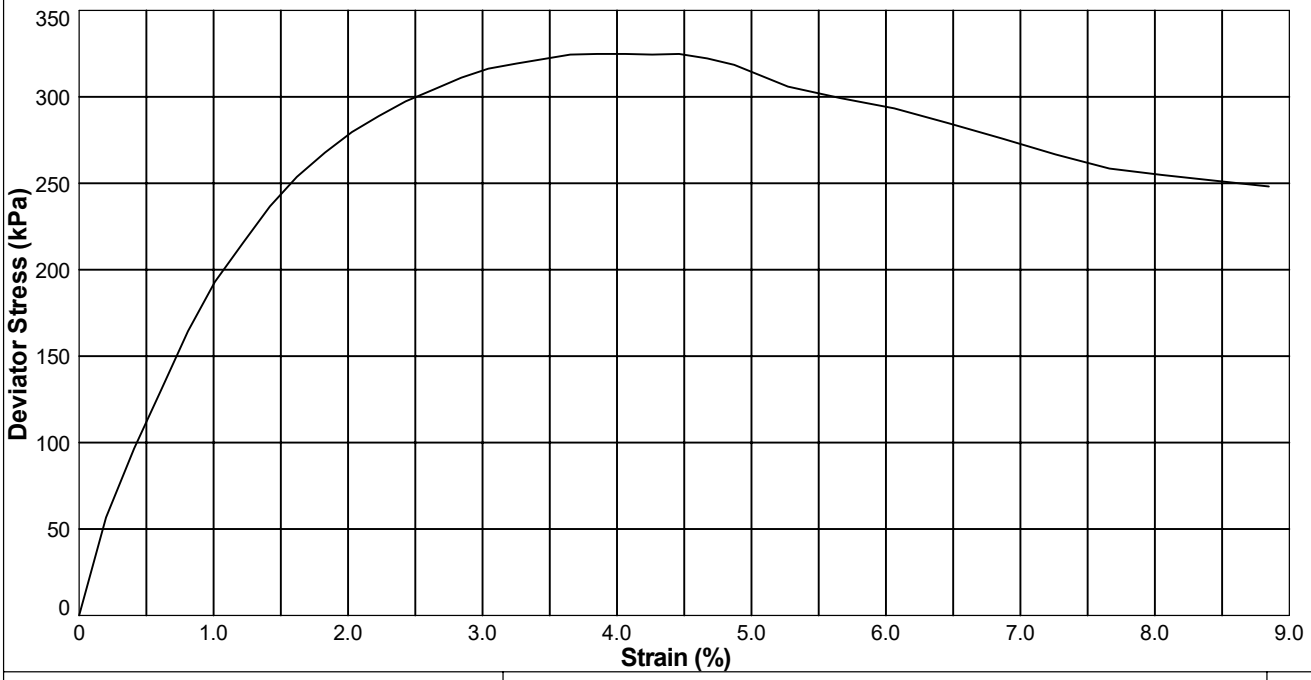
UNCONSOLIDATED QUICK UNDRAINED (SINGLE STAGE) TRIAXIAL COMPRESSION TEST

In accordance with BS1377 Part 7 Clause 8

Borehole: **BH6** Sample Ref: **8** Sample Type: **UT100** Depth (m): **3.53**

Description : **Greyish brown mottled orangish brown slightly sandy silty CLAY**

STAGE NUMBER			1	2	3
SAMPLE DETAILS	Sample Condition		Undisturbed		
	Orientation of sample		Vertical		
	Diameter	(mm)	103.42		
	Height	(mm)	202.23		
	Moisture Content	(%)	19		
	Bulk Density	(Mg/m^3)	2.14		
	Dry Density	(Mg/m^3)	1.81		
TEST DETAILS	Membrane Thickness	(mm)	0.24		
	Rate of Axial Displacement	(%/min)	0.99		
	Cell Pressure	(kPa)	70		
	Membrane Correction	(kPa)	0.26		
	Corrected Deviator Stress	(kPa)	325		
	Undrained Shear Strength	(kPa)	162		
	Strain at Failure	(%)	4.1		
	Mode of Failure		Brittle		



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Compiled By		Date
Francesca Bennett	FRANCESCA BENNETT	30/06/20

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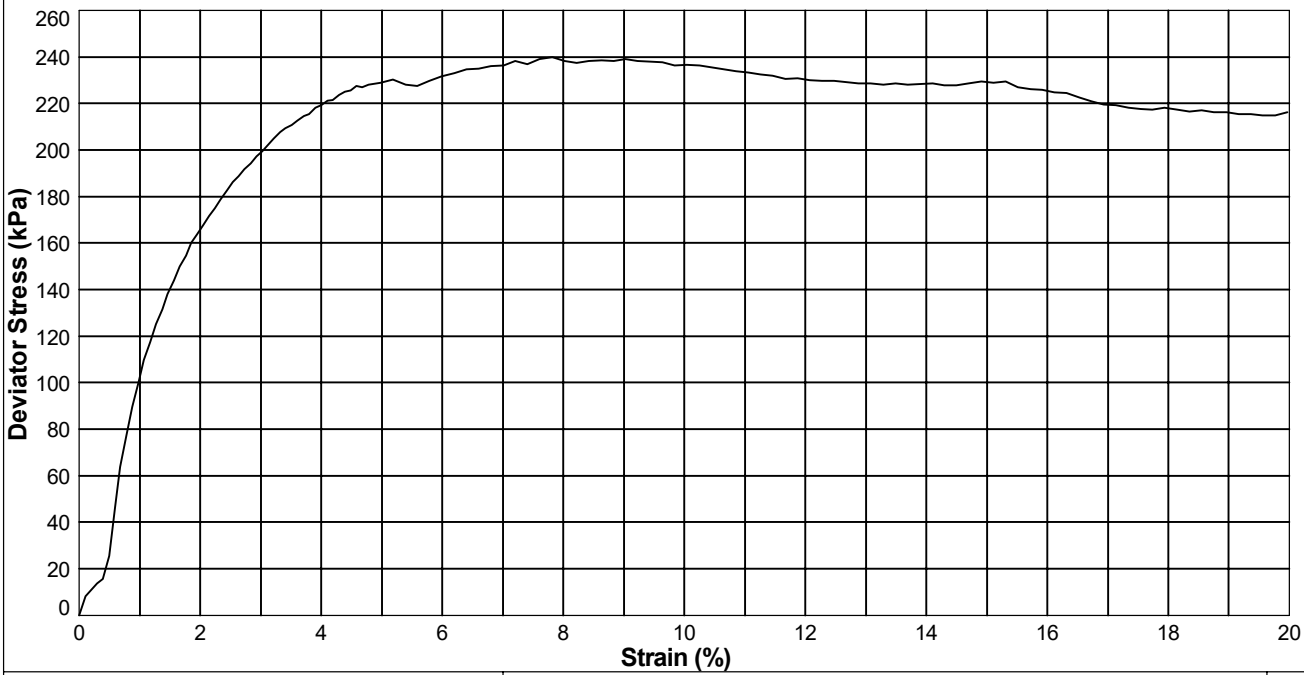
UNCONSOLIDATED QUICK UNDRAINED (SINGLE STAGE) TRIAXIAL COMPRESSION TEST

In accordance with BS1377 Part 7 Clause 8

Borehole: **BH6** Sample Ref: **12** Sample Type: **UT100** Depth (m): **5.53**

Description : **Brown mottled bluish grey slightly sandy silty CLAY**

STAGE NUMBER			1	2	3
SAMPLE DETAILS	Sample Condition		Undisturbed		
	Orientation of sample		Vertical		
	Diameter	(mm)	103.39		
	Height	(mm)	202.54		
	Moisture Content	(%)	17		
	Bulk Density	(Mg/m^3)	2.19		
	Dry Density	(Mg/m^3)	1.87		
TEST DETAILS	Membrane Thickness	(mm)	0.38		
	Rate of Axial Displacement	(%/min)	0.99		
	Cell Pressure	(kPa)	110		
	Membrane Correction	(kPa)	0.69		
	Corrected Deviator Stress	(kPa)	240		
	Undrained Shear Strength	(kPa)	120		
	Strain at Failure	(%)	7.8		
	Mode of Failure		Brittle		



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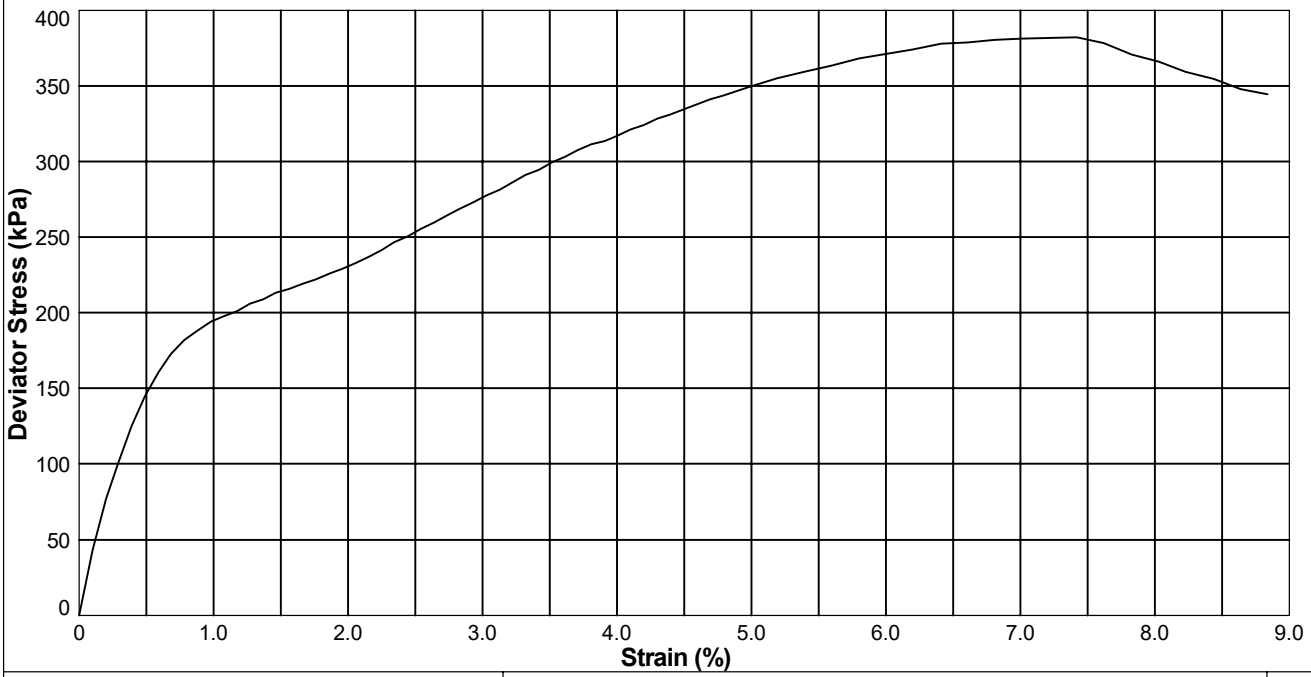
UNCONSOLIDATED QUICK UNDRAINED (SINGLE STAGE) TRIAXIAL COMPRESSION TEST

In accordance with BS1377 Part 7 Clause 8

Borehole: **BH6** Sample Ref: **16** Sample Type: **UT100** Depth (m): **7.55**

Description : **Brown mottled bluish grey and purple slightly sandy silty CLAY**

STAGE NUMBER			1	2	3
SAMPLE DETAILS	Sample Condition		Undisturbed		
	Orientation of sample		Vertical		
	Diameter	(mm)	103.76		
	Height	(mm)	202.26		
	Moisture Content	(%)	17		
	Bulk Density	(Mg/m^3)	2.21		
	Dry Density	(Mg/m^3)	1.89		
TEST DETAILS	Membrane Thickness	(mm)	0.24		
	Rate of Axial Displacement	(%/min)	0.74		
	Cell Pressure	(kPa)	150		
	Membrane Correction	(kPa)	0.42		
	Corrected Deviator Stress	(kPa)	382		
	Undrained Shear Strength	(kPa)	191		
	Strain at Failure	(%)	7.4		
	Mode of Failure		Brittle		



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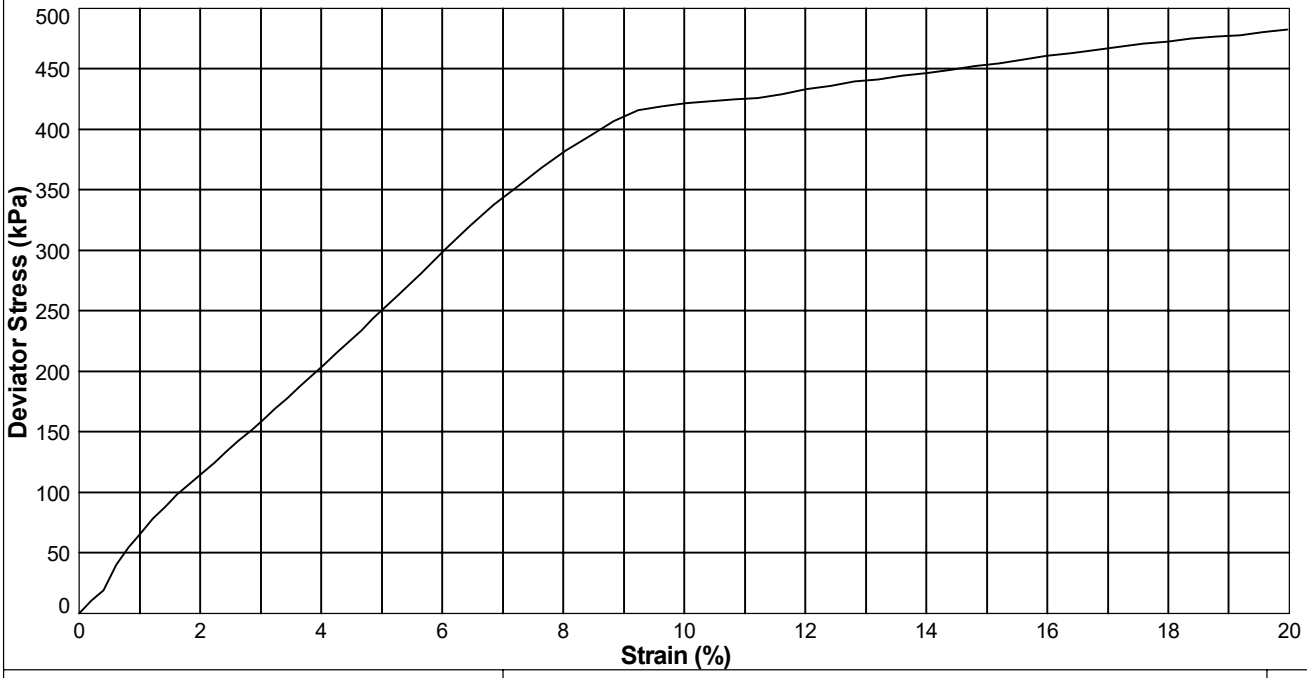
UNCONSOLIDATED QUICK UNDRAINED (SINGLE STAGE) TRIAXIAL COMPRESSION TEST

In accordance with BS1377 Part 7 Clause 8

Borehole: **BH6** Sample Ref: **21** Sample Type: **UT100** Depth (m): **10.55**

Description : **Yellowish brown slightly sandy silty CLAY**

STAGE NUMBER			1	2	3
SAMPLE DETAILS	Sample Condition		Undisturbed		
	Orientation of sample		Vertical		
	Diameter	(mm)	104.13		
	Height	(mm)	202.53		
	Moisture Content	(%)	16		
	Bulk Density	(Mg/m^3)	2.14		
	Dry Density	(Mg/m^3)	1.84		
TEST DETAILS	Membrane Thickness	(mm)	0.22		
	Rate of Axial Displacement	(%/min)	0.99		
	Cell Pressure	(kPa)	210		
	Membrane Correction	(kPa)	0.81		
	Corrected Deviator Stress	(kPa)	482		
	Undrained Shear Strength	(kPa)	241		
	Strain at Failure	(%)	20.0		
	Mode of Failure		Compound		



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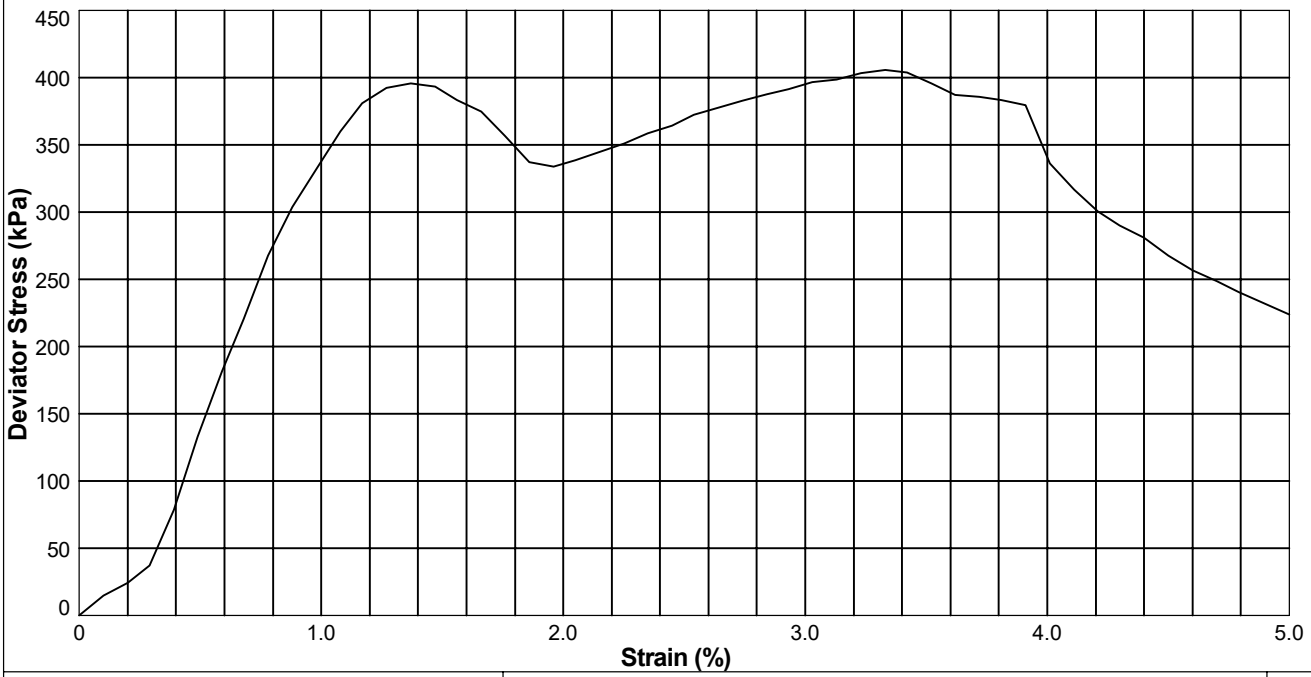
UNCONSOLIDATED QUICK UNDRAINED (SINGLE STAGE) TRIAXIAL COMPRESSION TEST

In accordance with BS1377 Part 7 Clause 8

Borehole: **BH6** Sample Ref: **25** Sample Type: **UT100** Depth (m): **12.52**

Description : **Brown mottled bluish grey slightly sandy silty CLAY**

STAGE NUMBER			1	2	3
SAMPLE DETAILS	Sample Condition		Undisturbed		
	Orientation of sample		Vertical		
	Diameter	(mm)	103.96		
	Height	(mm)	201.93		
	Moisture Content	(%)	15		
	Bulk Density	(Mg/m^3)	2.21		
	Dry Density	(Mg/m^3)	1.91		
TEST DETAILS	Membrane Thickness	(mm)	0.32		
	Rate of Axial Displacement	(%/min)	0.99		
	Cell Pressure	(kPa)	250		
	Membrane Correction	(kPa)	0.28		
	Corrected Deviator Stress	(kPa)	406		
	Undrained Shear Strength	(kPa)	203		
	Strain at Failure	(%)	3.3		
	Mode of Failure		Brittle		



