GEOTECHNICAL REPORT ON
GROUND INVESTIGATION

BENHALL MILL ROAD
TUNBRIDGE WELLS

FOR

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INFRASTRUCTURE
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CONTENTS

PAGE No.

FIGURES

APPENDICES

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APPROVAL & DISTRIBUTION SHEET

PROJECT DETAILS	
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FOREWORD

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1. INTRODUCTION

This interpretative report has been prepared upon the written instruction of Aecom Ltd, which is dated 11th August 2020.

The subject site is located off Benhall Mill Road, Tunbridge Wells, TN2 5JH and comprises a cemetery maintenance depot that is occupied by several buildings in the western section, and an area of green space, formerly used as burial ground, to the south east. It is understood that the proposed scheme for reuse of the site includes a replacement depot to the north west of the site with the remainder of the site to be redeveloped for residential purposes. A ground investigation was requested to assess the underlying ground conditions of the site for the purpose of foundation design.

The fieldwork was carried out in November 2020 and comprised twelve windowless sampler boreholes, four foundation inspection pits and seven TRL dynamic cone penetrometers. This report is based upon the above fieldwork and subsequent geotechnical laboratory testing programme.

Attention is drawn to the fact that whilst every effort has been made to ensure the accuracy of the data supplied and any analysis derived from it, there is a potential for variations in ground and groundwater conditions between and beyond the specific locations investigated. No liability can be accepted for any such variations. Furthermore, any recommendations are specific to the client's requirements as detailed herein and no liability will be accepted should these be used by third parties without prior consultation with CET Infrastructure.

An environmental desk study was carried out by CET although the report is not included herein. Whilst a review of the available Ordnance Survey maps has been carried out a desk study as recommended in BS5930 "Code of practice for ground investigations" was not requested and therefore was not carried out.

2. SITE SETTING

The subject site is located at Benhall Mill Road, Tunbridge Wells TN2 5JH at approximate grid reference TQ 593377 as shown on Figure 1.

The site comprises a cemetery maintenance depot that is occupied by several buildings including a barn-type building along the south west site boundary and a brick building to the north of the site. To the south east, an area, which was formerly a graveyard, comprises a large area of green space.

The northern section of the site is predominantly surfaced with asphalt with patchy concrete and some areas of exposed soil. To the south west is an absence of hardstanding with a former track leading from a gate on the southern boundary towards the current entrance of the site. Trees including leylandii, birch as well as ash and about 6m high were located along the western and southern site boundaries. The ground level slopes gently from north west to south east.

Reference to the British Geological Survey (BGS) geological map indicates that the site is underlain by deposits of both the Ashdown Formation and the Tunbridge Wells Sand Formation. No superficial deposits are recorded. Additionally, based on the current use of the site the Tunbridge Wells Sand Formation and the Ashdown Formation will likely be mantled by Made Ground deposits. Typically these deposits may be described as follows: -

Stratum	Description
Ashdown Formation	Siltstones and silty fine-grained sandstones with subordinate amounts of finely-bedded mudstone and mudstone arranged in rhythmic units commonly divided by thin pebble beds.
Tunbridge Wells Sand Formation	Predominantly fine- to medium-grained sandstone, siltstone and silty sand rhythms with finely-bedded mudstones and thin limestones.

During the ground investigation, it was not possible to distinguish the two strata by means of visual identification, hence the engineer's logs refer to the natural material as Ashdown Formation/Tunbridge Wells Sand Formation. These deposits were mantled by Made Ground to a maximum depth of 1.4m below ground level.

3. GROUND INVESTIGATION

The fieldwork comprised twelve windowless sampler boreholes, four foundation inspection pits and seven TRL dynamic cone penetrometers. The approximate locations of the exploratory holes are shown on Figure 2.

Details of the ground conditions encountered in the exploratory holes are presented on the engineer's logs in Appendix A. Reference should be made to these logs for detailed descriptions of the strata penetrated and the results of any in situ tests carried out. A summary only of the ground conditions encountered in the boreholes is presented below.

Seven TRL DCP tests were carried out to maximum depths of 1.5m below ground level.

Made Ground

Made Ground deposits were encountered in all the exploratory holes from ground level to a maximum depth of 1.4m below ground level in WS103. This material comprised a range of CLAY, SAND and GRAVEL with typical descriptions including but not limited to:

- Black, brown, grey, locally reddish or orange, gravelly SAND. The gravel was noted to comprise brick, concrete, glass, ceramic, coal, sandstone, metal, brown and grey flint;
- Black, dark brown, grey, dark grey or blueish grey, sandy, gravelly CLAY with the gravel comprising similar material to that described above; and
- Light brown and brown, sandy GRAVEL of sandstone with a medium cobble content of sandstone. Angular fine to coarse brick and fine coal were also noted.

WS107 was terminated at 0.6m below ground level due to the presence of a void from 0.6m to 1.4m below ground level. This borehole was relocated to WS107A. WS108 was also terminated within the Made Ground but at 0.8m below ground level due to the borehole collapsing. This exploratory hole was relocated to WS108A.

Tunbridge Wells Sand Formation/ Ashdown Formation

Deposits of the Tunbridge Wells Sand Formation/Ashdown Formation were encountered in all the boreholes from 0.9m at the shallowest and proved to the base to a maximum depth of 3.06m below ground level. Typically, this material comprised CLAY becoming SAND and SANDSTONE with depth. These strata can be described as one or more of the following:

- Grey, clayey, locally very clayey, sandstone gravelly SAND;
- Grey, locally iron stained, weathered SANDSTONE;
- Soft to firm, light brown and grey, sandy CLAY; and
- Grey and orange with red staining, weathered SANDSTONE.

Roots and rootlets were observed to a maximum depth of 1.6m below ground level in WS101.

Groundwater was encountered in all exploratory holes except for WS107 and WS108 and WS111. It should ben noted that these 'dry' boreholes were terminated at shallow depths either due to collapsing or refusal and that the absence of water may be a result of the depth of excavation. Groundwater levels in the remaining boreholes are presented in table 1 below. Notwithstanding the above, groundwater levels may vary both seasonally and in the long term.

Borehole	Depth to groundwater strike (m bgl)	Depth of water after 20 minutes (m bgl)
WS101	0.9	0.9
WS102	0.95	0.9
WS103	1	1
WS104	0.7	0.7
WS105	0.8	0.8
WS106	0.9	0.9
WS107A	1.5	1.5
WS108A	2	2
WS109	1.9	1.9
WS110	1.6	1.6
WS112	1.1	1.1

Table 1. Summary of groundwater levels recorded during site works.

Existing Foundations

Four foundation inspection pits were carried out at existing buildings and structures across the site and comprised the following:

TP101

TP101 exposed a possible concrete slab below the existing barn-type structure to 0.2m below ground level. This possible slab was constructed on a concrete pad measuring at least 1.4m below ground level and bearing within the SAND deposits of the Ashdown Formation/Tunbridge Wells Sand Formation. The pad stepped out 0.35m from the column on the side that was exposed.

TP102

TP102 exposed 0.1m of concrete underneath the existing warehouse unit, which was found to step in by 0.3m. It is unknown whether the slab continued underneath the extent of the building. The slab was bearing within Made Ground deposits.

TP103

TP103 exposed a corbelled brick footing to a depth of 0.805m below ground level. The brick stepped out at a depth of 0.65m below ground level with two brick courses, each measuring 70mm in width. The footing was bearing within the SAND deposits of the Ashdown Formation/Tunbridge Wells Sand Formation.

TP104

TP104 was undertaken to establish the foundation details of a retaining wall adjacent to Benhall Mill Road. The pit exposed sandstone cobbles to a depth of 0.9m below ground level, with the cobbles stepping out by 0.1m at a depth of 0.75m below ground level. The footing was bearing within the SAND deposits of the Ashdown Formation/Tunbridge Wells Sand Formation.

Detailed drawings of the foundation pits can be found in Appendix A, the locations of which are plotted on Figure 2.

LABORATORY TESTING

The following geotechnical laboratory testing programme was carried out to provide further information on the engineering properties of the subsoil. Unless stated otherwise, these tests were carried out in accordance with BS 1377 "Methods of Test for Soils for Civil Engineering Purposes".

Number of tests	Test	UKAS Accreditation
5	Moisture Content	CET
5	Atterberg Limits	CET
3	Particle Size Distribution by Wet Sieve.	CET
4	pH and water soluble sulphate	CET Supplier

4. DISCUSSION AND RECOMMENDATIONS

GENERAL

The subject site is located off Benhall Mill Road, Tunbridge Wells, TN2 5JH and comprises a cemetery maintenance depot occupied by several buildings in the western section, and an area of green space, formerly used as burial ground, to the south east. It is understood that the proposed scheme for the redevelopment of the site includes a replacement depot to the north west with the remainder of the site to be redeveloped for residential purposes. A ground investigation was requested by Aecom Ltd to provide information on the ground conditions underlying the site for the purpose of foundation design.

The fieldwork was carried out in November 2020 and comprised twelve windowless sampler boreholes, four foundation inspection pits and seven TRL dynamic cone penetrometers. An exploratory hole location plan is presented as Figure 2.

The ground investigation ascertained that the site is underlain by Made Ground and the Ashdown Formation/Tunbridge Wells Sand Formation.

Groundwater was observed in several boreholes at depths of from 0.7m to 2m below ground level across the site however the comments made in Section 3 of this report should be borne in mind.

Roots and rootlets were observed to a maximum depth of 1.6m below ground level. The depth of root penetration observed in those exploratory holes located close to the southern boundary of the site was commensurate with the number of trees in the vicinity.

Laboratory testing carried out on the cohesive samples recovered from the Ashdown Formation/Tunbridge Wells Sand Formation indicate that this stratum has a low volume change potential as defined in the National House Building Council (NHBC) Standards Chapter 4.2 “Building near trees”. As such these soils would be expected to exhibit changes in volume in response to variations in moisture content. In addition, reference to BS5930 suggests that the clayey Ashdown Formation/Tunbridge Wells Sand Formation deposits would be generally classified as having low and intermediate plasticity as well as carrying the designation CL.

The determination of desiccation is usually done by contrasting and comparing various methods of analysis, comprising moisture content versus depth profiles, the comparison of moisture contents with Atterberg Limits, in situ dial gauge penetrometer readings versus depth profiles (included in Appendix A) and the depths of observed root penetration.

The localised sand and gravel content of the cohesive deposits of the Ashdown Formation/Tunbridge Wells Sand Formation deposits is such that the comparison of plastic limit test results and moisture content is unable to conclusively ascertain whether or not this stratum is desiccated.

At equilibrium moisture content clay soils exhibit a roughly linear increase in strength with depth. As a clay soil becomes desiccated the strength of the soil increases above that at the equilibrium moisture content. A crude approximation of strength can be determined with the dial gauge penetrometer. Penetrometer profiles for each of the boreholes are included in Appendix A.

The dial gauge penetrometer readings taken in the cohesive deposits of the Ashdown Formation/Tunbridge Wells Sand Formation show possible evidence for desiccation that is locally commensurate with the depth of root penetration. Notwithstanding the source of the roots as described above and taking into account the results of the in situ testing, the depth of desiccation should be assumed to be commensurate with the depth of observed root penetration, which based upon the engineer's logs could be in excess of 1.6m below ground level.

FOUNDATIONS

New Depot

Made Ground was encountered to a maximum depth of 0.95m below ground level in boreholes located in the vicinity of the proposed replacement depot. This material is not recommended as a bearing stratum due to its unpredictable settlement and strength characteristics as well as the inherent risk of collapse settlement.

Based upon the engineer's logs, traditional shallow foundations bearing within the sandy strata of the Ashdown Formation/Tunbridge Wells Sand Formation may be considered for the proposed redevelopment with the proposed foundations for the new depot bearing at the greater depth of the following criteria: -

- At least 1m below ground level; or
- A minimum of 0.3m into the bearing stratum.

Reference to the engineer's logs suggests that the foundations for the proposed scheme are likely to bear at depths of between 1m and 1.25m below ground level.

Taking into account the various criteria above, a presumed net bearing value of 150kN/m^2 for a foundation no greater than 0.6m wide is considered appropriate for the SAND/SANDSTONE strata of Ashdown Formation/Tunbridge Wells Sand Formation. At this bearing value, outline calculations would suggest that

settlement is likely to be less than 10mm and will take place for the most part during the construction process.

It is important to note that the boreholes located in proximity to the existing depot building were terminated at depths between 1.33m and 1.62m below ground level due to the lack of progress into the very dense sand. Reference to other boreholes carried out across the site indicates that the Ashdown Formation/Tunbridge Wells Sand Foundation is likely to be present over the depth of the pressure bulb developed below the new foundations however it may be prudent to prove the presence of the sand/sandstone at depth prior to commencing the construction phase of the works.

Proposed Residential Housing

A significant volume of Made Ground was encountered in the boreholes located in the vicinity of the proposed residential development to a maximum depth of 1.5m below ground level in WS105. In addition to this, a "void" was measured from 0.6m to 1.4m below ground level in WS107. Made Ground is not recommended as a bearing stratum due to its unpredictable settlement and strength characteristics as well as the inherent risk of collapse settlement.

Based upon the engineer's logs, traditional shallow foundations bearing within the sandy strata of the Ashdown Formation/Tunbridge Wells Sand Formation may be considered for the proposed redevelopment. Foundations for the residential housing would bear at the greater of the following criteria: -

- At least 1m below ground level; and
- A minimum of 0.3m into the bearing stratum.

Reference to the engineer's logs suggests that the foundations for the proposed scheme are likely to bear at depths from 1.1m to 2.4m below ground level.

Taking into account the various criteria above including the results of the in situ SPTs, a presumed net bearing value of 100kN/m^2 is considered appropriate for foundations no greater than 0.75m wide. At this bearing value, outline calculations would suggest that settlement is likely to be less than 10mm and will take place for the most part during the construction process.

Locally, clayey deposits of the Ashdown Formation/Tunbridge Wells Sand Formation were encountered at depths from 1m to 2.1m below ground level. The design of the foundations should take into account the guidelines as given in the NHBC Standards Chapter 4.2 "Building near trees" with regard to protecting the sides of the foundations. It should be noted that areas of hardstanding including pavements, roads, parking,

etc., may be influenced by ground movement either resulting from the recovery of moisture where trees have been removed or as a result of future planting. Whether trees are planted or not, the top 1m to 1.5m of the ground will be impacted by seasonal variations in moisture content, which would impact open areas of gardens or soft landscaping around the development. This potential change may be taken into account especially where services enter and leave the properties.

It should be noted that Made Ground deposits were noted to be unstable during the ground investigation. In addition to this, monitoring carried out in the weeks following the site work measured groundwater levels from 1.26m to 1.76m below ground level. These factors could impact the chosen method of construction when it comes to excavating the foundation trenches due to the instability of the material and the likelihood of water ingress. As such, traditional shallow foundations may not be practicable. As an alternative, consideration could be given to the installation of short piles. Although this method may be more expensive, it would not require the same excavation support and groundwater ingress control measures that would be likely required for the construction of shallow foundations.

GROUND FLOOR SLAB

Made Ground is not recommended as a bearing stratum for ground floor slabs due to the unpredictable settlement and strength characteristics of these materials and the inherent risk of collapse settlement.

Locally underlying the Made Ground are the clayey deposits of the Ashdown Formation/Tunbridge Well Sand Formation that should be assumed to be desiccated to at least the depth of this stratum or the depth of observed root penetration, whichever is the greater.

In light of the depth of Made Ground across the site and the low volume change potential of the Ashdown Formation/Tunbridge Well Sand Formation, suspended ground floors incorporating a void beneath are recommended for the proposed residential properties. Reference should be made to the NHBC Standards Chapter 4.2 “building near trees” with regard to the size of void below the suspended floor due a low volume change potential in the Tunbridge Wells Sand Formation.

TEMPORARY WORKS FOR EXCAVATIONS

All boreholes were noted to be unstable whilst open. In light of the above, support will be required to maintain the stability of shallow excavations in the short term across the majority of site. Where personnel are required to enter excavations or if excavations are required to remain open for any significant length of time then the temporary support must be sufficient to provide a safe environment and to maintain the stability of the excavation.

Groundwater was encountered at depths from 0.7m to 2m below ground level during the site works. Monitoring visits have recorded water levels from 1.26m to 1.76m below ground level in the boreholes that were installed with wells. As such, it is likely that control measures will need to be implemented in relation to water ingress but this will have to be reassessed in relation to the conditions encountered at the time of excavation/construction.

PAVEMENT DESIGN

At this stage the design formation levels of the proposed roads and areas of car parking has not been finalised but even assuming the removal of the top 450mm of soil as part of the construction process, the majority of the exposed formation will comprise Made Ground.

Made Ground is not normally recommended as a sub-grade for pavement construction and any hardstanding or pavements constructed directly onto the Made Ground will be done so with the risk of settlement over time such that a long term maintenance programme will be required.

Consideration could be given to the total removal of Made Ground with the soils at formation level solely comprising the deposits of the Ashdown Formation/Tunbridge Wells Sand Formation. However, this exercise may prove to be costly in which case an alternative approach would be to proof roll the formation level after the initial site strip to identify any "soft" spots and have this removed and then replaced using an engineered fill that is commensurate with the surrounding soils. A geogrid reinforcement may also be placed however this would not necessarily preclude the need for further maintenance.

