

Plots 3, 4 and 5, Ashroyd Business Park, Hoyland

Phase 2 Site Investigation Report

S180236

Wm Saunders

Solmek Ltd
12 Yarm Road
Stockton-on-Tees
TS18 3NA
Tel: 01642 607083
Fax: 01642 612355
http://www.solmek.com

PHASE 2 SITE INVESTIGATION REPORT

PLOTS 3, 4 AND 5, ASHROYD BUSINESS PARK, HOYLAND

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Revision	Date	Prepared By	Signed
Final	April 2018	A Cutts *Senior Engineering Geologist*	
		Checked By	
		D Simpson *Principal Geotechnical Engineer*	
		Approved By	
		D Simpson *Principal Geotechnical Engineer*	

1 EXECUTIVE SUMMARY

Site Address	Ashroyd Business Park, Hoyland, Barnsley, S74 9SB.
Fieldwork	• 13no. cable percussive boreholes (BH1 to BH13) drilled to a max. depth of 6.20mbgl. • 6no. gas pipes (BH1, BH4, BH6, BH9, BH10 and BH12). • 23no. machine excavated trial pits (TP1 to TP23) to a maximum depth of 2.30mbgl. • 21no machine Plate Bearing Tests (PBT) at depths of between 0.30mbgl and 0.60mbgl. • Insitu CBR testing with a Farnell Probe along with geotechnical and contamination sampling.
Ground Conditions	*Plot 3* • Made ground ranged from 0.20mbgl to 5.40mbgl and was proven to deepen towards the north comprising clayey, sandy and gravelly topsoil to 0.30mbgl. Beneath this and over the remainder of the area firm and stiff consistency slightly sandy slightly gravelly medium and high strength clay fill was encountered. • The natural deposits consist of stiff and very stiff consistency slightly sandy to sandy slightly gravelly high to very high strength clay encountered at depths of between 0.30mbgl and 3.80mbgl. The clay was absent within TP1, TP3, TP4, TP7 and BH4. • Sandstone and weathered sandstone strata was encountered from depths of between 0.20mbgl and 5.40mbgl generally recovered as a clayey sandy gravel. Completely weathered mudstone was encountered in TP6 between 2.40mbgl and 2.60mbgl recovered as clayey sandy gravel. *Plot 4* • Made ground ranged from 0.20mbgl to 3.00mbgl proven to deepen towards the north and west. Topsoil to 0.30mbgl overlies the remainder of the made ground comprising clay fill described above. • The natural deposits consist of stiff consistency slightly sandy to sandy slightly gravelly medium to high strength clay from ground surface in TP19 and BH11, from 0.30mbgl in BH12 and 2.10mbgl in TP21. • Completely weathered mudstone and mudstone bedrock was encountered from depths of between 0.20mbgl and 3.00mbgl. *Plot 5* • Made ground ranged in depth from 0.60mbgl to 1.80mbgl but deepen towards the north comprising topsoil to 0.30mbgl over clay fill, described above. Cobbles were also noted within the trial pits. • The natural deposits generally consist of firm to very stiff consistency slightly sandy to sandy slightly gravelly medium to high strength clay to depths of up to 4.20mbgl. • Completely weathered mudstone and mudstone bedrock was encountered between 1.50mbgl and 4.20mbgl. • During fieldwork groundwater was not encountered across the entire site.
Contamination Testing Results	• 11no. samples were subject to a suite of metals, semi-metals, non-metals and inorganic determinants including spectated PAH, TPH CWG and asbestos. • No raised levels of contaminants detected, and no asbestos fibres were present. • Acidic pH was recorded (5.2).
Contamination Analysis	• No long term risk to human health from the samples subject to testing. • The levels of contamination are unlikely to pose a risk to construction workers provided appropriate PPE and dust control measures are adopted. • The general risk to controlled waters is considered low. • Topsoil on site to be reused, subject to further testing, as part of a clean cover system. • For utility supply pH precludes the use of wrapped steel and copper pipes. • Sub surface concrete should be designed to DS-1 ACEC (Class AC-2z). However, the soil around TP17, if not locally removed from the area, will require Class DS-1, ACEC (Class AC-3z).
Ground Gas Assessment	• Ongoing site monitoring. • The site is not in a Radon Affected Area and radon protection is not required.
Geotechnical Testing Results	• Triaxial testing in cohesive material indicate 4kPa-124kPa (very low to high strength clays). • SPTs of 29 to 50 in weathered mudstone (145 to 250kPa, high to very high strength conditions). • Cohesive strata have a medium volume change potential and Plot 5 a high volume change potential. • Moisture contents between 8.9 and 36%. • pH acidic to slightly alkaline and low sulphates. • The coefficient of volume compressibility (m_v) for the pressure range 0-50kPa and 50-100kPa was 0.005m^2/MN and 0.0036m^2/MN respectively.
Geotechnical Analysis& Foundation Recommendations	• Plot 3 - requires a combination of pads or piles or alternatively piles and a reinforced pseudo raft. • Plot 4 - A 2m^2 pad foundation placed on competent mudstone at depths of up to 1.80mbgl assuming a conservative strength of 125kN/m^2, calculates a bearing capacity of over 300kN/m². • Plot 5 - A 2m^2 pad foundation placed on natural medium to high strength clay at a minimum depth of 1.00mbgl assuming a conservative strength of 75kN/m^2, calculates a bearing capacity of over 180kN/m². • Provided the safe bearing capacity is not exceeded, settlements are calculated to be less than 25mm. • Adopt CBR of 2% for hardstanding design. Compaction of material in layers to Series 600 “Specification of Earthworks”. • Based on the ground conditions encountered, excavations should be within the capacity of normal earthworks plant, although larger plant may be required for ripping through competent bedrock.

2 INTRODUCTION

2.1 Authorisation

Solmek were instructed by William Saunders to undertake a site investigation on a parcel of land at Ashroyd Business Park, Hoyland near Barnsley, South Yorkshire, S74 9SB. A drawing showing the position of the site is included in Appendix A (Figure 1).

Sources of information, including previous work undertaken at the site, are detailed below:

- *Plot 5, Ashroyd Business Park, Hoyland, Barnsley, Wm Saunders Phase 1 Geo-Environmental Report (11717-WMS-ZZ-XX-RP-C-30901-S2-P1-PHASE_1_REPORT, March 2018)*

Reference should be made to the above report for details of the site's history, mining, environmental/contamination setting and expected underlying geological conditions.

2.2 Scope of Works

The proposed development comprises a series of industrial units, hardstanding parking areas and service yards. It is assumed that areas of soft landscape are proposed along the peripheries of each plot.

A site investigation comprising geotechnical and contamination analysis was requested. A ground gas risk assessment was also requested.

The fieldwork and testing was generally carried out according to the recommendations of BS5930: 2015 "Code of Practice for Ground Investigations" and all stratum descriptions are as recommended in that publication. The information provided in this report is based on the investigation fieldwork and is subject to the comments and approval of the various regulatory authorities.

There may be other conditions prevailing on the site which have not been disclosed by this investigation and which have not been taken into account by this report. Solmek reserve the right to alter conclusions and recommendations should further information be available or provided. Any schematic representation or opinion of the possible configuration of ground conditions between exploratory holes is conjectural and given for guidance only and confirmation of intermediate ground conditions should be considered if deemed necessary.

3 SITE DESCRIPTION AND FIELDWORK

The area of investigation comprises the southern section of a large disused parcel of land within Ashroyd Business Park, Hoyland near Barnsley, South Yorkshire at approximate OS Grid Ref 436517E, 401160N. The site is divided into three areas relating to the plot numbers proposed. The plots exhibit a general level topography which is inconsistent with the surrounding area which shows a sloping profile from the south towards the north.

Plot 3 lies in the west of the area beyond an existing access road. This comprises approximately 6.35 acres of undeveloped land covered by a thick scrub vegetation and reeds. The site displays a general undulating profile and was covered with areas of standing water. The access road adjacent to the eastern boundary of the plot falls slightly for the south to the north such that access to the southern part of the site is at road level however the northern part of the plot is raised above road level along an embankment.

Plot 5 lies along the southern boundary of the area and is accessed from the same road as Plot 3 although the entrance to this plot is raised. This comprises approximately 4.96 acres of undeveloped land covered by a thick scrub vegetation and reeds. The site displays a general undulating profile and was covered with areas of standing water.

Plot 4 is present to the north east of Plot 5 at the corner of Tinsley Road to the south and Ryecroft Bank along the eastern boundary. This is largely a square parcel of land comprising approximately 3.37 acres of undeveloped land covered by a thick scrub vegetation and reeds. The site displays a general undulating profile and was covered with areas of standing water.

The site lies within an area of primarily commercial/industrial usage, with industrial units observable to the immediate north and east. The A6195 (Dearne Valley Parkway) lies further to the north of the site, with housing along Upper Hoyland Road, Hawshaw Lane and Hawshaw Bank to the south.

3.1 Fieldwork

The fieldwork was carried out commencing on 26th February 2018 and comprised:

- 13no. cable percussive boreholes (BH1 to BH13 inclusive) drilled to a maximum depth of 6.20m below ground level (bgl).
    - The boreholes were positioned to target the proposed location of the units, provide general coverage and information to determine the local ground conditions.
    - In-situ standard penetration tests (SPT) were undertaken within the cable percussive boreholes
- Installation of 6no. ground gas and groundwater monitoring pipes in selected boreholes (BH1, BH4, BH6, BH9, BH10 and BH12).
    - Installations placed to capture potential ground gas from made ground, determine groundwater levels and obtain groundwater samples for analysis if encountered.
- 23no. machine excavated trial pits (TP1 to TP23 inclusive) to a maximum depth of 2.30mbgl.
    - The rationale for the positioning of the trial pits was to accurately appraise the shallow ground conditions and retrieve soil samples for contamination analysis.
    - Provide a wide coverage of the site to observed localised variations of ground materials.
    - Insitu hand shear vanes were undertaken within the trial pits.
- 21no. Plate Bearing Tests at depths of between 0.30mbgl and 0.60mbgl. In addition insitu CBR testing was undertaken within selected trial pits at depths of between 0.20mbgl and 0.60mbgl using a Farnell Probe.
    - To determine a suitable CBR value for the proposed design of service yards and parking areas.

Descriptions of the strata encountered in the boreholes and trial pits together with details of sampling and groundwater are presented in Appendix B of this report. Photographs of the trial pits are included within Appendix B.

A plans showing the location of all the exploratory positions undertaken can be found in Appendix A, Figure 2.

4 GROUND CONDITIONS

A summary of the ground conditions encountered is given below. Prior to the development of the Business Park the site underwent earthworks during the late 1990's to the mid 2000's, placing up to 6.00m of compacted cohesive fill material. The depth of fill material varies considerably across the three plots and therefore each plot has been discussed separately.

4.1 Plot 3 (TP's 1-10 Inclusive and BH's 1-4 Inclusive)

4.1.1 *Made Ground*

The depth of made ground ranged from 0.20mbgl in TP's 1, 3, 4 and 7 to 5.40mbgl in BH4. Generally, the made ground was proven to deepen towards the northern sections of the area which coincides with the fill depths from the earthworks operations.

The western two thirds of the site generally comprised a surface of clayey, sandy and gravelly topsoil to a maximum depth of 0.30mbgl. Beneath this and over the remainder of the area; made ground comprising firm and stiff consistency slightly sandy slightly gravelly medium and high strength clay fill with sandstone, mudstone and siltstone fragments was proven.

The base of the made ground was not proven in TP8 or TP9 at depths of 2.50mbgl and 2.40mbgl respectively.

4.1.2 *Natural Ground*

The natural deposits generally consist of stiff and very stiff consistency slightly sandy to sandy slightly gravelly high to very high strength clay with sandstone fragments. This was encountered below the clay fill at depths of between 0.30mbgl in TP2 and 3.80mbgl in BH1. The clay was absent within TP1, TP3, TP4 and TP7 at the base of the made ground and also in the north eastern corner of the plot at the base of the deepest made ground (BH4), where clayey sandy gravel was found.

4.1.3 *Solid Geology*

Sandstone and weathered sandstone strata was encountered from depths of between 0.20mbgl (TP1, 3, 4 and TP7) and 5.40mbgl (BH4). This was generally recovered as a clayey sandy gravel of sandstone. The completely weathered zones had a maximum thickness of 1.40m (BH2) and within the more competent bedrock 0.40m (TP2).

Completely weathered mudstone was encountered in TP6 between 2.40mbgl and 2.60mbgl. This was recovered as clayey sandy gravel.

4.1.4 *Groundwater*

Groundwater was not encountered within the boreholes or trial pits during the fieldwork.

It should be noted the rapid rate of advancement of the exploratory holes may mask minor seepages and it should be borne in mind that water levels fluctuate with a number of influences including season, rainfall, dewatering and pumping activities.

4.2 Plot 4 (TP's 18-23 Inclusive and BH's 10-13 Inclusive)

4.2.1 *Made Ground*

The depth of made ground ranged from 0.20mbgl in TP's 20, 22 and 23 to 3.00mbgl in BH10. Generally, the made ground was proven to deepen towards the northern and western sections of the area which coincides with the fill depths from the earthworks operations. The made ground was generally much shallower than in Plot 3.

The site generally comprised a surface of clayey, sandy and gravelly topsoil to a maximum depth of 0.30mbgl (TP18, BH12 and BH13). This overlies the remainder of the made ground comprising initially soft then firm and stiff consistency slightly sandy slightly gravelly medium and high strength clay fill with sandstone, coal, mudstone and siltstone fragments.

4.2.2 *Natural Ground*

The natural deposits generally consist of stiff consistency slightly sandy to sandy slightly gravelly medium to high strength clay with sandstone and mudstone fragments. This was encountered from ground surface in TP19 and BH11, from 0.30mbgl in BH12 and 2.10mbgl in TP21.

4.2.3 *Solid Geology*

Completely weathered mudstone and mudstone bedrock was encountered across the site from depths of between 0.20mbgl in TP's 20, 22 and 23 and 3.00mbgl in BH10. The completely weathered zones, comprising very stiff consistency gravelly clay and clayey gravel had a maximum thickness of 1.50m (BH13) and within the more competent bedrock 0.30m (TP18).

4.2.4 *Groundwater*

Groundwater was not encountered within the boreholes or trial pits during the fieldwork.

It should be noted the rapid rate of advancement of the exploratory holes may mask minor seepages and it should be borne in mind that water levels fluctuate with a number of influences including season, rainfall, dewatering and pumping activities.

4.3 Plot 5 (TP's 11-17 Inclusive and BH's 5-9 Inclusive)

4.3.1 *Made Ground*

The depth of made ground across this area was more consistent ranging in depth from 0.60mbgl in TP13 to 1.80mbgl in BH5. Generally, the made ground was proven to deepen towards the northern area which coincides with the fill depths from the earthworks operations.

The site generally comprised a surface of clayey, sandy and gravelly topsoil to a maximum depth of 0.30mbgl (TP12-14 inclusive). This overlies the remainder of the made ground comprising initially soft then firm and stiff consistency slightly sandy slightly gravelly medium and high strength clay fill with sandstone, coal, mudstone and siltstone fragments. Cobble size fragments of sandstone, siltstone and mudstone were also noted within the trial pits.

4.3.2 *Natural Ground*

The natural deposits generally consist of firm to very stiff consistency slightly sandy to sandy slightly gravelly medium to high strength clay with sandstone and mudstone fragments. This was encountered beneath the made ground in the majority of the exploratory positions to depths of up to 4.20mbgl in BH6.

4.3.3 *Solid Geology*

Completely weathered mudstone and mudstone bedrock was encountered across the site from depths of between 1.50mbgl in TP17 and 4.20mbgl in BH6. The completely weathered zones, comprising very stiff consistency gravelly clay and clayey gravel had a maximum thickness of 1.80m (BH7) and within the more competent bedrock 1.00m (BH6).

4.3.4 *Groundwater*

Groundwater was not encountered.

It should be noted the rapid rate of advancement of the exploratory holes may mask minor seepages and it should be borne in mind that water levels fluctuate with a number of influences including season, rainfall, dewatering and pumping activities.

5 CONTAMINATION TESTING RESULTS

The proposed development comprises a series of industrial units, hardstanding parking areas and service yards. It is assumed that areas of soft landscape are proposed along the peripheries of each plot. The chemical test results are presented in Appendix C.

5.1 Contamination Testing and Rationale

To provide information upon the possibility of ground contamination eleven samples comprising nine made ground and two natural ground were selected for shallow contamination testing. The end use is a less sensitive commercial development, with limited soft landscaping. The following samples were therefore considered appropriate for testing:

- BH1, 1.65-1.70m (MADE GROUND: Clay fill)
- TP2, 0.00-0.20m (MADE GROUND: Topsoil)
- TP8, 0.40-0.50m (MADE GROUND: Clay fill)
- TP10, 0.40-0.50m (MADE GROUND: Clay fill)
- TP11, 0.50-0.60m (MADE GROUND: Clay fill)
- TP14, 0.00-0.20m (MADE GROUND: Topsoil)
- TP15, 0.00-0.50m (MADE GROUND: Clay fill)
- TP17, 0.80-1.10m (MADE GROUND: Clay fill)
- TP18, 0.60-0.80m (Mudstone GRAVEL)
- TP21, 0.00-0.20m (MADE GROUND: Clay fill)
- TP23, 0.50-0.60m (Mudstone GRAVEL)

The samples selected are considered to provide coverage of the various types of made ground and natural deposits encountered during the site investigation which are likely to be encountered during the future site development by construction workers.

The scope of testing included:

- 11no Metals, semi-metals, non-metals, inorganic determinands
- 11no Asbestos identification screenings
- 11no Speciated Polyaromatic Hydrocarbons (PAHs)
- 11no Total Petroleum Hydrocarbon Criteria Working Group fractions (TPH CWG)

5.2 Test Results

Based on the proposed development at the site, the test results have been compared to a series of Land Quality Management (LQM) Suitable for Use Levels (S4UL) based on a commercial development. These are the most up to date thresholds published in December 2014. Where S4ULs are absent the EA CLEA model (May 2011) has been used to generate commercial development thresholds for selected inorganic determinants. The value for lead has been compared with the Category 4 Screening Level (March 2014) developed by Contaminated Land: Applications In Real Environments (CL:AIRE). The test results are presented in Appendix C, and a summary is provided below in Tables 1 and 2 with values above the threshold highlighted.

TABLE 1: SUMMARY OF INORGANIC CONTAMINATION TESTING RESULTS (COMMERCIAL)

Determinand	Units	Number of Samples above Level of Detection	Minimum Level	Maximum Level	Commercial Value	Number of Results Exceeding Threshold Value
Metals						
Cadmium	mg/kg	3	<0.2	0.3	190	0
Chromium	mg/kg	11	31	47	8600	0
Copper	mg/kg	11	26	55	68000	0
Lead	mg/kg	11	15	49	2300*	0
Mercury	mg/kg	0	<0.5	-	1100	0
Nickel	mg/kg	11	24	51	980	0
Zinc	mg/kg	11	79	182	730000	0
Semi-Metals						
Arsenic	mg/kg	11	4.6	13	640	0
Boron	mg/kg	3	<0.5	0.8	240000	0
Selenium	mg/kg	11	0.8	1.6	12000	0
Inorganic chemicals						
Cyanide	mg/kg	0	<1	-	1580**	0
W.S. Sulphate	mg/l	11	12	343	2000^	0
Other						
pH	pH	11	5.2	8.4	5.5^	1

* Category 4 Screening Levels, March 2014
** CLEA Software Version 1.06 (pH7 and 1%SOM)
^ EA Threshold Values

5.3 Metals, Semi Metals and Non-Metals

From the eleven samples tested, no elevated concentrations of metals, semi-metal or non-metals were recorded above the relevant thresholds for long term risk to human health.

5.4 Inorganic Chemicals

Soluble sulphates (potentially aggressive to foundation concrete) were recorded between 12 and 343mg/l, below the EA Lower Tier of 2000mg/l. The results of the pH testing were between 5.2 and 8.4. These pH levels indicate acidic to slightly alkaline conditions with one (from TP17, 0.80-1.10mbgl) below the EA threshold value.

5.5 Organic Chemicals

The organic thresholds vary depending on the levels of organic matter content (OMC). The average OMC

recorded across the site was 1.29% therefore an OMC of 1% has been used to determine the S4UL thresholds. Table 2, below, summarises the results.

TABLE 2: SUMMARY OF ORGANIC CONTAMINATION TESTING RESULTS (COMMERCIAL)

Determinand	Units	Number of Samples above LOD	Minimum Level	Maximum Level	S4UL 1% OMC	S4UL 2.5% OMC	S4UL 6% OMC	Number of Results Exceeding Threshold Value
TPH Aliphatic Fractions								
C5-6	mg/kg	0	<0.1	-	**3200**	5900	12000	0
C6-8	mg/kg	2	<0.1	0.1	**77800**	17000	40000	0
C8-10	mg/kg	1	<0.1	0.1	**2000**	4800	11000	0
C10-12	mg/kg	2	<4	5	**9700**	23000	47000	0
C12-16	mg/kg	5	<4	7	**59000**	82000	90000	0
C16-35	mg/kg	6	<10	21	**1600000**	1700000	1800000	0
TPH Aromatic Fractions								
C5-7 (Benzene)	mg/kg	0	<0.01	-	**26000**	46000	86000	0
C7-8 (Toluene)	mg/kg	0	<0.01	-	**56000**	110000	180000	0
C8-10	mg/kg	0	<0.01	-	**3500**	8100	17000	0
C10-12	mg/kg	0	<1	-	**16000**	28000	34000	0
C12-16	mg/kg	0	<1	-	**36000**	37000	38000	0
C16-21	mg/kg	0	<1		**28000**	28000	28000	0
C21-35	mg/kg	0	<1		**28000**	28000	28000	0
PAH								
Naphthalene	mg/kg	0	<0.01	-	**190**	460	1100	0
Acenaphthylene	mg/kg	0	<0.01	-	**83000**	97000	100000	0
Acenaphthene	mg/kg	0	<0.01	-	**84000**	97000	100000	0
Fluorene	mg/kg	0	<0.01	-	**63000**	68000	71000	0
Phenanthrene	mg/kg	2	<0.02	0.03	**22000**	22000	23000	0
Anthracene	mg/kg	0	<0.02	-	**520000**	540000	540000	0
Fluoranthene	mg/kg	1	<0.02	0.03	**23000**	23000	23000	0
Pyrene	mg/kg	2	<0.02	0.06	**54000**	54000	54000	0
Benz' (a)anth' ene	mg/kg	0	<0.02	-	**170**	170	180	0
Chrysene	mg/kg	0	<0.01	-	**350**	350	350	0
Benz' (b)fluor' ene	mg/kg	0	<0.02	-	**44**	44	45	0
Benz' (k)fluor' ene	mg/kg	0	<0.02	-	**1200**	1200	1200	0
Benz' (a)pyrene	mg/kg	0	<0.02	-	**35**	35	36	0
Id' (123cd)pyrene	mg/kg	0	<0.02	-	**500**	510	510	0
Diben(ah)anth'ene	mg/kg	0	<0.02	-	**3.5**	3.6	3.6	0
Benz (ghi)per' ene	mg/kg	0	<0.02	-	**3900**	4000	4000	0
Total PAH	mg/kg	0	<0.27	-	**1000***	1000*	1000*	0
Other								
Phenol	mg/kg	0	<0.50	-	**760**	1500	3200	0
* *EA Threshold Values*								

In terms of PAH and TPH Aliphatic/Aromatic splits, the determinants were below LQM/CIEH S4UL threshold values from the samples subject to testing.

5.6 Asbestos

Eleven samples were selected for asbestos screening. No asbestos fibres were detected in the samples tested to date.

5.7 Environmental Protection Act 1990: Part 2A Revised Statutory Guidance (April 2012)

This revised document explains how the Local Authority should decide if land, based on a legal interpretation, is contaminated. The document replaces the previous guidance given in Annex 3 of DEFRA Circular 01/2006, issued in accordance with section 78YA of the 1990 Environmental Protection Act.

The main objectives of the Part 2A regime are to *"identify and remove unacceptable risks to human health and the environment" and* to *"seek to ensure that contaminated land is made suitable for its current use".* Part 2A uses a risk-based approach to defining contaminated land whereby the "risk" is interpreted as *"the likelihood that harm, or pollution of water, will occur as a result of contaminants in, on or under the land"* and by *"the scale and seriousness of such harm or pollution if it did occur".*

For a relevant risk to exist a contaminant, pathway and receptor linkage must be present before the land can

be considered to be contaminated. The document explains that *"for a risk to exist there must be contaminants present in, on or under the land in a form and quantity that poses a hazard, and one or more pathways by which they might significantly harm people, the environment, or property; or significantly pollute controlled waters."* See Appendix E for additional notes on contamination guidelines.

6 CONCEPTUAL MODEL AND CONTAMINATION ANALYSIS

The contamination conceptual model in Table 3 identifies the potential pollution linkages present on site based on source – pathway – receptor relationships in accordance with CIRIA C552.

TABLE 3: CONCEPTUAL MODEL

Source	Pathway	Receptor
Ground gas • Made ground up to 5.40mbgl. • Total Organic Carbon (TOC) <3.0%. • In Coal Mining area. • No Landfills within 500m • The site is not in a Radon Affected area.	**Ground gas migration** Through underlying soils and ingress into structures Underlying strata – cohesive fills over impermeable natural clay and mudstone/sandstone rockhead.	**Users of the site after development is complete** • Adults using area for short periods. • Site to be covered by hardstanding and proposed buildings. • Limited soft landscaping.
Contamination based on historic land use and testing to date • Site has remained undeveloped however collieries and associated infrastructure located to the north and east. • The collieries were removed by the late 1950's and 1960's. • Industrial units built from the late 1970's onwards to the east of the site. **Ground Conditions** • Topsoil over cohesive fill to depths of up to 5.40mbgl. • Natural clay with sandstone and mudstone fragments. • Weathered mudstone and sandstone rockhead proven at depths of between 0.20mbgl and 5.40mbgl. • No groundwater encountered. **Contamination Testing** • Low levels of metals, inorganics, PAH and TPHCWG from the samples tested to date. • No asbestos noted from the samples tested to date. • Concrete Class DS-1, ACEC (Class AC-2z). • Services: Aggressive pH.	Dermal absorption Inhalation of soils Soil ingestion Contaminated water contact Windblown dust contact	**Users of the site during development** • Construction workforce **Users of Immediate surrounding sites** • Commercial premises.
	Uptake via roots and leaf surfaces	**Vegetation** • Minimal soft landscaping.
	Slow seepage/leaching contaminants - (soils of low leaching potential) Low permeable natural clay deposits.	**Groundwater** • Secondary A Aquifer. • Site is not in a SPZ. • No groundwater abstractions near site. • No groundwater encountered.
	Slow seepage/leaching contaminants - (soils of low leaching potential) and Accumulation of contaminated sediments. Low permeable natural clay deposits.	**Surface water** • Drain located over 300m north east. • Drainage ditches around site.
	Direct contact	**Construction materials** • Concrete • Service fabric

Risk Classification

Very High	High	Moderate	Moderate/Low	Low	Very Low

In general terms the majority of receptors fall within the low risk category with a moderate to low risk for construction materials.

Mitigation measures to reduce the risks identified for reach receptor are discussed in the following sections. Full details of the tables used to assess consequence, likelihood and risk classification are presented in Appendix E.

6.1 Users of the Site Once Development is Complete

To establish if the levels of contaminants present on site may pose a risk to the health of the future users of the site the results of the contamination testing have been compared to a series of LQM S4UL and C4SL thresholds based on a commercial land use.

Contamination levels within the fill were below thresholds apart from locally acidic pH recorded within the clay fill from TP17 at a depth of 0.80-1.10mbgl. Based on the testing undertaken to date there appears to be no impact from the site's current land use. Therefore, given the site's proposed land use, limited soft landscaping and the fact that the area will be covered by the newly proposed structure and hardstanding the risk of future site users coming into contact with contaminated materials is low.

If any zones of odorous, brightly coloured or suspected contaminated ground are encountered then work should cease in that area until the material has been tested. The results of the tests will determine whether or not remediation will be required.

The current legislation on waste involves the categorization of materials into inert waste, non reactive hazardous wastes and hazardous wastes. The determination of the category depends on DEFRA landfill directive waste acceptance criteria (WAC) testing. Material taken off site may be subject to WAC by the appropriate waste disposal company.

6.2 Construction Workers and Users of Surrounding Sites

Short term human exposure to contaminants present in soils can occur via several pathways during the construction and ground works phase of the development. These include dermal absorption after contact with contaminated ground, inhalation of soil or dust (including windblown dust), inhalation of volatised compounds, inadvertent soil ingestion and contact with contaminated groundwater.

It is considered that the made ground is unlikely to pose a significant risk to construction workers providing that correct PPE is employed. It is recommended that appropriate PPE in accordance with HSE and Environment Agency guidance is adopted for the duration of the contractor works. Dust control measures should be adopted to minimise the release of potential contaminants during ground works and minimise the spread to surrounding sites.

Although asbestos was not detected from the soil samples subjected to testing within this investigation, the possibility exists that asbestos containing materials may still be present on site and currently lie undetected. It is therefore advised that a 'watching brief' is undertaken during the initial site strip and any excavation works and advice sought if asbestos is found or suspected.

6.3 Vegetation

Plants can be affected by soil contamination in a number of ways resulting in growth inhibition, nutrient deficiencies and yellowing of leaves. Contaminants are taken up by plants through the roots and through foliage. Contaminants identified as being highly phytotoxic include boron, cadmium, copper, nickel, and zinc.

To establish if the levels of contaminants present on site may pose a risk to vegetation the results of the contamination testing have been compared to a series of threshold values published in "*Code of Good Agricultural Practice for the Protection of Soil"*. No raised phytotoxic determinands were detected.

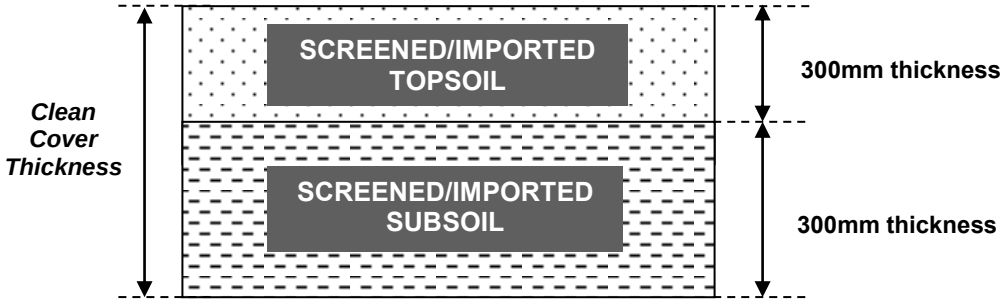
A clean cover is recommended to break pathways between the made ground and future site users. During the initial site strip, proposed soft landscaped areas should be excavated to 0.60mbgl or natural ground (whichever is the shallowest). Any deleterious materials encountered (i.e. brick rubble, ash and concrete) should be placed beneath areas of permanent hardcover or removed from site.

The topsoil testing undertaken to date is sufficient to initially assess the end use of the material for proposed soft landscaped areas. However, given the size of the proposed development, prior to undertaking a Phase 3 Remediation Statement for the scheme we would recommend undertaking a series of targeted topsoil only tests to fully assess if it can be reused in proposed soft landscaped areas on site.

The clean cover system should include on site screened topsoil to a depth of 300mm over screened site-won clean clay fill subsoil to 300mm.

Any proposed soft landscaping will require validation and appropriate certification would be required to ensure that the onsite or imported materials are clean and free from deleterious materials in accordance with the Local Authority Guidelines '*Verification Requirements for Cover Systems, Technical Guidance for developers, Landowners and Consultants'* (Yorkshire and Lincolnshire Pollution Advisory Group Version 3.4 – November 2017). Details of the clean cover system must be presented in a Phase 3 Remediation Statement.

The diagram below gives an overview of the minimum thicknesses of clean cover system that should be placed by the site operatives in soft landscaped areas.



6.4 Ground and Surface Water

The principal pathway by which soil contamination may reach the water environment is through a slow seepage or leaching to groundwater or surface water. The potential for contaminants to migrate along such pathways is dependent on the chemical and physical characteristics of the contaminants and the local hydrogeology.

No groundwater was recorded within the cable percussive boreholes and no groundwater was recorded within the trial pits.

Given the generally low soil contamination concentrations within the made ground coupled with the general lack of groundwater; the development is considered to represent a low risk to groundwater receptors.

6.5 Construction Materials and Water Service Pipes

Materials at risk from potential soil contamination include inorganic matrices such as cement and concrete and also organic material; e.g. plastics and rubbers. Acid ground conditions and elevated levels of sulphates can accelerate the corrosion of building materials. Plastics and rubbers are generally used for piping and service ducts and are potentially attacked by a range of chemicals, most of which are organic, particularly petroleum-based substances. Drinking water supplies can be tainted by substances that can penetrate piping and water companies enforce stringent threshold values.

Concrete Classification

BRE Special Digest One: *"Concrete in Aggressive Ground"*: 2005 3rd Edition has been used to assess the risks posed to underground concrete and to establish the design measures required to mitigate the risks. The results of the pH and sulphate tests generally fall into Class DS-1, ACEC (Class AC-2z) requirements for concrete protection assuming mobile groundwater conditions.

However, the area around TP17 indicates acidic pH at depths of between 0.80-1.10mbgl within the made ground which, if not locally removed from the area, will require Class DS-1, ACEC (Class AC-3z) for

concrete protection assuming mobile groundwater conditions.

Water Supply Pipes Material Selection

The levels of potential contaminants should be compared to thresholds supplied in the UK Water Industry Research (UKWIR) publication "Guidance for the selection of Water Supply Pipes to be used in Brownfield Sites" (January 2011). A Brownfield Site is defined in the document as "Land or premises that have previously been used or developed that may be vacant or derelict". It should be noted that Brownfield sites may not be contaminated. The guidance does not apply to Greenfield Sites however water companies may have their own assessment criteria which should be checked by the developer.

The concentrations of the selected determinants should be compared to the pipe material selection table in Appendix E and consultation with the appropriate water supply company is required to identify the most suitable service fabric. Alkaline and acidic pH precludes the use of copper pipes and wrapped steel pipes respectively.

7 GROUND GAS ASSESSMENT

Ground gas monitoring is currently underway and this will be reported as an addendum to this report.

8 GEOTECHNICAL TESTING AND ANALYSIS

Samples taken from the boreholes and trial pits underwent a series of geotechnical tests (BS 1377:1990) to aid foundation design and soil description. In addition, in-situ SPT and hand shear vanes were undertaken at regular intervals during drilling and trial pitting. The geotechnical results are presented in Appendix D.

8.1 Strength and Density

Nineteen samples were subject to quick 100/38mm undrained triaxial tests at depths of between 0.00 and 4.00mbgl. The tests produced shear strengths of between 4kPa (BH8, 2.00mbgl) and 124kPa (BH4, 4.00mbgl) indicative of very low and high strength ranges.

The layer of natural clay also gave SPT results of between 29 and 50. Using the rule of thumb that five times the SPT results gives an approximate shear strength values of 145kPa and 250kPa can be assumed which indicate high to very high strength clays. The latter tests were undertaken within the clay rich weathered mudstone zone.

Insitu hand shear vanes recorded within the natural clay ranged from 65 to 140kPa indicating medium to high strength conditions.

8.2 Consolidation and Compressibility

One sample of natural clay was selected for one dimensional consolidation testing at a depth of 4.00mbgl from BH4. Testing was undertaken in five stages at incremental pressure increases from 0-50kPa, 100kPa and 200kPa up to 400kPa, with an unload of 200kPa in stage five. The coefficient of volume compressibility (m_v) for the pressure range 0-50kPa and 50-100kPa was 0.005m^2/MN and 0.0036m^2/MN respectively.

The remainder of the results for each pressure increment and pressure unloads can be seen in Appendix D, with m_v values decreasing with increasing pressure and over the unload stage.

8.3 Moisture Contents

Thirty-three samples recovered from the boreholes and trial pits were subject to moisture content tests to determine the moisture at depths of 0.00mbgl and 5.45mbgl. Moisture levels were between 8.9% and 36%.

8.4 Atterberg Limit Determinations

Twenty cohesive samples were subject to Atterberg Limit Determination tests to classify the fine-grained soils. The results were compared to the Casagrande Chart published in BS 5930 and showed the samples to be clay of low to high plasticity. One sample from TP10 between 1.10mbgl and 1.20mbgl was an intermediate plasticity silt.

The Plasticity Indices were between 10 and 47 with the equivalent moisture contents recorded above the corresponding plastic limits. Two samples showed some degree of desiccation in BH12, 0.50-0.60mbgl and TP19, 0.00-0.40mbgl where the equivalent moisture contents were recorded below the corresponding plastic limits.

The majority of cohesive material across the site can generally be assessed as having a **medium** shrinkage potential with **high** shrinkage over Plot 5, in relation to NHBC Guidance Chapter 4.2.

8.5 pH and Sulphate Results

Twenty-five samples were tested for acidity and soluble sulphate content to assess whether the material may be potentially aggressive to building fabric. The results of the testing for pH were between 5.6 and 8.8 indicating acidic to slightly alkaline conditions. The soluble sulphates were between <10 and 354mg/l.

8.6 Particle Size Distribution Testing

Twelve samples of materials at depths of between 0.00 to 4.45mbgl were subject to Particle Size Distribution (PSD) testing in accordance with BS1377 Part 2 to aid soil descriptions.

8.7 CBR Tests

The PBT CBR results at depths of 0.30mbgl ranged from 1.25% to 8.91% and at 0.60mbgl they ranged from 1.55% to 3.86%.

The Farnell probe CBR results were comparable with the plate bearing test results. At depths of between 0.20mbgl and 0.30mbgl the CBR results ranged from 1.20% to 8.90% and at 0.60mbgl they ranged from 1.50% to 3.90%.

This variability in density and consistency of materials would indicate a conservative equilibrium CBR of 2.0% to be adopted for hardstanding design on the site.

The formation level should first be proof rolled prior to placing the sub base. Compacting the material in layers to Series 600 “Specification of Earthworks”. Further CBR testing should then be undertaken to ensure that suitable compaction has taken place.

8.8 Mining

A mining report was issued with the desk study from Plot 5. It stated that nine seams of coal had been worked with the shallowest being at a depth of 120.00mbgl. The last date of working was 1976 and all settlements should now have stopped. There are no mine entries in the vicinity.

The mining report indicated that there was coal near the surface which may have been worked in the past. The South Yorkshire Mining Advisory Service (SYMAS) indicated that there was an outcrop in the vicinity. During the redevelopment and reshaping of the area from the late 1990’s, no coal was encountered at the surface and no coal was encountered in boreholes sunk within the area of the assumed shallow seam to a depth of 12.00mbgl.

8.9 Foundations

Given the variability of fill depths across the three plots each plot has been discussed separately for foundation options.

8.9.1 *Plot 3*

The deepest areas of clay fill were recorded across this plot and over the northern section of the building footprint depths of up to 3.80mbgl were achieved. This overlies weathered sandstone where SPT N values increased to between 29 and 50 (indicating refusal). Towards the south of the building footprint the sandstone rockhead profile shallows to between 0.70mbgl and 1.60mbgl.

The proposed development is assumed to be of typical construction with structural loads assumed to be moderate to high. It would therefore be prudent to extend foundations to the weathered sandstone across the building footprint and deepening the foundations accordingly towards the northern boundary. A combination of pad and mini piled foundations could be adopted for this plot. Alternatively piling within the northern section could be adopted then placing a pseudo raft on top of the piles with southern the edge of the raft being placed upon competent shallow rock. Reinforcement of the raft would be required to compensate potential differential settlement given this variable depth of fill across the building footprint.

8.9.2 *Plot 4*

The clay fill was recorded across this plot at relatively shallow consistent depth up to 0.30mbgl. This overlies weathered mudstone to depths of 1.80mbgl, where refusal was reached.

The proposed development is assumed to be of typical construction with column loads assumed to be up to 675kN. It would therefore be prudent to extend foundations to the weathered mudstone at depths of up to 1.80mbgl.

A $2m^2$ pad foundation placed on competent mudstone assuming a conservative strength of $125kN/m^2$, calculates a bearing capacity of over $300kN/m^2$. This would be more than adequate to accommodate the loads specified.

8.9.3 *Plot 5*

The clay fill was recorded across this plot at relatively consistent depth up to depths of 1.80mbgl. This overlies generally stiff consistency medium to very high strength clay over weathered mudstone and sandstone.

The proposed development is assumed to be of typical construction with column loads assumed to be up to 200kN. It would therefore be prudent to extend foundations to the natural clay at a minimum depth of 1.00mbgl.

A $2m^2$ pad foundation placed on the natural medium to high strength clay assuming a conservative strength of $75kN/m^2$, calculates a bearing capacity of over $180kN/m^2$. This would be more than adequate to accommodate the loads specified.

8.9.4 *General*

Providing the safe bearing capacity is not exceeded settlements have been calculated to be less than 25mm.

It should be recognised that clay rich soils can deteriorate fairly rapidly on exposure, particularly in periods of wet weather and frost. It would be prudent to protect all exposed soils in foundation excavations with a concrete blinding layer, particularly if they are likely to remain open for extended period of time

Prior to placing foundation concrete, obvious soft or loose spots should be removed and replaced with suitably recompacted hardcore or lean mix concrete. In addition, all excavations should be inspected to ensure that they fully penetrate areas of disturbed ground.

BRE Special Digest One: *"Concrete in Aggressive Ground"*: 2005 3rd Edition has been used to assess the risks posed to underground concrete and to establish the design measures required to mitigate the risks. The results of the pH and sulphate tests fall into Class DS-1, ACEC (Class AC-2z) requirements for concrete protection assuming mobile groundwater conditions.

However, the area around TP17 indicates acidic pH at depths of between 0.80-1.10mbgl within the made

ground which, if not locally removed from the area, will require Class DS-1, ACEC (Class AC-3z) for concrete protection assuming mobile groundwater conditions.

Further advice should be sought from Solmek if unexpected ground conditions are encountered during redevelopment.

8.10 Excavation

Based on the nature of the ground conditions encountered, excavations should be within the capacity of normal earthworks plant, although larger plant may be required for ripping through competent bedrock. Stability of excavations will be moderate to poor in the made ground but should improve in the natural clay and rock underlying the site. Excavation sides should be designed, constructed and supported in accordance with the recommendations given in CIRIA Report No. 97: “Trenching Practice”.

8.11 Groundwater

Groundwater was not encountered during fieldwork.

It should be noted the rapid rate of advancement of the exploratory holes may mask minor seepages and it should be borne in mind that water levels fluctuate with a number of influences including season, rainfall, dewatering and pumping activities. Therefore, water levels significantly higher than those found during this investigation may be encountered.

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APPENDIX A



SOLMEK
12-16 Yarm Road, Stockton on Tees, TS18 3NA
Tel: 01642 607083 Email: info@solmek.com

Figure Title

Site Location Plan

Project Number

S180236

Project Name

Plots 3-5, Ashroyd Business Park

Client

William Saunders

Date

April 2018

DRG Number

Figure 1

Scale

1:6500 @ A4 [DO NOT SCALE]

Legend Key

Project Bounds - Project Bounds



SOLMEK
12-16 Yarm Road, Stockton on Tees, TS18 3NA
Tel: 01642 607083 Email: info@solmek.com

Figure Title

BH/TP Location Plan

Project Number

S180236

Project Name

Plots 3-5, Ashroyd Business Park

Client

William Saunders

Date

April 2018

DRG Number

Figure 2

Scale

1:3000 @ A4 [DO NOT SCALE]

Legend Key

- Locations By Type - CP
- Locations By Type - TP
- Project Bounds - Project Bounds

APPENDIX B

SOLMEK

Cable Percussive Log

Scale 1:50 Sheet 1 of 1

BH01

Contract no:	S180236	**Site:**	Plots 3-5, Ashroyd Business Park	**Driller:**	Bainbridge Brothers Ltd
				Plant used:	Dando 2000
				Started:	28/02/2018
Client:	William Saunders			**Ended:**	28/02/2018
Method:	Cable Percussive			**Backfilled:**	28/02/2018

GL (AOD):	
Easting:	436330
Northing:	401290
Logged:	AC
Status:	FINAL

Backfill / Installation	Legend	Depth (m)	Level (m AOD)	Stratum Description	Samples and Insitu Testing		
					Depth (m)	Type	Results
				MADE GROUND: Brown clayey sandy slightly gravelly topsoil.			
		0.20		MADE GROUND: Stiff consistency grey slightly sandy slightly gravelly medium strength clay fill of low plasticity. Gravel is angular to sub rounded fine to coarse of sandstone and mudstone. Soft at 3.00mbgl.	0.20 - 0.30	ES	
					0.50 - 0.60	B	
					1.20 - 1.65	B	35 blows
					1.20 - 1.65	U	
					1.65 - 1.70	ES	
					2.00 - 2.45	SPT (S)	N=14 (1,2/1,3,4,6)
					2.00 - 2.45	B + D	
					3.00 - 3.45	SPT (S)	N=14 (1,1/3,4,3,4)
					3.00 - 3.45	B + D	
		3.80		Stiff consistency grey slightly sandy slightly gravelly high strength CLAY. Gravel is angular to sub rounded fine to coarse sandstone. (Completely weathered SANDSTONE).	4.00 - 4.45	SPT (S)	N=29 (4,4/6,9,10,4)
					4.00 - 4.45	B + D	
					5.00 - 5.08	SPT (S)	N=50+ (25 for 20mm/50 for 65mm)
		5.20		End of Borehole at 5.200m	5.00 - 5.20	D	

Hole Diameter		Casing Depths		General Remarks
Depth Base (m)	Diameter (mm)	Depth Base (m)	Diameter (mm)	
5.20	95	5.20	100	1.2m hand dug trial pit. No groundwater encountered. Gas standpipe installed on completion.