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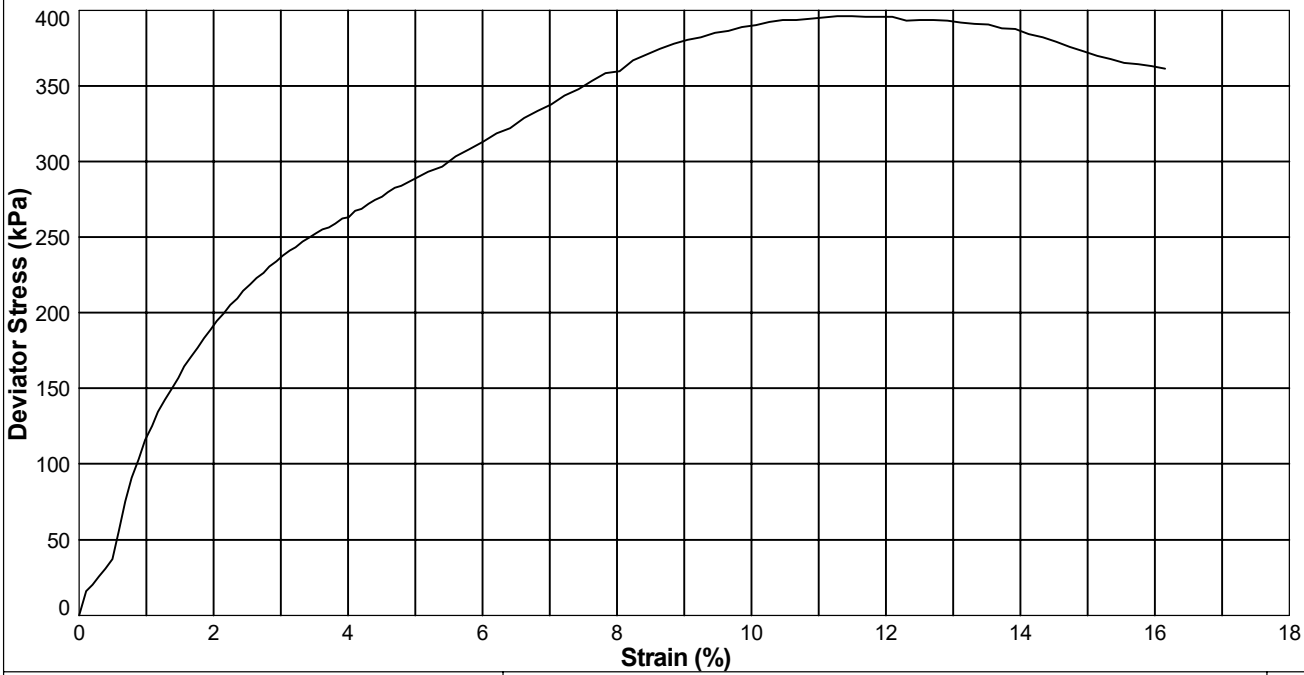
UNCONSOLIDATED QUICK UNDRAINED (SINGLE STAGE) TRIAXIAL COMPRESSION TEST

In accordance with BS1377 Part 7 Clause 8

Borehole: **BH6** Sample Ref: **34** Sample Type: **UT100** Depth (m): **17.58**

Description : **Dark grey silty CLAY**

STAGE NUMBER			1	2	3
SAMPLE DETAILS	Sample Condition		Undisturbed		
	Orientation of sample		Vertical		
	Diameter	(mm)	102.21		
	Height	(mm)	202.13		
	Moisture Content	(%)	19		
	Bulk Density	(Mg/m^3)	2.13		
	Dry Density	(Mg/m^3)	1.80		
TEST DETAILS	Membrane Thickness	(mm)	0.26		
	Rate of Axial Displacement	(%/min)	0.74		
	Cell Pressure	(kPa)	350		
	Membrane Correction	(kPa)	0.64		
	Corrected Deviator Stress	(kPa)	396		
	Undrained Shear Strength	(kPa)	198		
	Strain at Failure	(%)	11.3		
	Mode of Failure		Brittle		



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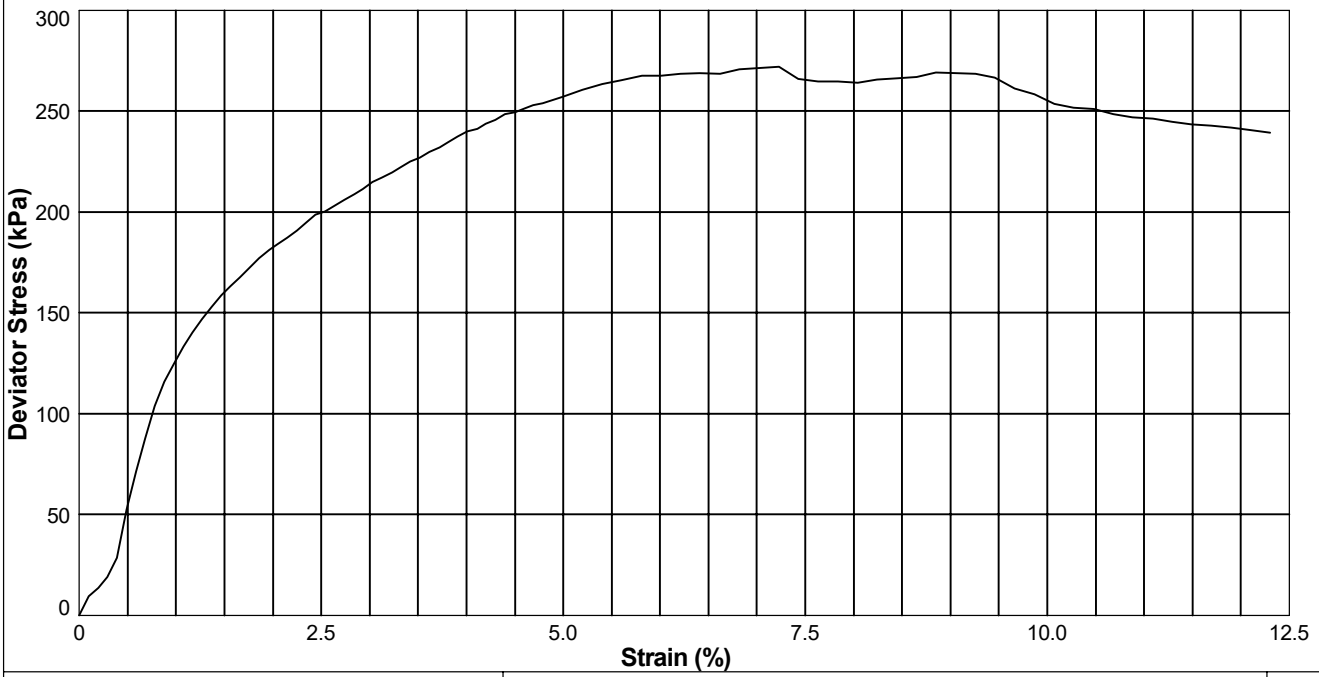
UNCONSOLIDATED QUICK UNDRAINED (SINGLE STAGE) TRIAXIAL COMPRESSION TEST

In accordance with BS1377 Part 7 Clause 8

Borehole: **BH7** Sample Ref: **18** Sample Type: **UT100** Depth (m): **8.56**

Description : **Brown slightly sandy CLAY**

STAGE NUMBER			1	2	3
SAMPLE DETAILS	Sample Condition		Undisturbed		
	Orientation of sample		Vertical		
	Diameter	(mm)	102.36		
	Height	(mm)	202.03		
	Moisture Content	(%)	17		
	Bulk Density	(Mg/m^3)	2.19		
	Dry Density	(Mg/m^3)	1.86		
TEST DETAILS	Membrane Thickness	(mm)	0.23		
	Rate of Axial Displacement	(%/min)	0.49		
	Cell Pressure	(kPa)	170		
	Membrane Correction	(kPa)	0.40		
	Corrected Deviator Stress	(kPa)	272		
	Undrained Shear Strength	(kPa)	136		
	Strain at Failure	(%)	7.2		
	Mode of Failure		Brittle		



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Compiled By		Date
	THOMAS DAVIES	30/06/20

Contract	Contract Ref:
Greenway	563166

UNCONSOLIDATED QUICK UNDRAINED (SINGLE STAGE) TRIAXIAL COMPRESSION TEST

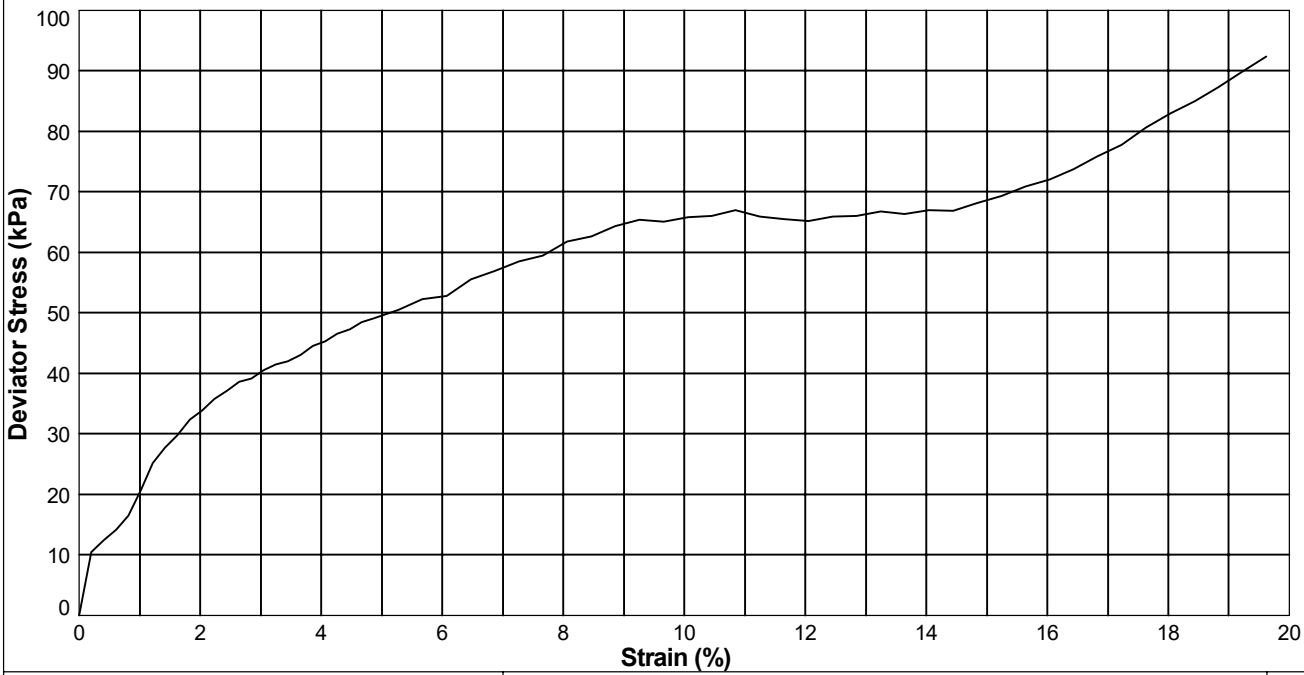
In accordance with BS1377 Part 7 Clause 8

Borehole: **BH7** Sample Ref: **22** Sample Type: **UT100** Depth (m): **10.54**

Description : **Reddish brown mottled bluish grey slightly sandy CLAY**

Remarks : **Top of specimen was soft. Rest of specimen was very stiff**

STAGE NUMBER			1	2	3
SAMPLE DETAILS	Sample Condition		Undisturbed		
	Orientation of sample		Vertical		
	Diameter	(mm)	103.43		
	Height	(mm)	202.01		
	Moisture Content	(%)	18		
	Bulk Density	(Mg/m^3)	2.12		
	Dry Density	(Mg/m^3)	1.79		
TEST DETAILS	Membrane Thickness	(mm)	0.20		
	Rate of Axial Displacement	(%/min)	0.50		
	Cell Pressure	(kPa)	210		
	Membrane Correction	(kPa)	0.73		
	Corrected Deviator Stress	(kPa)	92		
	Undrained Shear Strength	(kPa)	46		
	Strain at Failure	(%)	19.6		
	Mode of Failure		Plastic		



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Compiled By		Date
	THOMAS DAVIES	30/06/20

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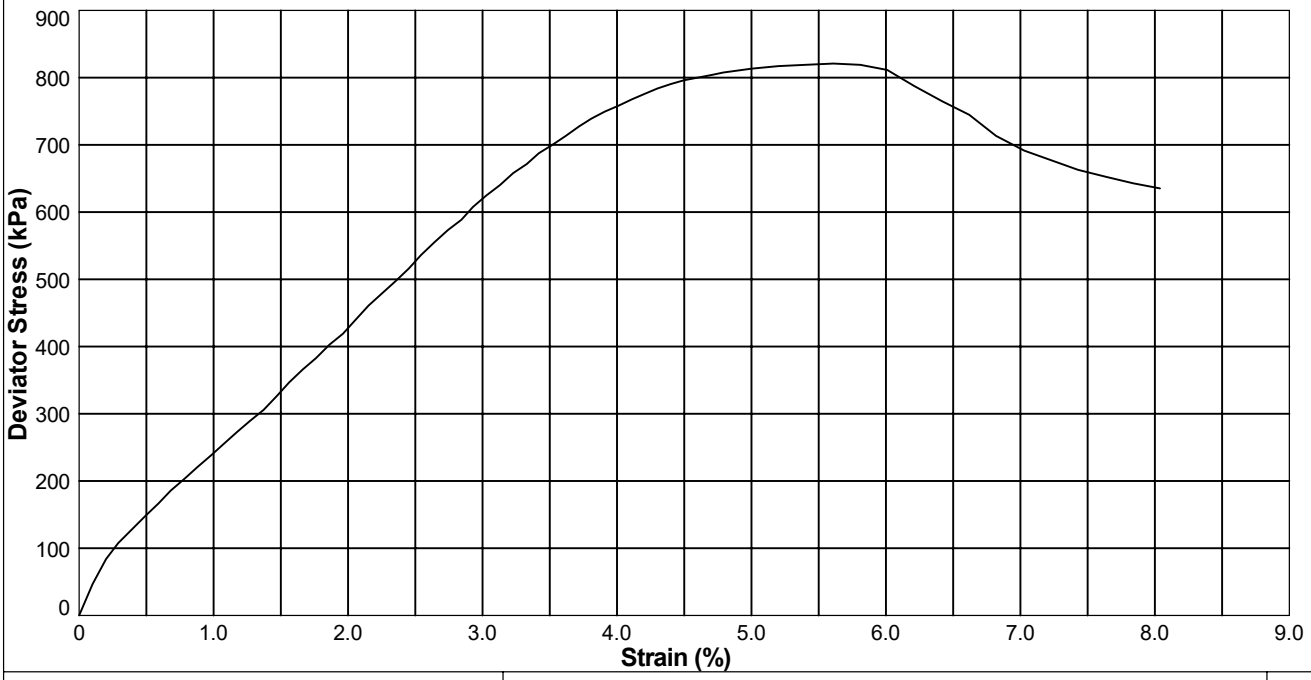
UNCONSOLIDATED QUICK UNDRAINED (SINGLE STAGE) TRIAXIAL COMPRESSION TEST

In accordance with BS1377 Part 7 Clause 8

Borehole: **BH7** Sample Ref: **26** Sample Type: **UT100** Depth (m): **12.58**

Description : **Brown mottled grey slightly sandy silty CLAY**

STAGE NUMBER			1	2	3
SAMPLE DETAILS	Sample Condition		Undisturbed		
	Orientation of sample		Vertical		
	Diameter	(mm)	103.96		
	Height	(mm)	201.93		
	Moisture Content	(%)	15		
	Bulk Density	(Mg/m^3)	2.21		
	Dry Density	(Mg/m^3)	1.91		
TEST DETAILS	Membrane Thickness	(mm)	0.32		
	Rate of Axial Displacement	(%/min)	0.74		
	Cell Pressure	(kPa)	250		
	Membrane Correction	(kPa)	0.45		
	Corrected Deviator Stress	(kPa)	820		
	Undrained Shear Strength	(kPa)	410		
	Strain at Failure	(%)	5.6		
	Mode of Failure		Brittle		



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Compiled By		Date
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Contract	Contract Ref:
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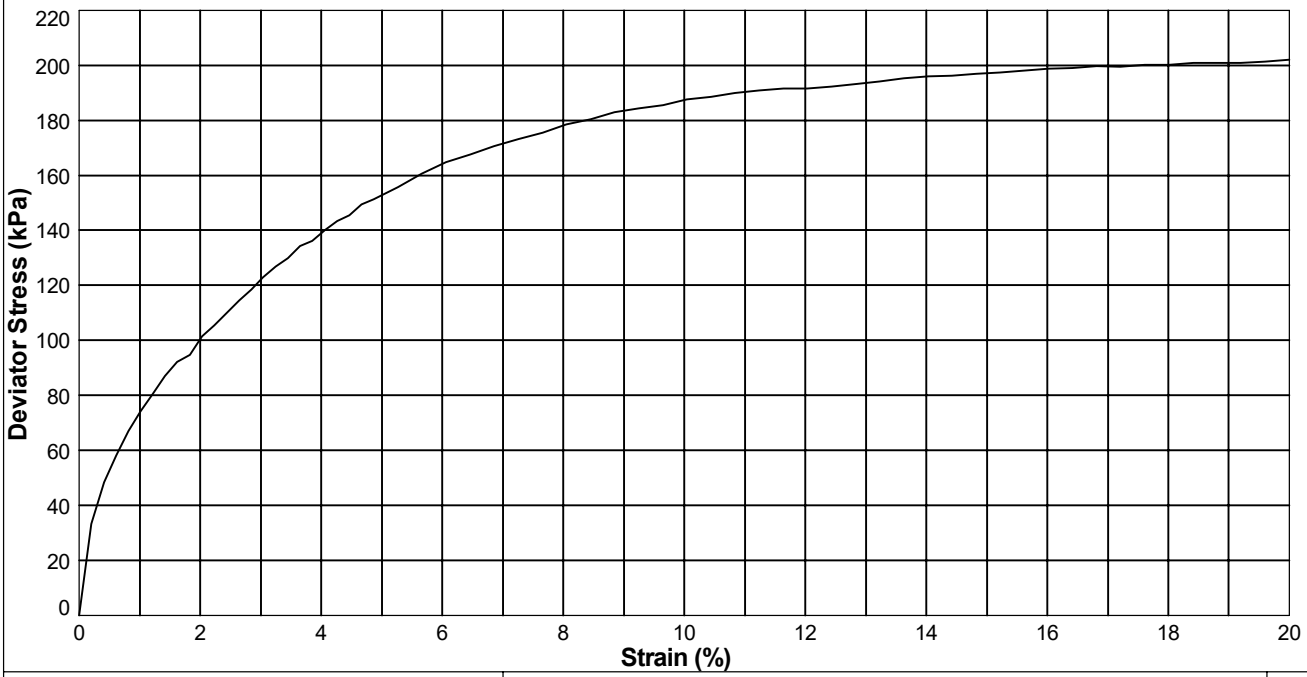
UNCONSOLIDATED QUICK UNDRAINED (SINGLE STAGE) TRIAXIAL COMPRESSION TEST

In accordance with BS1377 Part 7 Clause 8

Borehole: **BH8** Sample Ref: **4** Sample Type: **UT100** Depth (m): **1.53**

Description : **Orangish brown slightly gravelly slightly sandy silty CLAY**

STAGE NUMBER			1	2	3
SAMPLE DETAILS	Sample Condition		Undisturbed		
	Orientation of sample		Vertical		
	Diameter	(mm)	103.58		
	Height	(mm)	202.25		
	Moisture Content	(%)	20		
	Bulk Density	(Mg/m^3)	2.05		
	Dry Density	(Mg/m^3)	1.71		
TEST DETAILS	Membrane Thickness	(mm)	0.35		
	Rate of Axial Displacement	(%/min)	1.33		
	Cell Pressure	(kPa)	30		
	Membrane Correction	(kPa)	1.29		
	Corrected Deviator Stress	(kPa)	202		
	Undrained Shear Strength	(kPa)	101		
	Strain at Failure	(%)	20.0		
	Mode of Failure		Compound		



