

A1 in Northumberland: Morpeth to Ellingham

Scheme Number: TR010041

6.8 Environmental Statement – Appendix 11.4 Ground Investigation Works

**1 of 2
Part B**

APFP Regulation 5(2)(a)

Planning Act 2008

Infrastructure Planning (Applications: Prescribed
Forms and Procedure) Regulations 2009

June 2020

Infrastructure Planning

Planning Act 2008

**The Infrastructure Planning
(Applications: Prescribed Forms and
Procedure) Regulations 2009**

The A1 in Northumberland: Morpeth to Ellingham
Development Consent Order 20[xx]

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A1 NORTHUMBERLAND – ALNWICK TO ELLINGHAM GROUND INVESTIGATION WORK

Report No A8013-18

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1 INTRODUCTION

In April 2018 SOCOTEC UK Limited (SOCOTEC) was commissioned by Geoffrey Osborne Ltd (Osborne), on behalf of Highways England, to carry out a ground investigation associated with a proposed realignment and upgrade of the A1 between Morpeth and Ellingham, Northumberland.

The Investigation Supervisor, on behalf of Highways England, was WSP UK Ltd (WSP).

The proposed works were split into five sections, as below:

- ***Alnwick to Ellingham***
- Morpeth to Felton – River Coquet
- Morpeth to Felton – National Grid
- Morpeth to Felton – Northern Gas Networks
- Morpeth to Felton – Causey Park

This report presents the findings of the ground investigation for the *Alnwick to Ellingham* section of the route. The investigation works in this section are required to provide geotechnical and geoenvironmental information for the proposed dualling section of the carriageway and upgrading of existing junctions between Alnwick and North Charlton Junction.

The scope of the investigation was specified by WSP and comprised cable percussion and rotary follow-on boreholes, trial pitting and laboratory testing. The investigation was performed in accordance with the general requirements of BS 5930 (2015), BS EN 1997-2 (2007), BS EN ISO 22475-1 (2006) and other relevant related standards identified below. The fieldwork was carried out in two phases. The first was carried out between 9 and 30 July 2018 and the second between 5 September and 31 October 2018.

This report presents the factual records of the fieldwork and laboratory testing. The information is also presented as digital data as defined in AGS4 (2017).

2 SITE SETTING

2.1 Location and Description

The site is located adjacent to the A1 trunk road, an approximately 8 km long section, about 2 km north of Alnwick, Northumberland, see Site Location Plan in Appendix A. The National Grid reference for each end of the site are NU 169 225 and NU 196 155.

The site generally comprises arable and livestock farmland, with a series of fields separated by hedges and fences. North Charlton Junction marks the northern most extent of the site, and land belonging to Broxfield Farm, approximately 1 km north of Denwick Junction, marks the south.

2.2 Published Geology

The published geological map for the area, BGS Sheet 6 (1982 & 1975) and the BGS Geology of Britain Viewer (2018) show the southern portion of the site located predominantly on Glacial Till, and the northern portion predominantly on Glaciofluvial Deposits, and small areas where these encroach into each other. There are also localised area where Alluvium and Peat are shown along the site.

The underlying bedrock is predominantly shown to be the Tyne Limestone Formation and Alston Formation, comprising sandstones, siltstones, mudstones, thin limestones and some coals. There is also an area, just south of the centre of the site, where the Scremerston Coal Member is shown to underlie the site.

2.3 Previous Ground Investigations

Previous ground investigations have been completed between Alnwick and Ellingham between 1969 and 2012, most recently by Halcrow Group Ltd. The report for which has been provided by the client.

The ground investigation was undertaken to inform the design of a new spur road for the A1(T) northbound carriageway, which confirmed the embankment at the site location to comprise reworked glacial till. Groundwater levels were noted to be between 1 and 2 m bgl.

3 FIELDWORK

3.1 General

The exploratory hole locations were selected by WSP and set out by Osborne. The co-ordinates and reduced levels, of the as dug locations, were surveyed by SOCOTEC to National Grid and Ordnance Datum. The exploratory hole locations are shown on the Site Plan in Appendix A.

3.2 Exploratory Holes

The exploratory hole types are listed in the table below; additional detail is provided in Table B2 in Appendix B, including hole forming techniques, depths, locations details and comments as appropriate.

TABLE 1: SUMMARY OF EXPLORATORY HOLES

TYPE	QUANTITY	MAXIMUM DEPTH (m)	REMARKS
Cable Percussion (only)	1	4.05	BH/17/05 – unable to be followed by rotary due inclination of casing.
Rotary Open Hole Drilling extended by Rotary Core Drilling	1	10.00	BH/17/05A – rotary only borehole
Cable Percussion extended by Rotary Core Drilling	13	20.30	
Trial Pits (Machine dug)	44	4.00	
Inspection Pits	3	1.30	Hand dug to expose depth of cables.

The borehole numbering system was instructed by WSP.

The exploratory hole logs are presented in Appendix B. These provide information including the equipment and methods used, samples taken, tests carried out, water observations and descriptions of the strata encountered. Explanation of the terms and abbreviations used on the logs is given in the Key to Exploratory Hole Records in Appendix B, together with other explanatory information. The logging of soil and rock materials is in accordance with BS EN ISO 14688-1+A1 (2013) for soils and BS EN ISO 14689-1 (2003) for rocks, as amplified by BS 5930 (2015).

Standard penetration tests (SPT) in the cable percussion sections of the boreholes were carried out in accordance with BS EN ISO 22476-3+A1 (2011) and the SPT hammer energy ratio certificate is included in Appendix B. The SPT results are presented on the logs as uncorrected N values.

Photographs of the trial pits and rotary drilled cores are presented in Appendix G.

On completion of the fieldwork geotechnical samples were transported to the Carcroft laboratory of SOCOTEC for testing and temporary retention. Geoenvironmental samples were transported from site directly to the Burton-on-Trent laboratory of SOCOTEC.

3.3 Groundwater Monitoring

Groundwater monitoring instrumentation was installed in selected boreholes; details are shown on the logs and summarised in Appendix C.

Automatic water level loggers (divers) were placed in all installations and the data was downloaded on 8 January 2019, at the end of the post fieldwork monitoring period. Plots of water level against time are presented in Appendix C, along with a table of the manual dip data.

3.4 In Situ Testing

In situ soakaway testing was carried out in the three trial pits, TP/17/08, TP/17/14 and TP/17/33. Testing was carried out in accordance with BRE Digest 365 (2007); the results of the in situ testing are presented in Appendix D.

4 LABORATORY TESTING

4.1 Geotechnical Testing

Geotechnical laboratory testing was scheduled by WSP and was carried out in accordance with BS 1377 (1990) and ISRM (2007) unless otherwise stated. The testing is summarised below and the results are presented in Appendix E.

TABLE 2: SUMMARY OF GEOTECHNICAL LABORATORY TESTING

TYPE	REMARKS
Moisture Content Determination	
Particle Density	
Atterberg Limit Determination	
Particle Size Distribution Analysis	
Unconsolidated Undrained Triaxial Compression Testing	
One Dimensional Consolidation Test	
Dry Density/Moisture Content Relationship Tests	Light and Heavy Compaction Methods
California Bearing Capacity Test	
Moisture Condition Value Test	
Determination of Shear Strength by Direct Shear (Small Shearbox)	
Point Load Index Test	
Uniaxial Compressive Strength of Rock Test	
Index Properties of Rock	
pH and Water Soluble Sulphate, Acid Soluble Sulphate and Total Sulphur Content of Soils and Water	Test methods are BS 1377 or others recognised in BRE Special Digest 1 (2005)
Loss on Ignition	
Organic Matter	

4.2 Geoenvironmental Testing

Geoenvironmental laboratory testing was scheduled by WSP on the soil samples recovered during the fieldwork, and water samples taken by SOCOTEC from the installations. The testing was carried out by the laboratory at Burton-on-Trent; the results are presented in Appendix F.

REFERENCES

AGS : 2017 : Electronic transfer of geotechnical and geoenvironmental data (Edition 4.0.4 February 2017). Association of Geotechnical and Geoenvironmental Specialists.

BGS England and Wales Sheet 06 : 1982 & 1975 : Alnwick and Morpeth. 1:50,000 geological map (solid and drift). British Geological Survey.

BGS Geology of Britain Viewer : 2019. www.bgs.ac.uk. British Geological Survey.

BRE Digest 365 : 2007 : Soakaway design. Building Research Establishment, Garston, Watford.

BRE Special Digest 1 : 2005 : Concrete in aggressive ground. Building Research Establishment.

BS 1377 : 1990 : Methods of test for soils for civil engineering purposes. British Standards Institution.

BS 5930 : 2015 : Code of practice for ground investigations. British Standards Institution.

BS EN 1997-2 : 2007 : Eurocode 7 - Geotechnical design - Part 2 Ground investigation and testing. British Standards Institution.

BS EN ISO 14688-1:2002+A1 : 2013 : Geotechnical investigation and testing - Identification and classification of soil - Part 1 Identification and description. British Standards Institution.

BS EN ISO 14688-2:2004+A1 : 2013 : Geotechnical investigation and testing - Identification and classification of soil - Part 2 Principles for a classification. British Standards Institution.

BS EN ISO 14689-1 : 2003 : Geotechnical investigation and testing - Identification and classification of rock - Part 1 Identification and description. British Standards Institution.

BS EN ISO 22476-3:2005+A1 : 2011 : Geotechnical investigation and testing - Field testing - Part 3 Standard penetration test. British Standards Institution.

ISRM : 2007 : The Complete ISRM Suggested Methods for Rock Characterisation, Testing and Monitoring (1974-2006). Commission on Testing Methods, International Society for Rock Mechanics (Editors Ulusay R & Hudson JA).

APPENDIX A
FIGURES AND DRAWINGS

Site Location Plan

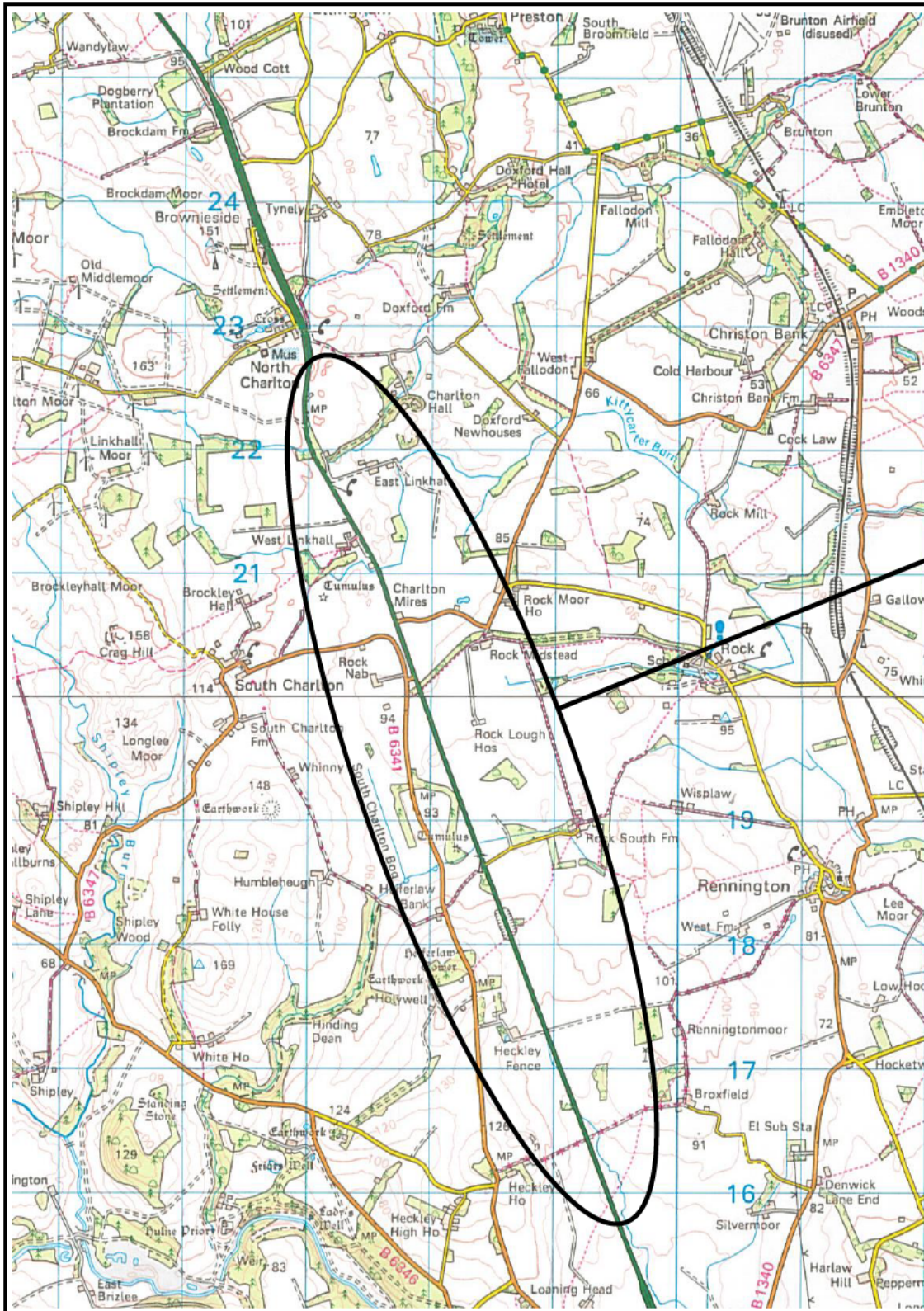
A1

Site Plan

A2

(2 Sheets)

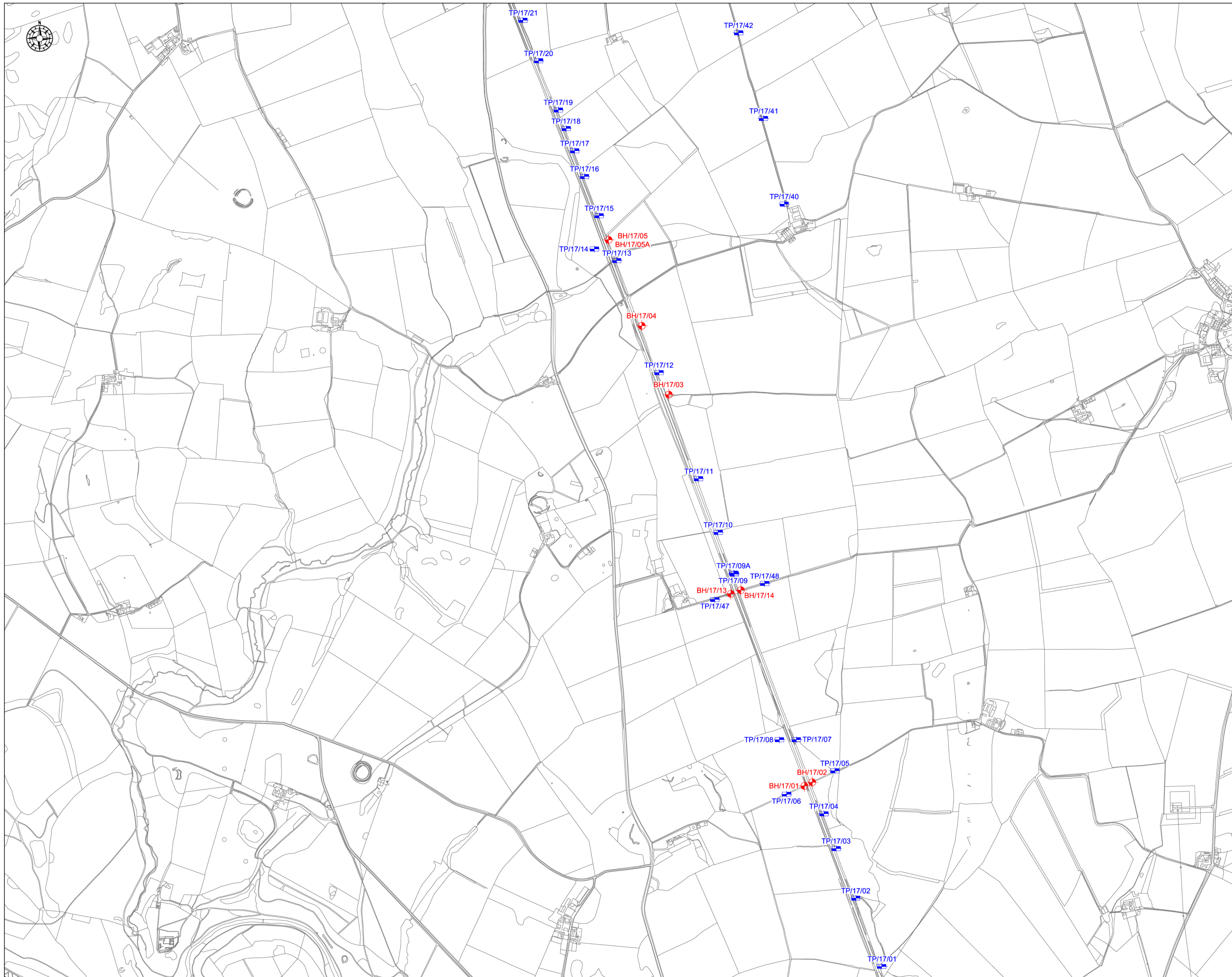
Site Location Plan



THE SITE

Reproduced from the 2016 Ordnance Survey 1:50 000 scale Landranger map No 81 by permission of Ordnance Survey on behalf of The Controller of Her Majesty's Stationery Office, © Crown copyright, SOCOTEC UK Limited. All rights reserved. Licence Number 100006060

<p>Notes: Scale 1:50 000</p>	<p>Project A1IN MORPETH TO FELTON & ALNWICK TO ELLINGHAM Project No. A8013-18 Carried out for Geoffrey Osbourne Limited</p>	<p>Figure A1</p>
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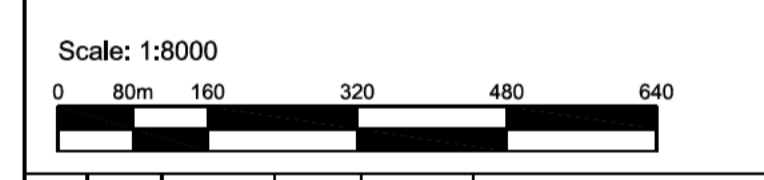


GENERAL NOTES

1. Reproduced from Geoffrey Osborne Limited's Drawing.
2. Hole Locations to National Grid Co-ordinate Reference System.

LEGEND TO SYMBOLS

- Borehole
- Trial Pit



Rev	Drawn	Date	Apprv.	Date	Modification Details
x	x	x	x	x	x

AMENDMENTS

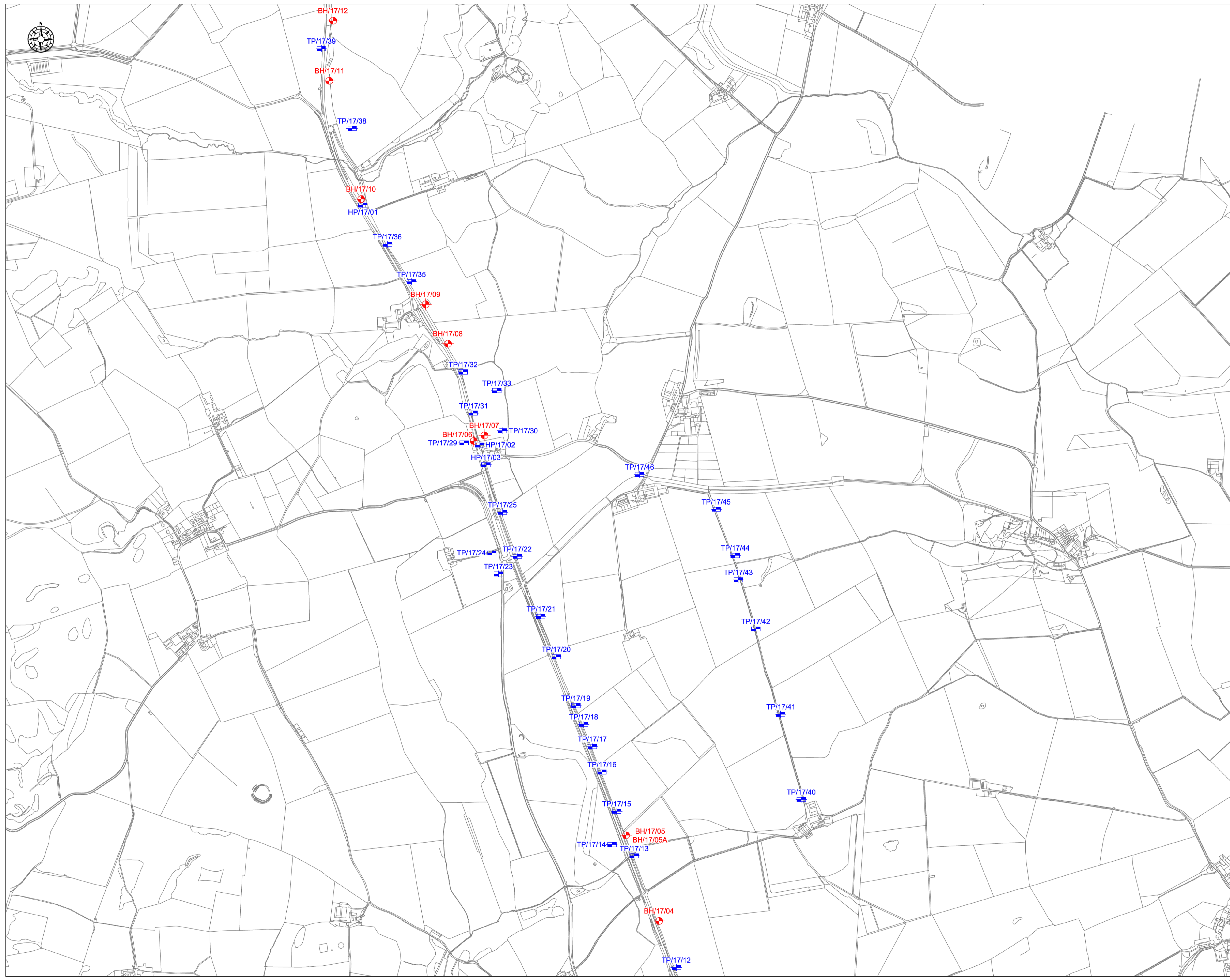
Title
SITE PLAN

Project
A1 IN NORTHUMBERLAND - ALNWICK TO ELLINGHAM

Client
GEOFFREY OSBORNE LIMITED



Date 17/01/2019	Drawn By BS	Apprv. By RT
Sheet Size A1	Scale 1:8000	Project No A8013-18
Drawing No A2	Rev 0	



GENERAL NOTES

1. Reproduced from Geoffrey Osborne Limited's Drawing.
2. Hole Locations to National Grid Co-ordinate Reference System.

LEGEND TO SYMBOLS

- Borehole
- Trial Pit

Scale: 1:8000

Rev	Drawn	Date	Apprv.	Date	Modification Details

AMENDMENTS

Title

SITE PLAN

Project

**A1 IN NORTHUMBERLAND -
ALNWICK TO ELLINGHAM**

Client

GEOFFREY OSBORNE LIMITED

SOCOTEC

Date	Drawn By	Apprv. By
17/01/2019	BS	RT

Sheet Size	Scale	Project No
A1	1:8000	A8013-18

Drawing No	Rev
A2	0

APPENDIX B
EXPLORATORY HOLE RECORDS

Key to Exploratory Hole Records	Key
Exploratory Hole Summary	B1
SPT Hammer Energy Ratio Report	SPT Hammer Reference: AR2330 AR323
Borehole Logs	BH/17/01 to BH/17/14 and BH/17/05A
Trial Pit Logs	TP/17/01 to TP/17/48 and TP/17/09A
Trial Pit Logs (Hand Dug)	HP/17/01 to HP/17/03



Key to Exploratory Hole Records

SAMPLES

Undisturbed

U	Driven tube sample	} nominally 100 mm diameter and full recovery unless otherwise stated
UT	Driven thin wall tube sample	
TW	Pushed thin wall tube sample	
P	Pushed piston sample	
L	Liner sample from dynamic (windowless) sampling. Full recovery unless otherwise stated	
CBR	CBR mould sample	
BLK	Block sample	
C / CS	Core sample (from rotary core) taken for laboratory testing.	
AMAL	Amalgamated sample	

Disturbed

D	Small sample
B	Bulk sample

Other

W	Water sample
G	Gas sample

	Environmental chemistry samples (in more than one container where appropriate)
ES	Soil sample
EW	Water sample

Comments

Sample reference numbers are assigned to every sample taken. A sample reference of 'NR' indicates that, while an attempt was made to take a tube sample, there was no recovery.

Samples taken from borehole installations (ie water or gas) after hole construction are not shown on the exploratory hole logs.

Specimens for point load testing undertaken on site (or other non-lab location) are not shown on the log.

IN SITU TESTS

SPT S or SPT C Standard Penetration Test, open shoe (S) or solid cone (C)

The Standard Penetration Test is defined in BS EN ISO 22476-3:2005+A1:2011. The incremental blow counts are given in the Field Records column; each increment is 75 mm unless stated otherwise and any penetration under self-weight in mm (SW) is noted. Where the full 300 mm test drive is achieved the total number of blows for the test drive is presented as N = ** in the Test column. Where the test drive blows reach 50 the total blow count beyond the seating drive is given (without the N = prefix).

IV	<i>in situ</i> vane shear strength, peak (p) and remoulded (r)
HV	Hand vane shear strength, peak (p) and remoulded (r)
PP	Pocket penetrometer test, converted to shear strength
KFH, KRH, KPI	Permeability tests (KFH = falling head, KRH = rising head; KPI = packer inflow); results provided in Field Records column (one value per stage for packer tests)

DRILLING RECORDS

The mechanical indices (TCR/SCR/RQD & If) are defined in BS 5930:2015

TCR	Total Core Recovery, %
SCR	Solid Core Recovery, %
RQD	Rock Quality Designation, %
If	Fracture spacing, mm. Minimum, typical and maximum spacing measurements are presented.
NI	The term non-intact (NI) is used where the core is fragmented.
NA	Used where a measurement is not applicable (eg. If, SCR and RQD in non-rock materials).

Flush returns, estimated percentage with colour where relevant, are given in the Records column

CRF	Core recovered (length in m) in the following run
AZCL	Assessed zone of core loss

GROUNDWATER

▼	Groundwater entry
▽	Depth to groundwater after standing period

Notes:

See report text for full references of standards.

Updated October 2017

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Project No. A8013-18

Carried out for Geoffrey Osborne Limited

Key



Key to Exploratory Hole Records

INSTALLATION

Details of standpipe/piezometer installations are given on the Record. Legend column shows installed instrument depths including slotted pipe section or tip depth, response zone filter material type and layers of backfill.

Standpipe/ piezometer

The type of instrument installed is indicated by a code in the Legend column at the depth of the response zone:

SP	Standpipe			
SPIE	Standpipe piezometer	Plain Pipe		
PPIE	Pneumatic piezometer			Slotted Pipe
EPIE	Electronic piezometer			Piezometer Tip

Inclinometer or Slip Indicator

The installation of vertical profiling instruments is indicated on the Record. The base of tubing is shown in the Legend column.

ICE	Biaxial inclinometer
ICM	Inclinometer tubing for use with probe
SLIP	Slip indicator

Settlement Points or Pressure Cells

The installation of single point instruments is indicated on the Record. The location of the measuring device is shown in the Legend column.

ESET	Electronic settlement cell/gauge
ETM	Magnetic extensometer settlement point
EPCE	Electronic embedment pressure cell
PPCE	Electronic push in pressure cell

INSTALLATION / BACKFILL LEGENDS

A legend describing the installation is shown in the rightmost column. Legend symbols used to describe the backfill materials are indicated below.

Macadam	Concrete	Grout	Bentonite	Sand	Gravel	Arisings

STRATUM LEGENDS

The legend symbols used for graphical representation of soils, rocks and other materials on the borehole logs are shown below. For soils with significant proportions of secondary soil types, a combination of two or more symbols may be used.

Macadam	Concrete	Topsoil	Made Ground / Fill	Peat	Void or No Information	
Clay	Silt	Sand	Gravel	Cobbles	Boulders	Coal
Mudstone	Siltstone	Sandstone	Conglomerate	Breccia	Limestone	Chalk
Igneous (Fine)	Igneous (Med)	Igneous (Coarse)	Metamorphic (Fine)	Metamorphic (Med)	Metamorphic (Coarse)	Tuff

Notes:

See report text for full references of standards.
Updated October 2017

Project A1 NORTHUMBERLAND – ALNWICK TO ELLINGHAM
Project No. A8013-18
Carried out for Geoffrey Osborne Limited

Key



Key to Exploratory Hole Records

NOTES

- 1 Soils and rocks are described in accordance with BS EN ISO 14688-1:2002+A1:2013 and 14689-1:2003 respectively as amplified by BS 5930:2015.
- 2 For fine soils, consistency determined during description is reported for those strata where undisturbed samples are available. Where the logger considers that the sample may not be representative of the condition in situ, for whatever reason, the reported consistency is given in brackets. The reliability of the sample is indicated by Probably or Possibly as appropriate. Hence (Probably firm) indicates the logger is reasonably confident of the assessment, but (Possibly firm) means less certainty. Where the samples available are too disturbed to allow a reasonable assessment of the in situ condition, no consistency is given.
- 3 Evidence of the occurrence of very coarse particles (cobbles and boulders) is presented on the logs. However, because of their size in relation to the exploratory hole these records may not be fully representative of their size and frequency in the ground mass.
- 4 The declination of bedding and joints is given with respect to the normal to the core axis. Thus in a vertical borehole this will be the dip.
- 5 The assessment of SCR, RQD and Fracture Spacing excludes artificial fractures.
- 6 Observations of discernible groundwater entries during the advancement of the exploratory hole are given at the foot of the log and in the Legend column. The absence of a recorded groundwater entry should not, however, be interpreted as a groundwater level below the base of the borehole. Under certain conditions groundwater entry may not be observed, for instance, drilling with water flush or overwater, or boring at a rate faster than water can accumulate in the borehole. Similarly, where water entry observations do exist, groundwater may also be present at higher elevations in the ground than where recorded in the borehole. In addition, where appropriate, water levels in the hole at the time of recovering individual samples or carrying out in situ tests and at shift changes are given in the Records column.
- 7 The borehole logs present the results of Standard Penetration Tests recorded in the field without correction or interpretation. However, in certain ground conditions (eg high hydraulic head or where very coarse particles are present) some judgement may be necessary in considering whether the results are representative of in situ mass conditions.

REFERENCES

- 1 BS EN ISO 14688-1:2002+A1 : 2013 : Geotechnical investigation and testing - Identification and classification of soil. Part 1 Identification and description. British Standards Institution
- 2 BS EN ISO 14689-1 : 2003 : Geotechnical investigation and testing - Identification and classification of rock. Part 1 Identification and description. British Standards Institution
- 3 BS EN ISO 22476-3:2005+A1 : 2011 : Geotechnical investigation and testing - Field testing. Part 3 Standard penetration test. British Standards Institution
- 4 BS 5930 : 2015 : Code of practice for ground investigations. British Standards Institution

Notes:

See report text for full references of standards.

Updated October 2017

Project A1 NORTHUMBERLAND – ALNWICK TO ELLINGHAM**Project No.** A8013-18**Carried out for** Geoffrey Osborne Limited**Key**

Sheet 3 of 3

Exploratory Hole Summary

Hole ID	Hole Depth, (m)	Hole Type	Eastings, (m)	Northings, (m)	Ground Level, (m AOD)	Start Date	End Date	Hole Remarks
BH/17/01	15.00	CP+RC	419259.46	616416.40	83.55	13/07/2018	20/07/2018	
BH/17/02	15.00	CP+RC	419295.01	616433.04	81.78	12/07/2018	19/07/2018	
BH/17/03	10.00	CP+RC	418642.96	618194.90	107.91	05/09/2018	12/09/2018	
BH/17/04	9.90	CP+RC	418519.84	618507.66	96.56	06/09/2018	13/09/2018	
BH/17/05	4.05	CP	418369.13	618898.10	85.49	06/09/2018	06/09/2018	
BH/17/05A	10.00	RO+RC	418369.33	618898.19	85.47	14/09/2018	14/09/2018	
BH/17/06	20.30	CP+RC	417674.39	620695.13	87.30	17/09/2018	20/09/2018	
BH/17/07	13.10	CP+RC	417722.97	620721.12	87.87	18/09/2018	20/09/2018	
BH/17/08	10.00	CP+RC	417556.90	621138.94	87.69	25/07/2018	26/07/2018	
BH/17/09	13.00	CP+RC	417454.97	621318.05	84.27	25/07/2018	24/10/2018	
BH/17/10	10.00	CP+RC	417160.84	621797.93	94.54	23/07/2018	25/07/2018	
BH/17/11	10.00	CP+RC	417015.49	622337.21	98.87	24/07/2018	24/07/2018	
BH/17/12	13.00	CP+RC	417032.86	622611.43	100.54	24/09/2018	23/10/2018	
BH/17/13	15.00	CP+RC	418924.93	617289.46	95.39	11/07/2018	24/07/2018	
BH/17/14	15.00	CP+RC	418970.49	617306.19	95.35	10/07/2018	17/07/2018	
HP/17/01	1.30	HP	417167.43	621770.44	95.38	31/07/2018	31/07/2018	
HP/17/02	1.00	HP	417701.61	620676.87	88.16	01/10/2018	01/10/2018	
HP/17/03	1.00	HP	417730.13	620587.16	87.46	02/10/2018	02/10/2018	
TP/17/01	3.80	TP	419610.97	615596.11	62.53	27/09/2018	27/09/2018	
TP/17/02	2.20	TP	419493.02	615906.04	67.41	19/07/2018	19/07/2018	
TP/17/03	3.80	TP	419404.00	616132.00	75.05	18/07/2018	18/07/2018	
TP/17/04	1.20	TP	419348.00	616290.02	76.57	18/07/2018	18/07/2018	
TP/17/05	3.60	TP	419397.98	616485.39	79.85	18/07/2018	18/07/2018	
TP/17/06	3.50	TP	419177.94	616379.03	88.55	26/07/2018	26/07/2018	
TP/17/07	2.60	TP	419223.12	616625.98	83.51	20/07/2018	20/07/2018	
TP/17/08	1.50	TP	419145.99	616626.00	87.97	26/09/2018	26/09/2018	
TP/17/09	0.50	TP	418939.96	617379.99	95.60	23/07/2018	23/07/2018	
TP/17/09A	2.30	TP	418937.98	617383.15	95.68	26/09/2018	26/09/2018	
TP/17/10	3.50	TP	418866.99	617568.92	101.32	23/07/2018	23/07/2018	
TP/17/11	2.60	TP	418777.80	617812.67	106.27	25/07/2018	25/07/2018	
TP/17/12	3.30	TP	418597.93	618295.02	103.01	05/09/2018	05/09/2018	
TP/17/13	2.20	TP	418406.31	618804.09	85.68	06/09/2018	06/09/2018	
TP/17/14	1.70	TP	418304.29	618856.48	87.15	27/09/2018	27/09/2018	
TP/17/15	2.60	TP	418326.24	619007.74	85.30	06/09/2018	06/09/2018	
TP/17/16	2.30	TP	418259.45	619186.73	85.88	06/09/2018	06/09/2018	
TP/17/17	1.70	TP	418215.17	619302.90	85.46	07/09/2018	07/09/2018	
TP/17/18	3.00	TP	418175.68	619403.84	86.77	07/09/2018	07/09/2018	
TP/17/19	3.60	TP	418140.17	619489.15	86.34	07/09/2018	07/09/2018	
TP/17/20	3.50	TP	418050.57	619711.79	90.87	10/09/2018	10/09/2018	

Notes:



Project A1IN MORPETH TO FELTON & ALNWICK TO ELLINGHAM
 Project No. A8013-18
 Carried out for Geoffrey Osborne Limited

Table

B1

Exploratory Hole Summary

Hole ID	Hole Depth, (m)	Hole Type	Eastings, (m)	Northings, (m)	Ground Level, (m AOD)	Start Date	End Date	Hole Remarks
TP/17/21	3.50	TP	417979.45	619896.18	92.15	10/09/2018	10/09/2018	
TP/17/22	3.30	TP	417872.07	620168.98	87.95	13/09/2018	13/09/2018	
TP/17/23	3.50	TP	417786.73	620089.44	91.23	17/09/2018	17/09/2018	
TP/17/24	2.60	TP	417756.46	620184.89	87.89	17/09/2018	13/09/2018	
TP/17/25	2.40	TP	417804.81	620370.35	86.96	13/09/2018	13/09/2018	
TP/17/26	-	TP	-	-	-	-	-	Cancelled
TP/17/27	-	TP	-	-	-	-	-	Cancelled
TP/17/28	-	TP	-	-	-	-	-	Cancelled
TP/17/29	4.00	TP	417629.85	620687.63	86.75	18/09/2018	18/09/2018	
TP/17/30	1.70	TP	417804.27	620742.72	86.05	20/09/2018	20/09/2018	
TP/17/31	2.50	TP	417671.57	620821.85	87.49	19/09/2018	19/09/2018	
TP/17/32	1.70	TP	417626.01	621010.06	87.44	19/09/2018	19/09/2018	
TP/17/33	1.50	TP	417779.28	620924.72	87.16	20/09/2018	20/09/2018	
TP/17/34	-	TP	-	-	-	-	43305.00	Cancelled
TP/17/35	2.60	TP	417390.01	621420.98	92.17	27/07/2018	17/07/2018	
TP/17/36	3.50	TP	417280.03	621592.44	92.68	21/09/2018	21/09/2018	
TP/17/37	-	TP	-	-	-	-	-	Cancelled
TP/17/38	2.00	TP	417119.08	622120.02	97.81	25/09/2018	25/09/2018	
TP/17/39	3.00	TP	416979.05	622484.24	99.29	25/09/2018	25/09/2018	
TP/17/40	2.80	TP	419167.94	619061.06	88.19	13/09/2018	13/09/2018	
TP/17/41	3.00	TP	419072.97	619449.79	94.08	12/09/2018	12/09/2018	
TP/17/42	2.40	TP	418960.09	619839.08	93.98	11/09/2018	11/09/2018	
TP/17/43	2.70	TP	418880.95	620062.95	90.37	12/09/2018	12/09/2018	
TP/17/44	2.30	TP	418867.08	620173.98	90.38	11/09/2018	11/09/2018	
TP/17/45	3.00	TP	418780.02	620384.03	94.73	11/09/2018	11/09/2018	
TP/17/46	1.20	TP	418430.70	620543.00	95.15	14/09/2018	14/09/2018	
TP/17/47	3.00	TP	418852.51	617263.26	96.29	26/07/2018	26/07/2018	
TP/17/48	3.60	TP	419079.00	617336.13	94.91	23/07/2018	23/07/2018	

CP = Cable Percission Borehole
 RO = Rotary (Openhole) Borehole
 RC = Rotary Cored Borehole
 TP = Trial Pit (Machine Dug)
 HP = Trial Pit (Hand Dug)

Notes:



Project A1iN MORPETH TO FELTON & ALNWICK TO ELLINGHAM
 Project No. A8013-18
 Carried out for Geoffrey Osborne Limited

Table

B1

SPT Hammer Energy Test Report

in accordance with BSEN ISO 22476-3:2005

ARCHWAY ENGINEERING
AINLEYS INDUSTRIAL ESTATE
ELLAND
WEST YORKSHIRE
HX5 9JP

SPT Hammer Ref: AR323
Test Date: 12/04/2018
Report Date: 12/04/2018
File Name: AR323.spt
Test Operator: SH

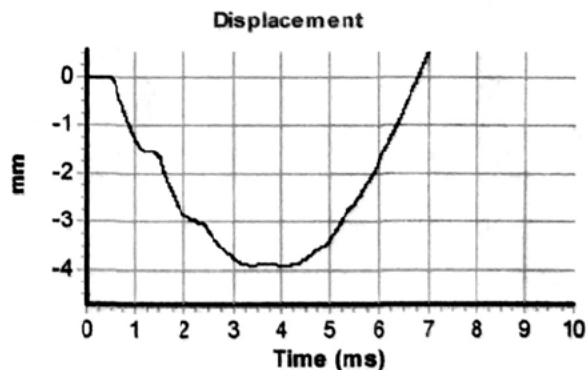
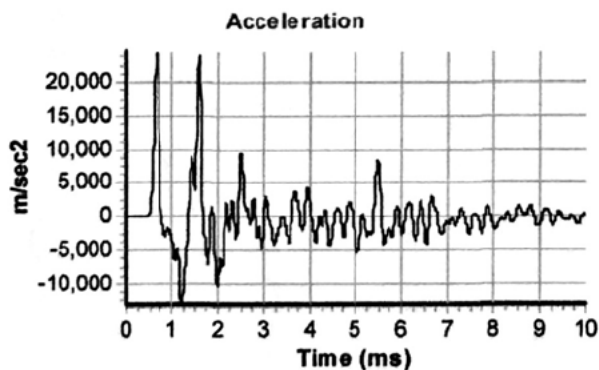
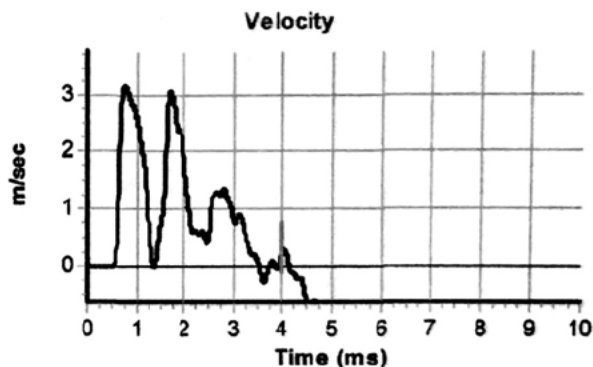
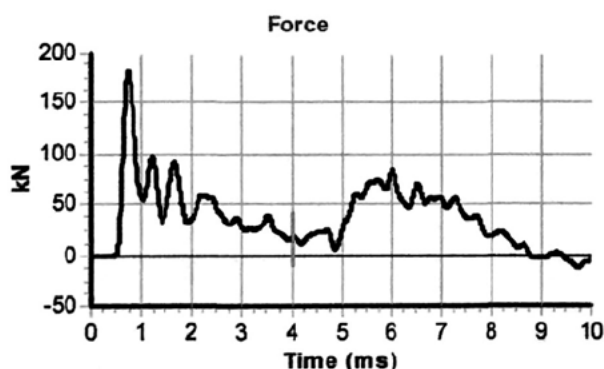
Instrumented Rod Data

Diameter d_r (mm): 54
Wall Thickness t_r (mm): 6.3
Assumed Modulus E_a (GPa): 200
Accelerometer No.1: 7080
Accelerometer No.2: 11609

SPT Hammer Information

Hammer Mass m (kg): 63.5
Falling Height h (mm): 760
SPT String Length L (m): 10.0

Comments / Location



Calculations

Area of Rod A (mm^2): 944
Theoretical Energy E_{theor} (J): 473
Measured Energy E_{meas} (J): 302

Energy Ratio E_r (%): **64**

Signed: M.GARDNER
Title: FITTER

The recommended calibration interval is 12 months

Borehole Log



Drilled	BD/AB	Start	Equipment, Methods and Remarks	Depth from	to	Diameter	Casing Depth	Ground Level	83.55 mOD
Logged	RT/MC	13/07/2018	Dando 175 J/Commachio 305. Cable percussion boring /Rotary core drilling (T8 116 size) using water flush. SPT Hammer ID: AR2330, Rod type: NWWY.	1.20	4.60	150	4.00	Coordinates (m)	E 419259.46
Checked	PH	End		4.60	15.00	116	4.60	National Grid	N 616416.40
Approved	PH	20/07/2018							

Samples and Tests

Depth	Type & No.	Records	Date Casing	Time Water	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.10	D 1	0.00-1.20 Hand excavated inspection pit.			Firm brown slightly gravelly sandy CLAY. Gravel is subangular to subrounded fine to coarse of grey sandstone. Frequent rootlets. (TOPSOIL)		(0.30)		
0.20	ES 2						0.30 +83.25		
0.30	D 3						0.40 +83.15		
0.50	ES 4								
0.50	D 5				Firm orangish brown slightly gravelly sandy CLAY. Gravel is subangular to subrounded fine to coarse of limestone and grey sandstone. (GLACIAL TILL)				
1.20 - 1.65	SPTS D 6	N=11 (8,5/4,3,2,2)		Dry	Firm dark brown slightly sandy slightly gravelly CLAY with Rare subangular cobbles of sandstone. Gravel is angular to subangular fine to coarse of limestone and grey medium grained sandstone. Frequent pockets (<5mm) of orange fine to medium sand. (GLACIAL TILL)				
1.20 - 1.65	D 7								
2.20 - 2.65	UT 8	45 blows 100% rec	1.50	Dry			(3.90)		
2.70	D 9					2.70 gravel becoming rare			
3.20 - 3.65	SPTS D 10	N=13 (2,2/3,3,3,4)	3.00	Dry					
3.20 - 3.65						3.20-3.65 greyish brown, sandy			
4.00	EW 1 EW 231118								
4.30 - 4.37	SPTS D 11	50 (25 for 22mm/50 for 48mm)	4.00 13/07/18	Dry 1700	Strong light grey massive fossiliferous LIMESTONE. (ALSTON FORMATION)	4.30-4.60 Recovered as slightly gravelly silt.	4.30 +79.25		
4.30			4.00	Dry					
4.65 - 4.78	100	CS 12	19/07/18	1130					
4.80 - 5.00	12		4.00	Dry					
	0								
5.38 - 5.48		CS 13							
5.82 - 5.76	89	CS 14			Medium strong thinly bedded light brown medium grained SANDSTONE, interbedded with weak grey mudstone. Orangish brown staining. Fractures are: 1. 0 to 10 degree, closely spaced, undulating, rough, partially open. 2. Subvertical, undulating, rough with clay fill. (ALSTON FORMATION)		5.52 +78.03		
5.00 - 6.50	34								
	21								
6.17 - 6.28	NI 110	CS 15					(1.30)		
	340								
6.98 - 7.04		CS 16			Strong thickly bedded, grey SILTSTONE. Fractures are 0 to 10 degree, very closely spaced, planar, rough with orangish brown staining. (ALSTON FORMATION)		6.82 +76.73		
6.50 - 8.00	93						(0.73)		
	73								
	35								
7.61 - 7.65		CS 17			Medium strong thinly laminated grey MUDSTONE. Fractures are: 1. Very closely spaced, planar, smooth with orangish brown staining. 2. 70 degree, planar, rough with orangish brown staining. (ALSTON FORMATION)		7.55 +76.00		
7.75 - 7.78		CS 18							
8.13 - 8.18	NI 60	CS 19					(1.10)		
	110								
8.00 - 9.50	95	Flush: 4.60 - 12.50 Water 95%			Weak black COAL, with orangish brown staining at top and bottom of seam. (ALSTON FORMATION)	8.45-8.85 weak, dark grey. Non intact	8.85 +74.90		
	54						(0.17)		
	35						8.82 +74.73		
9.29 - 9.50		CS 20			Strong thinly bedded grey SANDSTONE with mudstone laminae. Fractures are: 1. 10 degree, medium spaced, undulating, rough. 2. Very closely to closely spaced, planar, rough with orange staining and a trace of black coal. 3. 70 degree, stepped, rough, partially open with				
9.69 - 10.00		CS 21					(2.26)		

Depth	TCR	IF	Records	Date Casing	Time Water	Depth Related Remarks	Hard Boring
						Depths (m) Remarks	Depths (m) Duration (mins) Tools used
Groundwater Entries							
No.	Depth	Strike (m)	Remarks	Depth Sealed (m)			
1	3.60		Rose to 3.07 m after 20 minutes.				4.30 - 4.60 60 Chisel

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.	Project	A11N MORPETH TO FELTON & ALNWICK TO ELLINGHAM	Borehole	BH/17/01
Scale 1:50	Project No.	A8013-18		
© Copyright SOCOTEC UK Limited	Carried out for	Geoffrey Osborne Limited		
19/03/2019 10:29:00				Sheet 1 of 2

Borehole Log



Drilled	BD/AB	Start	Equipment, Methods and Remarks	Depth from (m)	to (m)	Diameter (mm)	Casing Depth (m)	Ground Level	83.55 mOD
Logged	RT/MC	13/07/2018	Dando 175. Commachio 305. Cable percussion boring. Rotary core drilling (T6 116 size) using water flush. SPT Hammer ID: AR2330, Rod type: NWY.	1.20	4.60	150	4.00	Coordinates (m)	E 419259.46
Checked	PH	End		4.60	15.00	116	4.60	National Grid	N 616416.40
Approved	PH	20/07/2018							

Samples and Tests

Depth	TCR SCR ROD	If	Records/Samples	Date Casing	Time Water	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
9.50 - 11.00	97 75 50					Strong thinly bedded grey SANDSTONE with mudstone laminae. Fractures are: 1. 10 degree, medium spaced, undulating, rough. 2. Very closely to closely spaced, planar, rough with orange staining and a trace of black coal. 3. 70 degree, stepped, rough, partially open with orangish brown staining. (ALSTON FORMATION)	11.00-11.18 AZCL	11.08 +72.47		
10.83 - 11.00			CS 22	19/07/18 4.60	1830 1.40					
11.12 - 11.27			CS 23	20/07/18 4.60	0730 2.35					
11.62 - 11.72	88 64 40		CS 24			Medium strong medium bedded grey MUDSTONE, with laminae and lenses of light grey fine grained sandstone. Fractures are: 1. 10 to 20 degree, very closely to closely spaced, planar, smooth, tight with orangish brown staining. 2. Subvertical, undulating, rough, tight with orangish brown staining. 3. Vertical, planar, rough, tight with orange staining. (ALSTON FORMATION)				
11.00 - 12.50										
12.31 - 12.40		NI 190 380	CS 25					(2.37)		
12.50 - 14.00	95 47 24						13.25-13.45 Sanstone.	13.45 +70.10		
14.10 - 14.16			Flush: 12.50 - 15.00 Water 50%			Strong thickly bedded light grey bioturbated LIMESTONE. Fractures are: 1. 10 to 20 degree, undulating, rough, partially open, no staining. 2. Vertical, undulating, rough, partially open. (ALSTON FORMATION)		(1.25)		
14.10 - 14.16			CS 26							
14.00 - 15.00	78 30 26		CS 27					14.70 +68.85		
14.62 - 14.72				20/07/18 4.60	1130	Strong grey fine grained SANDSTONE. (ALSTON FORMATION)		(0.30)		
						END OF EXPLORATORY HOLE		15.00 +68.55		

Groundwater Entries			Depth Related Remarks			Chiselling Details		
No.	Depth	Strike	Remarks	Depth Sealed		Depths (m)	Duration (mins)	Tools used

Borehole Log



Drilled	BD/AB	Start	Equipment, Methods and Remarks	Depth from	to	Diameter	Casing Depth	Ground Level	81.78 mOD
Logged	RT/AD	12/07/2018	Dando 175/Commachio 305. Cable percussion boring /Rotary core drilling (T8 116 size) using water flush. SPT Hammer ID: AR2330, Rod type: NWWY.	1.20	4.20	150	4.20	Coordinates (m)	E 419295.01
Checked	PH/AW	End		4.20	15.00	116	4.60	National Grid	N 616433.04
Approved	PH	19/07/2018							

Samples and Tests

Depth	Type & No.	Records	Date Casing	Time Water	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.20 0.30 0.30 - 0.50	D 1 ES 2 B 3	0.00-1.20 Hand excavated inspection pit.			Firm brown slightly sandy slightly gravelly CLAY. Gravel is angular to subangular fine to coarse of sandstone and limestone. (TOPSOIL)		(0.35) 0.35 +81.43		
0.75 0.75	ES 4 D 5				Firm orangish brown slightly gravelly sandy CLAY with low cobble content. Gravel is angular to subrounded fine to coarse of limestone and grey sandstone. Cobbles are subangular of grey sandstone. (GLACIAL TILL)		(0.65) 1.00 +80.78		
1.10 1.20 - 1.65 1.20 - 1.65	D 6 SPTS D 7	N=23 (3,5/7,8,6,4)		Dry	Firm dark brown slightly sandy slightly gravelly CLAY with frequent pockets (<5mm) of orange and yellow fine to coarse sand. Gravel is angular to subrounded fine to coarse of grey sandstone and mudstone. (GLACIAL TILL)		(2.20)		
2.20 - 2.65	UT 8	55 blows 100% rec	1.50	Dry					
2.70	D 9								
3.20 - 3.25 3.20	SPTS D 10	50 (25 for 16mm/50 for 33mm)			Light greyish brown medium grained SANDSTONE. Recovered as angular to subangular fine to coarse gravel. (ALSTON FORMATION)		3.20 +78.58 (1.00)		
4.00 4.00	EW 1 EW 231118		12/07/18 3.20	1800 2.10			4.20 +77.58		
4.80 - 5.60	90 10 0		18/07/18 3.20	1230 Dry	Extremely weak, grey, LIMESTONE with occasional yellow staining. Weak interbedded with extremely weak, grey sandstone and mudstone. Fractures are closely spaced horizontal, inclined and vertical undulating and stepped, smooth to rough, infill, very tight to open with brownish orange and greyish yellow staining. (ALSTON FORMATION)	5.35-5.60 some black subrounded fine to coarse gravel of coal			
5.56 - 6.75 5.70 - 5.90		CS 12 CS 11				5.93-6.07 some black subangular fine to medium gravel of coal 6.07-6.57 lithorelicts of coal	(3.44)		
5.80 - 7.10	95 86 49	NI 80 145				7.10-7.35 AZCL			
6.75 - 6.86		CS 13	18/07/18 4.60	1830 1.20					
7.10 - 8.60	83 74 11		19/07/18 4.60	0730 1.28	Medium strong, grey fine grained SANDSTONE, interbedded with weak to medium strong, grey siltstone and mudstone. Fractures are closely spaced horizontal, inclined and vertical, planar, undulating and stepped, smooth to rough, very tight to open with greyish yellow, brownish orange and brown staining. (ALSTON FORMATION)		7.64 +74.14		
8.60 - 10.10	100 79 0	NI 90 275				9.44-9.92 weak grey distinctly weathered fractured siltstone	(3.96)		
		Flush: 3.20 - 15.00 Water 95%				9.92-10.56 sandstone light grey			

Depth	TCR SCR RGD	If	Records	Date Casing	Time Water	Depth Related Remarks	Hard Boring		
Groundwater Entries	No.	Depth Strike (m)	Remarks	Depth Sealed (m)	Depths (m)	Remarks	Depths (m)	Duration (mins)	Tools used
1	3.20		Rose to 2.08 m after 20 minutes.				3.80 - 4.20	60	Chisel

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. © Copyright SOCOTEC UK Limited	Project	A11N MORPETH TO FELTON & ALNWICK TO ELLINGHAM	Borehole	BH/17/02
Scale 1:50	Project No.	A8013-18		
© Copyright SOCOTEC UK Limited 19/03/2019 10:29:01	Carried out for	Geoffrey Osborne Limited		Sheet 1 of 2

Borehole Log



Drilled	BD/AB	Start	Equipment, Methods and Remarks	Depth from (m)	to (m)	Diameter (mm)	Casing Depth (m)	Ground Level	81.78 mOD
Logged	RT/AD	12/07/2018	Dando 175, Commachio 305. Cable percussion boring, Rotary core drilling (T6 116 size) using water flush. SPT Hammer ID: AR2330, Rod type: NWY.	1.20	4.20	150	4.20	Coordinates (m)	E 419295.01
Checked	PH/AW	End		4.20	15.00	116	4.60	National Grid	N 616433.04
Approved	PH	19/07/2018							

Samples and Tests

Depth	TCR SCR ROD	If	Records/Samples	Date Casing	Time Water	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
10.10 - 10.25			CS 14			Medium strong, grey fine grained SANDSTONE, interbedded with weak to medium strong, grey siltstone and mudstone. Fractures are closely spaced horizontal, inclined and vertical, planar, undulating and stepped, smooth to rough, very tight to open with greyish yellow, brownish orange and brown staining. (ALSTON FORMATION)				
10.10 - 11.60 10.95 - 11.09	100 100 15		CS 15				10.90-11.10 siltstone and mudstone thinly laminated			
11.50 - 11.60			CS 16			Medium strong grey fine grained SANDSTONE, interlaminated with dark grey mudstone. Fractures are closely spaced, horizontal, inclined and vertical, planar, stepped to undulating, smooth top rough, very tight to open with slight orange to yellowish orange staining. (ALSTON FORMATION)	11.60-11.70 AZCL	11.60	+70.18	
11.60 - 13.10 12.40 - 12.70	93 65 33		CS 17				13.00-13.18 AZCL		(3.40)	
13.10 - 14.60 13.86 - 13.99 14.00 - 14.20	95 63 26	NI 120 325	CS 18 CS 19							
14.55 - 14.71 14.60 - 15.00	100 100 82		CS 20	19/07/18 4.60	1130 Dry					
						END OF EXPLORATORY HOLE		15.00	+66.78	

Groundwater Entries				Depth Related Remarks				Chiselling Details				
No.	Depth	Strike	Remarks	Depth Sealed	Depths (m)	Remarks	Depths (m)	Duration (mins)	Tools used			

Borehole Log



Drilled	RD/DC	Start	Equipment, Methods and Remarks	Depth from (m)	to (m)	Diameter (mm)	Casing Depth (m)	Ground Level	107.91 mOD
Logged	PW/PC	05/09/2018	Dando 4000/Massenza M13. Cable percussion boring/Rotary core drilling (PWF and T6116 size) using water flush. SPT Hammer ID: AR323 Rod Type: NWW	1.20	4.10	150	2.90	Coordinates (m)	E 418642.96
Checked	RT/AW	End		4.10	8.50	121	4.40	National Grid	N 618194.90
Approved	PH	12/09/2018		8.50	10.00	116			

Samples and Tests

Depth	Type & No.	Records	Date Casing	Time Water	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.25	ES 1	0.00-1.20 Hand excavated inspection pit.			Firm brown slightly sandy gravelly CLAY. Gravel is subangular to subrounded fine to coarse of sandstone. Frequent rootlets.		(0.35)		
0.50	ES 2				(TOPSOIL)		0.35 +107.56		
1.00 - 1.10	B 3				Firm brown and grey slightly gravelly sandy CLAY with low cobble content. Gravel is subangular to subrounded fine to coarse of sandstone. Cobbles are subangular.	1.10 thin coal seam	(1.85)		
1.20 - 1.65	U 4	70 blows 100% rec		Dry	(GLACIAL TILL)				
1.70	D 5								
2.00 - 2.45	SPTS D 6	N=26 (4,5/6,6,7,7)	1.50	Dry		2.20 grey clayey fine to coarse sand.	2.20 +105.71		
2.00 - 2.45	D 6				Soft dark grey slightly sandy slightly gravelly CLAY with low cobble content. Gravel is subangular to subrounded, fine to coarse of sandstone and mudstone. Cobbles are subangular to subrounded of sandstone.				
2.00 - 2.50	D 7				(GLACIAL TILL)				
2.70	D 8					3.00 possible cobble. Becoming slightly sandy clay	(1.50)		
3.00 - 3.24	SPTS D 9	50 (7,22/45,5 for 15mm)	2.90	Dry					
3.00 - 3.45	B 10								
3.00 - 3.50									
3.70	D 11				Grey SANDSTONE. Recovered as angular to subangular fine to coarse gravel. (Possible cobble).		3.70 +104.21		
			05/09/18	1800			(0.40)		
			2.90	Dry					
4.33 - 4.43	93	CS 12	12/09/18	0800	Stiff to very stiff dark grey and black CLAY with abundant randomly orientated mudstone lithorelicts. Occasional medium gravel size shell fragments.		4.10 +103.81		
4.10 - 4.85	0	Flush: 4.10 - 4.85 Water 50%	2.90	0.00	(SCREMERSTON COAL MEMBER)		(0.25)		
4.73 - 4.80	0	CS 13			Extremely weak thinly to thickly laminated dark grey and black carbonaceous MUDSTONE. Occasional shell fragments on bedding surfaces. Fractures are randomly orientated, very closely and closely spaced, planar, smooth and clean. Core loss assumed to be from similar material.	4.85-5.39 AZCL	4.35 +103.56		
5.00	NA	EW 1			(SCREMERSTON COAL MEMBER)				
5.00		EW 231118					(1.39)		
4.85 - 5.00	49								
5.58 - 5.74	14	CS 14							
5.90 - 6.00	0	CS 15			Strong thinly bedded dark grey LIMESTONE with abundant medium gravel size fossils and occasional subvertical white mineral veining. Fractures are 10 degree, closely spaced, planar and rough, clean.	5.74-5.90 1no. subvertical planar rough fracture with clay infill and orangish brown staining (up to 15mm) in clay material	5.74 +102.17		
		Flush: 4.85 - 7.40 Water 100%			(SCREMERSTON COAL MEMBER)		(0.41)		
6.34 - 6.62	80	CS 16			Soft, mottled orange, brown and grey, CLAY with abundant randomly orientated medium to coarse gravel size lithorelicts of carbonaceous mudstone. (Weathered MUDSTONE)	5.90-6.05 AZCL	6.15 +101.76		
6.82 - 6.98	90	CS 17			(SCREMERSTON COAL MEMBER)	6.39 1no. 45 degree planar rough fracture with orangish brown and grey clay infill (2mm)	(0.19)		
5.90 - 7.40	76	CS 18			Strong thinly to medium bedded dark grey LIMESTONE with abundant fine to medium gravel size fossils and occasional subvertical white mineral veining. Fractures are 10 degree, closely spaced, planar, rough and clean.		6.34 +101.57		
	53	CS 19			Extremely weak thinly laminated grey carbonaceous MUDSTONE. (SCREMERSTON COAL MEMBER)				
7.02 - 7.40		CS 20			Medium strong to strong thinly bedded dark grey LIMESTONE. Fractures are planar, rough and clean. (SCREMERSTON COAL MEMBER)		(1.06)		
7.40 - 8.50	100	CS 21			Extremely weak to very weak thinly laminated grey SILTSTONE. Fractures are 20 to 25 degree, planar, rough and clean. (SCREMERSTON COAL MEMBER)	7.72-7.85 recovered as subangular medium to coarse gravel size fragments	7.40 +100.51		
8.06 - 8.42	88	CS 22			Extremely weak to very weak thinly laminated grey MUDSTONE. Fractures are very closely spaced, 0 to 10 degree, undulating, rough and clean.		(0.19)		
	64	CS 23					7.59 +100.32		
8.70 - 8.90	NI 10	Flush: 7.40 - 10.00 Water 75%					(0.26)		
	150	CS 24					7.85 +100.06		
8.50 - 10.00	88	CS 25					(0.21)		
9.25 - 9.35	83	CS 26					8.06 +99.85		
9.88 - 9.90		CS 27							
		CS 28							
		CS 29							
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		CS 155							

Borehole Log



Drilled RD/DC	Start	Equipment, Methods and Remarks	Depth from	to	Diameter	Casing Depth	Ground Level	107.91 mOD
Logged PW/PC	05/09/2018	Dando 4000. Massenza M13. Cable percussion boring. Rotary core drilling (PWF and T6116 size) using water flush.	(m)	(m)	(mm)	(m)	Coordinates (m)	E 418642.96
Checked RT/AW	End	SPT Hammer ID: AR323 Rod Type: NWW	1.20	4.10	150	2.90	National Grid	N 618194.90
Approved PH	12/09/2018		4.10	8.50	121	4.40		
			8.50	10.00	116			

Samples and Tests				Strata Description					
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Depth	TCR SCR RCD	If	Records/Samples	Date Casing	Time Water	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
						Extremely weak to very weak thinly laminated grey MUDSTONE. Fractures are very closely spaced, 0 to 10 degree, undulating, rough and clean. (SCREMERSTON COAL MEMBER) Very weak thinly to thickly laminated grey rough SILTSTONE. Fractures are subhorizontal, very closely spaced, undulating, smooth and clean. (SCREMERSTON COAL MEMBER) END OF EXPLORATORY HOLE				

Groundwater Entries				Depth Related Remarks				Chiselling Details					
No.	Depth	Strike	Remarks	Depth Sealed	Depths (m)	Remarks	Depths (m)	Duration (mins)	Tools used				

Borehole Log



Drilled	RD/DC	Start	Equipment, Methods and Remarks	Depth from	to	Diameter	Casing Depth	Ground Level	96.56 mOD
Logged	PW/PC	06/09/2018	Dando 4000/Massenza MI3. Cable percussion boring /Rotary core drilling (T8116 size) using water flush. SPT Hammer ID: AR323 Rod Type: NWW	1.20	4.20	150	4.20	Coordinates (m)	E 418519.84
Checked	AW	End		4.20	9.90	116	4.20	National Grid	N 618507.68
Approved	PH	13/09/2018							

Samples and Tests

Depth	Type & No.	Records	Date Casing	Time Water	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.25	ES 1	0.00-1.20 Hand excavated inspection pit.			Firm brown slightly sandy gravelly CLAY. Gravel is subangular to subrounded fine to coarse of sandstone. Frequent rootlets. (TOPSOIL)		(0.37)		
0.50	ES 2				Firm brown slightly gravelly sandy CLAY with subangular cobbles of sandstone. Gravel is subangular to subrounded fine to coarse of sandstone. (GLACIAL TILL)		0.37 +96.19		
1.00 - 1.10	B 3								
1.20 - 1.65	U 4	75 blows 100% rec		Dry					
1.70	D 5								
2.00 - 2.45	SPTS D 6	N=23 (3,4/5,6,8,0)	1.50	Dry			(3.83)		
2.00 - 2.45	B 7								
2.00 - 2.50									
2.80	D 8								
3.00 - 3.45	U 9	80 blows 100% rec	1.50	Dry					
3.50	D 10								
3.70	D 11								
4.00 - 4.23	SPTS D 12	50 (7,7/8,42 for 5mm)	06/09/18	1800		4.00 becoming slightly sandy clay			
4.00			4.20	Dry		4.20-4.45 AZCL	4.20 +92.36		
4.25 - 4.40									
4.20 - 5.30	77 50 34	CS 13 Flush: 4.20 - 5.30 Water 90%	13/09/18	0800	Very weak to weak medium bedded light grey SANDSTONE. Fractures are 0-10 degree, closely spaced, undulating, rough and clean. (SCREMERSTON COAL MEMBER)	4.62-4.85 1no. subvertical planar smooth and clean fracture	(1.60)		
4.80 - 4.96		CS 14				5.12-5.30 recovered as subangular fine to coarse gravel			
4.96 - 5.10		CS 15				5.40 becoming medium strong			
5.00		EW 1				5.40-5.48 1no. vertical planar smooth and clean fracture	5.80 +90.76		
5.00		EW 231118				5.48-5.60 recovered as angular to subangular medium to coarse gravel	(0.78)		
5.30 - 6.80	93 29 0	Flush: 5.30 - 6.80 Water 70%			Extremely weak to very weak thinly to thickly laminated dark and light grey SANDSTONE. Fractures are: 1. Subhorizontal, planar, smooth and clean. 2. Subvertical, planar, smooth and clean. (SCREMERSTON COAL MEMBER)	5.69-5.80 1no. 45 degree planar smooth fracture with orangish brown surface staining	6.58 +89.98		
6.64 - 6.70						6.20 becoming weak	(0.46)		
6.64 - 6.70		CS 16			Medium strong thinly laminated dark grey SILTSTONE. Fractures are closely spaced, planar, smooth and clean. (SCREMERSTON COAL MEMBER)	6.44-6.50 1no. 45 degree planar smooth and clean fracture	7.04 +89.52		
7.10 - 7.20		CS 17				6.58-6.61 soft slightly gravelly sandy clay. Gravel is subangular fine to medium of siltstone			
7.36 - 7.48		CS 18			Very weak to weak thinly to thickly laminated light and dark grey SANDSTONE. Fractures are 0-10 degree, very closely to medium spaced, planar, smooth and clean. (SCREMERSTON COAL MEMBER)	6.98-7.04 extremely weak thinly laminated dark grey and black siltstone	(2.86)		
6.80 - 8.30	97 91 49	Flush: 6.80 - 8.30 Water 50%				8.10-8.30 thinly interlaminated siltstone/sandstone			
7.63 - 7.88		CS 19				8.15-8.24 1no. 45 degree undulating smooth and clean fracture			
8.46 - 8.64						8.34-8.62 1no. subvertical planar smooth and clean fracture			
8.30 - 9.90	98 74 10	Flush: 8.30 - 9.90 Water 45%	13/09/18	1800		8.67-8.81 1no. subvertical planar smooth and clean fracture	9.90 +86.56		
9.34 - 9.47		CS 21	4.20	2.20					
9.58 - 9.77		CS 22							
END OF EXPLORATORY HOLE									

Depth	TCR	IF	Records	Date Casing	Time Water	END OF EXPLORATORY HOLE	Depth Related Remarks	Hard Boring	
Depth	SCR					Remarks	Depths (m)	Duration (mins)	Tools used
	RGD								
Groundwater Entries			Depth Sealed (m)			Hard Boring			
No.	Depth (m)	Remarks							
1	4.20	Rose to 3.60 m after 20 minutes.							

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.	Project	A11N MORPETH TO FELTON & ALNWICK TO ELLINGHAM	Borehole	BH/17/04
Scale 1:50	Project No.	A8013-18		
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19/03/2019 10:29:03				Sheet 1 of 2

Borehole Log



Drilled	RD/DC	Start	Equipment, Methods and Remarks Dando 4000. Massenza MI3. Cable percussion boring. Rotary core drilling (T6116 size) using water flush. SPT Hammer ID: AR323 Rod Type: NWW	Depth from	to	Diameter	Casing Depth	Ground Level	96.56 mOD
Logged	PW/PC	06/09/2018		(m)	(m)	(mm)	(m)	Coordinates (m)	E 418519.84
Checked	AW	End		1.20	4.20	150	4.20	National Grid	N 618507.66
Approved	PH	13/09/2018		4.20	9.90	116	4.20		

Samples and Tests				Strata Description					
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Depth	TCR SCR RCD	If	Records/Samples	Date Casing	Time Water	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
							8.81-8.90 abundant subvertical and 45 degree fractures. Fractures are planar smooth and clean 8.91-8.95 pocket of very soft black slightly sandy silt 8.96-9.25 2no. 45 degree planar smooth and clean fractures 9.24-9.35 frequent lenses of black silt (up to 20mm) 9.58-9.70 1no. subvertical planar smooth and clean fracture			

Groundwater Entries				Depth Related Remarks				Chiselling Details			
No.	Depth	Strike	Remarks	Depth Sealed	Depths (m)	Remarks	Depths (m)	Duration (mins)	Tools used		

Borehole Log



Drilled RD	Start	Equipment, Methods and Remarks	Depth from (m)	to (m)	Diameter (mm)	Casing Depth (m)	Ground Level	85.49 mOD
Logged PW	06/09/2018	Dando 4000. Cable percussion boring. SPT Hammer ID: AR323 Rod Type: NWY	1.20	3.60	150	3.60	Coordinates (m)	E 418369.13
Checked RT/AW	End						National Grid	N 618898.10
Approved PH	06/09/2018							

Samples and Tests

Depth	Type & No.	Records	Date Casing	Time Water	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.35 0.40	ES 1 D 3	0.00-1.20 Hand excavated inspection pit.			Firm brown slightly sandy gravelly CLAY. Gravel is subangular to subrounded coarse of sandstone and limestone. Frequent rootlets. (TOPSOIL)		(0.35) +85.14		
0.80	D 2				Firm brown slightly sandy gravelly CLAY. Gravel is subangular to subrounded coarse of sandstone and limestone. (GLACIAL TILL)		(0.45) +84.69		
1.80 - 2.25 1.80	SPTS D 4	N=15 (4,3/3,3,3,6)	1.80	Dry	Medium dense brown sandy GRAVEL. Gravel is subangular to subrounded, fine to coarse sandstone and limestone. (GLACIAL TILL)	1.40 sand absent	(1.45)		
2.25	D 5						2.25 +83.24		
2.60 - 3.05 2.60	SPTS D 6	N=20 (10,10/5,5,5,5)	2.60	Dry	Stiff greyish brown slightly gravelly very sandy CLAY. Sand is fine to coarse. Gravel is angular to subrounded, fine to coarse sandstone. (GLACIAL TILL)		(1.35)		
3.60 - 4.05 3.60	SPTS D 7	N=54 (4,4/10,10,17,17)	3.60	Dry	Stiff greyish brown slightly sandy CLAY with rare boulders. (GLACIAL TILL)		3.60 +81.89		
			06/09/18 3.60	0000 Dry	END OF EXPLORATORY HOLE	4.00-4.05 black and grey subangular fine to medium GRAVEL of coal and mudstone	(0.45) +81.44		

Groundwater Entries			Depth Related Remarks			Hard Boring		
No.	Depth Strike (m)	Remarks	Depth Sealed (m)	Depths (m)	Remarks	Depths (m)	Duration (mins)	Tools used
				4.05	Rotary follow on not possible due to borehole casing not being straight. Borehole moved to BH/17/05A.			

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.	Project	A11N MORPETH TO FELTON & ALNWICK TO ELLINGHAM	Borehole	BH/17/05
Scale 1:50 © Copyright SOCOTEC UK Limited 19/03/2019 10:29:05	Project No.	A8013-18		Sheet 1 of 1
	Carried out for	Geoffrey Osborne Limited		

Borehole Log



Drilled DC	Start 14/09/2018	Equipment, Methods and Remarks Massenza M13. Rotary open hole drilling followed by rotary core drilling (T6116 size) using water flush.	Depth from (m) 1.20	to (m) 2.40	Diameter (mm) 130	Casing Depth (m) 3.00	Ground Level 85.47 mOD
Logged PC	End 14/09/2018						Coordinates (m) E 418369.33
Checked RT							National Grid N 618898.19
Approved PH							

Samples and Tests

Depth	TCR SCR RCD	If	Records/Samples	Date Casing	Time Water	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
			0.00-1.20 Hand excavated inspection pit.			Possible GLACIAL TILL (Drillers description).				
			1.20-2.40 Rotary open hole drilling.					(2.40)		
2.40 - 2.52			CS 1			Medium strong to strong light grey LIMESTONE. Fractures are subhorizontal, closely spaced, undulating, rough and clean. (SCREMERSTON COAL MEMBER)	2.40-2.48 AZCL	2.40 +83.07		
2.40 - 3.00	87 77 37		Flush: 2.40 - 3.00 Water 70%				2.73-2.79 recovered as very sandy subangular fine to coarse gravel	(0.60)		
3.10 - 3.58			CS 2			Strong thinly to medium bedded grey SANDSTONE. Fractures are horizontal, undulating, smooth, locally rough, and clean. (SCREMERSTON COAL MEMBER)		3.00 +82.47		
3.00 - 4.00	100 87 64	NI 120 460						(0.91)		
4.10 - 4.40			CS 3			Extremely weak to very weak thinly laminated dark grey MUDSTONE with occasional fine to medium light grey sand on laminae. (SCREMERSTON COAL MEMBER)	4.00-4.20 AZCL	3.91 +81.56		
4.63 - 4.73	87 71 42		CS 4			Strong to very strong, locally thinly laminated, light grey SANDSTONE. Fractures are horizontal, closely spaced, planar, smooth and clean. (SCREMERSTON COAL MEMBER)		4.30 +81.17		
4.00 - 5.50			Flush: 3.00 - 7.00 Water 100%					(0.95)		
5.09 - 5.20			CS 5			Strong thinly to thickly laminated light grey SANDSTONE and very weak to weak dark grey SILTSTONE. Fractures are horizontal, planar, smooth and clean. (SCREMERSTON COAL MEMBER)	5.50-5.60 AZCL	5.25 +80.22		
5.50 - 7.00	93 71 15	NI 60 230					6.26-6.30 recovered as angular to subangular medium to coarse gravel size fragments	(1.05)		
6.60 - 6.70			CS 6			Medium strong thinly interlaminated light grey SANDSTONE and dark grey SILTSTONE. Fractures are very closely spaced, undulating, smooth and clean. (SCREMERSTON COAL MEMBER)	7.00-7.20 AZCL	6.30 +79.17		
7.65 - 7.72	87 71 17		CS 7			Very weak to weak very thinly interlaminated light grey SILTSTONE and dark grey MUDSTONE. Fractures are horizontal, planar, smooth and clean. (SCREMERSTON COAL MEMBER)	7.20-7.24 recovered as angular fine to coarse gravel size fragments	(1.09)		
7.00 - 8.50			Flush: 7.00 - 8.50 Water 70%				7.33-7.39 recovered as angular fine to coarse gravel size fragments	7.39 +78.08		
8.50 - 8.94			CS 8			Medium strong to strong thinly laminated light grey SANDSTONE. Fractures are very closely spaced, planar, smooth and clean. (SCREMERSTON COAL MEMBER)	7.73-7.75 very soft dark grey silty clay	(0.76)		
8.50 - 10.00	83 71 36	NI 120 450	Flush: 8.50 - 10.00 Water 50%				7.75-7.83 1no. 60 degree planar smooth and clean fracture	8.15 +77.32		
9.85 - 9.95			CS 9	14/09/18 3.00	1800 2.00	Strong light grey LIMESTONE. Fractures are closely to medium spaced, undulating, smooth and clean. (SCREMERSTON COAL MEMBER)	7.85-7.89 1no. subvertical planar smooth and clean fracture	(0.79)		
						Medium strong thinly bedded dark grey SILTSTONE. Fractures are subhorizontal, closely	8.50-8.75 AZCL	8.94 +76.53		
							9.55-9.62 recovered as angular medium to coarse gravel	(0.78)		
							9.72-9.74 recovered as silty angular to subangular medium gravel	9.72 +75.75		
								(0.28)		
								10.00 +75.47		

Groundwater Entries				Depth Related Remarks				Chiselling Details		
No.	Depth	Strike	Remarks	Depth Sealed	Depths (m)	Remarks	Depths (m)	Duration (mins)	Tools used	

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.	Project A11N MORPETH TO FELTON & ALNWICK TO ELLINGHAM	Borehole BH/17/05A
Scale 1:50	Project No. A8013-18	
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Borehole Log



Drilled DC	Start	Equipment, Methods and Remarks Massenza M13. Rotary open hole drilling followed by rotary core drilling (T6116 size) using water flush.	Depth from (m)	to (m)	Diameter (mm)	Casing Depth (m)	Ground Level	85.47 mOD
Logged PC	14/09/2018		1.20	2.40	130	3.00	Coordinates (m)	E 418369.33
Checked RT	End		2.40	10.00	116		National Grid	N 618898.19
Approved PH	14/09/2018							

Samples and Tests				Strata Description					
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Depth	TCR SCR RCD	If	Records/Samples	Date Casing	Time Water	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
						Medium strong thinly bedded dark grey SILTSTONE. Fractures are subhorizontal, closely spaced, planar, smooth and clean. (SCREMERSTON COAL MEMBER) END OF EXPLORATORY HOLE	9.74-9.88 1no. subvertical planar smooth and clean fracture			

Groundwater Entries				Depth Related Remarks				Chiselling Details			
No.	Depth	Strike	Remarks	Depth Sealed	Depths (m)	Remarks	Depths (m)	Duration (mins)	Tools used		

Borehole Log



Drilled	RD/DC	Start	Equipment, Methods and Remarks	Depth from (m)	to (m)	Diameter (mm)	Casing Depth (m)	Ground Level	87.30 mOD
Logged	PC	17/09/2018	Massenza M13. Cable percussion boring/Rotary core drilling (T8116 size) using water flush. SPT Hammer ID: AR323 Rod Type: NWY	1.20	9.70	150	16.10	Coordinates (m)	E 417674.39
Checked	AW	End		9.70	20.30	116	19.10	National Grid	N 620695.13
Approved	PH	20/09/2018							

Samples and Tests

Depth	Type & No.	Records	Date Casing	Time Water	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.15 0.20 0.30 - 0.80	ES 1 D 2 B 3	0.00-1.20 Hand excavated inspection pit.			Orangish brown slightly gravelly silty fine to coarse SAND. Gravel is subangular to subrounded fine to medium of sandstone. Frequent rootlets. (TOPSOIL)		(0.30) 0.30 +87.00		
0.65	ES 4				Dense orangish brown very gravelly very clayey fine to coarse SAND with occasional cobbles. Gravel is subangular to rounded fine to coarse of sandstone. (Possible GLACIOFLUVIAL DEPOSITS)				
1.00	D 5								
1.20 - 1.65 1.20 - 1.65 1.20 - 1.70	SPTS D 6 B 7	N=39 (7,7/9,10,10,10)		Dry			(2.10)		
2.00 - 2.10 2.00 - 2.45 2.00 - 2.50	SPTS D 8 B 9	50 (25 for 30mm/50 for 65mm)	2.00	Dry					
3.00 - 3.45 3.00 - 3.50	SPTS B 10	N=8 (1,2/2,2,2,2)	2.00	Dry	Soft brown slightly sandy silty CLAY with rare gravel. (Possible GLACIOFLUVIAL DEPOSITS)		2.40 +84.90		
3.70 3.80 - 4.25	D 11 U 12	30 blows 100% rec	3.80	Dry		3.70 occasional pockets (up to 20mm) of soft brown clay	(2.40)		
4.30	D 13								
4.80 - 5.25 4.80 - 5.25 4.80 - 5.30	SPTS D 14 B 15	N=16 (2,4/4,4,4,4)	4.50	Dry	Soft to firm thinly interlaminated brown CLAY/ SILT. (Possible GLACIOFLUVIAL DEPOSITS)		4.80 +82.50		
5.00 - 5.93 5.60	SPTS D 16	50 (9,12/15,15,20 for 30mm)					(0.90)		
6.40 - 6.40 6.40 - 7.00	SPTC B 17	75 (25 for 0mm/75 for 0mm)					5.70 +81.60		
7.50 - 7.70 7.50 - 8.00	SPTC B 18	50 (9,14/50 for 50mm)				5.70 slightly clayey	(3.70)		
8.00 8.00	EW 1 EW 231118								
8.50 - 9.00	B 19								
9.50 - 9.54 9.50		SPTS 50 (25 for 20mm/50 for 17mm) D 20	17/09/18	1800 Dry	Very stiff grey slightly gravelly sandy silty CLAY. Gravel is subangular to subrounded fine to coarse of sandstone and mudstone with rare coal. (Possible GLACIOFLUVIAL DEPOSITS)		9.40 +77.90		
9.40 - 10.40	100	Flush: 9.40 - 10.40 Water	18/09/18	0800		9.73-9.78 1no. subangular cobble of sandstone	(0.92)		

Depth	TCR	SCR	RGD	If	Records	Date Casing	Time Water
					100%		

Groundwater Entries			Depth Related Remarks		Hard Boring			
No.	Depth Strike (m)	Remarks	Depth Sealed (m)	Depths (m)	Remarks	Depths (m)	Duration (mins)	Tools used
				0.00 - 9.70	No groundwater encountered during drilling.	9.40 - 9.70	60	Chisel

Borehole Log



Drilled	RD/DC	Start	Equipment, Methods and Remarks	Depth from (m)	to (m)	Diameter (mm)	Casing Depth (m)	Ground Level	87.30 mOD
Logged	PC	17/09/2018	Massenza M13. Cable percussion boring. Rotary core drilling (T6116 size) using water flush.	1.20	9.70	150	16.10	Coordinates (m)	E 417674.39
Checked	AW	End	SPT Hammer ID: AR323 Rod Type: NWW	9.70	20.30	116	19.10	National Grid	N 620695.13
Approved	PH	20/09/2018							

Samples and Tests

Depth	TCR SCR ROD	If	Records/Samples	Date Casing	Time Water	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
10.40 - 11.50	100 NA NA					Very stiff grey slightly gravelly sandy silty CLAY. Gravel is subangular to subrounded fine to coarse of sandstone and mudstone with rare coal. (Possible GLACIOFLUVIAL DEPOSITS)		10.32 +76.98		
11.50 - 12.80	88 NA NA					Grey and light grey very sandy silty angular to subangular fine to coarse GRAVEL of siltstone and sandstone. (Possible GLACIOFLUVIAL DEPOSITS)	11.26-12.12 strong light grey sandstone (possible large boulder) 11.90-12.00 possible cavings	(3.00)		
12.80 - 13.70	100 NA NA		Flush: 10.40 - 16.10 Water 90%			Very stiff dark grey slightly sandy gravelly CLAY. Gravel is subangular to subrounded fine to coarse of sandstone and siltstone. (GLACIAL TILL)	12.85-13.14 strong light grey sandstone (possible boulder)	13.32 +73.98 (0.28) 13.60 +73.70 13.70 +73.60		
13.70 - 14.80	100 NA NA	- NA -				Grey and light grey very sandy silty angular to subangular fine to coarse GRAVEL of siltstone and sandstone.				
14.80 - 16.10	100 NA NA			18/09/18 16.10	1800 0.00	Very stiff dark grey slightly sandy very gravelly CLAY. Gravel is angular to subangular fine to coarse of very weak to weak dark grey mudstone and medium strong light grey sandstone. (GLACIAL TILL)				
16.10 - 17.60	83 NA NA			19/09/18 16.10	0730 3.00		16.10-16.36 AZCL	(5.82)		
17.60 - 19.00	100 NA NA		Flush: 16.10 - 20.30 Water 100%							
19.00 - 20.30	87 62 58	750 750 750		19/09/18 16.10	1800 0.00	Medium strong dark grey fine grained LIMESTONE with abundant fossils. (ALSTON FORMATION)	19.00-19.17 AZCL			
19.97 - 20.30			CS 21	20/09/18 16.10	0730 2.80		19.52-19.87 very closely to closely spaced mineral veining (45degree)	19.52 +67.78		
							20.00-20.30 subvertical mineral veining	(0.78)		

Groundwater Entries				Depth Related Remarks				Chiselling Details		
No.	Depth	Strike	Remarks	Depth Sealed	Depths (m)	Remarks	Depths (m)	Duration (mins)	Tools used	

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.	Project	A11N MORPETH TO FELTON & ALNWICK TO ELLINGHAM	Borehole	BH/17/06
Scale 1:50	Project No.	A8013-18		
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Borehole Log



Drilled	RD/DC	Start	Equipment, Methods and Remarks	Depth from (m)	to (m)	Diameter (mm)	Casing Depth (m)	Ground Level	87.30 mOD
Logged	PC	17/09/2018	Massenza M13. Cable percussion boring. Rotary core drilling (T6116 size) using water flush.	1.20	9.70	150	16.10	Coordinates (m)	E 417674.39
Checked	AW	End	SPT Hammer ID: AR323 Rod Type: NWW	9.70	20.30	116	19.10	National Grid	N 620695.13
Approved	PH	20/09/2018							

Samples and Tests				Strata Description					
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Depth	TCR SCR ROD	If	Records/Samples	Date Casing	Time Water	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
				20/09/18 16.10	1800 2.80	Medium strong dark grey fine grained LIMESTONE with abundant fossils. (ALSTON FORMATION)		20.30 +67.00		
						END OF EXPLORATORY HOLE				

Groundwater Entries				Depth Related Remarks				Chiselling Details			
No.	Depth	Strike	Remarks	Depth Sealed	Depths (m)	Remarks	Depths (m)	Duration (mins)	Tools used		

Borehole Log



Drilled	RD/DC	Start	Equipment, Methods and Remarks	Depth from	to	Diameter	Casing Depth	Ground Level	87.87 mOD
Logged	PC	18/09/2018	Dando 4000/Massenza M13. Cable percussion boring /Rotary core drilling (T6116 size) using water flush. SPT Hammer ID: AR323, Rod type:: NWWY	(m)	(m)	(mm)	(m)	Coordinates (m)	E 417722.97
Checked	AW	End		1.20	8.40	150	8.40	National Grid	N 620721.12
Approved	PH	20/09/2018		8.40	13.10	116	10.30		

Samples and Tests

Depth	Type & No.	Records	Date Casing	Time Water	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.00 - 0.20 0.00 - 0.20 0.20	D 1 B 3 ES 2	0.00-1.20 Hand excavated inspection pit. 0.00-8.40 No groundwater encountered during drilling.			Brown slightly gravelly silty fine to coarse SAND. Gravel is subrounded of sandstone. Frequent rootlets. (TOPSOIL)		0.20 +87.67		
0.60 0.70	D 4 ES 5				Soft orange and brown slightly sandy slightly gravelly CLAY. Gravel is subangular to rounded fine to medium of sandstone. (GLACIAL TILL)				
1.20 - 1.65 1.20 - 1.65	SPTS D 6	N=5 (1,2/1,1,1,2)		Dry			(3.30)		
2.00 - 2.45	SPTS	N=4 (1,1/1,1,1,1)		Dry					
2.50 - 3.00	B 7								
3.00 - 3.45	U 8	30 blows 100% rec	1.50	Dry					
3.50 - 4.00	B 9				Soft thinly laminated brown CLAY/SILT with occasional fine brown sand on laminae. (GLACIAL TILL)		3.50 +84.37		
4.00 - 4.45 4.00 - 4.50 4.20	SPTS B 11 D 10	N=11 (1,2/2,3,3,3)	3.00	Dry			(0.70)		
5.00 - 5.45	U 12	37 blows 100% rec	3.00	Dry	Firm to stiff grey and brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse of sandstone and mudstone. Occasional pockets (up to 20mm) of firm brown clay. (GLACIAL TILL)		4.20 +83.67		
5.50 5.50 - 6.00	D 13 B 14								
6.00 - 6.45 6.00 - 6.45	SPTS D 15	N=18 (1,2/2,2,7,7)	3.00	Dry			(4.20)		
7.00 7.20 - 7.65	D 16 SPTS	N=29 (5,6/7,7,7,8)	7.20	Dry					
8.40 - 8.70 8.40		100 (9,14/16,84 for 75mm) D 17	18/09/18 8.40	1800 Dry			8.30-8.40 light grey sandstone. Recovered as angular to subangular fine to coarse gravel. Possible cobble 8.40-8.55 recovered material comprises of angular to subangular medium to coarse gravel size fragments of medium strong grey sandstone (possible cobble)	8.40 +79.47	
8.40 - 9.50	91 NA NA	Flush: 8.40 - 9.50 Water 85%	8.40 20/09/18 8.40	Dry 0730 4.70	Very stiff to stiff greyish brown slightly sandy gravelly CLAY. Gravel is subangular to subrounded fine to coarse of mudstone and sandstone. (GLACIAL TILL)				
9.50 - 10.30	100 NA NA								

Depth	TCR	SCR	RQD	If	Records	Date Casing	Time Water	Groundwater Entries	Depth Related Remarks	Hard Boring
No.	Depth	Strike (m)	Remarks	Depth Sealed (m)	Depths (m)	Remarks	Depths (m)	Duration (mins)	Tools used	

Borehole Log



Drilled	RD/DC	Start	Equipment, Methods and Remarks	Depth from (m)	to (m)	Diameter (mm)	Casing Depth (m)	Ground Level	87.87 mOD
Logged	PC	18/09/2018	Dando 4000. Massenza M13. Cable percussion boring. Rotary core drilling (T6116 size) using water flush. SPT Hammer ID: AR323, Rod type:: NWW	1.20	8.40	150	8.40	Coordinates (m)	E 417722.97
Checked	AW	End		8.40	13.10	116	10.30	National Grid	N 620721.12
Approved	PH	20/09/2018							

Samples and Tests Strata Description

Depth	TCR SCR ROD	If	Records/Samples	Date Casing	Time Water	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
10.30 - 11.60	100 NA NA	- NA -	Flush: 9.50 - 13.10 Water 100%			Very stiff to stiff greyish brown slightly sandy gravelly CLAY. Gravel is subangular to subrounded fine to coarse of mudstone and sandstone. (GLACIAL TILL)	8.55-8.63 medium strong to strong light grey sandstone (possible cobble) 9.66 becoming grey 10.01-10.08 medium strong to strong light grey sandstone (possible cobble) 10.08-10.30 medium strong dark grey fine grained sandstone (possible cobble) 10.30-10.55 additional material, possible cavings 11.00-11.08 medium strong light grey sandstone (possible cobble) 11.48-11.57 strong dark grey limestone (possible cobble) 12.71 frequent coarse gravel size fragments of strong dark grey limestone	(4.70)		
11.60 - 13.10	100 NA NA			20/09/18	1800					
				10.30	0.00	END OF EXPLORATORY HOLE	12.98-13.10 strong dark grey limestone with frequent fossils (possible cobble)	13.10 +74.77		

Groundwater Entries				Depth Related Remarks				Chiselling Details		
No.	Depth	Strike	Remarks	Depth Sealed	Depths (m)	Remarks	Depths (m)	Duration (mins)	Tools used	

Borehole Log



Drilled	BD/AB	Start	Equipment, Methods and Remarks	Depth from (m)	to (m)	Diameter (mm)	Casing Depth (m)	Ground Level	87.69 mOD
Logged	RT/AD	25/07/2018	Dando 175./Commachio 305. Cable percussion boring./Rotary core drilling (T6 116 size) using water flush. SPT Hammer ID: AR2330, Rod type: NWY.	1.20	5.20	150	5.50	Coordinates (m)	E 417556.90
Checked	AW	End		5.20	10.00	116		National Grid	N 621138.94
Approved	PH	26/07/2018							

Samples and Tests

Depth	Type & No.	Records	Date Casing	Time Water	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.00 - 0.30 0.10 0.20	B 3 ES 1 D 2	0.00-1.20 Hand excavated inspection pit.			Firm brown sandy gravelly CLAY with low cobble content. Gravel is angular to subrounded fine to coarse of sandstone and limestone. Cobbles are subangular to subrounded of sandstone and limestone (GLACIAL TILL).		(1.20)		
0.50 0.50 - 1.00	D 4 B 5								
1.20 - 1.52 1.20 1.20 - 1.65 1.20 - 1.70	SPTS D 6 D 7 B 8	37 (8,14/9,12,16 for 21mm)	1.20	Dry	Stiff reddish brown slightly sandy gravelly CLAY. Gravel is subangular to subrounded fine to coarse of sandstone. Frequent pockets of reddish brown fine to coarse sand (GLACIAL TILL).	1.20 occasional pockets of black organic matter	1.20 +86.49		
2.20 - 2.62 2.20 - 2.65 2.20 - 2.70	SPTS D 9 B 10	50 (7,11/14,10,10,16 for 45mm)	1.50	Dry					
3.20 - 3.54 3.20 - 3.65 3.20 - 3.50	SPTS D 11 B 12	50 (13,12 for 9mm/15,8,13,14 for 34mm)	1.50 25/07/18 1.50	Dry 1700 Dry			(4.00)		
4.20 - 4.57 4.20 - 4.70	SPTC B 13	50 (16,9 for 21mm/15,11,13,11 for 45mm)	1.50	Dry					
5.20 - 5.36 5.20	SPTS D 14	50 (25 for 36mm/39,11 for 52mm)	1.50	Dry	ZONE OF MINIMAL CORE RECOVERY. Recovered material comprises subangular to rounded, predominantly coarse GRAVEL with occasional cobbles of grey limestone, reddish brown and grey sandstone. Core loss presumed to be from finer material and/or weaker materials.		5.20 +82.49		
5.50 - 7.00	27 NA NA	Flush: 5.50 - 7.00 Water 50%							
7.00 - 8.50	30 NA NA	- NA -					(4.80)		
8.50 - 10.00	21 NA NA	Flush: 7.00 - 10.00 Water 0%							
			26/07/18 1.50	1700 Dry	END OF EXPLORATORY HOLE		10.00 +77.69		

Groundwater Entries	Depth Related Remarks	Hard Boring
No. Depth Strike (m) Remarks	Depths (m) Remarks	Depths (m) Duration (mins) Tools used
	0.00 - 10.00 No groundwater encountered during drilling.	3.50 - 3.70 30 Chisel 5.20 - 5.40 60 Chisel

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.	Project	A11N MORPETH TO FELTON & ALNWICK TO ELLINGHAM	Borehole	BH/17/08
Scale 1:50	Project No.	A8013-18		
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19/03/2019 10:29:07				Sheet 1 of 1

Borehole Log



Drilled	BD/AB	Start	Equipment, Methods and Remarks	Depth from	to	Diameter	Casing Depth	Ground Level	84.27 mOD
Logged	AD/RT/ IH	25/07/2018	Dando 175/Commachio 305. Cable percussion boring /Rotary core drilling (T8 116 and PWF size) using water flush. SPT Hammer ID: AR2330, Rod type: NWY. Driller suspects cobbles in gravel affecting sample recovery. Rod type: NWY	1.20	7.00	150	7.00	Coordinates (m)	E 417454.97
Checked	AW	End		7.00	10.00	116		National Grid	N 621318.05
Approved	PH	24/10/2018		10.00	13.00	121			

Samples and Tests

Depth	Type & No.	Records	Date Casing	Time Water	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.20 - 0.40	ES 1	0.00-1.20 Hand excavated inspection pit.			Brown silty fine SAND with frequent roots. (TOPSOIL)		0.10 (0.10) +84.17		
0.30 - 0.60	B 2						(0.50)		
0.60	D 3						+83.67		
1.00	ES 4	40 blows No Recovery			Soft to firm orangish brown and brown sandy gravelly silty CLAY with low cobble content. Gravel is angular to subrounded fine to coarse of sandstone and limestone. Cobbles are subangular to subrounded of limestone and sandstone (GLACIAL TILL).		1.40	1 N	
1.00	D 5								
1.20 - 1.65	U NR								
1.65 - 1.70	D 7								
2.00	D 8	N=20 (3,2/4,4,5,7)	1.50	Dry	Medium dense reddish brown sandy slightly clayey angular to subrounded fine to coarse GRAVEL of sandstone with low cobble content. Cobbles are subangular to subrounded of sandstone (GLACIAL TILL).		2.00 +82.27		
2.20 - 2.65	SPTC B 9								
2.20 - 2.70	B 9								
3.00	D 10	N=23 (3,3/4,5,8,8)	3.00	1.50			(4.90)		
3.20 - 3.65	SPTC B 11								
3.20 - 3.70	B 11								
4.20 - 4.85	SPTC	N=18 (4,4/3,5,5,5)	4.00	2.40					
5.00	EW 1	N=16 (3,4/4,5,3,4)	5.00	2.70					
5.00	EW 231118								
5.00	D 12								
5.20 - 5.85	SPTC								
6.00	D 13	N=14 (4,3/3,3,4,4)	6.20	3.50					
6.20 - 6.65	SPTC D 14								
6.30	D 14								
7.00 - 7.06	50 NA NA	50 (25 for 36mm/50 for 28mm) D Flush: 7.00 - 7.20 Water 90%	6.90	3.80	ZONE OF MINIMAL CORE RECOVERY. Recovered material comprises subangular to rounded, predominantly coarse, GRAVEL with occasional cobbles of grey limestone, reddish yellow and grey sandstone. Core loss presumed to be from finer and/or weaker materials.		6.90 +77.37		
7.00			7.00	7.00			Dry		
7.00 - 8.50	53 NA NA	Flush: 7.20 - 8.70 Water 40%	26/07/18	1830					
8.50 - 10.00									

Depth	TCR	SCR	RGD	If	Records	Date Casing	Time Water	Groundwater Entries	Depth Related Remarks	Hard Boring
								No. Depth Strike (m) Remarks	Depths (m) Remarks	Depths (m) Duration (mins) Tools used
								1 1.40	Depths (m) Remarks	6.90 - 7.10 60 Chisel

Borehole Log



Drilled BD/AB	Start	Equipment, Methods and Remarks Dando 175. Commachio 305. Cable percussion boring. Rotary core drilling (T6 116 and PWF size) using water flush. SPT Hammer ID: AR2330, Rod type: NWY. Driller suspects cobbles in gravel affecting sample recovery. Rod type: NWY	Depth from (m)	to (m)	Diameter (mm)	Casing Depth (m)	Ground Level	84.27 mOD
Logged AD/RT/IH	25/07/2018		1.20	7.00	150	7.00	Coordinates (m)	E 417454.97
Checked AW	End		7.00	10.00	116		National Grid	N 621318.05
Approved PH	24/10/2018		10.00	13.00	121			

Samples and Tests Strata Description

Depth	TCR SCR RGD	If	Records/Samples	Date Casing	Time Water	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
10.00 - 10.50	30 0 0		Flush: 8.70 - 13.00 Water 0%	24/10/18	0730	ZONE OF MINIMAL CORE RECOVERY. Recovered material comprises subangular to rounded, predominantly coarse, GRAVEL with occasional cobbles of grey limestone, reddish yellow and grey sandstone. Core loss presumed to be from finer and/or weaker materials.	10.50-12.00 0.20m recovered of silty brown fine to coarse sand.			
10.50 - 12.00	25 0 0	NA		7.00						
12.00 - 13.00	0 0 0			24/10/18	0700					
						END OF EXPLORATORY HOLE		13.00	+71.27	

Groundwater Entries				Depth Related Remarks				Chiselling Details			
No.	Depth	Strike	Remarks	Depth Sealed	Depths (m)	Remarks	Depths (m)	Duration (mins)	Tools used		

Borehole Log



Drilled	BJ/AB	Start	23/07/2018	Equipment, Methods and Remarks	Dando 175./Commachio 305. Cable percussion boring./Rotary core drilling (T6 116 size) using water flush. SPT Hammer ID: AR2330, Rod type: NWW. Rod type: NWW	Depth from (m)	1.20	to (m)	5.50	Diameter (mm)	150	Casing Depth (m)	5.60	Ground Level	94.54 mOD
Logged	AD	End	25/07/2018											Coordinates (m)	E 417160.84
Checked	AW													National Grid	N 621797.93
Approved	PH														