Chiselling		
From (m)	To (m)	Time (hr)
3.80	5.00	01:30

Ground Water				
Depth Strike (m)	Depth Casing (m)	Depth Sealed (m)	Time Elapsed (min)	Water Level (m)

SOLMEK

Cable Percussive Log

Scale 1:50 Sheet 1 of 1

BH02

Contract no:	S180236	**Site:**	Plots 3-5, Ashroyd Business Park	**Driller:**	Bainbridge Brothers Ltd
				Plant used:	Dando 2000
				Started:	28/02/2018
Client:	William Saunders			**Ended:**	28/02/2018
Method:	Cable Percussive			**Backfilled:**	28/02/2018

GL (AOD):	
Easting:	436367
Northing:	401262
Logged:	AC
Status:	FINAL

Backfill / Installation	Legend	Depth (m)	Level (m AOD)	Stratum Description	Samples and Insitu Testing		
					Depth (m)	Type	Results
				MADE GROUND: Brown clayey sandy slightly gravelly topsoil.			
		0.20		MADE GROUND: Stiff consistency grey slightly sandy slightly gravelly high strength clay fill of low plasticity. Gravel is angular to sub rounded fine to coarse of sandstone and mudstone.	0.20 - 0.30	B	
					0.50 - 0.60	B	
					1.20 - 1.65	B	30 blows
					1.20 - 1.65	U	
					1.65 - 1.70	B	
					2.00 - 2.45	SPT (S)	N=22 (2,4/4,5,6,7)
					2.00 - 2.45	B + D	
		2.80		Stiff consistency brown slightly sandy slightly gravelly high strength CLAY. Gravel is angular to sub rounded fine to coarse sandstone and mudstone.	3.00 - 3.45	SPT (S)	N=31 (3,5/5,7,9,10)
					3.00 - 3.45	B + D	
		3.80		Light brown clayey sandy angular GRAVEL of weathered sandstone. (Completely weathered SANDSTONE).	4.00 - 4.38	SPT (S)	N=50+ (9,10/12,15,19,4 for 10mm)
					4.00 - 4.45	B + D	
					5.00 - 5.11	SPT (S)	N=50+ (25 for 40mm/50 for 65mm)
		5.20		End of Borehole at 5.200m	5.00 - 5.20	D	

Hole Diameter		Casing Depths		General Remarks
Depth Base (m)	Diameter (mm)	Depth Base (m)	Diameter (mm)	
5.20	95	5.20	100	1.2m hand dug trial pit. No groundwater encountered. Borehole backfilled on completion.

Chiselling		
From (m)	To (m)	Time (hr)
3.80	5.00	01:30

Ground Water				
Depth Strike (m)	Depth Casing (m)	Depth Sealed (m)	Time Elapsed (min)	Water Level (m)

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Cable Percussive Log

Scale 1:50 Sheet 1 of 1

BH03

Contract no:	S180236	**Site:**	Plots 3-5, Ashroyd Business Park	**Driller:**	Bainbridge Brothers Ltd
				Plant used:	Dando 2000
				Started:	28/02/2018
Client:	William Saunders			**Ended:**	28/02/2018
Method:	Cable Percussive			**Backfilled:**	28/02/2018

GL (AOD):		
Easting:	436383	
Northing:	401296	
Logged:	AC	
Status:	FINAL	

Backfill / Installation	Legend	Depth (m)	Level (m AOD)	Stratum Description	Samples and Insitu Testing		
					Depth (m)	Type	Results
				MADE GROUND: Brown clayey sandy slightly gravelly topsoil.	0.20 - 0.30	B	
		0.30		MADE GROUND: Stiff consistency brown with grey mottling sandy gravelly medium strength clay fill. Gravel is angular to sub rounded fine to coarse of mudstone, sandstone.	0.50 - 0.60	B	
					1.20 - 1.65	SPT (S)	N=9 (1,2/2,2,2,3)
					1.20 - 1.65	B + D	
					2.00 - 2.45	B	55 blows
					2.00 - 2.45	B + D	
					2.00 - 2.50	U	
		2.90		Stiff consistency grey sandy gravelly very high strength CLAY. Gravel is angular to sub rounded fine to coarse sandstone. (Completely weathered SANDSTONE).	3.00 - 3.44	SPT (S)	N=50+
					3.00 - 3.45	D	(4,8/10,12,15,13 for 65mm)
					4.00 - 4.16	SPT (S)	N=50+ (20,5 for
		4.20		End of Borehole at 4.200m	4.00 - 4.20	B	10mm/50 for 70mm)

Hole Diameter		Casing Depths		General Remarks
Depth Base (m)	Diameter (mm)	Depth Base (m)	Diameter (mm)	
4.20	95	4.20	100	1.2m hand dug trial pit. No groundwater encountered. Borehole backfilled on completion.

Chiselling		
From (m)	To (m)	Time (hr)
2.90	4.00	01:00

Ground Water				
Depth Strike (m)	Depth Casing (m)	Depth Sealed (m)	Time Elapsed (min)	Water Level (m)

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Cable Percussive Log

Scale 1:50 Sheet 1 of 1

BH04

Contract no:	S180236	**Site:**	Plots 3-5, Ashroyd Business Park	**Driller:**	Bainbridge Brothers Ltd
				Plant used:	Dando 2000
				Started:	01/03/2018
Client:	William Saunders			**Ended:**	01/03/2018
Method:	Cable Percussive			**Backfilled:**	01/03/2018

GL (AOD):	
Easting:	436437
Northing:	401273
Logged:	AC
Status:	FINAL

Backfill / Installation	Legend	Depth (m)	Level (m AOD)	Stratum Description	Samples and Insitu Testing		
					Depth (m)	Type	Results
				MADE GROUND: Brown clayey sandy slightly gravelly topsoil.			
		0.20		MADE GROUND: Stiff consistency brown mottled grey sandy gravelly high strength clay fill of low plasticity. Gravel is angular to sub rounded fine to coarse of sandstone and mudstone. Very soft at 1.20mbgl.	0.20 - 0.30	B	
					0.50 - 0.60	B	
					1.20 - 1.65	SPT (S)	N=22 (1,2/5,5,5,7)
					1.20 - 1.65	B + D	
					2.00 - 2.45	B	75 blows
					2.00 - 2.45	U	
					2.65 - 2.70	B	
					3.00 - 3.45	SPT (S)	N=30 (3,5/6,6,9,9)
					3.00 - 3.45	B	
					4.00 - 4.45	U	55 blows
					4.45 - 4.50	B	
					5.00 - 5.45	SPT (S)	N=25 (3,4/6,5,6,8)
					5.00 - 5.45	B + D	
		5.40		Light brown clayey sandy angular GRAVEL of weathered sandstone. (Completely weathered SANDSTONE).			
					6.00 - 6.08	SPT (S)	N=50+ (25 for
		6.20			6.00 - 6.20	D	40mm/50 for 40mm)
				End of Borehole at 6.200m			

Hole Diameter		Casing Depths		General Remarks	Chiselling			Ground Water				
Depth Base (m)	Diameter (mm)	Depth Base (m)	Diameter (mm)		From (m)	To (m)	Time (hr)	Depth Strike (m)	Depth Casing (m)	Depth Sealed (m)	Time Elapsed (min)	Water Level (m)
6.20	95	6.20	100	1.2m hand dug trial pit. No groundwater encountered. Gas standpipe installed on completion.	5.40	6.00	01:00					

SOLMEK

Cable Percussive Log

Scale 1:50 Sheet 1 of 1

BH05

Contract no:	S180236	**Site:**	Plots 3-5, Ashroyd Business Park	**Driller:**	Bainbridge Brothers Ltd
				Plant used:	Dando 2000
				Started:	27/02/2018
Client:	William Saunders			**Ended:**	27/02/2018
Method:	Cable Percussive			**Backfilled:**	27/02/2018

GL (AOD):		
Easting:	436494	
Northing:	401180	
Logged:	AC	
Status:	FINAL	

Backfill / Installation	Legend	Depth (m)	Level (m AOD)	Stratum Description	Samples and Insitu Testing		
					Depth (m)	Type	Results
				MADE GROUND: Light brown clayey sandy slightly gravelly topsoil.			
		0.20		MADE GROUND: Stiff consistency brown mottled grey sandy gravelly low to high strength clay fill of low plasticity. Gravel is angular to sub rounded fine to coarse of sandstone and mudstone.	0.20 - 0.30	B	
					0.50 - 0.60	B	
					1.20 - 1.65	SPT (S)	N=23 (3,5/5,2,8,8)
					1.20 - 1.65	B + D	
		1.80		Stiff consistency grey sandy gravelly very high strength CLAY. Gravel is angular to sub rounded fine to coarse sandstone. Becoming very gravelly with depth. (Completely weathered SANDSTONE).	2.00 - 2.37	SPT (S)	N=50+ (10,10/15,16,19 for 70mm)
					2.00 - 2.45	B + D	
					3.00 - 3.22	SPT (S)	N=50+ (25 for 30mm/50 for 40mm)
		3.20		End of Borehole at 3.200m	3.00 - 3.20	D	

Hole Diameter		Casing Depths		General Remarks
Depth Base (m)	Diameter (mm)	Depth Base (m)	Diameter (mm)	
3.20	95	3.20	100	1.2m hand dug trial pit. No groundwater encountered. Borehole backfilled on completion.

Chiselling		
From (m)	To (m)	Time (hr)
1.80	3.00	01:00

Ground Water				
Depth Strike (m)	Depth Casing (m)	Depth Sealed (m)	Time Elapsed (min)	Water Level (m)

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Cable Percussive Log

Scale 1:50 Sheet 1 of 1

BH06

Contract no:	S180236	**Site:**	Plots 3-5, Ashroyd Business Park	**Driller:**	Bainbridge Brothers Ltd
				Plant used:	Dando 2000
				Started:	26/02/2018
Client:	William Saunders			**Ended:**	26/02/2018
Method:	Cable Percussive			**Backfilled:**	26/02/2018

GL (AOD):	
Easting:	436540
Northing:	401173
Logged:	AC
Status:	FINAL

Backfill / Installation	Legend	Depth (m)	Level (m AOD)	Stratum Description	Samples and Insitu Testing		
					Depth (m)	Type	Results
		0.10		MADE GROUND: Light brown sandy gravelly clay fill. (wet from surface water)			
				MADE GROUND: Firm consistency brown mottled grey sandy gravelly low to high strength clay fill. Gravel is angular to sub rounded fine to coarse of sandstone and mudstone.	0.20 - 0.30	B	
					0.50 - 0.60	B	
		1.20		Stiff consistency brown sandy slightly gravelly medium to high strength CLAY of medium plasticity. Gravel is angular to sub rounded fine to coarse sandstone and mudstone.	1.20 - 1.65	SPT (S)	N=17 (2,2/3,5,5,4)
					1.20 - 1.65	B + D	
					2.00 - 2.45	SPT (S)	N=14 (2,1/2,2,3,7)
					2.00 - 2.45	B + D	
					3.00 - 3.45	SPT (S)	N=8 (1,1/1,3,2,2)
					3.00 - 3.45	B + D	
	G				4.00 - 4.45	SPT (S)	N=26 (2,3/5,5,7,9)
					4.00 - 4.45	B + D	
		4.20		Brown grey clayey sandy angular gravel of mudstone. (Completely weathered MUDSTONE).	5.00 - 5.10	SPT (S)	N=50+ (20,5 for
		5.20		End of Borehole at 5.200m	5.00 - 5.20	D	10mm/45,5 for 10mm)

Hole Diameter		Casing Depths		General Remarks
Depth Base (m)	Diameter (mm)	Depth Base (m)	Diameter (mm)	
5.20	95	5.20	100	1.2m hand dug trial pit. No groundwater encountered. Gas standpipe installed on completion.

Chiselling		
From (m)	To (m)	Time (hr)
4.20	5.00	01:00

Ground Water				
Depth Strike (m)	Depth Casing (m)	Depth Sealed (m)	Time Elapsed (min)	Water Level (m)

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Cable Percussive Log

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BH07

Contract no:	S180236	**Site:**	Plots 3-5, Ashroyd Business Park	**Driller:**	Bainbridge Brothers Ltd
				Plant used:	Dando 2000
				Started:	26/02/2018
Client:	William Saunders			**Ended:**	26/02/2018
Method:	Cable Percussive			**Backfilled:**	26/02/2018

GL (AOD):	
Easting:	436572
Northing:	401131
Logged:	AC
Status:	FINAL

Backfill / Installation	Legend	Depth (m)	Level (m AOD)	Stratum Description	Samples and Insitu Testing		
					Depth (m)	Type	Results
				MADE GROUND: Firm consistency light yellow brown sandy slightly gravelly low strength clay fill of medium plasticity. Gravel is angular to sub rounded sandstone, siltstone and mudstone.	0.20 - 0.30	B	
					0.50 - 0.60	B	
		0.70		Very stiff consistency dark grey brown slightly sandy slightly gravelly CLAY. Gravel is subangular to sub rounded fine to coarse of mudstone. Becoming gravelly with depth. (Completely weathered MUDSTONE).	1.20 - 1.64 1.20 - 1.65	SPT (S) B + D	N=50+ (3,7/10,12,15,13 for 60mm)
					2.00 - 2.15 2.00 - 2.20	SPT (S) D	N=50+ (25 for 60mm/40,10 for 20mm)
		2.50		End of Borehole at 2.500m			

Hole Diameter		Casing Depths		General Remarks	Chiselling			Ground Water				
Depth Base (m)	Diameter (mm)	Depth Base (m)	Diameter (mm)		From (m)	To (m)	Time (hr)	Depth Strike (m)	Depth Casing (m)	Depth Sealed (m)	Time Elapsed (min)	Water Level (m)
2.50	95	2.50	100	1.2m hand dug trial pit. No groundwater encountered. Borehole backfilled on completion.	1.30	2.00	01:00					

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Cable Percussive Log

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BH08

Contract no:	S180236	**Site:**	Plots 3-5, Ashroyd Business Park	**Driller:**	Bainbridge Brothers Ltd
				Plant used:	Dando 2000
				Started:	26/02/2018
Client:	William Saunders			**Ended:**	26/02/2018
Method:	Cable Percussive			**Backfilled:**	26/02/2018

GL (AOD):	
Easting:	436622
Northing:	401151
Logged:	AC
Status:	FINAL

Backfill / Installation	Legend	Depth (m)	Level (m AOD)	Stratum Description	Samples and Insitu Testing		
					Depth (m)	Type	Results
				MADE GROUND: Light brown clayey sandy slightly gravelly topsoil.			
		0.20		MADE GROUND: Firm consistency brown mottled grey sandy gravelly clay fill. Gravel is angular to sub rounded fine to coarse of sandstone and mudstone.	0.20 - 0.30	B	
					0.50 - 0.60	B	
		1.00		Firm consistency brown sandy slightly gravelly very low to medium strength CLAY of medium plasticity. Gravel is angular to sub rounded fine to coarse sandstone and mudstone.	1.20 - 1.65	SPT (S)	N=13 (1,2/2,3,3,5)
					1.20 - 1.65	B + D	
		2.00		Dark grey brown very clayey slightly sandy angular fine to coarse GRAVEL of mudstone. (Completely weathered MUDSTONE).	2.00 - 2.45	SPT (S)	N=31 (3,3/5,7,9,10)
					2.00 - 2.45	B + D	
					2.80 - 2.86	SPT (S)	N=50+ (25 for 20mm/50 for 40mm)
		2.90		End of Borehole at 2.900m	2.80 - 2.90	B + D	

Hole Diameter		Casing Depths		General Remarks
Depth Base (m)	Diameter (mm)	Depth Base (m)	Diameter (mm)	
2.90	95	2.90	100	1.2m hand dug trial pit. No groundwater encountered. Borehole backfilled on completion.

Chiselling		
From (m)	To (m)	Time (hr)
2.60	2.80	00:30

Ground Water				
Depth Strike (m)	Depth Casing (m)	Depth Sealed (m)	Time Elapsed (min)	Water Level (m)

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Cable Percussive Log

Scale 1:50 Sheet 1 of 1

BH09

Contract no:	S180236	**Site:**	Plots 3-5, Ashroyd Business Park	**Driller:**	Bainbridge Brothers Ltd
				Plant used:	Dando 2000
				Started:	27/02/2018
Client:	William Saunders			**Ended:**	27/02/2018
Method:	Cable Percussive			**Backfilled:**	27/02/2018

GL (AOD):		
Easting:	436614	
Northing:	401184	
Logged:	AC	
Status:	FINAL	

Backfill / Installation	Legend	Depth (m)	Level (m AOD)	Stratum Description	Samples and Insitu Testing		
					Depth (m)	Type	Results
				MADE GROUND: Firm consistency brown mottled grey sandy gravelly low strength clay fill. Gravel is angular to sub rounded fine to coarse of sandstone and mudstone.	0.20 - 0.30	B	
					0.50 - 0.60	B	
					1.20 - 1.65	SPT (S)	N=7 (1,1/1,1,2,3)
					1.20 - 1.65	B + D	
		1.65		Stiff consistency brown sandy slightly gravelly very high strength CLAY of medium plasticity. Gravel is angular to sub rounded fine to coarse sandstone and mudstone.	2.00 - 2.45	B	60 blows
					2.00 - 2.45	U	
					2.45 - 2.50	B	
					3.00 - 3.45	SPT (S)	N=48
					3.00 - 3.45	B + D	(6,10/10,9,15,14)
		3.30		Dark grey brown very clayey slightly sandy angular fine to coarse GRAVEL of mudstone. (Completely weathered MUDSTONE).	3.50 - 3.66	SPT (S)	N=50+ (20,5 for
G		3.60		End of Borehole at 3.600m	3.50 - 3.60	D	10mm/45,5 for 5mm)

Hole Diameter		Casing Depths		General Remarks
Depth Base (m)	Diameter (mm)	Depth Base (m)	Diameter (mm)	
3.60	95	3.60	100	1.2m hand dug trial pit. No groundwater encountered. Gas standpipe installed on completion.

Chiselling		
From (m)	To (m)	Time (hr)
3.30	3.50	00:30

Ground Water				
Depth Strike (m)	Depth Casing (m)	Depth Sealed (m)	Time Elapsed (min)	Water Level (m)

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Cable Percussive Log

Scale 1:50 Sheet 1 of 1

BH10

Contract no:	S180236	**Site:**	Plots 3-5, Ashroyd Business Park	**Driller:**	Bainbridge Brothers Ltd
				Plant used:	Dando 2000
				Started:	01/03/2018
Client:	William Saunders			**Ended:**	01/03/2018
Method:	Cable Percussive			**Backfilled:**	01/03/2018

GL (AOD):	
Easting:	436631
Northing:	401294
Logged:	AC
Status:	FINAL

Backfill / Installation	Legend	Depth (m)	Level (m AOD)	Stratum Description	Samples and Insitu Testing		
					Depth (m)	Type	Results
				MADE GROUND: Firm consistency light yellow brown sandy slightly gravelly low to high strength clay fill of medium plasticity. Gravel is angular to sub rounded sandstone, siltstone and mudstone.	0.20 - 0.30	B	
					0.50 - 0.60	B	
					1.20	B	40 blows
					1.20 - 1.65	U	
					1.65 - 1.70	B	
					2.00 - 2.45	SPT (S)	N=24 (2,3/3,5,7,9)
					2.00 - 2.45	B + D	
		3.00		Very stiff consistency grey sandy gravelly very high strength CLAY. Gravel is angular to sub rounded fine to coarse mudstone. (Completely weathered MUDSTONE).	3.00 - 3.38	SPT (S)	N=50+
					3.00 - 3.45	B + D	(7,10/10,15,20,5 for 10mm)
					4.00 - 4.14	SPT (S)	N=50+ (25 for 70mm/50 for 65mm)
		4.20			4.00 - 4.20	D	
				End of Borehole at 4.200m			

Hole Diameter		Casing Depths		General Remarks
Depth Base (m)	Diameter (mm)	Depth Base (m)	Diameter (mm)	
4.20	95	4.20	100	1.2m hand dug trial pit. No groundwater encountered. Gas standpipe installed on completion.

Chiselling		
From (m)	To (m)	Time (hr)
3.00	4.00	01:00

Ground Water				
Depth Strike (m)	Depth Casing (m)	Depth Sealed (m)	Time Elapsed (min)	Water Level (m)

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Cable Percussive Log

Scale 1:50 Sheet 1 of 1

BH11

Contract no:	S180236	**Site:**	Plots 3-5, Ashroyd Business Park	**Driller:**	Bainbridge Brothers Ltd
				Plant used:	Dando 2000
				Started:	02/03/2018
Client:	William Saunders			**Ended:**	02/03/2018
Method:	Cable Percussive			**Backfilled:**	02/03/2018

GL (AOD):		
Easting:	436653	
Northing:	401270	
Logged:	AC	
Status:	FINAL	

Backfill / Installation	Legend	Depth (m)	Level (m AOD)	Stratum Description	Samples and Insitu Testing		
					Depth (m)	Type	Results
				Stiff consistency light brown to light grey slightly gravelly medium to high strength CLAY. Gravel is angular to sub rounded fine to coarse of mudstone siltstone and sandstone.	0.20 - 0.30	B	
					0.50 - 0.60	B	
		0.60		Brown very clayey slightly sandy angular fine to coarse GRAVEL of mudstone. (Completely weathered MUDSTONE).			
					1.20 - 1.31	SPT (S)	N=50+ (25 for 50mm/50 for 60mm)
		1.30		End of Borehole at 1.300m	1.20 - 1.30	D	

Hole Diameter		Casing Depths		General Remarks
Depth Base (m)	Diameter (mm)	Depth Base (m)	Diameter (mm)	
1.30	95	1.30	100	1.2m hand dug trial pit. No groundwater encountered. Borehole backfilled on completion.

Chiselling		
From (m)	To (m)	Time (hr)
0.50	1.20	01:00

Ground Water				
Depth Strike (m)	Depth Casing (m)	Depth Sealed (m)	Time Elapsed (min)	Water Level (m)

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Cable Percussive Log

Scale 1:50 Sheet 1 of 1

BH12

Contract no:	S180236	**Site:**	Plots 3-5, Ashroyd Business Park	**Driller:**	Bainbridge Brothers Ltd
				Plant used:	Dando 2000
				Started:	01/03/2018
Client:	William Saunders			**Ended:**	01/03/2018
Method:	Cable Percussive			**Backfilled:**	01/03/2018

GL (AOD):	
Easting:	436713
Northing:	401301
Logged:	AC
Status:	FINAL

Backfill / Installation	Legend	Depth (m)	Level (m AOD)	Stratum Description	Samples and Insitu Testing		
					Depth (m)	Type	Results
				MADE GROUND: Brown clayey sandy slightly gravelly topsoil.	0.20 - 0.30	B	
		0.30		Stiff consistency light brown to light grey slightly gravelly medium strength CLAY of medium plasticity. Gravel is angular to sub rounded fine to coarse of mudstone siltstone and sandstone.	0.50 - 0.60	B	
					1.20 - 1.65	SPT (S)	N=44 (3,7/9,10,10,15)
		1.30		Brown very clayey slightly sandy angular fine to coarse GRAVEL of mudstone. (Completely weathered MUDSTONE).	1.20 - 1.65	B + D	
					2.00 - 2.12	SPT (S)	N=50+ (25 for 65mm/50 for 60mm)
G		2.20		End of Borehole at 2.200m	2.00 - 2.20	D	

Hole Diameter		Casing Depths		General Remarks
Depth Base (m)	Diameter (mm)	Depth Base (m)	Diameter (mm)	
2.20	95	2.20	100	1.2m hand dug trial pit. No groundwater encountered. Gas standpipe installed on completion.

Chiselling		
From (m)	To (m)	Time (hr)
1.30	2.20	01:30

Ground Water				
Depth Strike (m)	Depth Casing (m)	Depth Sealed (m)	Time Elapsed (min)	Water Level (m)

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Cable Percussive Log

Scale 1:50 Sheet 1 of 1

BH13

Contract no:	S180236	**Site:**	Plots 3-5, Ashroyd Business Park	**Driller:**	Bainbridge Brothers Ltd
				Plant used:	Dando 2000
				Started:	02/03/2018
Client:	William Saunders			**Ended:**	02/03/2018
Method:	Cable Percussive			**Backfilled:**	02/03/2018

GL (AOD):	
Easting:	436723
Northing:	401271
Logged:	AC
Status:	FINAL

Backfill / Installation	Legend	Depth (m)	Level (m AOD)	Stratum Description	Samples and Insitu Testing		
					Depth (m)	Type	Results
				MADE GROUND: Brown clayey sandy slightly gravelly topsoil.	0.20 - 0.30	B	
		0.30		Brown very clayey slightly sandy angular fine to coarse GRAVEL of mudstone. (Completely weathered MUDSTONE).	0.50 - 0.60	B	
					1.20 - 1.29	SPT (S)	N=50+ (25 for
					1.20 - 1.30	D	50mm/50 for 40mm)
		1.80		End of Borehole at 1.800m			

Hole Diameter		Casing Depths		General Remarks
Depth Base (m)	Diameter (mm)	Depth Base (m)	Diameter (mm)	
1.80	95	1.80	100	1.2m hand dug trial pit. No groundwater encountered. Borehole backfilled on completion.

Chiselling		
From (m)	To (m)	Time (hr)
0.10	1.20	01:00

Ground Water				
Depth Strike (m)	Depth Casing (m)	Depth Sealed (m)	Time Elapsed (min)	Water Level (m)

Solmek Ltd
12 Yarm Road
Stockton on Tees
TS18 3NA
Tel: 01642 607083
Fax: 01642 612355

Trial Pit Log

TrialPit No
TP1
Sheet 1 of 1

Project Name:	Plots 3-5, Ashroyd Business Park	Project No. S180236	Co-ords: 436335E - 401204N Level:
Date	27/02/2018		
Plant Used:	JCB 3CX	Dimensions (m):	Scale 1:25
Client:	William Saunders	Depth 1.00	Logged SA

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.20 - 0.50 0.20 - 0.50 0.20	B ES CBR	6.0%	0.20			MADE GROUND: Brown clayey sandy slightly gravelly topsoil.
							Light brown clayey sandy angular GRAVEL of weathered sandstone. (Completely weathered SANDSTONE).
				0.80			Light brown SANDSTONE. Recovered as slightly clayey angular gravel.
				1.00			End of Pit at 1.00m

Remarks: No groundwater encountered

Stability: All sides stable.

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12 Yarm Road
Stockton on Tees
TS18 3NA
Tel: 01642 607083
Fax: 01642 612355

Trial Pit Log

TrialPit No
TP10
Sheet 1 of 1

Project Name:	Plots 3-5, Ashroyd Business Park	Project No. S180236	Co-ords: 436450E - 401211N Level:
Date	28/02/2018		
Plant Used:	JCB 3CX	Dimensions (m):	Scale 1:25
Client:	William Saunders	Depth 2.20	Logged SA

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.40 - 0.50 0.40 - 0.50	B ES					MADE GROUND: Firm consistency greyish brown slightly sandy slightly gravelly high strength clay fill of low plasticity. Gravel is angular to sub-angular fine to coarse of sandstone, siltstone, and mudstone.
	1.10 - 1.20	B		1.30			Stiff to very stiff consistency brown mottled grey slightly sandy slightly gravelly CLAY. Gravel is angular to sub angular fine to coarse of sandstone.
	1.80 - 2.00	B		2.20			End of Pit at 2.20m

Remarks: No groundwater encountered

Stability: All sides stable.

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12 Yarm Road
Stockton on Tees
TS18 3NA
Tel: 01642 607083
Fax: 01642 612355

Trial Pit Log

TrialPit No
TP11
Sheet 1 of 1

Project Name:	Plots 3-5, Ashroyd Business Park	Project No. S180236	Co-ords: 436500E - 401152N Level:
Date	28/02/2018		
Plant Used:	JCB 3CX	Dimensions (m):	Scale 1:25
Client:	William Saunders	Depth 2.40	Logged SA

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.50 - 0.60	B					MADE GROUND: Firm consistency greyish brown slightly sandy slightly gravelly clay fill of low plasticity. Gravel is angular to sub-angular fine to coarse of sandstone, siltstone, and mudstone.
	0.50 - 0.60	ES					
	1.00 - 1.20	B		1.10			
	1.50 - 1.60	B					Stiff to very stiff consistency brown mottled grey slightly sandy slightly gravelly CLAY of medium plasticity. Gravel is angular to sub angular fine to coarse of sandstone. Low strength at 1.50mbgl.
				2.40			End of Pit at 2.40m

1
2
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Remarks: No groundwater encountered

Stability: All sides stable.

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Fax: 01642 612355

Trial Pit Log

TrialPit No
TP12
Sheet 1 of 1

Project Name:	Plots 3-5, Ashroyd Business Park	Project No. S180236	Co-ords: 436524E - 401189N Level:
Date	28/02/2018		
Plant Used:	JCB 3CX	Dimensions (m):	Scale 1:25
Client:	William Saunders	Depth 2.40	Logged SA

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.00 - 0.20	ES					MADE GROUND: Dark grey clayey sandy gravelly topsoil. Gravel is angular to sub rounded of brick, ceramic, sandstone, siltstone and mudstone.
	0.30 - 0.60	LB		0.30			
	0.30	CBR	1.5%				MADE GROUND: Soft consistency light yellowish brown sandy slightly gravelly clay fill with a low cobble content. Gravel is sub-angular to sub-rounded fine to coarse of sandstone, siltstone and coal. Cobbles are rounded sandstone. (Occasional pockets of ashy clay).
	0.60	CBR	2.0%	0.60			MADE GROUND: Firm consistency light yellowish brown sandy slightly gravelly clay fill. Gravel is sub-angular to sub-rounded fine to coarse of sandstone, siltstone and mudstone. Rare plastic noted.
	0.80 - 1.50	LB					
				1.50			
	1.60 - 2.00	LB					Firm to stiff consistency light yellowish brown sandy slightly gravelly CLAY. Gravel is subangular to rounded fine to coarse of sandstone, siltstone and mudstone.
	2.20 - 2.40	LB		2.20			Firm to stiff consistency light yellowish brown slightly sandy slightly gravelly CLAY. Gravel is subangular to rounded fine to coarse of sandstone.
				2.40			End of Pit at 2.40m

1
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4
5

Remarks: No groundwater encountered

Stability: All sides stable.

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12 Yarm Road
Stockton on Tees
TS18 3NA
Tel: 01642 607083
Fax: 01642 612355

Trial Pit Log

TrialPit No
TP13
Sheet 1 of 1

Project Name:	Plots 3-5, Ashroyd Business Park	Project No. S180236	Co-ords: 436543E - 401149N Level:
Date	26/02/2018		
Plant Used:	JCB 3CX	Dimensions (m):	Scale 1:25
Client:	William Saunders	Depth 2.40	Logged SA

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.00 - 0.30	ES					MADE GROUND: Dark grey clayey sandy gravelly topsoil. Gravel is angular to sub rounded of brick, ceramic, sandstone, siltstone and mudstone.
	0.30 - 0.60	LB		0.30			
	0.30	CBR	1.4%				MADE GROUND: Soft consistency light yellowish brown sandy gravelly clay fill. Gravel is subangular to sub rounded fine to coarse of sandstone, mudstone, coal and ironstone.
	0.60	CBR	1.7%	0.60			Firm to stiff consistency light yellowish brown sandy slightly gravelly CLAY of low plasticity. Gravel is subangular to rounded fine to coarse of sandstone, siltstone and mudstone. Low strength at 0.80mbgl.
	0.80 - 1.20	LB					
				1.50			
	1.60 - 1.80	LB					Very stiff consistency light yellowish brown slightly sandy slightly gravelly CLAY. Gravel is subangular to sub rounded fine to coarse of sandstone.
				2.10			Brown grey clayey sandy angular GRAVEL of mudstone. (Completely weathered MUDSTONE).
				2.40			End of Pit at 2.40m

1
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Remarks: No groundwater encountered

Stability: All sides stable.

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TS18 3NA
Tel: 01642 607083
Fax: 01642 612355

Trial Pit Log

TrialPit No
TP14
Sheet 1 of 1

Project Name:	Plots 3-5, Ashroyd Business Park	Project No. S180236	Co-ords: 436564E - 401182N Level:
Date	26/02/2018		
Plant Used:	JCB 3CX	Dimensions (m):	Scale 1:25
Client:	William Saunders	Depth 2.60	Logged SA

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.00 - 0.20	ES					MADE GROUND: Dark grey clayey sandy gravelly topsoil. Gravel is angular to sub rounded of brick, ceramic, sandstone, siltstone and mudstone.
	0.30 - 0.60	LB		0.30			
	0.30	CBR	1.2%				MADE GROUND: Soft consistency light yellowish brown sandy slightly gravelly clay fill with a low cobble content. Gravel is sub-angular to sub-rounded fine to coarse of sandstone, siltstone and coal. Cobbles are rounded sandstone. (Occasional pockets of ashy clay).
	0.60	CBR	2.1%	0.60			MADE GROUND: Firm consistency dark brown sandy gravelly clay fill. Gravel is angular to sub rounded fine to coarse of sandstone, siltstone and mudstone. Rare plastic noted.
	0.80 - 1.20	LB					
				1.50			Firm to stiff consistency light yellowish brown sandy slightly gravelly CLAY. Gravel is sub angular to rounded fine to coarse of sandstone, siltstone and mudstone.
	1.60 - 2.00	LB					
	2.20 - 2.40	B		2.20			Very stiff consistency light yellowish brown slightly sandy slightly gravelly CLAY. Gravel is subangular to sub rounded fine to coarse of sandstone.
				2.50			Dark grey clayey sandy angular GRAVEL of mudstone. (Completely weathered MUDSTONE).
				2.60			End of Pit at 2.60m

1
2
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5

Remarks: No groundwater encountered

Stability: All sides stable.

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Stockton on Tees
TS18 3NA
Tel: 01642 607083
Fax: 01642 612355

Trial Pit Log

TrialPit No
TP15
Sheet 1 of 1

Project Name:	Plots 3-5, Ashroyd Business Park	Project No. S180236	Co-ords: 436602E - 401136N Level:
Date	26/02/2018		
Plant Used:	JCB 3CX	Dimensions (m):	Scale 1:25
Client:	William Saunders	Depth 1.80	Logged SA

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.00 - 0.50	ES					MADE GROUND: Firm consistency light yellowish brown sandy slightly gravelly clay fill of low plasticity and with a medium cobble content. Gravel is sub-angular to sub-rounded fine to coarse of sandstone, siltstone and coal. Cobbles are rounded sandstone. Very low strength at 0.50mbgl.
	0.30	CBR	2.1%				
	0.50 - 0.80	LB					
	0.60	CBR	2.5%				
				0.90			
	1.00 - 1.50	B					Very stiff consistency dark grey slightly sandy slightly gravelly CLAY. Gravel is subangular to sub rounded fine to coarse of mudstone. Becoming gravelly with depth. (Completely weathered MUDSTONE).
				1.80			End of Pit at 1.80m

1
2
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Remarks: No groundwater encountered

Stability: All sides stable.

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Trial Pit Log

TrialPit No
TP16
Sheet 1 of 1

Project Name:	Plots 3-5, Ashroyd Business Park	Project No. S180236	Co-ords: 436589E - 401163N Level:
Date	26/02/2018		
Plant Used:	JCB 3CX	Dimensions (m):	Scale 1:25
Client:	William Saunders	Depth 2.40	Logged SA

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.00 - 0.20	ES		0.20			MADE GROUND: Soft to firm consistency light orangish brown and grey sandy gravelly clay fill of low cobble content. Gravel is sub angular to sub rounded of mudstone, siltstone, sandstone and coal. Cobbles are angular siltstone and mudstone.
	0.30	CBR	3.2%				
	0.40 - 0.50	LB					MADE GROUND: Firm consistency dark brown sandy gravelly clay fill of medium to high cobble content. Gravel is sub angular to sub rounded fine to coarse of mudstone, siltstone, sandstone, coal and ironstone. Cobbles are angular mudstone, siltstone, sandstone, coal and ironstone. Occasional brick rubble and rare pockets of ashy clay.
	0.60 - 1.00	LB					
	0.60	CBR	3.9%				
	1.00 - 1.20	LB		1.00			MADE GROUND: Firm to stiff consistency yellowish brown with white mottling sandy slightly gravelly clay fill. Gravel is sub angular fine to coarse of sandstone.
	1.40 - 1.60	LB		1.40			MADE GROUND: Soft consistency bluish grey slightly sandy slightly gravelly clay fill. Gravel is sub rounded of mudstone and siltstone.
	1.80 - 2.00	B		1.60			Stiff consistency yellowish brown very sandy slightly gravelly CLAY. Gravel is sub angular fine to coarse of sandstone.
				2.30			Very stiff consistency dark grey slightly sandy slightly gravelly CLAY. Gravel is subangular to sub rounded fine to coarse of mudstone. (Completely weathered MUDSTONE).
				2.40			End of Pit at 2.40m

Remarks: No groundwater encountered

Stability: All sides stable.

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Trial Pit Log

TrialPit No
TP17
Sheet 1 of 1

Project Name:	Plots 3-5, Ashroyd Business Park	Project No. S180236	Co-ords: 436646E - 401176N Level:
Date	26/02/2018		
Plant Used:	JCB 3CX	Dimensions (m):	Scale 1:25
Client:	William Saunders	Depth 1.90	Logged SA

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.00 - 0.20	ES					MADE GROUND: Soft consistency light grey sandy gravelly clay fill with a medium cobble content. Gravel is angular fine to coarse of sandstone, siltstone, mudstone, coal and brick rubble. Cobbles are angular to rounded of sandstone, siltstone, mudstone and brick rubble.
				0.20			
	0.30 - 0.60	LB					MADE GROUND: Soft consistency light yellowish brown sandy slightly gravelly clay fill with a low cobble content. Gravel is sub angular to sub rounded fine to coarse of sandstone, siltstone and coal. Cobbles are rounded sandstone.
	0.30	CBR	1.4%				
	0.60	CBR	1.5%				
	0.80 - 1.10	ES					
				1.10			Firm consistency dark bluish grey sandy gravelly medium strength CLAY of low cobble content. Gravel is sub angular to sub rounded fine to coarse of sandstone, siltstone, mudstone and coal.
	1.20 - 1.40	LB					
				1.50			Dark grey very clayey slightly sandy angular fine to coarse GRAVEL of mudstone. (Completely weathered MUDSTONE).
	1.60 - 1.80	B					
				1.80			Dark grey MUDSTONE. Recovered as slightly clayey angular gravel.
				1.90			End of Pit at 1.90m

1
2
3
4
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Remarks: No groundwater encountered

Stability: All sides stable.

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Trial Pit Log

TrialPit No
TP18
Sheet 1 of 1

Project Name:	Plots 3-5, Ashroyd Business Park	Project No. S180236	Co-ords: 436622E - 401250N Level:
Date	28/02/2018		
Plant Used:	JCB 3CX	Dimensions (m):	Scale 1:25
Client:	William Saunders	Depth 1.30	Logged SA

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.30	CBR	2.4%	0.30			MADE GROUND: Brown clayey sandy slightly gravelly topsoil.
	0.60 - 0.80 0.60 - 0.80	B ES					Dark grey very clayey slightly sandy angular fine to coarse GRAVEL of mudstone. (Completely weathered MUDSTONE).
				1.00			Grey brown MUDSTONE. Recovered as slightly clayey angular gravel.
	1.20 - 1.30	B		1.30			End of Pit at 1.30m

1
2
3
4
5

Remarks: No groundwater encountered

Stability: All sides stable.

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Trial Pit Log

TrialPit No
TP19
Sheet 1 of 1

Project Name:	Plots 3-5, Ashroyd Business Park	Project No. S180236	Co-ords: 436635E - 401269N Level:
Plant Used:	JCB 3CX	Dimensions (m):	Depth 1.50
Client:	William Saunders		

Date: 01/03/2018
Scale: 1:25
Logged: SA

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.00 - 0.40	B					Stiff consistency light brown to light grey slightly gravelly medium to high strength CLAY. Gravel is angular to sub rounded fine to coarse of mudstone siltstone and sandstone.
	0.00 - 0.40	ES					
	0.30	CBR	2.9%				
	0.40	HV	70kPa				
	0.60	HV	140kPa				
				0.70			Brown very clayey slightly sandy angular fine to coarse GRAVEL of mudstone. (Completely weathered MUDSTONE).
	1.00 - 1.10	B					
				1.40			Light brown MUDSTONE. Recovered as slightly clayey angular gravel.
				1.50			End of Pit at 1.50m

1
2
3
4
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Remarks: No groundwater encountered

Stability: All sides stable.

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Trial Pit Log

TrialPit No
TP2
Sheet 1 of 1

Project Name:	Plots 3-5, Ashroyd Business Park	Project No. S180236	Co-ords: 436363E - 401189N Level:
Date	27/02/2018		
Plant Used:	JCB 3CX	Dimensions (m):	Scale 1:25
Client:	William Saunders	Depth 2.00	Logged SA

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.00 - 0.20 0.00 - 0.20 0.20 - 0.50 0.20 - 0.50 0.30 0.50 - 1.00 0.50 - 1.00 0.50 0.70	B ES B ES CBR B ES HV HV	 2.9% 70kPa 65kPa	0.30 0.70 1.60 2.00			MADE GROUND: Brown clayey sandy slightly gravelly topsoil. Stiff consistency light brown with grey mottling slightly sandy slightly gravelly CLAY. Light brown clayey sandy angular GRAVEL of weathered sandstone. (Completely weathered SANDSTONE). Light brown SANDSTONE. Recovered as slightly clayey angular gravel. End of Pit at 2.00m

Remarks: No groundwater encountered

Stability: All sides stable.

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Trial Pit Log

TrialPit No
TP20
Sheet 1 of 1

Project Name:	Plots 3-5, Ashroyd Business Park	Project No. S180236	Co-ords: 436637E - 401226N Level:
Date	01/03/2018		
Plant Used:	JCB 3CX	Dimensions (m):	Scale 1:25
Client:	William Saunders	Depth 0.60	Logged SA

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.00 - 0.30 0.00 - 0.30	B ES		0.20			MADE GROUND: Brown clayey sandy slightly gravelly topsoil.
	0.30	CBR	5.8%	0.40			Brown very clayey slightly sandy angular fine to coarse GRAVEL of mudstone. (Completely weathered MUDSTONE).
				0.60			Light brown MUDSTONE. Recovered as slightly clayey angular gravel.
							End of Pit at 0.60m

Remarks: No groundwater encountered

Stability: All sides stable.

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Trial Pit Log

TrialPit No: TP21
Sheet 1 of 1

Project Name:	Plots 3-5, Ashroyd Business Park	Project No. S180236	Co-ords: 436665E - 401297N Level:
Date	01/03/2018		
Plant Used:	JCB 3CX	Dimensions (m):	Scale 1:25
Client:	William Saunders	Depth 3.20	Logged SA

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.00 - 0.20 0.00 - 0.20	B ES					MADE GROUND: Soft to firm consistency light orangish brown and grey sandy gravelly clay fill with a low cobble content. Gravel is sub angular to sub rounded of mudstone, siltstone, sandstone and coal.
	0.30 0.30	HV CBR	65kPa 2.0%				
	0.50	HV	140kPa				
				0.60			
	0.80 - 1.00	B					MADE GROUND: Stiff consistency grey to light brown slightly gravelly slightly sandy silty medium to high strength clay fill of medium plasticity. Gravel is angular to sub rounded fine to coarse of mudstone and sandstone.
	0.90	HV	120kPa				
	1.20 - 1.50 1.20	B HV	100kPa				
	1.60	HV	110kPa				
				2.10			Stiff consistency light brown to light grey slightly gravelly high strength silty CLAY. Gravel is angular to sub rounded fine to coarse of mudstone and sandstone.
	2.30	HV	120kPa				
				3.00			Brown very clayey slightly sandy angular fine to coarse GRAVEL of mudstone. (Completely weathered MUDSTONE)
				3.20			End of Pit at 3.20m

1
2
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4
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Remarks: No groundwater encountered

Stability: All sides stable.

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Trial Pit Log

TrialPit No
TP22
Sheet 1 of 1

Project Name:	Plots 3-5, Ashroyd Business Park	Project No. S180236	Co-ords: 436654E - 401230N Level:
Date	01/03/2018		
Plant Used:	JCB 3CX	Dimensions (m):	Scale 1:25
Client:	William Saunders	Depth 0.60	Logged SA

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.00 - 0.30 0.00 - 0.30	B ES		0.20			MADE GROUND: Brown clayey sandy slightly gravelly topsoil.
	0.30	CBR	5.1%	0.40			Brown very clayey slightly sandy angular fine to coarse GRAVEL of mudstone. (Completely weathered MUDSTONE).
				0.60			Light brown MUDSTONE. Recovered as slightly clayey angular gravel.
							End of Pit at 0.60m

1
2
3
4
5

Remarks: No groundwater encountered

Stability: All sides stable.

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Trial Pit Log

TrialPit No
TP23
Sheet 1 of 1

Project Name:	Plots 3-5, Ashroyd Business Park	Project No. S180236	Co-ords: 436717E - 401232N Level:
Date	01/03/2018		
Plant Used:	JCB 3CX	Dimensions (m):	Scale 1:25
Client:	William Saunders	Depth 0.80	Logged SA

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.30	CBR	5.9%	0.20			MADE GROUND: Brown clayey sandy slightly gravelly topsoil.
	0.50 - 0.60 0.50 - 0.60	B ES		0.60			Brown very clayey slightly sandy angular fine to coarse GRAVEL of mudstone. (Completely weathered MUDSTONE).
				0.80			Light brown MUDSTONE. Recovered as slightly clayey angular gravel.
							End of Pit at 0.80m

1
2
3
4
5

Remarks: No groundwater encountered

Stability: All sides stable.

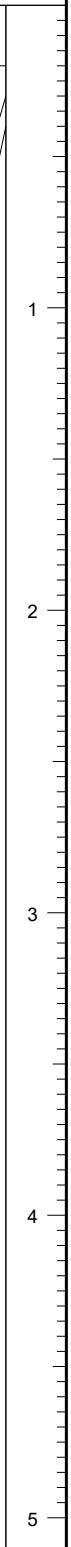
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Trial Pit Log

TrialPit No: TP3
Sheet 1 of 1

Project Name:	Plots 3-5, Ashroyd Business Park	Project No. S180236	Co-ords: 436387E - 401211N Level:
Date	27/02/2018		
Plant Used:	JCB 3CX	Dimensions (m):	Scale 1:25
Client:	William Saunders	Depth 0.40	Logged SA

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.00 - 0.30	B					MADE GROUND: Brown clayey sandy slightly gravelly topsoil.
	0.00 - 0.30	ES		0.20			
	0.30	CBR	8.9%	0.30			Light brown clayey sandy angular GRAVEL of weathered sandstone. (Completely weathered SANDSTONE).
				0.40			Light brown SANDSTONE. Recovered as slightly clayey angular gravel.
							End of Pit at 0.40m



Remarks: No groundwater encountered

Stability: All sides stable.