In the event that the formation level is solely within the deposits of the Ashdown Formation/Tunbridge Wells Sand Formation then the in situ TRL DCP results would suggest that a CBR value of about 3.5% would be suitable for preliminary design purposes however this should be confirmed by additional testing in the form of plate load CBR testing during the construction programme. The presence of clayey, gravelly SAND would indicate that the near surface deposits of the Ashdown Formation/Tunbridge Wells Sand Formation are likely to be frost susceptible.

SURFACE WATER DISPOSAL

The nature of clayey Ashdown Formation/Tunbridge Wells Sand Formation at shallow depths as well as the high groundwater table observed on the site is such that surface water discharging into this stratum is unlikely to be viable.

The presence of contaminants recorded in the Made Ground precludes the possibility of draining surface water through this material due to the potential mobilisation of contamination. For the same reason, the installation of permeable paving across the site is also unlikely to be viable.

In light of the above, it is likely that surface water would have to be discharged off site to a mains sewer. However, the adjacent cemetery may provide another option for surface water disposal as it is unlikely that the Made Ground in the cemetery is contaminated. Consideration could be given to an attenuation system to mitigate the 'on-site' issues outlined above. However, this method would be subject to further investigation as well as agreement with regard to landowners/custodians.

CONCRETE BELOW GROUND

Chemical testing was carried out on soil samples recovered from the Made Ground as well as the Ashdown Formation/Tunbridge Wells Sand Formation encountered over the course of the investigation. The ground investigation established that the underlying groundwater condition is likely to be classified as 'mobile'.

In accordance with BRE Special Digest 1:2005 Third Edition "Concrete in Aggressive Ground", Table C2 "Aggressive Chemical Environment for Concrete (ACEC) classification for brownfield locations", the Design Sulphate Class and ACEC Class have been established based upon the available laboratory results. The results of the water sulphate and pH determinations indicate that the concrete penetrating the Made Ground and the Ashdown Formation/Tunbridge Wells Sand Formation deposits could be designed to Design Sulphate Class DS-1 and ACEC Class AC-1. However, it should be noted that the composition of the Made Ground varied considerable across the site and as such there remains the risk of possible higher DS and ACEC classes.

FIGURES

CET INFRASTRUCTURE
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Client: AECOM			Project No. 1046240
			Sheet 1 of 1
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N

National Grid Coordinates: TQ593377

Site Location Plan

Scale: NTS

FIGURE 1

Appendix B

Lodge

El Sub Sta

129.0m +

WS112

WS111

WS109

WS110

WS107A

Cemetery

WS108A Depot Site

WS106

WS105

WS104

WS103

WS102

WS101

BENHALL MILL ROAD

SR

Und

TRL DCP

WLS

WLS with install

Foundation inspection pit

Borough Cemetery

10

15

Tunbridge Wells Borough Council	Town Hall Royal Tunbridge Wells Kent TN1 1RS Tel: 01892 526121 Fax: 01892 532958 e-mail: property@tunbridgewells.gov.uk	Revision	AutoCad File Name: L2P1K1 Cemetery Depot Site 2019 Scales: 1:500 at A3 Date: 11 Nov 19 Drawn by Checked: PND	Drawing Title: Site Plan	Project Title: Redevelopment Cemetery Depot Benhall Mill Lane Tunbridge Wells Drawing No.: L2P1K1 02 A

APPENDIX A

Fieldwork

INFRASTRUCTURE
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KEY TO BOREHOLE AND TRIAL PIT LOGS

Samples

D	Small disturbed sample
U	Undisturbed sample, 100mm nominal diameter
UT	Undisturbed thin walled sample, 100mm nominal diameter
B	Bulk disturbed samples (bar indicates sample range)
U38	Hand driven 'undisturbed' sample, 38mm nominal diameter
P	Undisturbed piston sample (bar indicates sample range)
W	Water sample
ICBR	In-situ California Bearing Ratio sample
*	No recovery sample
T	Tub sample
V	Vial sample
J	Jar sample

Tests

S	Standard penetration test
C	Cone penetration tests
N =	SPT/CPT 'N' Value (number of blows for 300mm full penetration)
80/150	Number of blows/total penetration(mm) for SPT/CPT test
25/25SP	As above for seating drive only
*	N value obtained over 450mm penetration
U =	Blows to achieve 450mm penetration for a U sample
V_h =	In-situ hand vane test in kN/m^2
m	In-situ CBR test by Mexe probe
V =	In-situ field vane test in kN/m^2
ppm =	Parts per million of flammable gas as methane equivalents
pp =	Pocket Penetrometer in kg/cm^2

Observations, Backfill and Installations

▼	Water strike – depth shown in metres below ground level.		
	Gravel backfill		Bentonite backfill
	Arisings backfill		Concrete
	Plain Pipe		Slotted Pipe

Client: **Aecom**		Hole Diameter (mm): 78mm tapering with depth to 2.6m	BOREHOLE NUMBER **WS101**
Method: Windowless Sampler			
Date Started: 04/11/2020	Co-ordinates	Ground Level (m AOD)	Ref. No: **1046240** Sheet 1 of 1

Backfill/Well Depth (m)	Backfill/Well Legend	Water Depth (m)	Samples Depth (m)	Samples Type	In Situ Tests Type	In Situ Tests Results	Reduced Level (mAOD)	Depth & (Thickness) (m)	Description of Strata	Legend
0.20			0.20	ES				(0.50)	Black, gravelly fine to coarse SAND. Gravel is angular to sub-rounded, fine and medium brick and sandstone (Made Ground)	
			0.50	ES				0.50		
		0.90 ▼	1.00	ES				(0.80)	Black, clayey, gravelly, fine and medium SAND. Gravel is angular to sub-rounded, fine and medium sandstone. Occasional pockets of soft clay. (Made Ground)	
					1.20	N =4		1.30		
			1.50	D	1.25	pp = 3.2			Soft to firm, light brown and grey, slightly fine sandy CLAY. (Ashdown Formation/Tunbridge Wells Sand Formation)	
			1.50	ES	1.50	pp = 2.1 Vh = 50.0		(0.80)		
					1.75	pp = 3.1				
2.10			2.00	D	2.00	N =16 pp = 3.0		2.10		
			2.50 - 2.60	D	2.50 2.60	Vh = 70.0 N =50/190mm		(0.45)	Medium Dense, grey, clayey, slightly gravelly, fine SAND. Gravel is angular, fine sandstone. (Ashdown Formation/Tunbridge Wells Sand Formation)	
								2.55		
2.94	W							(0.39)	Grey, locally iron stained, weathered SANDSTONE. (Ashdown Formation/Tunbridge Wells Sand Formation)	
								2.94	End of Borehole at 2.94m	

General Remarks:
1. Hole noted to be unstable whilst open.
2. Groundwater encountered at 0.9m below ground level with no change after 20 minutes.
3. Roots and rootlets observed to 1.6m below ground level.
4. SPT refused on grey, locally iron stained, weathered sandstone.

Driller:	PK	BOREHOLE RECORD Scale 1:33 See Key Sheet for explanation of symbols, etc.	CET INFRASTRUCTURE Giving our all
Logged:	CD		
Checked:	[redacted]	**Benhall Mill Road**	**FIG A1**
Appr'd:			

Client: **Aecom**		Hole Diameter (mm): 78mm tapering with depth to 2.7m	BOREHOLE NUMBER **WS102**
Method: Windowless Sampler			
Date Started: 04/11/2020	Co-ordinates	Ground Level (m AOD)	Ref. No: **1046240** Sheet 1 of 1

Backfill/Well Depth (m)	Backfill/Well Legend	Water Depth (m)	Samples Depth (m)	Samples Type	In Situ Tests Type	In Situ Tests Results	Reduced Level (mAOD)	Depth & (Thickness) (m)	Description of Strata	Legend
			0.20	ES				(1.20)	Black, gravelly, fine to coarse SAND. Gravel is angular to sub-rounded, fine to coarse brick, glass, metal and brown flint. Low cobble content of angular brick from ground level to 0.5m below ground level. (Made Ground)	
		0.90 ▽ 0.95	0.50	ES						
			1.00	ES						
					1.20	N =4		1.20		
					1.25	pp = 1.4		(0.60)	Soft to firm, light brown and grey, slightly fine sandy CLAY becoming sandy with depth. (Ashdown Formation/Tunbridge Wells Sand Formation)	
			1.50	D	1.50	pp = 1.8				
			1.50	ES		Vh = 48.0		1.80		
					1.75	pp = 1.9		(0.40)	Grey, clayey, slightly gravelly, fine SAND. Gravel is angular fine sandstone. (Ashdown Formation/Tunbridge Wells Sand Formation)	
			2.00	D	2.00	N =29		2.20		
						pp = 6.0		(0.81)	Grey, weathered SANDSTONE (Ashdown Formation/Tunbridge Wells Sand Formation)	
			2.70	D	2.70	N =50/155mm		3.01	End of Borehole at 3.01m	
3.01										

General Remarks:
1. Hole noted to be unstable whilst open.
2. Groundwater encountered at 0.9m, dropping to 0.95m below ground level after 20 minutes.
3. Roots and rootlets observed to 1.5m below ground level.

Driller:	PK	BOREHOLE RECORD Scale 1:33 See Key Sheet for explanation of symbols, etc.	CET INFRASTRUCTURE Giving our all
Logged:	CD		
Checked:	[redacted]	**Benhall Mill Road**	**FIG A2**
Appr'd:			

Client: **Aecom**		Hole Diameter (mm): 78mm tapering with depth to 2.7m	BOREHOLE NUMBER **WS103**
Method: Windowless Sampler			
Date Started: 04/11/2020	Co-ordinates	Ground Level (m AOD)	Ref. No: **1046240** Sheet 1 of 1

Backfill/Well Depth (m)	Backfill/Well Legend	Water Depth (m)	Samples Depth (m)	Samples Type	In Situ Tests Type	In Situ Tests Results	Reduced Level (mAOD)	Depth & (Thickness) (m)	Description of Strata	Legend
			0.20	ES					Black, gravelly, fine to coarse SAND. Gravel is angular to rounded, fine to coarse brick, concrete, glass, grey flint and sandstone.	
			0.50	ES				(1.00)	(Made Ground)	
		1.00	1.00	ES	1.00	pp = 0.6		1.00		
					1.20	N =3		(0.40)	Soft to firm, black and grey, slightly fine and medium sandy CLAY.	
					1.25	pp = 1.4		1.40	(Made Ground)	
			1.50	D	1.50	pp = 1.6			Soft to firm, light brown and grey, slightly fine sandy CLAY becoming sandy with depth.	
			1.50	ES		Vh = 30.0				
					1.75	pp = 2.2		(0.70)	(Ashdown Formation/Tunbridge Wells Sand Formation)	
			2.00	D	2.00	N =33		2.10		
			2.10 - 2.60	B		pp = 2.4		(0.50)	Medium dense, grey and orange, clayey, slightly gravelly, fine SAND. Gravel is angular, fine sandstone.	
			2.20	D	2.25	pp = 1.1		2.60	(Ashdown Formation/Tunbridge Wells Sand Formation)	
					2.50	pp = 2.5		(0.46)	Grey, weathered SANDSTONE	
			2.60	D					(Ashdown Formation/Tunbridge Wells Sand Formation)	
3.06					2.70	N =50/205mm		3.06	End of Borehole at 3.06m	

General Remarks:
1. Hole noted to be unstable whilst open.
2. Groundwater encountered at 1m below ground level with no change after 20 minutes.
3. Roots and rootlets observed to 1.4m below ground level.

Driller:	PK	BOREHOLE RECORD Scale 1:33 See Key Sheet for explanation of symbols, etc.	CET INFRASTRUCTURE Giving our all
Logged:	CD		
Checked:	[redacted]	**Benhall Mill Road**	**FIG A3**
Appr'd:			

Client: **Aecom**		Hole Diameter (mm): 78mm tapering with depth to 2.5m	BOREHOLE NUMBER **WS104**
Method: Windowless Sampler			
Date Started: 04/11/2020	Co-ordinates	Ground Level (m AOD)	Ref. No: **1046240** Sheet 1 of 1

Backfill/Well Depth (m)	Backfill/Well Legend	Water Depth (m)	Samples Depth (m)	Samples Type	In Situ Tests Type	In Situ Tests Results	Reduced Level (mAOD)	Depth & (Thickness) (m)	Description of Strata	Legend
			0.20	ES				(0.70)	Black, gravelly fine to coarse SAND. Gravel is angular to sub-rounded, fine to coarse, brick, concrete, glass and ceramic. (Made Ground)	
		0.70	0.70	ES				0.70		
			1.00	D	1.00	pp = 2.1		(0.30)	Soft to firm, black and grey, slightly fine and medium sandy CLAY. (Made Ground)	
			1.00	ES		Vh = 20.0		1.00		
					1.20	N =13			Stiff, light brown and grey, slightly fine sandy CLAY. (Ashdown Formation/Tunbridge Wells Sand Formation)	
			1.50	D	1.50	pp = 2.8		(0.80)		
			1.50	ES						
			2.00	D	2.00	N =32		1.80		
						pp = 6.0		(0.65)	Dense, grey and orange, clayey, slightly gravelly, fine SAND. Gravel is angular, fine sandstone. (Ashdown Formation/Tunbridge Wells Sand Formation)	
						Vh = 70.0		2.45		
			2.50	D	2.50	N =50/115mm		(0.32)	Grey and orange weathered SANDSTONE. (Ashdown Formation/Tunbridge Wells Sand Formation)	
2.77						pp = 5.5		2.77		

End of Borehole at 2.77m

General Remarks:
1. Hole noted to be unstable whilst open.
2. Groundwater encountered at 0.7m below ground level with no change after 20 minutes.
3. Roots and rootlets observed to 1.4m below ground level.

Driller:	PK	BOREHOLE RECORD Scale 1:33 See Key Sheet for explanation of symbols, etc.	CET INFRASTRUCTURE Giving our all
Logged:	CD		
Checked:	[redacted]	**Benhall Mill Road**	**FIG A4**
Appr'd:			

Client: **Aecom**	Hole Diameter (mm): 78mm tapering with depth to 1.8m	BOREHOLE NUMBER **WS105**
Method: Windowless Sampler		
Date Started: 04/11/2020 Co-ordinates	Ground Level (m AOD)	Ref. No: **1046240** Sheet 1 of 1

Backfill/Well Depth (m)	Backfill/Well Legend	Water Depth (m)	Samples Depth (m)	Samples Type	In Situ Tests Type	In Situ Tests Results	Reduced Level (mAOD)	Depth & (Thickness) (m)	Description of Strata	Legend
0.20			0.20	ES				(0.30)	Soft to firm, black and grey, slightly fine and medium sandy, slightly gravelly CLAY. Gravel is angular and sub-rounded, fine and medium sandstone. (Made Ground)	
			0.50	ES				0.30		
0.80		0.80	0.80	ES				(0.50)	Soft to firm, dark brown, slightly fine sandy, slightly gravelly CLAY. Gravel is angular, fine and medium concrete and glass. (Made Ground)	
			1.30	ES	1.20	N =9		0.80		
1.40	W		1.60	ES				(0.70)	Firm, black, slightly fine and medium sandy, slightly gravelly CLAY. Gravel is angular to sub-rounded, fine and medium ceramic, brick, concrete, flint and sandstone. Slight hydrocarbon odour noted. (Made Ground)	
			1.60 - 1.80	B	1.80	N =54		1.50		
2.25								(0.75)	Very dense, grey and orange, clayey, slightly gravelly, fine SAND. Gravel is angular, fine sandstone. (Ashdown Formation/Tunbridge Wells Sand Formation)	
								2.25	End of Borehole at 2.25m	

General Remarks:
1. Hole noted to be unstable whilst open.
2. Groundwater encountered at 0.8m below ground level with no change after 20 minutes.
3. Roots and rootlets observed to 1m below ground level.

Driller:	PK	BOREHOLE RECORD Scale 1:33 See Key Sheet for explanation of symbols, etc.	CET INFRASTRUCTURE Giving our all
Logged:	CD		
Checked:	[redacted]	**Benhall Mill Road**	**FIG A5**
Appr'd:			

Client: **Aecom**		Hole Diameter (mm): 78mm tapering with depth to 2m	BOREHOLE NUMBER **WS106**
Method: Windowless Sampler			Sheet 1 of 1
Date Started: 04/11/2020	Co-ordinates	Ground Level (m AOD)	Ref. No: **1046240**

Backfill/Well Depth (m)	Backfill/Well Legend	Water Depth (m)	Samples Depth (m)	Samples Type	In Situ Tests Type	In Situ Tests Results	Reduced Level (mAOD)	Depth & (Thickness) (m)	Description of Strata	Legend
									Vegetation overlying black, gravelly SAND. Gravel is angular to sub-rounded, fine and medium brick, glass, brown flint, and sandstone. (Made Ground)	
0.20			0.20	ES				(0.70)		
								0.70	Reddish black, slightly gravelly, fine to coarse SAND. Gravel is angular, fine sandstone and possible clinker. (Made Ground)	
		0.90	0.80	ES				(0.20)		
1.00			1.00	ES				0.90	Medium dense becoming very dense with depth, grey and orange, clayey, locally very clayey, slightly gravelly, fine SAND. Gravel is angular, fine sandstone. Band of orange, locally iron stained sandstone from 1.7m to 1.8m below ground level. (Ashdown Formation/Tunbridge Wells Sand Formation)	
			1.00 - 2.00	B	1.20	N =17		(1.48)		
					2.00	N =50/230mm				
2.38	W							2.38	End of Borehole at 2.38m	

General Remarks:
1. Hole noted to be unstable whilst open.
2. Groundwater encountered at 0.9m below ground level with no change after 20 minutes.
3. Roots and rootlets observed to 1.1m below ground level.

