

**Organics Exceedances of WQS in groundwater samples (Round 1 & 2 Groundwater Monitoring)**

REV	Date	Description	Drawn	Check	Approv
01	14/06/2018	FIRST ISSUE	FW	AP	GF

**Client**

HOMES AND COMMUNITIES AGENCY

PROJECT: NORTHSTOWE REMEDIAL STRATEGY

Site: Northstowe, Cambridgeshire

Client: Fry Building, 2 Marsham Street, London, SW1P 4DF

**ARCADIS** Design & Consultancy for natural and built assets

Registered office: Arcadis House, 34 York Way, London, N1 5AB

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**TITLE**

LOCATION OF ORGANICS EXCEEDANCES IN GROUNDWATER SAMPLES (ARCADIS ROUND 1 & 2)

Designed	[Signature]	Date: 14/06/2018	Signed
Drawn	[Signature]	Date: 14/06/2018	Signed
Checked	[Signature]	Date: 14/06/2018	Signed
Approved	[Signature]	Date: 14/06/2018	Signed
Scale	See Layout	Datum:	AOD
Original Size	A3	Grid:	OS
Suitability Code	S2	Project Number:	UA008426

Suitability Description: PRELIMINARY NOT FOR CONSTRUCTION

Drawing Number: Figure 7

Revision: 01

The groundwater data have been screened against the most stringent value out of the Environmental Quality Standards (EQS) from the Water Framework Directive or the UK Drinking Water Standards (DWS) from the Water Supply (Water Quality) Regulations 2016 or World Health Organisation.

There are no published EQS or DWS for TPH in the UK. In the absence of a specific standard, 10 µg/l is considered to be a reasonable indicative screening value at which TPH could be of concern (former UK Drinking Water Standard).







**Reg. 13(1)**

Development Services  
South Cambridgeshire District Council  
South Cambridgeshire Hall (6010)  
Cambourne  
Cambridge  
CB23 6EA

**Our ref:** AC/2018/126885/05-L01  
**Your ref:** S/0926/18  
**Date:** 25 June 2018

Dear Sir/Madam

**DISCHARGE OF CONDITION 17 (GROUNDWATER AND CONTAMINATION) OF PLANNING PERMISSION S/2011/14/OL. NORTHSTOWE PHASE 2, LONGSTANTON, CB24 3EW - FURTHER DETAIL.**

Thank you for consultation.

**Environment Agency position.**

Documents reviewed:

1. Memo on Northstowe – Remediation Method Statement, Arcadis ref: NOR-ARC-XX-XXX-RP-G-0144-P01, dated 14 June 2018.

**Condition 17:** Based on the information/details provided in the documentation referenced above, we can recommend the discharge of **Parts 1 to 3** of Condition 17.

Condition 17, parts 4 & 5 remain outstanding.

We are waiting to review the proposed environmental works at the site. The proposed environmental works (site investigation, remediation and verification and validation as necessary) should expand into the both deep soil and groundwater without limiting to shallow soils. Based on outcomes of these environmental works, associated risks to controlled waters should be revised and necessary mitigation measures should be implemented, if necessary, to manage unacceptable risks to controlled waters.

Yours faithfully

**Reg. 13(1)****Planning Liaison**

Direct e-mail [planning.brampton@environment-agency.gov.uk](mailto:planning.brampton@environment-agency.gov.uk)

**Please note** – Our hourly charge for pre application assessments is now £100 + VAT per hour

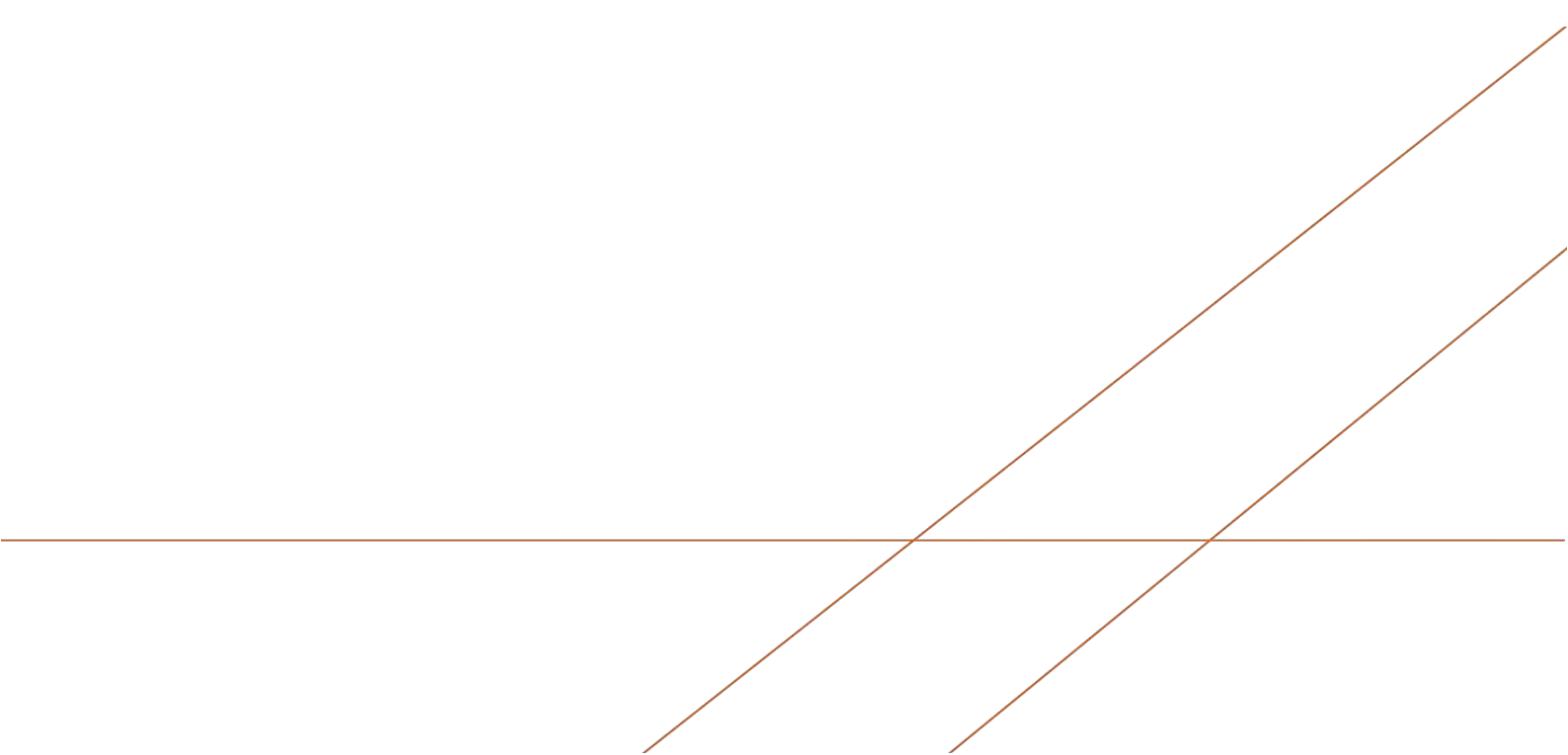
Environment Agency, East Anglia Area (West), Bromholme Lane, Brampton, Huntingdon, Cambs. PE28 4NE.

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# **NORTHSTOWE – PARCEL 2A**

## Ground Investigation Report

July 2018





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# Northstowe – Parcel 2A

## Ground Investigation Report

### Authorised Signatures

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Report No UA00XXXX-AFS-GLR-G001

Date July 2018

**Reg. 13(1)**



### Version control

Version	Date	Author	Changes
01	July 2018	<b>Reg. 13(1)</b>	
02	July 2018	<b>Reg. 13(1)</b>	Update as per client's request

This report dated July 2018 has been prepared for Homes England (the "Client") in accordance with the terms and conditions of appointment dated 3<sup>rd</sup> of May, 2018 (the "Appointment") between the Client and **Arcadis Consulting (UK) Limited** ("Arcadis") for the purposes specified in the Appointment. For avoidance of doubt, no other person(s) may use or rely upon this report or its contents, and Arcadis accepts no responsibility for any such use or reliance thereon by any other third party.



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## APPENDIX B

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## 1 INTRODUCTION

Homes England propose to undertake a housing development at Northstowe, in the county of Cambridgeshire. This ground investigation was commissioned by Homes England, 'the Client', to provide information on the ground conditions at the specific site.

The scope of the ground investigation for Parcel 2A was determined by Arcadis Consulting (UK) Limited, and the work was instructed on the 3rd of May, 2018. This work is in addition to the previous investigations undertaken (by others) for a wider Phase 2 in 2007.

This report provides a summary of the investigation and factual account of the fieldwork. factual account of the fieldwork undertaken within Parcel 2A including engineering descriptions of the various strata encountered, results of *in situ* testing and the subsequent geotechnical and geo-environmental laboratory testing undertaken on samples obtained.

### 1.1 Limitations

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Arcadis do not accept liability for any use of the information presented in this report unless it is signed by the author, checker and approver and marked as final.

It should be noted that ground conditions between exploratory holes may vary from those identified during this ground investigation; any design should take this into consideration. It should also be noted that groundwater levels may be subject to diurnal, tidal, seasonal, climatic variations and those recorded in this report are solely dependent on the time the ground investigation was carried out and the weather before and during the investigation.

### 1.2 Proposed Development

The wider Northstowe development comprises approximately 10,000 homes, a new town centre, schools, health centre and other supporting social infrastructure. Parcel 2A of Northstowe sits within Phase 2 which has received planning permission for up to 3,500 homes, a secondary school, 2 primary schools, a town centre and sports hub [2].

### 1.3 Existing Information

As part of the Parcel 2A scope of works, the following information and the ground conditions were made available to Arcadis prior to mobilisation to the site:

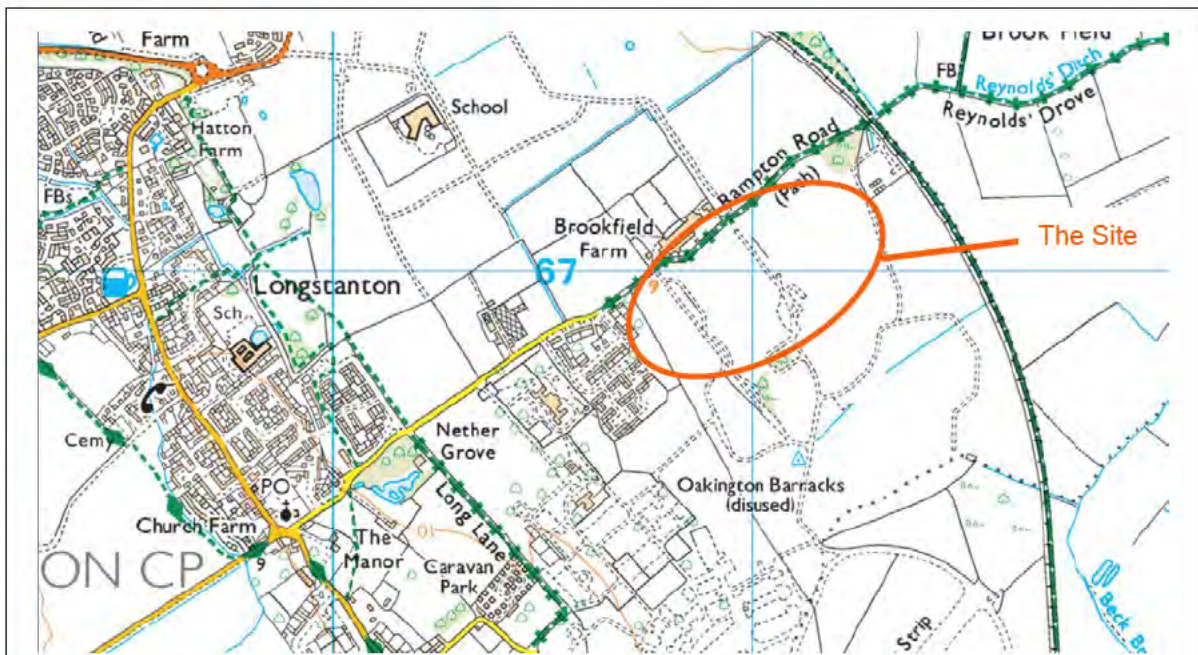
- a. Ground investigation Scope and Specification [1]; source: Arcadis Consulting (UK) Ltd.
- b. Previous Ground Investigation Report [2]; source: Arcadis Consulting (UK) Ltd. Arcadis Consulting. 2017. Ground Investigation Report for Northstowe Phase 2. Arcadis Consulting Report UA008426-AFS-GLR-G001 . March 2017.
- c. WSP Environmental (UK) (2007) Northstowe Zone B - Interim Factual Report (Report Number 12170626) [20]



## 2 SITE DETAILS

### 2.1 Site Location and Description

The investigated site was situated approximately 10 km northwest of Cambridge, 750m east of Longstanton and 3km north of Oakington, within the South Cambridgeshire District; at an approximate National Grid Reference (NGR) TL409657. Figure 2-1 shows the site location.



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Figure 2-1: Site Location and Red line boundary plan.

The Parcel 2A development area is approximately 8.5 hectares and is generally flat. The Parcel 2A development area 'the site' included areas of hardstanding and open space associated with the former RAF Oakington Airfield and former barracks, farmlands and a section of Rampton Road.



Historically, a sewage treatment works was present to the north eastern corner of the site and the open space between this and the existing settlement of Rampton Drift supported the former bomb storage and associated infrastructure.

The area to the west of the site was the location of the main barrack buildings including the former living quarters and associated welfare / training facilities / offices / vehicle maintenance garages and fuel storage areas.

There were groups of trees throughout the former Oakington Barracks, including avenues of mature trees around the barracks complex and leading to the station headquarter building.

## 2.2 Geology

The published 1:50 000 scale British Geological Survey (BGS) maps of the area incorporating the site, Sheet 187 [3] and Sheet 188 [4], and the BGS online GeoIndex [16] indicate the site to be underlain by superficial deposits of River Terrace Deposits. The underlying bedrock geology consists of mudstone from the Kimmeridge Clay Formation and Amphill Clay Formation. The general distribution of the strata at the site is shown in Figure 2-2. A summary of the anticipated geological sequence is shown in Table 2-1.

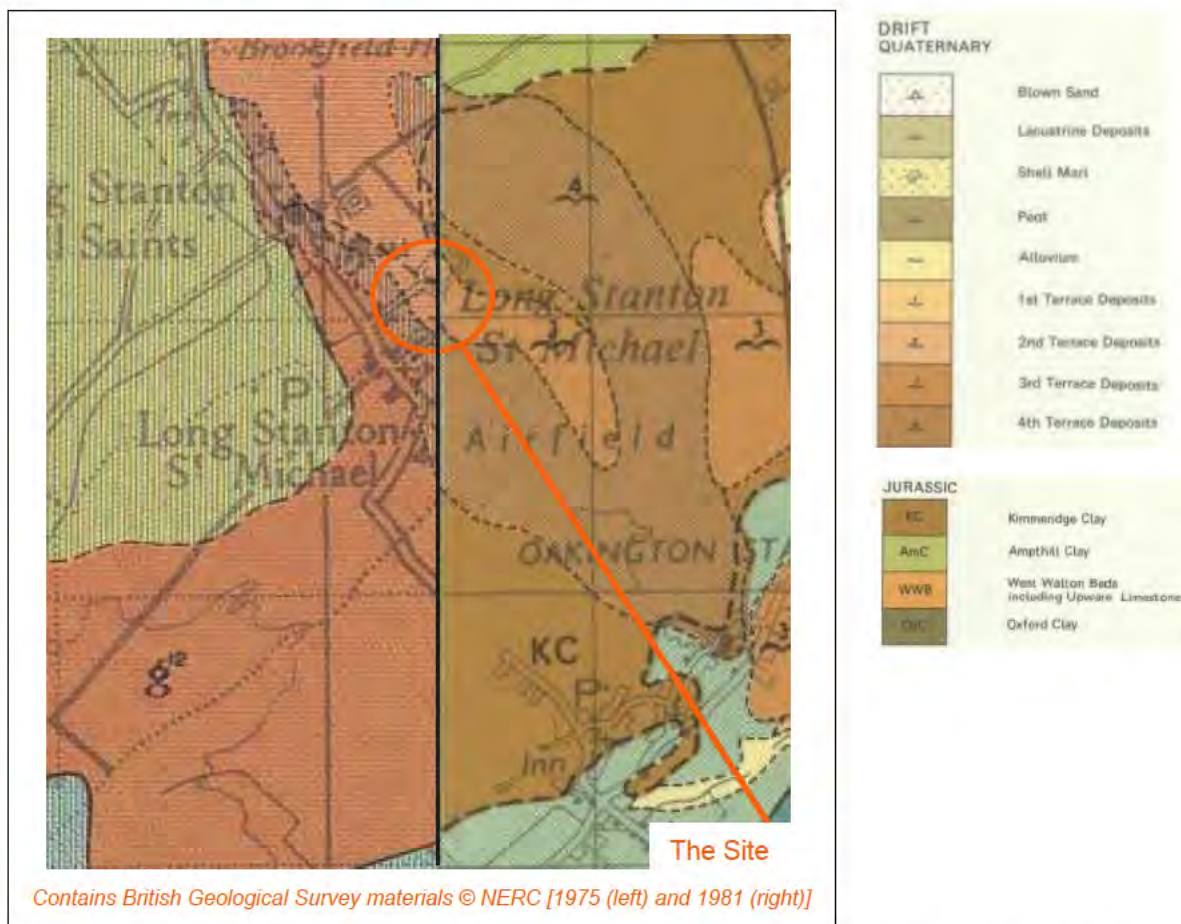


Figure 2-2: Geological Setting: Site location incorporates two different BGS sheets, Huntingdon (1975) displayed on the left and Cambridge (1981) on the right.



Period	Formation	Description
Quaternary	River Terrace Deposits	Sand and gravel, locally with lenses of silt, clay or peat.
Jurassic	Kimmeridge Clay Formation	Mudstone (calcareous or kerogen-rich or silty or sandy); thin siltstone and cementstone beds; locally sands and silts.
Jurassic	Amphill Clay Formation	Mainly smooth or slightly silty, pale to medium grey with argillaceous limestone (cementstone) nodules; some rhythmic alternations of dark grey mudstone in the lower part; topmost beds are typically pale grey marls with cementstone.

Table 2-1 Anticipated geological sequence

There are no faults located on the site, according to the BGS mapping. The previous borehole/investigations, undertaken by the British Geological Survey between 1980's and 1990's, encountered between 0.2 m and 1.2 m of medium dense made ground overlying medium dense to dense River Terrace Sand and Gravel between 4 m and 6 m thick before proving the bedrock. The Coal Authority website [17] indicates that there is no evidence of coal outcrops or mining activities within the vicinity of the site.

### 2.3 Hydrogeology and Hydrology

The superficial deposits (River Terrace Deposits) on the site are classified as a Secondary A aquifer by the Environment Agency (EA). Secondary A aquifers are defined as “permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers” [19].

The bedrock (Kimmeridge Clay Formation and Amphill Clay Formation) is classified as Unproductive Strata. Unproductive Strata is defined as “rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow” [19].

The superficial deposits are also classified as being in a minor aquifer intermediate groundwater vulnerability zone. The site is not situated within a groundwater source protection zone [18]. Flood risk zones, levels 3 are located to the immediate north, east and south of the site. Flood risk zones, level 2 are also located to the east, south and west of the site [18]. The groundwater is used by multiple sources for spray irrigation and agriculture purposes.

The closest surface water feature is an unnamed pond located in the southwest corner of the former Oakington Barracks.



### 3 FIELDWORK

#### 3.1 General

Ground investigation works within Parcel 2A were carried out in a single phase, between May 29th 2018 and June 5th 2018. The scope of the ground investigation including the location, scheduled depth and type of exploratory hole undertaken, determined by Arcadis Consulting (UK) Limited [1] and is summarised in table 3.1.

The ground investigation methods were undertaken in general accordance with the principles set out in BS EN 1997-2:2005 [10] and with the general practice described in BS5930:2015 [11]. The geo-environmental aspects of the ground investigation complied with the general requirements of BS 10175:2011 [12]. The investigation works were carried out under the supervision of a suitably experienced ground engineer who undertook the logging and reporting of the exploratory holes and in situ testing.

Location ID	Hole Type	Proposed Depth (m)	Comments
BH2A01	CP	10	Dual 50mm HDPE installations
BH2A02	CP	15	Dual 50mm HDPE installations
BH2A03	CP	15	Dual 50mm HDPE installations
BH2A04	CP	15	Dual 50mm HDPE installations
BH2A05	CP	15	Dual 50mm HDPE installations
BH2A06	CP	10	Dual 50mm HDPE installations
BH2A07	CP	10	Dual 50mm HDPE installations
TP2A01	TP	3.5	
TP2A02	TP	3.5	
TPSA2A03	TP	3.5	Undertake Soakaway Test
TP2A04	TP	3.5	
TP2A05	TP	3.5	
TP2A06	TP	3.5	
TPSA2A07	TP	3.5	Undertake Soakaway Test
TP2A08	TP	3.5	
TP2A09	TP	3.5	
TP2A10	TP	3.5	
TRL1	TRL probe	2.0	
TRL2	TRL probe	2.0	
TRL3	TRL probe	2.0	



Location ID	Hole Type	Proposed Depth (m)	Comments
TRL4	TRL probe	2.0	
TRL5	TRL probe	2.0	
TRL6	TRL probe	2.0	
TRL7	TRL probe	2.0	
TRL8	TRL probe	2.0	
TRL9	TRL probe	2.0	
TRL10	TRL probe	2.0	

Table 3-1. Summary of scope for ground investigation.

**Notes**

CP = cable percussive boring; TP = trial pitting; TRL = TRL Dynamic Cone Penetrometer Test.

## 3.2 Exploratory Holes

### 3.2.1 Exploratory Hole Locations

The co-ordinates and elevations of the exploratory hole locations were obtained by the Arcadis supervising engineer using a Trimble VRS NOW GPRS system; allowing an accuracy of +/-50 mm.

Drawing 10018973-GLR-EHP-0001 presented in Appendix A displays the as-constructed exploratory hole locations while the co-ordinates and elevation of the ground surface at each exploratory hole location are given on the individual logs.

### 3.2.2 Investigation Methodology

The following methods and techniques were undertaken to construct the exploratory holes at the site. The completed scope of investigation is summarised in Table 3-2 below.

Details of the methods of investigation, associated standards adopted and a key to the notation and symbols used on the logs are presented in Appendix B; the exploratory hole records are presented in Appendix C.

Location ID	Hole Type	Start Date	End Date	Final depth (m)	Termination Reason
BH2A01	CP	31/05/2018	01/06/2018	10.45	Targeted depth achieved. Borehole terminated with an SPT.
BH2A02	CP	04/06/2018	05/06/2018	15.45	
BH2A03	CP	30/05/2018	31/05/2018	15.45	
BH2A04	CP	01/06/2018	04/06/2018	15.45	
BH2A05	CP	05/06/2018	06/06/2018	15.45	
BH2A06	CP	30/05/2018	30/05/2018	10.45	



Location ID	Hole Type	Start Date	End Date	Final depth (m)	Termination Reason
BH2A07	CP	29/05/2018	29/05/2018	10.45	

Table 3-1. Summary of completed exploratory holes; cable percussive

**Notes**

CP = cable percussive boring.

Location ID	Hole Type	Start Date	End Date	Final depth (m)	Termination Reason
TP2A01	TP	01/06/2018	01/06/2018	2.00	Side wall collapse
TP2A02	TP	01/06/2018	01/06/2018	3.45	Hard strata
TPSA2A03	TP	31/05/2018	31/05/2018	1.30	Side wall collapse
TPSA2A03A	TP	31/05/2018	31/05/2018	0.50	Soakaway Test
TP2A04	TP	01/06/2018	01/06/2018	1.60	Side wall collapse
TP2A05	TP	30/05/2018	30/05/2018	1.51	Water ingress at 1.50mbgl making pit unstable
TP2A06	TP	30/05/2018	30/05/2018	3.30	Targeted depth achieved
TPSA2A07	TP	31/05/2018	31/05/2018	2.10	Water ingress at 2.00mbgl
TP2A08	TP	31/05/2018	31/05/2018	2.60	Hard strata
TP2A09	TP	01/06/2018	01/06/2018	1.80	Hard strata
TP2A010	TP	01/06/2018	01/06/2018	3.60	Targeted depth achieved

Table 3-3. Summary of completed exploratory holes; trial pitting

**Notes**

TP = trial pitting.

### 3.2.3 Cable Percussive Boring

Cable percussive boring was completed using Dando 2000 drilling rig equipped with 150mm casing and tools to undertake boreholes up to 15 m bgl.

Samples of the material recovered in the boreholes were taken to enable representative laboratory testing. Generally small disturbed samples were taken at each change in stratum and at 0.5 m intervals thereafter in clay soils; and bulk samples were taken at 1 m intervals where the sand and gravel content of the soil was significant.

Where specified by Design Organisation, UT100 open drive tube samples were taken using thin-walled sampling apparatus from the relatively undisturbed material at the base of the borehole.

Standard penetration tests (SPT) were generally undertaken at 1.0 m until the termination depth of the hole. Where cohesive soils were encountered, the SPT interval became 1.5m and UT100 samples were taken from 0.5 m below the lower end of the SPT.



In addition, sampling requirements for contamination testing - consisting of 1 No. 1 litre plastic tub, 1 glass jar and 2 glass vials - typically comprised for each sample location as:

- 1 sample from the topsoil (if present), taken as close to the surface as possible i.e. just below the grass root zone for example at 0.05-0.25 m within the hand dug inspection pit;
- 2 samples from the top 1.0 m within Made Ground;
- 1 sample per metre of Made Ground thereafter or change in strata;
- 1 sample in each natural stratum; and,
- 1 sample of materials that may be of particular interest e.g. where there is strong visual or olfactory evidence of contamination.

### 3.2.4 Trial Pitting/Trial Trenches

Trial pits were undertaken using a JCB 3CX backhoe wheeled excavator. The trial pits were logged entirely surface and arisings obtained from the trial pits.

Samples of the material recovered in the trial pits were taken to enable representative laboratory testing. Generally small disturbed samples were taken at each change in stratum and at 0.5 m intervals thereafter in clay soils; and bulk samples were taken at 1 m intervals where the sand and gravel content of the soil was assessed as significant.

In addition, sampling requirements for contamination testing was the same as the schedule outlined in the cable percussive boring section

Photographic records of the trial pit elevation and arisings were taken and are presented with the associated trial pit log.

## 3.3 *In situ* Testing

### 3.3.1 General

*In situ* testing was carried out within the relevant exploratory hole or at a specified test location. Where tests were undertaken within or associated with a specific borehole or trial pit, the test data is presented on the relevant exploratory hole log or as additional sheets to that log. As such, the location details will be the same as the associated hole and its position will be the same as the exploratory hole with which it is associated.

Where *in situ* tests were carried at standalone location not directly associated with other exploratory holes, the tests results are presented as individual records and as such; their as-constructed locations are given on the test records and their positions are shown on drawing 10018973-GLR-EHP-0001.

### 3.3.2 Penetration Testing

#### 3.3.2.1 Standard Penetration Tests

Standard penetration tests (SPT) were carried out as required in the investigation scope and in accordance with the methods given in the standard procedures presented within Appendix B. Generally tests were undertaken at regular intervals throughout the borehole to provide a profile of the soil's resistance with depth and a disturbed soil samples was recovered from the SPT split-spoon tool or a disturbed sample was taken over the range of the test interval.

The N-values as determined in the field are presented on the borehole logs as uncorrected values that do not take into account the energy losses or efficiency of the automatic trip hammer used to drive the test tool into the ground. The calibration certification for the test devices used in the investigation is presented in Appendix D.



### 3.3.2.2 TRL Dynamic Cone Penetrometer Test

The penetration resistance of the ground was determined by the TRL dynamic cone penetrometer at the locations specified in the ground investigation scope. Generally, the tests were undertaken adjacent to or as an extension of other exploratory holes to provide additional investigation depth or to provide a subjective record of the ground profile and therefore test results are presented with the associated exploratory hole record in Appendix C.

The TRL dynamic penetrometer is a hand-held test apparatus that uses a lightweight (8 kg) free-fall hammer to drive a 20 mm diameter 60° cone into the ground. The penetration of the cone is recorded after a set number of blows as millimetres per blow. The tests were undertaken in accordance with PR IN 277-04 [5], and the results have been assessed in terms of the CBR-value using the relationship proposed by Jones and Rolt [6] given as:

$$\text{Log (CBR)} = 2.48 - 1.057 \cdot \text{Log} \left( \frac{\text{mm}}{\text{blow}} \right).$$

Location ID	Hole Type	Final Depth (m)	Comments
TRL1	TRL probe	1.1	Terminated on refusal.
TRL2	TRL probe	1.5	Terminated on refusal.
TRL3	TRL probe	0.7	Terminated on refusal.
TRL4	TRL probe	1.5	Terminated on refusal.
TRL5	TRL probe	1.4	Terminated on refusal.
TRL6	TRL probe	1.9	Terminated on refusal.
TRL7	TRL probe	2	Terminated at scheduled depth.
TRL8	TRL probe	2	Terminated at scheduled depth.
TRL9	TRL probe	2	Terminated at scheduled depth.
TRL10	TRL probe	1.9	Terminated on refusal.

Table 3-4. Summary of TRL tests.

#### Notes

TRL = TRL Dynamic Cone Penetrometer Test.

### 3.3.3 Strength and Deformation Testing

#### 3.3.3.1 Determination of undrained shear strength using Hand Vane apparatus

Hand shear vane tests were carried out using a Pilcon hand shear vane with a cruciform vane of 19 mm/33 mm diameter. The tests were made in the sides of trial pits/base of the exploratory hole/in the end of recovered thin wall samples of suitable Quality Class as appropriate.

The test was performed in general accordance with the manufacturer's instructions and the vane was inserted a minimum distance of 70 mm below the surface tested. The vane head was rotated slowly at a speed not greater than 1 revolution per minute until the soil failed in shear or the maximum reading of the device was achieved. For valid tests, the remoulded strength of the failed soil was determined by rapidly



rotating the vane head for five complete rotations and allowing a minimum rest period of 3 minutes before reapplying torque to the vane.

The undrained soil strength was read directly from the calibrated vane head in kPa. It should be noted that these values are based on an empirical relationship derived by Pilcon from undrained triaxial compression tests on samples of London Clay.

Where possible, four tests were made to provide an average value, however, it should be noted that where natural fissures or discontinuities are present the minimum values may provide a better representation of the mass consistency of the soil and may be significant.

Due to the nature of the samples tested, the results are indicative for assistance in determining soil consistency for logging purposes only and should not be used to classify soil strength.

### 3.3.4 Hydraulic Tests

#### 3.3.4.1 Soakaway Tests

The soil infiltration rate was determined by conducting soakaway tests in accordance with the methodology described in BRE 365 [7]. The tests were conducted in trial pits dug to the anticipated soakaway depth. Summary information of the tests is presented Table 3-3 while detailed test sheets are presented with the relevant trial pit log in Appendix C.

Location ID	Depth of pit (m)	Time to empty (minutes)	Soil Infiltration Rate ( $f\text{ ms}^{-1}$ )	Comment/limitations
TPSA2A03A				
Test 1	1.3	41.5	2.55E-06	
Test 2	1.3	52	2.31E-06	
Test 3	1.2	60	1.69E-06	
TPSA2A07	2.1	N/A	N/A	Test pit filled only once due to excessive time to achieve infiltration. 75% not achieved.

Table 3-5 Summary of trial pit soakage tests

### 3.3.5 VOC Head Space Screening

The presence of Volatile Organic Compounds (VOC) within the ground and groundwater was determined using a photoionization detector (PID) to detect the 'headspace' vapours emitted by the compounds. The method is applicable to a wide range of compounds that have sufficiently high volatility to be effected liberated from the soil or water matrix in normal temperature and pressure ranges.

The headspace test was undertaken on the freshly extracted soil samples at regular intervals by placing a small amount of material into a screw-top glass jar so that the jar was not more than half-full. The jar opening was covered with an aluminium foil sheet and the lid screwed on to form an air-tight seal. The sample and jar were then shaken for about 15 seconds to break-up and disperse the soil before resting the sample for about 5 minutes.

The testing was undertaken using a GA5000 Landfill Gas Analyser. To assess the headspace vapour, the jar lid was removed and the PID inlet tube was inserted through the foil into the headspace area. The PID reading recorded was the highest response observed in the first 10 seconds. The screening results are presented on the relevant exploratory holes logs within Appendix C.



## 3.4 Installations and Post-fieldwork Monitoring

### 3.4.1 Installations

Installations to enable long term monitoring of the site were made in those boreholes selected by Arcadis Consulting UK (Ltd) and the details are summarised in Table 3-4 and are also provided on the relevant borehole logs.

Location ID	Installation Type	Response Zone Top m bgl	Response Zone Base m bgl	Comment/limitations
BH2A01	SP50 slotted	0.50	2.50	Two dual installations in each borehole. One to target shallow soils / groundwater strike (River Terrace deposits) and second to target groundwater in deep Clay.
BH2A01	SP50 slotted	4.00	7.00	
BH2A02	SP50 slotted	0.50	2.20	
BH2A02	SP50 slotted	4.00	8.00	
BH2A03	SP50 slotted	1.00	5.00	
BH2A03	SP50 slotted	12.00	15.00	
BH2A04	SP50 slotted	0.50	3.00	
BH2A04	SP50 slotted	12.00	15.00	
BH2A05	SP50 slotted	0.50	2.50	
BH2A05	SP50 slotted	12.00	15.00	
BH2A06	SP50 slotted	0.50	2.50	
BH2A06	SP50 slotted	4.00	7.00	
BH2A07	SP50 slotted	0.50	3.00	
BH2A07	SP50 slotted	7.00	10.00	

Table 3-62 Summary exploratory hole installations

#### Notes

SP50 = standpipe piezometer

### 3.4.2 Post-fieldwork Monitoring

Post-field work monitoring was undertaken on separate visits on June 21<sup>st</sup>, June 29<sup>th</sup>, July 6<sup>th</sup> and July 13<sup>th</sup>. In all, four visits to the site were made to record land gas emissions and groundwater levels. During the first monitoring visit, the well was purged by removing three well volumes of groundwater and in situ groundwater monitoring and sampling was undertaken. Where installations were purged dry, monitoring and sampling was conducted on groundwater recovered following recharging of groundwater in installations. Parameters measured during in situ monitoring were pH, dissolved oxygen, conductivity and redox potential. The results of the groundwater monitoring are presented within Appendix E.



## 4 LABORATORY TESTING

### 4.1 General

Geotechnical and geo-environmental chemical testing was undertaken on selected samples obtained from the exploratory holes. The testing was scheduled by the geotechnical and/or geo-environmental engineer and the testing was undertaken by an Arcadis approved testing laboratory.

### 4.2 Geotechnical Laboratory Testing

The geotechnical tests detailed in Table 4-1 were carried out in accordance with either BS1377:1990: Parts 1 to 9 [17]; BS EN ISO 17892: Parts 1 to 12 [18]; BRE SD 1:2005 [8]; or other methods as listed in Table 4-1. The complete results of the geotechnical laboratory testing are presented in Appendix F.

Test	Method	No of Determinations
Moisture content	BS 1377 : Part 2 : 3.2	55
4-point liquid and plastic limit	BS 1377 : Part 2 : 4.3 & 5.3	42
Particle Size Distribution - Wet sieving	BS 1377 : 1990 Part 2 : 9.2	10
Dry Den/MC (2.5kg Rammer Method 1 Litre Mould)	BS1377 : 1990 Part 4 : 3.3	5
CBR: Remoulded Specimen and tested at top only	BS1377 : 1990 Part 4 : 7	12*
Quick Undrained Triaxial Compression test - single specimen at one confining pressure	BS1377 : 1990 Part 7 : 8	28
pH, water soluble sulphate; total sulphate, total sulphur, chloride, nitrate, magnesium	BRE SD1 preferred methods	15

Table 4-1 Summary of geotechnical test data

\*Notes: One CBR Test omitted due to anomalous test result.

### 4.3 Geo-Environmental Laboratory Testing

Geo-environmental tests were undertaken on soil, groundwater and prepared leachate specimens obtained from the samples collected from the site. Testing was carried out for the contaminants detailed in Table 4-2, Table 4-3 and Table 4-4. The results of the chemical laboratory testing are presented in Appendix G. Details of the test methodology is presented with the test results.

Test type	Method	No of Determinations
Metals (As, B, Cr, Cd, Cu, Pb, Hg, Ni, Se, Zn),	Induced Coupled Plasma Optical Emission Spectroscopy (ICP-OES)	30



pH	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	30
Cyanide Free and Total	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	30
Speciated Polycyclic Aromatic Hydrocarbon compounds (PAH)	Gas Chromatography –Mass Spectrometry (GC-MS)	30
Total Petroleum Hydrocarbon Criteria Working Group (TPH CWG)	Gas Chromatography – Flame Ionisation Detector (GC-FID)	15
Benzene, Toluene, Ethylbenzene, Total Xylenes (BTEX)	GC-MS	15
Phenol (total), Cresol, Chlorinated Phenols	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	30
Total Organic Carbon	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests"	6
Asbestos Screen and Identification	In house method based on HSG 248	1

Table 4-2 Summary of geo-environmental test data – soil matrix

Test type	Method	No of Determinations
Metals (As, B, Cr, Cd, Cu, Pb, Hg, Ni, Se, Zn),	ICP-OES	27
Speciated Polycyclic Aromatic Hydrocarbon compounds (PAH)	GC-MS	27
pH	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	27
Cyanide Free and Total	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	27
TPH CWG	GC-FID	27

Table 4-3 Summary of geo-environmental test data – groundwater matrix



## 5 REFERENCES

### General References

1. Arcadis Consulting. 2018. Northstowe - Parcel 2A. Site Investigation Memo. May 2018.
2. Arcadis Consulting. 2017. Ground Investigation Report for Northstowe Phase 2. Arcadis Consulting Report UA008426-AFS-GLR-G001 . March 2017.
3. British Geological Survey. 1975. Huntingdon. England and Wales Sheet 187. Drift Deposits. 1:50 000. BGS Keyworth, Nottingham.
4. British Geological Survey. 1981. Cambridge. England and Wales Sheet 188. Solid and Drift Deposits. 1:50 000. BGS Keyworth, Nottingham.
5. TRL. 2004. Dynamic cone penetrometer tests and analysis. TRL Technical Report PR IN 277-04. Transport Research Laboratory, Crowthorne, England.
6. Jones C R and Rolt J. 1991. Operating instructions for the TRL dynamic cone penetrometer. 2<sup>nd</sup> Edition Information Note. Transport Research Laboratory, Crowthorne.
7. Building Research Establishment. 2016. Soakaway Design. BRE Digest DG365. BRE, Watford.
8. Building Research Establishment. 2005. Concrete in aggressive ground. BRE Special Digest 1. 3<sup>rd</sup> Edition. BRE, Watford.

### National Standards

9. BS EN 1997-1. 2004. Eurocode 7: Geotechnical Design. Part 1 General Rules. British Standards Institution, 2013 (revised text).
10. BS EN 1997-2. 2007. Eurocode 7: Geotechnical Design. Part 2 Ground Investigation and testing. British Standards Institution, 2010 (revised text).
11. BS 5930. 2015. Code of practice for ground investigations. British Standards Institution.
12. BS 10175. 2011. Investigation of potentially contaminated sites – Code of practice. British Standards Institution.
13. BS 1377. 1990. Method of test for soils for civil engineering purposes. Published in 9 Parts. British Standards Institution,
14. BS EN ISO 17892-1: Geotechnical investigation and testing – Laboratory testing of soil – Determination of water content. British Standards Institution.
15. BS EN ISO 17892-2: Geotechnical investigation and testing – Laboratory testing of soil – Determination of bulk density. British Standards Institution.

### Internet References

16. British Geological Survey: <http://www.bgs.ac.uk/data/mapViewers/home.html>. Accessed June 2018.
17. Coal Authority: <http://mapapps2.bgs.ac.uk/coalauthority/home.html>. Accessed June 2018.
18. Gov.UK: <https://flood-warning-information.service.gov.uk/long-term-flood-risk/map>. Accessed June 2018.
19. MagicMap: <http://magic.defra.gov.uk/MagicMap.aspx>. Accessed June 2018.

### Other References

20. WSP Environmental (UK) (2007) Northstowe Zone B - Interim Factual Report (Report Number 12170626)

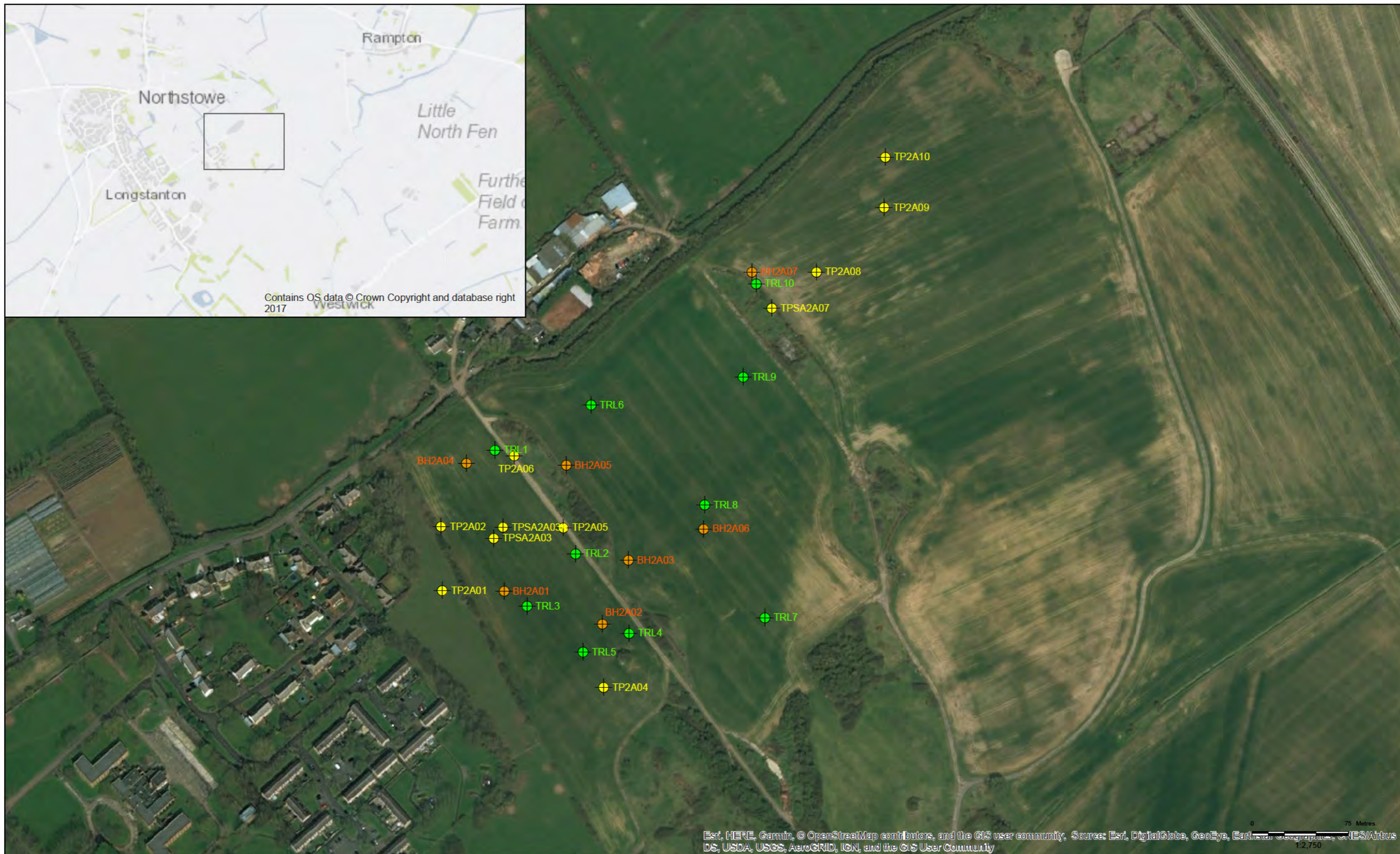


## APPENDIX A

### DRAWINGS

Drawing 10018973-GLR-EHP-0001: Exploratory Hole Location Plan





Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community, Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community


### Legend

- TRL Probe Locations
- Trial Pit Locations
- Borehole Locations

**Client**

**Homes England**  
Client

**Site**  
Former Oakington Airfield  
Cambridge

Homes England  
50 Victoria Street  
Westminster  
London  
SW1H 0TL

0300 123 900  
0300 123 900

Designed	Reg. 13(1)	Date	17 Jul 18	Signed	IT
Drawn		Date	17 Jul 18	Signed	IT
Checked	Reg. 13(1)	Date	20 Jul 18	Signed	SH
Approved	Reg. 13(1)	Date	20 Jul 18	Signed	GW
Scale:	1:2,750	Datum	AOD		
Original Size:	A3	Grid	OS		
Project Number	10018973				

**PROJECT:**  
Northstowe - Parcel 2A

**TITLE:**  
Exploratory Hole Location Plan

**ARCADIS** Design & Consultancy for natural and built assets

Registered office: Arcadis House, 34 York Way, Kings Cross, London N1 9AB, www.arcadis.com

Coordinating office: 10 Medawar Road, The Surrey Research Park, Guildford GU2 7AR

Drawing Number: 10018973-GLR-EHP-0001

Revision: 02



# APPENDIX B

## STANDARD PROCEDURES



## B0 General Principles

This ground investigation was undertaken in general accordance with the principles of BS EN 1997-1 [1] and BS EN 1997-2 [2] and the advice given in BS5930:2015 [8], which, provides complimentary guidance on the application of the primary standards. Where the requirements of the ground investigation specification differ from these primary standards, the investigation methodology was adapted as required and specific notes regarding methods and techniques employed were made in the appropriate report sections.

## B1 Buried Services

Service clearance was undertaken in accordance with Arcadis' *Safety, Health and Environment (SHE) Standard – Avoidance of Sub-Surface Hazards and Structures Standard*. This document details the methods and safe working practices used to undertake excavations safely. Prior to breaking ground, services plans were consulted and the area scanned using a Cable Avoidance Tool (CAT) with detected signals marked on the ground. For all investigation positions, other than for machine excavated trial pits, hand excavated inspection pits are completed to 1.20 m bgl prior to the use of drilling and boring plant.

## B2 Sampling requirements

The selection of sample types and sampling techniques has been chosen to take account of the soil fabric, size and quality of sample required based on whether the soils mass properties or the intact material properties of the ground are to be determined in subsequent laboratory tests. BS EN ISO 22475-1 [4] describes three generic sample groups that are:

- a. Sampling by drilling. Generally a disturbed sample recovered from the drilling tool or digging equipment, typically meeting Class 3 to Class 5 requirements, with the recovered material being stored in bulk bags or sealed jar or tub containers.
- b. Sampling by sampler. Typically referred to as open tube or drive sampling in which a tube with a sharp cutting edge is driven into the ground either by static thrust or dynamically driven to give a relatively undisturbed sample of Class 1 or Class 2 but may result in a Class 3 sample.
- c. Block sampling. Cylindrical large diameter samples or cuboid hand-cut samples usually relatively undisturbed Class 1 and Class 2.