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Trial Pit Log

TrialPit No
TP4
Sheet 1 of 1

Project Name:	Plots 3-5, Ashroyd Business Park	Project No. S180236	Co-ords: 436394E - 401185N Level:
Plant Used:	JCB 3CX	Dimensions (m):	Depth 0.90
Client:	William Saunders		

Date: 27/02/2018
Scale: 1:25
Logged: SA

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.00 - 0.10	B		0.20			MADE GROUND: Brown clayey sandy slightly gravelly topsoil.
	0.00 - 0.10	ES					
	0.10 - 0.50	B					
	0.10 - 0.50	ES					
	0.30	CBR	3.7%	0.70			Light brown clayey sandy angular GRAVEL of weathered sandstone. (Completely weathered SANDSTONE).
				0.90			Light brown SANDSTONE. Recovered as slightly clayey angular gravel.
							End of Pit at 0.90m

1
2
3
4
5

Remarks: No groundwater encountered

Stability: All sides stable.

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Trial Pit Log

TrialPit No
TP5
Sheet 1 of 1

Project Name:	Plots 3-5, Ashroyd Business Park	Project No. S180236	Co-ords: 436405E - 401260N Level:
Date	27/02/2018		
Plant Used:	JCB 3CX	Dimensions (m):	Scale 1:25
Client:	William Saunders	Depth 2.40	Logged SA

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.30 - 0.40	B					MADE GROUND: Grey slightly sandy slightly gravelly clay fill. Gravel is angular to sub angular fine to coarse of mudstone, siltstone and sandstone.
	0.30 - 0.40	ES					
				0.75			
	1.00 - 1.10	B					Firm consistency brown sandy slightly gravelly CLAY. Gravel is angular to sub angular fine to coarse of sandstone.
	2.00 - 2.10	B					
				2.40			End of Pit at 2.40m

Remarks: No groundwater encountered

Stability: All sides stable.

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Trial Pit Log

TrialPit No
TP6
Sheet 1 of 1

Project Name:	Plots 3-5, Ashroyd Business Park	Project No. S180236	Co-ords: 436418E - 401227N Level:
Date	27/02/2018		
Plant Used:	JCB 3CX	Dimensions (m):	Scale 1:25
Client:	William Saunders	Depth 2.60	Logged SA

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.30 - 0.40	ES					MADE GROUND: Grey slightly sandy slightly gravelly clay fill. Gravel is angular to sub angular fine to coarse of mudstone, siltstone and sandstone.
				0.50			Firm consistency brown sandy slightly gravelly CLAY. Gravel is angular to sub angular fine to coarse of sandstone.
	1.00 - 1.10	B					
	2.00 - 2.10	B					
				2.40			Light brown brown clayey sandy angular gravel of mudstone. (Completely weathered MUDSTONE).
				2.60			End of Pit at 2.60m

1
2
3
4
5

Remarks: No groundwater encountered

Stability: All sides stable.

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Trial Pit Log

TrialPit No
TP7
Sheet 1 of 1

Project Name:	Plots 3-5, Ashroyd Business Park	Project No. S180236	Co-ords: 436425E - 401195N Level:
Date	27/02/2018		
Plant Used:	JCB 3CX	Dimensions (m):	Scale 1:25
Client:	William Saunders	Depth 0.80	Logged SA

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
	0.00 - 0.50 0.00 - 0.50	B ES		0.20			MADE GROUND: Brown clayey sandy slightly gravelly topsoil.
	0.30	CBR	4.7%				Light brown SANDSTONE. Recovered as slightly clayey angular gravel.
				0.80			End of Pit at 0.80m

1
2
3
4
5

Remarks: No groundwater encountered

Stability: All sides stable.

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Trial Pit Log

TrialPit No
TP8
Sheet 1 of 1

Project Name:	Plots 3-5, Ashroyd Business Park	Project No. S180236	Co-ords: 436444E - 401300N Level:
Date	28/02/2018		
Plant Used:	JCB 3CX	Dimensions (m):	Scale 1:25
Client:	William Saunders	Depth 2.50	Logged SA

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.40 - 0.50 0.40 - 0.50	B ES					MADE GROUND: Firm consistency greyish brown slightly sandy slightly gravelly clay fill. Gravel is angular to sub-angular fine to coarse of sandstone, siltstone, and mudstone.
	1.20 - 1.30	B		1.10			MADE GROUND: Stiff consistency light brown slightly sandy slightly gravelly clay fill. Gravel is angular to sub angular fine to coarse of sandstone.
				2.50			End of Pit at 2.50m

1
2
3
4
5

Remarks: No groundwater encountered

Stability: All sides stable.

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Trial Pit Log

TrialPit No
TP9
Sheet 1 of 1

Project Name:	Plots 3-5, Ashroyd Business Park	Project No. S180236	Co-ords: 436446E - 401244N Level:
Date	28/02/2018		
Plant Used:	JCB 3CX	Dimensions (m):	Scale 1:25
Client:	William Saunders	Depth 2.40	Logged SA

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.40 - 0.50	ES					MADE GROUND: Firm consistency greyish brown slightly sandy slightly gravelly clay fill. Gravel is angular to sub-angular fine to coarse of sandstone, siltstone, and mudstone.
	1.30 - 1.40	B		1.30			MADE GROUND: Stiff to very stiff consistency brown mottled grey slightly sandy slightly gravelly clay fill. Gravel is angular to sub angular fine to coarse of sandstone.
	1.80 - 2.00	B		2.40			End of Pit at 2.40m

1
2
3
4
5

Remarks: No groundwater encountered

Stability: All sides stable.



Plate 15: View of TP8



Plate 16: View of TP8 Spoil

Client:	William Saunders
Project:	Plots 3-5, Ashroyd Business Park
Title:	Plates 15 & 16
DRG No:	Figure 10
Date	April 2018

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Plate 17: View of TP9



Plate 18: View of TP9 Spoil

Client:	William Saunders
Project:	Plots 3-5, Ashroyd Business Park
Title:	Plates 17 & 18
DRG No:	Figure 11
Date	April 2018

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Plate 19: View of TP10



Plate 20: View of TP10 Spoil

Client:	William Saunders
Project:	Plots 3-5, Ashroyd Business Park
Title:	Plates 19 & 20
DRG No:	Figure 12
Date	April 2018

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Plate 21: View of TP11



Plate 22: View of TP11 Spoil

Client:	William Saunders
Project:	Plots 3-5, Ashroyd Business Park
Title:	Plates 21 & 22
DRG No:	Figure 13
Date	April 2018

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Plate 23: View of TP12



Plate 24: View of TP12 Spoil

Client:	William Saunders
Project:	Plots 3-5, Ashroyd Business Park
Title:	Plates 23 & 24
DRG No:	Figure 14
Date	April 2018

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Plate 25: View of TP13



Plate 26: View of TP13 Spoil

Client:	William Saunders
Project:	Plots 3-5, Ashroyd Business Park
Title:	Plates 25 & 26
DRG No:	Figure 15
Date	April 2018

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Plate 27: View of TP14



Plate 28: View of TP14 Spoil

Client:	William Saunders
Project:	Plots 3-5, Ashroyd Business Park
Title:	Plates 27 & 28
DRG No:	Figure 16
Date	April 2018

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Plate 29: View of TP15



Plate 30: View of TP15 Spoil

Client:	William Saunders
Project:	Plots 3-5, Ashroyd Business Park
Title:	Plates 29 & 30
DRG No:	Figure 17
Date	April 2018

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Plate 33: View of TP17



Plate 34: View of TP17 Spoil

Client:	William Saunders
Project:	Plots 3-5, Ashroyd Business Park
Title:	Plates 33 & 34
DRG No:	Figure 19
Date	April 2018

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Plate 33: View of TP17



Plate 34: View of TP17 Spoil

Client:	William Saunders
Project:	Plots 3-5, Ashroyd Business Park
Title:	Plates 33 & 34
DRG No:	Figure 19
Date	April 2018

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Plate 35: View of TP18



Plate 36: View of TP18 Spoil

Client:	William Saunders
Project:	Plots 3-5, Ashroyd Business Park
Title:	Plates 35 & 36
DRG No:	Figure 20
Date	April 2018

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Plate 37: View of TP19



Plate 38: View of TP19 Spoil

Client:	William Saunders
Project:	Plots 3-5, Ashroyd Business Park
Title:	Plates 37 & 38
DRG No:	Figure 21
Date	April 2018

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Plate 39: View of TP20



Plate 40: View of TP20 Spoil

Client:	William Saunders
Project:	Plots 3-5, Ashroyd Business Park
Title:	Plates 39 & 40
DRG No:	Figure 22
Date	April 2018

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Plate 41: View of TP21



Plate 42: View of TP21 Spoil

Client:	William Saunders
Project:	Plots 3-5, Ashroyd Business Park
Title:	Plates 41 & 42
DRG No:	Figure 23
Date	April 2018

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Plate 43: View of TP22



Plate 44: View of TP22 Spoil

Client:	William Saunders
Project:	Plots 3-5, Ashroyd Business Park
Title:	Plates 43 & 44
DRG No:	Figure 24
Date	April 2018

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Plate 45: View of TP23



Plate 46: View of TP23 Spoil

Client:	William Saunders
Project:	Plots 3-5, Ashroyd Business Park
Title:	Plates 45 & 46
DRG No:	Figure 25
Date	April 2018

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Plate 1: View of TP1



Plate 2: View of TP1 Spoil

Client:	William Saunders
Project:	Plots 3-5, Ashroyd Business Park
Title:	Plates 1 & 2
DRG No:	Figure 3
Date	April 2018

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Plate 3: View of TP2



Plate 4: View of TP2 Spoil

Client:	William Saunders
Project:	Plots 3-5, Ashroyd Business Park
Title:	Plates 3 & 4
DRG No:	Figure 4
Date	April 2018

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Plate 5: View of TP3



Plate 6: View of TP3 Spoil

Client:	William Saunders
Project:	Plots 3-5, Ashroyd Business Park
Title:	Plates 5 & 6
DRG No:	Figure 5
Date	April 2018

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Plate 7: View of TP4



Plate 8: View of TP4 Spoil

Client:	William Saunders
Project:	Plots 3-5, Ashroyd Business Park
Title:	Plates 7 & 8
DRG No:	Figure 6
Date	April 2018

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Plate 9: View of TP5



Plate 10: View of TP5 Spoil

Client:	William Saunders
Project:	Plots 3-5, Ashroyd Business Park
Title:	Plates 9 & 10
DRG No:	Figure 7
Date	April 2018

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Plate 11: View of TP6



Plate 12: View of TP6 Spoil

Client:	William Saunders
Project:	Plots 3-5, Ashroyd Business Park
Title:	Plates 11 & 12
DRG No:	Figure 8
Date	April 2018

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Plate 13: View of TP7



Plate 14: View of TP7 Spoil

Client:	William Saunders
Project:	Plots 3-5, Ashroyd Business Park
Title:	Plates 13 & 14
DRG No:	Figure 9
Date	April 2018

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APPENDIX C

2531

ANALYTICAL TEST REPORT

Contract no:	70704
Contract name:	Ashroyd Business Park, Hoyland
Client reference:	S180236
Clients name:	Solmek
Clients address:	12 Yarm Road Stockton-on-Tees TS18 3NA
Samples received:	16 March 2018
Analysis started:	16 March 2018
Analysis completed	23 March 2018
Report issued:	23 March 2018

Notes:

Opinions and interpretations expressed herein are outside the UKAS accreditation scope.
Unless otherwise stated, Chemtech Environmental Ltd was not responsible for sampling.
Methods, procedures and performance data are available on request.
Results reported herein relate only to the material supplied to the laboratory.
This report shall not be reproduced except in full, without prior written approval.
Samples will be disposed of 6 weeks from initial receipt unless otherwise instructed.

Key:

U UKAS accredited test
M MCERTS & UKAS accredited test
$ Test carried out by an approved subcontractor
I/S Insufficient sample to carry out test
N/S Sample not suitable for testing
NAD No Asbestos Detected

Approved by:

Dave Bowerbank
Customer Services Co-ordinator

Chemtech Environmental Limited

SAMPLE INFORMATION

MCERTS (Soils):

Soil descriptions are only intended to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions. MCERTS accreditation applies for sand, clay and loam/topsoil, or combinations of these whether these are derived from naturally occurring soils or from made ground, as long as these materials constitute the major part of the sample. Other materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

All results are reported on a dry basis. Samples dried at no more than 30°C in a drying cabinet.
Analytical results are inclusive of stones.

Lab ref	Sample id	Depth (m)	Sample description	Material removed	% Removed	% Moisture
70704-1	BH1	1.65-1.70	Clay with Gravel	-	-	14.0
70704-2	TP2	0.00-0.20	Clay with Gravel & Roots	-	-	25.0
70704-3	TP8	0.40-0.50	Clay with Gravel & Roots	-	-	13.6
70704-4	TP10	0.40-0.50	Sandy Clay with Gravel	-	-	14.2
70704-5	TP11	0.50-0.60	Sandy Clay	-	-	11.9
70704-6	TP14	0.00-0.20	Clay with Gravel & Roots	-	-	20.9
70704-7	TP15	0.00-0.50	Sandy Clay with Gravel	-	-	18.2
70704-8	TP17	0.80-1.10	Clay	-	-	25.6
70704-9	TP18	0.60-0.80	Sandy Clay with Gravel	-	-	10.3
70704-10	TP21	0.00-0.20	Clay with Gravel	-	-	19.0
70704-11	TP23	0.50-0.60	Clay	-	-	12.4

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SOILS

Lab number			70704-1	70704-2	70704-3	70704-4	70704-5	70704-6
Sample id			BH1	TP2	TP8	TP10	TP11	TP14
Depth (m)			1.65-1.70	0.00-0.20	0.40-0.50	0.40-0.50	0.50-0.60	0.00-0.20
Date sampled			06/03/2018	06/03/2018	06/03/2018	06/03/2018	06/03/2018	06/03/2018
Test	Method	Units						
Arsenic (total)	CE127 M	mg/kg As	4.6	13	9.5	6.8	11	10
Boron (water soluble)	CE063 M	mg/kg B	<0.5	0.5	<0.5	<0.5	<0.5	<0.5
Cadmium (total)	CE127 M	mg/kg Cd	<0.2	0.3	0.3	<0.2	<0.2	0.2
Chromium (total)	CE127 M	mg/kg Cr	47	47	41	35	33	40
Chromium (III)	-	mg/kg CrIII	47	47	41	35	33	40
Chromium (VI)	CE146	mg/kg CrVI	<1	<1	<1	<1	<1	<1
Copper (total)	CE127 M	mg/kg Cu	28	40	37	35	27	33
Lead (total)	CE127 M	mg/kg Pb	26	49	29	24	20	28
Mercury (total)	CE127 M	mg/kg Hg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Nickel (total)	CE127 M	mg/kg Ni	36	33	50	34	39	35
Selenium (total)	CE127 M	mg/kg Se	0.9	0.9	1.2	0.9	0.8	1.0
Zinc (total)	CE127 M	mg/kg Zn	110	115	182	95	87	97
pH	CE004 M	units	6.2	7.2	7.4	7.3	7.3	7.5
Sulphate (2:1 water soluble)	CE061 M	mg/l SO_4	50	12	40	27	78	16
Cyanide (total)	CE077	mg/kg CN	<1	<1	<1	<1	<1	<1
Phenols (total)	CE078	mg/kg PhOH	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Total Organic Carbon (TOC)	CE072 M	% w/w C	0.41	2.90	0.38	0.54	0.36	1.44
Estimate of OMC (calculated from TOC)	CE072 M	% w/w	0.71	5.00	0.66	0.93	0.62	2.48
PAH								
Naphthalene	CE087 M	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acenaphthylene	CE087 M	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acenaphthene	CE087 M	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Fluorene	CE087 U	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Phenanthrene	CE087 M	mg/kg	<0.02	0.02	<0.02	<0.02	0.03	<0.02
Anthracene	CE087 U	mg/kg	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Fluoranthene	CE087 M	mg/kg	<0.02	0.03	<0.02	<0.02	<0.02	<0.02
Pyrene	CE087 M	mg/kg	0.03	0.06	<0.02	<0.02	<0.02	<0.02
Benzo(a)anthracene	CE087 U	mg/kg	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Chrysene	CE087 M	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(b)fluoranthene	CE087 M	mg/kg	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Benzo(k)fluoranthene	CE087 M	mg/kg	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Benzo(a)pyrene	CE087 U	mg/kg	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Indeno(123cd)pyrene	CE087 M	mg/kg	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Dibenz(ah)anthracene	CE087 M	mg/kg	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Benzo(ghi)perylene	CE087 M	mg/kg	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
PAH (total of USEPA 16)	CE087	mg/kg	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27
TPH								
VPH Aromatic (>EC5-EC7)	CE067	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
VPH Aromatic (>EC7-EC8)	CE067	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
VPH Aromatic (>EC8-EC10)	CE067	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
EPH Aromatic (>EC10-EC12)	CE068	mg/kg	<1	<1	<1	<1	<1	<1

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SOILS

Lab number			70704-1	70704-2	70704-3	70704-4	70704-5	70704-6
Sample id			BH1	TP2	TP8	TP10	TP11	TP14
Depth (m)			1.65-1.70	0.00-0.20	0.40-0.50	0.40-0.50	0.50-0.60	0.00-0.20
Date sampled			06/03/2018	06/03/2018	06/03/2018	06/03/2018	06/03/2018	06/03/2018
Test	Method	Units						
EPH Aromatic (>EC12-EC16)	CE068	mg/kg	<1	<1	<1	<1	<1	<1
EPH Aromatic (>EC16-EC21)	CE068	mg/kg	<1	<1	<1	<1	<1	<1
EPH Aromatic (>EC21-EC35)	CE068	mg/kg	<1	<1	<1	<1	<1	<1
VPH Aliphatic (>C5-C6)	CE067	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
VPH Aliphatic (>C6-C8)	CE067	mg/kg	<0.1	0.1	0.1	<0.1	<0.1	<0.1
VPH Aliphatic (>C8-C10)	CE067	mg/kg	<0.1	<0.1	0.1	<0.1	<0.1	<0.1
EPH Aliphatic (>C10-C12)	CE068	mg/kg	<4	<4	<4	<4	<4	<4
EPH Aliphatic (>C12-C16)	CE068	mg/kg	<4	<4	<4	4	<4	5
EPH Aliphatic (>C16-C35)	CE068	mg/kg	12	18	<10	18	<10	19
Subcontracted analysis								
Asbestos (qualitative)	$	-	NAD	NAD	NAD	NAD	NAD	NAD

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SOILS

Lab number			70704-7	70704-8	70704-9	70704-10	70704-11
Sample id			TP15	TP17	TP18	TP21	TP23
Depth (m)			0.00-0.50	0.80-1.10	0.60-0.80	0.00-0.20	0.50-0.60
Date sampled			06/03/2018	06/03/2018	06/03/2018	06/03/2018	06/03/2018
Test	Method	Units					
Arsenic (total)	CE127 M	mg/kg As	4.9	4.6	6.2	6.7	6.7
Boron (water soluble)	CE063 M	mg/kg B	<0.5	0.8	<0.5	0.6	<0.5
Cadmium (total)	CE127 M	mg/kg Cd	<0.2	<0.2	<0.2	<0.2	<0.2
Chromium (total)	CE127 M	mg/kg Cr	35	31	33	34	31
Chromium (III)	-	mg/kg CrIII	35	31	33	34	31
Chromium (VI)	CE146	mg/kg CrVI	<1	<1	<1	<1	<1
Copper (total)	CE127 M	mg/kg Cu	26	55	27	26	27
Lead (total)	CE127 M	mg/kg Pb	18	31	15	25	16
Mercury (total)	CE127 M	mg/kg Hg	<0.5	<0.5	<0.5	<0.5	<0.5
Nickel (total)	CE127 M	mg/kg Ni	29	24	51	32	36
Selenium (total)	CE127 M	mg/kg Se	0.8	1.6	1.1	0.8	0.8
Zinc (total)	CE127 M	mg/kg Zn	79	80	92	86	84
pH	CE004 M	units	8.4	5.2	6.5	7.1	7.2
Sulphate (2:1 water soluble)	CE061 M	mg/l SO_4	74	343	19	33	15
Cyanide (total)	CE077	mg/kg CN	<1	<1	<1	<1	<1
Phenols (total)	CE078	mg/kg PhOH	<0.5	<0.5	<0.5	<0.5	<0.5
Total Organic Carbon (TOC)	CE072 M	% w/w C	0.45	0.64	0.34	0.67	0.12
Estimate of OMC (calculated from TOC)	CE072 M	% w/w	0.78	1.10	0.59	1.16	0.21
PAH							
Naphthalene	CE087 M	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Acenaphthylene	CE087 M	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Acenaphthene	CE087 M	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Fluorene	CE087 U	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Phenanthrene	CE087 M	mg/kg	<0.02	<0.02	<0.02	<0.02	<0.02
Anthracene	CE087 U	mg/kg	<0.02	<0.02	<0.02	<0.02	<0.02
Fluoranthene	CE087 M	mg/kg	<0.02	<0.02	<0.02	<0.02	<0.02
Pyrene	CE087 M	mg/kg	<0.02	<0.02	<0.02	<0.02	<0.02
Benzo(a)anthracene	CE087 U	mg/kg	<0.02	<0.02	<0.02	<0.02	<0.02
Chrysene	CE087 M	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(b)fluoranthene	CE087 M	mg/kg	<0.02	<0.02	<0.02	<0.02	<0.02
Benzo(k)fluoranthene	CE087 M	mg/kg	<0.02	<0.02	<0.02	<0.02	<0.02
Benzo(a)pyrene	CE087 U	mg/kg	<0.02	<0.02	<0.02	<0.02	<0.02
Indeno(123cd)pyrene	CE087 M	mg/kg	<0.02	<0.02	<0.02	<0.02	<0.02
Dibenz(ah)anthracene	CE087 M	mg/kg	<0.02	<0.02	<0.02	<0.02	<0.02
Benzo(ghi)perylene	CE087 M	mg/kg	<0.02	<0.02	<0.02	<0.02	<0.02
PAH (total of USEPA 16)	CE087	mg/kg	<0.27	<0.27	<0.27	<0.27	<0.27
TPH							
VPH Aromatic (>EC5-EC7)	CE067	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
VPH Aromatic (>EC7-EC8)	CE067	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
VPH Aromatic (>EC8-EC10)	CE067	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
EPH Aromatic (>EC10-EC12)	CE068	mg/kg	<1	<1	<1	<1	<1

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SOILS

Lab number			70704-7	70704-8	70704-9	70704-10	70704-11
Sample id			TP15	TP17	TP18	TP21	TP23
Depth (m)			0.00-0.50	0.80-1.10	0.60-0.80	0.00-0.20	0.50-0.60
Date sampled			06/03/2018	06/03/2018	06/03/2018	06/03/2018	06/03/2018
Test	Method	Units					
EPH Aromatic (>EC12-EC16)	CE068	mg/kg	<1	<1	<1	<1	<1
EPH Aromatic (>EC16-EC21)	CE068	mg/kg	<1	<1	<1	<1	<1
EPH Aromatic (>EC21-EC35)	CE068	mg/kg	<1	<1	<1	<1	<1
VPH Aliphatic (>C5-C6)	CE067	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
VPH Aliphatic (>C6-C8)	CE067	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
VPH Aliphatic (>C8-C10)	CE067	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EPH Aliphatic (>C10-C12)	CE068	mg/kg	<4	<4	5	5	<4
EPH Aliphatic (>C12-C16)	CE068	mg/kg	<4	<4	6	7	4
EPH Aliphatic (>C16-C35)	CE068	mg/kg	<10	<10	15	21	<10
Subcontracted analysis							
Asbestos (qualitative)	$	-	NAD	NAD	NAD	NAD	NAD

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METHOD DETAILS

METHOD	SOILS	METHOD SUMMARY	SAMPLE	STATUS	LOD	UNITS
CE127	Arsenic (total)	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg As
CE063	Boron (water soluble)	Hot water extract, ICP-OES	Dry	M	0.5	mg/kg B
CE127	Cadmium (total)	Aqua regia digest, ICP-MS	Dry	M	0.2	mg/kg Cd
CE127	Chromium (total)	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg Cr
-	Chromium (III)	Calculation: Cr (total) - Cr (VI)	Dry		1	mg/kg CrIII
CE146	Chromium (VI)	Acid extraction, Colorimetry	Dry		1	mg/kg CrVI
CE127	Copper (total)	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg Cu
CE127	Lead (total)	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg Pb
CE127	Mercury (total)	Aqua regia digest, ICP-MS	Dry	M	0.5	mg/kg Hg
CE127	Nickel (total)	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg Ni
CE127	Selenium (total)	Aqua regia digest, ICP-MS	Dry	M	0.3	mg/kg Se
CE127	Zinc (total)	Aqua regia digest, ICP-MS	Dry	M	5	mg/kg Zn
CE004	pH	Based on BS 1377, pH Meter	Wet	M	-	units
CE061	Sulphate (2:1 water soluble)	Aqueous extraction, ICP-OES	Dry	M	10	mg/l SO_4
CE077	Cyanide (total)	Extraction, Continuous Flow Colorimetry	Wet	M	1	mg/kg CN
CE078	Phenols (total)	Extraction, Continuous Flow Colorimetry	Wet		0.5	mg/kg PhOH
CE072	Total Organic Carbon (TOC)	Removal of IC by acidification, Carbon Analyser	Dry	M	0.1	% w/w C
CE072	Estimate of OMC (calculated from TOC)	Calculation from Total Organic Carbon	Dry	M	0.1	% w/w
CE087	Naphthalene	Solvent extraction, GC-MS	Wet	M	0.01	mg/kg
CE087	Acenaphthylene	Solvent extraction, GC-MS	Wet	M	0.01	mg/kg
CE087	Acenaphthene	Solvent extraction, GC-MS	Wet	M	0.01	mg/kg
CE087	Fluorene	Solvent extraction, GC-MS	Wet	U	0.01	mg/kg
CE087	Phenanthrene	Solvent extraction, GC-MS	Wet	M	0.02	mg/kg
CE087	Anthracene	Solvent extraction, GC-MS	Wet	U	0.02	mg/kg
CE087	Fluoranthene	Solvent extraction, GC-MS	Wet	M	0.02	mg/kg
CE087	Pyrene	Solvent extraction, GC-MS	Wet	M	0.02	mg/kg
CE087	Benzo(a)anthracene	Solvent extraction, GC-MS	Wet	U	0.02	mg/kg
CE087	Chrysene	Solvent extraction, GC-MS	Wet	M	0.01	mg/kg
CE087	Benzo(b)fluoranthene	Solvent extraction, GC-MS	Wet	M	0.02	mg/kg
CE087	Benzo(k)fluoranthene	Solvent extraction, GC-MS	Wet	M	0.02	mg/kg
CE087	Benzo(a)pyrene	Solvent extraction, GC-MS	Wet	U	0.02	mg/kg
CE087	Indeno(123cd)pyrene	Solvent extraction, GC-MS	Wet	M	0.02	mg/kg
CE087	Dibenz(ah)anthracene	Solvent extraction, GC-MS	Wet	M	0.02	mg/kg
CE087	Benzo(ghi)perylene	Solvent extraction, GC-MS	Wet	M	0.02	mg/kg
CE087	PAH (total of USEPA 16)	Solvent extraction, GC-MS	Wet		0.27	mg/kg
CE067	VPH Aromatic (>EC5-EC7)	Headspace GC-FID	Wet		0.01	mg/kg
CE067	VPH Aromatic (>EC7-EC8)	Headspace GC-FID	Wet		0.01	mg/kg
CE067	VPH Aromatic (>EC8-EC10)	Headspace GC-FID	Wet		0.01	mg/kg
CE068	EPH Aromatic (>EC10-EC12)	Solvent extraction, GC-FID	Wet		1	mg/kg
CE068	EPH Aromatic (>EC12-EC16)	Solvent extraction, GC-FID	Wet		1	mg/kg
CE068	EPH Aromatic (>EC16-EC21)	Solvent extraction, GC-FID	Wet		1	mg/kg
CE068	EPH Aromatic (>EC21-EC35)	Solvent extraction, GC-FID	Wet		1	mg/kg
CE068	EPH Aromatic (>EC35-EC44)	Solvent extraction, GC-FID	Wet		1	mg/kg

METHOD DETAILS

METHOD	SOILS	METHOD SUMMARY	SAMPLE	STATUS	LOD	UNITS
CE067	VPH Aliphatic (>C5-C6)	Headspace GC-FID	Wet		0.1	mg/kg
CE067	VPH Aliphatic (>C6-C8)	Headspace GC-FID	Wet		0.1	mg/kg
CE067	VPH Aliphatic (>C8-C10)	Headspace GC-FID	Wet		0.1	mg/kg
CE068	EPH Aliphatic (>C10-C12)	Solvent extraction, GC-FID	Wet		4	mg/kg
CE068	EPH Aliphatic (>C12-C16)	Solvent extraction, GC-FID	Wet		4	mg/kg
CE068	EPH Aliphatic (>C16-C35)	Solvent extraction, GC-FID	Wet		4	mg/kg
CE068	EPH Aliphatic (>C35-C44)	Solvent extraction, GC-FID	Wet		10	mg/kg
$	Asbestos (qualitative)	HSG 248, Microscopy	Dry	U	-	-

Chemtech Environmental Limited

DEVIATING SAMPLE INFORMATION

Comments

Sample deviation is determined in accordance with the UKAS note "Guidance on Deviating Samples" and based on reference standards and laboratory trials.
For samples identified as deviating, test result(s) may be compromised and may not be representative of the sample at the time of sampling.
Chemtech Environmental Ltd cannot be held responsible for the integrity of sample(s) received if Chemtech Environmental Ltd did not undertake the sampling. Such samples may be deviating.

Key

N	No (not deviating sample)
Y	Yes (deviating sample)
NSD	Sampling date not provided
NST	Sampling time not provided (waters only)
EHT	Sample exceeded holding time(s)
IC	Sample not received in appropriate containers
HP	Headspace present in sample container
NCF	Sample not chemically fixed (where appropriate)
IT	Sample not cooled
OR	Other (specify)

Lab ref	Sample id	Depth (m)	Deviating	Tests (Reason for deviation)
70704-1	BH1	1.65-1.70	N	
70704-2	TP2	0.00-0.20	N	
70704-3	TP8	0.40-0.50	N	
70704-4	TP10	0.40-0.50	N	
70704-5	TP11	0.50-0.60	N	
70704-6	TP14	0.00-0.20	N	
70704-7	TP15	0.00-0.50	N	
70704-8	TP17	0.80-1.10	N	
70704-9	TP18	0.60-0.80	N	
70704-10	TP21	0.00-0.20	N	
70704-11	TP23	0.50-0.60	N	

APPENDIX D

Laboratory Report Front Sheet

Site name	Job number
Ashroyd Business Park, Hoyland	S180236

Solmek
12-16 Yarm Road,
Stockton on Tees,
TS18 3NA
01642 607083
lab@solmek.com

UKAS TESTING
7607

Client details:

Reference:	S180236
Name:	Solmek
Address:	12 Yarm Road, Stockton-on-tees, TS18 3NA
Telephone:	01642 607083
Email:	acutts@solmek.com
FAO:	A. Cutts

Date commenced: 16/03/2018

Date reported: 28/03/2018

Observations and interpretations are outside of the UKAS Accreditiation

A copy of the Laboratory Schedule of accredited tests as issued by UKAS is attached to this report. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced in full, without the prior written approval of the laboratory.

Samples will be held at the laboratory for a period of 4 weeks after the report date. After the 28-04-2018 all samples will be disposed of. Should further testing be required then the office should be informed before the above date.

Signature:	Approved Signitories:
K Watkin	☑ K Watkin (Lab Manager) ☐ U Mazhar (Assistant Lab Manager) ☐ I Nicholson (Technical Manager)

Summary of Classification Tests

Solmek
12-16 Yarm Road,
Stockton on Tees,
TS18 3NA
01642 607083
lab@solmek.com

UKAS TESTING
7607

Site name	Job number
Ashroyd Business Park, Hoyland	S180236

Hole	Depth Top m	Depth Base m	Type	w %	Oven temp. oc	wa %	Pa %	Pr %	wL %	wP %	IP %	IL	Plasticity class	Preparation method
BH01	1.20	1.65	U	21	105	40	52	48	31-s	21	10	1.900	CL	Tested after washing to remove >425µm
BH01	3.00	3.45	B	26	105	34	76	24	38-s	20	18	0.778	CI	Tested after >425µm removed by hand
BH01	4.00	4.45	B	23	105									
BH03	2.00	2.45	U	18	105	26	70	30	30-s	18	12	0.667	CL	Tested after >425µm removed by hand
BH03	4.00	4.20	B	17	105									
BH04	1.20	1.65	B	21	105	53	40	60	36-s	19	17	2.000	CI	Tested after >425µm removed by hand
BH04	4.00	4.45	U	22	105	34	65	35	33-s	17	16	1.063	CL	Tested after >425µm removed by hand
BH04	5.00	5.45	B	22	105	29	76	24	31-s	18	13	0.846	CL	Tested after >425µm removed by hand
BH05	1.20	1.65	U	19	105	33	58	42	33-s	17	16	1.000	CL	Tested after >425µm removed by hand
BH06	1.20	1.65	B	23	105	27	86	14	43-s	22	21	0.238	CI	Tested after >425µm removed by hand
BH06	3.00	3.45	B	29	105									
BH07	0.50	0.60	B	27	105	33	82	18	56-s	21	35	0.343	CH	Tested after >425µm removed by hand
BH08	2.00	2.45	B	33	105	37	90	10	42-s	22	20	0.750	CI	Tested after >425µm removed by hand
BH10	1.20	1.65	U	36	105	39	93	7	62-s	25	37	0.378	CH	Tested after >425µm removed by hand
BH10	2.00	2.45	B	22	105	23	95	5	39-s	19	20	0.200	CI	Tested after >425µm removed by hand
BH10	3.00	3.45	B	23	105									
BH11	0.50	0.60	B	16	105									
BH12	0.50	0.60	B	15	105	17	90	10	53-s	28	25	-0.440	CH	Tested after >425µm removed by hand
BH13	0.50	0.60	B	17	105									
TP01	0.20	0.50	B	12	105									

All tests found in Solmek UKAS Schedule of Accreditation are tested to standard unless otherwise indicated

Key	Description		Category	BS Test Code
w	Moisture content			BS 1377:1990 Part 2 Clause 3.2
wa	Equivalent moisture content passing 425µm sieve			BS 1377:1990 Part 2 Clause 3.2
wL	Liquid limit	Single point	-s	BS 1377:1990 Part 2 Clause 4.4
		Four point	-f	BS 1377:1990 Part 2 Clause 4.3
wP	Plastic limit			BS 1377:1990 Part 2 Clause 5.2
Pa	Percentage passing 425um sieve			
Pr	Percentage retained 425um sieve			
IP	Plasticity index			BS 1377:1990 Part 2 Clause 5.4
IL	Liquidity index			BS 1377:1990 Part 2 Clause 5.4
	Suffix indicating test is "Not UKAS Accredited"		*	

Approved by	KW
Approval date	23/03/2018 13:08
Date report generated	
Report Number	

Summary of Classification Tests

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12-16 Yarm Road,
Stockton on Tees,
TS18 3NA
01642 607083
lab@solmek.com

UKAS TESTING
7607

Site name	Job number
Ashroyd Business Park, Hoyland	S180236

Hole	Depth Top m	Depth Base m	Type	*w* %	Oven temp. oc	wa %	Pa %	Pr %	wL %	wP %	IP %	IL	Plasticity class	Preparation method
TP10	1.10	1.20	B	32	105	46	69	31	45-s	29	16	1.063	MI	Tested after >425µm removed by hand
TP11	1.50	1.60	B	27	105	30	89	11	44-s	23	21	0.333	CI	Tested after >425µm removed by hand
TP12	2.20	2.40	B	22	105									
TP13	0.80	1.20	B	18	105	26	68	32	38-s	21	17	0.294	CI	Tested after >425µm removed by hand
TP13	1.60	1.80	B	11	105									
TP15	0.50	0.80	B	24	105	39	61	39	36-s	19	17	1.176	CI	Tested after >425µm removed by hand
TP15	1.00	1.50	B	9.1	105									
TP17	1.20	1.40	B	25	105	28	90	10	69-s	22	47	0.128	CH	Tested after >425µm removed by hand
TP17	1.60	1.80	B	8.9	105									
TP18	0.60	0.80	B	11	105									
TP19	0.00	0.40	B	18	105	18	98	2	43-s	22	21	-0.190	CI	Tested after >425µm removed by hand
TP21	1.20	1.50	B	27	105	27	100	0	49-s	23	26	0.154	CI	Tested in natural condition
TP23	0.50	0.60	B	14	105									

All tests found in Solmek UKAS Schedule of Accreditation are tested to standard unless otherwise indicated

Key	Description		Category	BS Test Code
w	Moisture content			BS 1377:1990 Part 2 Clause 3.2
wa	Equivalent moisture content passing 425µm sieve			BS 1377:1990 Part 2 Clause 3.2
wL	Liquid limit	Single point	-s	BS 1377:1990 Part 2 Clause 4.4
		Four point	-f	BS 1377:1990 Part 2 Clause 4.3
wP	Plastic limit			BS 1377:1990 Part 2 Clause 5.2
Pa	Percentage passing 425um sieve			
Pr	Percentage retained 425um sieve			
IP	Plasticity index			BS 1377:1990 Part 2 Clause 5.4
IL	Liquidity index			BS 1377:1990 Part 2 Clause 5.4
	Suffix indicating test is "Not UKAS Accredited"		*	

Approved by	KW
Approval date	20/03/2018 08:54
Date report generated	
Report Number	

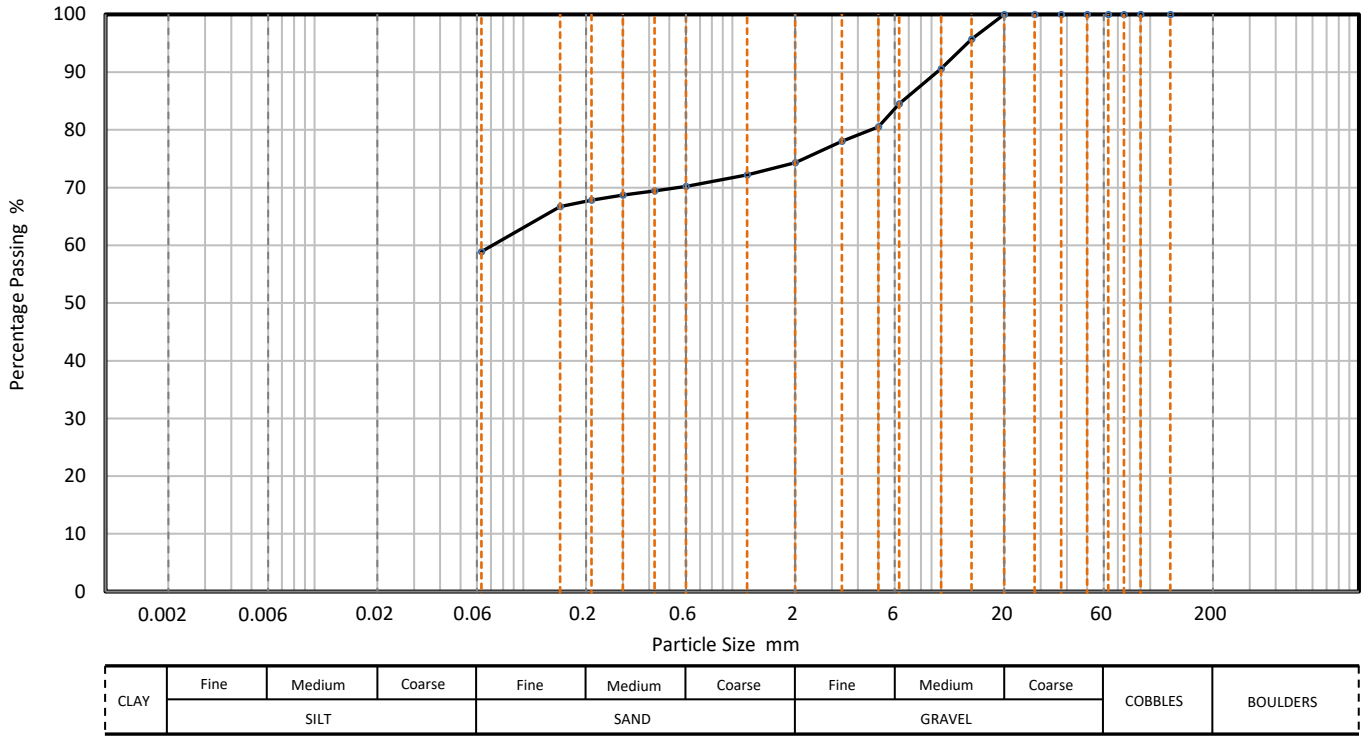
PARTICLE SIZE DISTRIBUTION

Site name	Job number
Ashroyd Business Park, Hoyland	S180236

Solmek
12-16 Yarm Road,
Stockton on Tees,
TS18 3NA
01642 607083
lab@solmek.com

UKAS TESTING 7607

Hole	BH01	Lab sample ID	SLMK201803166
Depth (Top) m	4.00	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m	4.45	Soil Description	Brown, slightly sandy, slighytly gravelly CLAY
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	96		
10	91		
6.3	85		
5	81		
3.35	78		
2	74		
1.18	72		
0.6	70		
0.425	69		
0.3	69		
0.212	68		
0.15	67		
0.063	59		

Dry Mass of sample, g: 282

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	25.7
Sand	15.4
Fines <0.063mm	59.0

Grading Analysis		
D100	mm	
D60	mm	0.0714
D30	mm	
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
Hydrometer is the usual Sedimentation method carried out by Solmek and is part of the Solmek UKAS accreditation schedule.

Approved by	KW
Approval date	23/03/2018 13:02

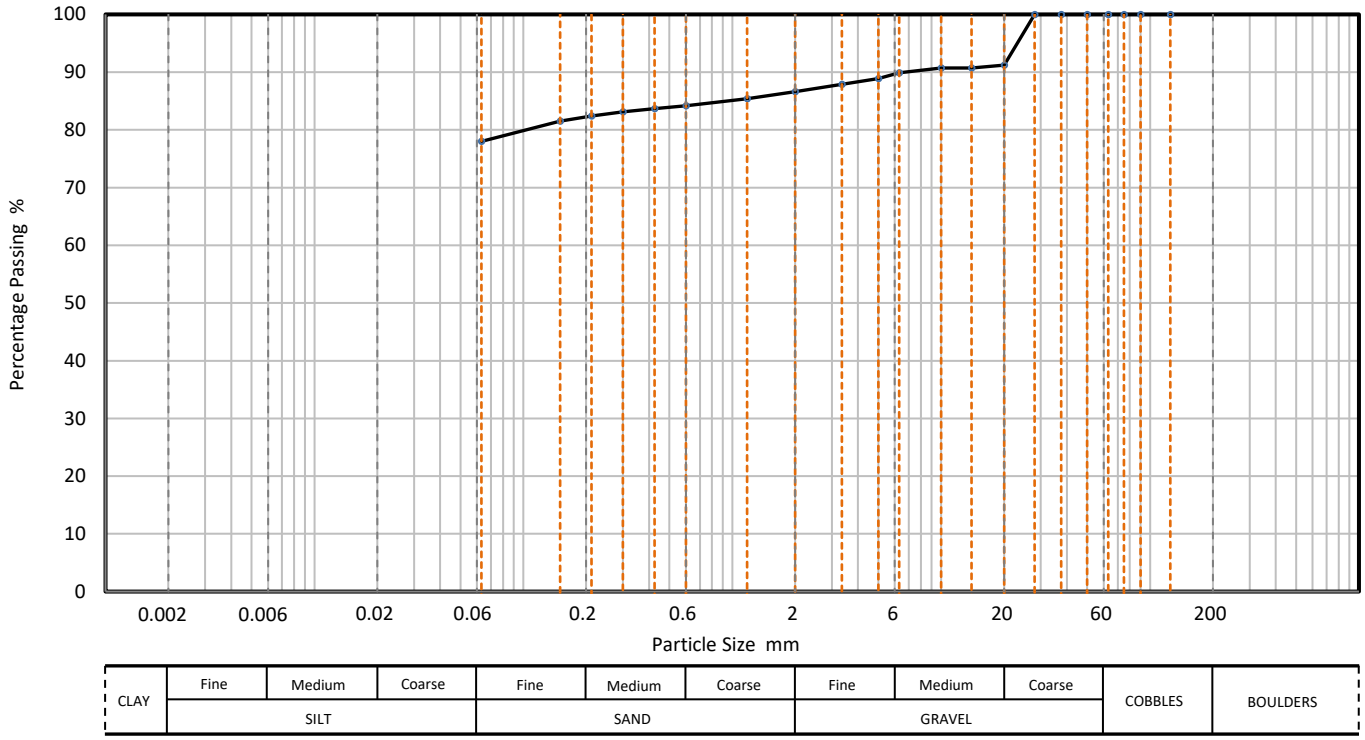
PARTICLE SIZE DISTRIBUTION

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Solmek
12-16 Yarm Road,
Stockton on Tees,
TS18 3NA
01642 607083
lab@solmek.com

UKAS TESTING 7607

Hole	BH03	Lab sample ID	SLMK201803168
Depth (Top) m	4.00	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m	4.2	Soil Description	Brown, slightly sandy, slightly gravelly CLAY
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	91		
14	91		
10	91		
6.3	90		
5	89		
3.35	88		
2	87		
1.18	85		
0.6	84		
0.425	84		
0.3	83		
0.212	82		
0.15	82		
0.063	78		

Dry Mass of sample, g	511

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	13.4
Sand	8.6
Fines <0.063mm	78.0

Grading Analysis		
D100	mm	
D60	mm	
D30	mm	
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
Hydrometer is the usual Sedimentation method carried out by Solmek and is part of the Solmek UKAS accreditation schedule.