Driller:	PK	BOREHOLE RECORD Scale 1:33 See Key Sheet for explanation of symbols, etc.	CET INFRASTRUCTURE Giving our all
Logged:	CD		
Checked:	[redacted]	**Benhall Mill Road**	**FIG A6**
Appr'd:			

Client: **Aecom**		Hole Diameter (mm):	BOREHOLE NUMBER **WS107**
Method: Windowless Sampler			
Date Started: 05/11/2020	Co-ordinates	Ground Level (m AOD)	Ref. No: **1046240** Sheet 1 of 1

Backfill/Well		Water	Samples		In Situ Tests		Reduced Level (mAOD)	Depth & (Thickness) (m)	Description of Strata	Legend
Depth (m)	Legend	Depth (m)	Depth (m)	Type	Type	Results				
			0.20	ES				(0.60)	Black, slightly gravelly, fine to coarse SAND. Gravel is angular, fine to coarse brick, glass and sandstone. (Made Ground)	
			0.50	ES						
0.60								0.60	End of Borehole at 0.60m	

General Remarks:
1. Hole terminated due to void measured from 0.6m to 1.4m below ground level.
2. Hole noted to be unstable whilst open.
3. Hole remained dry whilst open.

Driller:	SB	BOREHOLE RECORD Scale 1:33 See Key Sheet for explanation of symbols, etc.	CET INFRASTRUCTURE Giving our all
Logged:	CD		
Checked:	[redacted]	**Benhall Mill Road**	**FIG A7**
Appr'd:			

Client: **Aecom**	Hole Diameter (mm): 78mm tapering with depth to 2.5m	BOREHOLE NUMBER **WS107A**
Method: Windowless Sampler		
Date Started: 06/11/2020 Co-ordinates	Ground Level (m AOD)	Ref. No: **1046240** Sheet 1 of 1

Backfill/Well Depth (m)	Backfill/Well Legend	Water Depth (m)	Samples Depth (m)	Samples Type	In Situ Tests Type	In Situ Tests Results	Reduced Level (mAOD)	Depth & (Thickness) (m)	Description of Strata	Legend
			0.50	ES				(0.30) 0.30	Black, slightly gravelly fine to coarse SAND. Gravel is angular, fine and medium brick, glass and sandstone. (Made Ground)	
			0.80 - 1.00	ES				(0.50) 0.80	Soft, dark grey, slightly gravelly CLAY. Gravel is angular to sub-rounded, fine brick and sandstone. (Made Ground)	
			1.00 - 1.70	B	1.00	N =31		(0.90)	Dense, grey and orange, clayey, slightly gravelly, fine SAND. Gravel is angular, fine sandstone. (Ashdown Formation/Tunbridge Wells Sand Formation)	
		1.50 ▼						1.70		
					2.00	N =24		(0.80)	Weak grey SANDSTONE interbedded with fine grey and light brown SAND. (Ashdown Formation/Tunbridge Wells Sand Formation)	
					2.50	N =50/225mm		2.50 (0.38)	Grey and orange with red staining, weathered SANDSTONE. (Ashdown Formation/Tunbridge Wells Sand Formation)	
2.88								2.88	End of Borehole at 2.88m	

General Remarks:
1. Hole noted to be essentially stable.
2. Groundwater encountered at 1.5m below ground level wirth no change after 20 minutes.
3. Roots and rootlets observed to 0.8m below ground level.

Driller:	SB	BOREHOLE RECORD Scale 1:33 See Key Sheet for explanation of symbols, etc.	CET INFRASTRUCTURE Giving our all
Logged:	CD		
Checked:	[redacted]	**Benhall Mill Road**	**FIG A7A**
Appr'd:			

Client: **Aecom**							Hole Diameter (mm): 78mm tapering with depth to 0.8m			BOREHOLE NUMBER **WS108**
Method: Windowless Sampler										
Date Started: 06/11/2020	Co-ordinates						Ground Level (m AOD)		Ref. No: **1046240**	Sheet 1 of 1

Backfill/Well		Water	Samples		In Situ Tests		Reduced Level (mAOD)	Depth & (Thickness) (m)	Description of Strata	Legend
Depth (m)	Legend	Depth (m)	Depth (m)	Type	Type	Results				
			0.20	ES				(0.20) 0.20	Black, gravelly SAND. Gravel is angular to sub-rounded, fine and medium brick, glass, brown flint, and sandstone. (Made Ground)	
			0.60	ES				(0.60) 0.80	Light brown and brown, slightly fine to coarse sandy GRAVEL of angular, coarse sandstone with medium cobble content of angular sandstone. (Made Ground)	
0.80									End of Borehole at 0.80m	

General Remarks:
1. Borehole collapsed at 0.8m below ground level.

Driller:	SB	BOREHOLE RECORD	CET INFRASTRUCTURE Giving our all
Logged:	CD	Scale 1:33	
Checked:	[redacted]	See Key Sheet for explanation of symbols, etc.	
Appr'd:		**Benhall Mill Road**	**FIG A8**

Client: **Aecom**					Hole Diameter (mm): 78mm tapering with depth to 2.5m		BOREHOLE NUMBER **WS108A**
Method: Windowless Sampler							
Date Started: 06/11/2020	Co-ordinates			Ground Level (m AOD)	Ref. No: **1046240**		Sheet 1 of 1

Backfill/Well		Water	Samples		In Situ Tests		Reduced Level (mAOD)	Depth & (Thickness) (m)	Description of Strata	Legend
Depth (m)	Legend	Depth (m)	Depth (m)	Type	Type	Results				
			0.20	ES				(0.40)	Black, gravelly SAND. Gravel is angular to sub-rounded, fine and medium brick, glass, brown flint, and sandstone. (Made Ground)	
			0.50	ES				0.40		
								(0.50)	Soft to firm, blueish grey and orange, slightly fine sandy CLAY. (Made Ground)	
			1.00	ES				0.90		
			1.00 - 1.90	B	1.20	N =7			Light brown and grey, slightly gravelly, fine and medium SAND. Gravel is angular, fine sandstone. (Made Ground?)	
								(1.00)		
		2.00 ▼	2.00 - 2.50	D	2.00	N =24		1.90		
					2.50	N =50/25mm		(0.70)	Very stiff, grey and orange, fine sandy, slightly gravelly, CLAY. Gravel is angular, fine and medium sandstone. (Ashdown Formation/Tunbridge Wells Sand Formation)	
2.60								2.60	End of Borehole at 2.60m	

General Remarks:
1. Hole noted to be unstable whilst open.
2. Groundwater encountered at 2m below ground level with no change after 20 minutes.
3. Roots and rootlets observed to 1.2m below ground level.

Driller:	SB	BOREHOLE RECORD	CET INFRASTRUCTURE Giving our all
Logged:	CD	Scale 1:33 See Key Sheet for explanation of symbols, etc.	
Checked:	[redacted]	**Benhall Mill Road**	**FIG A8A**
Appr'd:			

Client: **Aecom**		Hole Diameter (mm): 78mm tapering with depth to 2.88m	BOREHOLE NUMBER **WS109**
Method: Windowless Sampler			
Date Started: 05/11/2020	Co-ordinates	Ground Level (m AOD)	Ref. No: **1046240** Sheet 1 of 1

Backfill/Well Depth (m)	Backfill/Well Legend	Water Depth (m)	Samples Depth (m)	Samples Type	In Situ Tests Type	In Situ Tests Results	Reduced Level (mAOD)	Depth & (Thickness) (m)	Description of Strata	Legend
0.20			0.20	ES				(0.30) 0.30	Black, slightly gravelly fine to coarse SAND. Gravel is angular, fine and medium brick, glass and sandstone. (Made Ground)	
			0.50	ES				(0.60) 0.90	Light brown and grey, slightly gravelly, fine to coarse SAND. Gravel is angular and sub-rounded, fine sandstone. (Ashdown Formation/Tunbridge Wells Sand Formation)	
1.00			1.00	ES				(0.60) 1.50	Light brown and grey, clayey, locally very clayey, slightly gravelly fine SAND. Gravel is angular, fine and medium sandstone. (Ashdown Formation/Tunbridge Wells Sand Formation)	
			1.00 - 1.50	B	1.20	N =52				
			1.60 - 2.00	D						
		1.90 ▼			2.00	N =30		(1.38)	Grey and orange weathered SANDSTONE. (Ashdown Formation/Tunbridge Wells Sand Formation)	
					2.45	N =50/275mm				
2.88	(W)							2.88	End of Borehole at 2.88m	

General Remarks:
1. Hole noted to be unstable whilst open.
2. Groundwater encountered at 1.9m below ground level with no change after 20 minutes.
3. Roots and rootlets observed to 0.8m below ground level.

Driller:	SB	BOREHOLE RECORD Scale 1:33 See Key Sheet for explanation of symbols, etc.	CET INFRASTRUCTURE Giving our all
Logged:	CD		
Checked:	[redacted]	**Benhall Mill Road**	**FIG A9**
Appr'd:			

Client: **Aecom**		Hole Diameter (mm): 78mm tapering with depth to 1.2m	BOREHOLE NUMBER **WS110**
Method: Windowless Sampler			
Date Started: 05/11/2020	Co-ordinates	Ground Level (m AOD)	Ref. No: **1046240** Sheet 1 of 1

Backfill/Well Depth (m)	Backfill/Well Legend	Water Depth (m)	Samples Depth (m)	Samples Type	In Situ Tests Type	In Situ Tests Results	Reduced Level (mAOD)	Depth & (Thickness) (m)	Description of Strata	Legend
0.20			0.20	ES				(0.20) 0.20	Black, sandy GRAVEL of angular, fine ash, clinker and concrete. (Made Ground)	
			0.50	ES				(0.50) 0.70	Soft, dark grey, slightly gravelly CLAY. Gravel is angular to sub-rounded, fine brick and sandstone. (Made Ground)	
1.00			1.00	ES				(0.45) 1.15	Soft to firm, light brown and grey, slightly fine sandy CLAY. (Ashdown Formation/Tunbridge Wells Sand Formation)	
			1.20 - 1.60	B	1.20	N =56/270mm		(0.47) 1.62	Very dense, light brown and grey, slightly gravelly, clayey, locally very clayey, fine SAND. Gravel is angular, fine sandstone. (Ashdown Formation/Tunbridge Wells Sand Formation)	
1.62	W	1.60 ▼							End of Borehole at 1.62m	

General Remarks:
1. Hole noted to be unstable whilst open.
2. Groundwater encountered at 1.6m below ground level with no change after 20 minutes.
3. Roots and rootlets observed to 0.5m below ground level.

Driller:	SB	BOREHOLE RECORD Scale 1:33 See Key Sheet for explanation of symbols, etc.	CET INFRASTRUCTURE Giving our all
Logged:	CD		
Checked:	[redacted]	**Benhall Mill Road**	**FIG A10**
Appr'd:			

Client: **Aecom**			Hole Diameter (mm): 78mm tapering with depth to 1.4m		BOREHOLE NUMBER **WS111**
Method: Windowless Sampler					
Date Started: 06/11/2020	Co-ordinates		Ground Level (m AOD)	Ref. No: **1046240**	Sheet 1 of 1

Backfill/Well		Water	Samples		In Situ Tests		Reduced Level (mAOD)	Depth & (Thickness) (m)	Description of Strata	Legend
Depth (m)	Legend	Depth (m)	Depth (m)	Type	Type	Results				
			0.20	ES				(0.30)	Black, gravelly SAND. Gravel is angular to sub-rounded, fine to coarse, brick, brown flint, bituminous material, coal and clinker. Hydrocarbon odour noted. (Made Ground)	
			0.30	ES				0.30		
0.50			0.60	ES				(0.10)		
			0.80	ES				0.40		
			1.00	ES	1.00	N =50/225mm		(0.55)	Soft to firm, blueish grey and orange, slightly fine sandy CLAY. (Made Ground)	
								0.95		
			1.30 - 1.38	ES				(0.43)	Grey and orange, clayey, slightly gravelly, fine SAND. Gravel is angular, fine sandstone. Strong hydrocarbon odour noted to be coming from saturated fibrous material from 0.6m to 0.8m below ground level. (Made Ground)	
1.38	G		1.38					1.38		
									Very dense, light brown and grey, slightly gravelly, fine and medium SAND becoming sandstone at depth. Gravel is angular, fine and medium sandstone. (Ashdown Formation/Tunbridge Wells Sand Formation)	
									End of Borehole at 1.38m	

General Remarks:
1. Hole noted to be unstable whilst open.
2. Hole remained dry whilst open.
3. Roots and rootlets observed to 0.4m below ground level.

Driller:	SB	BOREHOLE RECORD Scale 1:33 See Key Sheet for explanation of symbols, etc.	CET INFRASTRUCTURE Giving our all	
Logged:	CD			
Checked:	[redacted]	**Benhall Mill Road**		**FIG A11**
Appr'd:				

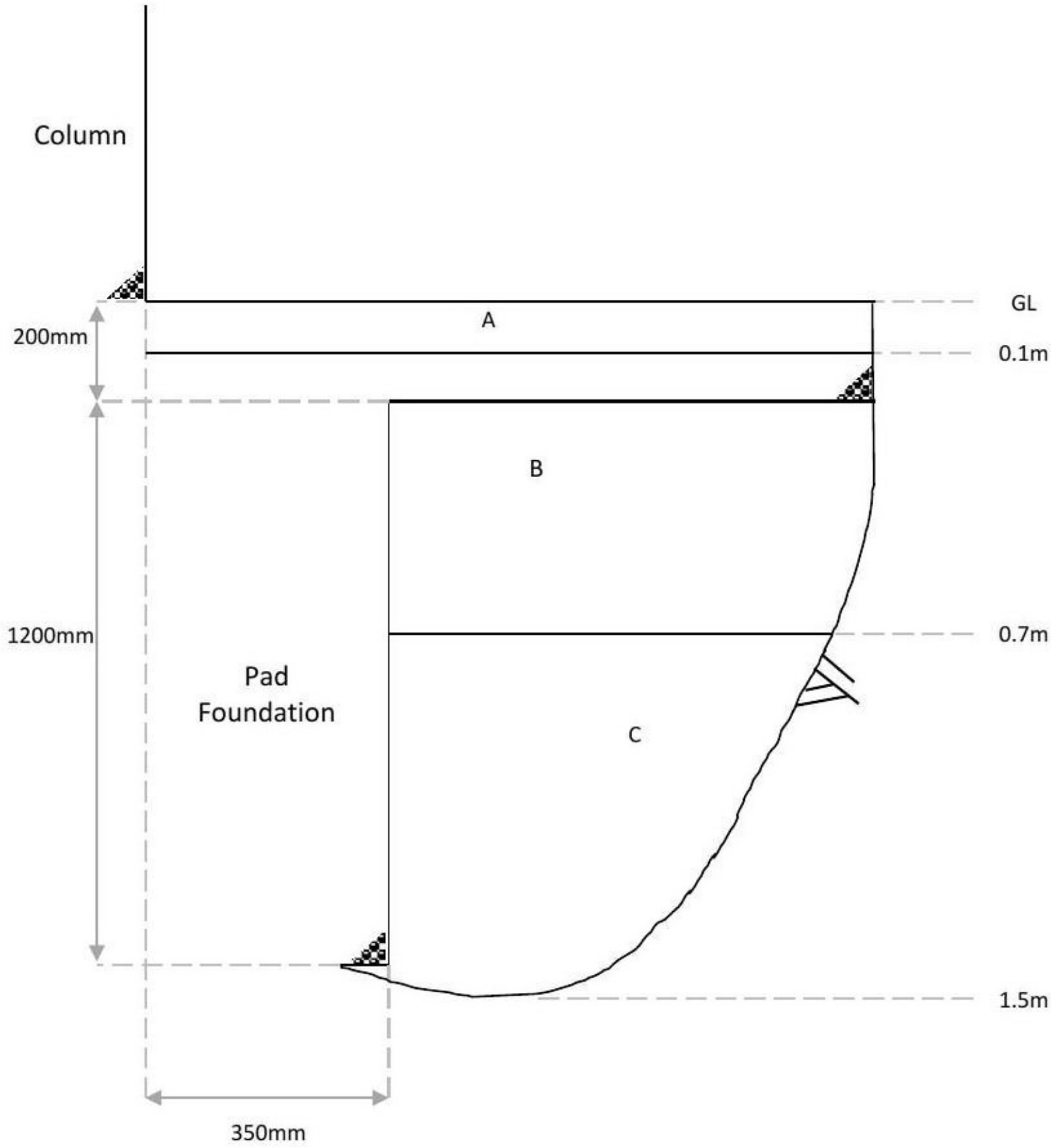
Client: **Aecom**		Hole Diameter (mm): 78mm tapering with depth to 1.3m	BOREHOLE NUMBER **WS112**
Method: Windowless Sampler			
Date Started: 06/11/2020	Co-ordinates	Ground Level (m AOD)	Ref. No: **1046240** Sheet 1 of 1

Backfill/Well		Water	Samples		In Situ Tests		Reduced Level (mAOD)	Depth & (Thickness) (m)	Description of Strata	Legend
Depth (m)	Legend	Depth (m)	Depth (m)	Type	Type	Results				
			0.20	ES				(0.05)	Asphalt	
								0.05	Light brown and brown, slightly fine to coarse sandy GRAVEL of angular, coarse sandstone, fine to coarse brick and fine coal. (Made Ground)	
			0.50	ES				(0.30)		
								0.35	Soft to firm, grey and brown reworked CLAY with occasional angular, fine and medium coal and sandstone. (Made Ground)	
			0.75 - 1.30	D				(0.40)		
			0.80	ES	1.00	N =50/180mm		0.75		
		1.10 ▼						(0.58)		
1.33								1.33	Very dense, light brown and grey, clayey, slightly gravelly, fine and medium SAND. Gravel is angular, fine sandstone. (Ashdown Formation/Tunbridge Wells Sand Formation)	
									End of Borehole at 1.33m	

General Remarks:
1. Hole noted to be unstable whilst open.
2. Groundwater encountered at 1.1m below ground level with no change after 20 minutes.
3. Roots and rootlets observed to 0.8m below ground level.