Samples and Tests				Strata Description				Depth, Level (Thickness)	Legend	Backfill
Depth	Type & No.	Records	Date Casing	Time Water	Main	Detail				
0.17 - 0.20 0.20	ES 1 D 2	0.00-1.20 Hand excavated inspection pit.			Brown slightly gravelly silty fine SAND with frequent roots. Gravel is angular to subangular fine to medium of sandstone and mudstone. (TOPSOIL)		(0.20)	+94.34		
0.50	D 3				Brown gravelly silty fine to coarse SAND. Gravel is angular to subangular fine to coarse of sandstone and mudstone. (GLACIAL TILL)		(0.80)			
1.00 - 1.20	ES 4				Orangish brown gravelly silty fine to coarse SAND. Gravel is angular to subangular fine to coarse of sandstone and mudstone. (GLACIAL TILL)		1.00	+93.54		
1.20 - 1.65	SPTS D 5	N=17 (2,3/2,4,4,7)		Dry	Stiff brown slightly sandy gravelly silty CLAY. Gravel is angular to subangular fine to medium of sandstone and limestone with rare black organic material. (GLACIAL TILL)		(0.20)	+93.34		
1.20 - 1.65	D 6						(0.45)			
2.00	D 7				Soft, becoming stiff, brown slightly sandy gravelly CLAY. Gravel is angular to subrounded fine to medium of various lithologies. (GLACIAL TILL)	2.20-2.65 stiff	1.65	+92.89		
2.20 - 2.65 2.20 - 2.65	SPTS D 8	N=19 (3,4/3,5,5,6)	1.50	Dry	Firm brown slightly gravelly sandy silty CLAY. Gravel is angular to subrounded fine to coarse of various lithologies. (GLACIAL TILL)		(1.00)			
3.20 - 3.65	UT 9	60 blows 78% rec	3.00	Dry			2.65	+91.89		
3.65 - 3.70	D 10						(1.55)			
4.20 - 4.65 4.20 - 4.65	SPTS D 11	N=30 (10,12/9,9,7,5)	3.00	4.00	Firm to stiff brown gravelly silty CLAY. Gravel is angular to subrounded fine to coarse of various lithologies with occasional red and black staining. (GLACIAL TILL)		4.20	+90.34		
5.20 - 5.41 5.20 - 5.65	SPTS	50 (13,12 for 13mm/21,29 for 45mm) D 12	4.50 23/07/18 5.50	Dry 1700 Dry	Yellow SANDSTONE. Recovered as very sandy angular to subrounded fine to medium gravel with rare reddish brown staining. (TYNE LIMESTONE FORMATION and ALSTON FORMATION)		5.20	+89.34		
5.60 - 6.60	40 0 0	Flush: 5.60 - 6.60 Water 95%	23/07/18 5.50	1700 Dry	ZONE OF MINIMAL CORE RECOVERY. Recovered material comprises subangular to subrounded, predominantly coarse GRAVEL to COBBLES of reddish yellow and grey sandstone, grey siltstone and limestone. Rare zones of orangish brown sandy clay. Occasional cored apparently boulder (200 to 300mm) size fragments. Core loss presumed to be from finer and/or weaker materials. (TYNE LIMESTONE FORMATION and ALSTON FORMATION)		(0.30)	+89.04		
6.60 - 7.10	100 0 0	Flush: 6.60 - 7.10 Water 25%	25/07/18 5.50	0930 Dry			5.50			
7.10 - 8.60	53 20 0	Flush: 7.10 - 8.60 Water 15%					(4.50)			
8.60 - 10.00	36 25 0	Flush: 8.60 - 10.00 Water 0%	25/07/18 5.60	1400 Dry						
END OF EXPLORATORY HOLE							10.00	+84.54		

Depth	TCR SCR RQD	If	Records	Date Casing	Time Water	Groundwater Entries		Depth Related Remarks		Hard Boring	
No.	Depth	Strike (m)	Remarks	Depth Sealed (m)	Depths (m)	Remarks	Depths (m)	Duration (mins)	Tools used		
1	4.20		Rose to 4.00 m after 20 minutes.				5.20 - 5.50	60	Chisel		

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.	Project	A11N MORPETH TO FELTON & ALNWICK TO ELLINGHAM				Borehole	BH/17/10	
Scale 1:50	Project No.	A8013-18				Sheet 1 of 1		
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19/03/2019 10:29:08								

Borehole Log



Drilled	BD/AB	Start	Equipment, Methods and Remarks	Depth from	to	Diameter	Casing Depth	Ground Level	98.87 mOD
Logged	RT/MC	24/07/2018	Dando 175/Commachio 305. Cable percussion boring /Rotary core drilling (T8 116 size) using water flush. SPT Hammer ID: AR2330, Rod type: NWW.	1.20	1.30	150	1.30	Coordinates (m)	E 417015.49
Checked	AW	End		1.30	10.00	116	1.30	National Grid	N 622337.21
Approved	PH	26/07/2018							

Samples and Tests

Depth	Type & No.	Records	Date Casing	Time Water	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.20	ES 1	0.00-0.80 Hand excavated inspection pit.			Firm brown slightly sandy gravelly CLAY with frequent rootlets. Gravel is angular to subrounded fine to coarse of sandstone and limestone. (GLACIAL TILL)		(0.70)		
0.20 - 0.50	D 2 B 3								
0.70	ES 4				Brown and light yellowish grey SANDSTONE. Recovered as very gravelly sand with high cobble content. Gravel is angular to subangular medium to coarse light grey (with yellow staining)		0.70 +98.17		
1.00 - 1.08	SPTS D 5	50 (25 for 36mm/50 for 42mm)	0.80 24/07/18	Dry 1800			(0.60)		
1.00				Dry					
1.83 - 1.71		CS 6	25/07/18	1400	sandstone. Cobbles are angular to subangular grey of sandstone. (TYNE LIMESTONE FORMATION and ALSTON FORMATION)	1.30-4.00 fractures are 50-70 degree medium spaced undulating rough partially open orangish brown staining	1.30 +97.57		
1.30 - 2.50	83 63 0	Flush: 1.30 - 2.50 Water 50%			Strong grey argillaceous bioclastic LIMESTONE. Fractures are very closely to closely spaced, subhorizontal, undulating rough with orangish brown and brownish grey staining. Core loss presumed to be from weaker and/or more weathered material. MINIMAL ZONE OF REDUCED CORE RECOVERY. (TYNE LIMESTONE FORMATION and ALSTON FORMATION)				
2.35 - 2.50		CS 7							
2.50 - 4.00	39 23 14								
3.26 - 3.34		CS 8							
3.58 - 3.88		CS 9							
4.00 - 5.50	67 39 0	NI 70 235	25/07/18 1.30	1800 Dry			(7.20)		
5.50 - 7.00	67 45 40	Flush: 2.50 - 10.00 Water 0%	26/07/18 1.30	1230 5.00		6.00-8.50 fractures are 40-50 degree medium spaced undulating rough partially open orangish brown staining 6.41-6.56 vertical undulating rough tight fracture with orangish brown staining			
7.00		EW 1							
7.00		EW 231118							
7.14 - 7.28		CS 10							
7.00 - 8.50	61 48 43								
8.07 - 8.30		CS 11							
8.83 - 8.99		CS 12			Weak fissile dark grey MUDSTONE. (TYNE LIMESTONE FORMATION and ALSTON FORMATION)		8.50 +90.37		
8.50 - 10.00	100 85 0	NI 210 560					(1.50)		
9.38 - 9.52		CS 13							
9.76 - 9.86		CS 14	26/07/18 1.30	1930 Dry					
					END OF EXPLORATORY HOLE				

Depth	TCR	SCR	RGD	IF	Records	Date Casing	Time Water	END OF EXPLORATORY HOLE			
Groundwater Entries								Depth Related Remarks			
No.	Depth	Strike (m)	Remarks	Depth Sealed (m)		Depths (m)	Remarks	Hard Boring	Depths (m)	Duration (mins)	Tools used
						0.00 - 1.30	No groundwater encountered during drilling.	0.80 - 1.30	60	Chisel	

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.	Project	A11N MORPETH TO FELTON & ALNWICK TO ELLINGHAM	Borehole	BH/17/11
Scale 1:50	Project No.	A8013-18		
© Copyright SOCOTEC UK Limited	Carried out for	Geoffrey Osborne Limited		
19/03/2019 10:29:09				Sheet 1 of 1

Borehole Log



Drilled	RD/WB	Start	Equipment, Methods and Remarks	Depth from (m)	to (m)	Diameter (mm)	Casing Depth (m)	Ground Level	100.54 mOD
Logged	PC/IH	24/09/2018	Dando 4000. Cable percussion boring. Rotary core drilling (PWF size) using water flush.	1.20	8.00	150	7.10	Coordinates (m)	E 417032.86
Checked	AW	End	SPT Hammer ID: AR323, Rod type: NWW	8.00	13.00	121		National Grid	N 622611.43
Approved	PH	23/10/2018							

Samples and Tests

Strata Description

Depth	TCR SCR ROD	If	Records/Samples	Date Casing	Time Water	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
10.00 - 11.50	51 29 15					ZONE OF REDUCED CORE RECOVERY. Recovered material comprises medium strong to strong light brown occasionally speckled black fine to coarse micaceous SANDSTONE. Core loss presumed to be from weaker and/or more weathered material. (TYNE LIMESTONE FORMATION AND ALSTON FORMATION)	10.21-10.26 closely spaced pink banding	(5.00)	[Dotted Pattern]	[Diagonal Lines]
11.50 - 13.00	64 45 33	- 50 -		23/10/18	1700					
						END OF EXPLORATORY HOLE		13.00	+87.54	

Groundwater Entries				Depth Related Remarks				Chiselling Details			
No.	Depth	Strike	Remarks	Depth Sealed	Depths (m)	Remarks	Depths (m)	Duration (mins)	Tools used		

Borehole Log



Drilled	BD/AB	Start	Equipment, Methods and Remarks	Depth from	to	Diameter	Casing Depth	Ground Level	95.39 mOD
Logged	RT/MC	11/07/2018	Dando 175/Commachio 305. Cable percussion boring /Rotary core drilling (T8 116 size) using water flush. SPT Hammer ID: AR2330, Rod type: N.W.Y. Rod type: N.W.Y	1.20	8.00	150	4.50	Coordinates (m)	E 418924.93
Checked	AW	End		6.00	15.00	116	6.00	National Grid	N 617289.48
Approved	PH	24/07/2018							

Samples and Tests				Strata Description					
Depth	Type & No.	Records	Date Casing	Time Water	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.20 0.30 0.45 0.60	D 1 ES 2 D 3 ES 4	0.00-1.20 Hand excavated inspection pit.			Firm brown slightly sandy gravelly CLAY with medium cobble content. Gravel is angular to subangular fine to coarse of sandstone and limestone. Cobbles are angular to subangular of sandstone and limestone. (TOPSOIL)		(0.40) 0.40 +94.99		
1.00 1.20 - 1.65 1.20 - 1.65	D 5 SPTS D 6	N=9 (3,2/2,2,2,3)	0.00	Dry	Soft to firm brown, mottled light brown, slightly sandy slightly gravelly CLAY. Gravel is subangular fine to medium of sandstone. Frequent pockets of reddish brown fine to coarse sand. Frequent intact plant remains. (GLACIAL TILL)		(0.80) 1.20 +94.19		
2.20 - 2.65	UT 7	55 blows 88% rec	1.50	Dry	Soft to firm dark brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse of sandstone. (GLACIAL TILL)		(3.00)		
3.20 - 3.65 3.20 - 3.65	SPTS D 8	N=5 (1,2/1,1,1,2)	1.50	2.95					
			11/07/18 3.00	1700 2.95					
			12/07/18 3.00	0730 2.28					
4.00	D 9								
4.20 - 4.65 4.20 - 4.65	UT NR B 10	80 blows No Recovery	3.00	4.10	Firm dark greyish brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse of sandstone. (GLACIAL TILL)		4.20 +91.19		
4.70 - 5.15 4.70 - 5.15	SPTS D 11	N=13 (2,2/3,3,3,4)	4.50	dry		4.70-5.80 sandy	(1.40)		
5.00	EW 1								
5.00	EW 231118								
5.80 - 5.64	SPTS	50 (25 for 26mm/50 for 18mm)	12/07/18 4.50	1100 Dry	Light grey SANDSTONE. Recovered as lightly cemented slightly sandy gravel. (TYNE LIMESTONE AND ALSTON FORMATION)		5.60 +89.79		
			24/07/18 4.50	0730 Dry	Strong thinly bedded pale grey fine to medium grained SANDSTONE. (TYNE LIMESTONE FORMATION AND ALSTON FORMATION)		(0.40) 6.00 +89.39		
6.58 - 6.77 6.00 - 7.50	93 83 63	CS 12					(1.68)		
7.00 - 7.14		CS 13							
7.70 - 7.82		CS 14				7.12-7.13 vertical undulating rough tight clean fracture 7.50-8.04 AZCL	7.68 +87.71		
7.50 - 9.00	64 56 32	80 125 330			Medium strong to strong thinly bedded grey fine to medium grained SANDSTONE with frequent dark grey mudstone laminations. Fractures are closely spaced, subhorizontal, undulating, rough, partially open, clean. (TYNE LIMESTONE FORMATION AND ALSTON FORMATION)	8.44-8.51 Weak dark grey mudstone.	(2.38)		
9.00 - 9.18		CS 15							
9.00 - 10.50	95 76 37								

Depth	TCR	IF	Records	Date Casing	Time Water	Depth Related Remarks	Hard Boring		
Groundwater Entries	No.	Depth Strike (m)	Remarks	Depth Sealed (m)	Depths (m)	Remarks	Depths (m)	Duration (mins)	Tools used
	1	3.20	Rose to 2.95 m after 20 minutes.				5.60 - 5.90	60	Chisel

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.	Project	A11N MORPETH TO FELTON & ALNWICK TO ELLINGHAM	Borehole	BH/17/13
Scale 1:50	Project No.	A8013-18		
© Copyright SOCOTEC UK Limited	Carried out for	Geoffrey Osborne Limited		
19/03/2019 10:29:10				Sheet 1 of 2

Borehole Log



Drilled	BD/AB	Start	Equipment, Methods and Remarks	Depth from	to	Diameter	Casing Depth	Ground Level	95.39 mOD
Logged	RT/MC	11/07/2018	Dando 175, Commachio 305. Cable percussion boring, Rotary core drilling (T6 116 size) using water flush. SPT Hammer ID: AR2330, Rod type: NWY. Rod type: NWY	(m)	(m)	(mm)	(m)	Coordinates (m)	E 418924.93
Checked	AW	End		6.00	15.00	150	4.50	National Grid	N 617289.46
Approved	PH	24/07/2018				116	6.00		

Samples and Tests

Depth	TCR SCR ROD	If	Records/Samples	Date Casing	Time Water	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
10.00 - 10.07			CS 16			Medium strong to strong thinly bedded grey fine to medium grained SANDSTONE with frequent dark grey mudstone laminations. Fractures are closely spaced, subhorizontal, undulating, rough, partially open, clean. (TYNE LIMESTONE FORMATION AND ALSTON FORMATION)	10.14-10.40 fractures are vertical stepped smooth very tight clean	10.06 +85.33		
11.00 - 11.06			CS 17			Weak, very thinly to thinly bedded dark grey MUDSTONE. Fractures are very closely to closely spaced, 0 to 10 degree undulating, smooth, tight, clean. (TYNE LIMESTONE FORMATION AND ALSTON FORMATION)		(2.21)		
10.50 - 12.00	97 72 0	NI 55 175								
12.08 - 12.16			CS 18				12.00-12.27 AZCL			
12.42 - 13.00			CS 19			Weak black COAL. (TYNE LIMESTONE FORMATION AND ALSTON FORMATION)	12.42-13.50 fractures are 0-10 degree undulating rough partially open clean	12.27 +83.12 12.42 +82.97		
12.00 - 13.50	82 75 58	100 240 580				Strong grey argillaceous bioclastic LIMESTONE. (TYNE LIMESTONE FORMATION AND ALSTON FORMATION)		(0.81)		
13.00 - 13.17			CS 20							
14.00 - 14.15			CS 21			Medium strong to strong thinly bedded grey fine grained SANDSTONE varying to SILTSTONE. (TYNE LIMESTONE FORMATION AND ALSTON FORMATION)	13.50-15.00 fractures are very closely to closely spaced, undulating rough partially open clean	13.23 +82.16		
14.15 - 14.36	93 93 47	30 105 390	CS 22					(1.31)		
13.50 - 15.00										
14.70 - 14.77			CS 23	24/07/18	1800 5.90	Weak thinly bedded grey MUDSTONE. (TYNE LIMESTONE FORMATION AND ALSTON FORMATION)		14.54 +80.85		
								(0.46)		
						END OF EXPLORATORY HOLE		15.00 +80.39		

Groundwater Entries			Depth Related Remarks			Chiselling Details			
No.	Depth	Strike	Remarks	Depth Sealed	Depths (m)	Remarks	Depths (m)	Duration (mins)	Tools used

Borehole Log



Drilled	BD/AB	Start	Equipment, Methods and Remarks	Depth from	to	Diameter	Casing Depth	Ground Level	95.35 mOD
Logged	RT/AD	10/07/2018	Dando 175./Commachio 305. Cable percussion boring./Rotary core drilling (T8 116 size) using water flush. SPT Hammer ID: AR2330, Rod type: NWW. Rod type: NWW	1.20	5.00	150	5.00	Coordinates (m)	E 418970.49
Checked	AW	End		5.00	15.00	116	5.00	National Grid	N 617306.19
Approved	PH	17/07/2018							

Samples and Tests

Depth	Type & No.	Records	Date Casing	Time Water	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.20 0.20 - 0.50 0.30	D 1 B 3 ES 2	0.00-1.20 Hand excavated inspection pit.			Brown slightly gravelly sandy CLAY with low cobble content. Gravel is subangular fine to coarse of sandstone. Cobbles are angular to subangular of sandstone. Occasional fine to medium fragments of mica. Rare fragments of vitreous clay pipe. (MADE GROUND)		(0.70)		
0.70 - 1.20 0.75 0.75	B 6 ES 4 D 5				Firm orangish brown, mottled brown, yellowish brown and light grey, slightly sandy slightly gravelly CLAY. Gravel is angular to subangular fine to coarse of grey sandstone. (GLACIAL TILL)		0.70 +94.65		
1.20 - 1.65 1.20 - 1.65	UT NR B 7	35 blows No Recovery	1.20	Dry					
1.70 - 2.15 1.70 - 2.15	SPTS D 8	N=10 (2,3/3,4,2,1)	1.50	Dry			(1.80)		
			10/07/18 1.50	1700 Dry					
			11/07/18 1.50	0800 1.80					
2.50 - 2.95 2.50 - 3.00	SPTS B 9	N=4 (1,2/1,1,1,1)	2.20	Dry	Soft to firm dark brown and dark greyish brown slightly gravelly sandy silty CLAY. Gravel is angular to subangular fine to coarse of sandstone and black mudstone. (GLACIAL TILL)		2.50 +92.85		
3.00 3.00	EW 1 EW 231118								
3.50 - 3.95	UT 10	87% rec	3.00	Dry			(2.00)		
4.00	D 11								
4.50 - 4.55 4.50 - 4.55	SPTS D 12	50 (25 for 36mm/50 for 15mm)	3.00	Dry	Yellowish brown and light grey SANDSTONE. Recovered as fine to coarse sand. (TYNE LIMESTONE FORMATION AND ALSTON FORMATION)		4.50 +90.85		
			11/07/18 3.00	1015 Dry			(0.50)		
			17/07/18 5.00	0800 1.29	Weak orangish yellow fine to medium grained SANDSTONE with thin laminae of black COAL. Fractures are closely spaced horizontal, inclined to vertical, undulating, rough, with hard infill, open with brownish orange staining and incipient. (TYNE LIMESTONE FORMATION AND ALSTON FORMATION)	5.00-6.06 non intact, recovered as subrounded fine to coarse gravel of sandstone 5.53-5.57 lenticular orange staining 5.80-5.87 lenticular bands of orange staining 5.98-6.06 black coal seam 6.06-6.63 frequent randomly orientated extremely thin veins of black organic material (possible lignite/coal) in limestone 6.63-6.69 non intact 6.69-6.78 frequent randomly orientated extremely thin veins of black organic material (possible lignite/coal) 6.78-7.00 no recovery 7.00-7.50 light grey fine grained sandstone with rare inclined to vertical extremely thin veins of black organic material (possible lignite/coal) 7.55-8.07 light grey fine sandstone 8.07-8.12 non intact 8.17-8.21 thin subhorizontal vein of black organic material (possible lignite/coal) 8.76-8.86 thin subhorizontal vein	5.00 +90.35		
5.00 - 6.00 5.88 - 5.90	100 79 27	Flush: 5.00 - 6.00 Water 98% CS 13					(1.06)		
6.13 - 6.35		CS 14			Medium strong to strong light grey SANDSTONE with randomly orientated veins of black organic material (possible lignite/coal). Fractures are closely to medium spaced, horizontal, inclined, to vertical, undulating to stepped, smooth to rough, very tight to tight with orange and brown staining to fracture surfaces and incipient. (TYNE LIMESTONE FORMATION AND ALSTON FORMATION)		6.06 +89.29		
6.00 - 7.50 7.00 - 7.16	83 77 50						(2.82)		
7.50 - 8.00	100 100 54								
8.24 - 8.42 8.42 - 8.80		CS 16 CS 17							
8.00 - 9.50	100 92 29								
9.12 - 9.29 9.50 - 9.57		CS 18 CS 19			Moderately strong to strong, grey SANDSTONE, thinly to thickly laminated with extremely weak to weak, dark grey MUDSTONE. Fractures are closely spaced, horizontal, inclined and vertical, planar, undulating to stepped, smooth to rough, clean, tight, partially open to open with rare staining and incipient. (TYNE LIMESTONE FORMATION AND ALSTON FORMATION)		8.88 +86.47		

Depth	TCR SCR RGD	if	Records	Date Casing	Time Water	Depth Related Remarks	Hard Boring
			Flush: 8.00 - 14.00 Water 95%			0.00 - 5.15 No groundwater encountered during drilling.	Depths (m) 4.60 - 5.00 Duration (mins) 60 Tools used Chisel

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. © Copyright SOCOTEC UK Limited Scale 1:50 19/03/2019 10:29:10	Project A11N MORPETH TO FELTON & ALNWICK TO ELLINGHAM	Borehole BH/17/14
Project No. A8013-18	Carried out for Geoffrey Osborne Limited	Sheet 1 of 2

Borehole Log



Drilled	BD/AB	Start	Equipment, Methods and Remarks	Depth from	to	Diameter	Casing Depth	Ground Level	95.35 mOD
Logged	RT/AD	10/07/2018	Dando 175. Commachio 305. Cable percussion boring. Rotary core drilling (T6 116 size) using water flush. SPT Hammer ID: AR2330, Rod type: NWY. Rod type: NWY	(m)	(m)	(mm)	(m)	Coordinates (m)	E 418970.49
Checked	AW	End		1.20	5.00	150	5.00	National Grid	N 617306.19
Approved	PH	17/07/2018		5.00	15.00	116	5.00		

Samples and Tests

Depth	TCR SCR ROD	If	Records/Samples	Date Casing	Time Water	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
10.00 - 10.13			CS 20			Moderately strong to strong, grey SANDSTONE, thinly to thickly laminated with extremely weak to weak, dark grey MUDSTONE. Fractures are closely spaced, horizontal, inclined and vertical, planar, undulating to stepped, smooth to rough, clean, tight, partially open to open with rare staining and incipient. (TYNE LIMESTONE FORMATION AND ALSTON FORMATION)	of black organic material (possible lignite/coal)		[Pattern]	[Pattern]
9.50 - 11.00	95 89 22						8.88-8.94 dark grey extremely weak mudstone 8.94-9.00 moderately strong thinly laminated sandstone and mudstone 9.06-9.60 moderately strong thinly laminated sandstone and mudstone 9.60-9.70 non intact	(2.90)		
11.23 - 11.33			CS 21			Extremely weak, dark grey MUDSTONE, thinly to thickly laminated with grey SILTSTONE. Fractures are closely spaced, horizontal, inclined to vertical, planar, undulating to stepped, smooth to rough, very tight to open and incipient. (TYNE LIMESTONE FORMATION AND ALSTON FORMATION)			[Pattern]	[Pattern]
11.00 - 12.50	100 100 24							11.78 +83.57		
12.50 - 12.61		NI 80 210	CS 22			END OF EXPLORATORY HOLE			[Pattern]	[Pattern]
12.61 - 12.70			CS 23							
12.50 - 14.00	97 97 15							(3.22)		
13.66 - 13.72			CS 24							
14.07 - 14.12			CS 25							
14.00 - 15.00	95 87 50		Flush: 14.00 - 15.00 Water 0%							
14.50 - 14.60			CS 26	17/07/18 5.00	1230 Dry					
								15.00 +80.35		

Groundwater Entries				Depth Related Remarks				Chiselling Details		
No.	Depth	Strike	Remarks	Depth Sealed	Depths (m)	Remarks	Depths (m)	Duration (mins)	Tools used	

Trial Pit Log



Logged PC Checked AW Approved TC	Start 27/09/2018 End 27/09/2018	Equipment, Methods and Remarks Wheeled backhoe. Machine excavated pit.	Dimension and Orientation Width 0.70 m Length 3.20 m 	Ground Level 62.53 mOD Coordinates (m) E 419610.97 National Grid N 615596.11
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Samples and Tests Strata Description

Depth	Type & No.	Records	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.20 0.20	ES2 D1		Brown sandy silty CLAY. (TOPSOIL)		(0.30) +62.23		
0.40 0.40 0.50 - 1.00	ES4 D3 B5		Firm to stiff orangish brown, mottled grey, slightly gravelly sandy CLAY. Gravel is subangular to subrounded fine to coarse of sandstone, mudstone and occasional coal. (GLACIAL TILL)	0.70 occasional subrounded cobble of sandstone. 1.00-1.20 frequent pockets of silty fine sand (up to 300mm)	(1.60)		
1.90 2.00 - 2.50	D6 B7		Stiff grey sandy gravelly CLAY. Gravel is subangular to subrounded fine to coarse of sandstone and mudstone. (GLACIAL TILL)	1.60 1 no. subangular boulder of sandstone (300mm)	1.90 +60.63		
2.90 3.00 - 3.50	D8 B9			2.70 frequent subrounded sandstone boulders (up to 500mm)	(1.90)		
		27/09/18 Dry					
			END OF EXPLORATORY HOLE		3.80 +58.73		

Groundwater Entries No. Depth Strike (m) Remarks	Remarks Depth (m) Remarks 0.00 - 3.80 No groundwater encountered during excavation.	Stability Stable Shoring None Weather Dry
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Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. Scale 1:25 © Copyright SOCOTEC UK Limited 28/03/2019 15:36:16	Project A1IN MORPETH TO FELTON & ALNWICK TO ELLINGHAM Project No. A8013-18 Carried out for Geoffrey Osborne Limited	Trial Pit <h2 style="text-align: center;">TP/17/01</h2> Sheet 1 of 1
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Trial Pit Log



Logged MC Checked PH Approved TC	Start 19/07/2018 End 19/07/2018	Equipment, Methods and Remarks 8T tracked excavator. Machine excavated.	Dimension and Orientation Width 0.60 m Length 4.00 m 	Ground Level 67.41 mOD Coordinates (m) E 419493.02 National Grid N 615906.04
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Samples and Tests		Strata Description					
Depth	Type & No.	Records	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.10 0.10 - 0.30 0.20	ES1 B1 D1		Brown slightly sandy slightly gravelly CLAY. Gravel is angular to subangular fine to coarse of sandstone. (TOPSOIL) Firm brown slightly gravelly sandy SILT with medium cobble and low boulder content. Gravel is subangular to subrounded fine to coarse of sandstone. Cobbles are subrounded, occasionally tabular, of sandstone. Boulders (<0.30m) are subrounded. (GLACIAL TILL)		0.10 (0.10) +67.31		
0.70 - 1.00 0.80	B2 D2				(0.90)		
1.10	ES2		Firm to stiff, mottled grey and brown, slightly sandy gravelly CLAY with medium cobble and low boulder content. Gravel is subangular to subrounded fine to coarse of sandstone. Cobbles are subrounded of sandstone. Boulders (<0.40m) are subrounded of sandstone. (GLACIAL TILL)		1.00 +66.41		
1.50 - 1.80	B3				(1.20)		
1.80	D3	19/07/18		1.80-2.20 increased boulder content. Pit becoming unstable and collapsing.			
			END OF EXPLORATORY HOLE		2.20 +65.21		

Groundwater Entries <table border="1"> <thead> <tr> <th>No.</th> <th>Depth</th> <th>Strike (m)</th> <th>Remarks</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>1.40</td> <td></td> <td></td> </tr> </tbody> </table>	No.	Depth	Strike (m)	Remarks	1	1.40			Remarks <table border="1"> <thead> <tr> <th>Depth (m)</th> <th>Remarks</th> </tr> </thead> <tbody> <tr> <td>0.00 - 2.20</td> <td>Strata too gravelly for hand vanes.</td> </tr> <tr> <td>2.20</td> <td>Trial pit terminated due to collapse.</td> </tr> </tbody> </table>	Depth (m)	Remarks	0.00 - 2.20	Strata too gravelly for hand vanes.	2.20	Trial pit terminated due to collapse.	Stability Unstable Shoring None Weather Warm, dry, cloudy
No.	Depth	Strike (m)	Remarks													
1	1.40															
Depth (m)	Remarks															
0.00 - 2.20	Strata too gravelly for hand vanes.															
2.20	Trial pit terminated due to collapse.															

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. Scale 1:25 © Copyright SOCOTEC UK Limited 28/03/2019 15:36:16	Project A11N MORPETH TO FELTON & ALNWICK TO ELLINGHAM Project No. A8013-18 Carried out for Geoffrey Osborne Limited	Trial Pit <h2>TP/17/02</h2> Sheet 1 of 1
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Trial Pit Log



Logged MC Checked PH Approved TC	Start 18/07/2018 End 18/07/2018	Equipment, Methods and Remarks 8T tracked excavator. Machine excavated.	Dimension and Orientation Width 0.60 m Length 5.20 m 	Ground Level 75.05 mOD Coordinates (m) E 419404.00 National Grid N 616132.00
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Samples and Tests Strata Description

Depth	Type & No.	Records	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.10	ES1		Brown slightly sandy slightly gravelly silty CLAY with frequent rootlets. Gravel is angular to subangular, fine to coarse of sandstone. (TOPSOIL)		(0.15)		
0.20	D1		Stiff brown, mottled grey, slightly sandy gravelly CLAY with low cobble content. Gravel is subangular to subrounded fine to coarse sandstone. Cobbles are subrounded of sandstone. (GLACIAL TILL)		0.15 +74.90		
0.50 - 0.80	B1				(0.75)		
0.60	D2						
1.20	ES2		Stiff grey, mottled light brown, slightly sandy gravelly CLAY with low to medium cobble and boulder content. Gravel is subangular to subrounded, fine to coarse of sandstone. Cobbles are subangular to subrounded of sandstone. Boulders (<0.50m) are subrounded of sandstone. (GLACIAL TILL)		0.90 +74.15		
1.20	D3						
1.20 - 1.50	B2				(1.50)		
2.40 - 2.60	B3		Very stiff, mottled light grey and brown, slightly sandy gravelly CLAY. Gravel is subangular to subrounded fine to coarse of sandstone. (GLACIAL TILL)		2.40 +72.65		
2.50	D4				(0.30)		
2.80 - 3.10	B4		Stiff dark brown gravelly CLAY with low to medium cobble content. Gravel is subrounded fine to coarse of various lithologies. Cobbles are subrounded of various lithologies. (GLACIAL TILL)		2.70 +72.35		
2.90	D5				(1.10)		
3.50 - 3.80	B5	18/07/18					
3.70	D6	Dry					
			END OF EXPLORATORY HOLE		3.80 +71.25		

Groundwater Entries No. Depth Strike (m) Remarks	Remarks Depth (m) Remarks 0.00 - 3.80 No groundwater encountered during excavation. 0.01 - 3.80 Strata too gravelly for hand vanes.	Stability Stable Shoring None Weather Warm, dry, slightly cloudy.
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Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. Scale 1:25 © Copyright SOCOTEC UK Limited 	Project A11N MORPETH TO FELTON & ALNWICK TO ELLINGHAM Project No. A8013-18 Carried out for Geoffrey Osborne Limited	Trial Pit <h3>TP/17/03</h3> Sheet 1 of 1
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Trial Pit Log



Logged MC Checked PH Approved TC	Start 18/07/2018 End 18/07/2018	Equipment, Methods and Remarks BT tracked excavator. Machine excavated.	Dimension and Orientation Width 0.60 m Length 4.20 m 	Ground Level 76.57 mOD Coordinates (m) E 419348.00 National Grid N 616290.02
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Samples and Tests Strata Description

Depth	Type & No.	Records	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.00 - 0.20	B1	18/07/18	Firm brown slightly sandy slightly gravelly CLAY with frequent rootlets. Gravel is angular to subangular, fine to medium of sandstone. (TOPSOIL)		(0.20)		
0.10	ES1				0.20 +76.37		
0.20	D1		Stiff brown, mottled grey, slightly sandy slightly gravelly CLAY with low to medium cobble and boulder content. Gravel is subangular to subrounded fine to coarse sandstone. Cobbles and boulders are subrounded of sandstone. (GLACIAL TILL)		(0.35)		
0.60 - 0.90	B2		Stiff grey, mottled dark greyish brown, slightly sandy gravelly CLAY with low to medium cobble and boulder content. Gravel is subangular to subrounded, fine to coarse of sandstone. Cobbles are subrounded of sandstone. Boulders are <0.40m, subrounded of sandstone. (GLACIAL TILL)		0.55 +76.02		
0.80	D2				(0.65)		1 ∞
			END OF EXPLORATORY HOLE	1-20 100mm diameter perforated plastic land drain, direction approximately North east to south west	1.20 +75.37		

Groundwater Entries <table border="1"> <tr> <th>No.</th> <th>Depth</th> <th>Strike (m)</th> <th>Remarks</th> </tr> <tr> <td>1</td> <td>0.90</td> <td></td> <td>Slight inflow.</td> </tr> </table>	No.	Depth	Strike (m)	Remarks	1	0.90		Slight inflow.	Remarks <table border="1"> <tr> <th>Depth (m)</th> <th>Remarks</th> </tr> <tr> <td>0.00 - 1.20</td> <td>Strata too gravelly for hand vanes.</td> </tr> <tr> <td>1.20</td> <td>Trial pit terminated on encountering perforated plastic land drain.</td> </tr> </table>	Depth (m)	Remarks	0.00 - 1.20	Strata too gravelly for hand vanes.	1.20	Trial pit terminated on encountering perforated plastic land drain.	Stability Stable Shoring None Weather Warm, dry, cloudy
No.	Depth	Strike (m)	Remarks													
1	0.90		Slight inflow.													
Depth (m)	Remarks															
0.00 - 1.20	Strata too gravelly for hand vanes.															
1.20	Trial pit terminated on encountering perforated plastic land drain.															

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. Scale 1:25 © Copyright SOCOTEC UK Limited 28/03/2019 15:36:17	Project A11N MORPETH TO FELTON & ALNWICK TO ELLINGHAM Project No. A8013-18 Carried out for Geoffrey Osborne Limited	Trial Pit <h2>TP/17/04</h2> Sheet 1 of 1
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Trial Pit Log



Logged MC Checked PH Approved TC	Start 18/07/2018 End 18/07/2018	Equipment, Methods and Remarks 8T tracked excavator. Machine excavated.	Dimension and Orientation Width 0.60 m Length 4.00 m  60 (Deg)	Ground Level 79.85 mOD Coordinates (m) E 419397.98 National Grid N 616485.39
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Samples and Tests Strata Description

Depth	Type & No.	Records	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.10	ES1		Brown sandy very gravelly CLAY. (MADE GROUND)		(0.20)		
0.30 - 0.50	B1		Firm to stiff brown, mottled orange and grey slightly sandy slightly gravelly CLAY with low cobble and boulder content. Rare fragments of broken brick. Gravel is angular to subrounded fine to coarse of sandstone. Boulders (<0.30m) are subrounded of sandstone. (MADE GROUND)		0.20 +79.65		
0.50	D1					(0.80)	
1.00	ES2		Stiff brown, mottled grey, slightly sandy slightly gravelly CLAY with low cobble content. Gravel is subangular to subrounded fine to coarse of sandstone. Cobbles are subangular to subrounded of sandstone. (GLACIAL TILL)		1.00 +78.85		
1.20 - 1.40	B2					(0.60)	
1.40	D2		Stiff dark grey slightly sandy slightly gravelly CLAY with low cobble content. Gravel is subangular to subrounded fine to coarse of dark grey sandstone and mudstone. Cobbles are subangular to subrounded of sandstone, mudstone and limestone. (GLACIAL TILL)		1.60 +78.25		
2.50 - 2.70	B3					(2.00)	
2.70	D3						
3.20 - 3.40	B4						
3.40	D4	18/07/18 Dry					
END OF EXPLORATORY HOLE					3.60 +76.25		

Groundwater Entries No. Depth Strike (m) Remarks	Remarks Depth (m) Remarks 0.00 - 3.60 No groundwater encountered during excavation. 0.01 - 3.60 Strata too gravelly for hand vanes. 3.60 Trial pit terminated due to maximum reach of excavator.	Stability Stable Shoring None Weather Warm, cloudy, light showers
Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. Scale 1:25 © Copyright SOCOTEC UK Limited 28/03/2019 15:36:17	Project A11N MORPETH TO FELTON & ALNWICK TO ELLINGHAM Project No. A8013-18 Carried out for Geoffrey Osborne Limited	Trial Pit <div style="text-align: center; font-size: 1.2em;">TP/17/05</div> Sheet 1 of 1

Trial Pit Log



Logged MC Checked PH Approved TC	Start 26/07/2018 End 26/07/2018	Equipment, Methods and Remarks 8T tracked excavator. Machine excavated.	Dimension and Orientation Width 0.60 m Length 3.80 m 	Ground Level 88.55 mOD Coordinates (m) E 419177.94 National Grid N 616379.03
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Samples and Tests Strata Description

Depth	Type & No.	Records	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.10	ES1		Brown slightly gravelly sandy CLAY with some cobbles of sandstone. (TOPSOIL)		(0.20)		
0.60	ES2		Firm grey, mottled brown, slightly gravelly sandy silty CLAY with low to medium cobble content. Gravel is angular to subrounded fine to coarse of sandstone and limestone. Cobbles are subangular to subrounded of sandstone. (GLACIAL TILL)		0.20 +88.35		
0.90 - 1.20	B3				(1.00)		
1.20	D4		Firm to stiff dark grey slightly sandy slightly gravelly CLAY with low cobble content. Gravel is subangular to subrounded fine to coarse of sandstone and mudstone. Cobbles are subangular to subrounded of sandstone and mudstone. (GLACIAL TILL)	1.40 boulder 0.60x0.30m	1.20 +87.35		
2.20 - 2.40	B5				(2.30)		
2.40	D6						
3.00 - 3.30	B7						
3.20	D8	26/07/18 Dry					
			END OF EXPLORATORY HOLE		3.50 +85.05		

Groundwater Entries No. Depth Strike (m) Remarks	Remarks Depth (m) Remarks 0.00 - 3.50 No groundwater encountered during excavation. 0.01 - 3.50 Strata too gravelly for hand vanes. 3.50 Trial pit terminated due to becoming stiff, maximum reach of excavator.	Stability Stable Shoring None Weather Warm, dry, cloudy
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Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. Scale 1:25 © Copyright SOCOTEC UK Limited 28/03/2019 15:36:18	Project A11N MORPETH TO FELTON & ALNWICK TO ELLINGHAM Project No. A8013-18 Carried out for Geoffrey Osborne Limited	Trial Pit <h2 style="text-align: center;">TP/17/06</h2> Sheet 1 of 1
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Trial Pit Log



Logged MC Checked PH Approved TC	Start 20/07/2018 End 20/07/2018	Equipment, Methods and Remarks 8T tracked 360 excavator. Machine excavated.	Dimension and Orientation Width 0.60 m Length 4.00 m 	Ground Level 83.51 mOD Coordinates (m) E 419223.12 National Grid N 616625.98
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Samples and Tests Strata Description

Depth	Type & No.	Records	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.10	ES1		Brown slightly sandy slightly gravelly CLAY. Gravel is angular to subangular, fine to coarse sandstone. (TOPSOIL)		(0.30)		
0.20 - 0.50	B1				0.30 +83.21		
0.50	D1		Firm to stiff brown, mottled orangish brown/grey slightly sandy slightly gravelly CLAY with low cobble content. Gravel is subangular to subrounded of sandstone and mudstone. Cobbles are of sandstone. (GLACIAL TILL)		(0.50)		
					0.80 +82.71		
1.20 - 1.40	B2		Stiff dark grey slightly sandy slightly gravelly silty CLAY with low to medium cobble content. Gravel is subangular to subrounded fine to coarse of sandstone and mudstone. Cobbles are subangular to subrounded of sandstone. (WEATHERED MUDSTONE/SANDSTONE)		(0.70)		
1.40	D2				1.50 +82.01		
1.80 - 2.00	B3						
2.00	D3				(1.10)		
		20/07/18 Dry					
			END OF EXPLORATORY HOLE	2.60 grey sandstone	2.60 +80.91		

Groundwater Entries No. Depth Strike (m) Remarks	Remarks Depth (m) Remarks 0.00 - 2.60 No groundwater encountered during excavation. 0.01 - 2.60 Strata too gravelly for hand vanes. 2.60 Trial pit terminated due to top of bedrock.	Stability Stable Shoring None Weather Warm, cloudy, showers
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Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. Scale 1:25 © Copyright SOCOTEC UK Limited 28/03/2019 15:36:18	Project A11N MORPETH TO FELTON & ALNWICK TO ELLINGHAM Project No. A8013-18 Carried out for Geoffrey Osborne Limited	Trial Pit <h2 style="text-align: center;">TP/17/07</h2> Sheet 1 of 1
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Trial Pit Log



Logged PC Checked PC Approved TC	Start 26/09/2018 End 26/09/2018	Equipment, Methods and Remarks Wheeled backhoe. Machine excavated pit. Soakaway test carried out.	Dimension and Orientation Width 0.70 m Length 1.50 m 	Ground Level 87.97 mOD Coordinates (m) E 419145.99 National Grid N 616626.00
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Samples and Tests			Strata Description				
Depth	Type & No.	Records	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.20 0.20	ES2 D1		Brown slightly sandy slightly gravelly CLAY. Gravel is subangular fine to medium of sandstone. (TOPSOIL)		(0.30)		
0.40 0.40 0.40 - 1.00	ES4 D3 B5		Firm to stiff orangish brown, mottled grey, slightly sandy gravelly CLAY. Gravel is subangular to rounded fine to coarse of sandstone, mudstone and rare coal. (GLACIAL TILL)		0.30 +87.67		
		26/09/18 Dry		1.10 1no. subrounded boulder of sandstone. (approximately 300mm)	(1.20)		
			END OF EXPLORATORY HOLE		1.50 +86.47		

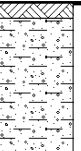
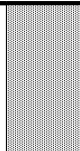
Groundwater Entries No. Depth Strike (m) Remarks	Remarks Depth (m) Remarks 0.00 - 1.50 No groundwater encountered during excavation.	Stability Stable Shoring None Weather Windy
Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. Scale 1:25 © Copyright SOCOTEC UK Limited 28/03/2019 15:36:18	Project A11N MORPETH TO FELTON & ALNWICK TO ELLINGHAM Project No. A8013-18 Carried out for Geoffrey Osborne Limited	Trial Pit TP/17/08 Sheet 1 of 1

Trial Pit Log



Logged MC Checked PH Approved TC	Start 23/07/2018 End 23/07/2018	Equipment, Methods and Remarks 8T tracked excavator. Machine excavated.	Dimension and Orientation Width 0.60 m Length 4.00 m 	Ground Level 95.60 mOD Coordinates (m) E 418939.96 National Grid N 617379.99
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Samples and Tests		Strata Description		
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Depth	Type & No.	Records	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.20	ES1	23/07/18 Dry	Brown slightly sandy CLAY. (TOPSOIL) Firm to stiff brown, mottled orangish brown/grey, slightly sandy slightly gravelly CLAY with low cobble content. Gravel is angular to subangular, fine to coarse of sandstone. Cobbles are subrounded of sandstone. (GLACIAL TILL)		0.05 (0.05) +95.55 (0.45) 0.50 +95.10		
			END OF EXPLORATORY HOLE				

Groundwater Entries No. Depth Strike (m) Remarks	Remarks Depth (m) 0.00 - 0.50 0.50 No groundwater encountered during excavation. Trial pit terminated due to possible service, relocated and designated TP/17/09A.	Stability Stable Shoring None Weather Warm, cloudy
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Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. Scale 1:25 © Copyright SOCOTEC UK Limited 28/03/2019 15:36:19	Project A11N MORPETH TO FELTON & ALNWICK TO ELLINGHAM Project No. A8013-18 Carried out for Geoffrey Osborne Limited	Trial Pit <h2>TP/17/09</h2> Sheet 1 of 1
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Trial Pit Log



Logged PC Checked PC Approved TC	Start 26/09/2018 End 26/09/2018	Equipment, Methods and Remarks Wheeled backhoe. Machine excavated pit.	Dimension and Orientation Width 0.70 m Length 3.80 m 	Ground Level 95.68 mOD Coordinates (m) E 418937.98 National Grid N 617383.15
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Samples and Tests Strata Description

Depth	Type & No.	Records	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.20 0.20	ES2 D1		Soft brown slightly sandy slightly gravelly CLAY. Gravel is subrounded fine to medium of sandstone. Frequent rootlets. (TOPSOIL)		(0.20) 0.20 +95.48		
0.40 0.40 0.50 - 1.00	ES4 D3 B5		Firm to stiff orange, mottled grey, slightly gravelly sandy CLAY. Gravel is subangular to subrounded fine to coarse of sandstone and mudstone. (GLACIAL TILL)		(2.00)		
1.50	D6			1.20 occasional subrounded cobble of sandstone 1.30 4 no. rounded boulders of sandstone (500mm)			
2.20 - 2.30	B7	26/09/18	Grey gravelly very silty SAND. Gravel is subangular to subrounded fine to coarse of sandstone and mudstone.		2.20 (0.10) +93.48 2.30 +93.38		
			END OF EXPLORATORY HOLE				

Groundwater Entries <table border="1"> <thead> <tr> <th>No.</th> <th>Depth</th> <th>Strike (m)</th> <th>Remarks</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>2.30</td> <td></td> <td>Seepage.</td> </tr> </tbody> </table>	No.	Depth	Strike (m)	Remarks	1	2.30		Seepage.	Remarks <table border="1"> <thead> <tr> <th>Depth (m)</th> <th>Remarks</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> </tr> </tbody> </table>	Depth (m)	Remarks			Stability Stable Shoring None Weather Dry, sunny
No.	Depth	Strike (m)	Remarks											
1	2.30		Seepage.											
Depth (m)	Remarks													

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. Scale 1:25 © Copyright SOCOTEC UK Limited 28/03/2019 15:36:19	Project A11N MORPETH TO FELTON & ALNWICK TO ELLINGHAM Project No. A8013-18 Carried out for Geoffrey Osborne Limited	Trial Pit TP/17/09A Sheet 1 of 1
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Trial Pit Log



Logged MC Checked PH Approved TC	Start 23/07/2018 End 23/07/2018	Equipment, Methods and Remarks BT tracked excavator. Machine excavated.	Dimension and Orientation Width 0.60 m Length 4.00 m 	Ground Level 101.32 mOD Coordinates (m) E 418866.99 National Grid N 617568.92
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Samples and Tests Strata Description

Depth	Type & No.	Records	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.20	ES1		Brown slightly sandy CLAY. (TOPSOIL)		(0.20) 0.20 +101.12		
1.00	ES2		Firm to stiff grey, mottled orangish brown, slightly gravelly sandy CLAY with low cobble content. Gravel is subangular to subrounded fine to coarse of sandstone. Cobbles are subangular to subrounded of sandstone. (GLACIAL TILL)		(1.40)		
1.10 - 1.40	B1						
1.40	D1						
2.20 - 2.50	B2		Stiff brown slightly sandy slightly gravelly CLAY with low cobble and boulder content. Gravel is angular to subangular, fine to coarse of sandstone. Cobbles and boulders are of sandstone. (GLACIAL TILL)		1.60 +99.72 (1.20)		
2.50	D2						
3.00 - 3.20	B3		Stiff dark grey slightly sandy gravelly silty CLAY. Gravel is angular to subangular, fine to coarse of sandstone. (GLACIAL TILL)		2.80 +98.52 (0.40)		
3.20	D3	23/07/18	Firm grey slightly sandy very gravelly CLAY. Gravel is angular to subrounded, fine to coarse of sandstone. (GLACIAL TILL)		3.20 +98.12 (0.30)		1
			END OF EXPLORATORY HOLE		3.50 +97.82		

Groundwater Entries <table border="1"> <thead> <tr> <th>No.</th> <th>Depth</th> <th>Strike (m)</th> <th>Remarks</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>3.20</td> <td></td> <td>No rise in level.</td> </tr> </tbody> </table>	No.	Depth	Strike (m)	Remarks	1	3.20		No rise in level.	Remarks <table border="1"> <thead> <tr> <th>Depth (m)</th> <th>Remarks</th> </tr> </thead> <tbody> <tr> <td>0.00 - 3.50</td> <td>Strata too gravelly for hand vanes.</td> </tr> <tr> <td>3.50</td> <td>Trial pit terminated due to collapse.</td> </tr> </tbody> </table>	Depth (m)	Remarks	0.00 - 3.50	Strata too gravelly for hand vanes.	3.50	Trial pit terminated due to collapse.	Stability Collapsing below 3.20m Shoring None Weather
No.	Depth	Strike (m)	Remarks													
1	3.20		No rise in level.													
Depth (m)	Remarks															
0.00 - 3.50	Strata too gravelly for hand vanes.															
3.50	Trial pit terminated due to collapse.															

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. Scale 1:25 © Copyright SOCOTEC UK Limited 28/03/2019 15:36:19	Project A11N MORPETH TO FELTON & ALNWICK TO ELLINGHAM Project No. A8013-18 Carried out for Geoffrey Osborne Limited	TP/17/10 Sheet 1 of 1
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Trial Pit Log



Logged MC Checked PH Approved TC	Start 25/07/2018 End 25/07/2018	Equipment, Methods and Remarks 8T tracked 360 excavator. Machine excavated.	Dimension and Orientation Width 0.60 m Length 5.00 m 	Ground Level 106.27 mOD Coordinates (m) E 418777.80 National Grid N 617812.67
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Samples and Tests Strata Description

Depth	Type & No.	Records	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.20	ES1		Firm brown slightly sandy slightly gravelly CLAY with low cobble content. Gravel is subangular to subrounded fine to coarse of sandstone and limestone. Cobbles are subangular to subrounded of sandstone. (TOPSOIL)		(0.20) 0.20 +106.07		
0.80 - 1.00	B1		Firm grey, mottled brown and orangish brown slightly sandy slightly gravelly CLAY with low cobble content. Gravel is subangular to subrounded fine to coarse of sandstone. (GLACIAL TILL)		(0.30) 0.50 +105.77		
1.00	ES2		Firm grey, mottled brown, slightly sandy gravelly CLAY with low cobble content. Gravel is subangular to subrounded fine to coarse of sandstone. (GLACIAL TILL)		(1.10)		
1.00	D1						
1.80 - 2.00	B2		Firm to stiff dark greyish brown slightly sandy slightly gravelly CLAY with low cobble content. Gravel is subangular to subrounded, fine to coarse of sandstone. Cobbles are of sandstone. Frequent pockets (<10mm x 10mm) of orange and light grey fine to medium sand. (GLACIAL TILL)		1.60 +104.67 (0.50)		
2.00	D2						
2.10 - 2.40	B3		Soft to firm brown, mottled orangish brown and grey sandy very gravelly CLAY with medium cobble content and rare boulders. Gravel is subangular to subrounded fine to coarse. Cobbles are subangular to subrounded of sandstone and limestone. Boulders are subrounded of sandstone. (GLACIAL TILL)		2.10 +104.17 (0.50)		
2.40	D3	25/07/18					
			END OF EXPLORATORY HOLE	2.60 pale grey micaceous medium grained sandstone	2.60 +103.67		

Groundwater Entries <table border="1"> <thead> <tr> <th>No.</th> <th>Depth</th> <th>Strike (m)</th> <th>Remarks</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>2.10</td> <td></td> <td>Seepage.</td> </tr> </tbody> </table>	No.	Depth	Strike (m)	Remarks	1	2.10		Seepage.	Remarks <table border="1"> <thead> <tr> <th>Depth (m)</th> <th>Remarks</th> </tr> </thead> <tbody> <tr> <td>0.00 - 2.60</td> <td>Strata too gravelly for hand vanes.</td> </tr> <tr> <td>0.10 - 2.60</td> <td>Trial pit extended as unidentified signal trace located between GL and 1.20m.</td> </tr> <tr> <td>2.60</td> <td>Trial pit terminated at assumed rock head.</td> </tr> </tbody> </table>	Depth (m)	Remarks	0.00 - 2.60	Strata too gravelly for hand vanes.	0.10 - 2.60	Trial pit extended as unidentified signal trace located between GL and 1.20m.	2.60	Trial pit terminated at assumed rock head.	Stability Unstable Shoring None Weather Warm, dry, partial cloud
No.	Depth	Strike (m)	Remarks															
1	2.10		Seepage.															
Depth (m)	Remarks																	
0.00 - 2.60	Strata too gravelly for hand vanes.																	
0.10 - 2.60	Trial pit extended as unidentified signal trace located between GL and 1.20m.																	
2.60	Trial pit terminated at assumed rock head.																	

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. Scale 1:25 © Copyright SOCOTEC UK Limited 28/03/2019 15:36:19	Project A11N MORPETH TO FELTON & ALNWICK TO ELLINGHAM Project No. A8013-18 Carried out for Geoffrey Osborne Limited	Trial Pit <h3>TP/17/11</h3> Sheet 1 of 1
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Trial Pit Log



Logged RT Checked RT Approved TC	Start 05/09/2018 End 05/09/2018	Equipment, Methods and Remarks JCB 3CX. Machine excavated.	Dimension and Orientation Width 0.70 m Length 2.80 m 	Ground Level 103.01 mOD Coordinates (m) E 418597.93 National Grid N 618295.02
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Samples and Tests Strata Description

Depth	Type & No.	Records	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.00 - 0.20	B1		Soft to firm brown, locally mottled orangish brown, slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse of sandstone. (TOPSOIL)		(0.30)		
0.20	ES3				0.30	+102.71	
0.20	D2						
0.50	HV	p 194kPa, r 16kPa	Dark brown, mottled bluish grey, slightly sandy slightly gravelly CLAY with low to medium cobble and boulder content. Gravel is subangular to subrounded fine to coarse of sandstone and siltstone. Frequent lenses (50x20mm) of grey and orange fine to coarse sand. Cobbles and boulders are subangular to subrounded of medium grained sandstone. (GLACIAL TILL)				
0.50 - 1.60	B4						
0.60	D5						
0.70	ES6						
1.10	HV	p 217kPa, r N/A					
1.20	D7						
1.50 - 2.00	B8						
2.50	D9		Firm to stiff dark brownish grey slightly sandy gravelly CLAY with low cobble content. Gravel is subangular to subrounded fine to coarse of sandstone. Cobbles are subrounded of medium grained sandstone and black mudstone. (GLACIAL TILL)		2.30	+100.71	
2.50 - 3.00	B10						
					(0.70)		
3.00	D11	05/09/18	Yellowish brown SANDSTONE. Recovered as angular to subangular cobbles and weak angular to subangular fine to coarse gravel in a light brown clay matrix.		3.00	+100.01	
					(0.30)		
3.30	D12		END OF EXPLORATORY HOLE		3.30	+99.71	

Groundwater Entries <table border="1"> <thead> <tr> <th>No.</th> <th>Depth</th> <th>Strike (m)</th> <th>Remarks</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>2.80</td> <td></td> <td>Damp.</td> </tr> <tr> <td>2</td> <td>3.30</td> <td></td> <td>Rose to 3.10 m after 20 minutes.</td> </tr> </tbody> </table>	No.	Depth	Strike (m)	Remarks	1	2.80		Damp.	2	3.30		Rose to 3.10 m after 20 minutes.	Remarks <table border="1"> <thead> <tr> <th>Depth (m)</th> <th>Remarks</th> </tr> </thead> <tbody> <tr> <td>3.30</td> <td>Trial pit terminated due to suspected rock head and water inflow.</td> </tr> </tbody> </table>	Depth (m)	Remarks	3.30	Trial pit terminated due to suspected rock head and water inflow.	Stability Stable Shoring None Weather Dry, sunny
No.	Depth	Strike (m)	Remarks															
1	2.80		Damp.															
2	3.30		Rose to 3.10 m after 20 minutes.															
Depth (m)	Remarks																	
3.30	Trial pit terminated due to suspected rock head and water inflow.																	

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. Scale 1:25 © Copyright SOCOTEC UK Limited 28/03/2019 15:36:20	Project A11N MORPETH TO FELTON & ALNWICK TO ELLINGHAM Project No. A8013-18 Carried out for Geoffrey Osborne Limited	Trial Pit <h2>TP/17/12</h2> Sheet 1 of 1
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Trial Pit Log



Logged RT Checked RT Approved TC	Start 06/09/2018 End 06/09/2018	Equipment, Methods and Remarks JCB 3CX. Machine excavated.	Dimension and Orientation Width 0.70 m Length 2.90 m 	Ground Level 85.68 mOD Coordinates (m) E 418406.31 National Grid N 618804.09
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Samples and Tests Strata Description

Depth	Type & No.	Records	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.10 0.10	ES1 D2		Soft brown slightly gravelly sandy CLAY. Gravel is subangular to subrounded fine to coarse of medium grained sandstone. (TOPSOIL)		(0.30)		
0.30 - 0.50	B3		Stiff brown, mottled orangish brown and grey, sandy gravelly CLAY with low cobble content. Gravel is subangular to subrounded fine to coarse of sandstone. Cobbles are subrounded of grey and yellow medium grained sandstone. (GLACIAL TILL)		0.30 +85.38 (0.40)		
0.50 0.50 0.60	ES5 D4 HV	p 217kPa, r N/A			0.70 +84.98		
0.70 - 1.00	B6		Very stiff grey slightly sandy gravelly CLAY. Gravel is angular to subangular fine to coarse tabular of extremely weak yellowish brown and grey medium grained sandstone. Frequent cobbles of tabular sandstone (<10mm thick). (GLACIAL TILL)		(0.80)		
1.00 1.00 - 1.50	D7 B8				1.50 +84.18		
			Dark brown and grey SANDSTONE. Recovered as sandy slightly clayey tabular fine to coarse gravel. Occasional cobble sized fragments. (Possible SCREMERSTON COAL MEMBER)	1.70-2.20 becoming wet	(0.70)		
2.00	D9	06/09/18			2.20 +83.48		
			END OF EXPLORATORY HOLE				

Groundwater Entries <table border="1"> <thead> <tr> <th>No.</th> <th>Depth</th> <th>Strike (m)</th> <th>Remarks</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>2.20</td> <td></td> <td>Rose to 2.00 m after 20 minutes.</td> </tr> </tbody> </table>	No.	Depth	Strike (m)	Remarks	1	2.20		Rose to 2.00 m after 20 minutes.	Remarks <table border="1"> <thead> <tr> <th>Depth (m)</th> <th>Remarks</th> </tr> </thead> <tbody> <tr> <td>0.50</td> <td>Strata unsuitable for hand vanes.</td> </tr> <tr> <td>2.20</td> <td>Trial pit terminated due to water ingress.</td> </tr> </tbody> </table>	Depth (m)	Remarks	0.50	Strata unsuitable for hand vanes.	2.20	Trial pit terminated due to water ingress.	Stability Below 2.2m, unstable, slightly spalling Shoring None Weather Dry, sunny
No.	Depth	Strike (m)	Remarks													
1	2.20		Rose to 2.00 m after 20 minutes.													
Depth (m)	Remarks															
0.50	Strata unsuitable for hand vanes.															
2.20	Trial pit terminated due to water ingress.															

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. Scale 1:25 © Copyright SOCOTEC UK Limited 28/03/2019 15:36:20	Project A11N MORPETH TO FELTON & ALNWICK TO ELLINGHAM Project No. A8013-18 Carried out for Geoffrey Osborne Limited	TP/17/13 Sheet 1 of 1
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Trial Pit Log



Logged PC Checked AW Approved TC	Start 27/09/2018 End 27/09/2018	Equipment, Methods and Remarks Wheeled backhoe. Machine excavated pit. Soakaway test carried out.	Dimension and Orientation Width 0.07 m Length 1.65 m 	Ground Level 87.15 mOD Coordinates (m) E 418304.29 National Grid N 618856.48
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Samples and Tests Strata Description

Depth	Type & No.	Records	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.20 0.20	ES2 D1		Brown slightly gravelly silty fine to medium SAND. Gravel is subrounded fine to medium of sandstone. Frequent rootlets. (TOPSOIL)		(0.50)		
0.60 0.60	ES4 D3		Orangish brown gravelly very silty fine to medium SAND with low cobble content. Gravel is subrounded to rounded fine to coarse of sandstone. Cobbles are subrounded of sandstone. (POSSIBLE ALLUVIAL DEPOSITS)		0.50 +86.65 (0.60)		
1.10 1.10 - 1.50	D5 B6	27/09/18 Dry	Orange, mottled grey, very gravelly very silty fine to medium SAND. Gravel is subrounded fine to coarse of sandstone. (POSSIBLE ALLUVIAL DEPOSITS)		1.10 +86.05 (0.60)		
			END OF EXPLORATORY HOLE		1.70 +85.45		

Groundwater Entries No. Depth Strike (m) Remarks	Remarks Depth (m) Remarks 0.00 - 1.70 No groundwater encountered during excavation.	Stability Stable Shoring None Weather Windy
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Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. Scale 1:25 © Copyright SOCOTEC UK Limited 28/03/2019 15:36:20	Project A11N MORPETH TO FELTON & ALNWICK TO ELLINGHAM Project No. A8013-18 Carried out for Geoffrey Osborne Limited	Trial Pit <h2 style="text-align: center;">TP/17/14</h2> Sheet 1 of 1
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Trial Pit Log



Logged RT Checked AW Approved TC	Start 06/09/2018 End 06/09/2018	Equipment, Methods and Remarks JCB 3CX. Machine excavated.	Dimension and Orientation Width 0.70 m Length 2.90 m 	Ground Level 85.30 mOD Coordinates (m) E 418326.24 National Grid N 619007.74
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Samples and Tests Strata Description

Depth	Type & No.	Records	Main	Detail	Depth, Level (Thickness)	Legend	Backfill	
0.10	D1	p 202kPa, r 78kPa	Soft to firm dark brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse of dark grey medium grained sandstone. (TOPSOIL)		(0.35)			
0.20	ES2							
0.40 - 0.60	B5		Firm to stiff grey and brown, mottled orangish brown and black, slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse of sandstone and lignite. Frequent rootlets. Frequent pockets (30x20mm) of orange and grey fine to coarse sand. (GLACIAL TILL)		0.35	+84.95		
0.50	HV							
0.50	ES4 D3							
1.00 - 1.20	B6	Firm dark grey very sandy CLAY. Frequent pockets and lenses (<60mm) of orange fine to coarse sand. (GLACIAL TILL)		1.00	+84.30			
1.20	D7							
1.60	D8	Soft grey sandy CLAY. Frequent bands (<3mm thick) of black fine to coarse sand size possible coal. (GLACIAL DEPOSITS)			1.60	+83.70		
1.60 - 2.00	B9							
2.50	D10	06/09/18			(1.00)			
			END OF EXPLORATORY HOLE		2.60	+82.70		

Groundwater Entries <table border="1"> <thead> <tr> <th>No.</th> <th>Depth</th> <th>Strike (m)</th> <th>Remarks</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>2.60</td> <td></td> <td>Rose to 2.00 m after 20 minutes. Fast inflow.</td> </tr> </tbody> </table>	No.	Depth	Strike (m)	Remarks	1	2.60		Rose to 2.00 m after 20 minutes. Fast inflow.	Remarks <table border="1"> <thead> <tr> <th>Depth (m)</th> <th>Remarks</th> </tr> </thead> <tbody> <tr> <td>1.00 - 2.60</td> <td>Strata unsuitable for hand vanes.</td> </tr> </tbody> </table>	Depth (m)	Remarks	1.00 - 2.60	Strata unsuitable for hand vanes.	Stability Below 2.00m, collapsing Shoring None Weather Dry, sunny, cloudy
No.	Depth	Strike (m)	Remarks											
1	2.60		Rose to 2.00 m after 20 minutes. Fast inflow.											
Depth (m)	Remarks													
1.00 - 2.60	Strata unsuitable for hand vanes.													

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. Scale 1:25 © Copyright SOCOTEC UK Limited 28/03/2019 15:36:21	Project A11N MORPETH TO FELTON & ALNWICK TO ELLINGHAM Project No. A8013-18 Carried out for Geoffrey Osborne Limited	Trial Pit <h2>TP/17/15</h2> Sheet 1 of 1
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Trial Pit Log



Logged RT Checked AW Approved TC	Start 06/09/2018 End 06/09/2018	Equipment, Methods and Remarks JCB 3CX. Machine excavated.	Dimension and Orientation Width 0.70 m Length 2.90 m 	Ground Level 85.88 mOD Coordinates (m) E 418259.45 National Grid N 619186.73
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Samples and Tests		Strata Description					
Depth	Type & No.	Records	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.10 0.10	ES2 D1		Soft to firm dark brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse of sandstone. Occasional pockets (<10mm) of yellow lightly cemented fine to coarse sand. (TOPSOIL)		(0.30)		
0.50 0.50 - 0.70 0.60	D4 B3 ES5		Firm brown, mottled orangish brown, sandy gravelly CLAY with low to medium cobble content. Gravel is subangular to subrounded fine to coarse of sandstone and lignite. Cobbles are subrounded to rounded of sandstone. (GLACIAL TILL)		0.30 +85.58 (0.40)		
1.00 1.00 - 1.20	D6 B7		Firm greyish brown, mottled orangish brown and brown slightly sandy gravelly CLAY. Gravel is subangular to rounded fine to coarse of sandstone and lignite/coal. (GLACIAL TILL)		0.70 +85.18 (0.30)		
1.30 - 1.80	B8		Brown and dark grey gravelly slightly clayey fine to coarse SAND with low cobble content. Gravel is subangular to subrounded fine to coarse of sandstone and limestone. Cobbles are subrounded to rounded of sandstone. (GLACIAL DEPOSITS)		1.00 +84.88 (0.30)		
		06/09/18	Brown and orangish brown clayey fine to coarse SAND. (GLACIAL DEPOSITS)		1.30 +84.58 (1.00)		
			END OF EXPLORATORY HOLE		2.30 +83.58		

Groundwater Entries No. Depth Strike (m) Remarks 1 2.10 Seepage.	Remarks Depth (m) Remarks 0.00 - 2.30 Strata unsuitable for hand vanes. 2.30 Trial pit terminated due to collapse.	Stability Below 1.30m, unstable. Shoring None Weather Dry, sunny
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Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. Scale 1:25 © Copyright SOCOTEC UK Limited 28/03/2019 15:36:21	Project A11N MORPETH TO FELTON & ALNWICK TO ELLINGHAM Project No. A8013-18 Carried out for Geoffrey Osborne Limited	TP/17/16 Sheet 1 of 1
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Trial Pit Log



Logged RT Checked AW Approved TC	Start 07/09/2018 End 07/09/2018	Equipment, Methods and Remarks JCB 3CX. Machine excavated.	Dimension and Orientation Width 0.70 m Length 3.20 m 	Ground Level 85.46 mOD Coordinates (m) E 418215.17 National Grid N 619302.90
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Samples and Tests Strata Description

Depth	Type & No.	Records	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.10	D1		Soft to firm dark brown sandy CLAY with rare subangular to subrounded fine to coarse gravel of sandstone. (TOPSOIL)		(0.30)		
0.20	ES2						
0.30	D3						
0.30 - 0.50	B5		Firm bluish grey, mottled orange, sandy CLAY with frequent lenses (<50mm) of orange fine to medium sand. (GLACIAL TILL)		0.30 +85.16		
0.50	HV	p 75kPa, r 34kPa					
0.50	ES4						
1.00	HV	p 52kPa, r 18kPa					
1.00 - 1.20	B6		Soft grey, mottled dark grey, very sandy CLAY with rare wood fragments (<20mm). (GLACIAL TILL)		1.00 +84.46		
1.20	D7						
1.50 - 1.70	B8	07/09/18					
			END OF EXPLORATORY HOLE		1.70 +83.76		

Groundwater Entries <table border="1"> <thead> <tr> <th>No.</th> <th>Depth</th> <th>Strike (m)</th> <th>Remarks</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>1.70</td> <td></td> <td>Rose to 1.40 m after 20 minutes. Fast inflow.</td> </tr> </tbody> </table>	No.	Depth	Strike (m)	Remarks	1	1.70		Rose to 1.40 m after 20 minutes. Fast inflow.	Remarks <table border="1"> <thead> <tr> <th>Depth (m)</th> <th>Remarks</th> </tr> </thead> <tbody> <tr> <td>1.70</td> <td>Trial pit terminated due to fast water inflow.</td> </tr> </tbody> </table>	Depth (m)	Remarks	1.70	Trial pit terminated due to fast water inflow.	Stability Stable Shoring None Weather Overcast, windy
No.	Depth	Strike (m)	Remarks											
1	1.70		Rose to 1.40 m after 20 minutes. Fast inflow.											
Depth (m)	Remarks													
1.70	Trial pit terminated due to fast water inflow.													

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. Scale 1:25 © Copyright SOCOTEC UK Limited 28/03/2019 15:36:21	Project A11N MORPETH TO FELTON & ALNWICK TO ELLINGHAM Project No. A8013-18 Carried out for Geoffrey Osborne Limited	Trial Pit <h2>TP/17/17</h2> Sheet 1 of 1
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Trial Pit Log



Logged RT Checked AW Approved TC	Start 07/09/2018 End 07/09/2018	Equipment, Methods and Remarks JCB 3CX. Machine excavated.	Dimension and Orientation Width 0.70 m Length 3.40 m 	Ground Level 86.77 mOD Coordinates (m) E 418175.68 National Grid N 619403.84
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Samples and Tests Strata Description

Depth	Type & No.	Records	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.10	D1		Soft dark brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse of yellow medium grained sandstone. Occasional to frequent rootlets. (TOPSOIL)		(0.25)		
0.20	ES2				0.25	+86.52	
0.30	D3			Stiff orangish brown gravelly very sandy CLAY. Gravel is subangular to subrounded fine to coarse of pink, yellow and grey sandstone. (GLACIAL TILL)		(1.15)	
0.50 0.50 - 1.00	ES4 BS						
1.40 1.40 - 1.80	D6 B7		Light brown, mottled reddish brown, slightly gravelly very silty fine to coarse SAND. Gravel is subangular fine to medium of sandstone and siltstone. (GLACIAL DEPOSITS)		1.40	+85.37	
		07/09/18				(1.00)	
2.40 2.40 - 2.80	D8 B9		Greyish brown fine to coarse very silty SAND. (GLACIAL DEPOSITS)		2.40	+84.37	1
						(0.60)	
			END OF EXPLORATORY HOLE		3.00	+83.77	

Groundwater Entries <table border="1"> <thead> <tr> <th>No.</th> <th>Depth</th> <th>Strike (m)</th> <th>Remarks</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>2.40</td> <td></td> <td>Wet.</td> </tr> </tbody> </table>	No.	Depth	Strike (m)	Remarks	1	2.40		Wet.	Remarks <table border="1"> <thead> <tr> <th>Depth (m)</th> <th>Remarks</th> </tr> </thead> <tbody> <tr> <td>3.00</td> <td>Trial pit terminated due to collapse.</td> </tr> </tbody> </table>	Depth (m)	Remarks	3.00	Trial pit terminated due to collapse.	Stability Below 2.40m, collapsing Shoring None Weather Rain, wind
No.	Depth	Strike (m)	Remarks											
1	2.40		Wet.											
Depth (m)	Remarks													
3.00	Trial pit terminated due to collapse.													

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. Scale 1:25 © Copyright SOCOTEC UK Limited 28/03/2019 15:36:22	Project A11N MORPETH TO FELTON & ALNWICK TO ELLINGHAM Project No. A8013-18 Carried out for Geoffrey Osborne Limited	Trial Pit <h2>TP/17/18</h2> Sheet 1 of 1
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Trial Pit Log



Logged RT Checked AW Approved TC	Start 07/09/2018 End 07/09/2018	Equipment, Methods and Remarks JCB 3CX. Machine excavated.	Dimension and Orientation Width 0.70 m Length 3.50 m 	Ground Level 86.34 mOD Coordinates (m) E 418140.17 National Grid N 619489.15
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Samples and Tests Strata Description

Depth	Type & No.	Records	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.10 0.10	ES1 D1		Firm brown slightly sandy slightly gravelly CLAY. Gravel is subangular fine to medium of sandstone. Occasional rootlets. (TOPSOIL)		(0.25) +86.09		
0.30 - 0.80	B3		Firm orangish brown, mottled grey, very sandy CLAY. Occasional subangular to subrounded fine to coarse gravel of sandstone and coal. (GLACIAL TILL)				
0.50 0.50 0.50	HV ES5 D4	p 66kPa, r 30kPa			(0.75)		
0.90 1.00	D6 D7			0.80 rare subangular to subrounded cobbles of sandstone	1.00 +85.34		
1.20 - 1.50	B8		Firm dark greyish brown, mottled brown and orangish brown, slightly sandy gravelly CLAY with medium cobble and low boulder content. Gravel is angular to subrounded fine to coarse of sandstone. Abundant pockets (<80mm) of orangish fine to coarse sand. Cobbles are subangular to subrounded of sandstone. Boulders are subrounded of sandstone and limestone. (GLACIAL TILL)		(1.60)		
2.00 2.00	HV D9	p 83kPa, r 31kPa			2.60 +83.74		
2.60 - 3.00	B10		Firm purplish grey sandy gravelly CLAY with medium cobble and low boulder content. Gravel is subangular to subrounded fine to coarse of sandstone. Cobbles are subrounded of sandstone. Boulders are subrounded of sandstone and limestone (<0.50m). (GLACIAL TILL)		(1.00)		
3.00	D11						
3.50	D12	07/09/18					
			END OF EXPLORATORY HOLE		3.60 +82.74		

Groundwater Entries No. Depth Strike (m) Remarks 1 3.40 Rose to 3.10 m after 20 minutes.	Remarks Depth (m) Remarks 3.60 Trial pit terminated due to water inflow.	Stability Stable Shoring None Weather Heavy persistent rain.
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Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. Scale 1:25 © Copyright SOCOTEC UK Limited 28/03/2019 15:36:22	Project A11N MORPETH TO FELTON & ALNWICK TO ELLINGHAM Project No. A8013-18 Carried out for Geoffrey Osborne Limited	Trial Pit <h2 style="text-align: center;">TP/17/19</h2> Sheet 1 of 1
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Trial Pit Log



Logged PW/RT Checked RT Approved TC	Start 10/09/2018 End 10/09/2018	Equipment, Methods and Remarks JCB 3CX. Machine excavated.	Dimension and Orientation Width 0.70 m Length 3.50 m 	Ground Level 90.87 mOD Coordinates (m) E 418050.57 National Grid N 619711.79
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Samples and Tests Strata Description

Depth	Type & No.	Records	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.00 - 0.20	B1		Soft brown slightly sandy CLAY with rootlets. (TOPSOIL)				
0.20	D2				(0.50)		
0.30	ES3						
0.50 - 1.00	B4		Firm brown, mottled grey, slightly sandy gravelly CLAY. Gravel is subangular to subrounded fine to coarse of sandstone. (GLACIAL TILL)		0.50 +90.37		
1.00	HV	p >217kPa, r N/A			(0.90)		
1.10	D5						
1.20	ES6						
1.40	D7		Yellow fine to coarse SAND. (GLACIAL DEPOSITS)		1.40 +89.47		
					(0.40)		
2.00	HV	p >217kPa, r N/A	Firm to stiff brown and grey sandy gravelly CLAY with low cobble content. Gravel is subangular to rounded fine to coarse of sandstone. Cobbles are subangular to subrounded of sandstone. (GLACIAL TILL)		1.80 +89.07		
2.00	D8						
2.50 - 3.00	B9				(1.70)		
		10/09/18 Dry					
3.50	D10		END OF EXPLORATORY HOLE		3.50 +87.37		

Groundwater Entries No. Depth Strike (m) Remarks	Remarks Depth (m) Remarks 0.00 - 3.50 No groundwater encountered during excavation. 2.00 - 3.50 Strata unsuitable for hand vanes. 3.50 Trial pit terminated due to collapse.	Stability Partially stable Shoring None Weather Cloudy, windy
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Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. Scale 1:25 © Copyright SOCOTEC UK Limited 28/03/2019 15:36:22	Project A11N MORPETH TO FELTON & ALNWICK TO ELLINGHAM Project No. A8013-18 Carried out for Geoffrey Osborne Limited	Trial Pit <h2>TP/17/20</h2> Sheet 1 of 1
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Trial Pit Log



Logged PW/RT Checked RT Approved TC	Start 10/09/2018 End 10/09/2018	Equipment, Methods and Remarks JCB 3CX. Machine excavated.	Dimension and Orientation Width 0.70 m Length 3.30 m 	Ground Level 92.15 mOD Coordinates (m) E 417979.45 National Grid N 619896.18
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Samples and Tests Strata Description

Depth	Type & No.	Records	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.15	B1		Soft brown slightly sandy CLAY with rootlets. (TOPSOIL)		(0.45)		
0.25	D2						
0.40	ES3						
0.50	B4		Firm brown, mottled grey, slightly sandy gravelly CLAY with low cobble content. Localised pockets and partings of light brown fine to coarse sand. Gravel is subangular to subrounded fine to coarse of sandstone. Cobbles are subrounded of sandstone. (GLACIAL TILL)		0.45 +91.70		
0.60	ES5						
0.80	D6						
1.00	HV	p >217kPa, r N/A					
1.20	D7						
1.50 - 2.00	B8				(2.35)		
2.00	HV	p 145kPa, r 32kPa					
2.80 - 3.00	B9		Soft light brownish grey slightly sandy silty CLAY. Rare pockets (<60x20mm) of grey subangular fine to coarse gravel of sandstone and rare black coal. Frequent lenses (<60mm) of light grey fine to medium sand. (GLACIAL TILL)		2.80 +89.35		
3.00	HV	p 29kPa, r 10kPa			(0.70)		
		10/09/18					
3.50	D10		END OF EXPLORATORY HOLE		3.50 +88.65		

Groundwater Entries No. Depth Strike (m) Remarks 1 3.20 Rose to 3.10 m after 20 minutes.	Remarks Depth (m) Remarks 3.50 Trial pit terminated due to water inflow.	Stability Stable Shoring None Weather Cloudy
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Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. Scale 1:25 © Copyright SOCOTEC UK Limited 28/03/2019 15:36:22	Project A11N MORPETH TO FELTON & ALNWICK TO ELLINGHAM Project No. A8013-18 Carried out for Geoffrey Osborne Limited	Trial Pit <h2 style="text-align: center;">TP/17/21</h2> Sheet 1 of 1
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Trial Pit Log



Logged RT Checked AW Approved TC	Start 13/09/2018 End 13/09/2018	Equipment, Methods and Remarks JCB 3CX. Machine excavated	Dimension and Orientation Width 0.70 m Length 3.90 m 	Ground Level 87.95 mOD Coordinates (m) E 417872.07 National Grid N 620168.98
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Samples and Tests Strata Description

Depth	Type & No.	Records	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.10 0.10	ES1 D2		Firm brown sandy gravelly CLAY. Gravel is subangular to subrounded fine to coarse of sandstone. Occasional rootlets. (TOPSOIL)		(0.30)		
0.30 - 0.80	B5		Firm brown, grey and dark brown slightly sandy very gravelly CLAY with high cobble and medium boulder content. Gravel is subangular to subrounded fine to coarse of sandstone and rare coal. Cobbles are subangular to subrounded of sandstone. Boulders are subrounded of sandstone. (GLACIAL TILL)		0.30 +87.65		
0.50 0.50	ES3 D4						
1.00	D6				(1.60)		
1.50	ES8			1.50 1no. subrounded boulder 0.70x0.70x0.30 of sandstone			
2.00 2.00 - 2.50	D9 B10		Stiff grey very gravelly CLAY with low cobble content. Gravel is subangular to subrounded fine to coarse of sandstone. Cobbles are subrounded of sandstone. (GLACIAL TILL)		1.90 +86.05		
3.00	D11	13/09/18			(1.40)		
			END OF EXPLORATORY HOLE		3.30 +84.65		

Groundwater Entries <table border="1"> <thead> <tr> <th>No.</th> <th>Depth</th> <th>Strike (m)</th> <th>Remarks</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>3.30</td> <td></td> <td>Rose to 2.30 m after 20 minutes. Fast inflow.</td> </tr> </tbody> </table>	No.	Depth	Strike (m)	Remarks	1	3.30		Rose to 2.30 m after 20 minutes. Fast inflow.	Remarks <table border="1"> <thead> <tr> <th>Depth (m)</th> <th>Remarks</th> </tr> </thead> <tbody> <tr> <td>0.30 - 3.30</td> <td>Strata too gravelly for hand vanes</td> </tr> <tr> <td>3.30</td> <td>Trial pit terminated due to water inflow.</td> </tr> </tbody> </table>	Depth (m)	Remarks	0.30 - 3.30	Strata too gravelly for hand vanes	3.30	Trial pit terminated due to water inflow.	Stability Stable Shoring None Weather Dry, sunny
No.	Depth	Strike (m)	Remarks													
1	3.30		Rose to 2.30 m after 20 minutes. Fast inflow.													
Depth (m)	Remarks															
0.30 - 3.30	Strata too gravelly for hand vanes															
3.30	Trial pit terminated due to water inflow.															

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. Scale 1:25 © Copyright SOCOTEC UK Limited 28/03/2019 15:36:23	Project A11N MORPETH TO FELTON & ALNWICK TO ELLINGHAM Project No. A8013-18 Carried out for Geoffrey Osborne Limited	Trial Pit <h2>TP/17/22</h2> Sheet 1 of 1
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Trial Pit Log



Logged PC Checked PC Approved TC	Start 17/09/2018 End 17/09/2018	Equipment, Methods and Remarks JCB 3CX. Machine excavated.	Dimension and Orientation Width 0.70 m Length 3.70 m 	Ground Level 91.23 mOD Coordinates (m) E 417786.73 National Grid N 620089.44
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Samples and Tests Strata Description

Depth	Type & No.	Records	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.20	D1		Orangish brown slightly gravelly very silty fine to coarse SAND. Gravel is subangular to subrounded fine to coarse of mudstone and sandstone. Frequent rootlets. (TOPSOIL)		(0.30)		
0.40 0.40 - 1.00	ES2 B3		Firm orange, mottled brown and grey, sandy gravelly CLAY with low cobble content. Gravel is subangular to subrounded fine to coarse of sandstone, mudstone and coal. Cobbles are subrounded of sandstone. (GLACIAL TILL)		0.30 +90.93 (1.10)		
1.10	ES4						
1.40 - 2.00	B6		Firm grey, mottled orangish brown, slightly gravelly sandy CLAY with low cobble content. Gravel is subangular to subrounded fine to coarse of sandstone and mudstone. Cobbles are subrounded of sandstone. Occasional pocket (< 30mm) of fine orange sand. (GLACIAL TILL)	1.60 1no. subrounded boulder (approximately 500mm) of sandstone	1.40 +89.83 (1.60)		
2.40 2.40 - 3.00	D7 B8						
		17/09/18 Dry	Very soft reddish brown slightly gravelly sandy CLAY/SILT. Gravel is subangular fine to coarse of sandstone. (GLACIAL TILL)		3.00 +88.23 (0.50)		
			END OF EXPLORATORY HOLE		3.50 +87.73		

Groundwater Entries No. Depth Strike (m) Remarks	Remarks Depth (m) Remarks 0.00 - 3.50 No groundwater encountered during excavation.	Stability Stable Shoring None Weather Dry
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Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. Scale 1:25 © Copyright SOCOTEC UK Limited 28/03/2019 15:36:23	Project A11N MORPETH TO FELTON & ALNWICK TO ELLINGHAM Project No. A8013-18 Carried out for Geoffrey Osborne Limited	Trial Pit <h2>TP/17/23</h2> Sheet 1 of 1
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Trial Pit Log



Logged PC Checked PC Approved TC	Start 17/09/2018 End 17/09/2018	Equipment, Methods and Remarks JCB 3CX. Machine excavated.	Dimension and Orientation Width 0.70 m Length 3.80 m 	Ground Level 87.89 mOD Coordinates (m) E 417756.46 National Grid N 620184.89
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Samples and Tests Strata Description

Depth	Type & No.	Records	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.10	D1		Brown slightly gravelly silty fine to medium SAND. Gravel is subangular to subrounded fine to medium of sandstone and coal. Frequent rootlets. (TOPSOIL)		(0.30)		
0.40 0.40 - 1.00	ES2 B3		Firm orange, mottled grey, slightly gravelly very sandy CLAY with low cobble content. Gravel is subangular to subrounded fine to coarse of mudstone, sandstone and occasional coal. Cobbles are subrounded of sandstone. Occasional pockets (< 20mm) of fine sand. (GLACIAL TILL)		0.30 +87.59 (1.20)		
1.40 1.40 - 2.00 1.50	ES4 B6 D5		Stiff brown slightly sandy slightly gravelly CLAY with medium cobble content. Gravel is subangular to subrounded fine to coarse of sandstone and mudstone. Cobbles are subrounded to rounded of sandstone. (GLACIAL TILL)	1.00 2no. subrounded boulders of sandstone (approximately 500mm) 1.80 2no. subrounded boulders of sandstone (approximately 500mm) 2.00 rare coarse gravel size organic remains	1.50 +86.39 (1.10)		
		17/09/18					
			END OF EXPLORATORY HOLE		2.60 +85.29		

Groundwater Entries <table border="1"> <tr> <th>No.</th> <th>Depth</th> <th>Strike (m)</th> <th>Remarks</th> </tr> <tr> <td>1</td> <td>2.60</td> <td></td> <td>Fast inflow.</td> </tr> </table>	No.	Depth	Strike (m)	Remarks	1	2.60		Fast inflow.	Remarks <table border="1"> <tr> <th>Depth (m)</th> <th>Remarks</th> </tr> <tr> <td>0.30 - 2.50</td> <td>Strata unsuitable for hand vanes.</td> </tr> <tr> <td>2.60</td> <td>Trial pit terminated due to water inflow.</td> </tr> </table>	Depth (m)	Remarks	0.30 - 2.50	Strata unsuitable for hand vanes.	2.60	Trial pit terminated due to water inflow.	Stability Stable Shoring None Weather Dry, overcast
No.	Depth	Strike (m)	Remarks													
1	2.60		Fast inflow.													
Depth (m)	Remarks															
0.30 - 2.50	Strata unsuitable for hand vanes.															
2.60	Trial pit terminated due to water inflow.															

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. Scale 1:25 © Copyright SOCOTEC UK Limited 28/03/2019 15:36:23	Project A11N MORPETH TO FELTON & ALNWICK TO ELLINGHAM Project No. A8013-18 Carried out for Geoffrey Osborne Limited	Trial Pit <h2>TP/17/24</h2> Sheet 1 of 1
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Trial Pit Log



Logged RT Checked RT Approved TC	Start 13/09/2018 End 13/09/2018	Equipment, Methods and Remarks JCB 3CX. Machine excavated.	Dimension and Orientation Width 0.70 m Length 3.40 m 	Ground Level 86.96 mOD Coordinates (m) E 417804.81 National Grid N 620370.35
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Samples and Tests Strata Description

Depth	Type & No.	Records	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.20 0.20 0.30 - 0.50	ES1 D2 B4		Firm greyish brown sandy gravelly CLAY. Gravel is angular to subrounded fine to coarse of sandstone. (TOPSOIL)		(0.30) 0.30 +86.66		
0.50 0.50	ES3 D5		Firm orangish brown, mottled brown and dark brown, sandy gravelly CLAY with low to medium cobble content. Gravel is subangular to rounded fine to coarse of sandstone and rare coal. Cobbles are subangular to subrounded of sandstone. (GLACIAL TILL)		(0.70)		
1.00 1.00 - 1.35	D6 B7		Orangish brown, becoming brown below 1.20m, mottled brown and grey, very sandy clayey angular to subrounded fine to coarse GRAVEL of sandstone. (GLACIAL TILL)		1.00 +85.96 (0.60)		1
1.60 - 2.00 1.70	B9 D8		Stiff greyish brown slightly gravelly sandy CLAY. Gravel is subangular to subrounded fine to coarse of sandstone. Occasional pockets (<10mm) of reddish brown and grey fine to coarse sand. (GLACIAL TILL)		1.60 +85.36 (0.80)		2
2.40	D10	13/09/18	END OF EXPLORATORY HOLE	2.40 high cobble content 2.40 boulder across entire width of pit, unable to dislodge	2.40 +84.56		

Groundwater Entries <table border="1"> <tr> <th>No.</th> <th>Depth</th> <th>Strike (m)</th> <th>Remarks</th> </tr> <tr> <td>1</td> <td>1.00</td> <td></td> <td>Damp.</td> </tr> <tr> <td>2</td> <td>1.50</td> <td></td> <td>Slight inflow.</td> </tr> </table>	No.	Depth	Strike (m)	Remarks	1	1.00		Damp.	2	1.50		Slight inflow.	Remarks <table border="1"> <tr> <th>Depth (m)</th> <th>Remarks</th> </tr> <tr> <td>0.30 - 2.40</td> <td>Strata too granular for hand vanes.</td> </tr> <tr> <td>2.40</td> <td>Trial pit terminated due to water inflow causing collapse of Faces A and C.</td> </tr> </table>	Depth (m)	Remarks	0.30 - 2.40	Strata too granular for hand vanes.	2.40	Trial pit terminated due to water inflow causing collapse of Faces A and C.	Stability Below 1.50m, unstable Shoring None Weather Overcast, windy
No.	Depth	Strike (m)	Remarks																	
1	1.00		Damp.																	
2	1.50		Slight inflow.																	
Depth (m)	Remarks																			
0.30 - 2.40	Strata too granular for hand vanes.																			
2.40	Trial pit terminated due to water inflow causing collapse of Faces A and C.																			

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. Scale 1:25 © Copyright SOCOTEC UK Limited 28/03/2019 15:36:24	Project A11N MORPETH TO FELTON & ALNWICK TO ELLINGHAM Project No. A8013-18 Carried out for Geoffrey Osborne Limited	Trial Pit <h3>TP/17/25</h3> Sheet 1 of 1
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Trial Pit Log



Logged PC Checked PC Approved TC	Start 18/09/2018 End 18/09/2018	Equipment, Methods and Remarks CASE 580. Machine excavated.	Dimension and Orientation Width 0.70 m Length 3.10 m 	Ground Level 86.75 mOD Coordinates (m) E 417629.85 National Grid N 620687.63
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Samples and Tests Strata Description

Depth	Type & No.	Records	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.20 0.20 - 1.00	D1 B3		Orangish brown slightly gravelly silty fine to coarse SAND with low cobble content. Gravel is subangular to rounded fine to coarse of sandstone. Cobbles are subrounded of sandstone. Frequent rootlets. (TOPSOIL)		(0.20) +86.55		
0.40	ES2		Firm, mottled orangish brown, slightly gravelly sandy CLAY with low cobble content. Gravel is subangular to rounded fine to coarse of sandstone and mudstone. Cobbles are rounded of sandstone. (GLACIAL TILL)	0.50 1 no. rounded boulder of sandstone (approximately 300mm)	(1.00)		
1.20 1.20	ES5 D4		Firm greyish brown slightly gravelly silty CLAY. Gravel is subangular to rounded fine to medium of mudstone and occasional sandstone. Cobbles are subrounded of sandstone. (GLACIAL TILL)		1.20 +85.55 (0.30)		
1.50 1.50 - 2.50	D6 B7		Firm grey, locally mottled brown, thinly laminated SILT. Frequent pockets (< 40mm) of brown/grey clay. (GLACIAL TILL)		1.50 +85.25		
2.50 2.50	HV D8	p 39kPa, r 6kPa			(1.50)		
3.00 - 3.50	B9		Firm grey thinly interlaminated CLAY and SILT. Frequent black and grey fine sand on laminae. (GLACIAL TILL)		3.00 +83.75		
3.50 3.50	HV D10	p 59kPa, r 14kPa			(1.00)		
		18/09/18 Dry					
			END OF EXPLORATORY HOLE		4.00 +82.75		

Groundwater Entries No. Depth Strike (m) Remarks	Remarks Depth (m) Remarks 0.00 - 4.00 No groundwater encountered during excavation. 0.20 - 4.00 Strata unsuitable for hand vanes.	Stability Stable Shoring None Weather Windy, dry
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Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. Scale 1:25 © Copyright SOCOTEC UK Limited 28/03/2019 15:36:24	Project A11N MORPETH TO FELTON & ALNWICK TO ELLINGHAM Project No. A8013-18 Carried out for Geoffrey Osborne Limited	TP/17/29 Sheet 1 of 1
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Trial Pit Log



Logged PC Checked PC Approved TC	Start 20/09/2018 End 20/09/2018	Equipment, Methods and Remarks CASE 580. Machine excavated.	Dimension and Orientation Width 0.70 m Length 3.90 m 	Ground Level 86.05 mOD Coordinates (m) E 417804.27 National Grid N 620742.72
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Samples and Tests Strata Description

Depth	Type & No.	Records	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.20	D1		Brown slightly sandy slightly gravelly CLAY/SILT. Gravel is subrounded to rounded fine to coarse of sandstone. Frequent rootlets. (TOPSOIL)		(0.30)		
0.30	D3		Orangish brown gravelly very silty fine to medium SAND. Gravel is subrounded fine to coarse of sandstone. (GLACIOFLUVIAL DEPOSITS)		0.30		
0.30	B2				+85.75		
0.70 - 1.20	B4			0.70 becoming greyish brown			
		20/09/18		1.00 low cobble content, cobbles are rounded of sandstone	(1.40)		
				1.40 2no. subrounded boulders of sandstone			
1.70	D5		END OF EXPLORATORY HOLE		1.70	+84.35	

Groundwater Entries <table border="1"> <tr> <th>No.</th> <th>Depth</th> <th>Strike (m)</th> <th>Remarks</th> </tr> <tr> <td>1</td> <td>1.70</td> <td></td> <td>Medium inflow.</td> </tr> </table>	No.	Depth	Strike (m)	Remarks	1	1.70		Medium inflow.	Remarks <table border="1"> <tr> <th>Depth (m)</th> <th>Remarks</th> </tr> <tr> <td>0.30 - 1.70</td> <td>Strata unsuitable for hand vanes.</td> </tr> <tr> <td>1.70</td> <td>Trial pit terminated due to water inflow.</td> </tr> </table>	Depth (m)	Remarks	0.30 - 1.70	Strata unsuitable for hand vanes.	1.70	Trial pit terminated due to water inflow.	Stability Stable Shoring None Weather Overcast
No.	Depth	Strike (m)	Remarks													
1	1.70		Medium inflow.													
Depth (m)	Remarks															
0.30 - 1.70	Strata unsuitable for hand vanes.															
1.70	Trial pit terminated due to water inflow.															

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. Scale 1:25 © Copyright SOCOTEC UK Limited 28/03/2019 15:36:24	Project A11N MORPETH TO FELTON & ALNWICK TO ELLINGHAM Project No. A8013-18 Carried out for Geoffrey Osborne Limited	Trial Pit <h2 style="text-align: center;">TP/17/30</h2> Sheet 1 of 1
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Trial Pit Log



Logged PC Checked PC Approved TC	Start 19/09/2018 End 19/09/2018	Equipment, Methods and Remarks CASE 580. Machine excavated.	Dimension and Orientation Width 0.70 m Length 4.00 m 	Ground Level 87.49 mOD Coordinates (m) E 417671.57 National Grid N 620821.85
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Samples and Tests		Strata Description			Depth, Level (Thickness)	Legend	Backfill
Depth	Type & No.	Records	Main	Detail			
0.20	D1		Brown slightly gravelly slightly clayey fine to coarse SAND. Gravel is subangular to subrounded fine to coarse of sandstone and mudstone. Frequent rootlets. (TOPSOIL)		(0.30)		
0.30 0.30 - 1.00	ES2 B3		Orange and brown gravelly very silty fine to coarse SAND with low cobble content. Gravel is subangular to rounded fine to coarse of sandstone, mudstone and quartzite. (GLACIOFLUVIAL DEPOSITS)		0.30 (1.40)		
1.20	ES4				1.70 (0.80)		
1.70 1.70 - 2.50	D5 B6	19/09/18	Orange, mottled brown, slightly gravelly clayey fine to coarse SAND with medium cobble content. Gravel is subrounded to rounded fine to coarse of sandstone. Cobbles are subrounded to rounded of sandstone. (GLACIOFLUVIAL DEPOSITS)		1.70 (0.80)		
			END OF EXPLORATORY HOLE		2.50 +84.99		

Groundwater Entries <table border="1"> <thead> <tr> <th>No.</th> <th>Depth</th> <th>Strike (m)</th> <th>Remarks</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>2.50</td> <td></td> <td>Slow inflow.</td> </tr> </tbody> </table>	No.	Depth	Strike (m)	Remarks	1	2.50		Slow inflow.	Remarks <table border="1"> <thead> <tr> <th>Depth (m)</th> <th>Remarks</th> </tr> </thead> <tbody> <tr> <td>0.30 - 2.50</td> <td>Strata unsuitable for hand vanes.</td> </tr> <tr> <td>2.50</td> <td>Trial pit terminated due to water inflow.</td> </tr> </tbody> </table>	Depth (m)	Remarks	0.30 - 2.50	Strata unsuitable for hand vanes.	2.50	Trial pit terminated due to water inflow.	Stability Stable Shoring None Weather Windy
No.	Depth	Strike (m)	Remarks													
1	2.50		Slow inflow.													
Depth (m)	Remarks															
0.30 - 2.50	Strata unsuitable for hand vanes.															
2.50	Trial pit terminated due to water inflow.															