Approved by	KW
Approval date	24/03/2018 09:01

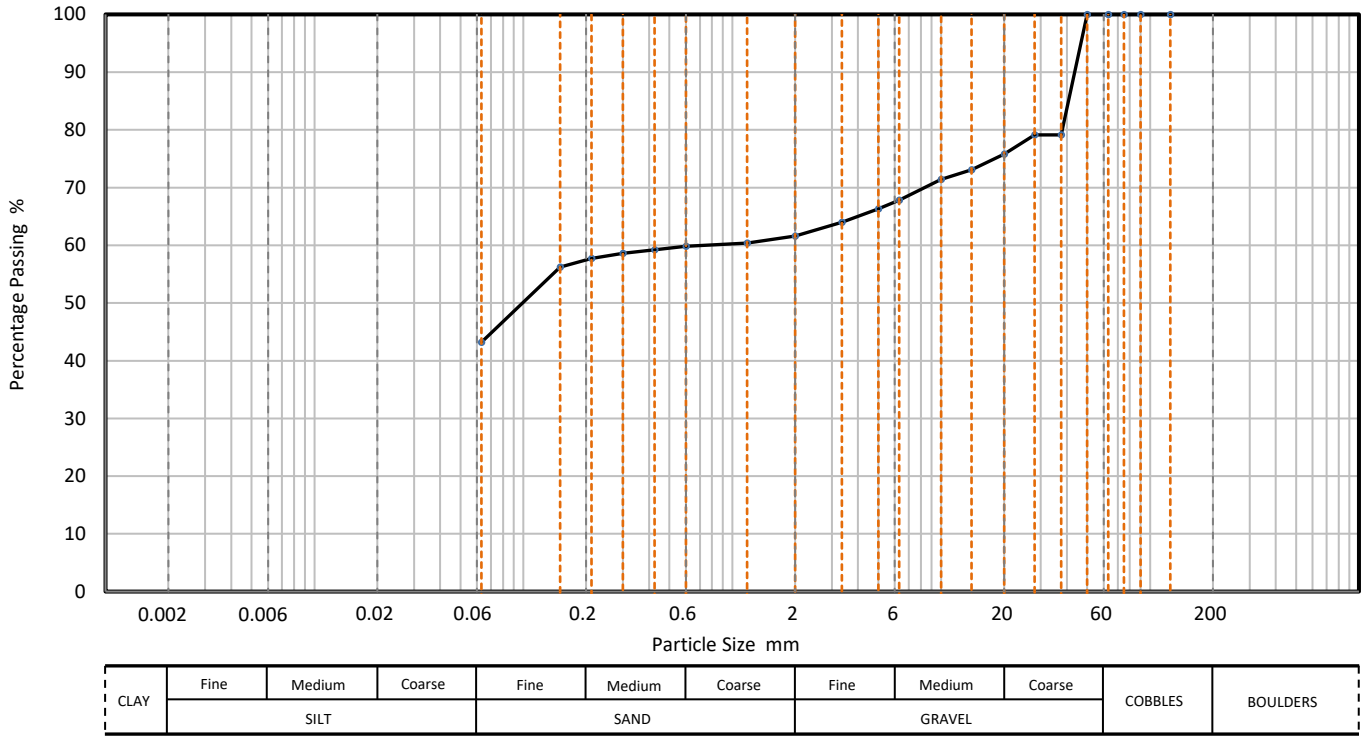
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Solmek
12-16 Yarm Road,
Stockton on Tees,
TS18 3NA
01642 607083
lab@solmek.com

UKAS TESTING 7607

Hole	BH10	Lab sample ID	SLMK2018031629
Depth (Top) m	3.00	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m	3.45	Soil Description	Brown, slightly sandy, gravelly CLAY
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	79		
28	79		
20	76		
14	73		
10	71		
6.3	68		
5	66		
3.35	64		
2	62		
1.18	60		
0.6	60		
0.425	59		
0.3	59		
0.212	58		
0.15	56		
0.063	43		

Dry Mass of sample, g: 726

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	38.4
Sand	18.5
Fines <0.063mm	43.0

Grading Analysis		
D100	mm	
D60	mm	0.741
D30	mm	
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
Hydrometer is the usual Sedimentation method carried out by Solmek and is part of the Solmek UKAS accreditation schedule.

Approved by	KW
Approval date	24/03/2018 09:02

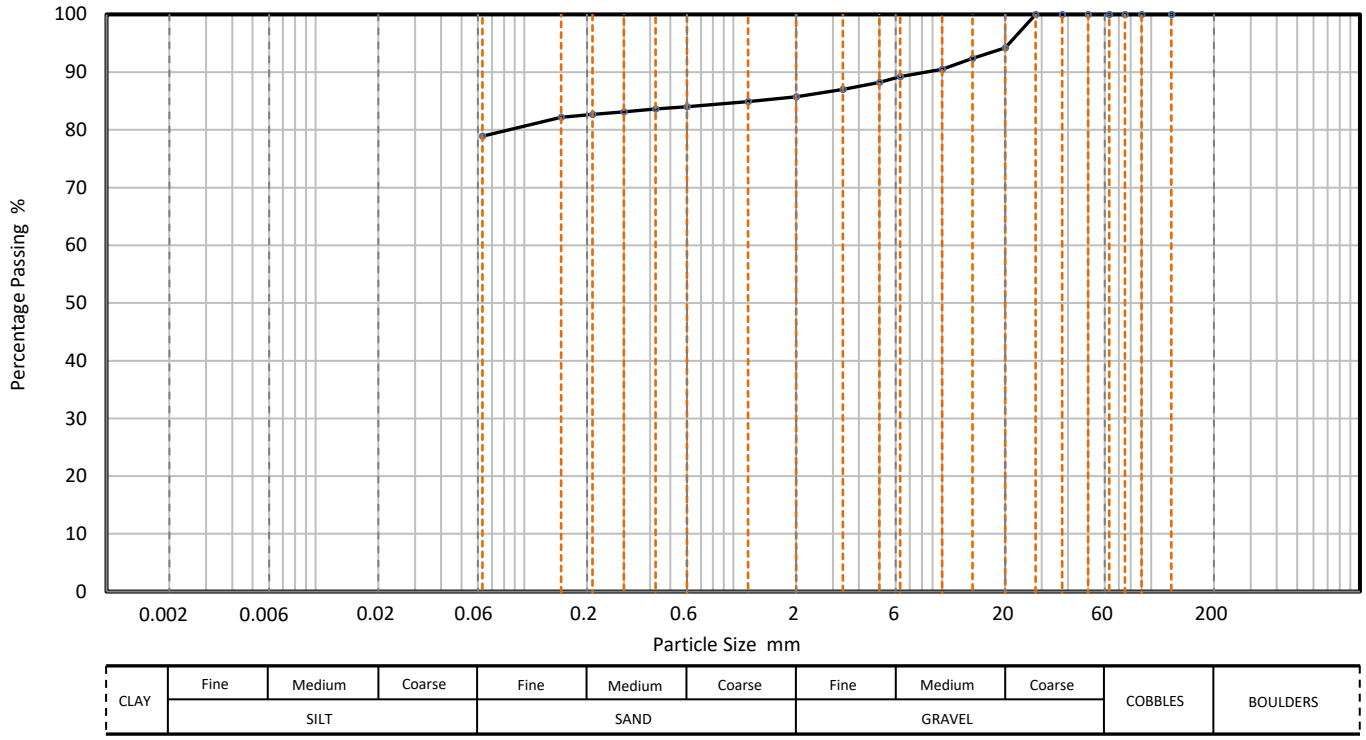
PARTICLE SIZE DISTRIBUTION

Site name	Job number
Ashroyd Business Park, Hoyland	S180236

Solmek
12-16 Yarm Road,
Stockton on Tees,
TS18 3NA
01642 607083
lab@solmek.com

UKAS TESTING
7607

Hole	BH11	Lab sample ID	SLMK2018031630
Depth (Top) m	0.50	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m	0.6	Soil Description	Brown, slightly sandy, slightly gravelly CLAY
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	94		
14	92		
10	91		
6.3	89		
5	88		
3.35	87		
2	86		
1.18	85		
0.6	84		
0.425	84		
0.3	83		
0.212	83		
0.15	82		
0.063	79		

Dry Mass of sample, g	804

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	14.3
Sand	6.8
Fines <0.063mm	79.0

Grading Analysis		
D100	mm	
D60	mm	
D30	mm	
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
Hydrometer is the usual Sedimentation method carried out by Solmek and is part of the Solmek UKAS accreditation schedule.

Approved by	KW
Approval date	23/03/2018 13:03

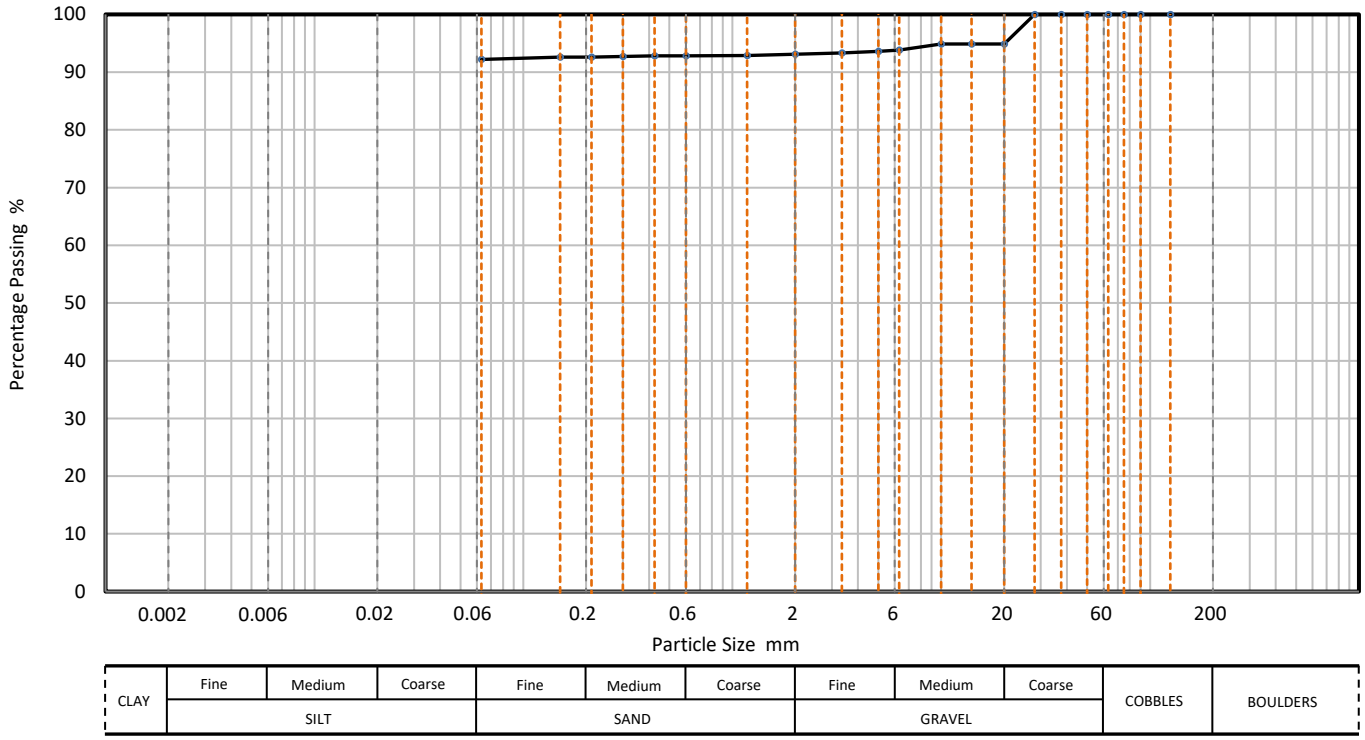
PARTICLE SIZE DISTRIBUTION

Site name	Job number
Ashroyd Business Park, Hoyland	S180236

Solmek
12-16 Yarm Road,
Stockton on Tees,
TS18 3NA
01642 607083
lab@solmek.com

UKAS TESTING
7607

Hole	BH13	Lab sample ID	SLMK2018031632
Depth (Top) m	0.50	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m	0.6	Soil Description	Brown, slightly sandy, slightly gravelly CLAY
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	95		
14	95		
10	95		
6.3	94		
5	94		
3.35	93		
2	93		
1.18	93		
0.6	93		
0.425	93		
0.3	93		
0.212	93		
0.15	93		
0.063	92		

Dry Mass of sample, g: 615

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	6.9
Sand	0.9
Fines <0.063mm	92.0

Grading Analysis		
D100	mm	
D60	mm	
D30	mm	
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
Hydrometer is the usual Sedimentation method carried out by Solmek and is part of the Solmek UKAS accreditation schedule.

Approved by	KW
Approval date	23/03/2018 13:01

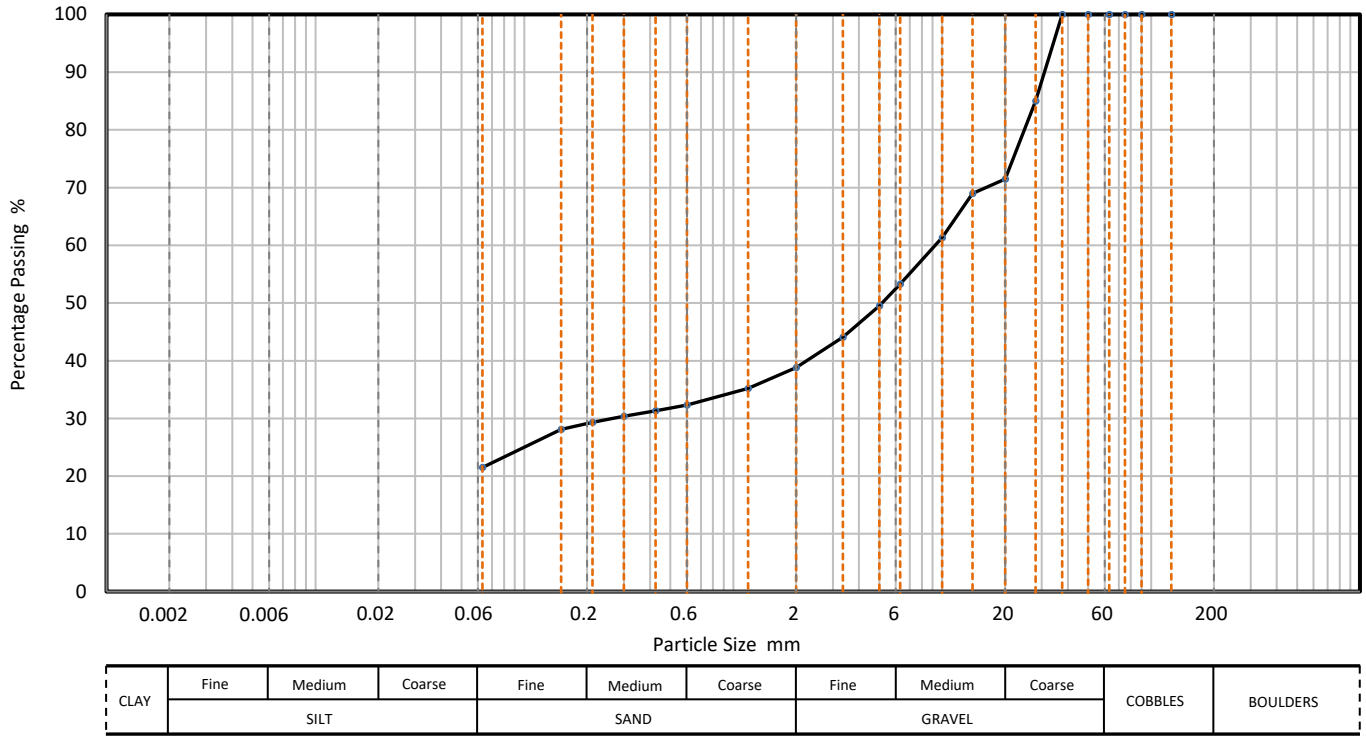
PARTICLE SIZE DISTRIBUTION

Site name	Job number
Ashroyd Business Park, Hoyland	S180236

Solmek
12-16 Yarm Road,
Stockton on Tees,
TS18 3NA
01642 607083
lab@solmek.com

UKAS TESTING 7607

Hole	TP01	Lab sample ID	SLMK2018031612
Depth (Top) m	0.20	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m	0.5	Soil Description	Brown, slightly sandy, slightly clayey SAND
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	85		
20	72		
14	69		
10	61		
6.3	53		
5	50		
3.35	44		
2	39		
1.18	35		
0.6	32		
0.425	31		
0.3	30		
0.212	29		
0.15	28		
0.063	22		

Dry Mass of sample, g: 1053

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	61.2
Sand	17.3
Fines <0.063mm	22.0

Grading Analysis		
D100	mm	
D60	mm	9.27
D30	mm	0.266
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
Hydrometer is the usual Sedimentation method carried out by Solmek and is part of the Solmek UKAS accreditation schedule.

Approved by	KW
Approval date	23/03/2018 13:02

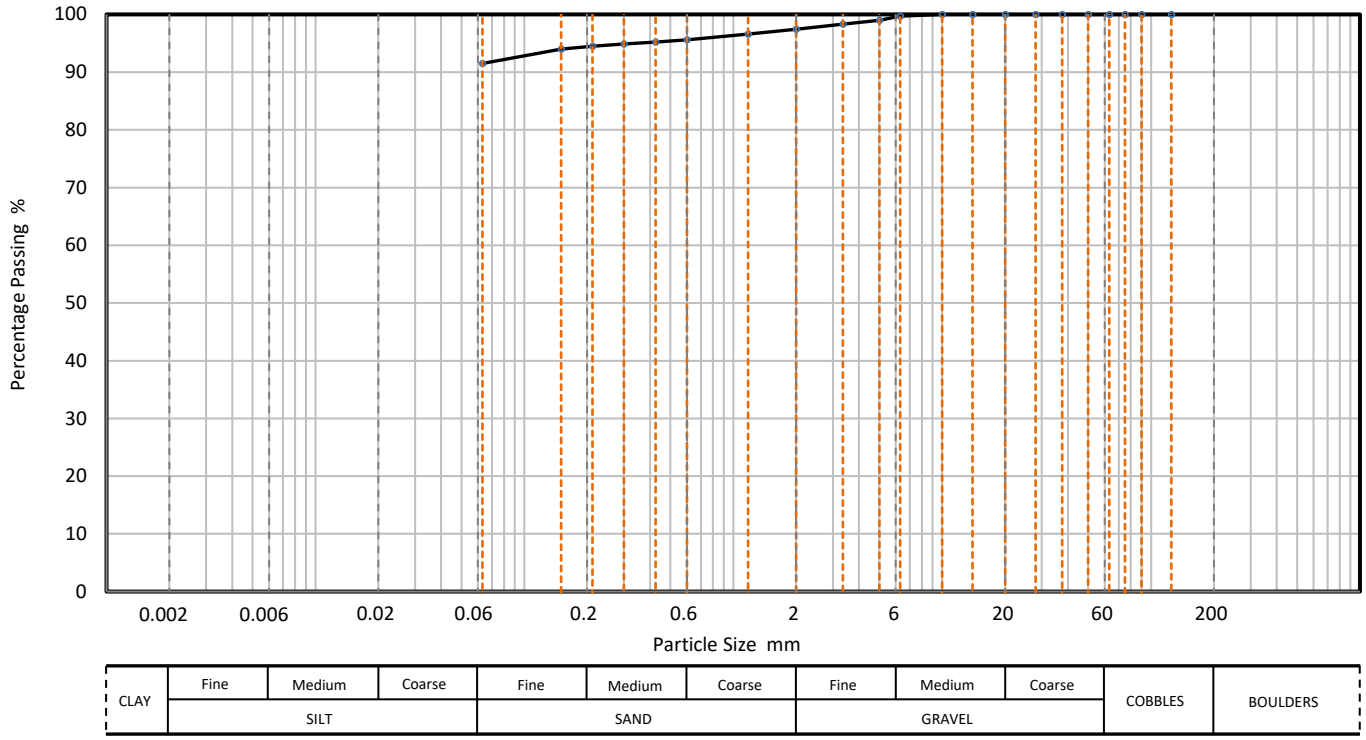
PARTICLE SIZE DISTRIBUTION

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01642 607083
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UKAS TESTING 7607

Hole	TP12	Lab sample ID	SLMK2018031620
Depth (Top) m	2.20	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m	2.4	Soil Description	Brown, slightly gravelly, slightly sandy CLAY
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	99		
3.35	98		
2	97		
1.18	97		
0.6	96		
0.425	95		
0.3	95		
0.212	95		
0.15	94		
0.063	92		

Dry Mass of sample, g: 503

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	2.6
Sand	5.8
Fines <0.063mm	92.0

Grading Analysis		
D100	mm	
D60	mm	
D30	mm	
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks

Preparation and testing in accordance with test method unless noted below

Accreditation status

Hydrometer is the usual Sedimentation method carried out by Solmek and is part of the Solmek UKAS accreditation schedule.

Approved by	KW
Approval date	23/03/2018 12:59

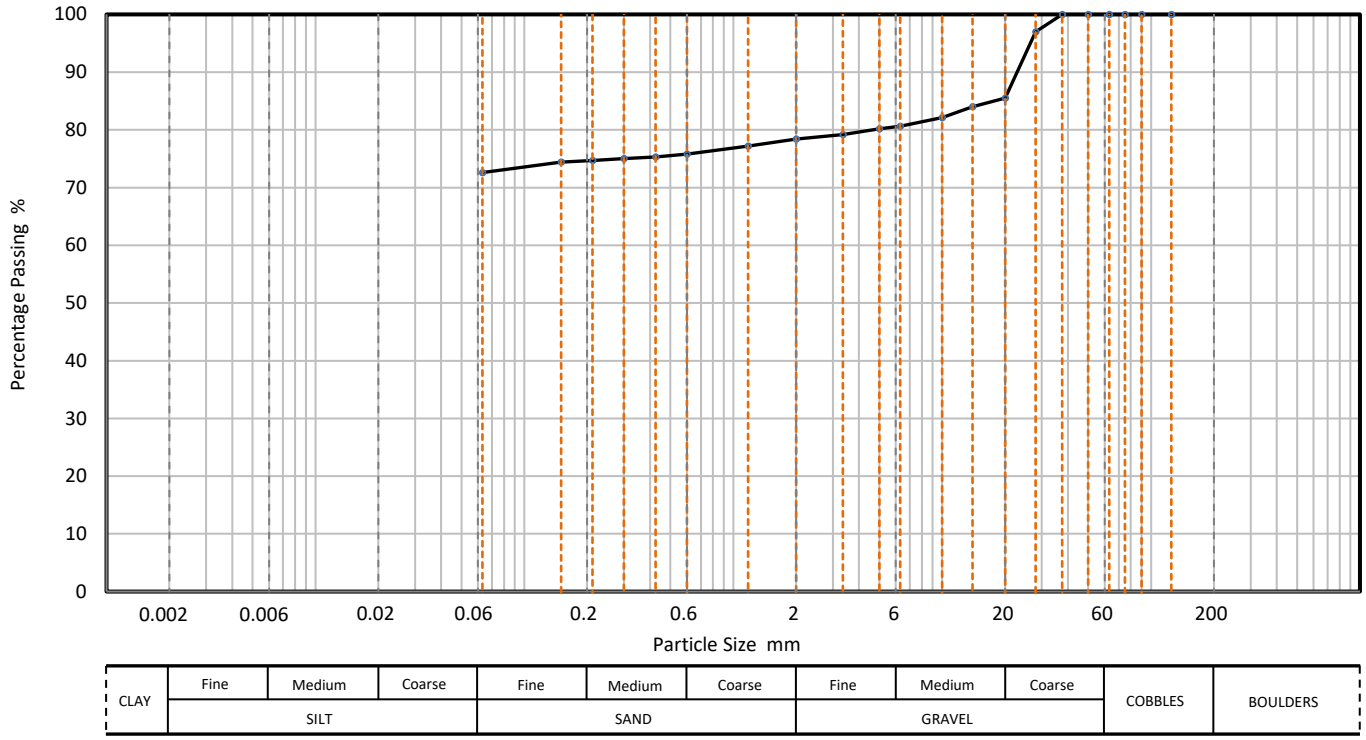
PARTICLE SIZE DISTRIBUTION

Site name	Job number
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Solmek
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UKAS TESTING 7607

Hole	TP13	Lab sample ID	SLMK2018031622
Depth (Top) m	1.60	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m	1.8	Soil Description	Brown, slightly sandy, slightly gravelly CLAY
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	97		
20	86		
14	84		
10	82		
6.3	81		
5	80		
3.35	79		
2	78		
1.18	77		
0.6	76		
0.425	75		
0.3	75		
0.212	75		
0.15	74		
0.063	73		

Dry Mass of sample, g	1018

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	21.6
Sand	5.8
Fines <0.063mm	73.0

Grading Analysis		
D100	mm	
D60	mm	
D30	mm	
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
Hydrometer is the usual Sedimentation method carried out by Solmek and is part of the Solmek UKAS accreditation schedule.

Approved by	KW
Approval date	23/03/2018 12:56

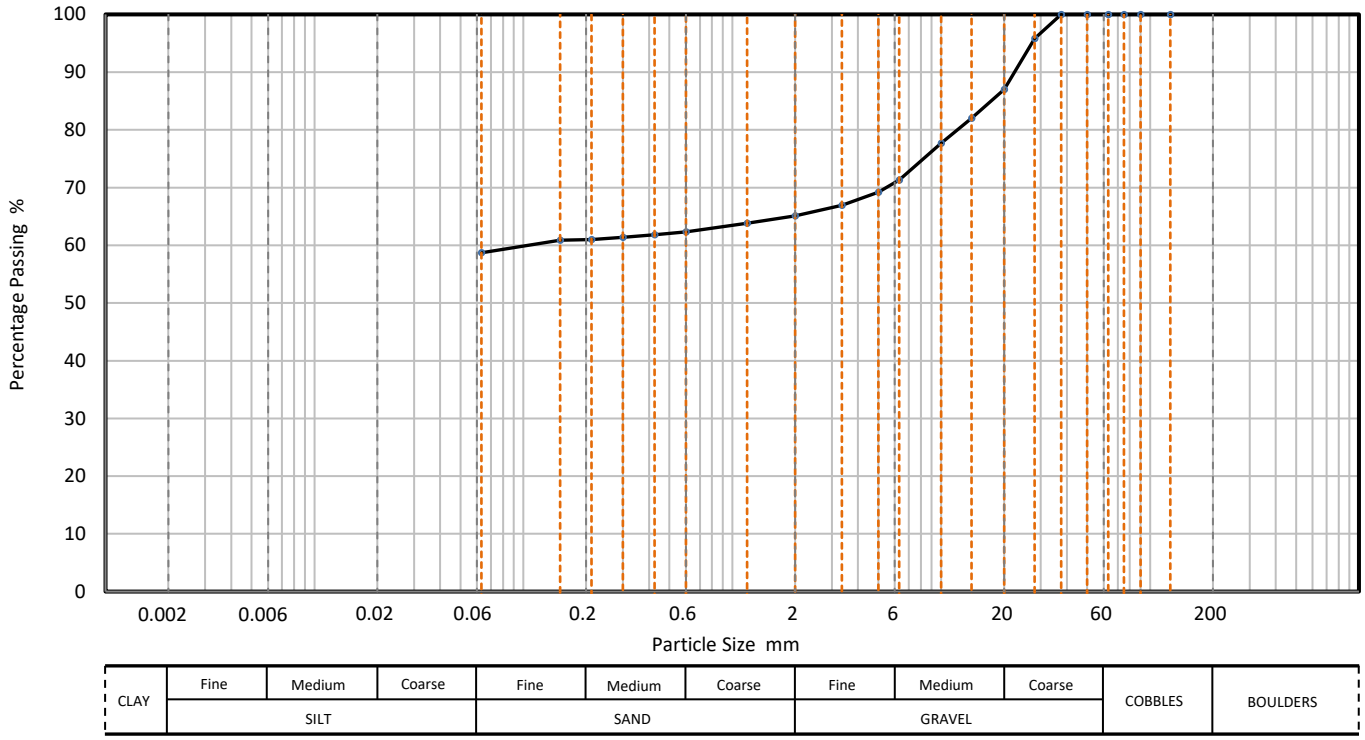
PARTICLE SIZE DISTRIBUTION

Site name	Job number
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12-16 Yarm Road,
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UKAS TESTING 7607

Hole	TP15	Lab sample ID	SLMK2018031624
Depth (Top) m	1.00	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m	1.5	Soil Description	Brown, slightly sandy, gravelly CLAY
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	96		
20	87		
14	82		
10	78		
6.3	71		
5	69		
3.35	67		
2	65		
1.18	64		
0.6	62		
0.425	62		
0.3	61		
0.212	61		
0.15	61		
0.063	59		

Dry Mass of sample, g: 1020

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	34.9
Sand	6.4
Fines <0.063mm	59.0

Grading Analysis		
D100	mm	
D60	mm	0.105
D30	mm	
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
Hydrometer is the usual Sedimentation method carried out by Solmek and is part of the Solmek UKAS accreditation schedule.

Approved by	KW
Approval date	23/03/2018 12:57

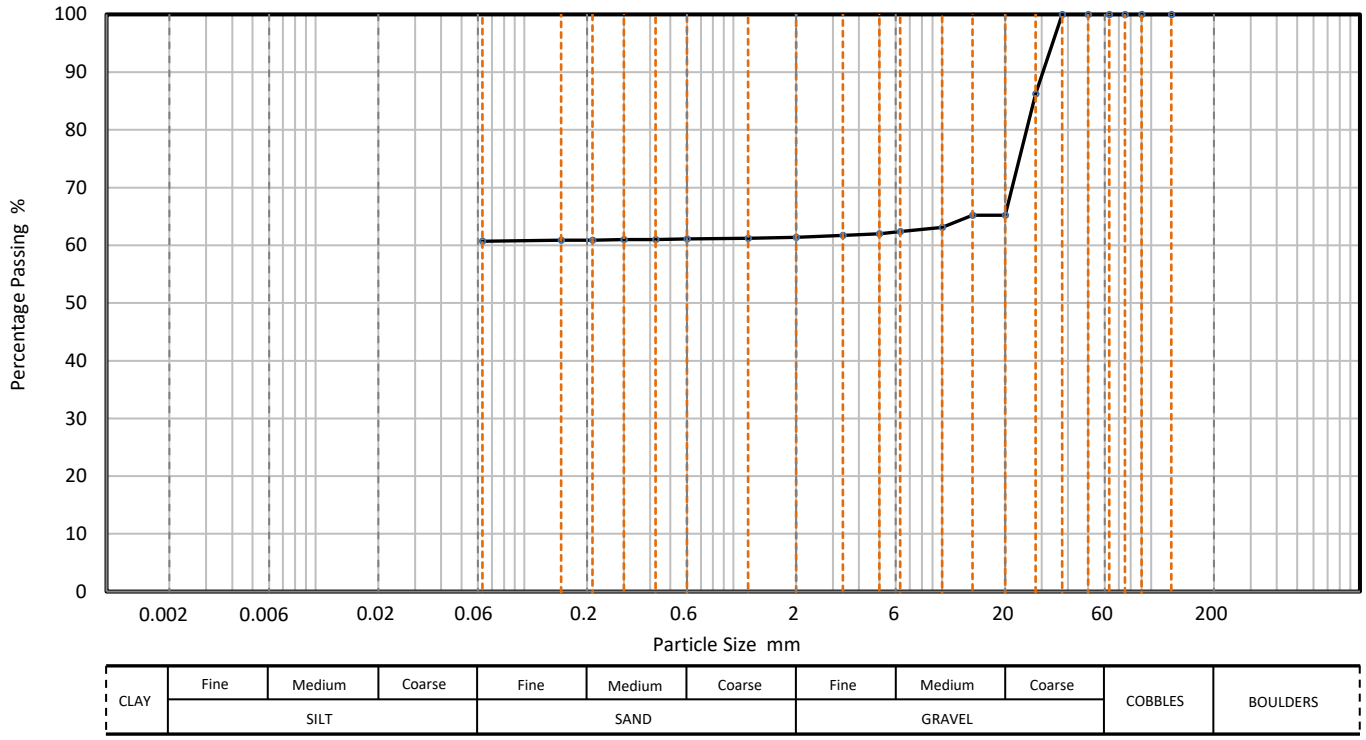
PARTICLE SIZE DISTRIBUTION

Site name	Job number
Ashroyd Business Park, Hoyland	S180236

Solmek
12-16 Yarm Road,
Stockton on Tees,
TS18 3NA
01642 607083
lab@solmek.com

UKAS TESTING 7607

Hole		TP17	Lab sample ID	SLMK2018031626
Depth (Top)	m	1.60	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base)	m	1.8	Soil Description	Brown, gravelly CLAY
Sample type		B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	86		
20	65		
14	65		
10	63		
6.3	62		
5	62		
3.35	62		
2	61		
1.18	61		
0.6	61		
0.425	61		
0.3	61		
0.212	61		
0.15	61		
0.063	61		

Dry Mass of sample, g	1005

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	38.6
Sand	0.7
Fines <0.063mm	61.0

Grading Analysis		
D100	mm	
D60	mm	
D30	mm	
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
Hydrometer is the usual Sedimentation method carried out by Solmek and is part of the Solmek UKAS accreditation schedule.

Approved by	KW
Approval date	24/03/2018 09:03

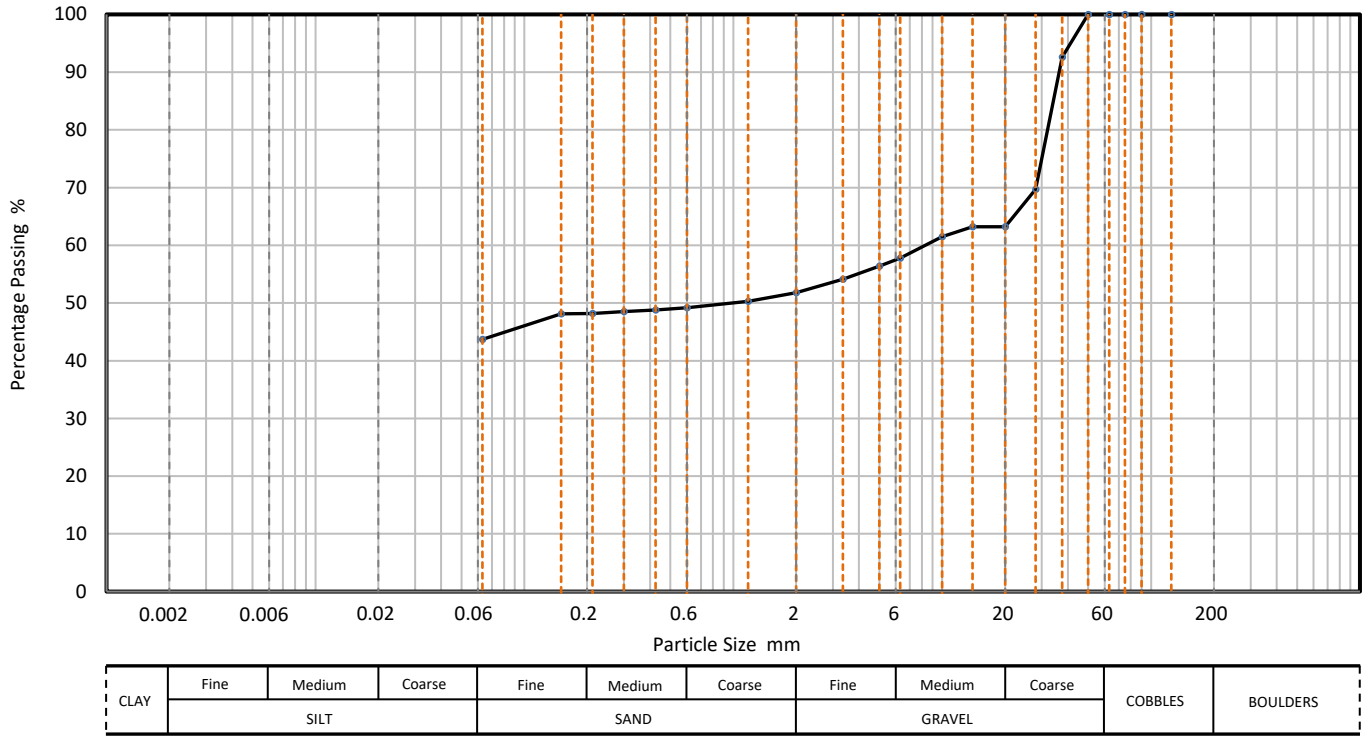
PARTICLE SIZE DISTRIBUTION

Site name	Job number
Ashroyd Business Park, Hoyland	S180236

Solmek
12-16 Yarm Road,
Stockton on Tees,
TS18 3NA
01642 607083
lab@solmek.com

UKAS TESTING 7607

Hole	TP18	Lab sample ID	SLMK2018031633
Depth (Top) m	0.60	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m	0.8	Soil Description	Brown, slightly sandy, clayey GRAVEL
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	93		
28	70		
20	63		
14	63		
10	62		
6.3	58		
5	56		
3.35	54		
2	52		
1.18	50		
0.6	49		
0.425	49		
0.3	49		
0.212	48		
0.15	48		
0.063	44		

Dry Mass of sample, g: 1144

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	48.2
Sand	8.1
Fines <0.063mm	44.0

Grading Analysis		
D100	mm	
D60	mm	8.32
D30	mm	
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks

Preparation and testing in accordance with test method unless noted below

Accreditation status

Hydrometer is the usual Sedimentation method carried out by Solmek and is part of the Solmek UKAS accreditation schedule.

Approved by	KW
Approval date	24/03/2018 09:04

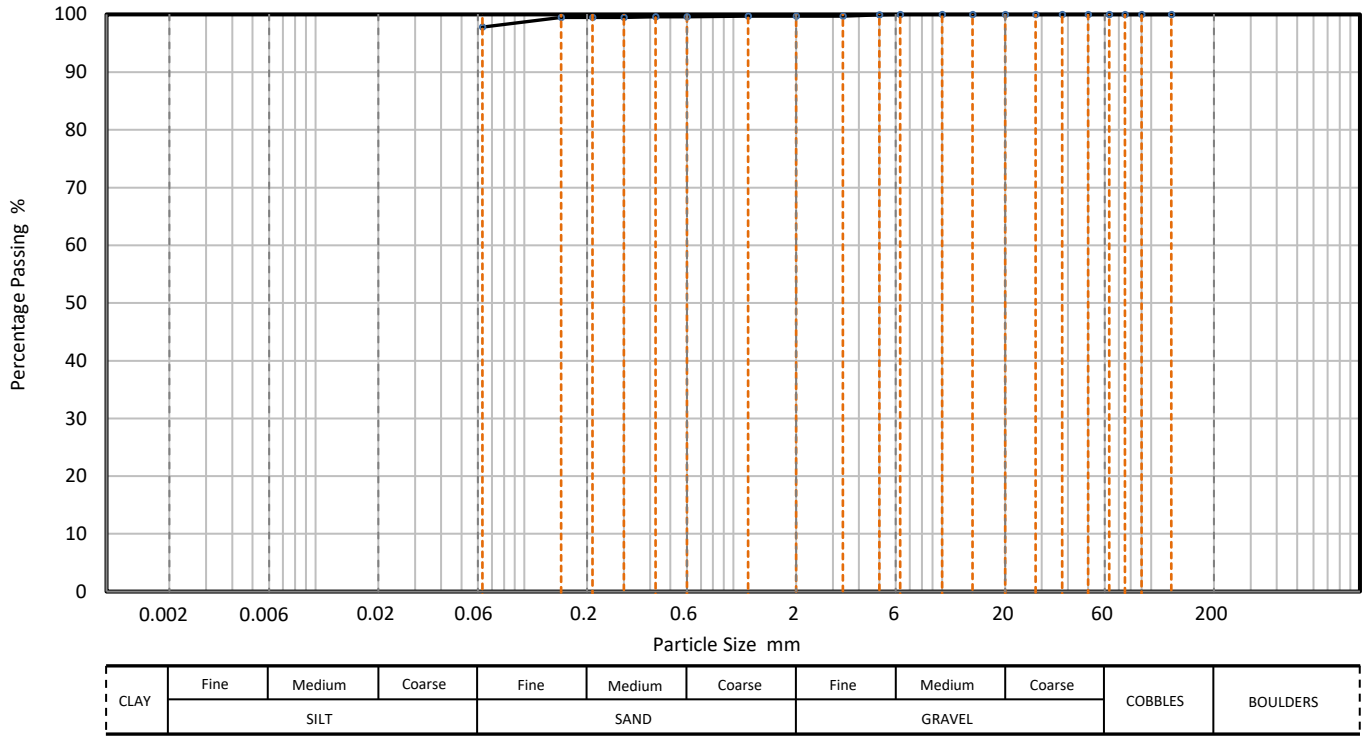
PARTICLE SIZE DISTRIBUTION

Site name	Job number
Ashroyd Business Park, Hoyland	S180236

Solmek
12-16 Yarm Road,
Stockton on Tees,
TS18 3NA
01642 607083
lab@solmek.com

UKAS TESTING 7607

Hole	TP23	Lab sample ID	SLMK2018031636
Depth (Top) m	0.50	Test Method	BS 1377 - 2 : 1990 Clause 9.2
Depth (Base) m	0.6	Soil Description	Brown, slightly sandy CLAY
Sample type	B		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	100		
0.212	100		
0.15	100		
0.063	98		

Dry Mass of sample, g	814

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	0.3
Sand	1.9
Fines <0.063mm	98.0

Grading Analysis		
D100	mm	
D60	mm	
D30	mm	
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks
Preparation and testing in accordance with test method unless noted below

Accreditation status
Hydrometer is the usual Sedimentation method carried out by Solmek and is part of the Solmek UKAS accreditation schedule.

Approved by	KW
Approval date	23/03/2018 13:00

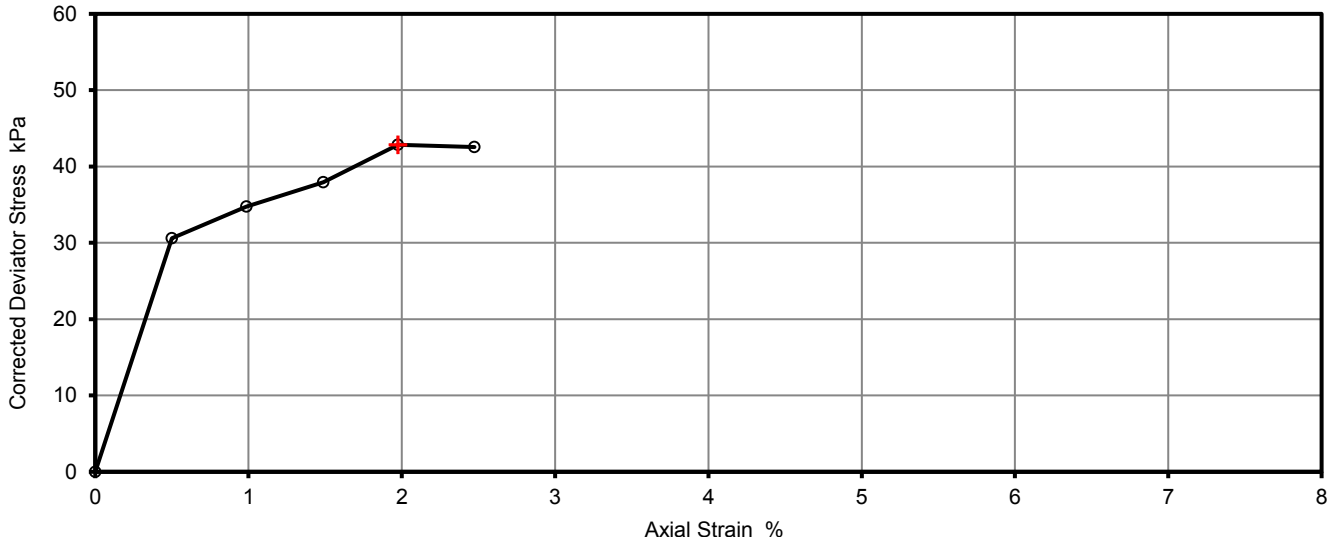
	Unconsolidated Undrained Triaxial Compression Test without measurement of pore pressure - single specimen			Job Ref	S180236
				Borehole/Pit No.	BH01
Site Name	Ashroyd Business Park, Hoyland			Sample No.	
Soil Description				Depth	3.00
Specimen Reference		Specimen Depth	m	Sample Type	B
Specimen Description	Soft consistency, brown, slightly gravelly, very low strength CLAY.			KeyLAB ID	SLMK201803165
Test Method	BS1377 : Part 7 : 1990, clause 8, single specimen			Date of test	24-03-2018

Test Number	1	
Length	76.0	mm
Diameter	38.0	mm
Bulk Density	2.04	Mg/m3
Moisture Content	25.9	%
Dry Density	1.62	Mg/m3
Rate of Strain	1.0	%/min
Cell Pressure	60	kPa
At failure: Axial Strain	2.0	%
At failure: Deviator Stress, (σ1 - σ3)f	43	kPa
At failure: Undrained Shear Strength, cu	21	kPa ½(σ1 - σ3)f
At failure: Mode of Failure	Plastic	

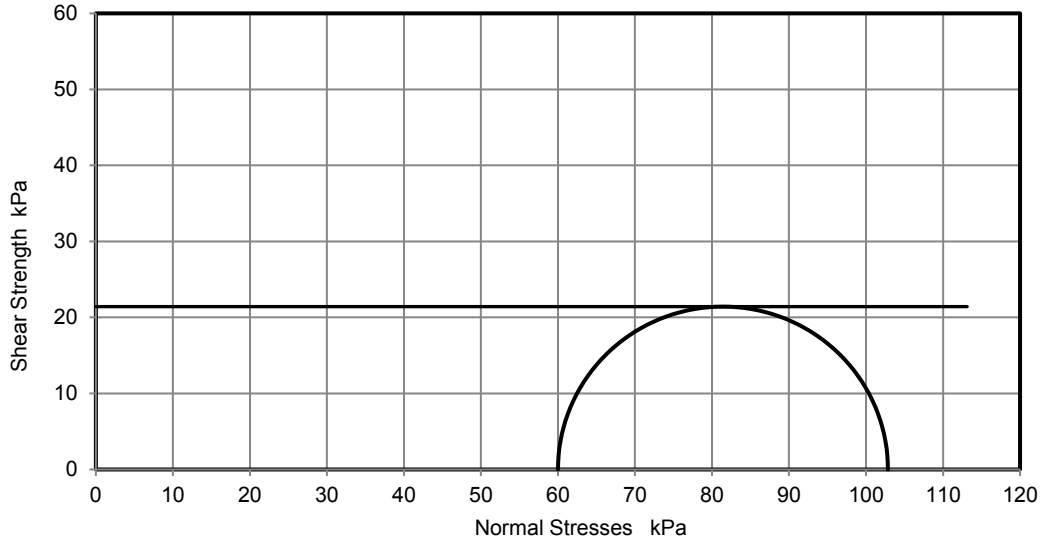
Tracable Equipment Record

Test Frame	TRI 003
Load Ring	LOAD CELL 003
Pressure Gauge	PRE 004
Digital Caliper	CAL-005
Balance	BAL-001

Deviator Stress v Axial Strain



Mohr Circles



Deviator stress corrected for area change and membrane effects

Mohr circles and their interpretation is not covered by BS1377.
This is provided for information only.