The open-tube sampling equipment used on the site was of a type and design that conformed to BS EN ISO 22475-1. For the purpose of this ground investigation block sampling was not required.

Generally samples were assessed on site and any unexpected deterioration in sample quality was reported to the ground engineer by the lead drilling technician.

Sufficient and representative samples were taken to allow the geo-mechanical properties of the ground to be adequately characterised and to enable the sequence of soil strata to be described by an engineering geologist or geotechnical engineer.

Where samples have been taken for chemical tests the drilling method attempted to adopt dry drilling over the sampling range that generally was achieved by the use of drill casing to separate and isolate the upper soil layers and exclude groundwater. Cross-contamination was further reduced by regular cleaning of sampling tools. Sample integrity was maintained by sealing samples immediately on collection and storing the samples in a temperature controlled cool box. Samples were despatched from the site at the end of the shift on which they were collected or as



required in the project specification. Details of best practice storage, preservation and decontamination measures undertaken are given below:

Task	Soil	Groundwater	Ground Gas
Storage	Glass jars and vials supplied by the laboratory were used for the collection of soil samples to be analysed for volatile compounds. Plastic one-litre tubs were used to collect soil samples for metals analysis.	Glass vials supplied by the laboratory were used for the collection of samples to be analysed for volatile compounds. Samples to be analysed for lower volatility compounds were stored in laboratory prepared glass bottles.	1.4L Canisters supplied by the laboratory.
Preservation	Filling of sample containers as far as practicable to minimise headspace and low storage temperature to minimise the potential for volatilisation and biodegradation of petroleum hydrocarbon compounds prior to analysis.		Not required.
Decontamination	Disposable gloves were worn and changed between sample collection to prevent cross-contamination.	Groundwater samples were collected using dedicated disposable tubing / bailers, that were changed between monitoring well locations in order to prevent cross-contamination.	Disposable gloves were worn and changed between sample collection to prevent cross contamination.
Transport	Samples stored in dedicated sample boxes provided by the laboratory. Sample details and analytical requests were recorded on the laboratory chain of custody form included with samples, prior to dispatching to laboratory for analysis. Samples were dispatched to the laboratory on the day of sampling.		

### B3 Sample description

Sample description was undertaken by the Arcadis site geologist in accordance with BS 5930: 2015. The descriptions of the individual samples were used to identify the sequence of strata at the exploratory hole location and from which representative exploratory hole logs were drawn.

### B4 *In situ* testing

*In situ* geotechnical tests were undertaken taking account of the investigation scope and requirement to attain the appropriate parameters required in the geotechnical design. The tests were undertaken in accordance with the requirements of the relevant parts of BS EN ISO 22476 [5, 6, 7] and other methods as follows:

#### Standard penetration testing

Standard penetration tests were carried out in accordance with BS EN ISO 22476-3, BS EN 1997-2 and the national Annex to BS EN 1997-2. The test records are presented on the borehole logs as blow counts for each increment with the N-value as the total number of blows of the four main test increments.

Where the N-value exceeds a total of 50 blows, the test reports the penetration in millimetres for the last test increment recorded, and the N value is indicated as greater than 50,

e.g. 4,5/12,14,18, 6 for 10 mm

indicates that the seating blows (4 and 5) were completed and that the test terminated in the 4<sup>th</sup> increment after penetrating 10 mm.

Where the seating blows exceeded 25 blows for less than 150 mm; the test was stopped and the rods remarked after which, the main drive was continued. The test is then reported as the number of blows in each seating drive for the recorded penetration with the results of the main drive given as above,

e.g. 14/11 for 45 mm/12,14,16, 8 for 10 mm.

In certain circumstances where groundwater in-flow may affect the test, particularly in fine sand or silt, low SPT blow counts may be recorded. Where the SPT blow count was very low, N values of 5 or less, the test was, at the discretion of the site engineer, continued for a further 300 mm, recording blows for each 75 mm increment. **This is not** a standard penetration test value, it does however give an indication of potential disturbance to the ground.

#### **TRL Dynamic cone penetrometer**

The TRL DCP is a device developed by the TRL to assess the California Bearing Ratio of road sub-base by correlation. As such the device was developed for use in a limited range of soil types. The test has no formal standard the test methodology and its use is discussed in TRL report PR IN 277-04 [11].

## **B5 Data transfer format**

The data collated during the ground investigation has been organised and managed using the “AGS data format” that allows data transfer between different disciplines and organisations in accordance with BS 8574 [9].



## B6 References

1. BS EN 1997-1. 2004. Eurocode 7: Geotechnical Design. Part 1 General Rules. British Standards Institution, 2013 (revised text).
2. BS EN 1997-2. 2007. Eurocode 7: Geotechnical Design. Part 2 Ground Investigation and testing. British Standards Institution, 2010 (revised text).
3. BS EN ISO 22282-1:2012. Geotechnical investigation and testing – Geohydraulic testing. Part 1: General Rules. British Standards Institution.
4. BS EN ISO 22475-1. Geotechnical investigation and testing – Sampling methods and groundwater measurements – Part 1 Technical principles for execution.
5. BS EN ISO 22476-1:2015. Geotechnical investigation and testing – Field testing – Part 1: Electrical cone and piezocone test. British Standards Institution
6. BS EN ISO 22476-2. Geotechnical investigation and testing – Field testing – Part 2: Dynamic Probing. British Standards Institution
7. BS EN ISO 22476-3 2005. Geotechnical investigation and testing – Field testing – Part 3: Standard penetration test. British Standards Institution
8. BS 5930: 2015. Code of practice for ground investigation. British Standards Institution.
9. BS 8574. Code of practice for the management of geotechnical data for ground engineering projects.
10. BS 1377-9. 1990. Methods of test for soils for civil engineering purposes. Part 9: In-situ tests. British Standards Institution.
11. TRL. 2004. Dynamic cone penetrometer tests and analysis. TRL Technical Report PR IN 277-04. Transport Research Laboratory, Crowthorne, England.

Northstowe – pARCEL 2A

## B7 Exploratory Hole Key



# Key to Exploratory Hole Symbols and Abbreviations

## SAMPLE TYPES

B	Bulk disturbed sample	ES	Environmental soil sample	U	Undisturbed sample
C	Core sample	EW	Environmental water sample	UT	Undisturbed thin wall sample
CBR-D	Disturbed sample from CBR test area	G	Gas sample	W	Water sample
CBR-U	Undisturbed sample from CBR test area	L	Liner sample		
D	Small disturbed sample	SPT	SPT split spoon sample		

## IN-SITU TESTING

SPTs	Standard Penetration Test (using a split spoon sampler)
SPTc	Standard Penetration Test (using a solid 60 degree cone)
N	Recorded SPT 'N' Value *
-/-	Blows/Penetration (mm) after seating blows totalling 150 mm
MX	Mexi Probe Test (records CBR as %)
HV	Hand Shear Vane Test (undrained shear strength quoted in kPa)
PP	Pocket Penetrometer Test (kg/m <sup>3</sup> )
( )	Denotes residual test value
PID	Photo Ionisation Detector (ppm) *
Kf/Kr	Permeability Test (f = falling head, r = rising head quoted in ms <sup>-1</sup> )
HPD	High Pressure Dilatometer Test (pressure meter)
PKR	Packer / Lugeon Permeability Test
CBR	California Bearing Ratio Test

## ROTARY CORE DETAILS

TCR	Total Core Recovery, %
SCR	Solid Core Recovery, %
RQD	Rock Quality Designation (% of intact core >100 mm)
FI	Fracture Spacing (average fracture spacing; in mm, over indicated length of core) **
NI	Non-Intact Core
AZCL	Assumed Zone of Core Loss

## GROUNDWATER

	Groundwater strike
	Standing water level after 20 minutes; 1st, 2nd etc (number denotes level order)

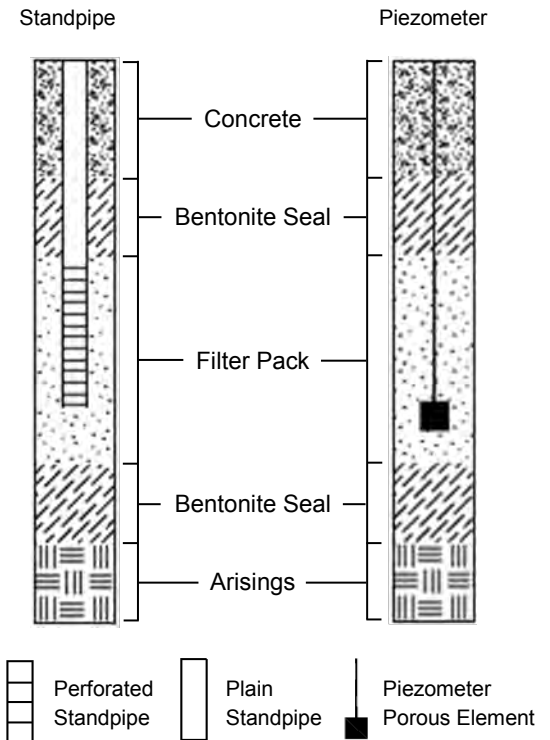
## STRATA LEGENDS - Note: Composite strata types are shown by combining symbols

	Made Ground		Silt		Peat		Limestone
	Concrete		Sand		Void		Chalk
	Bituminous Bound Materials		Gravel		Mudstone		Coal
	Topsoil		Cobbles		Siltstone		Metamorphic Rock
	Clay		Boulders		Sandstone		Fine Grained Igneous Rock

\* Where a single value is quoted this is the uncorrected 'N' value for a full 300 mm test drive following a seating drive of 150mm. Where the full test drive penetration is not achieved the number of blows is quoted for the penetration below the test total of 300mm, e.g.: 50/75.

\*\* The minimum, average and maximum are shown e.g. 5/45/125.

## INSTALLATION & BACKFILL DETAILS



## STRATUM BOUNDARIES

	Unit boundary
--	---------------

APPENDIX C  
EXPLORATORY HOLE LOGS



Project  
**Northstowe - Parcel 2A**  
Client  
**Homes England**

Project No.  
**10018973**  
Easting (OS mE)  
**540803.00**

Ground Level (mAOD)  
**8.73**  
Northing (OS mN)  
**266850.70**

Start Date  
**31/05/2018**  
End Date  
**01/06/2018**

Scale  
**1:50**  
Sheet 1 of 2

SAMPLES		TESTS			Water Strikes	PROGRESS		STRATA			Depth (Thickness)	Level	Install/ Backfill
Depth	Type/ No.	Depth	Type/ No.	Results		Date Time	Casing Water	Description	Legend				
0.00 - 0.50	B1						01/06/2018 07:00	0.00 Dry	Orangeish brown mottled light grey clayey gravelly fine to coarse SAND. Gravel is subangular to rounded fine to coarse flint. [RIVER TERRACE DEPOSITS]				
0.00 - 0.50	D20												
0.00 - 0.50	ES24												
0.50 - 1.00	B2										(1.00)		
0.50 - 1.00	D21											7.73	
0.50 - 1.00	ES25												
1.20 - 1.50	B3	1.20	SPT(S)	N=7 (2,1/2,1,2,2)					Firm brown slightly gravelly sandy CLAY. Sand is fine to coarse. Gravel is subangular rounded fine to coarse flint. [RIVER TERRACE DEPOSITS]		(0.70)		
1.20 - 1.50	D22												
1.20 - 1.50	ES26												
1.50 - 2.00	B4												
1.50 - 2.00	D23											7.03	
1.50 - 2.00	ES27												
2.00 - 2.45	U5								Stiff fissured dark grey CLAY. Fissures are extremely closely spaced, randomly orientated, smooth and mat. [KIMMERAGE CLAY FORMATION]				
2.50 - 3.00	B6												
3.00 - 3.45	D7	3.00	SPT(S)	N=50 (3,18/24,16,7,3)					Siltstone band recovered as light grey mottled bluish grey weak to very weak fine grained siltstone.		(4.30)		
3.50 - 4.00	D8												
4.00 - 4.45	U9												
4.50 - 5.00	D10								Siltstone band recovered as light grey mottled bluish grey weak to very weak fine grained siltstone.				
5.00 - 5.50	D11	5.00	SPT(S)	N=34 (5,5/7,8,9,10)									
5.50 - 6.00	B12												
6.00 - 6.45	U13												
6.50 - 7.50	D14								Very stiff fissured dark grey CLAY with occasional light grey siltstone pockets. Fissures are extremely closely spaced, randomly orientated, smooth and mat. [KIMMERAGE CLAY FORMATION]		6.00	2.73	
7.50 - 7.95	D15	7.50	SPT(S)	N=35 (5,5/7,8,9,11)									
8.00 - 9.00	D16												
9.00 - 9.45	U17												
9.50 - 10.00	B18												
10.00 - 10.45	D19	10.00	SPT(S)	N=35 (5,6/7,8,9,11)							(4.45)		

DRILLING TECHNIQUE			CHISELLING			WATER OBSERVATIONS					HOLE/CASING DIAMETER				WATER ADDED			
From	To	Type	From	To	Duration	Date/Time	Strike At	Time Elapsed	Rise To	Casing	Sealed	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Volume (ltr)
0.00	1.20	Inspection Pit	3.10	3.30	00:33	31/05/2018 14:30	2.40	20	2.11	1.65	3.15	150	10.45	150	3.15			
1.20	10.45	Cable Percussion	4.50	4.60	00:25	31/05/2018 15:30	4.60	20	4.43	3.15	3.15							

Remarks  
PID results not included as equipment became moisture sensitive. Exploratory hole terminated at scheduled depth of 10.45mbgl.

Termination Depth:  
**10.45m**

Project  
**Northstowe - Parcel 2A**  
Client  
**Homes England**

Project No.  
**10018973**  
Easting (OS mE)  
**540803.00**

Ground Level (mAOD)  
**8.73**  
Northing (OS mN)  
**266850.70**

Start Date  
**31/05/2018**  
End Date  
**01/06/2018**

Scale  
**1:50**  
**Sheet 2 of 2**

SAMPLES		TESTS			Water Strikes	PROGRESS		STRATA			Depth (Thickness)	Level	Install/ Backfill
Depth	Type/ No.	Depth	Type/ No.	Results		Date Time	Casing Water	Description	Legend				
						01/06/2018 11:00	3.15 13.84	Very stiff fissured dark grey CLAY with occasional light grey siltstone pockets. Fissures are extremely closely spaced, randomly orientated, smooth and mat. [KIMMERAGE CLAY FORMATION]			10.45	-1.72	

DRILLING TECHNIQUE			CHISELLING			WATER OBSERVATIONS					HOLE/CASING DIAMETER				WATER ADDED			
From	To	Type	From	To	Duration	Date/Time	Strike At	Time Elapsed	Rise To	Casing	Sealed	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Volume (ltr)
0.00	1.20	Inspection Pit	3.10	3.30	00:33	31/05/2018 14:30	2.40	20	2.11	1.65	3.15	150	10.45	150	3.15			
1.20	10.45	Cable Percussion	4.50	4.60	00:25	31/05/2018 15:30	4.60	20	4.43	3.15								

Remarks  
PID results not included as equipment became moisture sensitive. Exploratory hole terminated at scheduled depth of 10.45mbgl.

Termination Depth:  
**10.45m**



Unless otherwise stated  
Depth (m), Diameter (mm), Time (hhmm),  
Thickness (m), Level (mOD).

Equipment Used  
**Dando 2000**

Contractor  
**Arcadis Consulting (UK) Ltd**

Logged By  
**SH**

Checked By  
**SH**



Project  
**Northstowe - Parcel 2A**  
Client  
**Homes England**

Project No.  
**10018973**  
Easting (OS mE)  
**540877.00**

Ground Level (mAOD)  
**8.75**  
Northing (OS mN)  
**266834.00**

Start Date  
**04/06/2018**  
End Date  
**05/06/2018**

Scale  
**1:50**  
Sheet 1 of 2

SAMPLES		TESTS			Water Strikes	PROGRESS		STRATA			Depth (Thickness)	Level	Install/Backfill
Depth	Type/No.	Depth	Type/No.	Results		Date Time	Casing Water	Description	Legend				
0.00 - 0.50	B1												
0.00 - 0.50	D29								Orangish brown mottled white clayey slightly gravelly fine to coarse SAND. Gravel is angular to subrounded fine to medium flint.				
0.00 - 0.50	ES25								[RIVER TERRACE DEPOSITS]				
0.50 - 1.00	B2								Becoming very gravelly.		(1.20)		
0.50 - 1.00	D30												
0.50 - 1.00	ES26												
1.20 - 1.50	B3	1.20	SPT(S)	N=9 (2,2/3,2,2,2)		04/06/2018	1.20				1.20	7.55	
1.20 - 1.50	D31					17:00	0.77		Loose yellowish brown clayey very sandy GRAVEL. Sand is fine to coarse. Gravel is angular to subrounded fine to medium flint with occasional pockets (50 - 100mm) of sandy gravel, clayey sand and gravelly sand.				
1.20 - 1.50	ES27					05/06/2018	1.20		[RIVER TERRACE DEPOSITS]		(1.00)		
1.50 - 2.00	B4					07:00	0.77						
1.50 - 2.00	D32	2.00	SPT(S)	N=7 (2,3/2,2,1,2)									
1.50 - 2.00	ES28												
2.20 - 3.00	B5								Stiff dark grey CLAY.		2.20	6.55	
2.20 - 3.00	D33								[KIMMERAGE CLAY FORMATION]				
3.00 - 3.45	D6	3.00	SPT(S)	N=12 (1,2/2,3,3,4)									
3.50 - 4.00	D7												
4.00 - 4.45	U8								Siltstone band recovered as light grey mottled bluish grey weak to very weak fine grained siltstone.				
4.50 - 5.00	D9												
5.00 - 5.45	D10	5.00	SPT(S)	N=28 (5,5/6,6,7,9)					Siltstone band recovered as light grey mottled bluish grey weak to very weak fine grained siltstone.		(5.30)		
5.50 - 6.00	B11												
6.00 - 6.45	U12												
6.50 - 7.50	D13												
7.50 - 7.95	D14	7.50	SPT(S)	N=26 (3,5/5,6,7,8)					Very stiff dark grey CLAY.		7.50	1.25	
8.00 - 9.00	D15								[KIMMERAGE CLAY FORMATION]				
9.00 - 9.45	U16												
9.50 - 10.50	B17												

DRILLING TECHNIQUE			CHISELLING			WATER OBSERVATIONS				HOLE/CASING DIAMETER				WATER ADDED				
From	To	Type	From	To	Duration	Date/Time	Strike At	Time Elapsed	Rise To	Casing	Sealed	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Volume (ltr)
0.00	1.20	Inspection Pit Cable Percussion	4.40	4.70	01:10	04/06/2018 16:30	0.80	20	0.77	2.60	2.60	150	15.45	150	2.60			
1.20	15.45		14.20	14.40	00:40	05/06/2018 08:30	4.20	20	3.96	2.60	2.60							

Remarks  
PID results not included as equipment became moisture sensitive. Exploratory hole terminated at scheduled depth of 15.45mbgl.

Termination Depth:  
**15.45m**

Project  
**Northstowe - Parcel 2A**  
Client  
**Homes England**

Project No.  
**10018973**  
Easting (OS mE)  
**540877.00**

Ground Level (mAOD)  
**8.75**  
Northing (OS mN)  
**266834.00**

Start Date  
**04/06/2018**  
End Date  
**05/06/2018**

Scale  
**1:50**  
**Sheet 2 of 2**

SAMPLES		TESTS			Water Strikes	PROGRESS		STRATA				Depth (Thickness)	Level	Install/ Backfill
Depth	Type/ No.	Depth	Type/ No.	Results		Date Time	Casing Water	Description	Legend					
-10.50 - 10.95	D18	10.50	SPT(S)	N=31 (4,6/6,7,9,9)			Very stiff dark grey CLAY. [KIMMERAGE CLAY FORMATION]				(7.95)			
-11.00 - 12.00	D19													
-12.00 - 12.45	U20													
-12.50 - 13.50	D21													
-13.50 - 13.95	D22	13.50	SPT(S)	N=35 (4,5/6,8,10,11)										
-14.00 - 15.00	B23						Siltstone band recovered as light grey mottled bluish grey weak to very weak fine grained siltstone.				15.45	-6.70		
-15.00 - 15.45	D24				05/06/2018 13:00	2.60 11.83								

DRILLING TECHNIQUE			CHISELLING			WATER OBSERVATIONS					HOLE/CASING DIAMETER				WATER ADDED			
From	To	Type	From	To	Duration	Date/Time	Strike At	Time Elapsed	Rise To	Casing	Sealed	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Volume (ltr)
0.00	1.20	Inspection Pit Cable Percussion	4.40	4.70	01:10	04/06/2018 16:30	0.80	20	0.77			150	15.45	150	2.60			
1.20	15.45		14.20	14.40	00:40	05/06/2018 08:30	4.20	20	3.96	2.60								

Remarks  
PID results not included as equipment became moisture sensitive. Exploratory hole terminated at scheduled depth of 15.45mbgl.

Termination Depth:  
**15.45m**



Project  
**Northstowe - Parcel 2A**  
Client  
**Homes England**

Project No.  
**10018973**  
Easting (OS mE)  
**540900.30**

Ground Level (mAOD)  
**9.10**  
Northing (OS mN)  
**266874.90**

Start Date  
**30/05/2018**  
End Date  
**31/05/2018**

Scale  
**1:50**  
Sheet 1 of 2

SAMPLES		TESTS			Water Strikes	PROGRESS		STRATA			Depth (Thickness)	Level	Install/Backfill	
Depth	Type/No.	Depth	Type/No.	Results		Date Time	Casing Water	Description	Legend					
0.00 - 0.20	B3	0.00	P D	<1ppm			Grass over soft to firm dark brown gravelly very sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse flint. [TOPSOIL] Loose to dense orange brown clayey SAND and GRAVEL. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse flint. [RIVER TERRACE DEPOSITS] Very soft grey mottled orange brown sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse flint. [KIMMERAGE CLAY FORMATION] Firm grey mottled orange brown slightly gravelly CLAY with siltstone bands. Gravel is subangular to subrounded fine to coarse flint. [KIMMERAGE CLAY FORMATION] Stiff grey brown CLAY with frequent 10-50mm bands of siltstone. [KIMMERAGE CLAY FORMATION]							
0.00 - 0.20	D2													
0.00 - 0.20	ES1													
0.50 - 1.00	B6													
0.50 - 1.00	D5													
0.50 - 1.00	ES4													
1.20 - 1.50	B9	1.20	SPT(C)	N=4 (3,1/1,1,1,1)										
1.20 - 1.50	D8													
1.20 - 1.50	ES7													
1.50 - 2.00	B12	1.50	P D	4.3ppm										
1.50 - 2.00	D11													
1.50 - 2.00	ES10													
2.00 - 2.45	D13	2.00	SPT(S)	N=12 (1,2/2,3,3,4)										
2.00 - 2.45	P D	2.00		7.6ppm										
2.50 - 3.00	D14	2.50	P D	<1ppm										
3.00 - 3.45	UT15													
3.45 - 4.00	D16	3.45	P D	35.9ppm										
4.00 - 4.45	D17	4.00	SPT(S)	N=18 (2,3/3,4,5,6)		30/05/2018 18:30	1.65 Dry							
4.00 - 4.45	P D	4.00		3.8ppm		31/05/2018 07:30	1.65 Dry							
5.00 - 5.45	UT18													
5.50 - 6.00	B19													
6.00 - 6.45	D20	6.00	SPT(S)	N=23 (3,4/4,5,6,8)										
6.00 - 6.45	P D	6.00		2.6ppm										
7.50 - 8.00	B21													
8.00	SPT(C)	8.00		N=28 (10,13/8,8,6,6)										
8.50 - 9.00	D22	8.50	P D	5.1ppm										
9.00 - 9.45	D23	9.00	SPT(S)	N=28 (3,4/5,6,8,9)										
9.00 - 9.45	P D	9.00		<1ppm										
9.50 - 10.50	D24	9.50	P D	<1ppm										

DRILLING TECHNIQUE			CHISELLING			WATER OBSERVATIONS				HOLE/CASING DIAMETER				WATER ADDED				
From	To	Type	From	To	Duration	Date/Time	Strike At	Time Elapsed	Rise To	Casing	Sealed	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Volume (ltr)
0.00	15.45	Cable Percussion Inspection Pit	3.50	3.70	00:50	31/05/2018 18:00	4.70	20	4.53	1.65		150	15.45	150	1.65			
			4.60	4.70	00:30													
			13.70	13.80	00:33													

Remarks  
Exploratory hole terminated at scheduled depth of 15.45mbgl.

Termination Depth:  
**15.45m**

Project  
**Northstowe - Parcel 2A**  
 Client  
**Homes England**

Project No.  
**10018973**  
 Easting (OS mE)  
**540900.30**

Ground Level (mAOD)  
**9.10**  
 Northing (OS mN)  
**266874.90**

Start Date  
**30/05/2018**  
 End Date  
**31/05/2018**

Scale  
**1:50**  
 Sheet 2 of 2

SAMPLES		TESTS			Water Strikes	PROGRESS		STRATA			Depth (Thickness)	Level	Install/Backfill
Depth	Type/No.	Depth	Type/No.	Results		Date Time	Casing Water	Description	Legend				
-10.50 - 10.95	UT25						Stiff grey brown CLAY with frequent 10-50mm bands of siltstone. [KIMMERAGE CLAY FORMATION]						
-11.00 - 12.00	B26												
-12.00 - 12.45	D27	12.00 12.00	SPT(S) P D	N=30 (3,4/5,7,8,10) 1.6ppm									
-13.50 - 13.95	D28	13.50	P D	46.5ppm			Very stiff grey CLAY with occasional 10mm bands of siltstone. [KIMMERAGE CLAY FORMATION]				13.50	-4.40	
-14.50 - 15.00	D29	14.50	P D	13.2ppm							(1.95)		
-15.00 - 15.45	D30	15.00	P D	46.5ppm							15.45	-6.35	
					31/05/2018 13:30	1.65 13.87							

DRILLING TECHNIQUE			CHISELLING			WATER OBSERVATIONS					HOLE/CASING DIAMETER				WATER ADDED			
From	To	Type	From	To	Duration	Date/Time	Strike At	Time Elapsed	Rise To	Casing	Sealed	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Volume (ltr)
0.00	15.45	Cable Percussion	3.50	3.70	00:50	31/05/2018 18:00	4.70	20	4.53	1.65		150	15.45	150	1.65			
0.00	1.20	Inspection Pit	4.60	4.70	00:30													
			13.70	13.80	00:33													

Remarks  
 Exploratory hole terminated at scheduled depth of 15.45mbgl.

Termination Depth:  
**15.45m**



Project  
**Northstowe - Parcel 2A**  
Client  
**Homes England**

Project No.  
**10018973**  
Easting (OS mE)  
**540773.70**

Ground Level (mAOD)  
**8.58**  
Northing (OS mN)  
**266950.60**

Start Date  
**01/06/2018**  
End Date  
**04/06/2018**

Scale  
**1:50**  
Sheet 1 of 2

SAMPLES		TESTS			Water Strikes	PROGRESS		STRATA			Depth (Thickness)	Level	Install/Backfill
Depth	Type/No.	Depth	Type/No.	Results		Date Time	Casing Water	Description	Legend				
0.00 - 0.50	B1						MADE GROUND: Firm to stiff orangish brown mottled bluish grey and white slightly gravelly sandy CLAY with 10mm pockets of silt. Gravel is subangular to subrounded fine to medium flint.	[Cross-hatched pattern]	(0.80)	7.78			
0.00 - 0.50	D32												
0.00 - 0.50	ES28												
0.50 - 1.00	B2						30mm pockets of firm dark grey clay.	[Horizontal line pattern]	0.80	7.78			
0.50 - 1.00	D33												
0.50 - 1.00	ES29												
1.20 - 1.50	B4	1.20	SPT(S)	N=6 (1,1/1,1,2,2)		01/06/2018	1.20	Firm bluish grey mottled orangish brown slightly sandy CLAY with pockets and bands of silt and siltstone. [KIMMERAGE CLAY FORMATION]	[Vertical line pattern]	(2.20)			
1.20 - 1.50	D34					12:00	Dry						
1.20 - 1.50	ES30					04/06/2018	1.20						
1.20 - 1.65	D3					07:00	Dry						
1.50 - 2.00	B5												
1.50 - 2.00	D35												
1.50 - 2.00	ES31												
2.00 - 2.45	U6												
2.50 - 3.00	D7												
3.00 - 3.45	D8	3.00	SPT(S)	N=19 (3,3/4,4,5,6)				Very stiff grey slightly sandy CLAY with pockets and bands of silt and siltstone. [KIMMERAGE CLAY FORMATION]	[Vertical line pattern]	3.00	5.58		
3.00 - 3.45	D8												
3.50 - 4.00	D9												
4.00 - 4.45	U10												
4.50 - 5.00	B11							Siltstone band recovered as light grey mottled bluish grey weak to very weak fine grained siltstone.					
5.00 - 5.45	D12	5.00	SPT(S)	N=32 (5,5/6,8,8,10)				1mm elongated light grey pockets, Possible bioturbation.	[Vertical line pattern]	(12.45)			
5.00 - 5.45	D12												
5.50 - 6.00	D13												
6.00 - 6.45	U14												
6.50 - 7.50	D15												
7.50 - 7.95	D16	7.50	SPT(S)	N=29 (5,5/6,6,8,9)									
8.00 - 9.00	B17												
8.50 - 9.00	D18												
9.00 - 9.45	U19												
9.50 - 10.50	D20												

DRILLING TECHNIQUE			CHISELLING			WATER OBSERVATIONS					HOLE/CASING DIAMETER				WATER ADDED			
From	To	Type	From	To	Duration	Date/Time	Strike At	Time Elapsed	Rise To	Casing	Sealed	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Volume (ltr)
0.00	1.20	Inspection Pit	4.30	4.40	00:30	04/06/2018 14:00	14.80	20	14.53	1.85		150	15.45	150	1.85			
1.20	15.45	Cable Percussion	4.40	4.60	00:50													
			14.30	14.40	00:34													

Remarks  
PID results not included as equipment became moisture sensitive. Exploratory hole terminated at scheduled depth of 15.45mbgl.

Termination Depth:  
**15.45m**

Project  
**Northstowe - Parcel 2A**  
Client  
**Homes England**

Project No.  
**10018973**  
Easting (OS mE)  
**540773.70**

Ground Level (mAOD)  
**8.58**  
Northing (OS mN)  
**266950.60**

Start Date  
**01/06/2018**  
End Date  
**04/06/2018**

Scale  
**1:50**  
Sheet 2 of 2

SAMPLES		TESTS			Water Strikes	PROGRESS		STRATA			Depth (Thickness)	Level	Install/ Backfill
Depth	Type/ No.	Depth	Type/ No.	Results		Date Time	Casing Water	Description	Legend				
-10.50 - 10.95	D21	10.50	SPT(S)	N=31 (5,6/6,7,8,10)			Very stiff grey slightly sandy CLAY with pockets and bands of silt and siltstone. [KIMMERAGE CLAY FORMATION]			15.45	-6.87		
-11.00 - 12.00	D22												
-12.00 - 12.45	U23												
-12.50 - 13.50	B24												
-13.50 - 13.95	D25	13.50	SPT(S)	N=35 (3,4/6,9,9,11)									
-14.50 - 15.00	D26						Siltstone band recovered as light grey mottled bluish grey weak to very weak fine grained siltstone.						
-15.00 - 15.45	D27	15.00	SPT(S)	N=45 (5,8/9,11,11,14)		04/06/2018 16:00	1.65 14.54						

DRILLING TECHNIQUE			CHISELLING			WATER OBSERVATIONS					HOLE/CASING DIAMETER				WATER ADDED			
From	To	Type	From	To	Duration	Date/Time	Strike At	Time Elapsed	Rise To	Casing	Sealed	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Volume (ltr)
0.00	1.20	Inspection Pit	4.30	4.40	00:30	04/06/2018 14:00	14.80	20	14.53	1.65		150	15.45	150	1.65			
1.20	15.45	Cable Percussion	4.40	4.60	00:50													
			14.30	14.40	00:34													

Remarks  
PID results not included as equipment became moisture sensitive. Exploratory hole terminated at scheduled depth of 15.45mbgl.

Termination Depth:  
**15.45m**



Project  
**Northstowe - Parcel 2A**  
Client  
**Homes England**

Project No.  
**10018973**  
Easting (OS mE)  
**540851.50**

Ground Level (mAOD)  
**8.91**  
Northing (OS mN)  
**266949.30**

Start Date  
**05/06/2018**  
End Date  
**06/06/2018**

Scale  
**1:50**  
Sheet 1 of 2

SAMPLES		TESTS			Water Strikes	PROGRESS		STRATA			Depth (Thickness)	Level	Install/Backfill
Depth	Type/No.	Depth	Type/No.	Results		Date Time	Casing Water	Description	Legend				
0.00 - 0.20	B1							Firm to very stiff brownish grey sandy slightly gravelly CLAY with frequent rootlets. Gravel is angular to subrounded fine to medium flint.		(0.20)	8.71		
0.00 - 0.20	D27							[TOPSOIL]		0.20			
0.00 - 0.20	ES28									(0.30)			
0.20 - 0.50	B2							Brownish grey mottled bluish grey clayey gravelly SAND. Gravel is subangular to subrounded fine to medium flint with rare 5mm ironstone nodules.		0.50	8.41		
0.20 - 0.50	D29							[RIVER TERRACE DEPOSITS]					
0.20 - 0.50	ES30												
0.50 - 0.70	B3							Firm to stiff light brown, bluish grey, white and orangish brown sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular to rounded fine white flint.		(0.70)	7.71		
0.50 - 0.70	D31							[KIMMERAGE CLAY FORMATION]					
0.50 - 0.70	ES32												
1.20 - 1.50	B4	1.20	SPT(S)	N=7 (1,2/1,2,2,2)				Soft to firm orangish brown mottled bluish grey slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine flint.		(0.60)	7.11		
1.20 - 1.50	D33							[KIMMERAGE CLAY FORMATION]					
1.20 - 1.50	ES34												
1.50 - 2.00	B5							Firm dark grey slightly sandy CLAY with 1mm pockets of very light brown silt.		1.80	7.11		
1.50 - 2.00	D35							[KIMMERAGE CLAY FORMATION]					
1.50 - 2.00	ES36												
2.00 - 2.45	U6							Occasional fossil shell fragments.		(1.20)			
2.50 - 3.00	D7												
3.00 - 3.45	D8	3.00	SPT(S)	N=16 (2,2/3,4,4,5)				Stiff to very stiff bluish grey mottled grey and brown CLAY.		3.00	5.91		
3.50 - 4.00	D9							[KIMMERAGE CLAY FORMATION]					
4.00 - 4.45	U10												
4.50 - 5.00	B11					05/06/2018 17:00 Dry 06/06/2018 2:50 Dry 07:00 Dry				(2.60)			
5.00 - 5.45	D12	5.00	SPT(S)	N=34 (5,4/7,7,8,12)				Siltstone band recovered as light grey mottled bluish grey weak to very weak fine grained siltstone.		5.60	3.31		
5.50 - 6.00	D13							Stiff dark grey CLAY.					
6.00 - 6.45	U14							[KIMMERAGE CLAY FORMATION]					
6.50 - 7.50	D15												
7.50 - 7.95	D16	7.50	SPT(S)	N=26 (3,4/5,6,7,8)				Siltstone band recovered as light grey mottled bluish grey weak to very weak fine grained siltstone.					
8.00 - 9.00	B17												
9.00 - 9.45	U18												
9.50 - 10.50	D19												

DRILLING TECHNIQUE			CHISELLING			WATER OBSERVATIONS				HOLE/CASING DIAMETER				WATER ADDED				
From	To	Type	From	To	Duration	Date/Time	Strike At	Time Elapsed	Rise To	Casing	Sealed	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Volume (ltr)
0.00	1.20	Inspection Pit	4.30	4.60	01:00	05/06/2018 15:00	1.50	20	1.08	1.50	2.50	150	15.45	150	2.60			
1.20	15.45	Cable Percussion	5.40	5.60	00:33	06/06/2018 09:00	5.60	20	14.71	2.60	8.50							
			7.40	7.50	00:25	06/06/2018 14:00	14.80	20	5.49	2.60								
			14.60	14.80	00:33													

Remarks  
PID results not included as equipment became moisture sensitive. Exploratory hole terminated at scheduled depth of 15.45mbgl.

Termination Depth:  
**15.45m**

Project  
**Northstowe - Parcel 2A**  
Client  
**Homes England**

Project No.  
**10018973**  
Easting (OS mE)  
**540851.50**

Ground Level (mAOD)  
**8.91**  
Northing (OS mN)  
**266949.30**

Start Date  
**05/06/2018**  
End Date  
**06/06/2018**

Scale  
**1:50**  
**Sheet 2 of 2**

SAMPLES		TESTS			Water Strikes	PROGRESS		STRATA			Depth (Thickness)	Level	Install/ Backfill
Depth	Type/ No.	Depth	Type/ No.	Results		Date Time	Casing Water	Description	Legend				
-10.50 - 10.95	D20	10.50	SPT(S)	N=32 (5,5/6,8,8,10)			Stiff dark grey CLAY. [KIMMERAGE CLAY FORMATION]						
-11.00 - 12.00	D21												
-12.00 - 12.45	U22												
-12.50 - 13.50	B23												
-13.50 - 13.95	D24	13.50	SPT(S)	N=43 (6,7/9,10,11,13)									
-14.00 - 15.00	D25												
-15.00 - 15.45	D26	15.00	SPT(S)	N=49 (7,9/9,14,12,14)		06/06/2018 14:00	Siltstone band recovered as light grey mottled bluish grey weak to very weak fine grained siltstone.				15.45	-6.54	

DRILLING TECHNIQUE			CHISELLING			WATER OBSERVATIONS					HOLE/CASING DIAMETER				WATER ADDED			
From	To	Type	From	To	Duration	Date/Time	Strike At	Time Elapsed	Rise To	Casing	Sealed	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Volume (ltr)
0.00	1.20	Inspection Pit	4.30	4.60	01:00	05/06/2018 15:00	1.50	20	1.08	1.50	2.50	150	15.45	150	2.60			
1.20	15.45	Cable Percussion	5.40	5.60	00:33	06/06/2018 09:00	5.60	20	14.71	2.60	8.50							
			7.40	7.50	00:25	06/06/2018 14:00	14.80	20	5.49	2.60								
			14.60	14.80	00:33													

Remarks  
PID results not included as equipment became moisture sensitive. Exploratory hole terminated at scheduled depth of 15.45mbgl.

Termination Depth:  
**15.45m**



Project  
**Northstowe - Parcel 2A**  
Client  
**Homes England**

Project No.  
**10018973**  
Easting (OS mE)  
**540959.20**

Ground Level (mAOD)  
**9.37**  
Northing (OS mN)  
**266899.40**

Start Date  
**30/05/2018**  
End Date  
**30/05/2018**

Scale  
**1:50**  
Sheet 1 of 2

SAMPLES		TESTS			Water Strikes	PROGRESS		STRATA			Depth (Thickness)	Level	Install/ Backfill		
Depth	Type/ No.	Depth	Type/ No.	Results		Date Time	Casing Water	Description	Legend						
0.00 - 0.20	B3	0.00	P D	<1ppm	▼ ▲	30/05/2018	0.00	Grass over soft dark brown slightly gravelly sandy CLAY with occasional. Sand is fine to coarse. Gravel is subangular to rounded fine to coarse flint and brick. [TOPSOIL] MADE GROUND: Loose brown slightly silty gravelly fine to coarse SAND. Gravel is subangular to subrounded fine to coarse flint. Loose to dense orange brown slightly clayey SAND and GRAVEL. Sand is fine to coarse. Gravel is subangular to rounded fine to coarse flint. [RIVER TERRACE DEPOSITS] Soft brown mottled grey slightly gravelly CLAY. Gravel is subangular to subrounded fine flint. [RIVER TERRACE DEPOSITS] Stiff light grey brown mottled orange brown CLAY. [KIMMERAGE CLAY FORMATION]		(0.20)	9.17				
0.00 - 0.20	D2	0.20	P D	2.8ppm		08:00	Dry								0.20
0.00 - 0.20	ES1														
0.20 - 0.80	B6														
0.20 - 0.80	D5														
0.20 - 0.80	ES4														
0.80 - 1.20	B9	0.80	P D	<1ppm											0.80
0.80 - 1.20	D8														
0.80 - 1.20	ES7														
1.20 - 1.50	B13	1.20	SPT(S)	N=5 (1,1/1,1,1,2)											1.20
1.20 - 1.50	D12	1.20	P D	<1ppm											
1.20 - 1.50	ES11														
1.20 - 1.65	D10	1.50	P D	<1ppm											1.50
2.00 - 2.45	UT14														(1.00)
2.50 - 3.00	B16	2.50	P D	1.1ppm											2.50
2.50 - 3.00	D15														
3.00 - 3.45	D17	3.00	SPT(S)	N=20 (2,2/3,3,5,9)						3.00					
3.00 - 3.45		3.00	P D	<1ppm											
3.50 - 4.00	B19	3.50	P D	<1ppm						3.50					
3.50 - 4.00	D18														
4.50 - 4.95	D20	4.50	SPT(S)	N=18 (7,6/5,4,4,5)						4.50					
4.50 - 5.00	B22	4.50	P D	1.2ppm											
4.50 - 5.00	D21														
5.00 - 6.00	B24	4.95	P D	<1ppm						4.95					
5.00 - 6.00	D23	5.00	P D	<1ppm						5.00					
6.00 - 6.45	UT25														
6.50 - 7.50	B27	6.50	P D	<1ppm						6.50					
6.50 - 7.50	D26														
7.50 - 7.95	D28	7.50	SPT(S)	N=26 (3,7/5,6,6,9)						7.50					
7.50 - 7.95		7.50	P D	<1ppm											
8.00 - 9.00	B30	8.00	P D	<1ppm						8.00					
8.00 - 9.00	D29														
9.00 - 9.45	UT31														
9.50 - 10.00	B33	9.50	P D	<1ppm						9.50					
9.50 - 10.00	D32														
10.00 - 10.45	D34	10.00	SPT(S)	N=27 (3,4/5,6,7,9)						10.00					
10.00 - 10.45		10.00	P D	<1ppm											

DRILLING TECHNIQUE			CHISELLING			WATER OBSERVATIONS				HOLE/CASING DIAMETER				WATER ADDED				
From	To	Type	From	To	Duration	Date/Time	Strike At	Time Elapsed	Rise To	Casing	Sealed	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Volume (ltr)
0.00	10.45	Cable Percussion Inspection Pit	3.40	3.60	00:34	30/05/2018 14:30	4.20	20	4.01	1.65		150	10.45	150	1.65			

Remarks  
Exploratory hole terminated at scheduled depth of 10.45mbgl. Slight seepage at 4.20mbgl.

Termination Depth:  
**10.45m**

Project  
**Northstowe - Parcel 2A**  
Client  
**Homes England**

Project No.  
**10018973**  
Easting (OS mE)  
**540959.20**

Ground Level (mAOD)  
**9.37**  
Northing (OS mN)  
**266899.40**

Start Date  
**30/05/2018**  
End Date  
**30/05/2018**

Scale  
**1:50**  
**Sheet 2 of 2**

SAMPLES		TESTS			Water Strikes	PROGRESS		STRATA			Depth (Thickness)	Level	Install/ Backfill
Depth	Type/ No.	Depth	Type/ No.	Results		Date Time	Casing Water	Description	Legend				
						30/05/2018 15:45	1.65 Dry	Stiff grey CLAY with siltstone bands. [KIMMERAGE CLAY FORMATION]			10.45	-1.08	

DRILLING TECHNIQUE			CHISELLING			WATER OBSERVATIONS					HOLE/CASING DIAMETER				WATER ADDED			
From	To	Type	From	To	Duration	Date/Time	Strike At	Time Elapsed	Rise To	Casing	Sealed	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Volume (ltr)
0.00	10.45	Cable Percussion	3.40	3.60	00:34	30/05/2018 14:30	4.20	20	4.01	1.65		150	10.45	150	1.65			
0.00	1.20	Inspection Pit	4.30	4.40	00:34													

Remarks  
Exploratory hole terminated at scheduled depth of 10.45mbgl. Slight seepage at 4.20mbgl.

Termination Depth:  
**10.45m**



Unless otherwise stated  
Depth (m), Diameter (mm), Time (hhmm),  
Thickness (m), Level (mOD).

Equipment Used  
**Dando 2000**

Contractor  
**Arcadis Consulting (UK) Ltd**

Logged By  
**IT**

Checked By  
**SH**



Project  
**Northstowe - Parcel 2A**  
Client  
**Homes England**

Project No.  
**10018973**  
Easting (OS mE)  
**540996.80**

Ground Level (mAOD)  
**7.06**  
Northing (OS mN)  
**267100.20**

Start Date  
**29/05/2018**  
End Date  
**29/05/2018**

Scale  
**1:50**  
Sheet 1 of 2

SAMPLES		TESTS			Water Strikes	PROGRESS		STRATA			Depth (Thickness)	Level	Install/ Backfill
Depth	Type/ No.	Depth	Type/ No.	Results		Date Time	Casing Water	Description	Legend				
0.00 - 0.20	B1	0.00	P D	<1ppm		29/05/2018 08:00	0.00 Dry	Grass over firm to stiff brownish grey slightly gravelly slightly sandy CLAY. Gravel is angular to subrounded fine to medium flint and brick with frequent rootlets. [TOPSOIL]		0.20	6.86		
0.00 - 0.20	D30	0.20	P D	<1ppm									
0.00 - 0.20	ES2												
0.20 - 0.50	B3												
0.20 - 0.50	D31	0.50	P D	<1ppm									
0.20 - 0.50	ES4												
0.50 - 1.00	B5												
0.50 - 1.00	D32												
0.50 - 1.00	ES6												
1.20 - 1.50	B8	1.20	SPT(S)	N=24 (1,3/8,8,4,4)									
1.20 - 1.50	D33	1.20	P D	<1ppm									
1.20 - 1.50	ES9	1.20	P D	<1ppm									
1.20 - 1.65	B7	1.50	P D	<1ppm									
1.50 - 2.00	B11												
1.50 - 2.00	ES10												
2.00 - 2.45	U12												
2.50 - 3.00	B13	2.50	P D	<1ppm									
2.50 - 3.00	D34												
2.50 - 3.00	ES14												
3.00 - 3.45	D15	3.00	SPT(S)	N=25 (3,4/8,7,6,4)									
3.00 - 3.45	P D	3.00	P D	<1ppm									
3.50 - 4.00	B16	3.50	P D	<1ppm									
3.50 - 4.00	D35												
4.00 - 4.45	U17												
4.50 - 5.00	B18	4.50	P D	<1ppm									
4.50 - 5.00	D36												
5.00 - 5.45	D19	5.00	SPT(S)	N=25 (17,8/7,5,6,7)									
5.00 - 5.45	P D	5.00	P D	<1ppm									
5.50 - 6.00	B20	5.50	P D	<1ppm									
5.50 - 6.00	D37												
6.00 - 6.45	U21												
6.50 - 7.00	B22	6.50	P D	<1ppm									
6.50 - 7.00	D38												
7.00 - 7.45	D23	7.00	SPT(S)	N=30 (4,6/6,7,8,9)									
7.00 - 7.45	P D	7.00	P D	<1ppm									
7.50 - 8.00	B24	7.50	P D	<1ppm									
7.50 - 8.00	D39												
8.00 - 8.45	U25												
8.50 - 9.00	B26	8.50	P D	<1ppm									
8.50 - 9.00	D40												
9.00 - 9.45	D27	9.00	SPT(S)	N=28 (4,4/5,6,7,10)									
9.00 - 9.45	P D	9.00	P D	2.2ppm									
9.50 - 10.00	B28	9.50	P D	<1ppm									
9.50 - 10.00	D41												
10.00 - 10.45	D29	10.00	SPT(S)	N=29 (3,4/5,6,8,10)									
10.00 - 10.45	P D	10.00	P D	<1ppm									

DRILLING TECHNIQUE			CHISELLING			WATER OBSERVATIONS			HOLE/CASING DIAMETER				WATER ADDED					
From	To	Type	From	To	Duration	Date/Time	Strike At	Time Elapsed	Rise To	Casing	Sealed	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Volume (ltr)
1.20	10.45	Inspection Pit Cable Percussion	1.70	1.80	00:25							150	10.45	150	1.50			
			2.70	2.80	00:25													
			3.60	3.80	00:50													

Remarks  
Inspection pit excavated to 1.20m bgl. Exploratory hole terminated at required depth of 10.45m bgl. No groundwater encountered.