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. Scale 1:25 © Copyright SOCOTEC UK Limited 28/03/2019 15:36:24	Project A11N MORPETH TO FELTON & ALNWICK TO ELLINGHAM Project No. A8013-18 Carried out for Geoffrey Osborne Limited	Trial Pit <h2>TP/17/31</h2> Sheet 1 of 1
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Trial Pit Log



Logged PC Checked PC Approved TC	Start 19/09/2018 End 19/09/2018	Equipment, Methods and Remarks CASE 580. Machine excavated.	Dimension and Orientation Width 0.85 m Length 3.30 m 	Ground Level 87.44 mOD Coordinates (m) E 417626.01 National Grid N 621010.06
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Samples and Tests Strata Description

Depth	Type & No.	Records	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.20	D1		Brown slightly gravelly clayey fine to coarse SAND. Gravel is subrounded to rounded fine to coarse of sandstone. Frequent rootlets. (TOPSOIL)		(0.30)		
0.30 0.30 - 0.70	ES2 B4		Light brown very gravelly fine to coarse SAND with medium cobble content. Gravel is subrounded to rounded fine to coarse of sandstone, mudstone and rare coal. Cobbles are rounded of sandstone. (GLACIOFLUVIAL DEPOSITS)		0.30 +87.14 (0.40)		
0.50	D3						
0.70 0.70 0.70 - 1.20	ES6 D5 B7		Brown very sandy clayey rounded fine to coarse GRAVEL of sandstone, mudstone and quartzite, with medium cobble and boulder (<600mm) content. (GLACIOFLUVIAL DEPOSITS)		0.70 +86.74 (1.00)		
		19/09/18 Dry					
			END OF EXPLORATORY HOLE		1.70 +85.74		

Groundwater Entries No. Depth Strike (m) Remarks	Remarks Depth (m) Remarks 0.00 - 1.70 Strata unsuitable for hand vanes. 1.70 Trial pit terminated due to instability.	Stability Unstable Shoring None Weather Windy
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Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. Scale 1:25 © Copyright SOCOTEC UK Limited 	Project A11N MORPETH TO FELTON & ALNWICK TO ELLINGHAM Project No. A8013-18 Carried out for Geoffrey Osborne Limited	Trial Pit <h2 style="text-align: center;">TP/17/32</h2> Sheet 1 of 1
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Trial Pit Log



Logged PC Checked PC Approved TC	Start 20/09/2018 End 20/09/2018	Equipment, Methods and Remarks CASE 580. Machine excavated. Soakaway test carried out.	Dimension and Orientation Width 0.70 m Length 1.50 m 	Ground Level 87.16 mOD Coordinates (m) E 417779.28 National Grid N 620924.72
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Samples and Tests Strata Description

Depth	Type & No.	Records	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.10	D1		Brown slightly gravelly silty fine to coarse SAND. Gravel is subrounded to rounded fine to coarse of sandstone. Frequent rootlets. (TOPSOIL)		(0.20)		
0.30	ES2		Orangish brown slightly gravelly very silty fine to medium SAND with low cobble content. Gravel is subrounded to rounded fine to coarse of sandstone. Cobbles are rounded of sandstone. (GLACIOFLUVIAL DEPOSITS)		0.20 +86.96		
0.30	D3				(1.30)		
0.30 - 0.80	B4	20/09/18 Dry			1.30 1no. subrounded boulder of sandstone		
			END OF EXPLORATORY HOLE		1.50 +85.66		

Groundwater Entries No. Depth Strike (m) Remarks	Remarks Depth (m) Remarks 0.00 - 1.50 No groundwater encountered during excavation.	Stability Stable Shoring None Weather Overcast
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Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. Scale 1:25 © Copyright SOCOTEC UK Limited 28/03/2019 15:36:25	Project A11N MORPETH TO FELTON & ALNWICK TO ELLINGHAM Project No. A8013-18 Carried out for Geoffrey Osborne Limited	Trial Pit <h2 style="text-align: center;">TP/17/33</h2> Sheet 1 of 1
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Trial Pit Log



Logged MC Checked PH Approved TC	Start 27/07/2018 End 27/07/2018	Equipment, Methods and Remarks 8T tracked excavator. Machine excavated.	Dimension and Orientation Width 0.30 m Length 4.00 m 	Ground Level 92.17 mOD Coordinates (m) E 417390.01 National Grid N 621420.98
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Samples and Tests Strata Description

Depth	Type & No.	Records	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.10	ES1		Brown slightly sandy slightly gravelly CLAY. (TOPSOIL)		(0.20)		
			Brown clayey very sandy subangular to subrounded fine to coarse GRAVEL of sandstone. With high cobble and boulder content. Cobbles are subangular to rounded of sandstone and limestone. Boulders (<0.60m) are rounded and tabular of sandstone and limestone. (Possible GLACIOFLUVIAL DEPOSITS)		0.20 +91.97		
0.80	ES2						
1.00 - 1.20	B1						
1.20	D1				(2.40)		
2.20 - 2.40	B2						
2.40	D2	27/07/18	Dry				
			END OF EXPLORATORY HOLE		2.60 +89.57		

Groundwater Entries No. Depth Strike (m) Remarks	Remarks Depth (m) 0.00 - 2.60 0.01 - 2.60 2.60 Remarks No groundwater encountered during excavation. Strata too gravelly for hand vanes. Trial pit terminated due to removal of boulders causing undermining of the pit sides and instability. Unsafe to continue.	Stability Unstable Shoring None Weather Warm, cloudy, showers
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Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. Scale 1:25 © Copyright SOCOTEC UK Limited 28/03/2019 15:36:25	Project A11N MORPETH TO FELTON & ALNWICK TO ELLINGHAM Project No. A8013-18 Carried out for Geoffrey Osborne Limited	Trial Pit <h2 style="text-align: center;">TP/17/35</h2> Sheet 1 of 1
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Trial Pit Log



Logged PC Checked PC Approved TC	Start 21/09/2018 End 21/09/2018	Equipment, Methods and Remarks CASE 580. Machine excavated.	Dimension and Orientation Width 0.70 m Length 3.70 m 	Ground Level 92.68 mOD Coordinates (m) E 417280.03 National Grid N 621592.44
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Samples and Tests Strata Description

Depth	Type & No.	Records	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.20 0.20	ES2 D1		Brown slightly sandy slightly gravelly silty CLAY. Gravel is subrounded fine to coarse of sandstone and mudstone. (TOPSOIL)		(0.30)		
0.50 0.50	ES4 D3		Orangish brown slightly sandy slightly gravelly CLAY/SILT. Gravel is subrounded fine to coarse of sandstone. (GLACIAL TILL)		0.30 +92.38 (0.40)		
0.70 0.70 - 1.20	D5 B6		Orangish brown very gravelly very silty fine to coarse SAND with low cobble content. Gravel is subangular to rounded fine to coarse of sandstone. Cobbles are subrounded of sandstone. (GLACIOFLUVIAL DEPOSITS)		0.70 +91.98 (0.70)		
1.40 1.50 - 2.00	D7 B8		Orangish brown slightly gravelly silty fine to coarse SAND. (GLACIOFLUVIAL DEPOSITS)	1.80 occasional subrounded cobble of sandstone 2.10 1no. subrounded boulder (350mm) of sandstone	1.40 +91.28 (1.70)		
3.10	D9	21/09/18 Dry	Orangish brown gravelly slightly clayey fine to coarse SAND with low cobble content. Gravel is subangular to subrounded fine to coarse of sandstone and mudstone. Cobbles are rounded of sandstone. (GLACIOFLUVIAL DEPOSITS)	3.50 3no. subrounded boulders (400mm) of sandstone	3.10 +89.58 (0.40)		
			END OF EXPLORATORY HOLE		3.50 +89.18		

Groundwater Entries No. Depth Strike (m) Remarks	Remarks Depth (m) Remarks 0.00 - 3.50 No groundwater encountered during excavation. 3.50 Trial pit terminated due to instability.	Stability Below 2.50m, unstable Shoring None Weather Dry
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Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. Scale 1:25 © Copyright SOCOTEC UK Limited 	Project A11N MORPETH TO FELTON & ALNWICK TO ELLINGHAM Project No. A8013-18 Carried out for Geoffrey Osborne Limited	Trial Pit TP/17/36 Sheet 1 of 1
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Trial Pit Log



Logged PC Checked PC Approved TC	Start 25/09/2018 End 25/09/2018	Equipment, Methods and Remarks Tracked 360 excavator. Machine excavated pit.	Dimension and Orientation Width 0.70 m Length 3.60 m 	Ground Level 97.81 mOD Coordinates (m) E 417119.08 National Grid N 622120.02
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Samples and Tests Strata Description

Depth	Type & No.	Records	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.20 0.20	ES2 D1		Brown slightly gravelly sandy CLAY. Gravel is subangular to subrounded fine to coarse of sandstone. (TOPSOIL)		(0.40)		
0.50 0.50 - 1.00	ES5 D3 B4		Orange and brown very sandy very silty subangular to subrounded fine to coarse GRAVEL of sandstone. With medium cobble content of rounded of sandstone. (GLACIOFLUVIAL DEPOSITS)	1.00-1.30 3no. subrounded boulders of sandstone (up to 300mm)	0.40 +97.41 (1.20)		
1.60 1.60 - 2.00 1.60 - 2.00 1.60 - 2.00 1.60 - 2.00	D6 B10 B11 B7 B8 B9	25/09/18	Dry Brown and grey very sandy clayey subrounded to rounded fine to coarse GRAVEL of sandstone, quartzite and mudstone with medium cobble content. Cobbles are rounded of sandstone. (GLACIOFLUVIAL DEPOSITS)		1.60 +96.21 (0.40)		
			END OF EXPLORATORY HOLE		2.00 +95.81		

Groundwater Entries No. Depth Strike (m) Remarks	Remarks Depth (m) Remarks 0.00 - 2.00 No groundwater encountered during excavation. 2.00 - 2.00 Trial pit terminated due to instability.	Stability Unstable in Face A and C Shoring None Weather Dry
---	---	--

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. Scale 1:25 © Copyright SOCOTEC UK Limited 28/03/2019 15:36:26	Project A11N MORPETH TO FELTON & ALNWICK TO ELLINGHAM Project No. A8013-18 Carried out for Geoffrey Osborne Limited	Trial Pit <h2>TP/17/38</h2> Sheet 1 of 1
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Trial Pit Log



Logged PC Checked PC Approved TC	Start 25/09/2018 End 25/09/2018	Equipment, Methods and Remarks Tracked 360 excavator. Machine excavated pit.	Dimension and Orientation Width 0.60 m Length 3.50 m 	Ground Level 99.29 mOD Coordinates (m) E 416979.05 National Grid N 622484.24
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Samples and Tests Strata Description

Depth	Type & No.	Records	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.20 0.20	ES2 D1		Brown slightly sandy slightly gravelly SILT. Gravel is subangular to subrounded fine to coarse of sandstone. Frequent rootlets. (TOPSOIL)		(0.50)		
0.60 0.60 0.60 - 1.00	ES4 D3 B5		Orange and brown gravelly clayey fine to medium SAND. Gravel is subrounded to rounded fine to coarse of sandstone, quartzite and mudstone with medium cobble content. Locally grading to slightly sandy slightly gravelly clay. (GLACIOFLUVIAL DEPOSITS)		0.50 +98.79		
1.60 1.60 - 2.00	D6 B7			1.60 occasional pockets of orangish brown sandy clay (up to 40mm) 1.80-3.00 low cobble content. Cobbles are rounded of sandstone 2.00-3.00 frequent subangular boulders of sandstone (up to 400mm)	(2.50)		
3.00	D8	25/09/18 Dry	END OF EXPLORATORY HOLE		3.00 +96.29		

Groundwater Entries No. Depth Strike (m) Remarks	Remarks Depth (m) Remarks 0.00 - 3.00 No groundwater encountered during excavation. 0.01 - 3.00 Strata unsuitable for hand vanes. 3.00 Trial pit terminated due to instability in Face A and C.	Stability Below 2.00m, unstable. Shoring None Weather Windy, dry
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Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. Scale 1:25 © Copyright SOCOTEC UK Limited 28/03/2019 15:36:26	Project A11N MORPETH TO FELTON & ALNWICK TO ELLINGHAM Project No. A8013-18 Carried out for Geoffrey Osborne Limited	Trial Pit <h2 style="text-align: center;">TP/17/39</h2> Sheet 1 of 1
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Trial Pit Log



Logged RT Checked RT Approved TC	Start 13/09/2018 End 13/09/2018	Equipment, Methods and Remarks JCB 3CX. Machine excavated.	Dimension and Orientation Width 0.70 m Length 2.80 m 	Ground Level 88.19 mOD Coordinates (m) E 419167.94 National Grid N 619061.06
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Samples and Tests Strata Description

Depth	Type & No.	Records	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.10 0.10 - 0.30	ES1 B2		Brown slightly clayey fine to coarse SAND with frequent rootlets. (TOPSOIL)		(0.30) +87.89		
0.50 0.50 - 0.80	ES3 B4		Brown, locally grey and orangish brown, slightly clayey fine to coarse SAND with occasional pockets/lenses (<100mm) of soft brown sandy clay. (GLACIAL DEPOSITS)		(0.75)		
1.10 1.10 - 1.50	D5 B6		Firm grey, mottled dark grey, slightly sandy gravelly CLAY with low cobble content. Gravel is angular to subangular fine to coarse of sandstone and mudstone. Cobbles are subrounded of sandstone. (GLACIAL TILL)		1.05 +87.14		
2.00 2.00 - 2.50	D7 B8			2.00-2.80 stiff to very stiff, medium cobble content and rare subangular fine to coarse gravel of coal	(1.75)		
		13/09/18 Dry					
2.80	D9		END OF EXPLORATORY HOLE		2.80 +85.39		

Groundwater Entries No. Depth Strike (m) Remarks	Remarks Depth (m) Remarks 0.00 - 2.80 No groundwater encountered during excavation. 1.05 - 2.80 Strata too gravelly for hand vanes. 2.80 Trial pit terminated, agreed with WSP.	Stability Stable Shoring None Weather Windy, dry
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Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. Scale 1:25 © Copyright SOCOTEC UK Limited 28/03/2019 15:36:26	Project A11N MORPETH TO FELTON & ALNWICK TO ELLINGHAM Project No. A8013-18 Carried out for Geoffrey Osborne Limited	Trial Pit <h2 style="text-align: center;">TP/17/40</h2> Sheet 1 of 1
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Trial Pit Log



Logged RT Checked RT Approved TC	Start 12/09/2018 End 12/09/2018	Equipment, Methods and Remarks JCB 3CX. Machine excavated.	Dimension and Orientation Width 0.70 m Length 3.10 m 	Ground Level 94.08 mOD Coordinates (m) E 419072.97 National Grid N 619449.79
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Samples and Tests Strata Description

Depth	Type & No.	Records	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.10 0.10 0.10 - 0.40	ES1 D1 B3		Firm brown slightly sandy CLAY with frequent rootlets. (TOPSOIL)		(0.40)		
0.50 0.50 0.50 - 1.00	ES4 D5 B6		Firm orangish brown slightly gravelly sandy CLAY. Gravel is subangular to subrounded fine to coarse of sandstone. (GLACIAL TILL)		0.40 +93.68 (1.00)		
1.10	HV	p 165kPa, r 63kPa					
1.50 - 2.00	B7		Brown gravelly very silty fine to medium SAND. (GLACIAL DEPOSITS)		1.40 +92.68		
2.30 - 2.50	B8		Soft to firm brown, mottled grey, sandy gravelly CLAY with low cobble content. Gravel is subangular to subrounded fine to coarse of sandstone. Cobbles are subrounded of sandstone.	1.80 rare coal 1.90 gravelly with low cobble content. Gravel is subangular to subrounded fine to coarse of sandstone. Cobbles are subangular of sandstone	(0.90) 2.30 +91.78		
2.50	D9		(GLACIAL TILL)		(0.40)		
2.70 - 3.00	B10	12/09/18 Dry	Soft to firm light brown, mottled orangish brown, slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse of sandstone. Occasional subangular cobbles of sandstone. (GLACIAL TILL)		2.70 +91.38 (0.30)		
			END OF EXPLORATORY HOLE	3.00 2no. boulders	3.00 +91.08		

Groundwater Entries No. Depth Strike (m) Remarks	Remarks Depth (m) Remarks 0.00 - 3.00 No groundwater encountered during excavation. 2.30 - 3.00 Strata too gravelly for hand vanes. 3.00 - 3.00 Trial pit terminated on WSP instructions.	Stability Stable Shoring None Weather Dry, sunny
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Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. Scale 1:25 © Copyright SOCOTEC UK Limited 28/03/2019 15:36:27	Project A11N MORPETH TO FELTON & ALNWICK TO ELLINGHAM Project No. A8013-18 Carried out for Geoffrey Osborne Limited	TP/17/41 Sheet 1 of 1
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Trial Pit Log



Logged PW Checked RT Approved TC	Start 11/09/2018 End 11/09/2018	Equipment, Methods and Remarks JCB 3CX. Machine excavated.	Dimension and Orientation Width 0.70 m Length 3.30 m 	Ground Level 93.98 mOD Coordinates (m) E 418960.09 National Grid N 619839.08
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Samples and Tests			Strata Description				
Depth	Type & No.	Records	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.10 0.10 - 0.25	D1 B2		Soft brown slightly sandy CLAY with rare subangular fine to medium gravel of sandstone and frequent roots. (TOPSOIL)		(0.40)		
0.30 0.40 - 0.60	ES3 B4		Firm to stiff orangish brown and brown slightly gravelly sandy CLAY. Gravel is subangular to subrounded, fine to coarse of sandstone. Occasional pockets (<5mm) of orange fine sand. Rare pockets (<5mm) of black coal. Rare cobbles of sandstone. (GLACIAL TILL)		0.40 +93.58		
0.60 0.65	D5 ES6						
0.80 0.85 - 1.70	D7 B8						
1.00	HV	p >217kPa, r N/A					
1.20 - 2.00	B10				(2.00)		
2.00 2.00 - 2.40	D9 B12			2.00-2.30 subangular to subrounded fine to coarse gravel size fragments of coal			
2.20	D11	11/09/18 Dry		2.20 1 nr boulder.			
			END OF EXPLORATORY HOLE		2.40 +91.58		

Groundwater Entries No. Depth Strike (m) Remarks	Remarks Depth (m) 0.00 - 2.40 2.40 No groundwater encountered during excavated. Trial pit terminated on instruction from WSP.	Stability Stable Shoring None Weather Sunny, windy
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Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. Scale 1:25 © Copyright SOCOTEC UK Limited 28/03/2019 15:36:27	Project A11N MORPETH TO FELTON & ALNWICK TO ELLINGHAM Project No. A8013-18 Carried out for Geoffrey Osborne Limited	Trial Pit <h2>TP/17/42</h2> Sheet 1 of 1
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Trial Pit Log



Logged PW Checked RT Approved TC	Start 12/09/2018 End 12/09/2018	Equipment, Methods and Remarks JCB 3CX. Machine excavated.	Dimension and Orientation Width 0.70 m Length 3.30 m 	Ground Level 90.37 mOD Coordinates (m) E 418880.95 National Grid N 620062.95
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Samples and Tests			Strata Description					
Depth	Type & No.	Records	Main	Detail	Depth, Level (Thickness)	Legend	Backfill	
0.10	D1		Soft greyish brown sandy silty CLAY with frequent rootlets and occasional subangular to subrounded fine to medium gravel of sandstone. (TOPSOIL)		(0.40)			
0.20	ES2							
0.20 - 0.40	B3							
0.40	D4				0.40 +89.97			
0.40 - 0.60	B6		Firm brown and grey slightly sandy CLAY with rare subangular to subrounded fine to medium gravel of sandstone. Frequent lenses (<20mm) of grey fine to medium sand. (ALLUVIUM)		(0.20)			
0.50	ES5							
0.70	D7				0.60-0.80 +89.77			
0.80	HV	p 59kPa, r 17kPa	Soft grey mottled orangish brown sandy CLAY with frequent lenses (<30mm) of orange fine to medium sand and rare subangular to subrounded, fine to medium gravel of sandstone. (ALLUVIUM)	0.60-0.80 yellowish brown fine to medium sand				
1.00 - 1.50	B8				(0.90)			
1.60	D9		Soft grey slightly sandy CLAY with occasional pockets (<5mm) of black coal/lignite. Rare pockets of dark orange fine sand. (ALLUVIUM)		1.50 +88.87			
					(1.20)			
2.60 - 2.70	B10	12/09/18			2.70 +87.67			
			END OF EXPLORATORY HOLE					

Groundwater Entries No. Depth Strike (m) Remarks 1 2.20 Rose to 2.15 m after 20 minutes.	Remarks Depth (m) Remarks 0.80 Strata unsuitable for hand vanes. 2.70 Trial pit terminated due to water inflow.	Stability Stable Shoring None Weather Sunny, windy
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Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. Scale 1:25 © Copyright SOCOTEC UK Limited 28/03/2019 15:36:27	Project A11N MORPETH TO FELTON & ALNWICK TO ELLINGHAM Project No. A8013-18 Carried out for Geoffrey Osborne Limited	TP/17/43 Sheet 1 of 1
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Trial Pit Log



Logged RT Checked RT Approved TC	Start 11/09/2018 End 11/09/2018	Equipment, Methods and Remarks JCB 3CX. Machine excavated.	Dimension and Orientation Width 0.70 m Length 3.30 m 35 (Deg)	Ground Level 90.38 mOD Coordinates (m) E 418867.08 National Grid N 620173.98
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Samples and Tests Strata Description

Depth	Type & No.	Records	Main	Detail	Depth, Level (Thickness)	Legend	Backfill	
0.00 - 0.30	B3		Soft to firm dark brown slightly sandy CLAY. Frequent rootlets. (TOPSOIL)		(0.30)			
0.10	ES1				0.30	+90.08		
0.10	D2	p 180kPa, r 57kPa	Firm grey, mottled orange, very sandy CLAY. Frequent pockets (<10x5mm) of orange fine to medium sand. (GLACIAL TILL)		(0.40)			
0.50	HV				0.70	+89.68		
0.50	ES6				(0.60)			
0.50 - 0.70	D4							
0.70 - 1.00	B5			Firm brownish grey, locally mottled orangish brown, slightly sandy slightly gravelly CLAY with occasional subangular to subrounded fine to coarse gravel of sandstone. (GLACIAL TILL)				
0.75	B8	p 143kPa, r 73kPa			1.30	+89.08		
1.20	HV				(0.60)			
1.30	D9			Orangish brown and light brown very silty fine to medium SAND. (GLACIAL DEPOSITS)				
1.30 - 1.80	B10	B11			1.90	+88.48		
				Greyish brown, locally mottled orangish brown, fine to coarse SAND. (GLACIAL DEPOSITS)		(0.40)		
1.90 - 2.20		11/09/18			2.30	+88.08		1
			END OF EXPLORATORY HOLE					

Groundwater Entries <table border="1"> <thead> <tr> <th>No.</th> <th>Depth (m)</th> <th>Strike (m)</th> <th>Remarks</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>2.20</td> <td></td> <td>Slight inflow.</td> </tr> </tbody> </table>	No.	Depth (m)	Strike (m)	Remarks	1	2.20		Slight inflow.	Remarks <table border="1"> <thead> <tr> <th>Depth (m)</th> <th>Remarks</th> </tr> </thead> <tbody> <tr> <td>1.30 - 2.30</td> <td>Strata unsuitable for hand vanes.</td> </tr> <tr> <td>2.30</td> <td>Trial pit terminated due to collapse.</td> </tr> </tbody> </table>	Depth (m)	Remarks	1.30 - 2.30	Strata unsuitable for hand vanes.	2.30	Trial pit terminated due to collapse.	Stability Below 1.70m, collapsed Shoring None Weather Dry, cloudy
No.	Depth (m)	Strike (m)	Remarks													
1	2.20		Slight inflow.													
Depth (m)	Remarks															
1.30 - 2.30	Strata unsuitable for hand vanes.															
2.30	Trial pit terminated due to collapse.															

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. Scale 1:25 © Copyright SOCOTEC UK Limited 28/03/2019 15:36:27	Project A11N MORPETH TO FELTON & ALNWICK TO ELLINGHAM Project No. A8013-18 Carried out for Geoffrey Osborne Limited	Trial Pit <h2 style="text-align: center;">TP/17/44</h2> Sheet 1 of 1
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Trial Pit Log



Logged RT	Start 11/09/2018	Equipment, Methods and Remarks JCB 3CX. Machine excavated.	Dimension and Orientation		Ground Level 94.73 mOD
Checked RT	End		Width 0.70 m		Coordinates (m) E 418780.02
Approved TC	11/09/2018		Length 3.30 m		National Grid N 620384.03

Samples and Tests Strata Description

Depth	Type & No.	Records	Main	Detail	Depth, Level (Thickness)	Legend	Backfill	
0.00 - 0.25	B3	p >217kPa, r N/A	Soft dark brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse of sandstone. (TOPSOIL)		(0.35)			
0.10	ES2 D1							
0.35 - 0.70	B6	p >217kPa, r N/A	Very stiff orangish brown, mottled brown, slightly sandy gravelly CLAY. Gravel is angular to subrounded fine to coarse of sandstone and black coal. (GLACIAL TILL)	1.80-2.00 gravelly	0.35 +94.38			
0.50	HV ES4 D5							(0.55)
1.00	HV D7 B8				Very stiff dark reddish brown, mottled grey, slightly sandy slightly gravelly CLAY with low cobble content. Gravel is subangular to subrounded fine to coarse of sandstone and rare coal. Cobbles are subangular to subrounded of sandstone. (GLACIAL TILL)			
2.00	D9 B10	p >217kPa, r N/A	Dark grey sandy tabular, angular to subangular fine to coarse GRAVEL of sandstone and black coal. (GLACIAL TILL)		2.00 +92.73			
2.00 - 2.20								(0.40)
2.50	D11 B12	11/09/18 Dry	Firm light grey slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse of sandstone. (GLACIAL TILL)		2.40 +92.33			
2.50 - 3.00								(0.60)
			END OF EXPLORATORY HOLE		3.00 +91.73			

Groundwater Entries	Remarks	Stability Stable
No. Depth Strike (m) Remarks	Depth (m) Remarks	Shoring None
	0.00 - 3.00 No groundwater encountered during excavation.	Weather Cloudy, dry
	2.00 - 3.00 Strata unsuitable for hand vanes.	
	3.00 Trial pit terminated due to hard strata.	

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.	Project A1IN MORPETH TO FELTON & ALNWICK TO ELLINGHAM	Trial Pit TP/17/45
Scale 1:25 © Copyright SOCOTEC UK Limited	Project No. A8013-18	
28/03/2019 15:36:28	Carried out for Geoffrey Osborne Limited	Sheet 1 of 1



Trial Pit Log



Logged RT Checked RT Approved TC	Start 14/09/2018 End 14/09/2018	Equipment, Methods and Remarks JCB 3CX. Machine excavated.	Dimension and Orientation Width 0.70 m Length 2.80 m 	Ground Level 95.15 mOD Coordinates (m) E 418430.70 National Grid N 620543.00
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Samples and Tests Strata Description

Depth	Type & No.	Records	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.10 0.10	ES1 D2		Firm dark brown slightly sandy slightly gravelly CLAY. Gravel is subangular to rounded fine to coarse of sandstone. (TOPSOIL)		(0.25)		
0.30 0.30 - 0.60	D3 B5		Firm orangish brown, mottled brown and grey, slightly sandy slightly gravelly CLAY with low cobble content. Gravel is subangular to subrounded fine to coarse of sandstone and rare coal. Cobbles are subangular to subrounded of sandstone. (GLACIAL TILL)		0.25 +94.90		
0.50 0.50	HV ES4	p 152kPa, r 66kPa			(0.95)		
1.00 1.00 - 1.20	D6 B7	14/09/18 Dry					
1.20	HV	p >> 217kPa, r N/A	END OF EXPLORATORY HOLE	1.20 clay 100mm diameter field drain found	1.20 +93.95		

Groundwater Entries No. Depth Strike (m) Remarks	Remarks Depth (m) Remarks 0.00 - 1.20 No groundwater encountered during excavation. 1.20 - 1.20 Hole terminated in agreement with WSP on encountering clay drain.	Stability Stable Shoring None Weather Cloudy, light showers
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Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. Scale 1:25 © Copyright SOCOTEC UK Limited 28/03/2019 15:36:28	Project A11N MORPETH TO FELTON & ALNWICK TO ELLINGHAM Project No. A8013-18 Carried out for Geoffrey Osborne Limited	Trial Pit <h3>TP/17/46</h3> Sheet 1 of 1
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Trial Pit Log



Logged MC Checked PH Approved TC	Start 26/07/2018 End 26/07/2018	Equipment, Methods and Remarks 8T tracked excavator. Machine excavated.	Dimension and Orientation Width 0.60 m Length 4.00 m 	Ground Level 96.29 mOD Coordinates (m) E 418852.51 National Grid N 617263.26
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Samples and Tests Strata Description

Depth	Type & No.	Records	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.10	ES1		Firm brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is angular to subangular, fine to coarse of sandstone. (TOPSOIL)		(0.30)		
0.60	ES2		Firm grey, mottled brown, slightly sandy slightly gravelly CLAY with cobbles. Gravel is subangular to subrounded fine to coarse of sandstone. Cobbles are subrounded of sandstone and limestone. (GLACIAL TILL)		0.30 +95.99		
0.80 - 1.00	B1				(0.80)		
1.00	D1						
1.20 - 1.40	B2		Soft grey, mottled brown, sandy very gravelly CLAY with medium cobble and low boulder content. Gravel is subangular to subrounded fine to coarse of sandstone. Cobbles are subangular of sandstone and limestone. Boulders (< 0.50m) are subrounded and occasional tabular of sandstone. (GLACIAL TILL)		1.10 +95.19		1
1.40	D2				(0.90)		
2.50 - 2.80	B3		Firm to stiff dark grey slightly sandy gravelly CLAY with occasional cobbles. Gravel is subangular to subrounded fine to coarse of sandstone and mudstone. Cobbles are subangular to subrounded fine to coarse of sandstone and mudstone. (GLACIAL TILL)		2.00 +94.29		
2.60	D3				(1.00)		
		26/07/18					
			END OF EXPLORATORY HOLE		3.00 +93.29		

Groundwater Entries <table border="1"> <thead> <tr> <th>No.</th> <th>Depth</th> <th>Strike (m)</th> <th>Remarks</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>1.10</td> <td></td> <td></td> </tr> </tbody> </table>	No.	Depth	Strike (m)	Remarks	1	1.10			Remarks <table border="1"> <thead> <tr> <th>Depth (m)</th> <th>Remarks</th> </tr> </thead> <tbody> <tr> <td>0.00 - 3.00</td> <td>Strata too gravelly for hand vanes.</td> </tr> <tr> <td>1.10 - 2.00</td> <td>Trial pit unstable and collapsing into pit.</td> </tr> <tr> <td>3.00</td> <td>Trial pit terminated due to collapse.</td> </tr> </tbody> </table>	Depth (m)	Remarks	0.00 - 3.00	Strata too gravelly for hand vanes.	1.10 - 2.00	Trial pit unstable and collapsing into pit.	3.00	Trial pit terminated due to collapse.	Stability Unstable from 1.10m Shoring None Weather Warm, dry, cloudy
No.	Depth	Strike (m)	Remarks															
1	1.10																	
Depth (m)	Remarks																	
0.00 - 3.00	Strata too gravelly for hand vanes.																	
1.10 - 2.00	Trial pit unstable and collapsing into pit.																	
3.00	Trial pit terminated due to collapse.																	

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. Scale 1:25 © Copyright SOCOTEC UK Limited 28/03/2019 15:36:28	Project A11N MORPETH TO FELTON & ALNWICK TO ELLINGHAM Project No. A8013-18 Carried out for Geoffrey Osborne Limited	Trial Pit <h3>TP/17/47</h3> Sheet 1 of 1
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Trial Pit Log



Logged MC Checked PH Approved TC	Start 23/07/2018 End 23/07/2018	Equipment, Methods and Remarks 8T tracked excavator. Machine excavated.	Dimension and Orientation Width 0.60 m Length 4.00 m 	Ground Level 94.91 mOD Coordinates (m) E 419079.00 National Grid N 617336.13
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Samples and Tests Strata Description

Depth	Type & No.	Records	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.20	ES1		Grey sandy subangular to subrounded fine to coarse GRAVEL of sandstone. With fragments of whole and broken brick. (MADE GROUND)		(0.50)		
			Firm to stiff grey, mottled brown and orangish brown, slightly sandy slightly gravelly silty CLAY with low cobble content. Gravel is subangular to subrounded fine to coarse of predominantly sandstone. Cobbles are subangular to subrounded of sandstone. (GLACIAL TILL)		0.50 +94.41		
1.00	ES2				(0.80)		
			Stiff brown slightly sandy slightly gravelly CLAY with low cobble and high boulder content. Gravel is subangular to subrounded fine to coarse of sandstone and siltstone. Cobbles are subangular to subrounded of sandstone. Boulders (<0.60m) are subrounded, occasionally tabular, of sandstone. Frequent pockets (<5mm) of black lignite. (GLACIAL TILL)	1.30-1.60 low boulder content	1.30 +93.61		
1.80 - 2.20	B2				(1.20)		
2.20	D2						
			Stiff dark grey slightly sandy slightly gravelly CLAY with low cobble content. Gravel is subangular to subrounded fine to coarse. (GLACIAL TILL)		2.50 +92.41		
3.00 - 3.20	B3				(1.10)		
3.20	D3						
		23/07/18 Dry		3.40 Obstruction in face B			
			END OF EXPLORATORY HOLE		3.60 +91.31		

Groundwater Entries No. Depth Strike (m) Remarks	Remarks Depth (m) Remarks 0.00 - 3.60 No groundwater encountered during excavation. 0.01 - 3.60 Strata too gravelly for hand vanes. 3.60 Trial pit terminated at assumed rock head.	Stability Stable Shoring None Weather Warm, dry, cloudy
--	--	--

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. Scale 1:25 © Copyright SOCOTEC UK Limited 28/03/2019 15:36:29	Project A11N MORPETH TO FELTON & ALNWICK TO ELLINGHAM Project No. A8013-18 Carried out for Geoffrey Osborne Limited	Trial Pit <h2 style="text-align: center;">TP/17/48</h2> Sheet 1 of 1
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Trial Pit Log



Logged RT Checked PH Approved TC	Start 31/07/2018 End 31/07/2018	Equipment, Methods and Remarks Hand excavated.	Dimension and Orientation Width 0.40 m Length 1.20 m 	Ground Level 95.38 mOD Coordinates (m) E 417167.43 National Grid N 621770.44
---	--	--	---	---

Samples and Tests Strata Description

Depth	Type & No.	Records	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.20 0.20 0.30 - 0.50	ES1 D2 B3		Firm brown slightly gravelly sandy CLAY. Gravel is angular to subrounded fine to coarse of sandstone. Frequent rootlets. (TOPSOIL)		(0.25) 0.25 +95.13		
0.50 0.50	ES4 D5		Firm brown and light brown sandy gravelly CLAY. Gravel is angular to subangular fine to coarse of sandstone, limestone and occasional black lignite. Rare brick fragments (<20mm). (MADE GROUND)		(0.55) 0.80 +94.58		
		31/07/18 Dry	Soft to firm dark brown slightly sandy slightly gravelly CLAY. Gravel is angular to subrounded fine to coarse of sandstone. (GLACIAL TILL)		(0.50) 1.30 +94.08		
			END OF EXPLORATORY HOLE	1.30 cable tie over 66Kv cables			

Groundwater Entries No. Depth Strike (m) Remarks	Remarks Depth (m) Remarks 0.00 - 1.30 No groundwater encountered during excavation.	Stability Stable Shoring None Weather Dry, windy
---	--	---

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. Scale 1:25 © Copyright SOCOTEC UK Limited 28/03/2019 12:18:35	Project A11N MORPETH TO FELTON & ALNWICK TO ELLINGHAM Project No. A8013-18 Carried out for Geoffrey Osborne Limited	Trial Pit <h3>HP/17/01</h3> Sheet 1 of 1
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Trial Pit Log



Logged RT Checked RT Approved TC	Start 01/10/2018 End 01/10/2018	Equipment, Methods and Remarks Hand excavated.	Dimension and Orientation Width 0.70 m Length 1.17 m 	Ground Level 88.16 mOD Coordinates (m) E 417701.61 National Grid N 620676.87
---	--	--	---	---

Samples and Tests Strata Description

Depth	Type & No.	Records	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.10 - 0.30	B3		Firm dark brown slightly sandy gravelly CLAY with low cobble content. Gravel is angular to subrounded fine to coarse of sandstone, limestone, brick and macadam. Frequent rootlets. (MADE GROUND)				
0.20 0.20	ES1 D2						
0.50	D4						
0.80 0.80	ES5 D6	01/10/18 Dry		0.70-0.80 grey fine to coarse sand 0.80 clay tile overlaying HV (66**) power cables	1.00 +87.16		
			END OF EXPLORATORY HOLE	0.85 1no. plastic duct with suspected fibre optic cables within (150mm diameter)			

Groundwater Entries No. Depth Strike (m) Remarks	Remarks Depth (m) Remarks 0.00 - 1.00 No groundwater encountered during excavation. 1.00 Trial pit terminated due to services.	Stability Stable Shoring None Weather Dry, cloudy, cool
---	---	--

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. Scale 1:25 © Copyright SOCOTEC UK Limited 28/03/2019 12:18:35	Project A11N MORPETH TO FELTON & ALNWICK TO ELLINGHAM Project No. A8013-18 Carried out for Geoffrey Osborne Limited	Trial Pit <h2>HP/17/02</h2> Sheet 1 of 1
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Trial Pit Log



Logged RT Checked RT Approved TC	Start 02/10/2018 End 02/10/2018	Equipment, Methods and Remarks Hand excavated.	Dimension and Orientation Width 0.80 m Length 1.25 m 	Ground Level 87.46 mOD Coordinates (m) E 417730.13 National Grid N 620587.16
---	--	--	---	---

Samples and Tests Strata Description

Depth	Type & No.	Records	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
0.10 - 0.30	B1		Firm brown slightly sandy gravelly CLAY with low cobble content. Gravel is subangular to subrounded fine to coarse of limestone, sandstone and rare brick. Frequent rootlets. Cobbles are subangular of sandstone. (MADE GROUND)		(0.75)		
0.20 0.20	ES2 D3						
0.50	D4						
0.80 0.80 0.80 - 1.00	ES5 D6 B7	02/10/18	Dry Firm orangish brown slightly sandy gravelly CLAY with low cobble content. Gravel is angular to subrounded fine to coarse of sandstone and limestone. Cobbles are angular to subrounded of sandstone and limestone. (GLACIAL TILL)	0.80-1.00 Cable tile at 0.80m with 2no plastic ducts below.	0.75 (0.25) 1.00	+86.71 +86.46	
			END OF EXPLORATORY HOLE				

Groundwater Entries No. Depth Strike (m) Remarks	Remarks Depth (m) Remarks 0.00 - 1.00 No groundwater encountered during excavation. 1.00 Trial pit terminated due to services.	Stability Stable Shoring None Weather Sunny, windy
---	---	---

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column. Scale 1:25 © Copyright SOCOTEC UK Limited 28/03/2019 12:18:35	Project A11N MORPETH TO FELTON & ALNWICK TO ELLINGHAM Project No. A8013-18 Carried out for Geoffrey Osborne Limited	Trial Pit <h2 style="text-align: center;">HP/17/03</h2> Sheet 1 of 1
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APPENDIX C
INSTRUMENTATION AND MONITORING

Installation Details
Groundwater Monitoring
Diver Data Plot

Table C1
Table C2
Figure C3



Installations Summary

Instrument Reference	Instrument Type (See Notes)	Installation Date, dd/mm/yyyy	Pipe Diameter, mm	Instrument Base, mbgl	Response Zone Range, mbgl	Pipe Top Details	Headworks	Remarks
BH/17/01 (1)	SP	20/07/2018	50	4.00	1.00 to 4.00	Gas tap	Flush cover	
BH/17/02 (1)	SP	19/07/2018	50	5.60	3.50 to 5.60	Gas tap	Flush cover	
BH/17/03 (1)	SP	13/09/2018	50	5.00	1.00 to 5.00	Gas tap	Raised cover	
BH/17/04 (1)	SP	13/09/2018	50	5.00	1.00 to 5.00	Gas tap	Raised cover	
BH/17/06 (1)	SP	20/09/2018	50	9.40	5.70 to 9.40	Gas tap	Raised cover	
BH/17/09 (1)	SP	24/10/2018	50	5.00	1.00 to 5.00	Gas tap	Raised cover	
BH/17/11 (1)	SP	26/07/2018	50	10.00	1.00 to 10.00	Gas tap	Raised cover	
BH/17/13 (1)	SP	24/07/2018	50	10.00	1.00 to 10.00	Gas tap	Flush cover	
BH/17/14 (1)	SP	18/07/2018	50	4.00	1.00 to 4.00	Gas tap	Flush cover	

Notes: Type: SP - Standpipe, SPIE - Standpipe
Piezometer, HPIE - Hydraulic Piezometer, PPIE -
Pneumatic Piezometer, EPIE - Vibrating Wire
Piezometer, PWEL - Pumping Well



Project A1in MORPETH TO FELTON & ALNWICK TO ELLINGHAM
Project No. A8013-18
Carried out for Geoffrey Osborne Limited

Table

C1

Groundwater Monitoring

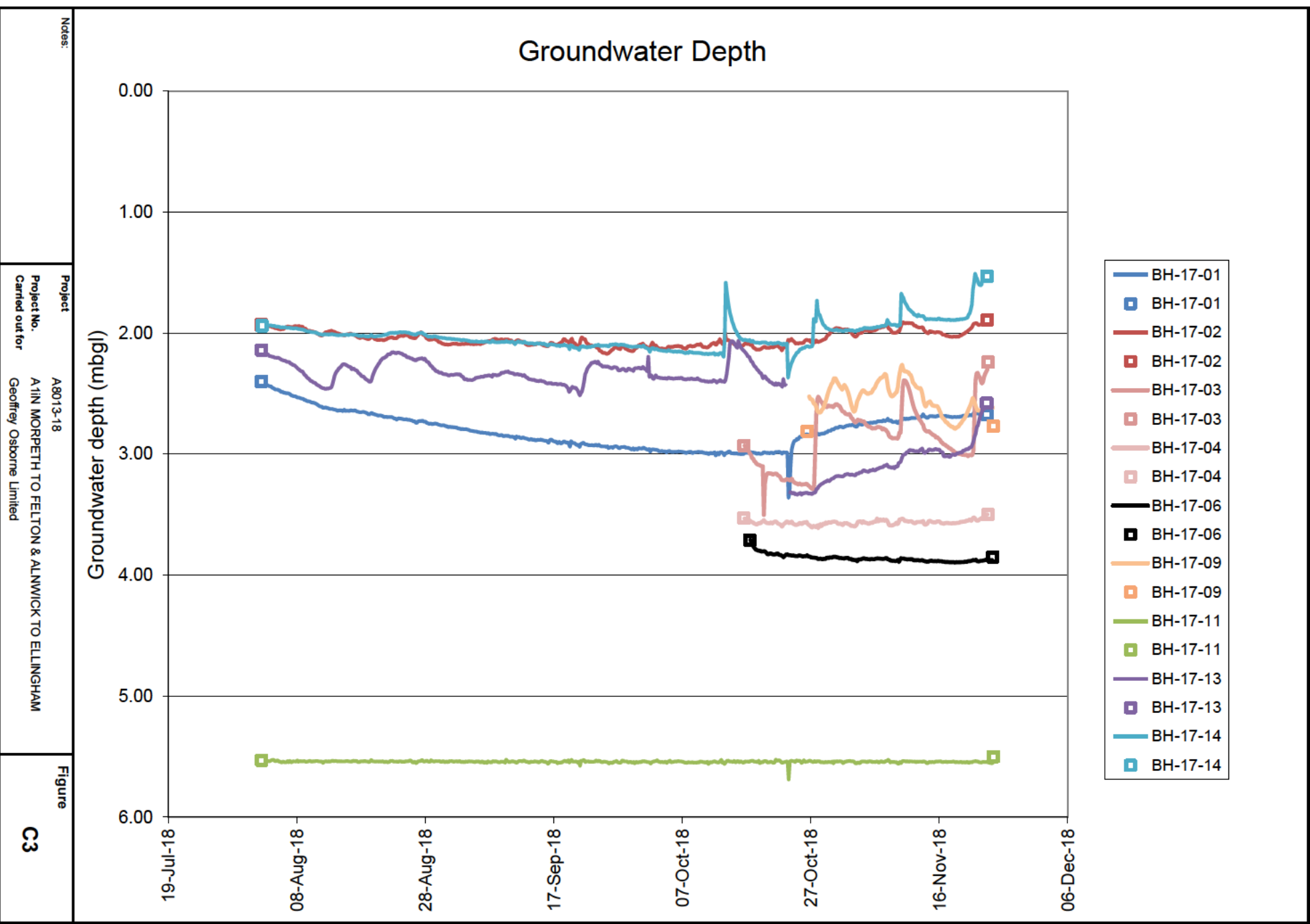
Instrument Reference	Instrument Type	Instrument Base, mbgl	Date Time dd/mm/yyyy hh:mm:ss	Groundwater depth, mbgl	Comments
BH/17/01 (1)	SP	4.00	02/08/2018 11:50:00	3.23	Diver Installed
			22/10/2018 14:30:00	2.96	
			23/10/2018 15:00:00	3.00	
			23/11/2018 09:32:00	2.67	
			08/01/2019 11:29:00	3.33	Diver Removed
BH/17/02 (1)	SP	3.50	02/08/2018 11:14:00	1.93	Diver Installed
			22/10/2018 14:15:00	2.18	
			23/10/2018 14:20:00	2.20	
			23/11/2018 12:00:00	1.89	
			08/01/2019 13:03:00	1.53	Diver removed
BH/17/03 (1)	SP	5.00	16/10/2018 12:00:00	2.93	Diver installed
			17/10/2018 10:30:00	2.93	
			19/10/2018 15:00:00	3.03	
			26/10/2018 10:36:00	3.14	
			23/11/2018 14:20:00	2.24	
			08/01/2019 12:23:00	3.01	Diver removed
BH/17/04 (1)	SP	5.00	16/10/2018 12:30:00	3.53	Diver installed
			17/10/2018 13:30:00	3.53	
			19/10/2018 14:45:00	3.54	
			26/10/2018 10:25:00	3.56	
			23/11/2018 13:20:00	3.60	
			08/01/2019 12:34:00	2.63	Diver removed
BH/17/06 (1)	SP	9.40	17/10/2018 12:57:00	3.71	Diver installed
			18/10/2018 12:50:00	3.71	
			24/11/2018 08:05:00	3.75	
			08/01/2019 11:04:00	3.36	Diver removed
BH/17/09 (1)	SP	5.00	26/10/2018 11:30:00	2.81	Diver installed
			24/11/2018 09:35:00	2.77	
			08/01/2019 10:37:00	2.40	Diver removed
BH/17/11 (1)	SP	10.00	02/08/2018 13:08:00	5.53	Diver Installed
			16/10/2018 10:30:00	5.52	
			23/10/2018 10:48:00	5.50	
			24/11/2018 10:40:00	5.50	
			08/01/2019 10:10:00	5.52	Diver removed
BH/17/13 (1)	SP	10.00	02/08/2018 12:36:00	2.14	Diver Installed
			22/10/2018 13:45:00	2.40	
			23/10/2018 08:00:00	2.40	
			23/11/2018 09:50:00	2.58	
			08/01/2019 11:40:00	2.16	Diver removed
BH/17/14 (1)	SP	4.00	02/08/2018 14:07:00	1.04	Diver installed
			22/10/2018 13:59:00	2.17	
			23/10/2018 09:00:00	2.20	
			23/11/2018 10:50:00	1.53	
			08/01/2019 11:50:00	1.54	Diver removed

Notes: Type: SP - Standpipe, SPIE - Standpipe Piezometer, HPIE - Hydraulic Piezometer, PPIE - Pneumatic Piezometer, EPIE - Vibrating Wire Piezometer, PWEL - Pumping Well



Project A11N MORPETH TO FELTON & ALNWICK TO ELLINGHAM
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Carried out for Geoffrey Osborne Limited

C2



Notes:

Project

Project No. A8013-18
Carried out for A I N MORPETH TO FELTON & ALNWICK TO ELLINGHAM
Geoffrey Osborne Limited

Figure

C3

**APPENDIX D
IN SITU TESTING**

Soakaway Permeability Tests

SKWY/TP/17/08
SKWY/TP/17/14
SKWY/TP/17/33/1
SKWY/TP/17/33/2

Soakaway Test

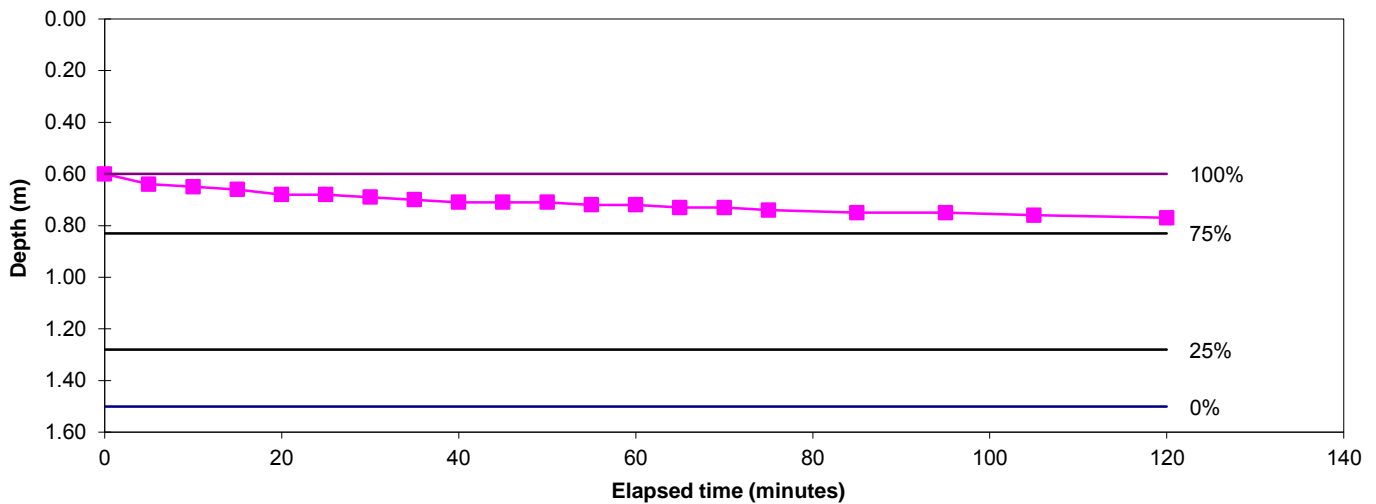


Trial Pit No: TP/17/08
 Length (m): 1.50
 Width (m): 0.70
 Depth (m): 1.50

Test No: 1
 Datum height:
 Granular infill: None

Date: 26/09/2018
 0.00 m agl

Elapsed time (minutes)	Water Depth (m below datum)	Elapsed time (minutes)	Water Depth (m below datum)
0	0.60	70	0.73
5	0.64	75	0.74
10	0.65	85	0.75
15	0.66	95	0.75
20	0.68	105	0.76
25	0.68	120	0.77
30	0.69		
35	0.70		
40	0.71		
45	0.71		
50	0.71		
55	0.72		
60	0.72		
65	0.73		



Start water depth for analysis (mbgl): 0.60
 75% effective depth (mbgl): 0.83 Elapsed time (mins): #N/A
 50% effective depth (mbgl): 1.05 Elapsed time (mins): #N/A
 25% effective depth (mbgl): 1.28 Elapsed time (mins): #N/A
 Base of soakage zone (mbgl): 1.50

Volume outflow between 75% and 25% effective depth (m3):
 Mean surface area of outflow (m²): 3.03
 (side area at 50% effective depth + base area)
 Time for outflow between 75% and 25% effective depth (mins):

Soil infiltration rate:	Unable to reliably determine soil infiltration rate as 25% effective depth not achieved.
Remarks Results processed following BRE DG 365 (2016).	

Notes:	Project A1IN MORPETH TO FELTON & ALNWICK TO ELLINGHAM	Figure SKWY/TP/17/08/
	Project No. A8013-18	
	Carried out for Geoffrey Osborne Limited	

Soakaway Test

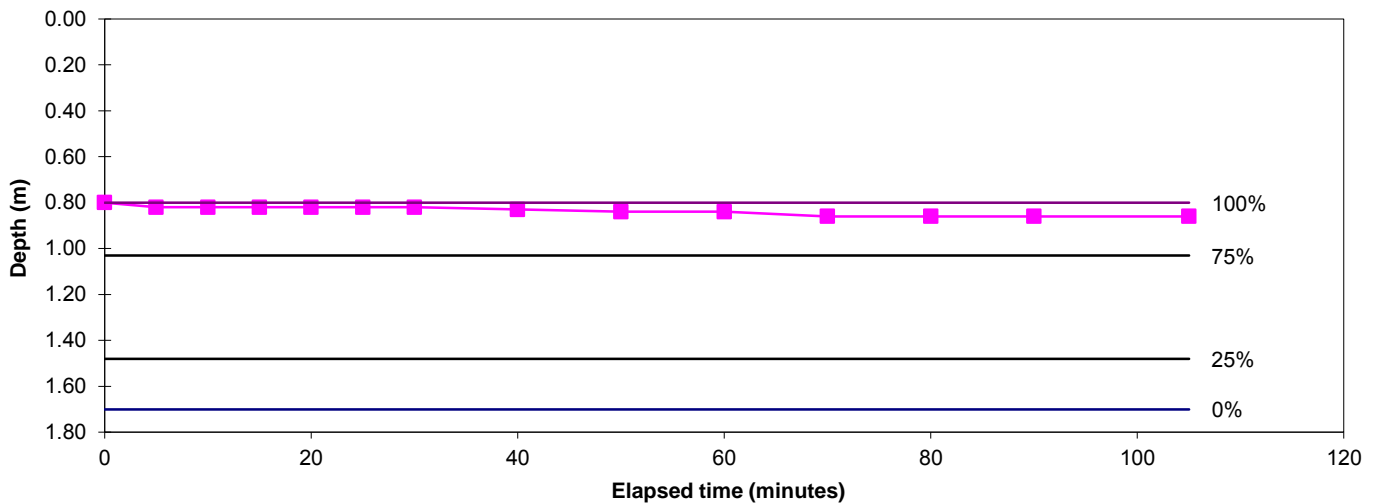


Trial Pit No: BH/17/14
 Length (m): 1.70
 Width (m): 0.70
 Depth (m): 1.70

Test No: 1
 Datum height:
 Granular infill: None

Date: 27/09/2018
 0.00 m agl

Elapsed time (minutes)	Water Depth (m below datum)	Elapsed time (minutes)	Water Depth (m below datum)
0	0.80		
5	0.82		
10	0.82		
15	0.82		
20	0.82		
25	0.82		
30	0.82		
40	0.83		
50	0.84		
60	0.84		
70	0.86		
80	0.86		
90	0.86		
105	0.86		



Start water depth for analysis (mbgl): 0.80
 75% effective depth (mbgl): 1.03 Elapsed time (mins): #N/A
 50% effective depth (mbgl): 1.25
 25% effective depth (mbgl): 1.48 Elapsed time (mins): #N/A
 Base of soakage zone (mbgl): 1.70

Volume outflow between 75% and 25% effective depth (m3):
 Mean surface area of outflow (m²): 3.35
 (side area at 50% effective depth + base area)
 Time for outflow between 75% and 25% effective depth (mins):

Soil infiltration rate:	Unable to reliably determine soil infiltration rate as 25% effective depth not achieved.
--------------------------------	---

Remarks: Results processed following BRE DG 365 (2016).

Soakaway Test

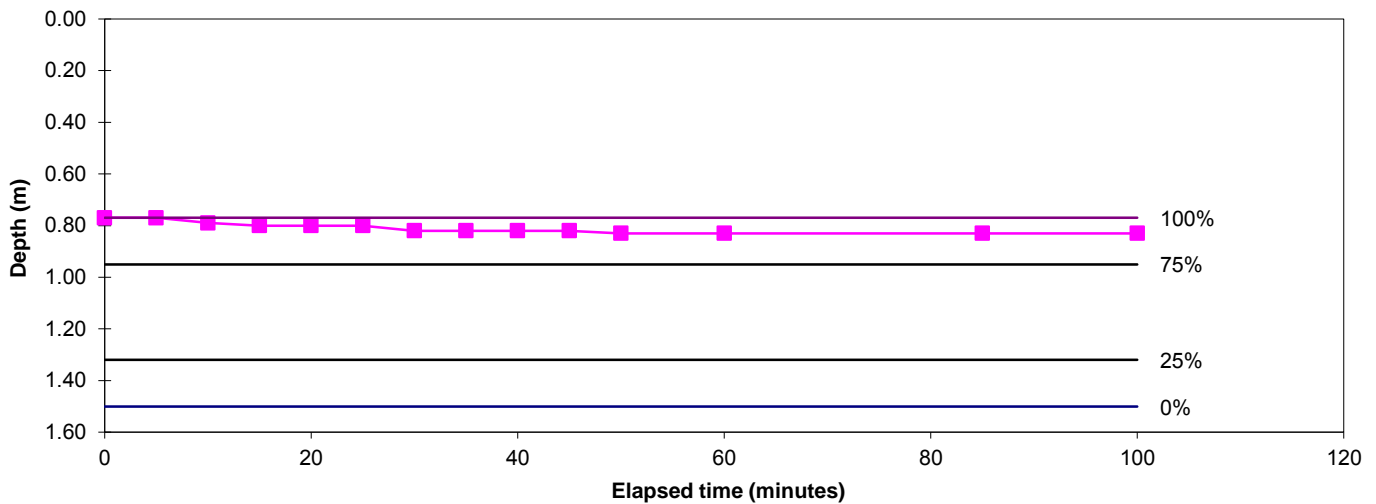


Trial Pit No: TP/17/33
 Length (m): 1.60
 Width (m): 0.70
 Depth (m): 1.50

Test No: 1
 Datum height:
 Granular infill: None

Date: 20/09/2018
 0.00 m agl

Elapsed time (minutes)	Water Depth (m below datum)	Elapsed time (minutes)	Water Depth (m below datum)
0	0.77		
5	0.77		
10	0.79		
15	0.80		
20	0.80		
25	0.80		
30	0.82		
35	0.82		
40	0.82		
45	0.82		
50	0.83		
60	0.83		
85	0.83		
100	0.83		



Start water depth for analysis (mbgl): 0.77
 75% effective depth (mbgl): 0.95 Elapsed time (mins): #N/A
 50% effective depth (mbgl): 1.14 Elapsed time (mins): #N/A
 25% effective depth (mbgl): 1.32 Elapsed time (mins): #N/A
 Base of soakage zone (mbgl): 1.50

Volume outflow between 75% and 25% effective depth (m3):
 Mean surface area of outflow (m²): 2.78
 (side area at 50% effective depth + base area)
 Time for outflow between 75% and 25% effective depth (mins):

Soil infiltration rate:	Unable to reliably determine soil infiltration rate as 25% effective depth not achieved.
Remarks	Results processed following BRE DG 365 (2016).

Notes:	Project A1IN MORPETH TO FELTON & ALNWICK TO ELLINGHAM Project No. A8013-18 Carried out for Geoffrey Osborne Limited	Figure SKWY/TP/17/33/
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Soakaway Test

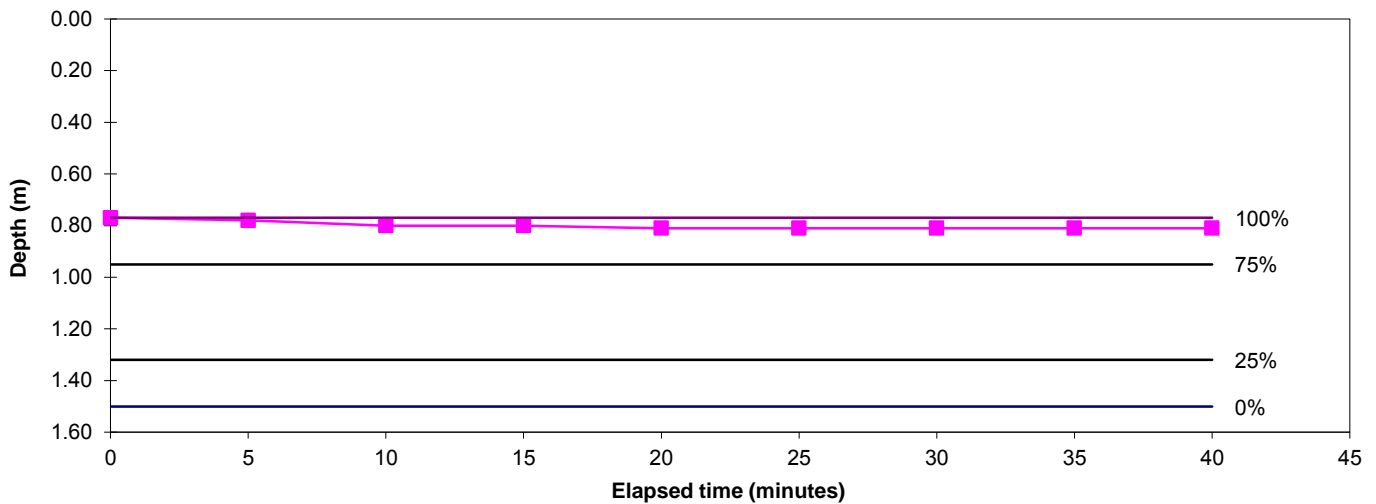


Trial Pit No: TP/17/33
 Length (m): 1.60
 Width (m): 0.70
 Depth (m): 1.50

Test No: 2
 Datum height:
 Granular infill: None

Date: 20/09/2018
 0.00 m agl

Elapsed time (minutes)	Water Depth (m below datum)	Elapsed time (minutes)	Water Depth (m below datum)
0	0.77		
5	0.78		
10	0.80		
15	0.80		
20	0.81		
25	0.81		
30	0.81		
35	0.81		
40	0.81		



Start water depth for analysis (mbgl): 0.77
 75% effective depth (mbgl): 0.95 Elapsed time (mins): #N/A
 50% effective depth (mbgl): 1.14
 25% effective depth (mbgl): 1.32 Elapsed time (mins): #N/A
 Base of soakage zone (mbgl): 1.50

Volume outflow between 75% and 25% effective depth (m3):
 Mean surface area of outflow (m²): 2.78
 (side area at 50% effective depth + base area)
 Time for outflow between 75% and 25% effective depth (mins):

Soil infiltration rate:	Unable to reliably determine soil infiltration rate as 25% effective depth not achieved.
Remarks	Results processed following BRE DG 365 (2016).

Notes:

Project A1IN MORPETH TO FELTON & ALNWICK TO ELLINGHAM
 Project No. A8013-18
 Carried out for Geoffrey Osborne Limited

Figure
SKWY/TP/17/33/

APPENDIX E
GEOTECHNICAL LABORATORY TEST RESULTS

Index Properties – Summary of Results	INDX 1 to 6
Particle Size Distribution Analyses	PSD 1 to 49
Unconsolidated Undrained Triaxial Compression Tests – Summary of Results	UUSUM
One Dimensional Consolidation Test	OED 1 to 2
Dry Density/Moisture Content – Light Compaction	COMPL 1 to 5
Dry Density/Moisture Content – Heavy Compaction	COMPH 1 to 7
California Bearing Ratio Test	CBR 1 to 27
Moisture Condition Value Test	MCVREL1 to 11 (2 Sheets per test)
Determination of Shear Strength by Direct Shear	SSB 1 to 25
Point Load Index	PLT1 to 6
Uniaxial Compressive Strength of Rock Tests	RUCS
Index Properties of Rock	RINDX1 to 5
Chemical Tests – Summary of Results	EFS/192867 EFS/192873 EFS/192876 EFS/193457 EFS/193468 EFS/193469 EFS/194145 EFS/189967 EFS/189968 EFS/189969

INDEX PROPERTIES - SUMMARY OF RESULTS

Hole No.	Sample			Soil Description	ρ	ρ_d	W	< 425 μ m sieve	W _L	W _P	I _p	ρ_s	Remarks	
	No.	Depth (m)												type
		from	to											
					Mg/m ³		%	%	%	%		Mg/m ³		
BH/17/01	6	1.20		D	Brown slightly sandy slightly gravelly CLAY.			11	67	31 a	17	14		
BH/17/01	10	3.20	3.65	D	Brown slightly sandy slightly gravelly CLAY			13	74 n	27 a	15	12		
BH/17/02	5	0.75		D	Dark brown slightly sandy slightly gravelly CLAY.				66 s	29 a	20	9		
BH/17/02	7	1.20	1.65	D	Brown slightly sandy slightly gravelly CLAY			7.1						
BH/17/02	9	2.70		D	Greyish brown slightly sandy slightly gravelly CLAY.			12	77	28 a	14	14		
BH/17/03	3	1.00	1.10	B	Brown slightly sandy slightly gravelly CLAY with one cobble.			23						
BH/17/03	5	1.70		D	Brown slightly sandy slightly gravelly CLAY.			14						
BH/17/03	7	2.00	2.50	D	Greyish brown slightly sandy slightly gravelly CLAY.			6	51 s	34 b	18	16		
BH/17/03	10	3.00	3.50	B	Dark grey slightly sandy slightly gravelly CLAY.			11						
BH/17/03	9	3.00	3.45	D	Brown slightly sandy CLAY.			6.9	55 s	39 b	20	19		
BH/17/04	3	1.00	1.10	B	Brown slightly sandy slightly gravelly CLAY.			13						
BH/17/04	5	1.70		D	Brown slightly sandy slightly gravelly CLAY.			14	93 n	32 a	17	15		
BH/17/04	7	2.00	2.50	B	Brown slightly sandy slightly gravelly CLAY.			14						
BH/17/04	10	3.50		D	Brown slightly sandy slightly gravelly CLAY			14	88 n	30 a	15	15		
BH/17/04	12	4.00		D	Brown slightly sandy CLAY.			12	81 s	30 b	14	16		
BH/17/05	2	0.80		D	Brown slightly sandy slightly gravelly CLAY.			8.7						
BH/17/05	6	2.60		D	Brown sandy slightly clayey GRAVEL.			7.2						
BH/17/05	7	3.60		D	Greyish brown slightly sandy slightly gravelly CLAY.			14	96 n	28 a	15	13		
BH/17/06	3	0.30	0.80	B	Brown sandy gravelly clayey COBBLES.			17						
BH/17/06	7	1.20	1.70	B	Brown slightly gravelly sandy CLAY.			12						
BH/17/06	11	3.70		D	Brown slightly sandy silty CLAY.			29	68 n	34 a	20	14		
BH/17/06	13	4.30		D	Greyish brown slightly sandy CLAY.			27	100 n	37 a	20	17		
BH/17/06	18	7.50	8.00	B	Grey slightly sandy slightly gravelly CLAY.			15						
BH/17/06	20	9.50		D	Grey slightly sandy gravelly silty CLAY			10						
BH/17/07	6	1.20	1.65	D				6.2						
BH/17/07	7	2.50	3.00	B	Brown slightly sandy slightly gravelly silty CLAY.			20						
BH/17/07	9	3.50	4.00	B	Grey slightly sandy silty CLAY.			26	100 n	44 a	22	22		
BH/17/07	11	4.00	4.50	B	Brown slightly sandy slightly gravelly CLAY.			23						
BH/17/07	14	5.50	6.00	B	Light brown slightly sandy CLAY.			28	100 n	51 a	25	26		
BH/17/07	15	6.00	6.45	D	Brown sandy CLAY.			16	100 n	23 a	14	9		
BH/17/08	6	1.20		D	Brown slightly sandy slightly gravelly silty CLAY.			6.8	59	39 a	24	15		

General notes:

All above tests carried out to BS1377 : 1990 unless annotated otherwise. See Remarks for further details

Key : ρ bulk density, linear

WL Liquid limit

WP Plastic limit

<425um preparation

ρ_s particle density

ρ_d dry density

a 4 point cone test

NP non - plastic

n from natural soil

-g = gas jar

w moisture content


b 1 point cone test

IP Plasticity Index

s sieved specimen

-p = small pyknometer

* test carried out to BS EN ISO 17892

QA Ref SLR 1 Rev 2.93 Mar 17		Project No A8013-18	Figure
		Project Name A1 ALNWICK TO ELLINGHAM	INDX
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INDEX PROPERTIES - SUMMARY OF RESULTS

Hole No.	Sample			Soil Description	ρ	ρ_d	W	< 425 μ m sieve	W _L	W _P	I _p	ρ_s	Remarks	
	No.	Depth (m)												type
		from	to											
					Mg/m ³	%	%	%	%		Mg/m ³			
BH/17/08	10	2.20	2.70	B	Brown slightly sandy gravelly CLAY.		8.2							
BH/17/08	12	3.20	3.50	B	Brown slightly sandy gravelly CLAY.			48 s	25 a	17	8			
BH/17/08	14	5.20		D	Brown clayey SAND.		3		b	NP				
BH/17/09	5	1.00		D	Brown slightly sandy slightly gravelly CLAY with rare rootlets.		12	63	40 a	23	17			
BH/17/09	9	2.20	2.70	B	Brown slightly sandy gravelly CLAY.		14							
BH/17/09	11	3.20	3.70	B	Brown very sandy clayey GRAVEL with one cobble.		9.3							
BH/17/09	13	6.00		D	Brown slightly sandy very gravelly CLAY		14	24 s	30 a	22	8			
BH/17/10	7	2.00		D	Brown slightly sandy gravelly silty CLAY.		18							
BH/17/10	10	3.65	3.70	D	Dark brown slightly gravelly sandy SILT.		18		b	NP				
BH/17/10	11	4.20	4.65	D	Brown slightly sandy gravelly CLAY		11							
BH/17/11	3	0.20	0.50	B	Brown slightly sandy gravelly CLAY.		11						2.69-g	
BH/17/11	5	1.00		D	Brown sandy gravelly silty CLAY.		2.3							
BH/17/12	4	0.60	1.00	B	Light brown slightly gravelly sandy CLAY.		17							
BH/17/12	8	2.00	2.50	B	Brown slightly sandy slightly gravelly CLAY.		17							
BH/17/12	16	6.00	6.50	B	Brown very gravelly clayey SAND		10							
BH/17/13	6	1.20	1.65	D	Brown slightly sandy slightly gravelly CLAY.		12	49 n	28 b	17	11			
BH/17/13	9	4.00		D	Dark brown slightly sandy slightly gravelly CLAY.		12	90	30 a	15	15			
BH/17/14	9	2.50	3.00	B	Greyish brown slightly gravelly sandy CLAY.		17							
BH/17/14	11	4.00		D	Dark brown slightly sandy slightly gravelly CLAY.		14	97 n	33 a	16	17			
TP/17/01	5	0.50	1.00	B	Brown slightly gravelly silty CLAY.		22	99 n	46 a	24	22			
TP/17/01	8	2.90		D	Brownish grey slightly sandy slightly gravelly CLAY.		12	83 n	27 a	13	14			
TP/17/02	1	0.20		D	Brown slightly sandy slightly gravelly CLAY with occasional rootlets.		18	97	41 a	25	16			
TP/17/02	3	1.80		D	Brown slightly sandy slightly gravelly CLAY		39	77 n	44 a	25	19			
TP/17/03	1	0.50	0.80	B	Brown slightly sandy slightly gravelly CLAY with occasional rootlets.		11						2.68-p	
TP/17/03	2	0.60		D	Brown slightly sandy slightly gravelly CLAY		9.6	63 n	30 a	18	12			
TP/17/03	3	2.40	2.60	B	Dark brown slightly sandy slightly gravelly CLAY.		13	87 s	31 a	18	13			
TP/17/03	5	2.90		D	Brown slightly sandy slightly gravelly CLAY		11	85 n	27 a	11	16			
TP/17/04	2	0.80		D	Greyish brown slightly sandy slightly gravelly CLAY with rare rootlets.		41	96	55 a	29	26			
TP/17/05	2	1.20	1.40	B	Brown slightly sandy slightly gravelly CLAY with occasional rootlets.		13							
TP/17/05	2	1.40		D	Dark brown slightly sandy slightly gravelly CLAY.		12	71	29 a	15	14			
TP/17/05	3	2.70		D	Brown slightly sandy slightly gravelly CLAY		13	82 n	30 a	14	16			

General notes:

All above tests carried out to BS1377 : 1990 unless annotated otherwise. See Remarks for further details

Key : ρ bulk density, linear

W_L Liquid limit

W_P Plastic limit

<425 μ m preparation

ρ_s particle density

ρ_d dry density

a 4 point cone test

NP non - plastic

n from natural soil

-g = gas jar

w moisture content

b 1 point cone test

IP Plasticity Index

s sieved specimen

-p = small pyknometer

* test carried out to BS EN ISO 17892

QA Ref SLR 1 Rev 2.93 Mar 17		Project No A8013-18	Figure
		Project Name A1 ALNWICK TO ELLINGHAM	INDX
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INDEX PROPERTIES - SUMMARY OF RESULTS

Hole No.	Sample			Soil Description	ρ	ρ_d	W	< 425 μ m sieve	W _L	W _P	I _p	ρ_s	Remarks	
	No.	Depth (m)												type
		from	to											
					Mg/m ³		%	%	%	%		Mg/m ³		
TP/17/06	1	0.90	1.20	B	Brown slightly gravelly sandy CLAY with occasional rootlets.			14						
TP/17/06	1	1.20		D	Brown slightly sandy slightly gravelly CLAY.			13	73 n	33 a	19	14		
TP/17/06	2	2.20	2.40	B				12						
TP/17/06	3	3.20		D	Brown slightly sandy slightly gravelly CLAY.			11	83 n	28 a	13	15		
TP/17/07	1	0.50		D	Brownish grey slightly sandy CLAY.			15	100	35 a	18	17		
TP/17/08	5	0.40	1.00	B	Brown slightly sandy slightly gravelly CLAY.			15	91 n	33 a	18	15		
TP/17/09A	3	0.40		D	Brown slightly sandy slightly gravelly CLAY.			16	78 n	37 a	20	17		
TP/17/09A	6	1.50		D	Brown slightly gravelly slightly sandy CLAY.			17	82 s	31 a	20	11		
TP/17/10	1	1.10	1.40	B	Brown slightly gravelly sandy CLAY.			19						
TP/17/10	2	2.20	2.50	B	Dark brown slightly sandy slightly gravelly CLAY.			26						
TP/17/10	2	2.50		D	Brown slightly sandy slightly gravelly CLAY			15	85 n	29 a	15	14		
TP/17/11	1	1.00		D	Brown slightly sandy slightly gravelly CLAY.			17	64	32 a	18	14		
TP/17/11	2	1.80	2.00	B	Brown slightly sandy slightly gravelly CLAY.			15						
TP/17/11	3	2.40		D	Brown slightly sandy slightly gravelly CLAY			16	81 n	35 a	19	16		
TP/17/12	4	0.50	1.60	B	Brown slightly sandy slightly gravelly CLAY with one cobble.			15						
TP/17/12	7	1.20		D	Brown slightly sandy slightly gravelly CLAY.			13	77 s	35 a	16	19		
TP/17/12	8	1.50	2.00	B	Brown slightly sandy slightly gravelly CLAY.			15						
TP/17/12	11	3.00		D	Brown slightly sandy slightly gravelly CLAY.			12	93 n	30 a	13	17		
TP/17/13	3	0.30	0.50	B	Dark brown slightly sandy slightly gravelly CLAY.			14						
TP/17/13	6	0.70	1.00	B	Brown slightly sandy gravelly CLAY with three cobbles.			8.2	86 n	38 a	19	19		
TP/17/13	8	1.00	1.50	B	Brown slightly sandy slightly gravelly CLAY.			12	47 s	39 a	18	21		
TP/17/14	6	1.10	1.50	B	Light brown slightly gravelly sandy CLAY.			13						
TP/17/15	3	0.50		D	Brown slightly sandy slightly gravelly CLAY.			17	86 s	38 a	23	15		
TP/17/15	8	1.60		D	Brown silty CLAY.			25						
TP/17/15	10	2.50		D	Grey slightly sandy silty CLAY.			24	100 n	28 a	15	13		
TP/17/16	4	0.50		D	Brown slightly sandy slightly gravelly CLAY.			10	48 s	37 a	25	12		
TP/17/16	6	1.00		D	Brown gravelly slightly clayey SAND.			8.7						
TP/17/17	5	0.30	0.50	B	Brown slightly sandy slightly gravelly CLAY with occasional rootlets.			20	100 n	37 a	20	17		
TP/17/17	8	1.50	1.70	B	Brownish grey slightly sandy CLAY.			29				2.64-p		
TP/17/18	3	0.30		D	Brown slightly gravelly sandy CLAY.			12	58 s	34 a	20	14		
TP/17/18	6	1.40		D	Brown slightly gravelly clayey SAND.			9.2		b	NP			

General notes:

All above tests carried out to BS1377 : 1990 unless annotated otherwise. See Remarks for further details

Key : ρ bulk density, linear

W_L Liquid limit

W_P Plastic limit

<425um preparation

ρ_s particle density

ρ_d dry density

a 4 point cone test

NP non - plastic

n from natural soil

-g = gas jar

w moisture content

b 1 point cone test

IP Plasticity Index

s sieved specimen

-p = small pyknometer

* test carried out to BS EN ISO 17892

QA Ref
SLR 1
Rev 2.93
Mar 17



Project No

A8013-18

Project Name

A1 ALNWICK TO ELLINGHAM

Figure

INDX

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INDEX PROPERTIES - SUMMARY OF RESULTS

Hole No.	Sample			Soil Description	ρ	ρ_d	W	< 425 μ m sieve	W _L	W _P	I _p	ρ_s	Remarks	
	No.	Depth (m)												type
		from	to											
					Mg/m ³		%	%	%	%		Mg/m ³		
TP/17/18	7	1.40	1.80	B	Brown slightly gravelly very silty SAND.			18						
TP/17/18	9	2.40	2.80	B	Greyish brown sandy CLAY.			19						
TP/17/19	3	0.30	0.80	B	Brown slightly sandy slightly gravelly silty CLAY.			20	96 n	37 a	22	15		
TP/17/19	3	0.30	0.80	B	Dark brown slightly sandy slightly gravelly CLAY.			21						
TP/17/19	6	0.90		D	Brown slightly sandy slightly gravelly CLAY.			16	93 n	26 a	17	9		
TP/17/19	9	2.00		D	Brownish grey slightly sandy slightly gravelly CLAY.			16	88 s	29 a	15	14		
TP/17/20	2	0.20		D	Brown slightly sandy slightly gravelly CLAY			31	93 n	40 a	27	13		
TP/17/20	4	0.50	1.00	B	Dark brown slightly sandy gravelly CLAY.								2.68-p	
TP/17/20	5	1.10		D	Brown slightly sandy slightly gravelly CLAY.			19	93 n	34 a	17	17		
TP/17/20	7	1.40		D	Brown slightly gravelly SAND.			13						
TP/17/21	2	0.25		D	Brown slightly sandy slightly gravelly CLAY. With occasional fine rootlets.			18	99 n	44 a	24	20		
TP/17/21	6	0.80		D	Brown slightly sandy slightly gravelly CLAY.			14						
TP/17/21	7	1.20		D	Brown slightly gravelly silty CLAY.			24	94 n	39 a	19	20		
TP/17/21	9	2.80	3.00	B	Brownish grey slightly sandy slightly gravelly clayey SILT.			28						
TP/17/22	4	0.50		D	Brown slightly sandy slightly gravelly CLAY.			12	79 s	36 a	17	19		
TP/17/22	6	1.00		D	Brown slightly sandy gravelly CLAY.			10	76 s	31 a	17	14		
TP/17/23	3	0.40	1.00	B	Dark brown slightly sandy CLAY			14						
TP/17/23	6	1.40	2.00	B	Brown slightly sandy slightly gravelly CLAY.			23						
TP/17/23	8	2.40	3.00	B	Brown slightly gravelly sandy CLAY with one cobble.			21						
TP/17/24	3	0.40	1.00	B	Brown slightly sandy slightly gravelly CLAY with occasional rootlets.			12						
TP/17/24	6	1.40	2.00	B	Brown slightly sandy CLAY with one cobble.			17	74 n	35 a	18	17		
TP/17/25	4	0.30	0.50	B	Dark brown slightly sandy CLAY.			17						
TP/17/25	5	0.50		D	Brown slightly sandy slightly gravelly CLAY.			16	77 s	33 a	23	10		
TP/17/25	7	1.00	1.35	B	Brown slightly sandy gravelly CLAY.			17						
TP/17/25	9	1.60	2.00	B	Greyish brown slightly gravelly sandy CLAY.			29						
TP/17/25	10	2.40		D	Brown slightly sandy slightly gravelly CLAY			17	92 n	40 a	18	22		
TP/17/29	1	0.20		D				14						
TP/17/29	4	1.20		D	Brown slightly sandy slightly gravelly CLAY.			27	99 n	53 a	27	26		
TP/17/29	6	1.50		D	Brown silty CLAY.			32	100 n	32 a	20	12		
TP/17/29	7	1.50	2.50	B	Dark brown slightly sandy CLAY.			27						
TP/17/29	9	3.00	3.50	B	Brown slightly sandy slightly gravelly CLAY.			31						

General notes:

All above tests carried out to BS1377 : 1990 unless annotated otherwise. See Remarks for further details

Key : ρ bulk density, linear

W_L Liquid limit

W_P Plastic limit

<425um preparation

ρ_s particle density

ρ_d dry density

a 4 point cone test

NP non - plastic

n from natural soil

-g = gas jar

w moisture content

b 1 point cone test

IP Plasticity Index

s sieved specimen

-p = small pyknometer

* test carried out to BS EN ISO 17892

QA Ref
SLR 1
Rev 2.93
Mar 17



Project No

A8013-18

Project Name

A1 ALNWICK TO ELLINGHAM

Figure

INDX

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INDEX PROPERTIES - SUMMARY OF RESULTS

Hole No.	Sample			Soil Description	ρ	ρ_d	W	< 425 μ m sieve	W _L	W _P	I _p	ρ_s	Remarks	
	No.	Depth (m)												type
		from	to											
					Mg/m ³		%	%	%	%		Mg/m ³		
TP/17/29	10	3.50		D	Brown silty CLAY.			30						
TP/17/30	4	0.70	1.20	B	Brown slightly gravelly sandy clayey SILT.			20						
TP/17/30	4	0.70	1.20	B	Brown slightly sandy slightly gravelly CLAY.			19						
TP/17/31	3	0.30	1.00	B	Brown slightly gravelly sandy clayey SILT with occasional rootlets and one cobble.			11						
TP/17/31	5	1.70		D	Brown slightly sandy gravelly CLAY with one cobble.			20						
TP/17/31	6	1.70	2.50	B	Dark brown SAND AND GRAVEL.			19						
TP/17/32	3	0.50		D	Brown slightly gravelly sandy CLAY.			4.2						
TP/17/32	5	0.70		D	Brown very sandy clayey GRAVEL.			4.9						
TP/17/32	7	0.70	1.20	B	Dark brown SAND AND GRAVEL.			4.8						
TP/17/33	4	0.30	0.80	B	Brown slightly gravelly very sandy clayey SILT.			7.4						
TP/17/35	1	1.00	1.20	B	Brown slightly sandy gravelly CLAY with one cobble.			13						
TP/17/36	7	1.40		D	Brown slightly sandy slightly gravelly CLAY.			15						
TP/17/36	8	1.50	2.00	B	Brown slightly sandy slightly gravelly CLAY.			15						
TP/17/38	4	0.50	1.00	B	Brown slightly sandy gravelly CLAY with one cobble.			19						
TP/17/38	11	1.60	2.00	B	Brown sandy clayey GRAVEL with three cobbles.			15						
TP/17/38	7	1.60	2.00	B	Brown slightly sandy slightly clayey GRAVEL.			6.5						
TP/17/38	9	1.60	2.00	B	Brown sandy clayey GRAVEL with one cobble.			13						
TP/17/39	5	0.60	1.00	B	Brown slightly sandy slightly gravelly CLAY with rare rootlets and one cobble.			10						
TP/17/39	7	1.60	2.00	B	Brown slightly sandy slightly gravelly CLAY with one cobble.			30						
TP/17/40	5	1.10		D	Brown slightly sandy slightly gravelly CLAY.			14	76 s	27 a	16	11		
TP/17/40	6	1.10	1.50	B	Greyish brown slightly sandy slightly gravelly silty CLAY with one cobble.			14						
TP/17/40	8	2.00	2.50	B	Dark brown slightly sandy CLAY.			11						
TP/17/41	3	0.10	0.40	B	Dark brown slightly gravelly sandy CLAY.			19						
TP/17/41	5	0.50		D	Brown slightly sandy slightly gravelly CLAY.			14	90 n	27 a	17	10		
TP/17/41	7	1.50	2.00	B	Brown gravelly very silty clayey SAND.			16						
TP/17/41	10	2.70	3.00	B	Brown slightly sandy slightly gravelly CLAY.			67						
TP/17/42	5	0.60		D	Brown slightly sandy slightly gravelly CLAY.			13	83 n	34 a	21	13		
TP/17/42	8	0.65	1.70	B	Brown slightly sandy slightly gravelly CLAY.			14	89 s	34 a	18	16		
TP/17/42	7	0.80		D	Brown slightly sandy slightly gravelly CLAY.			13						
TP/17/42	12	2.00		B	Dark brown slightly sandy slightly gravelly CLAY.			16						
TP/17/42	11	2.20		D	Brown slightly sandy slightly gravelly CLAY.			13						

General notes:

All above tests carried out to BS1377 : 1990 unless annotated otherwise. See Remarks for further details

Key : ρ bulk density, linear

WL Liquid limit

WP Plastic limit

<425um preparation

ρ_s particle density

ρ_d dry density

a 4 point cone test

NP non - plastic

n from natural soil

-g = gas jar

w moisture content


b 1 point cone test

IP Plasticity Index

s sieved specimen

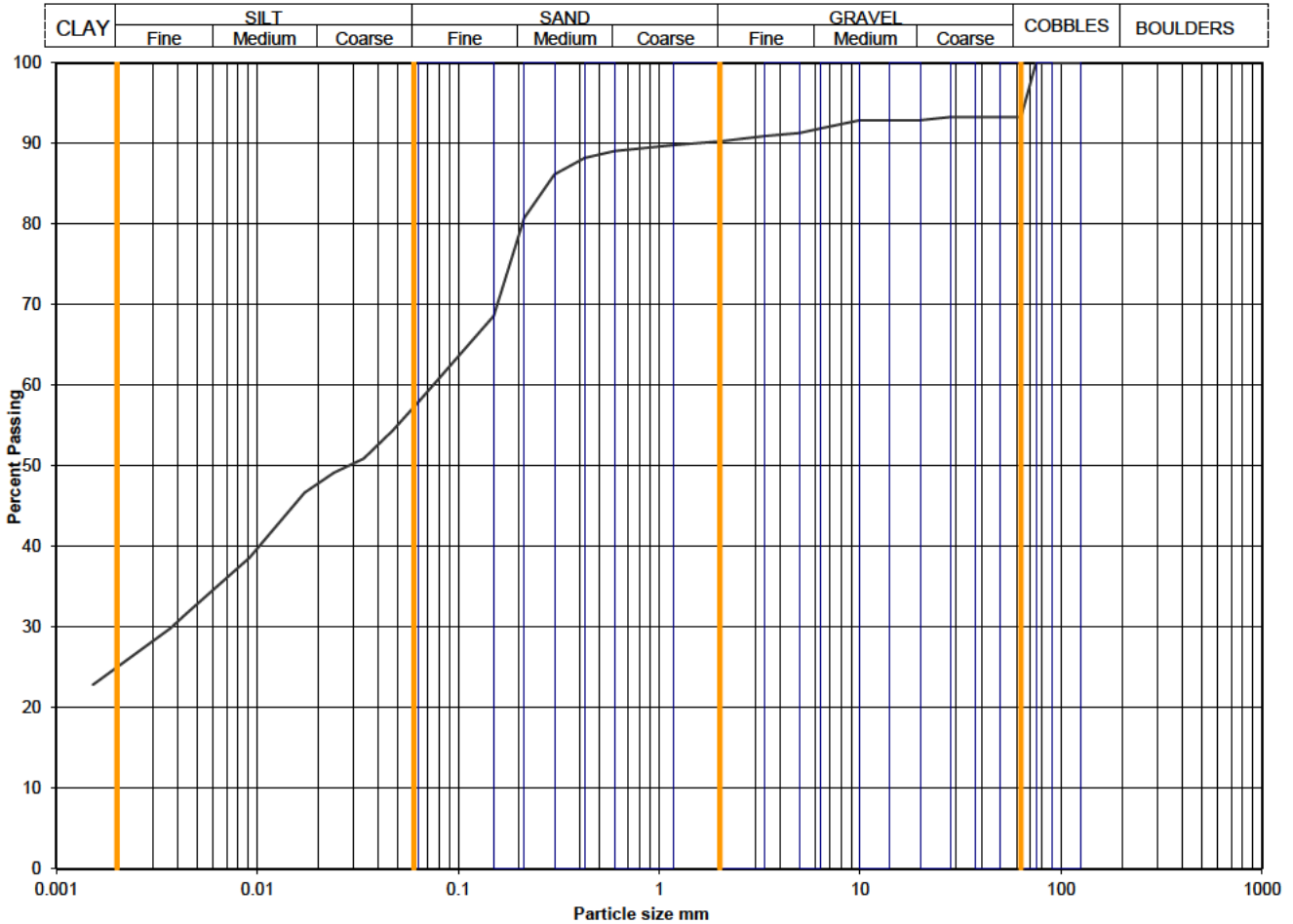
-p = small pyknometer

* test carried out to BS EN ISO 17892

QA Ref SLR 1 Rev 2.93 Mar 17		Project No A8013-18	Figure
		Project Name A1 ALNWICK TO ELLINGHAM	INDX
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Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:	Hole No	BH/17/03
	A8013-1820180910010738	Sample Depth (m BGL)	1.00 - 1.10
		Sample Type and No	B3
		Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	58
90	100	0.0471	54
75	100	0.0338	51
63	93	0.0241	49
50	93	0.0172	47
37.5	93	0.0091	39
28	93	0.0044	32
20	93	0.0037	30
14	93	0.0015	23
10	93		
6.3	92		
5.0	91		
3.35	91		
2.00	90		
1.18	90		
0.600	89		
0.425	88		
0.300	86		
0.212	81		
0.150	69		
0.063	58		

Particle density, Mg/m ³	
2.65	assumed
Dry mass of sample, kg	
6.7	

Soil description	Brown slightly sandy slightly gravelly CLAY with one cobble.		
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377		
Remarks			
Sample Proportions	Cobbles / boulders Gravel Sand Silt Clay	Whole	*<60mm
		7	0
		3	3
		32	34
		33	35
*<60mm values to aid description only		25	27

Uniformity Coefficient	D60 / D10	Not applicable
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Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

QA Ref
SLR 2,9
Rev 2.21
Jul 17



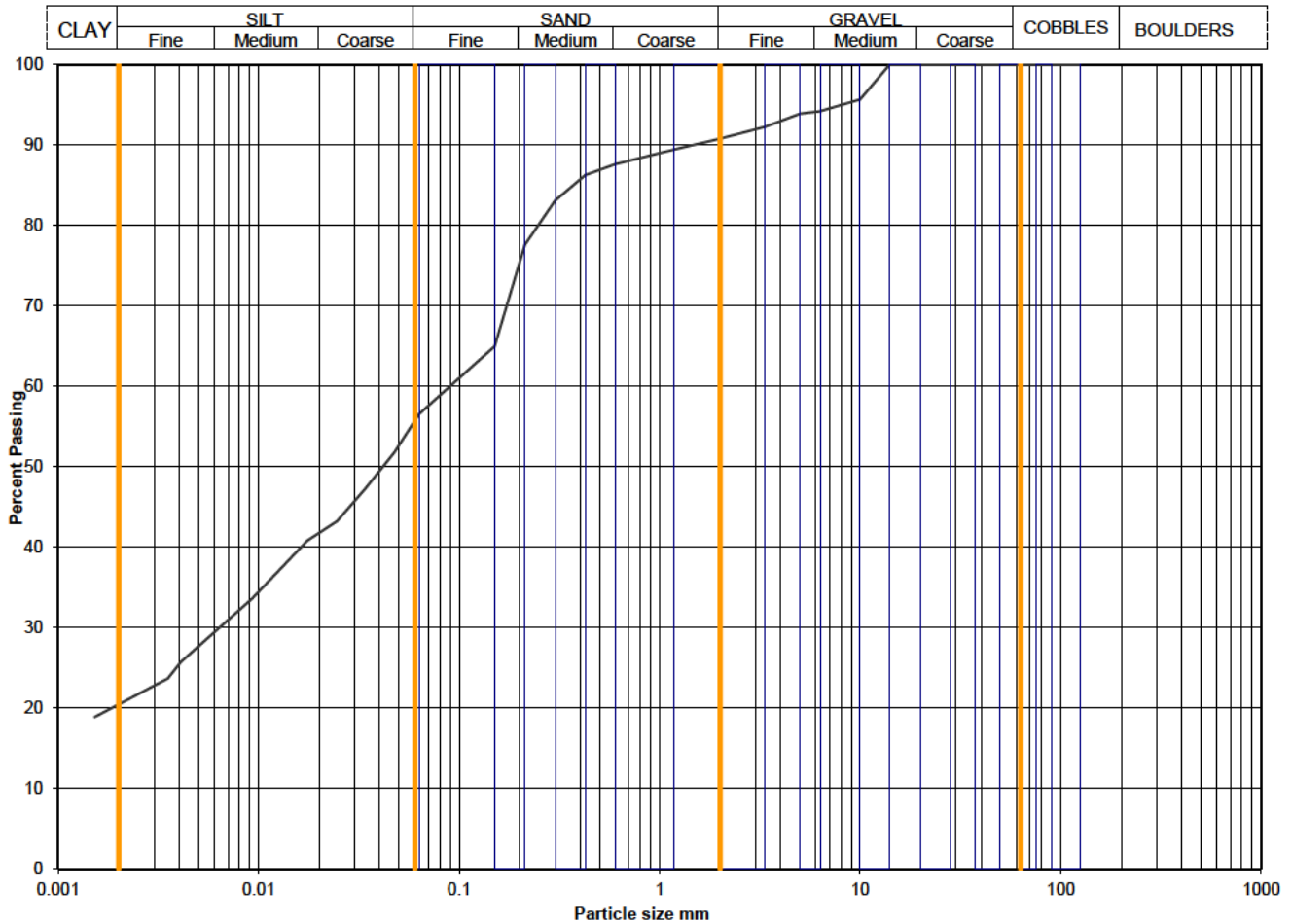
SOCOTEC

Project No A8013-18
Project Name A1 ALNWICK TO ELLINGHAM

Figure
PSD

Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:	Hole No	BH/17/04
	A8013-1820180910011256	Sample Depth (m BGL)	2.00 - 2.50
		Sample Type and No	B7
		Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	57
90	100	0.0473	52
75	100	0.0341	47
63	100	0.0245	43
50	100	0.0175	41
37.5	100	0.0093	34
28	100	0.0041	26
20	100	0.0035	24
14	100	0.0015	19
10	96		
6.3	94		
5.0	94		
3.35	92		
2.00	91		
1.18	89		
0.600	88		
0.425	86		
0.300	83		
0.212	78		
0.150	65		
0.063	57		

Particle density, Mg/m3	2.65	assumed
Dry mass of sample, kg	6.0	

Soil description	Brown slightly sandy slightly gravelly CLAY.		
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377		
Remarks			
Sample Proportions	Cobbles / boulders Gravel Sand Silt Clay	Whole	*<60mm
		0	0
		9	9
		34	34
		36	36
*<60mm values to aid description only		20	20

Uniformity Coefficient	D60 / D10	Not applicable
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Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

QA Ref
SLR 2,9
Rev 2.21
Jul 17

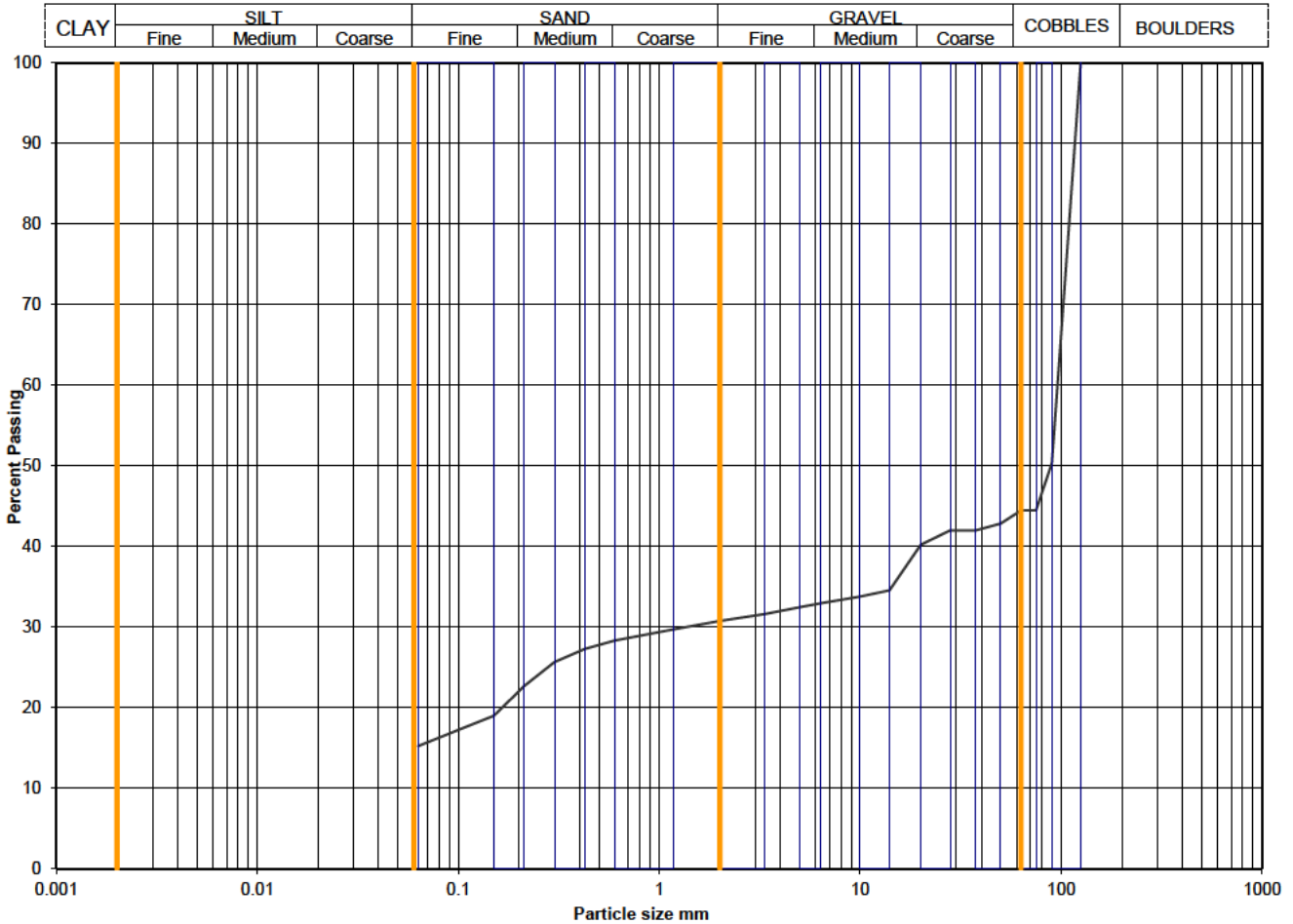


Project No A8013-18
Project Name A1 ALNWICK TO ELLINGHAM

Figure
PSD

Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:	Hole No	BH/17/06
	A8013-1820180924113627	Sample Depth (m BGL)	0.30 - 0.80
		Sample Type and No	B3
		Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	50		
75	44		
63	44		
50	43		
37.5	42		
28	42		
20	40		
14	35		
10	34		
6.3	33		
5.0	32		
3.35	32		
2.00	31		
1.18	30		
0.600	28		
0.425	27		
0.300	26		
0.212	23		
0.150	19		
0.063	15		

Dry mass of sample, kg	
7.8	

Soil description	Brown sandy gravelly clayey COBBLES.		
Preparation / Pretreatment	Sieve: natural material		
Remarks			
Sample Proportions <small>*<60mm values to aid description only</small>	Cobbles / boulders Gravel Sand Silt Clay	Whole	*<60mm
		56	0
		14	32
		16	36
		silt+clay =	
15	34		

Uniformity Coefficient	D60 / D10	Not applicable
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Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	none

QA Ref
SLR 2,9
Rev 2.21
Jul 17



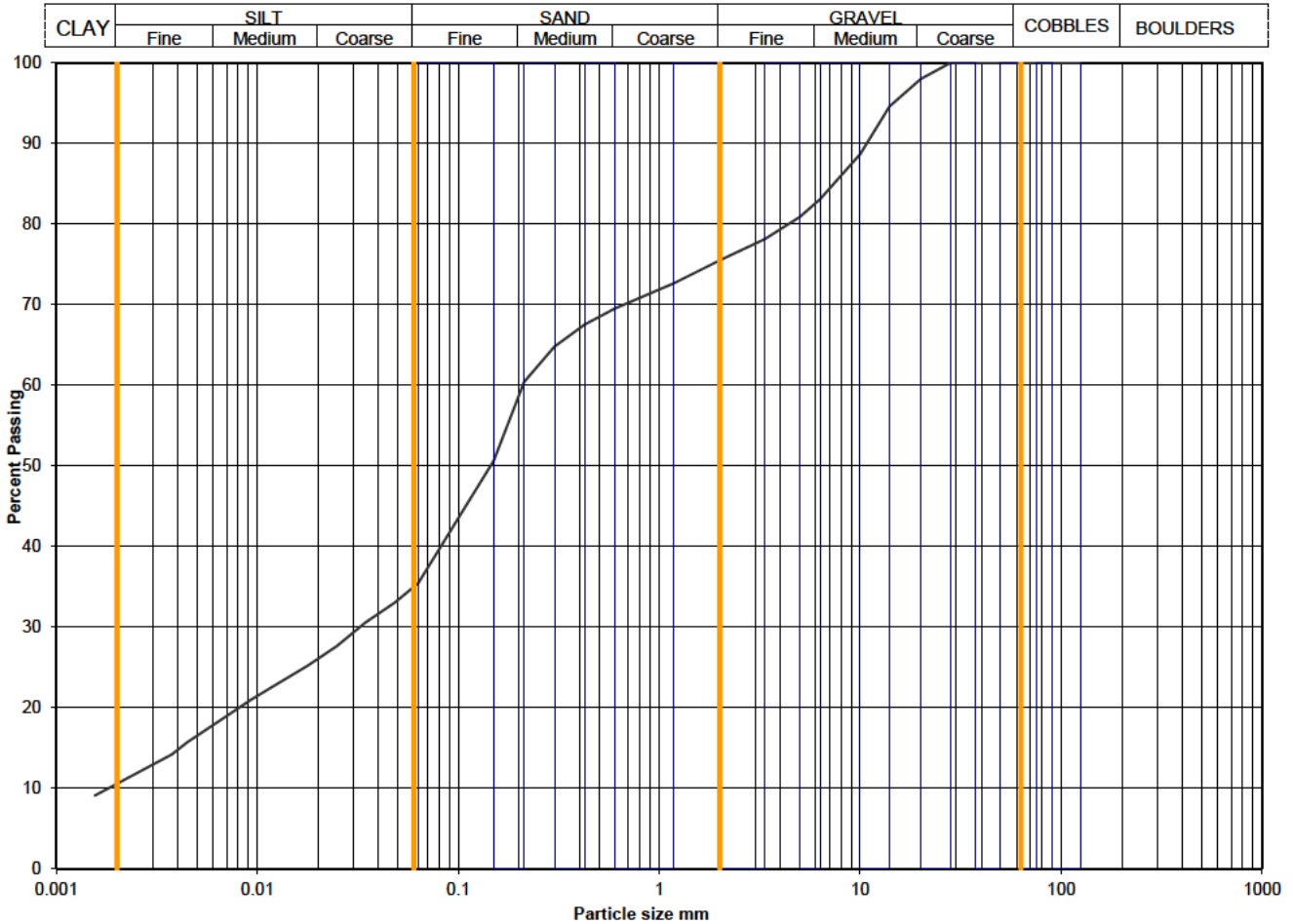
SOCOTEC

Project No A8013-18
Project Name A1 ALNWICK TO ELLINGHAM

Figure
PSD

Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:	Hole No	BH/17/06
	A8013-1820180924113657	Sample Depth (m BGL)	1.20 - 1.70
		Sample Type and No	B7
		Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	35
90	100	0.0481	33
75	100	0.0345	31
63	100	0.0248	28
50	100	0.0177	25
37.5	100	0.0094	21
28	100	0.0044	16
20	98	0.0037	14
14	95	0.0016	9
10	89		
6.3	83		
5.0	81		
3.35	78		
2.00	76		
1.18	73		
0.600	70		
0.425	68		
0.300	65		
0.212	60		
0.150	51		
0.063	35		

Particle density, Mg/m ³	
2.65	assumed
Dry mass of sample, kg	
2.8	

Soil description	Brown slightly gravelly sandy CLAY.		
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377		
Remarks			
Sample Proportions	Cobbles / boulders Gravel Sand Silt Clay	Whole	*<60mm
		0	0
		24	24
		40	40
		25	25
*<60mm values to aid description only		11	11

Uniformity Coefficient	D60 / D10	112
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Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