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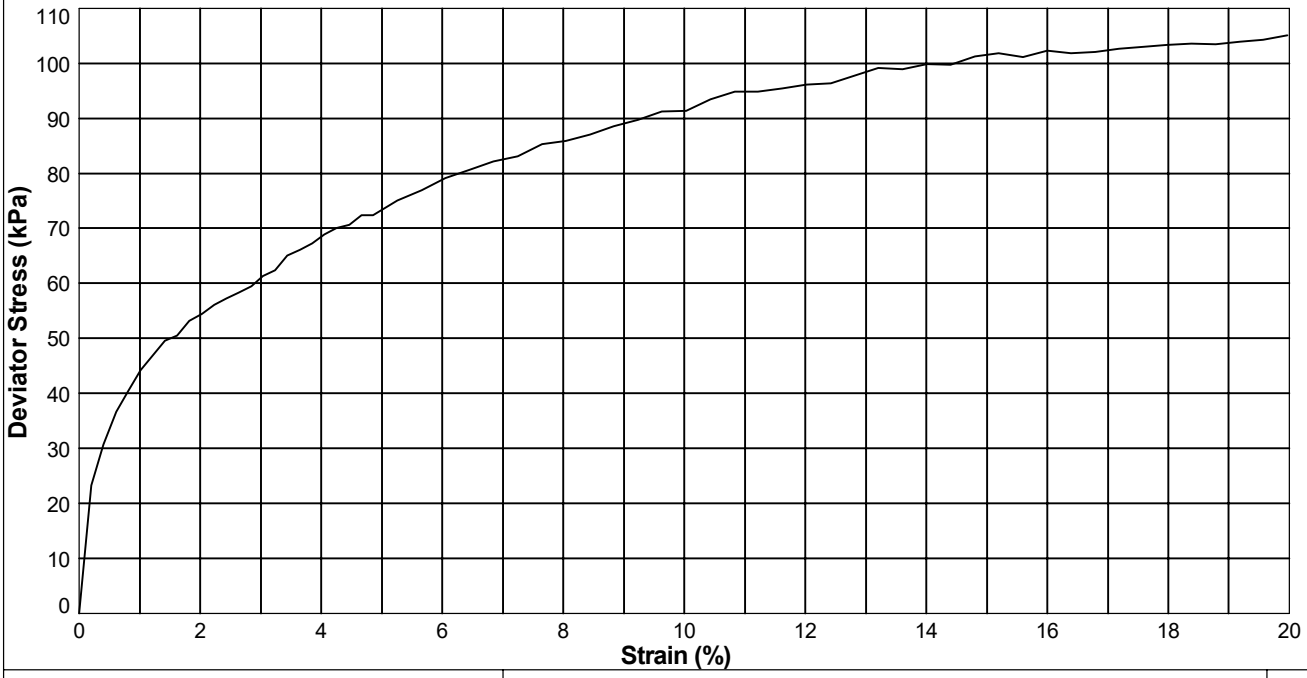
UNCONSOLIDATED QUICK UNDRAINED (SINGLE STAGE) TRIAXIAL COMPRESSION TEST

In accordance with BS1377 Part 7 Clause 8

Borehole: **BH8** Sample Ref: **8** Sample Type: **UT100** Depth (m): **3.56**

Description : **Orangish brown mottled grey slightly sandy silty CLAY**

STAGE NUMBER			1	2	3
SAMPLE DETAILS	Sample Condition		Undisturbed		
	Orientation of sample		Vertical		
	Diameter	(mm)	103.32		
	Height	(mm)	202.52		
	Moisture Content	(%)	34		
	Bulk Density	(Mg/m^3)	1.91		
	Dry Density	(Mg/m^3)	1.43		
TEST DETAILS	Membrane Thickness	(mm)	0.43		
	Rate of Axial Displacement	(%/min)	1.33		
	Cell Pressure	(kPa)	70		
	Membrane Correction	(kPa)	1.59		
	Corrected Deviator Stress	(kPa)	105		
	Undrained Shear Strength	(kPa)	53		
	Strain at Failure	(%)	20.0		
	Mode of Failure		Compound		



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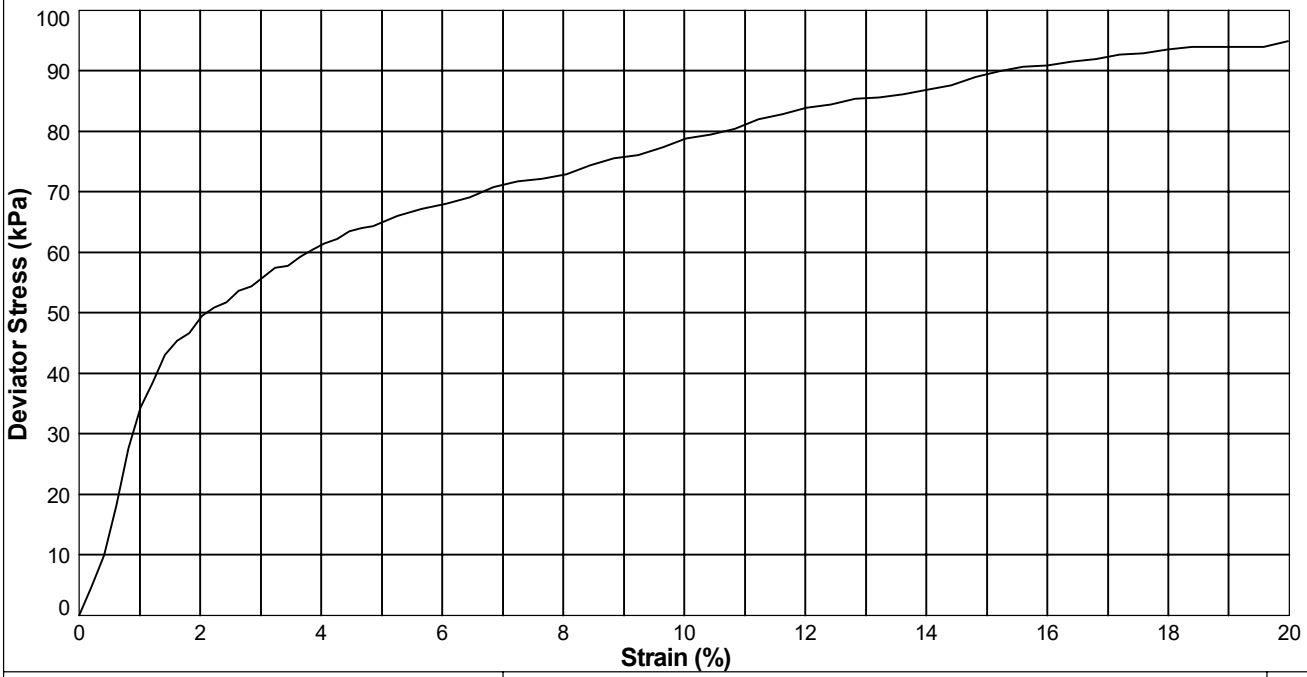
UNCONSOLIDATED QUICK UNDRAINED (SINGLE STAGE) TRIAXIAL COMPRESSION TEST

In accordance with BS1377 Part 7 Clause 8

Borehole: **BH8** Sample Ref: **13** Sample Type: **UT100** Depth (m): **5.57**

Description : **Orangish brown mottled bluish grey and purple slightly sandy silty CLAY**

STAGE NUMBER			1	2	3
SAMPLE DETAILS	Sample Condition		Undisturbed		
	Orientation of sample		Vertical		
	Diameter	(mm)	103.73		
	Height	(mm)	202.43		
	Moisture Content	(%)	22		
	Bulk Density	(Mg/m^3)	2.07		
	Dry Density	(Mg/m^3)	1.69		
TEST DETAILS	Membrane Thickness	(mm)	0.24		
	Rate of Axial Displacement	(%/min)	1.33		
	Cell Pressure	(kPa)	110		
	Membrane Correction	(kPa)	0.88		
	Corrected Deviator Stress	(kPa)	95		
	Undrained Shear Strength	(kPa)	47		
	Strain at Failure	(%)	20.0		
	Mode of Failure		Compound		



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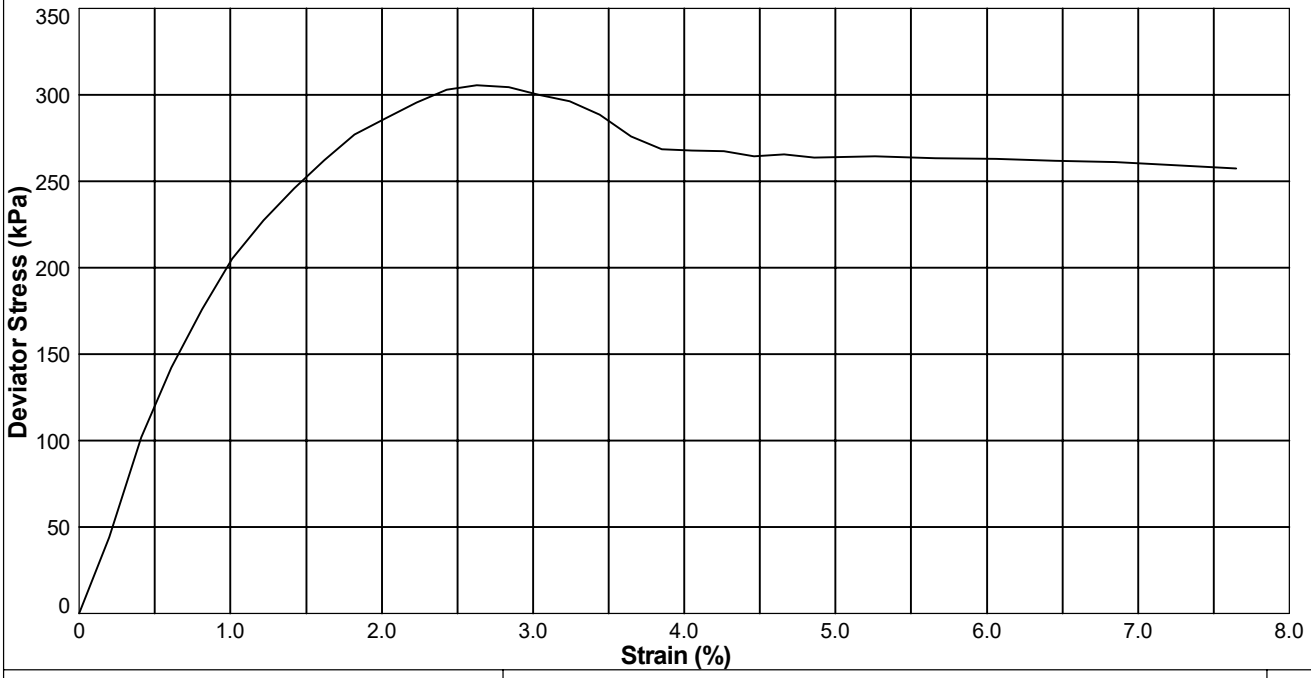
UNCONSOLIDATED QUICK UNDRAINED (SINGLE STAGE) TRIAXIAL COMPRESSION TEST

In accordance with BS1377 Part 7 Clause 8

Borehole: **BH8** Sample Ref: **17** Sample Type: **UT100** Depth (m): **7.58**

Description : **Brown mottled bluish grey slightly sandy silty CLAY**

STAGE NUMBER			1	2	3
SAMPLE DETAILS	Sample Condition		Undisturbed		
	Orientation of sample		Vertical		
	Diameter	(mm)	103.02		
	Height	(mm)	202.46		
	Moisture Content	(%)	21		
	Bulk Density	(Mg/m^3)	2.12		
	Dry Density	(Mg/m^3)	1.75		
TEST DETAILS	Membrane Thickness	(mm)	0.33		
	Rate of Axial Displacement	(%/min)	1.33		
	Cell Pressure	(kPa)	150		
	Membrane Correction	(kPa)	0.24		
	Corrected Deviator Stress	(kPa)	306		
	Undrained Shear Strength	(kPa)	153		
	Strain at Failure	(%)	2.6		
	Mode of Failure		Brittle		



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Compiled By		Date
Francesca Bennett	FRANCESCA BENNETT	30/06/20

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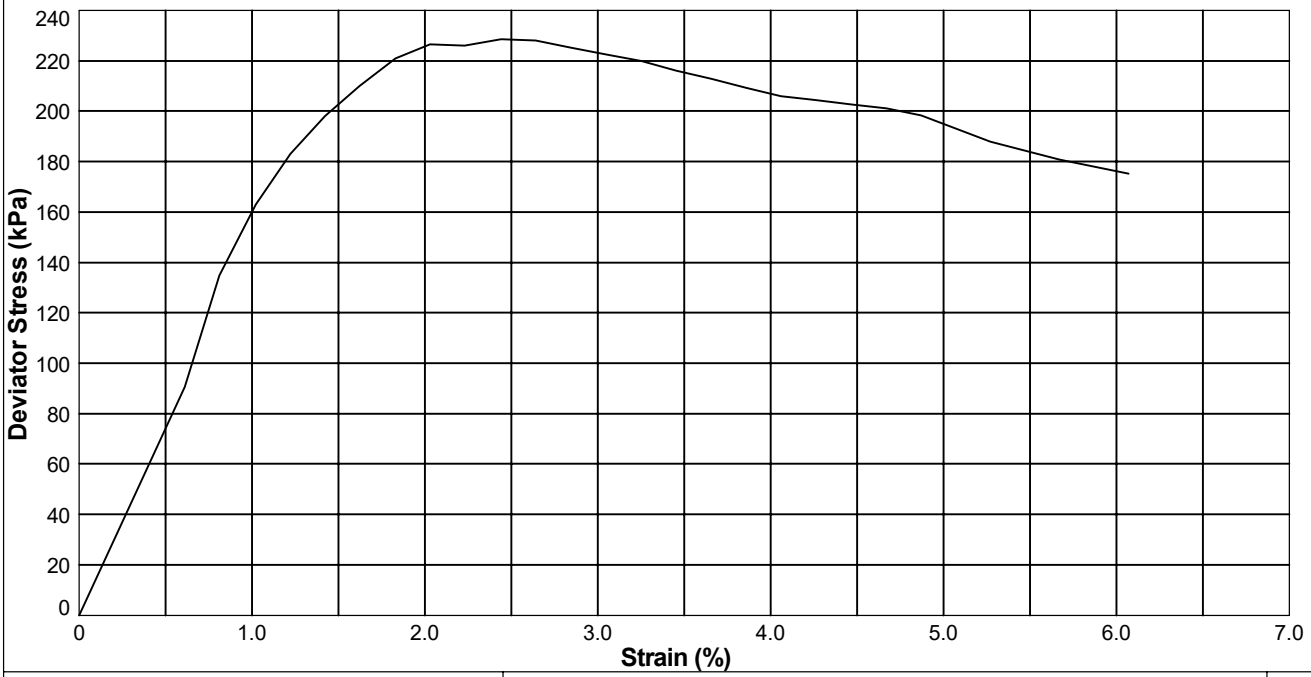
UNCONSOLIDATED QUICK UNDRAINED (SINGLE STAGE) TRIAXIAL COMPRESSION TEST

In accordance with BS1377 Part 7 Clause 8

Borehole: **BH8** Sample Ref: **21** Sample Type: **UT100** Depth (m): **9.58**

Description : **Brown mottled bluish grey slightly sandy silty CLAY**

STAGE NUMBER			1	2	3
SAMPLE DETAILS	Sample Condition		Undisturbed		
	Orientation of sample		Vertical		
	Diameter	(mm)	103.66		
	Height	(mm)	202.01		
	Moisture Content	(%)	17		
	Bulk Density	(Mg/m^3)	2.20		
	Dry Density	(Mg/m^3)	1.89		
TEST DETAILS	Membrane Thickness	(mm)	0.22		
	Rate of Axial Displacement	(%/min)	0.99		
	Cell Pressure	(kPa)	190		
	Membrane Correction	(kPa)	0.15		
	Corrected Deviator Stress	(kPa)	228		
	Undrained Shear Strength	(kPa)	114		
	Strain at Failure	(%)	2.4		
	Mode of Failure		Brittle		



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	THOMAS DAVIES	30/06/20

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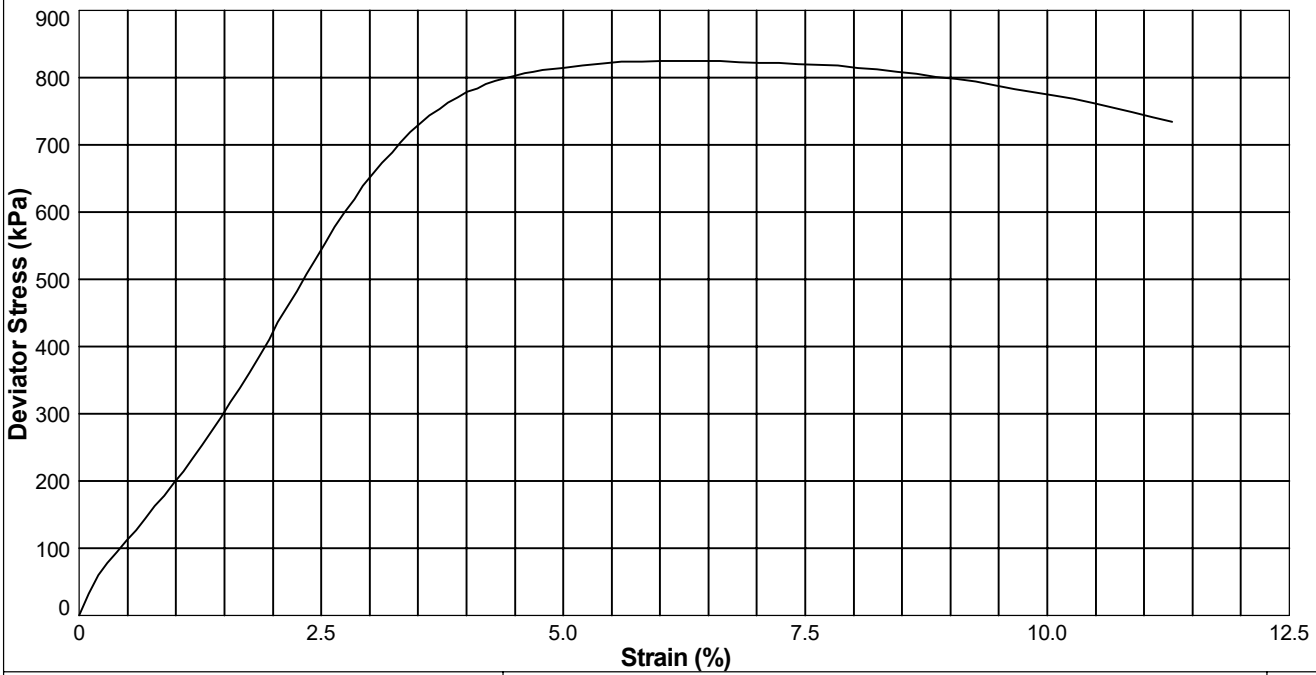
UNCONSOLIDATED QUICK UNDRAINED (SINGLE STAGE) TRIAXIAL COMPRESSION TEST

In accordance with BS1377 Part 7 Clause 8

Borehole: **BH8** Sample Ref: **25** Sample Type: **UT100** Depth (m): **11.52**

Description : **Orangish brown mottled bluish grey slightly sandy silty CLAY**

STAGE NUMBER			1	2	3
SAMPLE DETAILS	Sample Condition		Undisturbed		
	Orientation of sample		Vertical		
	Diameter	(mm)	103.66		
	Height	(mm)	202.02		
	Moisture Content	(%)	15		
	Bulk Density	(Mg/m^3)	2.19		
	Dry Density	(Mg/m^3)	1.91		
TEST DETAILS	Membrane Thickness	(mm)	0.22		
	Rate of Axial Displacement	(%/min)	0.50		
	Cell Pressure	(kPa)	230		
	Membrane Correction	(kPa)	0.33		
	Corrected Deviator Stress	(kPa)	825		
	Undrained Shear Strength	(kPa)	412		
	Strain at Failure	(%)	6.0		
	Mode of Failure		Compound		