Driller:	SB	BOREHOLE RECORD Scale 1:33 See Key Sheet for explanation of symbols, etc.	CET INFRASTRUCTURE Giving our all
Logged:	CD		
Checked:	[redacted]	**Benhall Mill Road**	**FIG A12**
Appr'd:			

Lead No:	**1046240**	Scale:	N.T.S	Date:	Drawn by:	Checked:	Approved:
Project:	**Benhall Mill Road**			30/11/2020	CD	PTE	PTE



Ground Conditions

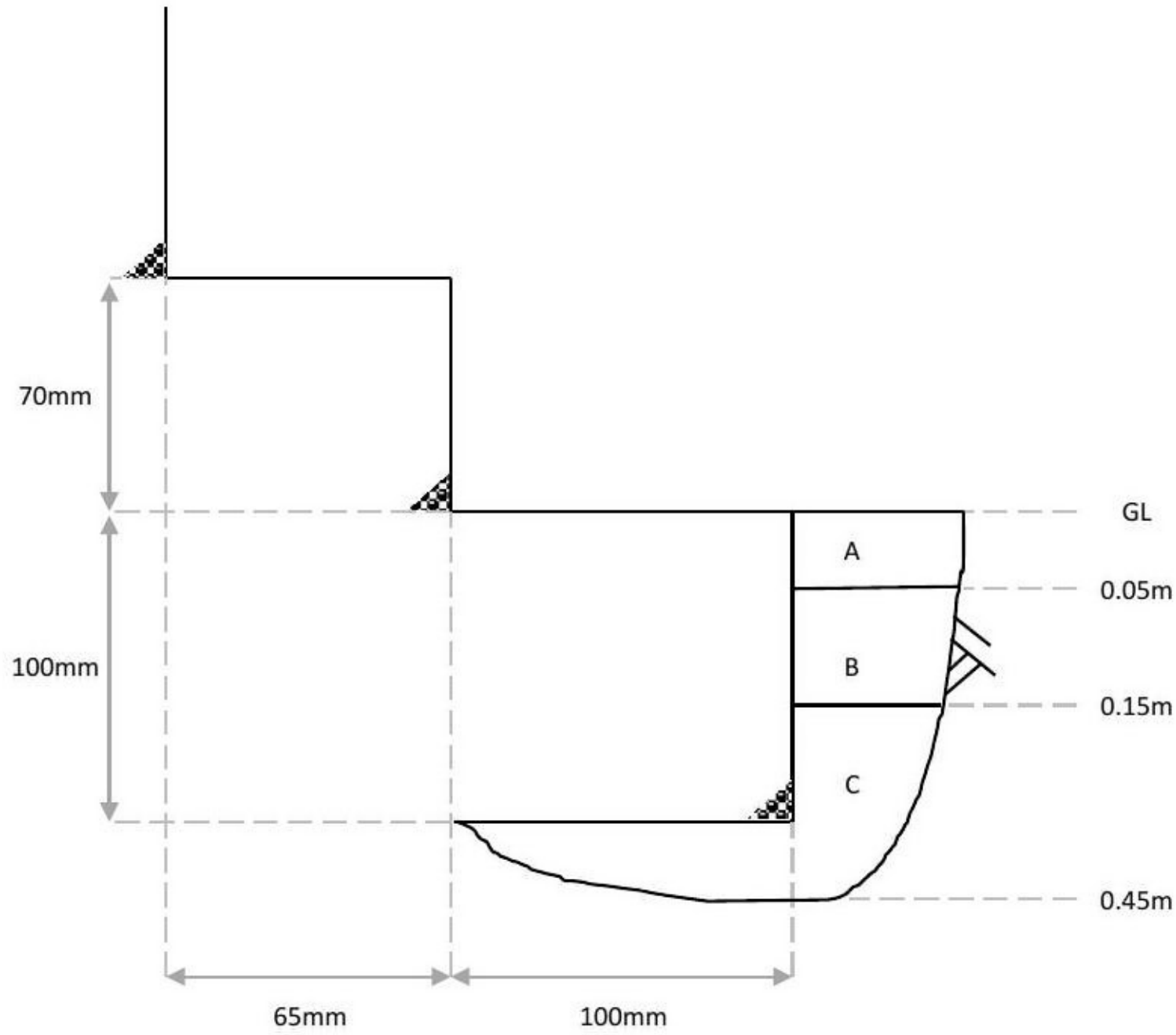
- **A** Asphalt.
- **B** Soft to firm, brown reworked CLAY. (Made Ground)
- **C** Light brown and grey, slightly gravelly fine and medium SAND. Gravel is angular, fine and medium sandstone. (Made Ground)

Notes

1. Roots and rootlets observed to 0.7m below ground level.
2. Trial pit remained dry whilst open.
3. Trial pit generally unstable whilst open.

FIG	TP01	CET INFRASTRUCTURE Giving our all
A13		

Lead No:	**1046240**	Scale:	N.T.S	Date:	Drawn by:	Checked:	Approved:
Project:	**Benhall Mill Road**			30/11/2020	CD	PTE	PTE



Ground Conditions

A Asphalt.

B Black and grey, clayey, gravelly, fine to coarse SAND. Gravel is angular to sub-rounded, fine and medium brick, concrete, coal and bituminous material. (Made Ground)

C Soft to firm, brown slightly fine to coarse sandy, slightly gravelly CLAY. Gravel is angular to sub-rounded, fine to coarse sandstone. (Made Ground)

Notes

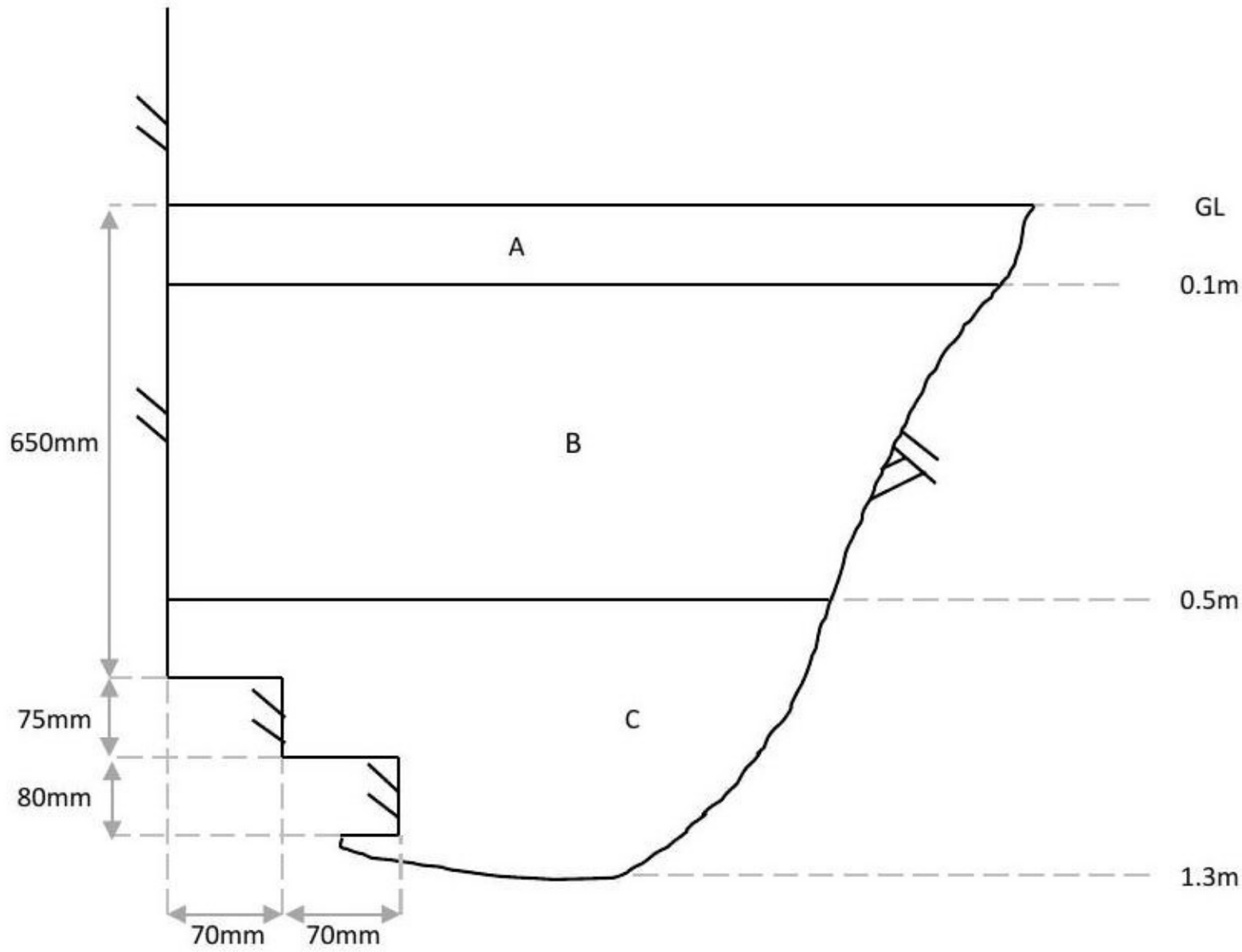
1 Roots and rootlets observed to base of pit.

2 Trial pit remained dry whilst open.

3 Trial pit generally unstable whilst open.

FIG	TP02	CET INFRASTRUCTURE Giving our all
A14		

Lead No:	1046240	Scale:	N.T.S	Date:	Drawn by:	Checked:	Approved:
Project:	**Benhall Mill Road**			30/11/2020	CD	PTE	PTE



Ground Conditions

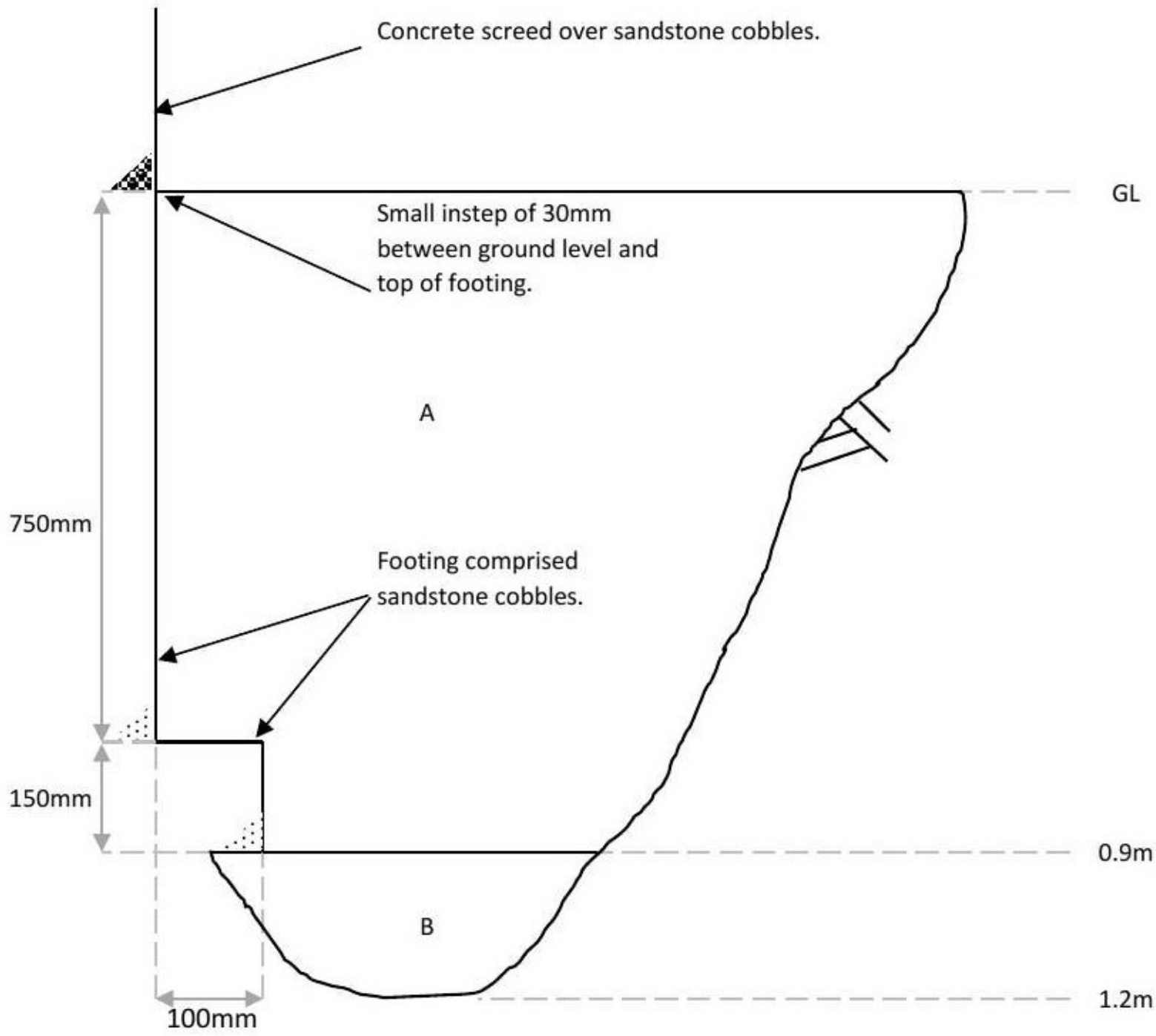
- **A** Asphalt.
- **B** Soft to firm, brown reworked CLAY. (Made Ground)
- **C** Light brown and grey, clayey, slightly gravelly fine and medium SAND. Gravel is angular, fine to coarse sandstone. (Made Ground)

Notes

1. No roots observed.
2. Trial pit remained dry whilst open.
3. Trial pit generally unstable whilst open.

FIG	TP03	CET INFRASTRUCTURE Giving our all
A15		

Lead No:	1046240	Scale:	N.T.S	Date:	Drawn by:	Checked:	Approved:
Project:	**Benhall Mill Road**			30/11/2020	CD	PTE	PTE



Ground Conditions

A Soft to firm, brown, slightly fine and medium sandy, slightly gravelly CLAY. Gravel is angular to sub-rounded, fine to coarse brick and sandstone (Made Ground)

B Light brown and grey, clayey, slightly gravelly fine and medium SAND. Gravel is angular, fine to coarse sandstone. (Made Ground)

Notes

1 Roots and rootlets observed to base of pit.

2 Trial pit remained dry whilst open.

3 Trial pit generally stable whilst open.

FIG	TP04	CET INFRASTRUCTURE Giving our all
A16		

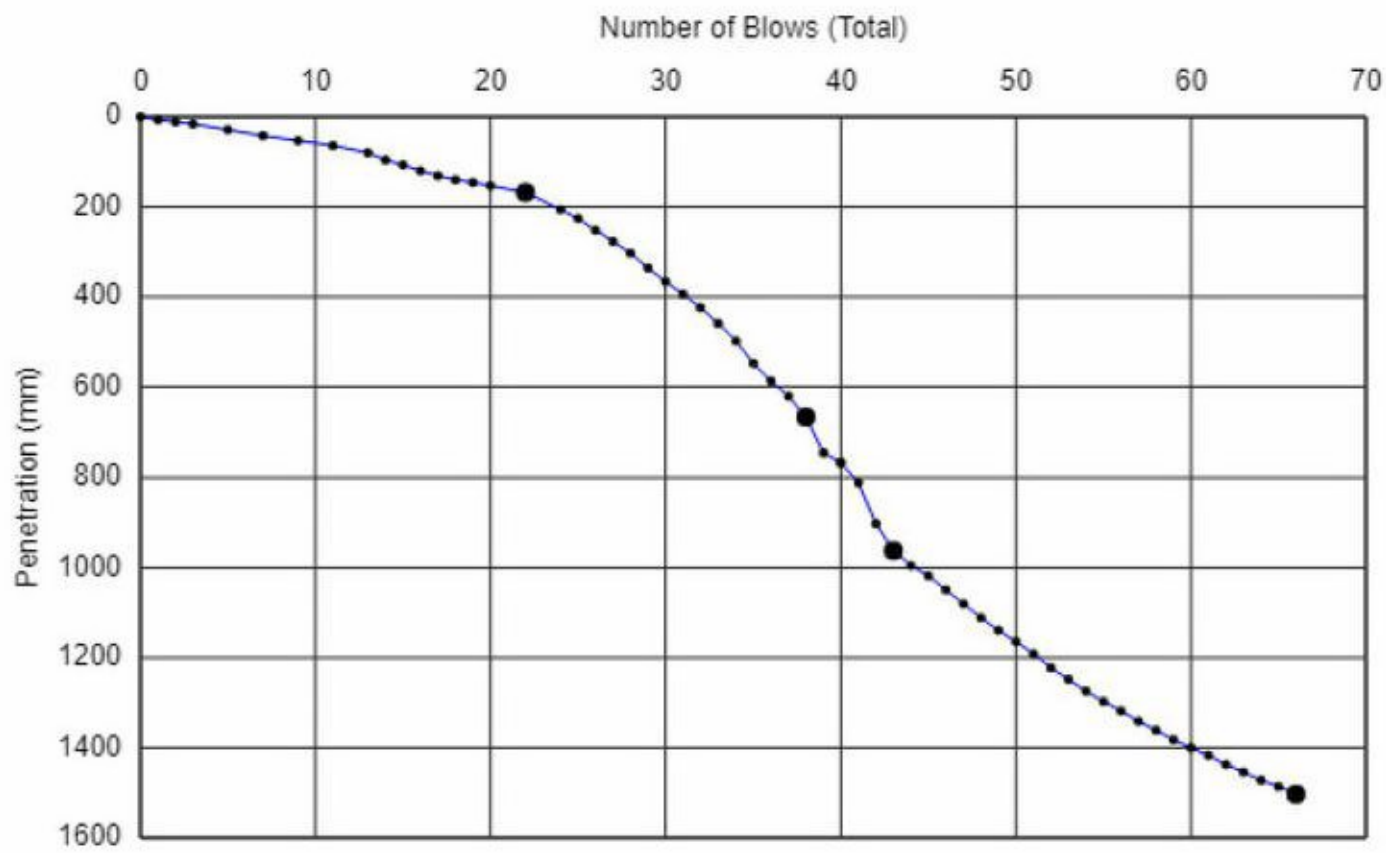
INFRASTRUCTURE
Giving our all

TEST REPORT: **Estimation of California Bearing Ratio By DCP Method**
In accordance with in-house procedure STP S9 (60° Cone)

REPORT NUMBER:	C1046240 / 119131.1.1.1		
CLIENT REF:	1046240	CLIENT:	Aecom Infrastructure & Environmental
DATE COMPLETED:	09/11/2020	ADDRESS:	U R S, Scott House, Alencon Link, Basingstoke, RG21 7PP
TESTED BY:	Jackie Ironmonger	SITE:	Benhall Mill Lane, Tunbridge Wells
LAYERS REMOVED:	No layers removed	LOCATION:	DCP101
MATERIAL:	Made Ground		

TEST RESULTS

Gradient Ref	Depth from (mm)	Depth to (mm)	No. of blows (per layer)	Blow rate (mm/blow)	Estimated C.B.R. Value (%)
1	0	168	22	7.6	35
2	168	667	16	31.2	8.0
3	667	962	5	59.0	4.1
4	962	1503	23	23.5	11



Remarks:
Depth of layer(s) removed before test: 0mm
Layer Type: No layers removed
Test results reported relate only to the items tested.
This report shall not be reproduced except in full without approval of the Laboratory.