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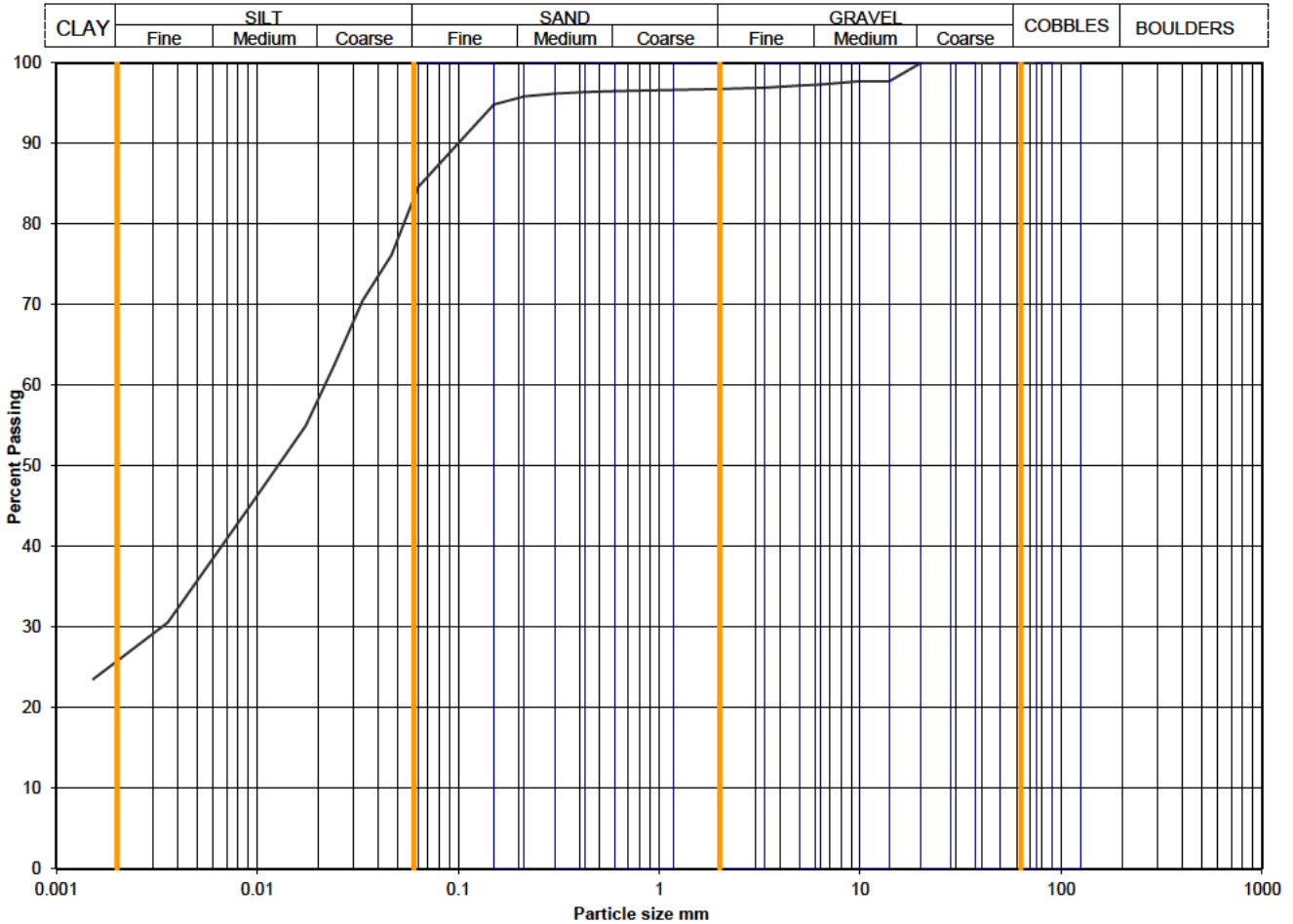
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Project Name A1 ALNWICK TO ELLINGHAM

Figure
PSD

Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:	Hole No	BH/17/06
	A8013-1820180924113710	Sample Depth (m BGL)	3.00 - 3.50
		Sample Type and No	B10
		Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	85
90	100	0.0464	76
75	100	0.0333	71
63	100	0.0241	63
50	100	0.0174	55
37.5	100	0.0092	45
28	100	0.0042	33
20	100	0.0036	31
14	98	0.0015	24
10	98		
6.3	97		
5.0	97		
3.35	97		
2.00	97		
1.18	97		
0.600	96	Particle density, Mg/m3	
0.425	96	2.65	assumed
0.300	96	Dry mass of sample, kg	
0.212	96		
0.150	95		
0.063	85	1.9	

Soil description	Brown slightly sandy slightly gravelly CLAY.		
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377		
Remarks			
Sample Proportions <small>*<math><60\text{ mm}</math> values to aid description only</small>	Cobbles / boulders Gravel Sand Silt Clay	Whole	*<math><60\text{ mm}</math>
		0	0
		3	3
		12	12
		59	59
		26	26

Uniformity Coefficient	D60 / D10	Not applicable
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Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

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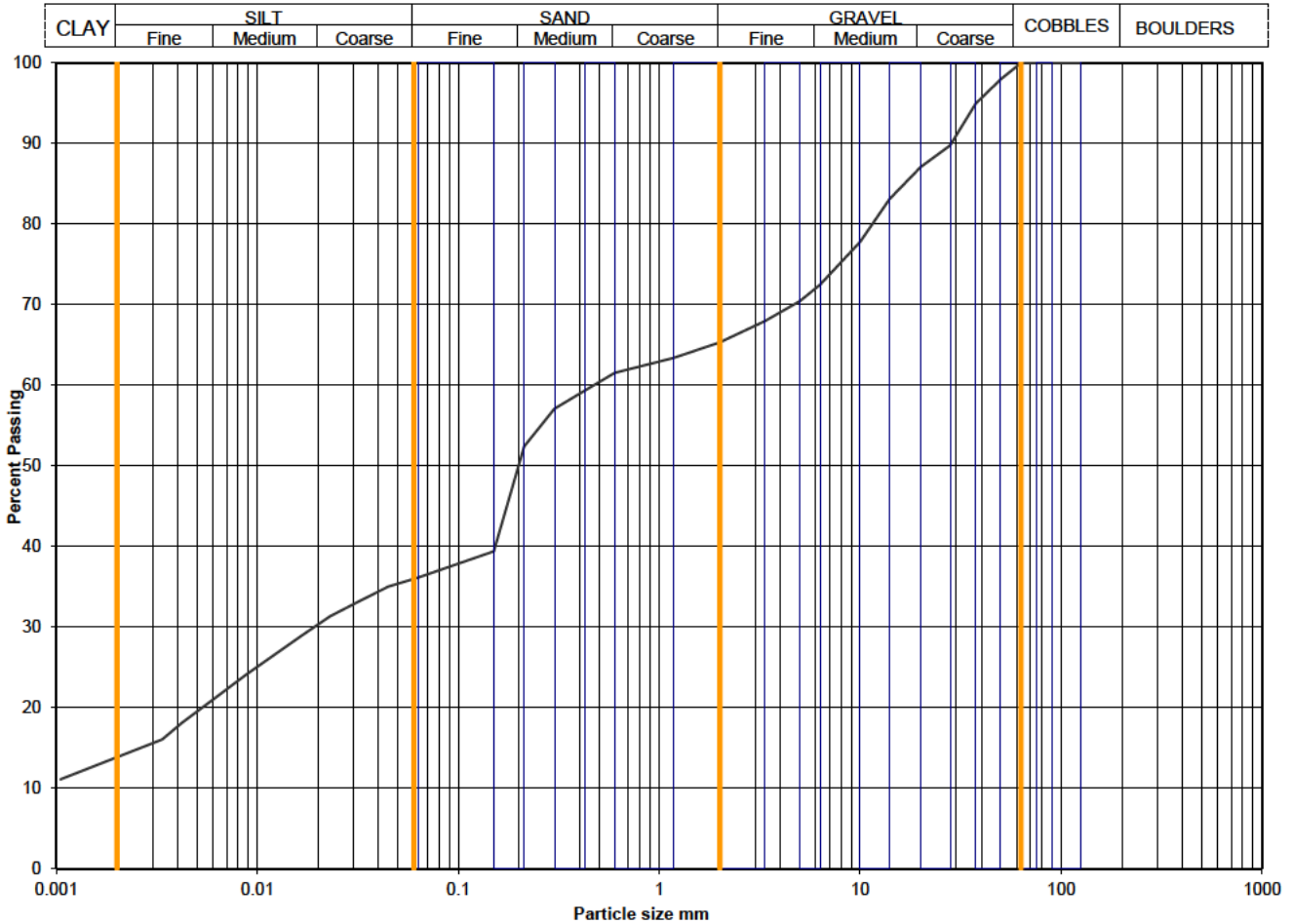
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Project Name A1 ALNWICK TO ELLINGHAM

Figure
PSD

Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:	Hole No	BH/17/06
	A8013-1820180924113820	Sample Depth (m BGL)	7.50 - 8.00
		Sample Type and No	B18
		Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	36
90	100	0.0447	35
75	100	0.0321	33
63	100	0.0230	31
50	98	0.0166	29
37.5	95	0.0089	24
28	90	0.0042	18
20	87	0.0034	16
14	83	0.0010	11
10	78		
6.3	72		
5.0	70		
3.35	68		
2.00	65		
1.18	63		
0.600	62		
0.425	59		
0.300	57		
0.212	52		
0.150	39		
0.063	36		

Particle density, Mg/m ³	2.65	assumed
Dry mass of sample, kg	8.7	

Soil description	Grey slightly sandy slightly gravelly CLAY.		
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377		
Remarks			
Sample Proportions	Cobbles / boulders Gravel Sand Silt Clay	Whole	*<60mm
		0	0
		35	35
		29	29
		22	22
*<60mm values to aid description only		14	14

Uniformity Coefficient	D60 / D10	Not applicable
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Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

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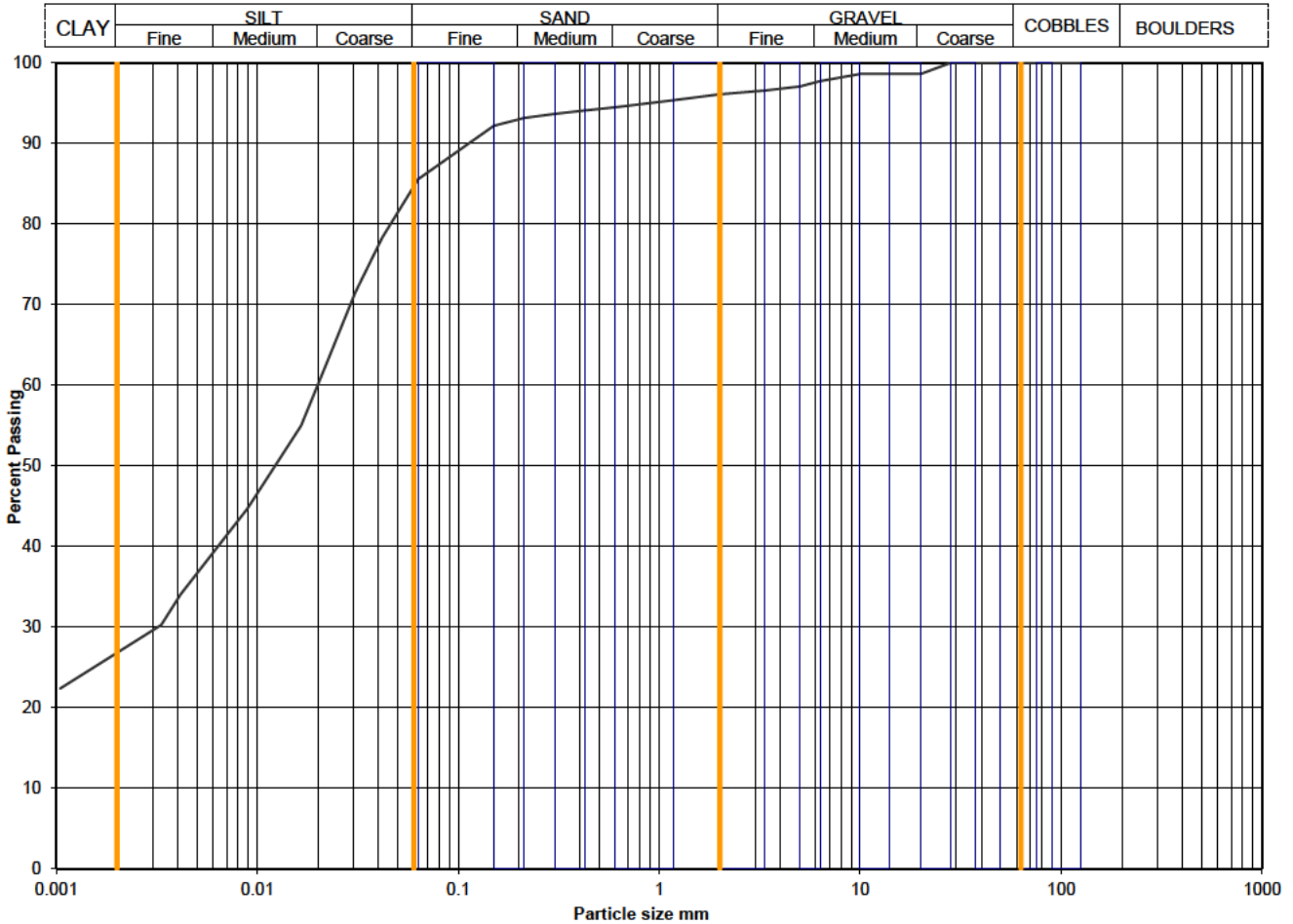


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Project Name A1 ALNWICK TO ELLINGHAM

Figure
PSD

Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:	Hole No	BH/17/07
	A8013-1820180925092332	Sample Depth (m BGL)	2.50 - 3.00
		Sample Type and No	B7
		Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	86
90	100	0.0417	78
75	100	0.0306	71
63	100	0.0225	63
50	100	0.0165	55
37.5	100	0.0089	45
28	100	0.0041	34
20	99	0.0033	30
14	99	0.0010	22
10	99		
6.3	98		
5.0	97		
3.35	97		
2.00	96		
1.18	95		
0.600	94		
0.425	94		
0.300	94		
0.212	93		
0.150	92		
0.063	86		

Particle density, Mg/m3	
2.65	assumed
Dry mass of sample, kg	
4.6	

Soil description	Brown slightly sandy slightly gravelly silty CLAY.		
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377		
Remarks			
Sample Proportions	Cobbles / boulders Gravel Sand Silt Clay	Whole	*<60mm
		0	0
		4	4
		11	11
		59	59
*<60mm values to aid description only		27	27

Uniformity Coefficient	D60 / D10	Not applicable
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Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

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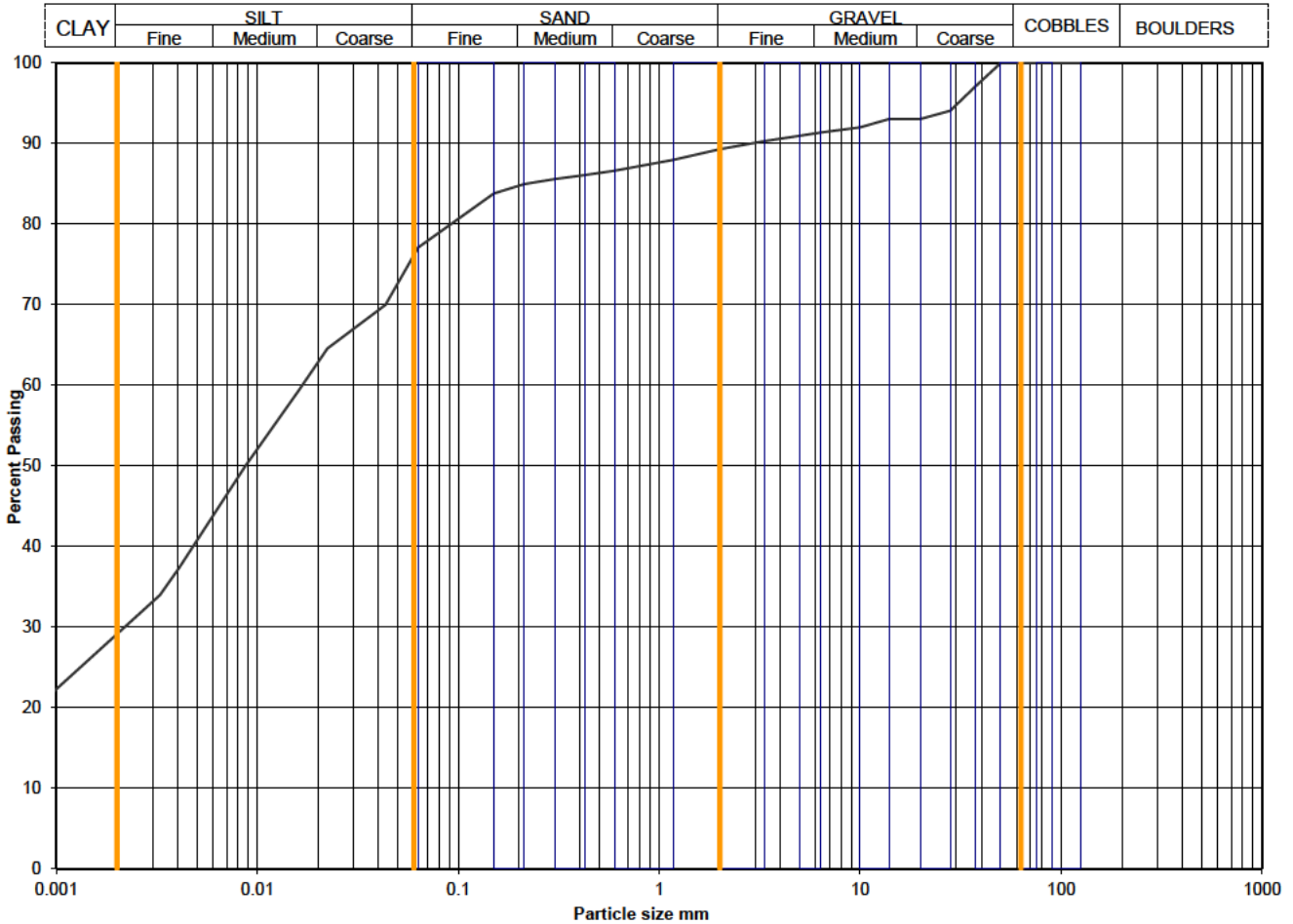


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Project Name A1 ALNWICK TO ELLINGHAM

Figure
PSD

Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:	Hole No	BH/17/07
	A8013-1820180925092532	Sample Depth (m BGL)	4.00 - 4.50
		Sample Type and No	B11
		Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	77
90	100	0.0434	70
75	100	0.0311	67
63	100	0.0223	65
50	100	0.0161	59
37.5	97	0.0087	50
28	94	0.0041	37
20	93	0.0033	34
14	93	0.0008	20
10	92		
6.3	91		
5.0	91		
3.35	90		
2.00	89		
1.18	88		
0.600	87		
0.425	86		
0.300	86		
0.212	85		
0.150	84		
0.063	77		

Particle density, Mg/m ³	
2.65	assumed
Dry mass of sample, kg	
9.7	

Soil description	Brown slightly sandy slightly gravelly CLAY.		
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377		
Remarks			
Sample Proportions	Cobbles / boulders Gravel Sand Silt Clay	Whole	*<math><60\text{ mm}</math>
		0	0
		11	11
		12	12
		48	48
*<math><60\text{ mm}</math> values to aid description only		29	29

Uniformity Coefficient	D60 / D10	Not applicable
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Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

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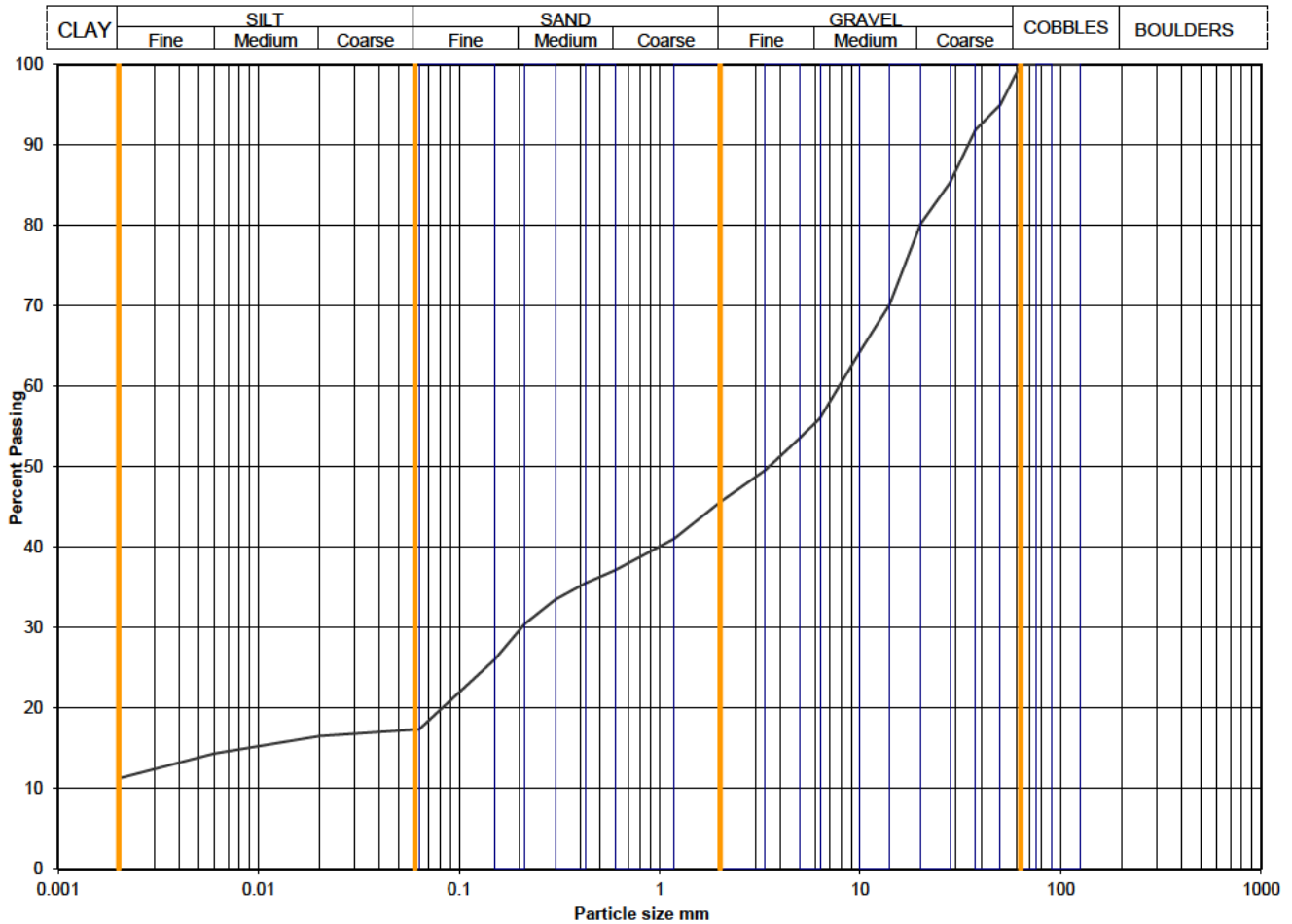
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Figure
PSD

Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:	Hole No	BH/17/08
	A8013-1820180727095907	Sample Depth (m BGL)	2.20 - 2.70
		Sample Type and No	B10
		Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0201	16
90	100	0.0060	14
75	100	0.0020	11
63	100		
50	95		
37.5	92		
28	85		
20	80		
14	70		
10	64		
6.3	56		
5.0	54		
3.35	50		
2.00	46		
1.18	41		
0.600	37		
0.425	35		
0.300	33		
0.212	30		
0.150	26		
0.063	17		

Particle density, Mg/m3	
2.65	assumed
Dry mass of sample, kg	
5.4	

Soil description	Brown slightly sandy gravelly CLAY.		
Preparation / Pretreatment	Sieve: natural material Pipette: as BS1377		
Remarks			
Sample Proportions	Cobbles / boulders Gravel Sand Silt Clay	Whole	*<60mm
		0	0
		54	54
		28	28
		6	6
*<60mm values to aid description only		11	11

Uniformity Coefficient	D60 / D10	Not applicable
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Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.4 pipette

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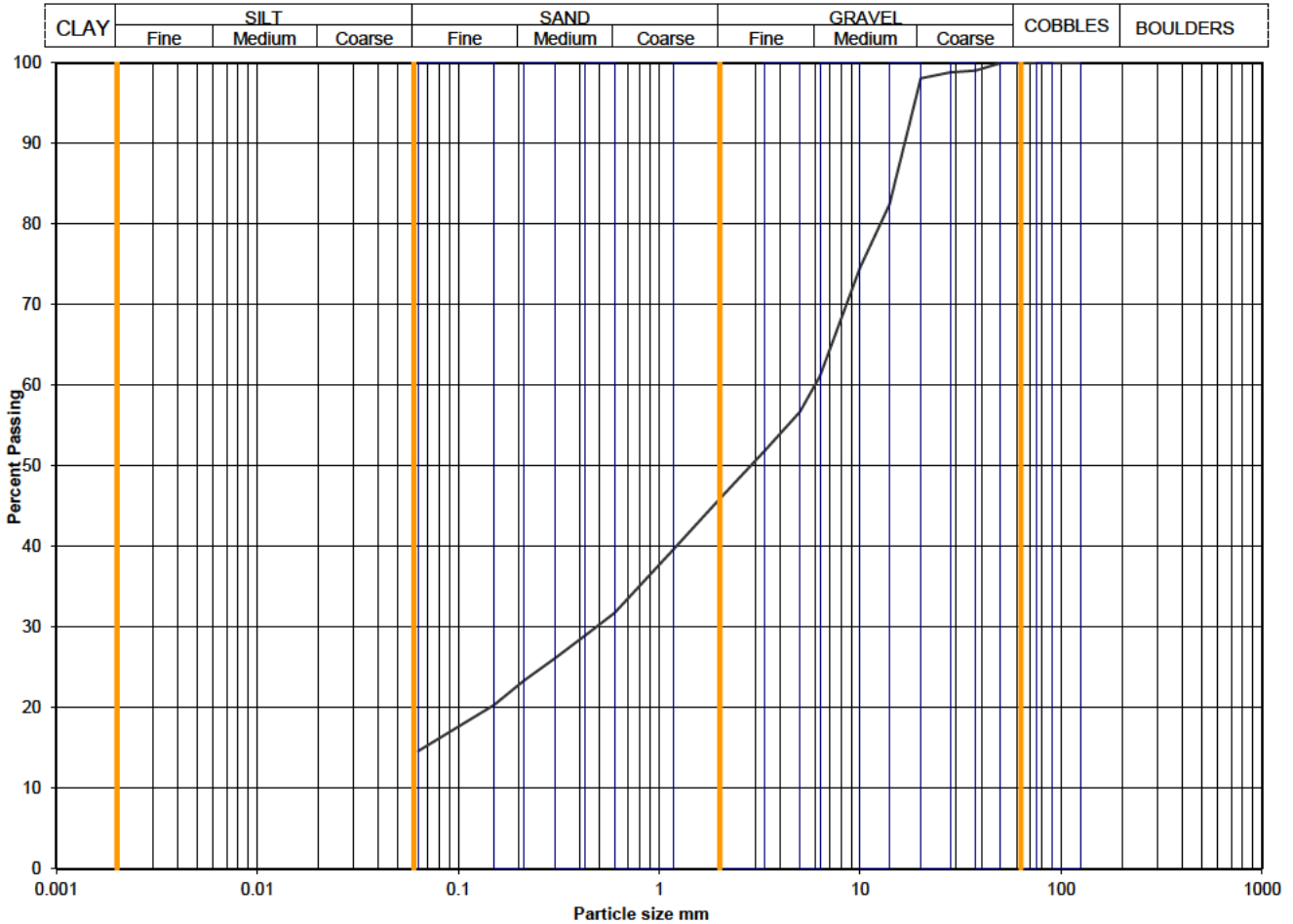
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Figure
PSD

Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:	Hole No	BH/17/09
	A8013-1820180727102428	Sample Depth (m BGL)	2.20 - 2.70
		Sample Type and No	B9
		Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	99		
28	99		
20	98		
14	82		
10	75		
6.3	61		
5.0	57		
3.35	52		
2.00	46		
1.18	40		
0.600	32		
0.425	29		
0.300	26		
0.212	23		
0.150	20		
0.063	15		
		Dry mass of sample, kg	
		28.7	

Soil description	Brown slightly sandy gravelly CLAY.		
Preparation / Pretreatment	Sieve: natural material		
Remarks			
Sample Proportions <small>*<math> <math></small>	Cobbles / boulders Gravel Sand Silt Clay	Whole	*<math> <math>
		0	0
		54	54
		31	31
		silt+clay =	
		15	15

Uniformity Coefficient	D60 / D10	Not applicable
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Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	none

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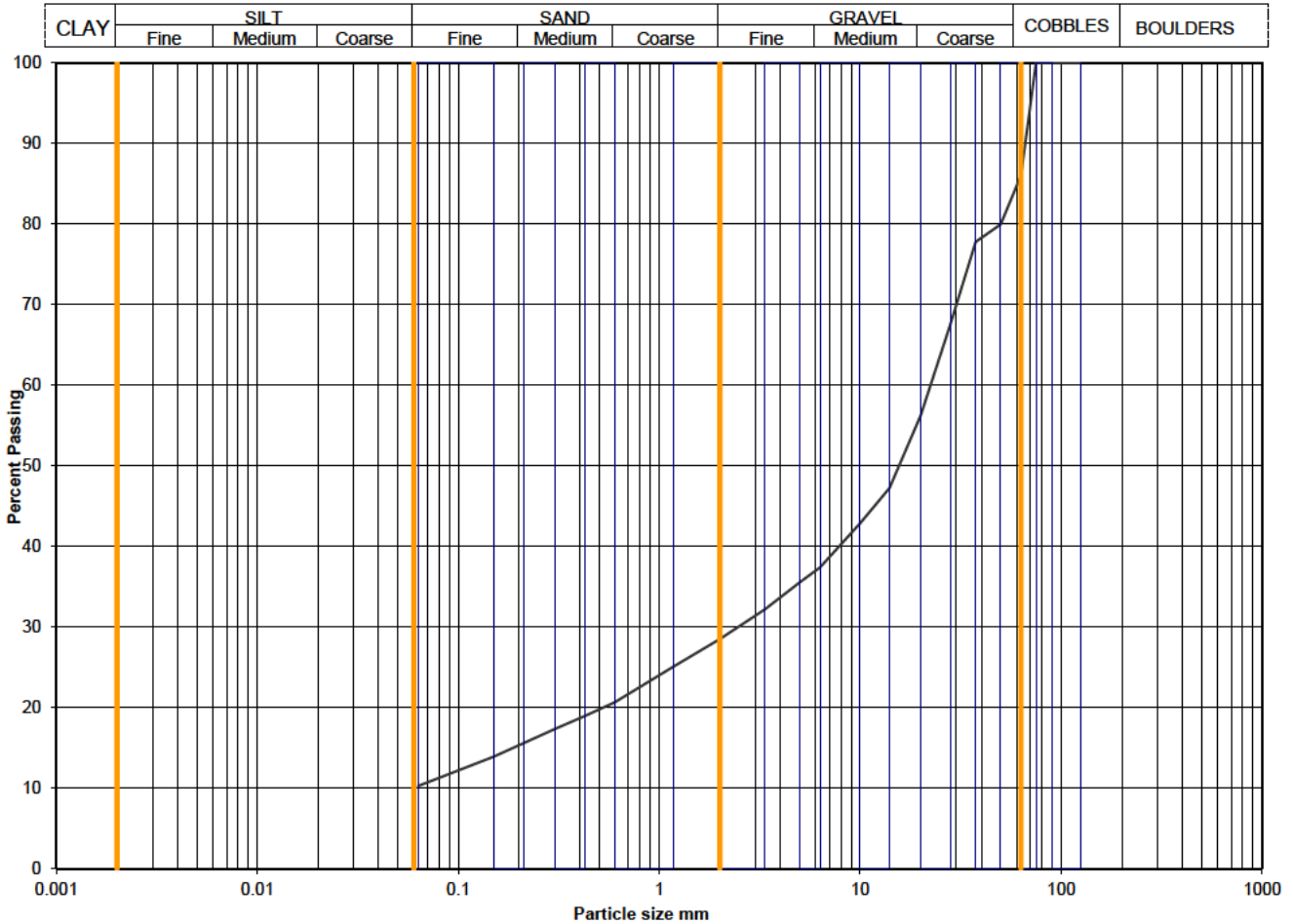
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Figure
PSD

Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:	Hole No	BH/17/09
	A8013-1820180727102511	Sample Depth (m BGL)	3.20 - 3.70
		Sample Type and No	B11
		Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	86		
50	80		
37.5	78		
28	67		
20	56		
14	47		
10	43		
6.3	37		
5.0	36		
3.35	32		
2.00	28		
1.18	25		
0.600	21		
0.425	19		
0.300	17		
0.212	16		
0.150	14		
0.063	10		

Dry mass of sample, kg	
4.3	

Soil description	Brown very sandy clayey GRAVEL with one cobble.		
Preparation / Pretreatment	Sieve: pre dried,		
Remarks			
Sample Proportions <small>*<60mm values to aid description only</small>	Cobbles / boulders Gravel Sand Silt Clay	Whole	*<60mm
		14	0
		58	67
		18	21
		silt+clay =	
10	12		

Uniformity Coefficient	D60 / D10	Not applicable
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Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	none

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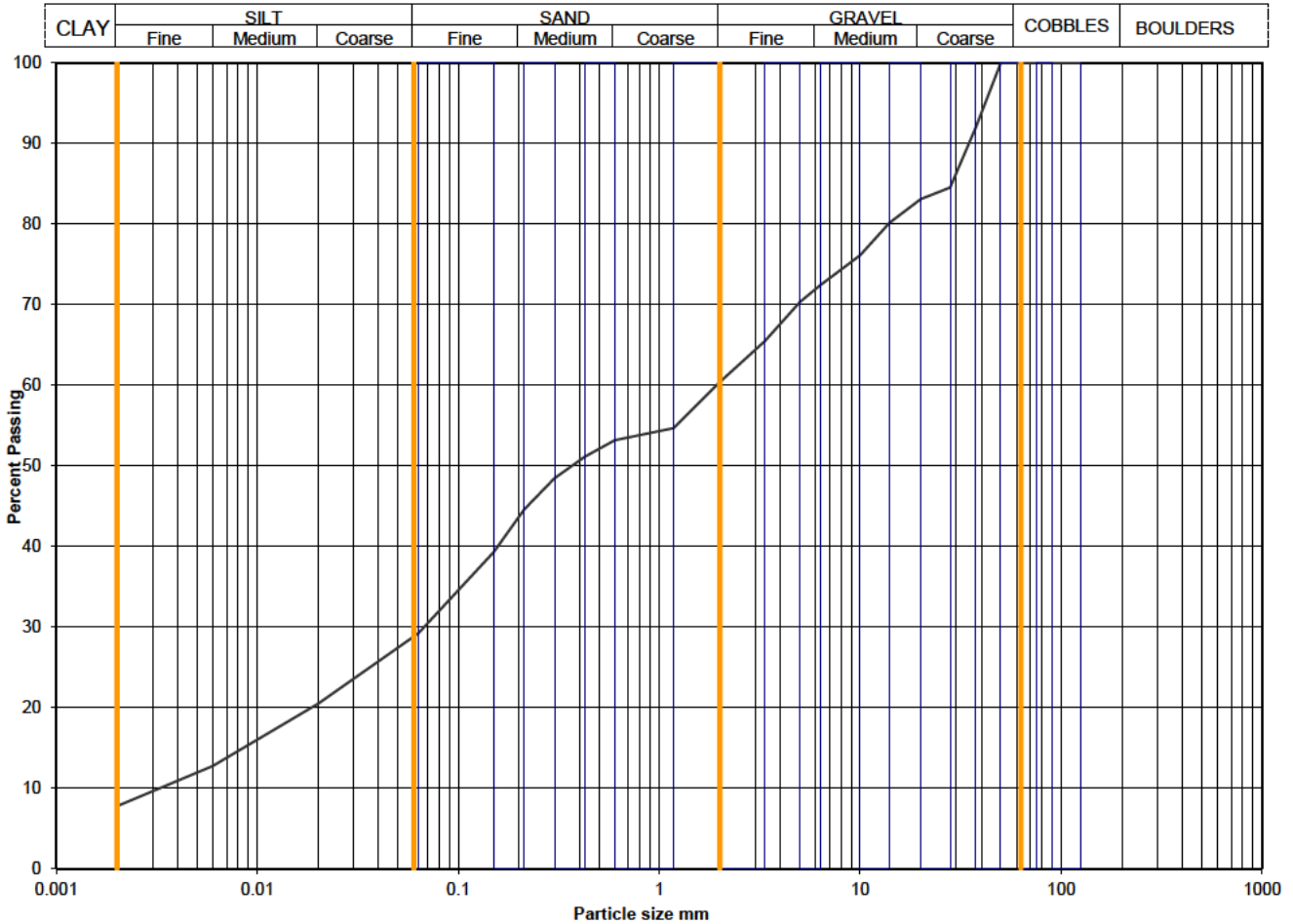
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Figure
PSD

Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:	Hole No	BH/17/10
	A8013-1820180725103722	Sample Depth (m BGL)	2
		Sample Type and No	D7
		Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0201	20
90	100	0.0060	13
75	100	0.0020	8
63	100		
50	100		
37.5	92		
28	85		
20	83		
14	80		
10	76		
6.3	72		
5.0	70		
3.35	65		
2.00	60		
1.18	55		
0.600	53		
0.425	51		
0.300	48		
0.212	45		
0.150	39		
0.063	29		

Soil description	Brown slightly sandy gravelly silty CLAY.		
Preparation / Pretreatment	Sieve: pre dried, Pipette: as BS1377		
Remarks			
Sample Proportions	Cobbles / boulders Gravel Sand Silt Clay	Whole	*<60mm
		0	0
		40	40
		31	31
		21	21
*<60mm values to aid description only		8	8

Uniformity Coefficient	D60 / D10	585
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Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.3 dry sieve
	Sedimentation	9.4 pipette

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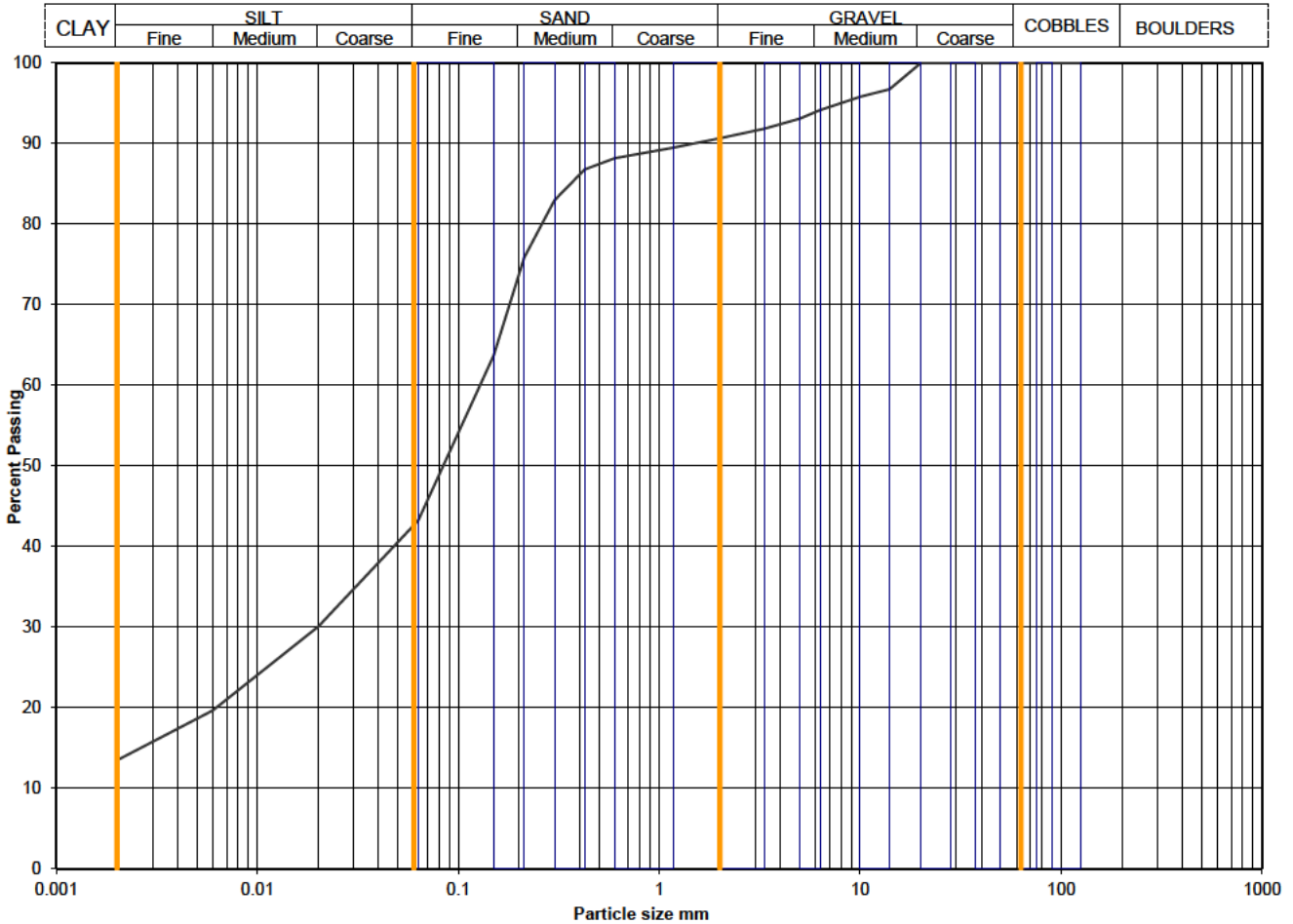
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Figure
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Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:	Hole No	BH/17/10
	A8013-1820180725105600	Sample Depth (m BGL)	3.65 - 3.70
		Sample Type and No	D10
		Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0201	30
90	100	0.0060	20
75	100	0.0020	13
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	97		
10	96		
6.3	94		
5.0	93		
3.35	92		
2.00	91		
1.18	89		
0.600	88		
0.425	87		
0.300	83		
0.212	76		
0.150	64		
0.063	43		

Particle density, Mg/m ³	2.65 assumed
Dry mass of sample, kg	0.5

Soil description	Dark brown slightly gravelly sandy SILT.		
Preparation / Pretreatment	Sieve: natural material Pipette: as BS1377		
Remarks			
Sample Proportions	Cobbles / boulders Gravel Sand Silt Clay	Whole	*<60mm
		0	0
		9	9
		47	47
		30	30
*<60mm values to aid description only		13	13

Uniformity Coefficient	D60 / D10	Not applicable
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Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.4 pipette

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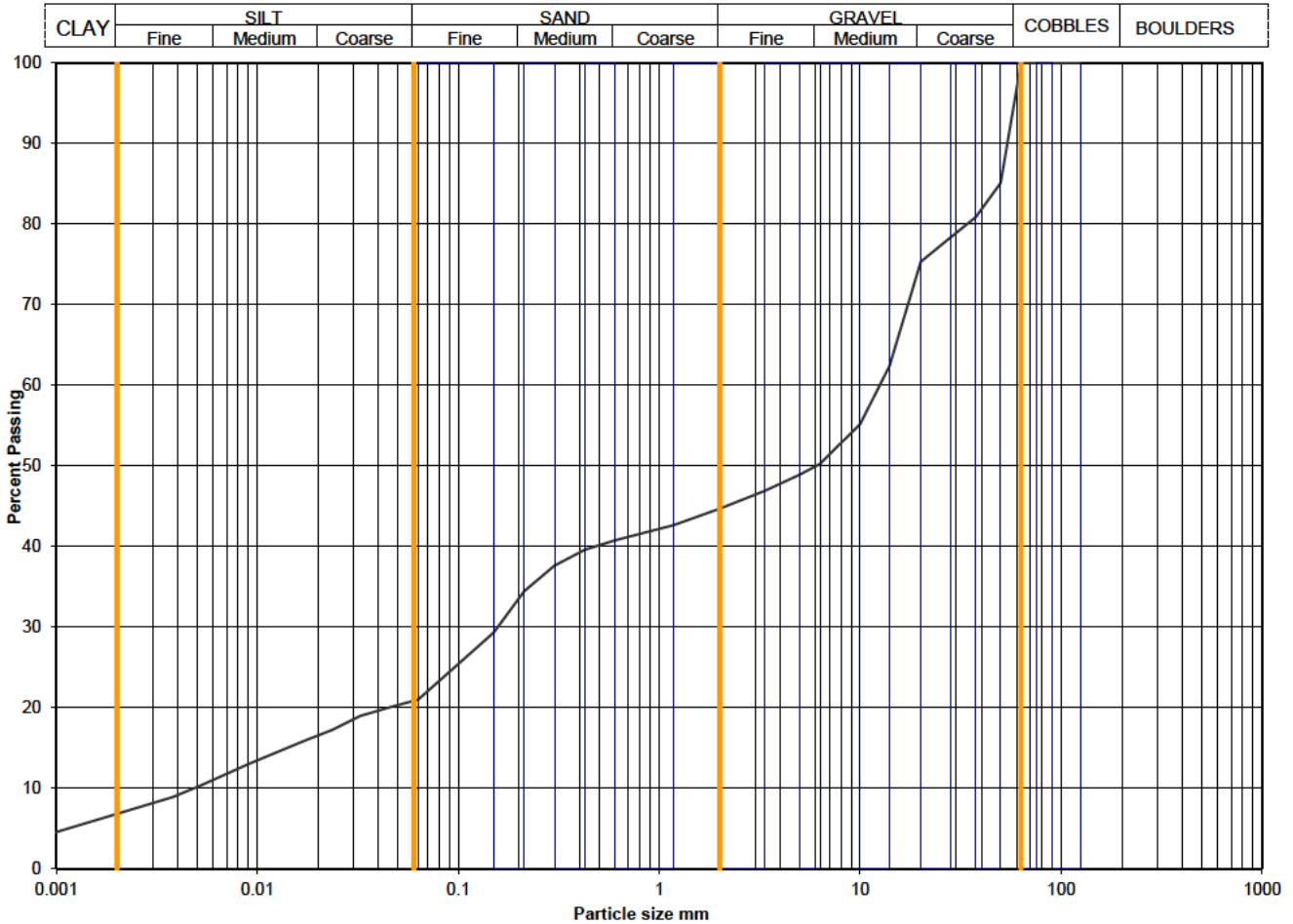
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Figure
PSD

Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:	Hole No	BH/17/11
	A8013-1820180725112711	Sample Depth (m BGL)	0.20 - 0.50
		Sample Type and No	B3
		Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	21
90	100	0.0449	20
75	100	0.0323	19
63	100	0.0234	17
50	85	0.0168	16
37.5	81	0.0090	13
28	78	0.0052	10
20	75	0.0038	9
14	62	0.0009	4
10	55		
6.3	50		
5.0	49		
3.35	47		
2.00	45		
1.18	43		
0.600	41		
0.425	40		
0.300	38		
0.212	34		
0.150	29		
0.063	21		

Particle density, Mg/m3	
2.65	assumed
Dry mass of sample, kg	
7.8	

Soil description	Brown slightly sandy gravelly CLAY.		
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377		
Remarks			
Sample Proportions	Cobbles / boulders Gravel Sand Silt Clay	Whole	*<60mm
		0	0
		55	55
		24	24
		14	14
*<60mm values to aid description only		7	7

Uniformity Coefficient	D60 / D10	2697
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Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

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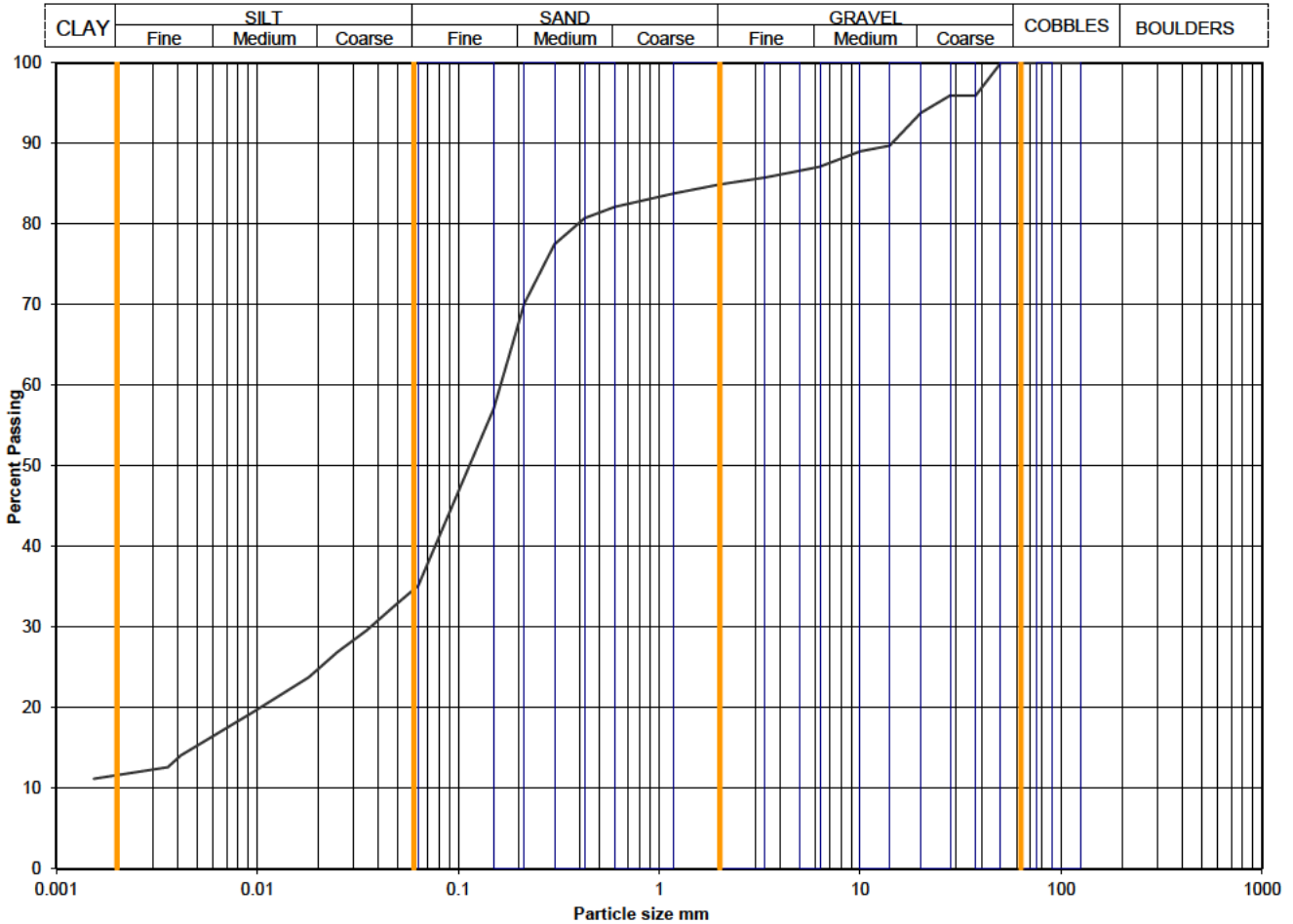
Figure
PSD

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Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:	Hole No	BH/17/12
	A8013-1820181005011904	Sample Depth (m BGL)	0.60 - 1.00
		Sample Type and No	B4
		Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	35
90	100	0.0484	33
75	100	0.0348	30
63	100	0.0250	27
50	100	0.0180	24
37.5	96	0.0095	19
28	96	0.0042	14
20	94	0.0036	13
14	90	0.0015	11
10	89		
6.3	87		
5.0	87		
3.35	86		
2.00	85		
1.18	84		
0.600	82		
0.425	81		
0.300	77		
0.212	70		
0.150	57		
0.063	35		

Particle density, Mg/m3	2.65	assumed
Dry mass of sample, kg	5.3	

Soil description	Light brown slightly gravelly sandy CLAY.		
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377		
Remarks			
Sample Proportions	Cobbles / boulders Gravel Sand Silt Clay	Whole	*<60mm
		0	0
		15	15
		50	50
		24	24
*<60mm values to aid description only		12	12

Uniformity Coefficient	D60 / D10	Not applicable
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Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

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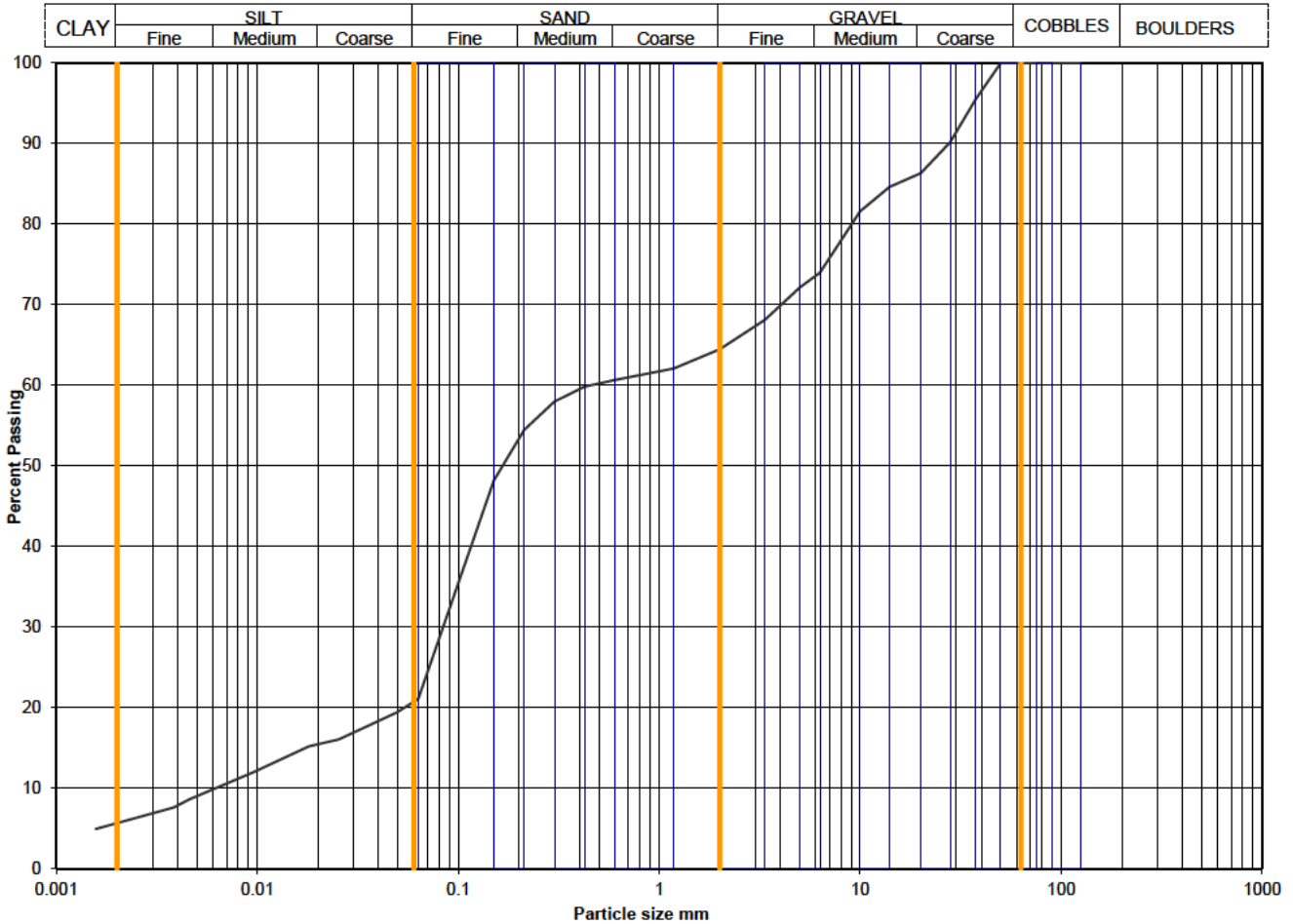
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Figure
PSD

Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:	Hole No	BH/17/12
	A8013-1820181005012836	Sample Depth (m BGL)	6.00 - 6.50
		Sample Type and No	B16
		Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	21
90	100	0.0494	19
75	100	0.0354	18
63	100	0.0253	16
50	100	0.0180	15
37.5	95	0.0095	12
28	90	0.0046	9
20	86	0.0038	8
14	85	0.0016	5
10	82		
6.3	74		
5.0	72		
3.35	68		
2.00	64		
1.18	62		
0.600	61		
0.425	60		
0.300	58		
0.212	54		
0.150	48		
0.063	21		

Particle density, Mg/m ³	2.65 assumed
Dry mass of sample, kg	2.7

Soil description	Brown very gravelly clayey SAND		
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377		
Remarks			
Sample Proportions	Cobbles / boulders Gravel Sand Silt Clay	Whole	*<60mm
		0	0
		36	36
		43	43
		15	15
*<60mm values to aid description only		6	6

Uniformity Coefficient	D60 / D10	121
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Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

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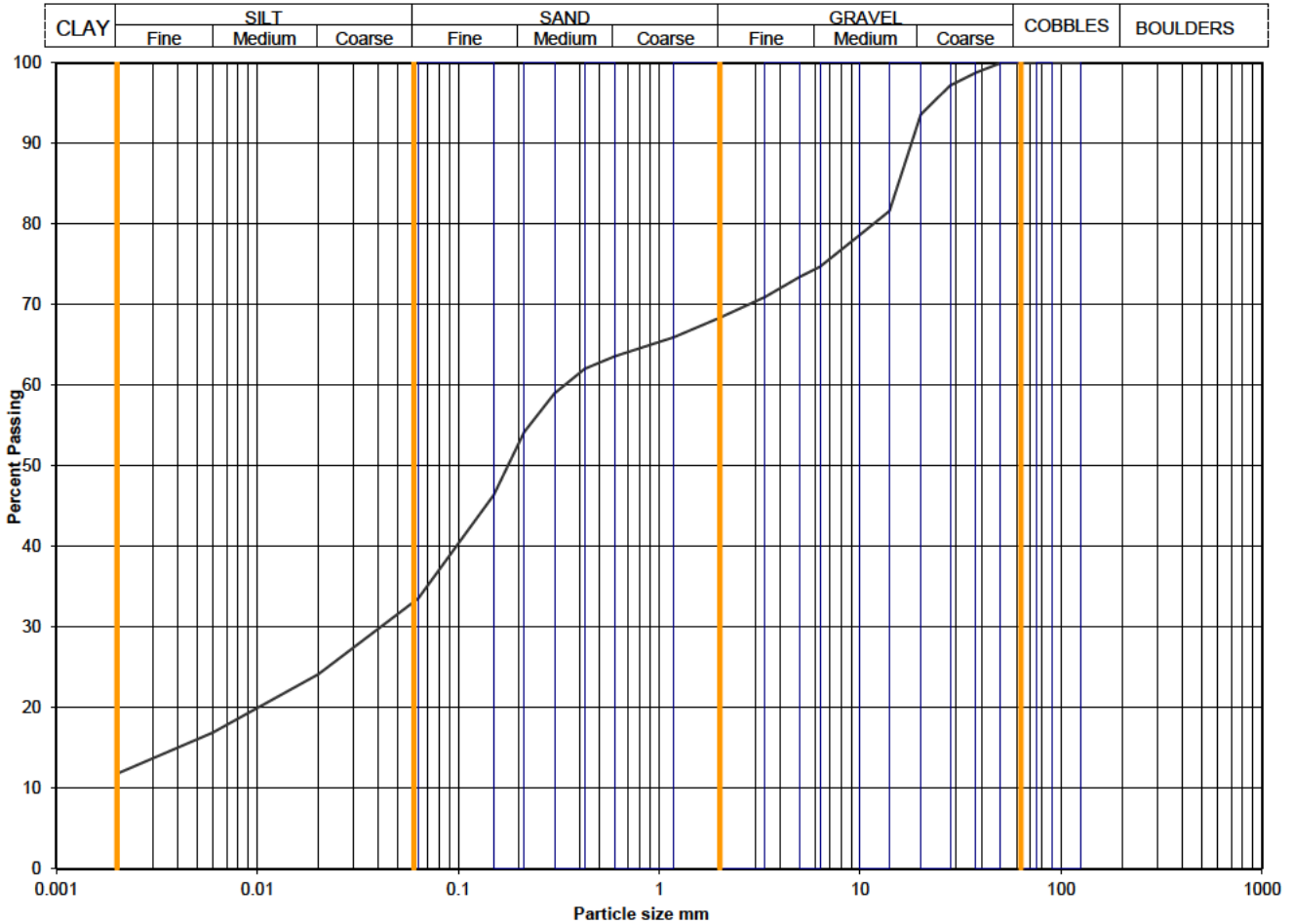
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Figure
PSD

Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:	Hole No	BH/17/14
	A8013-1820180712031622	Sample Depth (m BGL)	2.50 - 3.00
		Sample Type and No	B9
		Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0201	24
90	100	0.0060	17
75	100	0.0020	12
63	100		
50	100		
37.5	99		
28	97		
20	94		
14	82		
10	79		
6.3	75		
5.0	73		
3.35	71		
2.00	68		
1.18	66		
0.600	64		
0.425	62		
0.300	59		
0.212	54		
0.150	46		
0.063	34		
		Particle density, Mg/m ³ 2.65 assumed	
		Dry mass of sample, kg 6.7	

Soil description	Greyish brown slightly gravelly sandy CLAY.		
Preparation / Pretreatment	Sieve: natural material Pipette: as BS1377		
Remarks			
Sample Proportions	Cobbles / boulders Gravel Sand Silt Clay	Whole	*<60mm
		0	0
		32	32
		35	35
		22	22
*<60mm values to aid description only		12	12

Uniformity Coefficient	D60 / D10	Not applicable
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Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.4 pipette

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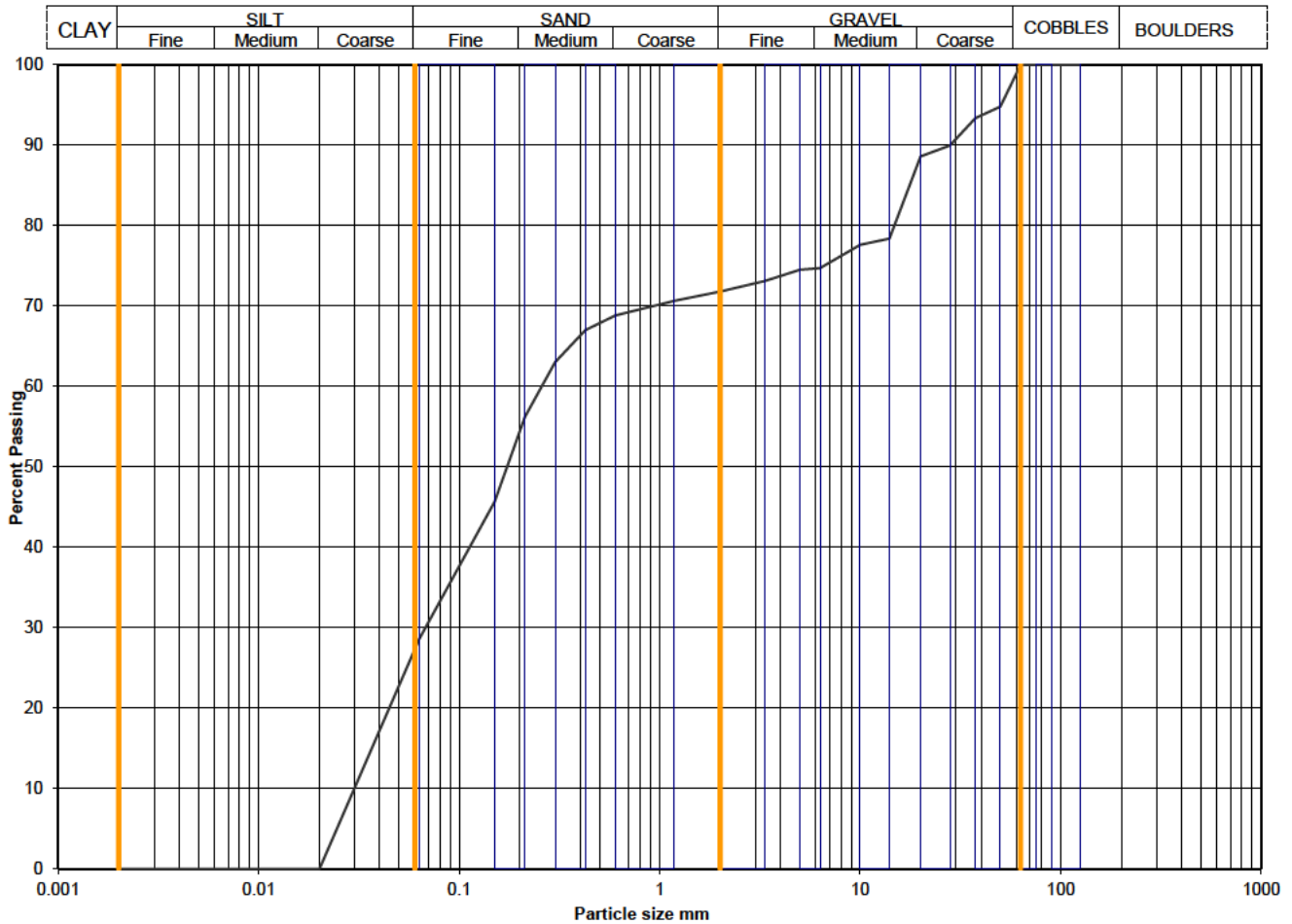
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Project Name A1 ALNWICK TO ELLINGHAM

Figure
PSD

Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:	Hole No	TP/17/02
	A8013-1820180720012438	Sample Depth (m BGL)	0.70 - 1.00
		Sample Type and No	B2
		Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0201	0
90	100	0.0060	0
75	100	0.0020	0
63	100		
50	95		
37.5	93		
28	90		
20	89		
14	78		
10	78		
6.3	75		
5.0	74		
3.35	73		
2.00	72		
1.18	71		
0.600	69		
0.425	67		
0.300	63		
0.212	56		
0.150	46		
0.063	29		

Particle density, Mg/m ³	2.65 assumed
Dry mass of sample, kg	11.2

Soil description	Greyish brown slightly gravelly sandy SILT.		
Preparation / Pretreatment	Sieve: natural material Pipette: as BS1377		
Remarks			
Sample Proportions	Cobbles / boulders Gravel Sand Silt Clay	Whole	*<60mm
		0	0
		28	28
		43	43
		29	29
*<60mm values to aid description only		0	0

Uniformity Coefficient	D60 / D10	9
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Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.4 pipette

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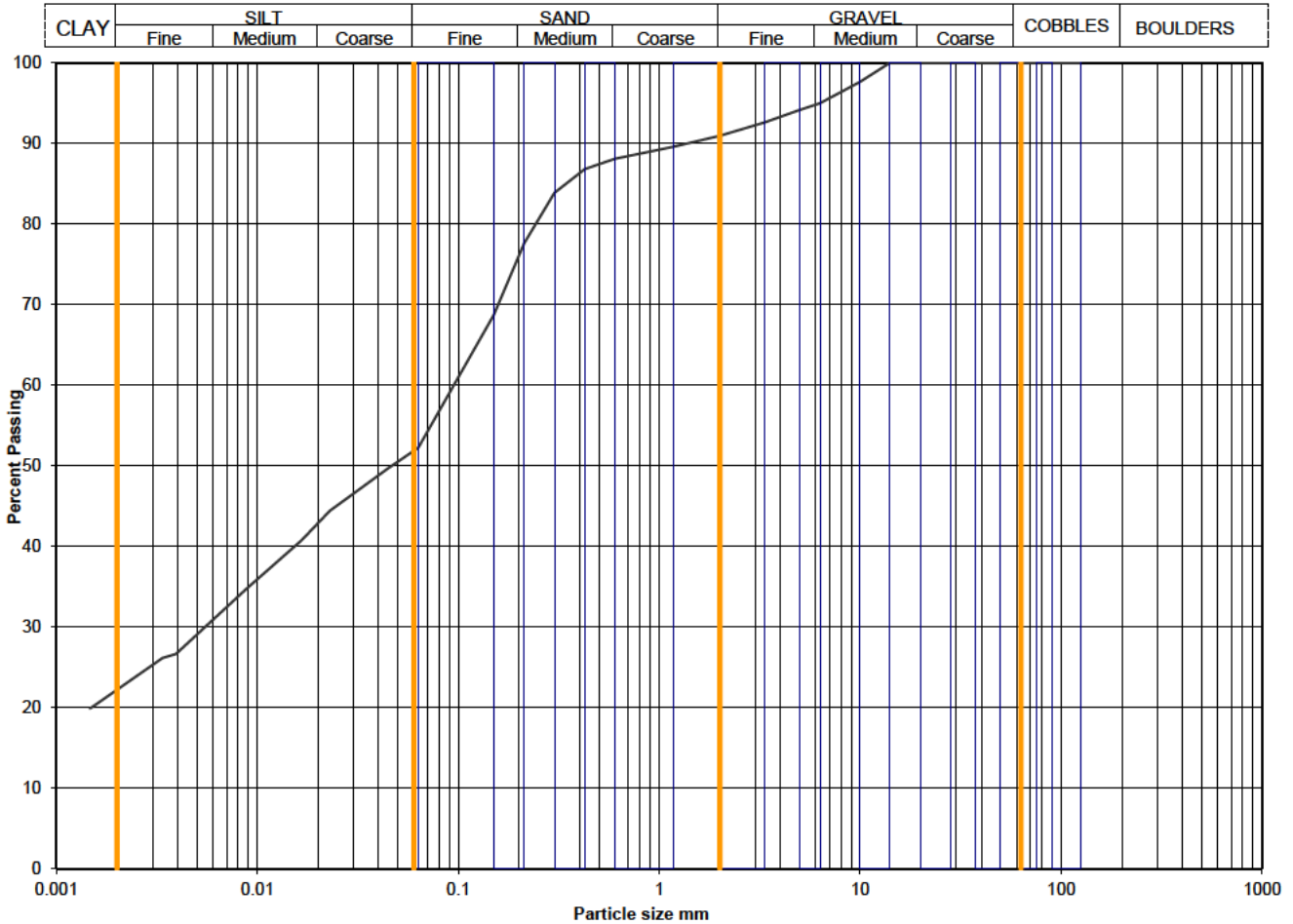


Project No A8013-18
Project Name A1 ALNWICK TO ELLINGHAM

Figure
PSD

Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:	Hole No	TP/17/06
	A8013-1820180730105942	Sample Depth (m BGL)	0.90 - 1.20
		Sample Type and No	B1
		Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	52
90	100	0.0444	50
75	100	0.0319	47
63	100	0.0229	44
50	100	0.0165	41
37.5	100	0.0088	35
28	100	0.0039	27
20	100	0.0034	26
14	100	0.0015	20
10	98		
6.3	95		
5.0	94		
3.35	93		
2.00	91		
1.18	90		
0.600	88		
0.425	87		
0.300	84		
0.212	78		
0.150	69		
0.063	52		

Particle density, Mg/m ³	
2.65	assumed
Dry mass of sample, kg	
9.5	

Soil description	Brown slightly gravelly sandy CLAY with occasional rootlets.		
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377		
Remarks			
Sample Proportions	Cobbles / boulders Gravel Sand Silt Clay	Whole	*<60mm
		0	0
		9	9
		39	39
		30	30
*<60mm values to aid description only		22	22

Uniformity Coefficient	D60 / D10	Not applicable
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Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

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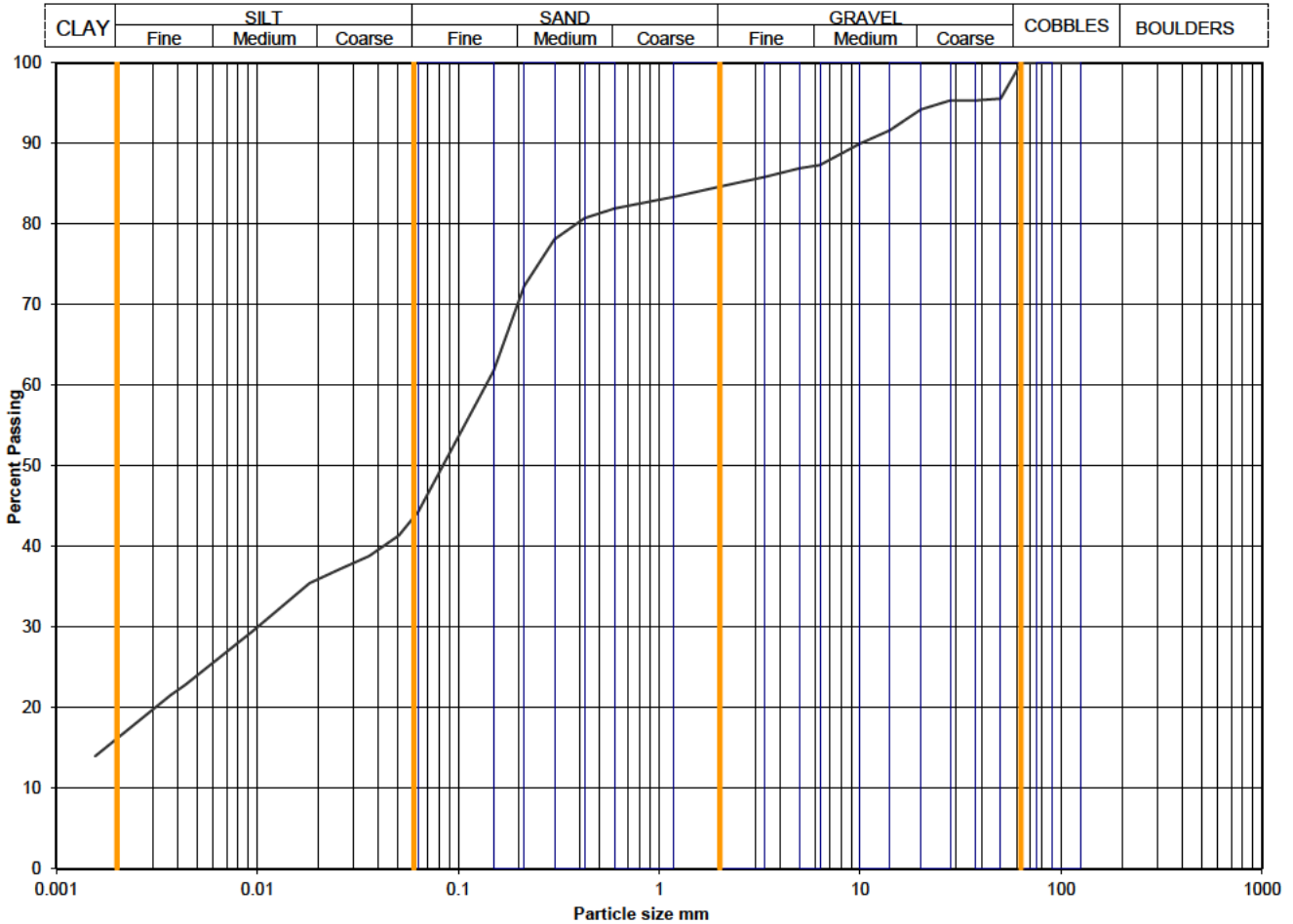
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Figure
PSD

Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:	Hole No	TP/17/09A
	A8013-18-20180926033941	Sample Depth (m BGL)	2.20 - 2.30
		Sample Type and No	B7
		Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	44
90	100	0.0505	41
75	100	0.0360	39
63	100	0.0256	37
50	96	0.0182	35
37.5	95	0.0095	30
28	95	0.0044	23
20	94	0.0037	22
14	92	0.0016	14
10	90		
6.3	87		
5.0	87		
3.35	86		
2.00	85		
1.18	83		
0.600	82		
0.425	81		
0.300	78		
0.212	72		
0.150	62		
0.063	44		

Particle density, Mg/m3	
2.65	assumed
Dry mass of sample, kg	
12.6	

Soil description	Brown slightly gravelly sandy CLAY.		
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377		
Remarks			
Sample Proportions	Cobbles / boulders Gravel Sand Silt Clay	Whole	*<60mm
		0	0
		15	15
		40	40
		28	28
*<60mm values to aid description only		16	16

Uniformity Coefficient	D60 / D10	Not applicable
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Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

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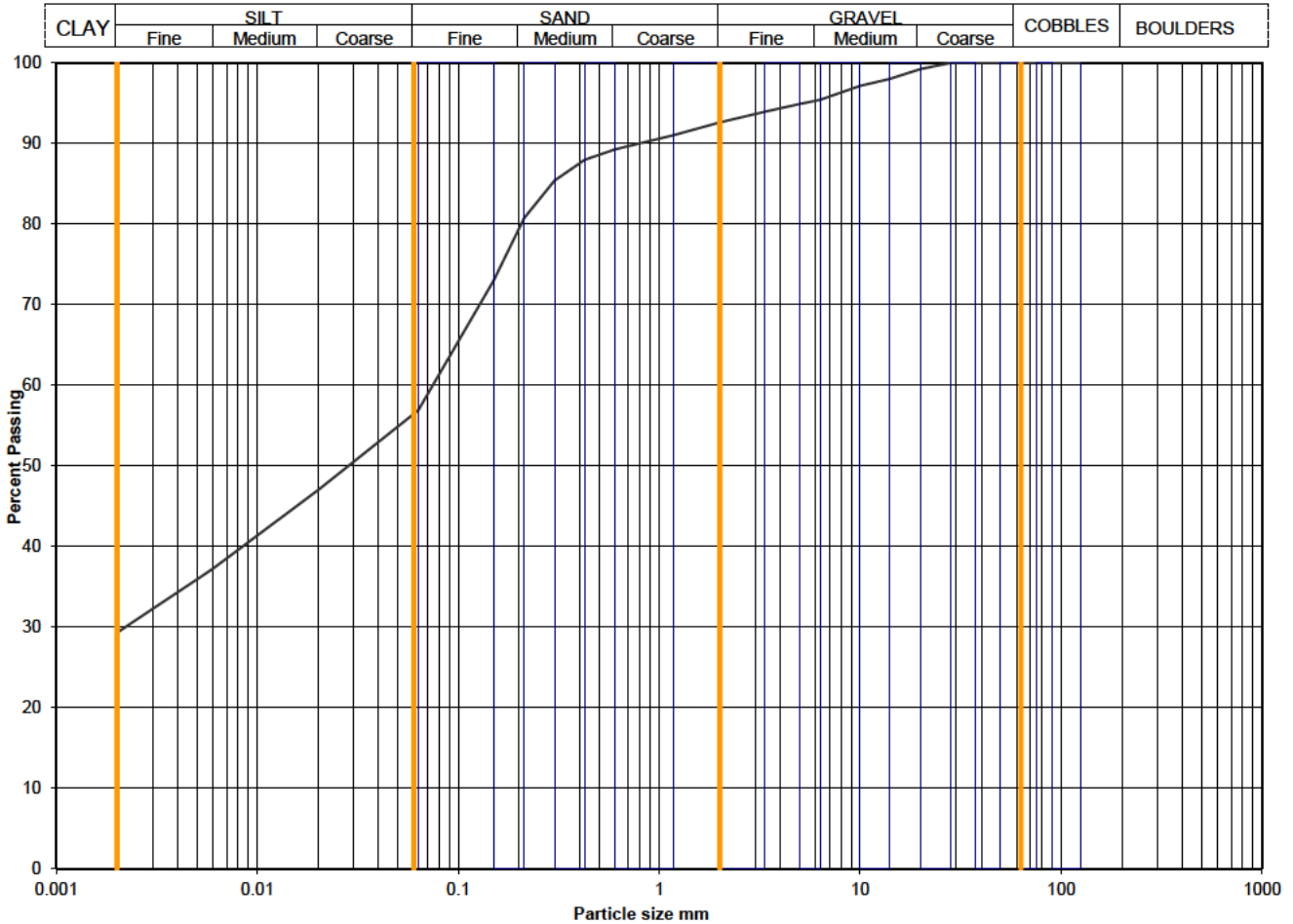
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Figure
PSD

Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:	Hole No	TP/17/10
	A8013-1820180725120603	Sample Depth (m BGL)	1.10 - 1.40
		Sample Type and No	B1
		Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0201	47
90	100	0.0060	37
75	100	0.0020	29
63	100		
50	100		
37.5	100		
28	100		
20	99		
14	98		
10	97		
6.3	95		
5.0	95		
3.35	94		
2.00	93		
1.18	91		
0.600	89		
0.425	88		
0.300	85		
0.212	81		
0.150	73		
0.063	57		
		Particle density, Mg/m ³ 2.65 assumed	
		Dry mass of sample, kg 8.1	

Soil description	Brown slightly gravelly sandy CLAY.		
Preparation / Pretreatment	Sieve: natural material Pipette: as BS1377		
Remarks			
Sample Proportions <small>*<math><60\text{mm}</math> values to aid description only</small>	Cobbles / boulders Gravel Sand Silt Clay	Whole	*<math><60\text{mm}</math>
		0	0
		7	7
		36	36
		28	28
		29	29

Uniformity Coefficient	D60 / D10	Not applicable
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Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.4 pipette

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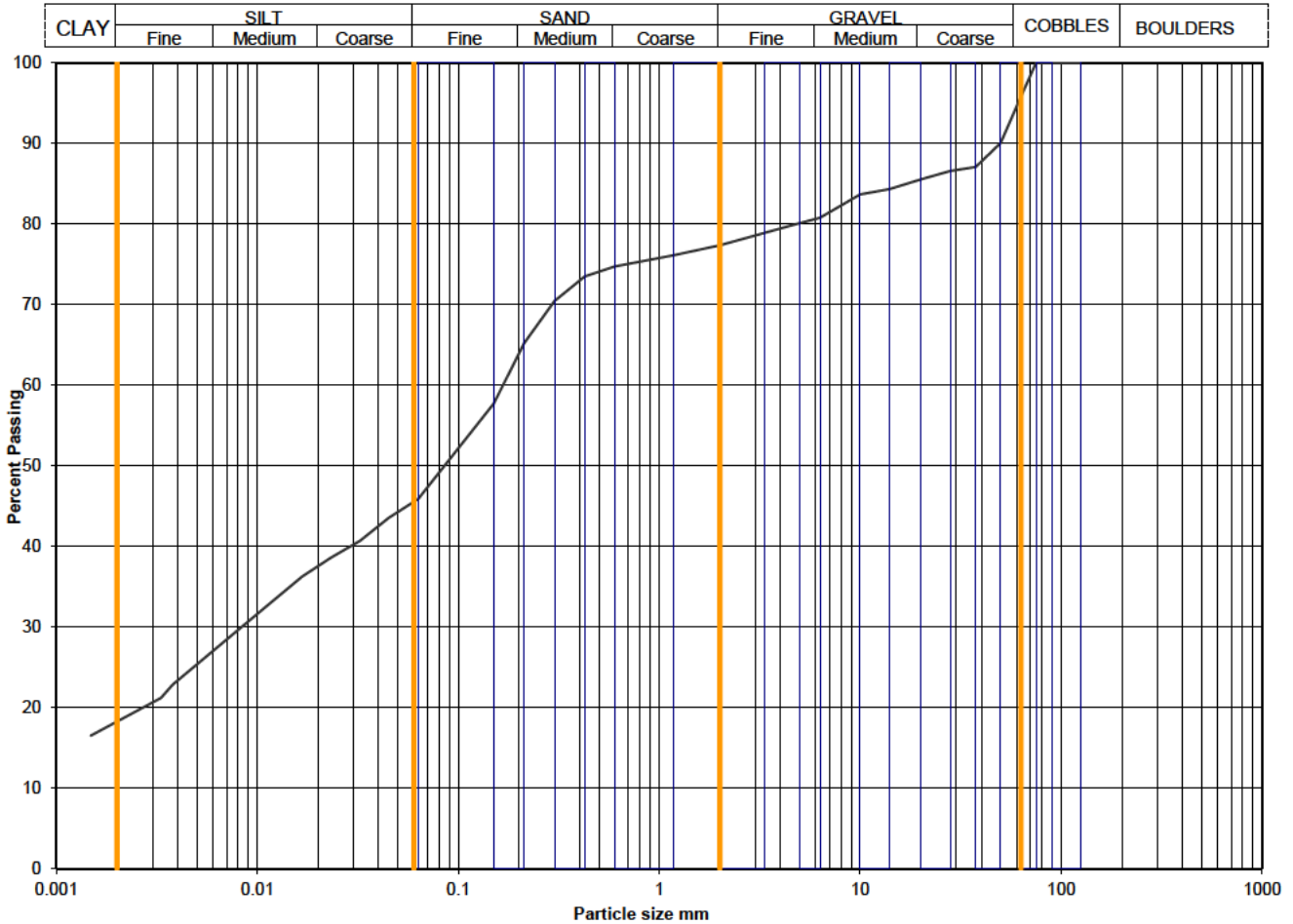
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Figure
PSD

Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:	Hole No	TP/17/12
	A8013-1820180910111623	Sample Depth (m BGL)	0.50 - 1.60
		Sample Type and No	B4
		Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	46
90	100	0.0449	44
75	100	0.0324	41
63	96	0.0232	39
50	90	0.0167	36
37.5	87	0.0089	31
28	87	0.0038	23
20	86	0.0033	21
14	84	0.0015	16
10	84		
6.3	81		
5.0	80		
3.35	79		
2.00	77		
1.18	76		
0.600	75		
0.425	73		
0.300	70		
0.212	65		
0.150	58		
0.063	46		

Particle density, Mg/m3	2.65	assumed
Dry mass of sample, kg	9.5	

Soil description	Brown slightly sandy slightly gravelly CLAY with one cobble.		
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377		
Remarks			
Sample Proportions	Cobbles / boulders Gravel Sand Silt Clay	Whole	*<60mm
		4	0
		18	19
		31	32
		28	29
*<60mm values to aid description only		18	19

Uniformity Coefficient	D60 / D10	Not applicable
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Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

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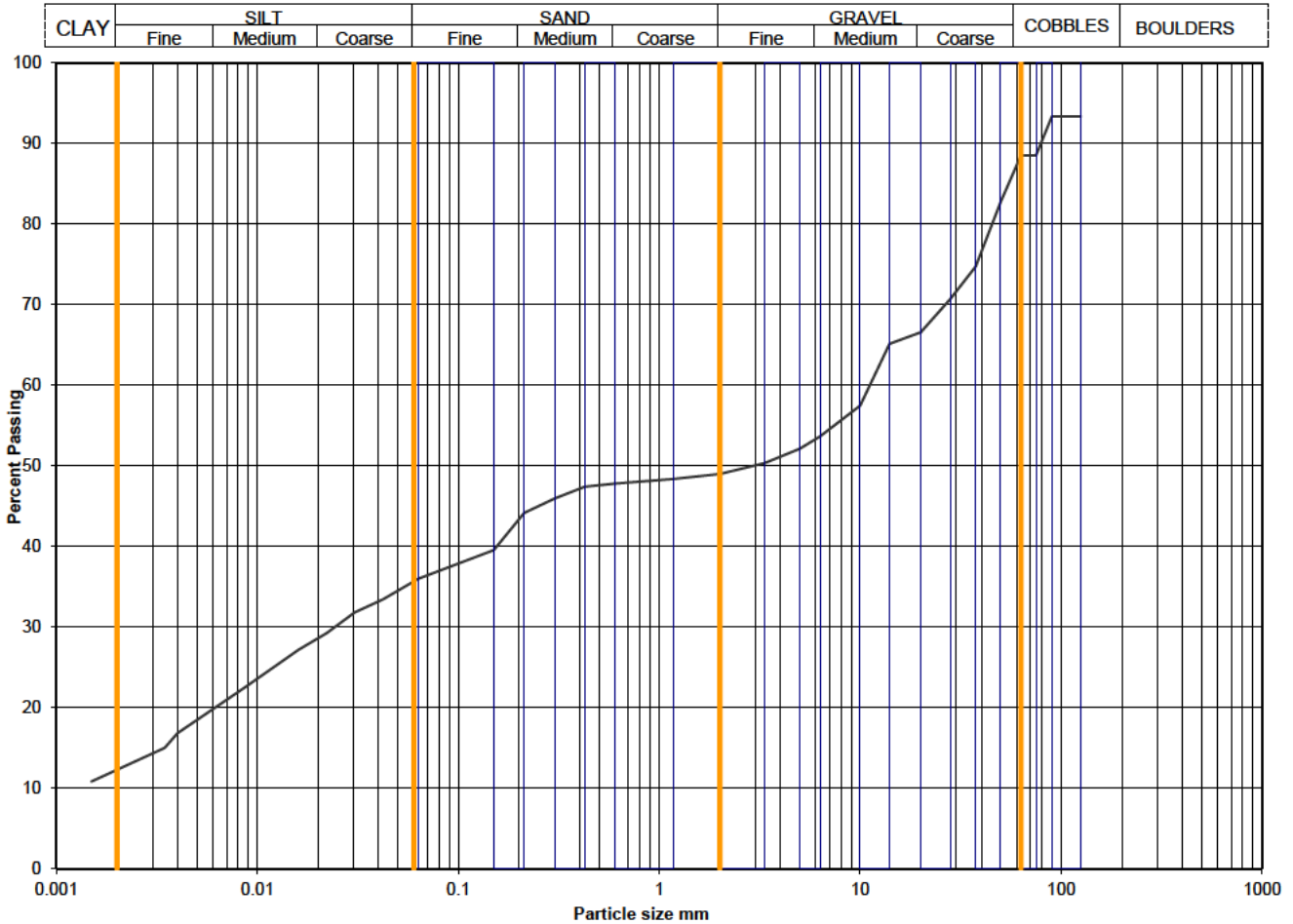
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Figure
PSD

Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:	Hole No	TP/17/13
	A8013-1820180910122413	Sample Depth (m BGL)	0.70 - 1.00
		Sample Type and No	B6
		Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	93	0.0630	36
90	93	0.0421	33
75	89	0.0304	32
63	89	0.0221	29
50	83	0.0160	27
37.5	75	0.0087	22
28	71	0.0040	17
20	67	0.0034	15
14	65	0.0015	11
10	57		
6.3	54		
5.0	52		
3.35	50		
2.00	49		
1.18	48		
0.600	48		
0.425	47		
0.300	46		
0.212	44		
0.150	40		
0.063	36		

Particle density, Mg/m ³	
2.65	assumed
Dry mass of sample, kg	
12.0	

Soil description	Brown slightly sandy gravelly CLAY with three cobbles.		
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377		
Remarks			
Sample Proportions	Cobbles / boulders Gravel Sand Silt Clay	Whole	*<60mm
		11	0
		40	45
		13	15
		24	27
*<60mm values to aid description only		12	14

Uniformity Coefficient	D60 / D10	Not applicable
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Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

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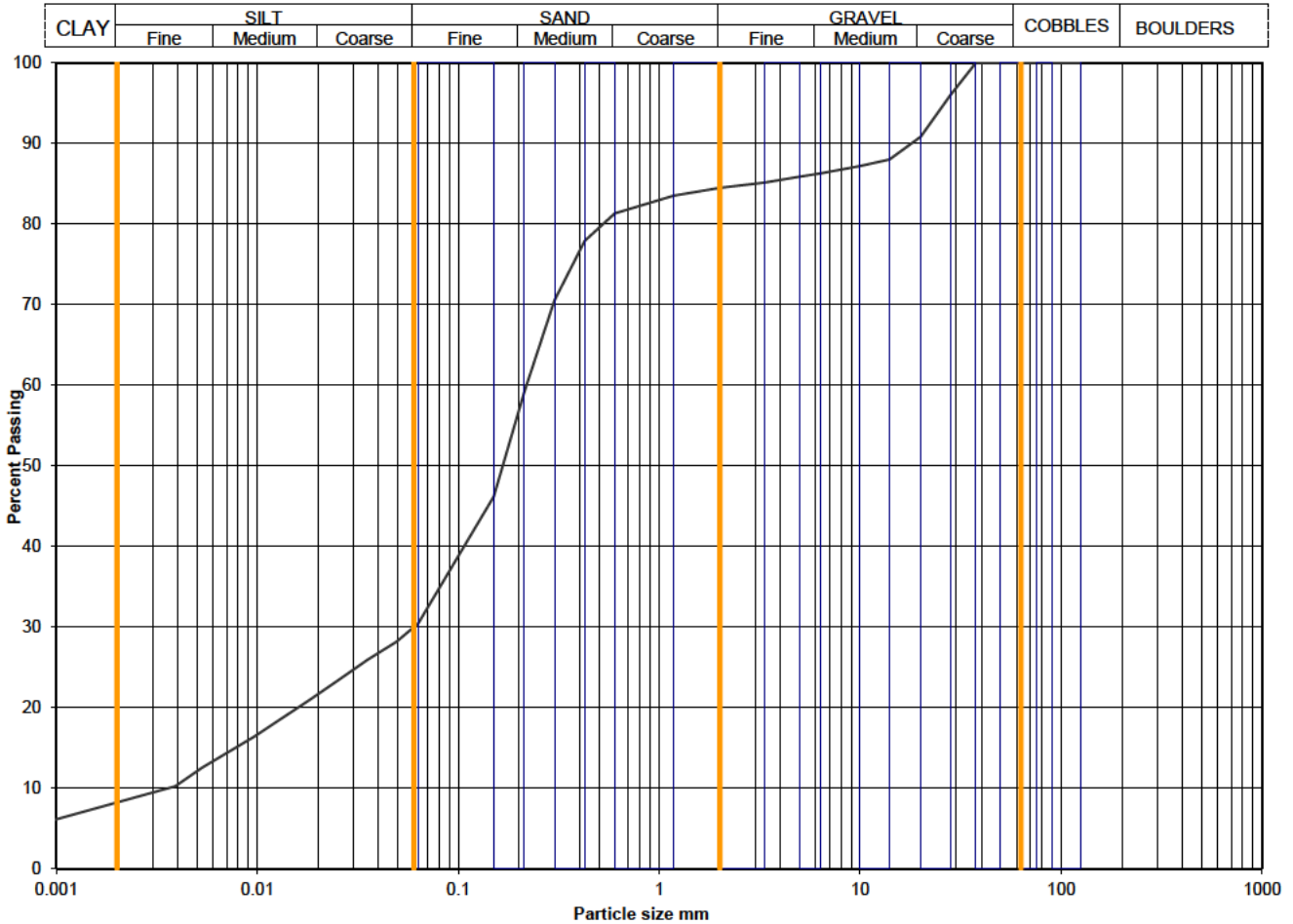
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Project Name A1 ALNWICK TO ELLINGHAM

Figure
PSD

Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:	Hole No	TP/17/14
	A8013-18-20180927094550	Sample Depth (m BGL)	0.6
		Sample Type and No	D3
		Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	30
90	100	0.0491	28
75	100	0.0352	26
63	100	0.0252	23
50	100	0.0181	21
37.5	100	0.0096	16
28	96	0.0053	12
20	91	0.0039	10
14	88	0.0009	6
10	87		
6.3	86		
5.0	86		
3.35	85		
2.00	85		
1.18	84		
0.600	81		
0.425	78		
0.300	71		
0.212	59		
0.150	46		
0.063	30		

Particle density, Mg/m3	2.65	assumed
Dry mass of sample, kg	1.3	

Soil description	Brown slightly gravelly sandy CLAY.		
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377		
Remarks			
Sample Proportions	Cobbles / boulders Gravel Sand Silt Clay	Whole	*<60mm
		0	0
		15	15
		54	54
		22	22
*<60mm values to aid description only		8	8

Uniformity Coefficient	D60 / D10	60
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Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

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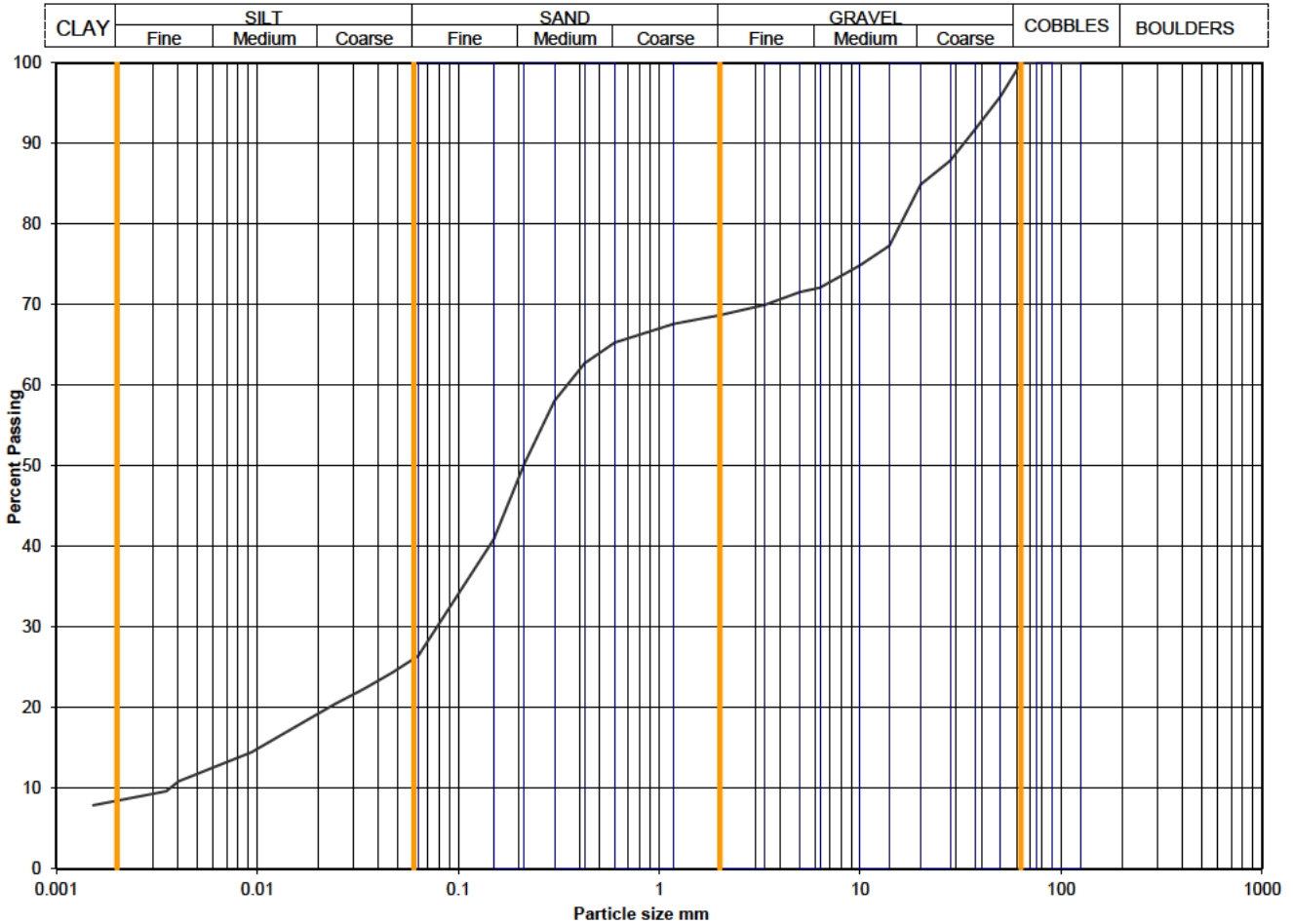
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Figure
PSD

Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:	Hole No	TP/17/14
	A8013-18-20180927095439	Sample Depth (m BGL)	1.10 - 1.50
		Sample Type and No	B6
		Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	26
90	100	0.0470	24
75	100	0.0339	22
63	100	0.0244	20
50	96	0.0175	18
37.5	92	0.0093	14
28	88	0.0041	11
20	85	0.0035	10
14	77	0.0015	8
10	75		
6.3	72		
5.0	72		
3.35	70		
2.00	69		
1.18	68		
0.600	65		
0.425	63		
0.300	58		
0.212	50		
0.150	41		
0.063	26		

Particle density, Mg/m3	
2.65	assumed
Dry mass of sample, kg	
12.6	

Soil description	Light brown slightly gravelly sandy CLAY.		
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377		
Remarks			
Sample Proportions	Cobbles / boulders Gravel Sand Silt Clay	Whole	*<60mm
		0	0
		31	31
		42	42
		18	18
*<60mm values to aid description only		8	8

Uniformity Coefficient	D60 / D10	79
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Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

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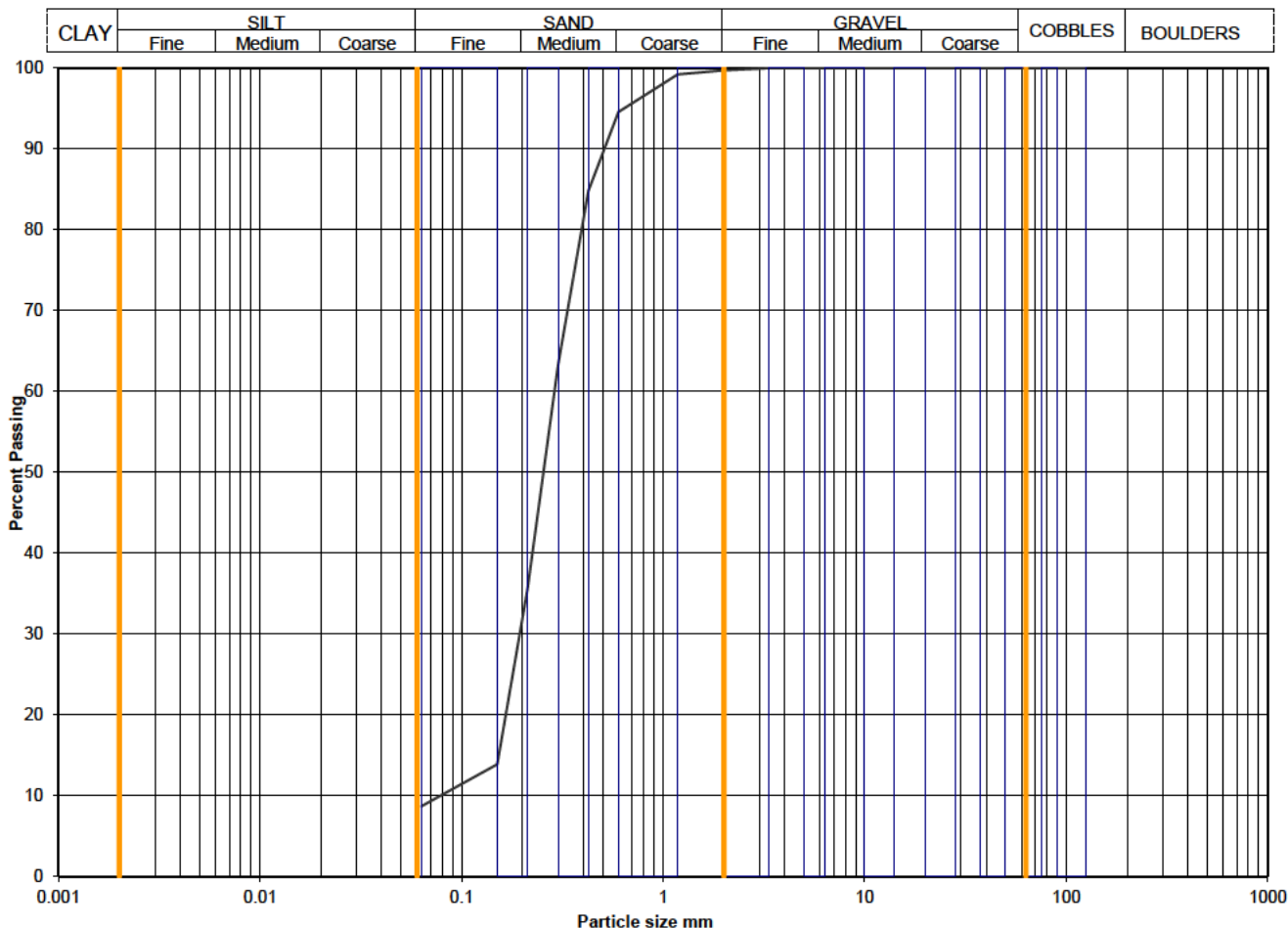
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Project Name A1 ALNWICK TO ELLINGHAM