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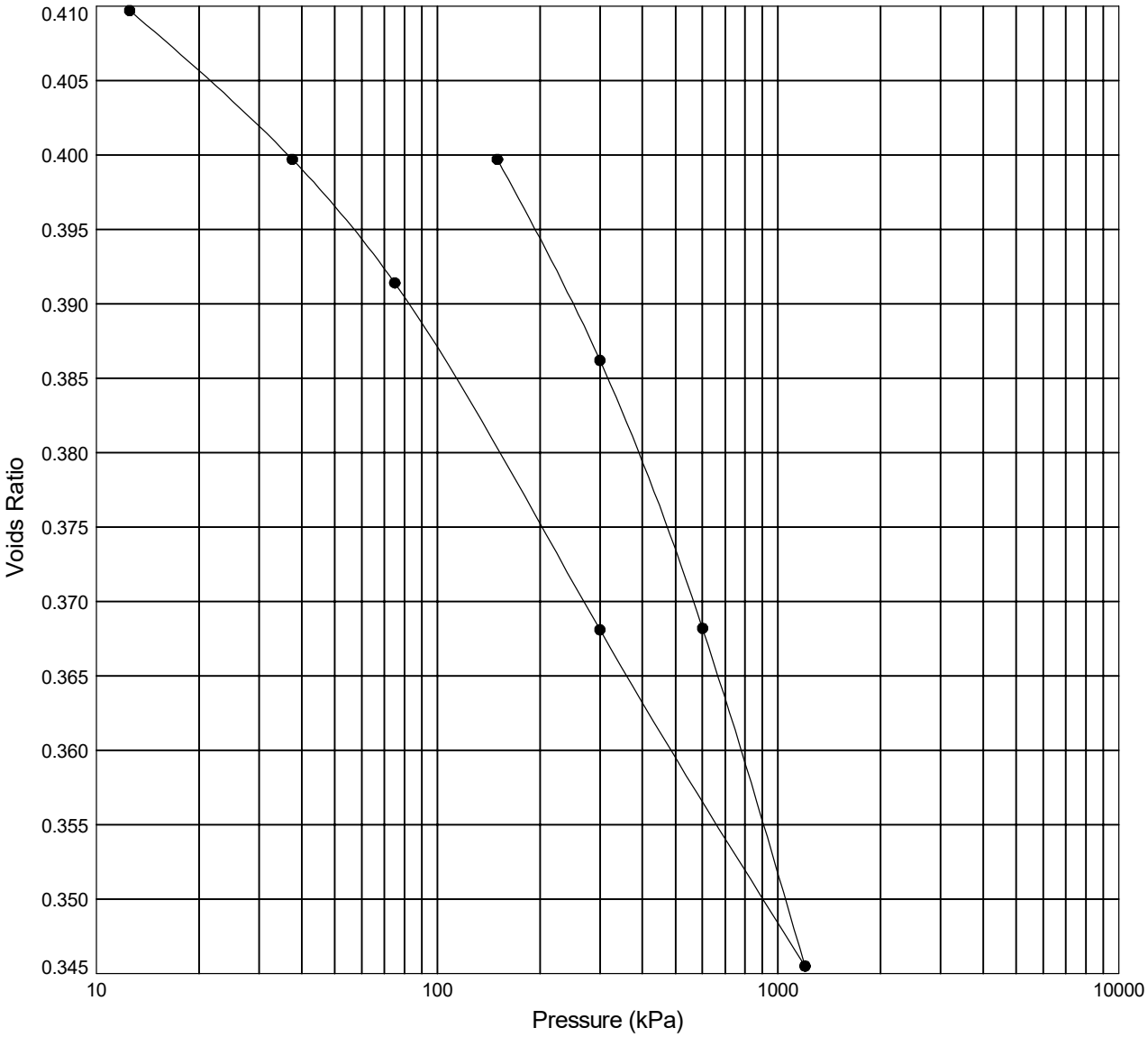
Compiled By		Date
	THOMAS DAVIES	30/06/20

Contract	Contract Ref:
Greenway	563166

ONE DIMENSIONAL CONSOLIDATION TEST

In accordance with BS1377 Part 5 Clause 3

Borehole: **BH1** Sample Ref: **16** Sample Type: **UT100** Depth (m): **7.53**



Initial Specimen Condition			Final Specimen Condition		
Moisture Content (%)	:	**17**	Moisture Content (%)	:	**18**
Bulk Density (Mg/m^3)	:	**2.19**	Bulk Density (Mg/m^3)	:	**2.21**
Dry Density (Mg/m^3)	:	**1.88**	Dry Density (Mg/m^3)	:	**1.88**
Void Ratio	:	**0.4092**	Void Ratio	:	**0.4097**

Specimen Details			
Description	Height (mm)	:	**18.91**
	Diameter (mm)	:	**74.98**
Orangish brown mottled purple and bluish grey slightly sandy CLAY	Particle Density (Mg/m^3) (assumed)	:	**2.65**
	Swelling Pressure (kPa)	:	**65**

Test Results			
Pressure Range (kPa)	Mv (m^2/MN)	Cv (m^2/yr)	Voids Ratio
65 - 150	**0.079**	**6.5**	**0.3997**
150 - 300	**0.064**	**2.2**	**0.3862**
300 - 600	**0.043**	**1.3**	**0.3682**
600 - 1200	**0.028**	**1.1**	**0.3455**
1200 - 300	**NA**	**NA**	**0.3681**
300 - 75	**NA**	**NA**	**0.3914**
75 - 37.5	**NA**	**NA**	**0.3997**
37.5 - 12.5	**NA**	**NA**	**0.4097**

Notes: Method of time-setting used: **T90.** Temperature range during test (degC): **18.5 - 21.1.**

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Compiled By		Date
	CONNEL MCLAUGHLIN	**12/03/20**

Contract	Contract Ref:
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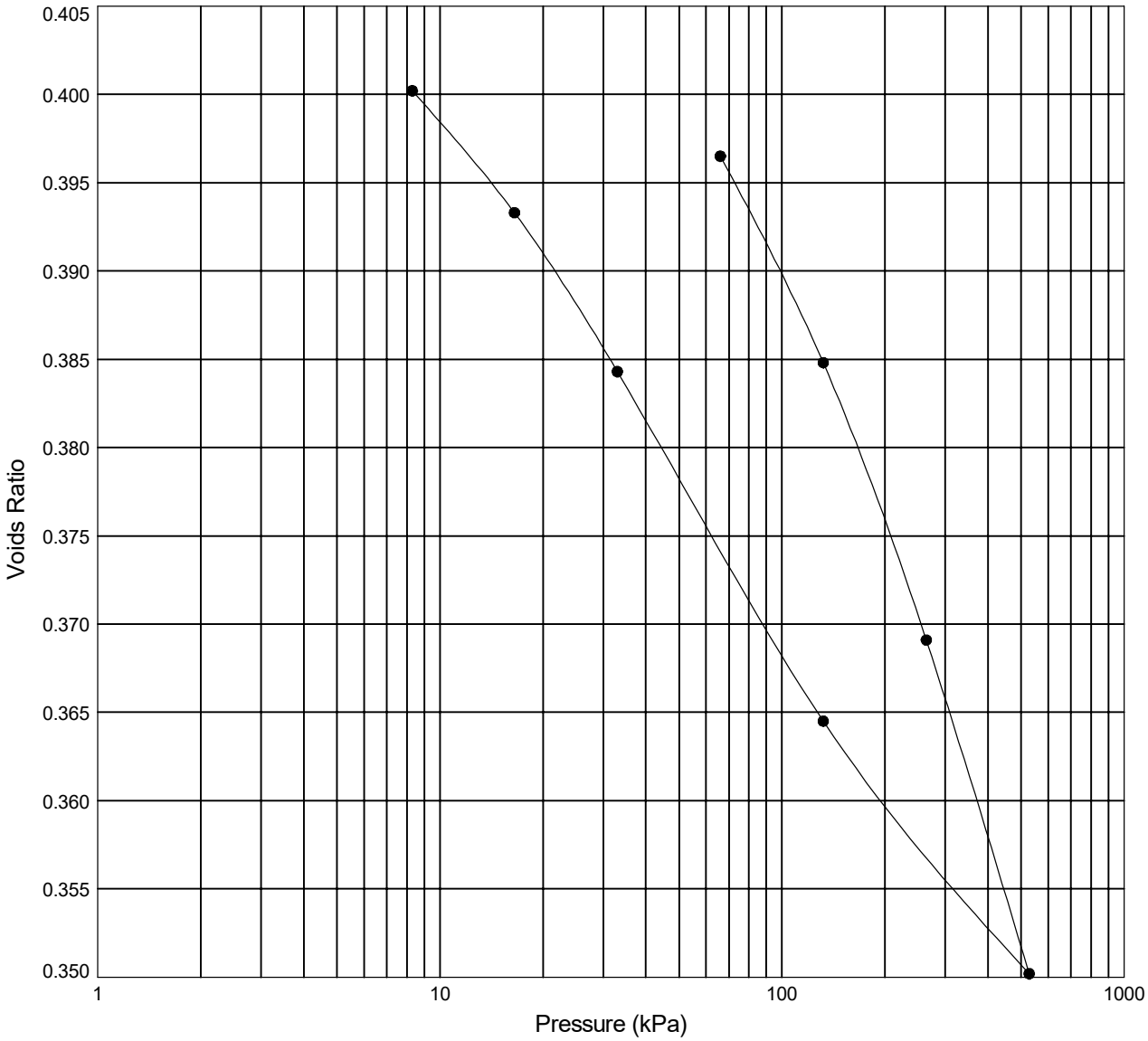
ONE DIMENSIONAL CONSOLIDATION TEST

In accordance with BS1377 Part 5 Clause 4.3

Borehole: **BH4** Sample Ref: **16** Sample Type: **UT100** Depth (m): **7.56**



Initial Specimen Condition			Final Specimen Condition		
Moisture Content (%)	:	**16**	Moisture Content (%)	:	**17**
Bulk Density (Mg/m^3)	:	**2.19**	Bulk Density (Mg/m^3)	:	**2.21**
Dry Density (Mg/m^3)	:	**1.89**	Dry Density (Mg/m^3)	:	**1.89**
Void Ratio	:	**0.4032**	Void Ratio	:	**0.4002**

Specimen Details			
Description	Height (mm)	:	**18.95**
	Diameter (mm)	:	**75.86**
Bluish grey mottled brown slightly sandy silty CLAY	Particle Density (Mg/m^3) (assumed)	:	**2.65**
	Swelling Pressure (kPa)	:	**33**

Test Results			
Pressure Range (kPa)	Mv (m^2/MN)	Cv (m^2/yr)	Voids Ratio
33 - 66	**0.14**	**12**	**0.3965**
66 - 132	**0.13**	**8.2**	**0.3848**
132 - 264	**0.086**	**9.1**	**0.3691**
264 - 528	**0.052**	**14**	**0.3502**
528 - 132	**NA**	**NA**	**0.3645**
132 - 33	**NA**	**NA**	**0.3843**
33 - 16.5	**NA**	**NA**	**0.3933**
16.5 - 8.3	**NA**	**NA**	**0.4002**

Notes: Method of time-setting used: **T90.** Temperature range during test (degC): **17.8 - 21.1.**

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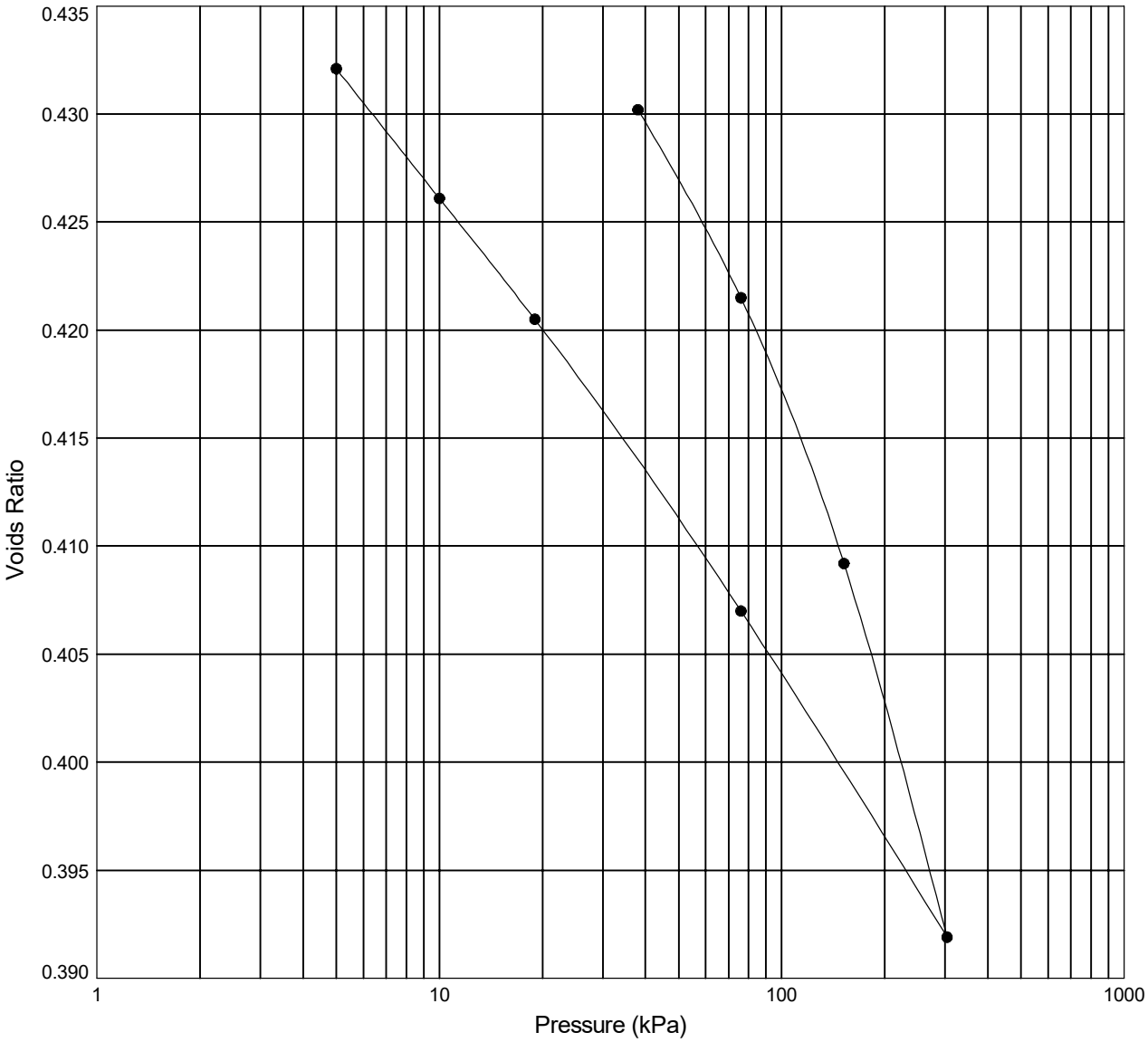
Compiled By	Date
MYRTO SAVVA	**21/04/20**

Contract	Contract Ref:
Greenway	**563166**

ONE DIMENSIONAL CONSOLIDATION TEST

In accordance with BS1377 Part 5 Clause 3

Borehole: **BH8** Sample Ref: **21** Sample Type: **UT100** Depth (m): **9.53**



Initial Specimen Condition			Final Specimen Condition		
Moisture Content (%)	:	**18**	Moisture Content (%)	:	**19**
Bulk Density (Mg/m^3)	:	**2.17**	Bulk Density (Mg/m^3)	:	**2.20**
Dry Density (Mg/m^3)	:	**1.84**	Dry Density (Mg/m^3)	:	**1.85**
Void Ratio	:	**0.4364**	Void Ratio	:	**0.4321**

Specimen Details			
Description	Height (mm)	:	**19.03**
	Diameter (mm)	:	**74.91**
Orangish brown slightly gravelly slightly sandy silty CLAY	Particle Density (Mg/m^3) (assumed)	:	**2.65**
	Swelling Pressure (kPa)	:	**19**

Test Results			
Pressure Range (kPa)	Mv (m^2/MN)	Cv (m^2/yr)	Voids Ratio
19 - 38	**0.23**	**31**	**0.4302**
38 - 76	**0.16**	**14**	**0.4215**
76 - 152	**0.11**	**7.0**	**0.4092**
152 - 304	**0.081**	**11**	**0.3919**
304 - 76	**NA**	**NA**	**0.4070**
76 - 19	**NA**	**NA**	**0.4205**
19 - 10	**NA**	**NA**	**0.4261**
10 - 5	**NA**	**NA**	**0.4321**

Notes: Method of time-setting used: **T90.** Temperature range during test (degC): **20.3 - 24.4.**

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Compiled By		Date
D. Richards	**DAISY RICHARDS**	**10/07/20**

Contract	Contract Ref:
Greenway	**563166**

SUMMARY OF CHEMICAL ANALYSES

Exploratory Position ID	Sample Ref	Sample Type	Depth (m)	Acid Soluble Sulphate (% SO_4)	Aqueous Extract Sulphate (mg/l SO_4)	pH	Total Sulphur (%)	Description
BH1	4	UT100	1.50	<0.02	24	7.68	<0.01	Orangish brown mottled greenish grey sandy CLAY
BH1	8	UT100	3.50	0.08	135	8.36	0.51	Dark greyish brown slightly sandy CLAY
BH1	16	UT100	7.50	<0.02	50	8.91	<0.01	Orangish brown mottled purple and bluish grey slightly sandy CLAY
BH2	4	UT100	1.50	0.38	15	8.72	0.14	Dark brown slightly sandy CLAY
BH2	8	UT100	3.50	0.12	150	8.50	0.52	Dark brownish grey slightly sandy CLAY
BH2	16	UT100	7.50	0.09	19	9.26	0.04	Bluish grey mottled purple slightly sandy CLAY
BH2	24	UT100	11.50	<0.02	14	8.89	<0.01	Yellowish brown sandy silty CLAY
BH3	16	UT100	7.50	0.03	103	8.80	0.03	Bluish grey mottled brown slightly sandy silty CLAY

NOTES:- Chemical tests were undertaken by Envirolab

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Compiled By		Date	Contract Ref:
Francesca Bennett	**FRANCESCA BENNETT**	**12.03.20**	**563166**
Contract: **Greenway**			

SUMMARY OF CHEMICAL ANALYSES

Exploratory Position ID	Sample Ref	Sample Type	Depth (m)	Acid Soluble Sulphate (% SO_4)	Aqueous Extract Sulphate (mg/l SO_4)	pH	Total Sulphur (%)	Description
BH3	20	UT100	9.50	0.02	96	9.00	<0.01	Yellowish brown mottled bluish grey sandy silty CLAY

NOTES:- Chemical tests were undertaken by Envirolab

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Compiled By		Date	Contract Ref:
Francesca Bennett	FRANCESCA BENNETT	12.03.20	563166
Contract: Greenway			

SUMMARY OF CHEMICAL ANALYSES

Exploratory Position ID	Sample Ref	Sample Type	Depth (m)	Acid Soluble Sulphate (% SO_4)	Aqueous Extract Sulphate (mg/l SO_4)	pH	Total Sulphur (%)	Description
BH4	4	UT100	1.50	0.03	43	8.30	0.01	Brown slightly gravelly slightly sandy silty CLAY
BH4	12	UT100	5.50	<0.02	35	8.84	<0.01	Bluish grey mottled purple and yellowish brown slightly sandy silty CLAY
BH4	20	UT100	9.50	<0.02	61	8.71	<0.01	Brown mottled grey slightly sandy silty CLAY

NOTES:- Chemical tests were undertaken by Envirolab

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Compiled By		Date	Contract Ref:
	THOMAS DAVIES	21.04.20	563166
Contract: Greenway			

SUMMARY OF CHEMICAL ANALYSES

Exploratory Position ID	Sample Ref	Sample Type	Depth (m)	Acid Soluble Sulphate (% SO_4)	Aqueous Extract Sulphate (mg/l SO_4)	pH	Total Sulphur (%)	Description
BH6	4	UT100	1.50	0.03	74	8.47	0.01	Yellowish brown slightly gravelly slightly sandy silty CLAY
BH6	16	UT100	7.50	<0.02	118	8.70	<0.01	Brown mottled bluish grey and purple slightly sandy silty CLAY
BH8	8	UT100	3.53	0.02	118	8.58	<0.01	Orangish brown mottled grey slightly sandy silty CLAY
BH8	21	UT100	9.50	0.02	116	8.50	0.02	Brown mottled bluish grey slightly gravelly slightly sandy silty CLAY

NOTES:- Chemical tests were undertaken by Envirolab

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Compiled By		Date	Contract Ref:
Francesca Bennett	**FRANCESCA BENNETT**	**10.07.20**	**563166**
Contract: **Greenway**			

APPENDIX E - GEOENVIRONMENTAL TESTING

(i) Laboratory Test Results

(ii) Laboratory UKAS Accreditation Certificate

envirolab
Units 7 & 8, Sandpits Business Park
Mottram Road, Hyde, Cheshire, SK14 3AR

Final Test Report

Envirolab Job Number:	20/00549		
Issue Number:	1	Date:	30-Jan-20

Client: Structural Soils Limited (Bristol)
The Old School
Stillhouse Lane
Bedminster
Bristol
UK, BS3 4EB

Project Manager:	Gareth R. Jones
Project Name:	Greenway
Project Ref:	563166
Order No:	N/A
Date Samples Received:	21-Jan-20
Date Instructions Received:	21-Jan-20
Date Analysis Completed:	30-Jan-20

Notes - Soil analysis

All results are reported as dry weight (<40°C).