Termination Depth:  
**10.45m**

Project  
**Northstowe - Parcel 2A**  
Client  
**Homes England**

Project No.  
**10018973**  
Easting (OS mE)  
**540996.80**

Ground Level (mAOD)  
**7.06**  
Northing (OS mN)  
**267100.20**

Start Date  
**29/05/2018**  
End Date  
**29/05/2018**

Scale  
**1:50**  
**Sheet 2 of 2**

SAMPLES		TESTS			Water Strikes	PROGRESS		STRATA			Depth (Thickness)	Level	Install/Backfill
Depth	Type/No.	Depth	Type/No.	Results		Date Time	Casing Water	Description	Legend				
						29/05/2018 16:00	1.50 Dry	Stiff to very stiff dark grey CLAY. [KIMMERAGE CLAY FORMATION]			10.45	-3.39	

DRILLING TECHNIQUE			CHISELLING			WATER OBSERVATIONS					HOLE/CASING DIAMETER				WATER ADDED			
From	To	Type	From	To	Duration	Date/Time	Strike At	Time Elapsed	Rise To	Casing	Sealed	Hole Dia.	Depth	Casing Dia.	Depth	From	To	Volume (ltr)
0.00	1.20	Inspection Pit Cable Percussion	1.70	1.80	00:25							150	10.45	150	1.50			
1.20	10.45		2.70	2.80	00:25													
			3.60	3.80	00:50													

Remarks  
Inspection pit excavated to 1.20mbgl. Exploratory hole terminated at required depth of 10.45mbgl. No groundwater encountered.

Termination Depth:  
**10.45m**



Project  
**Northstowe - Parcel 2A**  
Client  
**Homes England**

Project No.  
**10018973**  
Easting (OS mE)  
**540754.90**

Ground Level (mAOD)  
**8.43**  
Northing (OS mN)  
**266851.00**

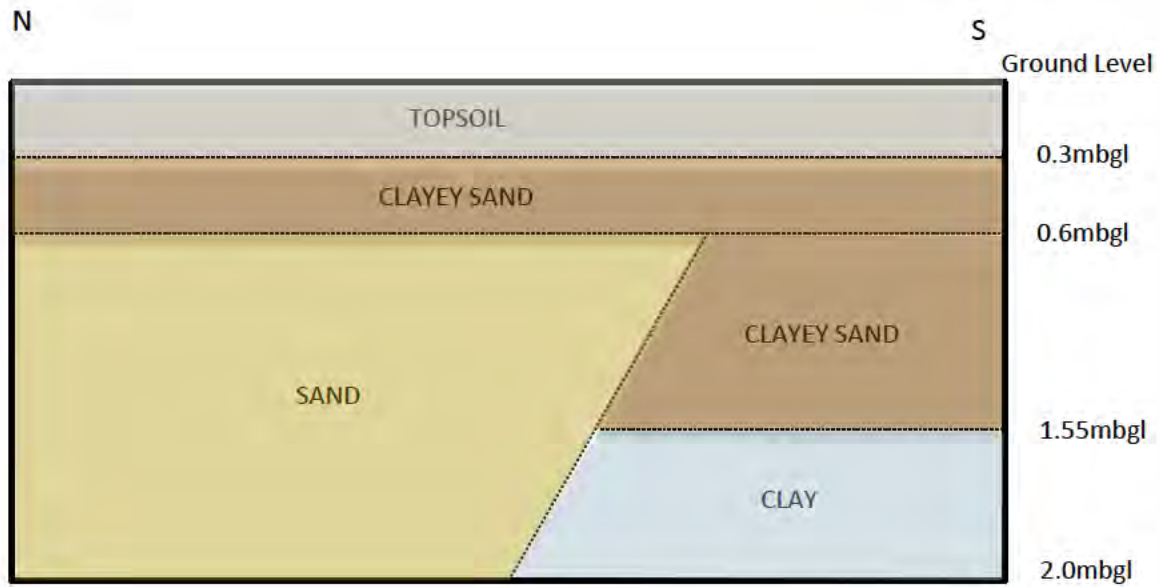
Start Date  
**01/06/2018**  
End Date  
**01/06/2018**

Scale  
**1:25**  
Sheet 1 of 1

SAMPLES		TESTS			Water Strikes	STRATA		Depth (Thickness)	Level	Install/Backfill
Depth	Type/No.	Depth	Type/No.	Results		Description	Legend			
0.00 - 0.20 0.00 - 0.20 0.00 - 0.20	B1 D2 ES3					Brownish grey silty gravelly fine to coarse SAND of quartz with frequent roots and rootlets. Gravel is angular to subrounded fine to medium flint. [TOPSOIL]		(0.30)		
0.30 - 0.40 0.30 - 0.40 0.30 - 0.40	B4 D5 ES6					Orangish brown very clayey gravelly fine to medium SAND. Gravel is subrounded fine flint. [RIVER TERRACE DEPOSITS]		0.30 (0.30)	8.13	
0.60 - 0.80 0.60 - 0.80 0.60 - 0.80	B10 D11 ES12					Soft bluish grey mottled orangish brown slightly sandy CLAY. Sand is fine to coarse. [KIMMERAGE CLAY FORMATION] In the eastern half of the trial pit the geology is split between a sloping discontinuity of sand & gravel (east) and clay (west). Please refer to attached sketch for greater detail.		0.60	7.83	
1.00 - 1.20 1.00 - 1.20 1.00 - 1.20	B7 D6 ES9				▼			(0.95) (1.40)		
1.55 - 1.70 1.55 - 1.70 1.55 - 1.70	B13 D14 ES15					Yellowish brown and white fine to coarse SAND & GRAVEL. Gravel is subangular to subrounded fine to medium flint with 100mm bands of gravelly sand (see cross sectional diagram). [RIVER TERRACE DEPOSITS] In the eastern half of the trial pit the geology is split between a sloping discontinuity of sand & gravel (east) and clay (west). Please refer to attached sketch for greater detail.		1.55 (0.45)	6.88	
						Firm dark grey CLAY. [KIMMERAGE CLAY FORMATION]		2.00	6.43 6.43	

<p><b>PLAN DETAILS</b></p> <p>Long Axis Orientation:</p> <p>Shoring / Support: None</p> <p>Stability: Poor</p> <p>Groundwater (description):</p>	<p><b>Remarks</b></p> <p>Water strike at 1.0mbgl. Trial Pit terminated due to side wall collapse. Please refer to attached sketch for greater detail regarding discontinuity. PID results not included as equipment became moisture sensitive.</p> <p>Termination Depth: <b>2.00m</b></p>
--	---

# TP2A01 EAST FACE CROSS SECTION VIEW



Comments

Refer to trial pit logs for further description.

Client <b>Homes England</b>  <b>Homes &amp; Communities Agency</b>	Status <b>FINAL</b>			Project <b>Northstowe - Parcel 2A</b>		Arcadis Consulting (UK) Ltd 10 Medway Road The Surrey Research Park Guildford GU2 7AR 
	Scale <b>NTS</b>		Current Issue Signatures			
	Datum	N/A	Author	IT		
	Grid	N/A	Checker	SH		
	© Copyright Reserved		Approver			
Title <b>TP2A01 Cross Section</b>					Drawing No.   Project No.   Issue No. 002   10081973   01	



Project  
**Northstowe - Parcel 2A**  
 Client  
**Homes England**

Job No  
**10018973**  
 Easting (OS mE)  
**540754.90**

Ground Level (mAOD)  
**8.43**  
 Northing (OS mN)  
**266851.00**

Start Date  
**01/06/2018**  
 End Date  
**01/06/2018**



**TP2A01 Trial Pit. Depth 2.0m**



**TP2A01 Trial Pit Spoil**







Project  
**Northstowe - Parcel 2A**  
 Client  
**Homes England**

Job No  
**10018973**  
 Easting (OS mE)  
**540754.00**

Ground Level (mAOD)  
**8.562**  
 Northing (OS mN)  
**266901.00**

Start Date  
**01/06/2018**  
 End Date  
**01/06/2018**



**TP2A02 Trial Pit. Depth 3.40m**



**TP2A02 Trial Pit Spoil**



Project  
**Northstowe - Parcel 2A**  
Client  
**Homes England**

Project No.  
**10018973**  
Easting (OS mE)  
**540803.10**

Ground Level (mAOD)  
**8.52**  
Northing (OS mN)  
**266900.70**

Start Date  
**31/05/2018**  
End Date  
**31/05/2018**

Scale  
**1:25**  
Sheet 1 of 1

SAMPLES		TESTS			Water Strikes	STRATA		Depth (Thickness)	Level	Install/ Backfill
Depth	Type/ No.	Depth	Type/ No.	Results		Description	Legend			
0.00 - 0.20 0.00 - 0.20 0.00 - 0.20	B1 D2 ES3					Brownish yellow and white silty very gravelly fine to coarse SAND. Gravel is subangular to rounded fine to medium flint with 100mm bands of very gravelly sand and very sandy gravel. [RIVER TERRACE DEPOSITS]		(1.20)		
0.50 - 0.60 0.50 - 0.60 0.50 - 0.60	B4 D5 ES6									
		1.20	HV(1)	64(18)kPa						
		1.20	HV(2)	66(18)kPa		Firm to stiff dark grey CLAY. [KIMMERAGE CLAY FORMATION]		1.20 (0.10)	7 32	
		1.20	HV(3)	66(22)kPa				1.30	7 22	

<p><b>PLAN DETAILS</b></p> <p>Long Axis Orientation:</p> <p>Shoring / Support: None</p> <p>Stability: Poor</p> <p>Groundwater (description):</p>	<p><b>Remarks</b></p> <p>Trial Pit terminated due to side wall collapse. Water strike at 0.85mbgl, and clay at 1.2mbgl made the pit unsuitable for soakaway testing. Trial Pit backfilled and moved 3m east and named TPSA2A03A. PID results not included as equipment became moisture sensitive.</p> <p>Termination Depth: <b>1.30m</b></p>
--	--



Project  
**Northstowe - Parcel 2A**  
 Client  
**Homes England**

Job No  
**10018973**  
 Easting (OS mE)  
**540803.10**

Ground Level (mAOD)  
**8.523**  
 Northing (OS mN)  
**266900.70**

Start Date  
**31/05/2018**  
 End Date  
**31/05/2018**



**TPSA2A03 Trial Pit. Depth 1.30m**



**TPSA2A03 Trial Pit Spoil**



Project  
**Northstowe - Parcel 2A**  
Client  
**Homes England**

Project No.  
**10018973**  
Easting (OS mE)  
**540803.10**

Ground Level (mAOD)  
**8.61**  
Northing (OS mN)  
**266900.70**

Start Date  
**31/05/2018**  
End Date  
**31/05/2018**

Scale  
**1:25**  
Sheet 1 of 1

SAMPLES		TESTS			Water Strikes	STRATA		Depth (Thickness)	Level	Install/ Backfill
Depth	Type/ No.	Depth	Type/ No.	Results		Description	Legend			
0.20 - 0.40 0.20 - 0.40	B1 D2					Yellowish brown slightly silty very gravelly fine to coarse SAND. Gravel is subangular to subrounded fine to medium flint. [RIVER TERRACE DEPOSITS]		0.50	8.11	

<p><b>PLAN DETAILS</b></p> <p>Long Axis Orientation:</p> <p>Shoring / Support: None</p> <p>Stability: Poor</p> <p>Groundwater (description):</p>	<p><b>Remarks</b></p> <p>Trial Pit terminated above clay at 0.50mbgl in order to preform soakaway test. Roughly 0.50m of soil stripped by archaeologists at location exposing river terrace deposits. PID results not included as equipment became moisture sensitive.</p> <p>Termination Depth: <b>0.50m</b></p>
--	---



Project  
**Northstowe - Parcel 2A**  
Client  
**Homes England**

Job No  
**10018973**  
Easting (OS mE)  
**540803.10**

Ground Level (mAOD)  
**8.612**  
Northing (OS mN)  
**266900.70**

Start Date  
**31/05/2018**  
End Date  
**31/05/2018**



**TPSA2A03A Trial Pit. Depth 0.50m**



**TPSA2A03A Trial Pit Spoil**



Project  
**Northstowe - Parcel 2A**  
Client  
**Homes England**

Project No.  
**10018973**  
Easting (OS mE)  
**540880.80**

Ground Level (mAOD)  
**8.84**  
Northing (OS mN)  
**266775.60**

Start Date  
**01/06/2018**  
End Date  
**01/06/2018**

Scale  
**1:25**  
Sheet 1 of 1

SAMPLES		TESTS			Water Strikes	STRATA		Depth (Thickness)	Level	Install/ Backfill
Depth	Type/ No.	Depth	Type/ No.	Results		Description	Legend			
0.00 - 0.25 0.00 - 0.25 0.00 - 0.25	B1 D2 ES3	0.00	PID	<1ppm	▼	Orangish brown very clayey very gravelly fine to coarse SAND. Gravel is subangular to subrounded fine to medium flint. [RIVER TERRACE DEPOSITS]		(0.25)	8 59	
0.25 - 0.40 0.25 - 0.40 0.25 - 0.40	B4 D5 ES8	0.25	PID	1.5ppm		Yellowish brown and white slightly clayey very gravelly fine to coarse SAND. Gravel is subangular to subrounded fine to medium flint. [RIVER TERRACE DEPOSITS]		0.25		
1.25 - 1.40 1.25 - 1.40	B6 D7	1.25	PID HV(1) HV(2) HV(3)	<1ppm 78(20)kPa 80(20)kPa 82(20)kPa		Firm to stiff dark grey CLAY. [KIMMERAGE CLAY FORMATION]		1.25 (0.35)	7 59	
								1.60	7 24	

<p><b>PLAN DETAILS</b></p> <p>Long Axis Orientation:</p> <p>Shoring / Support: None</p> <p>Stability: Poor</p> <p>Groundwater (description):</p>	<p><b>Remarks</b></p> <p>Trial Pit terminated at 1.60mbgl due to side walls collapsing.</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin-left: auto;"> <p>Termination Depth: <b>1.60m</b></p> </div>
--	---



Project  
**Northstowe - Parcel 2A**  
 Client  
**Homes England**

Job No  
**10018973**  
 Easting (OS mE)  
**540880.80**

Ground Level (mAOD)  
**8.842**  
 Northing (OS mN)  
**266775.60**

Start Date  
**01/06/2018**  
 End Date  
**01/06/2018**



**TP2A04 Trial Pit. Depth 1.20m**



**TP2A04 Trial Pit Spoil**



Project  
**Northstowe - Parcel 2A**  
Client  
**Homes England**

Project No.  
**10018973**  
Easting (OS mE)  
**540849.50**

Ground Level (mAOD)  
**9.14**  
Northing (OS mN)  
**266900.20**

Start Date  
**30/05/2018**  
End Date  
**30/05/2018**

Scale  
**1:25**  
Sheet 1 of 1

SAMPLES		TESTS			Water Strikes	STRATA		Depth (Thickness)	Level	Install/ Backfill
Depth	Type/ No.	Depth	Type/ No.	Results		Description	Legend			
0.00 - 0.15	B1				▼	Brownish grey silty gravelly fine to coarse SAND with frequent roots and rootlets. Gravel is angular to subrounded fine to medium flint brick and concrete. [TOPSOIL] MADE GROUND: Yellowish brown slightly silty very gravelly fine to coarse SAND with low boulder and cobble content. Gravel is angular to subrounded fine to coarse flint, brick and concrete. Cobbles are subangular brick and concrete. Boulders are subangular concrete.  Local pockets of brown slightly sandy CLAY.		(0.15)	8 99	
0.00 - 0.15	D2									
0.00 - 0.15	ES3									
0.15 - 0.30	B4									
0.15 - 0.30	D5									
0.15 - 0.30	ES6									
0.40 - 0.60	B6									
0.50 - 0.70	B3									
0.60 - 0.80	B7									
0.60 - 0.80	D8									
0.60 - 0.80	ES9									
1.40 - 1.50	B10									
1.40 - 1.50	D11									
1.40 - 1.50	ES12									
1.50 - 1.51	B13									
1.50 - 1.51	D14									
1.50 - 1.51	ES15									
								1.51	7 63	

<p><b>PLAN DETAILS</b></p> <p>Long Axis Orientation:</p> <p>Shoring / Support: None</p> <p>Stability: Poor</p> <p>Groundwater (description):</p>	<p><b>Remarks</b></p> <p>Water strike at 1.5mbgl. Trial Pit terminated at 1.50mbgl due to water ingress making pit unstable. PID results not included as equipment became moisture sensitive.</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin-left: auto;"> <p>Termination Depth: <b>1.51m</b></p> </div>
--	---



Project  
**Northstowe - Parcel 2A**  
 Client  
**Homes England**

Job No  
**10018973**  
 Easting (OS mE)  
**540849.50**

Ground Level (mAOD)  
**9.136**  
 Northing (OS mN)  
**266900.20**

Start Date  
**30/05/2018**  
 End Date  
**30/05/2018**



**TP2A05 Trial Pit. Depth 1.50m**



**TP2A05 Trial Pit Spoil**



Project  
**Northstowe - Parcel 2A**  
Client  
**Homes England**

Project No.  
**10018973**  
Easting (OS mE)  
**540810.90**

Ground Level (mAOD)  
**9.13**  
Northing (OS mN)  
**266956.40**

Start Date  
**30/05/2018**  
End Date  
**30/05/2018**

Scale  
**1:25**  
Sheet 1 of 1

SAMPLES		TESTS			Water Strikes	STRATA		Depth (Thickness)	Level	Install/ Backfill
Depth	Type/ No.	Depth	Type/ No.	Results		Description	Legend			
0.00 - 0.30	B2					MADE GROUND: Soft brown slightly sandy gravelly CLAY with low to medium cobble content. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse flint, brick, and concrete. Cobbles are angular to subangular of brick and concrete.		(0.30)	8 83	
0.00 - 0.30	D1									
0.00 - 0.30	ES3									
0.30 - 0.35	ES4					MADE GROUND: Soft to firm light brown mottled orange brown slightly gravelly sandy CLAY. Gravel is subangular to subrounded fine to coarse flint. Sand is fine to coarse.  Black ash and coal present.		(0.50)	8 83	
0.40 - 0.60	B6	0.40	HV(1)	48(26)kPa						
0.40 - 0.60	D5	0.40	HV(2)	58(30)kPa						
0.40 - 0.60	ES7	0.40	HV(3)	64(26)kPa						
0.80 - 1.00	B9					Firm brown mottled orange brown and yellow brown slightly sandy CLAY. Sand is fine to medium. [KIMMERAGE CLAY FORMATION]		(0.20)	8 33	
0.80 - 1.00	D8									
0.80 - 1.00	ES10					Firm grey brown mottled orange brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subrounded fine flint. [KIMMERAGE CLAY FORMATION]		(0.50)	8 13	
1.20 - 1.50	B2									
1.20 - 1.50	D1									
1.20 - 1.50	ES3					Fissured stiff to very stiff grey brown mottled orange brown CLAY. [KIMMERAGE CLAY FORMATION]		1.50	7 63	
2.00 - 2.50	D4									
2.30 - 2.50	B5					Fissured stiff to very stiff grey brown mottled orange brown CLAY. [KIMMERAGE CLAY FORMATION]		(1.80)	7 63	
2.60 - 2.60		2.60	HV(4)	64(20)kPa						
2.60 - 2.60		2.60	HV(5)	64(50)kPa						
2.60 - 2.60		2.60	HV(6)	66(34)kPa		Fissured stiff to very stiff grey brown mottled orange brown CLAY. [KIMMERAGE CLAY FORMATION]		1.50	7 63	
2.90 - 3.00	D6									
3.00 - 3.20	B7					Fissured stiff to very stiff grey brown mottled orange brown CLAY. [KIMMERAGE CLAY FORMATION]		3.30	5 83	

<b>PLAN DETAILS</b> <p>Long Axis Orientation:</p> <p>Shoring / Support: None</p> <p>Stability: Unstable</p> <p>Groundwater (description):</p>		<b>Remarks</b> Trial Pit terminated at required depth of 3.30mbgl. PID results not included as equipment became moisture sensitive.
		Termination Depth: <b>3.30m</b>



Project  
**Northstowe - Parcel 2A**  
 Client  
**Homes England**

Job No  
**10018973**  
 Easting (OS mE)  
**540810.90**

Ground Level (mAOD)  
**9.133**  
 Northing (OS mN)  
**266956.40**

Start Date  
**30/05/2018**  
 End Date  
**30/05/2018**



**TP2A06 Trial Pit. Depth 3.3m**



**TP2A06 Trial Pit Spoil**

Project  
**Northstowe - Parcel 2A**  
Client  
**Homes England**

Project No.  
**10018973**  
Easting (OS mE)  
**541012.40**

Ground Level (mAOD)  
**7.18**  
Northing (OS mN)  
**267071.80**

Start Date  
**31/05/2018**  
End Date  
**31/05/2018**

Scale  
**1:25**  
Sheet 1 of 1

SAMPLES		TESTS			Water Strikes	STRATA		Depth (Thickness)	Level	Install/Backfill
Depth	Type/No.	Depth	Type/No.	Results		Description	Legend			
0.00 - 0.15	B1					MADE GROUND: Stiff brownish grey slightly sandy slightly gravelly CLAY with frequent rootlets. Gravel is angular to subangular fine to medium flint and brick.	[Cross-hatched pattern]	(0.15)	7.03	[Stratigraphic column]
0.00 - 0.15	D2									
0.00 - 0.15	ES3									
0.15 - 0.50	B4									
0.15 - 0.50	D5									
0.15 - 0.50	ES6									
0.50 - 0.70	B7	0.50	HV(1)	50(11)kPa		MADE GROUND: Firm bluish grey mottled orangish brown slightly sandy slightly gravelly CLAY with occasional roots. Gravel is subangular to subrounded to subangular fine to medium flint and charcoal.	[Cross-hatched pattern]	(1.95)	[Stratigraphic column]	
0.50 - 0.70	D8	0.50	HV(2)	55(21)kPa						
0.50 - 0.70	ES9	0.50	HV(3)	57(24)kPa						
1.50 - 1.60	B10	1.50	HV(4)	75(25)kPa		Firm to stiff bluish grey mottled orangish brown slightly sandy slightly gravelly CLAY. Gravel is angular to subangular fine Mica and siltstone. Rare pockets of 20mm very light brown silts and fine to medium sand. Sand is extremely weak siltstone. [KIMMERAGE CLAY FORMATION]	[Dotted pattern]	(0.60)	[Stratigraphic column]	
1.50 - 1.60	D1	1.50	HV(5)	82(20)kPa						
		1.50	HV(6)	91(30)kPa						
2.00 - 2.10	D2	2.00	HV(7)	100(30)kPa	▼			2.10	5.08	[Stratigraphic column]
		2.00	HV(8)	108(30)kPa					5.08	
		2.00	HV(9)	110(30)kPa						

<p><b>PLAN DETAILS</b></p> <p>1.8 0.5</p> <p>Long Axis Orientation:</p> <p>Shoring / Support: None</p> <p>Stability: Good</p> <p>Groundwater (description):</p>	<p><b>Remarks</b></p> <p>Water strike at 2.00mbgl. Trial Pit terminated due to water in base of pit. Soakaway undertaken within exploratory hole. P D results not included as equipment became moisture sensitive.</p> <p>Termination Depth: <b>2.10m</b></p>
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Project  
**Northstowe - Parcel 2A**  
 Client  
**Homes England**

Job No  
**10018973**  
 Easting (OS mE)  
**541012.40**

Ground Level (mAOD)  
**7.182**  
 Northing (OS mN)  
**267071.80**

Start Date  
**31/05/2018**  
 End Date  
**31/05/2018**



**TPSA2A07 Trial Pit. Depth: 2.10m**



**TPSA2A07 Trial Pit Spoil**







Project  
**Northstowe - Parcel 2A**  
 Client  
**Homes England**

Job No  
**10018973**  
 Easting (OS mE)  
**541047.10**

Ground Level (mAOD)  
**6.89**  
 Northing (OS mN)  
**267100.20**

Start Date  
**31/05/2018**  
 End Date  
**31/05/2018**



**TP2A08 Trial Pit. Depth 2.60m**



**TP2A08 Trial Pit Spoil**



Project  
**Northstowe - Parcel 2A**  
Client  
**Homes England**

Project No.  
**10018973**  
Easting (OS mE)  
**541100.30**

Ground Level (mAOD)  
**6.09**  
Northing (OS mN)  
**267150.50**

Start Date  
**01/06/2018**  
End Date  
**01/06/2018**

Scale  
**1:25**  
Sheet 1 of 1

SAMPLES		TESTS			Water Strikes	STRATA		Depth (Thickness)	Level	Install/ Backfill
Depth	Type/ No.	Depth	Type/ No.	Results		Description	Legend			
0.00 - 0.25 0.00 - 0.25 0.00 - 0.25	B3 D2 ES1	0.00	PID	20ppm		MADE GROUND: Stiff to very stiff brown mottled orange brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine flint.		(0.25)	5 84	
0.25 - 0.40 0.25 - 0.40 0.25 - 0.40	B6 D5 ES4	0.20 0.20 0.25	HV(1) HV(2) HV(3) PID	20(12)kPa 48(30)kPa 66(50)kPa 23ppm		MADE GROUND: Soft to firm light brown mottled grey sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to medium flint.		(0.15)		
0.50 - 0.60 0.50 - 0.60 0.50 - 0.60	B9 D8 ES7	0.50 0.50 0.50	PID HV(4) HV(5) HV(6)	20ppm 102(30)kPa 90(30)kPa 98(40)kPa		Firm to stiff blue grey mottled orange brown slightly sandy CLAY with pockets and bands of silt - possible iron oxidation. Sand is fine to medium. [KIMMERAGE CLAY FORMATION]		0.40		
1.00 - 1.20 1.00 - 1.20 1.00 - 1.20	B2 D1 ES10	1.00	PID	23ppm			(1.30)			
1.50 - 1.60 1.50 - 1.60	B4 D3	1.50	PID	21ppm			1.70	4 39		

<p><b>PLAN DETAILS</b></p> <p>Long Axis Orientation:</p> <p>Shoring / Support: None</p> <p>Stability: Stable</p> <p>Groundwater (description):</p>	<p><b>Remarks</b></p> <p>Trial Pit terminated at 1.80mbgl due to hard strata.</p> <p>Termination Depth: <b>1.80m</b></p>
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Project  
**Northstowe - Parcel 2A**  
 Client  
**Homes England**

Job No  
**10018973**  
 Easting (OS mE)  
**541100.30**

Ground Level (mAOD)  
**6.09**  
 Northing (OS mN)  
**267150.50**

Start Date  
**01/06/2018**  
 End Date  
**01/06/2018**



**TP2A09 Trial Pit. Depth 1.80m**



**TP2A09 Trial Pit Spoil**



Project  
**Northstowe - Parcel 2A**  
Client  
**Homes England**

Project No.  
**10018973**  
Easting (OS mE)  
**541100.90**

Ground Level (mAOD)  
**5.72**  
Northing (OS mN)  
**267189.90**

Start Date  
**01/06/2018**  
End Date  
**01/06/2018**

Scale  
**1:25**  
Sheet 1 of 1

SAMPLES		TESTS			Water Strikes	STRATA		Depth (Thickness)	Level	Install/ Backfill
Depth	Type/ No.	Depth	Type/ No.	Results		Description	Legend			
0.00 - 0.25 0.00 - 0.25 0.00 - 0.25	B1 D2 ES3	0.00	PID	<1ppm		Firm to stiff brownish grey slightly sandy slightly gravelly CLAY with occasional rootlets. Gravel is subangular to subrounded fine to medium flint. [TOPSOIL]		(0.25)		
0.25 - 0.60 0.25 - 0.60 0.25 - 0.60	B4 D5 ES6	0.25	PID	<1ppm		MADE GROUND: Firm light brown mottled bluish grey slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to medium flint with 10mm pockets of very light brown silt and fine to coarse sand, sand is extremely weak siltstone. Rare charcoal, brick and clay pipe (3inch).		0.25 (0.35)	5.47	
0.60 - 1.20 0.60 - 1.20 0.60 - 1.20	B7 D8 ES9	0.60 0.60 0.60	PID HV(1) HV(2) HV(3)	<1ppm 80(20)kPa 82(30)kPa 86(32)kPa		Stiff bluish grey mottled orangish brown slightly sandy CLAY. With 10mm pockets of very light brown silt and fine to coarse sand, sand is extremely weak siltstone. [KIMMERAGE CLAY FORMATION]		0.60 (0.60)	5.12	
1.20 - 1.60 1.20 - 1.60	B10 D11	1.20	PID	<1ppm		Extremely weak S LTSTONE recovered as very light brown mottled orange SILT. Black staining - possible organics. Rare Ammonite fossils.		1.20 (0.40)	4.52	
1.60 - 1.80	D12	1.60	PID	<1ppm		Stiff to very stiff bluish grey mottled orangish brown CLAY with occasional partially decayed rootlets and vegetation (purple) and 10mm bands of fine to coarse sand and rare ironstone nodules. [KIMMERAGE CLAY FORMATION]		1.60	4.12	
		1.90 1.90 1.90	HV(4) HV(5) HV(6)	110(37)kPa 92(36)kPa 94(34)kPa		Rare black staining - possible organics. Becoming firm.				
2.20 - 2.30	D13	2.20	PID	<1ppm						
2.40 - 2.50	B14							(2.00)		
3.20 - 3.30	D15	3.20	PID	<1ppm				3.60	2.12	

<p><b>PLAN DETAILS</b></p> <p>Long Axis Orientation:</p> <p>Shoring / Support: None</p> <p>Stability: Good</p> <p>Groundwater (description):</p>	<p><b>Remarks</b></p> <p>Trial Pit terminated at required depth of 3.60m bgl. PID results not included as equipment became moisture sensitive.</p> <p>Termination Depth: <b>3.60m</b></p>
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Project  
**Northstowe - Parcel 2A**  
 Client  
**Homes England**

Job No  
**10018973**  
 Easting (OS mE)  
**541100.90**

Ground Level (mAOD)  
**5.717**  
 Northing (OS mN)  
**267189.90**

Start Date  
**01/06/2018**  
 End Date  
**01/06/2018**



**TP2A10 Trial Pit. Depth 3.60m**



**TP2A10 Trial Pit Spoil**



# Trial Pit Soakaway Test

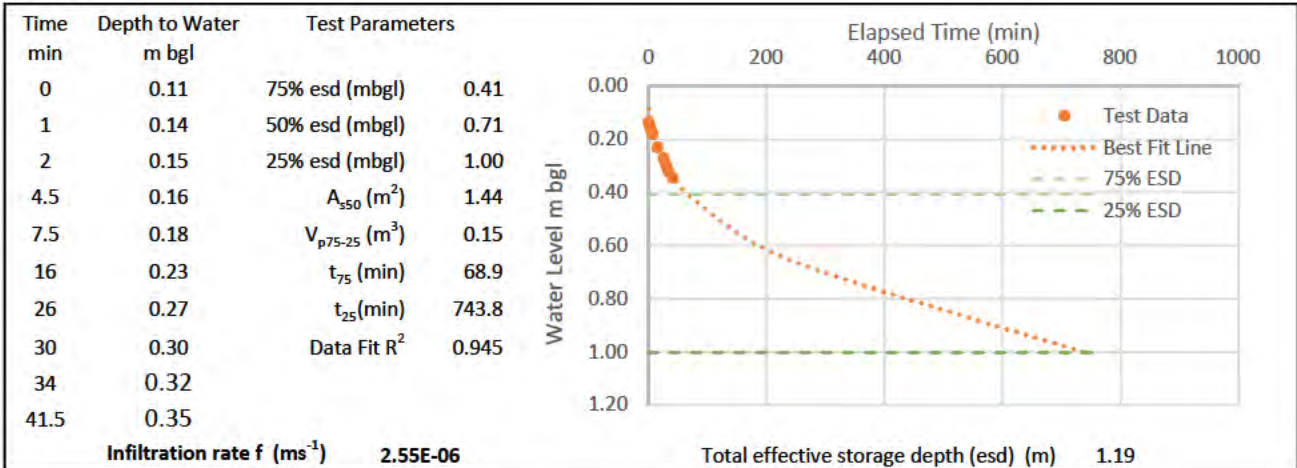
Based on BRE DG 365:2016

Project	Northstowe - Parcel 2A	Status	LOCATION ID
Project ID	10018973	CHECKED	TPSA2A03A

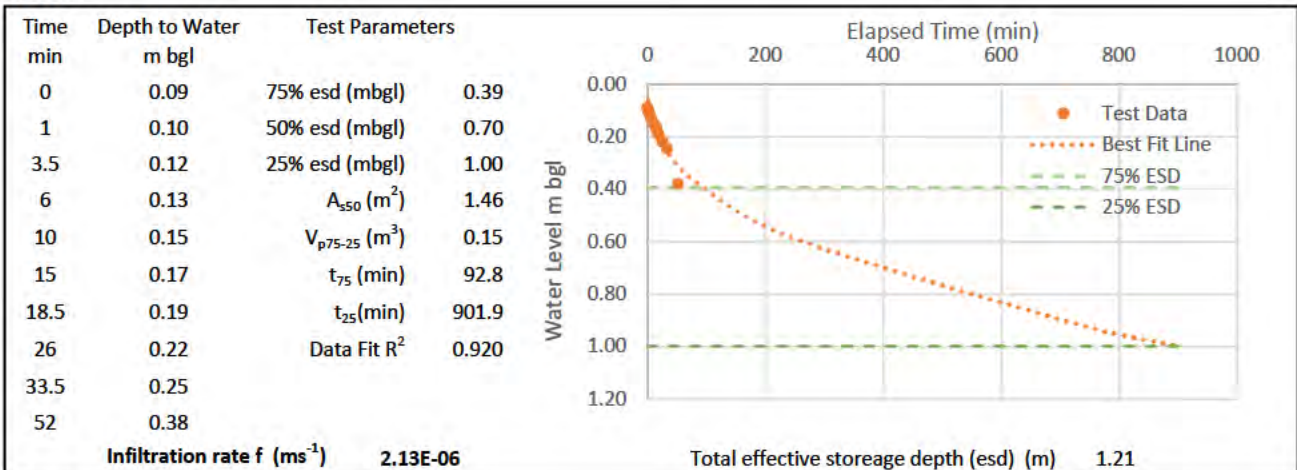
## Trial Pit Details

Test 1	Test 2	Test 3	Ground Level	8.61 mAOD	Date Excavated	31/05/2018	
Depth	1.30	1.30	1.20	Coordinates	540803.1 mE	Date Tested	31/05/2018
Width	0.50	0.50	0.40		266900.7 mN		
Length	0.50	0.50	0.50				

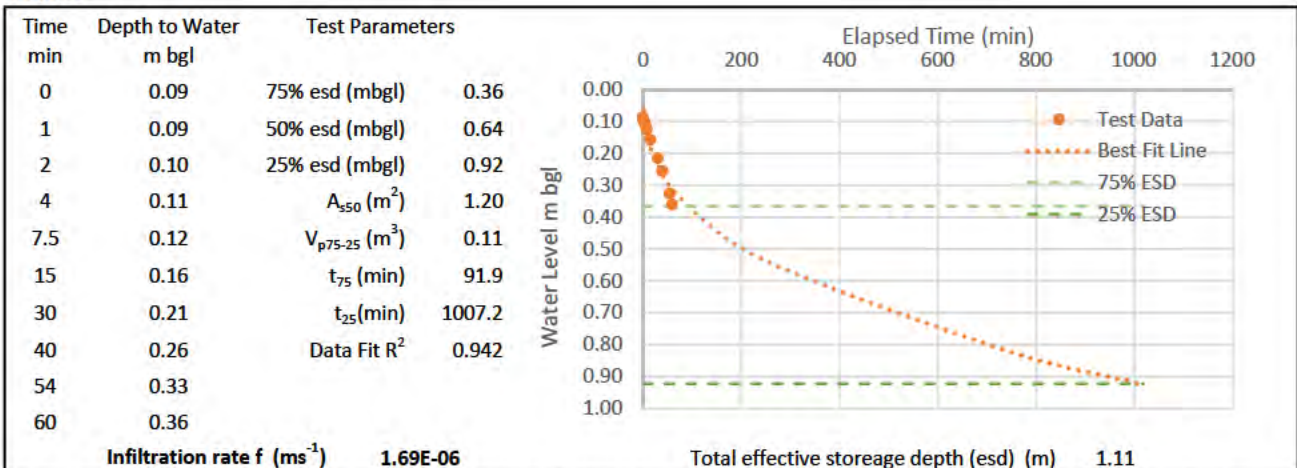
### Test 1



### Test 2



### Test 3



Carried out by	Notes: Minor collapse on the short axis side of the wall.	Logged	Checked
Arcadis Consulting (UK) Ltd		MT	SH



# Trial Pit Soakaway Test

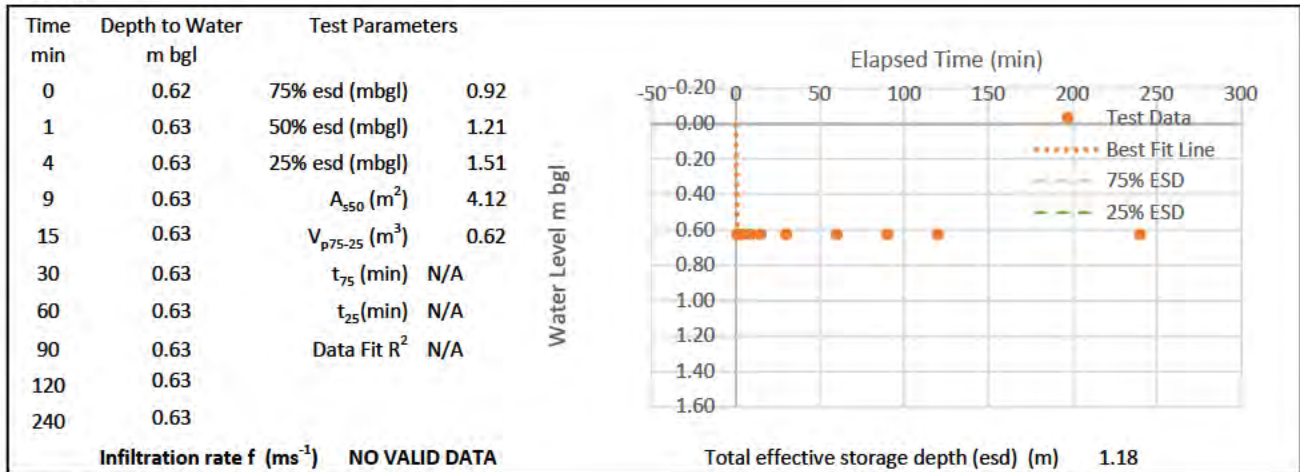
Based on BRE DG 365:2016

Project	Northstowe Parcel 2A	Status	LOCATION ID
Project ID	10018973	CHECKED	TPSA2A07

## Trial Pit Details

Test 1	Ground Level	7.18 mAOD	Date Excavated	31/05/2018
Depth 1.80	Coordinates	541012.4 mE	Date Tested	31/05/2018
Width 0.50		267071.8 mN		
Length 2.10				

## Test 1



## Test 2

**TEST NOT UNDERTAKEN**

## Test 3

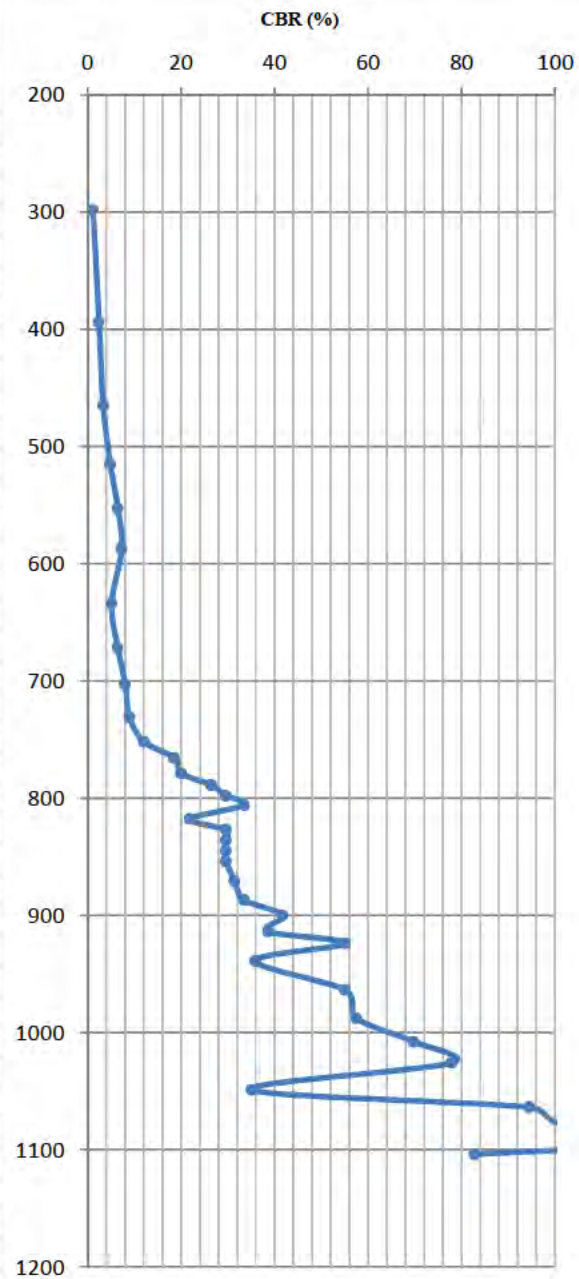
**TEST NOT UNDERTAKEN**

Carried out by Arcadis Consulting (UK) Ltd	Notes: Test pit filled only once due to excessive time to achieve infiltration. No valid data obtained from infiltration rate because 75% has not been achieved.	Logged MT	Checked SH
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**TRL PENETROMETER TESTING**

Project <b>Northstowe - Parcel 2A</b>			Position ID <b>TRL2A01</b>	
Job No. <b>10018937</b>	Date <b>04/06/2918</b>	Ground Level (m) <b>8.607</b>		
Contractor <b>Arcadis Consulting (UK) Ltd</b>		Co-ordinates <b>540796 E 266961 N</b>	Initial Scale Reading (mm) <b>103</b>	Sheet <b>1 of 1</b>

Total No. of Blows	Scale Reading (mm)	DCP (mm/blow)	Depth Below Ground Level (mm)	Log <sub>10</sub> (mm/blow)	CBR (%)
1	195	195.00	298	2.29	1.15
2	291	96.00	394	1.98	2.43
3	362	71.00	465	1.85	3.34
4	412	50.00	515	1.70	4.83
5	450	38.00	553	1.58	6.46
6	484	34.00	587	1.53	7.26
7	531	47.00	634	1.67	5.16
8	569	38.00	672	1.58	6.46
9	600	31.00	703	1.49	8.01
10	628	28.00	731	1.45	8.92
11	649	21.00	752	1.32	12.09
12	663	14.00	766	1.15	18.56
13	676	13.00	779	1.11	20.07
14	686	10.00	789	1.00	26.49
15	695	9.00	798	0.95	29.61
16	703	8.00	806	0.90	33.53
17	715	12.00	818	1.08	21.84
18	724	9.00	827	0.95	29.61
19	733	9.00	836	0.95	29.61
20	742	9.00	845	0.95	29.61
21	751	9.00	854	0.95	29.61
23	768	8.50	871	0.93	31.45
25	784	8.00	887	0.90	33.53
27	797	6.50	900	0.81	41.76
29	811	7.00	914	0.85	38.61
31	821	5.00	924	0.70	55.10
33	836	7.50	939	0.88	35.90
38	861	5.00	964	0.70	55.10
43	885	4.80	988	0.68	57.53
48	905	4.00	1008	0.60	69.76
53	923	3.60	1026	0.56	77.98
56	946	7.67	1049	0.88	35.07
61	961	3.00	1064	0.48	94.55
66	975	2.80	1078	0.45	101.71
71	984	1.80	1087	0.26	162.25
76	1001	3.40	1104	0.53	82.84



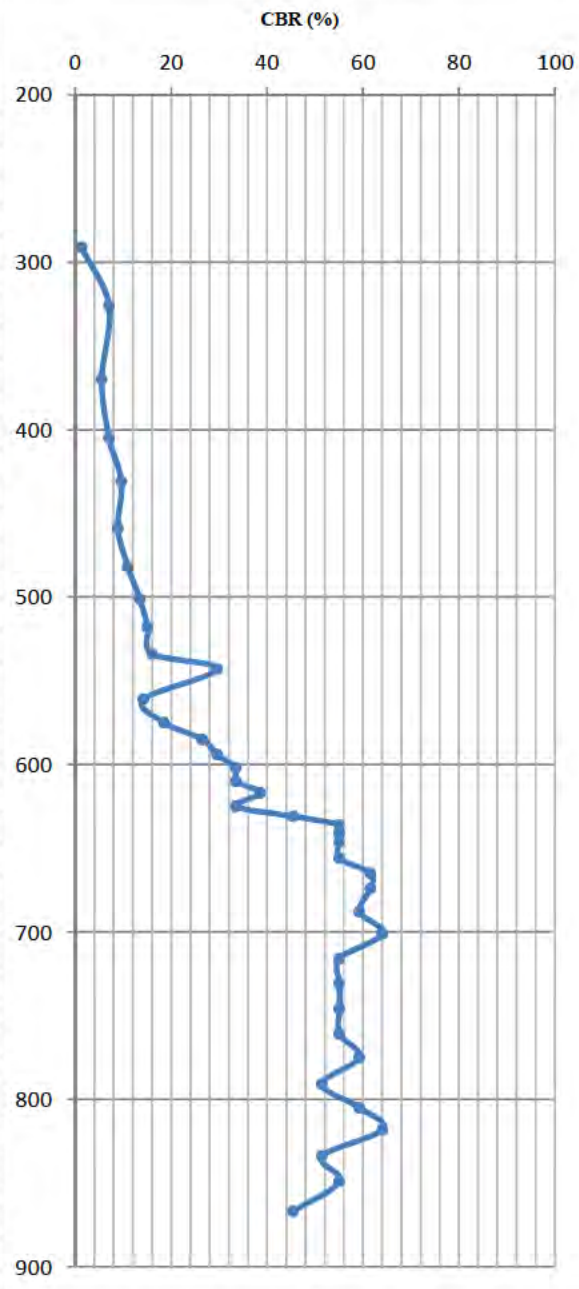
Remarks Test terminated due to low penetration. Test carried out in accordance with the operating instructions for the TRL dynamic cone penetrometer. CBR correlation based on the relationship $\text{Log}_{10}(\text{CBR}) = 2.48 - 1.057 \times \text{Log}_{10}(\text{mm/blow})$ developed by TRL taken from the Highways Agency Interim Advice Note 76-03 - Design Guide for Road Pavement Foundations (2006).	Checker: SH	Operator:  
	Approver: GW	SH