Figure
PSD

Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:	Hole No	TP/17/16
	A8013-1820180910115124	Sample Depth (m BGL)	1.30 - 1.80
		Sample Type and No	B8
		Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5.0	100		
3.35	100		
2.00	100		
1.18	99		
0.600	95		
0.425	85		
0.300	63		
0.212	36		
0.150	14		
0.063	9		
		Dry mass of sample, kg	
		10.2	

Soil description	Brown silty SAND.		
Preparation / Pretreatment	Sieve: natural material		
Remarks			
Sample Proportions <small>*<60mm values to aid description only</small>	Cobbles / boulders Gravel Sand Silt Clay	Whole	*<60mm
		0	0
		0	0
		91	91
		silt+clay =	
		9	9

Uniformity Coefficient	D60 / D10	4
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Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	none

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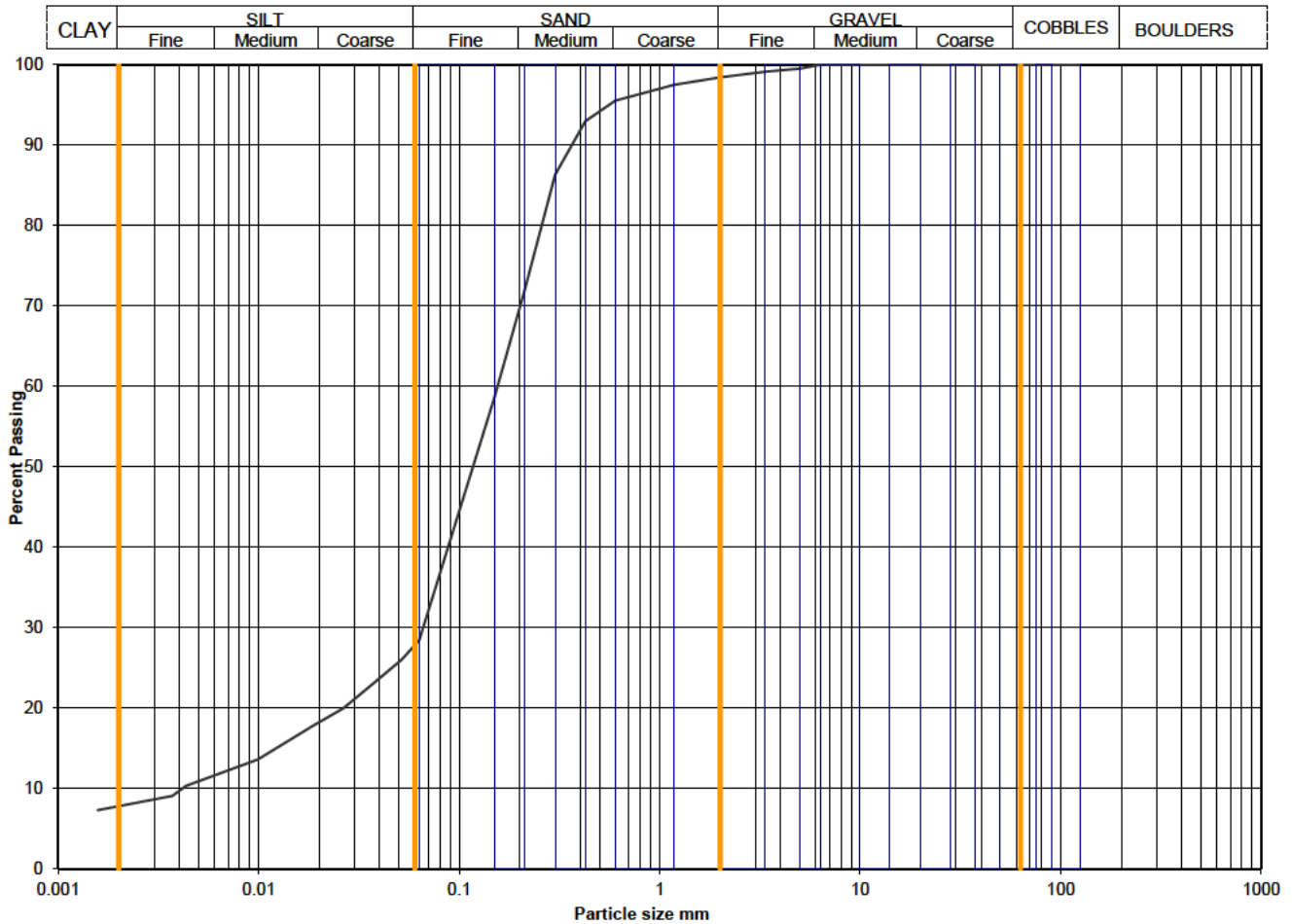
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Figure
PSD

Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:	Hole No	TP/17/18
	A8013-1820180911093440	Sample Depth (m BGL)	1.40 - 1.80
		Sample Type and No	B7
		Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	28
90	100	0.0516	26
75	100	0.0369	23
63	100	0.0264	20
50	100	0.0188	18
37.5	100	0.0099	14
28	100	0.0043	10
20	100	0.0037	9
14	100	0.0016	7
10	100		
6.3	100		
5.0	100		
3.35	99		
2.00	98		
1.18	97		
0.600	96		
0.425	93		
0.300	86		
0.212	72		
0.150	59		
0.063	28		

Particle density, Mg/m ³	2.65	assumed
Dry mass of sample, kg	9.9	

Soil description	Brown slightly gravelly very silty SAND.		
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377		
Remarks			
Sample Proportions	Cobbles / boulders Gravel Sand Silt Clay	Whole	*<60mm
		0	0
		2	2
		70	70
		21	21
*<60mm values to aid description only		8	8
Uniformity Coefficient	D60 / D10	37	
Test Method	BS 1377 : Part 2 : 1990		
	Sieving	9.2	wet sieve
	Sedimentation	9.5	hydrometer

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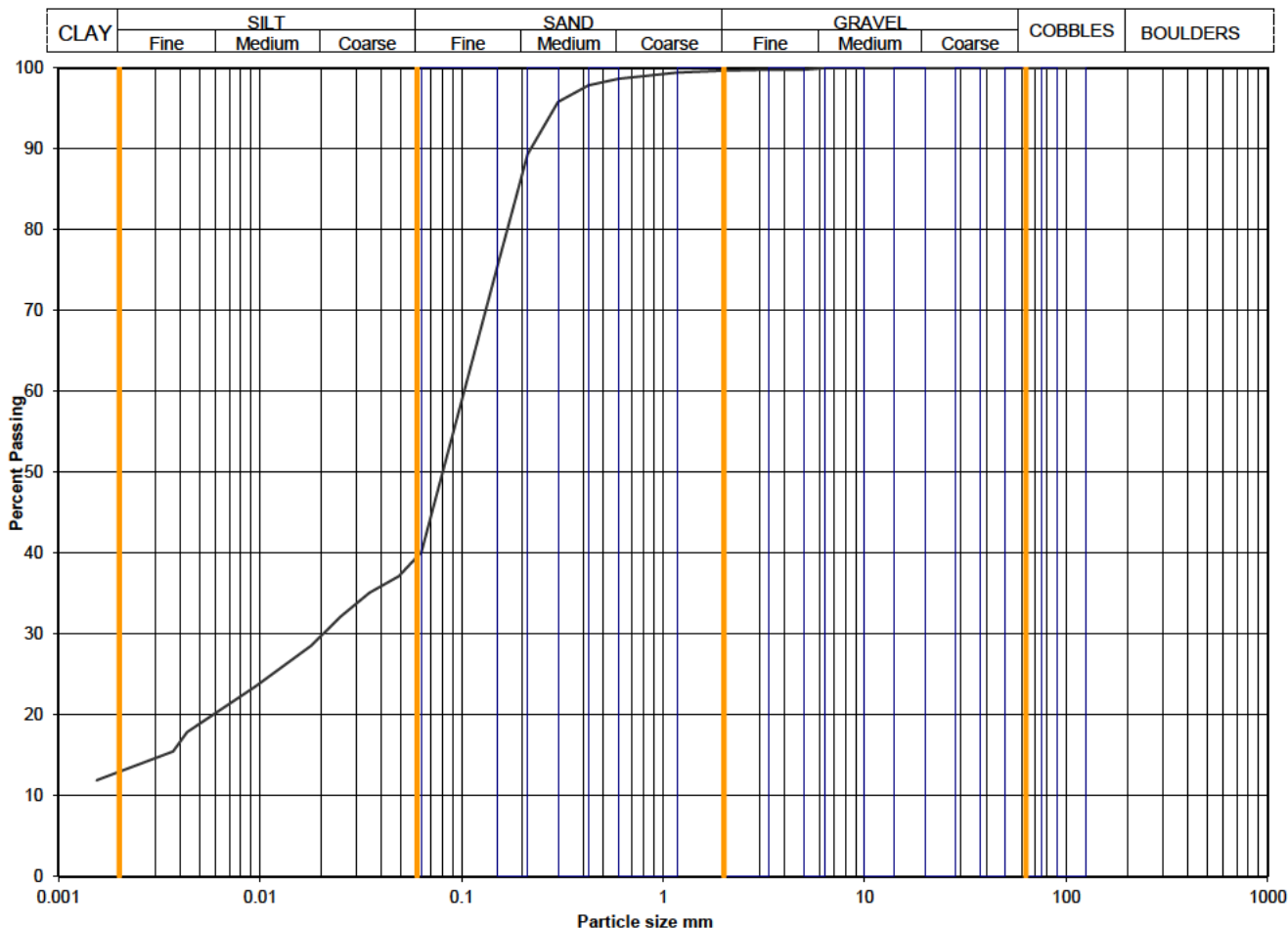


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Figure
PSD

Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:	Hole No	TP/17/18
	A8013-1820180911093516	Sample Depth (m BGL)	2.40 - 2.80
		Sample Type and No	B9
		Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	40
90	100	0.0488	37
75	100	0.0348	35
63	100	0.0249	32
50	100	0.0179	29
37.5	100	0.0094	23
28	100	0.0043	18
20	100	0.0037	15
14	100	0.0015	12
10	100		
6.3	100		
5.0	100		
3.35	100		
2.00	100		
1.18	99		
0.600	99		
0.425	98		
0.300	96		
0.212	89		
0.150	75		
0.063	40		

Particle density, Mg/m ³	2.65	assumed
Dry mass of sample, kg	9.0	

Soil description	Greyish brown sandy CLAY.		
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377		
Remarks			
Sample Proportions	Cobbles / boulders Gravel Sand Silt Clay	Whole	*<60mm
		0	0
		0	0
		60	60
		27	27
*<60mm values to aid description only		13	13

Uniformity Coefficient	D60 / D10	Not applicable
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Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

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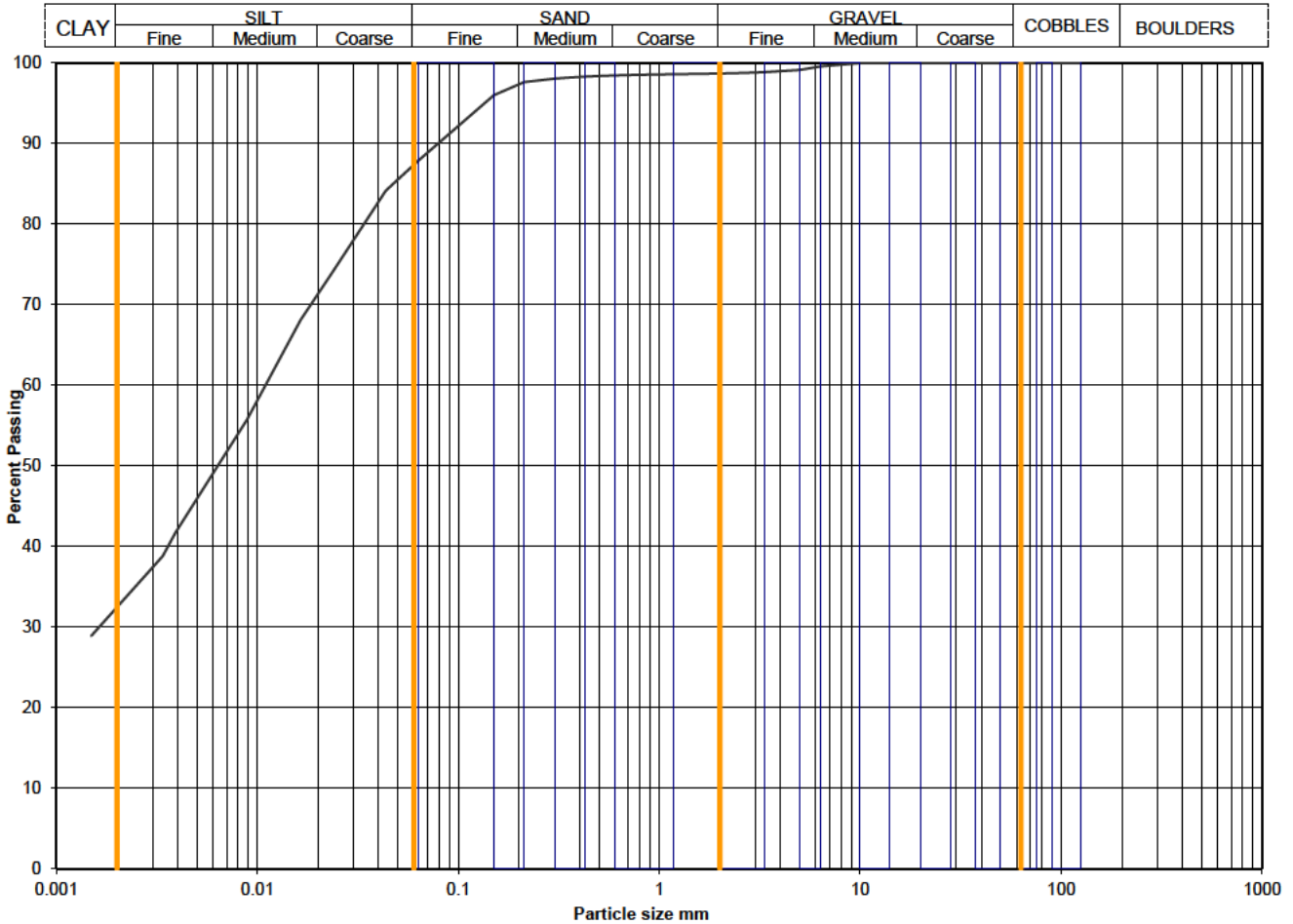
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Figure
PSD

Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:	Hole No	TP/17/21
	A8013-1820181003012219	Sample Depth (m BGL)	2.80 - 3.00
		Sample Type and No	B9
		Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	88
90	100	0.0436	84
75	100	0.0315	79
63	100	0.0227	73
50	100	0.0164	68
37.5	100	0.0088	56
28	100	0.0039	42
20	100	0.0034	39
14	100	0.0015	29
10	100		
6.3	100		
5.0	99		
3.35	99		
2.00	99		
1.18	99		
0.600	98		
0.425	98		
0.300	98		
0.212	98		
0.150	96		
0.063	88		

Particle density, Mg/m ³	2.65 assumed
Dry mass of sample, kg	7.3

Soil description	Brownish grey slightly sandy slightly gravelly clayey SILT.		
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377		
Remarks			
Sample Proportions	Cobbles / boulders Gravel Sand Silt Clay	Whole	*<60mm
		0	0
		1	1
		11	11
		55	55
*<60mm values to aid description only		32	32

Uniformity Coefficient	D60 / D10	Not applicable
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Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

QA Ref
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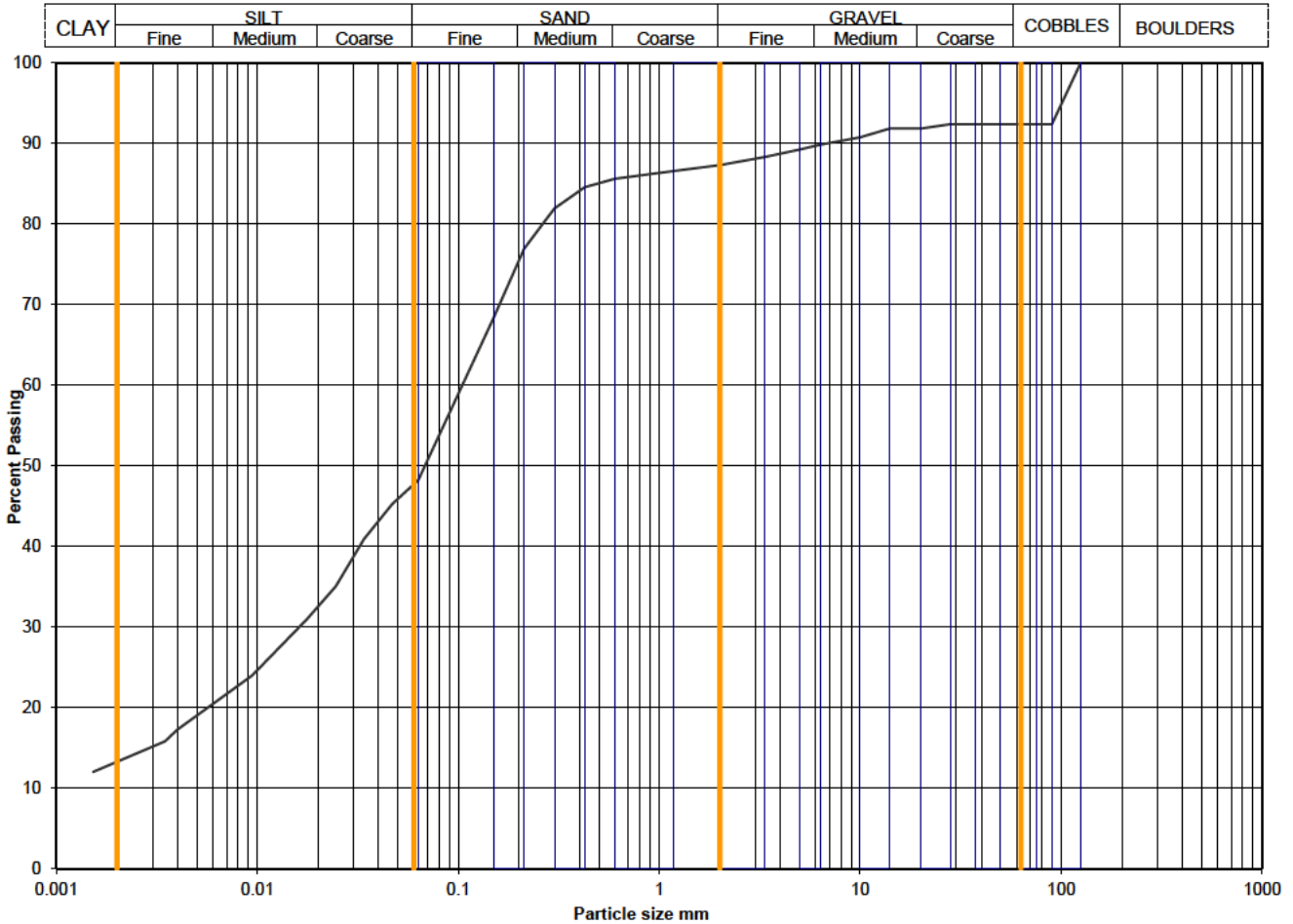
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Project No A8013-18
Project Name A1 ALNWICK TO ELLINGHAM

Figure
PSD

Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:	Hole No	TP/17/23
	A8013-1820180924104014	Sample Depth (m BGL)	2.40 - 3.00
		Sample Type and No	B8
		Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	48
90	92	0.0468	45
75	92	0.0338	41
63	92	0.0246	35
50	92	0.0177	31
37.5	92	0.0094	24
28	92	0.0040	17
20	92	0.0035	16
14	92	0.0015	12
10	91		
6.3	90		
5.0	89		
3.35	88		
2.00	87		
1.18	87		
0.600	86		
0.425	85		
0.300	82		
0.212	77		
0.150	68		
0.063	48		

Particle density, Mg/m ³	
2.65	assumed
Dry mass of sample, kg	
14.2	

Soil description	Brown slightly gravelly sandy CLAY with one cobble.		
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377		
Remarks			
Sample Proportions	Cobbles / boulders Gravel Sand Silt Clay	Whole	*<60mm
		8	0
		5	5
		39	42
		35	38
*<60mm values to aid description only		13	14
Uniformity Coefficient	D60 / D10	Not applicable	
Test Method	BS 1377 : Part 2 : 1990		
	Sieving	9.2	wet sieve
	Sedimentation	9.5	hydrometer

QA Ref
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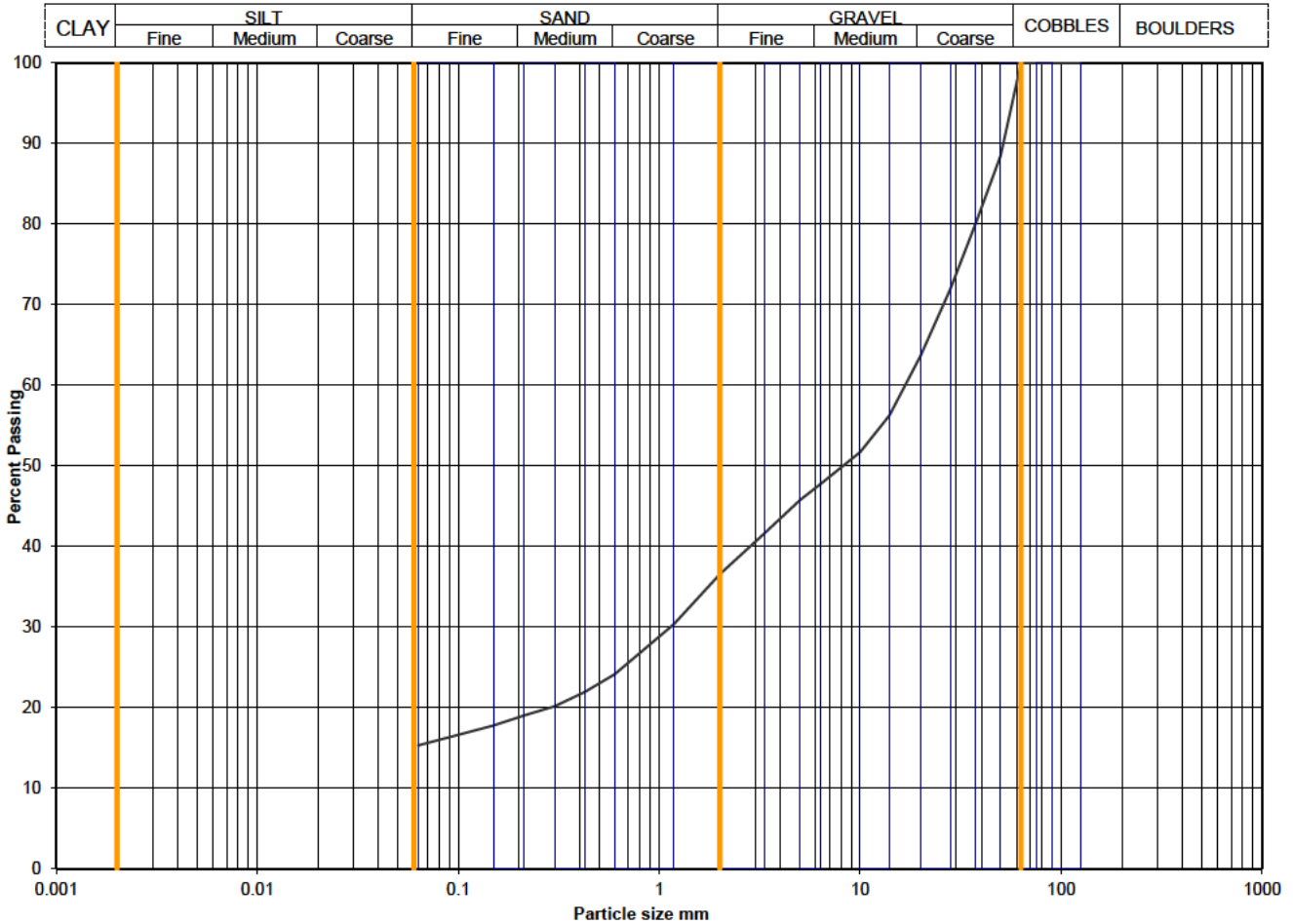


Project No A8013-18
Project Name A1 ALNWICK TO ELLINGHAM

Figure
PSD

Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:	Hole No	TP/17/25
	A8013-1820180917105355	Sample Depth (m BGL)	1.00 - 1.35
		Sample Type and No	B7
		Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	89		
37.5	80		
28	72		
20	64		
14	56		
10	52		
6.3	48		
5.0	46		
3.35	42		
2.00	37		
1.18	30		
0.600	24		
0.425	22		
0.300	20		
0.212	19		
0.150	18		
0.063	15		

Dry mass of sample, kg	
8.6	

Soil description	Brown slightly sandy gravelly CLAY.		
Preparation / Pretreatment	Sieve: natural material		
Remarks			
Sample Proportions	Cobbles / boulders Gravel Sand Silt Clay	Whole	*<60mm
		0	0
		63	63
		21	21
		silt+clay =	
*<60mm values to aid description only		15	15

Uniformity Coefficient	D60 / D10	Not applicable
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Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	none

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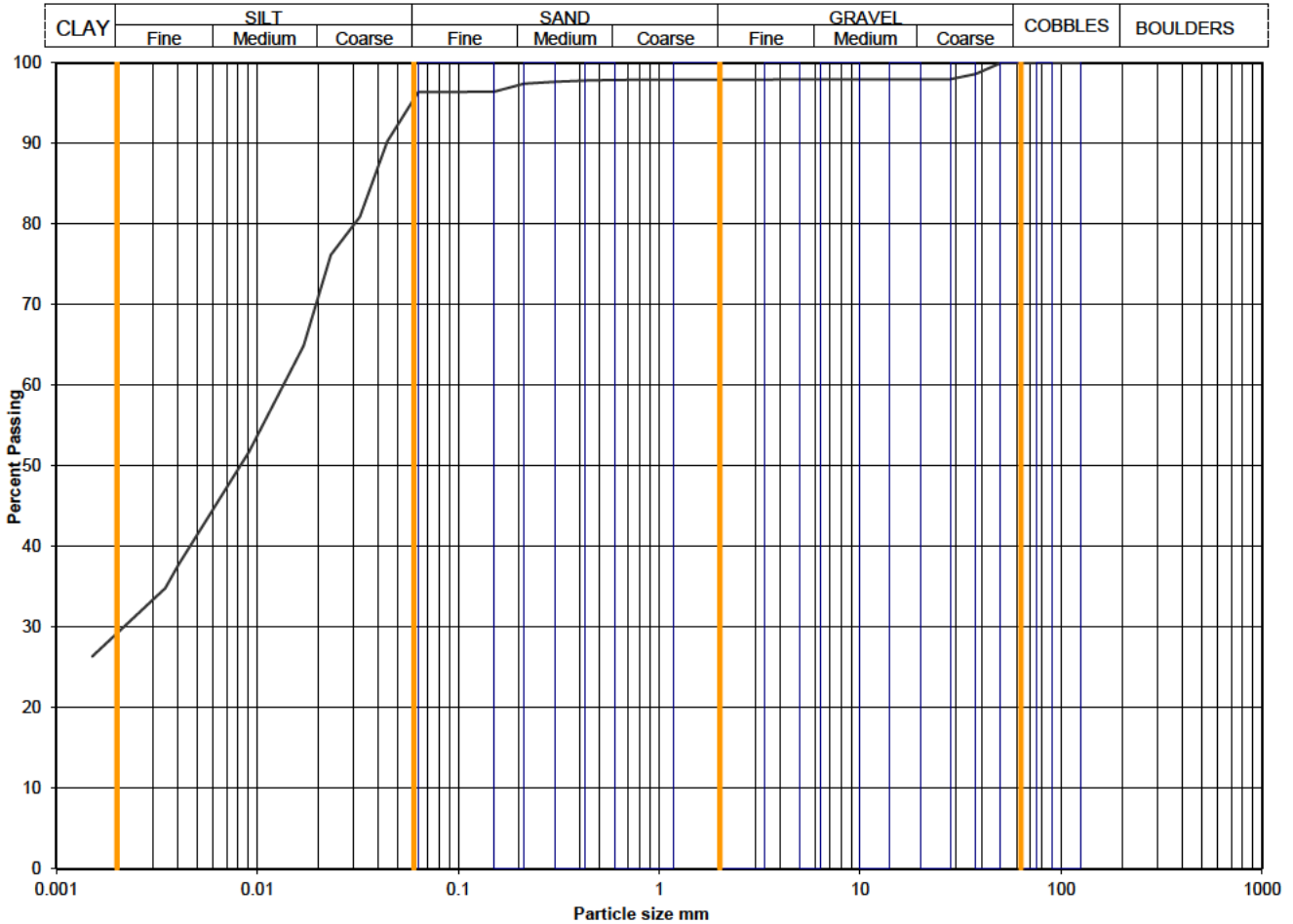
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Project Name A1 ALNWICK TO ELLINGHAM

Figure
PSD

Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:	Hole No	TP/17/29
	A8013-1820180924105245	Sample Depth (m BGL)	3.00 - 3.50
		Sample Type and No	B9
		Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	96
90	100	0.0443	90
75	100	0.0323	81
63	100	0.0232	76
50	100	0.0170	65
37.5	99	0.0091	52
28	98	0.0040	38
20	98	0.0035	35
14	98	0.0015	26
10	98		
6.3	98		
5.0	98		
3.35	98		
2.00	98		
1.18	98		
0.600	98		
0.425	98		
0.300	98		
0.212	97		
0.150	96		
0.063	96		
		Particle density, Mg/m3	
		2.65	assumed
		Dry mass of sample, kg	
		7.5	

Soil description	Brown slightly sandy slightly gravelly CLAY.		
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377		
Remarks			
Sample Proportions	Cobbles / boulders Gravel Sand Silt Clay	Whole	*<60mm
		0	0
		2	2
		2	2
		67	67
*<60mm values to aid description only		29	29

Uniformity Coefficient	D60 / D10	Not applicable
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Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

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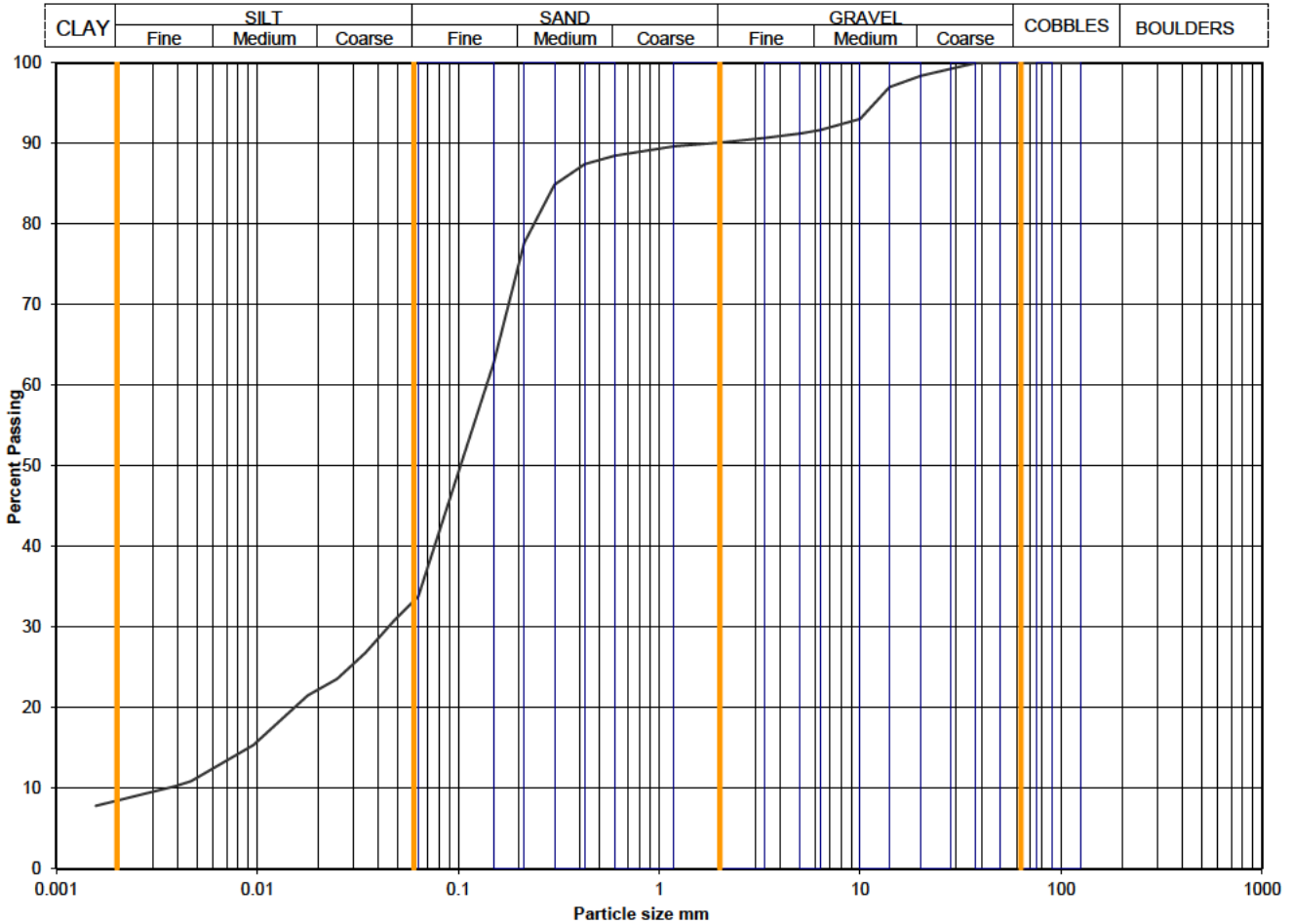
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Project Name A1 ALNWICK TO ELLINGHAM

Figure
PSD

Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:	Hole No	TP/17/30
	A8013-1820180924012555	Sample Depth (m BGL)	0.70 - 1.20
		Sample Type and No	B4
		Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	34
90	100	0.0474	31
75	100	0.0344	27
63	100	0.0249	24
50	100	0.0178	21
37.5	100	0.0095	15
28	99	0.0047	11
20	98	0.0039	10
14	97	0.0016	8
10	93		
6.3	92		
5.0	91		
3.35	91		
2.00	90		
1.18	90		
0.600	88		
0.425	87		
0.300	85		
0.212	78		
0.150	63		
0.063	34		

Particle density, Mg/m3	2.65	assumed
Dry mass of sample, kg	8.0	

Soil description	Brown slightly gravelly sandy clayey SILT.		
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377		
Remarks			
Sample Proportions	Cobbles / boulders Gravel Sand Silt Clay	Whole	*<60mm
		0	0
		10	10
		56	56
		25	25
*<60mm values to aid description only		8	8

Uniformity Coefficient	D60 / D10	39
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Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

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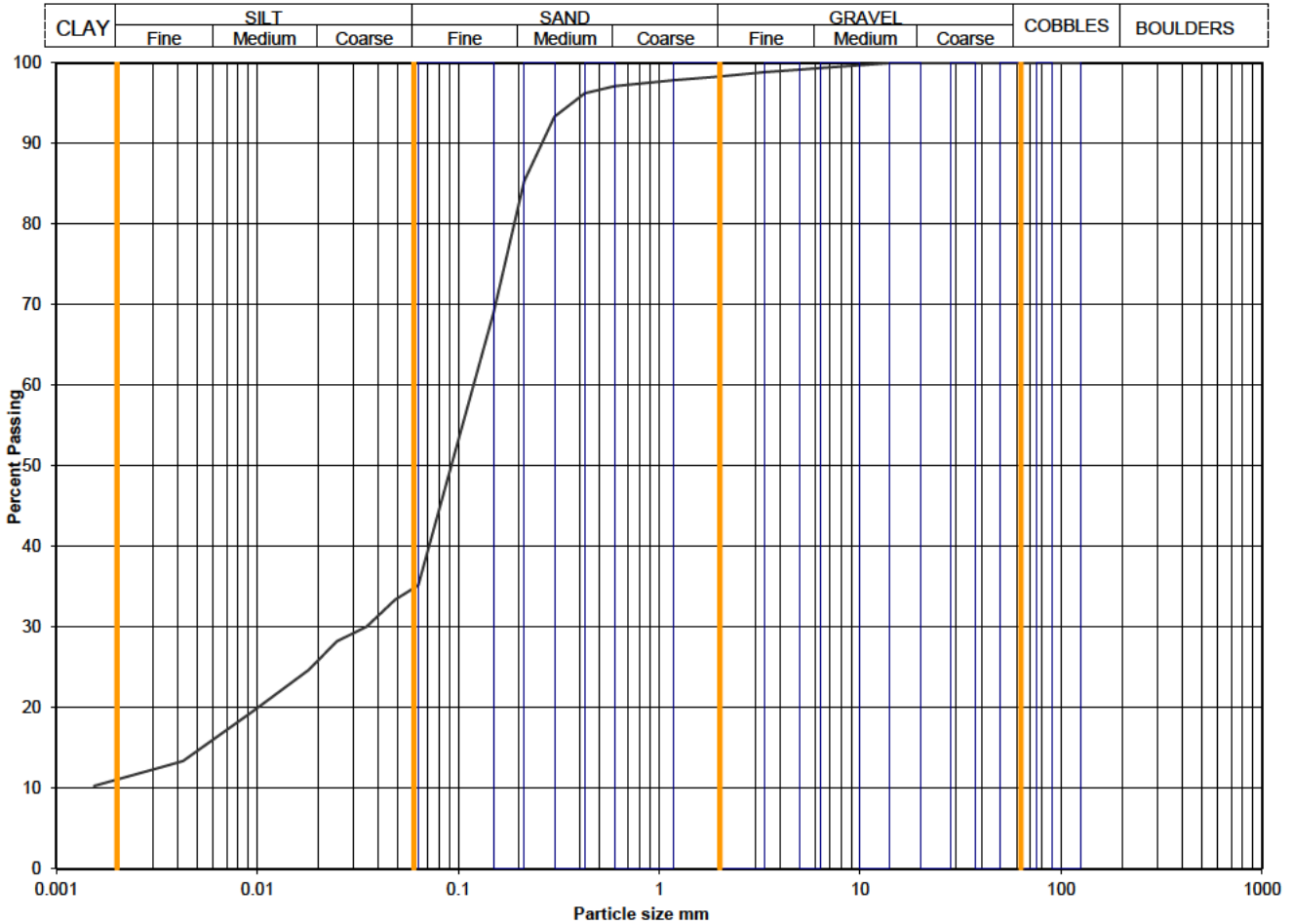


Project No A8013-18
Project Name A1 ALNWICK TO ELLINGHAM

Figure
PSD

Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:	Hole No	TP/17/30
	A8013-1820180924012555	Sample Depth (m BGL)	0.70 - 1.20
		Sample Type and No	B4
		Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	35
90	100	0.0485	33
75	100	0.0349	30
63	100	0.0249	28
50	100	0.0179	25
37.5	100	0.0095	19
28	100	0.0043	13
20	100	0.0036	13
14	100	0.0015	10
10	100		
6.3	99		
5.0	99		
3.35	99		
2.00	98		
1.18	98		
0.600	97		
0.425	96		
0.300	93		
0.212	85		
0.150	69		
0.063	35		

Particle density, Mg/m3	
2.65	assumed
Dry mass of sample, kg	
6.8	

Soil description	Brown slightly sandy slightly gravelly CLAY.		
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377		
Remarks			
Sample Proportions	Cobbles / boulders Gravel Sand Silt Clay	Whole	*<60mm
		0	0
		2	2
		63	63
		24	24
*<60mm values to aid description only		11	11

Uniformity Coefficient	D60 / D10	Not applicable
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Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

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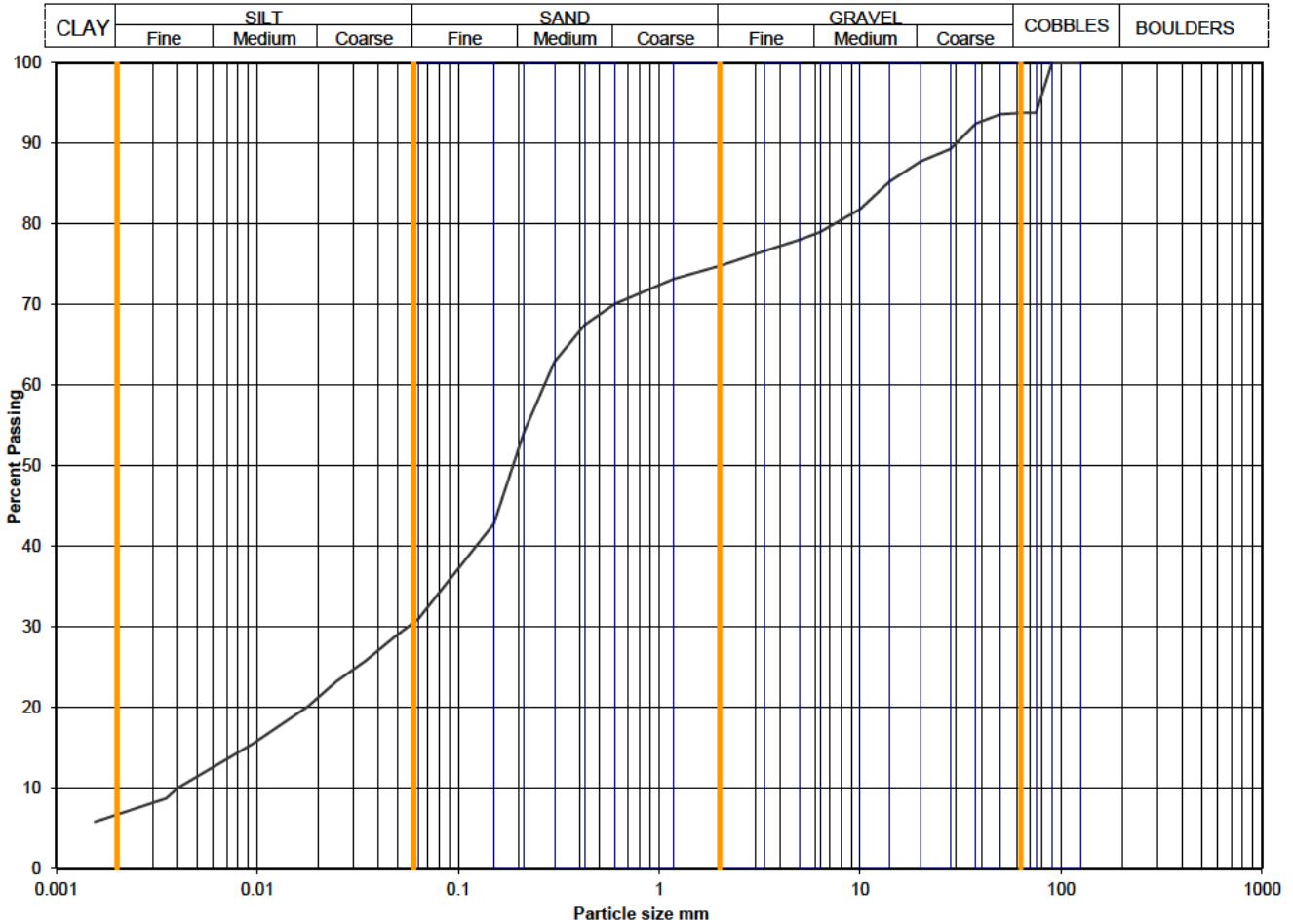
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Figure
PSD

Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:	Hole No	TP/17/31
	A8013-1820180924121348	Sample Depth (m BGL)	0.30 - 1.00
		Sample Type and No	B3
		Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	31
90	100	0.0475	29
75	94	0.0343	26
63	94	0.0247	23
50	94	0.0178	20
37.5	92	0.0095	15
28	89	0.0040	10
20	88	0.0035	9
14	85	0.0016	6
10	82		
6.3	79		
5.0	78		
3.35	77		
2.00	75		
1.18	73		
0.600	70		
0.425	68		
0.300	63		
0.212	54		
0.150	43		
0.063	31		

Particle density, Mg/m3	
2.65	assumed
Dry mass of sample, kg	
11.7	

Soil description	Brown slightly gravelly sandy clayey SILT with occasional rootlets and one cobble.		
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377		
Remarks			
Sample Proportions	Cobbles / boulders Gravel Sand Silt Clay	Whole	*<60mm
		6	0
		19	20
		44	47
		24	26
*<60mm values to aid description only		7	7

Uniformity Coefficient	D60 / D10	60
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Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

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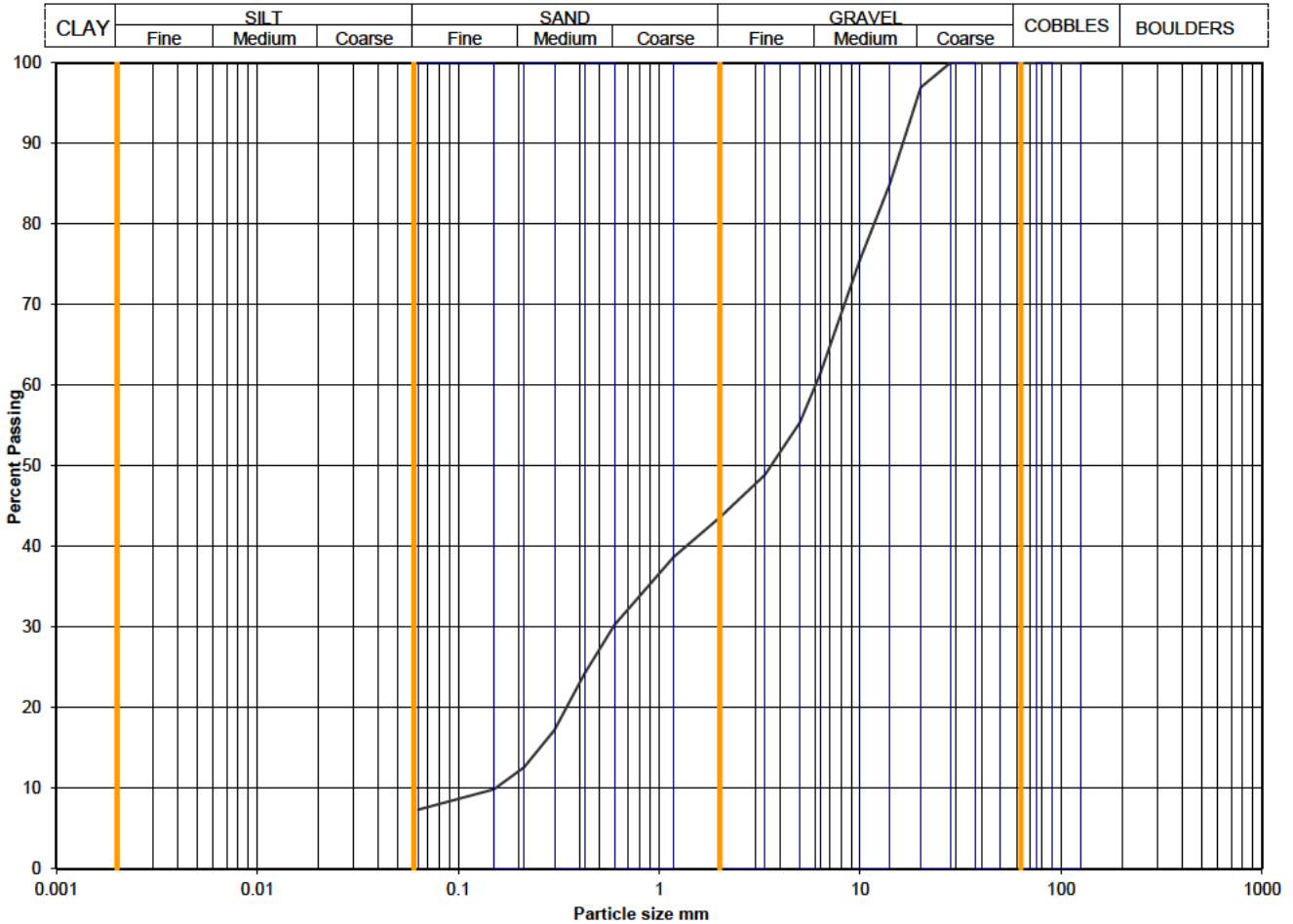
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Project Name A1 ALNWICK TO ELLINGHAM

Figure
PSD

Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:	Hole No	TP/17/32
	A8013-1820180924122317	Sample Depth (m BGL)	0.7
		Sample Type and No	D5
		Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	97		
14	85		
10	76		
6.3	61		
5.0	55		
3.35	49		
2.00	44		
1.18	39		
0.600	30		
0.425	24		
0.300	17		
0.212	13		
0.150	10		
0.063	7		

Dry mass of sample, kg	
1.5	

Soil description	Brown very sandy clayey GRAVEL.		
Preparation / Pretreatment	Sieve: natural material		
Remarks			
Sample Proportions <small>*<60mm values to aid description only</small>	Cobbles / boulders Gravel Sand Silt Clay	Whole	*<60mm
		0	0
		56	56
		36	36
		silt+clay =	
		7	7

Uniformity Coefficient	D60 / D10	39
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Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	none

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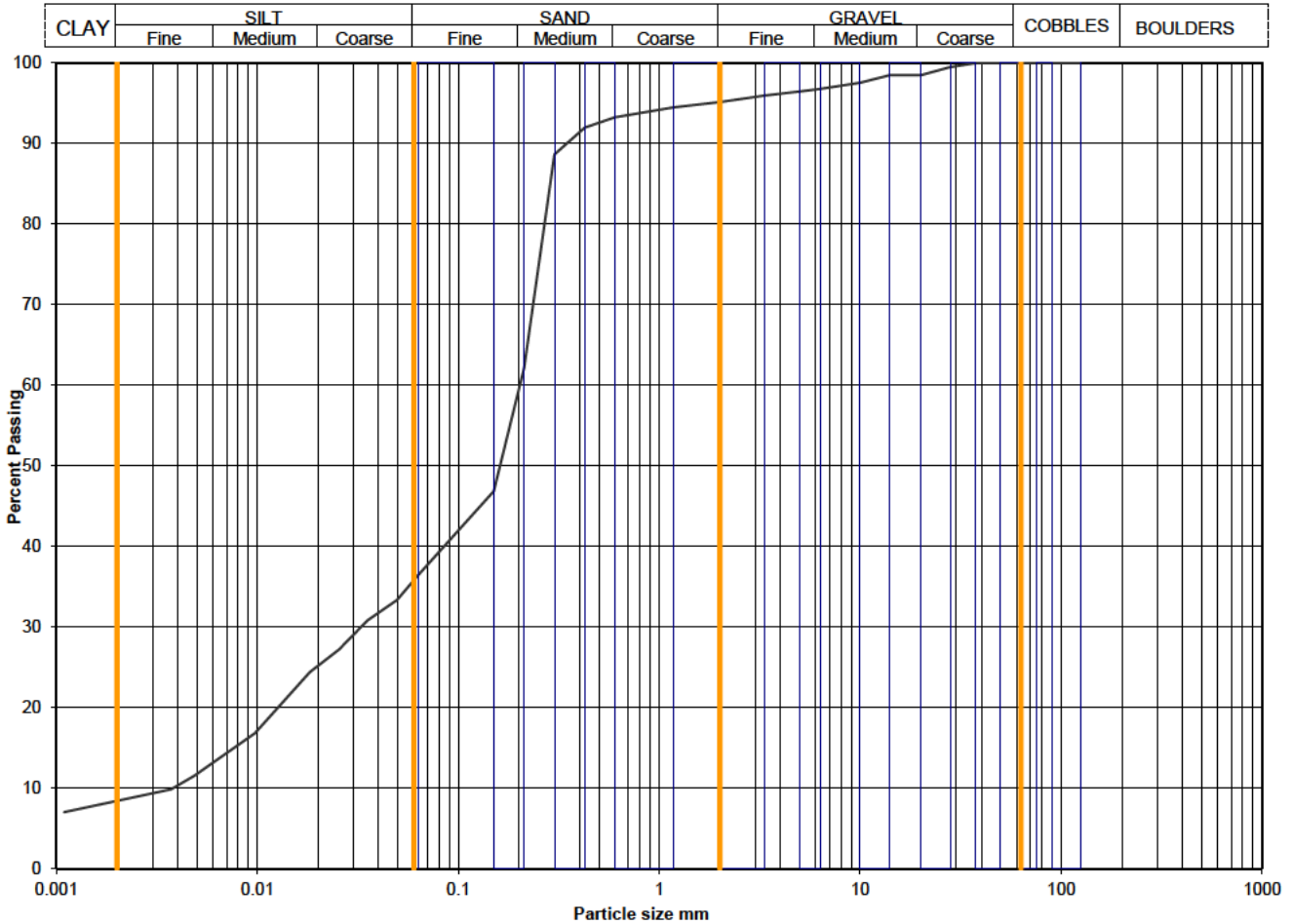
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Project Name A1 ALNWICK TO ELLINGHAM

Figure
PSD

Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:	Hole No	TP/17/33
	A8013-1820180924022257	Sample Depth (m BGL)	0.30 - 0.80
		Sample Type and No	B4
		Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	36
90	100	0.0495	33
75	100	0.0354	31
63	100	0.0254	27
50	100	0.0182	24
37.5	100	0.0097	17
28	99	0.0048	11
20	98	0.0037	10
14	98	0.0011	7
10	98		
6.3	97		
5.0	96		
3.35	96		
2.00	95		
1.18	94		
0.600	93		
0.425	92		
0.300	89		
0.212	62		
0.150	47		
0.063	36		

Particle density, Mg/m ³	
2.65	assumed
Dry mass of sample, kg	
9.4	

Soil description	Brown slightly gravelly very sandy clayey SILT.		
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377		
Remarks			
Sample Proportions	Cobbles / boulders Gravel Sand Silt Clay	Whole	*<60mm
		0	0
		5	5
		59	59
		28	28
*<60mm values to aid description only		8	8

Uniformity Coefficient	D60 / D10	54
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Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

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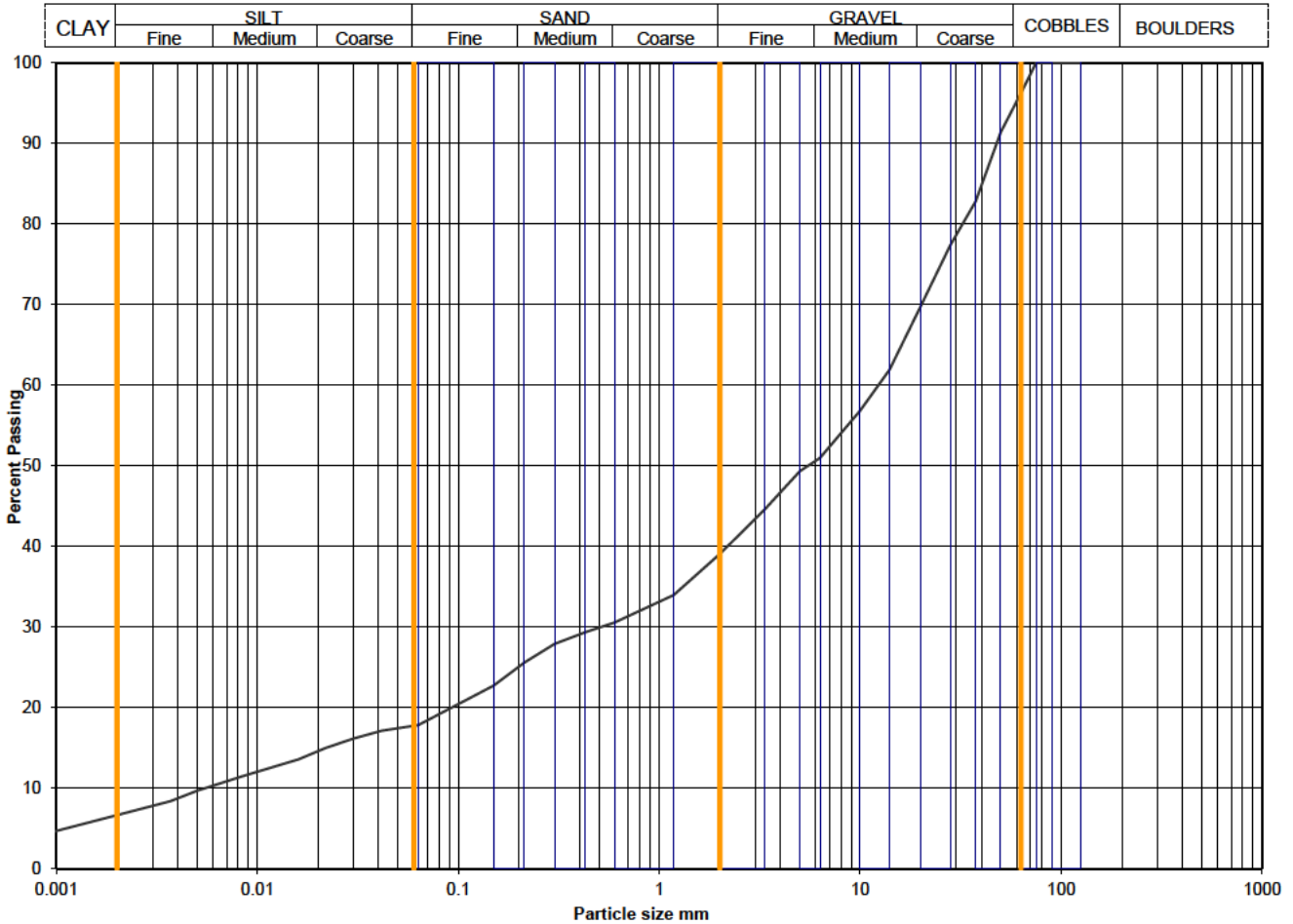


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Project Name A1 ALNWICK TO ELLINGHAM

Figure
PSD

Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:	Hole No	TP/17/35
	A8013-1820180730112356	Sample Depth (m BGL)	1.00 - 1.20
		Sample Type and No	B1
		Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	18
90	100	0.0416	17
75	100	0.0301	16
63	96	0.0219	15
50	91	0.0160	14
37.5	83	0.0086	12
28	77	0.0050	10
20	70	0.0037	8
14	62	0.0008	4
10	57		
6.3	51		
5.0	49		
3.35	45		
2.00	39		
1.18	34		
0.600	31		
0.425	29		
0.300	28		
0.212	26		
0.150	23		
0.063	18		

Particle density, Mg/m3	2.65	assumed
Dry mass of sample, kg	11.0	

Soil description	Brown slightly sandy gravelly CLAY with one cobble.		
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377		
Remarks			
Sample Proportions	Cobbles / boulders Gravel Sand Silt Clay	Whole	*<60mm
		4	0
		57	59
		21	22
		11	11
*<60mm values to aid description only		7	7

Uniformity Coefficient	D60 / D10	2326
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Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

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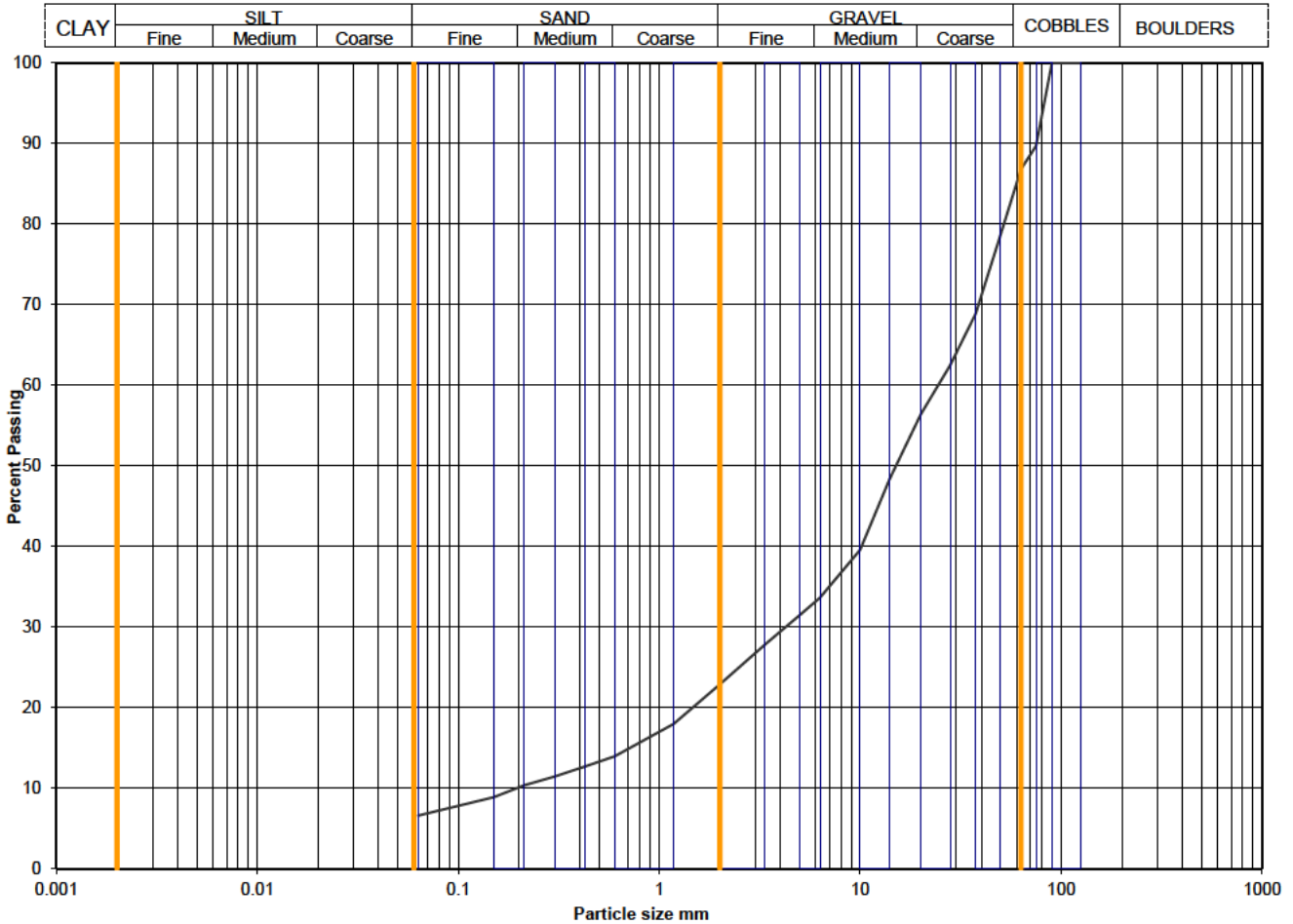
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Project Name A1 ALNWICK TO ELLINGHAM

Figure
PSD

Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:	Hole No	TP/17/35
	A8013-1820180730112403	Sample Depth (m BGL)	2.20 - 2.40
		Sample Type and No	B2
		Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	90		
63	87		
50	79		
37.5	69		
28	62		
20	56		
14	48		
10	40		
6.3	34		
5.0	31		
3.35	28		
2.00	23		
1.18	18		
0.600	14		
0.425	13		
0.300	11		
0.212	10		
0.150	9		
0.063	7		

Dry mass of sample, kg	
12.8	

Soil description	Brown sandy silty GRAVEL with three cobbles.		
Preparation / Pretreatment	Sieve: natural material		
Remarks			
Sample Proportions <small>*<60mm values to aid description only</small>	Cobbles / boulders Gravel Sand Silt Clay	Whole	*<60mm
		13	0
		64	74
		16	18
		silt+clay =	
7	8		

Uniformity Coefficient	D60 / D10	128
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Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	none

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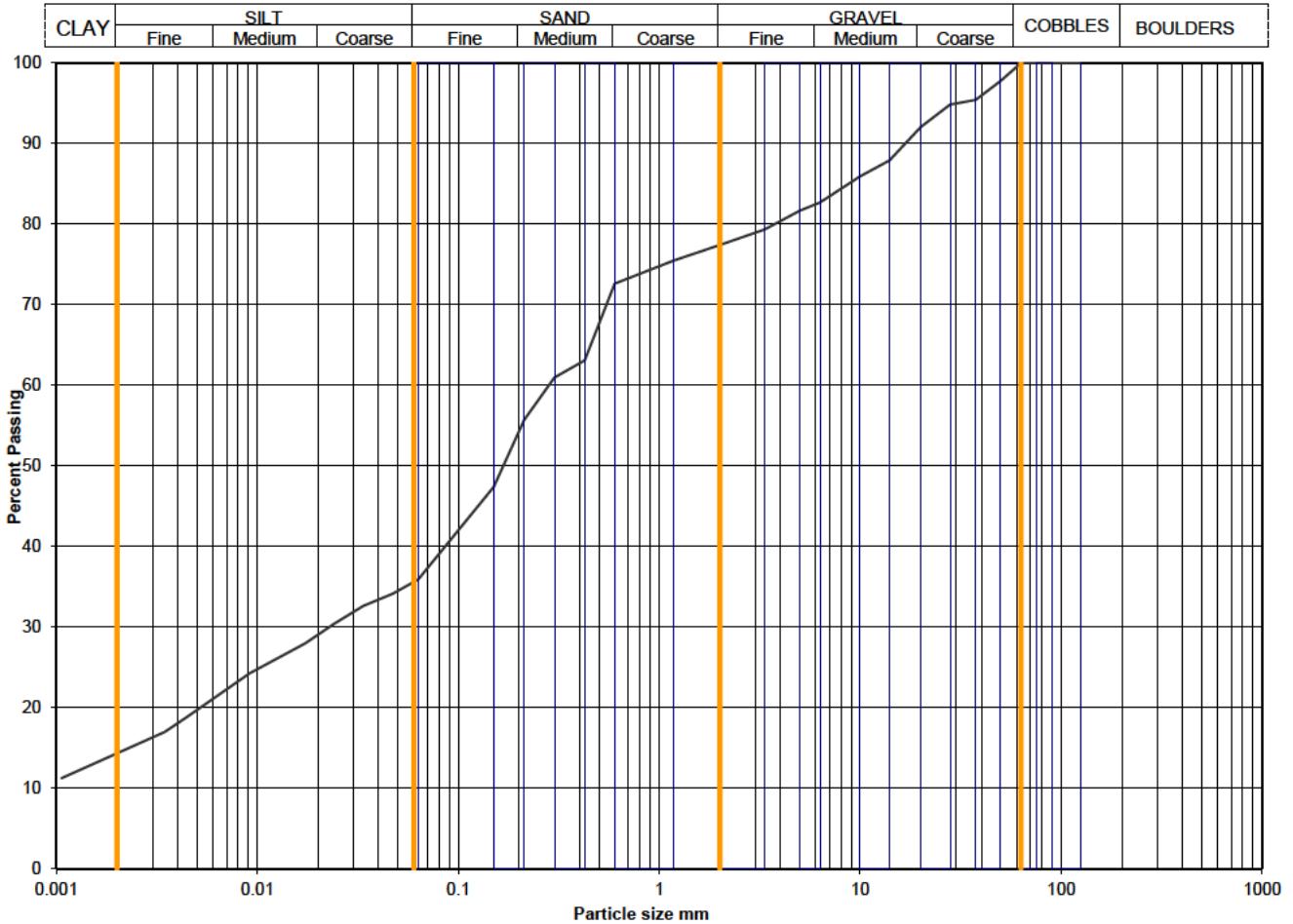
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Project Name A1 ALNWICK TO ELLINGHAM

Figure
PSD

Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:	Hole No	TP/17/36
	A8013-1820180924023108	Sample Depth (m BGL)	0.70 - 1.20
		Sample Type and No	B6
		Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	36
90	100	0.0471	34
75	100	0.0336	33
63	100	0.0241	30
50	98	0.0173	28
37.5	95	0.0091	24
28	95	0.0044	19
20	92	0.0034	17
14	88	0.0011	11
10	86		
6.3	83		
5.0	82		
3.35	79		
2.00	77		
1.18	75		
0.600	73		
0.425	63		
0.300	61		
0.212	56		
0.150	47		
0.063	36		

Particle density, Mg/m3	
2.65	assumed
Dry mass of sample, kg	
12.5	

Soil description	Brown slightly gravelly sandy CLAY with occasional rootlets.		
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377		
Remarks			
Sample Proportions	Cobbles / boulders Gravel Sand Silt Clay	Whole	*<60mm
		0	0
		23	23
		42	42
		22	22
*<60mm values to aid description only		14	14

Uniformity Coefficient	D60 / D10	Not applicable
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Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

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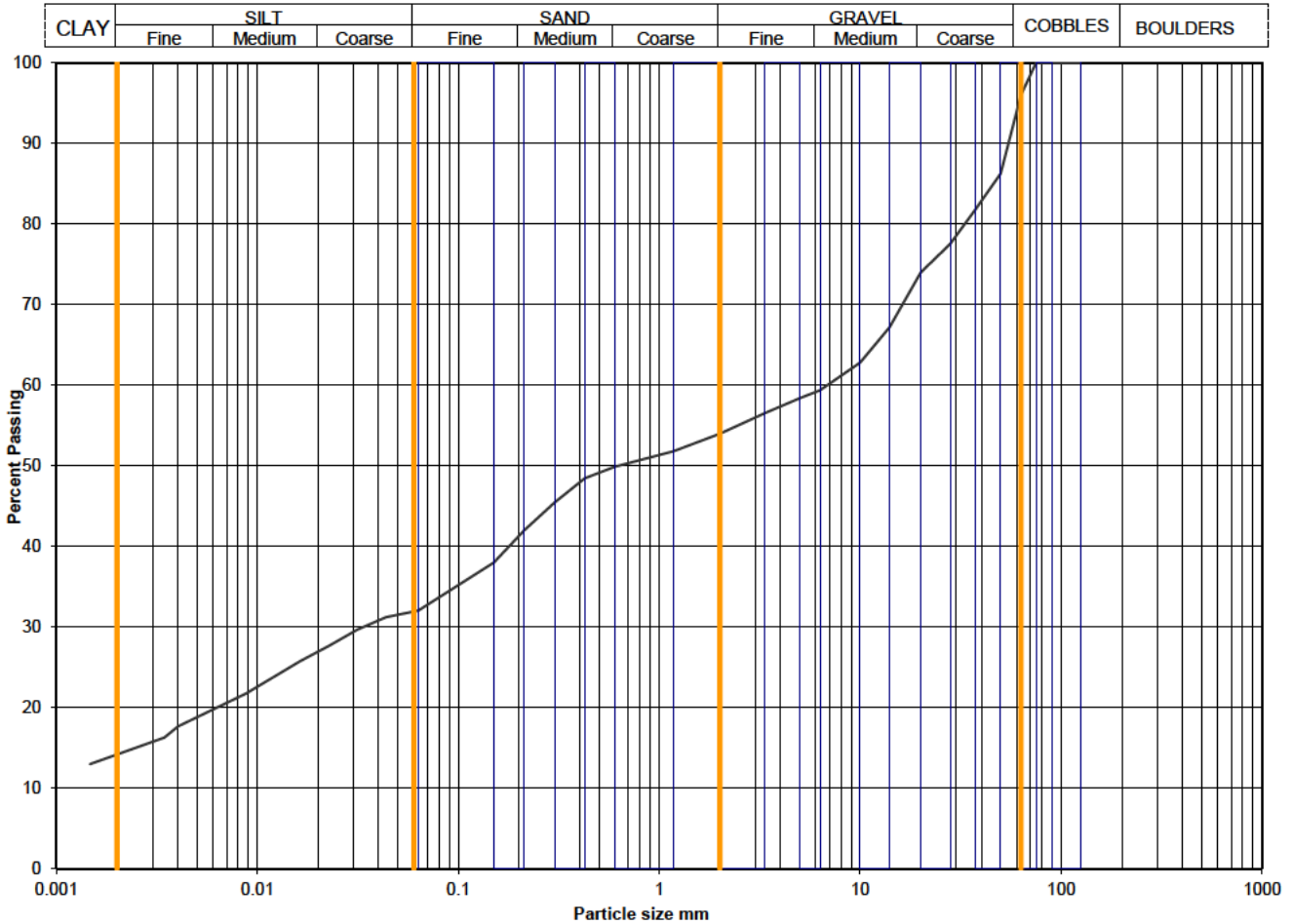
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Project Name A1 ALNWICK TO ELLINGHAM

Figure
PSD

Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:	Hole No	TP/17/38
	A8013-18-20180925081902	Sample Depth (m BGL)	0.50 - 1.00
		Sample Type and No	B4
		Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	32
90	100	0.0437	31
75	100	0.0314	30
63	96	0.0227	28
50	86	0.0163	26
37.5	82	0.0087	22
28	78	0.0040	18
20	74	0.0034	16
14	67	0.0015	13
10	63		
6.3	59		
5.0	58		
3.35	57		
2.00	54		
1.18	52		
0.600	50		
0.425	48		
0.300	45		
0.212	42		
0.150	38		
0.063	32		

Particle density, Mg/m3	
2.65	assumed
Dry mass of sample, kg	
12.1	

Soil description	Brown slightly sandy gravelly CLAY with one cobble.		
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377		
Remarks	hydro: 3.8		
Sample Proportions	Cobbles / boulders Gravel Sand Silt Clay	Whole	*<60mm
		4	0
		42	44
		22	23
		18	19
*<60mm values to aid description only		14	15

Uniformity Coefficient	D60 / D10	Not applicable
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Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

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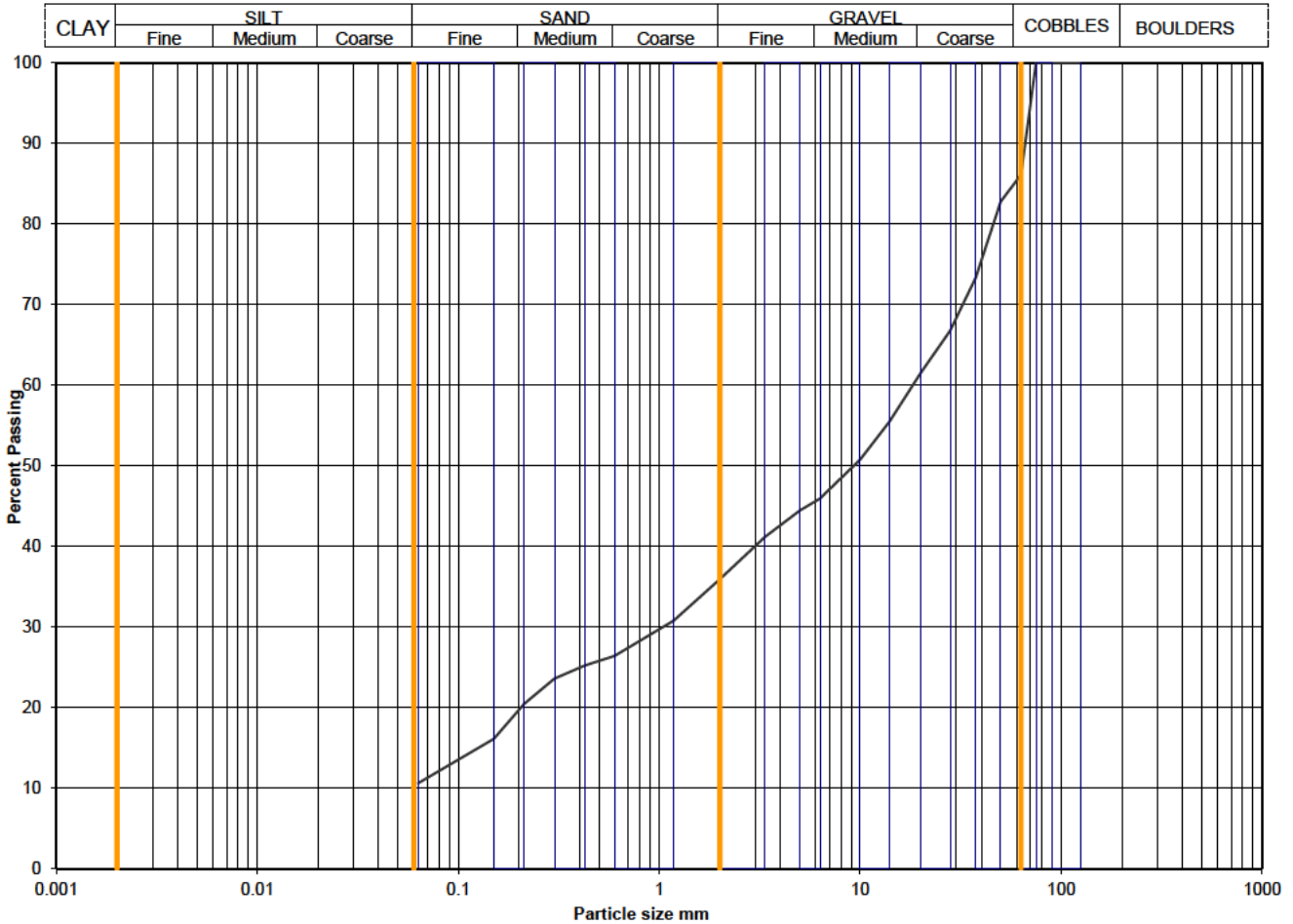
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Project Name A1 ALNWICK TO ELLINGHAM

Figure
PSD

Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:	Hole No	TP/17/38
	A8013-18-20180925082040	Sample Depth (m BGL)	1.60 - 2.00
		Sample Type and No	B11
		Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	86		
50	83		
37.5	73		
28	67		
20	62		
14	55		
10	51		
6.3	46		
5.0	44		
3.35	41		
2.00	36		
1.18	31		
0.600	26		
0.425	25		
0.300	24		
0.212	20		
0.150	16		
0.063	11		

Dry mass of sample, kg	
14.3	

Soil description	Brown sandy clayey GRAVEL with three cobbles.		
Preparation / Pretreatment	Sieve: natural material		
Remarks			
Sample Proportions <small>*<60mm values to aid description only</small>	Cobbles / boulders Gravel Sand Silt Clay	Whole	*<60mm
		14	0
		50	58
		25	29
		silt+clay =	
		11	13

Uniformity Coefficient	D60 / D10	Not applicable
------------------------	-----------	----------------

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	none

QA Ref
SLR 2,9
Rev 2.21
Jul 17



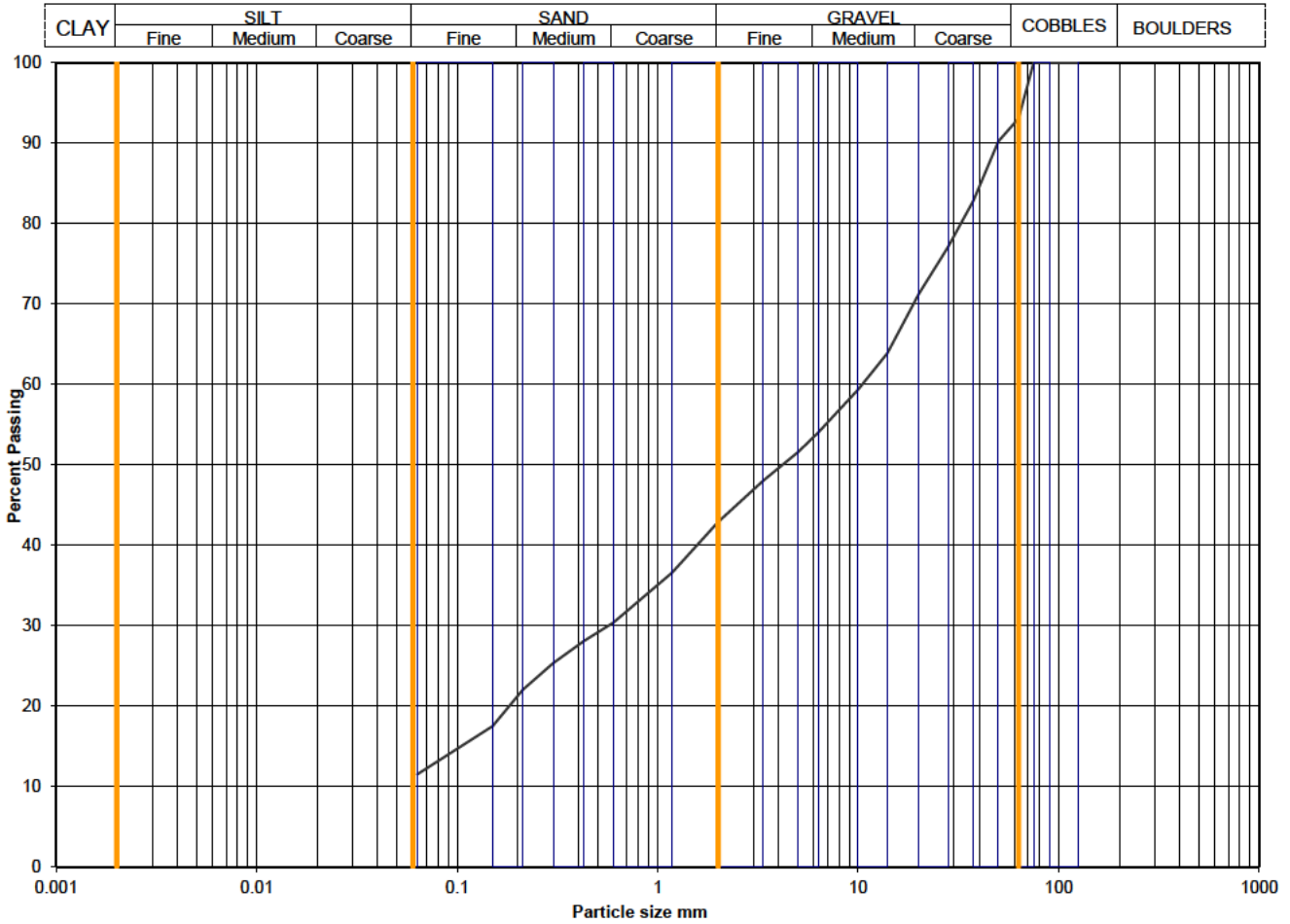
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Project No A8013-18
Project Name A1 ALNWICK TO ELLINGHAM

Figure
PSD

Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:	Hole No	TP/17/38
	A8013-18-20180925082020	Sample Depth (m BGL)	1.60 - 2.00
		Sample Type and No	B9
		Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	93		
50	90		
37.5	83		
28	77		
20	71		
14	64		
10	59		
6.3	54		
5.0	52		
3.35	48		
2.00	43		
1.18	37		
0.600	30		
0.425	28		
0.300	25		
0.212	22		
0.150	17		
0.063	11		

Dry mass of sample, kg	
12.7	

Soil description	Brown sandy clayey GRAVEL with one cobble.		
Preparation / Pretreatment	Sieve: natural material		
Remarks			
Sample Proportions <small>*<60mm values to aid description only</small>	Cobbles / boulders Gravel Sand Silt Clay	Whole	*<60mm
		7	0
		50	54
		31	33
		silt+clay =	
		11	12

Uniformity Coefficient	D60 / D10	Not applicable
------------------------	-----------	----------------

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	none

QA Ref
SLR 2,9
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Jul 17



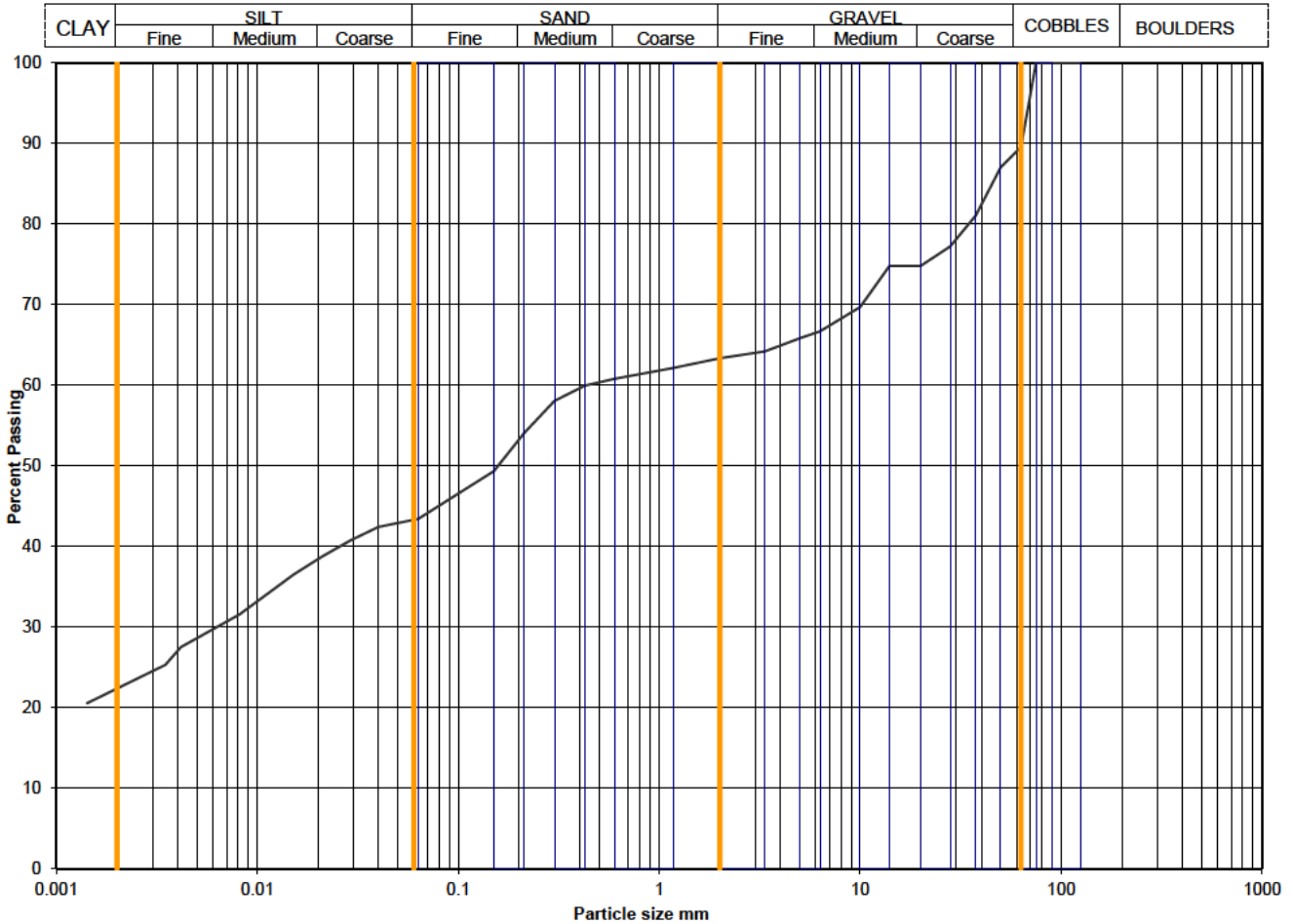
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Project No A8013-18
Project Name A1 ALNWICK TO ELLINGHAM

Figure
PSD

Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:	Hole No	TP/17/39
	A8013-18-20180925075811	Sample Depth (m BGL)	1.60 - 2.00
		Sample Type and No	B7
		Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	43
90	100	0.0400	42
75	100	0.0288	41
63	90	0.0208	39
50	87	0.0151	36
37.5	81	0.0082	32
28	77	0.0042	27
20	75	0.0035	25
14	75	0.0014	21
10	70		
6.3	67		
5.0	66		
3.35	64		
2.00	63		
1.18	62		
0.600	61		
0.425	60		
0.300	58		
0.212	54		
0.150	49		
0.063	43		

Particle density, Mg/m ³	
2.65	assumed
Dry mass of sample, kg	
10.0	

Soil description	Brown slightly sandy slightly gravelly CLAY with one cobble.		
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377		
Remarks			
Sample Proportions	Cobbles / boulders Gravel Sand Silt Clay	Whole	*<60mm
		10	0
		26	29
		20	22
		21	23
*<60mm values to aid description only		22	25

Uniformity Coefficient	D60 / D10	Not applicable
------------------------	-----------	----------------

Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

QA Ref
SLR 2,9
Rev 2.21
Jul 17

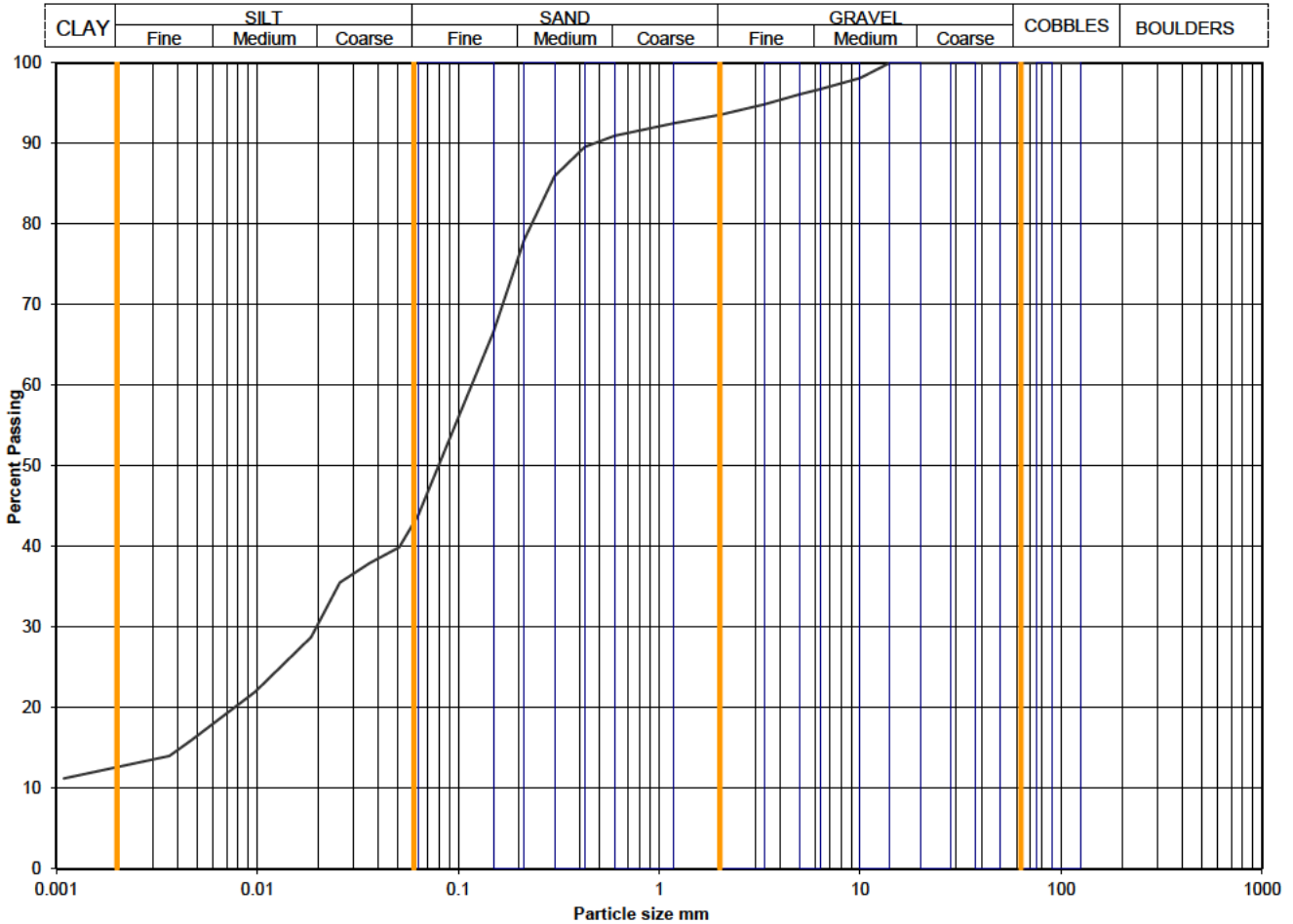


Project No A8013-18
Project Name A1 ALNWICK TO ELLINGHAM

Figure
PSD

Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:	Hole No	TP/17/41
	A8013-1820180917100945	Sample Depth (m BGL)	1.50 - 2.00
		Sample Type and No	B7
		Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	44
90	100	0.0507	40
75	100	0.0360	38
63	100	0.0257	35
50	100	0.0185	29
37.5	100	0.0098	22
28	100	0.0047	16
20	100	0.0036	14
14	100	0.0011	11
10	98		
6.3	97		
5.0	96		
3.35	95		
2.00	94		
1.18	93		
0.600	91		
0.425	90		
0.300	86		
0.212	78		
0.150	67		
0.063	44		

Particle density, Mg/m ³	
2.65	assumed
Dry mass of sample, kg	
10.5	

Soil description	Brown gravelly very silty clayey SAND.		
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377		
Remarks			
Sample Proportions	Cobbles / boulders Gravel Sand Silt Clay	Whole	*<60mm
		0	0
		6	6
		50	50
		31	31
*<60mm values to aid description only		13	13

Uniformity Coefficient	D60 / D10	Not applicable
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Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

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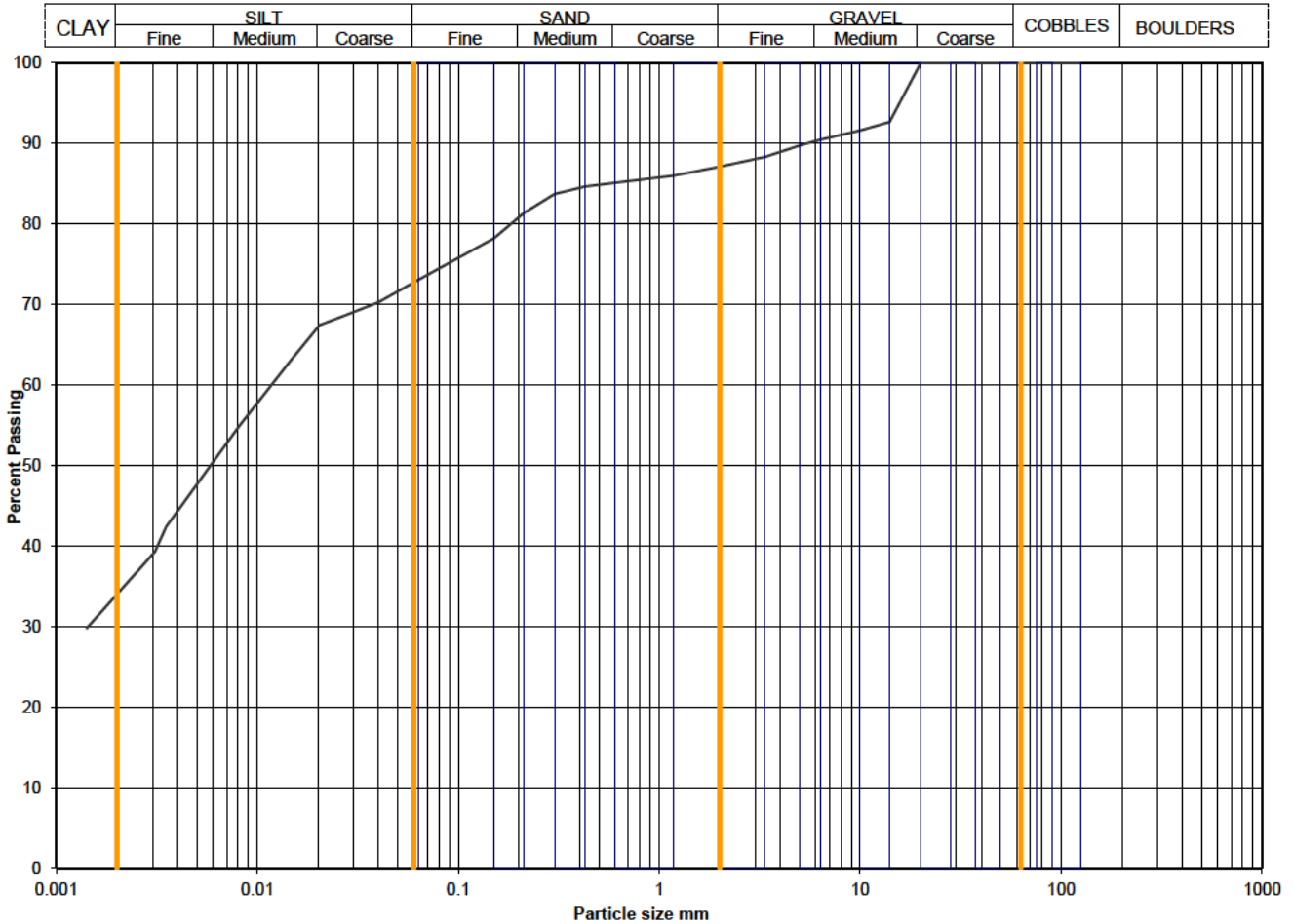
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Project No A8013-18
Project Name A1 ALNWICK TO ELLINGHAM

Figure
PSD

Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:	Hole No	TP/17/41
	A8013-1820180917101058	Sample Depth (m BGL)	2.70 - 3.00
		Sample Type and No	B10
		Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	73
90	100	0.0400	70
75	100	0.0285	69
63	100	0.0204	67
50	100	0.0148	63
37.5	100	0.0080	55
28	100	0.0035	42
20	100	0.0031	39
14	93	0.0014	30
10	92		
6.3	90		
5.0	90		
3.35	88		
2.00	87		
1.18	86		
0.600	85		
0.425	85		
0.300	84		
0.212	81		
0.150	78		
0.063	73		

Particle density, Mg/m ³	2.65	assumed
Dry mass of sample, kg	3.9	

Soil description	Brown slightly sandy slightly gravelly CLAY.		
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377		
Remarks			
Sample Proportions	Cobbles / boulders Gravel Sand Silt Clay	Whole	*<60mm
		0	0
		13	13
		14	14
		39	39
*<60mm values to aid description only		34	34

Uniformity Coefficient	D60 / D10	Not applicable
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Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

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Jul 17



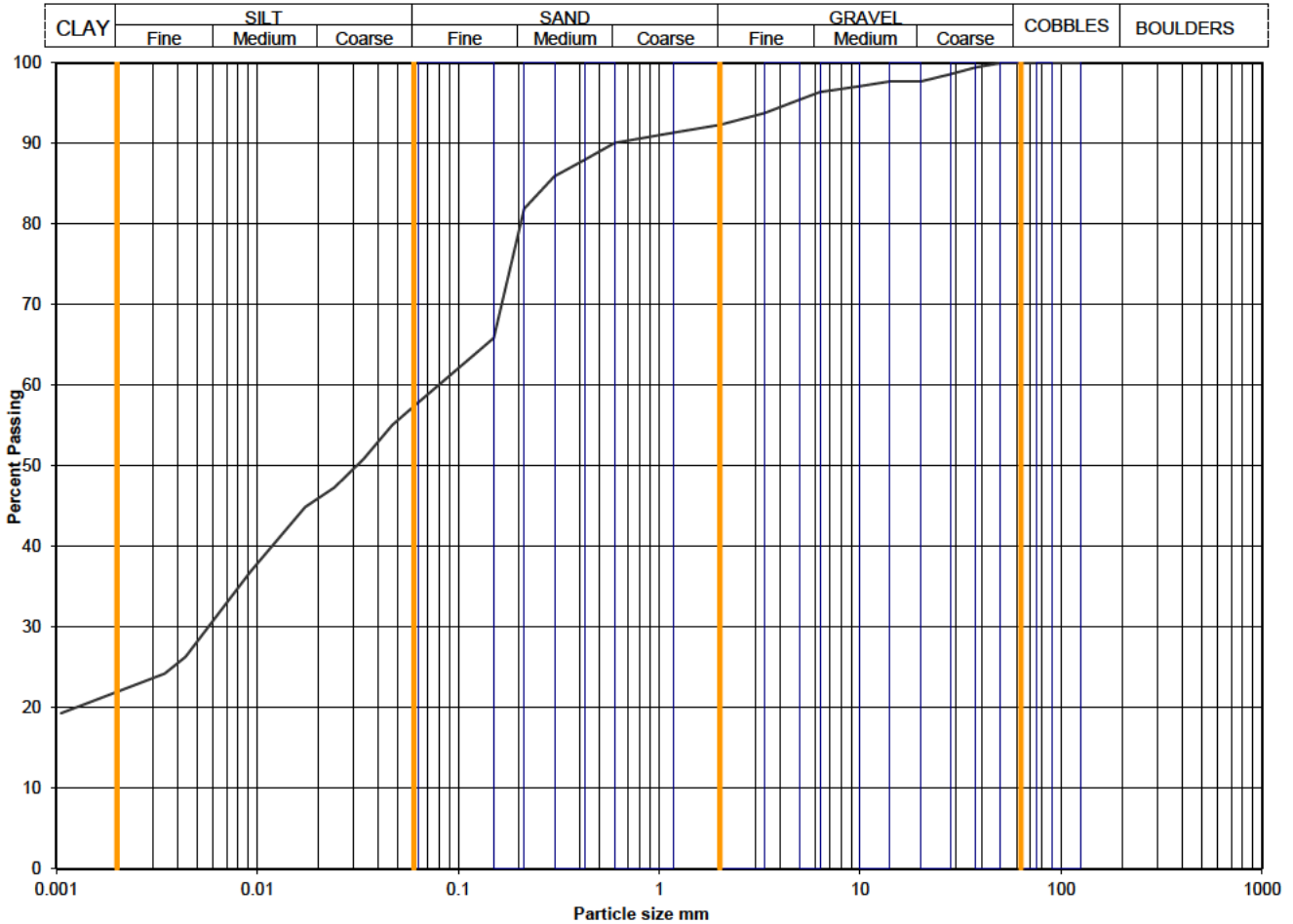
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Project No A8013-18
Project Name A1 ALNWICK TO ELLINGHAM

Figure
PSD

Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:	Hole No	TP/17/44
	A8013-1820180917115827	Sample Depth (m BGL)	0.70 - 1.00
		Sample Type and No	B8
		Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	58
90	100	0.0470	55
75	100	0.0338	51
63	100	0.0242	47
50	100	0.0173	45
37.5	99	0.0092	37
28	99	0.0044	26
20	98	0.0035	24
14	98	0.0011	19
10	97		
6.3	96		
5.0	95		
3.35	94		
2.00	92		
1.18	91		
0.600	90		
0.425	88		
0.300	86		
0.212	82		
0.150	66		
0.063	58		

Particle density, Mg/m ³	2.65	assumed
Dry mass of sample, kg	7.8	

Soil description	Brown slightly sandy slightly gravelly CLAY with rare rootlets.		
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377		
Remarks			
Sample Proportions	Cobbles / boulders Gravel Sand Silt Clay	Whole	*<60mm
		0	0
		8	8
		34	34
		36	36
*<60mm values to aid description only		22	22

Uniformity Coefficient	D60 / D10	Not applicable
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Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

QA Ref
SLR 2,9
Rev 2.21
Jul 17



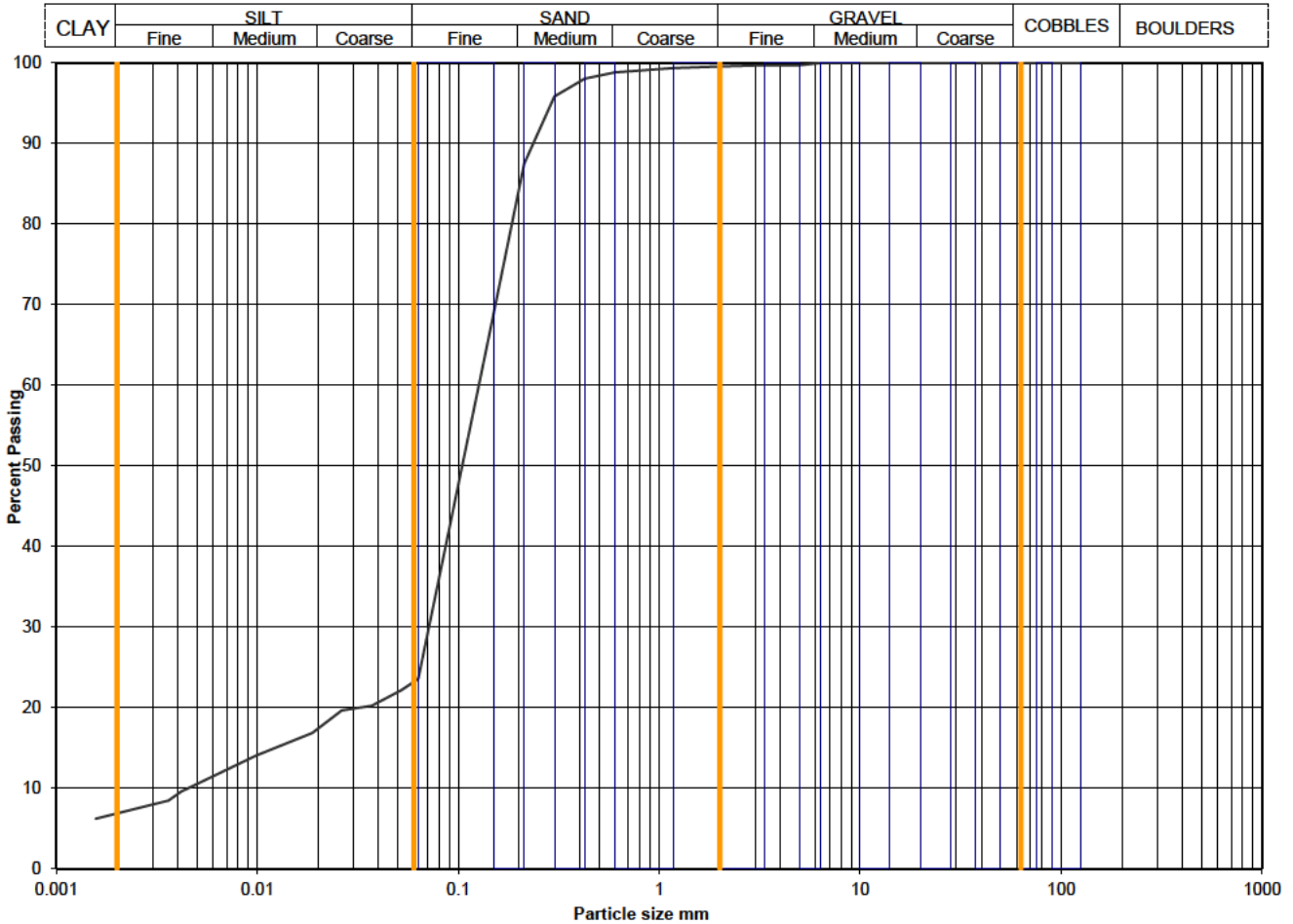
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Project No A8013-18
Project Name A1 ALNWICK TO ELLINGHAM

Figure
PSD

Particle Size Distribution Analysis

Sample Details:	SAMPLE ID:	Hole No	TP/17/44
	A8013-1820180917115846	Sample Depth (m BGL)	1.30 - 1.80
		Sample Type and No	B10
		Specimen Ref	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0630	24
90	100	0.0520	22
75	100	0.0371	20
63	100	0.0263	20
50	100	0.0188	17
37.5	100	0.0098	14
28	100	0.0042	10
20	100	0.0036	8
14	100	0.0016	6
10	100		
6.3	100		
5.0	100		
3.35	100		
2.00	100		
1.18	99		
0.600	99		
0.425	98		
0.300	96		
0.212	87		
0.150	69		
0.063	24		

Particle density, Mg/m3	2.65	assumed
Dry mass of sample, kg	12.0	

Soil description	Brown very sandy clayey SILT.		
Preparation / Pretreatment	Sieve: natural material Hydro: as BS1377		
Remarks			
Sample Proportions	Cobbles / boulders Gravel Sand Silt Clay	Whole	*<60mm
		0	0
		0	0
		76	76
		17	17
*<60mm values to aid description only		7	7

Uniformity Coefficient	D60 / D10	28
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Test Method	BS 1377 : Part 2 : 1990	
	Sieving	9.2 wet sieve
	Sedimentation	9.5 hydrometer

QA Ref
SLR 2,9
Rev 2.21
Jul 17



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Project Name A1 ALNWICK TO ELLINGHAM



Figure
PSD

UNCONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TESTS WITHOUT MEASUREMENT OF PORE PRESSURE - SUMMARY OF RESULTS

Hole No.	Sample			Soil Description	Density		w %	Test type	Dia. mm	σ ₃ kPa	At failure / end of stage				Membrane Thickness mm	Remarks	
	No.	Depth (m)			type	bulk Mg/m ³					dry	Axial strain %	σ ₁ - σ ₃ kPa	CU kPa			M O D E
		from	to														
BH/17/01	8	2.20	2.65	UT	Firm greyish brown slightly gravelly sandy CLAY.	2.27	1.99	14	UUM	102.6	25	20	113	56	P	0.5	Ran to 20% on Stage 1
BH/17/02	8	2.20	2.65	UT	Firm brown slightly sandy slightly gravelly CLAY.	2.24	1.95	15	UUM	103	25	19.8	66	33	C	0.5	Ran to 20% on Stage 1
BH/17/03	4	1.20	1.65	U	Firm to stiff brown slightly sandy slightly gravelly CLAY.	2.03	1.74	16	UU	99.2	25	19.7	78	39	P	0.6	
BH/17/04	9	3.00	3.45	U	Firm to stiff greyish brown slightly sandy slightly gravelly CLAY.	2.19	1.93	13	UU	102.8	60	19.9	157	79	P	0.6	
BH/17/06	12	3.80	4.25	U	Soft to firm greyish brown slightly sandy silty CLAY.	1.95	1.48	32	UU	103	75	19.9	35	17	P	0.6	
BH/17/07	8	3.00	3.45	U	Firm greyish brown slightly sandy silty CLAY.	1.94	1.47	32	UU	103.6	70	11.4	55	27	P	0.6	
BH/17/07	12	5.00	5.45	U	Firm laminated greyish brown slightly sandy slightly gravelly silty CLAY.	2.02	1.6	26	UU	102.5	100	11.4	42	21	C	0.6	
BH/17/12	5	1.20	1.65	UT	Very soft brown slightly clayey SAND.	1.96	1.69	16	UU	100.6	20	19.4	81	40	C	0.5	
BH/17/12	9	3.00	3.45	UT	Brown slightly clayey SAND.	1.95	1.72	13	UU	103	50	17.7	156	78	C	0.5	
BH/17/12	13	5.00	5.45	UT	Brown slightly clayey SAND.	1.59	1.46	8.6	UU	103.1	90	10.6	216	108	C	0.5	
BH/17/13	7	2.20	2.65	UT	Stiff dark brown slightly sandy slightly gravelly CLAY.	2.25	1.98	14	UUM	102.7 102.7 102.7	25 50 100	15.3 17.8 19.8	249 265 283	125 132 141	P	0.5	
BH/17/14	10	3.50	3.95	UT	Soft to firm greyish brown slightly sandy slightly gravelly CLAY.	2.22	1.99	12	UUM	103.3 103.3 103.3	35 75 150	3.0 5.0 19.9	9 12 17	4 6 9	P	0.5	

General notes: Tests carried out in accordance with BS1377: Part 7: 1990, clause 8 for single stage, clause 9 for multistage tests. Specimens nominally 2:1 height diameter ratio and tested at a rate of strain of 2%/minute, unless annotated otherwise. Latex rubber membrane used and membrane correction applied in accordance with BS1377-7 8.5.1.4 unless stated.