For samples with Matrix Codes 1 - 6 natural stones >10mm are removed or excluded from the sample prior to analysis and reported results corrected to a whole sample basis.

For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis.

Notes - General

This report shall not be reproduced, except in full, without written approval from Envirolab.

Subscript "A" indicates analysis performed on the sample as received. "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve, unless asbestos is found to be present in which case all analysis is performed on the sample as received.

All analysis is performed on the dried and crushed sample for samples with Matrix Code 7 and this supercedes any "A" subscripts.

All analysis is performed on the sample as received for soil samples from outside the European Union and this supercedes any "D" subscripts

For complex, multi-compound analysis, quality control results do not always fall within chart limits for every compound and we have criteria for reporting in these situations.

If results are in italic font they are associated with such quality control failures and may be unreliable.

A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid

Predominant Matrix Codes: 1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample

Secondary Matrix Codes: A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal, E = contains roots/twigs.

IS indicates Insufficient sample for analysis, NDP indicates No Determination Possible and NAD indicates No Asbestos Detected.

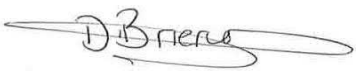
Analytical results reflect the quality of the sample at the time of analysis only. Opinions and interpretations expressed are outside the scope of our accreditation.

Please contact us if you need any further information.

Prepared by:

Melanie Marshall
Laboratory Coordinator

Approved by:



Danielle Brierley
Client Manager

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Landfill WAC analysis must not be used for hazardous waste classification purposes. This analysis is only applicable for landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Sample Details						Landfill Waste Acceptance Criteria Limits		
Lab Sample ID	Method	ISO17025	MCERTS	20/00549/1				
Client Sample Number				101		Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
Client Sample ID				BH3				
Depth to Top				0.3				
Depth to Bottom				0.35				
Date Sampled				15/01/2020				
Sample Type				Soil - ES				
Sample Matrix Code				6AE				
Solid Waste Analysis								
pH (pH Units)$_D$	A-T-031	N	N	**5.69**		-	>6	-
ANC to pH 4 (mol/kg)$_D$	A-T-ANC	N	N	**0.07**		-	to be evaluated	to be evaluated
ANC to pH 6 (mol/kg)$_D$	A-T-ANC	N	N	**0.02**		-	to be evaluated	to be evaluated
Loss on Ignition (%)$_D$	A-T-030	N	N	**5.8**		-	-	10
Total Organic Carbon (%)$_D$	A-T-032	N	N	**1.56**		3	5	6
PAH Sum of 17 (mg/kg) $_A$	A-T-019	N	N			100	-	-
Mineral Oil (mg/kg)$_A$	A-T-007	N	N			500	-	-
Sum of 7 PCBs (mg/kg)$_A$	A-T-004	N	N			1	-	-
Sum of BTEX (mg/kg)$_A$	A-T-022	N	N			6	-	-
Eluate Analysis				**10:1**	**10:1**	**Limit values for compliance leaching test using**		
				mg/l	**mg/kg**	**BS EN 12457-2 at L/S 10 l/kg (mg/kg)**		
Arsenic	A-T-025	N	N	<0.001	**<0.01**	0.5	2	25
Barium	A-T-025	N	N	0.050	**0.500**	20	100	300
Cadmium	A-T-025	N	N	<0.001	**<0.01**	0.04	1	5
Chromium	A-T-025	N	N	<0.001	**<0.01**	0.5	10	70
Copper	A-T-025	N	N	0.008	**0.080**	2	50	100
Mercury	A-T-025	N	N	<0.0005	**<0.005**	0.01	0.2	2
Molybdenum	A-T-025	N	N	<0.001	**<0.01**	0.5	10	30
Nickel	A-T-025	N	N	0.005	**0.050**	0.4	10	40
Lead	A-T-025	N	N	0.007	**0.070**	0.5	10	50
Antimony	A-T-025	N	N	<0.001	**<0.01**	0.06	0.7	5
Selenium	A-T-025	N	N	<0.001	**<0.01**	0.1	0.5	7
Zinc	A-T-025	N	N	0.019	**0.190**	4	50	200
Chloride	A-T-026	N	N	4	**38**	800	15000	25000
Fluoride	A-T-026	N	N	0.2	**2.0**	10	150	500
Sulphate as SO_4	A-T-026	N	N	38	**375**	1000	20000	50000
Total Dissolved Solids	A-T-035	N	N	<20	**<200**	4000	60000	100000
Phenol Index	A-T-050	N	N	<0.01	**<0.1**	1	-	-
Dissolved Organic Carbon	A-T-032	N	N	<0.2	**<200**	500	800	1000
Leach Test Information								
pH (pH Units)	A-T-031	N	N	7.2				
Conductivity (µS/cm)	A-T-037	N	N	15				
Mass Sample (kg)				0.237				
Dry Matter (%)	A-T-044	N	N	73.9				

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

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Landfill WAC analysis must not be used for hazardous waste classification purposes. This analysis is only applicable for landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Sample Details						Landfill Waste Acceptance Criteria Limits		
Lab Sample ID	Method	ISO17025	MCERTS	20/00549/3				
Client Sample Number				103		Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
Client Sample ID				BH3				
Depth to Top				0.9				
Depth to Bottom				1.00				
Date Sampled				15/01/2020				
Sample Type				Soil - ES				
Sample Matrix Code				5AE				
Solid Waste Analysis								
pH (pH Units)$_D$	A-T-031	N	N	**8.02**		-	>6	-
ANC to pH 4 (mol/kg)$_D$	A-T-ANC	N	N	**0.07**		-	to be evaluated	to be evaluated
ANC to pH 6 (mol/kg)$_D$	A-T-ANC	N	N	**0.02**		-	to be evaluated	to be evaluated
Loss on Ignition (%)$_D$	A-T-030	N	N	**6.6**		-	-	10
Total Organic Carbon (%)$_D$	A-T-032	N	N	**0.18**		3	5	6
PAH Sum of 17 (mg/kg)$_A$	A-T-019	N	N			100	-	-
Mineral Oil (mg/kg)$_A$	A-T-007	N	N			500	-	-
Sum of 7 PCBs (mg/kg)$_A$	A-T-004	N	N			1	-	-
Sum of BTEX (mg/kg)$_A$	A-T-022	N	N			6	-	-
Eluate Analysis				**10:1** mg/l	**10:1** mg/kg	Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic	A-T-025	N	N	<0.001	**<0.01**	0.5	2	25
Barium	A-T-025	N	N	0.005	**0.050**	20	100	300
Cadmium	A-T-025	N	N	<0.001	**<0.01**	0.04	1	5
Chromium	A-T-025	N	N	<0.001	**<0.01**	0.5	10	70
Copper	A-T-025	N	N	<0.001	**<0.01**	2	50	100
Mercury	A-T-025	N	N	<0.0005	**<0.005**	0.01	0.2	2
Molybdenum	A-T-025	N	N	<0.001	**<0.01**	0.5	10	30
Nickel	A-T-025	N	N	<0.001	**<0.01**	0.4	10	40
Lead	A-T-025	N	N	<0.001	**<0.01**	0.5	10	50
Antimony	A-T-025	N	N	<0.001	**<0.01**	0.06	0.7	5
Selenium	A-T-025	N	N	<0.001	**<0.01**	0.1	0.5	7
Zinc	A-T-025	N	N	0.008	**0.080**	4	50	200
Chloride	A-T-026	N	N	<1.00	**<10**	800	15000	25000
Fluoride	A-T-026	N	N	1.0	**10.0**	10	150	500
Sulphate as SO_4	A-T-026	N	N	3	**27**	1000	20000	50000
Total Dissolved Solids	A-T-035	N	N	36	**360**	4000	60000	100000
Phenol Index	A-T-050	N	N	<0.01	**<0.1**	1	-	-
Dissolved Organic Carbon	A-T-032	N	N	<0.2	**<200**	500	800	1000
Leach Test Information								
pH (pH Units)	A-T-031	N	N	7.9				
Conductivity (µS/cm)	A-T-037	N	N	72				
Mass Sample (kg)				0.224				
Dry Matter (%)	A-T-044	N	N	78.1				

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

Units 7 & 8 Sandpits Business Park
Mottram Road, Hyde, Cheshire, SK14 3AR

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 20/00549
Issue Number: 1 **Date:** 30 January, 2020

Client:
Structural Soils Limited (Bristol)
The Old School
Stillhouse Lane
Bedminster
Bristol
UK
BS3 4EB

Project Manager: Gareth R. Jones
Project Name: Greenway
Project Ref: 563166
Order No: N/A
Date Samples Received: 21/01/20
Date Instructions Received: 21/01/20
Date Analysis Completed: 30/01/20

Prepared by:

Melanie Marshall
Laboratory Coordinator

Approved by:

Danielle Brierley
Client Manager

Envirolab Job Number: 20/00549

Client Project Name: Greenway

Client Project Ref: 563166

Lab Sample ID	20/00549/1	20/00549/3						Units	Limit of Detection	Method ref
Client Sample No	101	103								
Client Sample ID	BH3	BH3								
Depth to Top	0.30	0.90								
Depth To Bottom	0.35	1.00								
Date Sampled	15-Jan-20	15-Jan-20								
Sample Type	Soil - ES	Soil - ES								
Sample Matrix Code	6AE	5AE								
% Moisture at <40C$_A$	20.3	18.5						% w/w	0.1	A-T-044
% Stones >10mm$_A$	17.9	<0.1						% w/w	0.1	A-T-044
pH$_D$$^{M\#}$	5.69	8.02						pH	0.01	A-T-031s
ANC to pH4$_D$	0.07	0.07						mol/kg	0.01	A-T-ANCs
ANC to pH6$_D$	0.02	0.02						mol/kg	0.01	A-T-ANCs
Sulphate (acid soluble)$_D$$^{M\#}$	480	<200						mg/kg	200	A-T-028s
Cyanide (total)$_A$$^{M\#}$	<1	<1						mg/kg	1	A-T-042sTCN
Sulphide$_A$	<5	9						mg/kg	5	A-T-S2-s
Loss on ignition (550degC)$_D$$^{M\#}$	5.8	6.6						% w/w	0.6	A-T-030s
Organic matter$_D$$^{M\#}$	2.7	0.3						% w/w	0.1	A-T-032 OM
Total Organic Carbon$_D$$^{M\#}$	1.56	0.18						% w/w	0.03	A-T-032s
Arsenic$_D$$^{M\#}$	4	8						mg/kg	1	A-T-024s
Boron (water soluble)$_D$$^{M\#}$	<1.0	<1.0						mg/kg	1	A-T-027s
Cadmium$_D$$^{M\#}$	<0.5	0.6						mg/kg	0.5	A-T-024s
Copper$_D$$^{M\#}$	9	15						mg/kg	1	A-T-024s
Chromium$_D$$^{M\#}$	19	36						mg/kg	1	A-T-024s
Lead$_D$$^{M\#}$	27	12						mg/kg	1	A-T-024s
Mercury$_D$	<0.17	<0.17						mg/kg	0.17	A-T-024s
Nickel$_D$$^{M\#}$	10	21						mg/kg	1	A-T-024s
Selenium$_D$$^{M\#}$	<1	<1						mg/kg	1	A-T-024s
Zinc$_D$$^{M\#}$	34	46						mg/kg	5	A-T-024s
EPH Total (>C10-C40)$_A$$^{\#}$	<10	<10						mg/kg	10	A-T-007s
Chromium (hexavalent) (10:1 leachable)$_A$	<0.05	<0.05						mg/l	0.05	A-T-040w
Chromium (trivalent) (10:1 leachable)	<0.05	<0.05						mg/l	0.05	Calc

Envirolab Job Number: 20/00549

Client Project Name: Greenway

Client Project Ref: 563166

Lab Sample ID	20/00549/1	20/00549/3						Units	Limit of Detection	Method ref
Client Sample No	101	103								
Client Sample ID	BH3	BH3								
Depth to Top	0.30	0.90								
Depth To Bottom	0.35	1.00								
Date Sampled	15-Jan-20	15-Jan-20								
Sample Type	Soil - ES	Soil - ES								
Sample Matrix Code	6AE	5AE								
Asbestos in Soil (inc. matrix) ^										
Asbestos in soil$_D^{\#}$	NAD	-								A-T-045
Asbestos ACM - Suitable for Water Absorption Test?$_D$	N/A	-								A-T-045
BTEX & MTBE										
BTEX - Benzene$_A^{\#}$	<0.01	<0.01						mg/kg	0.01	A-T-022s
BTEX - Toluene$_A^{\#}$	<0.01	<0.01						mg/kg	0.01	A-T-022s
BTEX - Ethyl Benzene$_A^{\#}$	<0.01	<0.01						mg/kg	0.01	A-T-022s
BTEX - m & p Xylene$_A^{\#}$	<0.01	<0.01						mg/kg	0.01	A-T-022s
BTEX - o Xylene$_A^{\#}$	<0.01	<0.01						mg/kg	0.01	A-T-022s
MTBE$_A^{\#}$	<0.01	<0.01						mg/kg	0.01	A-T-022s

Envirolab Job Number: 20/00549

Client Project Name: Greenway

Client Project Ref: 563166

Lab Sample ID	20/00549/1	20/00549/3						Units	Limit of Detection	Method ref
Client Sample No	101	103								
Client Sample ID	BH3	BH3								
Depth to Top	0.30	0.90								
Depth To Bottom	0.35	1.00								
Date Sampled	15-Jan-20	15-Jan-20								
Sample Type	Soil - ES	Soil - ES								
Sample Matrix Code	6AE	5AE								
PAH-16MS										
Acenaphthene$_A^{M\#}$	<0.01	<0.01						mg/kg	0.01	A-T-019s
Acenaphthylene$_A^{M\#}$	<0.01	<0.01						mg/kg	0.01	A-T-019s
Anthracene$_A^{M\#}$	<0.02	<0.02						mg/kg	0.02	A-T-019s
Benzo(a)anthracene$_A^{M\#}$	<0.04	<0.04						mg/kg	0.04	A-T-019s
Benzo(a)pyrene$_A^{M\#}$	<0.04	<0.04						mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene$_A^{M\#}$	<0.05	<0.05						mg/kg	0.05	A-T-019s
Benzo(ghi)perylene$_A^{M\#}$	<0.05	<0.05						mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene$_A^{M\#}$	<0.07	<0.07						mg/kg	0.07	A-T-019s
Chrysene$_A^{M\#}$	<0.06	<0.06						mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene$_A^{M\#}$	<0.04	<0.04						mg/kg	0.04	A-T-019s
Fluoranthene$_A^{M\#}$	<0.08	<0.08						mg/kg	0.08	A-T-019s
Fluorene$_A^{M\#}$	<0.01	<0.01						mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene$_A^{M\#}$	<0.03	<0.03						mg/kg	0.03	A-T-019s
Naphthalene $_A^{M\#}$	<0.03	<0.03						mg/kg	0.03	A-T-019s
Phenanthrene$_A^{M\#}$	<0.03	<0.03						mg/kg	0.03	A-T-019s
Pyrene$_A^{M\#}$	<0.07	<0.07						mg/kg	0.07	A-T-019s
Total PAH-16MS$_A^{M\#}$	<0.08	<0.08						mg/kg	0.01	A-T-019s
Phenols (speciated HPLC)										
Phenol$_A$	<0.2	<0.2						mg/kg	0.2	A-T-050s
Cresols$_A$	<0.2	<0.2						mg/kg	0.2	A-T-050s
Xylenols$_A$	<0.2	<0.2						mg/kg	0.2	A-T-050s
Resorcinol$_A$	<0.2	<0.2						mg/kg	0.2	A-T-050s
Phenols - Total by HPLC$_A$	<0.2	<0.2						mg/kg	0.2	A-T-050s

Envirolab Job Number: 20/00549

Client Project Name: Greenway

Client Project Ref: 563166

Lab Sample ID	20/00549/1	20/00549/3						Units	Limit of Detection	Method ref
Client Sample No	101	103								
Client Sample ID	BH3	BH3								
Depth to Top	0.30	0.90								
Depth To Bottom	0.35	1.00								
Date Sampled	15-Jan-20	15-Jan-20								
Sample Type	Soil - ES	Soil - ES								
Sample Matrix Code	6AE	5AE								
Speciated PCB-EC7										
PCB BZ $28_A^{M\#}$	<0.002	<0.002						mg/kg	0.002	A-T-004s
PCB BZ $52_A^{M\#}$	<0.002	<0.002						mg/kg	0.002	A-T-004s
PCB BZ $101_A^{M\#}$	<0.004	<0.004						mg/kg	0.004	A-T-004s
PCB BZ $118_A^{M\#}$	<0.007	<0.007						mg/kg	0.007	A-T-004s
PCB BZ $138_A^{M\#}$	<0.006	<0.006						mg/kg	0.006	A-T-004s
PCB BZ $153_A^{M\#}$	<0.004	<0.004						mg/kg	0.004	A-T-004s
PCB BZ $180_A^{M\#}$	<0.004	<0.004						mg/kg	0.004	A-T-004s
Total Speciated PCB-$EC7_A^{M\#}$	<0.007	<0.007						mg/kg	0.002	A-T-004s

REPORT NOTES

General
This report shall not be reproduced, except in full, without written approval from Envirolab.
The results reported herein relate only to the material supplied to the laboratory.
The residue of any samples contained within this report, and any received with the same delivery, will be disposed of six weeks after initial scheduling. For samples tested for Asbestos we will retain a portion of the dried sample for a minimum of six months after the initial Asbestos testing is completed.
Analytical results reflect the quality of the sample at the time of analysis only.
Opinions and interpretations expressed are outside the scope of our accreditation.
If results are in italic font they are associated with an AQC failure, these are not accredited and are unreliable.
A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.
The Client Sample No, Client Sample ID, Depth to Top, Depth to Bottom and Date Sampled were all provided by the client.

Soil chemical analysis:
All results are reported as dry weight (<40°C).
For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as '% stones >10mm'.
For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any “A” subscripts
All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any "D" subscripts.

TPH analysis of water by method A-T-007:
Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

Electrical Conductivity of water by Method A-T-037:
Results greater than 12900µS/cm @ 25°C / 11550µS/cm @ 20°C fall outside the calibration range and as such are unaccredited.

Asbestos:
Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.
Stones etc. are not removed from the sample prior to analysis.
Quantification of asbestos is a 3 stage process including visual identification, hand picking and weighing and fibre counting by sedimentation/phase contrast optical microscopy if required. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres) quantification by sedimentation is performed.
Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used.

Predominant Matrix Codes:
1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample.
Samples with Matrix Code 7 & 8 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our BSEN 17025 or MCERTS accreditations, with the exception of bulk asbestos which are BSEN 17025 accredited.
Secondary Matrix Codes:
A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal, E = contains roots/twigs.

Key:
IS indicates Insufficient Sample for analysis.
US indicates Unsuitable Sample for analysis.
NDP indicates No Determination Possible.
NAD indicates No Asbestos Detected.
N/A indicates Not Applicable.
Superscript # indicates method accredited to ISO 17025.
Superscript "M" indicates method accredited to MCERTS.
Subscript "A" indicates analysis performed on the sample as received.
Subscript "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve

Please contact us if you need any further information.