No of membranes used
1
Total thickness (mm)
0.26

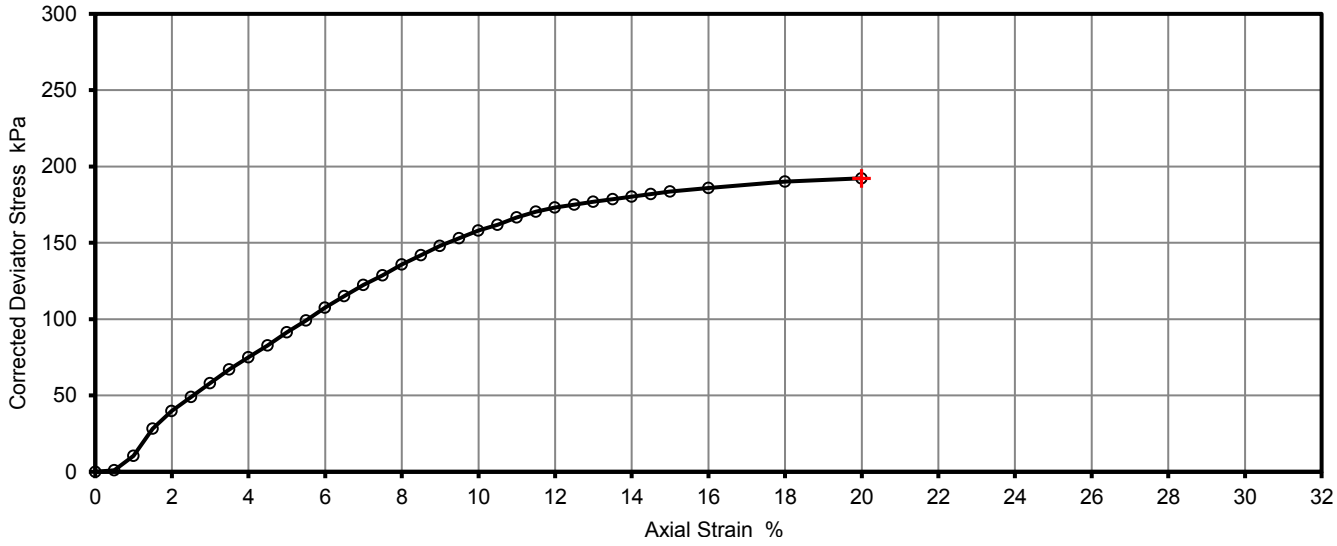
	Unconsolidated Undrained Triaxial Compression Test without measurement of pore pressure - single specimen			Job Ref	S180236
				Borehole/Pit No.	BH03
Site Name	Ashroyd Business Park, Hoyland			Sample No.	
Soil Description				Depth	2.00
Specimen Reference		Specimen Depth	m	Sample Type	U
Specimen Description	Firm consistency, brown, high strength CLAY.			KeyLAB ID	SLMK201803167
Test Method	BS1377 : Part 7 : 1990, clause 8, single specimen			Date of test	23-03-2018

Test Number		1	
Length		203.0	mm
Diameter		103.0	mm
Bulk Density		2.10	Mg/m3
Moisture Content		18.1	%
Dry Density		1.78	Mg/m3
Rate of Strain		1.0	%/min
Cell Pressure		40	kPa
At failure	Axial Strain	20.0	%
	Deviator Stress, (σ1 - σ3)f	192	kPa
	Undrained Shear Strength, cu	96	kPa ½(σ1 - σ3)f
	Mode of Failure	Compound	

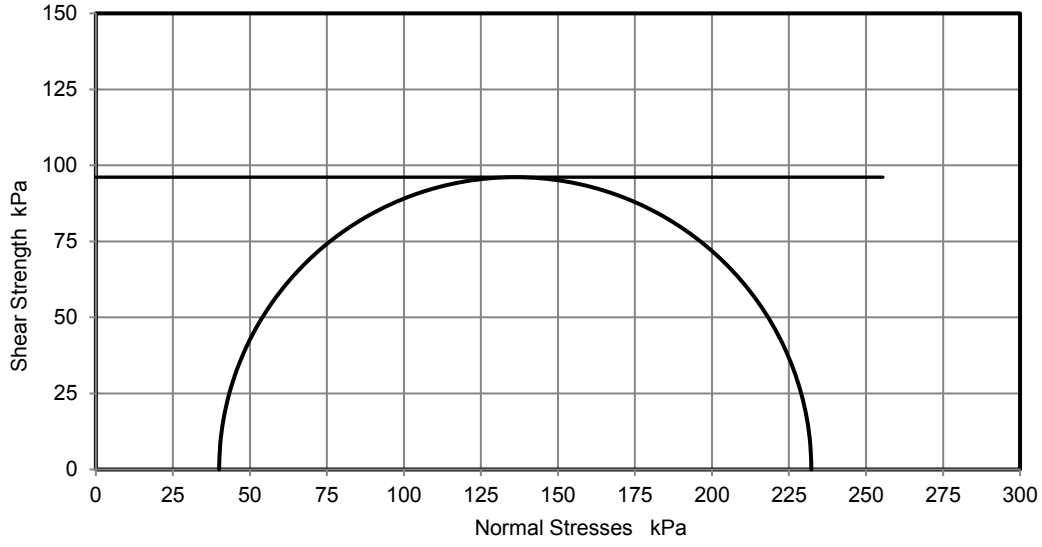
Tracable Equipment Record

Test Frame	TRI 004
Load Ring	LOAD CELL 001
Pressure Gauge	PRE 006
Digital Caliper	CAL-005
Balance	BAL-001

Deviator Stress v Axial Strain



Mohr Circles



Deviator stress corrected for area change and membrane effects

Mohr circles and their interpretation is not covered by BS1377.
This is provided for information only.

No of membranes used
1
Total thickness (mm)
0.35

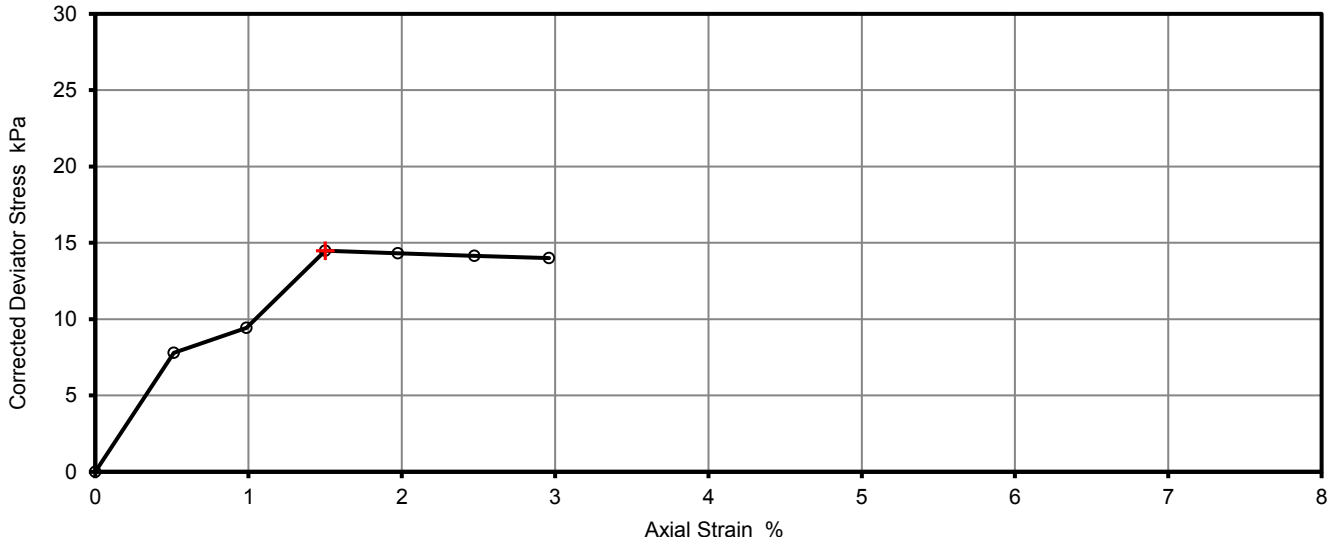
	Unconsolidated Undrained Triaxial Compression Test without measurement of pore pressure - single specimen			Job Ref	S180236
				Borehole/Pit No.	BH04
Site Name	Ashroyd Business Park, Hoyland			Sample No.	
Soil Description				Depth	1.20
Specimen Reference		Specimen Depth	m	Sample Type	B
Specimen Description	Soft consistency, brown, slightly gravelly, extremely low strength CLAY.			KeyLAB ID	SLMK201803169
Test Method	BS1377 : Part 7 : 1990, clause 8, single specimen			Date of test	25-03-2018

Test Number		1	
Length		76.0	mm
Diameter		38.0	mm
Bulk Density		1.96	Mg/m3
Moisture Content		20.9	%
Dry Density		1.62	Mg/m3
Rate of Strain		1.0	%/min
Cell Pressure		24	kPa
At failure	Axial Strain	1.5	%
	Deviator Stress, (σ1 - σ3)f	14	kPa
	Undrained Shear Strength, cu	7	kPa ½(σ1 - σ3)f
	Mode of Failure	Plastic	

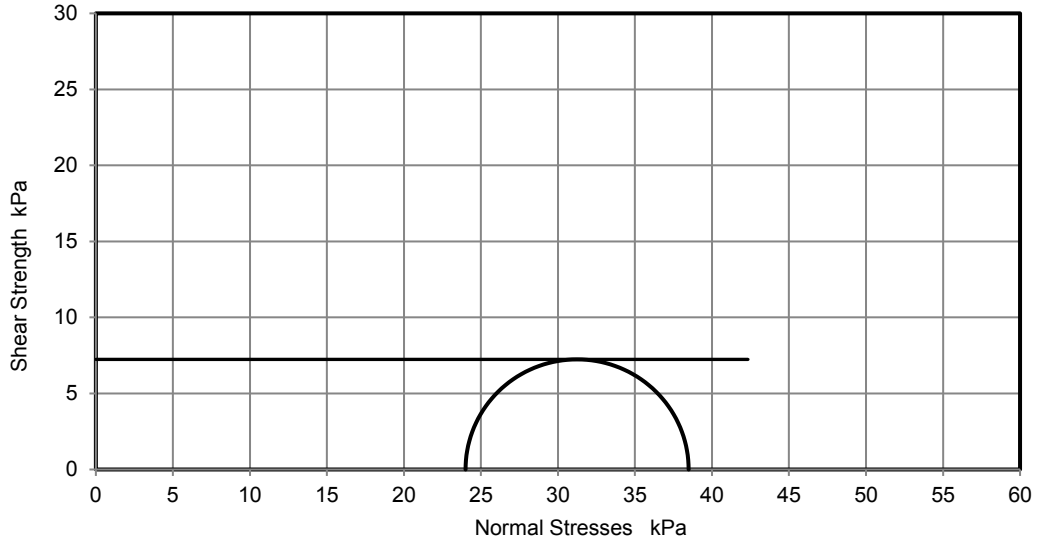
Tracable Equipment Record

Test Frame	TRI 003
Load Ring	LOAD CELL 003
Pressure Gauge	PRE 004
Digital Caliper	CAL-005
Balance	BAL-001

Deviator Stress v Axial Strain



Mohr Circles



Deviator stress corrected for area change and membrane effects

Mohr circles and their interpretation is not covered by BS1377.
This is provided for information only.

No of membranes used
1
Total thickness (mm)
0.26

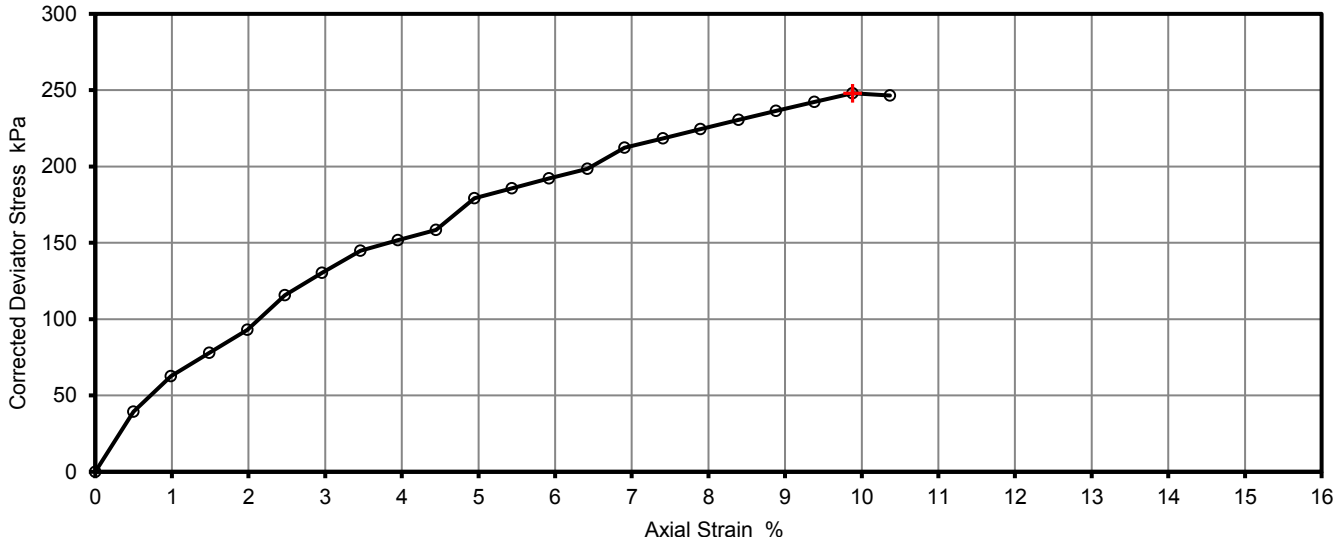
	Unconsolidated Undrained Triaxial Compression Test without measurement of pore pressure - single specimen			Job Ref	S180236
				Borehole/Pit No.	BH04
Site Name	Ashroyd Business Park, Hoyland			Sample No.	
Soil Description				Depth	4.00
Specimen Reference		Specimen Depth	m	Sample Type	U
Specimen Description	Firm consistency, brown mottled grey, slightly silty high strength CLAY.			KeyLAB ID	SLMK2018031610
Test Method	BS1377 : Part 7 : 1990, clause 8, single specimen			Date of test	25-03-2018

Test Number		1	
Length		76.0	mm
Diameter		38.0	mm
Bulk Density		2.12	Mg/m3
Moisture Content		21.7	%
Dry Density		1.74	Mg/m3
Rate of Strain		1.0	%/min
Cell Pressure		80	kPa
At failure	Axial Strain	9.9	%
	Deviator Stress, (σ1 - σ3)f	248	kPa
	Undrained Shear Strength, cu	124	kPa ½(σ1 - σ3)f
	Mode of Failure	Plastic	

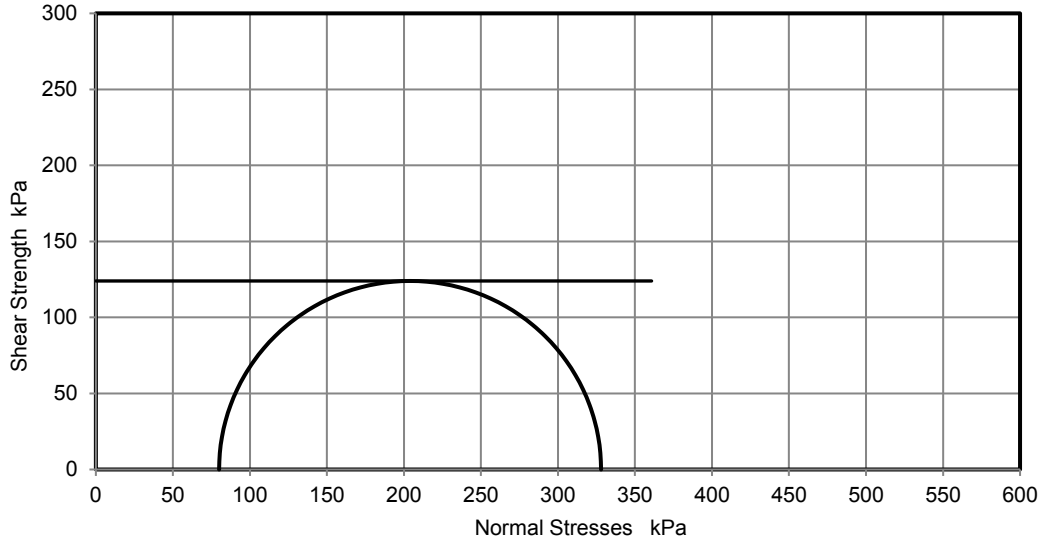
Tracable Equipment Record

Test Frame	TRI 004
Load Ring	LOAD CELL 001
Pressure Gauge	PRE 006
Digital Caliper	CAL-005
Balance	BAL-001

Deviator Stress v Axial Strain



Mohr Circles



Deviator stress corrected for area change and membrane effects

Mohr circles and their interpretation is not covered by BS1377.
This is provided for information only.

No of membranes used
1
Total thickness (mm)
0.26

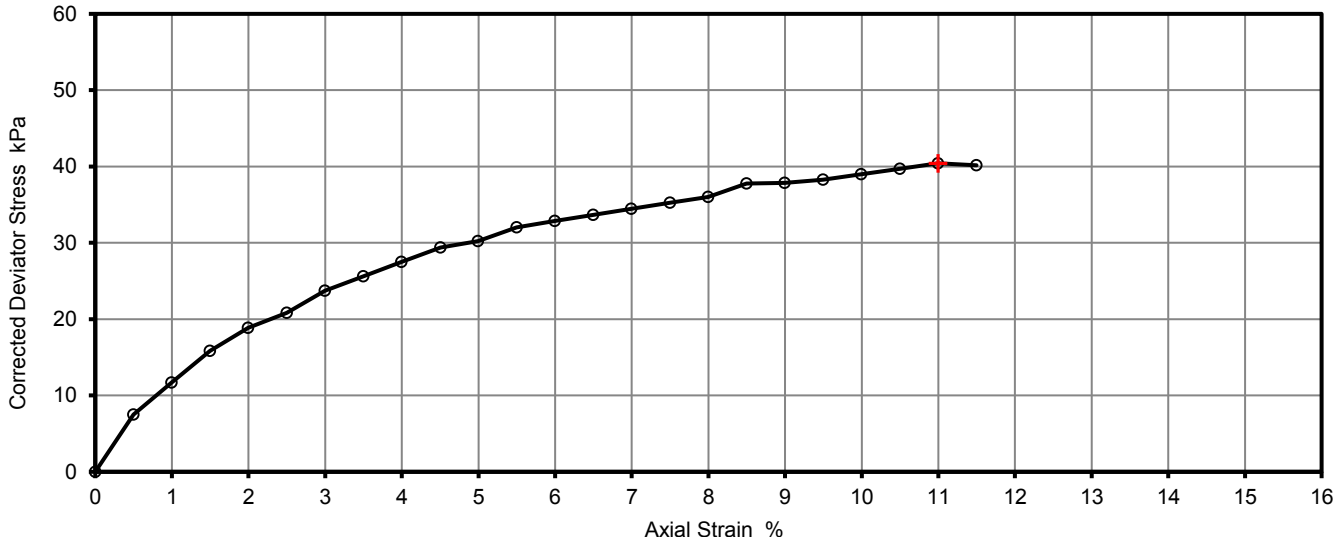
	Unconsolidated Undrained Triaxial Compression Test without measurement of pore pressure - single specimen			Job Ref	S180236
				Borehole/Pit No.	BH05
Site Name	Ashroyd Business Park, Hoyland			Sample No.	
Soil Description				Depth	1.20
Specimen Reference		Specimen Depth	m	Sample Type	U
Specimen Description	Firm consistency, brown mottled grey & orange, slightly sandy, silty, low strength CLAY.			KeyLAB ID	SLMK2018031614
Test Method	BS1377 : Part 7 : 1990, clause 8, single specimen			Date of test	24-03-2018

Test Number		1	
Length		203.0	mm
Diameter		103.0	mm
Bulk Density		2.05	Mg/m3
Moisture Content		23.5	%
Dry Density		1.66	Mg/m3
Rate of Strain		1.0	%/min
Cell Pressure		24	kPa
At failure	Axial Strain	11.0	%
	Deviator Stress, (σ1 - σ3)f	40	kPa
	Undrained Shear Strength, cu	20	kPa ½(σ1 - σ3)f
	Mode of Failure	Compound	

Tracable Equipment Record

Test Frame	TRI 003
Load Ring	LOAD CELL 003
Pressure Gauge	PRE 004
Digital Caliper	CAL-005
Balance	BAL-001

Deviator Stress v Axial Strain



Mohr Circles



Deviator stress corrected for area change and membrane effects

Mohr circles and their interpretation is not covered by BS1377.
This is provided for information only.

No of membranes used
1
Total thickness (mm)
0.35

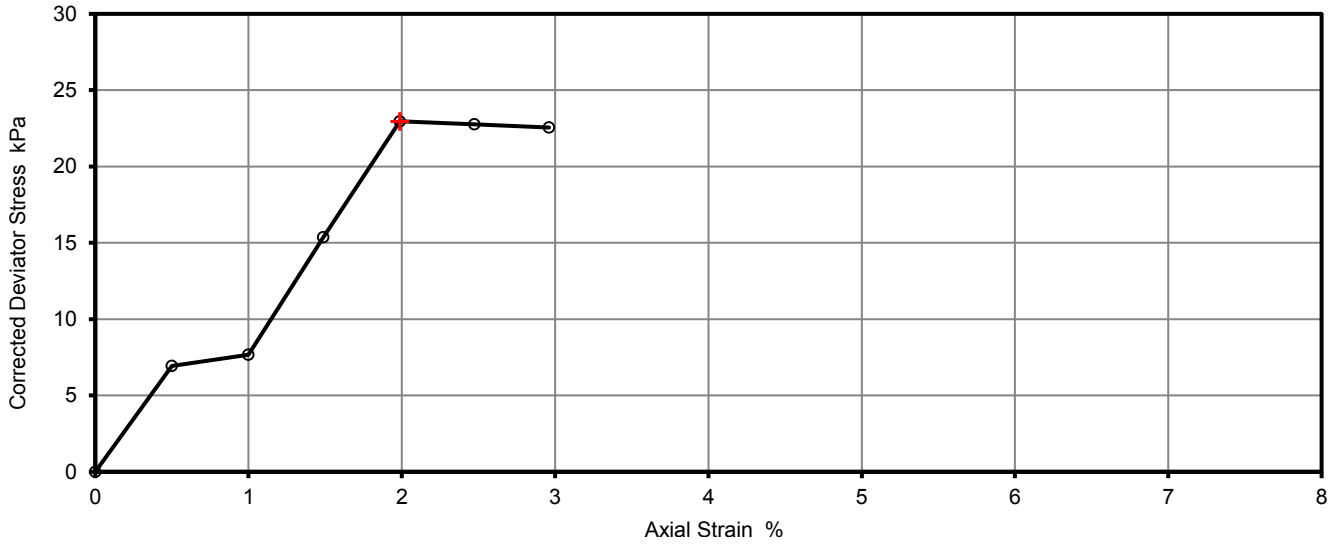
	Unconsolidated Undrained Triaxial Compression Test without measurement of pore pressure - single specimen			Job Ref	S180236
				Borehole/Pit No.	BH06
Site Name	Ashroyd Business Park, Hoyland			Sample No.	
Soil Description				Depth	1.20
Specimen Reference		Specimen Depth	m	Sample Type	B
Specimen Description	Soft consistency, orangish brown, very low strength CLAY.			KeyLAB ID	SLMK2018031615
Test Method	BS1377 : Part 7 : 1990, clause 8, single specimen			Date of test	27-03-2018

Test Number		1	
Length		76.0	mm
Diameter		38.0	mm
Bulk Density		1.98	Mg/m3
Moisture Content		23.4	%
Dry Density		1.61	Mg/m3
Rate of Strain		1.0	%/min
Cell Pressure		24	kPa
At failure	Axial Strain	2.0	%
	Deviator Stress, (σ1 - σ3)f	23	kPa
	Undrained Shear Strength, cu	11	kPa ½(σ1 - σ3)f
	Mode of Failure	Compound	

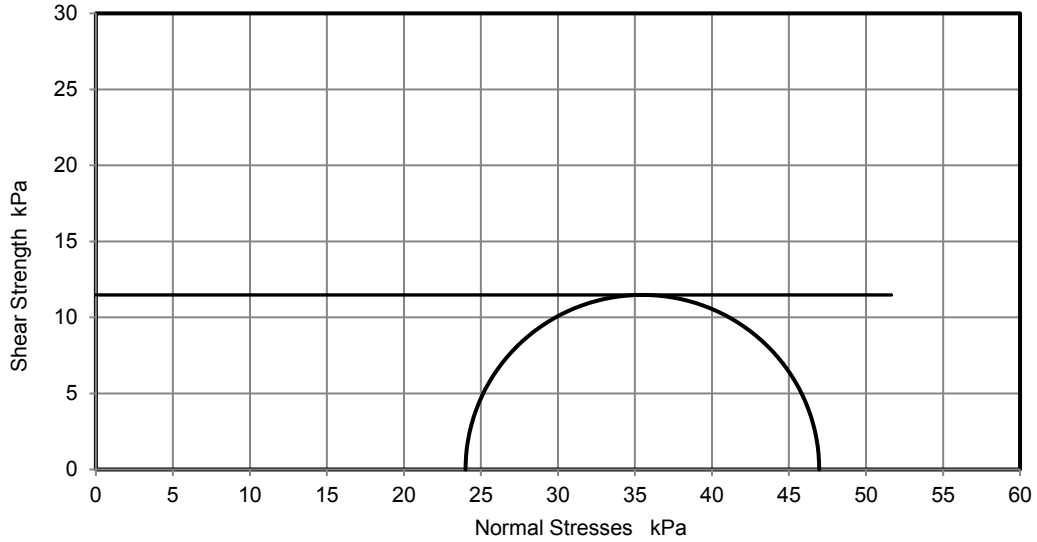
Tracable Equipment Record

Test Frame	TRI 004
Load Ring	LOAD CELL 001
Pressure Gauge	PRE 006
Digital Caliper	CAL-005
Balance	BAL-001

Deviator Stress v Axial Strain



Mohr Circles



Deviator stress corrected for area change and membrane effects

Mohr circles and their interpretation is not covered by BS1377.
This is provided for information only.

No of membranes used
1
Total thickness (mm)
0.26

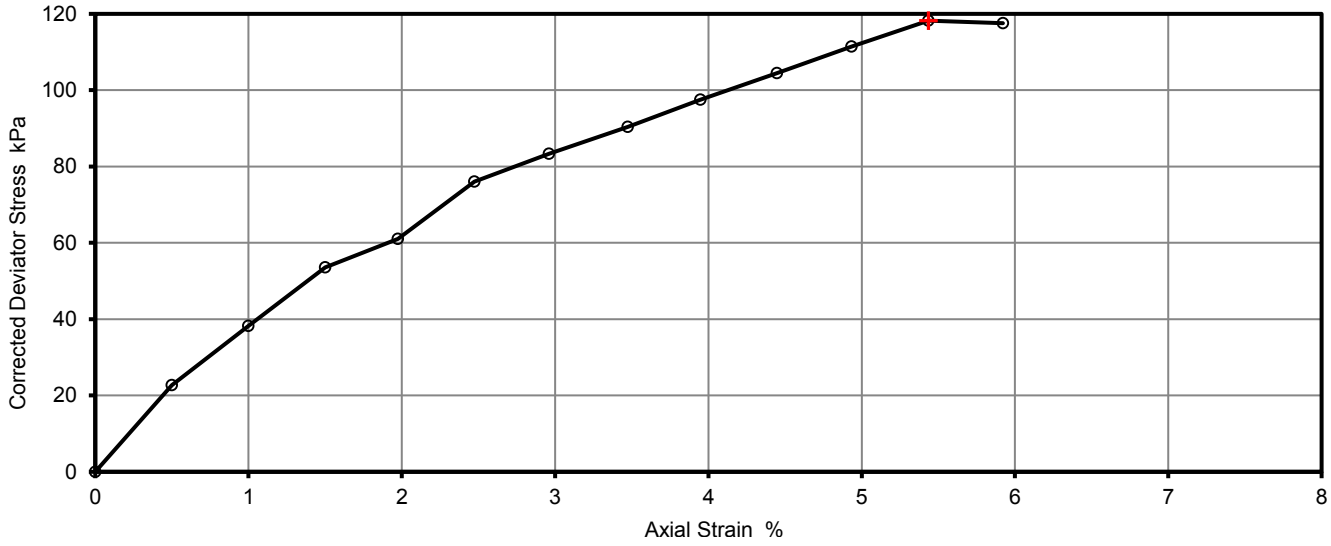
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				Borehole/Pit No.	BH06
Site Name	Ashroyd Business Park, Hoyland			Sample No.	
Soil Description				Depth	3.00
Specimen Reference		Specimen Depth	m	Sample Type	B
Specimen Description	Firm consistency, brown, medium strength CLAY.			KeyLAB ID	SLMK2018031616
Test Method	BS1377 : Part 7 : 1990, clause 8, single specimen			Date of test	24-03-2018

Test Number		1	
Length		76.0	mm
Diameter		38.0	mm
Bulk Density		2.00	Mg/m3
Moisture Content		29.0	%
Dry Density		1.55	Mg/m3
Rate of Strain		1.0	%/min
Cell Pressure		60	kPa
At failure	Axial Strain	5.4	%
	Deviator Stress, (σ1 - σ3)f	118	kPa
	Undrained Shear Strength, cu	59	kPa ½(σ1 - σ3)f
	Mode of Failure	Compound	

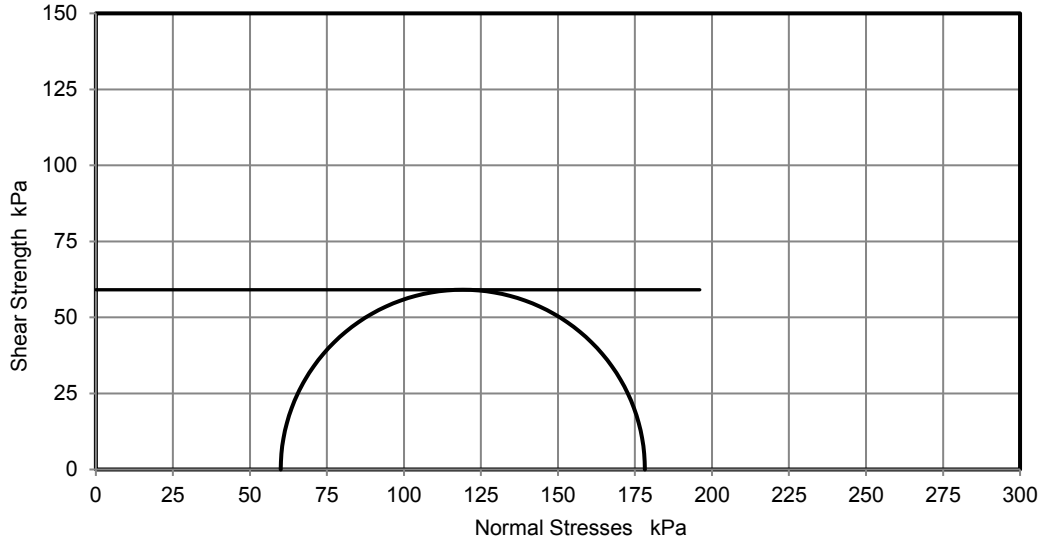
Tracable Equipment Record

Test Frame	TRI 003
Load Ring	LOAD CELL 003
Pressure Gauge	PRE 004
Digital Caliper	CAL-005
Balance	BAL-001

Deviator Stress v Axial Strain



Mohr Circles



Deviator stress corrected for area change and membrane effects

Mohr circles and their interpretation is not covered by BS1377.
This is provided for information only.

No of membranes used
1
Total thickness (mm)
0.26

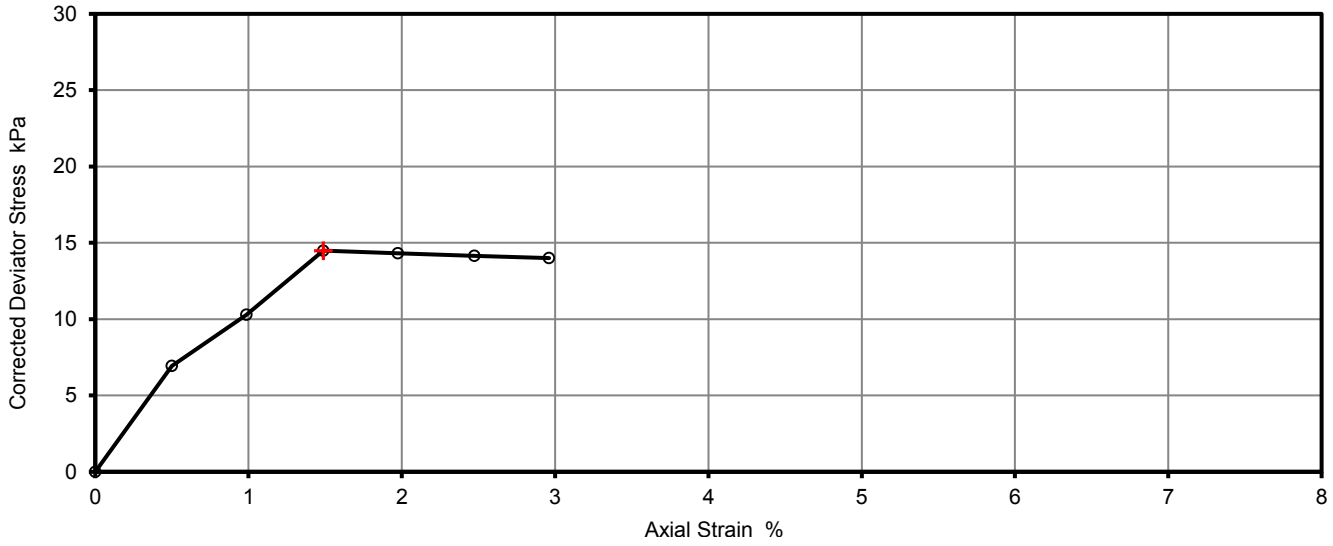
	Unconsolidated Undrained Triaxial Compression Test without measurement of pore pressure - single specimen			Job Ref	S180236
				Borehole/Pit No.	BH07
Site Name	Ashroyd Business Park, Hoyland			Sample No.	
Soil Description				Depth	0.50
Specimen Reference		Specimen Depth	m	Sample Type	B
Specimen Description	Soft consistency, grey, slightly sandy extremely low strength CLAY.			KeyLAB ID	SLMK2018031617
Test Method	BS1377 : Part 7 : 1990, clause 8, single specimen			Date of test	26-03-2018

Test Number		1	
Length		76.0	mm
Diameter		38.0	mm
Bulk Density		1.94	Mg/m3
Moisture Content		26.6	%
Dry Density		1.53	Mg/m3
Rate of Strain		1.0	%/min
Cell Pressure		10	kPa
At failure	Axial Strain	1.5	%
	Deviator Stress, (σ1 - σ3)f	14	kPa
	Undrained Shear Strength, cu	7	kPa ½(σ1 - σ3)f
	Mode of Failure	Plastic	

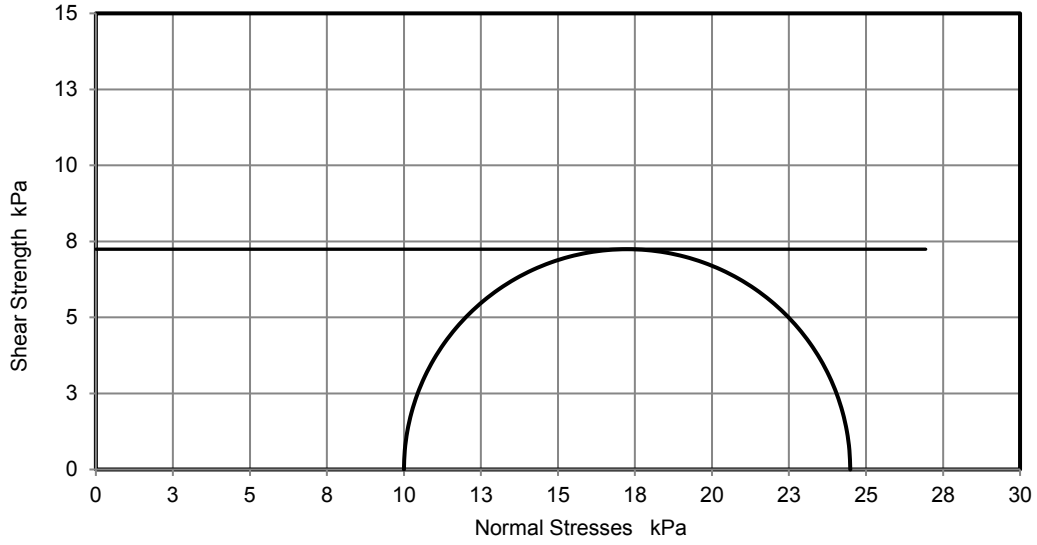
Tracable Equipment Record

Test Frame	TRI 004
Load Ring	LOAD CELL 001
Pressure Gauge	PRE 006
Digital Caliper	CAL-005
Balance	BAL-001

Deviator Stress v Axial Strain



Mohr Circles



Deviator stress corrected for area change and membrane effects

Mohr circles and their interpretation is not covered by BS1377.
This is provided for information only.

No of membranes used
1
Total thickness (mm)
0.26

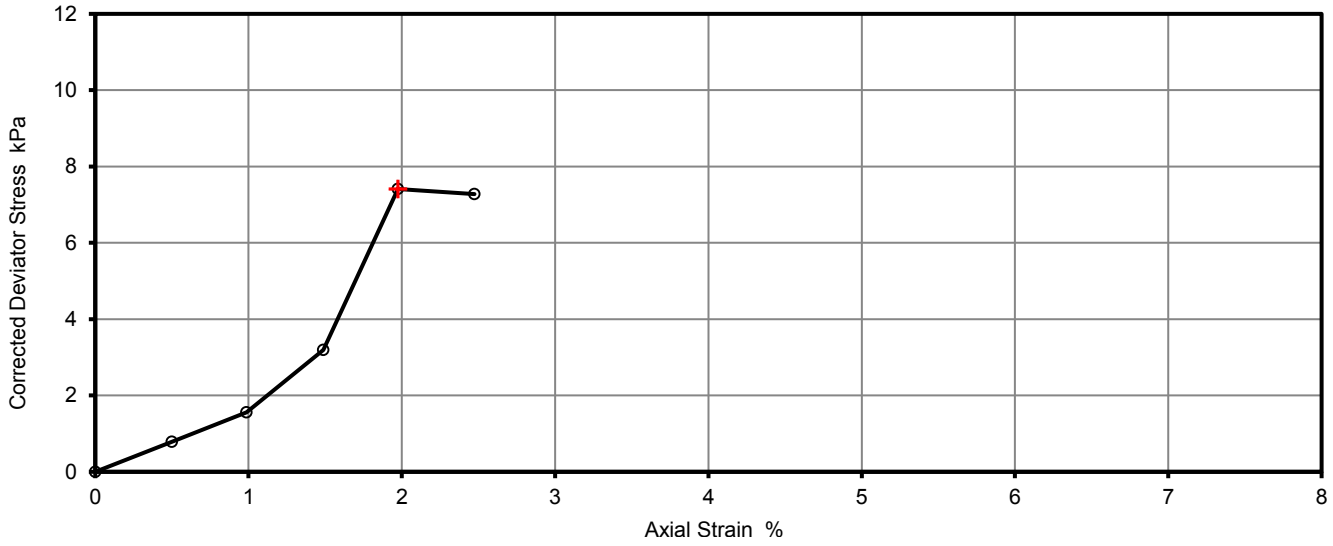
	Unconsolidated Undrained Triaxial Compression Test without measurement of pore pressure - single specimen			Job Ref	S180236
				Borehole/Pit No.	BH08
Site Name	Ashroyd Business Park, Hoyland			Sample No.	
Soil Description				Depth	2.00
Specimen Reference		Specimen Depth	m	Sample Type	B
Specimen Description	Soft consistency, greyish orange extremely low strength CLAY.			KeyLAB ID	SLMK2018031618
Test Method	BS1377 : Part 7 : 1990, clause 8, single specimen			Date of test	26-03-2018

Test Number		1	
Length		76.0	mm
Diameter		38.0	mm
Bulk Density		1.92	Mg/m3
Moisture Content		33.2	%
Dry Density		1.44	Mg/m3
Rate of Strain		1.0	%/min
Cell Pressure		40	kPa
At failure	Axial Strain	2.0	%
	Deviator Stress, (σ1 - σ3)f	7	kPa
	Undrained Shear Strength, cu	4	kPa ½(σ1 - σ3)f
	Mode of Failure	Plastic	

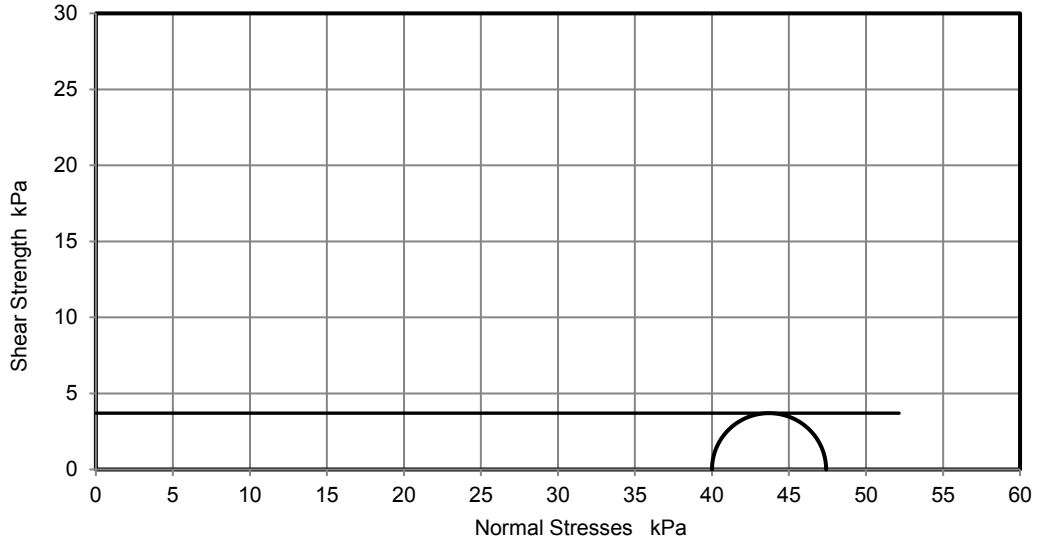
Tracable Equipment Record

Test Frame	TRI 003
Load Ring	LOAD CELL 003
Pressure Gauge	PRE 004
Digital Caliper	CAL-005
Balance	BAL-001

Deviator Stress v Axial Strain



Mohr Circles



Deviator stress corrected for area change and membrane effects

Mohr circles and their interpretation is not covered by BS1377.
This is provided for information only.