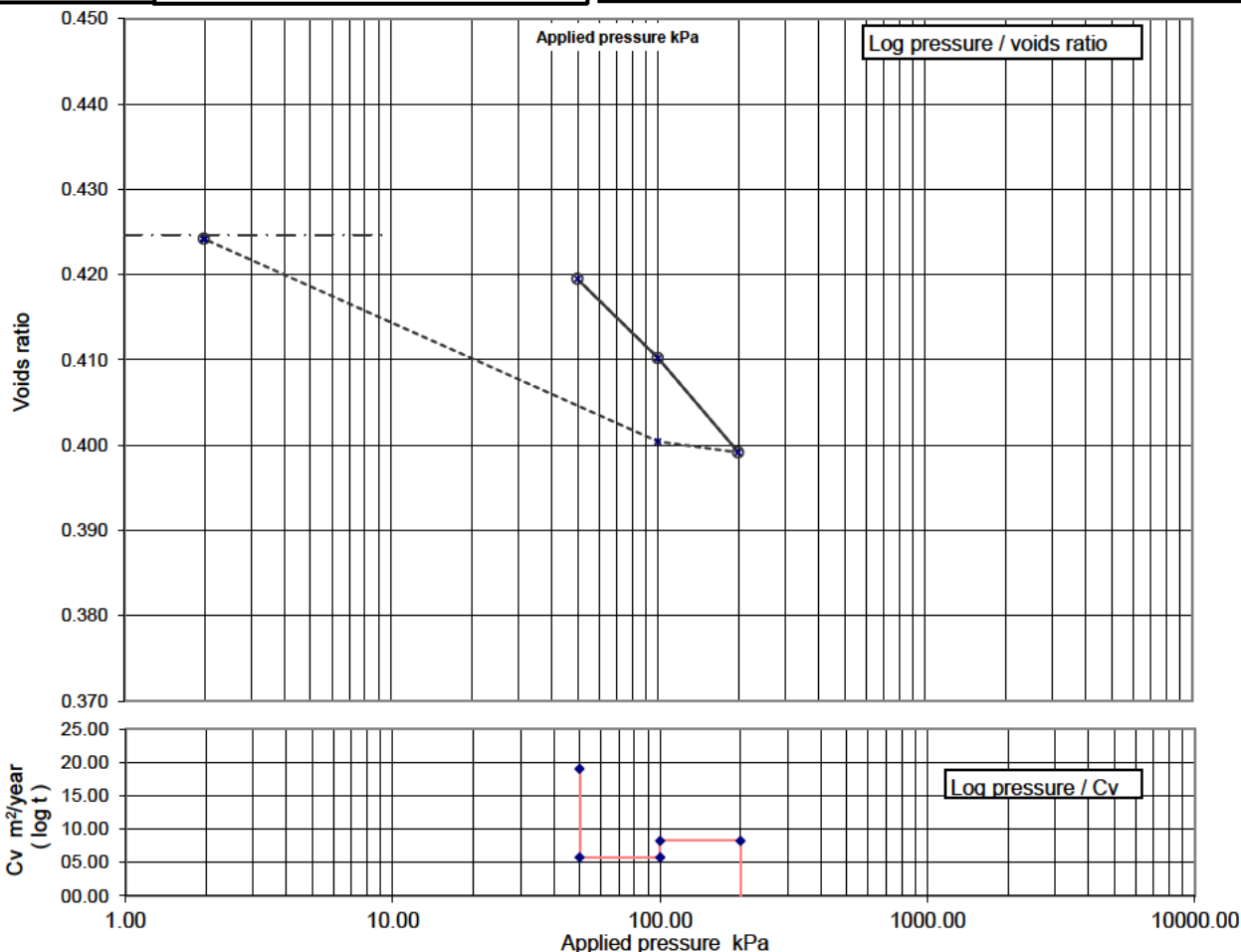
Legend
 UU - single stage test (may be in sets of specimens) σ₃ cell pressure Mode of failure P plastic
 UUM - multistage test on a single specimen σ₁ - σ₃ deviator stress B brittle
 suffix R - remoulded or recompacted CU undrained shear strength C compound

QA Ref SLR 2 Rev 2.7 Apr 15  1157 	Project No A8013-18 Project Name A1 ALNWICK TO ELLINGHAM	Figure UUSUM
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ONE DIMENSIONAL CONSOLIDATION TEST

Sample Details:	SAMPLE ID:
	A8013-1820180910011238

Hole No	BH/17/04
Sample Depth (m BGL)	1.20 - 1.65
Sample Type and No	U4
Specimen Ref	



Soil description: Firm brown slightly sandy slightly gravelly CLAY.

Preparation: Undisturbed

Liquid limit %		Plastic limit %	
----------------	--	-----------------	--

(if available)

Specimen details

	Initial	Final	
Particle density	2.65	assumed	Mg/m ³
Diameter	74.96		mm
Height	19.07	19.07	mm
Voids ratio	0.425	0.424	
Moisture content	14	16	%
Bulk density	2.13	2.15	Mg/m ³
Dry density	1.86	1.86	Mg/m ³
Saturation	90	98	%
Average temperature for test	20		°C

Swelling pressure: >25 kPa

Notes :

Specimen taken 40 mm from base of sample

Applied Pressure kPa	Voids ratio	mv m ² /MN	cv (t ₅₀ , log) m ² /year	cv (t ₉₀ , root) m ² /year
25	0.4247	/	/	/
50	0.4195	0.147	19	21
100	0.4102	0.131	5.7	5.6
200	0.3991	0.078	8.2	9.1
100	0.4004	0.009	-	-
2	0.4242	0.173	-	-

QA Ref
SLR 5.3
Rev 2.19
Jun 17



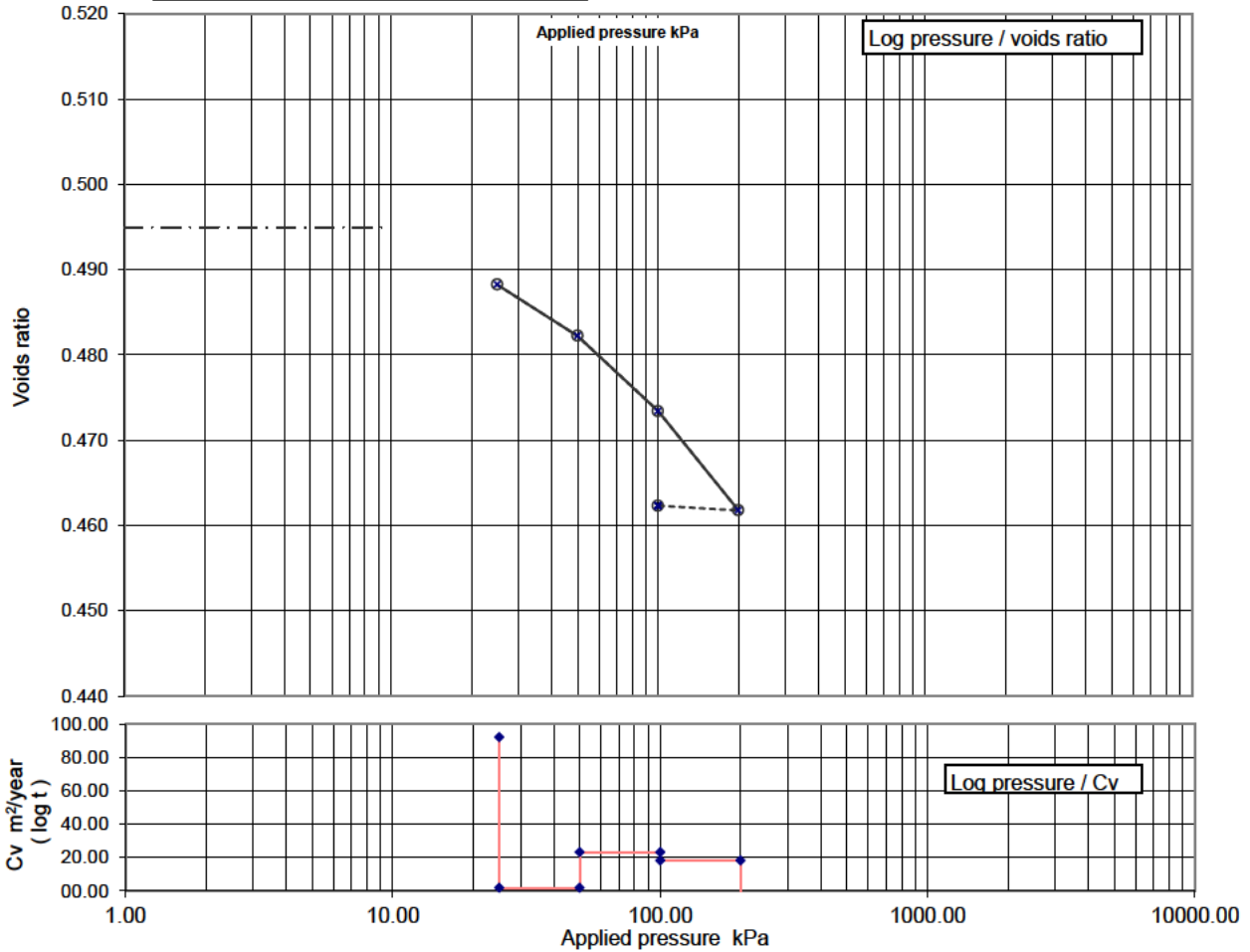
Project No: A8013-18
Project Name: A1 ALNWICK TO ELLINGHAM

Figure: OED

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ONE DIMENSIONAL CONSOLIDATION TEST

Sample Details:	SAMPLE ID:	Hole No	BH/17/12
	A8013-1820181005011926	Sample Depth (m BGL)	1.20 - 1.65
		Sample Type and No	UT5
		Specimen Ref	



Soil description

Brown slightly clayey SAND.

Preparation

Undisturbed

Index properties

Liquid limit %		Plastic limit %	
----------------	--	-----------------	--

(if available)

Specimen details

Particle density

	Initial	Final	
Particle density	2.65	assumed	Mg/m3
Diameter	75.04		mm
Height	19.15	18.73	mm
Voids ratio	0.495	0.462	
Moisture content	16	16	%
Bulk density	2.06	2.10	Mg/m3
Dry density	1.77	1.81	Mg/m3
Saturation	85	93	%
Average temperature for test	21		oC

Average temperature for test

Swelling pressure

not measured kPa

Notes :

Specimen taken 10 mm from base of sample

Applied Pressure kPa	Voids ratio	mv m2/MN	cv (t50, log) m2/year	cv (t90, root) m2/year
0	0.4949	/	/	/
25	0.4882	0.180	92	39
50	0.4822	0.162	1.6	1.9
100	0.4734	0.119	23	24
200	0.4618	0.079	18	19
100	0.4623	0.004	-	-

QA Ref
SLR 5.3
Rev 2.19
Jun 17



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Project Name A1 ALNWICK TO ELLINGHAM

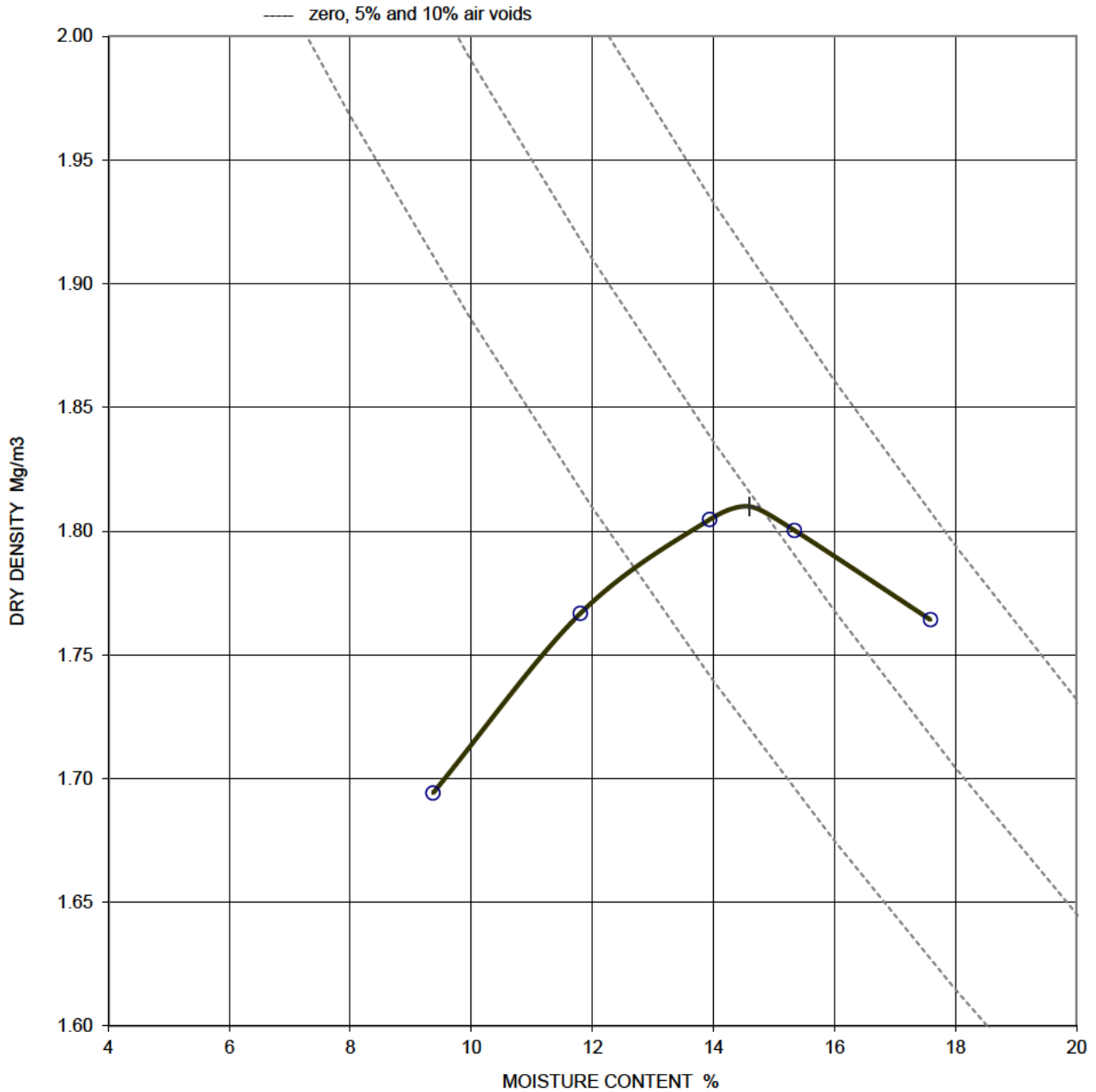
Figure
OED

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DRY DENSITY / MOISTURE CONTENT RELATIONSHIP
BS1377 : PART 4 : 1990 : LIGHT COMPACTION, 2.5 kg rammer

Sample Details:	SAMPLE ID:	Hole No	TP/17/11
	A8013-1820180730111536	Sample Depth (m BGL)	0.80 - 1.00
		Sample Type and No	B1
		Specimen Ref	



Soil description Brown slightly sandy slightly gravelly CLAY.

Test method BS 1377:part 4:1990: clause 3.5, 2.5 kg rammer in a 1 litre mould

Preparation Original material was natural, single sample tested

Material > 37.5mm	0	%
Material < 37.5mm > 20mm	0	%
Particle density	2.65	assumed

Remarks

Derived Parameters +

Maximum dry density, Mg/m3
1.81

Optimum moisture content, %
15

QA Ref
SLD 4, 3.3/4
Rev 2.5
Sep 17



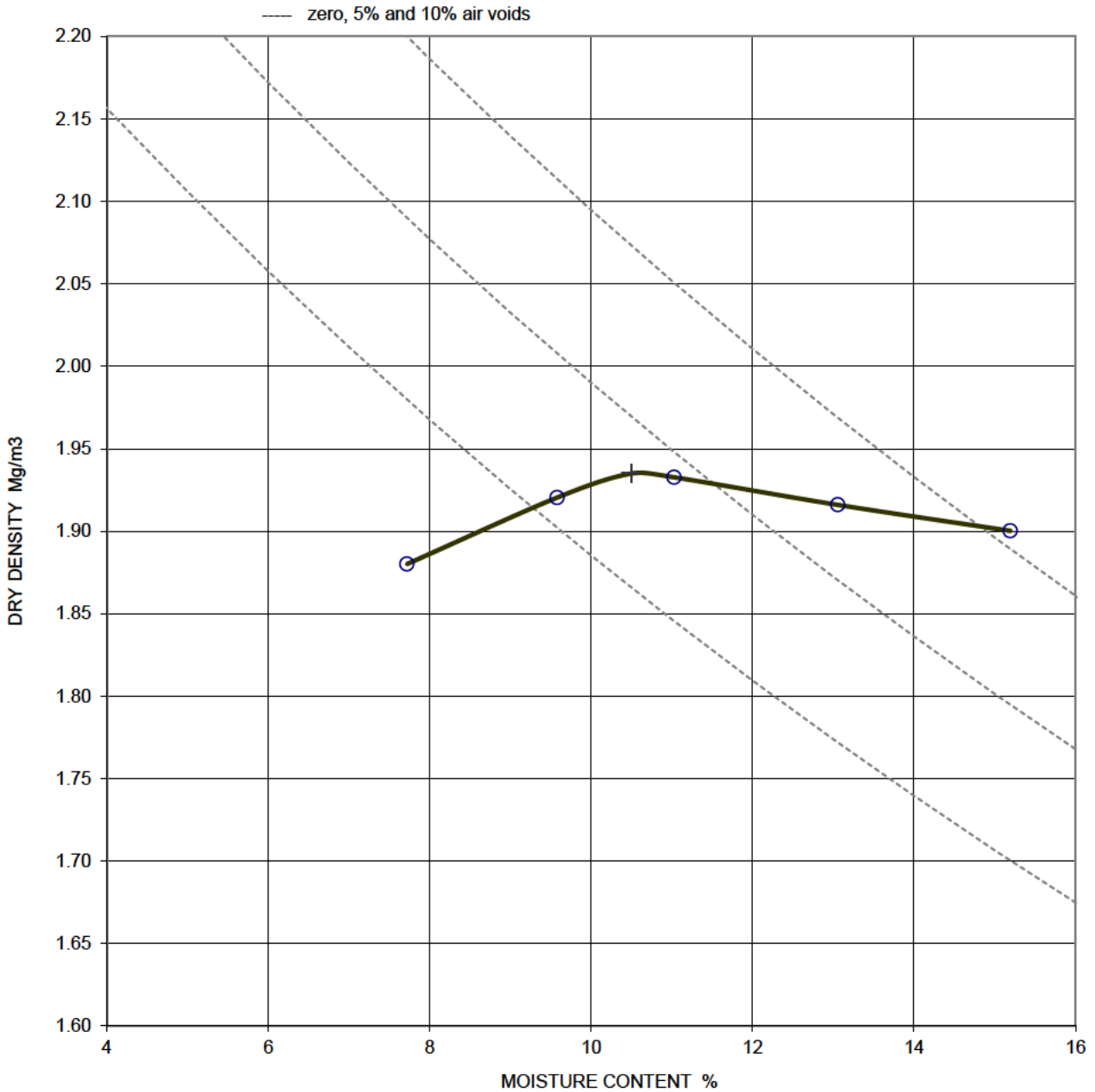
Project No A8013-18
Project Name A1 ALNWICK TO ELLINGHAM

Figure
COMPL

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DRY DENSITY / MOISTURE CONTENT RELATIONSHIP
BS1377 : PART 4 : 1990 : LIGHT COMPACTION, 2.5 kg rammer

Sample Details:	SAMPLE ID:	Hole No	TP/17/12
	A8013-1820180910111917	Sample Depth (m BGL)	1.50 - 2.00
		Sample Type and No	B8
		Specimen Ref	



Soil description	Brown slightly sandy slightly gravelly CLAY.
Test method	BS 1377:part 4:1990: clause 3.5, 2.5 kg rammer in a 1 litre mould
Preparation	Original material was natural, single sample tested
Material > 37.5mm	0 %
Material < 37.5mm > 20mm	4 %
Particle density	2.65 assumed
Remarks	

Derived Parameters +	
Maximum dry density, Mg/m3	1.94
Optimum moisture content, %	11

QA Ref
SLD 4, 3.3/4
Rev 2.5
Sep 17

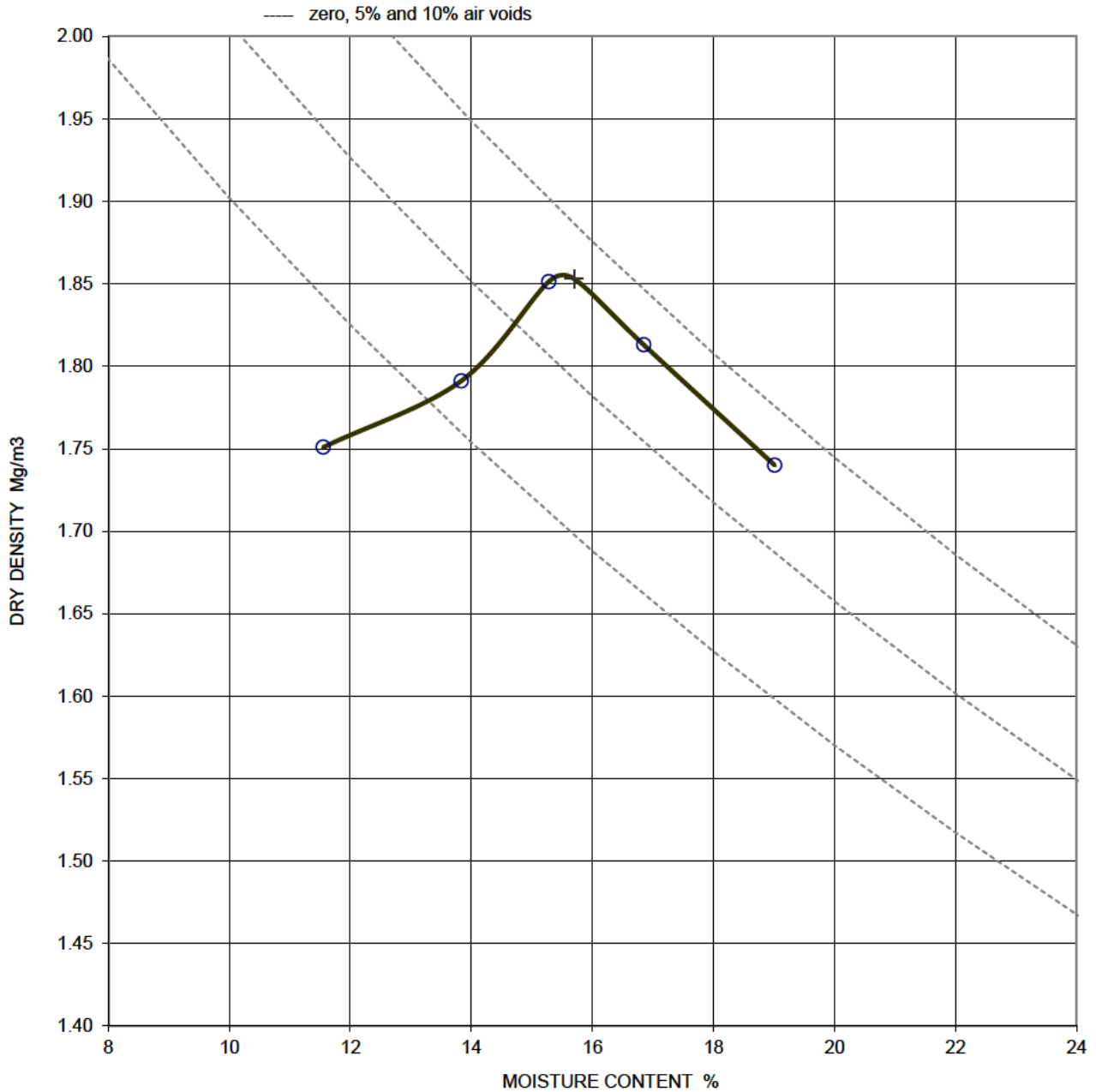


Project No A8013-18
Project Name A1 ALNWICK TO ELLINGHAM

Figure
COMPL

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP
BS1377 : PART 4 : 1990 : LIGHT COMPACTION, 2.5 kg rammer

Sample Details:	SAMPLE ID:	Hole No	TP/17/20
	A8013-1820181003010909	Sample Depth (m BGL)	0.50 - 1.00
		Sample Type and No	B4
		Specimen Ref	



Soil description Dark brown slightly sandy gravelly CLAY.

Test method BS 1377:part 4:1990: clause 3.5, 2.5 kg rammer in a 1 litre mould

Preparation Original material was natural, single sample tested

Material > 37.5mm	0	%
Material < 37.5mm > 20mm	2	%

Particle density 2.68 measured - small pycnometer

Remarks

Derived Parameters +

Maximum dry density, Mg/m3
1.85

Optimum moisture content, %
16

QA Ref
SLD 4, 3.3/4
Rev 2.5
Sep 17

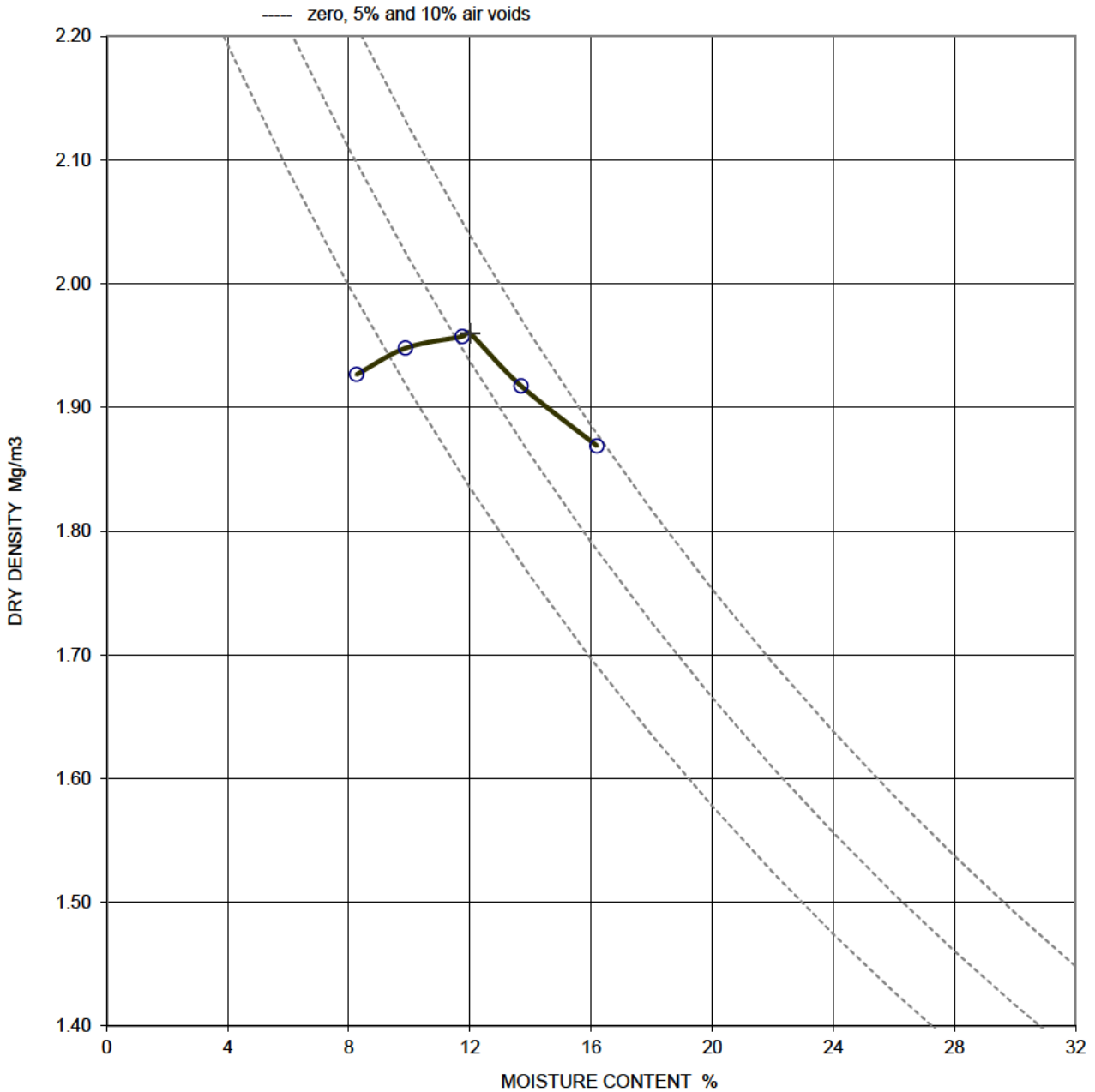


Project No A8013-18
Project Name A1 ALNWICK TO ELLINGHAM

Figure
COMPL

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP
BS1377 : PART 4 : 1990 : LIGHT COMPACTION, 2.5 kg rammer

Sample Details:	SAMPLE ID:	Hole No	TP/17/38
	A8013-18-20180925082002	Sample Depth (m BGL)	1.60 - 2.00
		Sample Type and No	B8
		Specimen Ref	



Soil description Brown gravelly clayey SAND.

Test method BS 1377:part 4:1990: clause 3.6, 2.5 kg rammer in a CBR mould

Preparation Original material was natural, single sample tested

Material > 37.5mm 18 %

Material < 37.5mm > 20mm 13 %

Particle density 2.70 assumed

Remarks

Grading Zone X

Derived Parameters +

Maximum dry density, Mg/m3
1.96

Optimum moisture content, %
12

QA Ref
SLD 4, 3.3/4
Rev 2.5
Sep 17



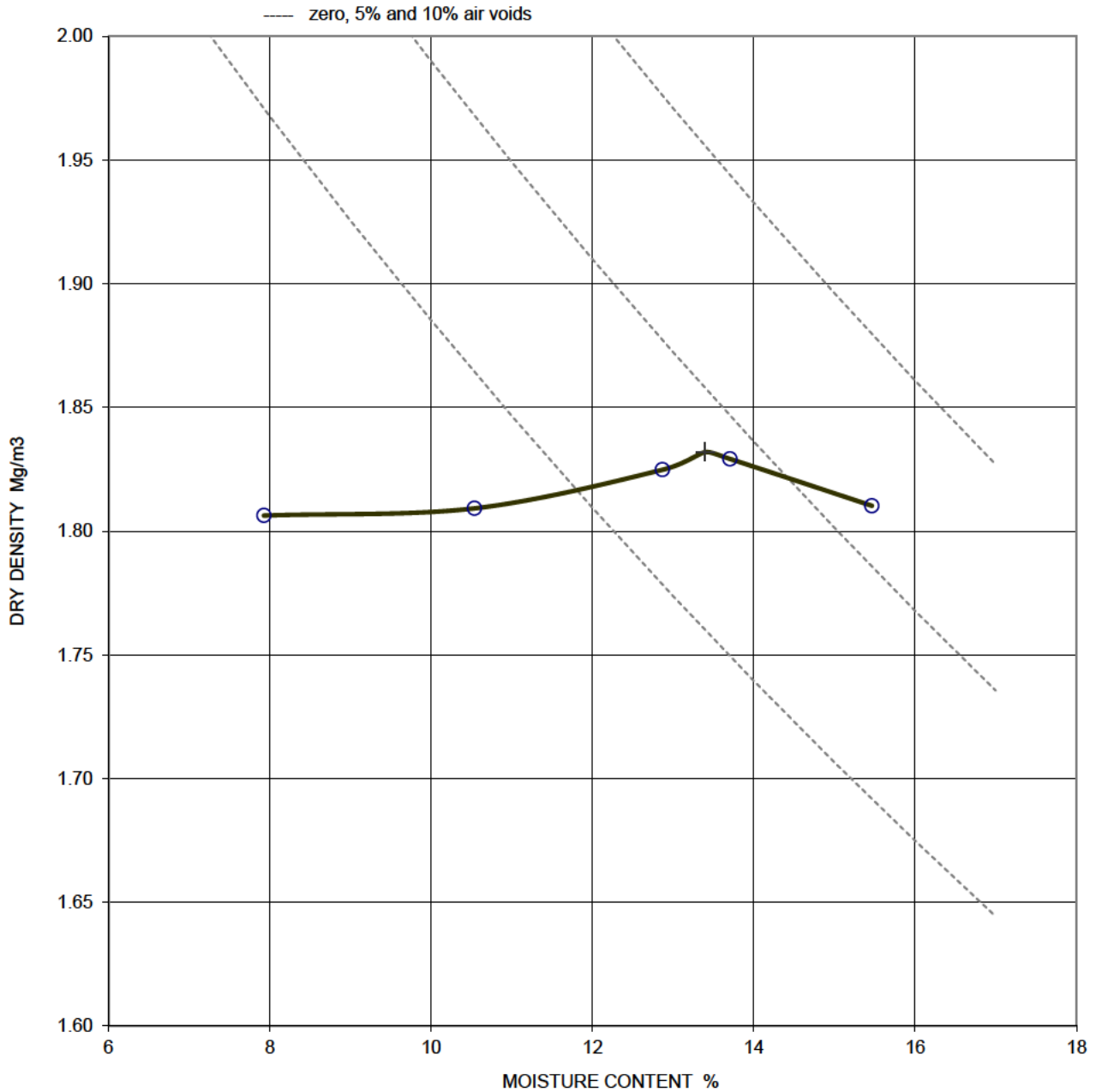
Project No A8013-18
Project Name A1 ALNWICK TO ELLINGHAM

Figure
COMPL

Printed:
17/12/2018 17:21

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP
BS1377 : PART 4 : 1990 : LIGHT COMPACTION, 2.5 kg rammer

Sample Details:	SAMPLE ID:	Hole No	TP/17/39
	A8013-18-20180925075721	Sample Depth (m BGL)	0.60 - 1.00
		Sample Type and No	B5
		Specimen Ref	



Soil description Brown slightly sandy slightly gravelly CLAY with rare rootlets and one cobble.

Test method BS 1377:part 4:1990: clause 3.6, 2.5 kg rammer in a CBR mould

Preparation Original material was natural, single sample tested

Material > 37.5mm 5 %

Material < 37.5mm > 20mm 4 %

Particle density 2.65 assumed

Remarks

Derived Parameters +

Maximum dry density, Mg/m3 **1.83**

Optimum moisture content, % **13**

QA Ref
SLD 4, 3.3/4
Rev 2.5
Sep 17



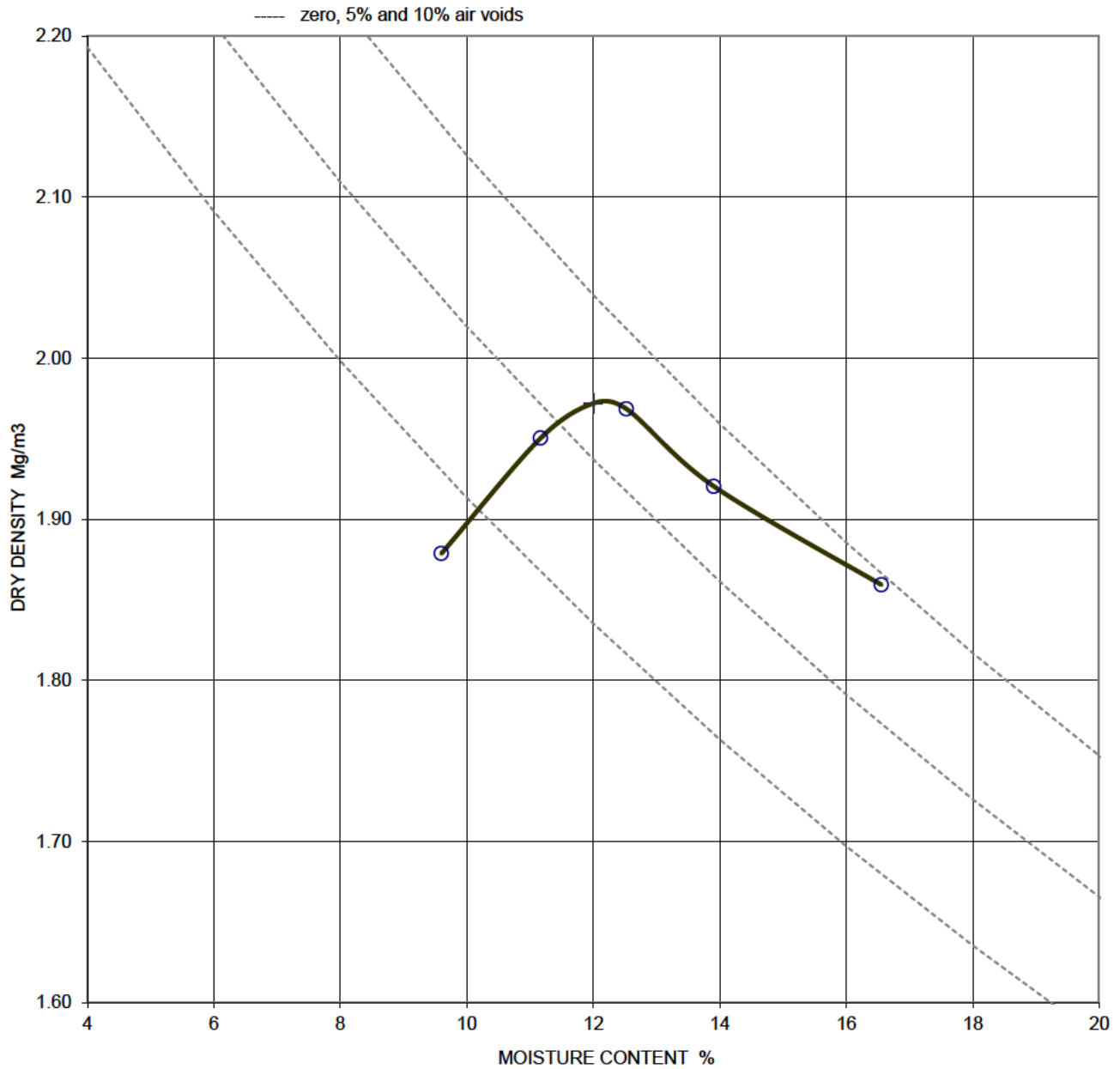
Project No A8013-18
Project Name A1 ALNWICK TO ELLINGHAM

Figure
COMPL

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17/12/2018 17:21

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP
BS1377 : PART 4 : 1990 : HEAVY COMPACTION, 4.5 kg rammer

Sample Details:	SAMPLE ID:	Hole No	BH/17/04
	A8013-1820180910011235	Sample Depth (m BGL)	1.00 - 1.10
		Sample Type and No	B3
		Specimen Ref	



Soil description Brown slightly sandy slightly gravelly CLAY.

Test method BS 1377:part 4:1990: clause 3.5, 4.5 kg rammer in a 1 litre mould

Preparation Original material was natural, single sample tested

Material > 37.5mm 0 %

Material < 37.5mm > 20mm 1 %

Particle density 2.70 assumed

Remarks

Derived Parameters +

Maximum dry density, Mg/m3
1.97

Optimum moisture content, %
12

QA Ref
SLD 4, 3.5/6
Rev 2.8
Sep 17



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Project Name A1 ALNWICK TO ELLINGHAM

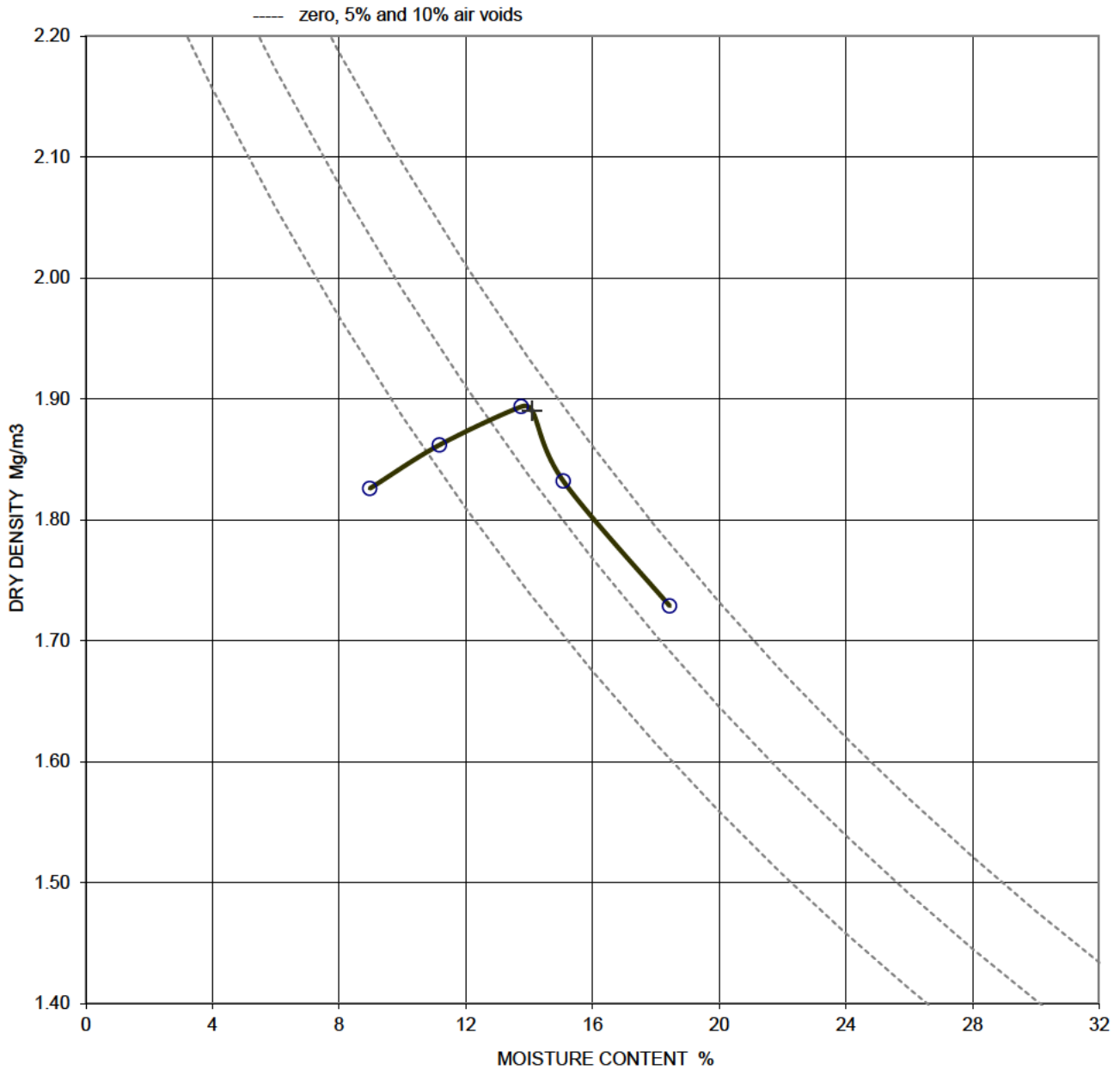
Figure
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DRY DENSITY / MOISTURE CONTENT RELATIONSHIP
BS1377 : PART 4 : 1990 : HEAVY COMPACTION, 4.5 kg rammer

Sample Details:	SAMPLE ID:	Hole No	BH/17/12
	A8013-1820181005012308	Sample Depth (m BGL)	2.00 - 2.50
		Sample Type and No	B8
		Specimen Ref	



Soil description Brown slightly sandy slightly gravelly CLAY.

Test method BS 1377:part 4:1990: clause 3.5, 4.5 kg rammer in a 1 litre mould

Preparation Original material was natural, single sample tested

Material > 37.5mm 0 %

Material < 37.5mm > 20mm 2 %

Particle density 2.65 assumed

Remarks

Derived Parameters +

Maximum dry density, Mg/m3
1.89

Optimum moisture content, %
14

QA Ref
SLD 4, 3.5/6
Rev 2.8
Sep 17



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 Project Name A1 ALNWICK TO ELLINGHAM

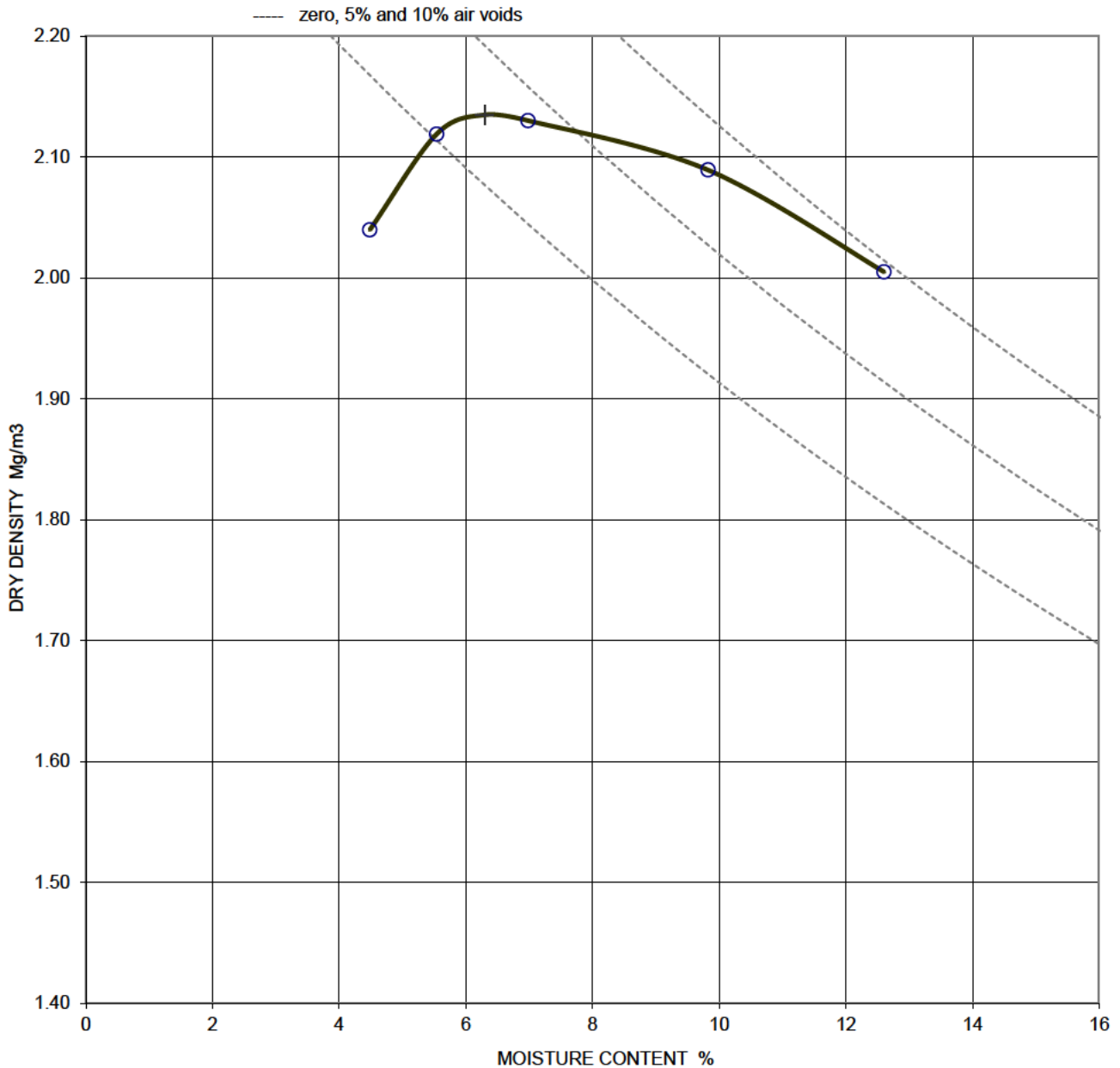
Figure
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DRY DENSITY / MOISTURE CONTENT RELATIONSHIP
BS1377 : PART 4 : 1990 : HEAVY COMPACTION, 4.5 kg rammer

Sample Details:	SAMPLE ID:	Hole No	TP/17/01
	A8013-18-20180927030149	Sample Depth (m BGL)	2.00 - 2.50
		Sample Type and No	B7
		Specimen Ref	



Soil description Dark brown slightly sandy slightly gravelly CLAY with one cobble.

Test method BS 1377:part 4:1990: clause 3.6, 4.5 kg rammer in a CBR mould

Preparation Original material was natural, single sample tested

Material > 37.5mm 15 %

Material < 37.5mm > 20mm 3 %

Particle density 2.70 assumed

Remarks

Derived Parameters +

Maximum dry density, Mg/m3
2.14

Optimum moisture content, %
6.3

Grading Zone X

QA Ref
SLD 4, 3.5/6
Rev 2.8
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Project Name A1 ALNWICK TO ELLINGHAM

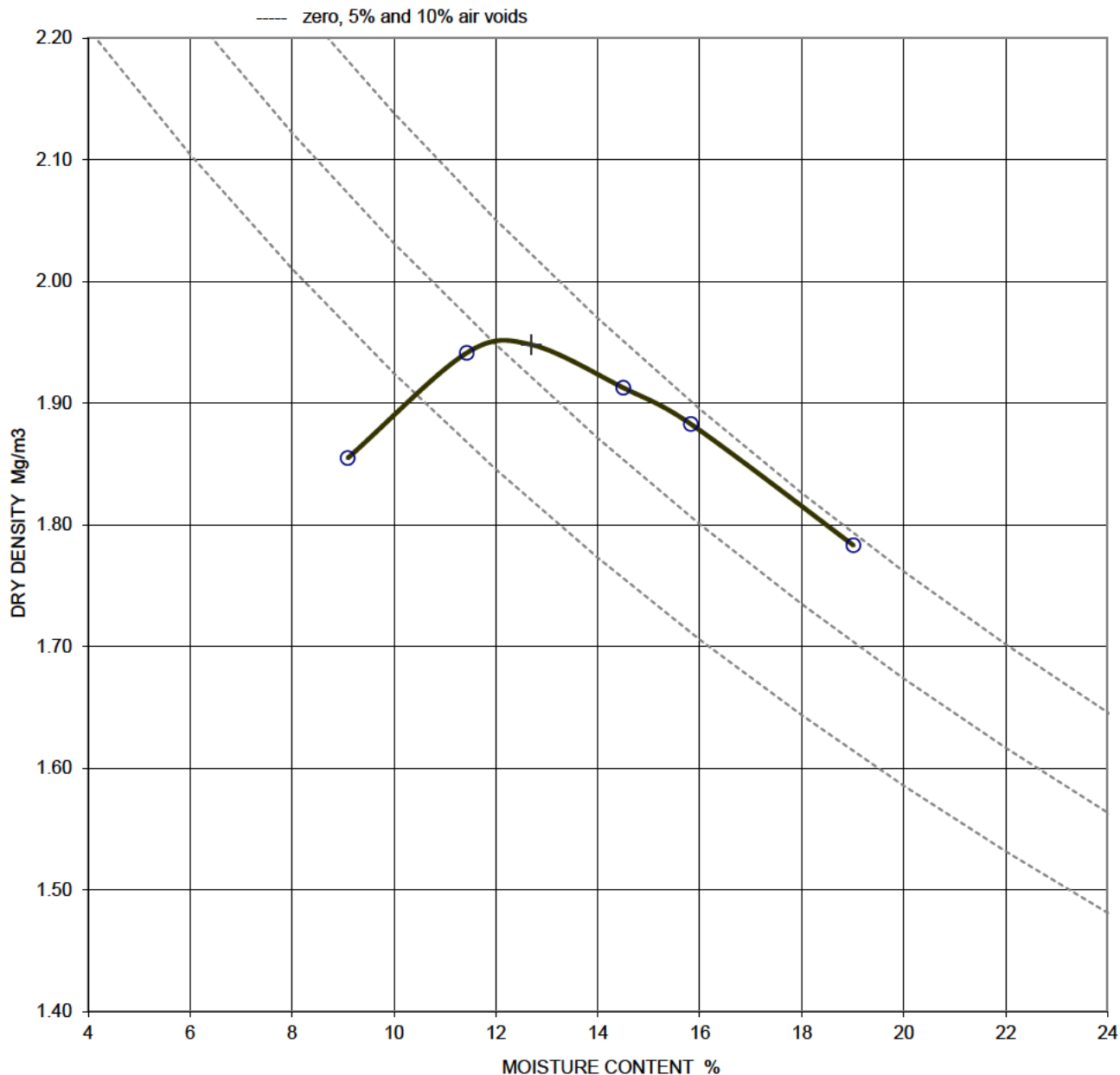
Figure
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DRY DENSITY / MOISTURE CONTENT RELATIONSHIP
BS1377 : PART 4 : 1990 : HEAVY COMPACTION, 4.5 kg rammer

Sample Details:	SAMPLE ID:	Hole No	TP/17/09A
	A8013-18-20180926031656	Sample Depth (m BGL)	0.50 - 1.00
		Sample Type and No	B5
		Specimen Ref	



Soil description Greyish brown slightly sandy slightly gravelly CLAY with one cobble.

Derived Parameters +

Test method BS 1377:part 4:1990: clause 3.5, 4.5 kg rammer in a 1 litre mould

Maximum dry density, Mg/m3
1.95

Preparation Original material was natural, single sample tested

Material > 37.5mm 0 %

Material < 37.5mm > 20mm 2 %

Optimum moisture content, %
13

Particle density 2.72 assumed

Remarks

QA Ref
SLD 4, 3.5/6
Rev 2.8
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Project No A8013-18
Project Name A1 ALNWICK TO ELLINGHAM

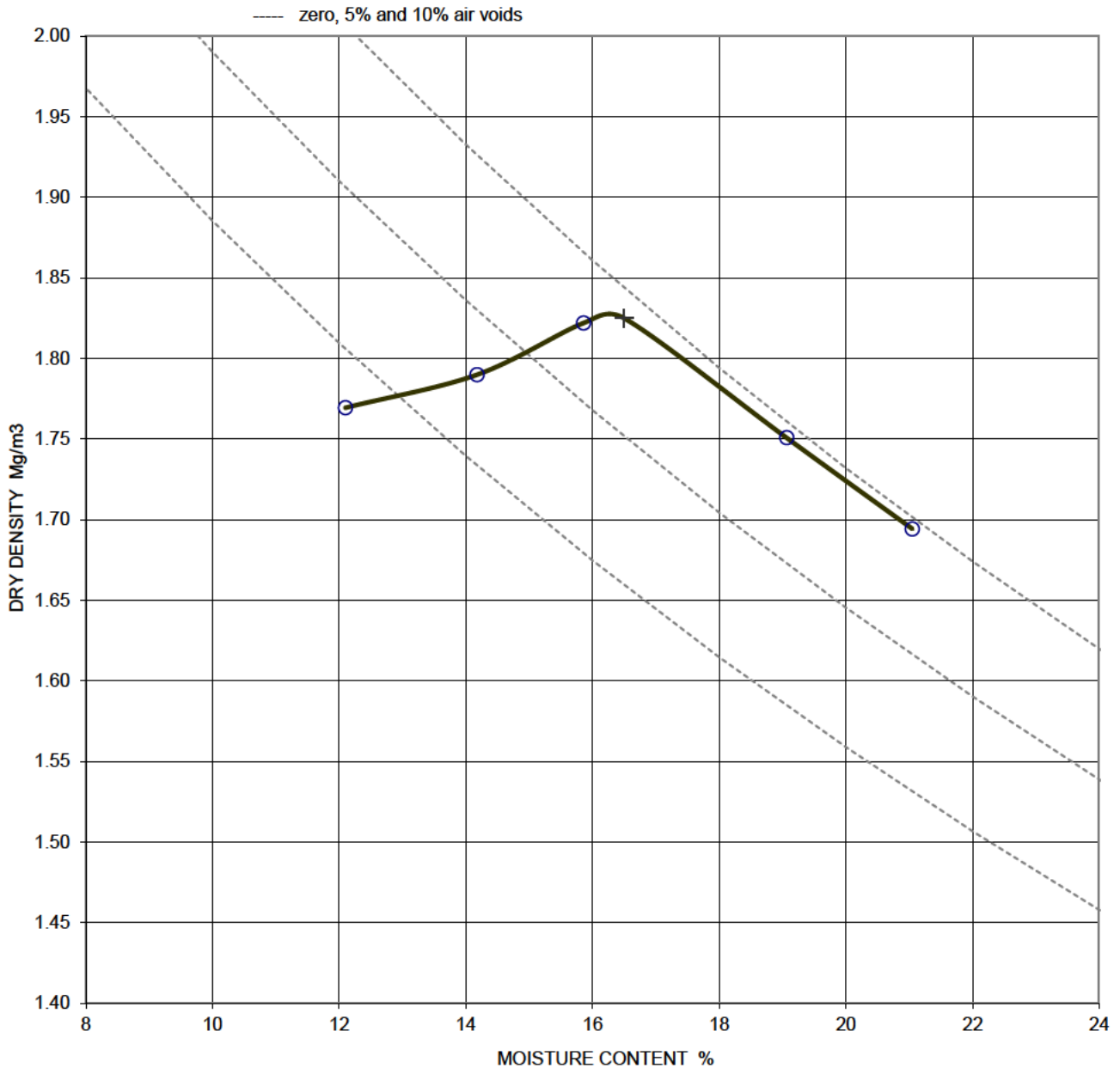
Figure
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Optimum moisture content, maximum dry density and optimum moisture content are based on the assumption of 100% compaction. © Copyright 2017 SOCOTEC UK Limited.

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DRY DENSITY / MOISTURE CONTENT RELATIONSHIP
BS1377 : PART 4 : 1990 : HEAVY COMPACTION, 4.5 kg rammer

Sample Details:	SAMPLE ID:	Hole No	TP/17/21
	A8013-1820181003012145	Sample Depth (m BGL)	0.5
		Sample Type and No	B4
		Specimen Ref	



Soil description Brown slightly sandy slightly gravelly CLAY.

Test method BS 1377:part 4:1990: clause 3.5, 4.5 kg rammer in a 1 litre mould

Preparation Original material was natural, single sample tested

Material > 37.5mm 0 %

Material < 37.5mm > 20mm 2 %

Particle density 2.65 assumed

Remarks

Derived Parameters +

Maximum dry density, Mg/m3
1.83

Optimum moisture content, %
17

QA Ref
SLD 4, 3.5/6
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Project Name A1 ALNWICK TO ELLINGHAM

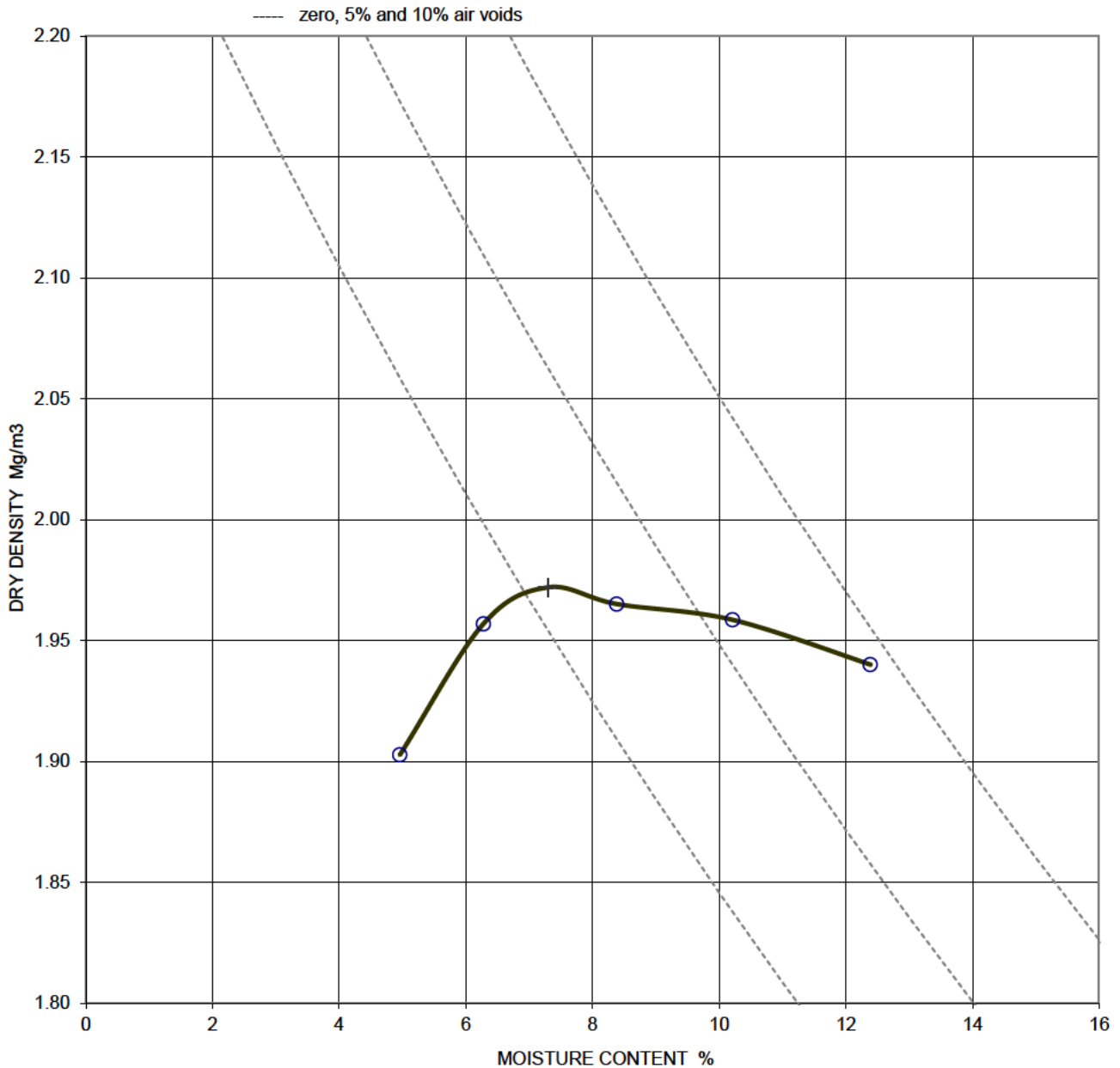
Figure
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DRY DENSITY / MOISTURE CONTENT RELATIONSHIP
BS1377 : PART 4 : 1990 : HEAVY COMPACTION, 4.5 kg rammer

Sample Details:	SAMPLE ID:	Hole No	TP/17/32
	A8013-1820180924122312	Sample Depth (m BGL)	0.30 - 0.70
		Sample Type and No	B4
		Specimen Ref	



Soil description Brown very gravelly clayey SAND with occasional rootlets and one cobble.

Test method BS 1377:part 4:1990: clause 3.6, 4.5 kg rammer in a CBR mould

Preparation Original material was natural, single sample tested

Material > 37.5mm 6 %

Material < 37.5mm > 20mm 13 %

Particle density 2.58 assumed

Remarks

Derived Parameters +

Maximum dry density, Mg/m3 **1.97**

Optimum moisture content, % **7.3**

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Project Name A1 ALNWICK TO ELLINGHAM

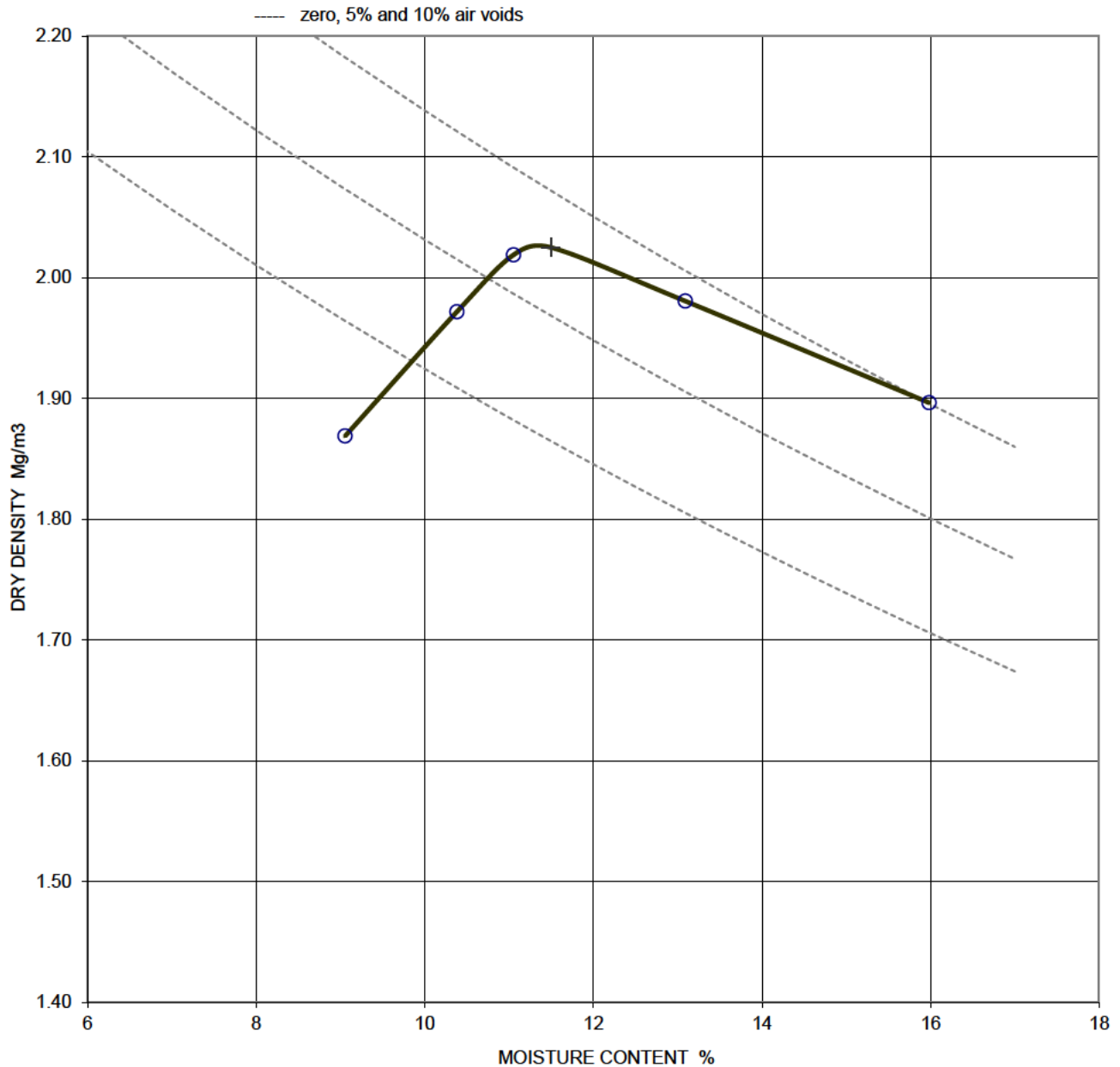
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DRY DENSITY / MOISTURE CONTENT RELATIONSHIP
BS1377 : PART 4 : 1990 : HEAVY COMPACTION, 4.5 kg rammer

Sample Details:	SAMPLE ID:	Hole No	TP/17/38
	A8013-18-20180925082030	Sample Depth (m BGL)	1.60 - 2.00
		Sample Type and No	B10
		Specimen Ref	



Soil description Brown gravelly clayey SAND.

Test method BS 1377:part 4:1990: clause 3.6, 4.5 kg rammer in a CBR mould
 Preparation Original material was natural, single sample tested
 Material > 37.5mm 10 %
 Material < 37.5mm > 20mm 19 %
 Particle density 2.72 assumed
 Remarks

Derived Parameters +

Maximum dry density, Mg/m3
2.03
 Optimum moisture content, %
12

Grading Zone X

QA Ref
 SLD 4, 3.5/6
 Rev 2.8
 Sep 17



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 Project Name A1 ALNWICK TO ELLINGHAM

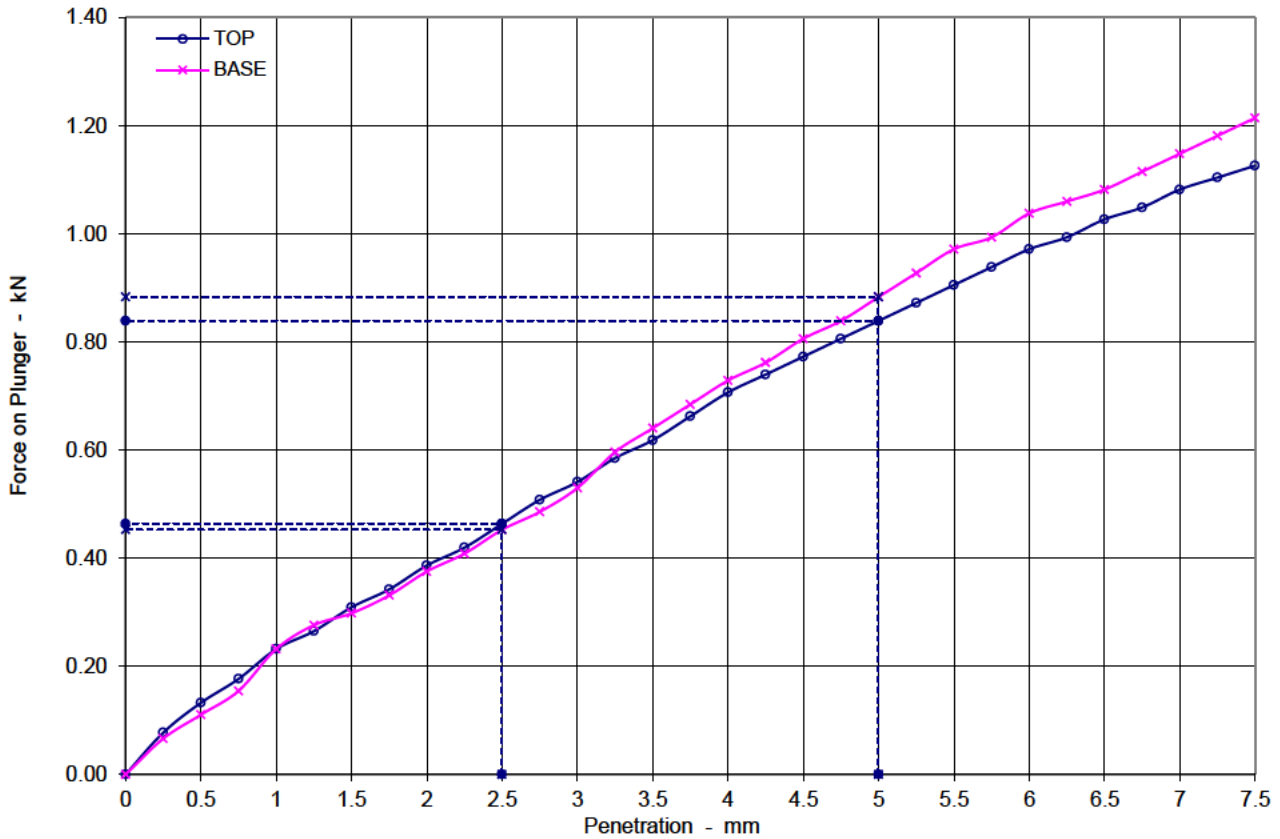
Figure
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California Bearing Ratio (BS1377:1990:Part 4 , section 7)

Sample Details:	SAMPLE ID:	Hole No	TP/17/01
	A8013-18-20180927025134	Sample Depth (m)	0.50 - 1.00
		Sample Type and No	B5
		Specimen Ref	1



Soil description	Brown slightly gravelly silty CLAY.
------------------	-------------------------------------

Test Conditions		
Sample Retained on 20 mm sieve	%	0

Sample Conditions		
Initial Moisture Content	%	22.0
Bulk Density	Mg/m³	1.94
Dry Density	Mg/m³	1.58
Moisture Content - TOP	%	22.0
Moisture Content - BASE	%	22.0


Method of Compaction		
Recompacted - Rammer compaction with specified effort (2.5kg)		
Preparation	Soaked test	NO
	Soaking Period	days N/A
	Amount of Swell	mm N/A

Penetration mm	CBR Values %	
	TOP	BASE
2.5	3.5	3.4
5	4.2	4.4

Surcharge applied	kg	5
	kPa	3

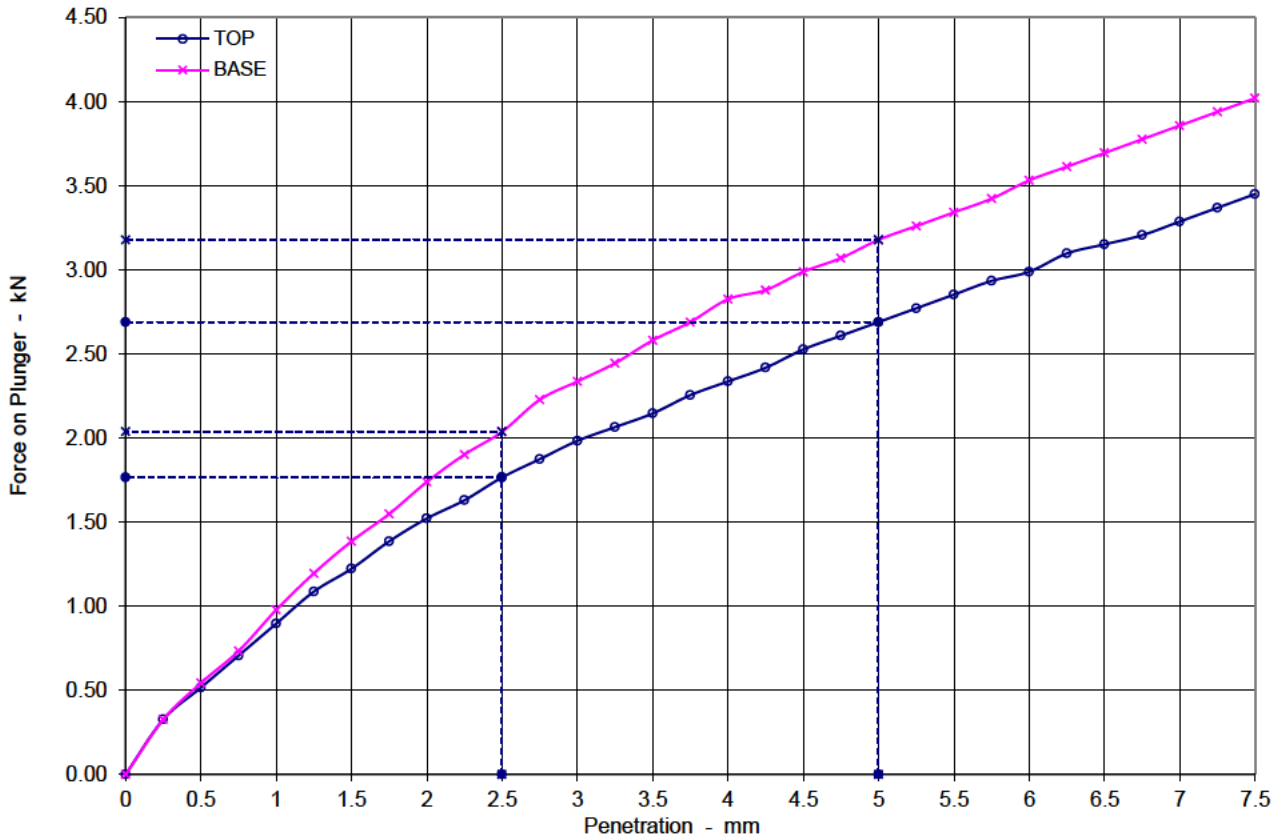
Notes :

Accepted CBR %	4.2	4.4
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QA Ref SLR 4.7 Rev 2.8 Mar 17	 SOCOTEC	Project No	A8013-18	Figure	CBR
		Project Name	A1 ALNWICK TO ELLINGHAM		
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California Bearing Ratio (BS1377:1990:Part 4 , section 7)

Sample Details:	SAMPLE ID:	Hole No	TP/17/03
	A8013-1820180720013512	Sample Depth (m)	0.50 - 0.80
		Sample Type and No	B1
		Specimen Ref	1



Soil description: Brown slightly sandy slightly gravelly CLAY with occasional rootlets.

Test Conditions		
Sample Retained on 20 mm sieve	%	8

Sample Conditions		
Initial Moisture Content	%	11.0
Bulk Density	Mg/m ³	2.19
Dry Density	Mg/m ³	1.96
Moisture Content - TOP	%	12.0
Moisture Content - BASE	%	12.0

Method of Compaction		
Recompacted - Rammer compaction with specified effort (4.5kg)		
Soaked test		NO
Soaking Period	days	N/A
Amount of Swell	mm	N/A

Penetration mm	CBR Values %	
	TOP	BASE
2.5	13.0	15.0
5	13.0	16.0

Surcharge applied	kg	5
	kPa	3

Notes :

Accepted CBR %	13.0	16.0
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QA Ref
SLR 4.7
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Mar 17



Project No: A8013-18
Project Name: A1 ALNWICK TO ELLINGHAM

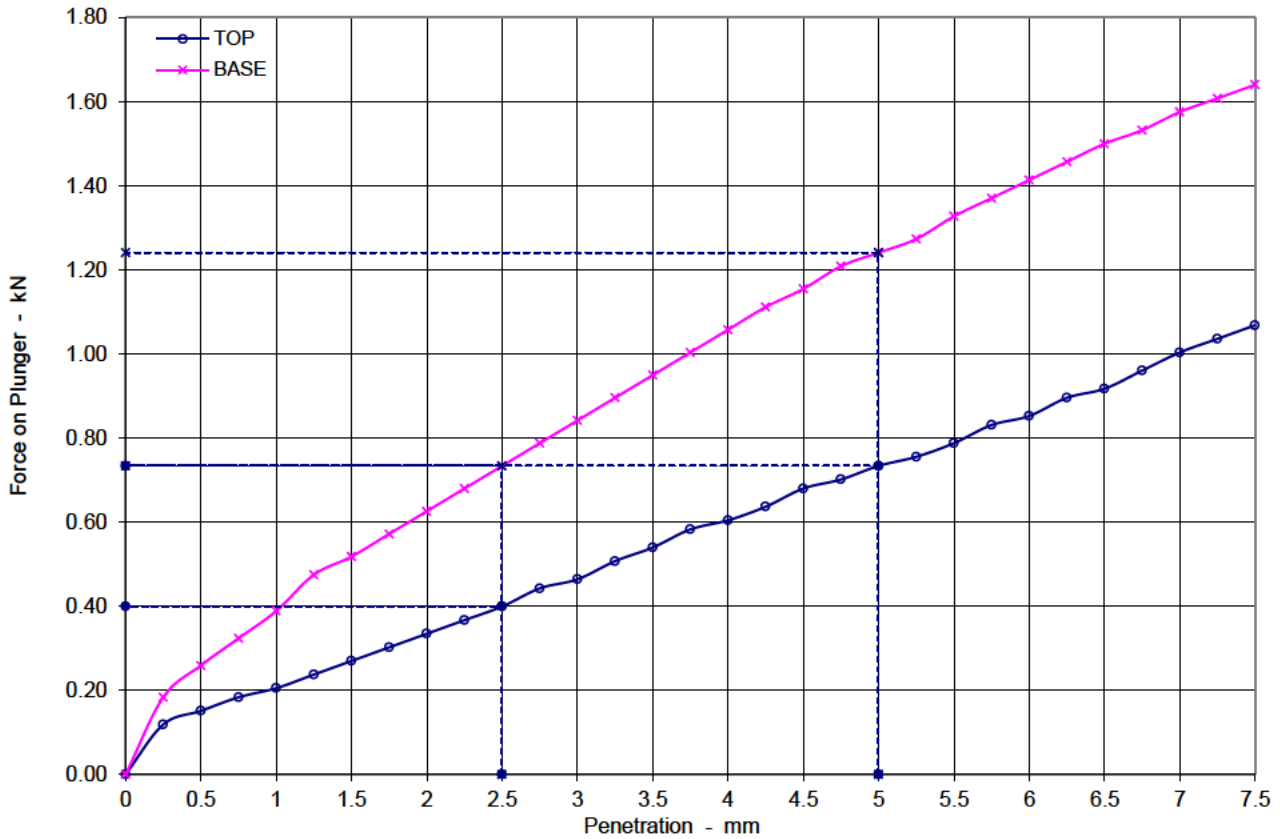
Figure
CBR

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California Bearing Ratio (BS1377:1990:Part 4 , section 7)

Sample Details:	SAMPLE ID:	Hole No	TP/17/05
	A8013-1820180730113822	Sample Depth (m)	1.20 - 1.40
		Sample Type and No	B2
		Specimen Ref	1



Soil description	Brown slightly sandy slightly gravelly CLAY with occasional rootlets.
------------------	---

Test Conditions		
Sample Retained on 20 mm sieve	%	14

Sample Conditions		
Initial Moisture Content	%	13.0
Bulk Density	Mg/m ³	2.22
Dry Density	Mg/m ³	1.97
Moisture Content - TOP	%	12.0
Moisture Content - BASE	%	14.0


Method of Compaction		
Recompacted - Rammer compaction with specified effort (2.5kg)		
Soaked test		NO
Soaking Period	days	N/A
Amount of Swell	mm	N/A

Penetration mm	CBR Values %	
	TOP	BASE
2.5	3.0	5.6
5	3.7	6.2

Surcharge applied	kg	5
	kPa	3

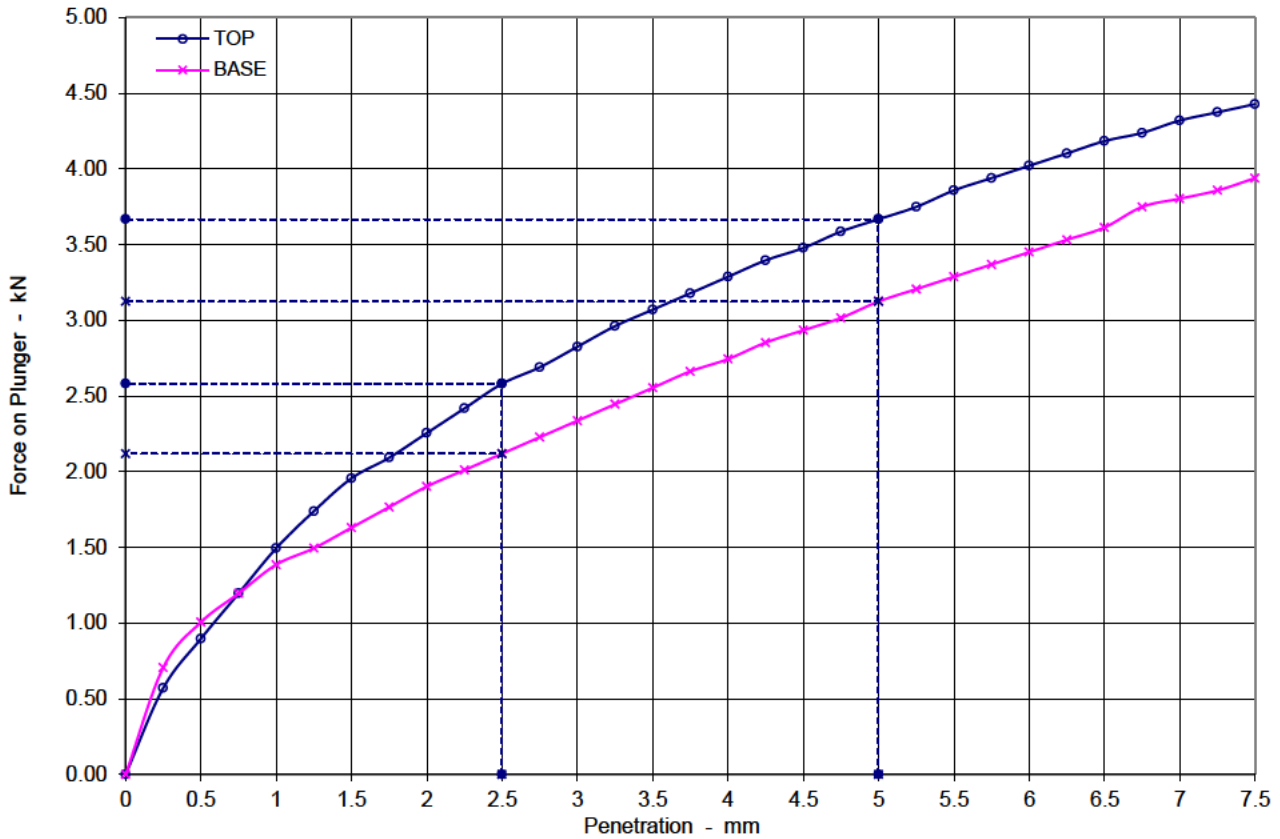
Notes :

Accepted CBR %	3.7	6.2
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QA Ref SLR 4.7 Rev 2.8 Mar 17	 SOCOTEC	Project No	A8013-18	Figure	CBR
		Project Name	A1 ALNWICK TO ELLINGHAM		
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California Bearing Ratio (BS1377:1990:Part 4 , section 7)

Sample Details:	SAMPLE ID:	Hole No	TP/17/06
	A8013-1820180730105942	Sample Depth (m)	0.90 - 1.20
		Sample Type and No	B1
		Specimen Ref	1



Soil description: Brown slightly sandy slightly gravelly CLAY with occasional rootlets.

Test Conditions		
Sample Retained on 20 mm sieve	%	4

Sample Conditions		
Initial Moisture Content	%	14.0
Bulk Density	Mg/m ³	2.03
Dry Density	Mg/m ³	1.78
Moisture Content - TOP	%	13.0
Moisture Content - BASE	%	13.0


Method of Compaction		
Recompacted - Rammer compaction with specified effort (2.5kg)		
Soaked test		NO
Soaking Period	days	N/A
Amount of Swell	mm	N/A

Penetration mm	CBR Values %	
	TOP	BASE
2.5	20.0	16.0
5	18.0	16.0

Surcharge applied	kg	5
	kPa	3

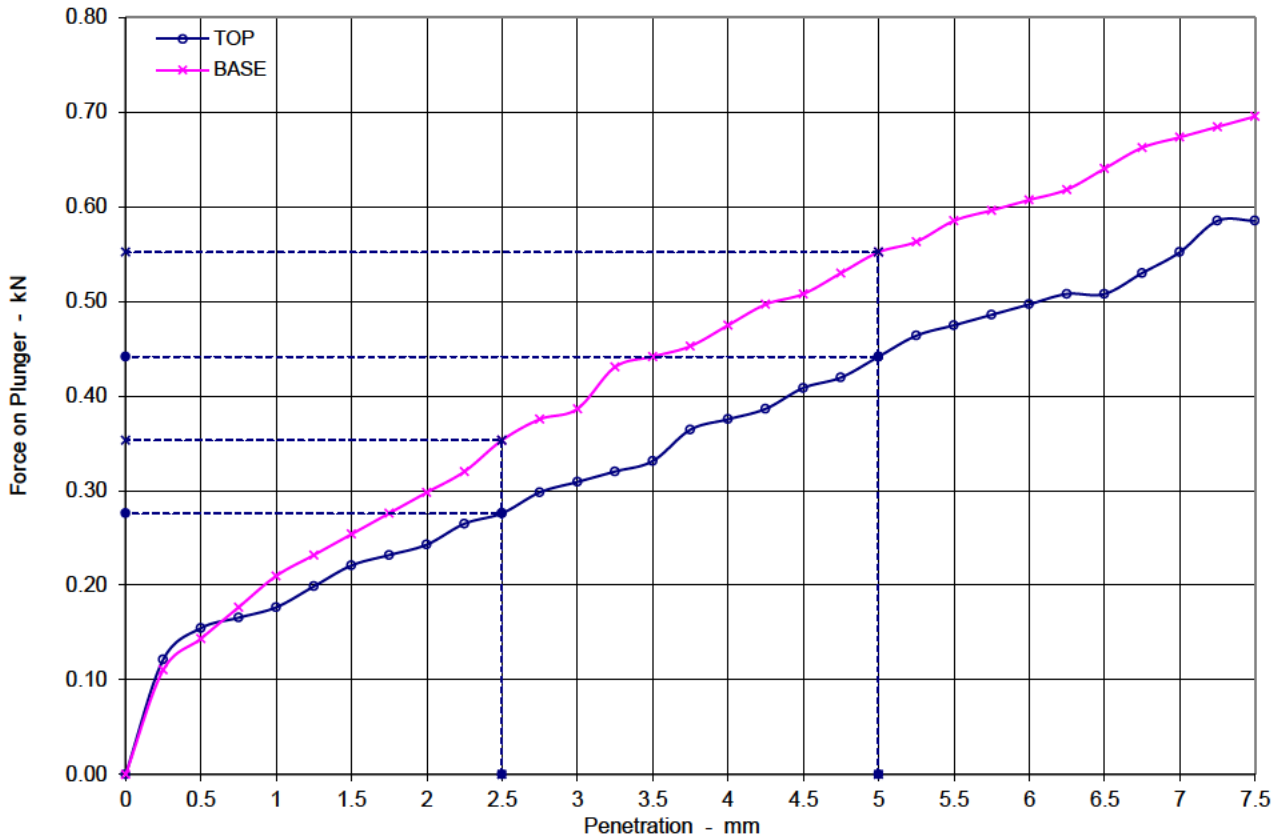
Notes :

Accepted CBR %	20.0	16.0
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QA Ref SLR 4.7 Rev 2.8 Mar 17	 SOCOTEC	Project No	A8013-18	Figure	CBR
		Project Name	A1 ALNWICK TO ELLINGHAM		
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California Bearing Ratio (BS1377:1990:Part 4 , section 7)

Sample Details:	SAMPLE ID:	Hole No	TP/17/07
	A8013-1820180725122315	Sample Depth (m)	1.20 - 1.40
		Sample Type and No	B2
		Specimen Ref	1



Soil description: Dark brownish grey slightly gravelly silty CLAY.

Test Conditions		
Sample Retained on 20 mm sieve	%	0

Sample Conditions		
Initial Moisture Content	%	30.0
Bulk Density	Mg/m ³	1.85
Dry Density	Mg/m ³	1.42
Moisture Content - TOP	%	29.0
Moisture Content - BASE	%	29.0

Method of Compaction		
Recompacted - Rammer compaction with specified effort (2.5kg)		
Preparation	Soaked test	NO
	Soaking Period	days N/A
	Amount of Swell	mm N/A

Penetration mm	CBR Values %	
	TOP	BASE
2.5	2.1	2.7
5	2.2	2.8

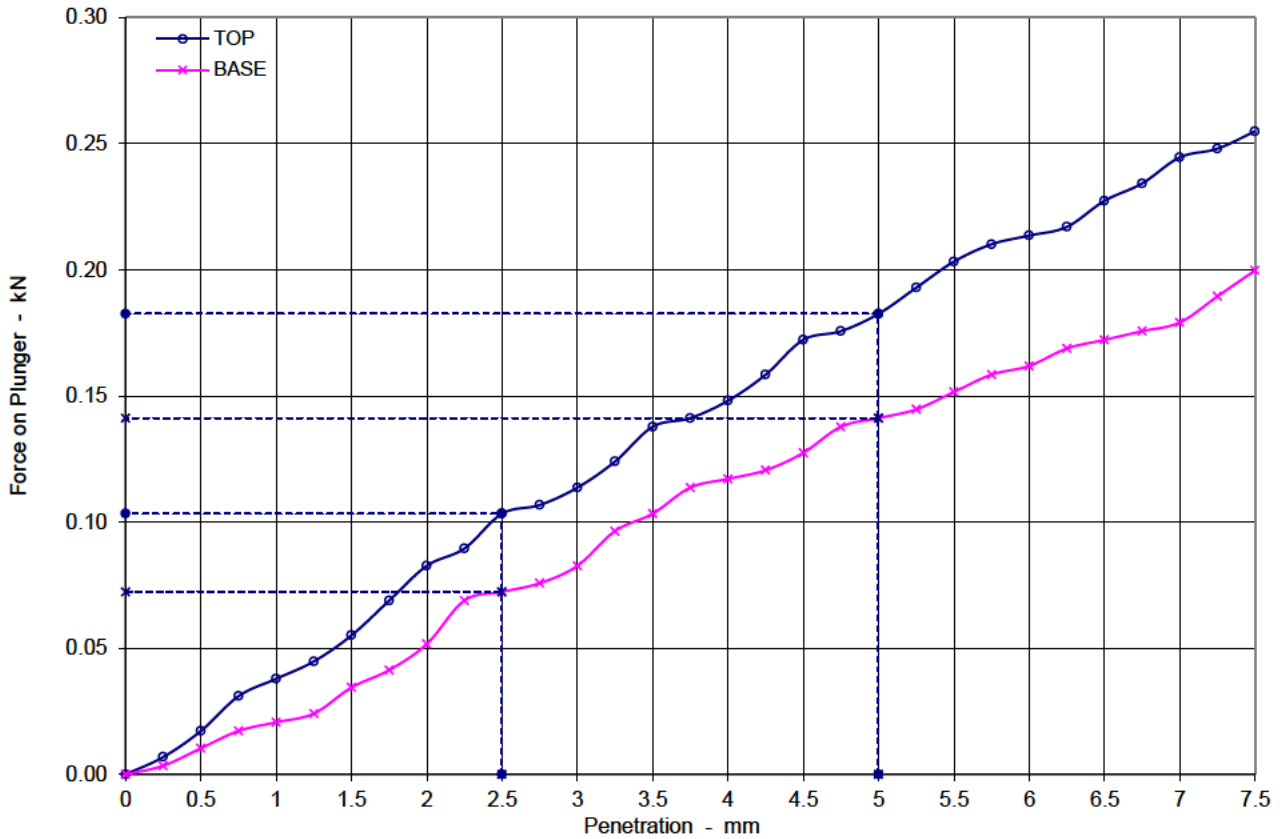
Surcharge applied	kg	5
	kPa	3

Notes :
Top and Base

Accepted CBR %	2.2	2.8
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California Bearing Ratio (BS1377:1990:Part 4 , section 7)

Sample Details:	SAMPLE ID:	Hole No	TP/17/10
	A8013-1820180725120609	Sample Depth (m)	2.20 - 2.50
		Sample Type and No	B2
		Specimen Ref	1



Soil description: Dark brown slightly sandy slightly gravelly CLAY.