**TRL PENETROMETER TESTING**

Project <b>Northstowe - Parcel 2A</b>			Position ID <b>TRL2A02</b>	
Job No. <b>10018937</b>	Date <b>04/06/2918</b>	Ground Level (m) <b>8.74</b>		
Contractor <b>Arcadis Consulting (UK) Ltd</b>	Co-ordinates <b>540859 E 266880 N</b>	Initial Scale Reading (mm) <b>115</b>	Sheet <b>1 of 2</b>	

Total No. of Blows	Scale Reading (mm)	DCP (mm/blow)	Depth Below Ground Level (mm)	Log <sub>10</sub> (mm/blow)	CBR (%)
1	176	176.00	291	2.25	1.28
2	211	35.00	326	1.54	7.05
3	255	44.00	370	1.64	5.53
4	290	35.00	405	1.54	7.05
5	316	26.00	431	1.41	9.65
6	344	28.00	459	1.45	8.92
7	367	23.00	482	1.36	10.98
8	386	19.00	501	1.28	13.44
9	403	17.00	518	1.23	15.12
10	419	16.00	534	1.20	16.12
11	428	9.00	543	0.95	29.61
12	446	18.00	561	1.26	14.23
13	460	14.00	575	1.15	18.56
14	470	10.00	585	1.00	26.49
15	479	9.00	594	0.95	29.61
16	487	8.00	602	0.90	33.53
17	495	8.00	610	0.90	33.53
18	502	7.00	617	0.85	38.61
19	510	8.00	625	0.90	33.53
20	516	6.00	631	0.78	45.45
21	521	5.00	636	0.70	55.10
22	526	5.00	641	0.70	55.10
23	531	5.00	646	0.70	55.10
25	541	5.00	656	0.70	55.10
27	550	4.50	665	0.65	61.60
29	559	4.50	674	0.65	61.60
32	573	4.67	688	0.67	59.27
35	586	4.33	701	0.64	64.10
38	601	5.00	716	0.70	55.10
41	616	5.00	731	0.70	55.10
44	631	5.00	746	0.70	55.10
47	646	5.00	761	0.70	55.10
50	660	4.67	775	0.67	59.27
53	676	5.33	791	0.73	51.47
56	690	4.67	805	0.67	59.27
59	703	4.33	818	0.64	64.10
62	719	5.33	834	0.73	51.47
65	734	5.00	849	0.70	55.10
68	752	6.00	867	0.78	45.45



Remarks Test carried out in accordance with the operating instructions for the TRL dynamic cone penetrometer. CBR correlation based on the relationship $\text{Log}_{10}(\text{CBR}) = 2.48 - 1.057 \times \text{Log}_{10}(\text{mm/blow})$ developed by TRL taken from the Highways Agency Interim Advice Note 76-03 - Design Guide for Road Pavement Foundations (2006).	Checker: SH	Operator:  
	Approver: GW	SH

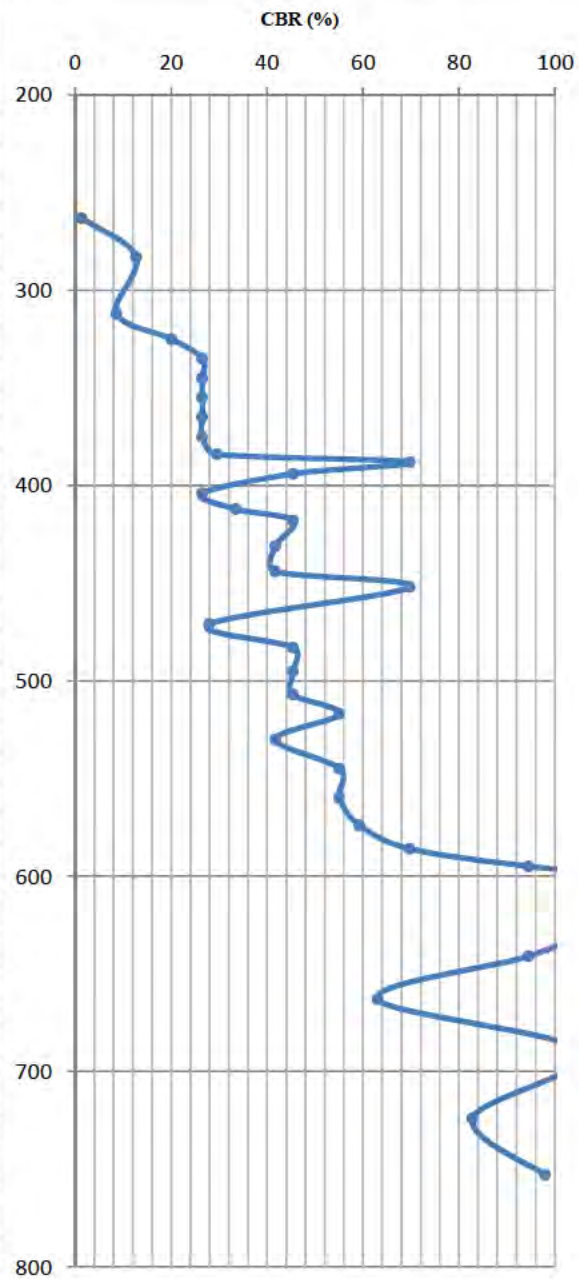




**TRL PENETROMETER TESTING**

Project Northstowe - Parcel 2A			Position ID <b>TRL2A03</b>	
Job No. 10018937	Date 04/06/2918	Ground Level (m) 8.632		
Contractor Arcadis Consulting (UK) Ltd	Co-ordinates 540821 E 266839 N	Initial Scale Reading (mm) 100	Sheet 1 of 1	

Total No. of Blows	Scale Reading (mm)	DCP (mm/blow)	Depth Below Ground Level (mm)	Log <sub>10</sub> (mm/blow)	CBR (%)
1	163	163.00	263	2.21	1.39
2	183	20.00	283	1.30	12.73
3	212	29.00	312	1.46	8.59
4	225	13.00	325	1.11	20.07
5	235	10.00	335	1.00	26.49
6	245	10.00	345	1.00	26.49
7	255	10.00	355	1.00	26.49
8	265	10.00	365	1.00	26.49
9	275	10.00	375	1.00	26.49
10	284	9.00	384	0.95	29.61
11	288	4.00	388	0.60	69.76
12	294	6.00	394	0.78	45.45
13	304	10.00	404	1.00	26.49
14	312	8.00	412	0.90	33.53
15	318	6.00	418	0.78	45.45
17	331	6.50	431	0.81	41.76
19	344	6.50	444	0.81	41.76
21	352	4.00	452	0.60	69.76
23	371	9.50	471	0.98	27.96
25	383	6.00	483	0.78	45.45
27	395	6.00	495	0.78	45.45
29	407	6.00	507	0.78	45.45
31	417	5.00	517	0.70	55.10
33	430	6.50	530	0.81	41.76
36	445	5.00	545	0.70	55.10
39	460	5.00	560	0.70	55.10
42	474	4.67	574	0.67	59.27
45	486	4.00	586	0.60	69.76
48	495	3.00	595	0.48	94.55
51	502	2.33	602	0.37	123.32
56	513	2.20	613	0.34	131.24
61	526	2.60	626	0.41	110.00
66	541	3.00	641	0.48	94.55
71	563	4.40	663	0.64	63.08
81	590	2.70	690	0.43	105.69
91	624	3.40	724	0.53	82.84
101	653	2.90	753	0.46	98.00

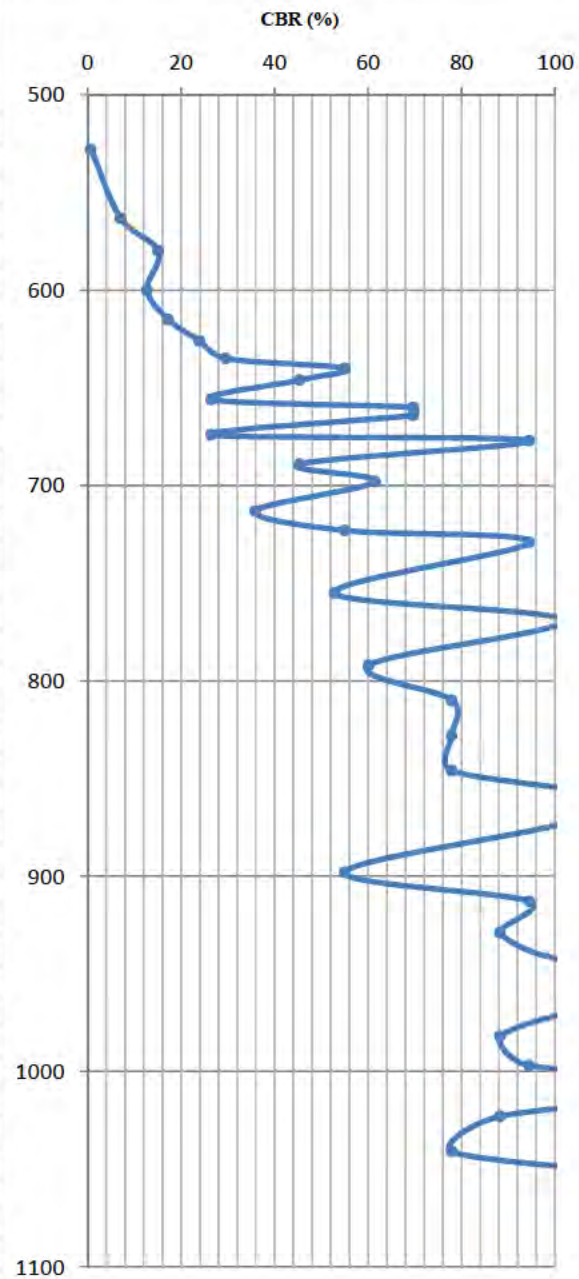


Remarks Test stopped. TRL Probe not vertical. Test carried out in accordance with the operating instructions for the TRL dynamic cone penetrometer. CBR correlation based on the relationship $\text{Log}_{10}(\text{CBR}) = 2.48 - 1.057 \times \text{Log}_{10}(\text{mm/blow})$ developed by TRL taken from the Highways Agency Interim Advice Note 76-03 - Design Guide for Road Pavement Foundations (2006).	Checker: SH	Operator:  SH
	Approver: GW	

**TRL PENETROMETER TESTING**

Project <b>Northstowe - Parcel 2A</b>			Position ID <b>TRL2A04</b>	
Job No. <b>10018937</b>	Date <b>04/06/2918</b>	Ground Level (m) <b>8.662</b>		Sheet <b>1 of 2</b>
Contractor <b>Arcadis Consulting (UK) Ltd</b>		Co-ordinates <b>540899.6 E 266814.9 N</b>	Initial Scale Reading (mm) <b>213</b>	

Total No. of Blows	Scale Reading (mm)	DCP (mm/blow)	Depth Below Ground Level (mm)	Log <sub>10</sub> (mm/blow)	CBR (%)
1	315	315.00	528	2.50	0.69
2	350	35.00	563	1.54	7.05
3	367	17.00	580	1.23	15.12
4	387	20.00	600	1.30	12.73
5	402	15.00	615	1.18	17.25
6	413	11.00	626	1.04	23.95
7	422	9.00	635	0.95	29.61
8	427	5.00	640	0.70	55.10
9	433	6.00	646	0.78	45.45
10	443	10.00	656	1.00	26.49
11	447	4.00	660	0.60	69.76
12	451	4.00	664	0.60	69.76
13	461	10.00	674	1.00	26.49
14	464	3.00	677	0.48	94.55
16	476	6.00	689	0.78	45.45
18	485	4.50	698	0.65	61.60
20	500	7.50	713	0.88	35.90
22	510	5.00	723	0.70	55.10
24	516	3.00	729	0.48	94.55
29	542	5.20	755	0.72	52.87
34	556	2.80	769	0.45	101.71
39	579	4.60	792	0.66	60.18
44	597	3.60	810	0.56	77.98
49	615	3.60	828	0.56	77.98
54	633	3.60	846	0.56	77.98
59	646	2.60	859	0.41	110.00
64	660	2.80	873	0.45	101.71
69	685	5.00	898	0.70	55.10
74	700	3.00	913	0.48	94.55
79	716	3.20	929	0.51	88.32
84	730	2.80	943	0.45	101.71
89	740	2.00	953	0.30	145.15
94	753	2.60	966	0.41	110.00
99	769	3.20	982	0.51	88.32
104	784	3.00	997	0.48	94.55
109	794	2.00	1007	0.30	145.15
114	810	3.20	1023	0.51	88.32
119	828	3.60	1041	0.56	77.98
124	840	2.40	1053	0.38	119.71



Remarks Test carried out in accordance with the operating instructions for the TRL dynamic cone penetrometer. CBR correlation based on the relationship $\text{Log}_{10}(\text{CBR}) = 2.48 - 1.057 \times \text{Log}_{10}(\text{mm/blow})$ developed by TRL taken from the Highways Agency Interim Advice Note 76-03 - Design Guide for Road Pavement Foundations (2006).	Checker: SH	Operator: SH
	Approver: GW	

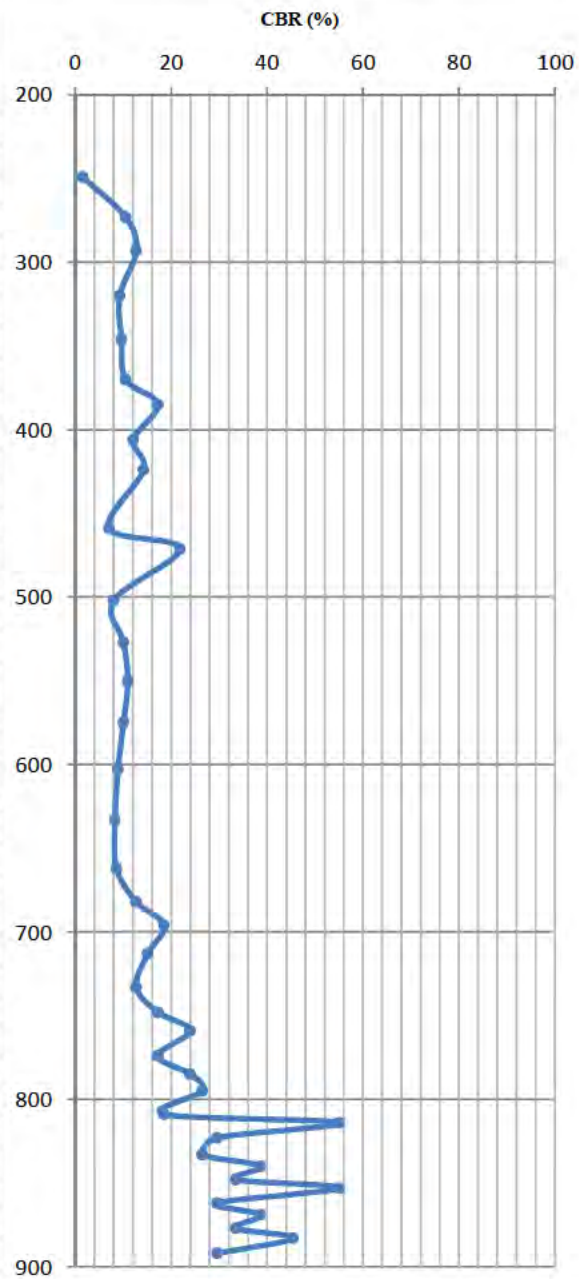




**TRL PENETROMETER TESTING**

Project <b>Northstowe - Parcel 2A</b>			Position ID <b>TRL2A05</b>	
Job No. <b>10018937</b>	Date <b>04/06/2918</b>	Ground Level (m) <b>8.826</b>		Sheet <b>1 of 2</b>
Contractor <b>Arcadis Consulting (UK) Ltd</b>		Co-ordinates <b>540865 E 266803 N</b>	Initial Scale Reading (mm) <b>100</b>	

Total No. of Blows	Scale Reading (mm)	DCP (mm/blow)	Depth Below Ground Level (mm)	Log <sub>10</sub> (mm/blow)	CBR (%)
1	149	149.00	249	2.17	1.52
2	173	24.00	273	1.38	10.50
3	193	20.00	293	1.30	12.73
4	220	27.00	320	1.43	9.27
5	246	26.00	346	1.41	9.65
6	270	24.00	370	1.38	10.50
7	285	15.00	385	1.18	17.25
8	306	21.00	406	1.32	12.09
9	324	18.00	424	1.26	14.23
10	359	35.00	459	1.54	7.05
11	371	12.00	471	1.08	21.84
12	402	31.00	502	1.49	8.01
13	427	25.00	527	1.40	10.05
14	450	23.00	550	1.36	10.98
15	475	25.00	575	1.40	10.05
16	503	28.00	603	1.45	8.92
17	533	30.00	633	1.48	8.29
18	562	29.00	662	1.46	8.59
19	582	20.00	682	1.30	12.73
20	596	14.00	696	1.15	18.56
21	613	17.00	713	1.23	15.12
22	633	20.00	733	1.30	12.73
23	648	15.00	748	1.18	17.25
24	659	11.00	759	1.04	23.95
25	674	15.00	774	1.18	17.25
26	685	11.00	785	1.04	23.95
27	695	10.00	795	1.00	26.49
28	709	14.00	809	1.15	18.56
29	714	5.00	814	0.70	55.10
30	723	9.00	823	0.95	29.61
31	733	10.00	833	1.00	26.49
32	740	7.00	840	0.85	38.61
33	748	8.00	848	0.90	33.53
34	753	5.00	853	0.70	55.10
35	762	9.00	862	0.95	29.61
36	769	7.00	869	0.85	38.61
37	777	8.00	877	0.90	33.53
38	783	6.00	883	0.78	45.45
39	792	9.00	892	0.95	29.61



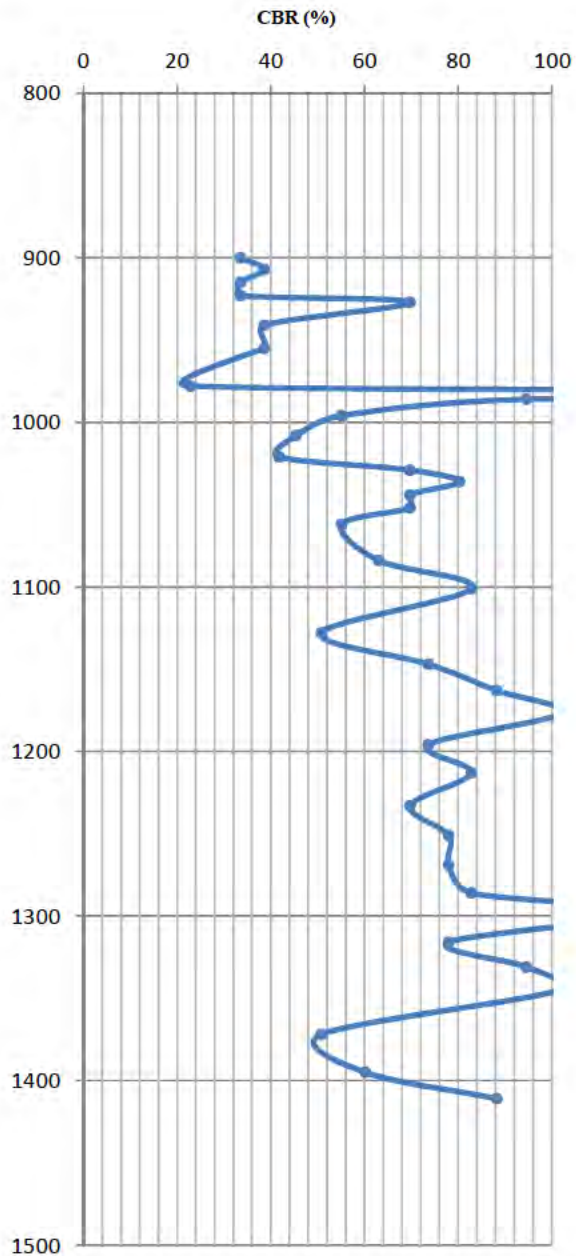
Remarks Test carried out in accordance with the operating instructions for the TRL dynamic cone penetrometer. CBR correlation based on the relationship $\text{Log}_{10}(\text{CBR}) = 2.48 - 1.057 \times \text{Log}_{10}(\text{mm/blow})$ developed by TRL taken from the Highways Agency Interim Advice Note 76-03 - Design Guide for Road Pavement Foundations (2006).	Checker:	Operator:
	SH	
	Approver:	SH
	GW	



**TRL PENETROMETER TESTING**

Project <b>Northstowe - Parcel 2A</b>			Position ID <b>TRL2A05</b>	
Job No. <b>10018937</b>	Date <b>04/06/2018</b>	Ground Level (m) <b>8.826</b>		
Contractor <b>Arcadis Consulting (UK) Ltd</b>		Co-ordinates <b>540865 E 266803 N</b>	Initial Scale Reading (mm) <b>100</b>	Sheet <b>2 of 2</b>

Total No. of Blows	Scale Reading (mm)	DCP (mm/blow)	Depth Below Ground Level (mm)	Log <sub>10</sub> (mm/blow)	CBR (%)
40	800	8.00	900	0.90	33.53
41	807	7.00	907	0.85	38.61
42	815	8.00	915	0.90	33.53
43	823	8.00	923	0.90	33.53
44	827	4.00	927	0.60	69.76
46	841	7.00	941	0.85	38.61
48	855	7.00	955	0.85	38.61
50	878	11.50	978	1.06	22.85
52	880	1.00	980	0.00	302.00
54	886	3.00	986	0.48	94.55
56	896	5.00	996	0.70	55.10
58	908	6.00	1008	0.78	45.45
60	921	6.50	1021	0.81	41.76
62	929	4.00	1029	0.60	69.76
64	936	3.50	1036	0.54	80.34
66	944	4.00	1044	0.60	69.76
68	952	4.00	1052	0.60	69.76
70	962	5.00	1062	0.70	55.10
75	984	4.40	1084	0.64	63.08
80	1001	3.40	1101	0.53	82.84
85	1028	5.40	1128	0.73	50.80
90	1047	3.80	1147	0.58	73.65
95	1063	3.20	1163	0.51	88.32
100	1077	2.80	1177	0.45	101.71
105	1096	3.80	1196	0.58	73.65
110	1113	3.40	1213	0.53	82.84
115	1133	4.00	1233	0.60	69.76
120	1151	3.60	1251	0.56	77.98
125	1169	3.60	1269	0.56	77.98
130	1186	3.40	1286	0.53	82.84
135	1198	2.40	1298	0.38	119.71
140	1216	3.60	1316	0.56	77.98
145	1231	3.00	1331	0.48	94.55
150	1245	2.80	1345	0.45	101.71
155	1272	5.40	1372	0.73	50.80
160	1295	4.60	1395	0.66	60.18
165	1311	3.20	1411	0.51	88.32
167	1320	4.50	1420	0.65	61.60



Remarks Test carried out in accordance with the operating instructions for the TRL dynamic cone penetrometer. CBR correlation based on the relationship $\text{Log}_{10}(\text{CBR}) = 2.48 - 1.057 \times \text{Log}_{10}(\text{mm/blow})$ developed by TRL taken from the Highways Agency Interim Advice Note 76-03 - Design Guide for Road Pavement Foundations (2006).	Checker: SH	Operator:
	Approver: GW	SH

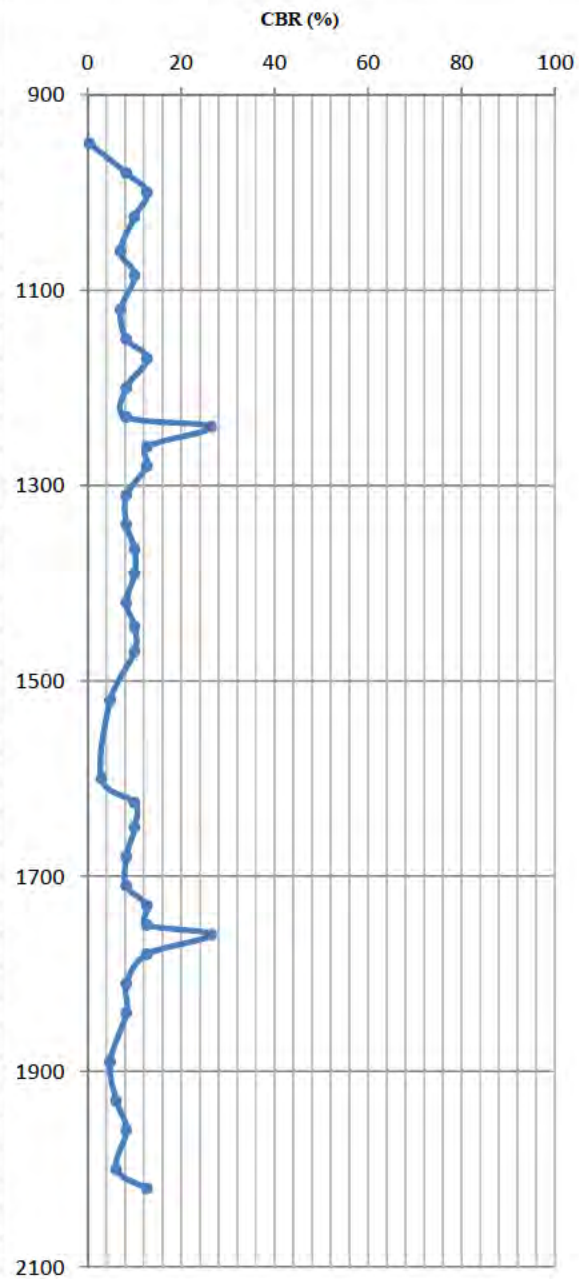




**TRL PENETROMETER TESTING**

Project <b>Northstowe - Parcel 2A</b>			Position ID <b>TRL2A07</b>
Job No. <b>10018937</b>	Date <b>05/06/2018</b>	Ground Level (m) <b>9.326</b>	
Contractor <b>Arcadis Consulting (UK) Ltd</b>	Co-ordinates <b>541007 E 266830 N</b>	Initial Scale Reading (mm) <b>460</b>	Sheet <b>1 of 1</b>

Total No. of Blows	Scale Reading (mm)	DCP (mm/blow)	Depth Below Ground Level (mm)	Log <sub>10</sub> (mm/blow)	CBR (%)
1	490	490.00	950	2.69	0.43
2	520	30.00	980	1.48	8.29
3	540	20.00	1000	1.30	12.73
4	565	25.00	1025	1.40	10.05
5	600	35.00	1060	1.54	7.05
6	625	25.00	1085	1.40	10.05
7	660	35.00	1120	1.54	7.05
8	690	30.00	1150	1.48	8.29
9	710	20.00	1170	1.30	12.73
10	740	30.00	1200	1.48	8.29
11	770	30.00	1230	1.48	8.29
12	780	10.00	1240	1.00	26.49
13	800	20.00	1260	1.30	12.73
14	820	20.00	1280	1.30	12.73
15	850	30.00	1310	1.48	8.29
16	880	30.00	1340	1.48	8.29
17	905	25.00	1365	1.40	10.05
18	930	25.00	1390	1.40	10.05
19	960	30.00	1420	1.48	8.29
20	985	25.00	1445	1.40	10.05
21	1010	25.00	1470	1.40	10.05
22	1060	50.00	1520	1.70	4.83
23	1140	80.00	1600	1.90	2.94
24	1165	25.00	1625	1.40	10.05
25	1190	25.00	1650	1.40	10.05
26	1220	30.00	1680	1.48	8.29
27	1250	30.00	1710	1.48	8.29
28	1270	20.00	1730	1.30	12.73
29	1290	20.00	1750	1.30	12.73
30	1300	10.00	1760	1.00	26.49
31	1320	20.00	1780	1.30	12.73
32	1350	30.00	1810	1.48	8.29
33	1380	30.00	1840	1.48	8.29
34	1430	50.00	1890	1.70	4.83
35	1470	40.00	1930	1.60	6.12
36	1500	30.00	1960	1.48	8.29
37	1540	40.00	2000	1.60	6.12
38	1560	20.00	2020	1.30	12.73

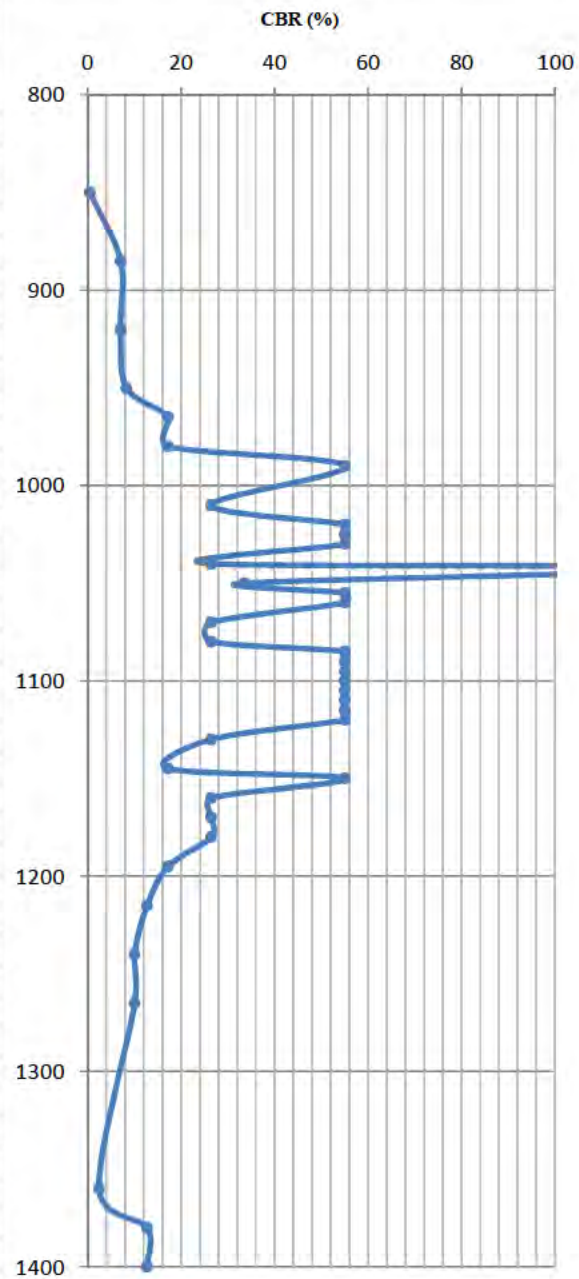


Remarks Test carried out in accordance with the operating instructions for the TRL dynamic cone penetrometer. CBR correlation based on the relationship $\text{Log}_{10}(\text{CBR}) = 2.48 - 1.057 \times \text{Log}_{10}(\text{mm/blow})$ developed by TRL taken from the Highways Agency Interim Advice Note 76-03 - Design Guide for Road Pavement Foundations (2006).	Checker:	Operator:
	SH	
	Approver:	MT
	GW	

**TRL PENETROMETER TESTING**

Project <b>Northstowe - Parcel 2A</b>			Position ID <b>TRL2A08</b>
Job No. <b>10018937</b>	Date <b>05/06/2018</b>	Ground Level (m) <b>8.798</b>	
Contractor <b>Arcadis Consulting (UK) Ltd</b>	Co-ordinates <b>540960 E 266918 N</b>	Initial Scale Reading (mm) <b>410</b>	Sheet <b>1 of 2</b>

Total No. of Blows	Scale Reading (mm)	DCP (mm/blow)	Depth Below Ground Level (mm)	Log <sub>10</sub> (mm/blow)	CBR (%)
1	440	440.00	850	2.64	0.49
2	475	35.00	885	1.54	7.05
3	510	35.00	920	1.54	7.05
4	540	30.00	950	1.48	8.29
5	555	15.00	965	1.18	17.25
6	570	15.00	980	1.18	17.25
8	580	5.00	990	0.70	55.10
10	600	10.00	1010	1.00	26.49
12	610	5.00	1020	0.70	55.10
13	615	5.00	1025	0.70	55.10
14	620	5.00	1030	0.70	55.10
15	630	10.00	1040	1.00	26.49
16	632	2.00	1042	0.30	145.15
17	640	8.00	1050	0.90	33.53
18	645	5.00	1055	0.70	55.10
19	650	5.00	1060	0.70	55.10
20	660	10.00	1070	1.00	26.49
21	670	10.00	1080	1.00	26.49
22	675	5.00	1085	0.70	55.10
23	680	5.00	1090	0.70	55.10
24	685	5.00	1095	0.70	55.10
25	690	5.00	1100	0.70	55.10
26	695	5.00	1105	0.70	55.10
27	700	5.00	1110	0.70	55.10
28	705	5.00	1115	0.70	55.10
29	710	5.00	1120	0.70	55.10
30	720	10.00	1130	1.00	26.49
31	735	15.00	1145	1.18	17.25
32	740	5.00	1150	0.70	55.10
33	750	10.00	1160	1.00	26.49
34	760	10.00	1170	1.00	26.49
35	770	10.00	1180	1.00	26.49
36	785	15.00	1195	1.18	17.25
37	805	20.00	1215	1.30	12.73
38	830	25.00	1240	1.40	10.05
39	855	25.00	1265	1.40	10.05
40	950	95.00	1360	1.98	2.45
41	970	20.00	1380	1.30	12.73
42	990	20.00	1400	1.30	12.73



Remarks Test carried out in accordance with the operating instructions for the TRL dynamic cone penetrometer. CBR correlation based on the relationship $\text{Log}_{10}(\text{CBR}) = 2.48 - 1.057 \times \text{Log}_{10}(\text{mm/blow})$ developed by TRL taken from the Highways Agency Interim Advice Note 76-03 - Design Guide for Road Pavement Foundations (2006).	Checker: SH	Operator: MT
	Approver: GW	











## APPENDIX D

### CERTIFICATION OF FIELD APPARATUS





# Hammer Energy Test Report

in accordance with BSEN ISO 22476-3:2005

**Dynamic sampling uk ltd**  
Unit 5-8 victory parkway  
victory road  
Derby  
DE24 8ZF

Hammer Ref: CJ03  
Test Date: 02/08/2017  
Report Date: 02/08/2017  
File Name: CJ03.spt  
Test Operator: TP

## Instrumented Rod Data

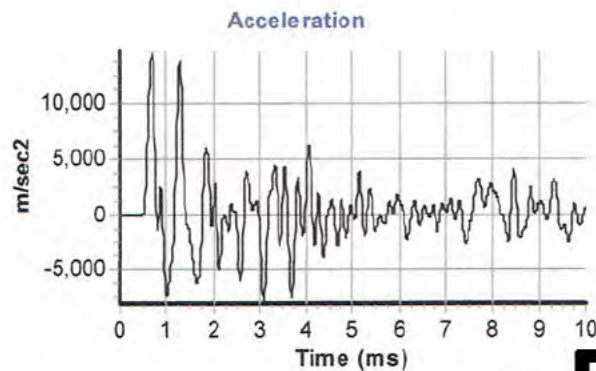
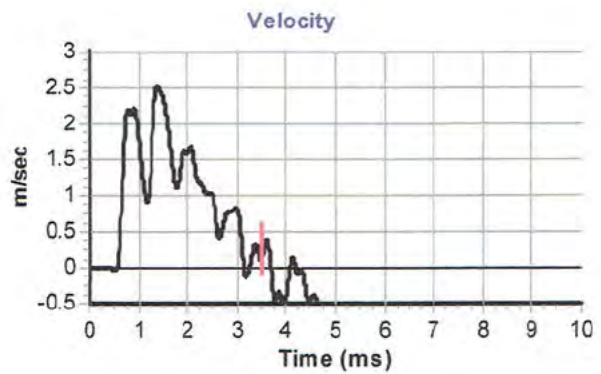
Diameter  $d_r$  (mm): 54  
Wall Thickness  $t_r$  (mm): 6.9  
Assumed Modulus  $E_a$  (GPa): 208  
Accelerometer No.1: 6455  
Accelerometer No.2: 6457

## Hammer Information

Hammer Mass  $m$  (kg): 63.5  
Falling Height  $h$  (mm): 760  
String Length  $L$  (m): 15.0

## Comments / Location

C.J. associates hammer tested at Dynamic samplings yard.



## Calculations

Area of Rod A ( $\text{mm}^2$ ): 1021  
Theoretical Energy  $E_{\text{theor}}$  (J): 473  
Measured Energy  $E_{\text{meas}}$  (J): 327

**Energy Ratio  $E_r$  (%):** 69

# Reg. 13(1)

Title: Associate Director.

The recommended calibration interval is 12 months

## APPENDIX E

### MONITORING DATA



Project:	Northstowe - Parcel 2A		
Job Number:	10018973	Date:	29/06/2018

Weather:	Very warm / Dry
Engineer:	RD

Monitoring Point Reference	Date/ Time	Atmos. Pressure (mbar)	Temp. (°C)	Well Pressure (Pa)	Flow Rate (l/h)	Time (sec)	CH4 (% v/v)	LEL (%)	CO2 (% v/v)	O2 (% v/v)	H2S (ppm)	CO (ppm)	Hex. (%)	PID cf	VOC (ppm)	Depth to Water (m)	Depth to base (m)	Comments (all readings from GL, note datum height if different)
BH2A01S	29/06/2018	1025		Peak 7	Peak 0	Initial	0	0	0	21	0	0				0.83	2.44	Measured from Ground Level
						30	0	0	0.7	20.1	0	1						
						60	0	0	0.8	19.7	0	1						
						90	0	0	0.8	19.5	0	0						
						120	0	0	0.9	19.5	0	1						
						150	0	0	0.9	19.4	0	1						
						180	0	0	0.9	19.4	0	1						
				Steady 7	Steady 0													
BH2A01D	29/06/2018	1025		Peak 5	Peak 0	Initial	0	0	0	20.8	0	1				0.6	6.21	Measured from Ground Level
						30	0	0	0.2	20.5	0	3						
						60	0	0	0.2	20.5	0	3						
						90	0	0	0.2	20.5	0	3						
						120	0	0	0.2	20.5	0	2						
						150	0	0	0.2	20.5	0	2						
						180	0	0	0.2	20.6	0	2						
				Steady 5	Steady 0													
BH2A02S	29/06/2018	1025		Peak 9	Peak 0	Initial	0	0	0.1	20.7	0	0				0.75	2.2	Measured from Ground Level
						30	0	0	0.2	20.5	0	0						
						60	0	0	0.2	20.5	0	1						
						90	0	0	0.3	20.5	0	1						
						120	0	0	0.3	20.5	0	0						
						150	0	0	0.3	20.5	0	1						
						180	0	0	0.3	20.5	0	0						
				Steady 9	Steady 0													
BH2A02D	29/06/2018	1025		Peak 3763	Peak 6.6	Initial	0	0	0.1	20.7	0	3				0.56	7.88	Measured from Ground Level
						30	0	0	0.2	20.5	0	4						
						60	0	0	0.2	20.5	0	4						
						90	0	0	0.2	20.5	0	4						
						120	0	0	0.2	20.5	0	4						
						150	0	0	0.2	20.5	0	4						
						180	0	0	0.2	20.5	0	4						
				Steady 3763	Steady 3.0													

Notes: PID readings have not been taken.

Ambient Concentration	
CH4	0
CO2	0.428571429
O2	20.43015873
H2S	0.095238095
CO	1.19047619

Previous weather conditions, Atmospheric pressure trend and rate, flooding, soil moisture, water draw in tube, wind direction/strength, condition of monitoring point, missing/open tap, datum level, vegetation stress, odours, bubbles, etc.

QA Checklist:	
Weather conditions logged for previous 24 hrs	N
Gas monitor calibrated	Y
All filters in place	Y
Flow reading stable and zeroed	Y

Instrument Details:	Serial No.	Hyder/other ref.
Landfill Gas Analyser		GA5000
PID		
Dip meter/ interface probe		

Project:	Northstowe - Parcel 2A
Job Number:	10018973

Date:	29/06/2018
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Monitoring Point Reference	Date/ Time	Atmos. Pressure (mbar)	Temp. (°C)	Well Pressure (Pa)	Flow Rate (l/h)	Time (sec)	CH4 (% v/v)	LEL (%)	CO2 (% v/v)	O2 (% v/v)	H2S (ppm)	CO (ppm)	Hex. (%)	PID cf	VOC (ppm)	Depth to water (m)	Depth to base (m)	Comments (all readings from GL, note datum height if different)
BH2A03S	29/06/2018	1025		Peak 12	Peak 0	Initial	0	0	0.1	20.8	0	0				1.11	3.04	Measured from Ground Level
						30	0	0	0.2	20.8	0	2						
						60	0	0	0.2	20.8	0	2						
						90	0	0	0.2	20.8	0	2						
						120	0	0	0.2	20.8	0	2						
						150	0	0	0.2	20.8	0	2						
						180	0	0	0.2	20.8	0	2						
BH2A03D	29/06/2018	1025		Peak 0	Peak 0	Initial	0	0	0.1	20.8	0	0				1.1	5	Measured from Ground Level
						30	0	0	1.5	19.1	0	2						
						60	0	0	1.6	19	0	2						
						90	0	0	1.6	19	0	2						
						120	0	0	1.6	19	0	2						
						150	0	0	1.6	19	0	2						
						180	0	0	1.6	19	0	2						
BH2A04S	29/06/2018	1025		Peak 3	Peak 0	Initial	0	0	0.1	20.9	0	0				1.32	3.14	Measured from Ground Level
						30	0	0	0.5	20.7	1	0						
						60	0	0	0.5	20.7	1	0						
						90	0	0	0.5	20.7	1	0						
						120	0	0	0.5	20.7	1	0						
						150	0	0	0.5	20.7	1	0						
						180	0	0	0.5	20.7	1	0						
BH2A04D	29/06/2018	1025		Peak 15	Peak 0	Initial	0	0	0.1	21	0	0				1.35	14.96	Measured from Ground Level
						30	0	0	0.1	21	0	0						
						60	0	0	0.1	21	0	0						
						90	0	0	0.1	21	0	0						
						120	0	0	0.1	21	0	0						
						150	0	0	0.1	21	0	0						
						180	0	0	0.1	21	0	0						
BH2A05S	29/06/2018	1025		Peak 0	Peak 0.1	Initial	0	0	0.1	20.9	0	0				1.3	2.94	Measured from Ground Level
						30	0	0	0.5	20.7	0	0						
						60	0	0	0.5	20.6	0	0						
						90	0	0	0.5	20.6	0	0						
						120	0	0	0.5	20.6	0	0						
						150	0	0	0.5	20.6	0	0						
						180	0	0	0.5	20.6	0	0						

**Notes:**  
 PID readings have not been taken.

*Previous weather conditions, Atmospheric pressure trend and rate, flooding, soil moisture, water draw in tube, wind direction/strength, condition of monitoring point, missing/open tap, datum level, vegetation stress, odours, bubbles, etc.*



Project:	Northstowe - Parcel 2A		
Job Number:	10018973	Date:	29/06/2018

Weather:	Very warm / Dry
Engineer:	RD

Monitoring Point Reference	Date/ Time	Atmos. Pressure (mbar)	Temp. (°C)	Well Pressure (Pa)	Flow Rate (l/h)	Time (sec)	CH4 (% v/v)	LEL (%)	CO2 (% v/v)	O2 (% v/v)	H2S (ppm)	CO (ppm)	Hex. (%)	PID cf	VOC (ppm)	Depth to Water (m)	Depth to base (m)	Comments (all readings from GL, note datum height if different)
BH2A05D	29/06/2018	1025		Peak 9	Peak 0	Initial	0	0	0.1	20.9	0	1				1.43	15.02	Measured from Ground Level
						30	0	0	0.2	20.8	0	1						
						60	0	0	0.2	20.8	0	1						
						90	0	0	0.2	20.8	0	0						
						120	0	0	0.2	20.8	0	0						
						150	0	0	0.2	20.8	0	0						
						180	0	0	0.2	20.8	0	0						
				Steady 9	Steady 0													
BH2A06S	29/06/2018	1025		Peak 9	Peak 0	Initial	0	0	0	20.9	0	1				1.6	2.36	Measured from Ground Level
						30	0	0	1.7	20	0	0						
						60	0	0	1.7	19.9	0	0						
						90	0	0	1.6	19.9	0	0						
						120	0	0	1.6	19.9	0	0						
						150	0	0	1.6	19.9	0	0						
						180	0	0	1.6	19.9	0	0						
				Steady 9	Steady 0													
BH2A06D	29/06/2018	1025		Peak 10	Peak 0	Initial	0	0	0.1	20.8	0	1				1.6	7.06	Measured from Ground Level
						30	0	0	0.4	20.6	0	2						
						60	0	0	0.4	20.5	0	2						
						90	0	0	0.4	20.5	0	2						
						120	0	0	0.4	20.5	0	1						
						150	0	0	0.4	20.5	0	2						
						180	0	0	0.4	20.5	0	1						
				Steady 10	Steady 0													
BH2A07S	29/06/2018	1025		Peak 10	Peak 0	Initial	0	0	0	20.8	0	0				0.56	2.67	Measured from Ground Level
						30	0	0	0.1	20.8	0	0						
						60	0	0	0.1	20.7	0	0						
						90	0	0	0.1	20.7	0	0						
						120	0	0	0.1	20.7	0	0						
						150	0	0	0.1	20.7	0	0						
						180	0	0	0.1	20.7	0	0						
				Steady 10	Steady 0													

Notes: PID readings have not been taken.

Ambient Concentration	
CH4	0
CO2	0.44
O2	20.53939394
H2S	0
CO	0.689655172

Previous weather conditions, Atmospheric pressure trend and rate, flooding, soil moisture, water draw in tube, wind direction/strength, condition of monitoring point, missing/open tap, datum level, vegetation stress, odours, bubbles, etc.

QA Checklist:	
Weather conditions logged for previous 24 hrs	N
Gas monitor calibrated	Y
All filters in place	Y
Flow reading stable and zeroed	Y

Instrument Details:	Serial No.	Hyder/other ref.
Landfill Gas Analyser		GA5000
PID		
Dip meter/ interface probe		

Project:	Northstowe - Parcel 2A
Job Number:	10018973

Date:	29/06/2018
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Monitoring Point Reference	Date/ Time	Atmos. Pressure (mbar)	Temp. (°C)	Well Pressure (Pa)	Flow Rate (l/h)	Time (sec)	CH4 (% v/v)	LEL (%)	CO2 (% v/v)	O2 (% v/v)	H2S (ppm)	CO (ppm)	Hex. (%)	PID cf	VOC (ppm)	Depth to water (m)	Depth to base (m)	Comments (all readings from GL, note datum height if different)
BH2A07D	29/06/2018	1025		Peak 3	Peak 0	Initial	0	0	0	20.7	0	0				0.55	10.04	Measured from Ground Level
						30	0	0	0.2	20.6	0	2						
						60	0	0	0.2	20.6	0	2						
						90	0	0	0.2	20.6	0	2						
				Steady 3	Steady 0	120	0	0	0.2	20.6	0	2						
						150	0	0	0.2	20.6	0	2						
						180	0	0	0.2	20.6	0	2						

Notes:

PID readings have not been taken.