No of membranes used
1
Total thickness (mm)
0.26

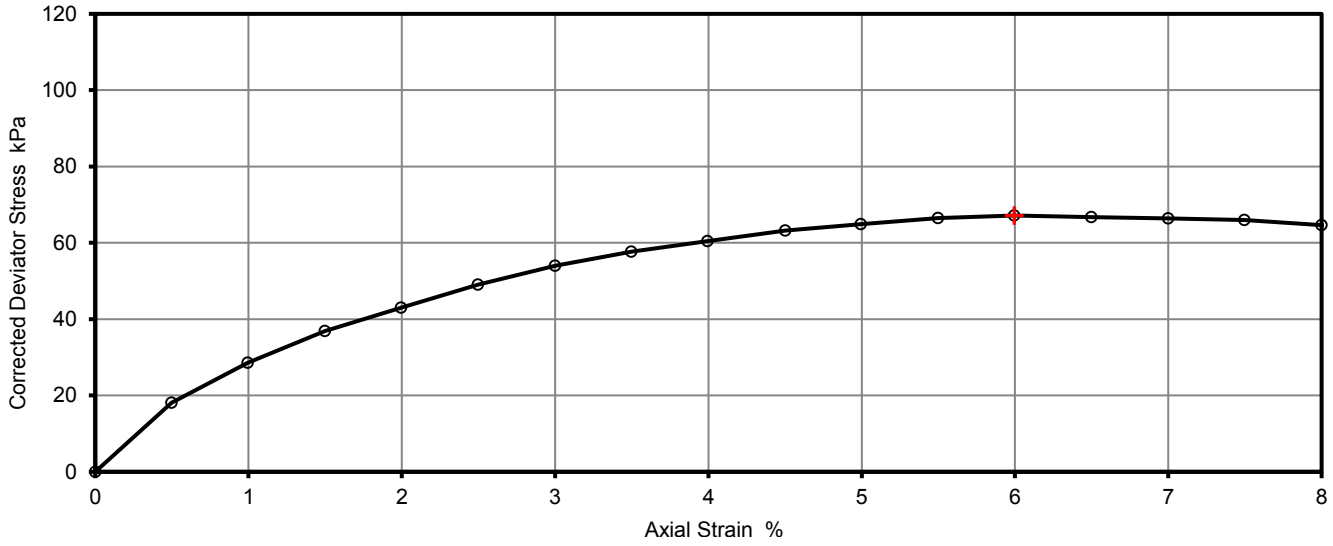
	Unconsolidated Undrained Triaxial Compression Test without measurement of pore pressure - single specimen			Job Ref	S180236
				Borehole/Pit No.	BH10
Site Name	Ashroyd Business Park, Hoyland			Sample No.	
Soil Description				Depth	1.20
Specimen Reference		Specimen Depth	m	Sample Type	U
Specimen Description	Firm consistency, light brown & yellow, sandy, gravelly, low strength CLAY.			KeyLAB ID	SLMK2018031627
Test Method	BS1377 : Part 7 : 1990, clause 8, single specimen			Date of test	26-03-2018

Test Number		1	
Length		203.0	mm
Diameter		103.0	mm
Bulk Density		1.96	Mg/m3
Moisture Content		34.1	%
Dry Density		1.46	Mg/m3
Rate of Strain		1.0	%/min
Cell Pressure		24	kPa
At failure	Axial Strain	6.0	%
	Deviator Stress, (σ1 - σ3)f	67	kPa
	Undrained Shear Strength, cu	34	kPa ½(σ1 - σ3)f
	Mode of Failure	Compound	

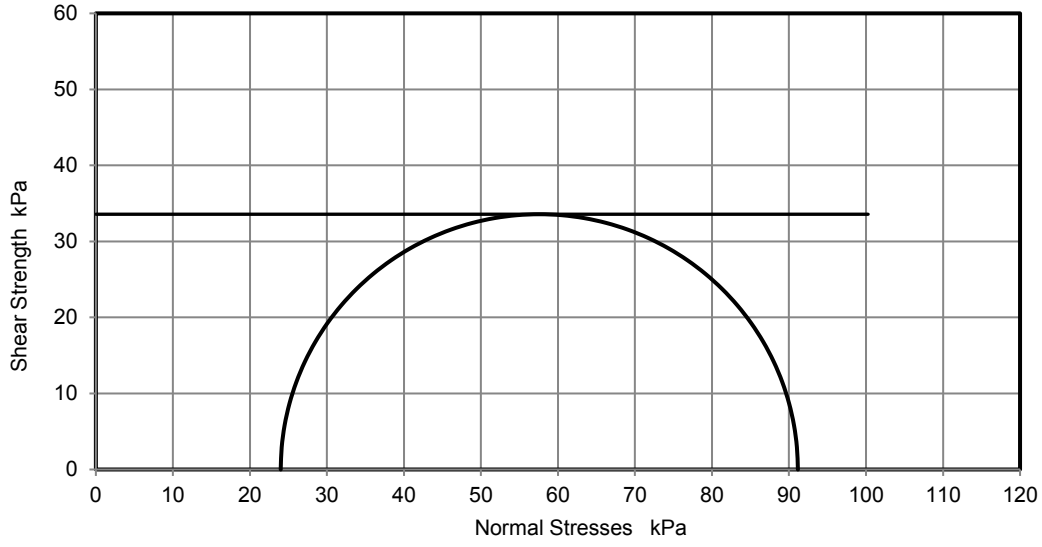
Tracable Equipment Record

Test Frame	TRI 004
Load Ring	LOAD CELL 001
Pressure Gauge	PRE 006
Digital Caliper	CAL-005
Balance	BAL-001

Deviator Stress v Axial Strain



Mohr Circles



Deviator stress corrected for area change and membrane effects

Mohr circles and their interpretation is not covered by BS1377.
This is provided for information only.

No of membranes used
1
Total thickness (mm)
0.35

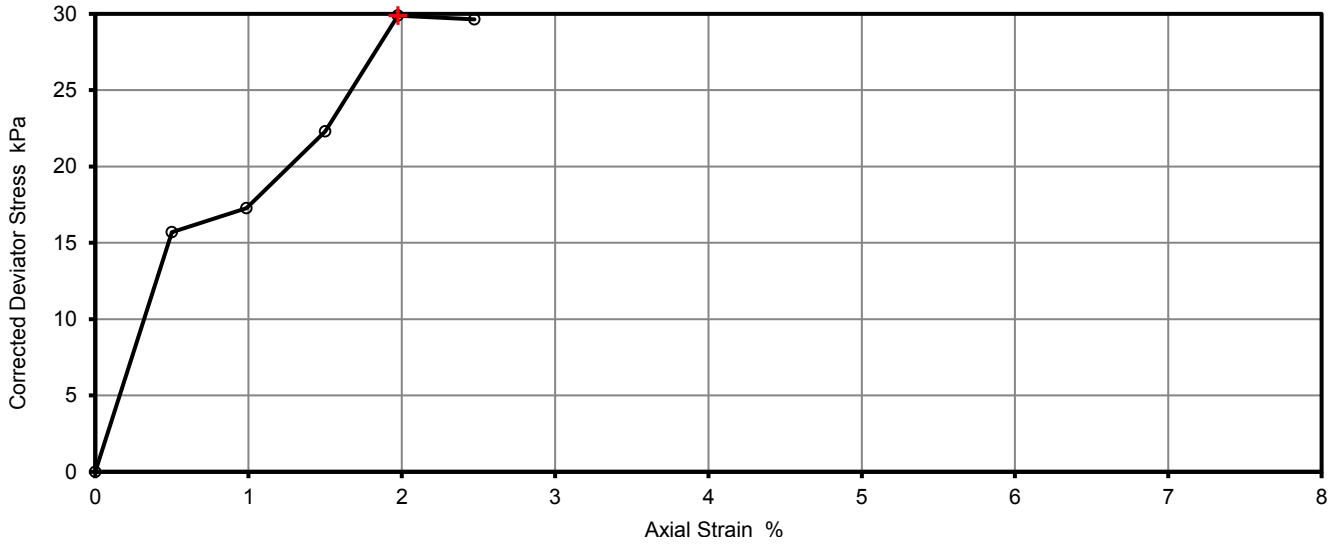
	Unconsolidated Undrained Triaxial Compression Test without measurement of pore pressure - single specimen			Job Ref	S180236
				Borehole/Pit No.	BH10
Site Name	Ashroyd Business Park, Hoyland			Sample No.	
Soil Description				Depth	2.00
Specimen Reference		Specimen Depth	m	Sample Type	B
Specimen Description	Soft consistency, brown, sandy, silty, low strength CLAY.			KeyLAB ID	SLMK2018031628
Test Method	BS1377 : Part 7 : 1990, clause 8, single specimen			Date of test	26-03-2018

Test Number		1	
Length		76.0	mm
Diameter		38.0	mm
Bulk Density		1.99	Mg/m3
Moisture Content		21.7	%
Dry Density		1.63	Mg/m3
Rate of Strain		1.0	%/min
Cell Pressure		40	kPa
At failure	Axial Strain	2.0	%
	Deviator Stress, (σ1 - σ3)f	30	kPa
	Undrained Shear Strength, cu	15	kPa ½(σ1 - σ3)f
	Mode of Failure	Plastic	

Tracable Equipment Record

Test Frame	TRI 003
Load Ring	LOAD CELL 003
Pressure Gauge	PRE 004
Digital Caliper	CAL-005
Balance	BAL-001

Deviator Stress v Axial Strain



Mohr Circles



Deviator stress corrected for area change and membrane effects

Mohr circles and their interpretation is not covered by BS1377.
This is provided for information only.

No of membranes used
1
Total thickness (mm)
0.26

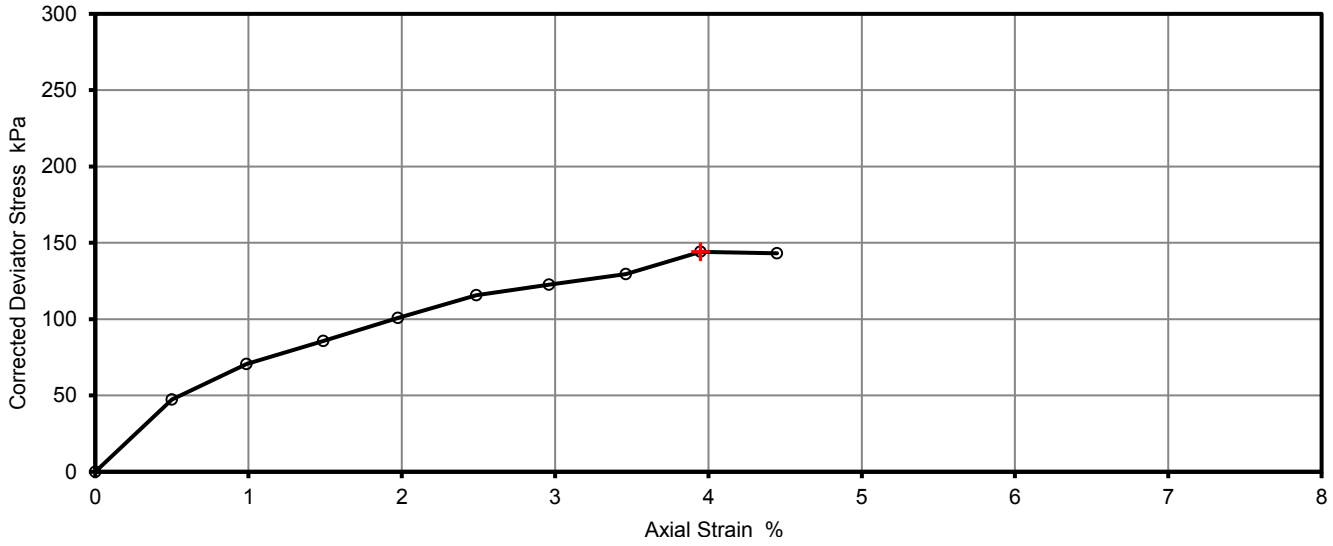
	Unconsolidated Undrained Triaxial Compression Test without measurement of pore pressure - single specimen			Job Ref	S180236
				Borehole/Pit No.	BH12
Site Name	Ashroyd Business Park, Hoyland			Sample No.	
Soil Description				Depth	0.50
Specimen Reference		Specimen Depth	m	Sample Type	B
Specimen Description	Firm consistency, brown mottled grey & orange, medium strength CLAY.			KeyLAB ID	SLMK2018031631
Test Method	BS1377 : Part 7 : 1990, clause 8, single specimen			Date of test	24-03-2018

Test Number		1	
Length		76.0	mm
Diameter		38.0	mm
Bulk Density		2.06	Mg/m3
Moisture Content		24.1	%
Dry Density		1.66	Mg/m3
Rate of Strain		1.0	%/min
Cell Pressure		10	kPa
At failure	Axial Strain	3.9	%
	Deviator Stress, (σ1 - σ3)f	144	kPa
	Undrained Shear Strength, cu	72	kPa ½(σ1 - σ3)f
	Mode of Failure	Compound	

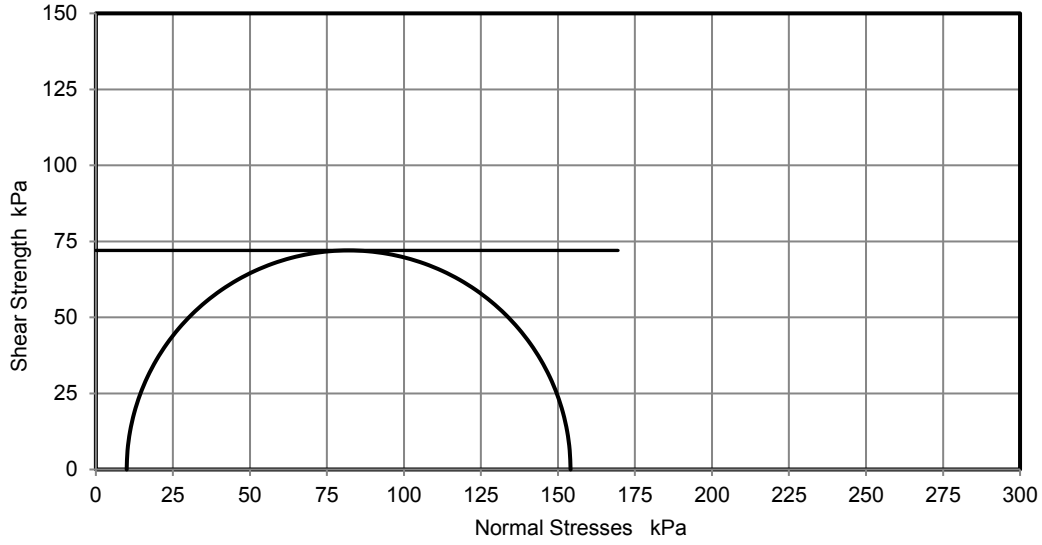
Tracable Equipment Record

Test Frame	TRI 004
Load Ring	LOAD CELL 001
Pressure Gauge	PRE 006
Digital Caliper	CAL-005
Balance	BAL-001

Deviator Stress v Axial Strain



Mohr Circles



Deviator stress corrected for area change and membrane effects

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This is provided for information only.

No of membranes used
1
Total thickness (mm)
0.26

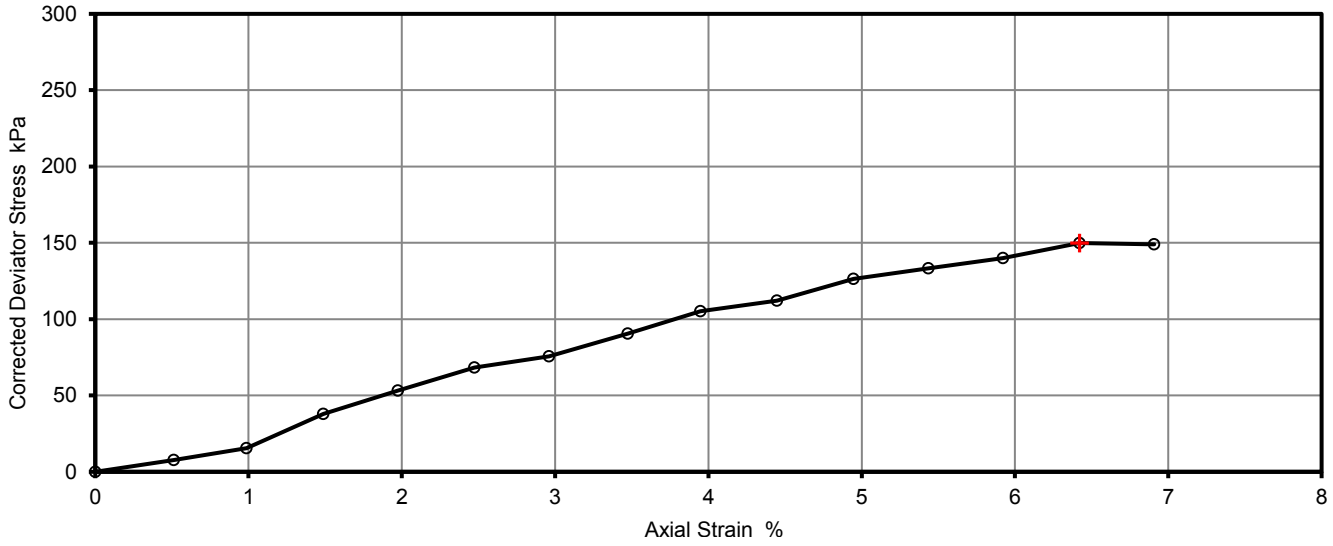
	Unconsolidated Undrained Triaxial Compression Test without measurement of pore pressure - single specimen			Job Ref	S180236
				Borehole/Pit No.	TP10
Site Name	Ashroyd Business Park, Hoyland			Sample No.	
Soil Description				Depth	1.10
Specimen Reference		Specimen Depth	m	Sample Type	B
Specimen Description	Firm consistency, slightly gravelly medium strength CLAY.			KeyLAB ID	SLMK2018031613
Test Method	BS1377 : Part 7 : 1990, clause 8, single specimen			Date of test	27-03-2018

Test Number		1	
Length		76.0	mm
Diameter		38.0	mm
Bulk Density		1.96	Mg/m3
Moisture Content		31.9	%
Dry Density		1.49	Mg/m3
Rate of Strain		1.0	%/min
Cell Pressure		22	kPa
At failure	Axial Strain	6.4	%
	Deviator Stress, (σ1 - σ3)f	150	kPa
	Undrained Shear Strength, cu	75	kPa ½(σ1 - σ3)f
	Mode of Failure	Plastic	

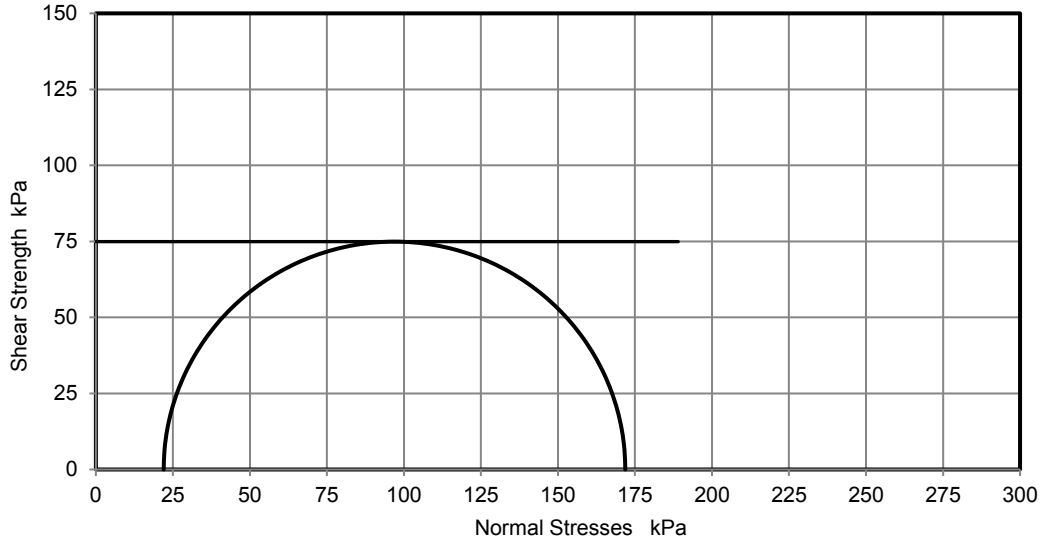
Tracable Equipment Record

Test Frame	TRI 004
Load Ring	LOAD CELL 001
Pressure Gauge	PRE 006
Digital Caliper	CAL-005
Balance	BAL-001

Deviator Stress v Axial Strain



Mohr Circles



Deviator stress corrected for area change and membrane effects

Mohr circles and their interpretation is not covered by BS1377.
This is provided for information only.

No of membranes used
1
Total thickness (mm)
0.26

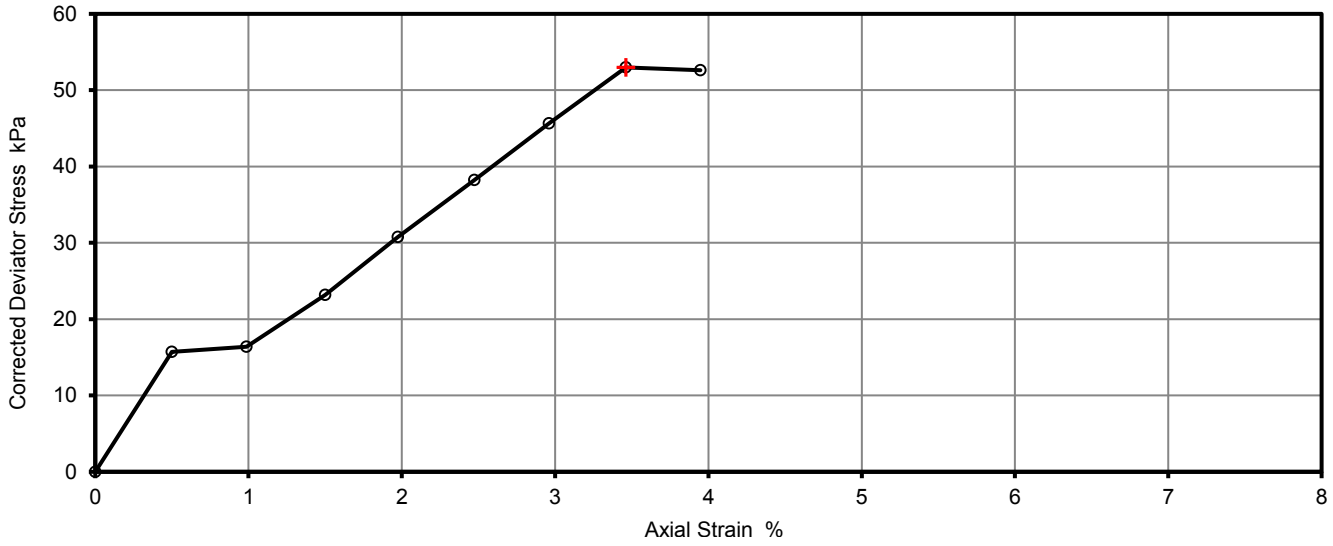
	Unconsolidated Undrained Triaxial Compression Test without measurement of pore pressure - single specimen			Job Ref	S180236
				Borehole/Pit No.	TP11
Site Name	Ashroyd Business Park, Hoyland			Sample No.	
Soil Description				Depth	1.50
Specimen Reference		Specimen Depth	m	Sample Type	B
Specimen Description	Firm consistency, greyish orange, slightly sandy low strength CLAY.			KeyLAB ID	SLMK2018031619
Test Method	BS1377 : Part 7 : 1990, clause 8, single specimen			Date of test	27-03-2018

Test Number	1	
Length	76.0	mm
Diameter	38.0	mm
Bulk Density	1.98	Mg/m3
Moisture Content	26.9	%
Dry Density	1.56	Mg/m3
Rate of Strain	1.0	%/min
Cell Pressure	30	kPa
At failure: Axial Strain	3.5	%
At failure: Deviator Stress, (σ1 - σ3)f	53	kPa
At failure: Undrained Shear Strength, cu	26	kPa ½(σ1 - σ3)f
At failure: Mode of Failure	Compound	

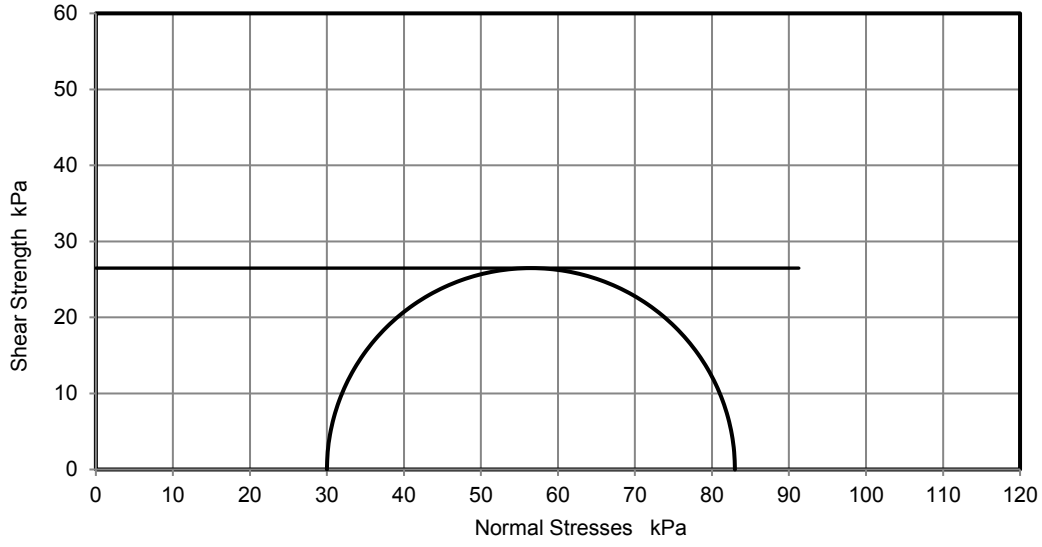
Tracable Equipment Record

Test Frame	TRI 004
Load Ring	LOAD CELL 001
Pressure Gauge	PRE 006
Digital Caliper	CAL-005
Balance	BAL-001

Deviator Stress v Axial Strain



Mohr Circles



Deviator stress corrected for area change and membrane effects

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This is provided for information only.

No of membranes used
1
Total thickness (mm)
0.26

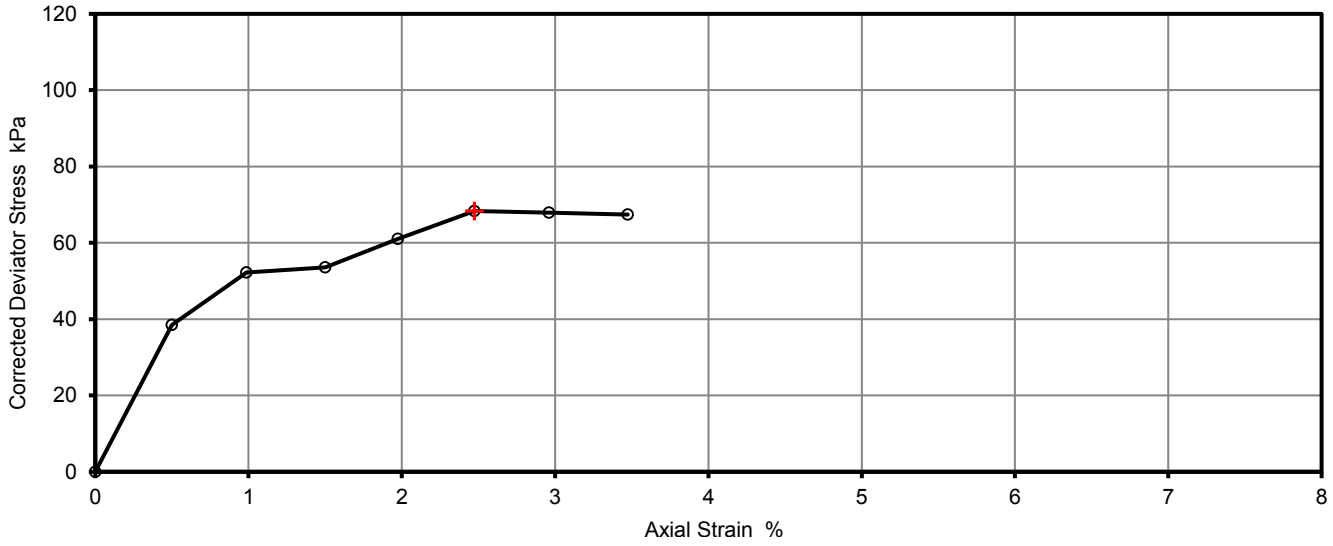
	Unconsolidated Undrained Triaxial Compression Test without measurement of pore pressure - single specimen			Job Ref	S180236
				Borehole/Pit No.	TP13
Site Name	Ashroyd Business Park, Hoyland			Sample No.	
Soil Description				Depth	0.80
Specimen Reference		Specimen Depth	m	Sample Type	B
Specimen Description	Firm consistency, brownish grey, slightly gravelly, low strength CLAY.			KeyLAB ID	SLMK2018031621
Test Method	BS1377 : Part 7 : 1990, clause 8, single specimen			Date of test	27-03-2018

Test Number		1	
Length		76.0	mm
Diameter		38.0	mm
Bulk Density		1.86	Mg/m3
Moisture Content		18.5	%
Dry Density		1.57	Mg/m3
Rate of Strain		1.0	%/min
Cell Pressure		16	kPa
At failure	Axial Strain	2.5	%
	Deviator Stress, (σ1 - σ3)f	68	kPa
	Undrained Shear Strength, cu	34	kPa ½(σ1 - σ3)f
	Mode of Failure	Compound	

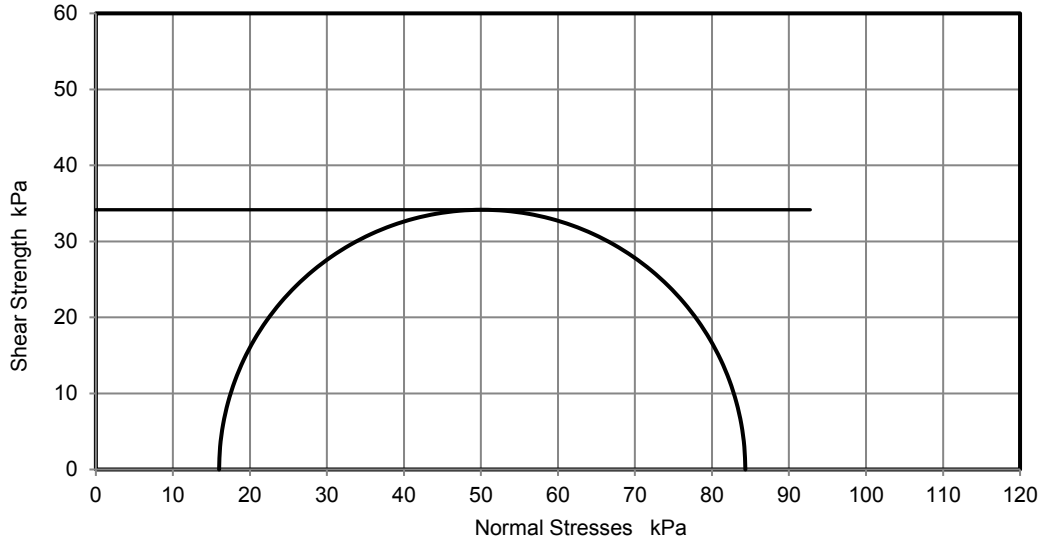
Tracable Equipment Record

Test Frame	TRI 003
Load Ring	LOAD CELL 003
Pressure Gauge	PRE 004
Digital Caliper	CAL-005
Balance	BAL-001

Deviator Stress v Axial Strain



Mohr Circles



Deviator stress corrected for area change and membrane effects

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This is provided for information only.

No of membranes used
1
Total thickness (mm)
0.26

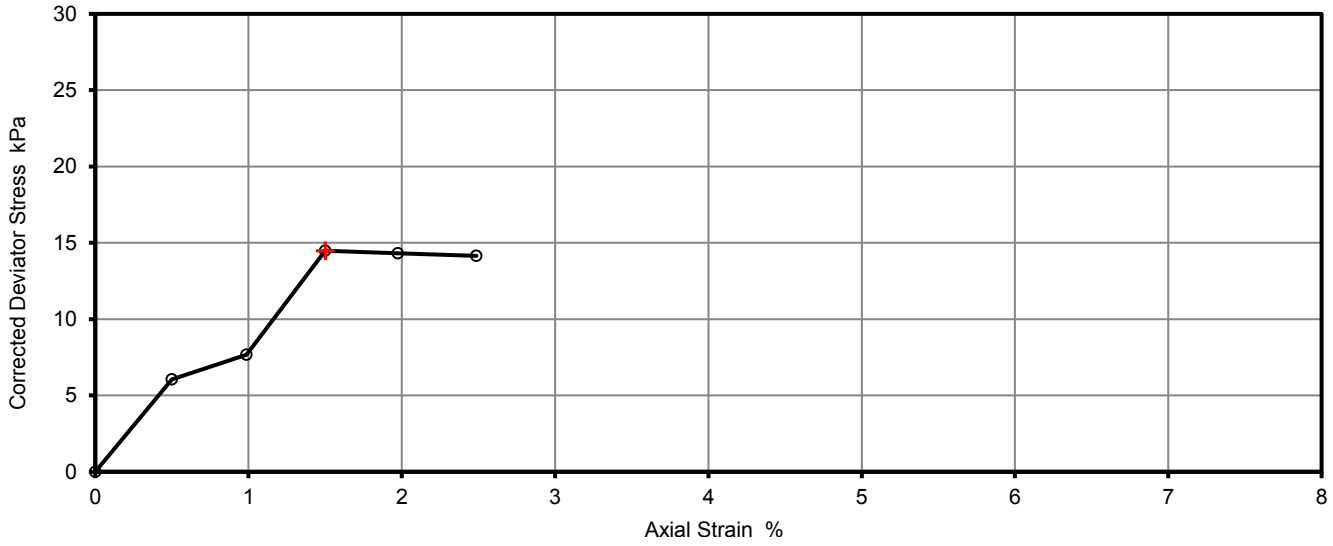
	Unconsolidated Undrained Triaxial Compression Test without measurement of pore pressure - single specimen			Job Ref	S180236
				Borehole/Pit No.	TP15
Site Name	Ashroyd Business Park, Hoyland			Sample No.	
Soil Description				Depth	0.50
Specimen Reference		Specimen Depth	m	Sample Type	B
Specimen Description	Soft consistency, greyish brown, slightly gravelly, extremely low strength CLAY.			KeyLAB ID	SLMK2018031623
Test Method	BS1377 : Part 7 : 1990, clause 8, single specimen			Date of test	25-03-2018

Test Number		1	
Length		76.0	mm
Diameter		38.0	mm
Bulk Density		2.01	Mg/m3
Moisture Content		23.9	%
Dry Density		1.62	Mg/m3
Rate of Strain		1.0	%/min
Cell Pressure		10	kPa
At failure	Axial Strain	1.5	%
	Deviator Stress, (σ1 - σ3)f	14	kPa
	Undrained Shear Strength, cu	7	kPa ½(σ1 - σ3)f
	Mode of Failure	Plastic	

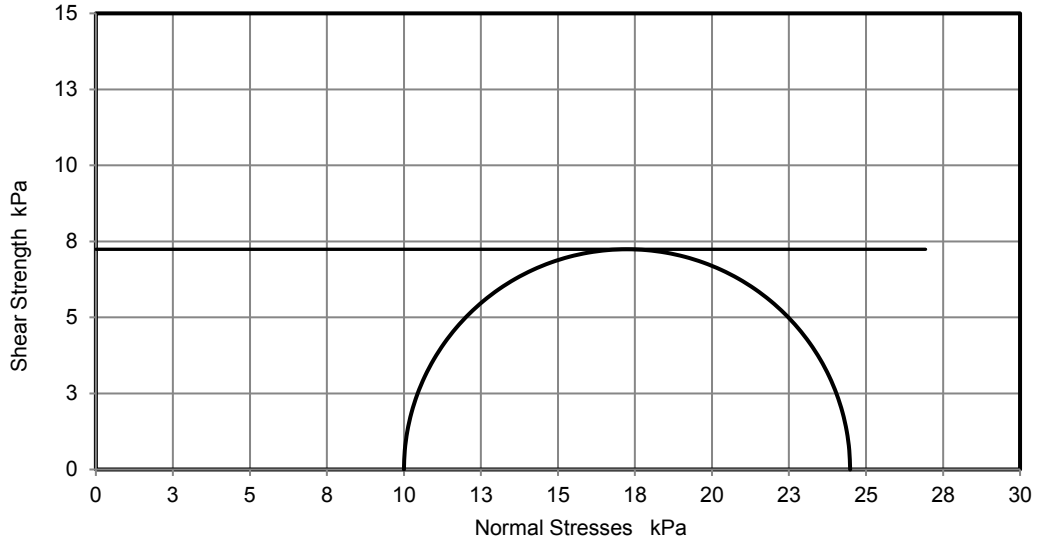
Tracable Equipment Record

Test Frame	TRI 004
Load Ring	LOAD CELL 001
Pressure Gauge	PRE 006
Digital Caliper	CAL-005
Balance	BAL-001

Deviator Stress v Axial Strain



Mohr Circles



Deviator stress corrected for area change and membrane effects

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This is provided for information only.

No of membranes used
1
Total thickness (mm)
0.26

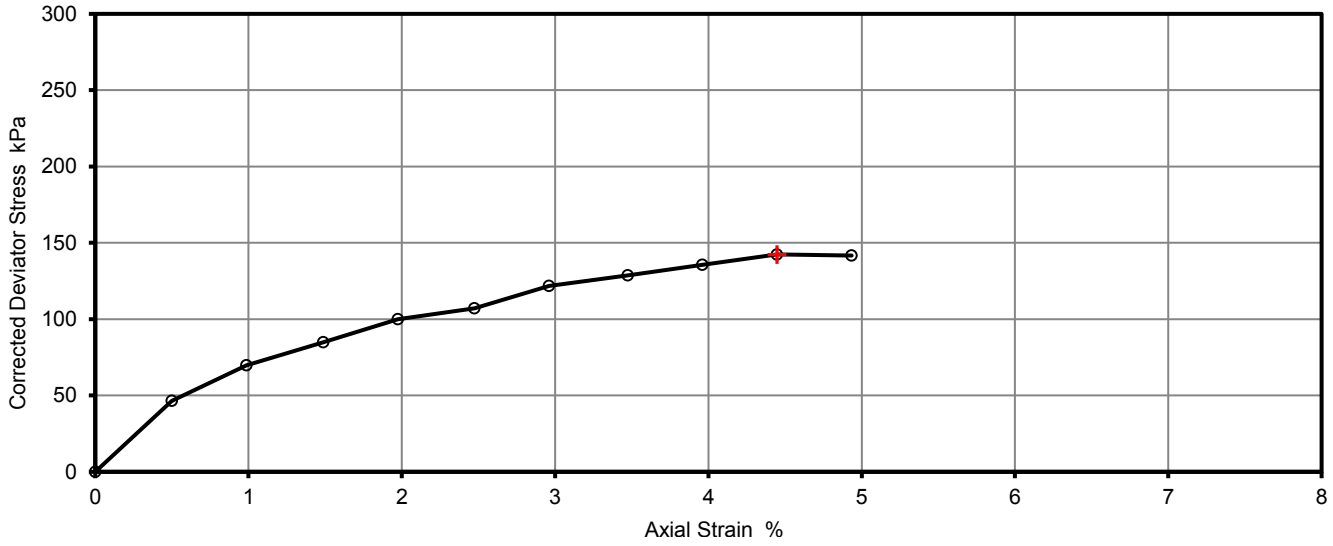
	Unconsolidated Undrained Triaxial Compression Test without measurement of pore pressure - single specimen			Job Ref	S180236
				Borehole/Pit No.	TP17
Site Name	Ashroyd Business Park, Hoyland			Sample No.	
Soil Description				Depth	1.20
Specimen Reference		Specimen Depth	m	Sample Type	B
Specimen Description	Firm consistency, grey, slightly gravelly, medium strength CLAY.			KeyLAB ID	SLMK2018031625
Test Method	BS1377 : Part 7 : 1990, clause 8, single specimen			Date of test	27-06-2018

Test Number		1	
Length		76.0	mm
Diameter		38.0	mm
Bulk Density		1.96	Mg/m3
Moisture Content		24.6	%
Dry Density		1.57	Mg/m3
Rate of Strain		1.0	%/min
Cell Pressure		24	kPa
At failure	Axial Strain	4.4	%
	Deviator Stress, (σ1 - σ3)f	142	kPa
	Undrained Shear Strength, cu	71	kPa ½(σ1 - σ3)f
	Mode of Failure	Compound	

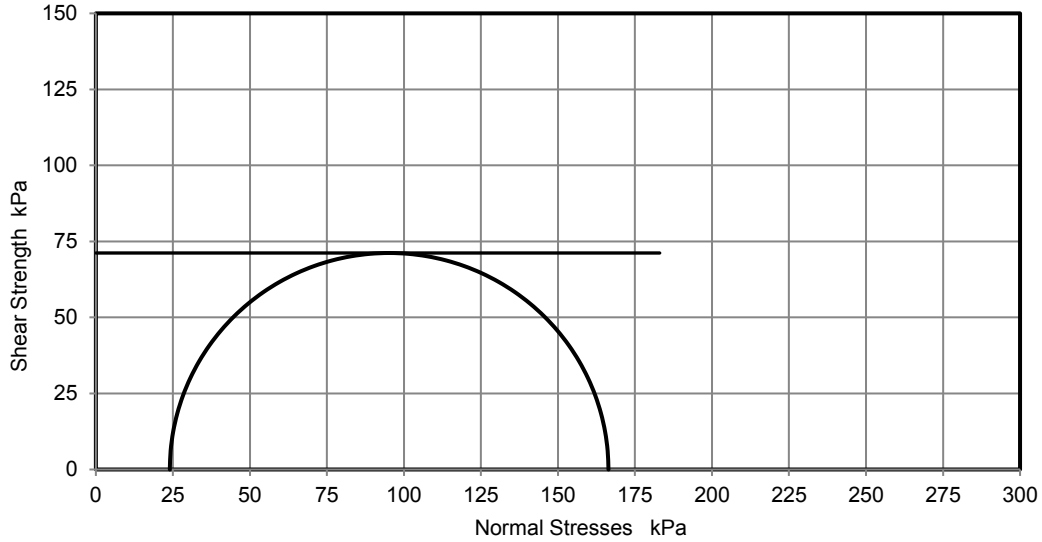
Tracable Equipment Record

Test Frame	TRI 004
Load Ring	LOAD CELL 001
Pressure Gauge	PRE 006
Digital Caliper	CAL-005
Balance	BAL-001

Deviator Stress v Axial Strain



Mohr Circles



Deviator stress corrected for area change and membrane effects

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This is provided for information only.

No of membranes used
1
Total thickness (mm)
0.26

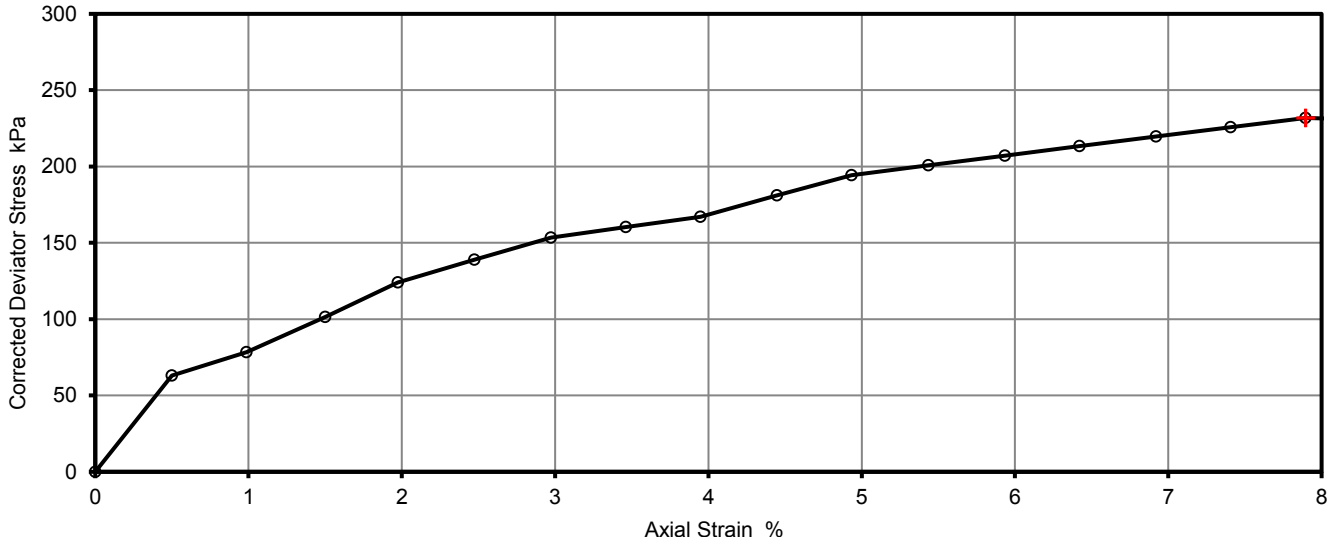
	Unconsolidated Undrained Triaxial Compression Test without measurement of pore pressure - single specimen			Job Ref	S180236
				Borehole/Pit No.	TP19
Site Name	Ashroyd Business Park, Hoyland			Sample No.	
Soil Description				Depth	0.00
Specimen Reference		Specimen Depth	m	Sample Type	B
Specimen Description	Firm consistency, orangish grey, high strength CLAY.			KeyLAB ID	SLMK2018031634
Test Method	BS1377 : Part 7 : 1990, clause 8, single specimen			Date of test	26-03-2018

Test Number		1	
Length		76.0	mm
Diameter		38.0	mm
Bulk Density		2.08	Mg/m3
Moisture Content		18.1	%
Dry Density		1.76	Mg/m3
Rate of Strain		1.0	%/min
Cell Pressure		10	kPa
At failure	Axial Strain	7.9	%
	Deviator Stress, (σ1 - σ3)f	232	kPa
	Undrained Shear Strength, cu	116	kPa ½(σ1 - σ3)f
	Mode of Failure	Compound	

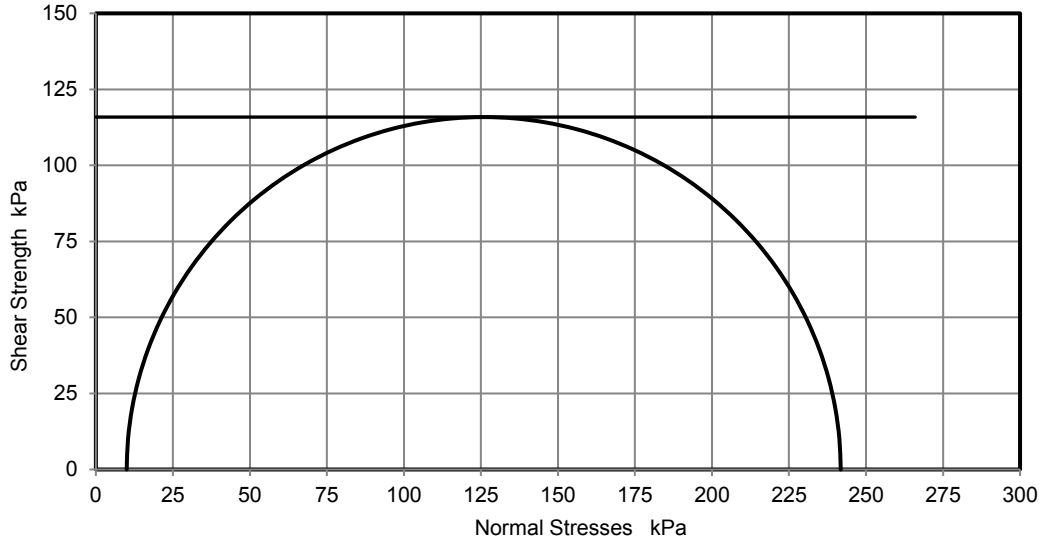
Tracable Equipment Record

Test Frame	TRI 004
Load Ring	LOAD CELL 001
Pressure Gauge	PRE 006
Digital Caliper	CAL-005
Balance	BAL-001

Deviator Stress v Axial Strain



Mohr Circles



Deviator stress corrected for area change and membrane effects

Mohr circles and their interpretation is not covered by BS1377.
This is provided for information only.