Report Format: S/RepSTP S9a

For and on behalf of CET
Paul Ettinger - Principal Geotechnical Engineer

[redacted]

Approved Signatory
08-Dec-20

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INFRASTRUCTURE
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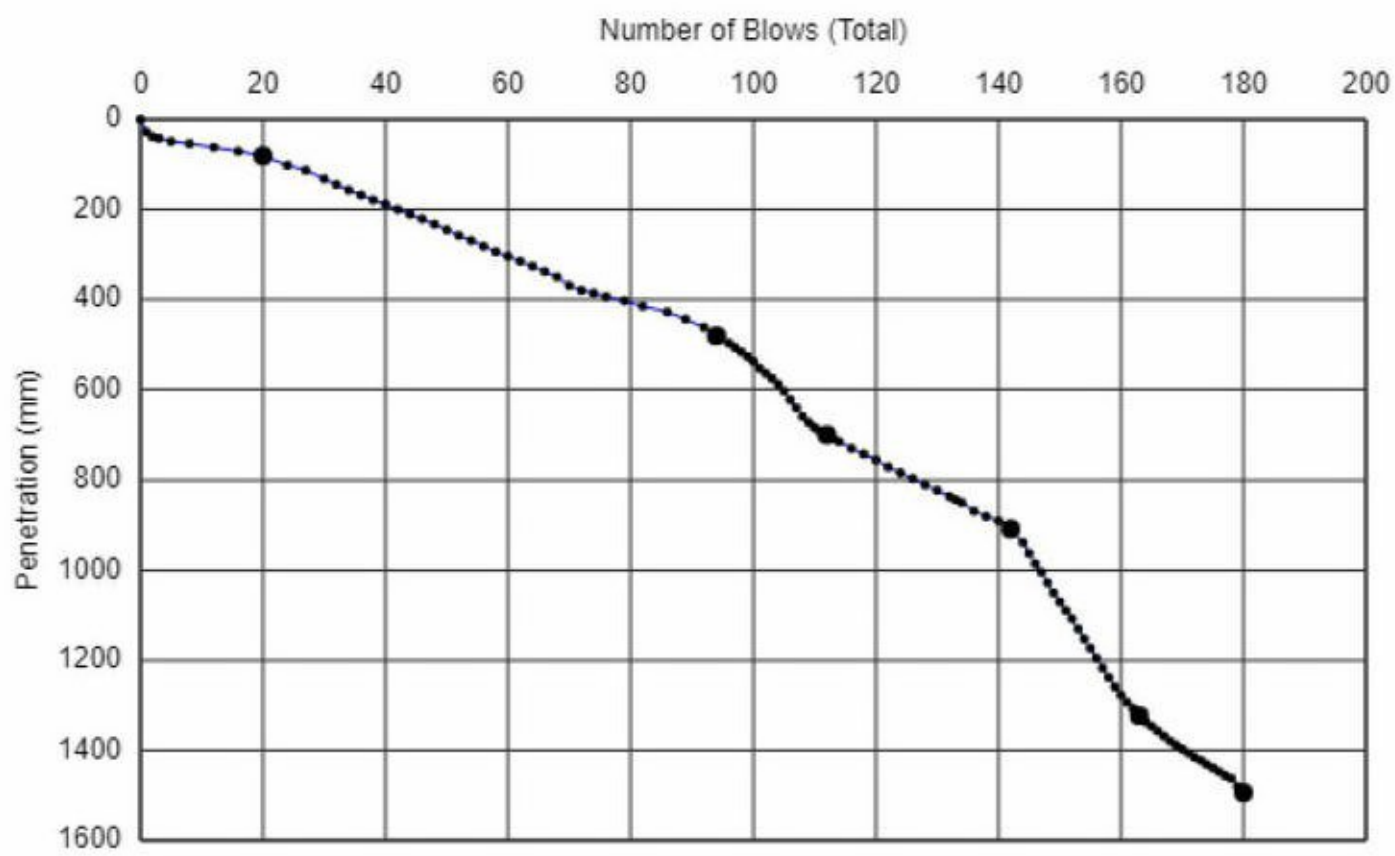
TEST REPORT: **Estimation of California Bearing Ratio By DCP Method**
In accordance with in-house procedure STP S9 (60° Cone)

REPORT NUMBER:	C1046240 / 119131.1.1.2		
CLIENT REF:	1046240	CLIENT:	Aecom Infrastructure & Environmental
DATE COMPLETED:	09/11/2020	ADDRESS:	U R S, Scott House, Alencon Link, Basingstoke, RG21 7PP
TESTED BY:	Jackie Ironmonger	SITE:	Benhall Mill Lane, Tunbridge Wells
LAYERS REMOVED:	No layers removed	LOCATION:	DCP102
MATERIAL:	Made Ground		

TEST RESULTS

Gradient Ref	Depth from (mm)	Depth to (mm)	No. of blows (per layer)	Blow rate (mm/blow)	Estimated C.B.R. Value (%)
1	0	81	20	4.0	69
2	81	481	74	5.4	51
3	481	701	18	12.2	21
4	701	908	30	6.9	39
5	908	1323	21	19.8	13
6	1323	1494	17	10.1	26



Remarks:
Depth of layer(s) removed before test: 0mm
Layer Type: No layers removed
Test results reported relate only to the items tested.
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For and on behalf of CET
Paul Ettinger - Principal Geotechnical Engineer

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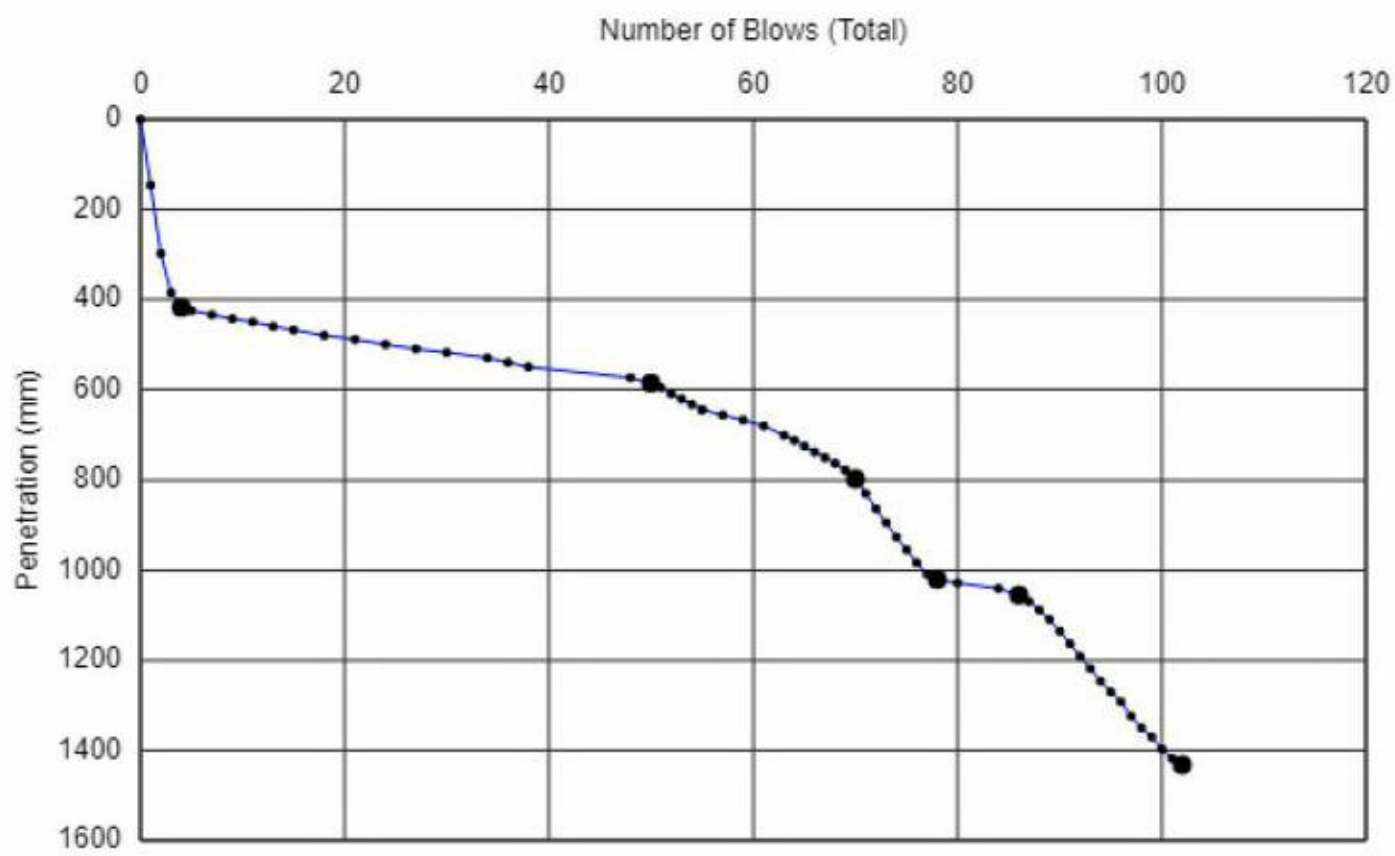
TEST REPORT:	**Estimation of California Bearing Ratio By DCP Method** In accordance with in-house procedure STP S9 (60° Cone)		
REPORT NUMBER:	C1046240 / 119131.1.1.3		
CLIENT REF:	1046240	CLIENT:	Aecom Infrastructure & Environmental
DATE COMPLETED:	09/11/2020	ADDRESS:	U R S, Scott House, Alencon Link, Basingstoke, RG21 7PP
TESTED BY:	Jackie Ironmonger	SITE:	Benhall Mill Lane, Tunbridge Wells
LAYERS REMOVED:	No layers removed	LOCATION:	DCP103
MATERIAL:	Made Ground		

TEST RESULTS

Gradient Ref	Depth from (mm)	Depth to (mm)	No. of blows (per layer)	Blow rate (mm/blow)	Estimated C.B.R. Value (%)
1	0	418	4	104.5	2.2
2	418	586	46	3.7	77
3	586	797	20	10.6	25
4	797	1020	8	27.9	9.0
5	1020	1055	8	4.4	63
6	1055	1432	16	23.6	11



Remarks:
Depth of layer(s) removed before test: 0mm
Layer Type: No layers removed
Test results reported relate only to the items tested.
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For and on behalf of CET
Paul Ettinger - Principal Geotechnical Engineer

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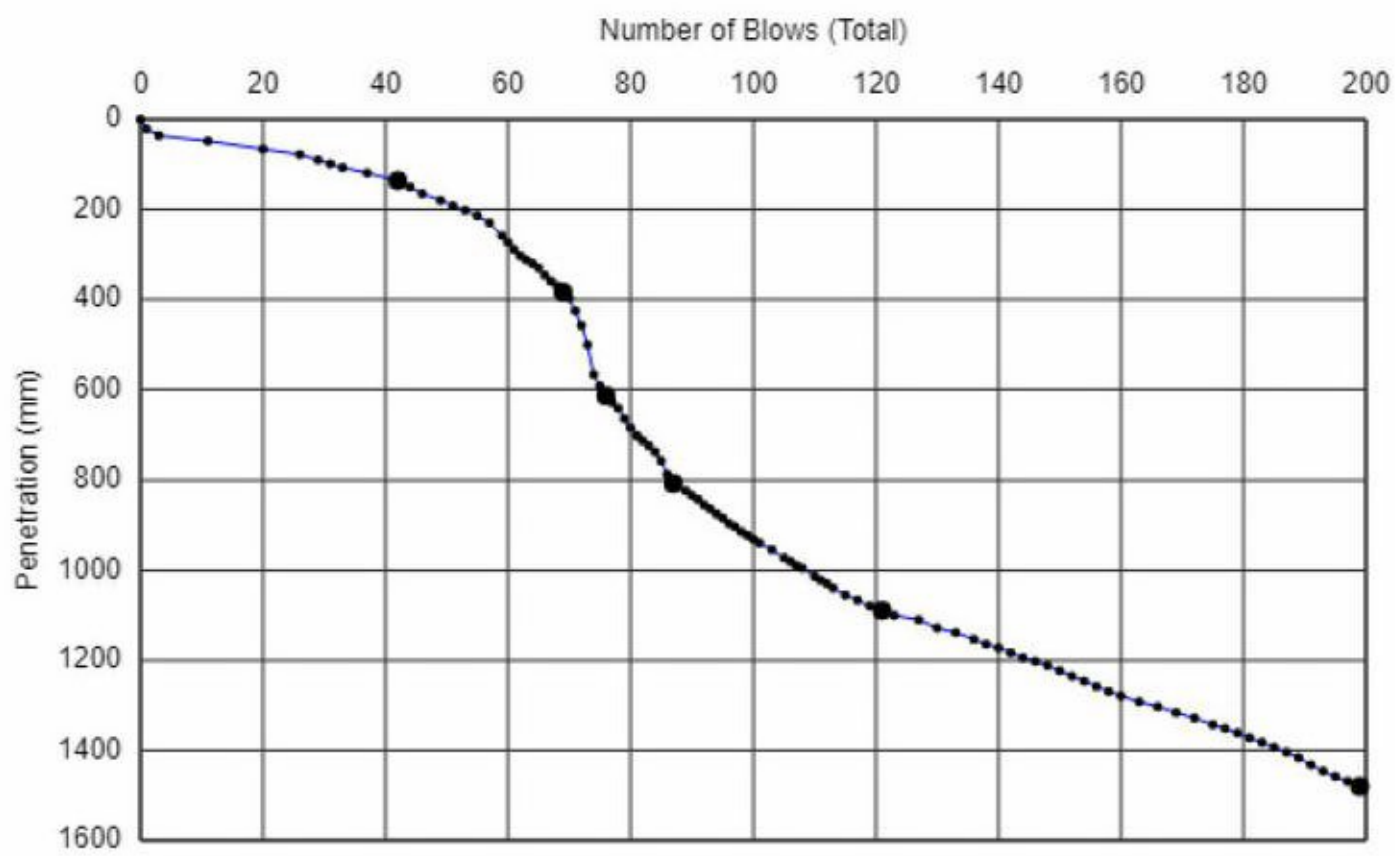
TEST REPORT: **Estimation of California Bearing Ratio By DCP Method**
In accordance with in-house procedure STP S9 (60° Cone)

REPORT NUMBER:	C1046240 / 119131.1.1.4		
CLIENT REF:	1046240	CLIENT:	Aecom Infrastructure & Environmental
DATE COMPLETED:	09/11/2020	ADDRESS:	U R S, Scott House, Alencon Link, Basingstoke, RG21 7PP
TESTED BY:	Jackie Ironmonger	SITE:	Benhall Mill Lane, Tunbridge Wells
LAYERS REMOVED:	No layers removed	LOCATION:	DCP104
MATERIAL:	Made Ground		