Test Conditions		
Sample Retained on 20 mm sieve	%	0

Sample Conditions		
Initial Moisture Content	%	17.0
Bulk Density	Mg/m ³	2.10
Dry Density	Mg/m ³	1.80
Moisture Content - TOP	%	17.0
Moisture Content - BASE	%	17.0


Method of Compaction		
Recompacted - Rammer compaction with specified effort (2.5kg)		
Soaked test		NO
Soaking Period	days	N/A
Amount of Swell	mm	N/A

Penetration mm	CBR Values %	
	TOP	BASE
2.5	0.8	0.6
5	0.9	0.7

Surcharge applied	kg	5
	kPa	3

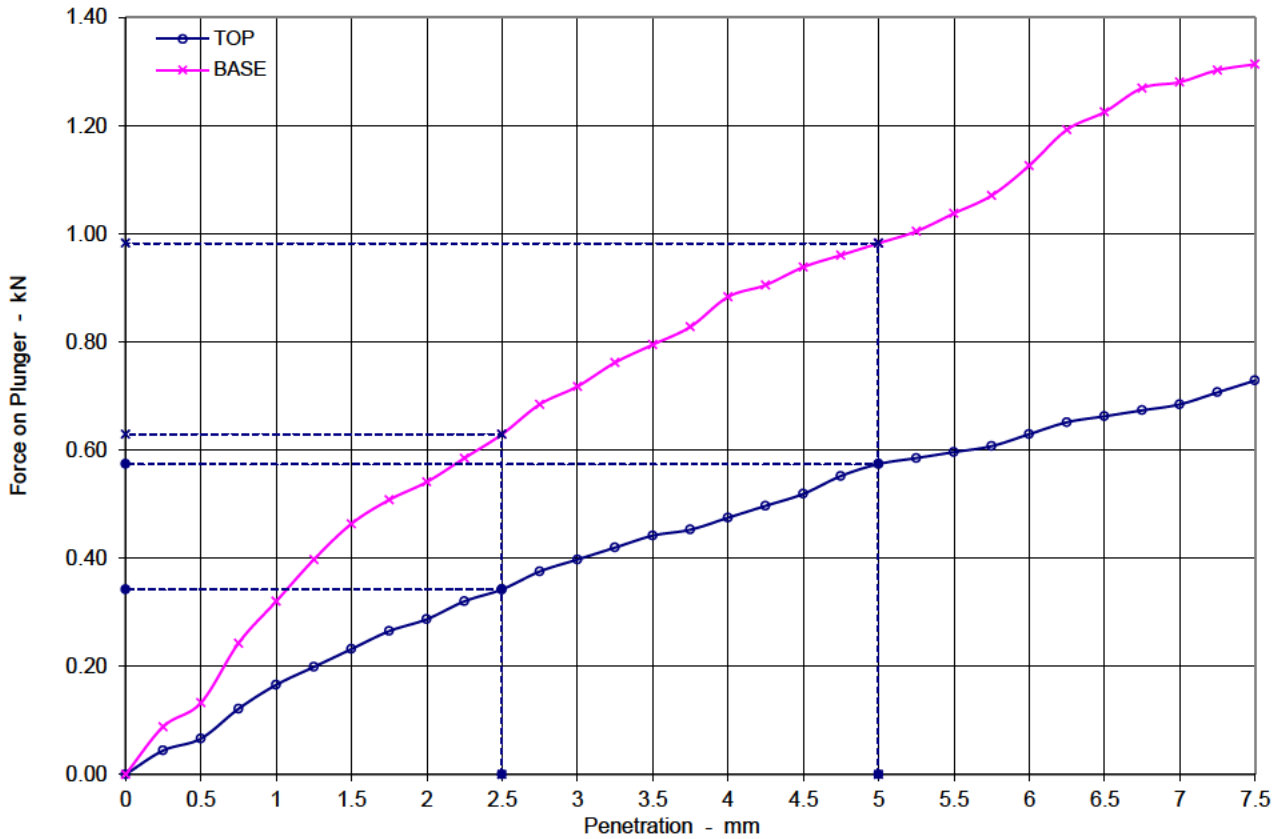
Notes :

Accepted CBR %	0.9	0.7
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QA Ref SLR 4.7 Rev 2.8 Mar 17	 SOCOTEC	Project No	A8013-18	Figure	CBR
		Project Name	A1 ALNWICK TO ELLINGHAM		
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California Bearing Ratio (BS1377:1990:Part 4 , section 7)

Sample Details:	SAMPLE ID:	Hole No	TP/17/11
	A8013-1820180730111543	Sample Depth (m)	1.80 - 2.00
		Sample Type and No	B2
		Specimen Ref	1



Soil description	Brown slightly sandy slightly gravelly CLAY.
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Test Conditions		
Sample Retained on 20 mm sieve	%	0

Sample Conditions		
Initial Moisture Content	%	15.0
Bulk Density	Mg/m ³	2.12
Dry Density	Mg/m ³	1.84
Moisture Content - TOP	%	16.0
Moisture Content - BASE	%	15.0

Method of Compaction		
Recompacted - Rammer compaction with specified effort (2.5kg)		
Soaked test		NO
Soaking Period	days	N/A
Amount of Swell	mm	N/A

Penetration mm	CBR Values %	
	TOP	BASE
2.5	2.6	4.8
5	2.9	4.9

Surcharge applied	kg	5
	kPa	3

Notes :

Accepted CBR %	2.9	4.9
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Mar 17



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Project Name A1 ALNWICK TO ELLINGHAM

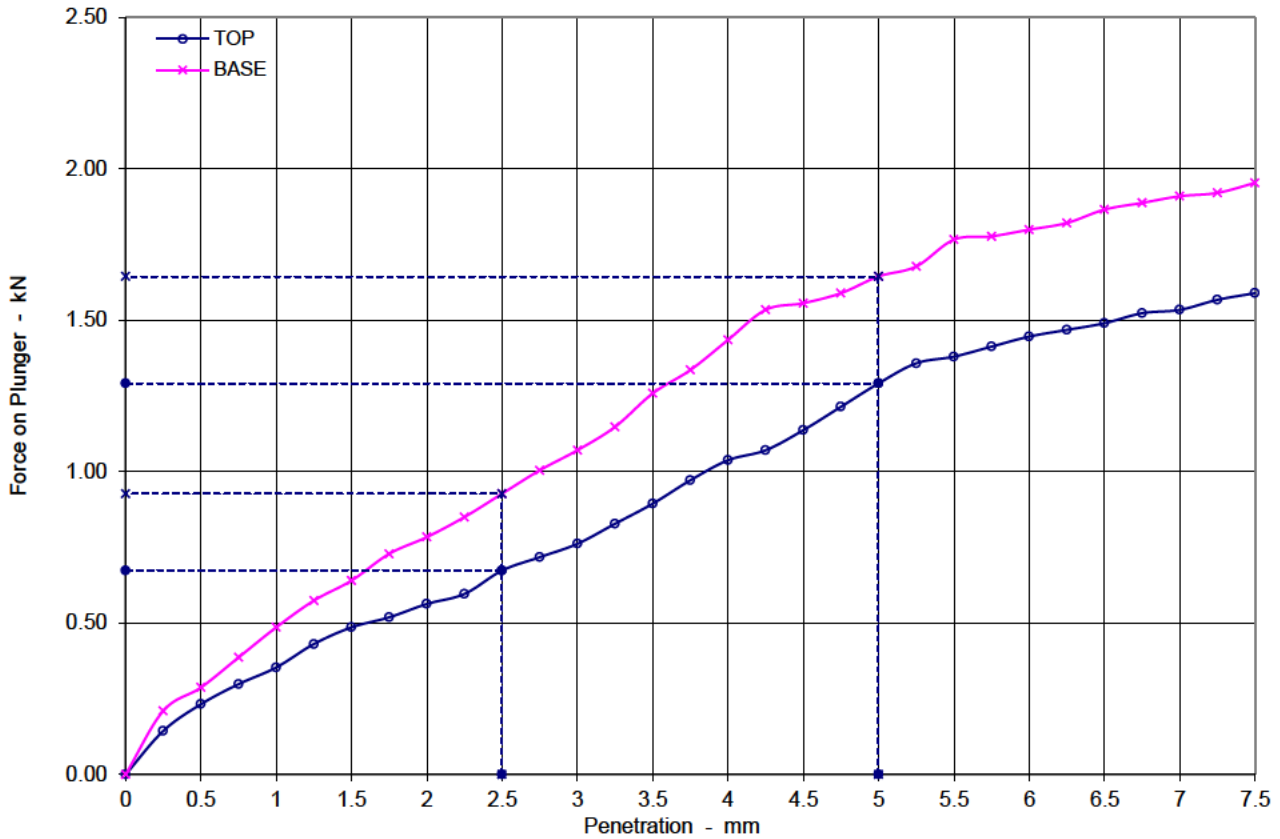
Figure
CBR

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California Bearing Ratio (BS1377:1990:Part 4 , section 7)

Sample Details:	SAMPLE ID:	Hole No	TP/17/12
	A8013-1820180910111623	Sample Depth (m)	0.50 - 1.60
		Sample Type and No	B4
		Specimen Ref	1



Soil description: Brown slightly sandy slightly gravelly CLAY.

Test Conditions		
Sample Retained on 20 mm sieve	%	14

Sample Conditions		
Initial Moisture Content	%	15.0
Bulk Density	Mg/m ³	2.12
Dry Density	Mg/m ³	1.85
Moisture Content - TOP	%	15.0
Moisture Content - BASE	%	16.0


Method of Compaction		
Recompacted - Rammer compaction with specified effort (4.5kg)		
Soaked test		NO
Soaking Period	days	N/A
Amount of Swell	mm	N/A

Penetration mm	CBR Values %	
	TOP	BASE
2.5	5.1	7.0
5	6.5	8.2

Surcharge applied	kg	5
	kPa	3

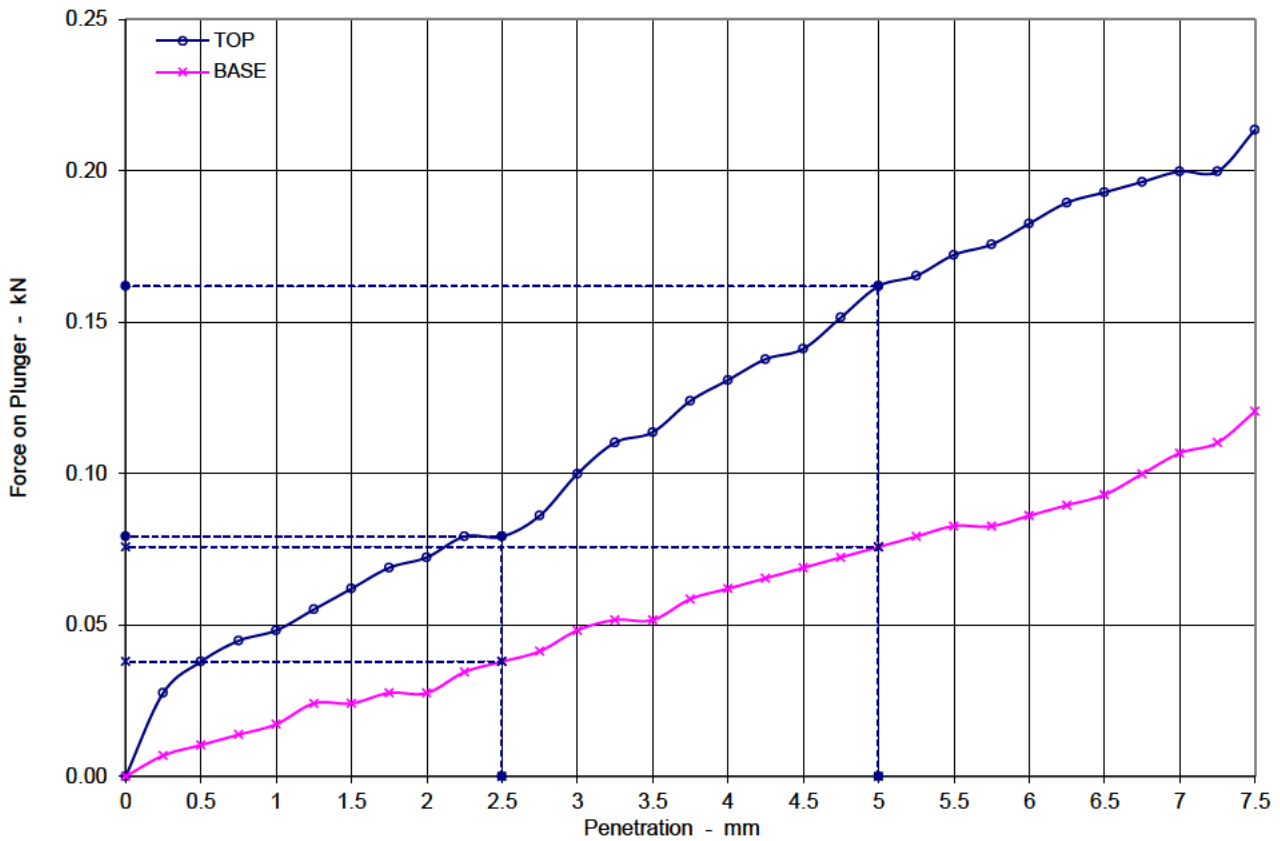
Notes :

Accepted CBR %	6.5	8.2
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QA Ref SLR 4.7 Rev 2.8 Mar 17	 SOCOTEC	Project No	A8013-18	Figure	CBR
		Project Name	A1 ALNWICK TO ELLINGHAM		
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California Bearing Ratio (BS1377:1990:Part 4 , section 7)

Sample Details:	SAMPLE ID:	Hole No	TP/17/17
	A8013-1820180911091519	Sample Depth (m)	1.00 - 1.20
		Sample Type and No	B6
		Specimen Ref	1



Soil description Greyish brown slightly sandy slightly gravelly silty CLAY.

Test Conditions		
Sample Retained on 20 mm sieve	%	0

Sample Conditions		
Initial Moisture Content	%	23.0
Bulk Density	Mg/m ³	2.10
Dry Density	Mg/m ³	1.72
Moisture Content - TOP	%	22.0
Moisture Content - BASE	%	23.0

Method of Compaction		
Recompacted - Rammer compaction with specified effort (2.5kg)		
Soaked test		NO
Soaking Period	days	N/A
Amount of Swell	mm	N/A

Penetration mm	CBR Values %	
	TOP	BASE
2.5	0.6	0.3
5	0.8	0.4

Surcharge applied	kg	5
	kPa	3

Notes :

Accepted CBR %	0.8	0.4
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Mar 17



Project No A8013-18
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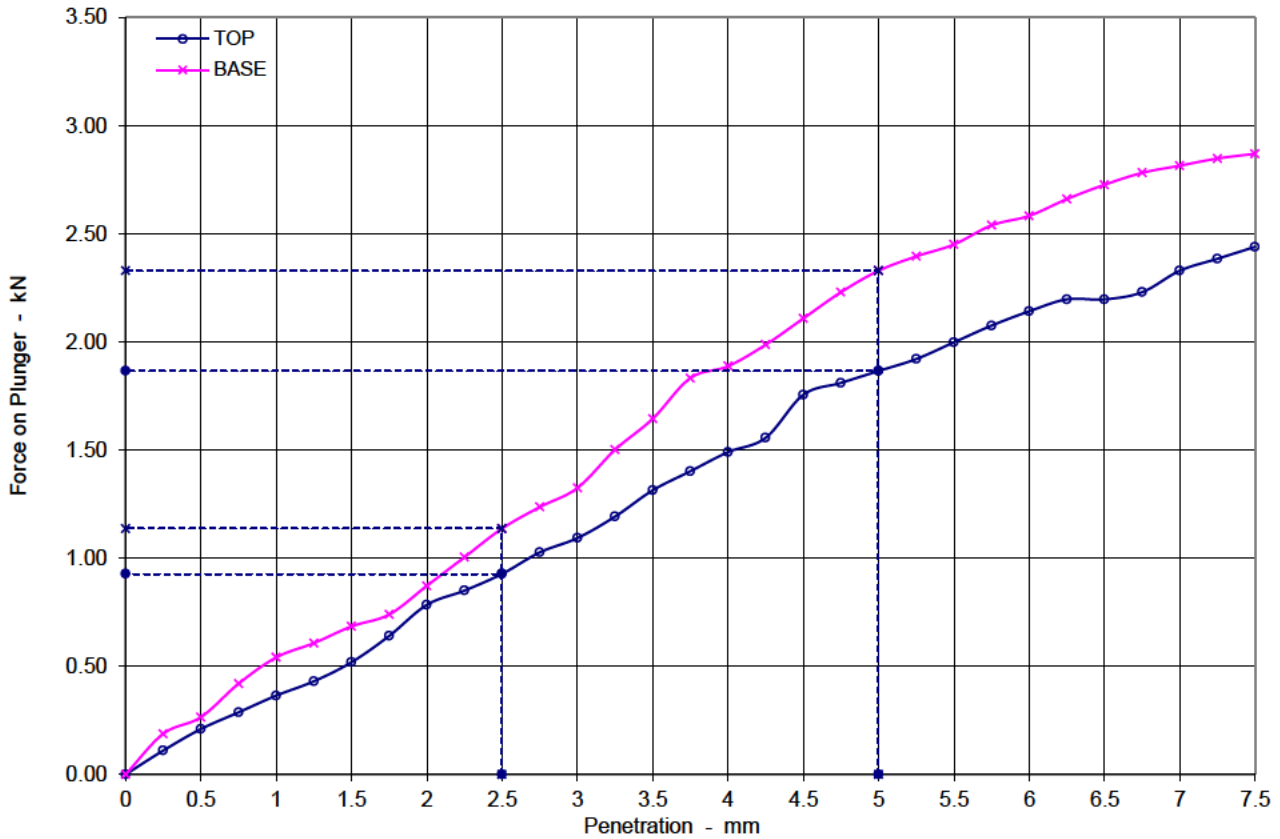
Figure
CBR

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California Bearing Ratio (BS1377:1990:Part 4 , section 7)

Sample Details:	SAMPLE ID:	Hole No	TP/17/19
	A8013-1820180911094338	Sample Depth (m)	0.30 - 0.80
		Sample Type and No	B3
		Specimen Ref	1



Soil description: Brown slightly sandy slightly gravelly silty CLAY.

Test Conditions		
Sample Retained on 20 mm sieve	%	2

Sample Conditions		
Initial Moisture Content	%	20.0
Bulk Density	Mg/m³	2.05
Dry Density	Mg/m³	1.71
Moisture Content - TOP	%	21.0
Moisture Content - BASE	%	21.0


Method of Compaction		
Recompacted - Rammer compaction with specified effort (2.5kg)		
Soaked test		NO
Soaking Period	days	N/A
Amount of Swell	mm	N/A

Penetration mm	CBR Values %	
	TOP	BASE
2.5	7.0	8.6
5	9.3	12.0

Surcharge applied	kg	5
	kPa	3

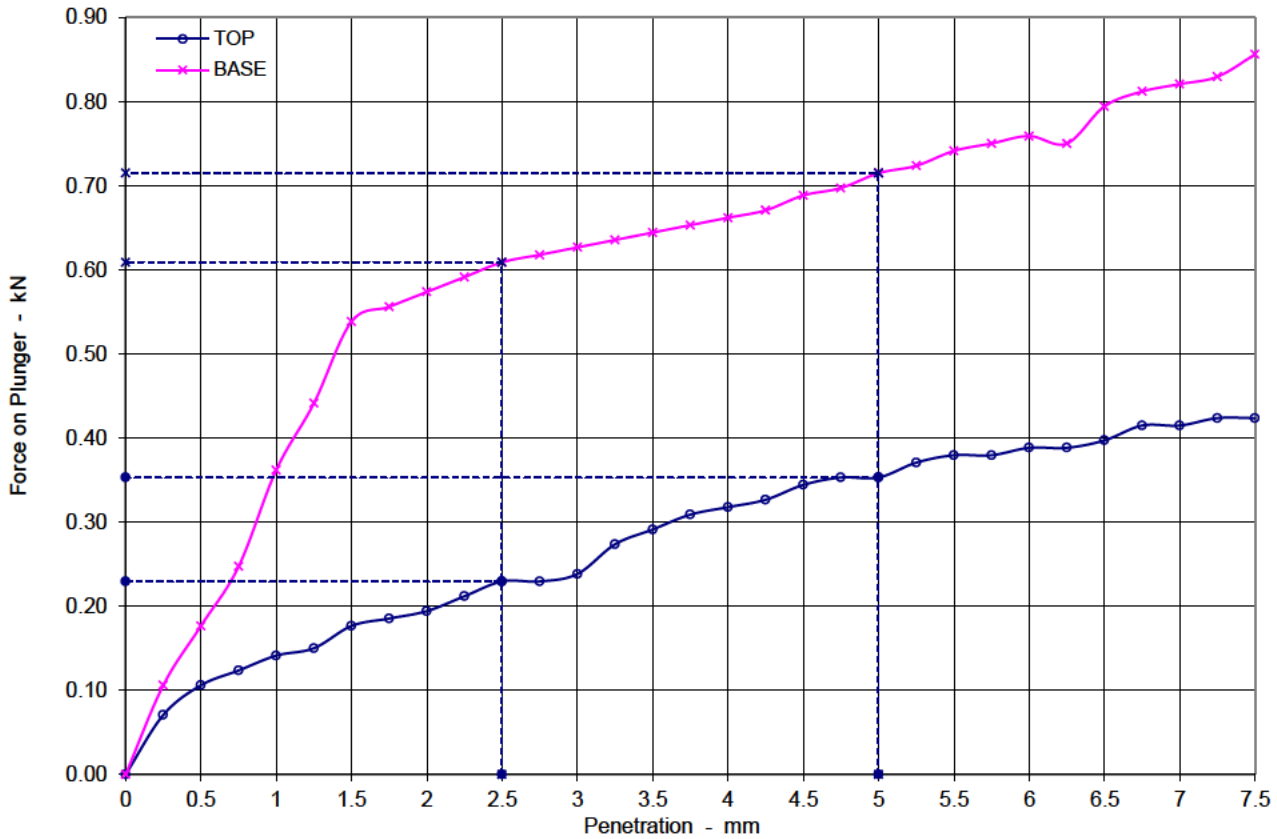
Notes :

Accepted CBR %	9.3	12.0
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QA Ref SLR 4.7 Rev 2.8 Mar 17	 SOCOTEC	Project No	A8013-18	Figure	CBR
		Project Name	A1 ALNWICK TO ELLINGHAM		
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California Bearing Ratio (BS1377:1990:Part 4 , section 7)

Sample Details:	SAMPLE ID:	Hole No	TP/17/21
	A8013-1820181003012215	Sample Depth (m)	1.50 - 2.00
		Sample Type and No	B8
		Specimen Ref	1



Soil description: Dark brown slightly sandy slightly gravelly CLAY.

Test Conditions		
Sample Retained on 20 mm sieve	%	8

Sample Conditions		
Initial Moisture Content	%	23.0
Bulk Density	Mg/m ³	2.04
Dry Density	Mg/m ³	1.66
Moisture Content - TOP	%	21.0
Moisture Content - BASE	%	21.0


Method of Compaction		
Recompacted - Rammer compaction with specified effort (4.5kg)		
Soaked test		NO
Soaking Period	days	N/A
Amount of Swell	mm	N/A

Penetration mm	CBR Values %	
	TOP	BASE
2.5	1.7	4.6
5	1.8	3.6

Surcharge applied	kg	5
	kPa	3

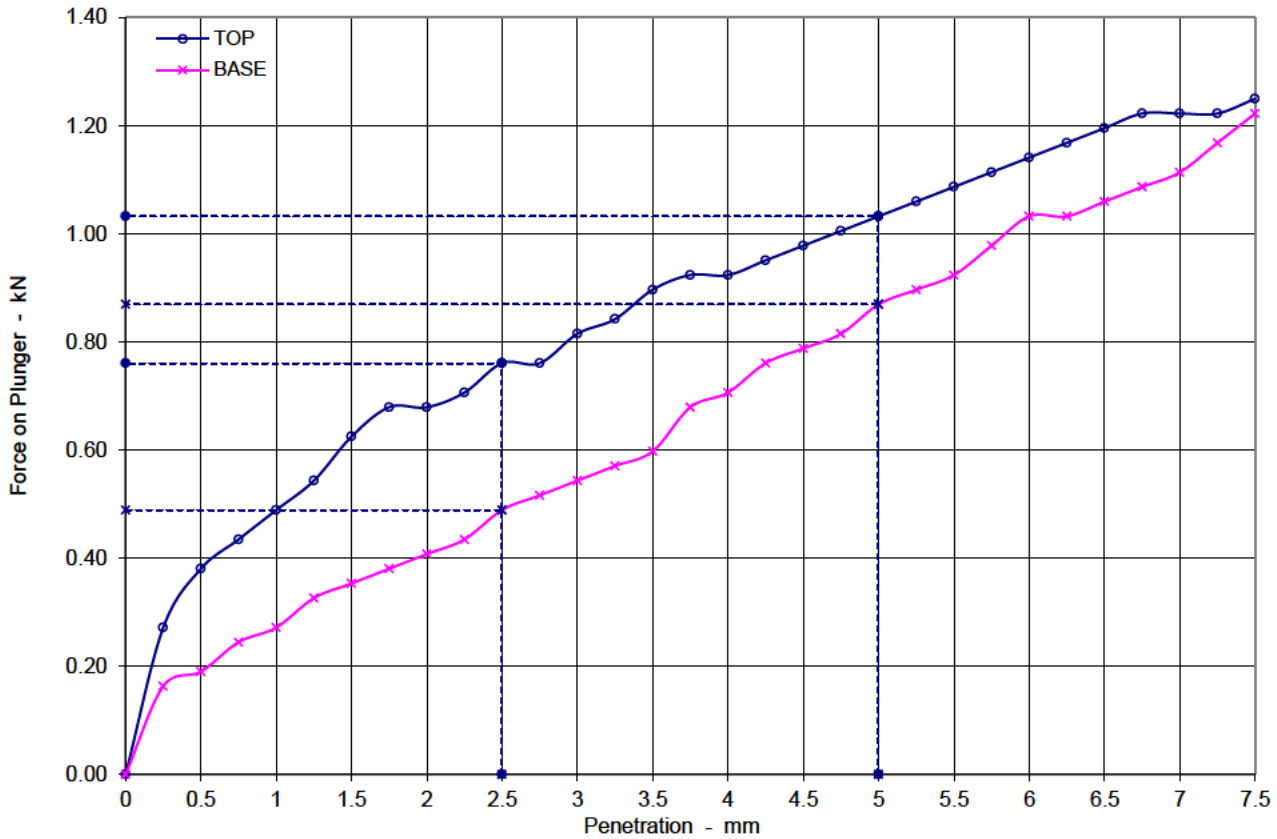
Notes :

Accepted CBR %	1.8	4.6
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QA Ref SLR 4.7 Rev 2.8 Mar 17	 SOCOTEC	Project No	A8013-18	Figure	CBR
		Project Name	A1 ALNWICK TO ELLINGHAM		
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California Bearing Ratio (BS1377:1990:Part 4 , section 7)

Sample Details:	SAMPLE ID:	Hole No	TP/17/22
	A8013-1820180917103224	Sample Depth (m)	0.30 - 0.80
		Sample Type and No	B5
		Specimen Ref	1



Soil description: Greyish brown gravelly CLAY.

Test Conditions		
Sample Retained on 20 mm sieve	%	26

Sample Conditions		
Initial Moisture Content	%	2.0
Bulk Density	Mg/m ³	2.28
Dry Density	Mg/m ³	2.24
Moisture Content - TOP	%	12.0
Moisture Content - BASE	%	11.0


Method of Compaction		
Recompacted - Rammer compaction with specified effort (2.5kg)		
Soaked test		NO
Soaking Period	days	N/A
Amount of Swell	mm	N/A

Penetration mm	CBR Values %	
	TOP	BASE
2.5	5.8	3.7
5	5.2	4.3

Surcharge applied	kg	5
	kPa	3

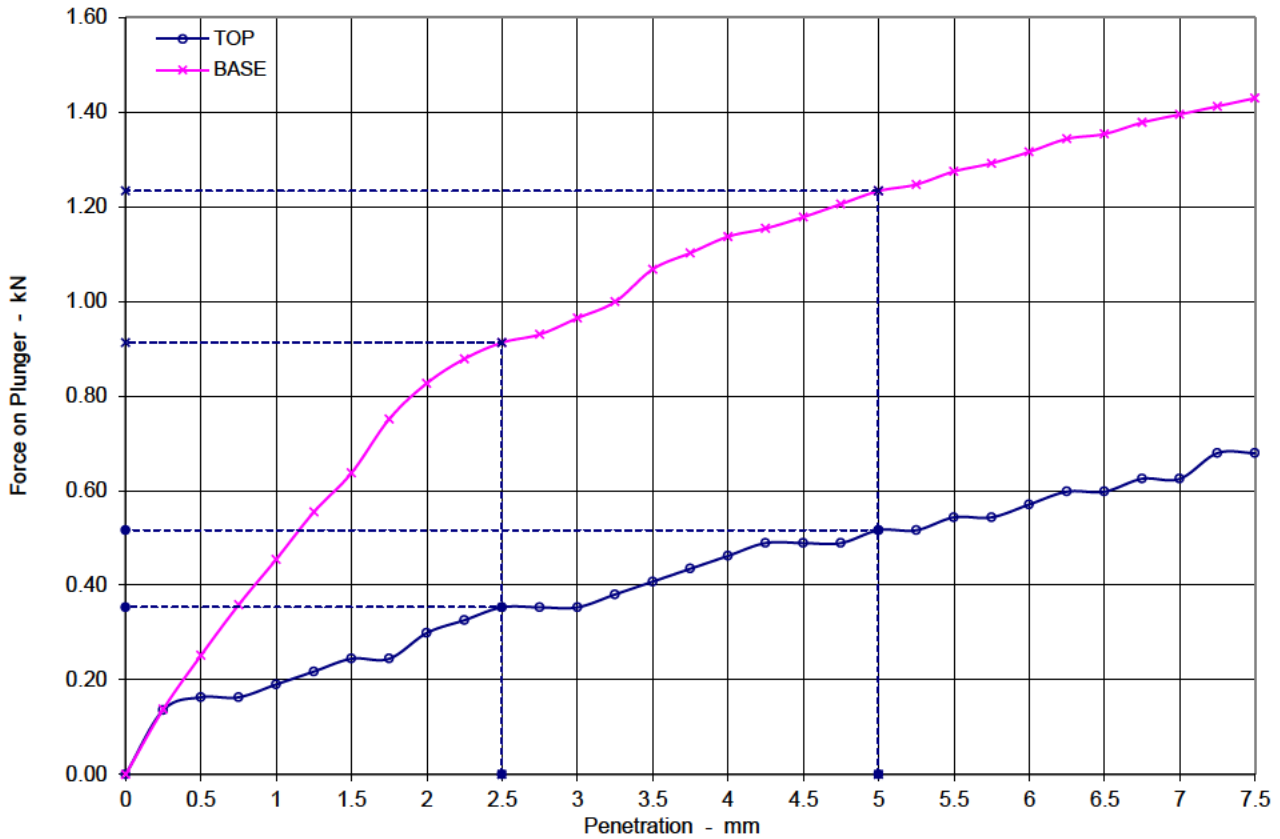
Notes :

Accepted CBR %	5.8	4.3
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QA Ref SLR 4.7 Rev 2.8 Mar 17	 SOCOTEC	Project No	A8013-18	Figure	CBR
		Project Name	A1 ALNWICK TO ELLINGHAM		
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California Bearing Ratio (BS1377:1990:Part 4 , section 7)

Sample Details:	SAMPLE ID:	Hole No	TP/17/23
	A8013-1820180924104009	Sample Depth (m)	1.40 - 2.00
		Sample Type and No	B6
		Specimen Ref	1



Soil description: Brown slightly sandy slightly gravelly CLAY.

Test Conditions		
Sample Retained on 20 mm sieve	%	2

Sample Conditions		
Initial Moisture Content	%	18.0
Bulk Density	Mg/m ³	2.11
Dry Density	Mg/m ³	1.79
Moisture Content - TOP	%	19.0
Moisture Content - BASE	%	17.0


Method of Compaction		
Recompacted - Rammer compaction with specified effort (2.5kg)		
Soaked test		NO
Soaking Period	days	N/A
Amount of Swell	mm	N/A

Penetration mm	CBR Values %	
	TOP	BASE
2.5	2.7	6.9
5	2.6	6.2

Surcharge applied	kg	5
	kPa	3

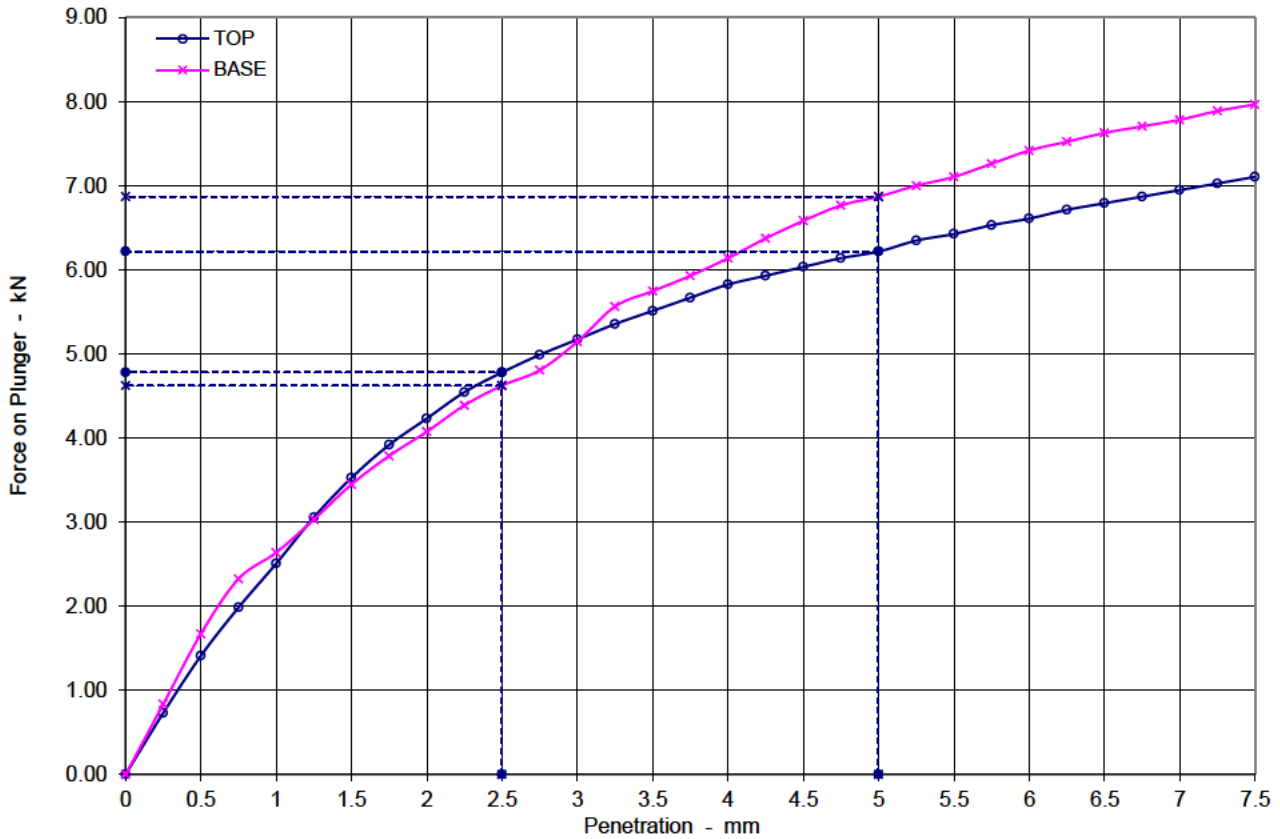
Notes :

Accepted CBR %	2.7	6.9
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QA Ref SLR 4.7 Rev 2.8 Mar 17	 SOCOTEC	Project No	A8013-18	Figure	CBR
		Project Name	A1 ALNWICK TO ELLINGHAM		
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California Bearing Ratio (BS1377:1990:Part 4 , section 7)

Sample Details:	SAMPLE ID:	Hole No	TP/17/24
	A8013-1820180919121057	Sample Depth (m)	0.40 - 1.00
		Sample Type and No	B3
		Specimen Ref	1



Soil description: Brown slightly sandy slightly gravelly CLAY with occasional rootlets.

Test Conditions		
Sample Retained on 20 mm sieve	%	1

Sample Conditions		
Initial Moisture Content	%	10.0
Bulk Density	Mg/m³	1.91
Dry Density	Mg/m³	1.73
Moisture Content - TOP	%	12.0
Moisture Content - BASE	%	11.0

Method of Compaction		
Recompacted - Rammer compaction with specified effort (2.5kg)		
Soaked test		NO
Soaking Period	days	N/A
Amount of Swell	mm	N/A

Penetration mm	CBR Values %	
	TOP	BASE
2.5	36.0	35.0
5	31.0	34.0

Surcharge applied	kg	5
	kPa	3

Notes :

Accepted CBR %	36.0	35.0
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Project No: A8013-18
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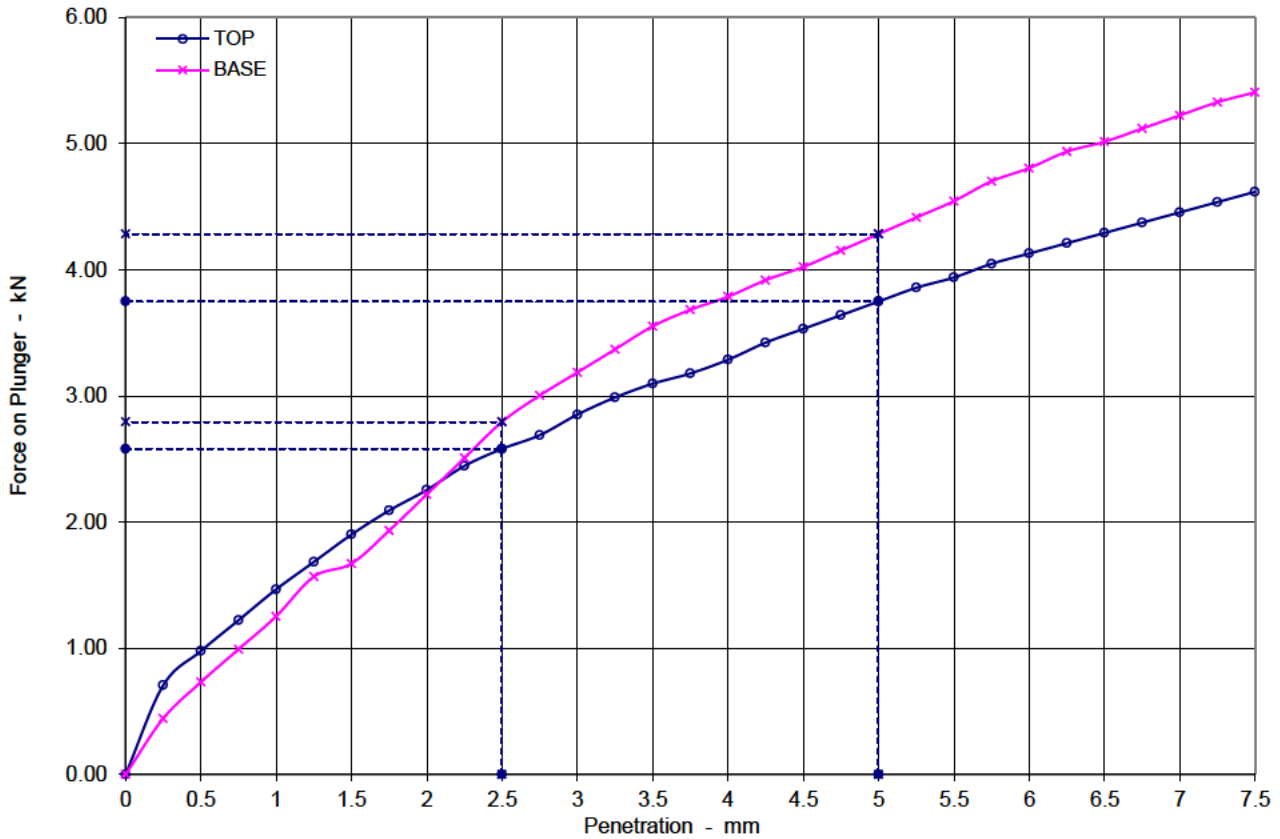
Figure
CBR

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California Bearing Ratio (BS1377:1990:Part 4 , section 7)

Sample Details:	SAMPLE ID:	Hole No	TP/17/29
	A8013-1820180924105147	Sample Depth (m)	0.20 - 1.00
		Sample Type and No	B3
		Specimen Ref	1



Soil description	Brown slightly gravelly sandy CLAY.
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Test Conditions		
Sample Retained on 20 mm sieve	%	1

Sample Conditions		
Initial Moisture Content	%	19.0
Bulk Density	Mg/m ³	1.99
Dry Density	Mg/m ³	1.68
Moisture Content - TOP	%	22.0
Moisture Content - BASE	%	19.0


Method of Compaction		
Recompacted - Rammer compaction with specified effort (2.5kg)		
Soaked test		NO
Soaking Period	days	N/A
Amount of Swell	mm	N/A

Penetration mm	CBR Values %	
	TOP	BASE
2.5	20.0	21.0
5	19.0	21.0

Surcharge applied	kg	5
	kPa	3

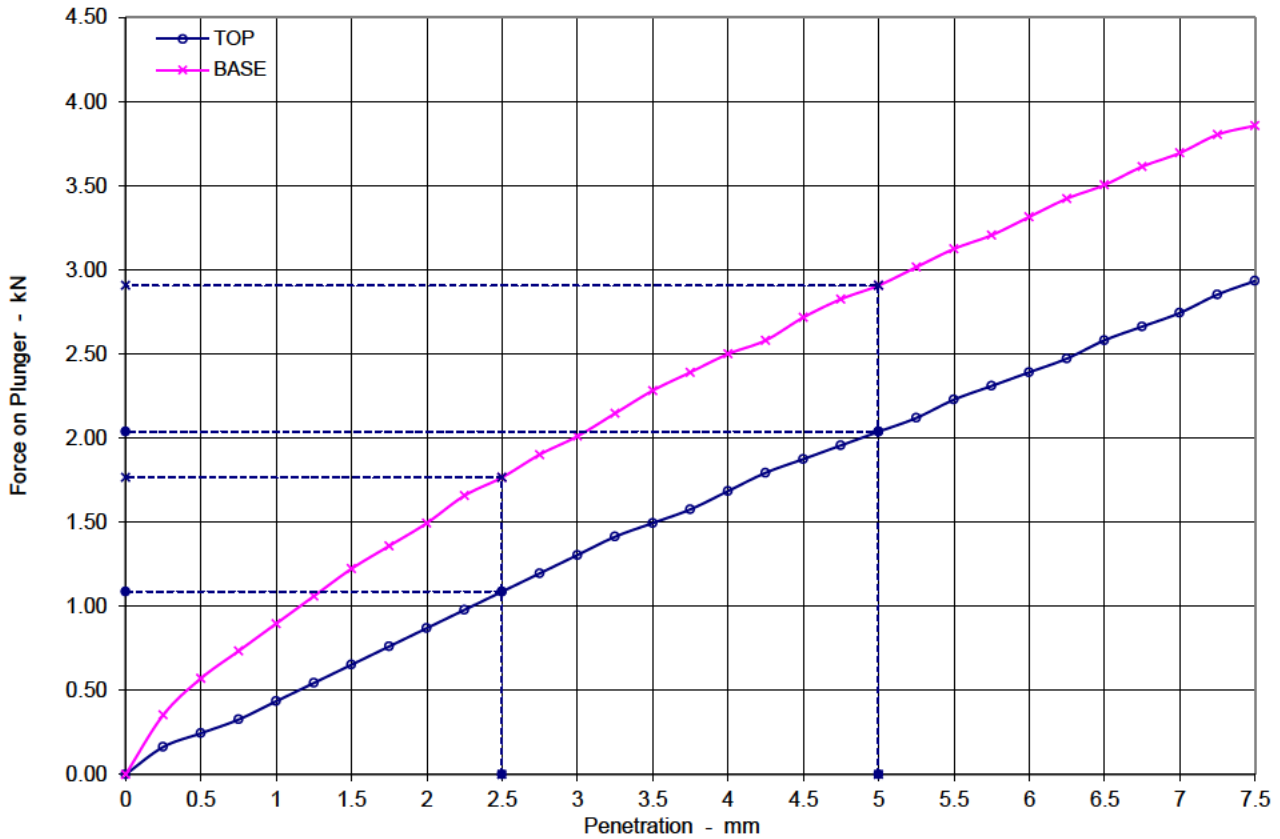
Notes :

Accepted CBR %	20.0	21.0
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QA Ref SLR 4.7 Rev 2.8 Mar 17	 SOCOTEC	Project No	A8013-18	Figure	CBR
		Project Name	A1 ALNWICK TO ELLINGHAM		
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California Bearing Ratio (BS1377:1990:Part 4 , section 7)

Sample Details:	SAMPLE ID:	Hole No	TP/17/35
	A8013-1820180730112356	Sample Depth (m)	1.00 - 1.20
		Sample Type and No	B1
		Specimen Ref	1



Soil description: Brown slightly sandy slightly gravelly CLAY with occasional rootlets.

Test Conditions		
Sample Retained on 20 mm sieve	%	30

Sample Conditions		
Initial Moisture Content	%	13.0
Bulk Density	Mg/m ³	2.08
Dry Density	Mg/m ³	1.84
Moisture Content - TOP	%	17.0
Moisture Content - BASE	%	17.0


Method of Compaction		
Recompacted - Rammer compaction with specified effort (2.5kg)		
Soaked test		NO
Soaking Period	days	N/A
Amount of Swell	mm	N/A

Penetration mm	CBR Values %	
	TOP	BASE
2.5	8.2	13.0
5	10.0	15.0

Surcharge applied	kg	5
	kPa	3

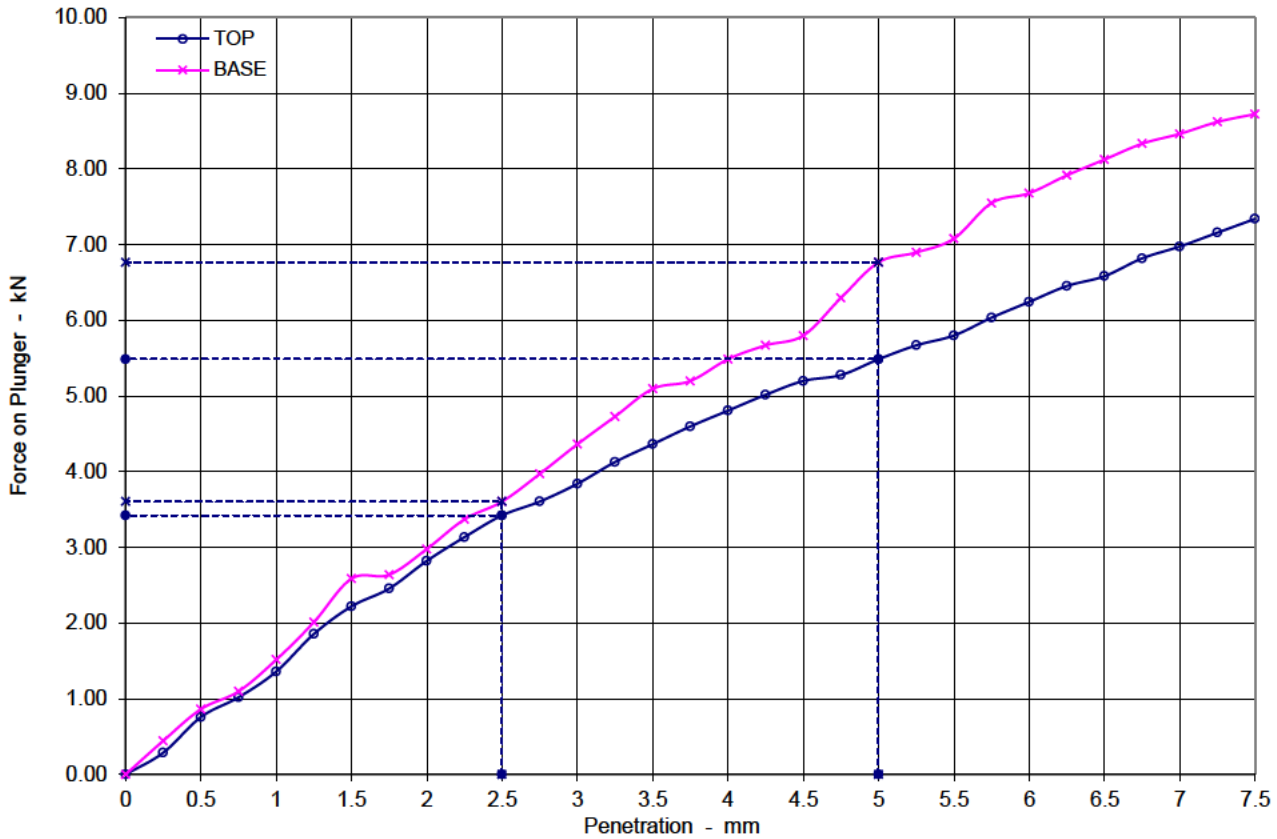
Notes :

Accepted CBR %	10.0	15.0
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QA Ref SLR 4.7 Rev 2.8 Mar 17	 SOCOTEC	Project No	A8013-18	Figure	CBR
		Project Name	A1 ALNWICK TO ELLINGHAM		
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California Bearing Ratio (BS1377:1990:Part 4 , section 7)

Sample Details:	SAMPLE ID:	Hole No	TP/17/36
	A8013-1820180924023108	Sample Depth (m)	0.70 - 1.20
		Sample Type and No	B6
		Specimen Ref	1



Soil description: Brown slightly sandy slightly gravelly CLAY with occasional rootlets.

Test Conditions		
Sample Retained on 20 mm sieve	%	8

Sample Conditions		
Initial Moisture Content	%	13.0
Bulk Density	Mg/m ³	2.01
Dry Density	Mg/m ³	1.78
Moisture Content - TOP	%	12.0
Moisture Content - BASE	%	12.0


Method of Compaction		
Recompacted - Rammer compaction with specified effort (2.5kg)		
Soaked test		NO
Soaking Period	days	N/A
Amount of Swell	mm	N/A

Penetration mm	CBR Values %	
	TOP	BASE
2.5	26.0	27.0
5	27.0	34.0

Surcharge applied	kg	5
	kPa	3

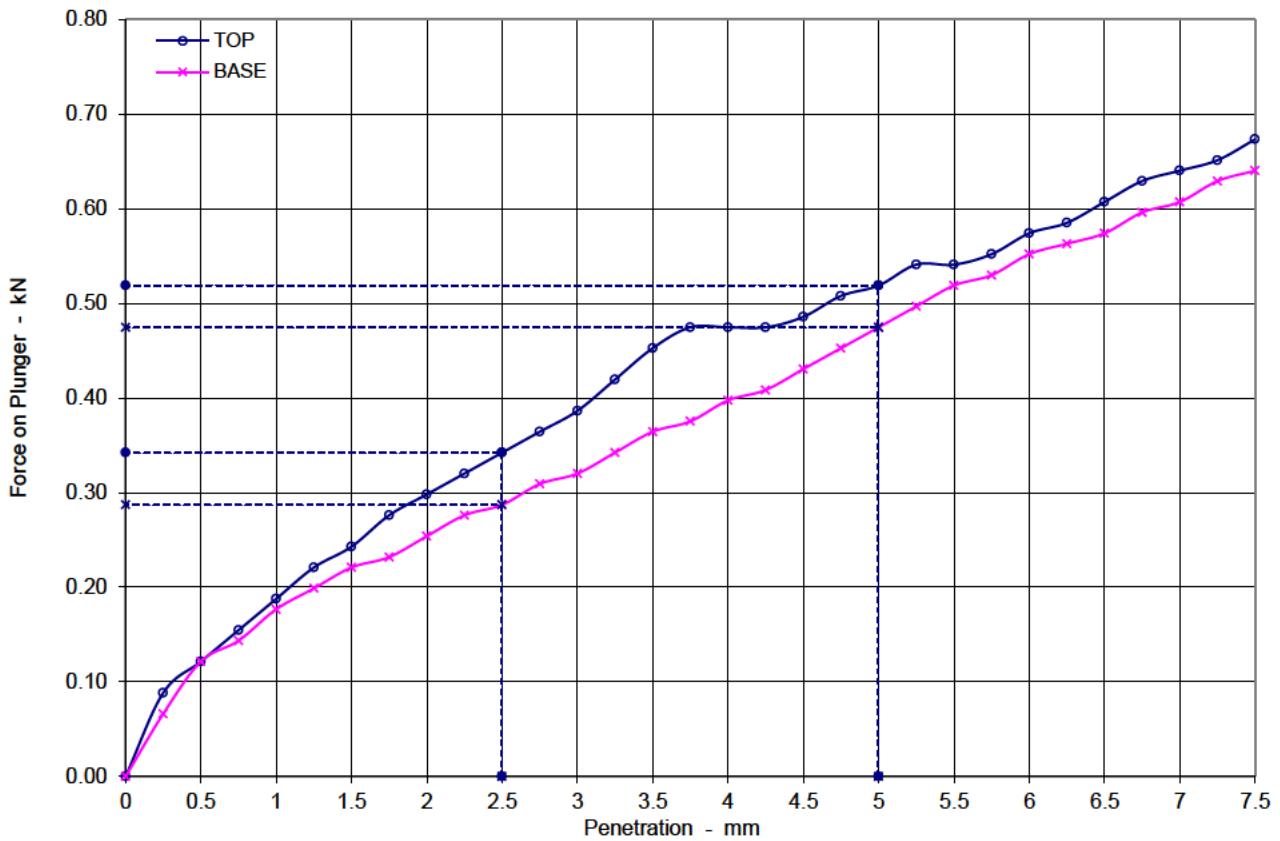
Notes :

Accepted CBR %	27.0	34.0
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QA Ref SLR 4.7 Rev 2.8 Mar 17	 SOCOTEC	Project No	A8013-18	Figure	CBR
		Project Name	A1 ALNWICK TO ELLINGHAM		
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California Bearing Ratio (BS1377:1990:Part 4 , section 7)

Sample Details:	SAMPLE ID:	Hole No	TP/17/39
	A8013-18-20180925075811	Sample Depth (m)	1.60 - 2.00
		Sample Type and No	B7
		Specimen Ref	1



Soil description: Brown slightly sandy slightly gravelly CLAY with one cobble.

Test Conditions		
Sample Retained on 20 mm sieve	%	25

Sample Conditions		
Initial Moisture Content	%	29.0
Bulk Density	Mg/m³	1.90
Dry Density	Mg/m³	1.47
Moisture Content - TOP	%	29.0
Moisture Content - BASE	%	28.0


Method of Compaction		
Recompacted - Rammer compaction with specified effort (2.5kg)		
Preparation	Soaked test	NO
	Soaking Period	days N/A
	Amount of Swell	mm N/A

Penetration mm	CBR Values %	
	TOP	BASE
2.5	2.6	2.2
5	2.6	2.4

Surcharge applied	kg	5
	kPa	3

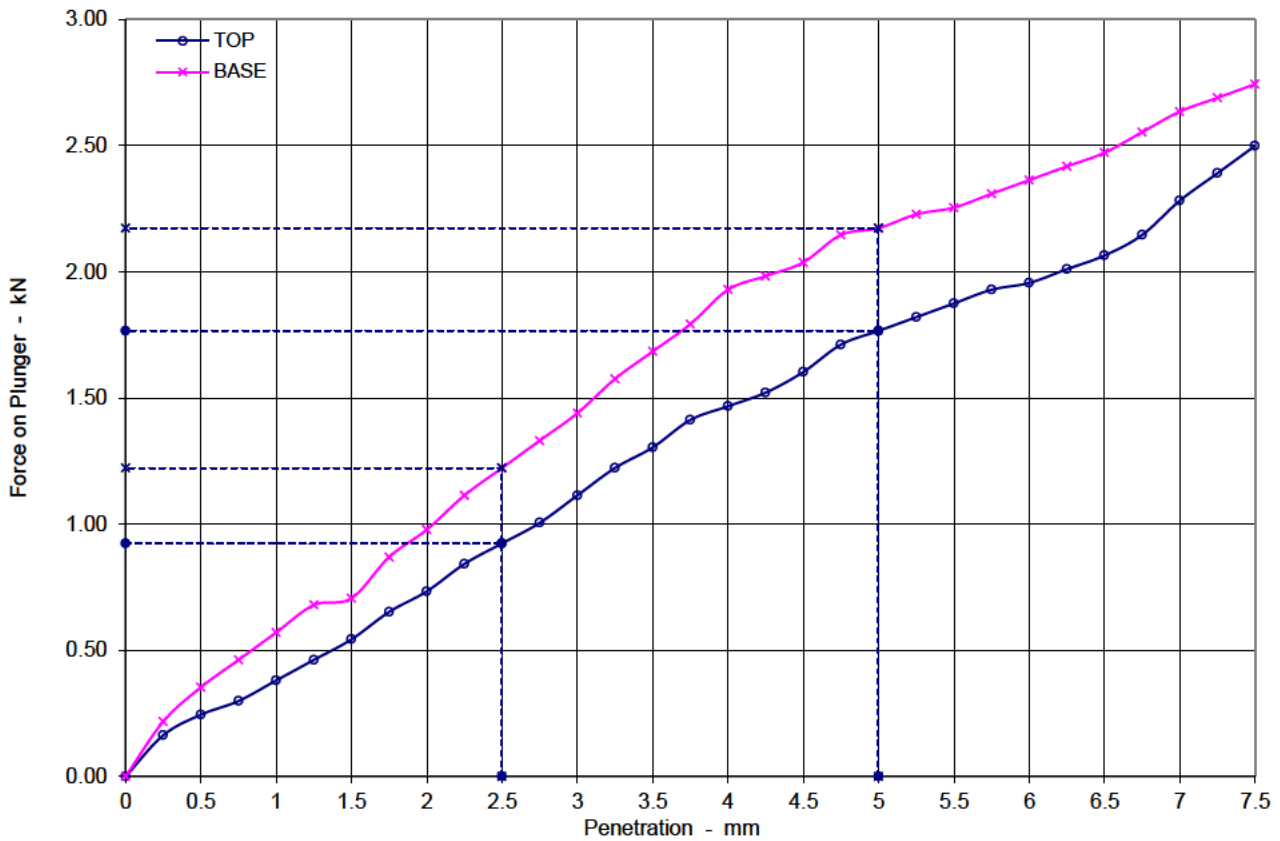
Notes :

Accepted CBR %	2.6	2.4
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QA Ref SLR 4.7 Rev 2.8 Mar 17	 SOCOTEC	Project No	A8013-18	Figure	CBR
		Project Name	A1 ALNWICK TO ELLINGHAM		
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California Bearing Ratio (BS1377:1990:Part 4 , section 7)

Sample Details:	SAMPLE ID:	Hole No	TP/17/40
	A8013-1820180917112040	Sample Depth (m)	0.50 - 0.80
		Sample Type and No	B4
		Specimen Ref	1



Soil description	Brown slightly gravelly SAND.
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Test Conditions		
Sample Retained on 20 mm sieve	%	0

Sample Conditions		
Initial Moisture Content	%	14.0
Bulk Density	Mg/m ³	1.96
Dry Density	Mg/m ³	1.72
Moisture Content - TOP	%	14.0
Moisture Content - BASE	%	13.0


Method of Compaction		
Recompacted - Rammer compaction with specified effort (2.5kg)		
Soaked test		NO
Soaking Period	days	N/A
Amount of Swell	mm	N/A

Penetration mm	CBR Values %	
	TOP	BASE
2.5	7.0	9.3
5	8.8	11.0

Surcharge applied	kg	5
	kPa	3

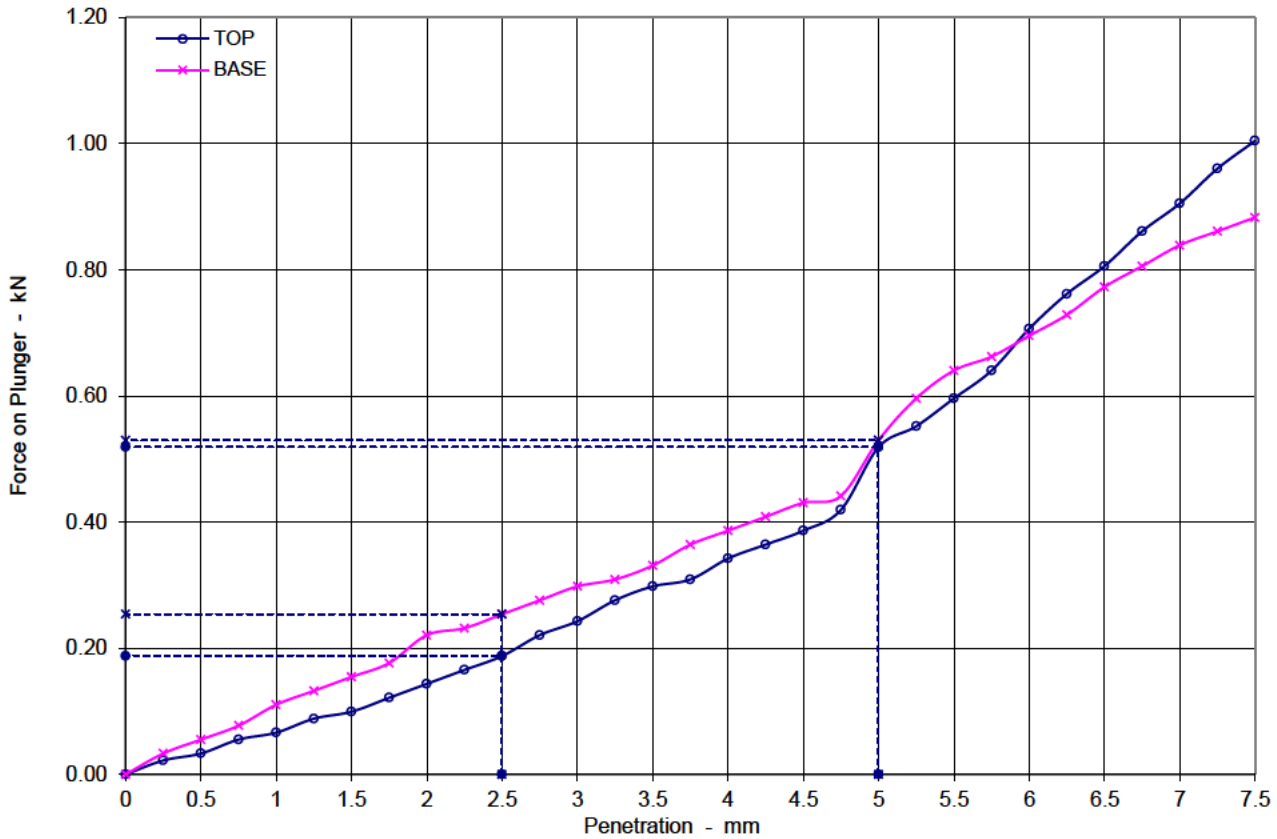
Notes :

Accepted CBR %	8.8	11.0
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QA Ref SLR 4.7 Rev 2.8 Mar 17	 SOCOTEC	Project No	A8013-18	Figure	CBR
		Project Name	A1 ALNWICK TO ELLINGHAM		
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California Bearing Ratio (BS1377:1990:Part 4 , section 7)

Sample Details:	SAMPLE ID:	Hole No	TP/17/41
	A8013-1820180917100929	Sample Depth (m)	0.10 - 0.40
		Sample Type and No	B3
		Specimen Ref	1



Soil description: Dark brown slightly gravelly sandy CLAY.

Test Conditions		
Sample Retained on 20 mm sieve	%	0

Sample Conditions		
Initial Moisture Content	%	19.0
Bulk Density	Mg/m ³	1.98
Dry Density	Mg/m ³	1.66
Moisture Content - TOP	%	19.0
Moisture Content - BASE	%	19.0


Method of Compaction		
Recompacted - Rammer compaction with specified effort (2.5kg)		
Soaked test		NO
Soaking Period	days	N/A
Amount of Swell	mm	N/A

Penetration mm	CBR Values %	
	TOP	BASE
2.5	1.4	1.9
5	2.6	2.6

Surcharge applied	kg	5
	kPa	3

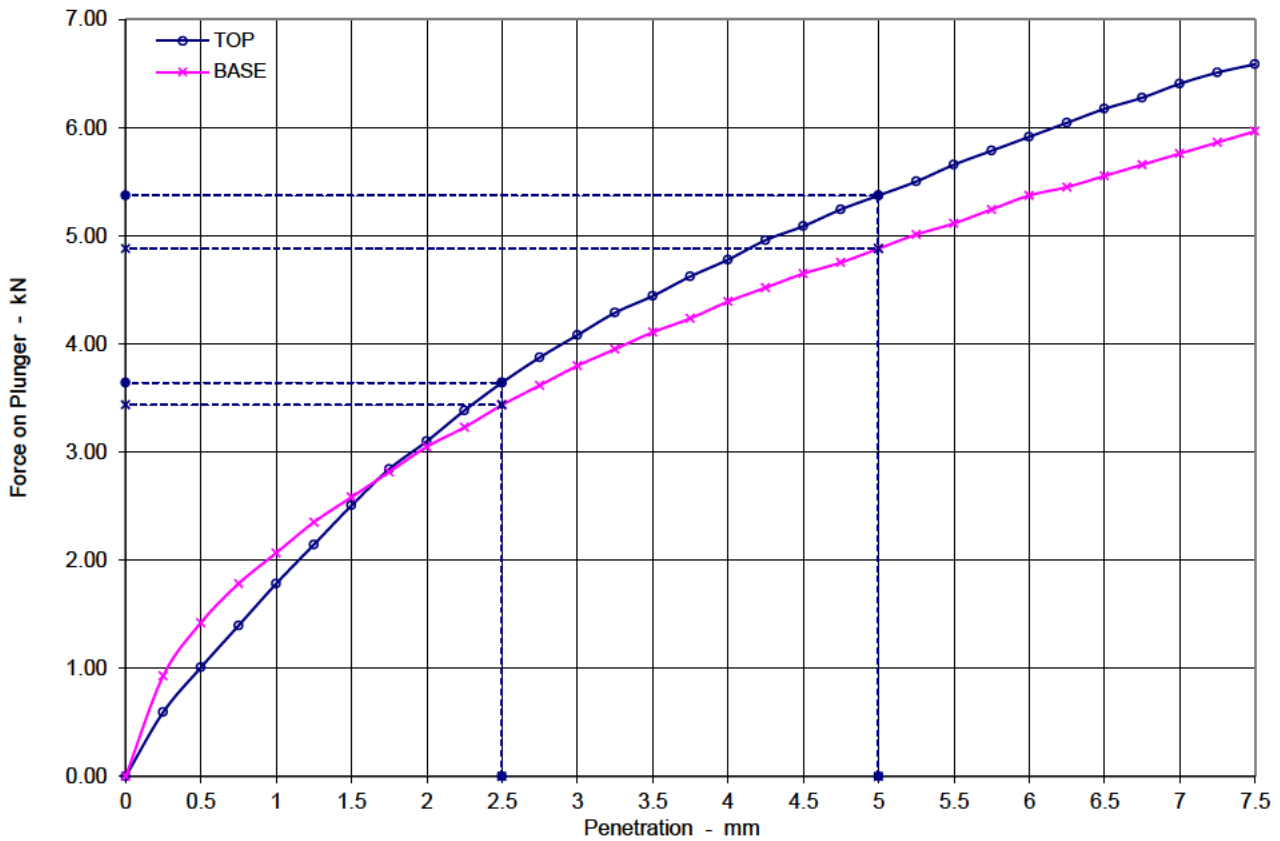
Notes :

Accepted CBR %	2.6	2.6
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QA Ref SLR 4.7 Rev 2.8 Mar 17	 SOCOTEC	Project No	A8013-18	Figure	CBR
		Project Name	A1 ALNWICK TO ELLINGHAM		
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California Bearing Ratio (BS1377:1990:Part 4 , section 7)

Sample Details:	SAMPLE ID:	Hole No	TP/17/42
	A8013-1820180917114149	Sample Depth (m)	0.40 - 0.60
		Sample Type and No	B4
		Specimen Ref	1



Soil description: Brown slightly sandy slightly gravelly CLAY with occasional rootlets.

Test Conditions		
Sample Retained on 20 mm sieve	%	3

Sample Conditions		
Initial Moisture Content	%	14.0
Bulk Density	Mg/m ³	1.99
Dry Density	Mg/m ³	1.75
Moisture Content - TOP	%	13.0
Moisture Content - BASE	%	13.0


Method of Compaction		
Recompacted - Rammer compaction with specified effort (2.5kg)		
Soaked test		NO
Soaking Period	days	N/A
Amount of Swell	mm	N/A

Penetration mm	CBR Values %	
	TOP	BASE
2.5	28.0	26.0
5	27.0	24.0

Surcharge applied	kg	5
	kPa	3

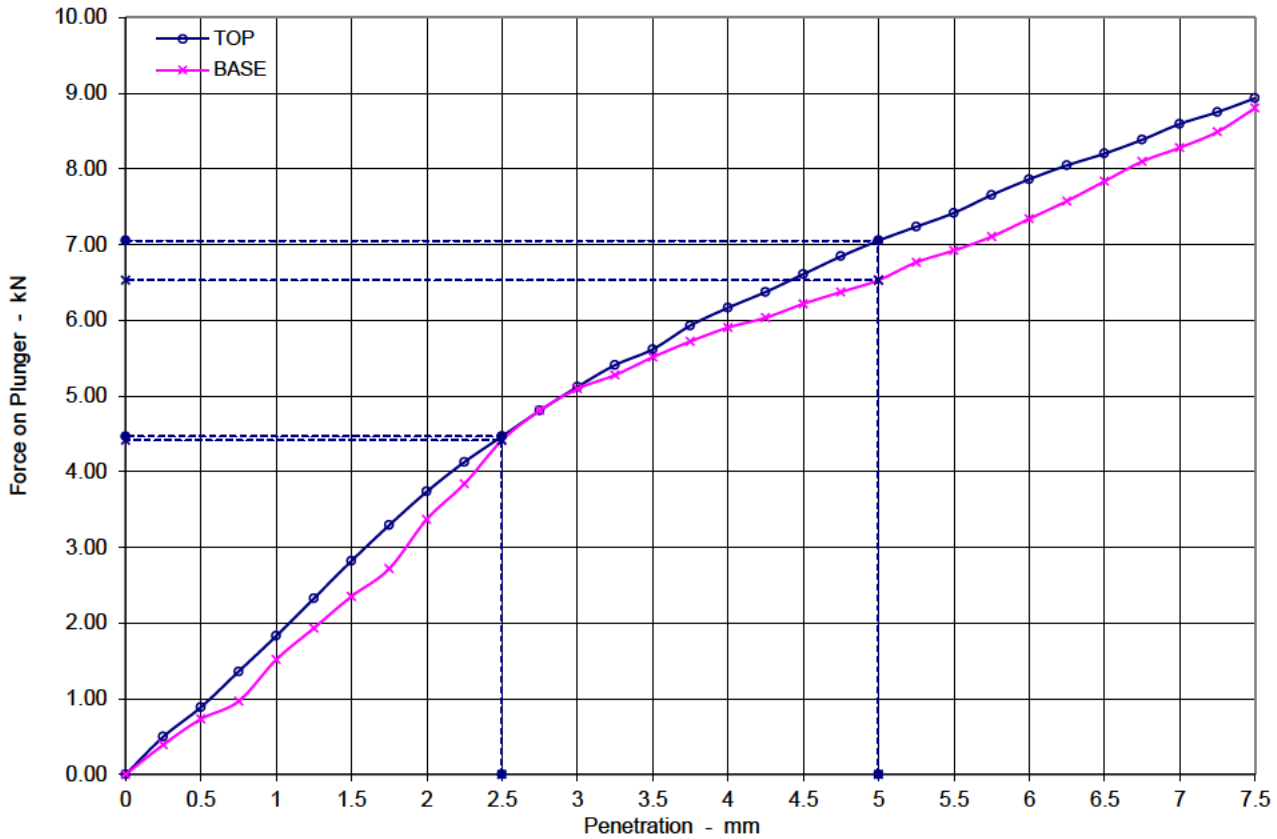
Notes :

Accepted CBR %	28.0	26.0
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QA Ref SLR 4.7 Rev 2.8 Mar 17	 SOCOTEC	Project No	A8013-18	Figure	CBR
		Project Name	A1 ALNWICK TO ELLINGHAM		
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California Bearing Ratio (BS1377:1990:Part 4 , section 7)

Sample Details:	SAMPLE ID:	Hole No	TP/17/43
	A8013-1820180917095201	Sample Depth (m)	0.40 - 0.60
		Sample Type and No	B6
		Specimen Ref	1



Soil description: Brownish grey slightly sandy slightly gavelly silty CLAY with rare rootlets.

Test Conditions		
Sample Retained on 20 mm sieve	%	0

Sample Conditions		
Initial Moisture Content	%	10.0
Bulk Density	Mg/m ³	2.03
Dry Density	Mg/m ³	1.84
Moisture Content - TOP	%	9.8
Moisture Content - BASE	%	9.6

Method of Compaction		
Recompacted - Rammer compaction with specified effort (2.5kg)		
Soaked test		NO
Soaking Period	days	N/A
Amount of Swell	mm	N/A

Penetration mm	CBR Values %	
	TOP	BASE
2.5	34.0	33.0
5	35.0	33.0

Surcharge applied	kg	5
	kPa	3

Notes :

Accepted CBR %	35.0	33.0
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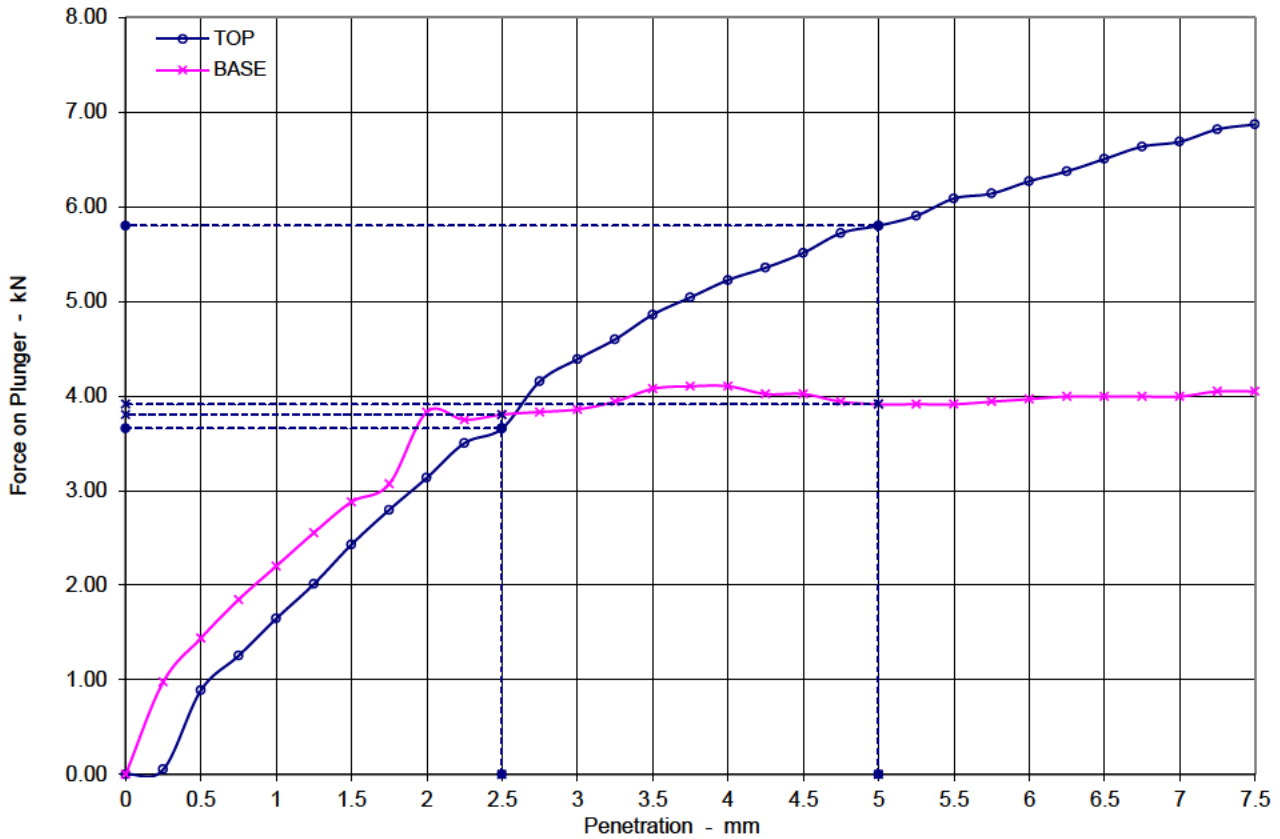
Figure
CBR

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California Bearing Ratio (BS1377:1990:Part 4 , section 7)

Sample Details:	SAMPLE ID:	Hole No	TP/17/45
	A8013-1820180917121321	Sample Depth (m)	0.35 - 0.70
		Sample Type and No	B6
		Specimen Ref	1



Soil description: Brown slightly sandy slightly gravelly CLAY.

Test Conditions		
Sample Retained on 20 mm sieve	%	3

Sample Conditions		
Initial Moisture Content	%	13.0
Bulk Density	Mg/m ³	2.02
Dry Density	Mg/m ³	1.79
Moisture Content - TOP	%	13.0
Moisture Content - BASE	%	13.0


Method of Compaction		
Recompacted - Rammer compaction with specified effort (2.5kg)		
Preparation	Soaked test	NO
	Soaking Period	days N/A
	Amount of Swell	mm N/A

Penetration mm	CBR Values %	
	TOP	BASE
2.5	28.0	29.0
5	29.0	20.0

Surcharge applied	kg	5
	kPa	3

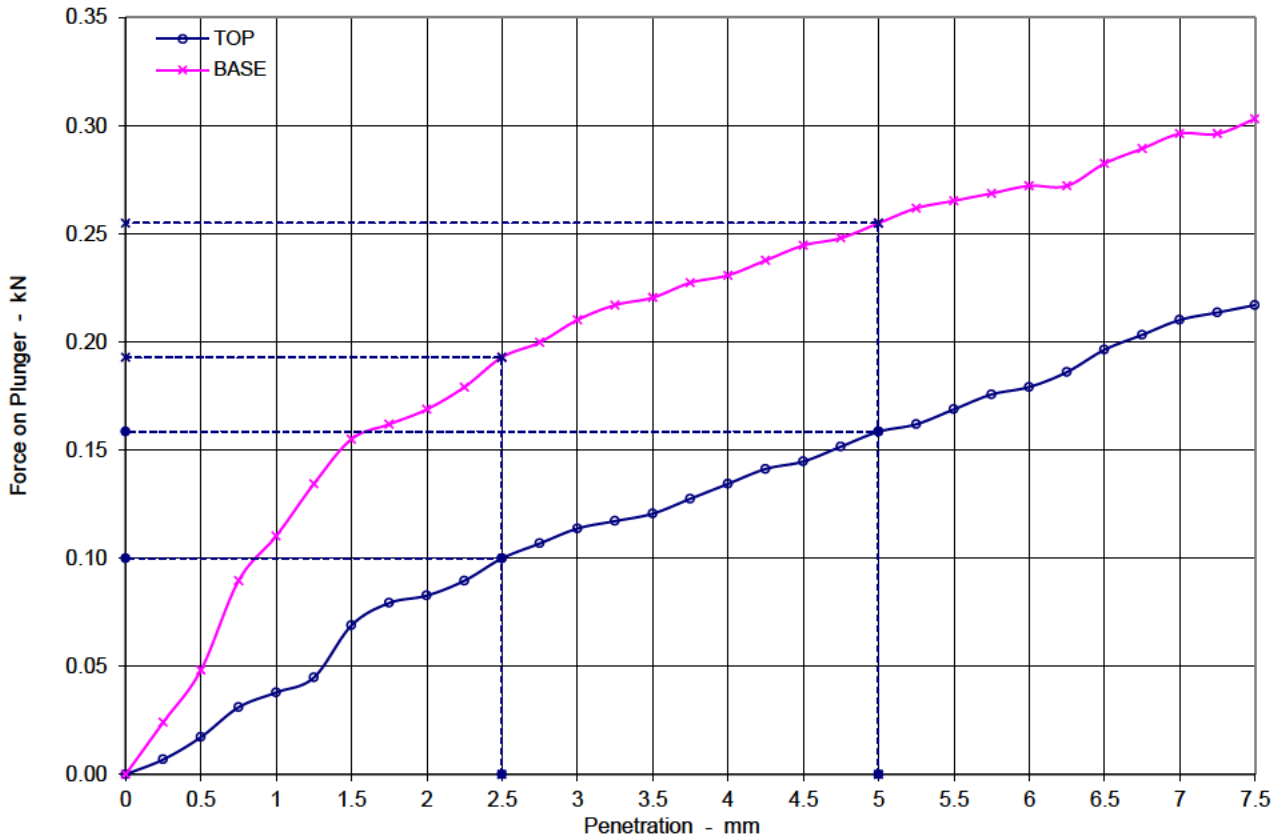
Notes :

Accepted CBR %	29.0	29.0
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QA Ref SLR 4.7 Rev 2.8 Mar 17	 SOCOTEC	Project No	A8013-18	Figure	CBR
		Project Name	A1 ALNWICK TO ELLINGHAM		
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California Bearing Ratio (BS1377:1990:Part 4 , section 7)

Sample Details:	SAMPLE ID:	Hole No	TP/17/46
	A8013-1820180917123805	Sample Depth (m)	0.30 - 0.60
		Sample Type and No	B5
		Specimen Ref	1



Soil description: Brown slightly sandy slightly gravelly CLAY.

Test Conditions		
Sample Retained on 20 mm sieve	%	1

Sample Conditions		
Initial Moisture Content	%	22.0
Bulk Density	Mg/m ³	2.03
Dry Density	Mg/m ³	1.66
Moisture Content - TOP	%	23.0
Moisture Content - BASE	%	23.0


Method of Compaction		
Recompacted - Rammer compaction with specified effort (2.5kg)		
Soaked test		NO
Soaking Period	days	N/A
Amount of Swell	mm	N/A

Penetration mm	CBR Values %	
	TOP	BASE
2.5	0.8	1.5
5	0.8	1.3

Surcharge applied	kg	5
	kPa	3

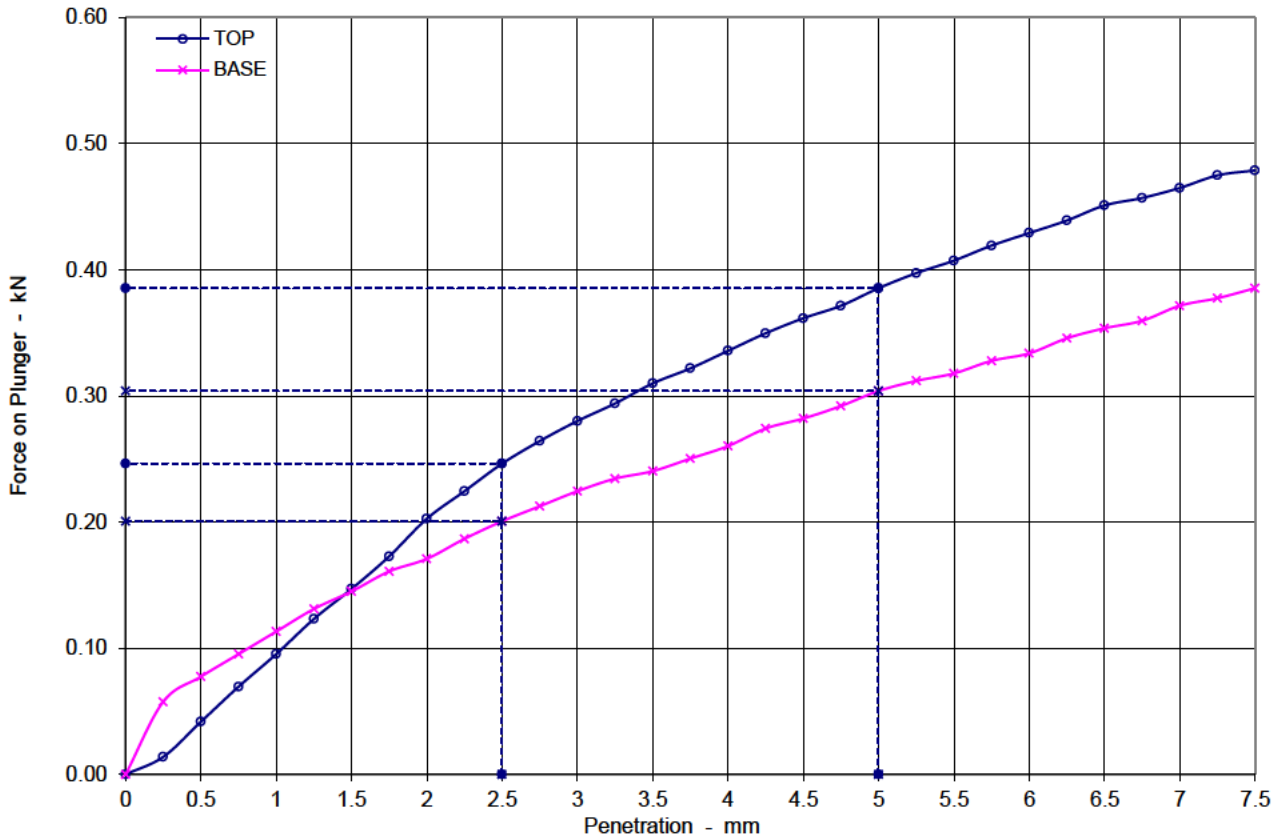
Notes :

Accepted CBR %	0.8	1.5
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QA Ref SLR 4.7 Rev 2.8 Mar 17	 SOCOTEC	Project No	A8013-18	Figure	CBR
		Project Name	A1 ALNWICK TO ELLINGHAM		
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California Bearing Ratio (BS1377:1990:Part 4 , section 7)

Sample Details:	SAMPLE ID:	Hole No	TP/17/47
	A8013-1820180730113014	Sample Depth (m)	0.80 - 1.00
		Sample Type and No	B1
		Specimen Ref	1



Soil description	Greyish brown slightly sandy slightly gravelly CLAY.
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Test Conditions		
Sample Retained on 20 mm sieve	%	0

Sample Conditions		
Initial Moisture Content	%	19.0
Bulk Density	Mg/m ³	2.05
Dry Density	Mg/m ³	1.72
Moisture Content - TOP	%	19.0
Moisture Content - BASE	%	20.0

Method of Compaction		
Recompacted - Rammer compaction with specified effort (2.5kg)		
Preparation	Soaked test	NO
	Soaking Period	days N/A
	Amount of Swell	mm N/A

Penetration mm	CBR Values %	
	TOP	BASE
2.5	1.9	1.5
5	1.9	1.5

Surcharge applied	kg	
	kPa	0

Notes :
Top and Base

Accepted CBR %	1.9	1.5
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Mar 17



Project No A8013-18
Project Name A1 ALNWICK TO ELLINGHAM

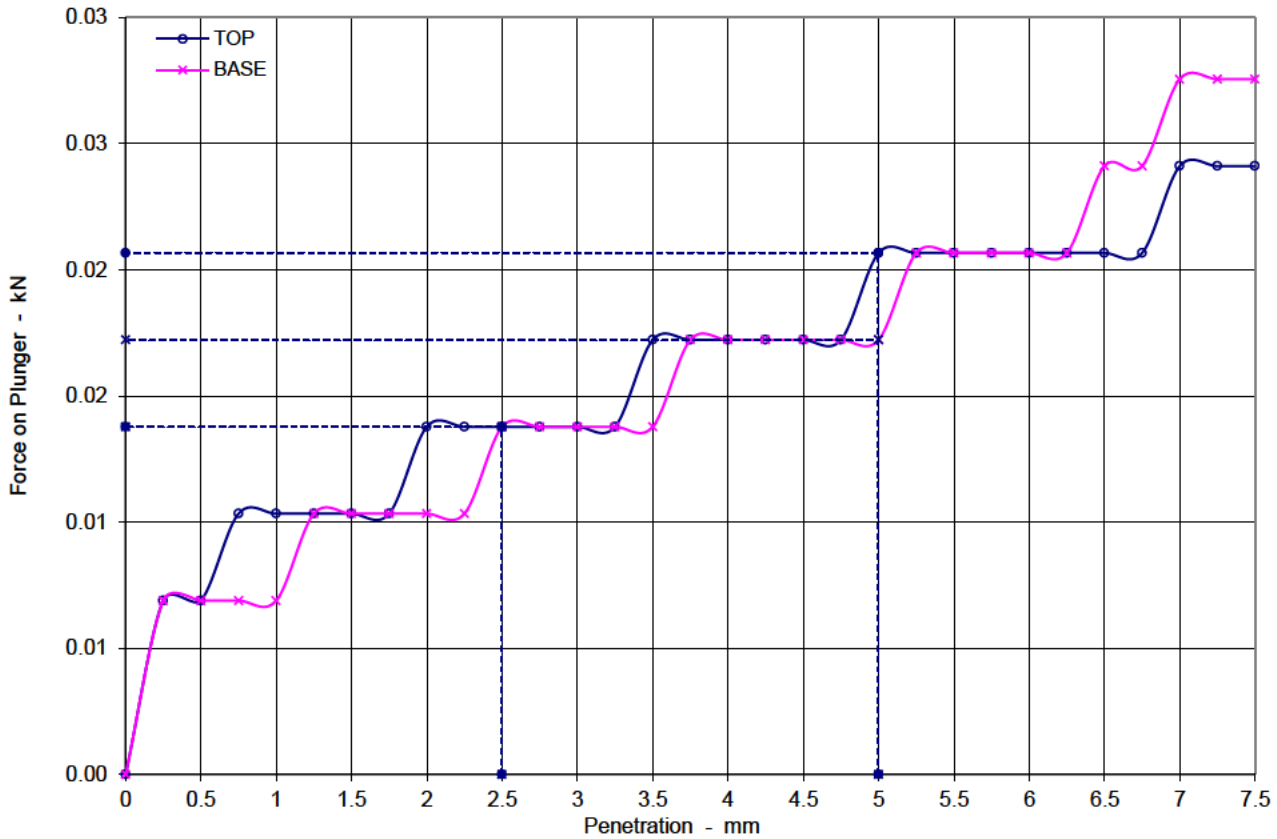
Figure
CBR

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California Bearing Ratio (BS1377:1990:Part 4 , section 7)

Sample Details:	SAMPLE ID:	Hole No	TP/17/47
	A8013-1820180730113019	Sample Depth (m)	1.20 - 1.40
		Sample Type and No	B2
		Specimen Ref	1



Soil description	Brown slightly gravelly very sandy CLAY.
------------------	--

Test Conditions		
Sample Retained on 20 mm sieve	%	10

Sample Conditions		
Initial Moisture Content	%	21.0
Bulk Density	Mg/m ³	2.09
Dry Density	Mg/m ³	1.73
Moisture Content - TOP	%	20.0
Moisture Content - BASE	%	20.0


Method of Compaction		
Recompacted - Rammer compaction with specified effort (2.5kg)		
Preparation	Soaked test	NO
	Soaking Period	days N/A
	Amount of Swell	mm N/A

Penetration mm	CBR Values %	
	TOP	BASE
2.5	0.1	0.1
5	0.1	0.1

Surcharge applied	kg	5
	kPa	3

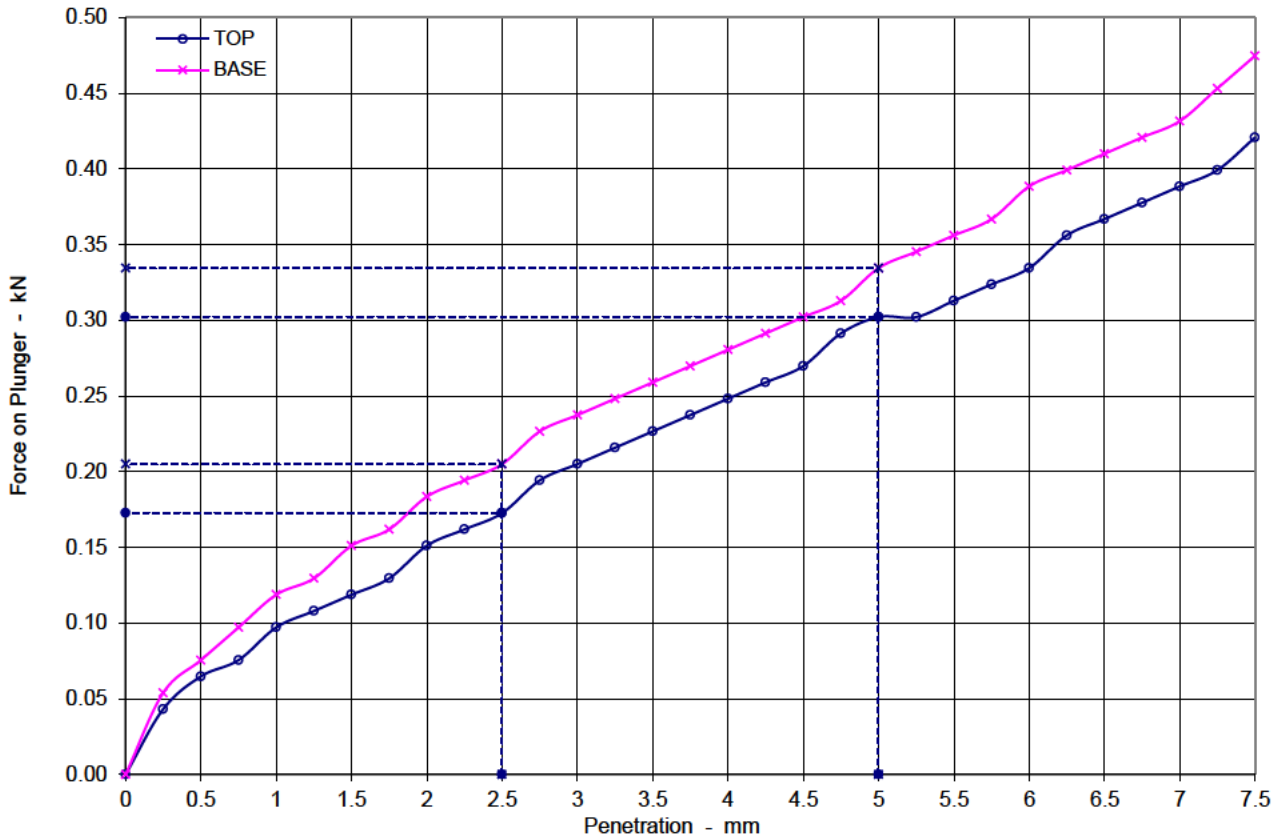
Notes :
Sample is Soft.

Accepted CBR %	0.1	0.1
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		Project Name	A1 ALNWICK TO ELLINGHAM		
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California Bearing Ratio (BS1377:1990:Part 4 , section 7)

Sample Details:	SAMPLE ID:	Hole No	TP/17/48
	A8013-1820180725113945	Sample Depth (m)	1.80 - 2.20
		Sample Type and No	B2
		Specimen Ref	1



Soil description: Greyish brown slightly sandy slightly gravelly CLAY.