Previous weather conditions, Atmospheric pressure trend and rate, flooding, soil moisture, water draw in tube, wind direction/strength, condition of monitoring point, missing/open tap, datum level, vegetation stress, odours, bubbles, etc.



Project:	Northstowe - Parcel 2A		
Job Number:	10018973	Date:	06/07/2018

Weather:	Dry
Engineer:	RD

Monitoring Point Reference	Date/ Time	Atmos. Pressure (mbar)	Temp. (°C)	Well Pressure (Pa)	Flow Rate (l/h)	Time (sec)	CH4 (% v/v)	LEL (%)	CO2 (% v/v)	O2 (% v/v)	H2S (ppm)	CO (ppm)	Hex. (%)	PID cf	VOC (ppm)	Depth to Water (m)	Depth to base (m)	Comments (all readings from GL, note datum height if different)
BH2A01S	06/07/2018 11:15	1019		Peak 0	Peak 0	Initial	0	0	0	20.8	0	0			0	0.85	2.44	Measured from Ground Level
						30	0	0	1.5	18.3	0	0		0.5				
						60	0	0	1.5	18.2	0	0		0.5				
						90	0	0	1.5	18.2	0	0		0.5				
						120	0	0	1.5	18.2	0	0		0.5				
						150	0	0	1.5	18.2	0	0		0.5				
						180	0	0	1.5	18.2	0	0		0.5				
						Steady 0	Steady 0											
BH2A01D	06/07/2018 11:15	1019		Peak 36	Peak 0.2	Initial	0	0	0	20.6	0	0			0	0.64	6.21	Measured from Ground Level
						30	0	0	0.3	20.2	0	4		0.4				
						60	0	0	0.2	20.3	0	4		0.4				
						90	0	0	0.2	20.3	0	3		0.4				
						120	0	0	0.2	20.4	0	3		0.4				
						150	0	0	0.2	20.4	0	3		0.4				
						180	0	0	0.2	20.5	0	2		0.4				
						Steady 36	Steady 0											
BH2A02S	06/07/2018 11:40	1019		Peak 0	Peak 0	Initial	0	0	0.1	20.6	0	0			0	0.73	2.2	Measured from Ground Level
						30	0	0	0.3	20.4	0	0		0.7				
						60	0	0	0.3	20.4	0	0		0.7				
						90	0	0	0.3	20.4	0	0		0.7				
						120	0	0	0.3	20.4	0	0		0.7				
						150	0	0	0.3	20.4	0	0		0.7				
						180	0	0	0.3	20.4	0	0		0.7				
						Steady 0	Steady 0											
BH2A02D	06/07/2018 11:40	1019		Peak 827	Peak 5.4	Initial	0	0	0	20.7	0	0			0.5	0.57	7.88	Measured from Ground Level / PID readings stopped at 120 seconds due to a pump error.
						30	0	0	0.4	20.1	0	6		0.7				
						60	0	0	0.4	20.1	0	8		1.1				
						90	0	0	0.4	20.1	0	8		1.1				
						120	0	0	0.4	20.1	0	8						
						150	0	0	0.4	20.1	0	8						
						180	0	0	0.4	20.1	0	8						
						Steady 827	Steady 1.2											

Notes:

Ambient Concentration	
CH4	0
CO2	0.668253968
O2	19.83333333
H2S	0
CO	1.031746032

Previous weather conditions, Atmospheric pressure trend and rate, flooding, soil moisture, water draw in tube, wind direction/strength, condition of monitoring point, missing/open tap, datum level, vegetation stress, odours, bubbles, etc.

QA checklist:	
Weather conditions logged for previous 24 hrs	N
Gas monitor calibrated	Y
All filters in place	Y
Flow reading stable and zeroed	Y

Instrument Details:	Serial No.	Hyder/other ref.
Landfill Gas Analyser		GA5000
PID		
Dip meter/ interface probe		

Project:	Northstowe - Parcel 2A
Job Number:	10018973

Date:	06/07/2018
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Monitoring Point Reference	Date/ Time	Atmos. Pressure (mbar)	Temp. (°C)	Well Pressure (Pa)	Flow Rate (l/h)	Time (sec)	CH4 (% v/v)	LEL (%)	CO2 (% v/v)	O2 (% v/v)	H2S (ppm)	CO (ppm)	Hex. (%)	PID cf	VOC (ppm)	Depth to water (m)	Depth to base (m)	Comments (all readings from GL, note datum height if different)	
BH2A03S	06/07/2018 09:10	1021		Peak 0	Peak 0	Initial	0	0	0.1	20.6	0	0			0.6	1.23	3.04	Measured from Ground Level	
						30	0	0	0.2	20.6	0	0		1.4					
						60	0	0	0.1	20.5	0	0		1.5					
						90	0	0	0.1	20.5	0	0		1.5					
						120	0	0	0.1	20.5	0	0		1.5					
						150	0	0	0.1	20.5	0	0		1.5					
						180	0	0	0.1	20.5	0	0		1.5					
						Steady 0	Steady 0	120	0	0	0.1	20.5	0	0					1.5
						Steady 0	Steady 0	150	0	0	0.1	20.5	0	0					1.5
Steady 0	Steady 0	180	0	0	0.1	20.5	0	0		1.5									
BH2A03D	06/07/2018 09:10	1021		Peak 0	Peak 0	Initial	0	0	0.1	20.5	0	0			0.7	1.22	5	Measured from Ground Level	
						30	0	0	3.4	17.3	0	0		0.8					
						60	0	0	3.6	16.9	0	0		1.3					
						90	0	0	3.7	16.8	0	0		1.3					
						120	0.1	0	3.7	16.8	0	0		1.3					
						150	0.1	0	3.7	16.8	0	0		1.3					
						180	0.1	0	3.7	16.8	0	0		1.3					
						Steady 0	Steady 0	120	0.1	0	3.7	16.8	0	0					1.3
						Steady 0	Steady 0	150	0.1	0	3.7	16.8	0	0					1.3
Steady 0	Steady 0	180	0.1	0	3.7	16.8	0	0		1.3									
BH2A04S	06/07/2018 10:50	1019		Peak 3	Peak 0	Initial	0	0	0	20.4	0	0			0	1.36	3.14	Measured from Ground Level	
						30	0	0	0.4	20.3	0	0		0.1					
						60	0	0	0.4	20.3	0	0		0.1					
						90	0	0	0.4	20.3	0	0		0.2					
						120	0	0	0.4	20.3	0	0		0.2					
						150	0	0	0.4	20.3	0	0		0.2					
						180	0	0	0.4	20.3	0	0		0.2					
						Steady 3	Steady 0	120	0	0	0.4	20.3	0	0					0.2
						Steady 3	Steady 0	150	0	0	0.4	20.3	0	0					0.2
Steady 3	Steady 0	180	0	0	0.4	20.3	0	0		0.2									
BH2A04D	06/07/2018 10:50	1019		Peak 2	Peak 0	Initial	0	0	0	20.5	0	0			0	1.34	14.96	Measured from Ground Level	
						30	0	0	0	20.4	0	0		0.1					
						60	0	0	0	20.4	0	0		0.1					
						90	0	0	0	20.4	0	0		0.1					
						120	0	0	0	20.4	0	0		0.1					
						150	0	0	0	20.4	0	0		0.1					
						180	0	0	0	20.4	0	0		0.1					
						Steady 2	Steady 0	120	0	0	0	20.4	0	0					0.1
						Steady 2	Steady 0	150	0	0	0	20.4	0	0					0.1
Steady 2	Steady 0	180	0	0	0	20.4	0	0		0.1									
BH2A05S	13/07/2018 10:30	1021		Peak 1	Peak 0.1	Initial	0	0	0	20.5	0	0			0.4	1.29	2.94	Measured from Ground Level	
						30	0	0	0.4	20.2	0	0		2.5					
						60	0	0	0.4	20.2	0	0		2					
						90	0	0	0.4	20.2	0	0		2.6					
						120	0	0	0.4	20.2	0	0		2.7					
						150	0	0	0.4	20.2	0	0		2.8					
						180	0	0	0.4	20.2	0	0		3					
						Steady 1	Steady 0.0	120	0	0	0.4	20.2	0	0					2.7
						Steady 1	Steady 0.0	150	0	0	0.4	20.2	0	0					2.8
Steady 1	Steady 0.0	180	0	0	0.4	20.2	0	0		3									

Notes:

Previous weather conditions, Atmospheric pressure trend and rate, flooding, soil moisture, water draw in tube, wind direction/strength, condition of monitoring point, missing/open top, datum level, vegetation stress, odours, bubbles, etc.



Project:	Northstowe - Parcel 2A		
Job Number:	10018973	Date:	06/07/2018

Weather:	Dry
Engineer:	RD

Monitoring Point Reference	Date/ Time	Atmos. Pressure (mbar)	Temp. (°C)	Well Pressure (Pa)	Flow Rate (l/h)	Time (sec)	CH4 (% v/v)	LEL (%)	CO2 (% v/v)	O2 (% v/v)	H2S (ppm)	CO (ppm)	Hex. (%)	PID cf	VOC (ppm)	Depth to Water (m)	Depth to base (m)	Comments (all readings from GL, note datum height if different)
BH2A05D	06/07/2018 10:30	1021		Peak 2	Peak 0	Initial	0	0	0	20.5	0	1			0	1.41	15.02	Measured from Ground Level
						30	0	0	0.1	20.4	0	0		0.5				
						60	0	0	0.1	20.4	0	0		2.3				
						90	0	0	0.1	20.4	0	0		2.2				
						120	0	0	0.1	20.4	0	0		2.5				
						150	0	0	0.1	20.4	0	0		2.7				
						180	0	0	0.1	20.4	0	0		2.8				
						Steady 2	Steady 0											
BH2A06S	06/07/2018 09:45	1021		Peak 1	Peak 0	Initial	0	0	0.1	20.4	0	0			1.9	1.74	2.36	Measured from Ground Level
						30	0	0	0.9	20	0	0		5.1				
						60	0	0	0.9	19.9	0	0		10.3				
						90	0	0	0.9	19.9	0	0		12.6				
						120	0	0	0.9	19.9	0	0		12.7				
						150	0	0	0.9	19.9	0	0		12.5				
						180	0	0	1	19.9	0	0		12.4				
						Steady 1	Steady 0											
BH2A06D	06/07/2018 09:45	1021		Peak 0	Peak 0	Initial	0	0	0.1	20.7	0	0			0.3	1.73	7.06	Measured from Ground Level
						30	0	0	0.4	20.6	0	0		4.1				
						60	0	0	0.4	20.6	0	0		8.6				
						90	0	0	0.4	20.6	0	0		12.5				
						120	0	0	0.4	20.6	0	0		8.6				
						150	0	0	0.4	20.6	0	0		9.2				
						180	0	0	0.4	20.6	0	0		9.1				
						Steady 0	Steady 0											
BH2A07S	06/07/2018 10:10	1021		Peak 0	Peak 0	Initial	0	0	0.1	20.7	0	0			0.4	0.59	2.67	Measured from Ground Level
						30	0	0	0.1	20.7	0	0		0.3				
						60	0	0	0.1	20.7	0	0		0.4				
						90	0	0	0.1	20.7	0	0		0.3				
						120	0	0	0.1	20.7	0	0		0.4				
						150	0	0	0.1	20.7	0	0		0.4				
						180	0	0	0.1	20.7	0	0		0.4				
						Steady 0	Steady 0											

Notes:

Ambient Concentration	
CH4	0
CO2	0.32
O2	20.43714286
H2S	0
CO	0.314285714

Previous weather conditions, Atmospheric pressure trend and rate, flooding, soil moisture, water draw in tube, wind direction/strength, condition of monitoring point, missing/open top, datum level, vegetation stress, odours, bubbles, etc.

QA Checklist:	
Weather conditions logged for previous 24 hrs	N
Gas monitor calibrated	Y
All filters in place	Y
Flow reading stable and zeroed	Y

Instrument Details:	Serial No.	Hyder/other ref.
Landfill Gas Analyser		GA5000
PID		
Dip meter/ interface probe		

Project:	Northstowe - Parcel 2A
Job Number:	10018973

Date:	06/07/2018
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Monitoring Point Reference	Date/ Time	Atmos. Pressure (mbar)	Temp. (°C)	Well Pressure (Pa)	Flow Rate (l/h)	Time (sec)	CH4 (% v/v)	LEL (%)	CO2 (% v/v)	O2 (% v/v)	H2S (ppm)	CO (ppm)	Hex. (%)	PID cf	VOC (ppm)	Depth to water (m)	Depth to base (m)	Comments (all readings from GL, note datum height if different)
BH2A07D	06/07/2018 10:10	1021		Peak 3	Peak 0	Initial	0	0	0.1	20.7	0	0			0.6	0.53	10.04	Measured from Ground Level
						30	0	0	0.3	20.4	0	2			3.7			
						60	0	0	0.3	20.4	0	2			4.5			
						90	0	0	0.3	20.4	0	2			7.2			
				Steady 3	Steady 0	120	0	0	0.3	20.4	0	2			9.6			
						150	0	0	0.3	20.5	0	1			9.4			
						180	0	0	0.2	20.5	0	1			9.5			

Notes:

*Previous weather conditions, Atmospheric pressure trend and rate, flooding, soil moisture, water draw in tube, wind direction/strength, condition of monitoring point, missing/open tap, datum level, vegetation stress, odours, bubbles, etc.*



Project:	Northstowe - Parcel 2A		
Job Number:	10018973	Date:	13/07/2018

Weather:	Sunny / Dry
Engineer:	RD

Monitoring Point Reference	Date/ Time	Atmos. Pressure (mbar)	Temp. (°C)	Well Pressure (Pa)	Flow Rate (l/h)	Time (sec)	CH4 (% v/v)	LEL (%)	CO2 (% v/v)	O2 (% v/v)	H2S (ppm)	CO (ppm)	Hex. (%)	PID cf	VOC (ppm)	Depth to Water (m)	Depth to base (m)	Comments (all readings from GL, note datum height if different)
BH2A01S	13/07/2018	1021		Peak 0	Peak 0	Initial	0	0	0	20.5	0	0			0	0.91	2.44	Measured from Ground Level
						30	0	0	1.4	18.6	0	0		0.6				
						60	0	0	1.4	18.5	0	0		0.6				
						90	0	0	1.4	18.5	0	0		0.6				
						120	0	0	1.4	18.5	0	0		0.6				
						150	0	0	1.4	18.4	0	0		0.6				
						180	0	0	1.4	18.4	0	0		0.6				
BH2A01D	13/07/2018	1021		Peak 75	Peak 0.4	Initial	0	0	0	20.6	0	0			0	0.61	6.21	Measured from Ground Level
						30	0	0	0.3	20.1	0	4		1.2				
						60	0	0	0.3	20.1	0	4		1.2				
						90	0	0	0.3	20.1	0	4		1.2				
						120	0	0	0.2	20.2	0	4		1.2				
						150	0	0	0.2	20.2	0	3		1.2				
						180	0	0	0.2	20.2	0	2		1.2				
BH2A02S	13/07/2018	1021		Peak 0	Peak 0	Initial	0	0	0.2	20.6	0	0			0	0.79	2.2	Measured from Ground Level
						30	0	0	0.2	20.1	0	0		0.3				
						60	0	0	0.2	20.1	0	0		0.3				
						90	0	0	0.2	20.1	0	0		0.3				
						120	0	0	0.2	20.1	0	0		0.3				
						150	0	0	0.2	20.1	0	0		0.3				
						180	0	0	0.2	20.1	0	0		0.3				
BH2A02D	13/07/2018	1021		Peak 437	Peak 3.5	Initial	0	0	0	20.5	0	0			0	0.57	7.88	Measured from Ground Level / PID readings stopped at 60 seconds due to a pump error.
						30	0	0	0.4	19.6	0	9		0.4				
						60	0	0	0.4	19.5	0	9						
						90	0	0	0.4	19.5	0	9						
						120	0	0	0.4	19.5	0	9						
						150	0	0	0.4	19.5	0	9						
						180	0	0	0.4	19.5	0	9						

Notes:

Ambient Concentration	
CH4	0
CO2	0.66666667
O2	19.82063492
H2S	0
CO	1.19047619

Previous weather conditions, Atmospheric pressure trend and rate, flooding, soil moisture, water draw in tube, wind direction/strength, condition of monitoring point, missing/open tap, datum level, vegetation stress, odours, bubbles, etc.

QA Checklist:	
Weather conditions logged for previous 24 hrs	N
Gas monitor calibrated	Y
All filters in place	Y
Flow reading stable and zeroed	Y

Instrument Details:	Serial No.	Hyder/other ref.
Landfill Gas Analyser		GAS000
PID		
Dip meter/ interface probe		

Project:	Northstowe - Parcel 2A
Job Number:	10018973

Date:	13/07/2018
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Monitoring Point Reference	Date/ Time	Atmos. Pressure (mbar)	Temp. (°C)	Well Pressure (Pa)	Flow Rate (l/h)	Time (sec)	CH4 (% v/v)	LEL (%)	CO2 (% v/v)	O2 (% v/v)	H2S (ppm)	CO (ppm)	Hex. (%)	PID cf	VOC (ppm)	Depth to water (m)	Depth to base (m)	Comments (all readings from GL, note datum height if different)
BH2A03S	13/07/2018	1023		Peak 1	Peak 0	Initial	0	0	0.1	20.6	0	0			0	1.21	3.04	Measured from Ground Level
						30	0	0	3.8	17.1	0	0	0.9					
						60	0	0	3.8	16.7	0	0	1.2					
						90	0	0	3.8	16.7	0	0	1.2					
						120	0	0	3.8	16.6	0	0	1.2					
						150	0	0	3.8	16.6	0	0	1.2					
						180	0	0	3.8	16.6	0	0	1.2					
BH2A03D	13/07/2018	1023		Peak 4	Peak 0	Initial	0	0	0	20.7	0	0			0	1.21	5	Measured from Ground Level
						30	0	0	0.2	20.5	0	0	1.8					
						60	0	0	0.2	20.5	0	0	2					
						90	0	0	0.2	20.5	0	0	2.2					
						120	0	0	0.2	20.5	0	0	2.2					
						150	0	0	0.2	20.5	0	0	2.2					
						180	0	0	0.2	20.5	0	0	2.2					
BH2A04S	13/07/2018	1021		Peak 5	Peak 0	Initial	0	0	0	20.7	0	0			0	1.37	3.14	Measured from Ground Level
						30	0	0	0.4	20.5	0	0	1.2					
						60	0	0	0.4	20.5	0	0	1.2					
						90	0	0	0.4	20.5	0	0	1.2					
						120	0	0	0.4	20.5	0	0	1.2					
						150	0	0	0.4	20.5	0	0	1.2					
						180	0	0	0.4	20.5	0	0	1.2					
BH2A04D	13/07/2018	1021		Peak 1	Peak 0	Initial	0	0	0	20.8	0	0			0	1.38	14.96	Measured from Ground Level
						30	0	0	0	20.8	0	0	1.3					
						60	0	0	0	20.8	0	0	1.3					
						90	0	0	0	20.8	0	0	1.3					
						120	0	0	0	20.8	0	0	1.3					
						150	0	0	0	20.8	0	0	1.3					
						180	0	0	0	20.8	0	0	1.3					
BH2A05S	13/07/2018	1023		Peak 0	Peak 0.0	Initial	0	0	0	20.7	0	0			0	1.3	2.94	Measured from Ground Level
						30	0	0	0.3	20.4	0	0	0.6					
						60	0	0	0.3	20.4	0	0	0.6					
						90	0	0	0.3	20.4	0	0	0.6					
						120	0	0	0.3	20.4	0	0	0.6					
						150	0	0	0.3	20.4	0	0	0.6					
						180	0	0	0.3	20.4	0	0	0.6					

**Notes:**

Overcast / Dry

*Previous weather conditions, Atmospheric pressure trend and rate, flooding, soil moisture, water draw in tube, wind direction/strength, condition of monitoring point, missing/open tap, datum level, vegetation stress, odours, bubbles, etc.*



Project:	Northstowe - Parcel 2A		
Job Number:	10018973	Date:	13/07/2018

Weather:	Sunny / Dry
Engineer:	RD

Monitoring Point Reference	Date/ Time	Atmos. Pressure (mbar)	Temp. (°C)	Well Pressure (Pa)	Flow Rate (l/h)	Time (sec)	CH4 (% v/v)	LEL (%)	CO2 (% v/v)	O2 (% v/v)	H2S (ppm)	CO (ppm)	Hex. (%)	PID cf	VOC (ppm)	Depth to Water (m)	Depth to base (m)	Comments (all readings from GL, note datum height if different)
BH2A05D	13/07/2018	1023		Peak 0	Peak 0	Initial	0	0	0	20.5	0	0			0	1.41	15.02	Measured from Ground Level
						30	0	0	0.1	20.3	0	0		1.5				
						60	0	0	0.1	20.3	0	0		2				
						90	0	0	0.1	20.3	0	0		2				
						120	0	0	0.1	20.3	0	0		2				
						150	0	0	0.1	20.3	0	0		2				
						180	0	0	0.1	20.3	0	0		2				
						Steady 0	Steady 0											
BH2A06S	13/07/2018	1023		Peak 0	Peak 0	Initial	0	0	0	20.7	0	0			0	1.72	2.36	Measured from Ground Level
						30	0	0	0.6	20.5	0	0		0.5				
						60	0	0	0.6	20.5	0	0		1.2				
						90	0	0	0.6	20.4	0	0		1.2				
						120	0	0	0.6	20.4	0	0		1.2				
						150	0	0	0.6	20.4	0	0		1.5				
						180	0	0	0.6	20.4	0	0		1.5				
						Steady 0	Steady 0											
BH2A06D	13/07/2018	1023		Peak 0	Peak 0	Initial	0	0	0	20.5	0	0			0	1.65	7.06	Measured from Ground Level
						30	0	0	0.3	20.3	0	0		3.3				
						60	0	0	0.2	20.2	0	0		3.5				
						90	0	0	0.2	20.2	0	0		3.3				
						120	0	0	0.2	20.2	0	0		3.3				
						150	0	0	0.2	20.2	0	0		3.3				
						180	0	0	0.2	20.2	0	0		3.3				
						Steady 0	Steady 0											
BH2A07S	13/07/2018	1023		Peak 1	Peak 0	Initial	0	0	0	20.5	0	0			0	0.69	2.67	Measured from Ground Level
						30	0	0	0.3	20.2	0	0		2.8				
						60	0	0	0.3	20.2	0	0		3.6				
						90	0	0	0.3	20.2	0	0		3.6				
						120	0	0	0.3	20.2	0	0		3.6				
						150	0	0	0.3	20.2	0	0						
						180	0	0	0.3	20.2	0	0						
						Steady 1	Steady 0											

Notes:

Ambient Concentration	
CH4	0
CO2	0.26
O2	20.27878788
H2S	0
CO	0

Previous weather conditions, Atmospheric pressure trend and rate, flooding, soil moisture, water draw in tube, wind direction/strength, condition of monitoring point, missing/open tap, datum level, vegetation stress, odours, bubbles, etc.

QA Checklist:	
Weather conditions logged for previous 24 hrs	N
Gas monitor calibrated	Y
All filters in place	Y
Flow reading stable and zeroed	Y

Instrument Details:	Serial No.	Hyder/other ref.
Landfill Gas Analyser		GA5000
PID		
Dip meter/ interface probe		

Project:	Northstowe - Parcel 2A
Job Number:	10018973

Date:	13/07/2018
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Monitoring Point Reference	Date/ Time	Atmos. Pressure (mbar)	Temp. (°C)	Well Pressure (Pa)	Flow Rate (l/h)	Time (sec)	CH4 (% v/v)	LEL (%)	CO2 (% v/v)	O2 (% v/v)	H2S (ppm)	CO (ppm)	Hex. (%)	PID cf	VOC (ppm)	Depth to water (m)	Depth to base (m)	Comments (all readings from GL, note datum height if different)
BH2A07D	13/07/2018	1023		Peak 10	Peak 0	Initial	0	0	0	20.5	0	0			0	0.66	10.04	Measured from Ground Level
						30	0	0	0.3	20.1	0	0			1.8			
						60	0	0	0.3	20.1	0	0			1.9			
						90	0	0	0.3	20.1	0	0			1.9			
				Steady 10	Steady 0	120	0	0	0.3	20.1	0	0			1.9			
						150	0	0	0.3	20.1	0	0			1.9			
						180	0	0	0.3	20.1	0	0			1.9			

**Notes:**

*Previous weather conditions, Atmospheric pressure trend and rate, flooding, soil moisture, water draw in tube, wind direction/strength, condition of monitoring point, missing/open tap, datum level, vegetation stress, odours, bubbles, etc.*



<b>Project:</b>	Northstowe - Parcel 2A	<b>Position No:</b>	BH2A01S
<b>Project No:</b>	10018973	<b>Sample Ref:</b>	EW1.5
<b>Engineer:</b>	RD	<b>Weather:</b>	Warm
<b>Date:</b>	21/06/2018		

<b>Borehole Depth:</b>	2.44	<b>Pre-Sampling Water Level (m):</b>	0.76
<b>Standpipe Diameter (mm):</b>	50	<b>Total Purge Volume (l) (3 x Single Purge Volume)</b>	8
<b>Single Purge Volume (l):</b>	2.6		

Operations	Time (min)	Depth to Water (m)	Volume Removed (l)	pH	Cond. (µScm-1)	Temp. (°C)	DO (%)	DO (mg)	ORP (mV)
Start	5	0.76	-	7.31	1143	15	11.7	1.17	56.1
First Purge Volume	10	0.76	2.6	7.25	1131	15.8	7.2	0.71	35.2
Second Purge Volume	15	0.76	2.6	7.25	1127	16	7.1	0.7	35
Third Purge Volume	20	0.76	2.6	7.18	1095	16.4	5	0.49	34.6
Stable Reading	25	0.76	-	7.17	1081	16.5	4.1	0.4	32.3

<b>Water Description at Start of Purging (Colour, Clarity, Odour)</b>	Silty	<b>Water Description During/After Purging (Colour, Clarity, Odour)</b>	Silty
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<b>Comments:</b>
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<b>Project:</b>	Northstowe - Parcel 2A	<b>Position No:</b>	BH2A01D
<b>Project No:</b>	10018973	<b>Sample Ref:</b>	EW6
<b>Engineer:</b>	RD	<b>Weather:</b>	
<b>Date:</b>	21/06/2018		

<b>Borehole Depth:</b>	6.21	<b>Pre-Sampling Water Level (m):</b>	0.59
<b>Standpipe Diameter (mm):</b>	50	<b>Total Purge Volume (l) (3 x Single Purge Volume)</b>	8
<b>Single Purge Volume (l):</b>	2.6		

Operations	Time (min)	Depth to Water (m)	Volume Removed (l)	pH	Cond. (µScm-1)	Temp. (°C)	DO (%)	DO (mg)	ORP (mV)
<b>Start</b>	5	0.59	-	7.35	1222	13.4	6.9	0.72	10.8
<b>First Purge Volume</b>	10	0.59	2.6	7.36	1239	13.3	4.5	0.46	32.7
<b>Second Purge Volume</b>	15	0.59	2.6	7.36	1251	12.4	4.3	0.46	32.5
<b>Third Purge Volume</b>	20	0.59	2.6	7.39	1095	16.5	5	0.49	34.6
<b>Stable Reading</b>	25	0.59	-	7.4	1306	13.7	8.4	0.87	35

<b>Water Description at Start of Purging (Colour, Clarity, Odour)</b>	Silty	<b>Water Description During/After Purging (Colour, Clarity, Odour)</b>	Silty
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<b>Comments:</b>	
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<b>Project:</b>	Northstowe - Parcel 2A	<b>Position No:</b>	BH2A02S
<b>Project No:</b>	10018973	<b>Sample Ref:</b>	EW6
<b>Engineer:</b>	RD	<b>Weather:</b>	
<b>Date:</b>	21/06/2018		

<b>Borehole Depth:</b>	2.2	<b>Pre-Sampling Water Level (m):</b>	0.68
<b>Standpipe Diameter (mm):</b>	50	<b>Total Purge Volume (l)</b>	8
<b>Single Purge Volume (l):</b>	2.6	<b>(3 x Single Purge Volume)</b>	

Operations	Time (min)	Depth to Water (m)	Volume Removed (l)	pH	Cond. (µScm-1)	Temp. (°C)	DO (%)	DO (mg)	ORP (mV)
Start	5	0.68	-	6.95	832	15.5	20	1.96	73.5
First Purge Volume	10	0.68	2.6	6.92	809	15.6	16	1.59	80.8
Second Purge Volume	15	0.68	2.6	7.02	731	16	29.2	2.87	93.2
Third Purge Volume	20	0.68	2.6	7.07	698	15.8	32	3.16	98.4
Stable Reading	25	0.68	-	7.08	697	16	33.4	3.28	100.4

<b>Water Description at Start of Purging (Colour, Clarity, Odour)</b>	Clear	<b>Water Description During/After Purging (Colour, Clarity, Odour)</b>	Clear
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<b>Comments:</b>
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<b>Project:</b>	Northstowe - Parcel 2A	<b>Position No:</b>	BH2A02D
<b>Project No:</b>	10018973	<b>Sample Ref:</b>	EW6
<b>Engineer:</b>	RD	<b>Weather:</b>	
<b>Date:</b>	21/06/2018		

<b>Borehole Depth:</b>	7.88	<b>Pre-Sampling Water Level (m):</b>	0.54
<b>Standpipe Diameter (mm):</b>	50	<b>Total Purge Volume (l)</b>	8
<b>Single Purge Volume (l):</b>	2.6	<b>(3 x Single Purge Volume)</b>	

Operations	Time (min)	Depth to Water (m)	Volume Removed (l)	pH	Cond. (µScm-1)	Temp. (°C)	DO (%)	DO (mg)	ORP (mV)
Start	5	0.54	-	7.33	1360	13	28.7	2.98	5.6
First Purge Volume	10	0.54	2.6	7.28	1352	11.9	14.4	1.53	9.2
Second Purge Volume	15	0.54	2.6	7.21	1307	11.6	6.8	0.79	11.9
Third Purge Volume	20	0.54	2.6	7.2	1281	11.2	5.8	0.63	11.8
Stable Reading	25	0.54	-	7.2	1279	11.3	5.6	0.61	13.6

<b>Water Description at Start of Purging (Colour, Clarity, Odour)</b>	Clear	<b>Water Description During/After Purging (Colour, Clarity, Odour)</b>	Clear
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<b>Comments:</b>
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<b>Project:</b>	Northstowe - Parcel 2A	<b>Position No:</b>	BH2A03S
<b>Project No:</b>	10018973	<b>Sample Ref:</b>	EW6
<b>Engineer:</b>	RD	<b>Weather:</b>	
<b>Date:</b>	21/06/2018		

<b>Borehole Depth:</b>	3.04	<b>Pre-Sampling Water Level (m):</b>	1
<b>Standpipe Diameter (mm):</b>	50	<b>Total Purge Volume (l)</b>	8
<b>Single Purge Volume (l):</b>	2.6	<b>(3 x Single Purge Volume)</b>	

Operations	Time (min)	Depth to Water (m)	Volume Removed (l)	pH	Cond. (µScm-1)	Temp. (°C)	DO (%)	DO (mg)	ORP (mV)
Start	5	1	-	7.17	908	13	36.8	3.87	0
First Purge Volume	10	1	2.6	7.16	902	13	37.5	3.95	0
Second Purge Volume	15	1	2.6	7.22	1338	12.2	19.6	2.09	14.1
Third Purge Volume	20	1	2.6	7.16	1296	12.2	19.6	2.1	15.3
Stable Reading	25	1	-	7.11	1128	12.3	21.7	2.31	15.5

<b>Water Description at Start of Purging (Colour, Clarity, Odour)</b>	Silty base	<b>Water Description During/After Purging (Colour, Clarity, Odour)</b>	Clear
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<b>Comments:</b>
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<b>Project:</b>	Northstowe - Parcel 2A	<b>Position No:</b>	BH2A03D
<b>Project No:</b>	10018973	<b>Sample Ref:</b>	EW6
<b>Engineer:</b>	RD	<b>Weather:</b>	
<b>Date:</b>	21/06/2018		

<b>Borehole Depth:</b>	5	<b>Pre-Sampling Water Level (m):</b>	1.03
<b>Standpipe Diameter (mm):</b>	50	<b>Total Purge Volume (l)</b>	8
<b>Single Purge Volume (l):</b>	2.6	<b>(3 x Single Purge Volume)</b>	

Operations	Time (min)	Depth to Water (m)	Volume Removed (l)	pH	Cond. (µScm-1)	Temp. (°C)	DO (%)	DO (mg)	ORP (mV)
Start	5	1.03	-	7.04	1322	14.5	15.8	1.52	55
First Purge Volume	10	1.03	2.6	7.02	1333	14.7	12.3	1.22	49.4
Second Purge Volume	15	1.03	2.6	7.01	1371	14.2	5.4	0.54	17.1
Third Purge Volume	20	1.03	2.6	7.01	1372	14.2	5.3	0.54	16.8
Stable Reading	25	1.03	-	7.01	1371	14	4.6	0.45	12.8

<b>Water Description at Start of Purging (Colour, Clarity, Odour)</b>	Clear	<b>Water Description During/After Purging (Colour, Clarity, Odour)</b>	Clear
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<b>Comments:</b>
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<b>Project:</b>	Northstowe - Parcel 2A	<b>Position No:</b>	BH2A04S
<b>Project No:</b>	10018973	<b>Sample Ref:</b>	EW6
<b>Engineer:</b>	RD	<b>Weather:</b>	Warm
<b>Date:</b>	21/06/2018		

<b>Borehole Depth:</b>	3.14	<b>Pre-Sampling Water Level (m):</b>	1.05
<b>Standpipe Diameter (mm):</b>	50	<b>Total Purge Volume (l) (3 x Single Purge Volume)</b>	8
<b>Single Purge Volume (l):</b>	2.6		

Operations	Time (min)	Depth to Water (m)	Volume Removed (l)	pH	Cond. (µScm-1)	Temp. (°C)	DO (%)	DO (mg)	ORP (mV)
Start	5	1.05	-	7.33	1135	10.9	51.5	5.67	193.3
First Purge Volume	15	1.05	2.6	7.07	1006	12.4	54.2	5.73	237.8
Second Purge Volume	20	1.05	2.6	7.15	1073	11.3	52.2	5.7	182.4
Third Purge Volume	25	1.05	2.6	7.22	1026	11.7	60.6	6.55	93.3
Stable Reading	30	1.05	-	7.22	1026	11.7	60.6	6.55	92.1

<b>Water Description at Start of Purging (Colour, Clarity, Odour)</b>	Clear	<b>Water Description During/After Purging (Colour, Clarity, Odour)</b>	Clear
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<b>Comments:</b>
Poor recharge, 0.8m dradown. Slow pumping.

## Water Sampling (Low Flow)

<b>Project:</b>	Northstowe - Parcel 2A	<b>Position No:</b>	BH2A04D
<b>Project No:</b>	10018973	<b>Sample Ref:</b>	EW6
<b>Engineer:</b>	RD	<b>Weather:</b>	Warm
<b>Date:</b>	21/06/2018		

<b>Borehole Depth:</b>	14.96	<b>Pre-Sampling Water Level (m):</b>	1.095
<b>Standpipe Diameter (mm):</b>	50	<b>Total Purge Volume (l) (3 x Single Purge Volume)</b>	8
<b>Single Purge Volume (l):</b>	2.6		

Operations	Time (min)	Depth to Water (m)	Volume Removed (l)	pH	Cond. (µScm-1)	Temp. (°C)	DO (%)	DO (mg)	ORP (mV)
<b>Start</b>	5	1.095	-	7.07	1006	12.4	54.2	5.73	237.8
<b>First Purge Volume</b>	15	1.095	2.6	7.03	999	12.1	49.2	5.28	209
<b>Second Purge Volume</b>	20	1.095	2.6	7.03	988	12	49.3	5.29	181.4
<b>Third Purge Volume</b>	25	1.095	2.6	7.03	988	12	49.2	5.28	181.8
<b>Stable Reading</b>	30	1.095	-	7.04	987	11.9	45.3	4.91	186.5

<b>Water Description at Start of Purging (Colour, Clarity, Odour)</b>	Clear	<b>Water Description During/After Purging (Colour, Clarity, Odour)</b>	Clear
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**Comments:**

Poor recharge, 0.8m dradown. Slow pumping.



## Water Sampling (Low Flow)

<b>Project:</b>	Northstowe - Parcel 2A	<b>Position No:</b>	BH2A05S
<b>Project No:</b>	10018973	<b>Sample Ref:</b>	EW6
<b>Engineer:</b>	RD	<b>Weather:</b>	Warm
<b>Date:</b>	21/06/2018		

<b>Borehole Depth:</b>	2.94	<b>Pre-Sampling Water Level (m):</b>	1.19
<b>Standpipe Diameter (mm):</b>	50	<b>Total Purge Volume (l) (3 x Single Purge Volume)</b>	8
<b>Single Purge Volume (l):</b>	2.6		

Operations	Time (min)	Depth to Water (m)	Volume Removed (l)	pH	Cond. (µScm-1)	Temp. (°C)	DO (%)	DO (mg)	ORP (mV)
<b>Start</b>	5	1.19	-	6.98	1708	14.9	45.4	4.44	89.7
<b>First Purge Volume</b>	15	1.19	2.6	6.88	1500	14	10.1	1.03	94
<b>Second Purge Volume</b>	20	1.19	2.6	6.87	1463	14	10.2	1.04	94.6
<b>Third Purge Volume</b>	25	1.19	2.6	6.87	1459	14.1	10.3	1.07	94.6
<b>Stable Reading</b>	30	1.19	-	6.87	1454	14.2	10.2	1.04	94.7

<b>Water Description at Start of Purging (Colour, Clarity, Odour)</b>	Clear	<b>Water Description During/After Purging (Colour, Clarity, Odour)</b>	Clear
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**Comments:**

<b>Project:</b>	Northstowe - Parcel 2A	<b>Position No:</b>	BH2A05D
<b>Project No:</b>	10018973	<b>Sample Ref:</b>	EW6
<b>Engineer:</b>	RD	<b>Weather:</b>	Warm
<b>Date:</b>	21/06/2018		

<b>Borehole Depth:</b>	15.02	<b>Pre-Sampling Water Level (m):</b>	1.22
<b>Standpipe Diameter (mm):</b>	50	<b>Total Purge Volume (l) (3 x Single Purge Volume)</b>	8
<b>Single Purge Volume (l):</b>	2.6		

Operations	Time (min)	Depth to Water (m)	Volume Removed (l)	pH	Cond. (µScm-1)	Temp. (°C)	DO (%)	DO (mg)	ORP (mV)
Start	5	1.22	-	7.48	1953	12	14.5	1.48	67.8
First Purge Volume	15	1.22	2.6	7.48	2063	11.6	7.4	0.8	94.5
Second Purge Volume	20	1.22	2.6	7.42	2029	11.5	10.8	1.57	68.1
Third Purge Volume	25	1.22	2.6	7.4	2025	11.5	11.4	1.23	59.2
Stable Reading	30	1.22	-	7.39	2015	11.6	11.7	1.26	60.8

<b>Water Description at Start of Purging (Colour, Clarity, Odour)</b>	Clear	<b>Water Description During/After Purging (Colour, Clarity, Odour)</b>	Clear
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**Comments:**



<b>Project:</b>	Northstowe - Parcel 2A	<b>Position No:</b>	BH2A06S
<b>Project No:</b>	10018973	<b>Sample Ref:</b>	EW6
<b>Engineer:</b>	RD	<b>Weather:</b>	Warm
<b>Date:</b>	21/06/2018		

<b>Borehole Depth:</b>	2.36	<b>Pre-Sampling Water Level (m):</b>	1.3
<b>Standpipe Diameter (mm):</b>	50	<b>Total Purge Volume (l) (3 x Single Purge Volume)</b>	8
<b>Single Purge Volume (l):</b>	2.6		

Operations	Time (min)	Depth to Water (m)	Volume Removed (l)	pH	Cond. (µScm-1)	Temp. (°C)	DO (%)	DO (mg)	ORP (mV)
Start			-						
First Purge Volume	5	1.3	2.6	7.03	128	13.9	29	3	11.6
Second Purge Volume	25	1.3	2.6	7.06	792	13.5	42.3	4.38	9.8
Third Purge Volume	30	1.3	2.6	7.13	940	14.5	51.2	5.12	12.4
Stable Reading			-						

<b>Water Description at Start of Purging (Colour, Clarity, Odour)</b>	Clear	<b>Water Description During/After Purging (Colour, Clarity, Odour)</b>	Clear
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<b>Comments:</b>
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<b>Project:</b>	Northstowe - Parcel 2A	<b>Position No:</b>	BH2A06D
<b>Project No:</b>	10018973	<b>Sample Ref:</b>	EW6
<b>Engineer:</b>	RD	<b>Weather:</b>	Warm
<b>Date:</b>	21/06/2018		

<b>Borehole Depth:</b>	7.06	<b>Pre-Sampling Water Level (m):</b>	1.32
<b>Standpipe Diameter (mm):</b>	50	<b>Total Purge Volume (l) (3 x Single Purge Volume)</b>	8
<b>Single Purge Volume (l):</b>	2.6		

Operations	Time (min)	Depth to Water (m)	Volume Removed (l)	pH	Cond. (µS/cm-1)	Temp. (°C)	DO (%)	DO (mg)	ORP (mV)
Start			-						
First Purge Volume	5	1.32	2.6	7.1	1814	13.1	7.1	0.75	3.3
Second Purge Volume	25	1.32	2.6	7.08	1869	12	3.7	0.42	8.7
Third Purge Volume	30	1.32	2.6	7.1	1879	12.5	3.7	0.47	12
Stable Reading			-						

<b>Water Description at Start of Purging (Colour, Clarity, Odour)</b>	Clear	<b>Water Description During/After Purging (Colour, Clarity, Odour)</b>	Clear
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**Comments:**



## Water Sampling (Low Flow)

<b>Project:</b>	Northstowe - Parcel 2A	<b>Position No:</b>	BH2A07S
<b>Project No:</b>	10018973	<b>Sample Ref:</b>	EW6
<b>Engineer:</b>	RD	<b>Weather:</b>	Warm
<b>Date:</b>	21/06/2018		

<b>Borehole Depth:</b>	2.67	<b>Pre-Sampling Water Level (m):</b>	0.52
<b>Standpipe Diameter (mm):</b>	50	<b>Total Purge Volume (l) (3 x Single Purge Volume)</b>	8
<b>Single Purge Volume (l):</b>	2.6		

Operations	Time (min)	Depth to Water (m)	Volume Removed (l)	pH	Cond. (µScm-1)	Temp. (°C)	DO (%)	DO (mg)	ORP (mV)
<b>Start</b>	5	0.52	-	6.96	4111	16.2	32.5	3.13	119
<b>First Purge Volume</b>	10	0.52	2.6	6.97	4129	16.1	31.5	3.04	119.7
<b>Second Purge Volume</b>	15	0.52	2.6	6.99	4136	16.2	26.5	2.57	118.9
<b>Third Purge Volume</b>	20	0.52	2.6	7.01	4102	16.2	25.6	2.47	117.4
<b>Stable Reading</b>	25	0.52	-	7.02	4093	16.2	25.4	2.45	116.8

<b>Water Description at Start of Purging (Colour, Clarity, Odour)</b>	Clear	<b>Water Description During/After Purging (Colour, Clarity, Odour)</b>	Clear
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**Comments:**

## Water Sampling (Low Flow)

<b>Project:</b>	Northstowe - Parcel 2A	<b>Position No:</b>	BH2A07D
<b>Project No:</b>	10018973	<b>Sample Ref:</b>	EW6
<b>Engineer:</b>	RD	<b>Weather:</b>	Warm
<b>Date:</b>	21/06/2018		

<b>Borehole Depth:</b>	10.04	<b>Pre-Sampling Water Level (m):</b>	0.54
<b>Standpipe Diameter (mm):</b>	50	<b>Total Purge Volume (l) (3 x Single Purge Volume)</b>	8
<b>Single Purge Volume (l):</b>	2.6		

Operations	Time (min)	Depth to Water (m)	Volume Removed (l)	pH	Cond. (µScm-1)	Temp. (°C)	DO (%)	DO (mg)	ORP (mV)
<b>Start</b>	5	0.54	-	6.89	4396	14.6	10.5	1.05	14.6
<b>First Purge Volume</b>	10	0.54	2.6	6.99	4360	14.4	10	1.01	14.6
<b>Second Purge Volume</b>	15	0.54	2.6	6.97	4189	13.4	14.3	1.18	14.5
<b>Third Purge Volume</b>	20	0.54	2.6	6.97	4068	13	17	1.77	14.5
<b>Stable Reading</b>	25	0.54	-	6.97	4043	12.9	16.5	1.71	14.7

<b>Water Description at Start of Purging (Colour, Clarity, Odour)</b>	Clear	<b>Water Description During/After Purging (Colour, Clarity, Odour)</b>	Clear
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**Comments:**



## Water Sampling (Low Flow)

<b>Project:</b>	Northstowe - Parcel 2A	<b>Position No:</b>	BH1003S
<b>Project No:</b>	10018973	<b>Sample Ref:</b>	EW6
<b>Engineer:</b>	RD	<b>Weather:</b>	Warm
<b>Date:</b>	21/06/2018		

<b>Borehole Depth:</b>	3.64	<b>Pre-Sampling Water Level (m):</b>	0.92
<b>Standpipe Diameter (mm):</b>	50	<b>Total Purge Volume (l) (3 x Single Purge Volume)</b>	8
<b>Single Purge Volume (l):</b>	2.6		

Operations	Time (min)	Depth to Water (m)	Volume Removed (l)	pH	Cond. (µScm-1)	Temp. (°C)	DO (%)	DO (mg)	ORP (mV)
<b>Start</b>	5	0.92	-	6.95	1074	13.7	5.5	0.57	124.3
<b>First Purge Volume</b>	15	0.92	2.6	6.95	1073	13.7	5.5	0.56	124.1
<b>Second Purge Volume</b>	20	0.92	2.6	6.96	1072	13.7	5.2	0.55	123.8
<b>Third Purge Volume</b>	25	0.92	2.6	6.97	1071	13.8	4.8	0.5	123
<b>Stable Reading</b>	30	0.92	-	6.98	1068	13.8	4.9	0.5	122.4

<b>Water Description at Start of Purging (Colour, Clarity, Odour)</b>	Clear	<b>Water Description During/After Purging (Colour, Clarity, Odour)</b>	Clear
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**Comments:**

## Water Sampling (Low Flow)

<b>Project:</b>	Northstowe - Parcel 2A	<b>Position No:</b>	BH1003D
<b>Project No:</b>	10018973	<b>Sample Ref:</b>	EW6
<b>Engineer:</b>	RD	<b>Weather:</b>	Warm
<b>Date:</b>	21/06/2018		