Envirolab Deviating Samples Report

Units 7&8 Sandpits Business Park, Mottram Road, Hyde, SK14 3AR
Tel. 0161 368 4921 email. ask@envlab.co.uk

Client: Structural Soils Limited (Bristol), The Old School , Stillhouse Lane, Bedminster, Bristol, UK, BS3 4EB

Project: Greenway

Clients Project No: 563166

Project No: 20/00549

Date Received: 21/01/2020 (am)

Cool Box Temperatures (°C): 6.1

NO DEVIATIONS IDENTIFIED

If, at any point before reaching the laboratory, the temperature of the samples has breached those set in published standards, e.g. BS-EN 5667-3, ISO 18400-102:2017, then the concentration of any affected analytes may differ from that at the time of sampling.

envirolab
Units 7 & 8, Sandpits Business Park
Mottram Road, Hyde, Cheshire, SK14 3AR

Final Test Report

Envirolab Job Number:	20/00724		
Issue Number:	1	Date:	4-Feb-20

Client: Structural Soils Limited (Bristol)
The Old School
Stillhouse Lane
Bedminster
Bristol
UK, BS3 4EB

Project Manager:	Gareth R. Jones
Project Name:	Greenway
Project Ref:	563166
Order No:	N/A
Date Samples Received:	22-Jan-20
Date Instructions Received:	24-Jan-20
Date Analysis Completed:	4-Feb-20

Notes - Soil analysis

All results are reported as dry weight (<40°C).

For samples with Matrix Codes 1 - 6 natural stones >10mm are removed or excluded from the sample prior to analysis and reported results corrected to a whole sample basis.

For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis.

Notes - General

This report shall not be reproduced, except in full, without written approval from Envirolab.

Subscript "A" indicates analysis performed on the sample as received. "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve, unless asbestos is found to be present in which case all analysis is performed on the sample as received.

All analysis is performed on the dried and crushed sample for samples with Matrix Code 7 and this supercedes any "A" subscripts.

All analysis is performed on the sample as received for soil samples from outside the European Union and this supercedes any "D" subscripts

For complex, multi-compound analysis, quality control results do not always fall within chart limits for every compound and we have criteria for reporting in these situations.

If results are in italic font they are associated with such quality control failures and may be unreliable.

A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid

Predominant Matrix Codes: 1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample

Secondary Matrix Codes: A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal, E = contains roots/twigs.

IS indicates Insufficient sample for analysis, NDP indicates No Determination Possible and NAD indicates No Asbestos Detected.

Analytical results reflect the quality of the sample at the time of analysis only. Opinions and interpretations expressed are outside the scope of our accreditation.

Please contact us if you need any further information.

Prepared by:

Melanie Marshall
Laboratory Coordinator

Approved by:

Holly Neary-King
Deputy Admin & Client Services Su

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Landfill WAC analysis must not be used for hazardous waste classification purposes. This analysis is only applicable for landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Sample Details						Landfill Waste Acceptance Criteria Limits		
Lab Sample ID	Method	ISO17025	MCERTS	20/00724/1				
Client Sample Number				101		Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
Client Sample ID				BH1				
Depth to Top				0.1				
Depth to Bottom				0.20				
Date Sampled				20/01/2020				
Sample Type				Soil - ES				
Sample Matrix Code				4ABE				
Solid Waste Analysis								
pH (pH Units)$_D$	A-T-031	N	N	**7.41**		-	>6	-
ANC to pH 4 (mol/kg)$_D$	A-T-ANC	N	N	**0.11**		-	to be evaluated	to be evaluated
ANC to pH 6 (mol/kg)$_D$	A-T-ANC	N	N	**0.01**		-	to be evaluated	to be evaluated
Loss on Ignition (%)$_D$	A-T-030	N	N	**6.4**		-	-	10
Total Organic Carbon (%)$_D$	A-T-032	N	N	**2.65**		3	5	6
PAH Sum of 17 (mg/kg) $_A$	A-T-019	N	N			100	-	-
Mineral Oil (mg/kg)$_A$	A-T-007	N	N			500	-	-
Sum of 7 PCBs (mg/kg)$_A$	A-T-004	N	N			1	-	-
Sum of BTEX (mg/kg)$_A$	A-T-022	N	N			6	-	-
Eluate Analysis				**10:1**	**10:1**	**Limit values for compliance leaching test using**		
				mg/l	**mg/kg**	**BS EN 12457-2 at L/S 10 l/kg (mg/kg)**		
Arsenic	A-T-025	N	N	0.005	**0.050**	0.5	2	25
Barium	A-T-025	N	N	0.102	**1.020**	20	100	300
Cadmium	A-T-025	N	N	0.001	**0.010**	0.04	1	5
Chromium	A-T-025	N	N	0.005	**0.050**	0.5	10	70
Copper	A-T-025	N	N	0.057	**0.570**	2	50	100
Mercury	A-T-025	N	N	<0.0005	**<0.005**	0.01	0.2	2
Molybdenum	A-T-025	N	N	0.001	**0.010**	0.5	10	30
Nickel	A-T-025	N	N	0.014	**0.140**	0.4	10	40
Lead	A-T-025	N	N	0.058	**0.580**	0.5	10	50
Antimony	A-T-025	N	N	0.003	**0.030**	0.06	0.7	5
Selenium	A-T-025	N	N	<0.001	**<0.01**	0.1	0.5	7
Zinc	A-T-025	N	N	0.084	**0.840**	4	50	200
Chloride	A-T-026	N	N	4	**42**	800	15000	25000
Fluoride	A-T-026	N	N	0.5	**5.0**	10	150	500
Sulphate as SO_4	A-T-026	N	N	29	**291**	1000	20000	50000
Total Dissolved Solids	A-T-035	N	N	47	**470**	4000	60000	100000
Phenol Index	A-T-050	N	N	<0.01	**<0.1**	1	-	-
Dissolved Organic Carbon	A-T-032	N	N	<0.2	**<200**	500	800	1000
Leach Test Information								
pH (pH Units)	A-T-031	N	N	7.6				
Conductivity (µS/cm)	A-T-037	N	N	94				
Mass Sample (kg)				0.212				
Dry Matter (%)	A-T-044	N	N	82.7				

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

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Landfill WAC analysis must not be used for hazardous waste classification purposes. This analysis is only applicable for landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Sample Details						Landfill Waste Acceptance Criteria Limits		
Lab Sample ID	Method	ISO17025	MCERTS	20/00724/9				
Client Sample Number				103		Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
Client Sample ID				BH4				
Depth to Top				0.9				
Depth to Bottom				1.00				
Date Sampled				20/01/2020				
Sample Type				Soil - ES				
Sample Matrix Code				6AE				
Solid Waste Analysis								
pH (pH Units)$_D$	A-T-031	N	N	**6.78**		-	>6	-
ANC to pH 4 (mol/kg)$_D$	A-T-ANC	N	N	**0.05**		-	to be evaluated	to be evaluated
ANC to pH 6 (mol/kg)$_D$	A-T-ANC	N	N	**0.01**		-	to be evaluated	to be evaluated
Loss on Ignition (%)$_D$	A-T-030	N	N	**5.5**		-	-	10
Total Organic Carbon (%)$_D$	A-T-032	N	N	**0.28**		3	5	6
PAH Sum of 17 (mg/kg)$_A$	A-T-019	N	N			100	-	-
Mineral Oil (mg/kg)$_A$	A-T-007	N	N			500	-	-
Sum of 7 PCBs (mg/kg)$_A$	A-T-004	N	N			1	-	-
Sum of BTEX (mg/kg)$_A$	A-T-022	N	N			6	-	-
Eluate Analysis				**10:1** mg/l	**10:1** mg/kg	Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic	A-T-025	N	N	<0.001	**<0.01**	0.5	2	25
Barium	A-T-025	N	N	0.034	**0.340**	20	100	300
Cadmium	A-T-025	N	N	<0.001	**<0.01**	0.04	1	5
Chromium	A-T-025	N	N	0.001	**0.010**	0.5	10	70
Copper	A-T-025	N	N	0.002	**0.020**	2	50	100
Mercury	A-T-025	N	N	<0.0005	**<0.005**	0.01	0.2	2
Molybdenum	A-T-025	N	N	<0.001	**<0.01**	0.5	10	30
Nickel	A-T-025	N	N	0.001	**0.010**	0.4	10	40
Lead	A-T-025	N	N	0.001	**0.010**	0.5	10	50
Antimony	A-T-025	N	N	<0.001	**<0.01**	0.06	0.7	5
Selenium	A-T-025	N	N	<0.001	**<0.01**	0.1	0.5	7
Zinc	A-T-025	N	N	0.011	**0.110**	4	50	200
Chloride	A-T-026	N	N	4	**43**	800	15000	25000
Fluoride	A-T-026	N	N	0.2	**2.0**	10	150	500
Sulphate as SO_4	A-T-026	N	N	44	**440**	1000	20000	50000
Total Dissolved Solids	A-T-035	N	N	24	**240**	4000	60000	100000
Phenol Index	A-T-050	N	N	<0.01	**<0.1**	1	-	-
Dissolved Organic Carbon	A-T-032	N	N	<0.2	**<200**	500	800	1000
Leach Test Information								
pH (pH Units)	A-T-031	N	N	7.5				
Conductivity (µS/cm)	A-T-037	N	N	47				
Mass Sample (kg)				0.222				
Dry Matter (%)	A-T-044	N	N	78.9				

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

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Units 7 & 8 Sandpits Business Park
Mottram Road, Hyde, Cheshire, SK14 3AR

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 20/00724
Issue Number: 1 **Date:** 04 February, 2020

Client:
Structural Soils Limited (Bristol)
The Old School
Stillhouse Lane
Bedminster
Bristol
UK
BS3 4EB

Project Manager: Gareth R. Jones
Project Name: Greenway
Project Ref: 563166
Order No: N/A
Date Samples Received: 22/01/20
Date Instructions Received: 24/01/20
Date Analysis Completed: 04/02/20

Prepared by:

Melanie Marshall
Laboratory Coordinator

Approved by:

Holly Neary-King
Deputy Admin & Client Services Supervisor

Envirolab Job Number: 20/00724

Client Project Name: Greenway

Client Project Ref: 563166

Lab Sample ID	20/00724/1	20/00724/9						Units	Limit of Detection	Method ref
Client Sample No	101	103								
Client Sample ID	BH1	BH4								
Depth to Top	0.1	0.90								
Depth To Bottom	0.20	1.00								
Date Sampled	20-Jan-20	20-Jan-20								
Sample Type	Soil - ES	Soil - ES								
Sample Matrix Code	4ABE	6AE								
% Moisture at <40C$_A$	17.9	19.7						% w/w	0.1	A-T-044
% Stones >10mm$_A$	<0.1	<0.1						% w/w	0.1	A-T-044
pH$_D$ M#	7.41	6.78						pH	0.01	A-T-031s
ANC to pH4$_D$	0.11	0.05						mol/kg	0.01	A-T-ANCs
ANC to pH6$_D$	0.01	0.01						mol/kg	0.01	A-T-ANCs
Sulphate (acid soluble)$_D$ M#	560	240						mg/kg	200	A-T-028s
Cyanide (total)$_A$ M#	<1	<1						mg/kg	1	A-T-042sTCN
Sulphide$_A$	<5	<5						mg/kg	5	A-T-S2-s
Loss on ignition (550degC)$_D$ M#	6.4	5.5						% w/w	0.6	A-T-030s
Organic matter$_D$ M#	4.6	0.5						% w/w	0.1	A-T-032 OM
Total Organic Carbon$_D$ M#	2.65	0.28						% w/w	0.03	A-T-032s
Arsenic$_D$ M#	8	9						mg/kg	1	A-T-024s
Boron (water soluble)$_D$ M#	<1.0	<1.0						mg/kg	1	A-T-027s
Cadmium$_D$ M#	3.1	0.8						mg/kg	0.5	A-T-024s
Copper$_D$ M#	78	17						mg/kg	1	A-T-024s
Chromium$_D$ M#	45	28						mg/kg	1	A-T-024s
Lead$_D$ M#	107	15						mg/kg	1	A-T-024s
Mercury$_D$	0.27	<0.17						mg/kg	0.17	A-T-024s
Nickel$_D$ M#	38	22						mg/kg	1	A-T-024s
Selenium$_D$ M#	<1	1						mg/kg	1	A-T-024s
Zinc$_D$ M#	171	43						mg/kg	5	A-T-024s
EPH Total (>C10-C40)$_A$ #	130	<10						mg/kg	10	A-T-007s
Chromium (hexavalent) (10:1 leachable)$_A$	<0.05	<0.05						mg/l	0.05	A-T-040w
Chromium (trivalent) (10:1 leachable)	<0.05	<0.05						mg/l	0.05	Calc

Envirolab Job Number: 20/00724

Client Project Name: Greenway

Client Project Ref: 563166

Lab Sample ID	20/00724/1	20/00724/9						Units	Limit of Detection	Method ref
Client Sample No	101	103								
Client Sample ID	BH1	BH4								
Depth to Top	0.1	0.90								
Depth To Bottom	0.20	1.00								
Date Sampled	20-Jan-20	20-Jan-20								
Sample Type	Soil - ES	Soil - ES								
Sample Matrix Code	4ABE	6AE								
Asbestos in Soil (inc. matrix) ^										
Asbestos in soil$_D^{\#}$	NAD	-								A-T-045
Asbestos ACM - Suitable for Water Absorption Test?$_D$	N/A	-								A-T-045
BTEX & MTBE										
BTEX - Benzene$_A^{\#}$	<0.01	<0.01						mg/kg	0.01	A-T-022s
BTEX - Toluene$_A^{\#}$	<0.01	<0.01						mg/kg	0.01	A-T-022s
BTEX - Ethyl Benzene$_A^{\#}$	<0.01	<0.01						mg/kg	0.01	A-T-022s
BTEX - m & p Xylene$_A^{\#}$	<0.01	<0.01						mg/kg	0.01	A-T-022s
BTEX - o Xylene$_A^{\#}$	<0.01	<0.01						mg/kg	0.01	A-T-022s
MTBE$_A^{\#}$	<0.01	<0.01						mg/kg	0.01	A-T-022s

Envirolab Job Number: 20/00724

Client Project Name: Greenway

Client Project Ref: 563166

Lab Sample ID	20/00724/1	20/00724/9						Units	Limit of Detection	Method ref
Client Sample No	101	103								
Client Sample ID	BH1	BH4								
Depth to Top	0.1	0.90								
Depth To Bottom	0.20	1.00								
Date Sampled	20-Jan-20	20-Jan-20								
Sample Type	Soil - ES	Soil - ES								
Sample Matrix Code	4ABE	6AE								
PAH-16MS										
Acenaphthene$_A^{M\#}$	<0.01	<0.01						mg/kg	0.01	A-T-019s
Acenaphthylene$_A^{M\#}$	0.01	<0.01						mg/kg	0.01	A-T-019s
Anthracene$_A^{M\#}$	0.05	<0.02						mg/kg	0.02	A-T-019s
Benzo(a)anthracene$_A^{M\#}$	0.52	<0.04						mg/kg	0.04	A-T-019s
Benzo(a)pyrene$_A^{M\#}$	0.61	<0.04						mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene$_A^{M\#}$	0.78	<0.05						mg/kg	0.05	A-T-019s
Benzo(ghi)perylene$_A^{M\#}$	0.35	<0.05						mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene$_A^{M\#}$	0.29	<0.07						mg/kg	0.07	A-T-019s
Chrysene$_A^{M\#}$	0.57	<0.06						mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene$_A^{M\#}$	0.07	<0.04						mg/kg	0.04	A-T-019s
Fluoranthene$_A^{M\#}$	0.79	<0.08						mg/kg	0.08	A-T-019s
Fluorene$_A^{M\#}$	<0.01	<0.01						mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene$_A^{M\#}$	0.39	<0.03						mg/kg	0.03	A-T-019s
Naphthalene $_A^{M\#}$	<0.03	<0.03						mg/kg	0.03	A-T-019s
Phenanthrene$_A^{M\#}$	0.22	<0.03						mg/kg	0.03	A-T-019s
Pyrene$_A^{M\#}$	0.78	<0.07						mg/kg	0.07	A-T-019s
Total PAH-16MS$_A^{M\#}$	5.43	<0.08						mg/kg	0.01	A-T-019s
Phenols (speciated HPLC)										
Phenol$_A$	<0.2	<0.2						mg/kg	0.2	A-T-050s
Cresols$_A$	<0.2	<0.2						mg/kg	0.2	A-T-050s
Xylenols$_A$	<0.2	<0.2						mg/kg	0.2	A-T-050s
Resorcinol$_A$	<0.2	<0.2						mg/kg	0.2	A-T-050s
Phenols - Total by HPLC$_A$	<0.2	<0.2						mg/kg	0.2	A-T-050s

Envirolab Job Number: 20/00724

Client Project Name: Greenway

Client Project Ref: 563166

Lab Sample ID	20/00724/1	20/00724/9						Units	Limit of Detection	Method ref
Client Sample No	101	103								
Client Sample ID	BH1	BH4								
Depth to Top	0.1	0.90								
Depth To Bottom	0.20	1.00								
Date Sampled	20-Jan-20	20-Jan-20								
Sample Type	Soil - ES	Soil - ES								
Sample Matrix Code	4ABE	6AE								
Speciated PCB-EC7										
PCB BZ $28_A^{M\#}$	<0.002	<0.002						mg/kg	0.002	A-T-004s
PCB BZ $52_A^{M\#}$	<0.002	<0.002						mg/kg	0.002	A-T-004s
PCB BZ $101_A^{M\#}$	<0.004	<0.004						mg/kg	0.004	A-T-004s
PCB BZ $118_A^{M\#}$	<0.007	<0.007						mg/kg	0.007	A-T-004s
PCB BZ $138_A^{M\#}$	<0.006	<0.006						mg/kg	0.006	A-T-004s
PCB BZ $153_A^{M\#}$	<0.004	<0.004						mg/kg	0.004	A-T-004s
PCB BZ $180_A^{M\#}$	<0.004	<0.004						mg/kg	0.004	A-T-004s
Total Speciated PCB-$EC7_A^{M\#}$	<0.007	<0.007						mg/kg	0.002	A-T-004s

REPORT NOTES

General
This report shall not be reproduced, except in full, without written approval from Envirolab.
The results reported herein relate only to the material supplied to the laboratory.
The residue of any samples contained within this report, and any received with the same delivery, will be disposed of six weeks after initial scheduling. For samples tested for Asbestos we will retain a portion of the dried sample for a minimum of six months after the initial Asbestos testing is completed.
Analytical results reflect the quality of the sample at the time of analysis only.
Opinions and interpretations expressed are outside the scope of our accreditation.
If results are in italic font they are associated with an AQC failure, these are not accredited and are unreliable.
A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.
The Client Sample No, Client Sample ID, Depth to Top, Depth to Bottom and Date Sampled were all provided by the client.

Soil chemical analysis:
All results are reported as dry weight (<40°C).
For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as '% stones >10mm'.
For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any “A” subscripts
All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any "D" subscripts.

TPH analysis of water by method A-T-007:
Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

Electrical Conductivity of water by Method A-T-037:
Results greater than 12900µS/cm @ 25°C / 11550µS/cm @ 20°C fall outside the calibration range and as such are unaccredited.

Asbestos:
Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.
Stones etc. are not removed from the sample prior to analysis.
Quantification of asbestos is a 3 stage process including visual identification, hand picking and weighing and fibre counting by sedimentation/phase contrast optical microscopy if required. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres) quantification by sedimentation is performed. Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used.

Predominant Matrix Codes:
1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample.
Samples with Matrix Code 7 & 8 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our BSEN 17025 or MCERTS accreditations, with the exception of bulk asbestos which are BSEN 17025 accredited.
Secondary Matrix Codes:
A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal, E = contains roots/twigs.

Key:
IS indicates Insufficient Sample for analysis.
US indicates Unsuitable Sample for analysis.
NDP indicates No Determination Possible.
NAD indicates No Asbestos Detected.
N/A indicates Not Applicable.
Superscript # indicates method accredited to ISO 17025.
Superscript "M" indicates method accredited to MCERTS.
Subscript "A" indicates analysis performed on the sample as received.
Subscript "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve

Please contact us if you need any further information.