TEST RESULTS

Gradient Ref	Depth from (mm)	Depth to (mm)	No. of blows (per layer)	Blow rate (mm/blow)	Estimated C.B.R. Value (%)
1	0	136	42	3.2	87
2	136	384	27	9.2	29
3	384	614	7	32.9	7.5
4	614	807	11	17.5	15
5	807	1089	34	8.3	32
6	1089	1480	78	5.0	55



Remarks:
Depth of layer(s) removed before test: 0mm
Layer Type: No layers removed
Test results reported relate only to the items tested.
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For and on behalf of CET
Paul Ettinger - Principal Geotechnical Engineer

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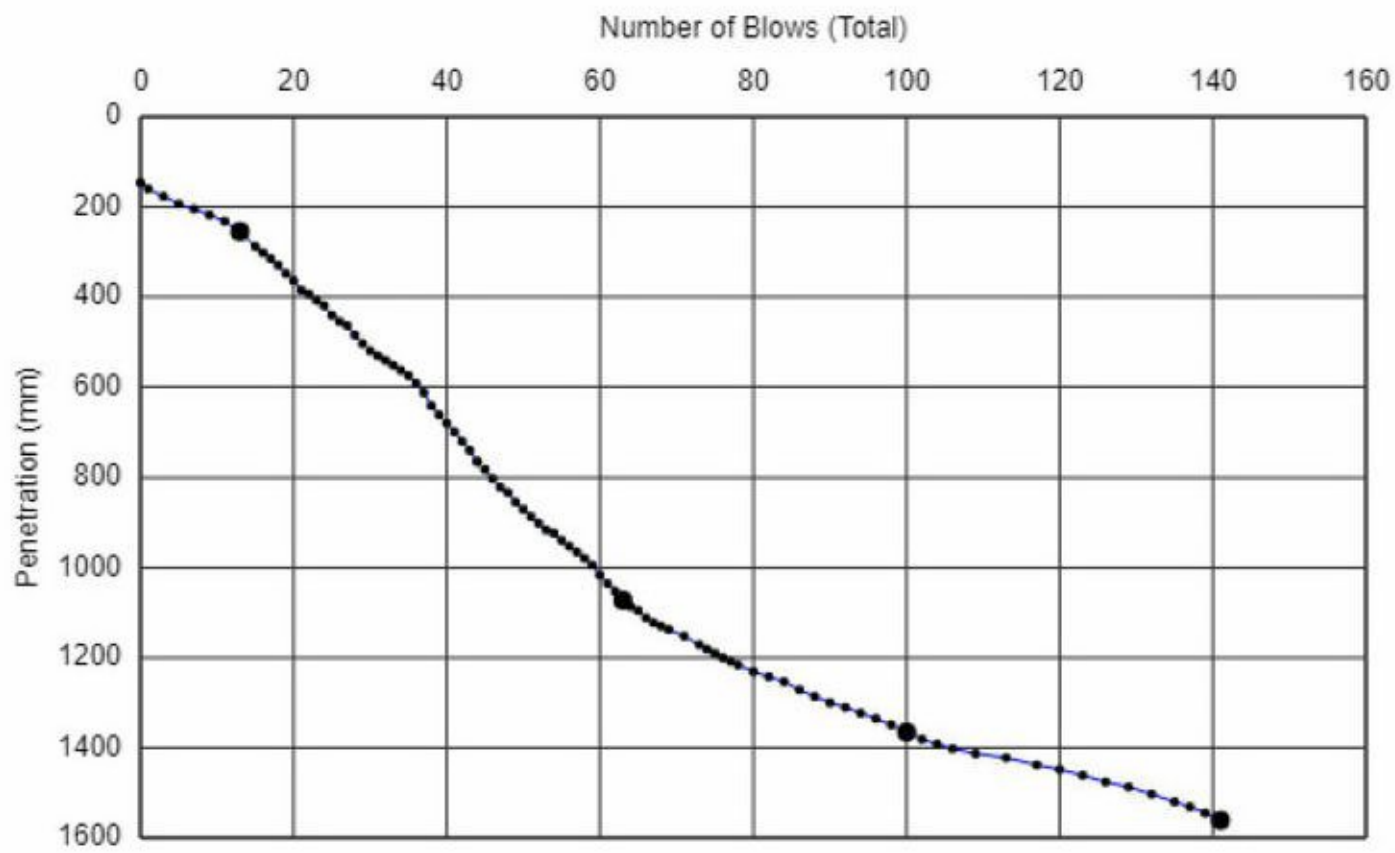
TEST REPORT:	**Estimation of California Bearing Ratio By DCP Method** In accordance with in-house procedure STP S9 (60° Cone)		
REPORT NUMBER:	C1046240 / 119131.1.1.5		
CLIENT REF:	1046240	CLIENT:	Aecom Infrastructure & Environmental
DATE COMPLETED:	09/11/2020	ADDRESS:	U R S, Scott House, Alencon Link, Basingstoke, RG21 7PP
TESTED BY:	Jackie Ironmonger	SITE:	Benhall Mill Lane, Tunbridge Wells
LAYERS REMOVED:	Other - See Engineers Log	LOCATION:	DCP106
MATERIAL:	Made Ground		

TEST RESULTS

Gradient Ref	Depth from (mm)	Depth to (mm)	No. of blows (per layer)	Blow rate (mm/blow)	Estimated C.B.R. Value (%)
1	146	255	13	8.4	32
2	255	1072	50	16.3	16
3	1072	1365	37	7.9	34
4	1365	1561	41	4.8	58



Remarks:
Depth of layer(s) removed before test: 146mm
Layer Type: Other
Test results reported relate only to the items tested.
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For and on behalf of CET
Paul Ettinger - Principal Geotechnical Engineer

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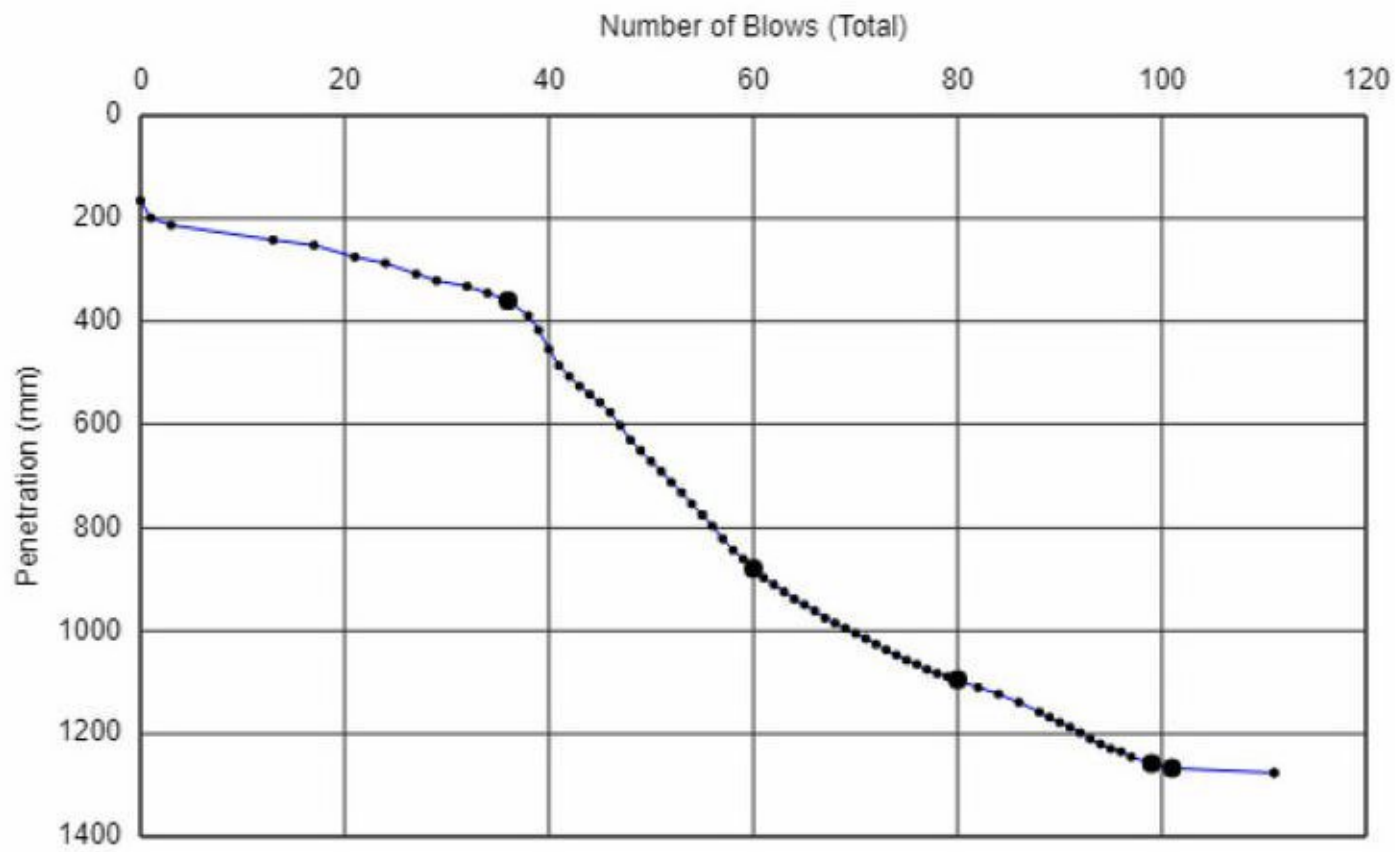
TEST REPORT:	**Estimation of California Bearing Ratio By DCP Method** In accordance with in-house procedure STP S9 (60° Cone)		
REPORT NUMBER:	C1046240 / 119131.1.1.6		
CLIENT REF:	1046240	CLIENT:	Aecom Infrastructure & Environmental
DATE COMPLETED:	09/11/2020	ADDRESS:	U R S, Scott House, Alencon Link, Basingstoke, RG21 7PP
TESTED BY:	Jackie Ironmonger	SITE:	Benhall Mill Lane, Tunbridge Wells
LAYERS REMOVED:	Other - See Engineers Log	LOCATION:	DCP107
MATERIAL:	Made Ground		

TEST RESULTS

Gradient Ref	Depth from (mm)	Depth to (mm)	No. of blows (per layer)	Blow rate (mm/blow)	Estimated C.B.R. Value (%)
1	165	360	36	5.4	51
2	360	879	24	21.6	12
3	879	1095	20	10.8	24
4	1095	1258	19	8.6	31
5	1258	1267	2	4.5	62



Remarks:
Depth of layer(s) removed before test: 165mm
Layer Type: Other
Test results reported relate only to the items tested.
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DCP stopped due to refusal

Report Format: S/RepSTP S9a

For and on behalf of CET
Paul Ettinger - Principal Geotechnical Engineer

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08-Dec-20

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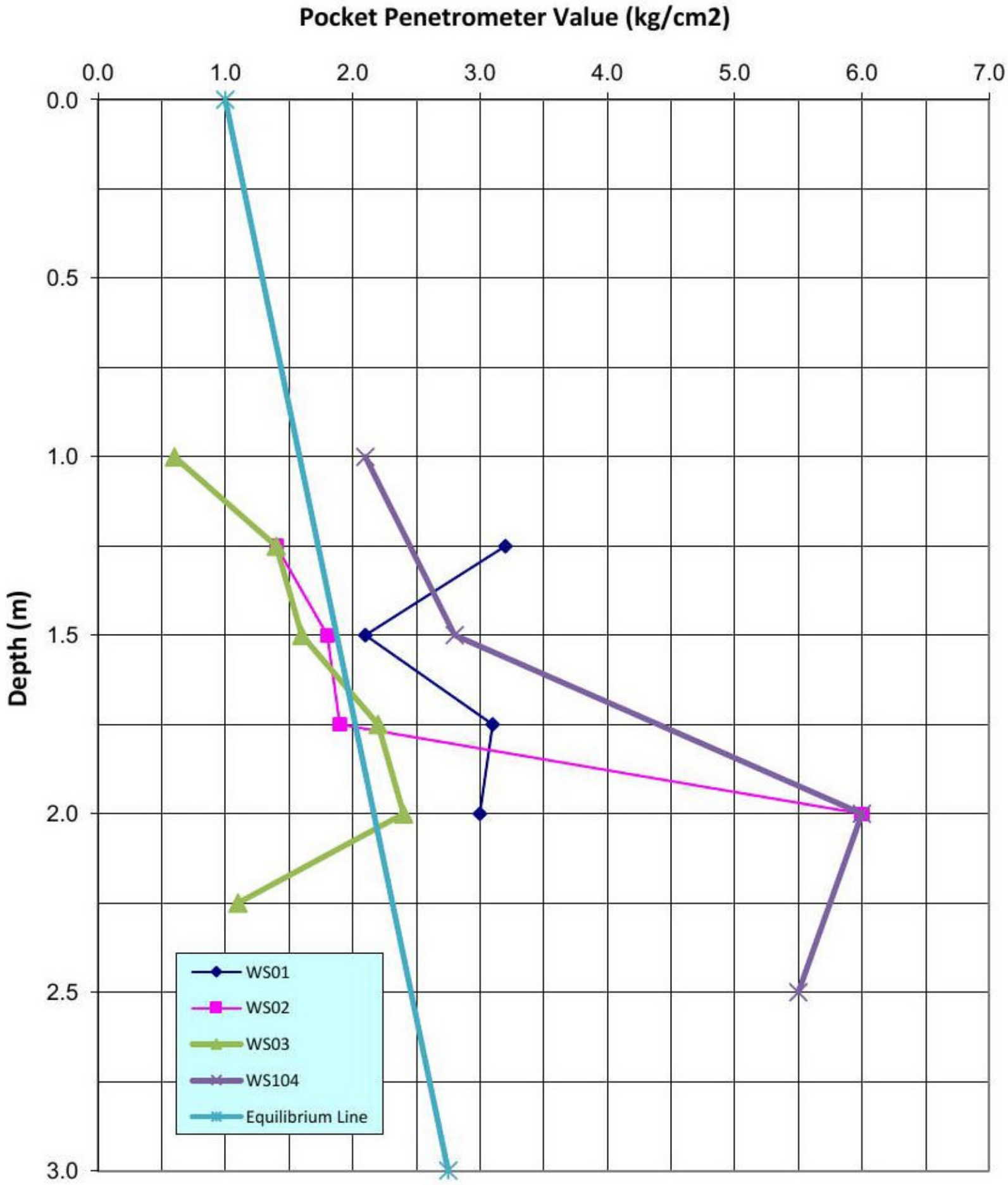
Lead No.: 1047010	Scale: N.T.S	Date	Drawn by	Checked	Approved
Site: **Benhall Mill Road**		03/12/20	CD	PTE	PTE



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APPENDIX B

Laboratory Testing

A summary table of moisture content and plasticity results are presented below in table B.1 and a summary of pH and water-soluble sulphate results are presented in table B.2.

Location	Depth (m below ground level)	Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	% passing through 425µm sieve	Modified Plasticity Index (%)	BS5930 classification
WS101	1.5	25	36	19	17	98.1	16.7	CL
WS102	1.5	24	34	19	15	98.4	14.8	CL
WS103	1.5	24	33	16	17	95.9	16.3	CL
WS104	1.5	15	23	15	8	87.4	7	CL
WS108A	2 – 2.5	17	23	13	10	97.9	9.8	CL

Table B.1. Summary of moisture content and Atterberg limit results.

Location	Depth (m below ground level)	Moisture Content (%)	pH	Water Soluble Sulphate as SO4 (2:1) BRE SD1 (mg/l)
WS102	2	13.3	7.7	20
WS104	1	21	7.6	30
WS105	1.6 - 1.8	10	7.8	< 10
WS108A	1 - 1.9	10.3	6.5	13

Table B.2. Summary of pH and water-soluble sulphate results.

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TEST REPORT:	**DETERMINATION OF THE MOISTURE CONTENT OF SOILS** BS 1377:Part 2:1990 clause 3.2 - oven drying method		
REPORT NUMBER:	C1048160 / 119878.1.1.1		
SAMPLE NUMBER:	See Below	CLIENT:	CET Geotechnical
CLIENT REF:	See Below	ADDRESS:	Northdown House, Ashford Road, Harrietsham, ME17 1QW
DATE SAMPLED:	04/11/2020	SITE:	Benhall Mill Road - 1046240
SAMPLED BY:	Client	SUPPLIER:	Site Won
DATE RECEIVED:	19/11/2020	SOURCE:	Site Won
DATE COMPLETED:	23/11/2020	MATERIAL:	See Below
TESTED BY:	DG, AV	LOCATION:	See Below
TYPE OF SAMPLE:	Disturbed	PREPARATION METHOD:	BS 1377-1: 1990 clause 7

TEST RESULT:

SAMPLE NO.	CLIENT REF.	LOCATION OF TEST	MATERIAL DESCRIPTION	MOISTURE CONTENT (%)	LOWER LIMIT	UPPER LIMIT
189376	WS101 1.50-1.50	WS101 1.50-1.50	Light Brown/Grey With Occ Stone	25	NA	NA

Remarks:
Remaining sample will be retained for a minimum of 28 days from date of report.
Test results reported relate only to the items tested.
This report shall not be reproduced except in full without approval of the Laboratory.