<b>Borehole Depth:</b>	8.92	<b>Pre-Sampling Water Level (m):</b>	0.92
<b>Standpipe Diameter (mm):</b>	50	<b>Total Purge Volume (l) (3 x Single Purge Volume)</b>	8
<b>Single Purge Volume (l):</b>	2.6		

Operations	Time (min)	Depth to Water (m)	Volume Removed (l)	pH	Cond. (µScm-1)	Temp. (°C)	DO (%)	DO (mg)	ORP (mV)
<b>Start</b>	5	0.92	-	6.95	1075	13.6	5.6	0.58	1246
<b>First Purge Volume</b>	15	0.92	2.6	7.07	2327	13.6	6.7	0.68	29.1
<b>Second Purge Volume</b>	20	0.92	2.6	7.06	2308	13.7	6.4	0.65	48.6
<b>Third Purge Volume</b>	25	0.92	2.6	7.07	2313	14	6.1	0.63	50.2
<b>Stable Reading</b>	30	0.92	-	7.06	2308	14	6.2	0.63	75.8

<b>Water Description at Start of Purging (Colour, Clarity, Odour)</b>	Clear	<b>Water Description During/After Purging (Colour, Clarity, Odour)</b>	Clear
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**Comments:**



<b>Project:</b>	Northstowe - Parcel 2A	<b>Position No:</b>	BH1103D
<b>Project No:</b>	10018973	<b>Sample Ref:</b>	EW6
<b>Engineer:</b>	RD	<b>Weather:</b>	Warm
<b>Date:</b>	21/06/2018		

<b>Borehole Depth:</b>	9.34	<b>Pre-Sampling Water Level (m):</b>	0.54
<b>Standpipe Diameter (mm):</b>	50	<b>Total Purge Volume (l) (3 x Single Purge Volume)</b>	8
<b>Single Purge Volume (l):</b>	2.6		

Operations	Time (min)	Depth to Water (m)	Volume Removed (l)	pH	Cond. (µScm-1)	Temp. (°C)	DO (%)	DO (mg)	ORP (mV)
Start	5	0.54	-	7.17	710	12	77.2	7.57	21.8
First Purge Volume	10	0.54	2.6	7.16	708	12	498.3	5.95	21.5
Second Purge Volume	15	0.54	2.6	7.18	673	11.9	10.3	1.11	12.6
Third Purge Volume	20	0.54	2.6	7.2	658	11.7	9.1	0.98	4
Stable Reading	25	0.54	-	7.24	657	12.1	7.2	0.77	5.3

<b>Water Description at Start of Purging (Colour, Clarity, Odour)</b>	Clear	<b>Water Description During/After Purging (Colour, Clarity, Odour)</b>	Clear
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<b>Comments:</b>
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## Water Sampling (Low Flow)

<b>Project:</b>	Northstowe - Parcel 2A	<b>Position No:</b>	BH1108
<b>Project No:</b>	10018973	<b>Sample Ref:</b>	EW6
<b>Engineer:</b>	RD	<b>Weather:</b>	Warm
<b>Date:</b>	21/06/2018		

<b>Borehole Depth:</b>	5.66	<b>Pre-Sampling Water Level (m):</b>	1.35
<b>Standpipe Diameter (mm):</b>	50	<b>Total Purge Volume (l) (3 x Single Purge Volume)</b>	8
<b>Single Purge Volume (l):</b>	2.6		

Operations	Time (min)	Depth to Water (m)	Volume Removed (l)	pH	Cond. (µScm-1)	Temp. (°C)	DO (%)	DO (mg)	ORP (mV)
<b>Start</b>	5	1.35	-	7.06	506	15.2	15.5	1.55	2.1
<b>First Purge Volume</b>	10	1.35	2.6	7.06	506	15.2	15.4	1.54	1.6
<b>Second Purge Volume</b>	15	1.35	2.6	7.08	502	14.8	17.6	1.33	7.7
<b>Third Purge Volume</b>	20	1.35	2.6	7.09	503	14.9	11	1.1	8.1
<b>Stable Reading</b>	25	1.35	-	7.08	503	14.9	10.2	1.04	7.5

<b>Water Description at Start of Purging (Colour, Clarity, Odour)</b>	Clear	<b>Water Description During/After Purging (Colour, Clarity, Odour)</b>	Clear
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**Comments:**



<b>Project:</b>	Northstowe - Parcel 2A	<b>Position No:</b>	BH1205S
<b>Project No:</b>	10018973	<b>Sample Ref:</b>	EW6
<b>Engineer:</b>	RD	<b>Weather:</b>	Warm
<b>Date:</b>	22/06/2018		

<b>Borehole Depth:</b>	3.84	<b>Pre-Sampling Water Level (m):</b>	0.67
<b>Standpipe Diameter (mm):</b>	50	<b>Total Purge Volume (l) (3 x Single Purge Volume)</b>	8
<b>Single Purge Volume (l):</b>	2.6		

Operations	Time (min)	Depth to Water (m)	Volume Removed (l)	pH	Cond. (µScm-1)	Temp. (°C)	DO (%)	DO (mg)	ORP (mV)
Start	5	0.67	-	5.37	2223	13.9	12.3	1.25	66
First Purge Volume	10	0.67	2.6	5.36	2227	13.9	11.8	1.13	66
Second Purge Volume	15	0.67	2.6	5.44	2268	13.8	8.9	0.91	58.2
Third Purge Volume	20	0.67	2.6	5.36	2271	13.5	11.2	1.15	56.6
Stable Reading	25	0.67	-	5.32	2273	13.4	13.2	1.37	58.9

<b>Water Description at Start of Purging (Colour, Clarity, Odour)</b>	Clear	<b>Water Description During/After Purging (Colour, Clarity, Odour)</b>	Clear
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<b>Comments:</b>
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## Water Sampling (Low Flow)

<b>Project:</b>	Northstowe - Parcel 2A	<b>Position No:</b>	BH1205D
<b>Project No:</b>	10018973	<b>Sample Ref:</b>	EW6
<b>Engineer:</b>	RD	<b>Weather:</b>	Warm
<b>Date:</b>	22/06/2018		

<b>Borehole Depth:</b>	19.77	<b>Pre-Sampling Water Level (m):</b>	0.83
<b>Standpipe Diameter (mm):</b>	50	<b>Total Purge Volume (l) (3 x Single Purge Volume)</b>	8
<b>Single Purge Volume (l):</b>	2.6		

Operations	Time (min)	Depth to Water (m)	Volume Removed (l)	pH	Cond. (µS/cm-1)	Temp. (°C)	DO (%)	DO (mg)	ORP (mV)
<b>Start</b>	5	0.83	-	5.93	1953	11.7	10.5	1.09	1.2
<b>First Purge Volume</b>	10	0.83	2.6	5.93	1953	11.7	10.3	1.12	1.2
<b>Second Purge Volume</b>	15	0.83	2.6	5.94	1951	11.6	9.3	1	0
<b>Third Purge Volume</b>	20	0.83	2.6	5.95	1928	11.4	8.9	0.96	0.3
<b>Stable Reading</b>	25	0.83	-	5.97	1903	11.3	9.1	0.99	1.5

<b>Water Description at Start of Purging (Colour, Clarity, Odour)</b>	Clear	<b>Water Description During/After Purging (Colour, Clarity, Odour)</b>	Clear
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**Comments:**



## Water Sampling (Low Flow)

<b>Project:</b>	Northstowe - Parcel 2A	<b>Position No:</b>	BH601S
<b>Project No:</b>	10018973	<b>Sample Ref:</b>	EW6
<b>Engineer:</b>	RD	<b>Weather:</b>	Warm
<b>Date:</b>	22/06/2018		

<b>Borehole Depth:</b>	3.59	<b>Pre-Sampling Water Level (m):</b>	0.94
<b>Standpipe Diameter (mm):</b>	50	<b>Total Purge Volume (l) (3 x Single Purge Volume)</b>	8
<b>Single Purge Volume (l):</b>	2.6		

Operations	Time (min)	Depth to Water (m)	Volume Removed (l)	pH	Cond. (µScm-1)	Temp. (°C)	DO (%)	DO (mg)	ORP (mV)
<b>Start</b>	5	0.94	-	6.92	2832	13	54	5.61	44.1
<b>First Purge Volume</b>	10	0.94	2.6	6.88	3127	12.7	32.6	3.38	18.1
<b>Second Purge Volume</b>	15	0.94	2.6	6.84	3448	12.4	14.2	1.5	1.5
<b>Third Purge Volume</b>	20	0.94	2.6	6.84	3527	12.4	11.5	1.22	13.5
<b>Stable Reading</b>	25	0.94	-	6.84	3534	12.3	10.9	1.15	15.8

<b>Water Description at Start of Purging (Colour, Clarity, Odour)</b>	Clear	<b>Water Description During/After Purging (Colour, Clarity, Odour)</b>	Clear
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<b>Comments:</b>	
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<b>Project:</b>	Northstowe - Parcel 2A	<b>Position No:</b>	BH601D
<b>Project No:</b>	10018973	<b>Sample Ref:</b>	EW6
<b>Engineer:</b>	RD	<b>Weather:</b>	Warm
<b>Date:</b>	22/06/2018		

<b>Borehole Depth:</b>	9.82	<b>Pre-Sampling Water Level (m):</b>	0.92
<b>Standpipe Diameter (mm):</b>	50	<b>Total Purge Volume (l) (3 x Single Purge Volume)</b>	8
<b>Single Purge Volume (l):</b>	2.6		

Operations	Time (min)	Depth to Water (m)	Volume Removed (l)	pH	Cond. (µScm-1)	Temp. (°C)	DO (%)	DO (mg)	ORP (mV)
Start	5	0.92	-	7.18	2418	10.3	33.8	3.62	10.8
First Purge Volume	10	0.92	2.6	7.23	2371	10.9	18.7	1.98	9.6
Second Purge Volume	15	0.92	2.6	7.4	1832	10.8	10.3	1.13	33.9
Third Purge Volume	20	0.92	2.6	7.48	1438	10.6	8.6	0.96	39.5
Stable Reading	25	0.92	-	7.48	1354	10.4	8	0.89	40.9

<b>Water Description at Start of Purging (Colour, Clarity, Odour)</b>	Clear	<b>Water Description During/After Purging (Colour, Clarity, Odour)</b>	Clear
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<b>Comments:</b>
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## Water Sampling (Low Flow)

<b>Project:</b>	Northstowe - Parcel 2A	<b>Position No:</b>	BH604S
<b>Project No:</b>	10018973	<b>Sample Ref:</b>	EW6
<b>Engineer:</b>	RD	<b>Weather:</b>	Warm
<b>Date:</b>	22/06/2018		

<b>Borehole Depth:</b>	2.95	<b>Pre-Sampling Water Level (m):</b>	1.1
<b>Standpipe Diameter (mm):</b>	50	<b>Total Purge Volume (l) (3 x Single Purge Volume)</b>	8
<b>Single Purge Volume (l):</b>	2.6		

Operations	Time (min)	Depth to Water (m)	Volume Removed (l)	pH	Cond. (µScm-1)	Temp. (°C)	DO (%)	DO (mg)	ORP (mV)
Start	5	1.1	-	7.12	2500	15.8	15.3	1.46	3.2
First Purge Volume	10	1.1	2.6	7.12	2489	15.8	14.4	1.4	2.9
Second Purge Volume	15	1.1	2.6	7.12	2482	15.7	14.2	1.33	2.6
Third Purge Volume	20	1.1	2.6	7.1	2301	15.7	10.1	0.99	14.8
Stable Reading	25	1.1	-	7.09	2278	15.8	10	0.97	12.4

<b>Water Description at Start of Purging (Colour, Clarity, Odour)</b>	Clear	<b>Water Description During/After Purging (Colour, Clarity, Odour)</b>	Clear
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**Comments:**

<b>Project:</b>	Northstowe - Parcel 2A	<b>Position No:</b>	BH604D
<b>Project No:</b>	10018973	<b>Sample Ref:</b>	EW6
<b>Engineer:</b>	RD	<b>Weather:</b>	Warm
<b>Date:</b>	22/06/2018		

<b>Borehole Depth:</b>	7.8	<b>Pre-Sampling Water Level (m):</b>	
<b>Standpipe Diameter (mm):</b>	50	<b>Total Purge Volume (l)</b> (3 x Single Purge Volume)	8
<b>Single Purge Volume (l):</b>			

Operations	Time (min)	Depth to Water (m)	Volume Removed (l)	pH	Cond. (µScm-1)	Temp. (°C)	DO (%)	DO (mg)	ORP (mV)
Start									
First Purge Volume	10			7.62	1934	11.4	11	1.17	14
Second Purge Volume	15			7.72	1915	11.2	8.2	0.9	37.4
Third Purge Volume	20			7.77	2010	12	27.2	2.96	28.9
Stable Reading									

<b>Water Description at Start of Purging (Colour, Clarity, Odour)</b>	Clear	<b>Water Description During/After Purging (Colour, Clarity, Odour)</b>	Clear
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**Comments:**

Well going dry, sampling. Depth to water unknown, well to small to dip.



## Water Sampling (Low Flow)

<b>Project:</b>	Northstowe - Parcel 2A	<b>Position No:</b>	BH606S
<b>Project No:</b>	10018973	<b>Sample Ref:</b>	EW6
<b>Engineer:</b>	RD	<b>Weather:</b>	Warm
<b>Date:</b>	22/06/2018		

<b>Borehole Depth:</b>	2.08	<b>Pre-Sampling Water Level (m):</b>	1.41
<b>Standpipe Diameter (mm):</b>	50	<b>Total Purge Volume (l) (3 x Single Purge Volume)</b>	8
<b>Single Purge Volume (l):</b>	2.6		

Operations	Time (min)	Depth to Water (m)	Volume Removed (l)	pH	Cond. (µS/cm-1)	Temp. (°C)	DO (%)	DO (mg)	ORP (mV)
Start			-						
First Purge Volume	15	1.41	2.6	7.09	735	16.5	15.4	1.53	15.1
Second Purge Volume	20	1.41	2.6	7.09	736	16.4	15.6	1.5	15.6
Third Purge Volume	25	1.41	2.6	7.1	733	16.5	15	1.48	9.8
Stable Reading	30	1.41	-	7.09	731	16.5	14.9	1.48	9.8

<b>Water Description at Start of Purging (Colour, Clarity, Odour)</b>	Clear	<b>Water Description During/After Purging (Colour, Clarity, Odour)</b>	Clear
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**Comments:**

<b>Project:</b>	Northstowe - Parcel 2A	<b>Position No:</b>	BH606D
<b>Project No:</b>	10018973	<b>Sample Ref:</b>	EW3.5
<b>Engineer:</b>	RD	<b>Weather:</b>	Warm
<b>Date:</b>	22/06/2018		

<b>Borehole Depth:</b>	4.99	<b>Pre-Sampling Water Level (m):</b>	1.29
<b>Standpipe Diameter (mm):</b>	50	<b>Total Purge Volume (l) (3 x Single Purge Volume)</b>	8
<b>Single Purge Volume (l):</b>	2.6		

Operations	Time (min)	Depth to Water (m)	Volume Removed (l)	pH	Cond. (µS/cm-1)	Temp. (°C)	DO (%)	DO (mg)	ORP (mV)
Start			-						
First Purge Volume	15	1.29	2.6	6.95	1514	12.2	7.4	0.78	82.4
Second Purge Volume	20	1.29	2.6	6.95	1517	12.2	7.9	0.84	79.5
Third Purge Volume	25	1.29	2.6	6.96	1506	12.4	5.6	0.59	86.7
Stable Reading	30	1.29	-	6.96	1504	12.4	5.5	0.59	86.1

<b>Water Description at Start of Purging (Colour, Clarity, Odour)</b>	Clear	<b>Water Description During/After Purging (Colour, Clarity, Odour)</b>	Clear
---	-------	--	-------

<b>Comments:</b>
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## APPENDIX F

### GEOTECHNICAL LABORATORY TEST DATA



## Contract Number: 39651

Client Ref: 10018973

Report Date: 10-07-2018

Client PO: 14011884

Client **Arcadis**  
**Fortran Rd**  
**St Mellons**  
**Cardiff**  
**CF3 0EY**

Contract Title: **Northstowe - Parcel 2A**

For the attention of: **Reg. 13(1)**

Date Received: 15-06-2018

Date Commenced: 15-06-2018

Date Completed: 10-07-2018

Test Description	Qty
<b>Moisture Content</b> BS 1377 : Part 2 : 3.2 - * UKAS	55
<b>4 Point Liquid &amp; Plastic Limit (LL/PL)</b> BS 1377 Part 2 : 4.3 & 5.3 - * UKAS	42
<b>PSD Wet Sieve method</b> BS 1377 : 1990 Part 2 : 9.2 - * UKAS	10
<b>Dry Den/MC (2.5kg Rammer Method 1 Litre Mould)</b> BS1377 : 1990 Part 4 : 3.3 - * UKAS	5
<b>CBR: Remoulded Specimen and tested at top only</b> BS1377 : 1990 Part 4 : 7 - * UKAS	13
<b>Quick Undrained Triaxial Compression test - single specimen at one confining pressure (100mm or 38mm diameter)</b> BS1377 : 1990 Part 7 : 8 - * UKAS	28

Notes: Observations and Interpretations are outside the UKAS Accreditation  
\* - denotes test included in laboratory scope of accreditation  
# - denotes test carried out by approved contractor  
@ - denotes non accredited tests

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.

**Approved Signatories:**

Reg. 13(1) (Associate Director) - Reg. 13(1) (Contracts Manager) - Reg. 13(1) (Office Manager)

Reg. 13(1) (Quality/Technical Manager) - Reg. 13(1) (Advanced Testing Manager) - Reg. 13(1) (Administrative/Accounts Assistant)

Reg. 13(1) (Administrative/Quality Assistant)





## Contract Number: 39651

Test Description	Qty
<b>(GI) BRE Suite Total Sulphate, Aqueous Sulphate, Total Sulphur, Aqueous Nitrate, Aqueous Mag, Chloride,</b> 1377 : 1990 Part 3 & BRE CP2/79 - @ Non Accredited Test	15
<b>Disposal of Samples on Project</b>	1

**Notes:** Observations and Interpretations are outside the UKAS Accreditation  
 \* - denotes test included in laboratory scope of accreditation  
 # - denotes test carried out by approved contractor  
 @ - denotes non accredited tests

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 Reg. 13(1) (Quality/Technical Manager) - Reg. 13(1) (Advanced Testing Manager) - Reg. 13(1) (Administrative/Accounts Assistant)  
 Reg. 13(1) (Administrative/Quality Assistant)



**LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX  
( BS 1377 : Part 2 : 1990 Method 5 )**

**DESCRIPTIONS**

Contract Number	<b>39651</b>
Site Name	<b>Northstowe - Parcel 2A</b>

Hole Reference	Sample Number	Sample Type	Depth (m)			Descriptions
				-		
BH2A01	5	U	2.00	-	2.45	Brown fine to medium gravelly silty CLAY
BH2A01	9	U	4.00	-	4.45	Brown silty CLAY
BH2A01	13	U	6.00	-	6.45	Brown silty CLAY
BH2A01	17	U	9.00	-	9.45	Grey silty CLAY
BH2A02	6	D	3.00	-	3.45	Brown silty CLAY
BH2A02	8	U	4.00	-	4.45	Brown silty CLAY
BH2A02	12	U	6.00	-	6.45	Brown silty CLAY
BH2A02	14	D	7.50	-	7.95	Brown silty CLAY
BH2A02	16	U	9.00	-	9.45	Brown silty CLAY
BH2A02	20	U	12.00	-	12.45	Brown silty CLAY
BH2A02	24	D	15.00	-	15.45	Brown silty CLAY
BH2A03	11	D	1.50	-	2.00	Brown fine to medium gravelly silty CLAY
BH2A03	15	U	3.00	-	3.45	Grey silty CLAY
BH2A03	18	U	5.00	-	5.45	Brown fine to medium gravelly silty CLAY
BH2A03	21	B	7.50	-	8.00	Brown silty CLAY
BH2A03	25	U	10.50	-	10.95	Brown silty CLAY
BH2A03	28	D	13.50	-	13.95	Grey slightly clayey fine to coarse GRAVEL
BH2A04	6	U	2.00	-	2.45	Brown silty CLAY
BH2A04	10	U	4.00	-	4.45	Brown silty CLAY
BH2A04	14	U	6.00	-	6.45	Brown silty CLAY
BH2A04	16	D	7.50	-	7.95	Brown fine to medium gravelly silty CLAY
BH2A04	19	U	9.00	-	9.45	Brown silty CLAY
BH2A04	23	U	12.00	-	12.45	Brown silty CLAY
BH2A04	27	D	15.00	-	15.45	Brown silty CLAY

Operators	Checked	08/07/2018	Reg. 13(1)	<b>Reg. 13(1)</b>
RO/MH	Approved	09/07/2018	Reg. 13(1)	







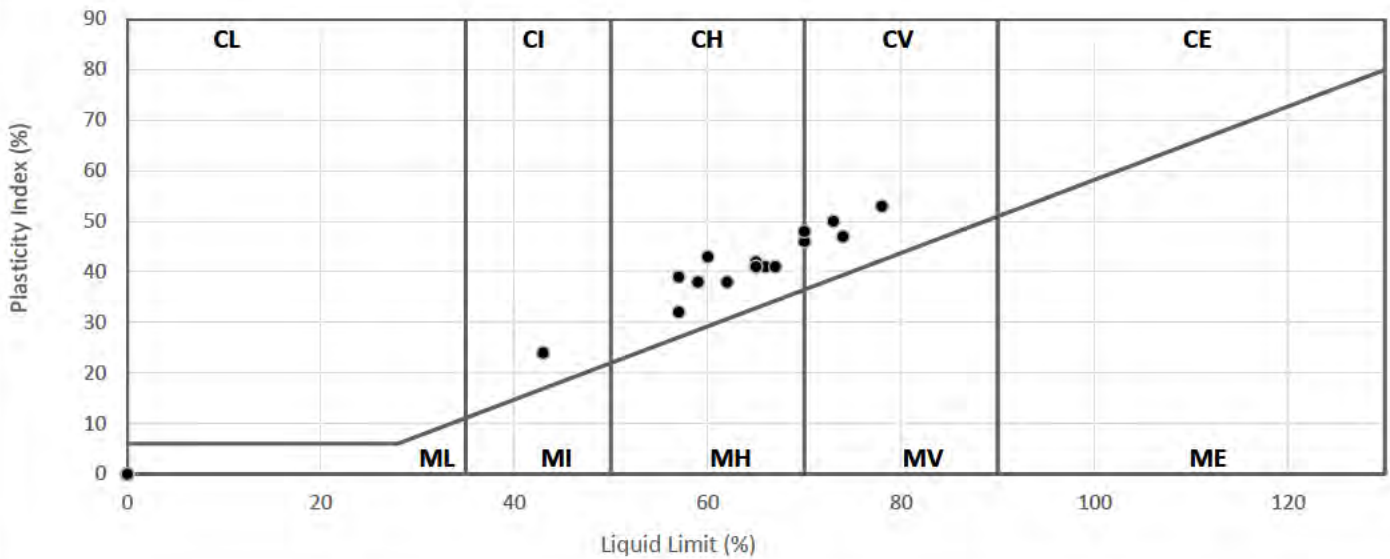
**LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX  
( BS 1377 : Part 2 : 1990 Method 5 )**

Contract Number	<b>39651</b>
Site Name	<b>Northstowe - Parcel 2A</b>

Hole Reference	Sample Number	Sample Type	Depth (m)			Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity index %	Passing 425mm %	Remarks
				-							
BH2A01	5	U	2.00	-	2.45	30	60	17	43	94	CH High Plasticity
BH2A01	9	U	4.00	-	4.45	27	78	25	53	100	CV Very High Plasticity
BH2A01	13	U	6.00	-	6.45	25	66	25	41	100	CH High Plasticity
BH2A01	17	U	9.00	-	9.45	87	59	21	38	100	CH High Plasticity
BH2A02	6	D	3.00	-	3.45	29					
BH2A02	8	U	4.00	-	4.45	27	65	23	42	100	CH High Plasticity
BH2A02	12	U	6.00	-	6.45	31	57	25	32	100	CH High Plasticity
BH2A02	14	D	7.50	-	7.95	31					
BH2A02	16	U	9.00	-	9.45	32	67	26	41	100	CH High Plasticity
BH2A02	20	U	12.00	-	12.45	28	65	24	41	100	CH High Plasticity
BH2A02	24	D	15.00	-	15.45	26					
BH2A03	11	D	1.50	-	2.00	30					
BH2A03	15	U	3.00	-	3.45	14	43	19	24	100	CI Intermediate Plasticity
BH2A03	18	U	5.00	-	5.45	31	70	24	46	90	CH/V High/HighPlasticity
BH2A03	21	B	7.50	-	8.00	33					
BH2A03	25	U	10.50	-	10.95	26	73	23	50	100	CV Very High Plasticity
BH2A03	28	D	13.50	-	13.95	8.2					
BH2A04	6	U	2.00	-	2.45	34	62	24	38	100	CH High Plasticity
BH2A04	10	U	4.00	-	4.45	25	57	18	39	100	CH High Plasticity
BH2A04	14	U	6.00	-	6.45	24	65	24	41	100	CH High Plasticity
BH2A04	16	D	7.50	-	7.95	24					
BH2A04	19	U	9.00	-	9.45	30	74	27	47	100	CV Very High Plasticity
BH2A04	23	U	12.00	-	12.45	28	70	22	48	100	CH/V High/HighPlasticity
BH2A04	27	D	15.00	-	15.45	23					

Symbols: NP : Non Plastic # : Liquid Limit and Plastic Limit Wet Sieved

**PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION  
BS 5930:1999+A2:2010**



Operators	Checked	08/07/2018	Reg. 13(1)
DB	Approved	09/07/2018	Reg. 13(1)





**LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX  
( BS 1377 : Part 2 : 1990 Method 5 )**

**DESCRIPTIONS**

Contract Number	39651
Site Name	Northstowe - Parcel 2A

Hole Reference	Sample Number	Sample Type	Depth (m)			Descriptions
				-		
BH2A05	6	U	2.00	-	2.45	Brown slightly sandy silty CLAY
BH2A05	10	U	4.00	-	4.45	Brown silty CLAY
BH2A05	14	U	6.00	-	6.45	Brown silty CLAY
BH2A05	16	D	7.50	-	7.95	Brown silty CLAY
BH2A05	18	U	9.00	-	9.45	Brown silty CLAY
BH2A05	22	U	12.00	-	12.45	Grey silty CLAY
BH2A05	26	D	15.00	-	15.45	Brown silty CLAY
BH2A06	2	D	0.00	-	0.20	Brown fine to coarse gravelly silty CLAY with rootlets
BH2A06	14	U	2.00	-	2.45	Brown silty CLAY
BH2A06	17	D	3.00	-	3.45	Brown silty CLAY
BH2A06	25	U	6.00	-	6.45	Brown silty CLAY
BH2A06	28	D	7.50	-	7.95	Brown silty CLAY
BH2A06	31	U	9.00	-	9.45	Brown silty CLAY
BH2A07	31	D	0.20	-	0.50	Brown silty CLAY
BH2A07	12	U	2.00	-	2.45	Brown silty CLAY
BH2A07	17	U	4.00	-	4.45	Brown silty CLAY
BH2A07	21	U	6.00	-	6.45	Brown silty CLAY
BH2A07	25	U	8.00	-	8.45	Brown silty CLAY
BH2A07	27	D	9.00	-	9.45	Brown silty CLAY
TP2A02	9	D	1.10	-	1.30	Brown silty CLAY
TP2A04	7	D	1.25	-	1.40	Brown silty CLAY
TP2A06	1	D	0.00	-	0.30	Brown fine to coarse gravelly sandy CLAY
TP2A06	8	D	0.80	-	1.00	Brown slightly sandy fine to medium gravelly silty CLAY
TP2A06	4	D	2.00	-	2.50	Brown fine to medium gravelly silty CLAY

Operators	Checked	08/07/2018	Reg. 13(1)	<b>Reg. 13(1)</b>
RO/MH	Approved	09/07/2018	Reg. 13(1)	







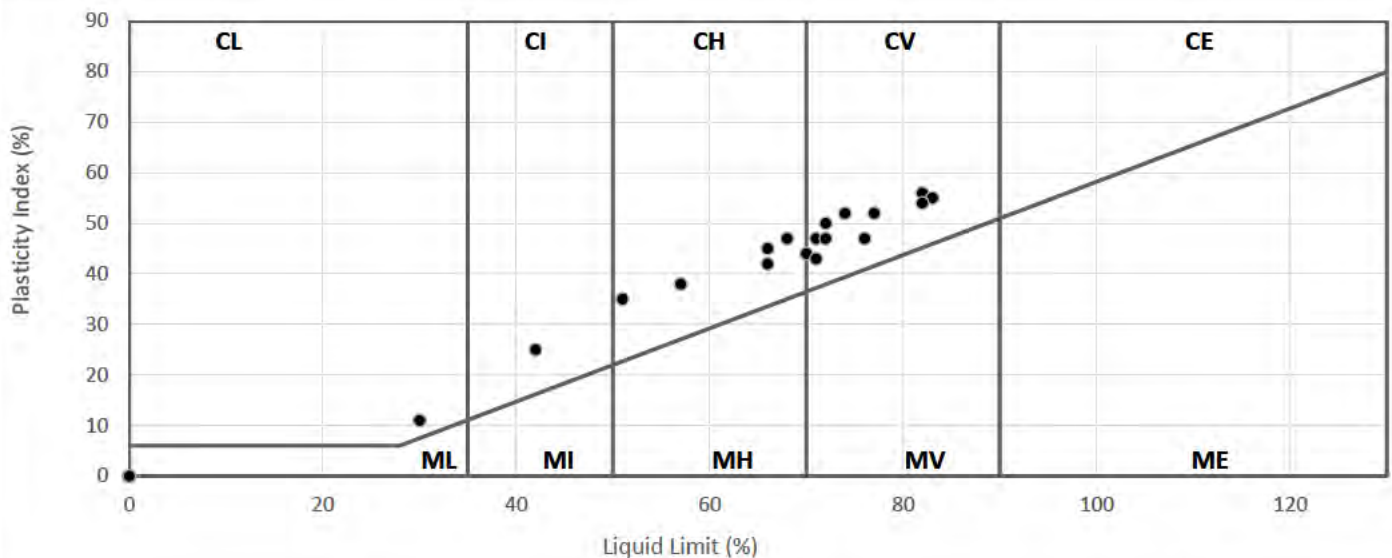
**LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX  
( BS 1377 : Part 2 : 1990 Method 5 )**

Contract Number	<b>39651</b>
Site Name	<b>Northstowe - Parcel 2A</b>

Hole Reference	Sample Number	Sample Type	Depth (m)			Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity index %	Passing 425mm %	Remarks
				-							
BH2A05	6	U	2.00	-	2.45	36	76	29	47	100	CV Very High Plasticity
BH2A05	10	U	4.00	-	4.45	33	77	25	52	100	CV Very High Plasticity
BH2A05	14	U	6.00	-	6.45	26	68	21	47	100	CH High Plasticity
BH2A05	16	D	7.50	-	7.95	29					
BH2A05	18	U	9.00	-	9.45	31	83	28	55	100	CV Very High Plasticity
BH2A05	22	U	12.00	-	12.45	15	51	16	35	100	CH High Plasticity
BH2A05	26	D	15.00	-	15.45	25					
BH2A06	2	D	0.00	-	0.20	11	42	17	25	69	CI Intermediate Plasticity
BH2A06	14	U	2.00	-	2.45	34	82	26	56	100	CV Very High Plasticity
BH2A06	17	D	3.00	-	3.45	34					
BH2A06	25	U	6.00	-	6.45	28	66	21	45	100	CH High Plasticity
BH2A06	28	D	7.50	-	7.95	28					
BH2A06	31	U	9.00	-	9.45	32	83	28	55	100	CV Very High Plasticity
BH2A07	31	D	0.20	-	0.50	30	70	26	44	100	CH/V High/HighPlasticity
BH2A07	12	U	2.00	-	2.45	32	71	28	43	100	CV Very High Plasticity
BH2A07	17	U	4.00	-	4.45	29	72	22	50	100	CV Very High Plasticity
BH2A07	21	U	6.00	-	6.45	32	82	28	54	100	CV Very High Plasticity
BH2A07	25	U	8.00	-	8.45	30	57	19	38	100	CH High Plasticity
BH2A07	27	D	9.00	-	9.45	30					
TP2A02	9	D	1.10	-	1.30	30	74	22	52	100	CV Very High Plasticity
TP2A04	7	D	1.25	-	1.40	29	71	24	47	100	CV Very High Plasticity
TP2A06	1	D	0.00	-	0.30	12	30	19	11	47	CL Low Plasticity
TP2A06	8	D	0.80	-	1.00	30	66	24	42	89	CH High Plasticity
TP2A06	4	D	2.00	-	2.50	31	72	25	47	92	CV Very High Plasticity

Symbols: NP : Non Plastic # : Liquid Limit and Plastic Limit Wet Sieved

**PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION  
BS 5930:1999+A2:2010**



Operators	Checked	08/07/2018	Reg. 13(1)
DB	Approved	09/07/2018	Reg. 13(1)

**Reg. 13(1)**







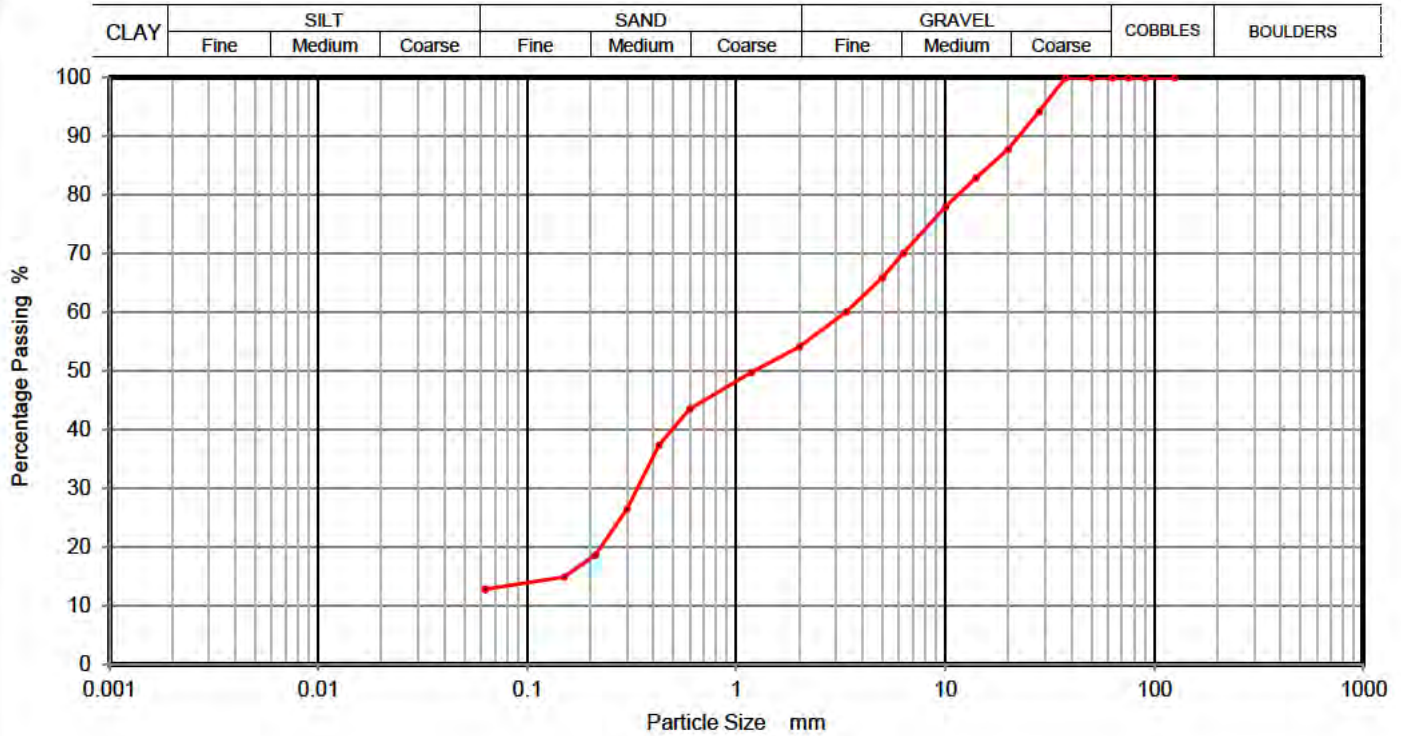




**PARTICLE SIZE DISTRIBUTION**  
**BS 1377 Part 2:1990**  
**Wet Sieve, Clause 9.2**

Contract Number	39651
Borehole/Pit No.	BH2A02
Sample No.	4
Depth Top	1.50
Depth Base	2.00
Sample Type	B

Site Name	Northstowe - Parcel 2A
Soil Description	Brown silty/ clayey fine to coarse sandy fine to coarse GRAVEL



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	
90	100	0.0060	
75	100	0.0019	
63	100		
50	100		
37.5	100		
28	94		
20	88		
14	83		
10	78		
6.3	70		
5	66		
3.35	60		
2	54		
1.18	50		
0.6	44		
0.425	37		
0.3	27		
0.212	19		
0.15	15		
0.063	13		

Sample Proportions	% dry mass
Cobbles	0
Gravel	46
Sand	41
Silt and Clay	13

Grading Analysis	
Uniformity Coefficient	

Remarks  
 Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	08/07/2018	Reg. 13(1)
RO/MH	Approved	09/07/2018	Reg. 13(1)

**Reg. 13(1)**



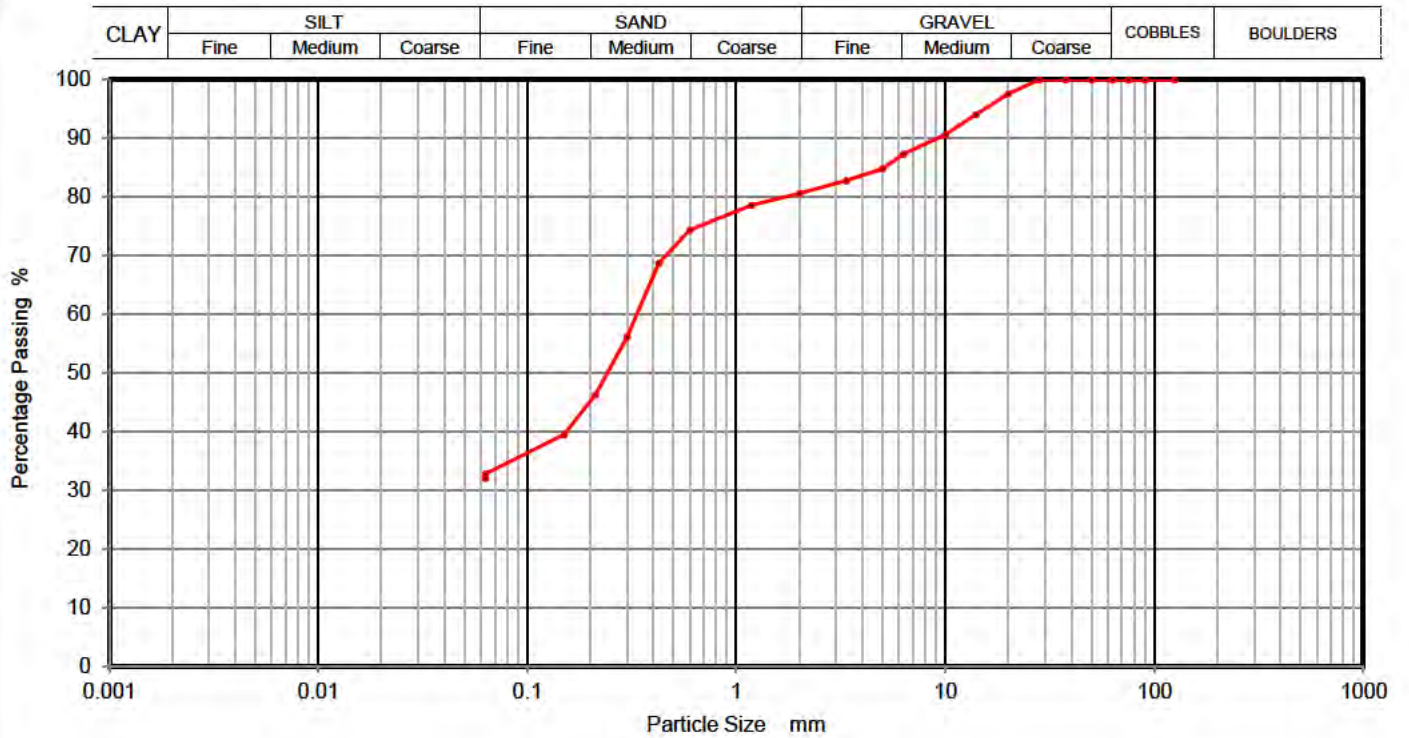




**PARTICLE SIZE DISTRIBUTION**  
**BS 1377 Part 2:1990**  
**Wet Sieve, Clause 9.2**

Contract Number	39651
Borehole/Pit No.	BH2A03
Sample No.	3
Depth Top	0.00
Depth Base	0.20
Sample Type	B

Site Name	Northstowe - Parcel 2A
Soil Description	Brown fine to coarse gravelly silty/ clayey fine to coarse SAND



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	
90	100	0.0060	
75	100	0.0019	
63	100		
50	100		
37.5	100		
28	100		
20	98		
14	94		
10	91		
6.3	87		
5	85		
3.35	83		
2	81		
1.18	79		
0.6	74		
0.425	69		
0.3	56		
0.212	46		
0.15	40		
0.063	33		

Sample Proportions	% dry mass
Cobbles	0
Gravel	19
Sand	48
Silt and Clay	33

Grading Analysis	
Uniformity Coefficient	

Remarks  
 Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	08/07/2018	Reg. 13(1)
RO/MH	Approved	09/07/2018	Reg. 13(1)

**Reg. 13(1)**

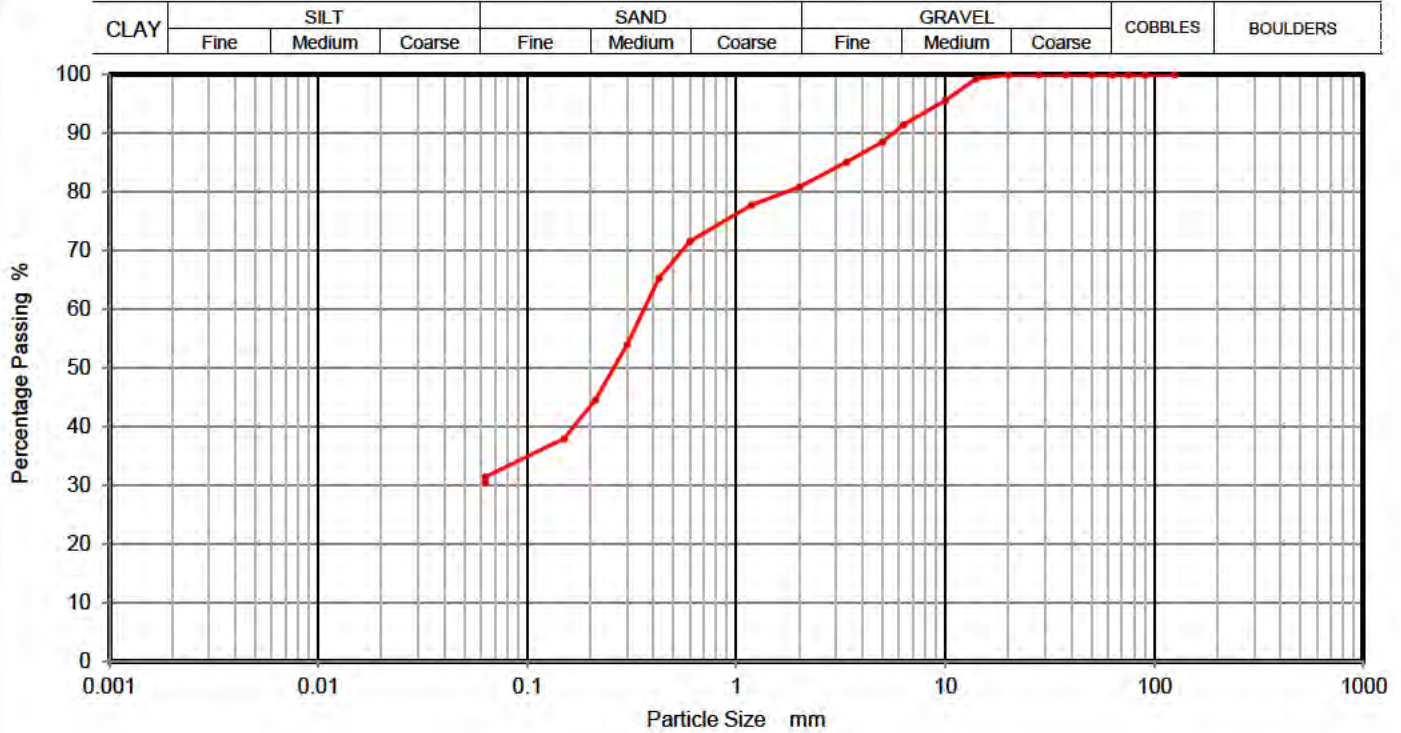




**PARTICLE SIZE DISTRIBUTION**  
**BS 1377 Part 2:1990**  
**Wet Sieve, Clause 9.2**

Contract Number	39651
Borehole/Pit No.	BH2A05
Sample No.	2
Depth Top	0.20
Depth Base	0.50
Sample Type	B

Site Name	Northstowe - Parcel 2A
Soil Description	Brown fine to medium gravelly silty/ clayey fine to coarse SAND



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	
90	100	0.0060	
75	100	0.0019	
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	99		
10	96		
6.3	91		
5	89		
3.35	85		
2	81		
1.18	78		
0.6	72		
0.425	65		
0.3	54		
0.212	45		
0.15	38		
0.063	31		

Sample Proportions	% dry mass
Cobbles	0
Gravel	19
Sand	50
Silt and Clay	31

Grading Analysis	
Uniformity Coefficient	

Remarks  
 Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	09/07/2018	Reg. 13(1)
RO/MH	Approved	10/07/2018	Reg. 13(1)