Envirolab Deviating Samples Report

Units 7&8 Sandpits Business Park, Mottram Road, Hyde, SK14 3AR
Tel. 0161 368 4921 email. ask@envlab.co.uk

Client: Structural Soils Limited (Bristol), The Old School , Stillhouse Lane, Bedminster, Bristol, UK, BS3 4EB

Project: Greenway

Clients Project No: 563166

Project No: 20/00724

Date Received: 24/01/2020 (am)

Cool Box Temperatures (°C): 9.9, 9.6

NO DEVIATIONS IDENTIFIED

If, at any point before reaching the laboratory, the temperature of the samples has breached those set in published standards, e.g. BS-EN 5667-3, ISO 18400-102:2017, then the concentration of any affected analytes may differ from that at the time of sampling.

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Units 7 & 8, Sandpits Business Park
Mottram Road, Hyde, Cheshire, SK14 3AR

Final Test Report

Envirolab Job Number:	20/04352		
Issue Number:	1	Date:	12-Jun-20

Client: Structural Soils Limited (Bristol)
The Old School
Stillhouse Lane
Bedminster
Bristol
UK, BS3 4EB

Project Manager:	Tom Payne
Project Name:	Greenway
Project Ref:	563166
Order No:	N/A
Date Samples Received:	2-Jun-20
Date Instructions Received:	2-Jun-20
Date Analysis Completed:	12-Jun-20

Notes - Soil analysis

All results are reported as dry weight (<40°C).

For samples with Matrix Codes 1 - 6 natural stones >10mm are removed or excluded from the sample prior to analysis and reported results corrected to a whole sample basis.

For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis.

Notes - General

This report shall not be reproduced, except in full, without written approval from Envirolab.

Subscript "A" indicates analysis performed on the sample as received. "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve, unless asbestos is found to be present in which case all analysis is performed on the sample as received.

All analysis is performed on the dried and crushed sample for samples with Matrix Code 7 and this supercedes any "A" subscripts.

All analysis is performed on the sample as received for soil samples from outside the European Union and this supercedes any "D" subscripts

For complex, multi-compound analysis, quality control results do not always fall within chart limits for every compound and we have criteria for reporting in these situations.

If results are in italic font they are associated with such quality control failures and may be unreliable.

A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid

Predominant Matrix Codes: 1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample

Secondary Matrix Codes: A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal, E = contains roots/twigs.

IS indicates Insufficient sample for analysis, NDP indicates No Determination Possible and NAD indicates No Asbestos Detected.

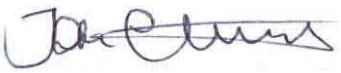
Analytical results reflect the quality of the sample at the time of analysis only. Opinions and interpretations expressed are outside the scope of our accreditation.

Please contact us if you need any further information.

Prepared by:

Sophie France
Client Service Manager

Approved by:



John Gustafson
Managing Director

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Landfill WAC analysis must not be used for hazardous waste classification purposes. This analysis is only applicable for landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Sample Details						Landfill Waste Acceptance Criteria Limits		
Lab Sample ID	Method	ISO17025	MCERTS	20/04352/1				
Client Sample Number				101		Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
Client Sample ID				BH5				
Depth to Top				0.5				
Depth to Bottom								
Date Sampled				27/05/2020				
Sample Type				Soil - ES				
Sample Matrix Code				6				
Solid Waste Analysis								
pH (pH Units)$_D$	A-T-031	N	N	**7.99**		-	>6	-
ANC to pH 4 (mol/kg)$_D$	A-T-ANC	N	N	**0.06**		-	to be evaluated	to be evaluated
ANC to pH 6 (mol/kg)$_D$	A-T-ANC	N	N	**0.02**		-	to be evaluated	to be evaluated
Loss on Ignition (%)$_D$	A-T-030	N	N	**4.3**		-	-	10
Total Organic Carbon (%)$_D$	A-T-032	N	N	**0.34**		3	5	6
PAH Sum of 17 (mg/kg) $_A$	A-T-019	N	N			100	-	-
Mineral Oil (mg/kg)$_A$	A-T-007	N	N			500	-	-
Sum of 7 PCBs (mg/kg)$_A$	A-T-004	N	N			1	-	-
Sum of BTEX (mg/kg)$_A$	A-T-022	N	N			6	-	-
Eluate Analysis				**10:1**	**10:1**	**Limit values for compliance leaching test using**		
				mg/l	**mg/kg**	**BS EN 12457-2 at L/S 10 l/kg (mg/kg)**		
Arsenic	A-T-025	N	N	0.002	**0.020**	0.5	2	25
Barium	A-T-025	N	N	0.097	**0.970**	20	100	300
Cadmium	A-T-025	N	N	<0.001	**<0.01**	0.04	1	5
Chromium	A-T-025	N	N	<0.001	**<0.01**	0.5	10	70
Copper	A-T-025	N	N	0.005	**0.050**	2	50	100
Mercury	A-T-025	N	N	<0.0005	**<0.005**	0.01	0.2	2
Molybdenum	A-T-025	N	N	<0.001	**<0.01**	0.5	10	30
Nickel	A-T-025	N	N	0.001	**0.010**	0.4	10	40
Lead	A-T-025	N	N	0.004	**0.040**	0.5	10	50
Antimony	A-T-025	N	N	<0.001	**<0.01**	0.06	0.7	5
Selenium	A-T-025	N	N	<0.001	**<0.01**	0.1	0.5	7
Zinc	A-T-025	N	N	0.013	**0.130**	4	50	200
Chloride	A-T-026	N	N	6	**59**	800	15000	25000
Fluoride	A-T-026	N	N	0.7	**7.0**	10	150	500
Sulphate as SO_4	A-T-026	N	N	51	**508**	1000	20000	50000
Total Dissolved Solids	A-T-035	N	N	39	**390**	4000	60000	100000
Phenol Index	A-T-050	N	N	<0.01	**<0.1**	1	-	-
Dissolved Organic Carbon	A-T-032	N	N	<0.2	**<200**	500	800	1000
Leach Test Information								
pH (pH Units)	A-T-031	N	N	7.2				
Conductivity (µS/cm)	A-T-037	N	N	79				
Mass Sample (kg)				0.214				
Dry Matter (%)	A-T-044	N	N	81.9				

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Sample Details						Landfill Waste Acceptance Criteria Limits		
Lab Sample ID	Method	ISO17025	MCERTS	20/04352/2				
Client Sample Number				102		Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
Client Sample ID				BH5				
Depth to Top				0.9				
Depth to Bottom								
Date Sampled				27/05/2020				
Sample Type				Soil - ES				
Sample Matrix Code				6				
Solid Waste Analysis								
pH (pH Units)$_D$	A-T-031	N	N	**7.76**		-	>6	-
ANC to pH 4 (mol/kg)$_D$	A-T-ANC	N	N	**0.05**		-	to be evaluated	to be evaluated
ANC to pH 6 (mol/kg)$_D$	A-T-ANC	N	N	**<0.01**		-	to be evaluated	to be evaluated
Loss on Ignition (%)$_D$	A-T-030	N	N	**4.3**		-	-	10
Total Organic Carbon (%)$_D$	A-T-032	N	N	**0.2**		3	5	6
PAH Sum of 17 (mg/kg)$_A$	A-T-019	N	N			100	-	-
Mineral Oil (mg/kg)$_A$	A-T-007	N	N			500	-	-
Sum of 7 PCBs (mg/kg)$_A$	A-T-004	N	N			1	-	-
Sum of BTEX (mg/kg)$_A$	A-T-022	N	N			6	-	-
Eluate Analysis				**10:1 mg/l**	**10:1 mg/kg**	**Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg (mg/kg)**		
Arsenic	A-T-025	N	N	<0.001	**<0.01**	0.5	2	25
Barium	A-T-025	N	N	0.223	**2.230**	20	100	300
Cadmium	A-T-025	N	N	<0.001	**<0.01**	0.04	1	5
Chromium	A-T-025	N	N	<0.001	**<0.01**	0.5	10	70
Copper	A-T-025	N	N	0.002	**0.020**	2	50	100
Mercury	A-T-025	N	N	<0.0005	**<0.005**	0.01	0.2	2
Molybdenum	A-T-025	N	N	<0.001	**<0.01**	0.5	10	30
Nickel	A-T-025	N	N	0.001	**0.010**	0.4	10	40
Lead	A-T-025	N	N	0.003	**0.030**	0.5	10	50
Antimony	A-T-025	N	N	<0.001	**<0.01**	0.06	0.7	5
Selenium	A-T-025	N	N	<0.001	**<0.01**	0.1	0.5	7
Zinc	A-T-025	N	N	0.004	**0.040**	4	50	200
Chloride	A-T-026	N	N	9	**86**	800	15000	25000
Fluoride	A-T-026	N	N	0.5	**5.0**	10	150	500
Sulphate as SO_4	A-T-026	N	N	97	**967**	1000	20000	50000
Total Dissolved Solids	A-T-035	N	N	<20	**<200**	4000	60000	100000
Phenol Index	A-T-050	N	N	<0.01	**<0.1**	1	-	-
Dissolved Organic Carbon	A-T-032	N	N	<0.2	**<200**	500	800	1000
Leach Test Information								
pH (pH Units)	A-T-031	N	N	7.2				
Conductivity (µS/cm)	A-T-037	N	N	35				
Mass Sample (kg)				0.214				
Dry Matter (%)	A-T-044	N	N	81.6				

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Sample Details						Landfill Waste Acceptance Criteria Limits		
Lab Sample ID	Method	ISO17025	MCERTS	20/04352/3				
Client Sample Number				101		Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
Client Sample ID				BH6				
Depth to Top				0.2				
Depth to Bottom								
Date Sampled				27/05/2020				
Sample Type				Soil - ES				
Sample Matrix Code				6AE				
Solid Waste Analysis								
pH (pH Units)$_D$	A-T-031	N	N	**7.57**		-	>6	-
ANC to pH 4 (mol/kg)$_D$	A-T-ANC	N	N	**0.08**		-	to be evaluated	to be evaluated
ANC to pH 6 (mol/kg)$_D$	A-T-ANC	N	N	**<0.01**		-	to be evaluated	to be evaluated
Loss on Ignition (%)$_D$	A-T-030	N	N	**10.4**		-	-	10
Total Organic Carbon (%)$_D$	A-T-032	N	N	**3.49**		3	5	6
PAH Sum of 17 (mg/kg)$_A$	A-T-019	N	N			100	-	-
Mineral Oil (mg/kg)$_A$	A-T-007	N	N			500	-	-
Sum of 7 PCBs (mg/kg)$_A$	A-T-004	N	N			1	-	-
Sum of BTEX (mg/kg)$_A$	A-T-022	N	N			6	-	-
Eluate Analysis				**10:1** mg/l	**10:1** mg/kg	Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic	A-T-025	N	N	0.003	**0.030**	0.5	2	25
Barium	A-T-025	N	N	0.040	**0.400**	20	100	300
Cadmium	A-T-025	N	N	<0.001	**<0.01**	0.04	1	5
Chromium	A-T-025	N	N	<0.001	**<0.01**	0.5	10	70
Copper	A-T-025	N	N	0.007	**0.070**	2	50	100
Mercury	A-T-025	N	N	<0.0005	**<0.005**	0.01	0.2	2
Molybdenum	A-T-025	N	N	<0.001	**<0.01**	0.5	10	30
Nickel	A-T-025	N	N	0.005	**0.050**	0.4	10	40
Lead	A-T-025	N	N	0.006	**0.060**	0.5	10	50
Antimony	A-T-025	N	N	<0.001	**<0.01**	0.06	0.7	5
Selenium	A-T-025	N	N	<0.001	**<0.01**	0.1	0.5	7
Zinc	A-T-025	N	N	0.008	**0.080**	4	50	200
Chloride	A-T-026	N	N	3	**26**	800	15000	25000
Fluoride	A-T-026	N	N	0.5	**5.0**	10	150	500
Sulphate as SO_4	A-T-026	N	N	8	**76**	1000	20000	50000
Total Dissolved Solids	A-T-035	N	N	80	**800**	4000	60000	100000
Phenol Index	A-T-050	N	N	<0.01	**<0.1**	1	-	-
Dissolved Organic Carbon	A-T-032	N	N	<0.2	**<200**	500	800	1000
Leach Test Information								
pH (pH Units)	A-T-031	N	N	7.3				
Conductivity (µS/cm)	A-T-037	N	N	160				
Mass Sample (kg)				0.209				
Dry Matter (%)	A-T-044	N	N	83.9				

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Sample Details						Landfill Waste Acceptance Criteria Limits		
Lab Sample ID	Method	ISO17025	MCERTS	20/04352/4				
Client Sample Number				102		Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
Client Sample ID				BH6				
Depth to Top				0.4				
Depth to Bottom								
Date Sampled				27/05/2020				
Sample Type				Soil - ES				
Sample Matrix Code				6E				
Solid Waste Analysis								
pH (pH Units)$_D$	A-T-031	N	N	**7.83**		-	>6	-
ANC to pH 4 (mol/kg)$_D$	A-T-ANC	N	N	**0.04**		-	to be evaluated	to be evaluated
ANC to pH 6 (mol/kg)$_D$	A-T-ANC	N	N	**<0.01**		-	to be evaluated	to be evaluated
Loss on Ignition (%)$_D$	A-T-030	N	N	**5.4**		-	-	10
Total Organic Carbon (%)$_D$	A-T-032	N	N	**1.49**		3	5	6
PAH Sum of 17 (mg/kg)$_A$	A-T-019	N	N			100	-	-
Mineral Oil (mg/kg)$_A$	A-T-007	N	N			500	-	-
Sum of 7 PCBs (mg/kg)$_A$	A-T-004	N	N			1	-	-
Sum of BTEX (mg/kg)$_A$	A-T-022	N	N			6	-	-
Eluate Analysis				**10:1** mg/l	**10:1** mg/kg	Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic	A-T-025	N	N	0.002	**0.020**	0.5	2	25
Barium	A-T-025	N	N	0.103	**1.030**	20	100	300
Cadmium	A-T-025	N	N	<0.001	**<0.01**	0.04	1	5
Chromium	A-T-025	N	N	0.002	**0.020**	0.5	10	70
Copper	A-T-025	N	N	0.007	**0.070**	2	50	100
Mercury	A-T-025	N	N	<0.0005	**<0.005**	0.01	0.2	2
Molybdenum	A-T-025	N	N	<0.001	**<0.01**	0.5	10	30
Nickel	A-T-025	N	N	0.004	**0.040**	0.4	10	40
Lead	A-T-025	N	N	0.009	**0.090**	0.5	10	50
Antimony	A-T-025	N	N	<0.001	**<0.01**	0.06	0.7	5
Selenium	A-T-025	N	N	<0.001	**<0.01**	0.1	0.5	7
Zinc	A-T-025	N	N	0.010	**0.100**	4	50	200
Chloride	A-T-026	N	N	7	**65**	800	15000	25000
Fluoride	A-T-026	N	N	0.8	**8.0**	10	150	500
Sulphate as SO_4	A-T-026	N	N	54	**543**	1000	20000	50000
Total Dissolved Solids	A-T-035	N	N	57	**570**	4000	60000	100000
Phenol Index	A-T-050	N	N	<0.01	**<0.1**	1	-	-
Dissolved Organic Carbon	A-T-032	N	N	27.90	**279**	500	800	1000
Leach Test Information								
pH (pH Units)	A-T-031	N	N	7.3				
Conductivity (µS/cm)	A-T-037	N	N	114				
Mass Sample (kg)				0.227				
Dry Matter (%)	A-T-044	N	N	77.1				

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Sample Details						Landfill Waste Acceptance Criteria Limits		
Lab Sample ID	Method	ISO17025	MCERTS	20/04352/5				
Client Sample Number				103		Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
Client Sample ID				BH6				
Depth to Top				0.7				
Depth to Bottom								
Date Sampled				27/05/2020				
Sample Type				Soil - ES				
Sample Matrix Code				6				
Solid Waste Analysis								
pH (pH Units)$_D$	A-T-031	N	N	**7.71**		-	>6	-
ANC to pH 4 (mol/kg)$_D$	A-T-ANC	N	N	**0.04**		-	to be evaluated	to be evaluated
ANC to pH 6 (mol/kg)$_D$	A-T-ANC	N	N	**<0.01**		-	to be evaluated	to be evaluated
Loss on Ignition (%)$_D$	A-T-030	N	N	**4.5**		-	-	10
Total Organic Carbon (%)$_D$	A-T-032	N	N	**0.23**		3	5	6
PAH Sum of 17 (mg/kg)$_A$	A-T-019	N	N			100	-	-
Mineral Oil (mg/kg)$_A$	A-T-007	N	N			500	-	-
Sum of 7 PCBs (mg/kg)$_A$	A-T-004	N	N			1	-	-
Sum of BTEX (mg/kg)$_A$	A-T-022	N	N			6	-	-
Eluate Analysis				**10:1** mg/l	**10:1** mg/kg	Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic	A-T-025	N	N	<0.001	**<0.01**	0.5	2	25
Barium	A-T-025	N	N	0.160	**1.600**	20	100	300
Cadmium	A-T-025	N	N	<0.001	**<0.01**	0.04	1	5
Chromium	A-T-025	N	N	<0.001	**<0.01**	0.5	10	70
Copper	A-T-025	N	N	0.003	**0.030**	2	50	100
Mercury	A-T-025	N	N	<0.0005	**<0.005**	0.01	0.2	2
Molybdenum	A-T-025	N	N	<0.001	**<0.01**	0.5	10	30
Nickel	A-T-025	N	N	0.002	**0.020**	0.4	10	40
Lead	A-T-025	N	N	0.003	**0.030**	0.5	10	50
Antimony	A-T-025	N	N	<0.001	**<0.01**	0.06	0.7	5
Selenium	A-T-025	N	N	<0.001	**<0.01**	0.1	0.5	7
Zinc	A-T-025	N	N	0.005	**0.050**	4	50	200
Chloride	A-T-026	N	N	8	**83**	800	15000	25000
Fluoride	A-T-026	N	N	0.4	**4.0**	10	150	500
Sulphate as SO_4	A-T-026	N	N	52	**524**	1000	20000	50000
Total Dissolved Solids	A-T-035	N	N	22	**220**	4000	60000	100000
Phenol Index	A-T-050	N	N	<0.01	**<0.1**	1	-	-
Dissolved Organic Carbon	A-T-032	N	N	<0.2	**<200**	500	800	1000
Leach Test Information								
pH (pH Units)	A-T-031	N	N	7.3				
Conductivity (µS/cm)	A-T-037	N	N	44				
Mass Sample (kg)				0.196				
Dry Matter (%)	A-T-044	N	N	89.3				

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Units 7 & 8 Sandpits Business Park
Mottram Road, Hyde, Cheshire, SK14 3AR

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 20/04352
Issue Number: 1 **Date:** 12 June, 2020

Client:
Structural Soils Limited (Bristol)
The Old School
Stillhouse Lane
Bedminster
Bristol
UK
BS3 4EB

Project Manager: Tom Payne
Project Name: Greenway
Project Ref: 563166
Order No: N/A
Date Samples Received: 02/06/20
Date Instructions Received: 02/06/20
Date Analysis Completed: 12/06/20

Prepared by:

Sophie France
Client Service Manager

Approved by:

John Gustafson
Managing Director

Envirolab Job Number: 20/04352

Client Project Name: Greenway

Client Project Ref: 563166

Lab Sample ID	20/04352/1	20/04352/2	20/04352/3	20/04352/4	20/04352/5			Units	Limit of Detection	Method ref
Client Sample No	101	102	101	102	103					
Client Sample ID	BH5	BH5	BH6	BH6	BH6					
Depth to Top	0.50	0.90	0.20	0.40	0.70					
Depth To Bottom										
Date Sampled	27-May-20	27-May-20	27-May-20	27-May-20	27-May-20					
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES					
Sample Matrix Code	6	6	6AE	6E	6					
% Moisture at <40C$_A$	16.8	17.2	13.9	14.4	14.9			% w/w	0.1	A-T-044
% Stones >10mm$_A$	<0.1	<0.1	1.8	<0.1	<0.1			% w/w	0.1	A-T-044
pH$_D$$^{M\#}$	7.99	7.76	7.57	7.83	7.71			pH	0.01	A-T-031s
Sulphate (acid soluble)$_D$$^{M\#}$	210	<200	640	420	<200			mg/kg	200	A-T-028s
Cyanide (total)$_A$$^{M\#}$	<1	<1	<1	<1	<1			mg/kg	1	A-T-042sTCN
Sulphide$_A$	17	13	<5	<5	9			mg/kg	5	A-T-S2-s
Loss on ignition (550degC)$_D$$^{M\#}$	4.3	4.3	10.4	5.4	4.5			% w/w	0.6	A-T-030s
Organic matter$_D$$^{M\#}$	0.6	0.4	6.0	2.6	0.4			% w/w	0.1	A-T-032 OM
Total Organic Carbon$_D$$^{M\#}$	0.34	0.20	3.49	1.49	0.23			% w/w	0.03	A-T-032s
Arsenic$_D$$^{M\#}$	<1	<1	3	6	<1			mg/kg	1	A-T-024s
Boron (water soluble)$_D$$^{M\#}$	<1.0	<1.0	<1.0	<1.0	<1.0			mg/kg	1	A-T-027s
Cadmium$_D$$^{M\#}$	<0.5	<0.5	<0.5	<0.5	<0.5			mg/kg	0.5	A-T-024s
Copper$_D$$^{M\#}$	11	20	25	13	21			mg/kg	1	A-T-024s
Chromium$_D$$^{M\#}$	37	47	37	34	51			mg/kg	1	A-T-024s
Lead$_D$$^{M\#}$	15	16	40	24	15			mg/kg	1	A-T-024s
Mercury$_D$	<0.17	<0.17	<0.17	<0.17	<0.17			mg/kg	0.17	A-T-024s
Nickel$_D$$^{M\#}$	17	35	27	16	47			mg/kg	1	A-T-024s
Selenium$_D$$^{M\#}$	<1	<1	<1	<1	<1			mg/kg	1	A-T-024s
Zinc$_D$$^{M\#}$	46	54	71	49	59			mg/kg	5	A-T-024s
EPH Total (>C10-C40)$_A$$^{\#}$	<10	<10	34	48	<10			mg/kg	10	A-T-007s
Chromium (leachable)$_A$$^{\#}$	<1	<1	<1	2	<1			µg/l	1	A-T-025w
Chromium (hexavalent) (leachable)$_A$	<0.05	<0.05	<0.05	<0.05	<0.05			mg/l	0.05	A-T-040w
Chromium (trivalent) (leachable)	<0.05	<0.05	<0.05	<0.05	<0.05			mg/l	0.05	Calc

Envirolab Job Number: 20/04352

Client Project Name: Greenway

Client Project Ref: 563166

Lab Sample ID	20/04352/1	20/04352/2	20/04352/3	20/04352/4	20/04352/5			Units	Limit of Detection	Method ref
Client Sample No	101	102	101	102	103					
Client Sample ID	BH5	BH5	BH6	BH6	BH6					
Depth to Top	0.50	0.90	0.20	0.40	0.70					
Depth To Bottom										
Date Sampled	27-May-20	27-May-20	27-May-20	27-May-20	27-May-20					
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES					
Sample Matrix Code	6	6	6AE	6E	6					
Asbestos in Soil (inc. matrix) ^										
Asbestos in soil$_D^{\#}$	NAD	-	NAD	-	-					A-T-045
Asbestos ACM - Suitable for Water Absorption Test?$_D$	N/A	-	N/A	-	-					A-T-045
BTEX										
BTEX - Benzene$_A^{\#}$	<0.01	<0.01	<0.01	<0.01	<0.01			mg/kg	0.01	A-T-022s
BTEX - Toluene$_A^{\#}$	<0.01	<0.01	<0.01	<0.01	<0.01			mg/kg	0.01	A-T-022s
BTEX - Ethyl Benzene$_A^{\#}$	<0.01	<0.01	<0.01	<0.01	<0.01			mg/kg	0.01	A-T-022s
BTEX - m & p Xylene$_A^{\#}$	<0.01	<0.01	<0.01	<0.01	<0.01			mg/kg	0.01	A-T-022s
BTEX - o Xylene$_A^{\#}$	<0.01	<0.01	<0.01	<0.01	<0.01			mg/kg	0.01	A-T-022s
OCP+OPP Combined Pest Suite (incl. Atrazine and Simazine)										
Dichlobenil$_A$	-	-	<0.01	-	-			mg/kg	0.01	A-T-056
Tecnazene$_A$	-	-	<0.01	-	-			mg/kg	0.01	A-T-056
Trifluralin$_A$	-	-	<0.01	-	-			mg/kg	0.01	A-T-056
alpha-Hexachlorocyclohexane (HCH)$_A$	-	-	<0.01	-	-			mg/kg	0.01	A-T-056
Hexachlorobenzene (HCB)$_A$	-	-	<0.01	-	-			mg/kg	0.01	A-T-056
Simazine$_A$	-	-	<0.01	-	-			mg/kg	0.01	A-T-056
Atrazine$_A$	-	-	<0.01	-	-			mg/kg	0.01	A-T-056
beta-Hexachlorocyclohexane (HCH)$_A$	-	-	<0.01	-	-			mg/kg	0.01	A-T-056
Quintozene (PCNB)$_A$	-	-	<0.01	-	-			mg/kg	0.01	A-T-056
Chlorothalonil$_A$	-	-	<0.01	-	-			mg/kg	0.01	A-T-056
delta-Hexachlorocyclohexane (HCH)$_A$	-	-	<0.01	-	-			mg/kg	0.01	A-T-056
Triallate$_A$	-	-	<0.01	-	-			mg/kg	0.01	A-T-056
Heptachlor$_A$	-	-	<0.01	-	-			mg/kg	0.01	A-T-056
Aldrin$_A$	-	-	<0.01	-	-			mg/kg	0.01	A-T-056
Triadimefon$_A$	-	-	<0.01	-	-			mg/kg	0.01	A-T-056
Telodrin$_A$	-	-	<0.01	-	-			mg/kg	0.01	A-T-056
Isodrin$_A$	-	-	<0.01	-	-			mg/kg	0.01	A-T-056
Pendimethalin$_A$	-	-	<0.01	-	-			mg/kg	0.01	A-T-056
Heptachlor epoxide$_A$	-	-	<0.01	-	-			mg/kg	0.01	A-T-056
trans-Chlordane (Gamma)$_A$	-	-	<0.01	-	-			mg/kg	0.01	A-T-056

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Client Project Name: Greenway

Client Project Ref: 563166

Lab Sample ID	20/04352/1	20/04352/2	20/04352/3	20/04352/4	20/04352/5			Units	Limit of Detection	Method ref
Client Sample No	101	102	101	102	103					
Client Sample ID	BH5	BH5	BH6	BH6	BH6					
Depth to Top	0.50	0.90	0.20	0.40	0.70					
Depth To Bottom										
Date Sampled	27-May-20	27-May-20	27-May-20	27-May-20	27-May-20					
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES					
Sample Matrix Code	6	6	6AE	6E	6					
o,p-DDE (2,4)$_A$	-	-	<0.01	-	-			mg/kg	0.01	A-T-056
Endosulphan I (Alpha)$_A$	-	-	<0.01	-	-			mg/kg	0.01	A-T-056
cis-Chlordane (Alpha)$_A$	-	-	<0.01	-	-			mg/kg	0.01	A-T-056
p,p-DDE (4,4)$_A$	-	-	<0.01	-	-			mg/kg	0.01	A-T-056
Dieldrin$_A$	-	-	<0.01	-	-			mg/kg	0.01	A-T-056
o,p-DDD (2,4)$_A$	-	-	<0.01	-	-			mg/kg	0.01	A-T-056
Endrin$_A$	-	-	<0.01	-	-			mg/kg	0.01	A-T-056
Endosulphan II (Beta)$_A$	-	-	<0.01	-	-			mg/kg	0.01	A-T-056
p,p-DDD (4,4)$_A$	-	-	<0.01	-	-			mg/kg	0.01	A-T-056
o,p-DDT (2,4)$_A$	-	-	<0.01	-	-			mg/kg	0.01	A-T-056
Endrin Aldehyde$_A$	-	-	<0.01	-	-			mg/kg	0.01	A-T-056
Endrin Ketone$_A$	-	-	<0.01	-	-			mg/kg	0.01	A-T-056
Endosulphan Sulphate$_A$	-	-	<0.01	-	-			mg/kg	0.01	A-T-056
p,p-DDT (4,4)$_A$	-	-	<0.01	-	-			mg/kg	0.01	A-T-056
o,p-Methoxychlor$_A$	-	-	<0.01	-	-			mg/kg	0.01	A-T-056
p,p-Methoxychlor$_A$	-	-	<0.01	-	-			mg/kg	0.01	A-T-056
Permethrin I (cis)$_A$	-	-	<0.01	-	-			mg/kg	0.01	A-T-056
Permethrin II (trans)$_A$	-	-	<0.01	-	-			mg/kg	0.01	A-T-056
Dichlorvos$_A$	-	-	<0.01	-	-			mg/kg	0.01	A-T-056
Mevinphos$_A$	-	-	<0.01	-	-			mg/kg	0.01	A-T-056
Demeton-S$_A$	-	-	<0.50	-	-			mg/kg	0.5	A-T-056
Demeton-O$_A$	-	-	<0.50	-	-			mg/kg	0.5	A-T-056
Phorate$_A$	-	-	<0.01	-	-			mg/kg	0.01	A-T-056
Dimethoate$_A$	-	-	<0.01	-	-			mg/kg	0.01	A-T-056
Propetamphos$_A$	-	-	<0.01	-	-			mg/kg	0.01	A-T-056
Diazinon (Dimpylate)$_A$	-	-	<0.01	-	-			mg/kg	0.01	A-T-056
Disulfoton$_A$	-	-	<0.10	-	-			mg/kg	0.1	A-T-056
Etrimphos$_A$	-	-	<0.01	-	-			mg/kg	0.01	A-T-056
Chlorpyrifos-methyl$_A$	-	-	<0.01	-	-			mg/kg	0.01	A-T-056
Parathion (Ethyl Parathion)$_A$	-	-	<0.01	-	-			mg/kg	0.01	A-T-056
Methyl Parathion$_A$	-	-	<0.01	-	-			mg/kg	0.01	A-T-056
Pirimiphos-methyl$_A$	-	-	<0.01	-	-			mg/kg	0.01	A-T-056
Fenitrothion$_A$	-	-	<0.01	-	-			mg/kg	0.01	A-T-056
Fensulphothion$_A$	-	-	<0.01	-	-			mg/kg	0.01	A-T-056

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Client Project Name: Greenway

Client Project Ref: 563166

Lab Sample ID	20/04352/1	20/04352/2	20/04352/3	20/04352/4	20/04352/5			Units	Limit of Detection	Method ref
Client Sample No	101	102	101	102	103					
Client Sample ID	BH5	BH5	BH6	BH6	BH6					
Depth to Top	0.50	0.90	0.20	0.40	0.70					
Depth To Bottom										
Date Sampled	27-May-20	27-May-20	27-May-20	27-May-20	27-May-20					
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES					
Sample Matrix Code	6	6	6AE	6E	6					
Fenthion$_A$	-	-	<0.01	-	-			mg/kg	0.01	A-T-056
Malathion$_A$	-	-	<0.01	-	-			mg/kg	0.01	A-T-056
Chlorfenvinphos$_A$	-	-	<0.01	-	-			mg/kg	0.01	A-T-056
Chlorpyrifos$_A$	-	-	<0.01	-	-			mg/kg	0.01	A-T-056
Trichloronate$_A$	-	-	<0.01	-	-			mg/kg	0.01	A-T-056
Prothiofos (Tokuthion)$_A$	-	-	<0.01	-	-			mg/kg	0.01	A-T-056
Ethion$_A$	-	-	<0.01	-	-			mg/kg	0.01	A-T-056
Triazophos$_A$	-	-	<0.01	-	-			mg/kg	0.01	A-T-056
Sulprofos$_A$	-	-	<0.01	-	-			mg/kg	0.01	A-T-056
Carbophenothion$_A$	-	-	<0.01	-	-			mg/kg	0.01	A-T-056
Phosalone$_A$	-	-	<0.01	-	-			mg/kg	0.01	A-T-056
Azinphos-methyl$_A$	-	-	<0.01	-	-			mg/kg	0.01	A-T-056
Azinphos-ethyl$_A$	-	-	<0.01	-	-			mg/kg	0.01	A-T-056
Coumaphos$_A$	-	-	<0.01	-	-			mg/kg	0.01	A-T-056

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Client Project Ref: 563166

Lab Sample ID	20/04352/1	20/04352/2	20/04352/3	20/04352/4	20/04352/5			Units	Limit of Detection	Method ref
Client Sample No	101	102	101	102	103					
Client Sample ID	BH5	BH5	BH6	BH6	BH6					
Depth to Top	0.50	0.90	0.20	0.40	0.70					
Depth To Bottom										
Date Sampled	27-May-20	27-May-20	27-May-20	27-May-20	27-May-20					
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES					
Sample Matrix Code	6	6	6AE	6E	6					
PAH-16MS										
Acenaphthene$_A^{M\#}$	<0.01	<0.01	<0.01	<0.01	<0.01			mg/kg	0.01	A-T-019s
Acenaphthylene$_A^{M\#}$	<0.01	<0.01	<0.01	<0.01	<0.01			mg/kg	0.01	A-T-019s
Anthracene$_A^{M\#}$	<0.02	<0.02	0.03	<0.02	<0.02			mg/kg	0.02	A-T-019s
Benzo(a)anthracene$_A^{M\#}$	<0.04	<0.04	0.15	0.12	<0.04			mg/kg	0.04	A-T-019s
Benzo(a)pyrene$_A^{M\#}$	<0.04	<0.04	0.19	0.15	<0.04			mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene$_A^{M\#}$	<0.05	<0.05	0.21	0.15	<0.05			mg/kg	0.05	A-T-019s
Benzo(ghi)perylene$_A^{M\#}$	<0.05	<0.05	0.14	0.11	<0.05			mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene$_A^{M\#}$	<0.07	<0.07	0.10	0.08	<0.07			mg/kg	0.07	A-T-019s
Chrysene$_A^{M\#}$	<0.06	<0.06	0.23	0.19	<0.06			mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene$_A^{M\#}$	<0.04	<0.04	<0.04	<0.04	<0.04			mg/kg	0.04	A-T-019s
Fluoranthene$_A^{M\#}$	<0.08	<0.08	0.35	0.28	<0.08			mg/kg	0.08	A-T-019s
Fluorene$_A^{M\#}$	<0.01	<0.01	<0.01	<0.01	<0.01			mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene$_A^{M\#}$	<0.03	<0.03	0.14	0.11	<0.03			mg/kg	0.03	A-T-019s
Naphthalene $_A^{M\#}$	<0.03	<0.03	<0.03	<0.03	<0.03			mg/kg	0.03	A-T-019s
Phenanthrene$_A^{M\#}$	<0.03	<0.03	0.14	0.12	<0.03			mg/kg	0.03	A-T-019s
Pyrene$_A^{M\#}$	<0.07	<0.07	0.31	0.25	<0.07			mg/kg	0.07	A-T-019s
Total PAH-16MS$_A^{M\#}$	<0.08	<0.08	1.99	1.56	<0.08			mg/kg	0.01	A-T-019s
Phenols (speciated HPLC)										
Phenol$_A$	<0.2	<0.2	<0.2	<0.2	<0.2			mg/kg	0.2	A-T-050s
Cresols$_A$	<0.2	<0.2	<0.2	<0.2	<0.2			mg/kg	0.2	A-T-050s
Xylenols$_A$	<0.2	<0.2	<0.2	<0.2	<0.2			mg/kg	0.2	A-T-050s
Resorcinol$_A$	<0.2	<0.2	<0.2	<0.2	<0.2			mg/kg	0.2	A-T-050s
Phenols - Total by HPLC$_A$	<0.2	<0.2	<0.2	<0.2	<0.2			mg/kg	0.2	A-T-050s

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Client Project Name: Greenway

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Lab Sample ID	20/04352/1	20/04352/2	20/04352/3	20/04352/4	20/04352/5			Units	Limit of Detection	Method ref
Client Sample No	101	102	101	102	103					
Client Sample ID	BH5	BH5	BH6	BH6	BH6					
Depth to Top	0.50	0.90	0.20	0.40	0.70					
Depth To Bottom										
Date Sampled	27-May-20	27-May-20	27-May-20	27-May-20	27-May-20					
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES					
Sample Matrix Code	6	6	6AE	6E	6					
Speciated PCB-EC7										
PCB BZ $28_A^{M\#}$	<0.002	<0.002	<0.002	<0.002	<0.002			mg/kg	0.002	A-T-004s
PCB BZ $52_A^{M\#}$	<0.002	<0.002	<0.002	<0.002	<0.002			mg/kg	0.002	A-T-004s
PCB BZ $101_A^{M\#}$	<0.004	<0.004	<0.004	<0.004	<0.004			mg/kg	0.004	A-T-004s
PCB BZ $118_A^{M\#}$	<0.007	<0.007	<0.007	<0.007	<0.007			mg/kg	0.007	A-T-004s
PCB BZ $138_A^{M\#}$	<0.006	<0.006	<0.006	<0.006	<0.006			mg/kg	0.006	A-T-004s
PCB BZ $153_A^{M\#}$	<0.004	<0.004	<0.004	<0.004	<0.004			mg/kg	0.004	A-T-004s
PCB BZ $180_A^{M\#}$	<0.004	<0.004	<0.004	<0.004	<0.004			mg/kg	0.004	A-T-004s
Total Speciated PCB-$EC7_A^{M\#}$	<0.007	<0.007	<0.007	<0.007	<0.007			mg/kg	0.002	A-T-004s

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Lab Sample ID	20/04352/1	20/04352/2	20/04352/3	20/04352/4	20/04352/5			Units	Limit of Detection	Method ref
Client Sample No	101	102	101	102	103					
Client Sample ID	BH5	BH5	BH6	BH6	BH6					
Depth to Top	0.50	0.90	0.20	0.40	0.70					
Depth To Bottom										
Date Sampled	27-May-20	27-May-20	27-May-20	27-May-20	27-May-20					
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES					
Sample Matrix Code	6	6	6AE	6E	6					
TPH CWG										
Ali >C5-C6$_A^{\#}$	-	-	<0.01	-	-			mg/kg	0.01	A-T-022s
Ali >C6-C8$_A^{\#}$	-	-	<0.01	-	-			mg/kg	0.01	A-T-022s
Ali >C8-C10$_A$	-	-	<1	-	-			mg/kg	1	A-T-055s
Ali >C10-C12$_A^{M\#}$	-	-	<1	-	-			mg/kg	1	A-T-055s
Ali >C12-C16$_A^{M\#}$	-	-	<1	-	-			mg/kg	1	A-T-055s
Ali >C16-C21$_A^{M\#}$	-	-	1	-	-			mg/kg	1	A-T-055s
Ali >C21-C35$_A$	-	-	21	-	-			mg/kg	1	A-T-055s
Total Aliphatics$_A$	-	-	22	-	-			mg/kg	1	A-T-055s
Aro >C5-C7$_A^{\#}$	-	-	<0.01	-	-			mg/kg	0.01	A-T-022s
Aro >C7-C8$_A^{\#}$	-	-	<0.01	-	-			mg/kg	0.01	A-T-022s
Aro >C8-C10$_A$	-	-	2	-	-			mg/kg	1	A-T-055s
Aro >C10-C12$_A^{M\#}$	-	-	<1	-	-			mg/kg	1	A-T-055s
Aro >C12-C16$_A$	-	-	2	-	-			mg/kg	1	A-T-055s
Aro >C16-C21$_A^{M\#}$	-	-	11	-	-			mg/kg	1	A-T-055s
Aro >C21-C35$_A^{M\#}$	-	-	49	-	-			mg/kg	1	A-T-055s
Total Aromatics$_A$	-	-	64	-	-			mg/kg	1	A-T-055s
TPH (Ali & Aro >C5-C35)$_A$	-	-	87	-	-			mg/kg	1	A-T-055s
MTBE$_A^{\#}$	-	-	<0.01	-	-			mg/kg	0.01	A-T-022s