No of membranes used
1
Total thickness (mm)
0.26

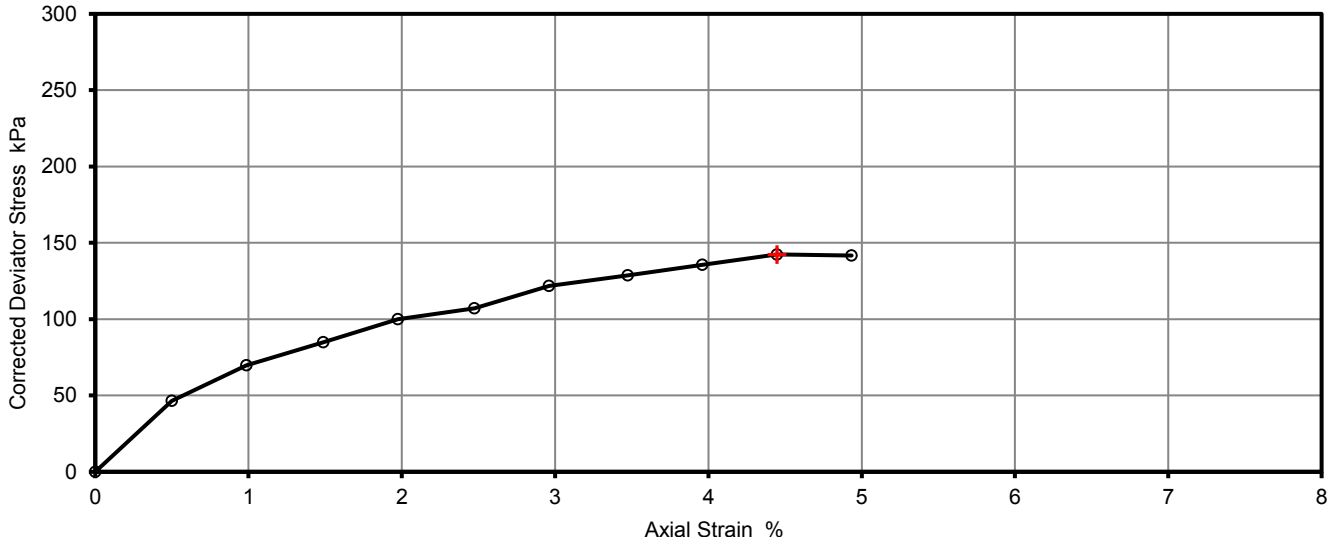
	Unconsolidated Undrained Triaxial Compression Test without measurement of pore pressure - single specimen			Job Ref	S180236
				Borehole/Pit No.	TP21
Site Name	Ashroyd Business Park, Hoyland			Sample No.	
Soil Description				Depth	1.20
Specimen Reference		Specimen Depth	m	Sample Type	B
Specimen Description	Firm consistency, greensih grey medium strength CLAY.			KeyLAB ID	SLMK2018031635
Test Method	BS1377 : Part 7 : 1990, clause 8, single specimen			Date of test	27-03-2018

Test Number		1	
Length		76.0	mm
Diameter		38.0	mm
Bulk Density		1.96	Mg/m3
Moisture Content		27.3	%
Dry Density		1.54	Mg/m3
Rate of Strain		1.0	%/min
Cell Pressure		24	kPa
At failure	Axial Strain	4.4	%
	Deviator Stress, (σ1 - σ3)f	142	kPa
	Undrained Shear Strength, cu	71	kPa ½(σ1 - σ3)f
	Mode of Failure	Compound	

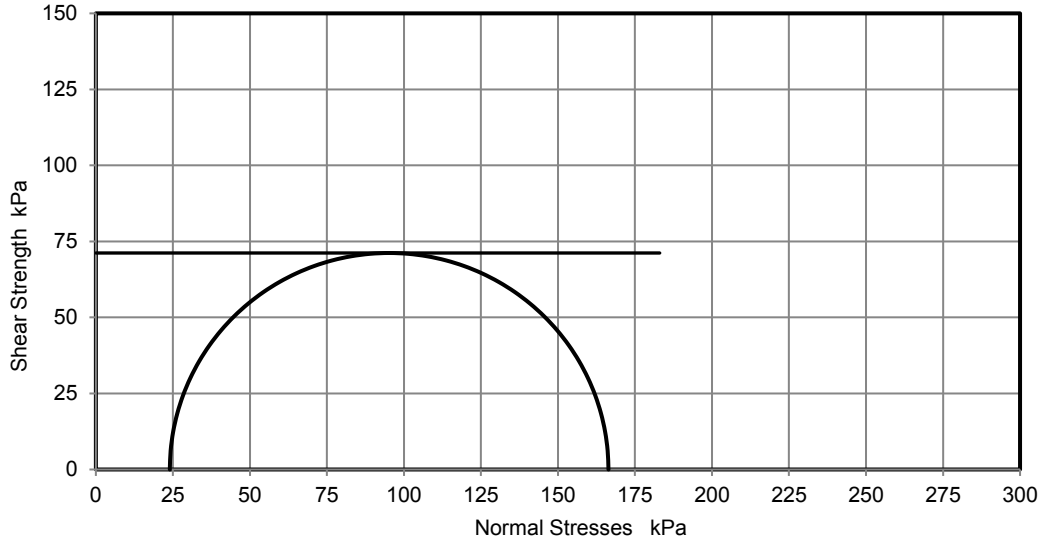
Tracable Equipment Record

Test Frame	TRI 003
Load Ring	LOAD CELL 003
Pressure Gauge	PRE 004
Digital Caliper	CAL-005
Balance	BAL-001

Deviator Stress v Axial Strain



Mohr Circles

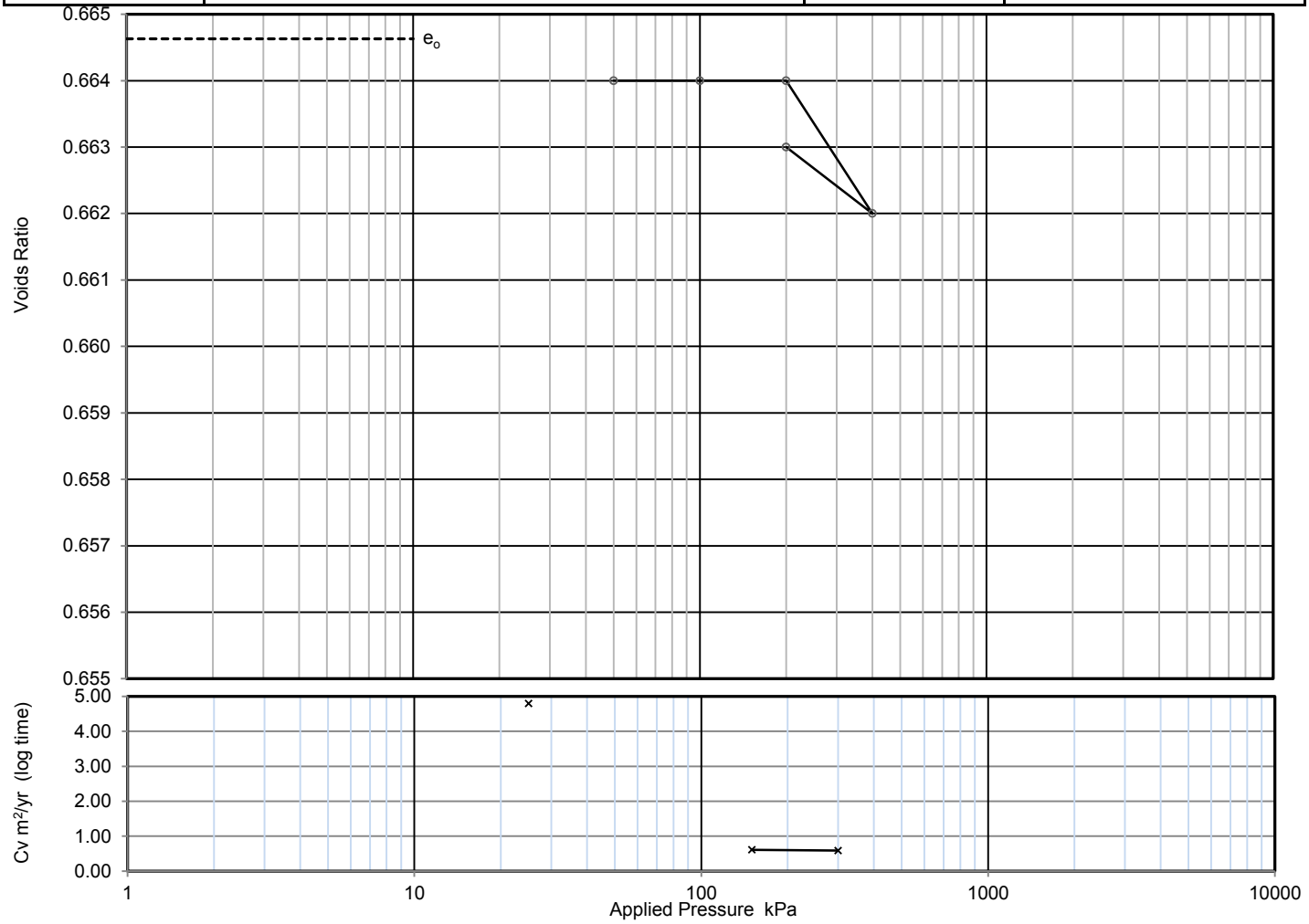


Deviator stress corrected for area change and membrane effects

Mohr circles and their interpretation is not covered by BS1377.
This is provided for information only.

No of membranes used
1
Total thickness (mm)
0.26

	ONE DIMENSIONAL CONSOLIDATION TEST BS1377:Part 5:1990, clause 3			Job Ref	S180236
				Borehole/Pit No.	BH04
Site Name	Ashroyd Business Park, Hoyland			Sample No.	
Soil Description				Depth	4
Specimen Reference		Specimen Depth	m	Sample Type	U
Specimen Description	Firm, brown, slightly gravelly, slightly sandy, CLAY.			KeyLAB ID	SLMK2018031610
Test Method	BS1377:Part 5:1990, clause 3			Date started	



Applied Pressure kPa	Voids ratio	Mv m2/MN	Cv (t50, log) m2/yr	Cv (t90, root) m2/yr	Csec
0.0	0.665	-	-	-	-
50	0.664	0.005	4.8	23	0.0011
100	0.664	0.0036		34	0.0011
200	0.664	0.0016	0.61	3	0.0018
400	0.662	0.0034	0.59	2.9	0.0026
200	0.663	0.0013			

Preparation

Index tests Liquid limit % Plastic limit %

Particle density assumed 2.65 Mg/m3

Specimen details	Initial	Final	
Diameter	75.00	-	mm
Height	20.00	19.98	mm
Moisture Content	25.0	25.0	%
Bulk density	1.99		Mg/m3
Dry density	1.59		Mg/m3
Voids Ratio	0.665		
Saturation	100		%
Average temperature for test	20.0		oC
Swelling Pressure			kPa
Settlement on saturation			%

Remarks

Final values should be used with caution Cv plotted at mid point of load increments Cv corrected to 20oC	Tested TT	Checked UM	Approved KW	Printed : 29-03-18 10:56	Fig. No 1

2531

ANALYTICAL TEST REPORT

Contract no:	70705
Contract name:	Ashroyd Business Park, Hoyland
Client reference:	S180236
Clients name:	Solmek
Clients address:	12 Yarm Road Stockton-on-Tees TS18 3NA
Samples received:	16 March 2018
Analysis started:	16 March 2018
Analysis completed	23 March 2018
Report issued:	23 March 2018

Notes:

Opinions and interpretations expressed herein are outside the UKAS accreditation scope.
Unless otherwise stated, Chemtech Environmental Ltd was not responsible for sampling.
Methods, procedures and performance data are available on request.
Results reported herein relate only to the material supplied to the laboratory.
This report shall not be reproduced except in full, without prior written approval.
Samples will be disposed of 6 weeks from initial receipt unless otherwise instructed.

Key:

U UKAS accredited test
M MCERTS & UKAS accredited test
$ Test carried out by an approved subcontractor
I/S Insufficient sample to carry out test
N/S Sample not suitable for testing

Approved by:

Dave Bowerbank
Customer Services Co-ordinator

Chemtech Environmental Limited

SAMPLE INFORMATION

MCERTS (Soils):

Soil descriptions are only intended to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions. MCERTS accreditation applies for sand, clay and loam/topsoil, or combinations of these whether these are derived from naturally occurring soils or from made ground, as long as these materials constitute the major part of the sample. Other materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

All results are reported on a dry basis. Samples dried at no more than 30ÁC in a drying cabinet.
Analytical results are inclusive of stones.

Lab ref	Sample id	Depth (m)	Sample description	Material removed	% Removed	% Moisture
70705-1	BH1	1.20-1.65	Sandy Clay with Gravel	-	-	14.7
70705-2	BH1	3.00-3.45	Sandy Clay with Gravel & Roots	-	-	16.3
70705-3	BH1	4.00-4.45	Sandy Clay with Gravel & Mudstone	-	-	8.2
70705-4	BH3	2.00-2.45	Sandy Clay with Gravel & Mudstone	-	-	10.2
70705-5	BH3	4.00-4.20	Sandy Clay with Gravel & Mudstone	-	-	11.7
70705-6	BH4	1.20-1.65	Sandy Clay with Gravel	-	-	15.7
70705-7	BH4	4.00-4.45	Clay	-	-	17.5
70705-8	BH4	5.00-5.45	Sandy Clay with Gravel	-	-	16.6
70705-9	BH5	1.20-1.65	Sandy Clay with Gravel	-	-	12.7
70705-10	BH6	3.00-3.45	Sandy Clay with Gravel & Roots	-	-	20.0
70705-11	BH7	0.50-0.60	Clay with Gravel	-	-	19.9
70705-12	BH8	2.00-2.45	Clay with Gravel & Roots	-	-	26.9
70705-13	BH10	1.20-1.65	Sandy Clay with Gravel	-	-	20.1
70705-14	BH10	2.00-2.45	Sandy Clay with Gravel & Roots	-	-	18.1
70705-15	BH11	0.50-0.60	Sandy Clay with Gravel & Roots	-	-	13.3
70705-16	BH13	0.50-0.60	Sandy Clay with Gravel	-	-	12.6
70705-17	TP1	0.20-0.50	Sandy Clay with Gravel	-	-	21.5
70705-18	TP11	1.50-1.60	Sandy Clay	-	-	21.0
70705-19	TP13	0.80-1.20	Sandy Clay with Gravel & Roots	-	-	12.4
70705-20	TP15	0.50-0.80	Sandy Clay with Gravel	-	-	19.3
70705-21	TP17	1.20-1.40	Sandy Clay with Gravel	-	-	13.8
70705-22	TP18	0.60-0.80	Sandy Clay with Gravel & Mudstone	-	-	9.5
70705-23	TP19	0.00-0.40	Sandy Clay	-	-	12.9
70705-24	TP21	1.20-1.50	Sandy Clay	-	-	18.0
70705-25	TP23	0.50-0.60	Sandy Clay	-	-	11.7

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SOILS

Lab number			70705-1	70705-2	70705-3	70705-4	70705-5	70705-6
Sample id			BH1	BH1	BH1	BH3	BH3	BH4
Depth (m)			1.20-1.65	3.00-3.45	4.00-4.45	2.00-2.45	4.00-4.20	1.20-1.65
Date sampled			06/03/2018	06/03/2018	06/03/2018	06/03/2018	06/03/2018	06/03/2018
Test	Method	Units						
pH	CE004 M	units	7.5	6.4	6.1	6.3	5.6	6.5
Sulphate (2:1 water soluble)	CE061 M	mg/l SO_4	32	45	27	32	40	24

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SOILS

Lab number			70705-7	70705-8	70705-9	70705-10	70705-11	70705-12
Sample id			BH4	BH4	BH5	BH6	BH7	BH8
Depth (m)			4.00-4.45	5.00-5.45	1.20-1.65	3.00-3.45	0.50-0.60	2.00-2.45
Date sampled			06/03/2018	06/03/2018	06/03/2018	06/03/2018	06/03/2018	06/03/2018
Test	Method	Units						
pH	CE004 M	units	6.8	5.6	6.8	7.5	7.5	7.3
Sulphate (2:1 water soluble)	CE061 M	mg/l SO_4	74	60	53	65	25	61

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SOILS

Lab number			70705-13	70705-14	70705-15	70705-16	70705-17	70705-18
Sample id			BH10	BH10	BH11	BH13	TP1	TP11
Depth (m)			1.20-1.65	2.00-2.45	0.50-0.60	0.50-0.60	0.20-0.50	1.50-1.60
Date sampled			06/03/2018	06/03/2018	06/03/2018	06/03/2018	06/03/2018	06/03/2018
Test	Method	Units						
pH	CE004 M	units	7.4	7.6	8.2	7.6	6.8	8.7
Sulphate (2:1 water soluble)	CE061 M	mg/l SO_4	93	60	27	<10	16	60

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SOILS

Lab number			70705-19	70705-20	70705-21	70705-22	70705-23	70705-24
Sample id			TP13	TP15	TP17	TP18	TP19	TP21
Depth (m)			0.80-1.20	0.50-0.80	1.20-1.40	0.60-0.80	0.00-0.40	1.20-1.50
Date sampled			06/03/2018	06/03/2018	06/03/2018	06/03/2018	06/03/2018	06/03/2018
Test	Method	Units						
pH	CE004 M	units	6.7	8.8	7.3	7.1	7.1	7.1
Sulphate (2:1 water soluble)	CE061 M	mg/l SO_4	42	354	126	15	39	76

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SOILS

Lab number			70705-25
Sample id			TP23
Depth (m)			0.50-0.60
Date sampled			06/03/2018
Test	Method	Units	
pH	CE004 M	units	7.1
Sulphate (2:1 water soluble)	CE061 M	mg/l SO_4	18

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METHOD DETAILS

METHOD	SOILS	METHOD SUMMARY	SAMPLE	STATUS	LOD	UNITS
CE004	pH	Based on BS 1377, pH Meter	Wet	M	-	units
CE061	Sulphate (2:1 water soluble)	Aqueous extraction, ICP-OES	Dry	M	10	mg/l SO_4

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DEVIATING SAMPLE INFORMATION

Comments

Sample deviation is determined in accordance with the UKAS note "Guidance on Deviating Samples" and based on reference standards and laboratory trials.

For samples identified as deviating, test result(s) may be compromised and may not be representative of the sample at the time of sampling.

Chemtech Environmental Ltd cannot be held responsible for the integrity of sample(s) received if Chemtech Environmental Ltd did not undertake the sampling. Such samples may be deviating.

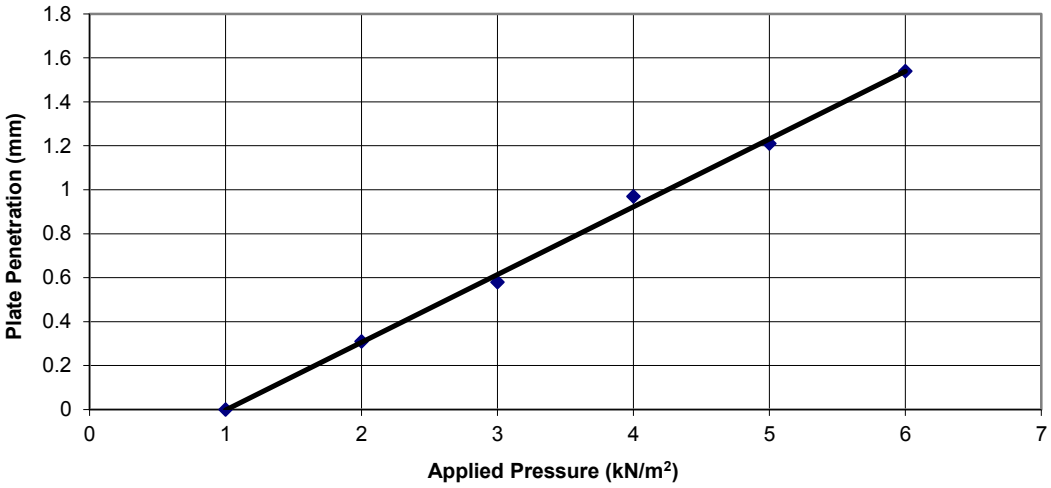
Key

N	No (not deviating sample)
Y	Yes (deviating sample)
NSD	Sampling date not provided
NST	Sampling time not provided (waters only)
EHT	Sample exceeded holding time(s)
IC	Sample not received in appropriate containers
HP	Headspace present in sample container
NCF	Sample not chemically fixed (where appropriate)
IT	Sample not cooled
OR	Other (specify)

Lab ref	Sample id	Depth (m)	Deviating	Tests (Reason for deviation)
70705-1	BH1	1.20-1.65	N	
70705-2	BH1	3.00-3.45	N	
70705-3	BH1	4.00-4.45	N	
70705-4	BH3	2.00-2.45	N	
70705-5	BH3	4.00-4.20	N	
70705-6	BH4	1.20-1.65	N	
70705-7	BH4	4.00-4.45	N	
70705-8	BH4	5.00-5.45	N	
70705-9	BH5	1.20-1.65	N	
70705-10	BH6	3.00-3.45	N	
70705-11	BH7	0.50-0.60	N	
70705-12	BH8	2.00-2.45	N	
70705-13	BH10	1.20-1.65	N	
70705-14	BH10	2.00-2.45	N	
70705-15	BH11	0.50-0.60	N	
70705-16	BH13	0.50-0.60	N	
70705-17	TP1	0.00-0.50	N	
70705-18	TP11	1.50-1.60	N	
70705-19	TP13	0.80-1.20	N	
70705-20	TP15	0.50-0.80	N	
70705-21	TP17	1.20-1.40	N	
70705-22	TP18	0.60-0.80	N	
70705-23	TP19	0.00-0.40	N	
70705-24	TP21	1.20-1.50	N	
70705-25	TP23	0.50-0.60	N	

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PLATE BEARING TEST		**Date:**	26/2/18 - 1/3/18
Location:	Ashroyd Business Park, Barnsley	**Test No:**	TP1
		Test Level:	0.30mbgl
Test Method: BS 1377 : Part 9 : 1990 (Incremental Method)		**Weather:**	Fair
Plate Diameter:	0.305 m	**Load Applied:**	140 kPa
Kentledge Type:	360 Excavator and Jack	**Start Time of Test:**	00:00



	Pressure (kN/m^2)	Plate Pentration (mm)
Initial	0	0
Stage 1	28	0.31
Stage 2	56	0.58
Stage 3	84	0.97
Stage 4	112	1.21
Stage 5	140	1.54
Stage 6		
Stage 7		
Stage 8		
Stage 9		
Stage 10		

Conversion Factor	0.45
Stress Applied @ 1.25mm	113.75 kN/m^2
Total Plate Deflection	1.54 mm
Plate Diameter	305 mm
k305	90998
k762	40744
CBR	5.95 %

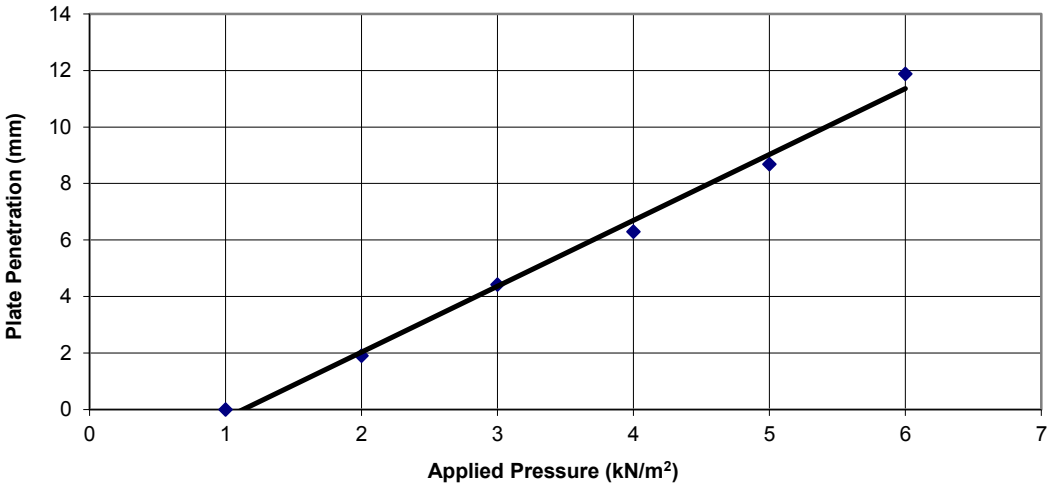
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PLATE BEARING TEST		**Date:**	26/2/18 - 1/3/18
Location:	Ashroyd Business Park, Barnsley	**Test No:**	TP13
		Test Level:	0.30 mbgl
Test Method: BS 1377 : Part 9 : 1990 (Incremental Method)		**Weather:**	Rain & Snow
Plate Diameter:	0.305 m	**Load Applied:**	280 kPa
Kentledge Type:	360 Excavator and Jack	**Start Time of Test:**	00:00



	Pressure (kN/m^2)	Plate Pentration (mm)
Initial	28	0
Stage 1	56	1.90
Stage 2	112	4.42
Stage 3	168	6.30
Stage 4	224	8.69
Stage 5	280	11.88
Stage 6		
Stage 7		
Stage 8		
Stage 9		
Stage 10		

Conversion Factor	0.45
Stress Applied @ 1.25mm	48.86 kN/m^2
Total Plate Deflection	11.88 mm
Plate Diameter	305 mm
k305	39085
k762	17500
CBR	1.38 %

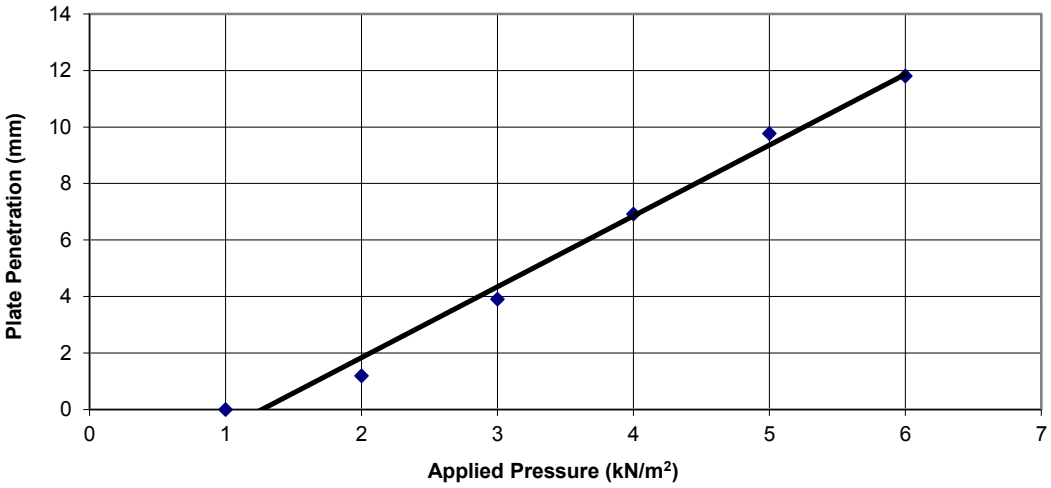
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PLATE BEARING TEST		**Date:**	26/2/18 - 1/3/18
Location:	Ashroyd Business Park, Barnsley	**Test No:**	TP13
		Test Level:	0.60 mbgl
Test Method: BS 1377 : Part 9 : 1990 (Incremental Method)		**Weather:**	Rain & Snow
Plate Diameter:	0.305 m	**Load Applied:**	280 kPa
Kentledge Type:	360 Excavator and Jack	**Start Time of Test:**	00:00



	Pressure (kN/m^2)	Plate Pentration (mm)
Initial	28	0
Stage 1	56	1.20
Stage 2	112	3.91
Stage 3	168	6.92
Stage 4	224	9.77
Stage 5	280	11.80
Stage 6		
Stage 7		
Stage 8		
Stage 9		
Stage 10		

Conversion Factor	0.45
Stress Applied @ 1.25mm	54.49 kN/m^2
Total Plate Deflection	11.80 mm
Plate Diameter	305 mm
k305	43589
k762	19517
CBR	1.66 %

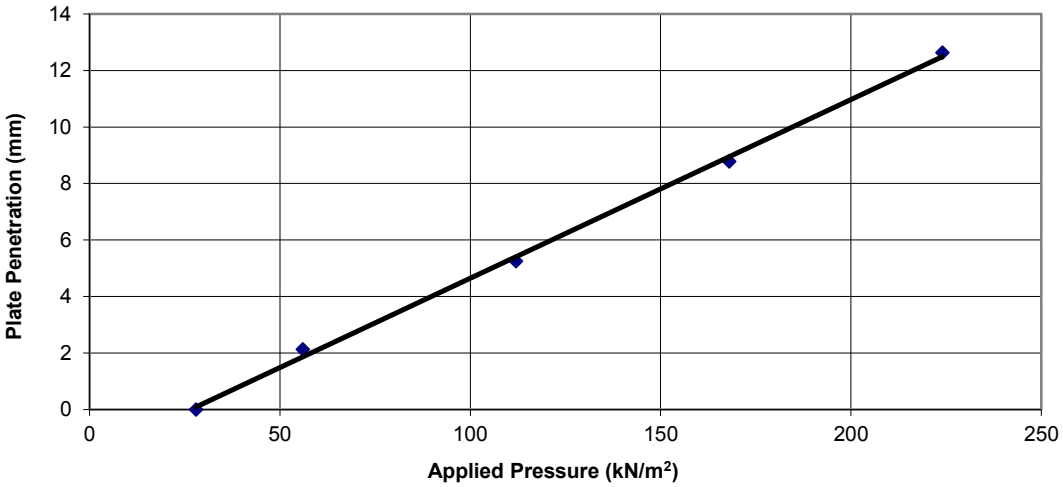
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PLATE BEARING TEST		**Date:**	26/2/18 - 1/3/18
Location:	Ashroyd Business Park, Barnsley	**Test No:**	TP14
		Test Level:	0.30 mbgl
Test Method: BS 1377 : Part 9 : 1990 (Incremental Method)		**Weather:**	Rain & Snow
Plate Diameter:	0.305 m	**Load Applied:**	224 kPa
Kentledge Type:	360 Excavator and Jack	**Start Time of Test:**	00:00



	Pressure (kN/m²)	Plate Pentration (mm)
Initial	28	0
Stage 1	56	2.14
Stage 2	112	5.25
Stage 3	168	8.78
Stage 4	224	12.64
Stage 5		
Stage 6		
Stage 7		
Stage 8		
Stage 9		
Stage 10		

Conversion Factor	0.45
Stress Applied @ 1.25mm	46.27 kN/m²
Total Plate Deflection	12.64 mm
Plate Diameter	305 mm
k305	37018
k762	16575
CBR	1.25 %

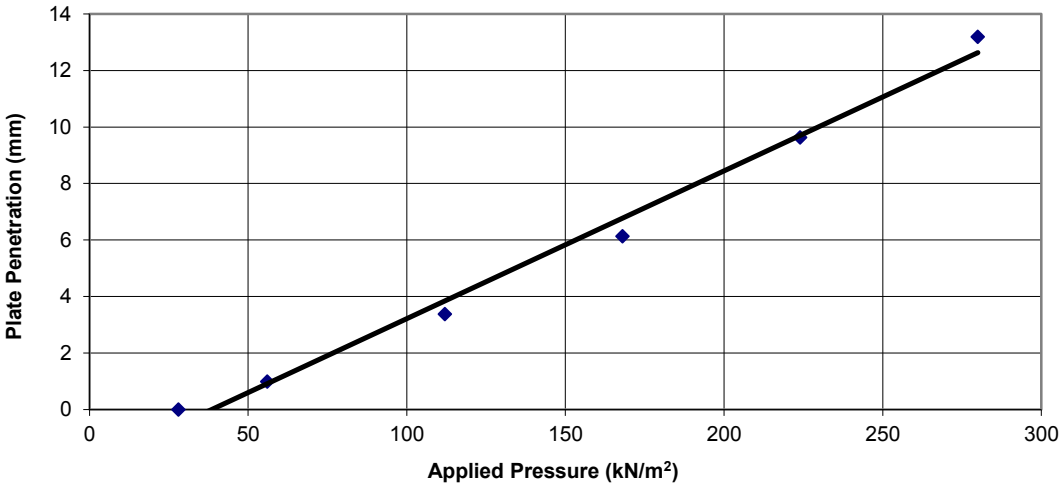
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PLATE BEARING TEST		**Date:**	26/2/18 - 1/3/18
Location:	Ashroyd Business Park, Barnsley	**Test No:**	TP14
		Test Level:	0.60 mbgl
Test Method: BS 1377 : Part 9 : 1990 (Incremental Method)		**Weather:**	Rain & Snow
Plate Diameter:	0.305 m	**Load Applied:**	280 kPa
Kentledge Type:	360 Excavator and Jack	**Start Time of Test:**	00:00



	Pressure (kN/m^2)	Plate Pentration (mm)
Initial	28	0
Stage 1	56	0.99
Stage 2	112	3.38
Stage 3	168	6.13
Stage 4	224	9.63
Stage 5	280	13.20
Stage 6		
Stage 7		
Stage 8		
Stage 9		
Stage 10		

Conversion Factor	0.45
Stress Applied @ 1.25mm	62.38 kN/m^2
Total Plate Deflection	13.20 mm
Plate Diameter	305 mm
k305	49902
k762	22344
CBR	2.10 %

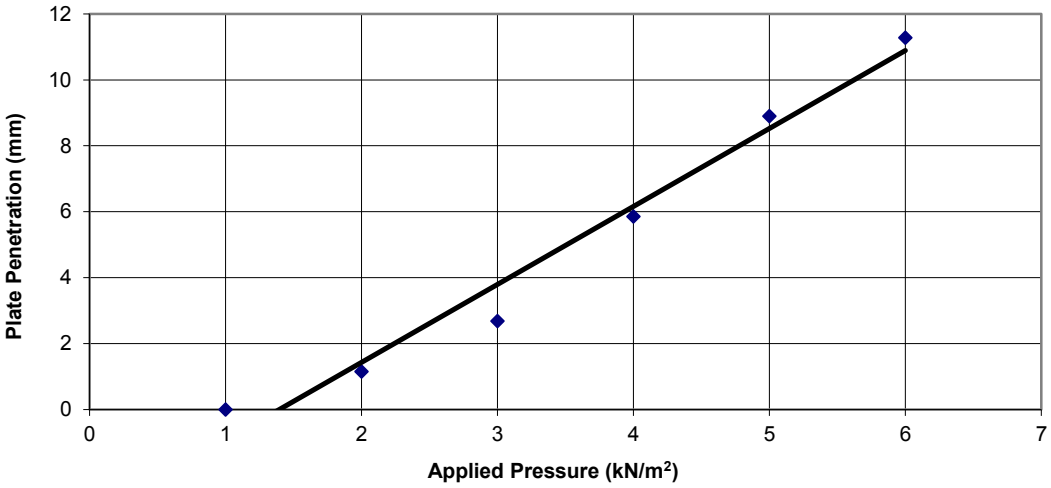
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PLATE BEARING TEST		**Date:**	26/2/18 - 1/3/18
Location:	Ashroyd Business Park, Barnsley	**Test No:**	TP15
		Test Level:	0.30 mbgl
Test Method: BS 1377 : Part 9 : 1990 (Incremental Method)		**Weather:**	Rain & Snow
Plate Diameter:	0.305 m	**Load Applied:**	280 kPa
Kentledge Type:	360 Excavator and Jack	**Start Time of Test:**	00:00



	Pressure (kN/m^2)	Plate Pentration (mm)
Initial	28	0
Stage 1	56	1.16
Stage 2	112	2.69
Stage 3	168	5.86
Stage 4	224	8.90
Stage 5	280	11.28
Stage 6		
Stage 7		
Stage 8		
Stage 9		
Stage 10		

Conversion Factor	0.45
Stress Applied @ 1.25mm	63.03 kN/m^2
Total Plate Deflection	11.28 mm
Plate Diameter	305 mm
k305	50425
k762	22577
CBR	2.14 %

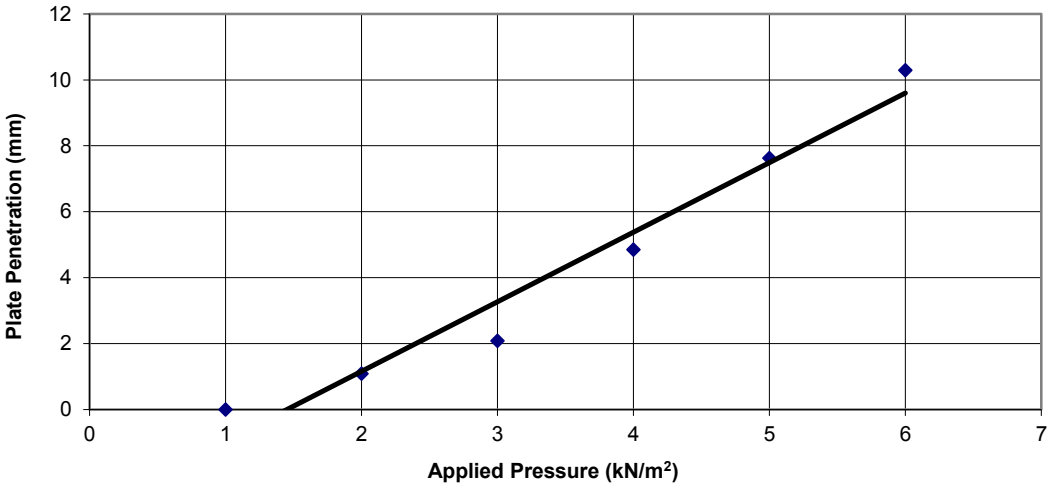
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PLATE BEARING TEST		**Date:**	26/2/18 - 1/3/18
Location:	Ashroyd Business Park, Barnsley	**Test No:**	TP15
		Test Level:	0.60 mbgl
Test Method: BS 1377 : Part 9 : 1990 (Incremental Method)		**Weather:**	Rain & Snow
Plate Diameter:	0.305 m	**Load Applied:**	280 kPa
Kentledge Type:	360 Excavator and Jack	**Start Time of Test:**	00:00



	Pressure (kN/m^2)	Plate Pentration (mm)
Initial	28	0
Stage 1	56	1.09
Stage 2	112	2.09
Stage 3	168	4.86
Stage 4	224	7.63
Stage 5	280	10.30
Stage 6		
Stage 7		
Stage 8		
Stage 9		
Stage 10		

Conversion Factor	0.45
Stress Applied @ 1.25mm	69.37 kN/m^2
Total Plate Deflection	10.30 mm
Plate Diameter	305 mm
k305	55494
k762	24847
CBR	2.53 %

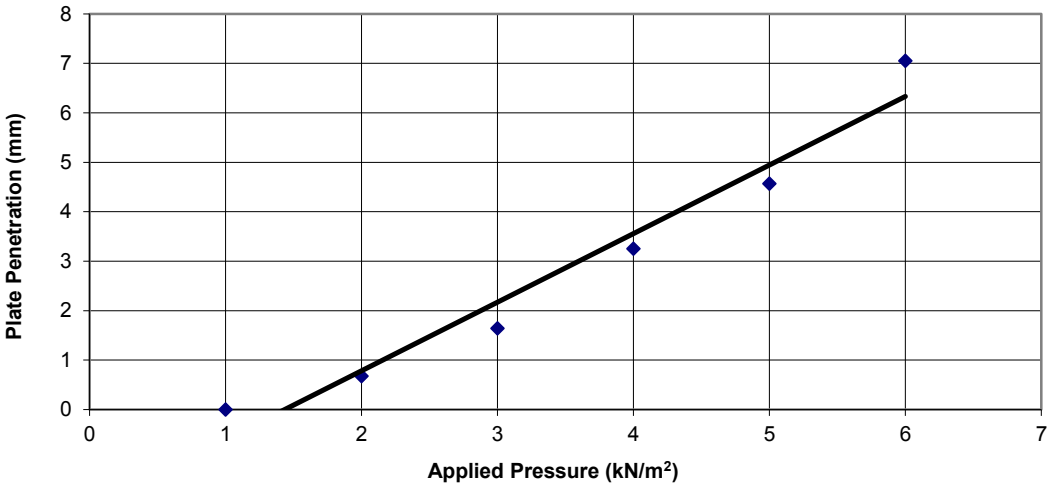
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PLATE BEARING TEST		**Date:**	26/2/18 - 1/3/18
Location:	Ashroyd Business Park, Barnsley	**Test No:**	TP16
		Test Level:	0.30 mbgl
Test Method: BS 1377 : Part 9 : 1990 (Incremental Method)		**Weather:**	Rain & Snow
Plate Diameter:	0.305 m	**Load Applied:**	280 kPa
Kentledge Type:	360 Excavator and Jack	**Start Time of Test:**	00:00



	Pressure (kN/m^2)	Plate Pentration (mm)
Initial	14	0
Stage 1	56	0.68
Stage 2	112	1.64
Stage 3	168	3.25
Stage 4	224	4.57
Stage 5	280	7.05
Stage 6		
Stage 7		
Stage 8		
Stage 9		
Stage 10		

Conversion Factor	0.45
Stress Applied @ 1.25mm	79.78 kN/m^2
Total Plate Deflection	7.05 mm
Plate Diameter	305 mm
k305	63822
k762	28576
CBR	3.22 %

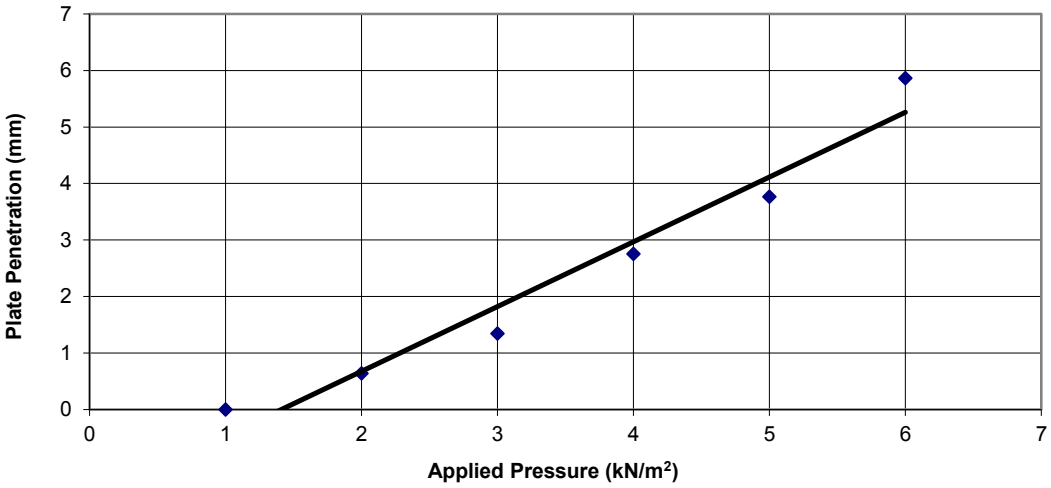
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PLATE BEARING TEST		**Date:**	26/2/18 - 1/3/18
Location:	Ashroyd Business Park, Barnsley	**Test No:**	TP16
		Test Level:	0.60 mbgl
Test Method: BS 1377 : Part 9 : 1990 (Incremental Method)		**Weather:**	Rain & Snow
Plate Diameter:	0.305 m	**Load Applied:**	280 kPa
Kentledge Type:	360 Excavator and Jack	**Start Time of Test:**	00:00



	Pressure (kN/m^2)	Plate Pentration (mm)
Initial	14	0
Stage 1	56	0.64
Stage 2	112	1.35
Stage 3	168	2.76
Stage 4	224	3.77
Stage 5	280	5.87
Stage 6		
Stage 7		
Stage 8		
Stage 9		
Stage 10		

Conversion Factor	0.45
Stress Applied @ 1.25mm	88.61 kN/m^2
Total Plate Deflection	5.87 mm
Plate Diameter	305 mm
k305	70887
k762	31739
CBR	3.86 %

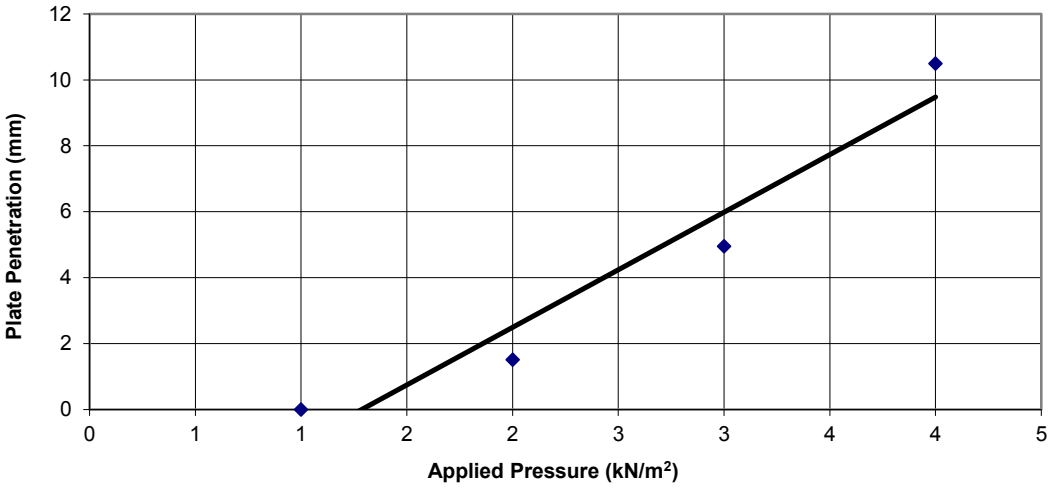
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PLATE BEARING TEST		**Date:**	26/2/18 - 1/3/18
Location:	Ashroyd Business Park, Barnsley	**Test No:**	TP17
		Test Level:	0.30 mbgl
Test Method: BS 1377 : Part 9 : 1990 (Incremental Method)		**Weather:**	Rain & Snow
Plate Diameter:	0.305 m	**Load Applied:**	168 kPa
Kentledge Type:	360 Excavator and Jack	**Start Time of Test:**	00:00