**Reg. 13(1)**







**PARTICLE SIZE DISTRIBUTION**  
**BS 1377 Part 2:1990**  
**Wet Sieve, Clause 9.2**

Contract Number **39651**

Borehole/Pit No. **BH2A07**

Site Name **Northstowe - Parcel 2A**

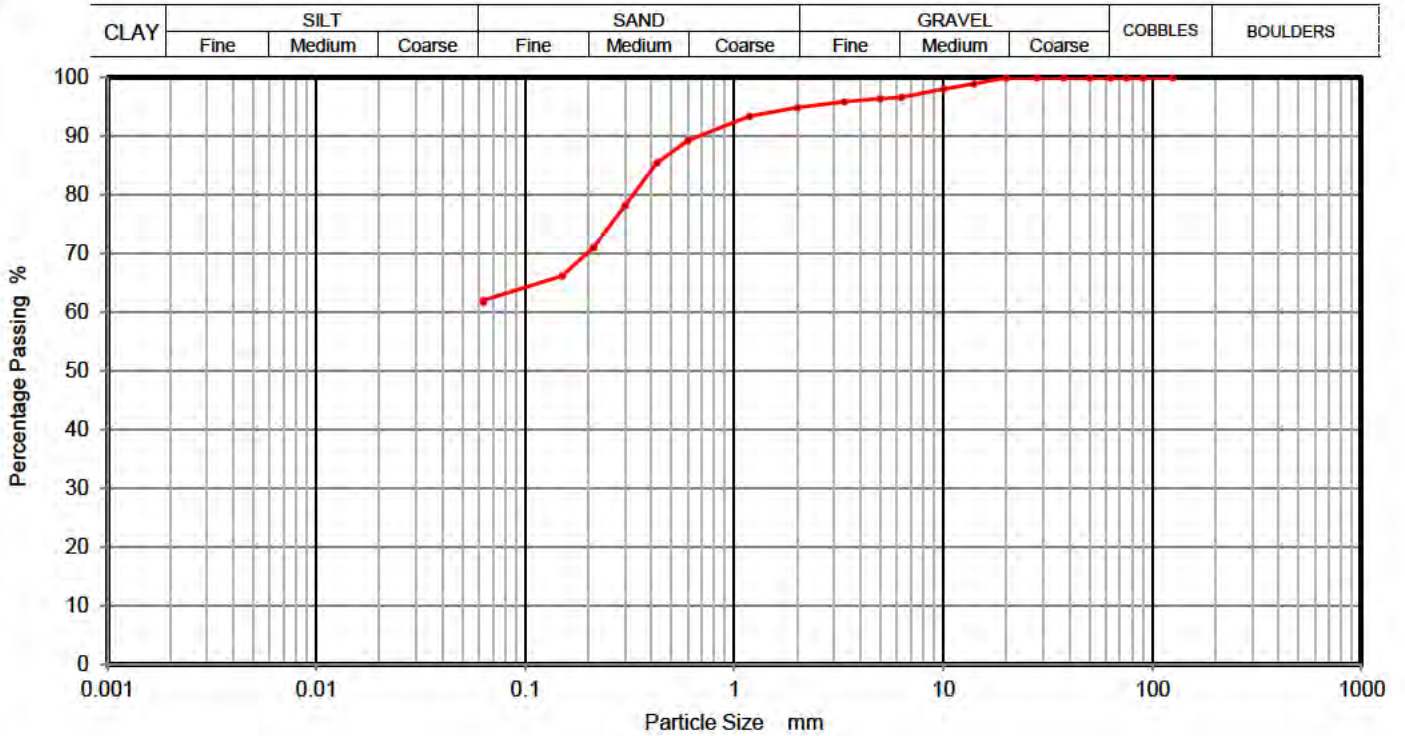
Sample No. **1**

Soil Description **Brown slightly fine to medium gravelly fine to coarse sandy SILT/  
CLAY**

Depth Top **0.00**

Depth Base **0.20**

Sample Type **B**



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	
90	100	0.0060	
75	100	0.0019	
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	99		
10	98		
6.3	97		
5	96		
3.35	96		
2	95		
1.18	93		
0.6	89		
0.425	85		
0.3	78		
0.212	71		
0.15	66		
0.063	62		

Sample Proportions	% dry mass
Cobbles	0
Gravel	5
Sand	33
Silt and Clay	62

Grading Analysis	
Uniformity Coefficient	

Remarks  
 Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	09/07/2018	Reg. 13(1)
RO/MH	Approved	10/07/2018	Reg. 13(1)

Reg. 13(1)

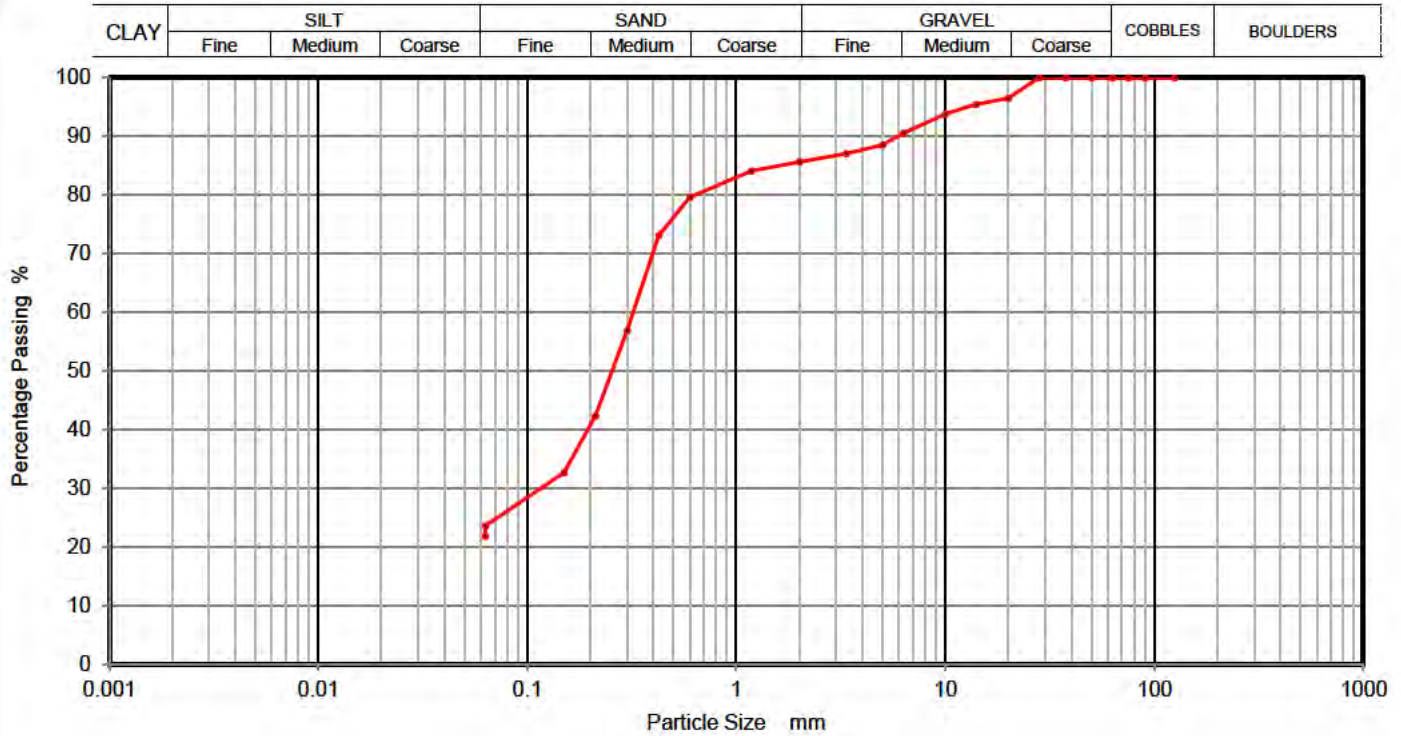




**PARTICLE SIZE DISTRIBUTION**  
**BS 1377 Part 2:1990**  
**Wet Sieve, Clause 9.2**

Contract Number	39651
Borehole/Pit No.	TP2A01
Sample No.	1
Depth Top	0.00
Depth Base	0.20
Sample Type	B

Site Name	Northstowe - Parcel 2A
Soil Description	Brown fine to coarse gravelly silty/ clayey fine to coarse SAND



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	
90	100	0.0060	
75	100	0.0019	
63	100		
50	100		
37.5	100		
28	100		
20	97		
14	95		
10	94		
6.3	91		
5	89		
3.35	87		
2	86		
1.18	84		
0.6	80		
0.425	73		
0.3	57		
0.212	42		
0.15	33		
0.063	24		

Sample Proportions	% dry mass
Cobbles	0
Gravel	14
Sand	62
Silt and Clay	24

Grading Analysis	
Uniformity Coefficient	

Remarks  
 Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	09/07/2018	Reg. 13(1)
RO/MH	Approved	10/07/2018	Reg. 13(1)

Reg. 13(1)

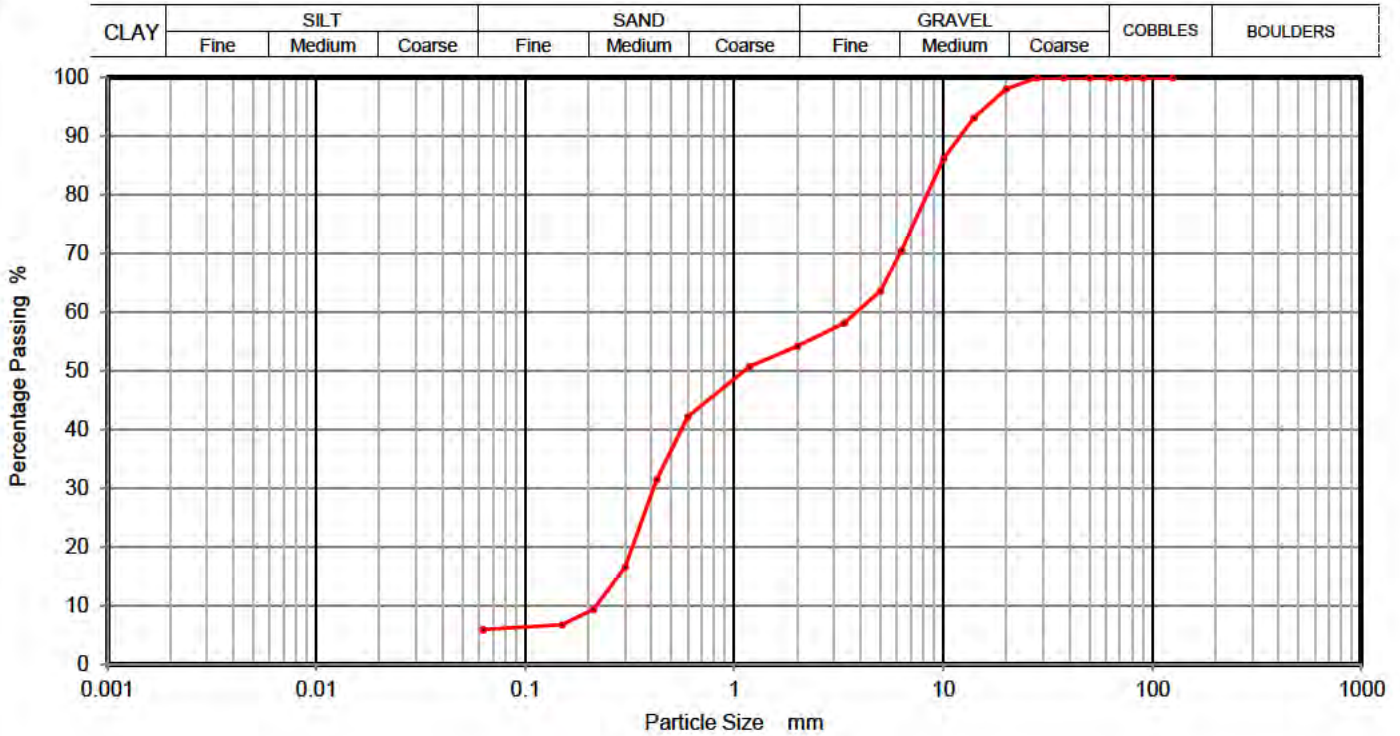






**PARTICLE SIZE DISTRIBUTION**  
**BS 1377 Part 2:1990**  
**Wet Sieve, Clause 9.2**

Contract Number	39651
Borehole/Pit No.	TP2A02
Site Name	Northstowe - Parcel 2A
Sample No.	4
Soil Description	Brown slightly silty/ clayey fine to coarse gravelly fine to coarse SAND
Depth Top	0.10
Depth Base	0.30
Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	
90	100	0.0060	
75	100	0.0019	
63	100		
50	100		
37.5	100		
28	100		
20	98		
14	93		
10	86		
6.3	71		
5	64		
3.35	58		
2	54		
1.18	51		
0.6	42		
0.425	32		
0.3	17		
0.212	9		
0.15	7		
0.063	6		

Sample Proportions	% dry mass
Cobbles	0
Gravel	46
Sand	48
Silt and Clay	6

Grading Analysis	
Uniformity Coefficient	

Remarks  
 Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	09/07/2018	Reg. 13(1)
RO/MH	Approved	10/07/2018	Reg. 13(1)

Reg. 13(1)





**PARTICLE SIZE DISTRIBUTION**  
**BS 1377 Part 2:1990**  
**Wet Sieve, Clause 9.2**

Contract Number **39651**

Borehole/Pit No. **TP2A04**

Site Name **Northstowe - Parcel 2A**

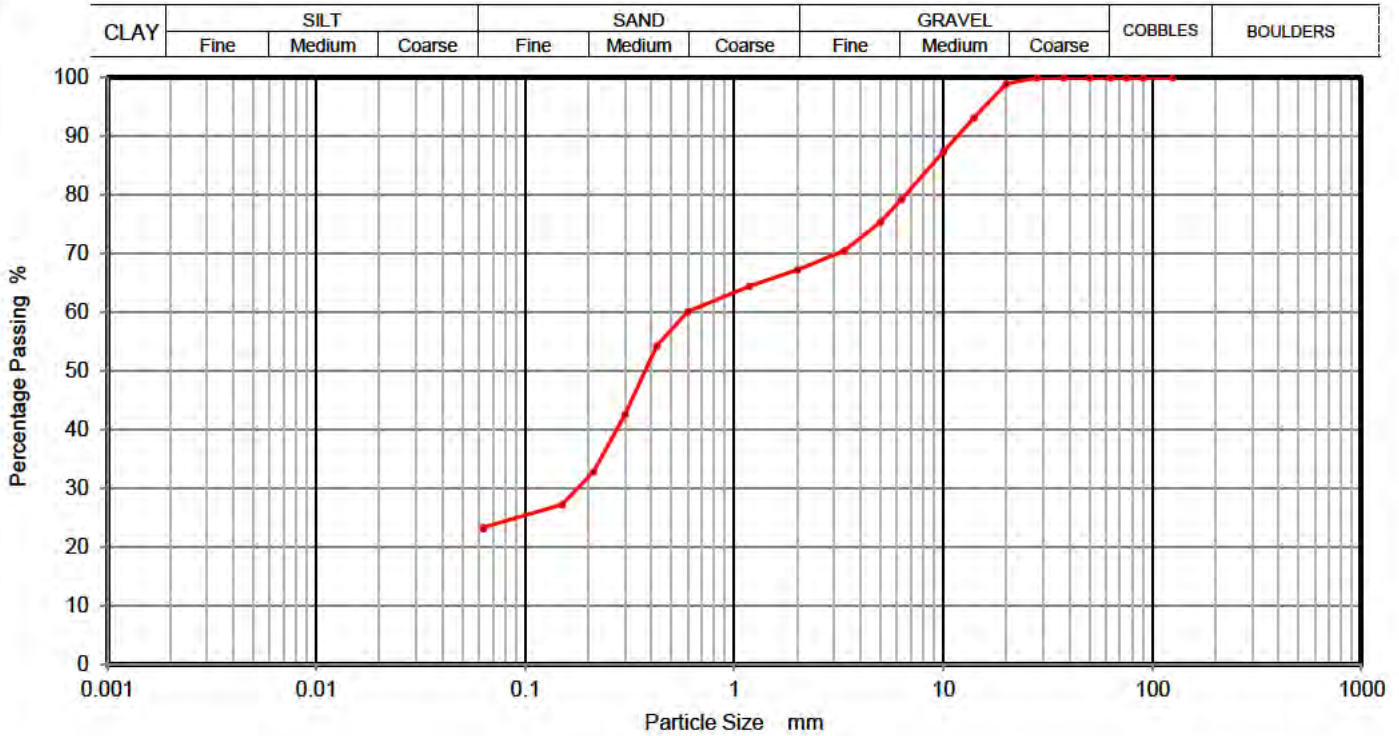
Sample No. **1**

Soil Description **Brown silty/ clayey fine to coarse gravelly fine to coarse SAND**

Depth Top **0.00**

Depth Base **0.25**

Sample Type **B**



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	
90	100	0.0060	
75	100	0.0019	
63	100		
50	100		
37.5	100		
28	100		
20	99		
14	93		
10	87		
6.3	79		
5	75		
3.35	71		
2	67		
1.18	64		
0.6	60		
0.425	54		
0.3	43		
0.212	33		
0.15	27		
0.063	23		

Sample Proportions	% dry mass
Cobbles	0
Gravel	33
Sand	44
Silt and Clay	23

Grading Analysis	
Uniformity Coefficient	

Remarks  
 Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	09/07/2018	Reg. 13(1)
RO/MH	Approved	10/07/2018	Reg. 13(1)

**Reg. 13(1)**



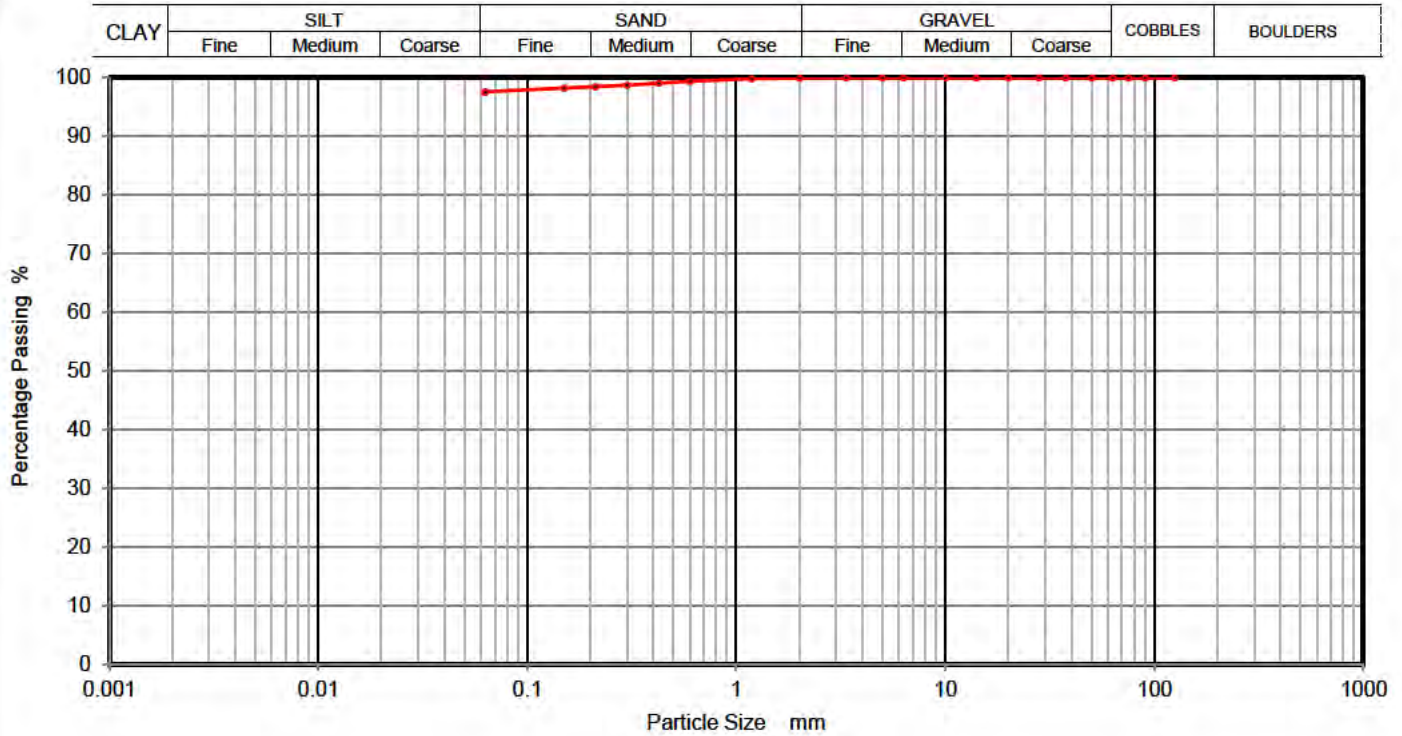




**PARTICLE SIZE DISTRIBUTION**  
**BS 1377 Part 2:1990**  
**Wet Sieve, Clause 9.2**

Contract Number	39651
Borehole/Pit No.	TP2A05
Sample No.	7
Depth Top	0.60
Depth Base	0.80
Sample Type	B

Site Name	Northstowe - Parcel 2A
Soil Description	Brown slightly fine to coarse sandy SILT/ CLAY



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	
90	100	0.0060	
75	100	0.0019	
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	99		
0.425	99		
0.3	99		
0.212	98		
0.15	98		
0.063	98		

Sample Proportions	% dry mass
Cobbles	0
Gravel	0
Sand	2
Silt and Clay	98

Grading Analysis	
Uniformity Coefficient	

Remarks  
 Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	09/07/2018	Reg. 13(1)
RO/MH	Approved	10/07/2018	Reg. 13(1)

**Reg. 13(1)**

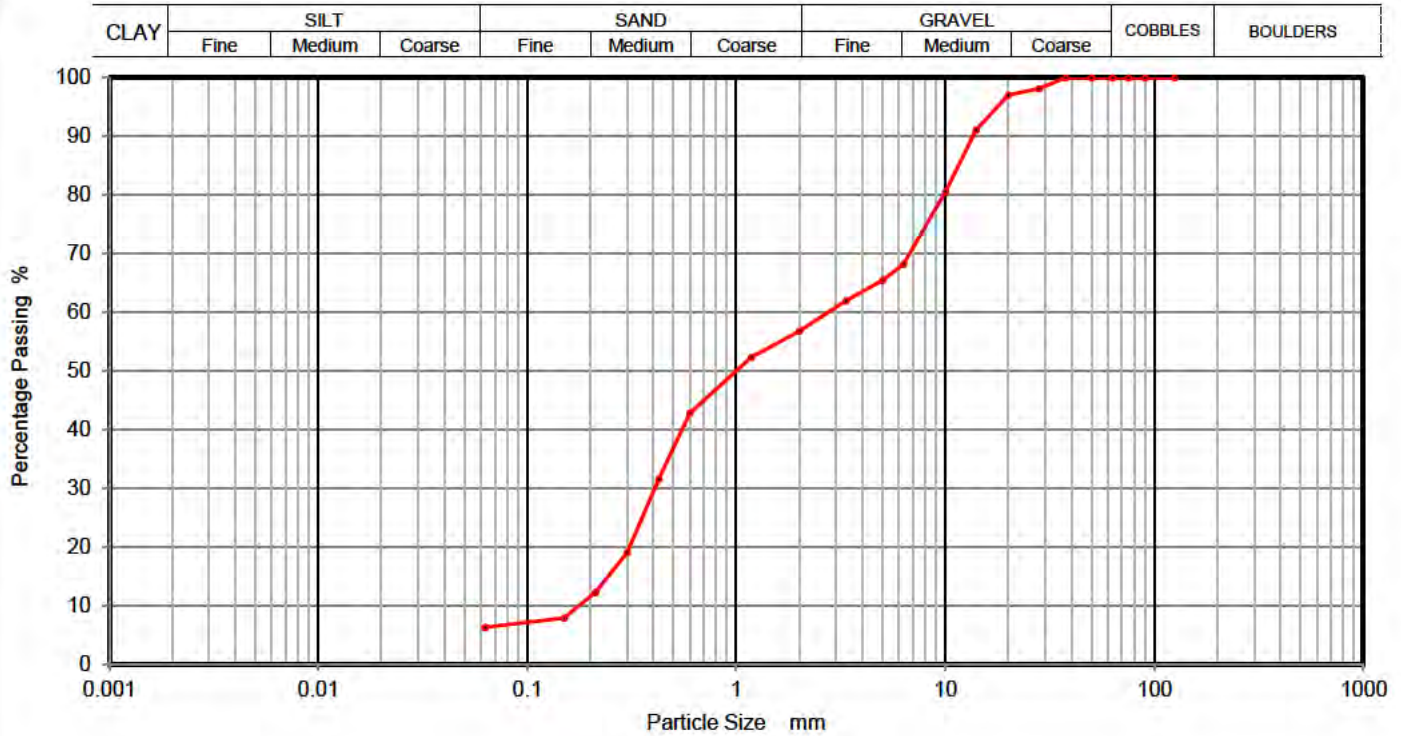




**PARTICLE SIZE DISTRIBUTION  
BS 1377 Part 2:1990  
Wet Sieve, Clause 9.2**

Contract Number	39651
Borehole/Pit No.	TPSA2A03
Sample No.	4
Depth Top	0.50
Depth Base	0.60
Sample Type	B

Site Name	Northstowe - Parcel 2A
Soil Description	Brown slightly silty/ clayey fine to coarse gravelly fine to coarse SAND



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	
90	100	0.0060	
75	100	0.0019	
63	100		
50	100		
37.5	100		
28	98		
20	97		
14	91		
10	81		
6.3	68		
5	65		
3.35	62		
2	57		
1.18	52		
0.6	43		
0.425	32		
0.3	19		
0.212	12		
0.15	8		
0.063	6		

Sample Proportions	% dry mass
Cobbles	0
Gravel	43
Sand	51
Silt and Clay	6

Grading Analysis	
Uniformity Coefficient	

Remarks  
Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	09/07/2018	Reg. 13(1)
RO/MH	Approved	10/07/2018	Reg. 13(1)

Reg. 13(1)



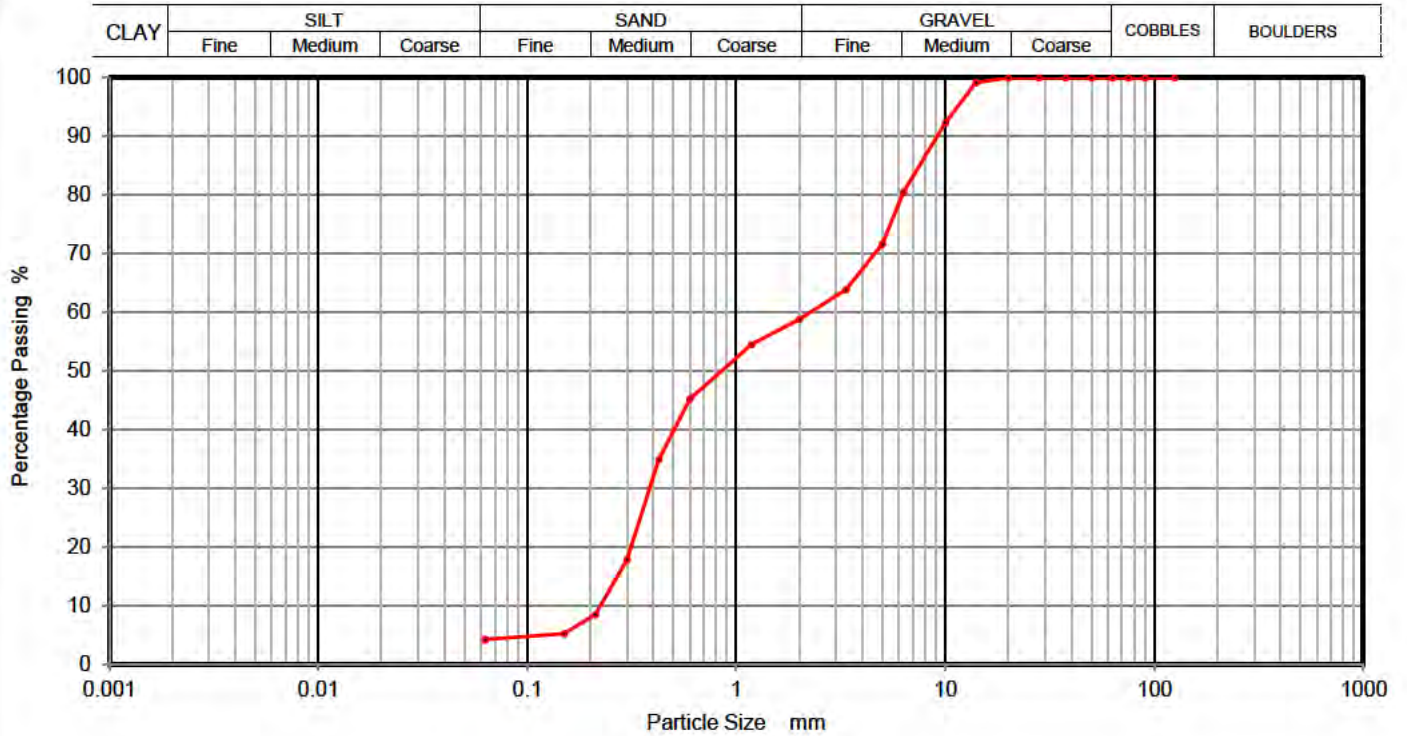




**PARTICLE SIZE DISTRIBUTION**  
**BS 1377 Part 2:1990**  
**Wet Sieve, Clause 9.2**

Contract Number	39651
Borehole/Pit No.	TPSA2A03A
Sample No.	1
Depth Top	0.20
Depth Base	0.40
Sample Type	B

Site Name	Northstowe - Parcel 2A
Soil Description	Brown slightly silty/ clayey fine to medium gravelly fine to coarse SAND



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	
90	100	0.0060	
75	100	0.0019	
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	99		
10	92		
6.3	81		
5	72		
3.35	64		
2	59		
1.18	55		
0.6	45		
0.425	35		
0.3	18		
0.212	9		
0.15	5		
0.063	4		

Sample Proportions	% dry mass
Cobbles	0
Gravel	41
Sand	55
Silt and Clay	4

Grading Analysis	
Uniformity Coefficient	

Remarks  
 Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	09/07/2018	Reg. 13(1)
RO/MH	Approved	10/07/2018	Reg. 13(1)

**Reg. 13(1)**

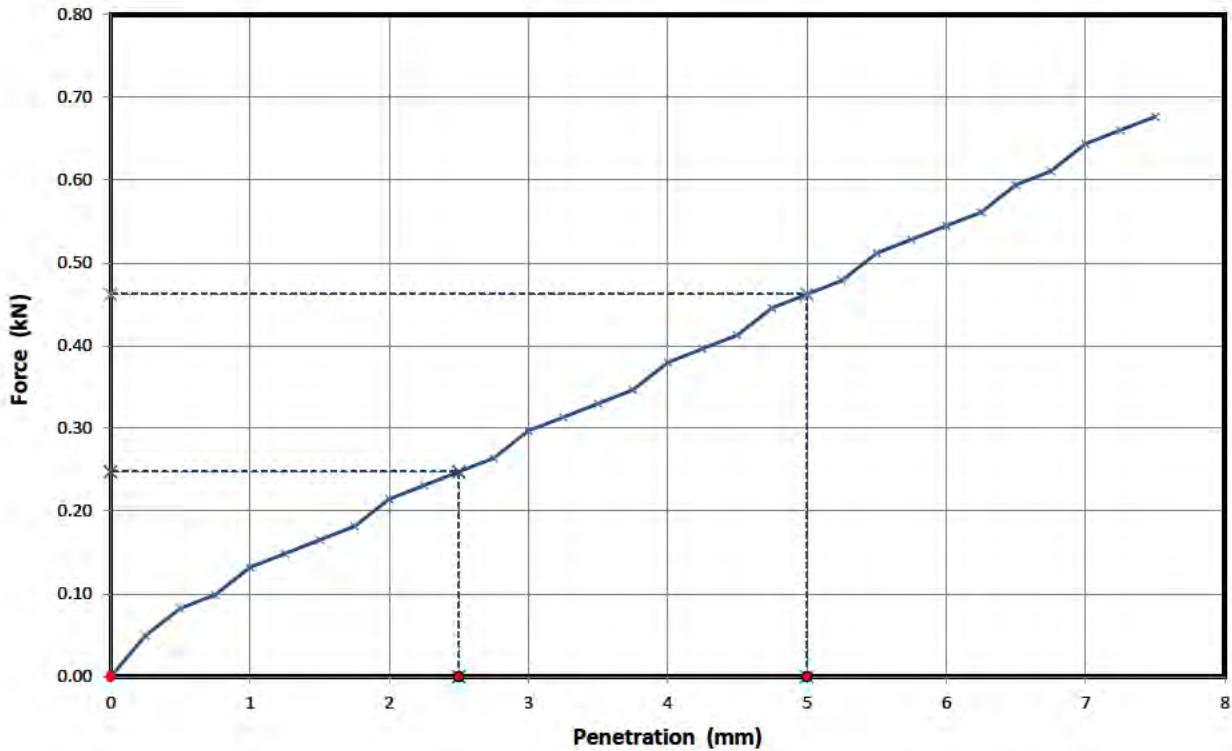






Contract Number	39651
Borehole/Pit No.	BH2A01
Sample No.	2
Depth Top	0.50
Depth Base	1.00
Sample Type	B

Site Name	Northstowe - Parcel 2A
Soil Description	Brown clayey SAND
Compaction Method	2.5 Kg Rammer
Retained 20mm	0%



Initial Sample Conditions	
Moisture Content (%)	16
Moisture Top (%)	16
Moisture Bottom (%)	
Bulk Density (Mg/m3)	2.18
Dry Density (Mg/m3)	1.87

Specified Testing Parameters	
Surcharge (Kg)	2
Soaking Time (hours)	N/A
Swelling (mm)	N/A
Remarks	

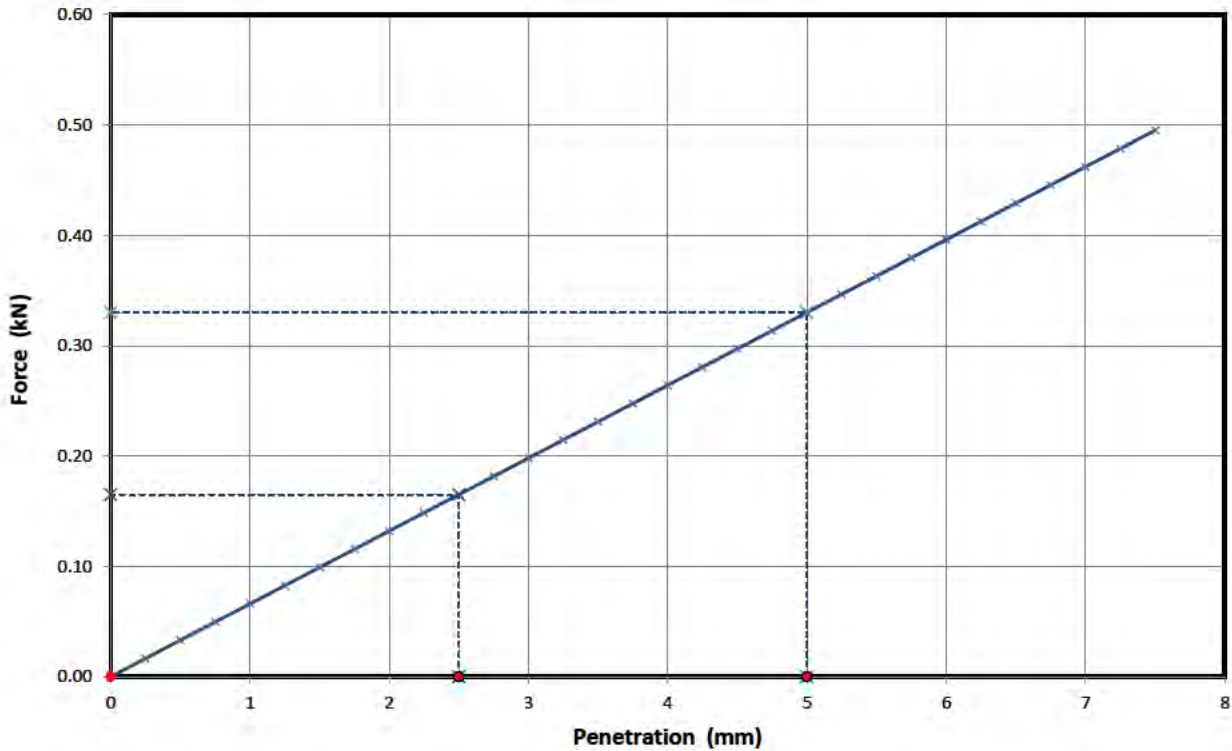
CBR Test Values			
2.5mm Top	1.9	2.5mm Bottom	
5mm Top	2.3	5mm Bottom	
CBR Value %	2.3	CBR Value %	

Operators	Checked	09/07/2018	Reg. 13(1)
RO/MH	Approved	10/07/2018	Reg. 13(1)

**Reg. 13(1)**



Site Name	Northstowe - Parcel 2A	Sample No.	1
Soil Description	Brown clayey SAND	Depth Top	0.00
Compaction Method	2.5 Kg Rammer	Depth Base	0.50
Retained 20mm	0%	Sample Type	B



Initial Sample Conditions	
Moisture Content (%)	15
Moisture Top (%)	15
Moisture Bottom (%)	
Bulk Density (Mg/m3)	2.11
Dry Density (Mg/m3)	1.83

Specified Testing Parameters	
Surcharge (Kg)	2
Soaking Time (hours)	N/A
Swelling (mm)	N/A
Remarks	

CBR Test Values			
2.5mm Top	1.3	2.5mm Bottom	
5mm Top	1.7	5mm Bottom	
CBR Value %	1.7	CBR Value %	

Operators	Checked	09/07/2018	Reg. 13(1)
RO/MH	Approved	10/07/2018	Reg. 13(1)

**Reg. 13(1)**







**California Bearing Ratio  
BS 1377: Part 4: 1990 Clause 7**

Contract Number 39651

Borehole/Pit No. BH2A03

Site Name Northstowe - Parcel 2A

Sample No. 6

Soil Description Brown fine to medium gravelly sandy silty CLAY

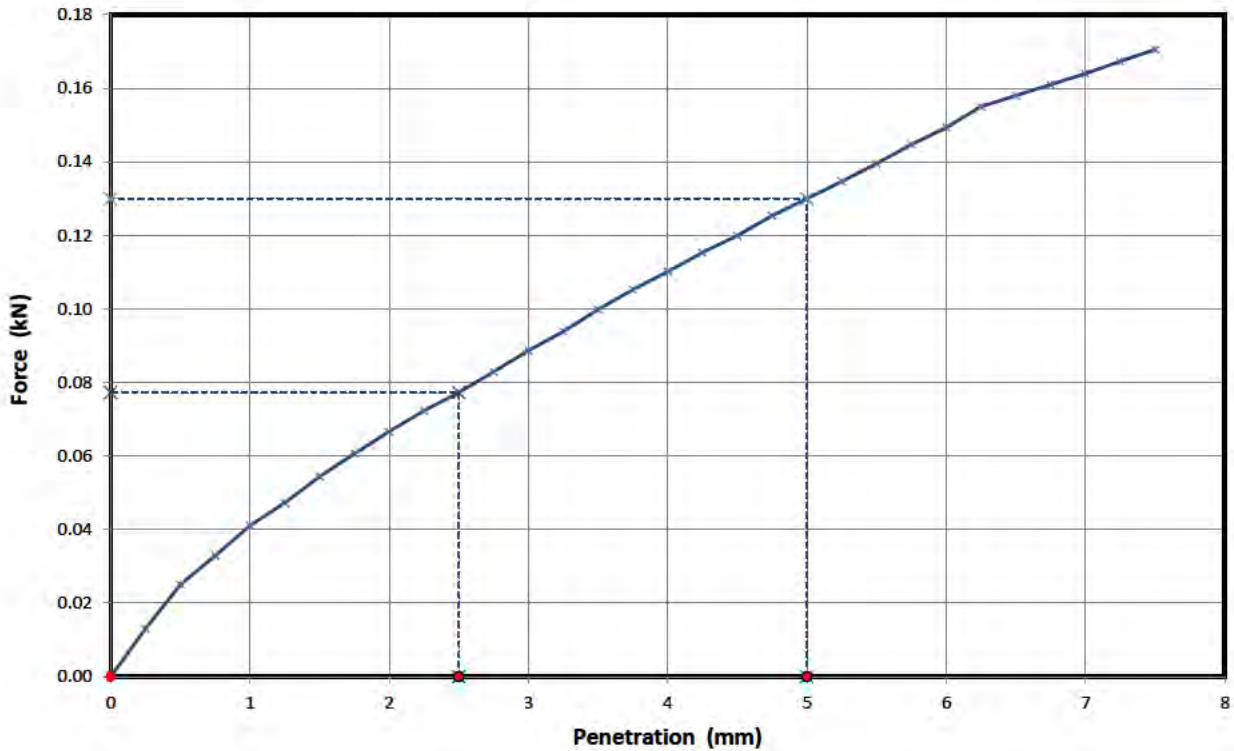
Depth Top 0.50

Compaction Method 2.5 Kg Rammer

Depth Base 1.00

Retained 20mm 0%

Sample Type B



Initial Sample Conditions	
Moisture Content (%)	18
Moisture Top (%)	18
Moisture Bottom (%)	
Bulk Density (Mg/m3)	2.09
Dry Density (Mg/m3)	1.77

Specified Testing Parameters	
Surcharge (Kg)	2
Soaking Time (hours)	N/A
Swelling (mm)	N/A
Remarks	

CBR Test Values			
2.5mm Top	0.6	2.5mm Bottom	
5mm Top	0.7	5mm Bottom	
CBR Value %	0.7	CBR Value %	

Operators	Checked	09/07/2018	Reg. 13(1)	<b>Reg. 13(1)</b>
RO/MH	Approved	10/07/2018	Reg. 13(1)	





**California Bearing Ratio  
BS 1377: Part 4: 1990 Clause 7**

Contract Number 39651

Borehole/Pit No. TP2A04

Site Name Northstowe - Parcel 2A

Sample No. 1

Soil Description Brown fine to coarse gravelly sandy CLAY

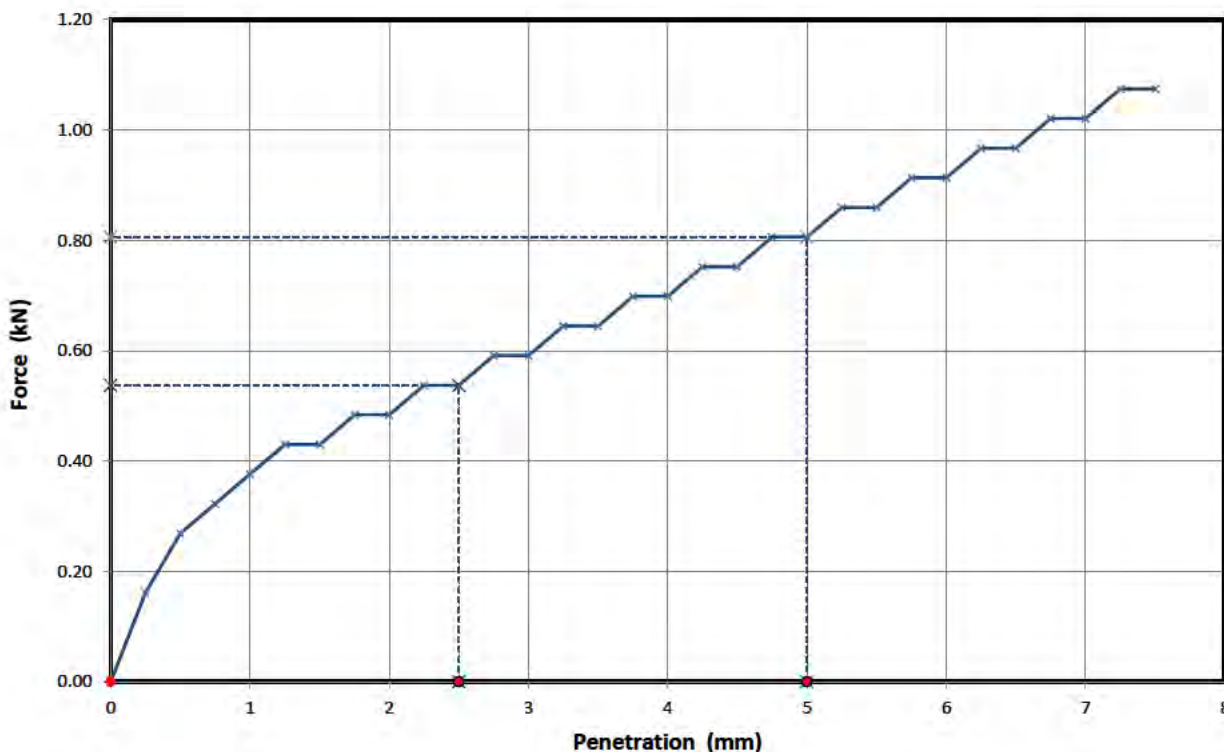
Depth Top 0.00

Compaction Method 2.5 Kg Rammer

Depth Base 0.50

Retained 20mm 0%

Sample Type B



Initial Sample Conditions	
Moisture Content (%)	25
Moisture Top (%)	24
Moisture Bottom (%)	
Bulk Density (Mg/m3)	1.90
Dry Density (Mg/m3)	1.52

Specified Testing Parameters	
Surcharge (Kg)	2
Soaking Time (hours)	N/A
Swelling (mm)	N/A
Remarks	

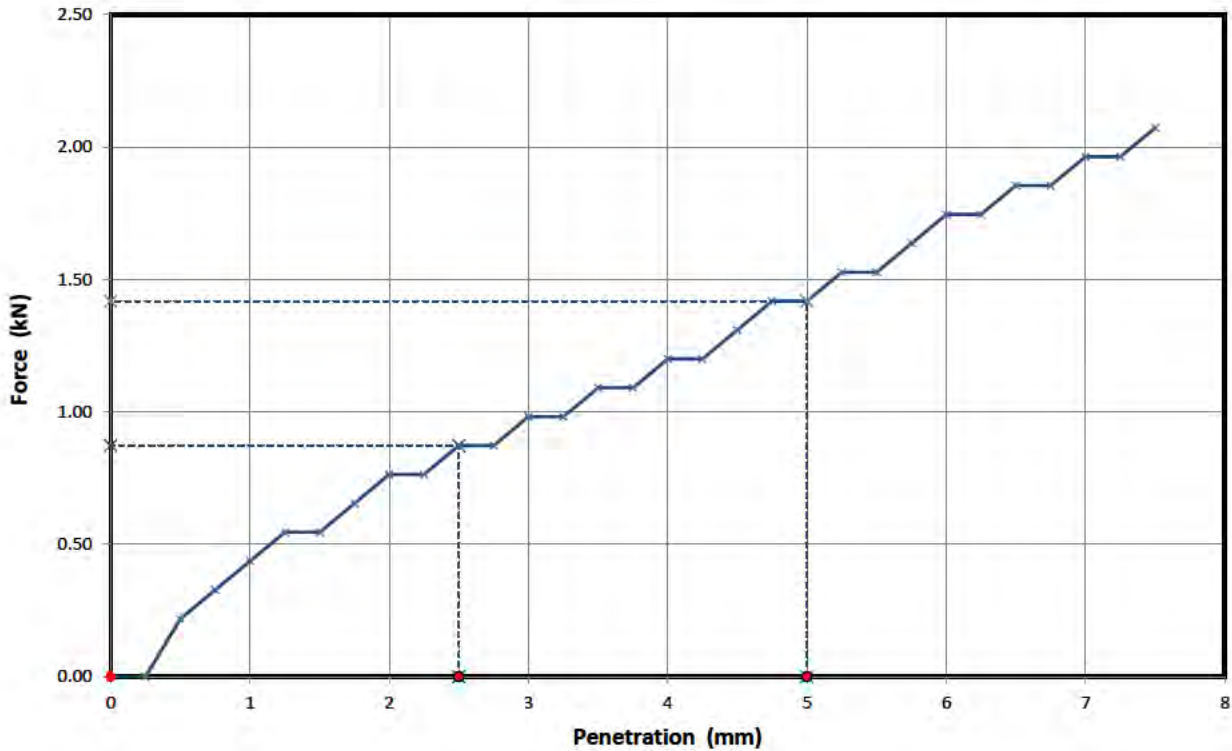
CBR Test Values			
2.5mm Top	4.1	2.5mm Bottom	
5mm Top	4.0	5mm Bottom	
CBR Value %	<b>4.1</b>	CBR Value %	