For and on behalf of CET
Dan Gay - Laboratory Supervisor

[redacted]

Approved Signatory
23-Nov-20

UKAS TESTING
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Report Format: L/Rep S2(Multi)/7

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TEST REPORT:	**DETERMINATION OF THE MOISTURE CONTENT OF SOILS** BS 1377:Part 2:1990 clause 3.2 - oven drying method		
REPORT NUMBER:	C1048160 / 119878.3.1.1		
SAMPLE NUMBER:	See Below	CLIENT:	CET Geotechnical
CLIENT REF:	See Below	ADDRESS:	Northdown House, Ashford Road, Harrietsham, ME17 1QW
DATE SAMPLED:	04/11/2020	SITE:	Benhall Mill Road - 1046240
SAMPLED BY:	Client	SUPPLIER:	Site Won
DATE RECEIVED:	19/11/2020	SOURCE:	Site Won
DATE COMPLETED:	23/11/2020	MATERIAL:	See Below
TESTED BY:	DG, AV	LOCATION:	See Below
TYPE OF SAMPLE:	Disturbed	PREPARATION METHOD:	BS 1377-1: 1990 clause 7

TEST RESULT:

SAMPLE NO.	CLIENT REF.	LOCATION OF TEST	MATERIAL DESCRIPTION	MOISTURE CONTENT (%)	LOWER LIMIT	UPPER LIMIT
189377	WS102 1.50-1.50	WS102 1.50-1.50	Light Brown/ Grey Clay With Occ. Stone	24	NA	NA

Remarks:
Remaining sample will be retained for a minimum of 28 days from date of report.
Test results reported relate only to the items tested.
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For and on behalf of CET
Dan Gay - Laboratory Supervisor

[redacted]

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23-Nov-20

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Report Format: L/Rep S2(Multi)/7

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TEST REPORT:	**DETERMINATION OF THE MOISTURE CONTENT OF SOILS** BS 1377:Part 2:1990 clause 3.2 - oven drying method		
REPORT NUMBER:	C1048160 / 119878.5.1.1		
SAMPLE NUMBER:	See Below	CLIENT:	CET Geotechnical
CLIENT REF:	See Below	ADDRESS:	Northdown House, Ashford Road, Harrietsham, ME17 1QW
DATE SAMPLED:	Unknown	SITE:	Benhall Mill Road - 1046240
SAMPLED BY:	Client	SUPPLIER:	Site Won
DATE RECEIVED:	19/11/2020	SOURCE:	Site Won
DATE COMPLETED:	24/11/2020	MATERIAL:	See Below
TESTED BY:	DG, AV	LOCATION:	See Below
TYPE OF SAMPLE:	Disturbed	PREPARATION METHOD:	BS 1377-1: 1990 clause 7

TEST RESULT:

SAMPLE NO.	CLIENT REF.	LOCATION OF TEST	MATERIAL DESCRIPTION	MOISTURE CONTENT (%)	LOWER LIMIT	UPPER LIMIT
189378	WS103 1.50-1.50	WS103 1.50-1.50	Light Brown/Grey Clay With Occ. Stones	24	NA	NA

Remarks:
Remaining sample will be retained for a minimum of 28 days from date of report.
Test results reported relate only to the items tested.
This report shall not be reproduced except in full without approval of the Laboratory.

For and on behalf of CET
Dan Gay - Laboratory Supervisor

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24-Nov-20

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TEST REPORT:	**DETERMINATION OF THE MOISTURE CONTENT OF SOILS** BS 1377:Part 2:1990 clause 3.2 - oven drying method		
REPORT NUMBER:	C1048160 / 119878.7.1.1		
SAMPLE NUMBER:	See Below	CLIENT:	CET Geotechnical
CLIENT REF:	See Below	ADDRESS:	Northdown House, Ashford Road, Harrietsham, ME17 1QW
DATE SAMPLED:	04/11/2020	SITE:	Benhall Mill Road - 1046240
SAMPLED BY:	Client	SUPPLIER:	Site Won
DATE RECEIVED:	19/11/2020	SOURCE:	Site Won
DATE COMPLETED:	23/11/2020	MATERIAL:	See Below
TESTED BY:	DG, AV	LOCATION:	See Below
TYPE OF SAMPLE:	Disturbed	PREPARATION METHOD:	BS 1377-1: 1990 clause 7

TEST RESULT:

SAMPLE NO.	CLIENT REF.	LOCATION OF TEST	MATERIAL DESCRIPTION	MOISTURE CONTENT (%)	LOWER LIMIT	UPPER LIMIT
189379	WS104 1.50-1.50	WS104 1.50-1.50	Dark Brown/Grey Sandy Clay With Occ Stone	15	NA	NA

Remarks:
Remaining sample will be retained for a minimum of 28 days from date of report.
Test results reported relate only to the items tested.
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For and on behalf of CET
Dan Gay - Laboratory Supervisor

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TEST REPORT:	**DETERMINATION OF THE MOISTURE CONTENT OF SOILS** BS 1377:Part 2:1990 clause 3.2 - oven drying method		
REPORT NUMBER:	C1048160 / 119878.11.1.1		
SAMPLE NUMBER:	See Below	CLIENT:	CET Geotechnical
CLIENT REF:	See Below	ADDRESS:	Northdown House, Ashford Road, Harrietsham, ME17 1QW
DATE SAMPLED:	06/11/2020	SITE:	Benhall Mill Road - 1046240
SAMPLED BY:	Client	SUPPLIER:	Site Won
DATE RECEIVED:	19/11/2020	SOURCE:	Site Won
DATE COMPLETED:	23/11/2020	MATERIAL:	See Below
TESTED BY:	DG, AV	LOCATION:	See Below
TYPE OF SAMPLE:	Disturbed	PREPARATION METHOD:	BS 1377-1: 1990 clause 7

TEST RESULT:

SAMPLE NO.	CLIENT REF.	LOCATION OF TEST	MATERIAL DESCRIPTION	MOISTURE CONTENT (%)	LOWER LIMIT	UPPER LIMIT
189383	WS108A 2.00-2.50	WS108A 2.00-2.50	Dark Brown/Grey Sandy Clay	17	NA	NA

Remarks:
Remaining sample will be retained for a minimum of 28 days from date of report.
Test results reported relate only to the items tested.
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For and on behalf of CET
Dan Gay - Laboratory Supervisor

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INFRASTRUCTURE
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TEST REPORT: **DETERMINATION OF THE PLASTICITY INDEX OF SOIL**
BS 1377:Part 2:1990 clause 5.4

REPORT NUMBER:	C1048160 / 119878.2.1.1		
SAMPLE NUMBER:	189376	CLIENT:	CET Geotechnical
CLIENT REF:	WS101 1.50-1.50	ADDRESS:	Northdown House, Ashford Road, Harrietsham, ME17 1QW
DATE SAMPLED:	04/11/2020	SITE:	Benhall Mill Road - 1046240
SAMPLED BY:	Client	SUPPLIER:	Site Won, Site Won
DATE RECEIVED:	19/11/2020	MATERIAL:	Light Brown/Grey With Occ Stone
DATE COMPLETED:	25/11/2020	LOCATION:	WS101 1.50-1.50,
TESTED BY:	DG, RB, AV, JW	PREPARATION METHOD:	BS 1377:Part 1:1990 cl 7.3 & 7.4.3
TYPE OF SAMPLE:	Disturbed	VARIATIONS:	None
WITHIN ORIGINAL SAMPLE:	N/A		

RESULTS:

TEST DETAILS	TEST RESULT	SPECIFICATION LIMITS	
		Lower Limit	Upper Limit
THE LIQUID LIMIT OF THE SAMPLE:	36%	N/A	N/A
THE PLASTIC LIMIT OF THE SAMPLE:	19%	N/A	N/A
THE PLASTICITY INDEX OF THE SAMPLE:	17%		
THE PERCENTAGE PASSING 425µm TEST SIEVE:	98.1%		
Sample History:	The material was tested after washing through a 425µm test sieve		

Remarks:
Remaining sample will be retained for a minimum of 28 days from date of report.
Test results reported relate only to the items tested.
This report shall not be reproduced except in full without approval of the Laboratory.

For and on behalf of CET
Dan Gay - Laboratory Supervisor

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25-Nov-20

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TEST REPORT: **DETERMINATION OF THE PLASTICITY INDEX OF SOIL**
BS 1377:Part 2:1990 clause 5.4

REPORT NUMBER:	C1048160 / 119878.4.1.1		
SAMPLE NUMBER:	189377	CLIENT:	CET Geotechnical
CLIENT REF:	WS102 1.50-1.50	ADDRESS:	Northdown House, Ashford Road, Harrietsham, ME17 1QW
DATE SAMPLED:	04/11/2020	SITE:	Benhall Mill Road - 1046240
SAMPLED BY:	Client	SUPPLIER:	Site Won, Site Won
DATE RECEIVED:	19/11/2020	MATERIAL:	Light Brown/ Grey Clay With Occ. Stone
DATE COMPLETED:	25/11/2020	LOCATION:	WS102 1.50-1.50,
TESTED BY:	MD, DG, RB, AV	PREPARATION METHOD:	BS 1377:Part 1:1990 cl 7.3 & 7.4.3
TYPE OF SAMPLE:	Disturbed	VARIATIONS:	None
WITHIN ORIGINAL SAMPLE:	N/A		

RESULTS:

TEST DETAILS	TEST RESULT	SPECIFICATION LIMITS	
		Lower Limit	Upper Limit
THE LIQUID LIMIT OF THE SAMPLE:	34%	N/A	N/A
THE PLASTIC LIMIT OF THE SAMPLE:	19%	N/A	N/A
THE PLASTICITY INDEX OF THE SAMPLE:	15%		
THE PERCENTAGE PASSING 425µm TEST SIEVE:	98.4%		
Sample History:	The material was tested after washing through a 425µm test sieve		

Remarks:
Remaining sample will be retained for a minimum of 28 days from date of report.
Test results reported relate only to the items tested.
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For and on behalf of CET
Dan Gay - Laboratory Supervisor

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TEST REPORT:	**DETERMINATION OF THE PLASTICITY INDEX OF SOIL** BS 1377:Part 2:1990 clause 5.4		
REPORT NUMBER:	C1048160 / 119878.6.1.1		
SAMPLE NUMBER:	189378	CLIENT:	CET Geotechnical
CLIENT REF:	WS103 1.50-1.50	ADDRESS:	Northdown House, Ashford Road, Harrietsham, ME17 1QW
DATE SAMPLED:	Unknown	SITE:	Benhall Mill Road - 1046240
SAMPLED BY:	Client	SUPPLIER:	Site Won, Site Won
DATE RECEIVED:	19/11/2020	MATERIAL:	Light Brown/Grey silty Clay With Occ. Stones
DATE COMPLETED:	01/12/2020	LOCATION:	WS103 1.50-1.50,
TESTED BY:	CD, MG, AP, AV, JW	PREPARATION METHOD:	BS 1377:Part 1:1990 cl 7.3 & 7.4.3
TYPE OF SAMPLE:	Disturbed	VARIATIONS:	None
WITHIN ORIGINAL SAMPLE:	N/A		

RESULTS:

TEST DETAILS	TEST RESULT	SPECIFICATION LIMITS	
		Lower Limit	Upper Limit
THE LIQUID LIMIT OF THE SAMPLE:	33%	N/A	N/A
THE PLASTIC LIMIT OF THE SAMPLE:	16%	N/A	N/A
THE PLASTICITY INDEX OF THE SAMPLE:	17%		
THE PERCENTAGE PASSING 425µm TEST SIEVE:	95.9%		
Sample History:	The material was tested after washing through a 425µm test sieve		

Remarks:
Remaining sample will be retained for a minimum of 28 days from date of report.
Test results reported relate only to the items tested.
This report shall not be reproduced except in full without approval of the Laboratory.

For and on behalf of CET
Chris Davidson - Laboratory Manager

[redacted]

Approved Signatory
01-Dec-20

UKAS TESTING
0927

Report Format: L/Rep S4/rev.6

Northdown House, Ashford Road
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INFRASTRUCTURE
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TEST REPORT:	**DETERMINATION OF THE PLASTICITY INDEX OF SOIL** BS 1377:Part 2:1990 clause 5.4		
REPORT NUMBER:	C1048160 / 119878.8.1.1		
SAMPLE NUMBER:	189379	CLIENT:	CET Geotechnical
CLIENT REF:	WS104 1.50-1.50	ADDRESS:	Northdown House, Ashford Road, Harrietsham, ME17 1QW
DATE SAMPLED:	04/11/2020	SITE:	Benhall Mill Road - 1046240
SAMPLED BY:	Client	SUPPLIER:	Site Won, Site Won
DATE RECEIVED:	19/11/2020	MATERIAL:	Dark Brown/Grey Sandy Clay With Occ Stone
DATE COMPLETED:	25/11/2020	LOCATION:	WS104 1.50-1.50,
TESTED BY:	DG, RB, AV, JW	PREPARATION METHOD:	BS 1377:Part 1:1990 cl 7.3 & 7.4.3
TYPE OF SAMPLE:	Disturbed	VARIATIONS:	None
WITHIN ORIGINAL SAMPLE:	N/A		

RESULTS:

TEST DETAILS	TEST RESULT	SPECIFICATION LIMITS	
		Lower Limit	Upper Limit
THE LIQUID LIMIT OF THE SAMPLE:	23%	N/A	N/A
THE PLASTIC LIMIT OF THE SAMPLE:	15%	N/A	N/A
THE PLASTICITY INDEX OF THE SAMPLE:	8%		
THE PERCENTAGE PASSING 425µm TEST SIEVE:	87.4%		
Sample History:	The material was tested after washing through a 425µm test sieve		

Remarks:
Remaining sample will be retained for a minimum of 28 days from date of report.
Test results reported relate only to the items tested.
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For and on behalf of CET
Dan Gay - Laboratory Supervisor

[redacted]

Approved Signatory
25-Nov-20

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TEST REPORT:	**DETERMINATION OF THE PLASTICITY INDEX OF SOIL** BS 1377:Part 2:1990 clause 5.4		
REPORT NUMBER:	C1048160 / 119878.12.1.1		
SAMPLE NUMBER:	189383	CLIENT:	CET Geotechnical
CLIENT REF:	WS108A 2.00-2.50	ADDRESS:	Northdown House, Ashford Road, Harrietsham, ME17 1QW
DATE SAMPLED:	06/11/2020	SITE:	Benhall Mill Road - 1046240
SAMPLED BY:	Client	SUPPLIER:	Site Won, Site Won
DATE RECEIVED:	19/11/2020	MATERIAL:	Dark Brown/Grey Sandy Clay
DATE COMPLETED:	25/11/2020	LOCATION:	WS108A 2.00-2.50,
TESTED BY:	DG, RB, AV, JW	PREPARATION METHOD:	BS 1377:Part 1:1990 cl 7.3 & 7.4.3
TYPE OF SAMPLE:	Disturbed	VARIATIONS:	None
WITHIN ORIGINAL SAMPLE:	N/A		

RESULTS:

TEST DETAILS	TEST RESULT	SPECIFICATION LIMITS	
		Lower Limit	Upper Limit
THE LIQUID LIMIT OF THE SAMPLE:	23%	N/A	N/A
THE PLASTIC LIMIT OF THE SAMPLE:	13%	N/A	N/A
THE PLASTICITY INDEX OF THE SAMPLE:	10%		
THE PERCENTAGE PASSING 425µm TEST SIEVE:	97.9%		
Sample History:	The material was tested after washing through a 425µm test sieve		

Remarks:
Remaining sample will be retained for a minimum of 28 days from date of report.
Test results reported relate only to the items tested.
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For and on behalf of CET
Dan Gay - Laboratory Supervisor

[redacted]