	Pressure (kN/m^2)	Plate Pentration (mm)
Initial	28	0
Stage 1	56	1.51
Stage 2	112	4.96
Stage 3	168	10.50
Stage 4		
Stage 5		
Stage 6		
Stage 7		
Stage 8		
Stage 9		
Stage 10		

Conversion Factor	0.45
Stress Applied @ 1.25mm	50.76 kN/m^2
Total Plate Deflection	10.50 mm
Plate Diameter	305 mm
k305	40610
k762	18183
CBR	1.47 %

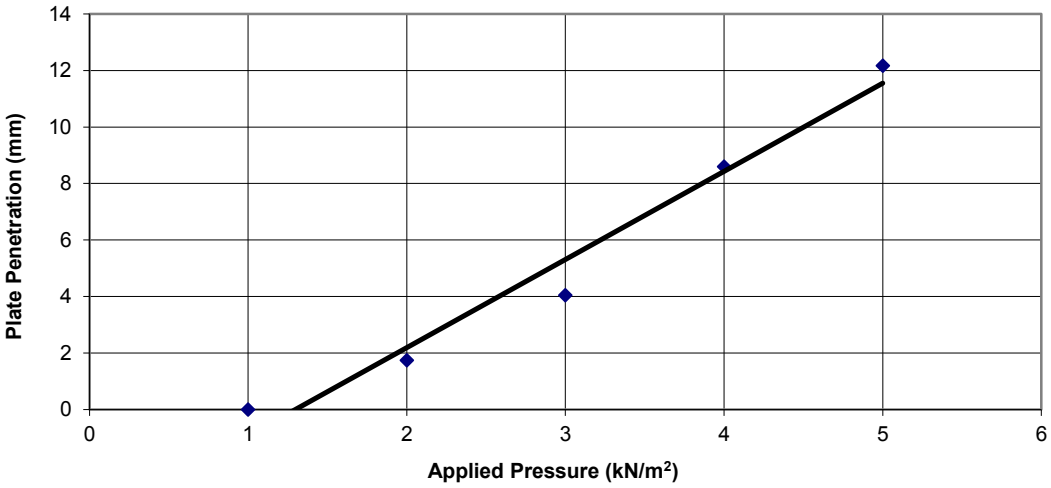
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PLATE BEARING TEST		**Date:**	26/2/18 - 1/3/18
Location:	Ashroyd Business Park, Barnsley	**Test No:**	TP17
		Test Level:	0.60 mbgl
Test Method: BS 1377 : Part 9 : 1990 (Incremental Method)		**Weather:**	Rain & Snow
Plate Diameter:	0.305 m	**Load Applied:**	224 kPa
Kentledge Type:	360 Excavator and Jack	**Start Time of Test:**	00:00



	Pressure (kN/m^2)	Plate Pentration (mm)
Initial	28	0
Stage 1	56	1.74
Stage 2	112	4.05
Stage 3	168	8.60
Stage 4	224	12.17
Stage 5		
Stage 6		
Stage 7		
Stage 8		
Stage 9		
Stage 10		

Conversion Factor	0.45
Stress Applied @ 1.25mm	52.25 kN/m^2
Total Plate Deflection	12.17 mm
Plate Diameter	305 mm
k305	41798
k762	18715
CBR	1.55 %

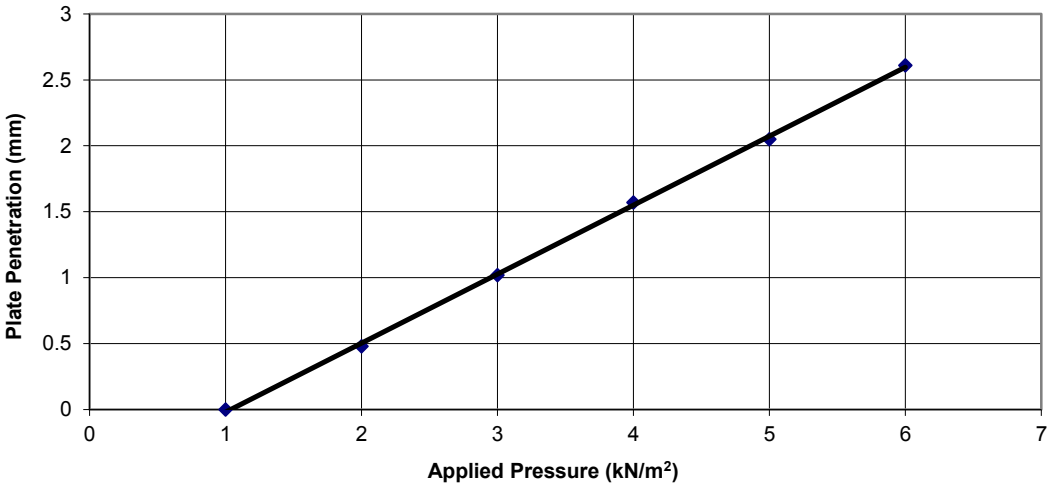
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PLATE BEARING TEST		**Date:**	26/2/18 - 1/3/18
Location:	Ashroyd Business Park, Barnsley	**Test No:**	TP18
		Test Level:	0.30mbgl
Test Method: BS 1377 : Part 9 : 1990 (Incremental Method)		**Weather:**	Fair
Plate Diameter:	0.305 m	**Load Applied:**	140 kPa
Kentledge Type:	360 Excavator and Jack	**Start Time of Test:**	00:00



	Pressure (kN/m^2)	Plate Pentration (mm)
Initial	0	0
Stage 1	28	0.48
Stage 2	56	1.02
Stage 3	84	1.57
Stage 4	112	2.05
Stage 5	140	2.61
Stage 6		
Stage 7		
Stage 8		
Stage 9		
Stage 10		

Conversion Factor	0.45
Stress Applied @ 1.25mm	67.95 kN/m^2
Total Plate Deflection	2.61 mm
Plate Diameter	305 mm
k305	54359
k762	24339
CBR	2.44 %

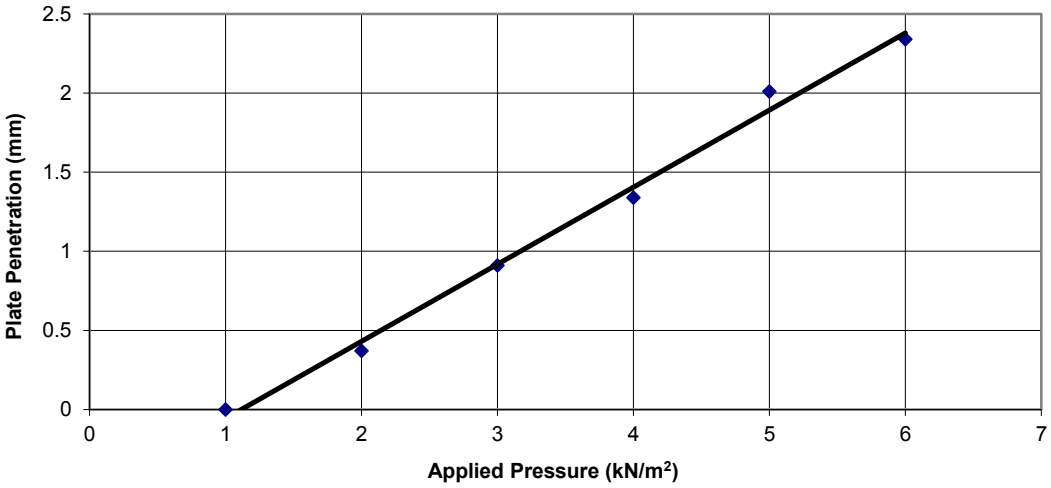
Produced by:

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PLATE BEARING TEST		**Date:**	26/2/18 - 1/3/18
Location:	Ashroyd Business Park, Barnsley	**Test No:**	TP19
		Test Level:	0.30mbgl
Test Method: BS 1377 : Part 9 : 1990 (Incremental Method)		**Weather:**	Fair
Plate Diameter:	0.305 m	**Load Applied:**	140 kPa
Kentledge Type:	360 Excavator and Jack	**Start Time of Test:**	00:00



	Pressure (kN/m^2)	Plate Pentration (mm)
Initial	0	0
Stage 1	28	0.37
Stage 2	56	0.91
Stage 3	84	1.34
Stage 4	112	2.01
Stage 5	140	2.34
Stage 6		
Stage 7		
Stage 8		
Stage 9		
Stage 10		

Conversion Factor	0.45
Stress Applied @ 1.25mm	75.08 kN/m^2
Total Plate Deflection	2.34 mm
Plate Diameter	305 mm
k305	60062
k762	26892
CBR	2.90 %

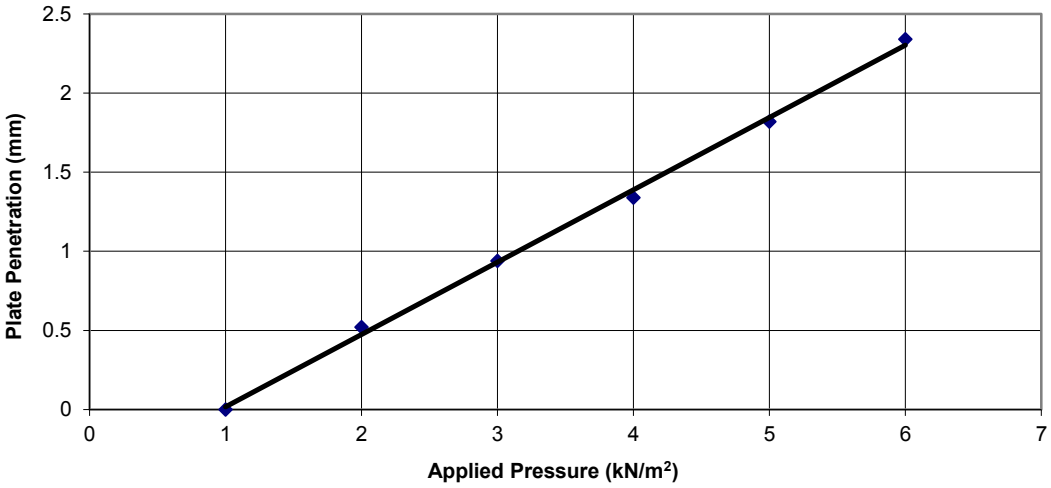
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GEOTECHNICAL TESTING LABORATORY

PLATE BEARING TEST		**Date:**	26/2/18 - 1/3/18
Location:	Ashroyd Business Park, Barnsley	**Test No:**	TP2
		Test Level:	0.30mbgl
Test Method: BS 1377 : Part 9 : 1990 (Incremental Method)		**Weather:**	Fair
Plate Diameter:	0.305 m	**Load Applied:**	140 kPa
Kentledge Type:	360 Excavator and Jack	**Start Time of Test:**	00:00



	Pressure (kN/m^2)	Plate Pentration (mm)
Initial	0	0
Stage 1	28	0.52
Stage 2	56	0.94
Stage 3	84	1.34
Stage 4	112	1.82
Stage 5	140	2.34
Stage 6		
Stage 7		
Stage 8		
Stage 9		
Stage 10		

Conversion Factor	0.45
Stress Applied @ 1.25mm	75.51 kN/m^2
Total Plate Deflection	2.34 mm
Plate Diameter	305 mm
k305	60410
k762	27048
CBR	2.93 %

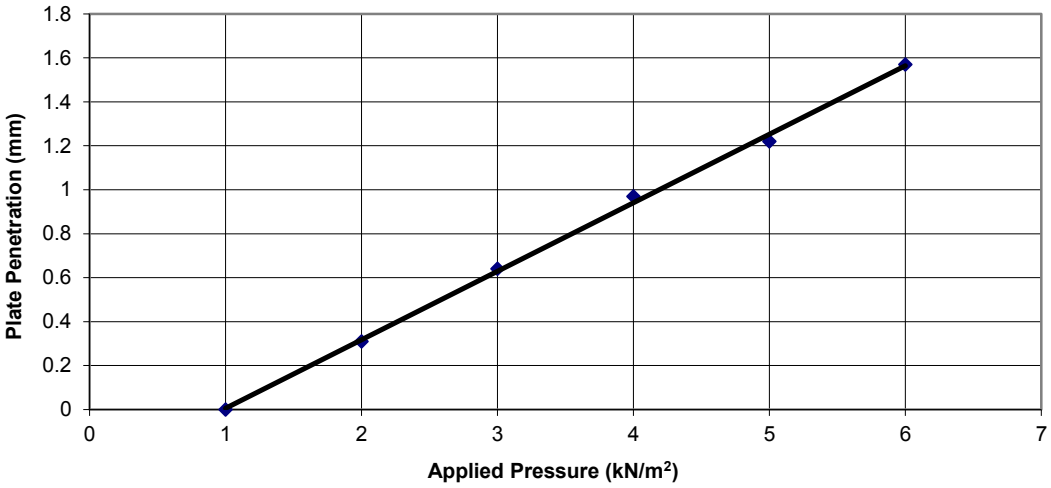
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GEOTECHNICAL TESTING LABORATORY

PLATE BEARING TEST		**Date:**	26/2/18 - 1/3/18
Location:	Ashroyd Business Park, Barnsley	**Test No:**	TP20
		Test Level:	0.30mbgl
Test Method: BS 1377 : Part 9 : 1990 (Incremental Method)		**Weather:**	Fair
Plate Diameter:	0.305 m	**Load Applied:**	140 kPa
Kentledge Type:	360 Excavator and Jack	**Start Time of Test:**	00:00



	Pressure (kN/m^2)	Plate Pentration (mm)
Initial	0	0
Stage 1	28	0.31
Stage 2	56	0.64
Stage 3	84	0.97
Stage 4	112	1.22
Stage 5	140	1.57
Stage 6		
Stage 7		
Stage 8		
Stage 9		
Stage 10		

Conversion Factor	0.45
Stress Applied @ 1.25mm	111.77 kN/m^2
Total Plate Deflection	1.57 mm
Plate Diameter	305 mm
k305	89415
k762	40035
CBR	5.77 %

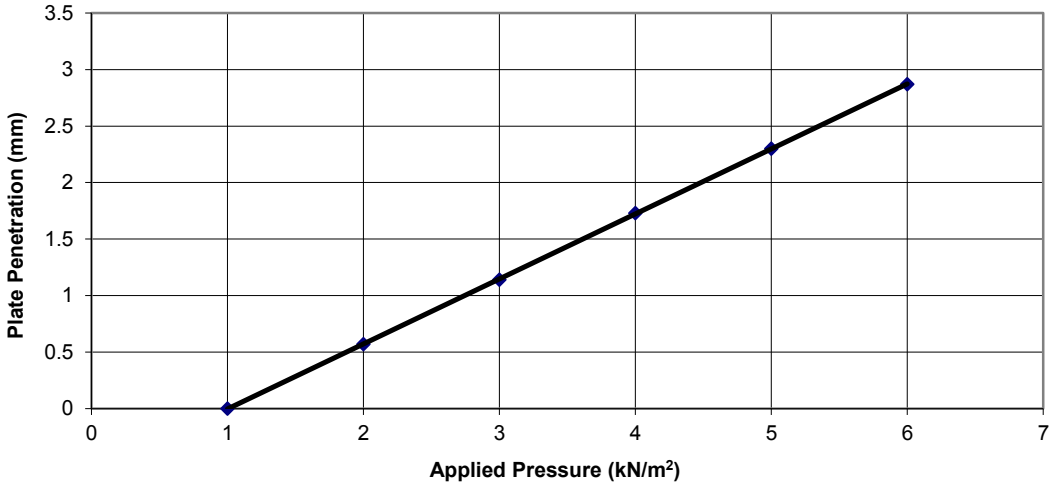
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GEOTECHNICAL TESTING LABORATORY

PLATE BEARING TEST		**Date:**	26/2/18 - 1/3/18
Location:	Ashroyd Business Park, Barnsley	**Test No:**	TP21
		Test Level:	0.30mbgl
Test Method: BS 1377 : Part 9 : 1990 (Incremental Method)		**Weather:**	Fair
Plate Diameter:	0.305 m	**Load Applied:**	140 kPa
Kentledge Type:	360 Excavator and Jack	**Start Time of Test:**	00:00



	Pressure (kN/m^2)	Plate Pentration (mm)
Initial	0	0
Stage 1	28	0.57
Stage 2	56	1.14
Stage 3	84	1.73
Stage 4	112	2.30
Stage 5	140	2.87
Stage 6		
Stage 7		
Stage 8		
Stage 9		
Stage 10		

Conversion Factor	0.45
Stress Applied @ 1.25mm	60.99 kN/m^2
Total Plate Deflection	2.87 mm
Plate Diameter	305 mm
k305	48795
k762	21848
CBR	2.02 %

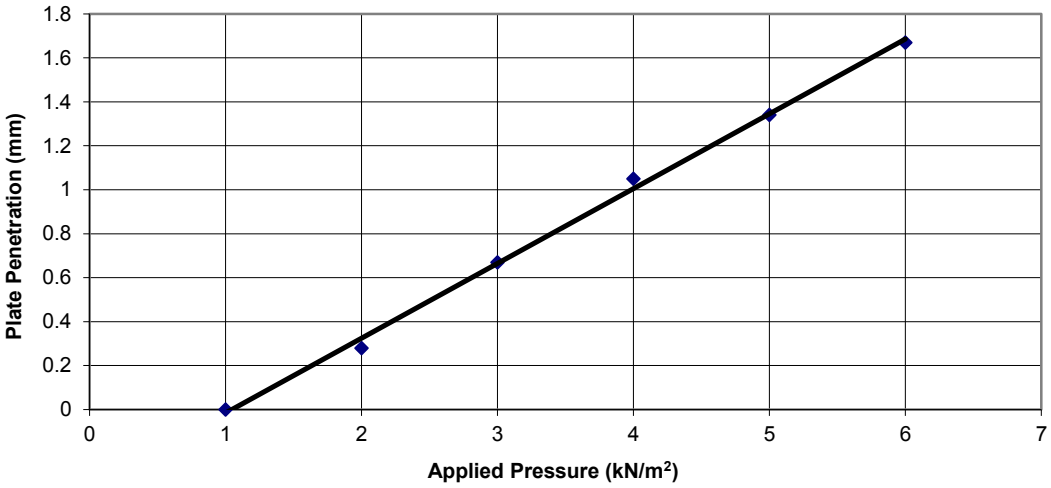
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PLATE BEARING TEST		**Date:**	26/2/18 - 1/3/18
Location:	Ashroyd Business Park, Barnsley	**Test No:**	TP22
		Test Level:	0.30mbgl
Test Method: BS 1377 : Part 9 : 1990 (Incremental Method)		**Weather:**	Fair
Plate Diameter:	0.305 m	**Load Applied:**	140 kPa
Kentledge Type:	360 Excavator and Jack	**Start Time of Test:**	00:00



	Pressure (kN/m^2)	Plate Pentration (mm)
Initial	0	0
Stage 1	28	0.28
Stage 2	56	0.67
Stage 3	84	1.05
Stage 4	112	1.34
Stage 5	140	1.67
Stage 6		
Stage 7		
Stage 8		
Stage 9		
Stage 10		

Conversion Factor	0.45
Stress Applied @ 1.25mm	104.15 kN/m^2
Total Plate Deflection	1.67 mm
Plate Diameter	305 mm
k305	83318
k762	37305
CBR	5.11 %

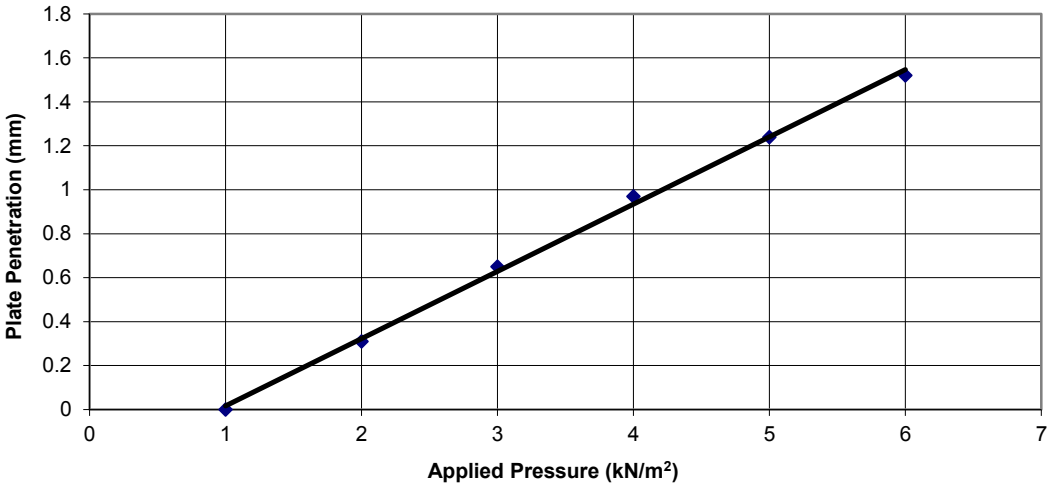
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GEOTECHNICAL TESTING LABORATORY

PLATE BEARING TEST		**Date:**	26/2/18 - 1/3/18
Location:	Ashroyd Business Park, Barnsley	**Test No:**	TP23
		Test Level:	0.30mbgl
Test Method: BS 1377 : Part 9 : 1990 (Incremental Method)		**Weather:**	Fair
Plate Diameter:	0.305 m	**Load Applied:**	140 kPa
Kentledge Type:	360 Excavator and Jack	**Start Time of Test:**	00:00



	Pressure (kN/m^2)	Plate Pentration (mm)
Initial	0	0
Stage 1	28	0.31
Stage 2	56	0.65
Stage 3	84	0.97
Stage 4	112	1.24
Stage 5	140	1.52
Stage 6		
Stage 7		
Stage 8		
Stage 9		
Stage 10		

Conversion Factor	0.45
Stress Applied @ 1.25mm	112.85 kN/m^2
Total Plate Deflection	1.52 mm
Plate Diameter	305 mm
k305	90283
k762	40424
CBR	5.87 %

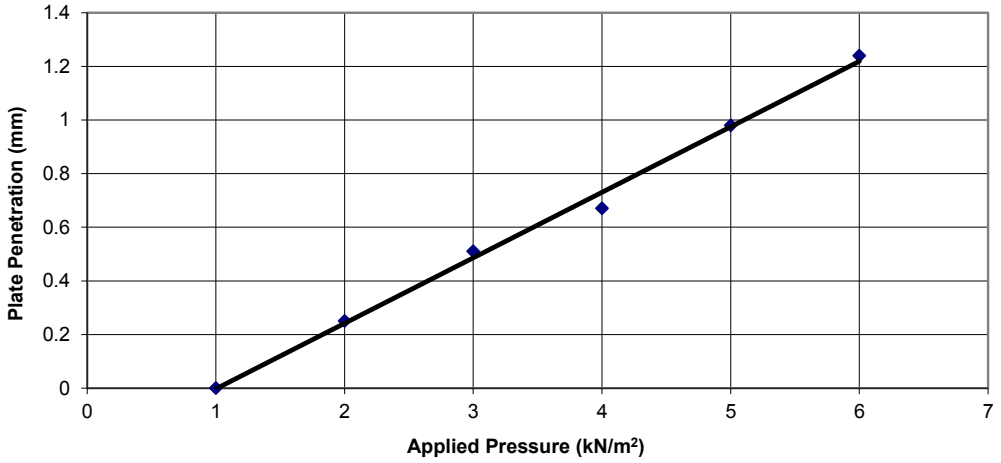
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GEOTECHNICAL TESTING LABORATORY

PLATE BEARING TEST		**Date:**	26/2/18 - 1/3/18
Location:	Ashroyd Business Park, Barnsley	**Test No:**	TP3
		Test Level:	0.30mbgl
Test Method: BS 1377 : Part 9 : 1990 (Incremental Method)		**Weather:**	Fair
Plate Diameter:	0.305 m	**Load Applied:**	140 kPa
Kentledge Type:	360 Excavator and Jack	**Start Time of Test:**	00:00



	Pressure (kN/m^2)	Plate Pentration (mm)
Initial	0	0
Stage 1	28	0.25
Stage 2	56	0.51
Stage 3	84	0.67
Stage 4	112	0.98
Stage 5	140	1.24
Stage 6		
Stage 7		
Stage 8		
Stage 9		
Stage 10		

Conversion Factor	0.45
Stress Applied @ 1.25mm	143.55 kN/m^2
Total Plate Deflection	1.24 mm
Plate Diameter	305 mm
k305	114838
k762	51418
CBR	8.91 %

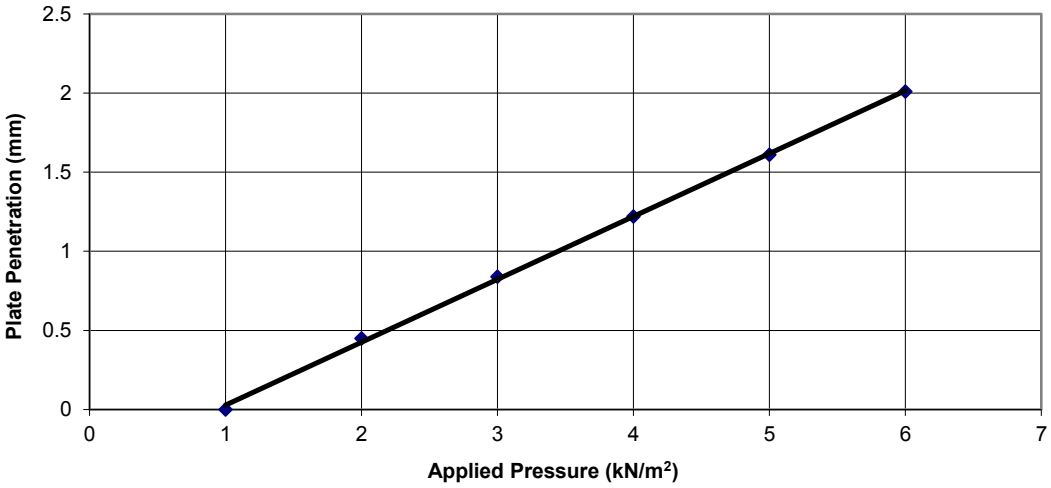
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Checked by:

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GEOTECHNICAL TESTING LABORATORY

PLATE BEARING TEST		**Date:**	26/2/18 - 1/3/18
Location:	Ashroyd Business Park, Barnsley	**Test No:**	TP4
		Test Level:	0.30mbgl
Test Method: BS 1377 : Part 9 : 1990 (Incremental Method)		**Weather:**	Fair
Plate Diameter:	0.305 m	**Load Applied:**	140 kPa
Kentledge Type:	360 Excavator and Jack	**Start Time of Test:**	00:00



	Pressure (kN/m^2)	Plate Pentration (mm)
Initial	0	0
Stage 1	28	0.45
Stage 2	56	0.84
Stage 3	84	1.22
Stage 4	112	1.61
Stage 5	140	2.01
Stage 6		
Stage 7		
Stage 8		
Stage 9		
Stage 10		

Conversion Factor	0.45
Stress Applied @ 1.25mm	86.09 kN/m^2
Total Plate Deflection	2.01 mm
Plate Diameter	305 mm
k305	68869
k762	30836
CBR	3.67 %

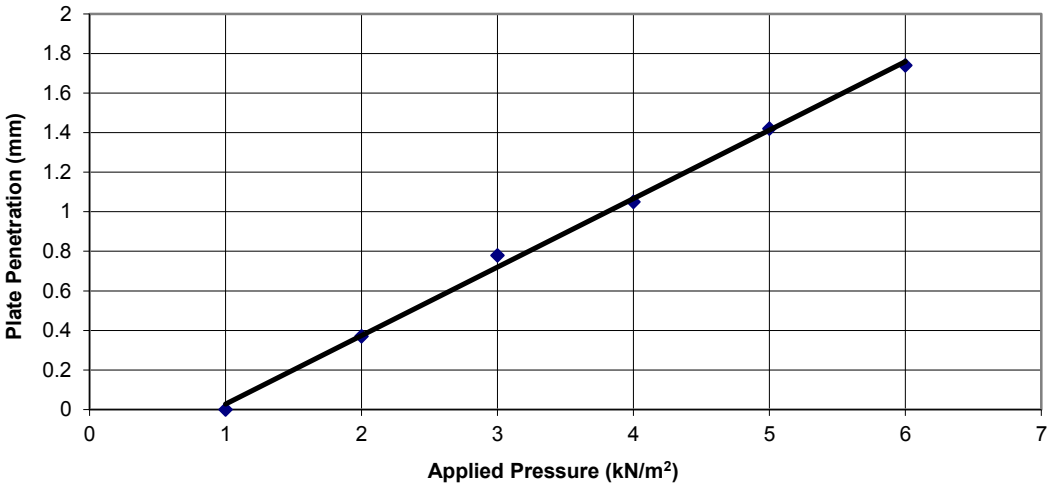
Produced by:

Checked by:

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GEOTECHNICAL TESTING LABORATORY

PLATE BEARING TEST		**Date:**	26/2/18 - 1/3/18
Location:	Ashroyd Business Park, Barnsley	**Test No:**	TP7
		Test Level:	0.30mbgl
Test Method: BS 1377 : Part 9 : 1990 (Incremental Method)		**Weather:**	Fair
Plate Diameter:	0.305 m	**Load Applied:**	140 kPa
Kentledge Type:	360 Excavator and Jack	**Start Time of Test:**	00:00



	Pressure (kN/m^2)	Plate Pentration (mm)
Initial	0	0
Stage 1	28	0.37
Stage 2	56	0.78
Stage 3	84	1.05
Stage 4	112	1.42
Stage 5	140	1.74
Stage 6		
Stage 7		
Stage 8		
Stage 9		
Stage 10		

Conversion Factor	0.45
Stress Applied @ 1.25mm	98.84 kN/m^2
Total Plate Deflection	1.74 mm
Plate Diameter	305 mm
k305	79072
k762	35404
CBR	4.66 %

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APPENDIX E

SOLMEK NOTES ON CONTAMINATION GUIDANCE (REF: VERSION 1/2018)

UK BACKGROUND

Environmental Protection Act 1990: Part 2A Revised Statutory Guidance (April 2012)

This revised document explains how the Local Authority should decide if land, based on a legal interpretation, is contaminated. The document replaces the previous guidance given in Annex 3 of DEFRA Circular 01/2006, issued in accordance with section 78YA of the 1990 Environmental Protection Act.

The main objectives of the Part 2A regime are to *"identify and remove unacceptable risks to human health and the environment" and* to *"seek to ensure that contaminated land is made suitable for its current use".*

Part 2A uses a risk based approach to defining contaminated land whereby the "risk" is interpreted as *"the likelihood that harm, or pollution of water, will occur as a result of contaminants in, on or under the land"* and by *"the scale and seriousness of such harm or pollution if it did occur".*

For a relevant risk to exist a contaminant, pathway and receptor linkage must be present before the land can be considered to be contaminated. The document explains that *"for a risk to exist there must be contaminants present in, on or under the land in a form and quantity that poses a hazard, and one or more pathways by which they might significantly harm people, the environment, or property; or significantly pollute controlled waters."*

A conceptual model is used to develop and communicate the risks associated with a particular site.

To determine if land is contaminated the local authority use various categories from 1 to 4. Categories 1 and 2 include *"land which is capable of being determined as contaminated land on grounds of significant possibility of significant harm to human health."*

Categories 3 and 4 *"encompass land which is not capable of being determined on such grounds".*

PRELIMINARY CONCEPTUAL MODEL

Preliminary Conceptual Models are undertaken in accordance with CIRIA C552. The Preliminary Conceptual Model assesses the consequence and the likelihood of a risk being realised to provide a risk classification, using the tables detailed below.

CONSEQUENCE OF RISK BEING REALISED (Based on C552 CIRIA, 2001)

Classification	Definition	Example
Severe	Short-term (acute) risk to human health, the environment, an element of the development or other aspect with is likely to result in *significant harm*, damage or both.	High concentrations of cyanide on the surface of an informal recreational area. Major spills of contaminants from site into controlled water. High concentrations of explosive gas in the subsurface environment that have a clear unobstructed pathway into buildings.
Moderate	Chronic damage to human health, a plausible chance that an event will occur, although the timeline is not immediate to be in the short-term.	Appreciable concentration of contamination that over the longer-term will cause significant harm i.e. high lead concentration in topsoil. Shallow mine workings that are potentially unstable but may remain in a satisfactory or stable conditions for a number of years.
Mild	Low level pollution of non-sensitive water, a feasible hazardous scenario although the timeline of such occurring can probably be considered in 10's of years.	The effect of high sulphate concentrations on structural concrete. Pollution of non-classified groundwater.
Minor	Harm, although not necessarily significant to human health, or with respect to other aspects of the development, which are considered implausible in terms of occurrence, or will have little consequential impact.	The presence of contaminants at such low concentrations that protective equipment is required during site works. Any damage to structures is minimal and will not be structural in characteristics.

PROBABILITY OF RISK BEING REALISED (C552 CIRIA, 2001)

Classification	Definition
High Likelihood	There is a viable pollutant linkage and an event that either appears very likely in the short term and almost inevitable over the long term, or there is evidence that the receptor has been harmed or polluted.
Likely	There is a viable pollutant linkage and all elements are present and in the right place, which means that it is probable that an event will occur. Circumstances are such that an event is not inevitable, but possible in the short term and likely over the long term.
Low Likelihood	There is a viable pollutant linkage and circumstances are possible under which an event could occur. However, it is by no means certain that even over a longer period such event would take place, and is less likely in the shorter term.
Unlikely	There is a viable pollutant linkage but circumstances are such that it is improbable that an event would occur even in the very long term.

RISK CLASSIFICATION MATRIX (C552 CIRIA, 2001)

Risk = Probability x Consequence		Consequence			
		Severe	Medium	Mild	Minor
Probability	High likelihood	Very high risk	High risk	Moderate risk	Moderate/low risk
	Likely	High risk	Moderate risk	Moderate/low risk	Low risk
	Low likelihood	Moderate risk	Moderate/low risk	Low risk	Very low risk
	Unlikely	Moderate/low risk	Low risk	Very low risk	Very low risk

HUMAN RECEPTORS

Human exposure to contaminants present in soils can occur via several pathways. Direct exposure pathways include dermal absorption after contact with contaminated ground, inhalation of soil or dust, inhalation of volatised compounds, and inadvertent soil ingestion (or deliberate soil ingestion in the case of some children). Other indirect pathways include human ingestion of plants grown in contaminated soil or contaminated ground or surface water. Contaminants associated with wind blown dust can affect humans on surrounding sites.

VEGETATION

Plants can be affected by soil contamination in a number of ways resulting in growth inhibition, nutrient deficiencies and yellowing of leaves. Contaminants are taken up by plants through the roots and through foliage. Contaminants identified as being highly phytotoxic include boron, cadmium, copper, lead, nickel, and zinc.

To establish if the levels of contaminants present on a site may pose a risk to vegetation the results of the contamination testing are compared to a series of threshold values published in 'Code of Good Agricultural Practice for the Protection of Soil'.

GROUNDWATER AND SURFACE WATER RECEPTORS

The principal pathway by which soil contamination may reach the water environment is through a slow seepage or leaching to groundwater or surface water. The potential for contaminants to migrate along such pathways is dependent on the chemical and physical characteristics of the contaminants and the local hydrogeology. Surface watercourses may also accumulate contamination as contaminated sediments are deposited within the water body.

Where the site investigated overlies major/principal aquifers (and in some cases minor/secondary aquifers depending on certain conditions), groundwater Source Protection Zones and areas in close proximity to groundwater abstractions, contamination test results have been compared with the Water Supply (Water Quality) Regulations 1989 and The Water Supply (Water Quality) Regulations 2000.

Should a surface water receptor, such as a fresh water environment (river, canal, stream, lake etc), or marine environment be considered sensitive in relation to a site, then test results are compared with DEFRA & SEPA Environmental Quality Standards (2004). Many of the Environmental Quality Standards are hardness ($CaCO_3$) depended. Where no hardness values are available, Solmek assume conservative values (of between 0 and 50mg/l).

In the absence of vulnerable ground and surface water environments, Solmek may compare any test results with the Environment Agency Leachate Quality Threshold Values.

DETAILED QUANTITATIVE RISK ASSESSMENT (DQRA)

In line with CLR 11- Model Procedures, a DQRA for groundwater/human health may be required following a Phase 2 investigation and before the preparation of a Phase 3 Remediation Strategy. For human health DQRA, a site specific assessment criteria is undertaken using CLEA Software Version 1.06. For groundwater DQRA, the Environment Agency Remedial Targets Worksheet Version 3.1 is used.

WASTE ACCEPTANCE CRITERIA

The WAC testing relates to materials that are to be exported from a site/development to landfill, and do not directly relate to human health specifically. The WAC test categorises materials as either inert waste, non-reactive hazardous waste, and hazardous waste.

The testing results are generally presented as certificates which can be used by site owners/contractors etc, which should be presented to the accepting waste facility or waste contractor.

CONSTRUCTION MATERIALS

Materials at risk from possible soil contaminants include inorganic matrices such as cement and concrete and also organic material such as plastics and rubbers. Acid ground conditions and high levels of sulphates can accelerate the corrosion of building materials. Where pH and soluble sulphate analysis has been undertaken, Solmek compare the test results with the guidelines presented within BRE Special Digest 1, 2005 (3rd Edition) 'Concrete in Aggressive Ground'. Plastics and rubbers are generally used for piping and service ducts and are potentially attacked by a range of chemicals, most of which are organic, particularly petroleum based substances. Drinking water supplies can be tainted by substances that can penetrate piping and water companies enforce stringent threshold values.

The levels of potential contaminants should be compared to thresholds supplied in the UK Water Industry Research (UKWIR) publication "Guidance for the selection of Water Supply Pipes to be used in Brownfield Sites" (January 2011). A Brownfield Site is defined in the document as "Land or premises that have not previously been used or developed that may be vacant or derelict". It should be noted that Brownfield sites may not be contaminated. The guidance does not apply to Greenfield Sites however water companies may have their own assessment criteria which should be checked by the developer. The table below outlines the pipe material selection threshold concentrations.

	Pipe Material (Threshold concentrations in mg/kg)					
Parameter group	**PE**	**PVC**	**Barrier pipe (PE-AL-PE)**	**Wrapped Steel**	**Wrapped Ductile Iron**	**Copper**
Extended VOC suite by purge and trap or head space and GC-MS with TIC	0.5	0.125	Pass	Pass	Pass	Pass
+ BTEX + MTBE	0.1	0.03	Pass	Pass	Pass	Pass
SVOCs TIC by purge and trap or head space and GC-MS with TIC (aliphatic and aromatic C5-C10)	2	1.4	Pass	Pass	Pass	Pass
+ Phenols	2	0.4	Pass	Pass	Pass	Pass
+ Cresols and chlorinated phenols	2	0.04	Pass	Pass	Pass	Pass
Mineral oil C11-C20	10	Pass	Pass	Pass	Pass	Pass
Mineral oil C21-C40	500	Pass	Pass	Pass	Pass	Pass
Corrosive (Conductivity, Redox and pH)	Pass	Pass	Pass	Corrosive if pH <7 and conductivity >400µS/cm	Corrosive if pH <5, Eh not neutral and conductivity >400µS/cm	Corrosive if pH <5 or >8 and Eh positive
Specific suite identified as relevant following site investigation						
Ethers	0.5	1	Pass	Pass	Pass	Pass
Nitrobenzene	0.5	0.4	Pass	Pass	Pass	Pass
Ketones	0.5	0.02	Pass	Pass	Pass	Pass
Aldehydes	0.5	0.02	Pass	Pass	Pass	Pass
Amines	Fail	Pass	Pass	Pass	Pass	Pass

REQUIREMENTS OF PARTIES WITHIN THE DEVELOPMENT PROCESS

Interested parties involved in the development process may use the data in different ways and there may be varying views and interpretation of the factual data. Local Authority staff may have a view on contamination and human health and the wider environment. The Environment Agency are concerned principally with the protection of Controlled waters. Building insurers, funders and purchasers may be primarily concerned with issues of potential commercial blight. Purchasers are also not always fully informed, and perceptions on issues associated with risk can affect the decision to purchase. Developers and construction organisations will focus on financial aspects of dealing with the contamination in the context of the development and construction programme.

RISKS & LIABILITIES FROM CONTAMINATION

In simple terms, risks associated with contamination may be considered in terms of 1) statutory risks and 2) development related risks. If contamination is severe or forms a potential hazard based on its potential to affect groundwater, surface water or human health, a statutory risk may be present, and as such, if the risk is not reduced, criminal proceedings may be instigated by a government body or local authority.

If the contamination is less severe or not considered to be mobile, it may be considered a commercial liability which could, in theory remain untreated, but which may at a later date affect the value of the property, or, with changing legislation, become a statutory risk. Commercial liabilities could give rise to civil proceedings by third parties if there are grounds for action.

♠Solmek conditions of offer, notes on limitations & basis for contract (ref: version1/2018)

These conditions accompany our tender and supercede any previous conditions issued. Solmek will prepare a report solely for the use of the Client (the party invoiced) and its agent(s). No reliance should be placed on the contents of this report, in whole or in part by 3rd parties. The report, its content and format and associated data are copyright, and the property of Solmek. Photocopying of part or all of the contents, transfer or reproduction of any kind is forbidden without written permission from Solmek. A charge may be levied against such approval, the same to be made at the discretion of Solmek. Solmek was a trading name of Hymas Geoenvironmental Ltd.

Solmek cannot be held liable and do not warrant, or otherwise guarantee the validity of information provided by third parties and subsequently used in our reports. Solmek are not responsible for the action negligent of otherwise of subcontractors or third parties.

Site investigation is a process of sampling. The scope and size of an investigation may be considered proportional to levels of confidence regarding the ground and groundwater conditions. The exploratory holes undertaken investigate only a small volume of the ground in relation to the overall size of the site, and can only provide a general indication of site conditions. The opinions provided and recommendations given in this report are based on the ground conditions as encountered within each of the exploratory holes. There may be different ground conditions elsewhere on the site which have not been identified by this investigation and which therefore have not been taken into account in this report. Reports are generally subject to the comments of the local authority and Environment Agency. The comments made on groundwater conditions are based on observations made at the time that site work was carried out. It should be noted that mobile contamination, ground gas levels and groundwater levels may vary owing to seasonal, tidal and/or weather related effects. Solmek cannot be held liable for any unrecorded or unforeseen obstructions between exploratory boreholes and trial pits. This includes instances where previous structures on the site (buried man made structures) or the presence of boulder clay (cobbles and/or boulder obstructions) have been anticipated. All types of piling operations should make allowance for obstructions within the construction budget to accommodate this. Unrecorded ancient mining may occur anywhere where seams that have been worked and influence the rock and soil above. Dissolution cavities can occur where gypsum or chalk is present. Rotary drilling is the recommended technique to prove the integrity of the rock.

Where the scope of the investigation is limited via access to information, time constraints, equipment limitations, testing, interpretation or by the client or his agents budgetary constraints, elements not set out in the proposal and excluded from the report are deemed to be omitted from the scope of the investigation.

Desk studies are generally prepared in accordance with RICS guidelines. Environmental site investigations are generally undertaken as 'exploratory investigations' in accordance with the definitions provided in paragraph 5.4 of BS 10175:2001 in order to confirm the conceptual assumptions. You are advised to familiarize yourself with the typical scope of such an investigation. No pumping of water will be undertaken unless a licence or facilities/equipment have been arranged by others.

Where the type, number or/and depth of exploratory hole is specified by others, Solmek cannot and will not be responsible for any subsequent shortfall or inadequacy in data, and any consequent shortfall in interpretation of environmental and geotechnical aspects which may be required at a later date in order to facilitate the design of permanent or temporary works.

All information acquired by Solmek in the course of investigation is the property of Solmek, and, only also becomes the joint property of the Client only on the complete settlement of all invoices relating to the project. Solmek reserve the right to use the information in commercial tendering and marketing, unless the Client expressly wishes otherwise in writing. The quoted rates do not include VAT, and payment terms are 30 days from dispatch of invoice from our offices. Quotes are subject to a site visit.

We have allowed for 1 mobilisation and normal working hours unless otherwise stated. The scope of the investigation may be reviewed following the desk study and/or fieldwork. The presence or otherwise of Japanese Knotweed or other invasive plants can be difficult to identify especially during winter months. If Japanese Knotweed or other invasive species are suspect, it should be confirmed by an ecologist. We have not allowed for acquiring services information, and cannot be responsible for damage to underground services or pipes not shown to us or not clearly shown on plans. Costs incurred will be passed on to you, and in commissioning Solmek you understand and accept that you/your agent have a contractual relationship with Solmek & you accept this. Our rates assume unobstructed, reasonably level and firm access to the exploratory positions and adequate clear working areas and headroom. We have priced on the basis that you or your client have the necessary permissions, wayleaves and approvals to access land. All boreholes and pits are backfilled with arisings except where gas monitoring pipes are installed with stopcock covers. Solmek are not responsible for any uneven surfaces as a result of siteworks and rutting and backfilled excavations may require re-levelling and/or making good by others after fieldwork is complete, and Solmek has not allowed for this. No price has been provided or requested for a return visit to remove pipework and covers. Hourly rates apply to consultancy only and do not include expenses unless otherwise shown. If warranties are required, legal costs incurred will be passed on to you assuming Solmek agree to complete such warranties, modified or otherwise and you understand and agree to pay all costs.

We reserve the right to pursue full payment of the invoice prior to release of any information including reports. We advise you/your client that we may elect to pursue our statutory rights under late payment legislation, and will apply 8% to the base rate for unreasonably late payments. Solmek are exempt from the CIS Scheme. Solmek offer to undertake work only in strict accordance with conditions covered by our current insurances, which are available for inspection. Solmek are not responsible for acts, negligent or otherwise of subcontractors and as a matter of policy cannot indemnify any other parties. Professional indemnity Insurance is limited to ten times the invoice net total except where stated otherwise by Solmek. Solmek give notice that consequential loss as a direct or indirect result of Solmek's activities or omission of the same are excluded.