Operators	Checked	09/07/2018	Reg. 13(1)	Reg. 13(1)
RO/MH	Approved	10/07/2018	Reg. 13(1)	





Site Name	Northstowe - Parcel 2A	Sample No.	3
Soil Description	Brown fine to medium gravelly sandy CLAY	Depth Top	0.50
Compaction Method	2.5 Kg Rammer	Depth Base	0.70
Retained 20mm	0%	Sample Type	B



Initial Sample Conditions	
Moisture Content (%)	16
Moisture Top (%)	15
Moisture Bottom (%)	
Bulk Density (Mg/m3)	2.14
Dry Density (Mg/m3)	1.85

Specified Testing Parameters	
Surcharge (Kg)	2
Soaking Time (hours)	N/A
Swelling (mm)	N/A
Remarks	

CBR Test Values			
2.5mm Top	6.6	2.5mm Bottom	
5mm Top	7.1	5mm Bottom	
CBR Value %	7.1	CBR Value %	

Operators	Checked	09/07/2018	Reg. 13(1)
RO/MH	Approved	10/07/2018	Reg. 13(1)

**Reg. 13(1)**

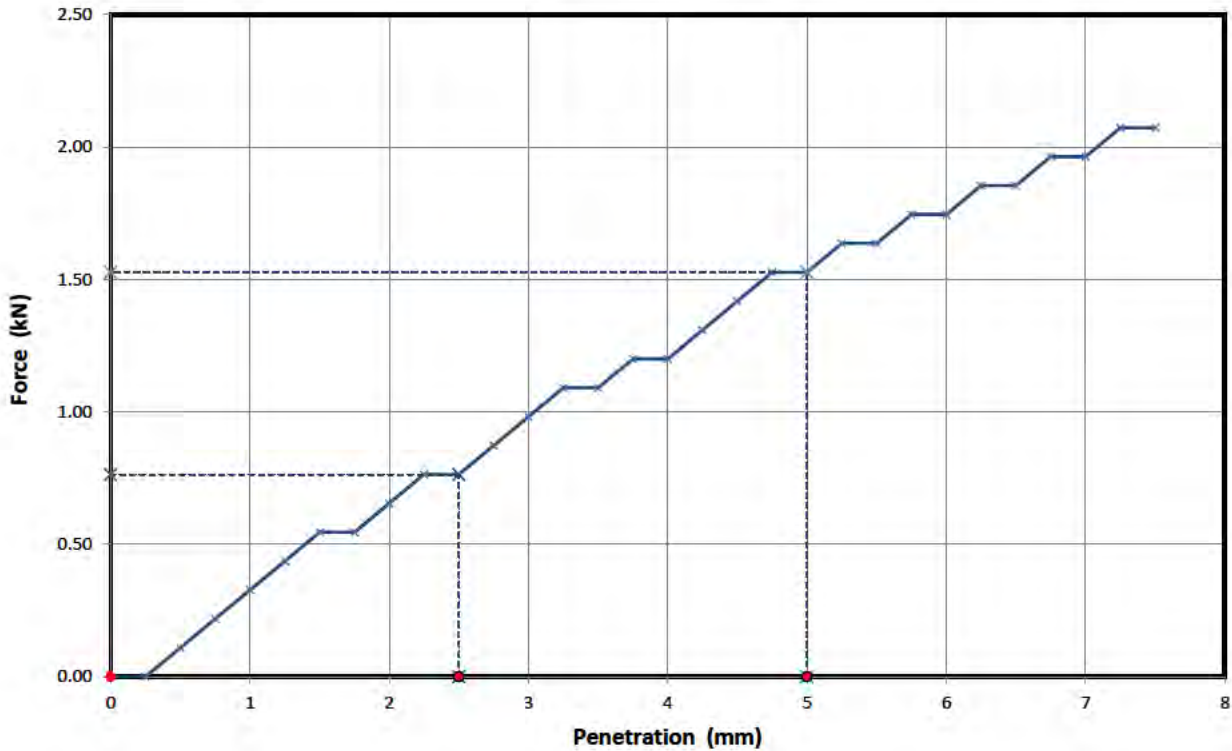




**California Bearing Ratio  
BS 1377: Part 4: 1990 Clause 7**

Contract Number	39651
Borehole/Pit No.	BH2A06
Sample No.	9
Depth Top	0.80
Depth Base	1.20
Sample Type	B

Site Name	Northstowe - Parcel 2A
Soil Description	Brown fine to coarse gravelly sandy CLAY
Compaction Method	2.5 Kg Rammer
Retained 20mm	0%



Initial Sample Conditions	
Moisture Content (%)	11
Moisture Top (%)	11
Moisture Bottom (%)	
Bulk Density (Mg/m3)	2.22
Dry Density (Mg/m3)	2.00

Specified Testing Parameters	
Surcharge (Kg)	2
Soaking Time (hours)	N/A
Swelling (mm)	N/A
Remarks	

CBR Test Values			
2.5mm Top	5.8	2.5mm Bottom	
5mm Top	7.6	5mm Bottom	
CBR Value %	7.6	CBR Value %	

Operators	Checked	09/07/2018	Reg. 13(1)
RO/MH	Approved	10/07/2018	Reg. 13(1)

**Reg. 13(1)**



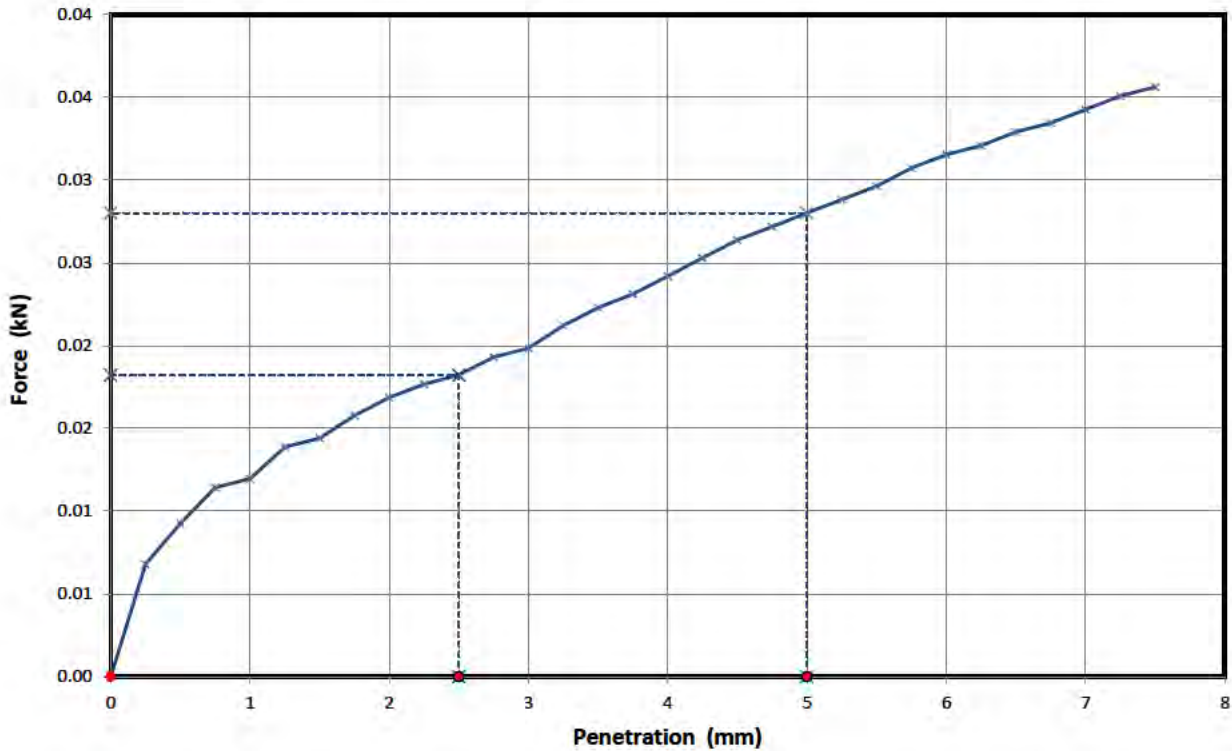




**California Bearing Ratio  
BS 1377: Part 4: 1990 Clause 7**

Contract Number	39651
Borehole/Pit No.	TP2A01
Sample No.	10
Depth Top	0.60
Depth Base	0.80
Sample Type	B

Site Name	Northstowe - Parcel 2A
Soil Description	Brown fine to coarse gravelly SAND
Compaction Method	2.5 Kg Rammer
Retained 20mm	12%



Initial Sample Conditions	
Moisture Content (%)	10
Moisture Top (%)	9.1
Moisture Bottom (%)	
Bulk Density (Mg/m3)	2.05
Dry Density (Mg/m3)	1.86

Specified Testing Parameters	
Surcharge (Kg)	2
Soaking Time (hours)	N/A
Swelling (mm)	N/A
Remarks	

CBR Test Values			
2.5mm Top	0.1	2.5mm Bottom	
5mm Top	0.1	5mm Bottom	
CBR Value %	<b>0.1</b>	CBR Value %	

Operators	Checked	09/07/2018	Reg. 13(1)
RO/MH	Approved	10/07/2018	Reg. 13(1)

**Reg. 13(1)**

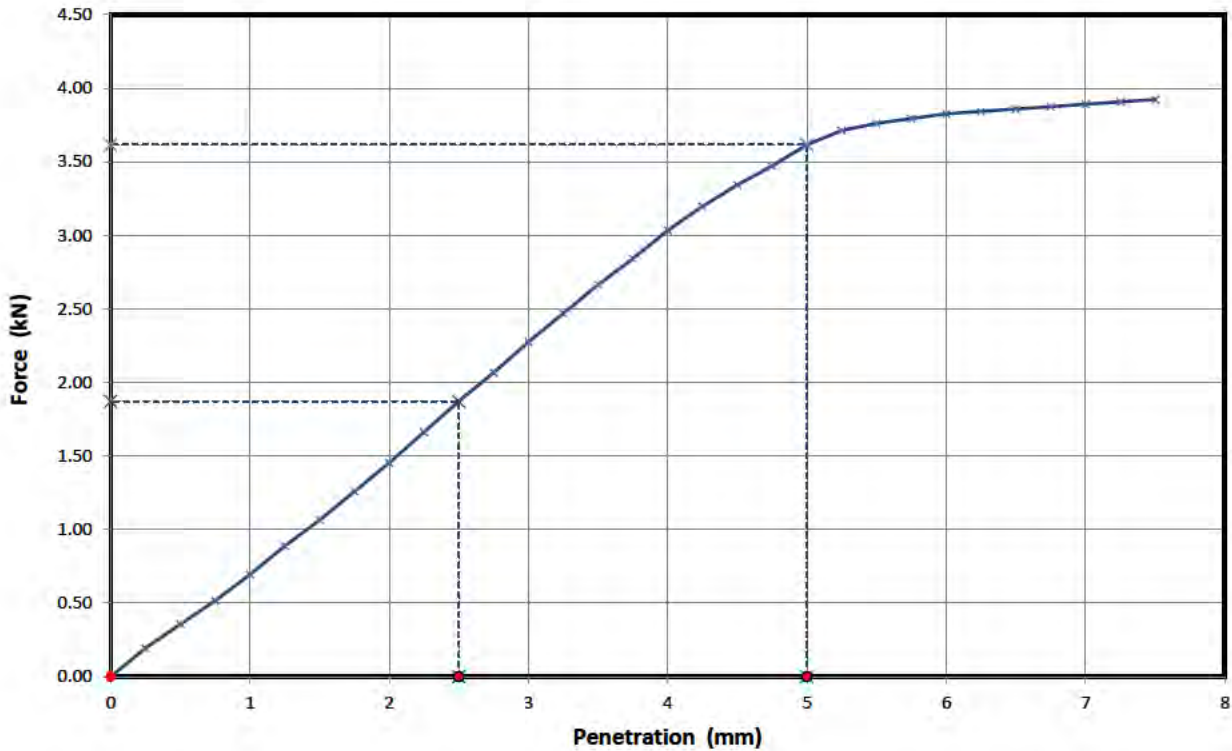




**California Bearing Ratio  
BS 1377: Part 4: 1990 Clause 7**

Contract Number	39651
Borehole/Pit No.	TP2A04
Sample No.	4
Depth Top	0.25
Depth Base	0.40
Sample Type	B

Site Name	Northstowe - Parcel 2A
Soil Description	Brown fine to medium gravelly SAND
Compaction Method	2.5 Kg Rammer
Retained 20mm	0%



Initial Sample Conditions	
Moisture Content (%)	10
Moisture Top (%)	10
Moisture Bottom (%)	
Bulk Density (Mg/m3)	2.21
Dry Density (Mg/m3)	2.01

Specified Testing Parameters	
Surcharge (Kg)	2
Soaking Time (hours)	N/A
Swelling (mm)	N/A
Remarks	

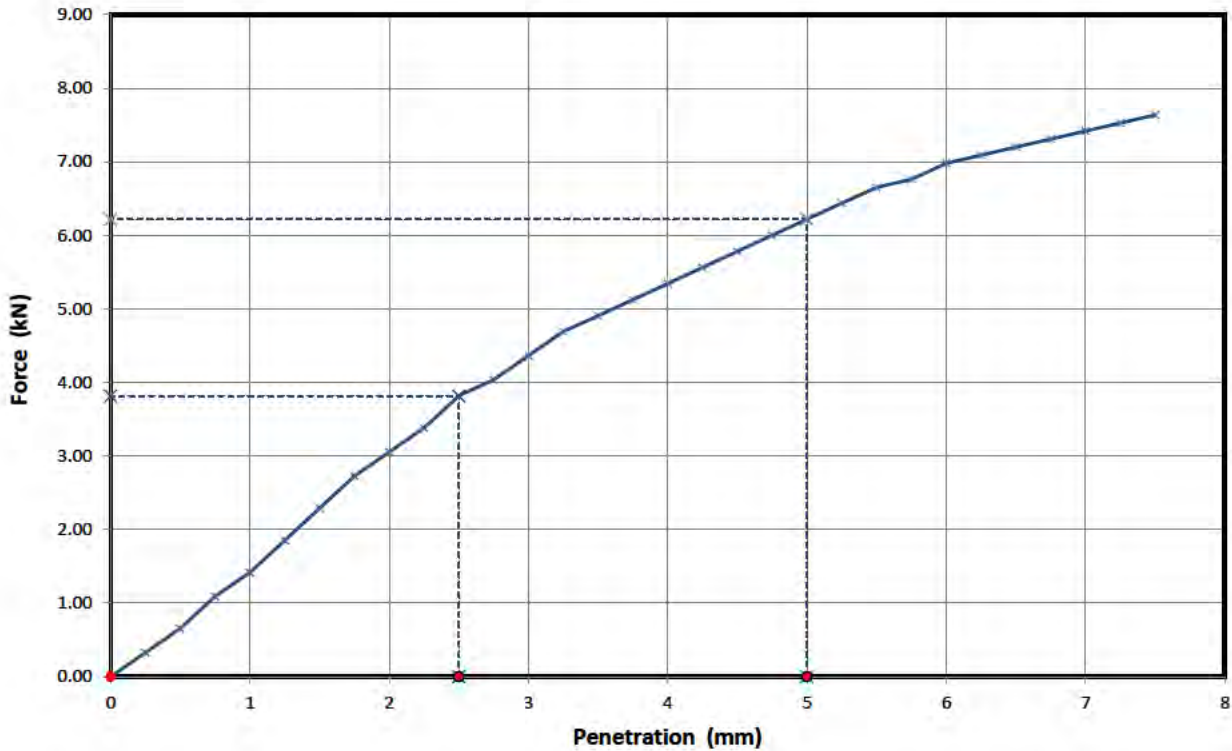
CBR Test Values			
2.5mm Top	14.2	2.5mm Bottom	
5mm Top	18.1	5mm Bottom	
CBR Value %	<b>18.1</b>	CBR Value %	

Operators	Checked	09/07/2018	Reg. 13(1)	<b>Reg. 13(1)</b>
RO/MH	Approved	10/07/2018	Reg. 13(1)	





Site Name	Northstowe - Parcel 2A	Sample No.	4
Soil Description	Brown sandy clayey fine to coarse GRAVEL	Depth Top	0.15
Compaction Method	2.5 Kg Rammer	Depth Base	0.30
Retained 20mm	0%	Sample Type	B



Initial Sample Conditions	
Moisture Content (%)	7.5
Moisture Top (%)	7.1
Moisture Bottom (%)	
Bulk Density (Mg/m3)	2.11
Dry Density (Mg/m3)	1.97

Specified Testing Parameters	
Surcharge (Kg)	2
Soaking Time (hours)	N/A
Swelling (mm)	N/A
Remarks	

CBR Test Values			
2.5mm Top	28.9	2.5mm Bottom	
5mm Top	31.1	5mm Bottom	
CBR Value %	<b>31.1</b>	CBR Value %	

Operators	Checked	09/07/2018	Reg. 13(1)
RO/MH	Approved	10/07/2018	Reg. 13(1)

**Reg. 13(1)**





**California Bearing Ratio  
BS 1377: Part 4: 1990 Clause 7**

Contract Number 39651

Borehole/Pit No. TP2A05

Site Name Northstowe - Parcel 2A

Sample No. 6

Soil Description Brown fine to coarse gravelly silty CLAY

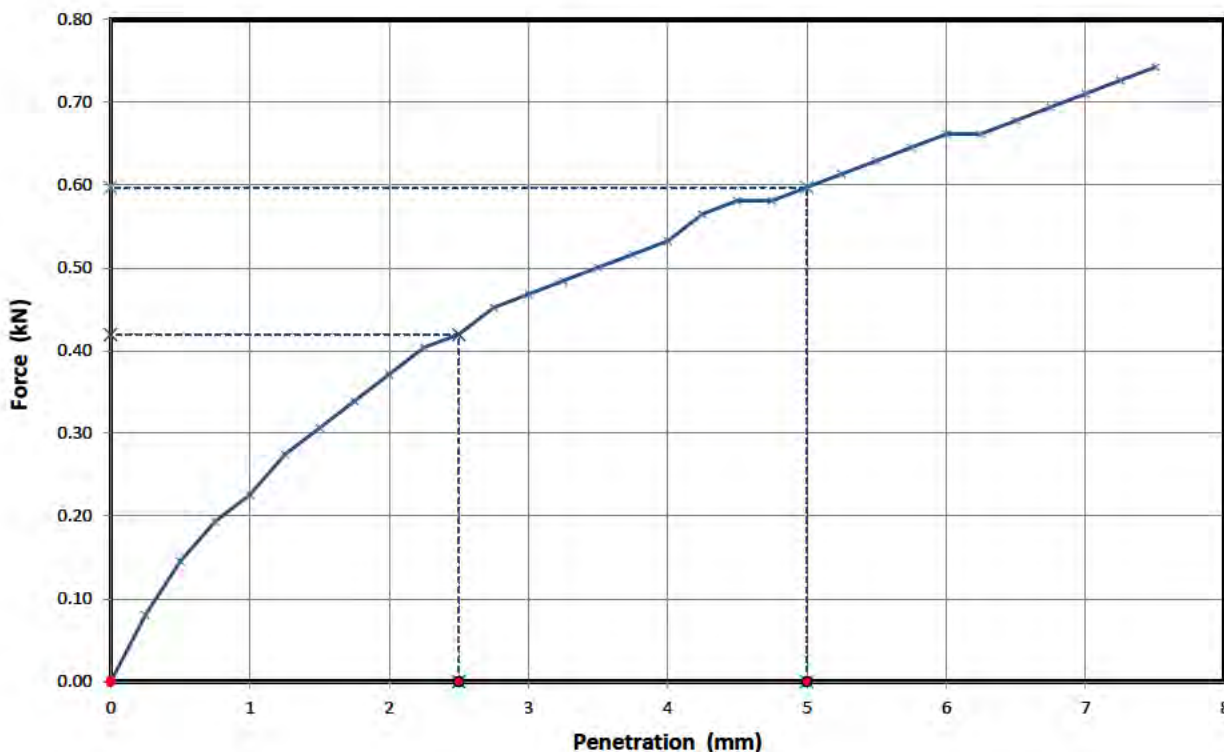
Depth Top 0.40

Compaction Method 2.5 Kg Rammer

Depth Base 0.60

Retained 20mm 0%

Sample Type B



Initial Sample Conditions	
Moisture Content (%)	19
Moisture Top (%)	19
Moisture Bottom (%)	
Bulk Density (Mg/m3)	2.04
Dry Density (Mg/m3)	1.71

Specified Testing Parameters	
Surcharge (Kg)	2
Soaking Time (hours)	N/A
Swelling (mm)	N/A
Remarks	

CBR Test Values			
2.5mm Top	3.2	2.5mm Bottom	
5mm Top	3.0	5mm Bottom	
CBR Value %	<b>3.2</b>	CBR Value %	

Operators	Checked	09/07/2018	Reg. 13(1)
RO/MH	Approved	10/07/2018	Reg. 13(1)

**Reg. 13(1)**







**California Bearing Ratio  
BS 1377: Part 4: 1990 Clause 7**

Contract Number 39651

Borehole/Pit No. TP2A08

Site Name Northstowe - Parcel 2A

Sample No. 4

Soil Description Brown silty CLAY

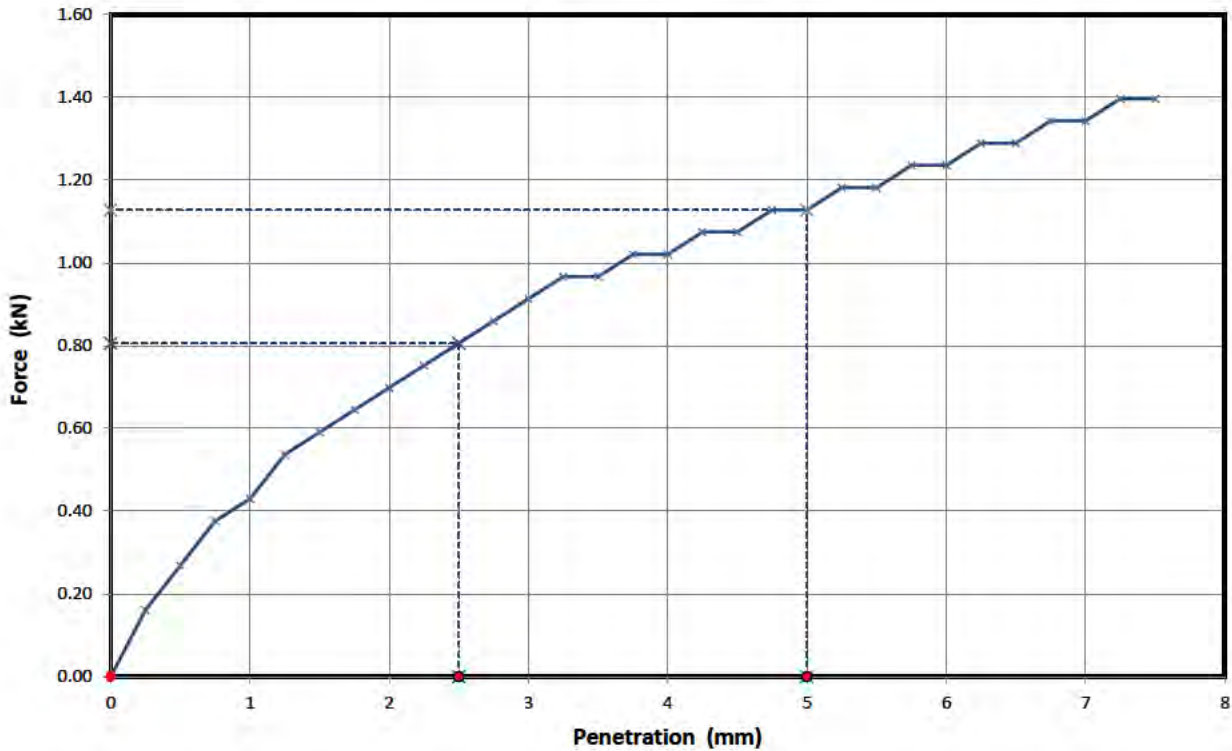
Depth Top 0.20

Compaction Method 2.5 Kg Rammer

Depth Base 0.50

Retained 20mm 0%

Sample Type B



Initial Sample Conditions	
Moisture Content (%)	19
Moisture Top (%)	19
Moisture Bottom (%)	
Bulk Density (Mg/m3)	1.99
Dry Density (Mg/m3)	1.67

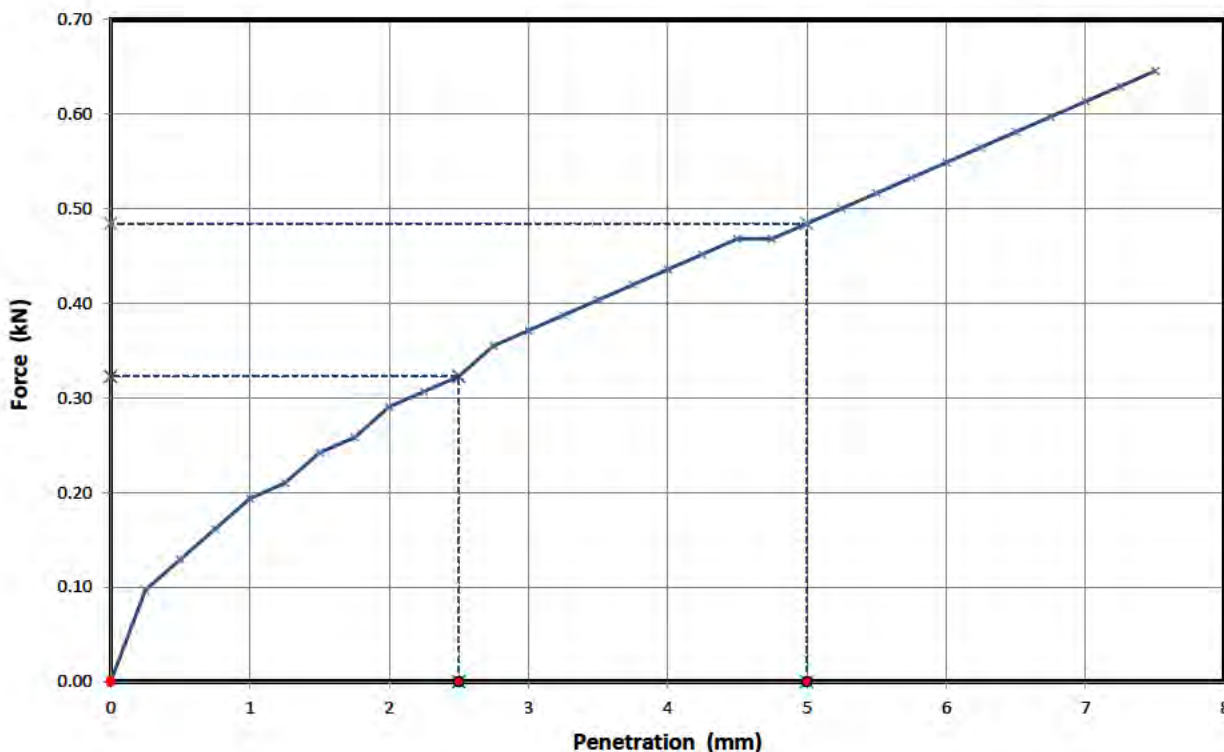
Specified Testing Parameters	
Surcharge (Kg)	2
Soaking Time (hours)	N/A
Swelling (mm)	N/A
Remarks	

CBR Test Values			
2.5mm Top	6.1	2.5mm Bottom	
5mm Top	5.6	5mm Bottom	
CBR Value %	<b>6.1</b>	CBR Value %	

Operators	Checked	09/07/2018	Reg. 13(1)	<b>Reg. 13(1)</b>
RO/MH	Approved	10/07/2018	Reg. 13(1)	



Site Name	Northstowe - Parcel 2A	Sample No.	6
Soil Description	Brown fine gravelly silty CLAY	Depth Top	0.25
Compaction Method	2.5 Kg Rammer	Depth Base	0.40
Retained 20mm	0%	Sample Type	B



Initial Sample Conditions	
Moisture Content (%)	18
Moisture Top (%)	18
Moisture Bottom (%)	
Bulk Density (Mg/m3)	1.99
Dry Density (Mg/m3)	1.69

Specified Testing Parameters	
Surcharge (Kg)	2
Soaking Time (hours)	N/A
Swelling (mm)	N/A
Remarks	

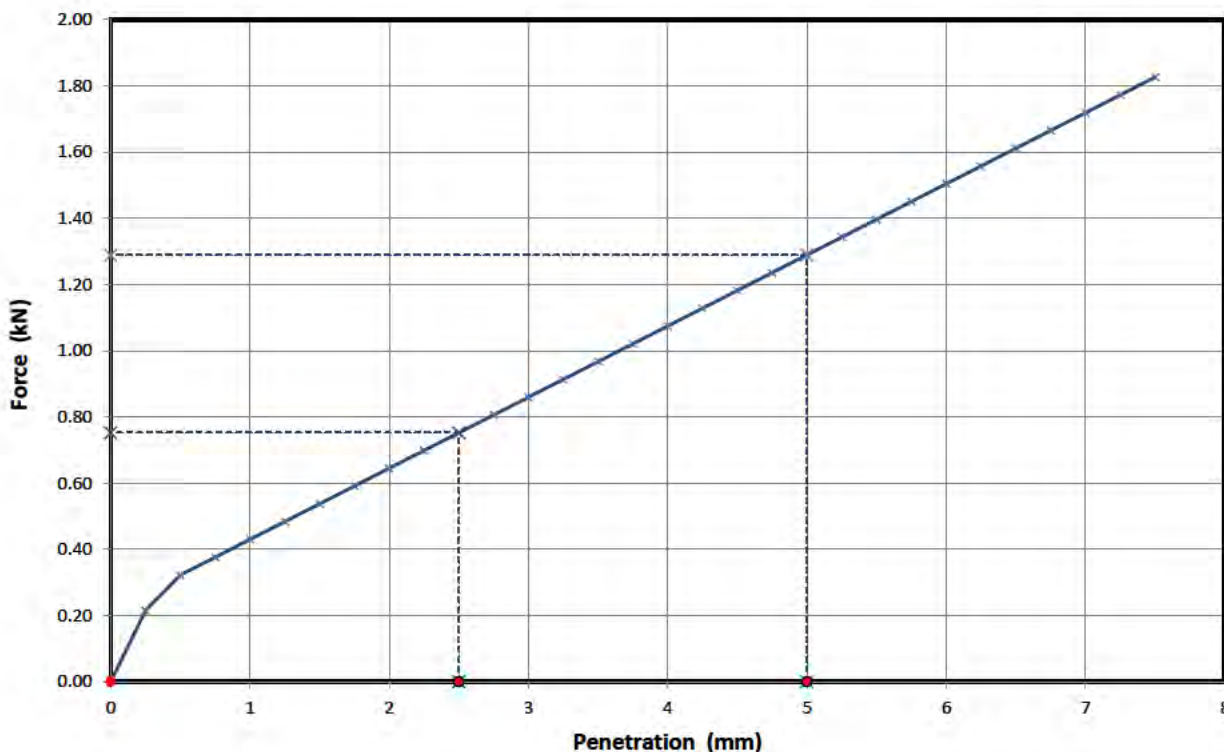
CBR Test Values			
2.5mm Top	2.4	2.5mm Bottom	
5mm Top	2.4	5mm Bottom	
CBR Value %	2.4	CBR Value %	

Operators	Checked	09/07/2018	Reg. 13(1)	<b>Reg. 13(1)</b>
RO/MH	Approved	10/07/2018	Reg. 13(1)	





Site Name	Northstowe - Parcel 2A	Sample No.	4
Soil Description	Brown silty CLAY	Depth Top	0.25
Compaction Method	2.5 Kg Rammer	Depth Base	0.60
Retained 20mm	0%	Sample Type	B



Initial Sample Conditions	
Moisture Content (%)	25
Moisture Top (%)	25
Moisture Bottom (%)	
Bulk Density (Mg/m3)	1.90
Dry Density (Mg/m3)	1.51

Specified Testing Parameters	
Surcharge (Kg)	2
Soaking Time (hours)	N/A
Swelling (mm)	N/A
Remarks	

CBR Test Values			
2.5mm Top	5.7	2.5mm Bottom	
5mm Top	6.4	5mm Bottom	
CBR Value %	<b>6.4</b>	CBR Value %	

Operators	Checked	09/07/2018	Reg. 13(1)	<b>Reg. 13(1)</b>
RO/MH	Approved	10/07/2018	Reg. 13(1)	

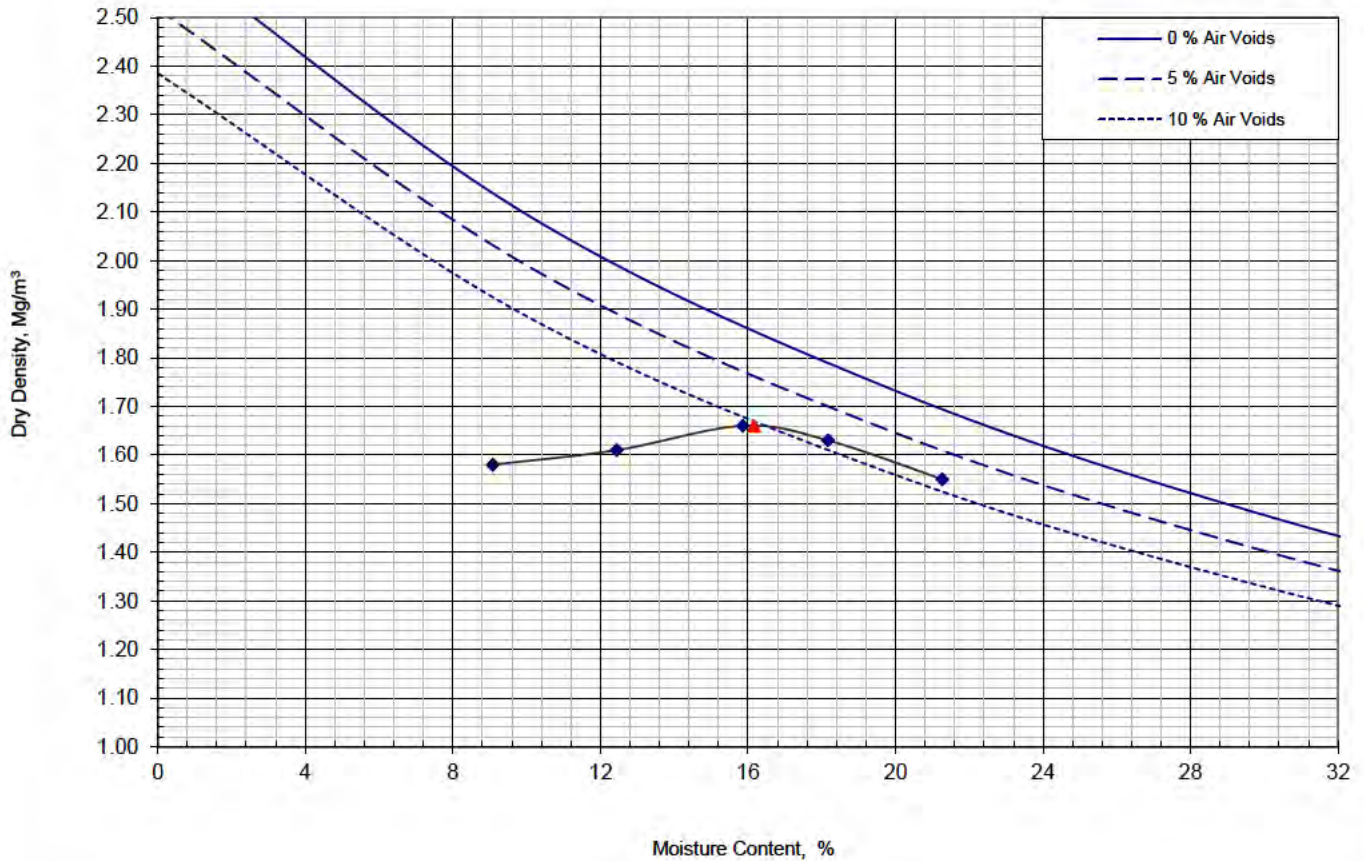




**Dry Density / Moisture Content Relationship  
BS 1377:Part 4:1990**

Contract Number	39651
Borehole / Pit No	TP2A01
Sample No	7
Depth Top	1.00
Depth Base	1.20
Sample Type	B

Site Name	Northstowe - Parcel 2A
Soil Description	Brown fine to medium gravelly sandy CLAY
Compaction Method	2.5 Kg Rammer
Compaction Clause	BS1377:Part 4:1990, Clause 3.4



Compaction Point	1	2	3	4	5						
Moisture Content	9.1	12	16	18	21						
Bulk Density	1.72	1.81	1.92	1.93	1.88						
Dry Density	1.58	1.61	1.66	1.63	1.55						

Initial Moisture Content	21	%
Maximum Dry Density	1.66	Mg/m <sup>3</sup>
Optimum Moisture Content	16	%
Particle Density	2.65 Assumed	Mg/m <sup>3</sup>
Material Retained 37.5mm	0	%
Material Retained 20mm	0	%

Operators	Checked	09/07/2018	Reg. 13(1)
CA	Approved	10/07/2018	Reg. 13(1)

**Reg. 13(1)**



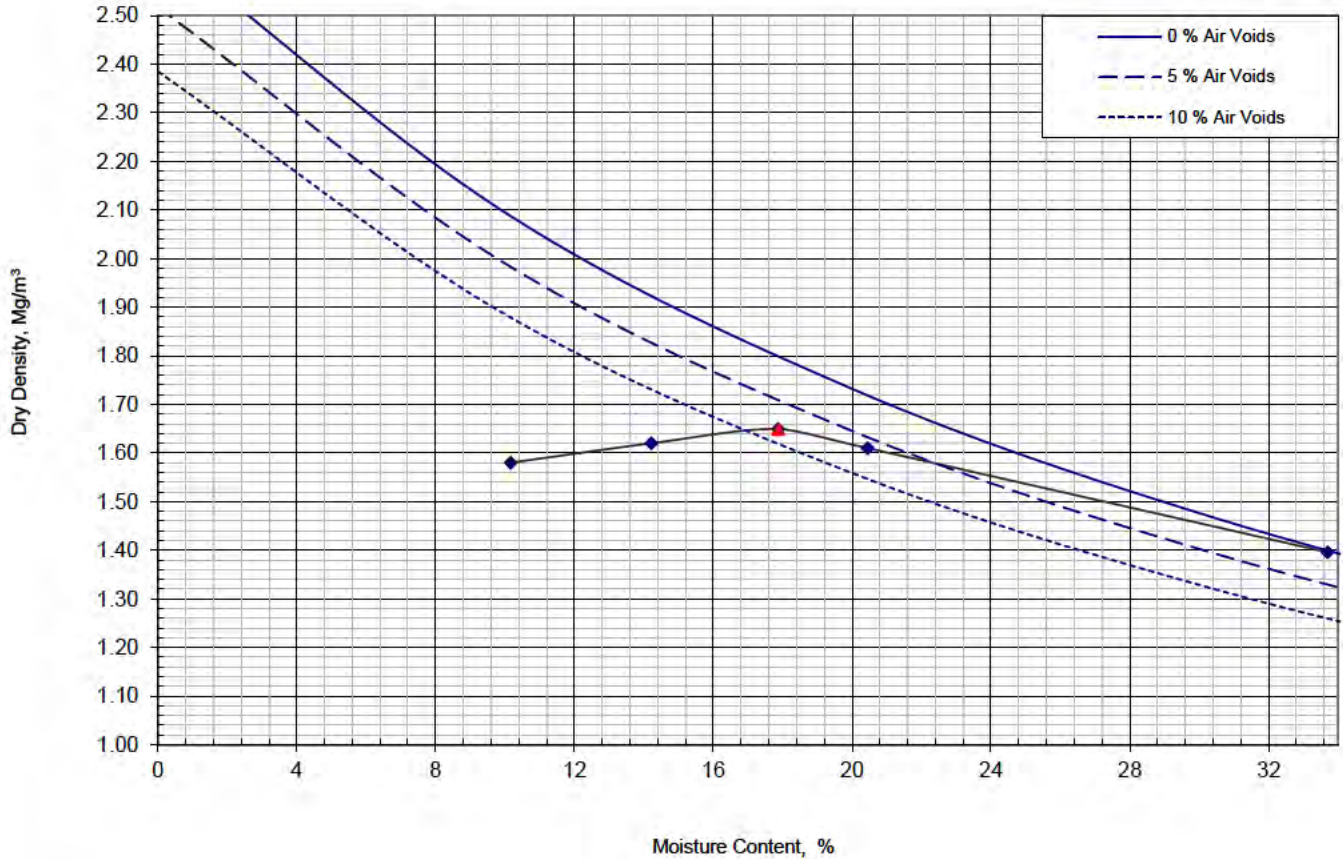




**Dry Density / Moisture Content Relationship  
BS 1377:Part 4:1990**

Contract Number	39651
Borehole / Pit No	TP2A06
Sample No	2
Depth Top	1.20
Depth Base	1.50
Sample Type	B

Site Name	Northstowe - Parcel 2A
Soil Description	Grey slightly silty sandy CLAY
Compaction Method	2.5 Kg Rammer
Compaction Clause	BS1377:Part 4:1990, Clause 3.4



Compaction Point	1	2	3	4	5						
Moisture Content	10	14	18	20	34						
Bulk Density	1.74	1.85	1.94	1.94	1.87						
Dry Density	1.58	1.62	1.65	1.61	1.40						

Initial Moisture Content	34	%
Maximum Dry Density	1.65	Mg/m <sup>3</sup>
Optimum Moisture Content	18	%
Particle Density	2.65 Assumed	Mg/m <sup>3</sup>
Material Retained 37.5mm	0	%
Material Retained 20mm	0	%

Operators	Checked	09/07/2018	Reg. 13(1)
CA	Approved	10/07/2018	Reg. 13(1)

**Reg. 13(1)**

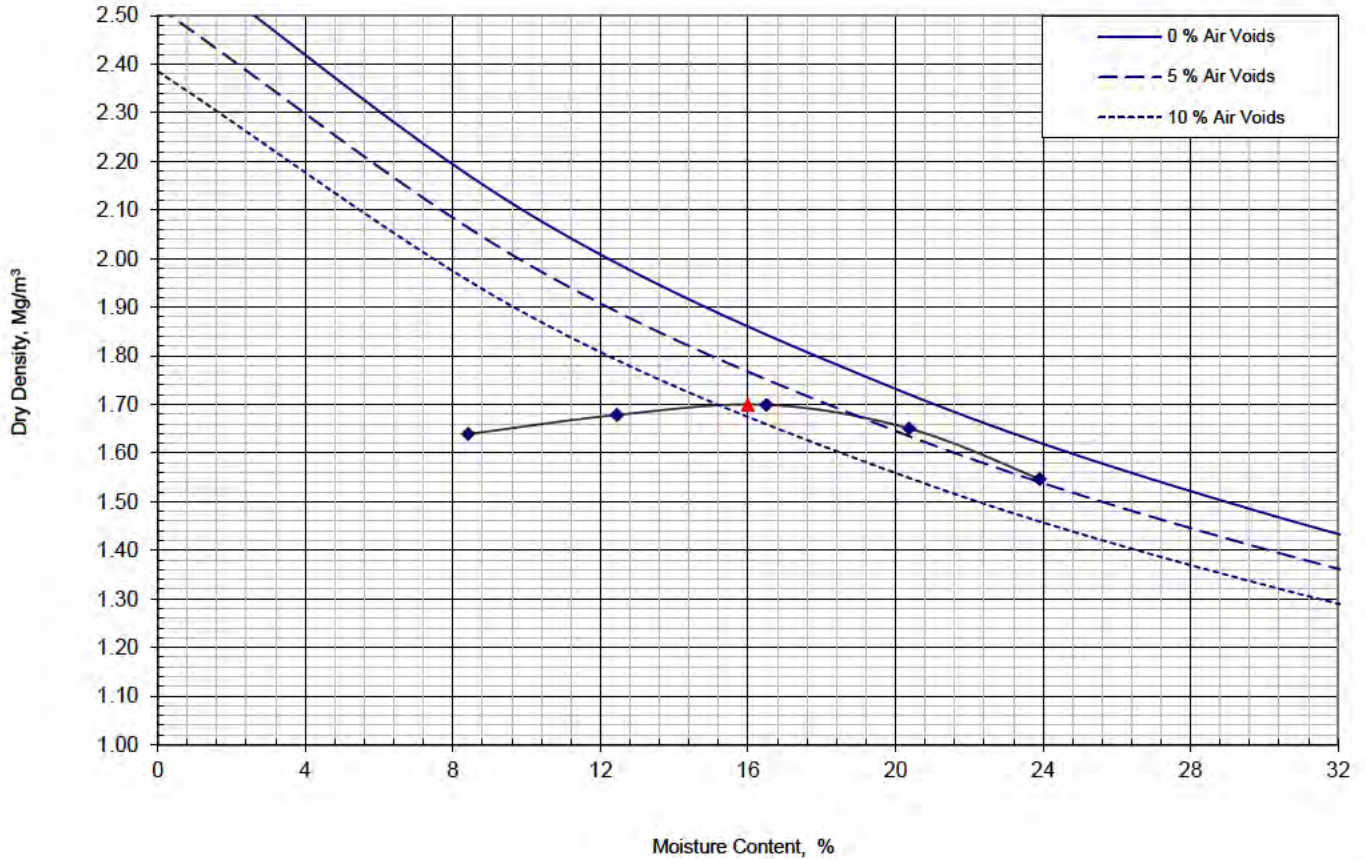




**Dry Density / Moisture Content Relationship  
BS 1377:Part 4:1990**

Contract Number	39651
Borehole / Pit No	TP2A08
Sample No	7
Depth Top	0.50
Depth Base	0.70
Sample Type	B

Site Name	Northstowe - Parcel 2A
Soil Description	Grey silty CLAY
Compaction Method	2.5 Kg Rammer
Compaction Clause	BS1377:Part 4:1990, Clause 3.4



Compaction Point	1	2	3	4	5						
Moisture Content	8.4	12	17	20	24						
Bulk Density	1.78	1.89	1.98	1.99	1.92						
Dry Density	1.64	1.68	1.70	1.65	1.55						

Initial Moisture Content	24	%
Maximum Dry Density	1.70	Mg/m <sup>3</sup>
Optimum Moisture Content	16	%
Particle Density	2.65 Assumed	Mg/m <sup>3</sup>
Material Retained 37.5mm	0	%
Material Retained 20mm	0	%

Operators	Checked	09/07/2018	Reg. 13(1)
CA	Approved	10/07/2018	Reg. 13(1)

**Reg. 13(1)**