Approved Signatory
25-Nov-20

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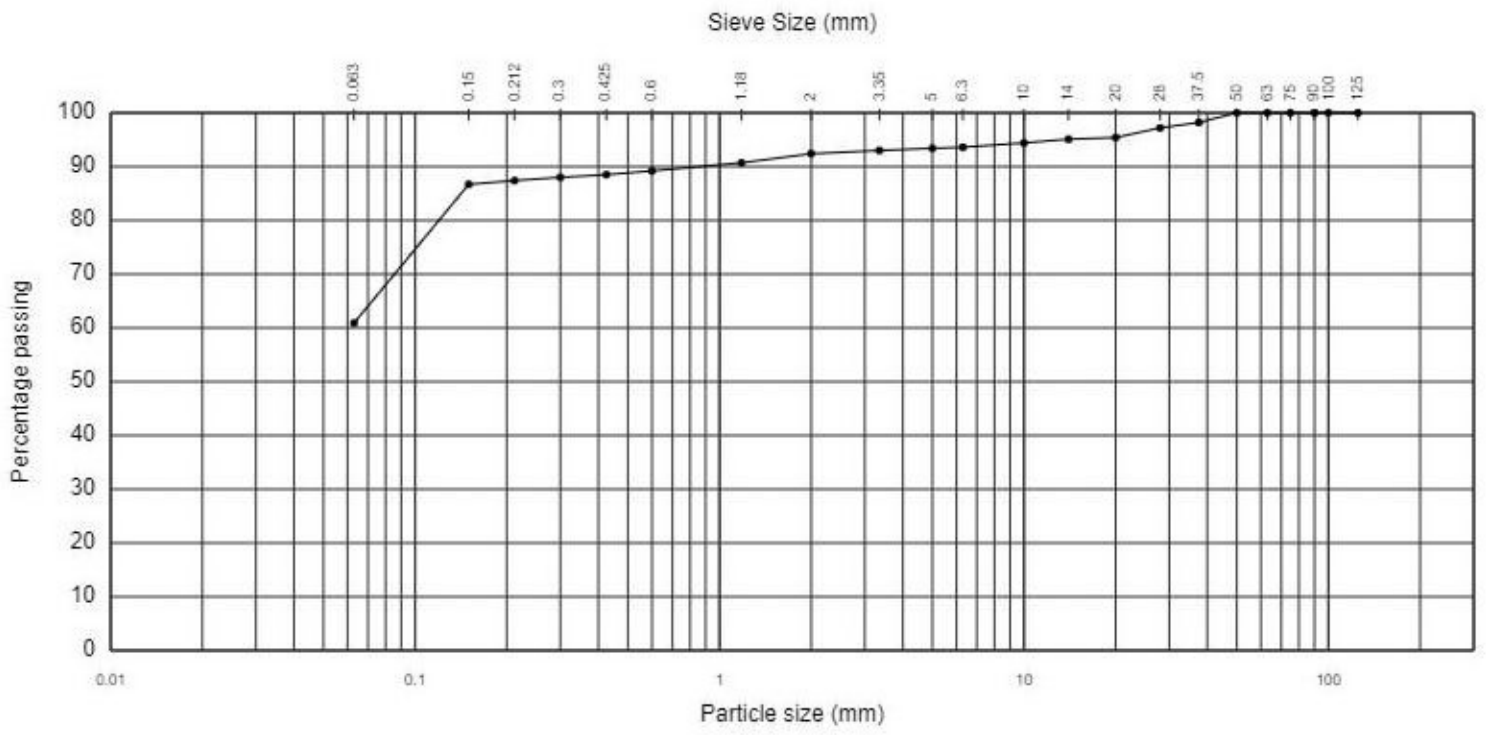
TEST REPORT:	**DETERMINATION OF PARTICLE SIZE DISTRIBUTION** BS 1377 - 2 : 1990, Method 9.2 Washing & Dry Sieving		
REPORT NUMBER:	C1048160 / 119878.9.1.1		
SAMPLE NUMBER:	189380	CLIENT:	CET Geotechnical
CLIENT REF:	WS106 1.00-2.00	ADDRESS:	Northdown House, Ashford Road, Harrietsham, ME17 1QW
DATE SAMPLED:	04/11/2020	SITE:	Benhall Mill Road - 1046240
SAMPLED BY:	Client	SUPPLIER:	Site Won, Site Won
DATE RECEIVED:	19/11/2020	MATERIAL:	Dark Brown/Grey Sandy Clay With Stones
DATE COMPLETED:	24/11/2020	CLASSIFICATION:	Class 2A
TESTED BY:	DG, BM, AV, CG	LOCATION:	WS106 1.00-2.00
WITHIN ORIGINAL SPECIMEN:	N/A	PREPARATION METHOD:	BS 1377:Part 1:1990 clause 7.3 & 7.4.5
TYPE OF SAMPLE:	Disturbed	VARIATIONS:	No variations

RESULT



Class 2A - Specification for Highway Works (2016) Table 6/2 Earthworks Materials - Class 2A

Uniformity Coefficient (D60/D10) N/A

Percentage passing 63µm > 10% therefore uniformity coefficient is estimated minimum (not UKAS accredited).

Sample complies with the grading specification

Moisture content: 15%

SIEVE ANALYSYS

Particle Diameter mm	Passing %	Specification Limits
125	100	100 - 100
100	100	
90	100	
75	100	
63	100	
50	100	
37.5	98	
28	97	
20	95	
14	95	
10	94	
6.3	94	
5	93	
3.35	93	
2	92	80 - 100
1.18	91	
0.6	89	
0.425	89	
0.3	88	
0.212	87	
0.15	87	
0.063	61	15 - 100

Remarks:
Remaining sample will be retained for a minimum of 28 days from date of report.
Test results reported relate only to the items tested.
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For and on behalf of CET
Dan Gay - Laboratory Supervisor

[redacted]

Approved Signatory
24-Nov-20

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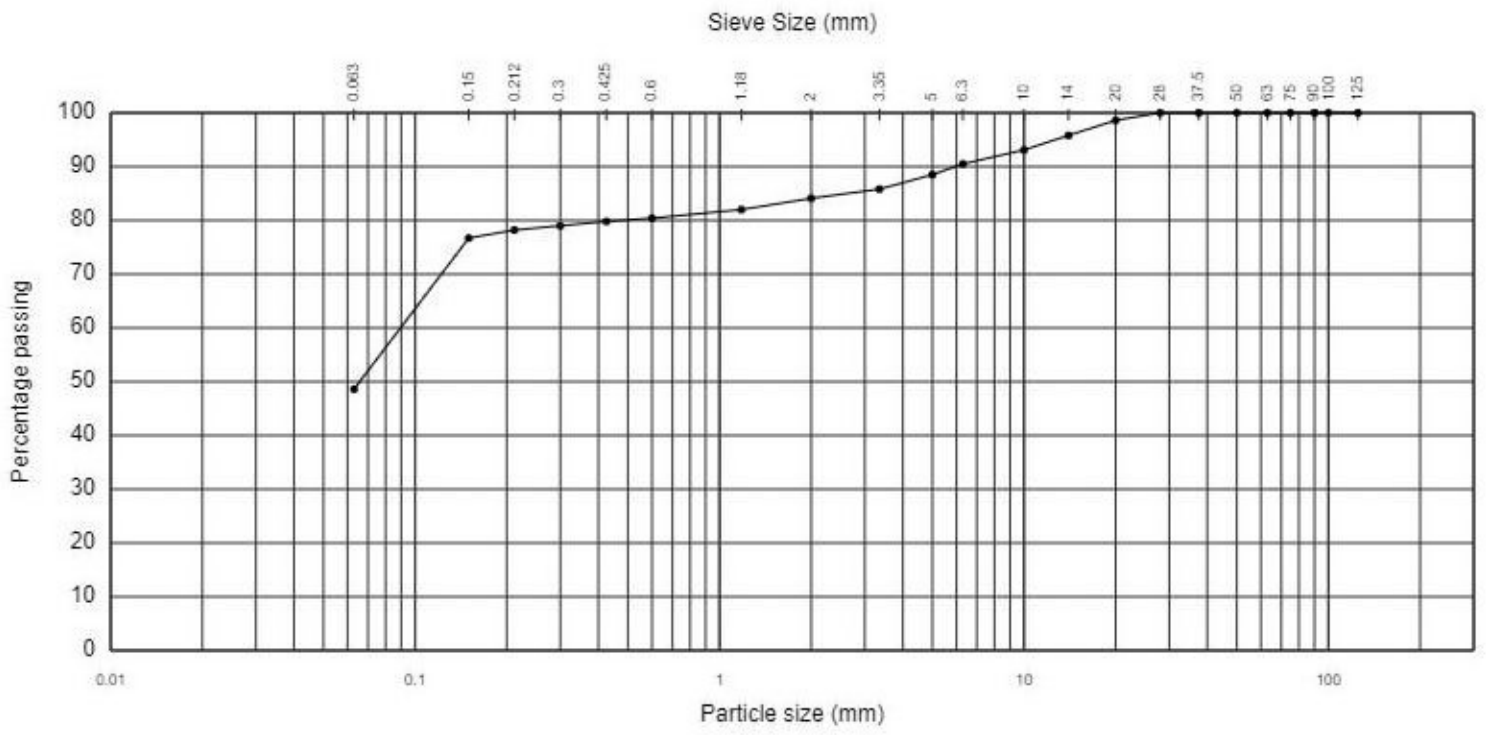
TEST REPORT:	**DETERMINATION OF PARTICLE SIZE DISTRIBUTION** BS 1377 - 2 : 1990, Method 9.2 Washing & Dry Sieving		
REPORT NUMBER:	C1048160 / 119878.13.1.1		
SAMPLE NUMBER:	189386	CLIENT:	CET Geotechnical
CLIENT REF:	WS109 1.00-1.50	ADDRESS:	Northdown House, Ashford Road, Harrietsham, ME17 1QW
DATE SAMPLED:	Unknown	SITE:	Benhall Mill Road - 1046240
SAMPLED BY:	Client	SUPPLIER:	Site Won, Site Won
DATE RECEIVED:	19/11/2020	MATERIAL:	Dark Brown/Grey Sandy Clay with Stones
DATE COMPLETED:	24/11/2020	CLASSIFICATION:	Class 2A
TESTED BY:	DG, BM, AV, CG	LOCATION:	WS109 1.00-1.50
WITHIN ORIGINAL SPECIMEN:	N/A	PREPARATION METHOD:	BS 1377:Part 1:1990 clause 7.3 & 7.4.5
TYPE OF SAMPLE:	Disturbed	VARIATIONS:	No variations

RESULT



Class 2A - Specification for Highway Works (2016) Table 6/2 Earthworks Materials - Class 2A

Uniformity Coefficient (D60/D10) N/A

Percentage passing 63µm > 10% therefore uniformity coefficient is estimated minimum (not UKAS accredited).

Sample complies with the grading specification

Moisture content: 11%

SIEVE ANALYSYS

Particle Diameter mm	Passing %	Specification Limits
125	100	100 - 100
100	100	
90	100	
75	100	
63	100	
50	100	
37.5	100	
28	100	
20	99	
14	96	
10	93	
6.3	91	
5	89	
3.35	86	
2	84	80 - 100
1.18	82	
0.6	80	
0.425	80	
0.3	79	
0.212	78	
0.15	77	
0.063	49	15 - 100

Remarks:
Remaining sample will be retained for a minimum of 28 days from date of report.
Test results reported relate only to the items tested.
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For and on behalf of CET
Dan Gay - Laboratory Supervisor

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24-Nov-20

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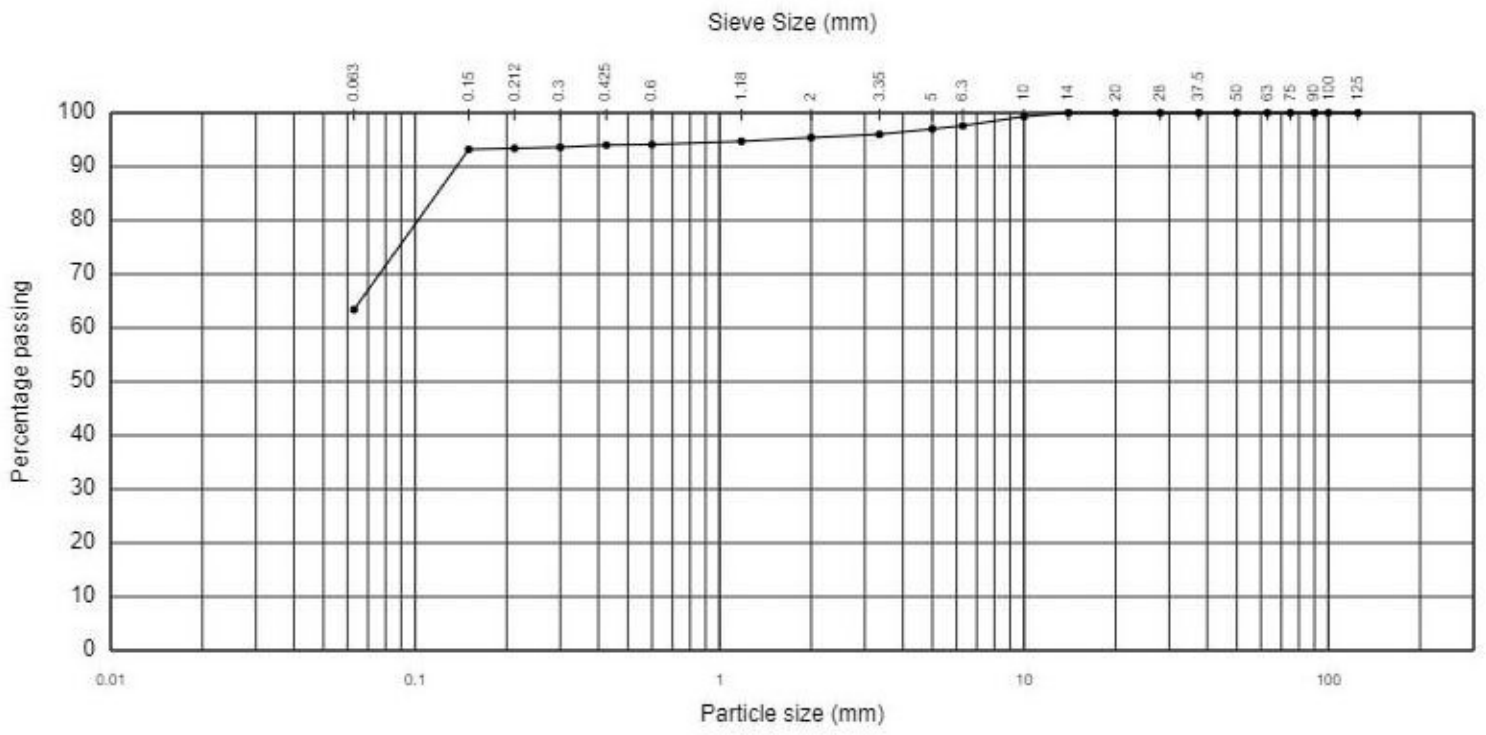
TEST REPORT:	**DETERMINATION OF PARTICLE SIZE DISTRIBUTION** BS 1377 - 2 : 1990, Method 9.2 Washing & Dry Sieving		
REPORT NUMBER:	C1048160 / 119878.15.1.1		
SAMPLE NUMBER:	189387	CLIENT:	CET Geotechnical
CLIENT REF:	WS110 1.20-1.60	ADDRESS:	Northdown House, Ashford Road, Harrietsham, ME17 1QW
DATE SAMPLED:	05/11/2020	SITE:	Benhall Mill Road - 1046240
SAMPLED BY:	Client	SUPPLIER:	Site Won, Site Won
DATE RECEIVED:	19/11/2020	MATERIAL:	Light Brown/Grey Sandy Clay
DATE COMPLETED:	24/11/2020	CLASSIFICATION:	Class 2A
TESTED BY:	DG, BM, AV, CG	LOCATION:	WS110 1.20-1.60
WITHIN ORIGINAL SPECIMEN:	N/A	PREPARATION METHOD:	BS 1377:Part 1:1990 clause 7.3 & 7.4.5
TYPE OF SAMPLE:	Disturbed	VARIATIONS:	No variations

RESULT



Class 2A - Specification for Highway Works (2016) Table 6/2 Earthworks Materials - Class 2A

Uniformity Coefficient (D60/D10) N/A

Percentage passing 63µm > 10% therefore uniformity coefficient is estimated minimum (not UKAS accredited).

Sample complies with the grading specification

Moisture content: 12%

SIEVE ANALYSYS

Particle Diameter mm	Passing %	Specification Limits
125	100	100 - 100
100	100	
90	100	
75	100	
63	100	
50	100	
37.5	100	
28	100	
20	100	
14	100	
10	99	
6.3	98	
5	97	
3.35	96	
2	95	80 - 100
1.18	95	
0.6	94	
0.425	94	
0.3	94	
0.212	93	
0.15	93	
0.063	63	15 - 100

Remarks:
Remaining sample will be retained for a minimum of 28 days from date of report.
Test results reported relate only to the items tested.
This report shall not be reproduced except in full without approval of the Laboratory.

For and on behalf of CET
Dan Gay - Laboratory Supervisor

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Approved Signatory
24-Nov-20

UKAS TESTING
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4480

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ME17 1QW

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

DETS Report No: 20-13699

Site Reference:	Benhall Mill Road
Project / Job Ref:	1046240
Order No:	None Supplied
Sample Receipt Date:	20/11/2020
Sample Scheduled Date:	20/11/2020
Report Issue Number:	1
Reporting Date:	26/11/2020

Authorised by:
[redacted]
Dave Ashworth
Technical Manager

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

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

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

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Soil Analysis Certificate						
DETS Report No: 20-13699	Date Sampled	None Supplied	None Supplied	None Supplied	None Supplied	
CET UK Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	
Site Reference: Benhall Mill Road	TP / BH No	WS102	WS104	WS105	WS108A	
Project / Job Ref: 1046240	Additional Refs	D2	D1	B6	B	
Order No: None Supplied	Depth (m)	2.00	1.00	1.60 - 1.80	1.00 - 1.90	
Reporting Date: 26/11/2020	DETS Sample No	511867	511868	511869	511870	

Determinand	Unit	RL	Accreditation					
pH	pH Units	N/a	MCERTS	7.7	7.6	7.8	6.5	
W/S Sulphate as SO_4 (2:1)	mg/l	< 10	MCERTS	20	30	< 10	13	
W/S Sulphate as SO_4 (2:1)	g/l	< 0.01	MCERTS	0.02	0.03	< 0.01	0.01	

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

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Soil Analysis Certificate - Sample Descriptions	
DETS Report No: 20-13699	
CET UK Ltd	
Site Reference: Benhall Mill Road	
Project / Job Ref: 1046240	
Order No: None Supplied	
Reporting Date: 26/11/2020	

DETS Sample No	TP / BH No	Additional Refs	Depth (m)	Moisture Content (%)	Sample Matrix Description
^ 511867	WS102	D2	2.00	13.3	Light brown sandy clay
^ 511868	WS104	D1	1.00	21	Light brown sandy clay
^ 511869	WS105	B6	1.60 - 1.80	10	Light grey sandy clay
^ 511870	WS108A	B	1.00 - 1.90	10.3	Light brown sandy clay

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

Insufficient Sample I/S

Unsuitable Sample U/S

^ no sampling date provided; unable to confirm if samples are within acceptable holding times

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Soil Analysis Certificate - Methodology & Miscellaneous Information
DETS Report No: 20-13699
CET UK Ltd
Site Reference: Benhall Mill Road
Project / Job Ref: 1046240
Order No: None Supplied
Reporting Date: 26/11/2020

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

D Dried
AR As Received