Test Conditions		
Sample Retained on 20 mm sieve	%	7

Sample Conditions		
Initial Moisture Content	%	20.0
Bulk Density	Mg/m³	2.13
Dry Density	Mg/m³	1.78
Moisture Content - TOP	%	18.0
Moisture Content - BASE	%	18.0


Method of Compaction		
Recompacted - Rammer compaction with specified effort (4.5kg)		
Preparation	Soaked test	NO
	Soaking Period	days N/A
	Amount of Swell	mm N/A

Penetration mm	CBR Values %	
	TOP	BASE
2.5	1.3	1.6
5	1.5	1.7

Surcharge applied	kg	5
	kPa	3

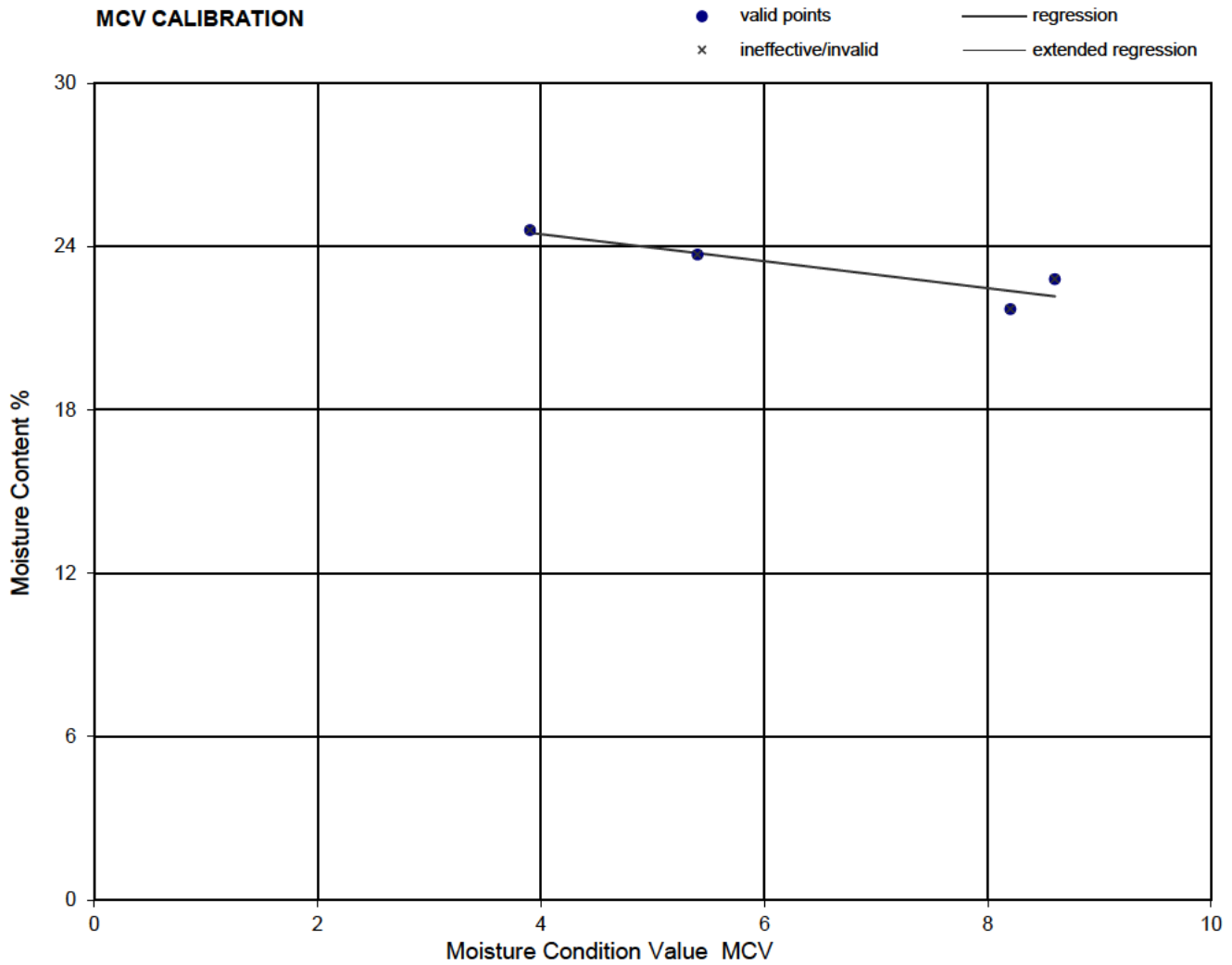
Notes :

Accepted CBR %	1.5	1.7
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QA Ref SLR 4.7 Rev 2.8 Mar 17	 SOCOTEC	Project No	A8013-18	Figure	CBR
		Project Name	A1 ALNWICK TO ELLINGHAM		
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MOISTURE CONDITION VALUE (MCV) / MOISTURE CONTENT

Sample Details:	SAMPLE ID:	Hole No	BH/17/03
	A8013-1820180910010738	Sample Depth (m BGL)	1.00 - 1.10
		Sample Type and No	B3
		Specimen Ref	



Characteristics of calibration line (determined using linear regression)	
Intercept	26.4
Slope	-0.50
Sensitivity (Change in MCV per 1% moisture content)	2.01
Correlation (proximity of test points to regression line)	-0.90
Method of interpretation of MCV	Steepest straight line

The above characteristics are NOT covered by UKAS accreditation to BS1377

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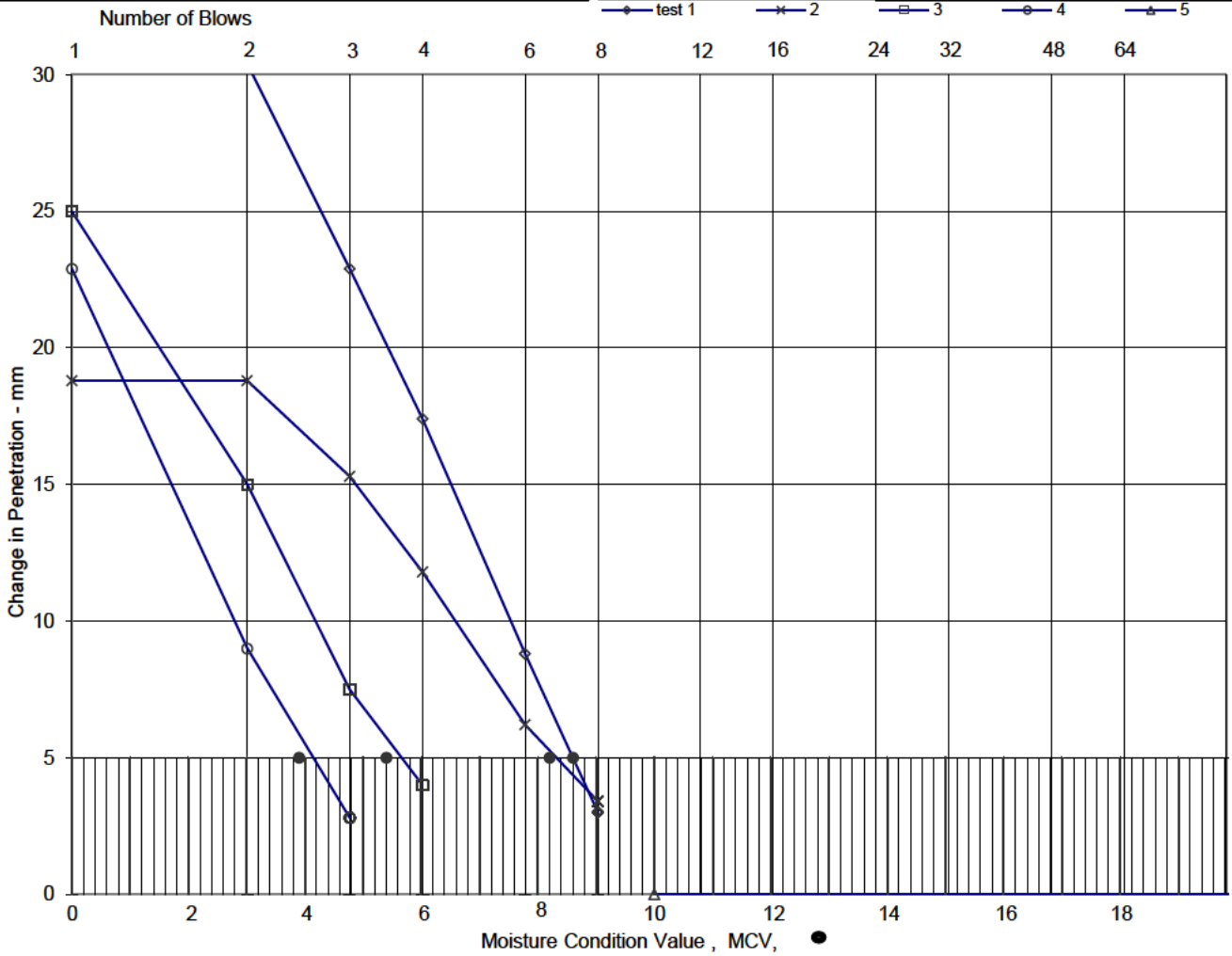
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Figure
MCVREL

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MOISTURE CONDITION VALUE (MCV) / MOISTURE CONTENT

Sample Details:	SAMPLE ID:	Hole No	BH/17/03
	A8013-1820180910010738	Sample Depth (m BGL)	1.00 - 1.10
		Sample Type and No	B3
		Specimen Ref	



Test No	* ineffective / invalid point	1	2	3	4	*
Moisture Condition Value		8.6	8.2	5.4	3.9	
Moisture Content	%	-2146826259.0	-2146826259.0	-2146826259.0	-2146826259.0	
Bulk density after test	Mg/m ³	1.70	1.71	1.67	1.66	
Dry density after test	Mg/m ³	1.38	1.41	1.35	1.33	

Soil description	Brown slightly sandy slightly gravelly CLAY with one cobble.
Procedure / Preparation	using single sample
Remarks	

Initial moisture content <20mm	22.8
Material retained on 20mm sieve	7

Method of determining MCV	Steepest straight line
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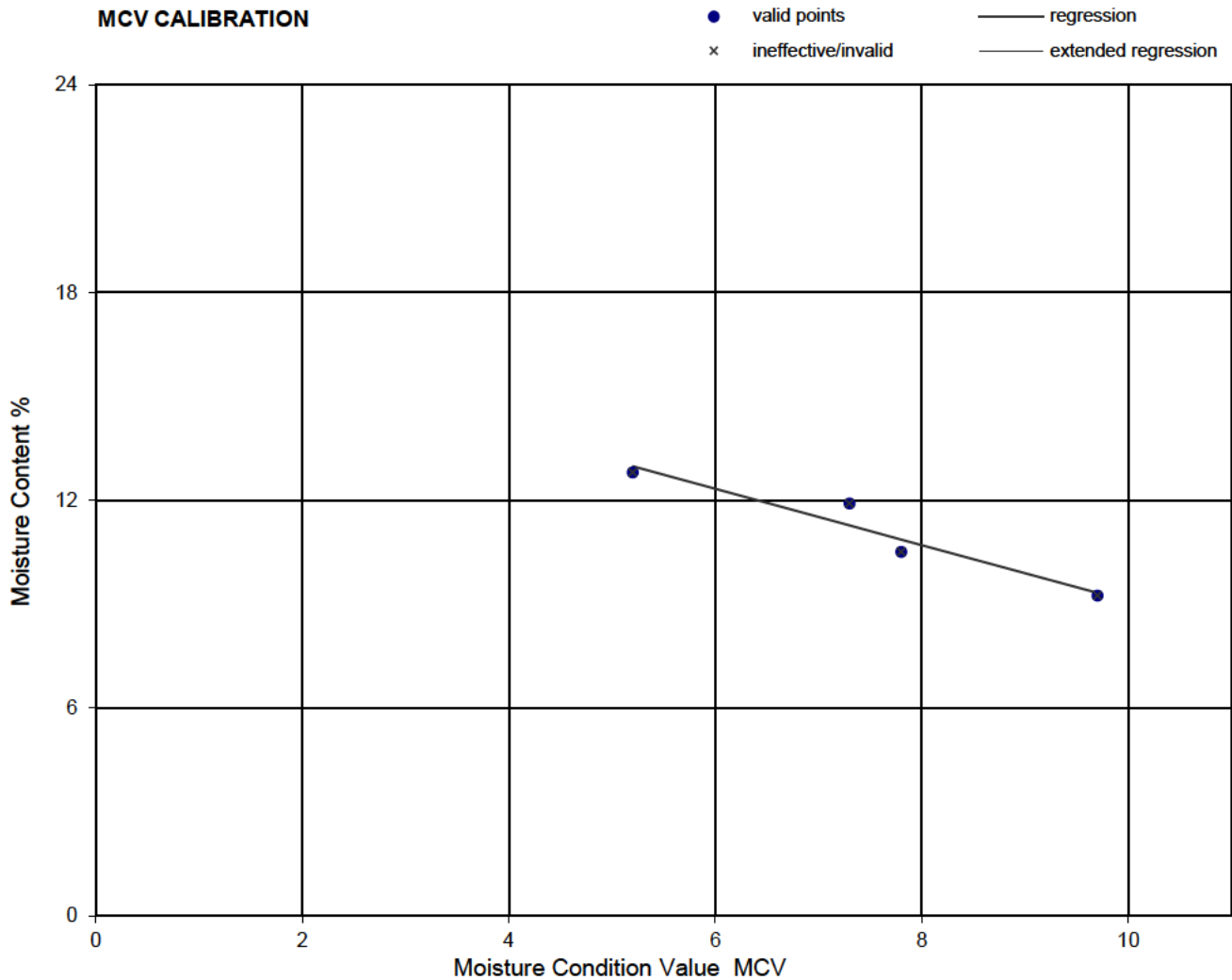
Figure
MCVREL

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MOISTURE CONDITION VALUE (MCV) / MOISTURE CONTENT

Sample Details:	SAMPLE ID:	Hole No	BH/17/03
	A8013-1820180910010830	Sample Depth (m BGL)	3.00 - 3.50
		Sample Type and No	B10
		Specimen Ref	



Characteristics of calibration line (determined using linear regression)	
Intercept	17.2
Slope	-0.81
Sensitivity (Change in MCV per 1% moisture content)	1.23
Correlation (proximity of test points to regression line)	-0.96
Method of interpretation of MCV	Steepest straight line

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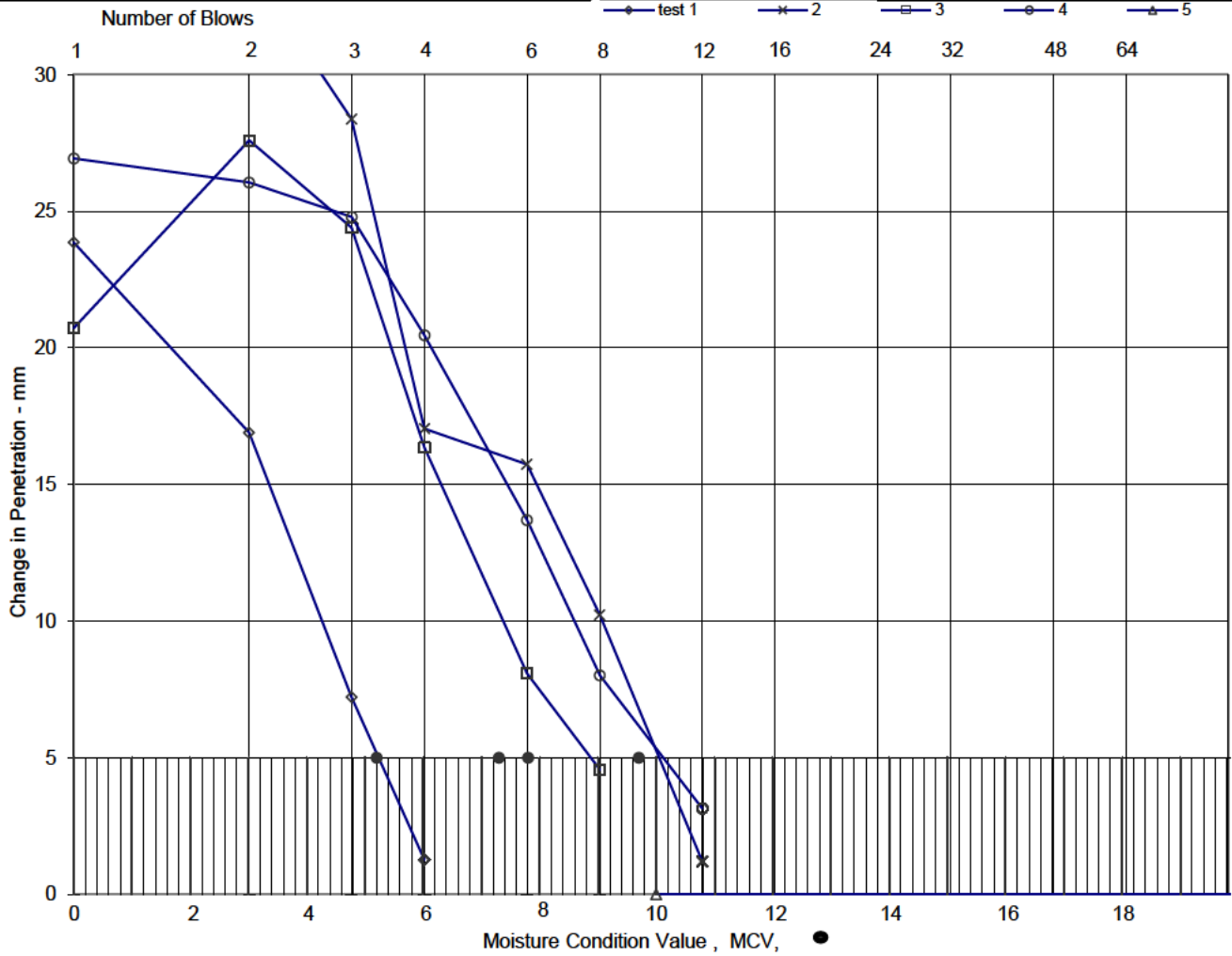
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Figure
MCVREL

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MOISTURE CONDITION VALUE (MCV) / MOISTURE CONTENT

Sample Details:	SAMPLE ID:	Hole No	BH/17/03
	A8013-1820180910010830	Sample Depth (m BGL)	3.00 - 3.50
		Sample Type and No	B10
		Specimen Ref	



Test No	* ineffective / invalid point	1	2	3	4	*
Moisture Condition Value		5.2	7.3	7.8	9.7	
Moisture Content	%	-2146826259.0	-2146826259.0	-2146826259.0	-2146826259.0	
Bulk density after test	Mg/m ³	1.98	1.94	1.68	1.68	
Dry density after test	Mg/m ³	1.76	1.73	1.52	1.54	

Soil description	Dark grey slightly sandy slightly gravelly CLAY.
Procedure / Preparation	using single sample
Remarks	

Initial moisture content <20mm	11
Material retained on 20mm sieve	0

Method of determining MCV	Steepest straight line
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Figure
MCVREL

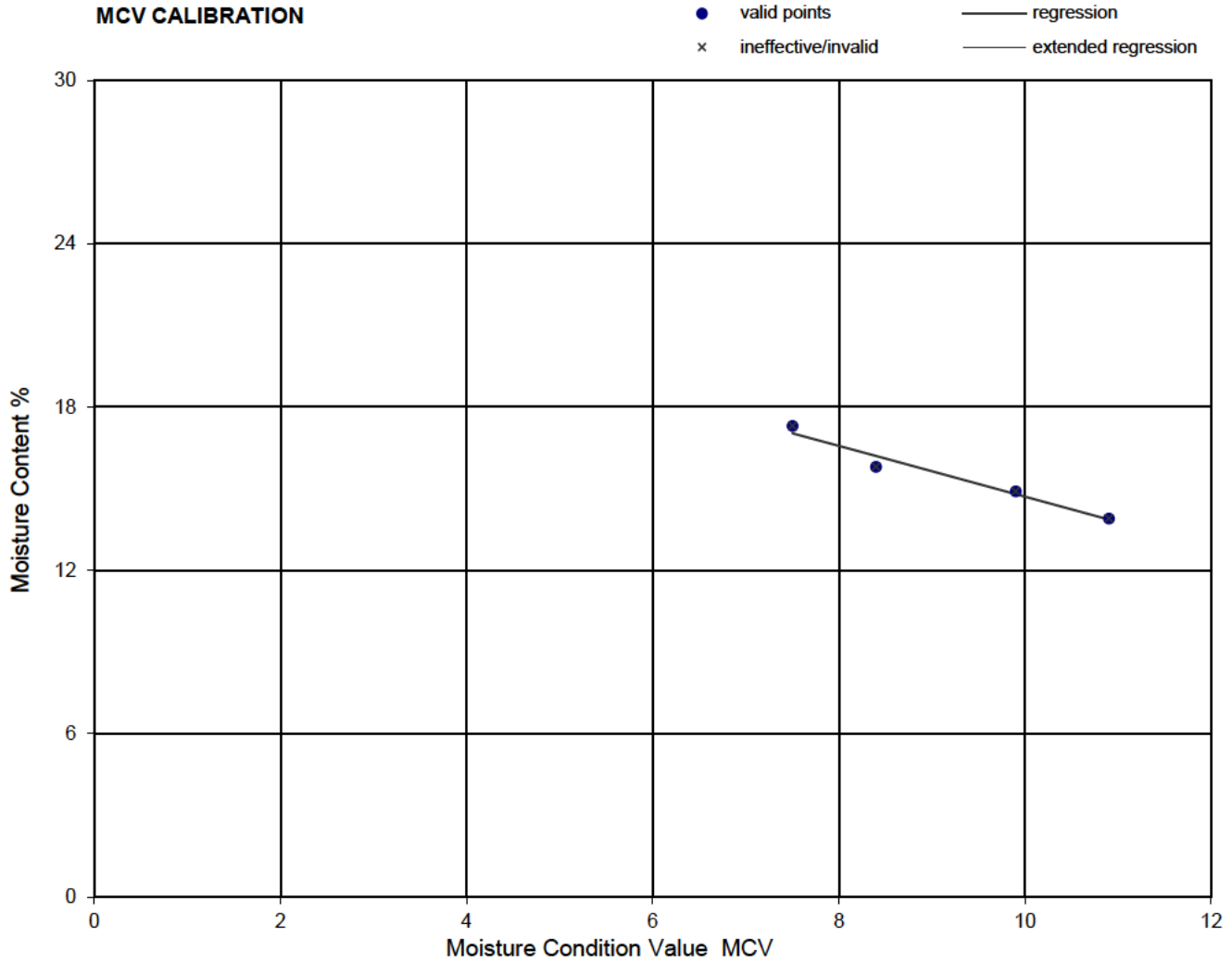
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MOISTURE CONDITION VALUE (MCV) / MOISTURE CONTENT

Sample Details:	SAMPLE ID:	Hole No	BH/17/04
	A8013-1820180910011235	Sample Depth (m BGL)	1.00 - 1.10
		Sample Type and No	B3
		Specimen Ref	



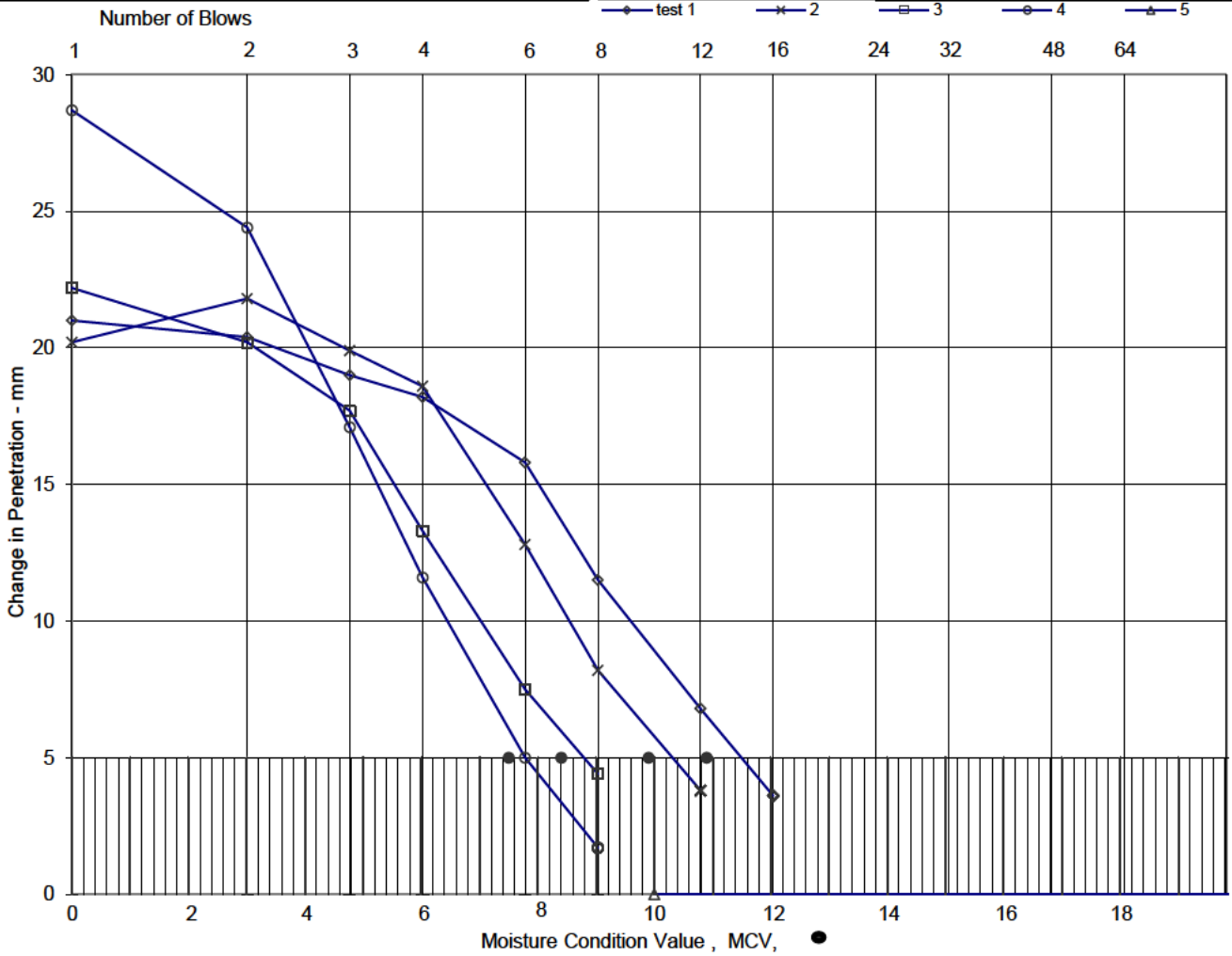
Characteristics of calibration line (determined using linear regression)	
Intercept	24.0
Slope	-0.93
Sensitivity (Change in MCV per 1% moisture content)	1.07
Correlation (proximity of test points to regression line)	-0.98
Method of interpretation of MCV	Steepest straight line

The above characteristics are NOT covered by UKAS accreditation to BS1377

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MOISTURE CONDITION VALUE (MCV) / MOISTURE CONTENT

Sample Details:	SAMPLE ID:	Hole No	BH/17/04
	A8013-1820180910011235	Sample Depth (m BGL)	1.00 - 1.10
		Sample Type and No	B3
		Specimen Ref	



Test No	* ineffective / invalid point	1	2	3	4	*
Moisture Condition Value		10.9	9.9	8.4	7.5	
Moisture Content	%	-2146826259.0	-2146826259.0	-2146826259.0	-2146826259.0	
Bulk density after test	Mg/m ³	1.80	1.79	1.78	1.76	
Dry density after test	Mg/m ³	1.58	1.56	1.54	1.50	

Soil description	Brown slightly sandy slightly gravelly CLAY.
Procedure / Preparation	using single sample
Remarks	

Initial moisture content <20mm	13.9
Material retained on 20mm sieve	1.1

Method of determining MCV	Steepest straight line
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Figure
MCVREL

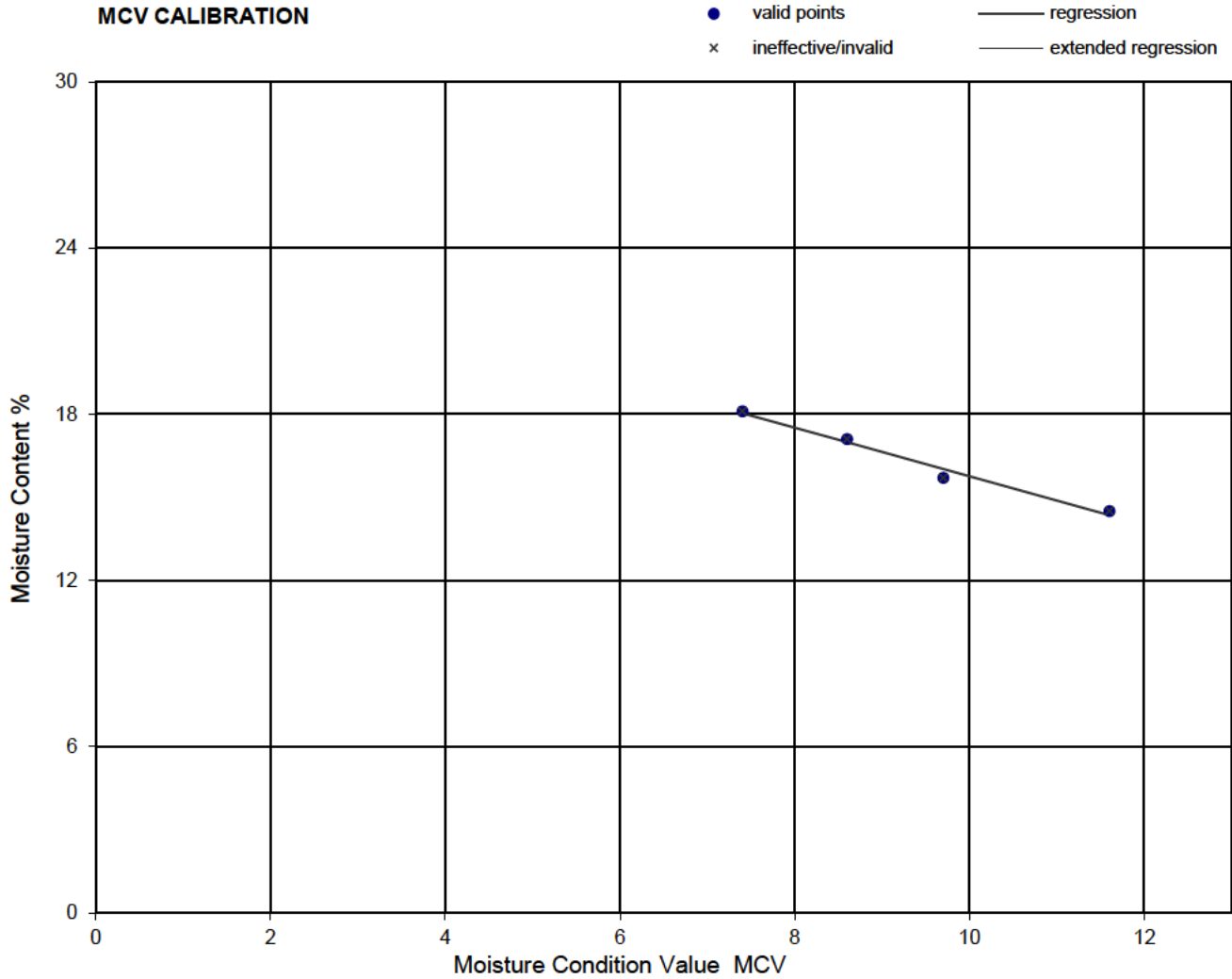
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MOISTURE CONDITION VALUE (MCV) / MOISTURE CONTENT

Sample Details:	SAMPLE ID:	Hole No	TP/17/13
	A8013-1820180910122358	Sample Depth (m BGL)	0.30 - 0.50
		Sample Type and No	B3
		Specimen Ref	



Characteristics of calibration line (determined using linear regression)	
Intercept	24.5
Slope	-0.88
Sensitivity (Change in MCV per 1% moisture content)	1.14
Correlation (proximity of test points to regression line)	-0.99
Method of interpretation of MCV	Steepest straight line

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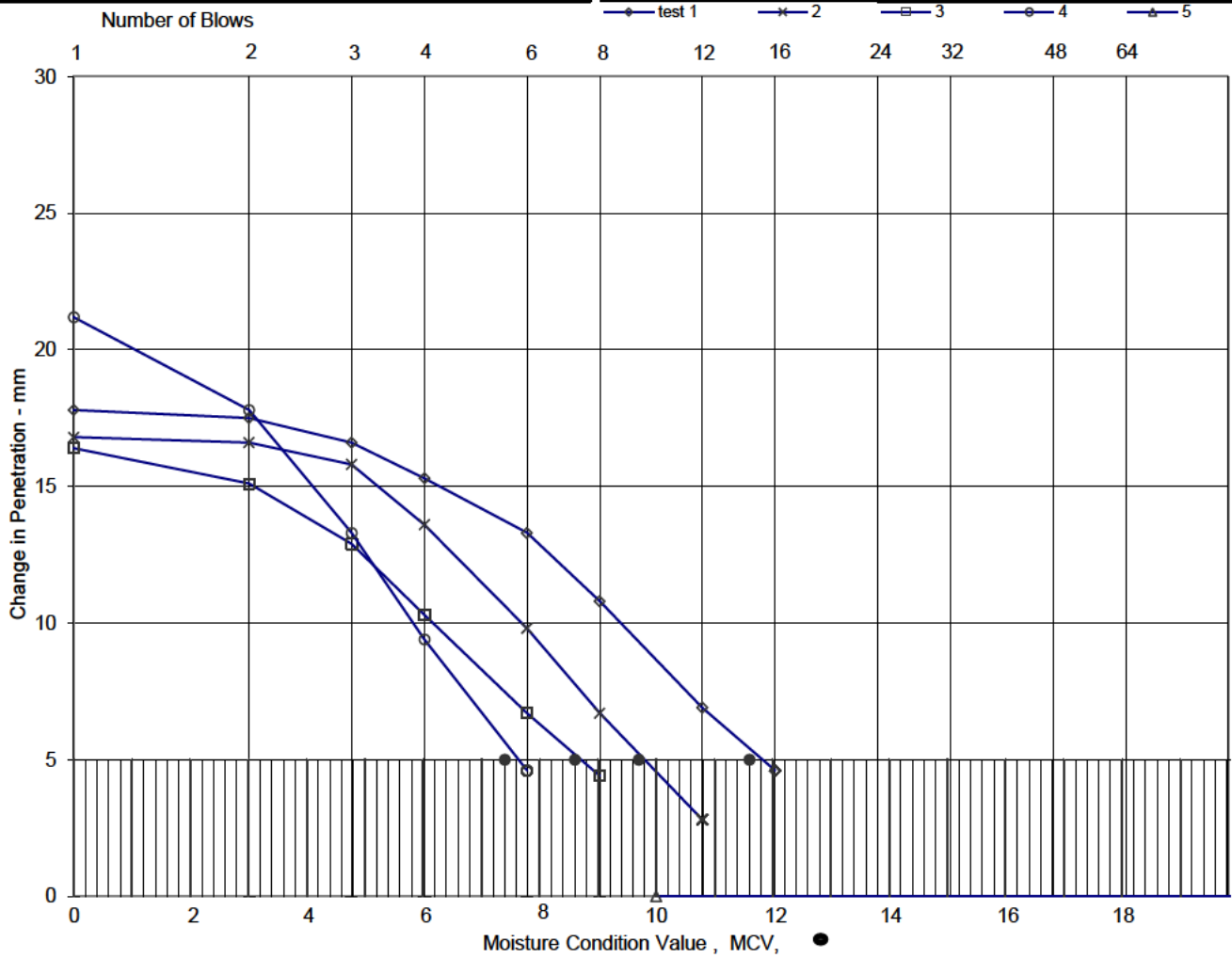
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Figure
MCVREL

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MOISTURE CONDITION VALUE (MCV) / MOISTURE CONTENT

Sample Details:	SAMPLE ID:	Hole No	TP/17/13
	A8013-1820180910122358	Sample Depth (m BGL)	0.30 - 0.50
		Sample Type and No	B3
		Specimen Ref	



Test No	* ineffective / invalid point	1	2	3	4	*
Moisture Condition Value		11.6	9.7	8.6	7.4	
Moisture Content	%	-2146826259.0	-2146826259.0	-2146826259.0	-2146826259.0	
Bulk density after test	Mg/m ³	1.79	1.77	1.76	1.73	
Dry density after test	Mg/m ³	1.56	1.53	1.50	1.46	

Soil description	Dark brown slightly sandy slightly gravelly CLAY.
Procedure / Preparation	using single sample
Remarks	

Initial moisture content <20mm	14.5
Material retained on 20mm sieve	6.1

Method of determining MCV	Steepest straight line
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Figure
MCVREL

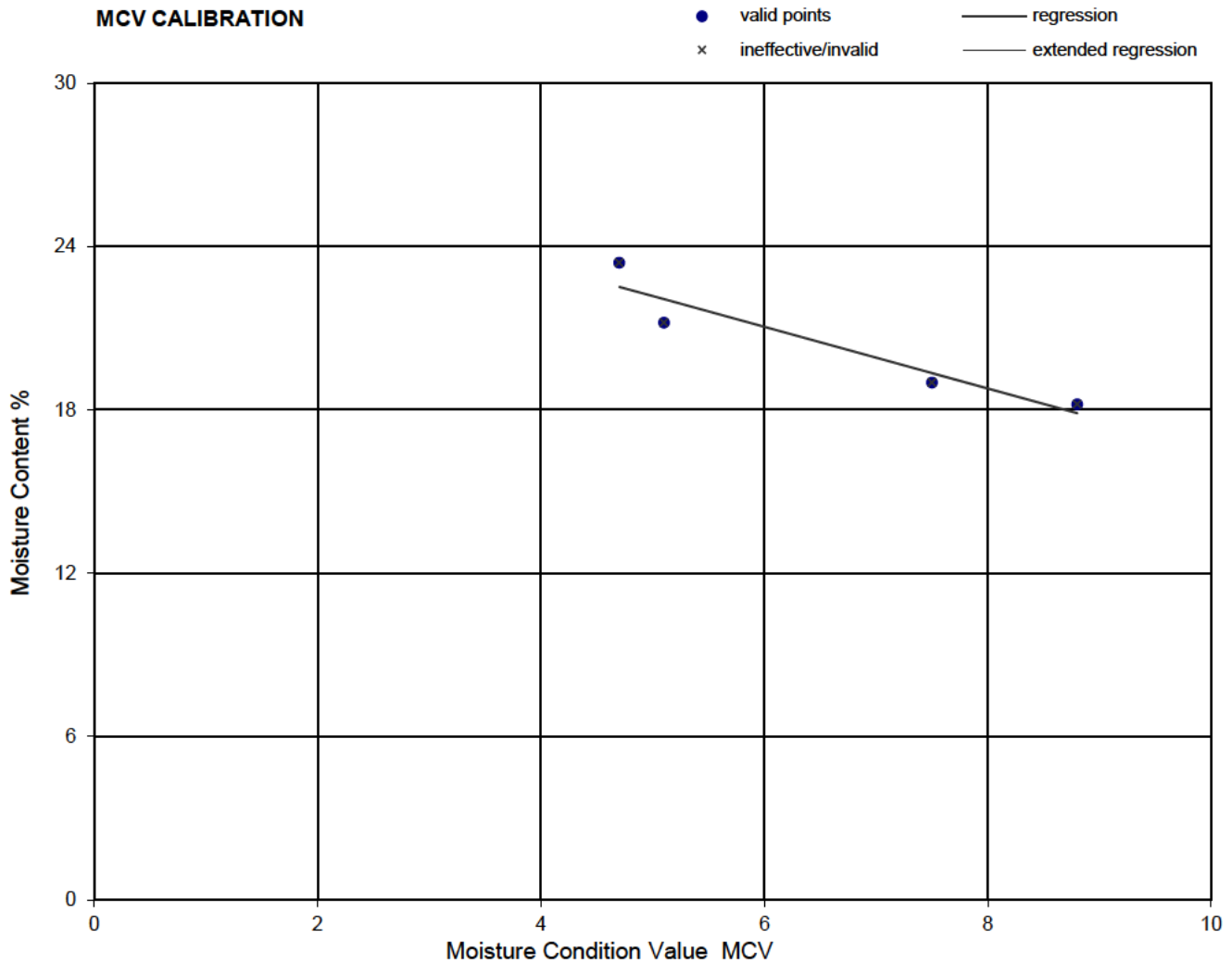
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MOISTURE CONDITION VALUE (MCV) / MOISTURE CONTENT

Sample Details:	SAMPLE ID:	Hole No	TP/17/15
	A8013-1820180910120311	Sample Depth (m BGL)	1.00 - 1.20
		Sample Type and No	B6
		Specimen Ref	



Characteristics of calibration line (determined using linear regression)	
Intercept	27.8
Slope	-1.13
Sensitivity (Change in MCV per 1% moisture content)	0.88
Correlation (proximity of test points to regression line)	-0.95
Method of interpretation of MCV	Steepest straight line

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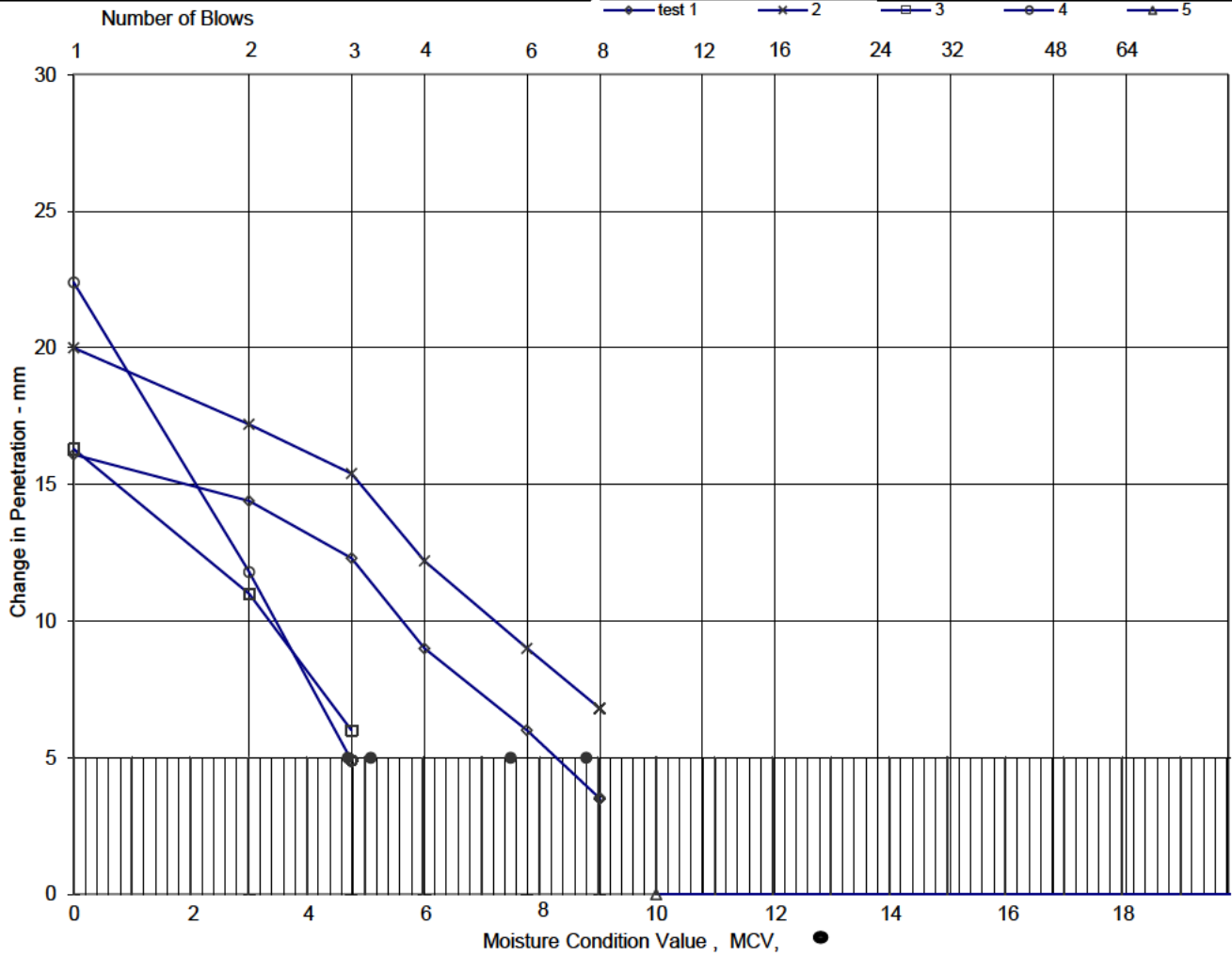
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MOISTURE CONDITION VALUE (MCV) / MOISTURE CONTENT

Sample Details:	SAMPLE ID:	Hole No	TP/17/15
	A8013-1820180910120311	Sample Depth (m BGL)	1.00 - 1.20
		Sample Type and No	B6
		Specimen Ref	



Test No	* ineffective / invalid point	1	2	3	4	*
Moisture Condition Value		7.5	8.8	5.1	4.7	
Moisture Content	%	-2146826259.0	-2146826259.0	-2146826259.0	-2146826259.0	
Bulk density after test	Mg/m ³	1.72	1.72	1.70	1.67	
Dry density after test	Mg/m ³	1.45	1.46	1.40	1.35	

Soil description	Brownish grey slightly sandy slightly gravelly CLAY.
Procedure / Preparation	using single sample
Remarks	

Initial moisture content <20mm	19
Material retained on 20mm sieve	0

Method of determining MCV	Steepest straight line
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Figure
MCVREL

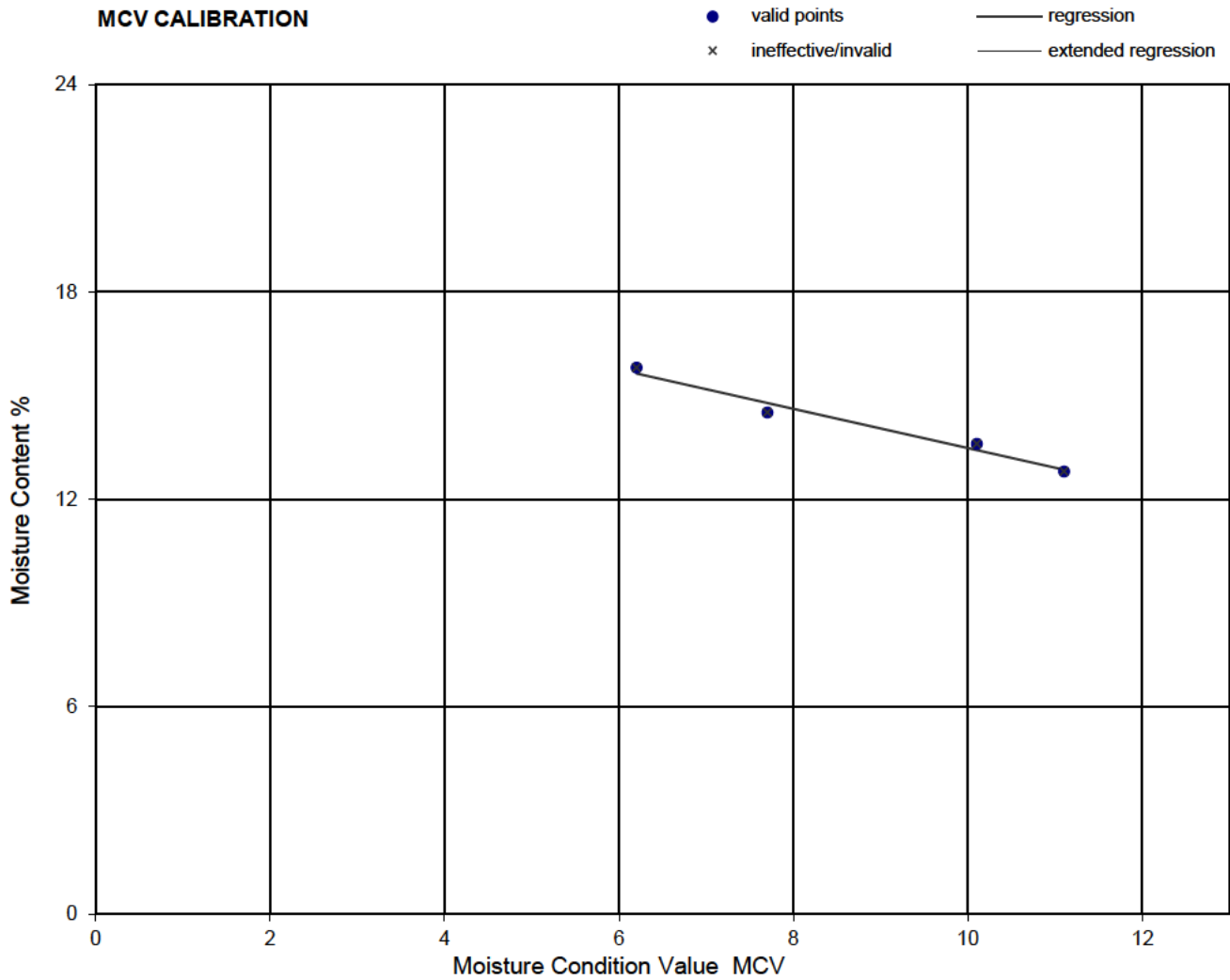
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MOISTURE CONDITION VALUE (MCV) / MOISTURE CONTENT

Sample Details:	SAMPLE ID:	Hole No	TP/17/16
	A8013-1820180910115022	Sample Depth (m BGL)	0.50 - 0.70
		Sample Type and No	B3
		Specimen Ref	



Characteristics of calibration line (determined using linear regression)	
Intercept	19.2
Slope	-0.57
Sensitivity (Change in MCV per 1% moisture content)	1.76
Correlation (proximity of test points to regression line)	-0.99
Method of interpretation of MCV	Steepest straight line

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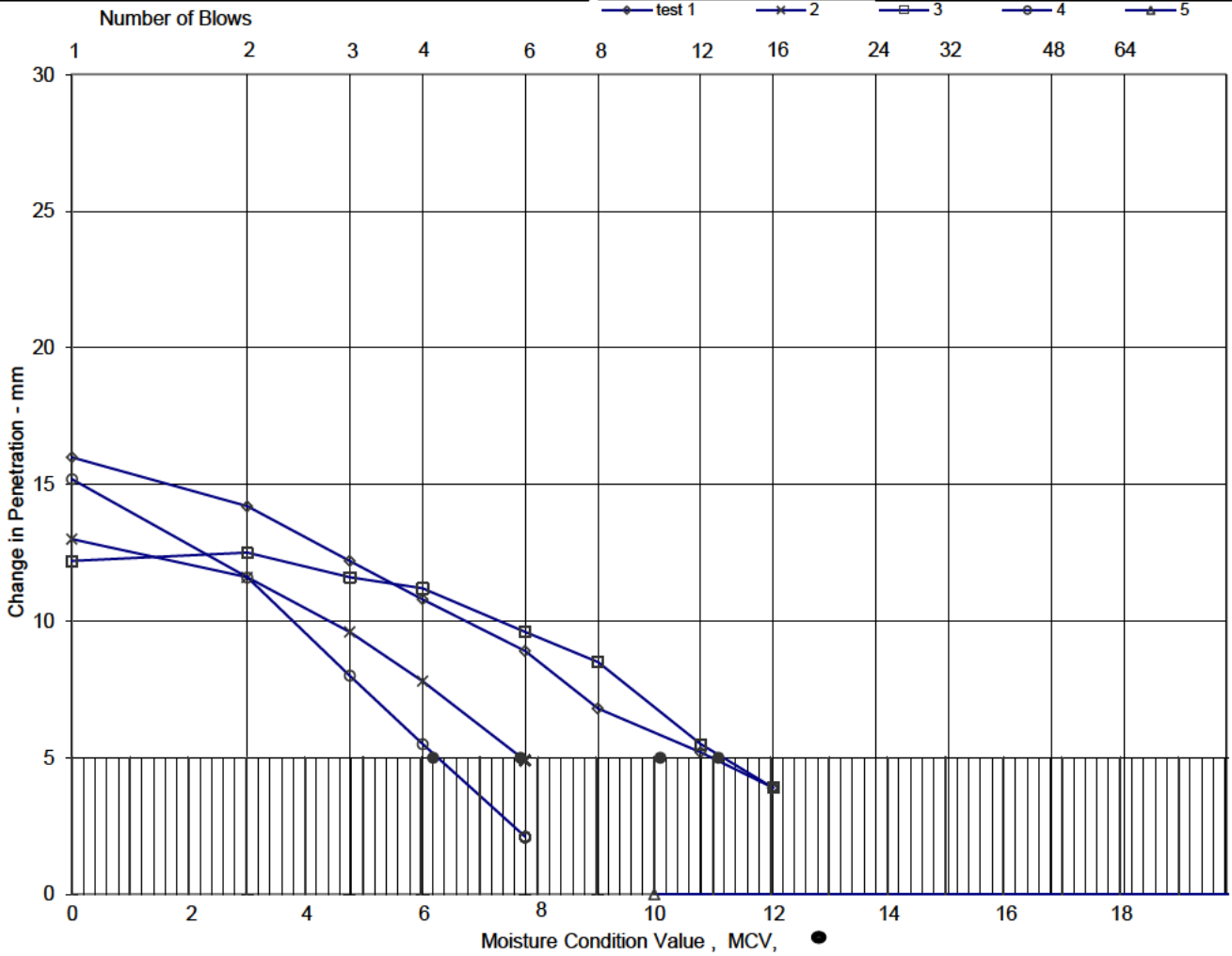
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MOISTURE CONDITION VALUE (MCV) / MOISTURE CONTENT

Sample Details:	SAMPLE ID:	Hole No	TP/17/16
	A8013-1820180910115022	Sample Depth (m BGL)	0.50 - 0.70
		Sample Type and No	B3
		Specimen Ref	



Test No	* ineffective / invalid point	1	2	3	4	*
Moisture Condition Value		10.1	7.7	11.1	6.2	
Moisture Content	%	-2146826259.0	-2146826259.0	-2146826259.0	-2146826259.0	
Bulk density after test	Mg/m ³	1.82	1.78	1.81	1.77	
Dry density after test	Mg/m ³	1.60	1.55	1.60	1.53	

Soil description	Greyish brown slightly gravelly sandy CLAY.
Procedure / Preparation	using single sample
Remarks	

Initial moisture content <20mm	13.6
Material retained on 20mm sieve	11

Method of determining MCV	Steepest straight line
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Figure
MCVREL

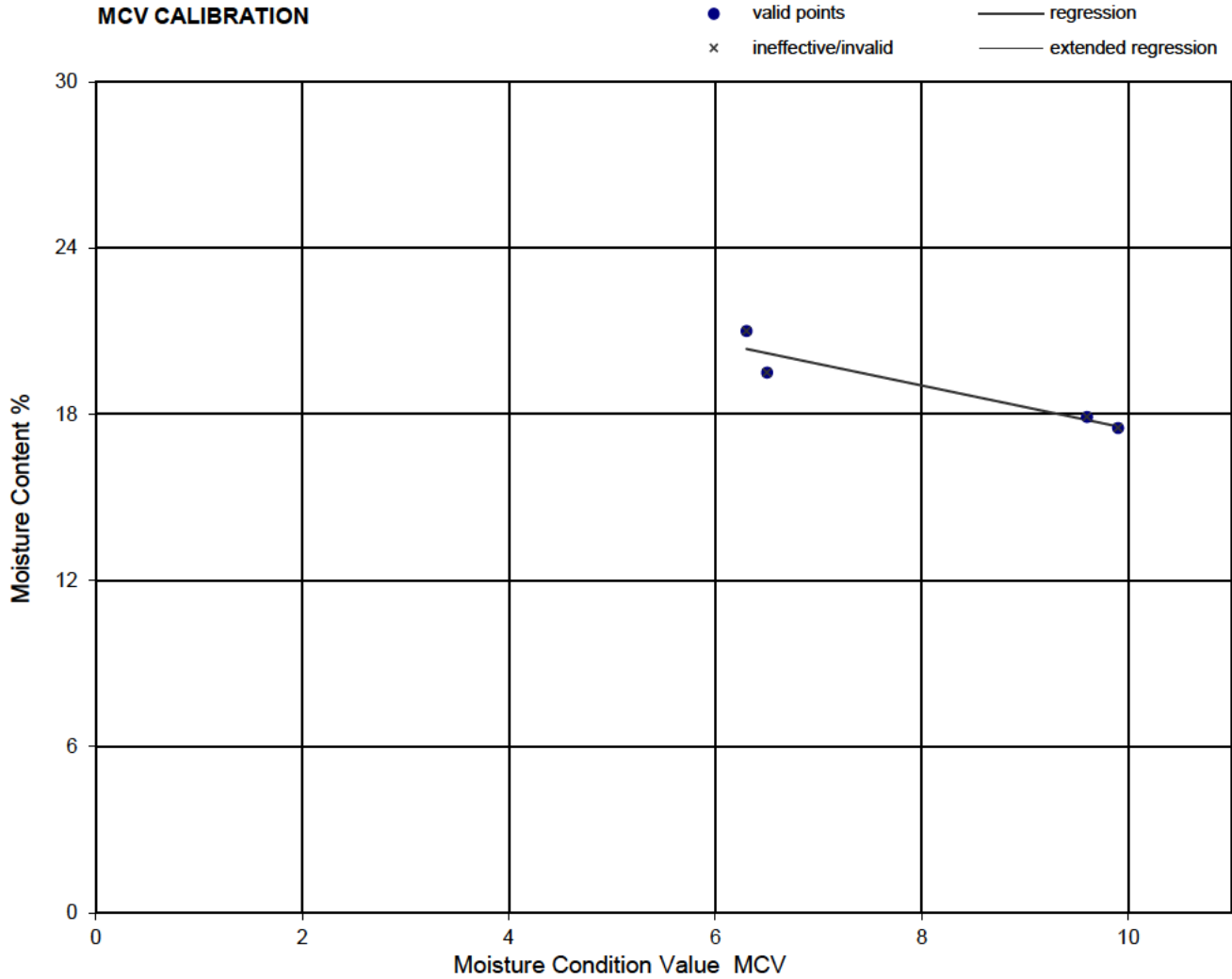
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MOISTURE CONDITION VALUE (MCV) / MOISTURE CONTENT

Sample Details:	SAMPLE ID:	Hole No	TP/17/17
	A8013-1820180911091513	Sample Depth (m BGL)	0.30 - 0.50
		Sample Type and No	B5
		Specimen Ref	



Characteristics of calibration line (determined using linear regression)	
Intercept	25.2
Slope	-0.78
Sensitivity (Change in MCV per 1% moisture content)	1.29
Correlation (proximity of test points to regression line)	-0.94
Method of interpretation of MCV	Steepest straight line

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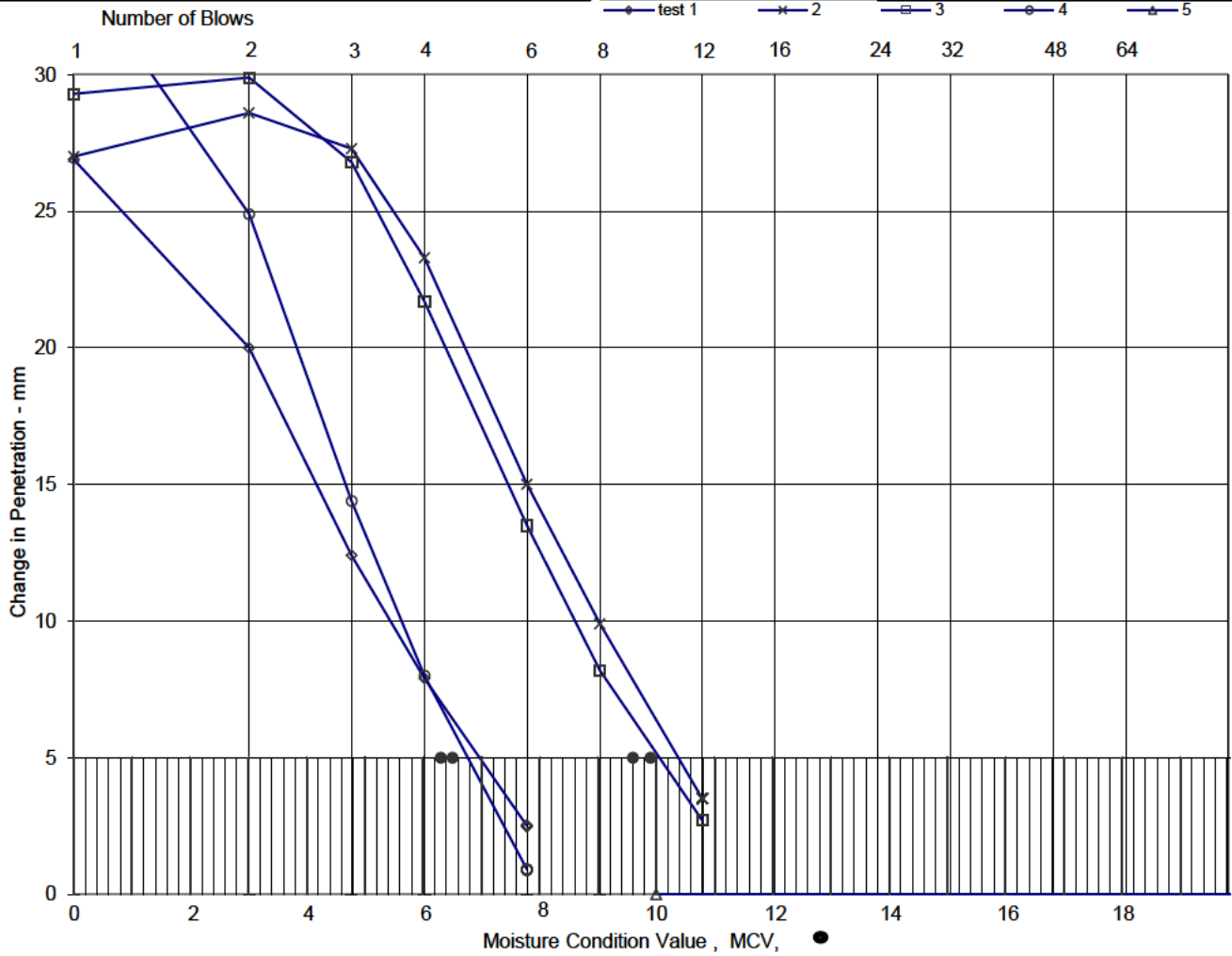
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Figure
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MOISTURE CONDITION VALUE (MCV) / MOISTURE CONTENT

Sample Details:	SAMPLE ID:	Hole No	TP/17/17
	A8013-1820180911091513	Sample Depth (m BGL)	0.30 - 0.50
		Sample Type and No	B5
		Specimen Ref	



Test No	* ineffective / invalid point	1	2	3	4	*
Moisture Condition Value		6.5	9.9	9.6	6.3	
Moisture Content	%	-2146826259.0	-2146826259.0	-2146826259.0	-2146826259.0	
Bulk density after test	Mg/m ³	1.74	1.78	1.77	1.69	
Dry density after test	Mg/m ³	1.46	1.51	1.50	1.40	

Soil description	Brown slightly sandy slightly gravelly CLAY with occasional rootlets.
Procedure / Preparation	using single sample
Remarks	

Initial moisture content <20mm	19.5
Material retained on 20mm sieve	0

Method of determining MCV	Steepest straight line
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Figure
MCVREL

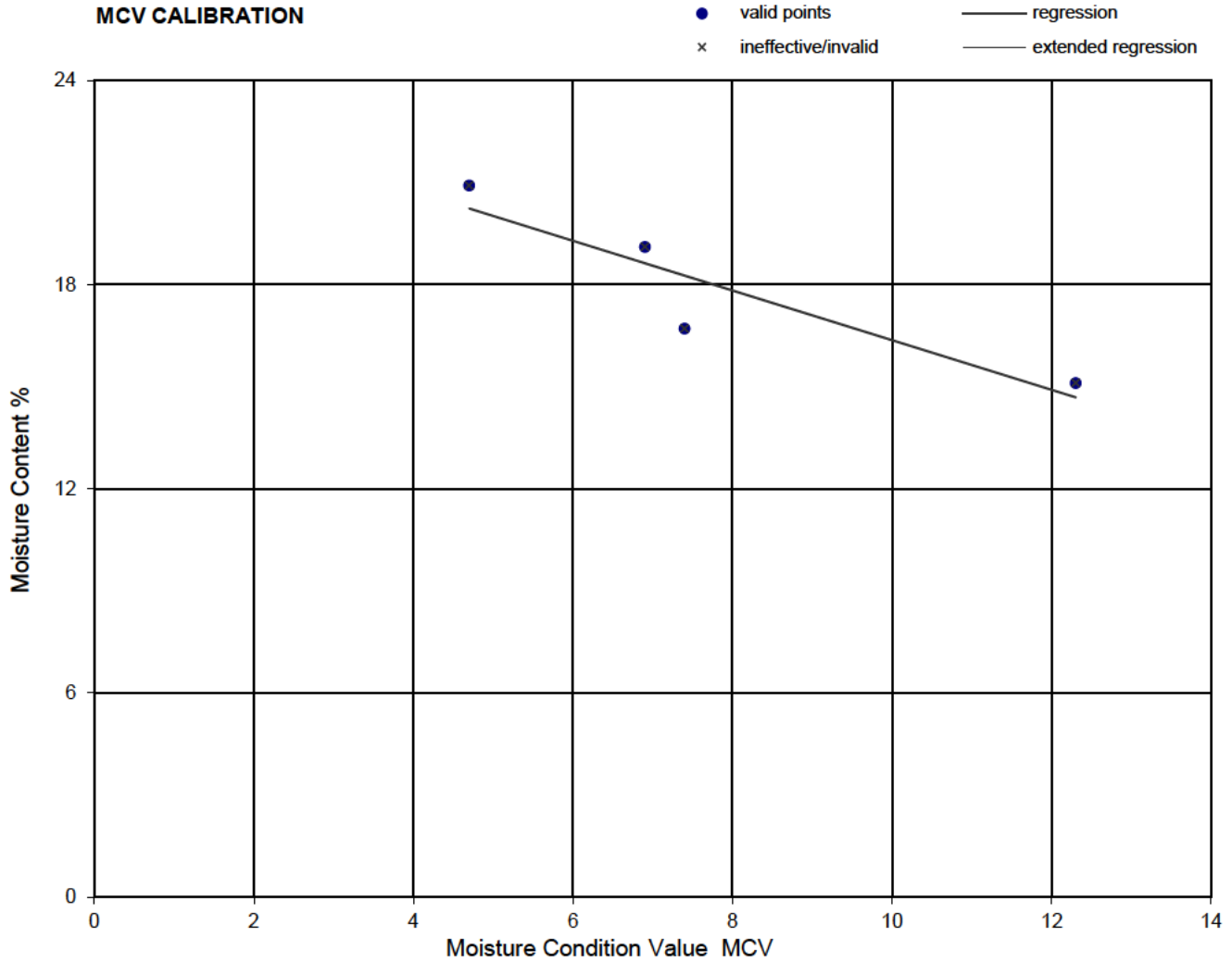
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MOISTURE CONDITION VALUE (MCV) / MOISTURE CONTENT

Sample Details:	SAMPLE ID:	Hole No	TP/17/24
	A8013-1820180919121111	Sample Depth (m BGL)	1.40 - 2.00
		Sample Type and No	B6
		Specimen Ref	



Characteristics of calibration line (determined using linear regression)	
Intercept	23.7
Slope	-0.73
Sensitivity (Change in MCV per 1% moisture content)	1.37
Correlation (proximity of test points to regression line)	-0.91
Method of interpretation of MCV	Steepest straight line

The above characteristics are NOT covered by UKAS accreditation to BS1377

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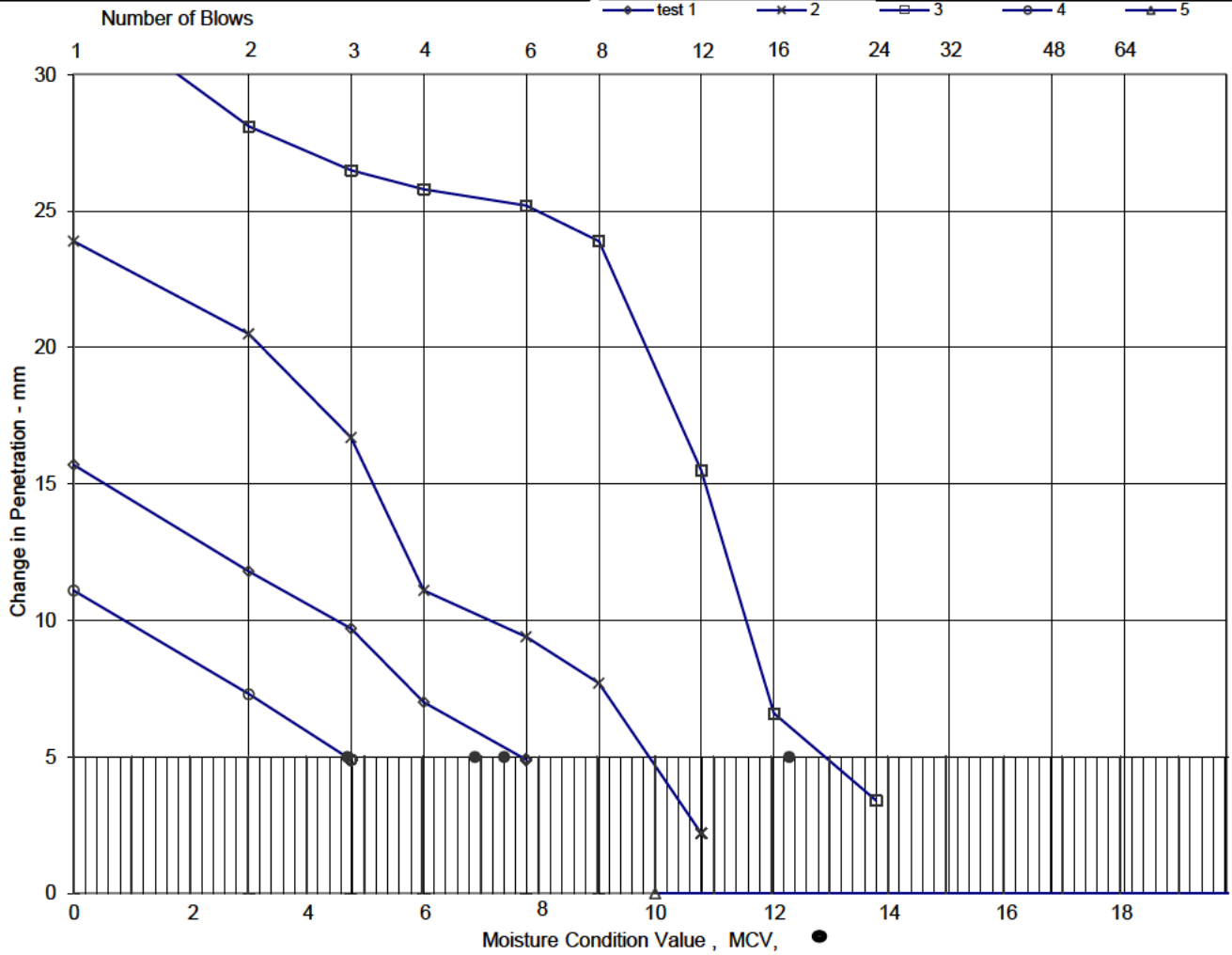
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Figure
MCVREL

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MOISTURE CONDITION VALUE (MCV) / MOISTURE CONTENT

Sample Details:	SAMPLE ID:	Hole No	TP/17/24
	A8013-1820180919121111	Sample Depth (m BGL)	1.40 - 2.00
		Sample Type and No	B6
		Specimen Ref	



Test No	* ineffective / invalid point	1	2	3	4	*
Moisture Condition Value		6.9	7.4	12.3	4.7	
Moisture Content	%	-2146826259.0	-2146826259.0	-2146826259.0	-2146826259.0	
Bulk density after test	Mg/m ³	1.74	1.79	1.83	1.77	
Dry density after test	Mg/m ³	1.46	1.53	1.59	1.46	

Soil description	Brown slightly sandy CLAY with one cobble.
Procedure / Preparation	using single sample
Remarks	

Initial moisture content <20mm	19.1
Material retained on 20mm sieve	19.8

Method of determining MCV	Steepest straight line
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Figure
MCVREL

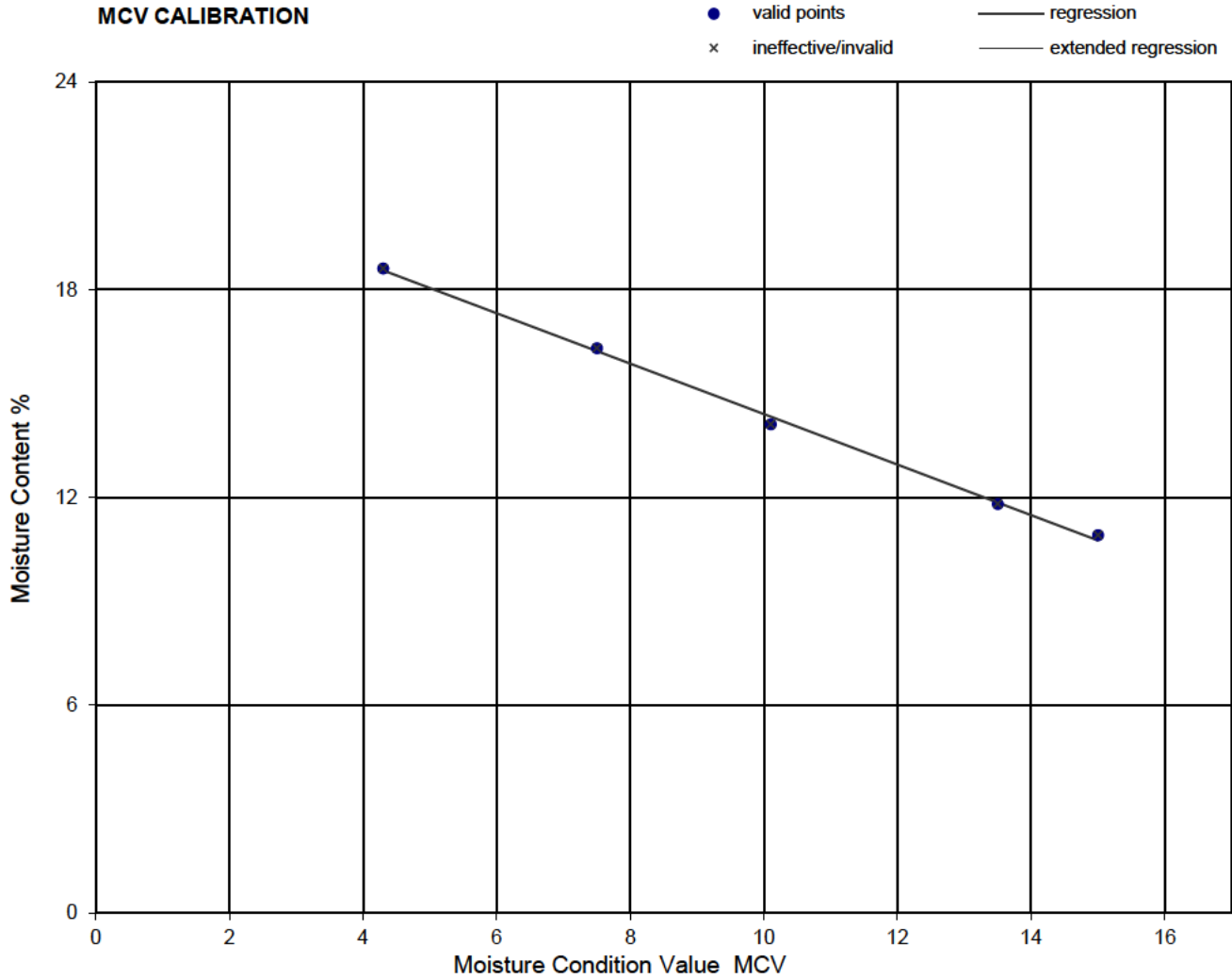
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MOISTURE CONDITION VALUE (MCV) / MOISTURE CONTENT

Sample Details:	SAMPLE ID:	Hole No	TP/17/42
	A8013-1820180917114221	Sample Depth (m BGL)	0.65 - 1.70
		Sample Type and No	B8
		Specimen Ref	



Characteristics of calibration line (determined using linear regression)	
Intercept	21.7
Slope	-0.73
Sensitivity (Change in MCV per 1% moisture content)	1.37
Correlation (proximity of test points to regression line)	-1.00
Method of interpretation of MCV	Steepest straight line

The above characteristics are NOT covered by UKAS accreditation to BS1377

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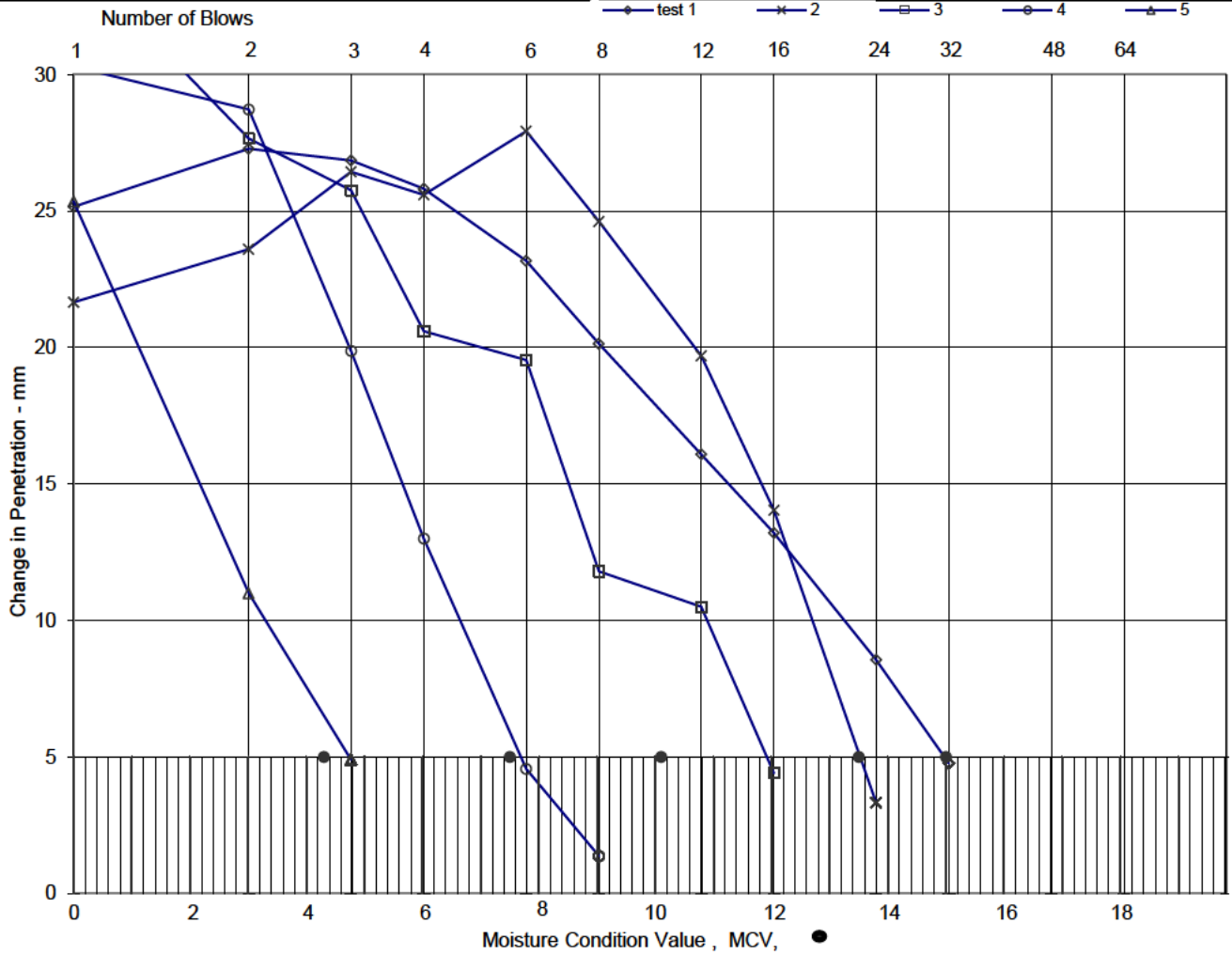
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Figure
MCVREL

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MOISTURE CONDITION VALUE (MCV) / MOISTURE CONTENT

Sample Details:	SAMPLE ID:	Hole No	TP/17/42
	A8013-1820180917114221	Sample Depth (m BGL)	0.65 - 1.70
		Sample Type and No	B8
		Specimen Ref	



Test No	* ineffective / invalid point	1	2	3	4	5
Moisture Condition Value		15.0	13.5	10.1	7.5	4.3
Moisture Content	%	-2146826259.0	-2146826259.0	-2146826259.0	-2146826259.0	-2146826259.0
Bulk density after test	Mg/m ³	2.01	2.11	2.14	2.27	2.30
Dry density after test	Mg/m ³	1.81	1.89	1.88	1.95	1.94

Soil description	Brown slightly sandy slightly gravelly CLAY.
Procedure / Preparation	using single sample
Remarks	

Initial moisture content <20mm	13.7
Material retained on 20mm sieve	2.2

Method of determining MCV	Steepest straight line
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QA Ref
SLD 4, 5.5
Rev 2.7
Jun 15



Project No A8013-18
Project Name A1 ALNWICK TO ELLINGHAM

Figure
MCVREL

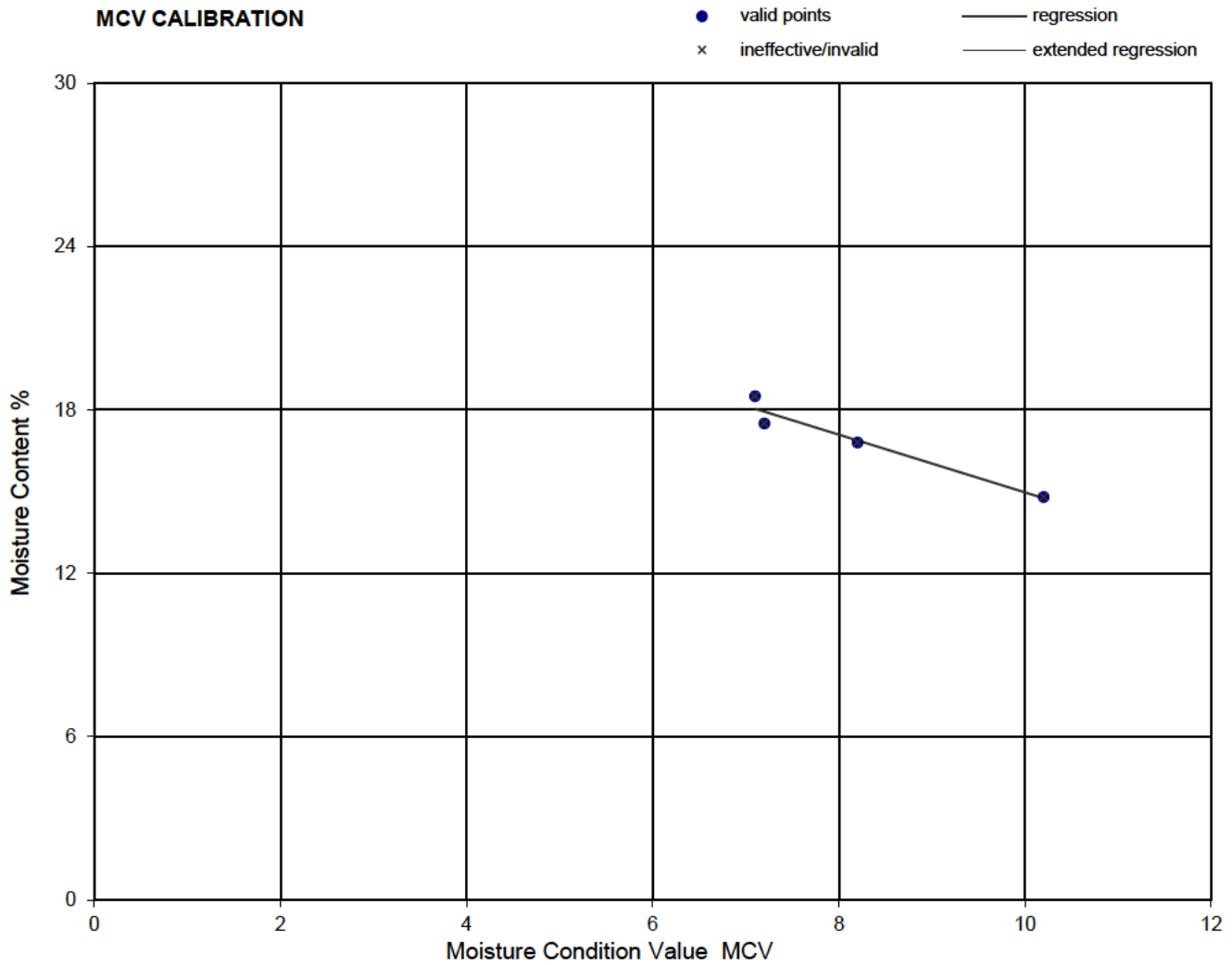
sheet 2 of 2

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MOISTURE CONDITION VALUE (MCV) / MOISTURE CONTENT

Sample Details:	SAMPLE ID:	Hole No	TP/17/42
	A8013-1820180917114237	Sample Depth (m BGL)	1.20 - 2.00
		Sample Type and No	B10
		Specimen Ref	



Characteristics of calibration line (determined using linear regression)	
Intercept	25.5
Slope	-1.06
Sensitivity (Change in MCV per 1% moisture content)	0.95
Correlation (proximity of test points to regression line)	-0.97
Method of interpretation of MCV	Steepest straight line

The above characteristics are NOT covered by UKAS accreditation to BS1377

QA Ref
SLD 4, 5.5
Rev 2.7
Jun 15



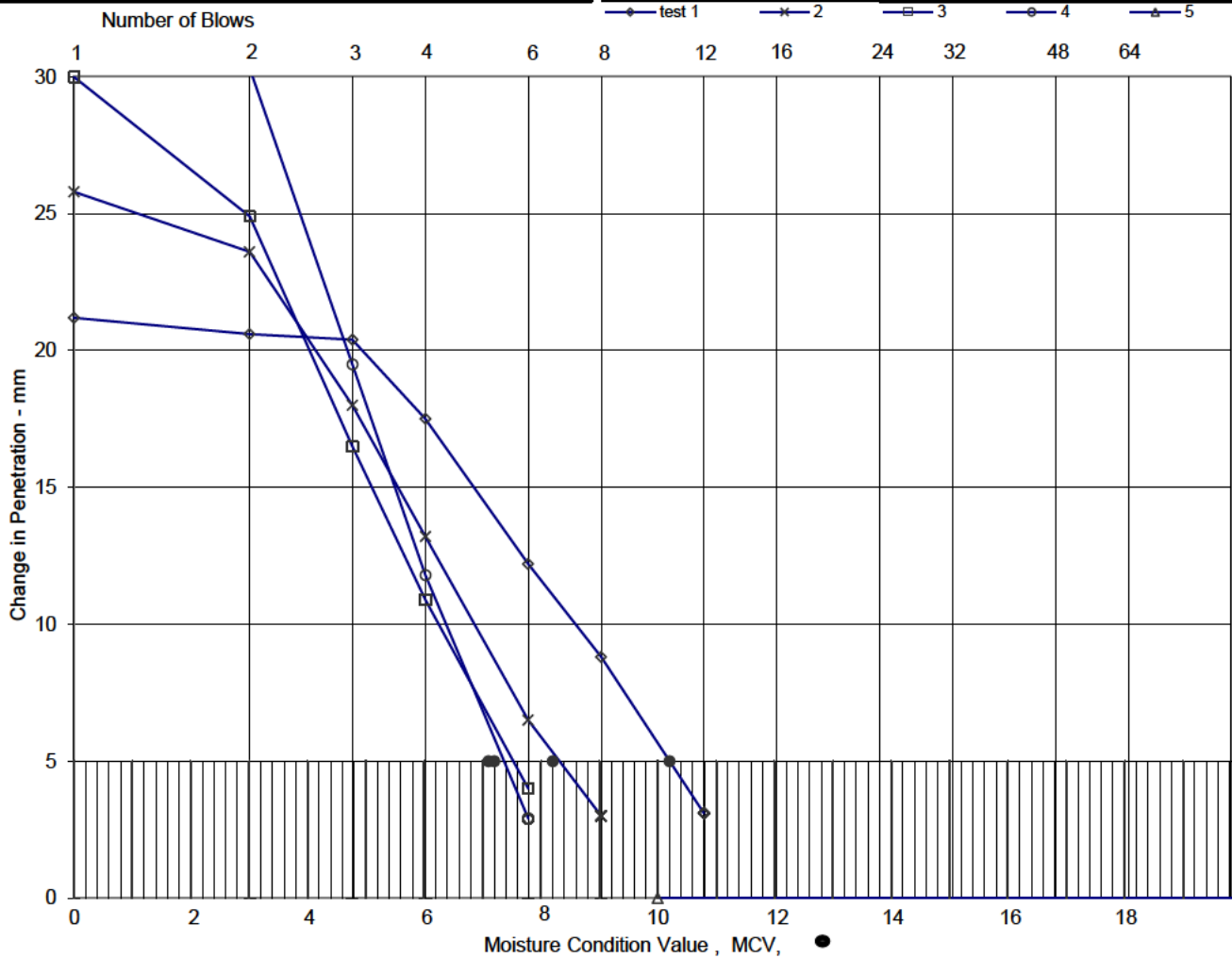
Project No A8013-18
 Project Name A1 ALNWICK TO ELLINGHAM

Figure
MCVREL

sheet 1 of 2

MOISTURE CONDITION VALUE (MCV) / MOISTURE CONTENT

Sample Details:	SAMPLE ID:	Hole No	TP/17/42
	A8013-1820180917114237	Sample Depth (m BGL)	1.20 - 2.00
		Sample Type and No	B10
		Specimen Ref	



Test No	* ineffective / invalid point	1	2	3	4	*
Moisture Condition Value		10.2	8.2	7.2	7.1	
Moisture Content	%	-2146826259.0	-2146826259.0	-2146826259.0	-2146826259.0	
Bulk density after test	Mg/m ³	1.79	1.77	1.76	0.23	
Dry density after test	Mg/m ³	1.56	1.52	1.50	0.19	

Soil description	Dark brown slightly sandy slightly gravelly CLAY.
Procedure / Preparation	using single sample
Remarks	

Initial moisture content <20mm	14.8
Material retained on 20mm sieve	5.1

Method of determining MCV	Steepest straight line
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QA Ref
SLD 4, 5.5
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Project No A8013-18
Project Name A1 ALNWICK TO ELLINGHAM

Figure
MCVREL

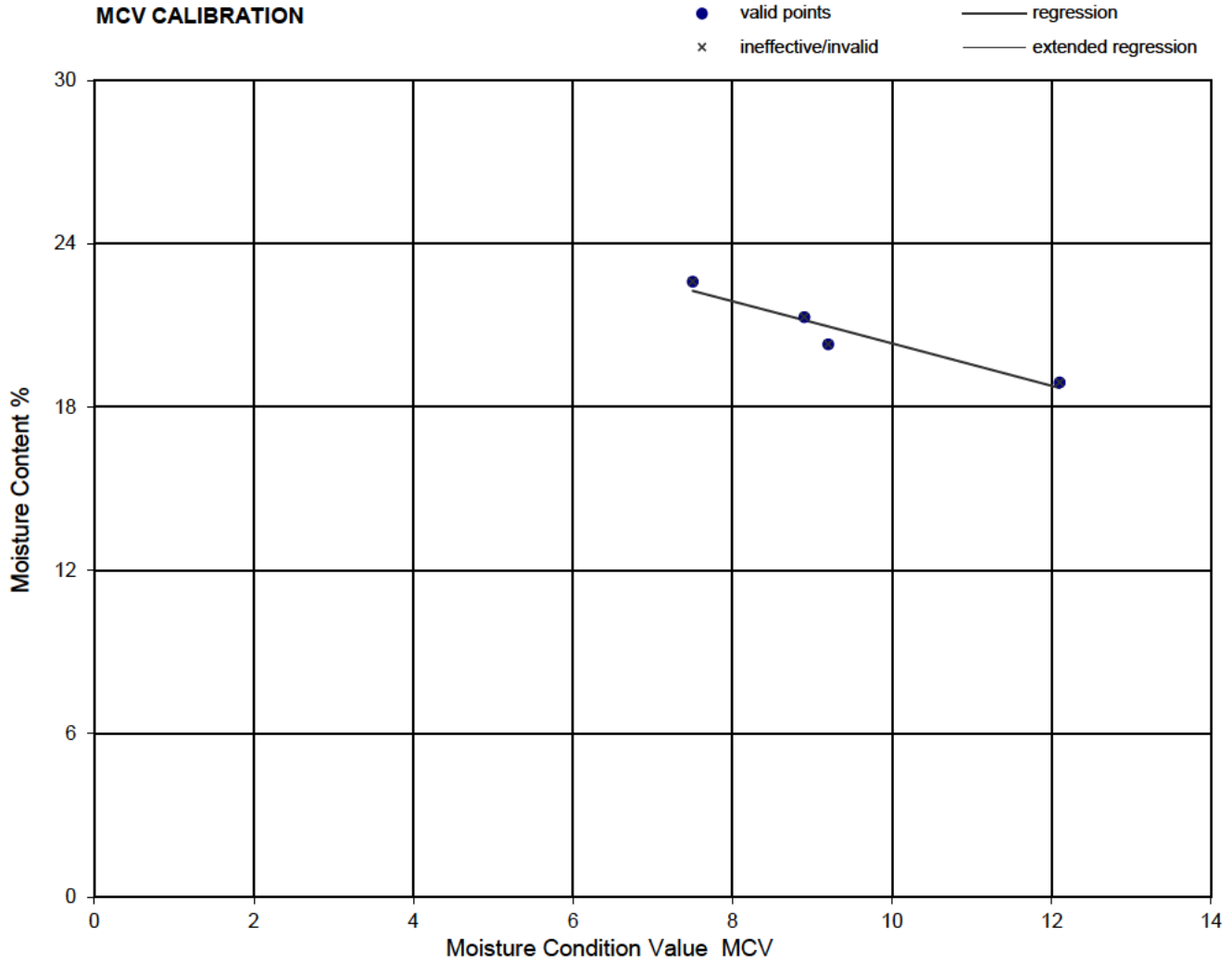
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MOISTURE CONDITION VALUE (MCV) / MOISTURE CONTENT

Sample Details:	SAMPLE ID:	Hole No	TP/17/43
	A8013-1820180917095151	Sample Depth (m BGL)	0.20 - 0.40
		Sample Type and No	B3
		Specimen Ref	



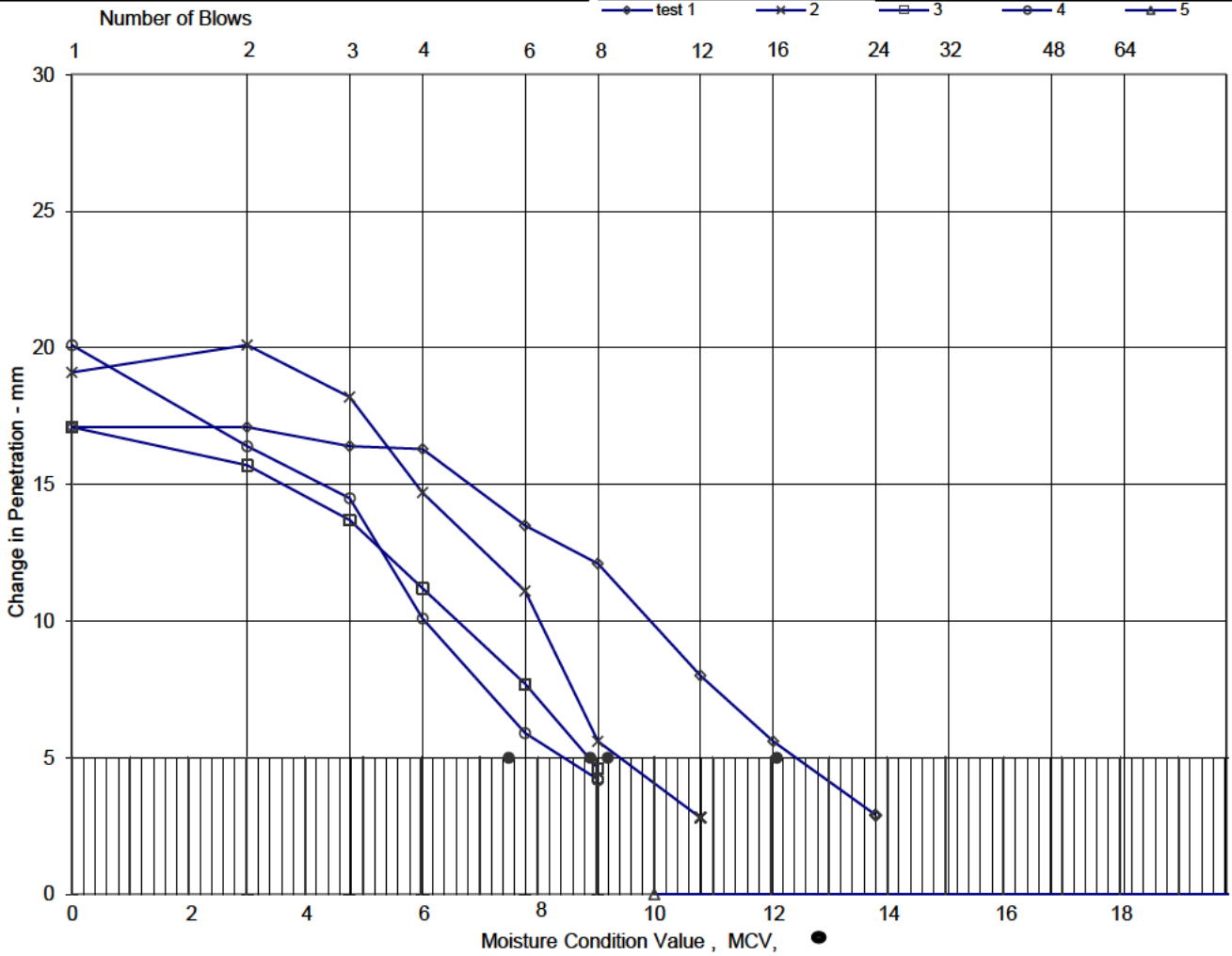
Characteristics of calibration line (determined using linear regression)	
Intercept	28.1
Slope	-0.78
Sensitivity (Change in MCV per 1% moisture content)	1.29
Correlation (proximity of test points to regression line)	-0.96
Method of interpretation of MCV	Steepest straight line

The above characteristics are NOT covered by UKAS accreditation to BS1377

QA Ref SLD 4, 5.5 Rev 2.7 Jun 15	 	Project No	A8013-18	Figure MCVREL sheet 1 of 2
		Project Name	A1 ALNWICK TO ELLINGHAM	
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MOISTURE CONDITION VALUE (MCV) / MOISTURE CONTENT

Sample Details:	SAMPLE ID:	Hole No	TP/17/43
	A8013-1820180917095151	Sample Depth (m BGL)	0.20 - 0.40
		Sample Type and No	B3
		Specimen Ref	



Test No	* ineffective / invalid point	1	2	3	4	*
Moisture Condition Value		12.1	9.2	8.9	7.5	
Moisture Content	%	-2146826259.0	-2146826259.0	-2146826259.0	-2146826259.0	
Bulk density after test	Mg/m ³	1.71	1.68	1.66	1.65	
Dry density after test	Mg/m ³	1.44	1.40	1.37	1.35	

Soil description	Dark brown sandy CLAY.
Procedure / Preparation	using single sample
Remarks	

Initial moisture content <20mm	
Material retained on 20mm sieve	0

Method of determining MCV	Steepest straight line
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Project No A8013-18
Project Name A1 ALNWICK TO ELLINGHAM

Figure
MCVREL

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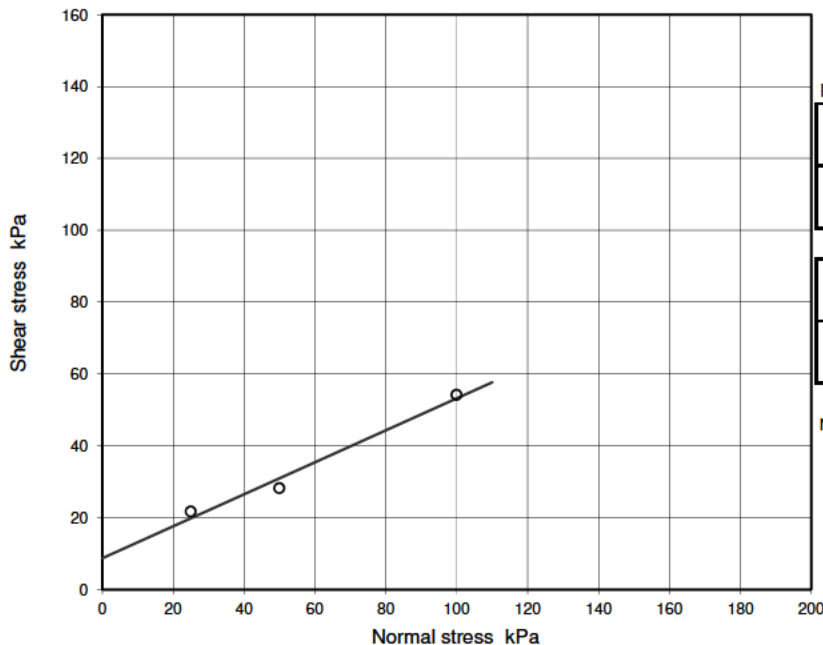
**Determination of shear strength by direct shear (Small shearbox apparatus)
(BS1377 : Part 7 : clause 4 : 1990)**

Project No	A8013-18	Sample Details:	Hole No.	TP/17/03		
Project Name	A1 Alnwick To Ellingham		Depth (m BGL)	1.20 - 1.50		
			Sample No	2	Type	B
			ID			
			Spec Ref			

Soil Description	Brown slightly sandy slightly gravelly CLAY.	Specimen(s) nominally 60mm x 60mm square
Specimen Type /Preparation	-2mm material. Recompact to maximum achievable density at as received moisture content.	Test(s) carried out in submerged condition
		Particle density, assumed 2.65 Mg/m ³

Specimen Details		No.	1	2	3	4	5	6
Initial	Height	mm	26.1	26.1	26.1			
	Bulk Density	Mg/m ³	2.06	2.06	2.06			
	Water Content	%	15.5	15.5	15.5			
	Dry density	Mg/m ³	1.79	1.79	1.79			
	Voids ratio		0.484	0.484	0.484			
	Degree of Saturation	%	85	85	85			
Consol ¹	Consolidation / Normal Stress applied	kPa	25	50	100			
	Change in height during consolidation	mm	-0.396	-0.664	-1.088			
	Voids ratio after consolidation		0.462	0.446	0.422			
Shear see note 1	Voids ratio at end of test		0.465	0.423	0.378			
	Moisture content at end of test	%	17.0	16.0	14.3			
	Saturation at end of test	%	97	100	100			

Shearing stage							
Rate of displacement	Peak	mm/min	0.041	0.041	0.041		
	Residual	mm/min					
Peak values, (o)	Relative displacement	mm	1.58	6.18	8.20		
	Shear stress	kPa	21.7	28.2	54.2		
Residual values, (x)	No. of reversals						
	Relative displacement	mm					
	Shear stress	kPa					



Shear Strength Parameters

Peak strength, (o)		Regression	Manual
c'	kPa	8.7	-
Ø'	degrees	24	-
Residual strength, (x)			
c' _R	kPa	-	-
Ø' _R	degrees	-	-

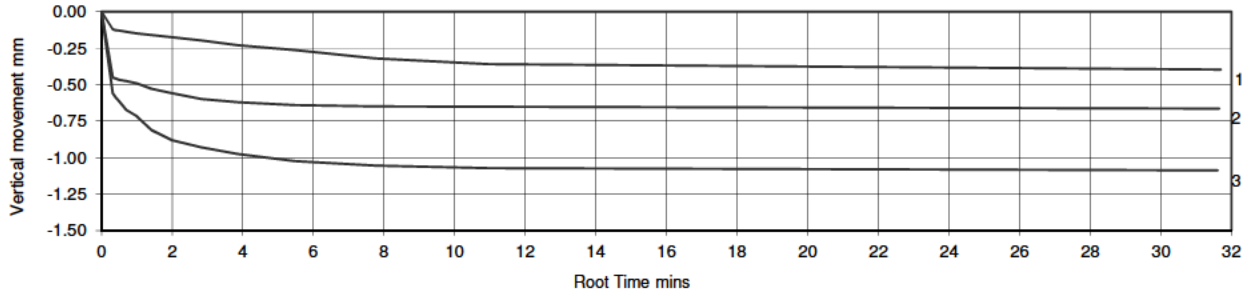
Notes :

1 After shear values based on BS1377. Pt 7 cl. 4.6.1.6 using ØH calculated from consolidation and shear stages

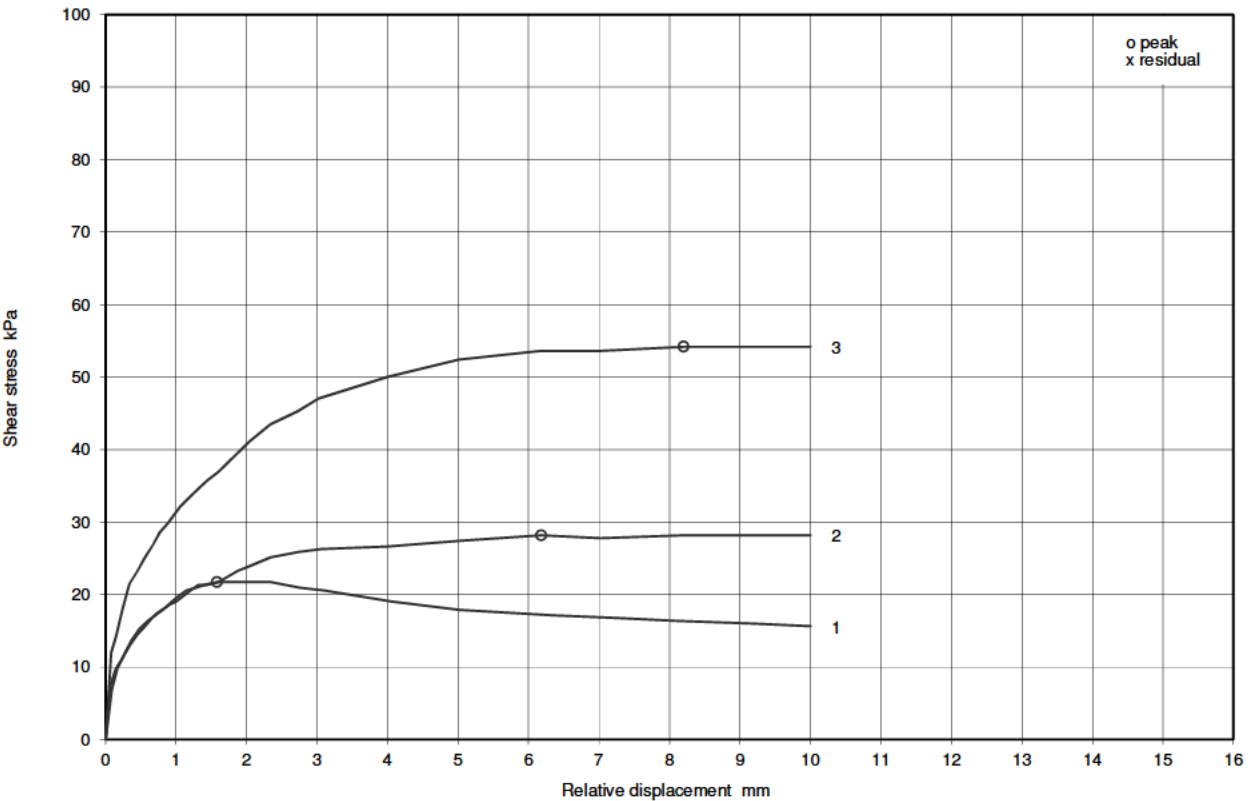
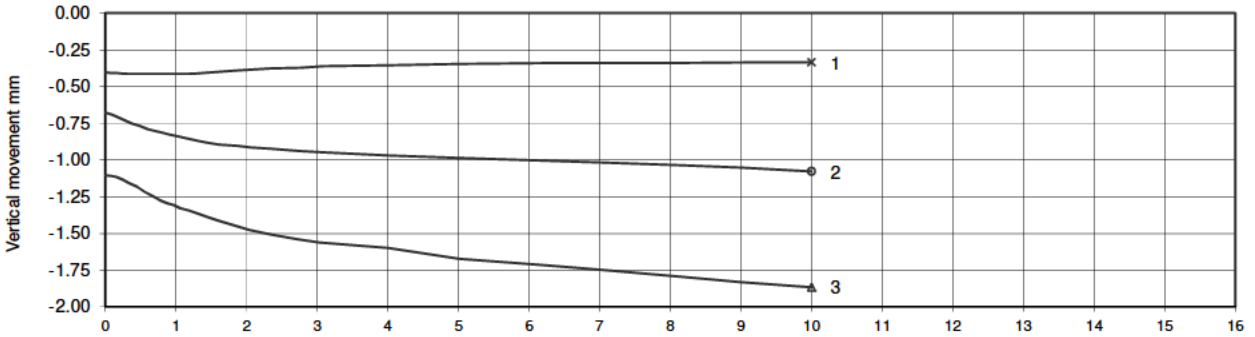
**Determination of shear strength by direct shear (Small shearbox apparatus)
(BS1377 : Part 7 : clause 4 : 1990)**

Project No	A8013-18	Sample Details:	Hole No.	TP/17/03	
Project Name	A1 Alnwick To Ellingham		Depth (m BGL)	1.20 - 1.50	
		Sample No	2	Type	B
		ID			
		Spec Ref			

Consolidation stage(s)



Shearing stage(s)



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Figure

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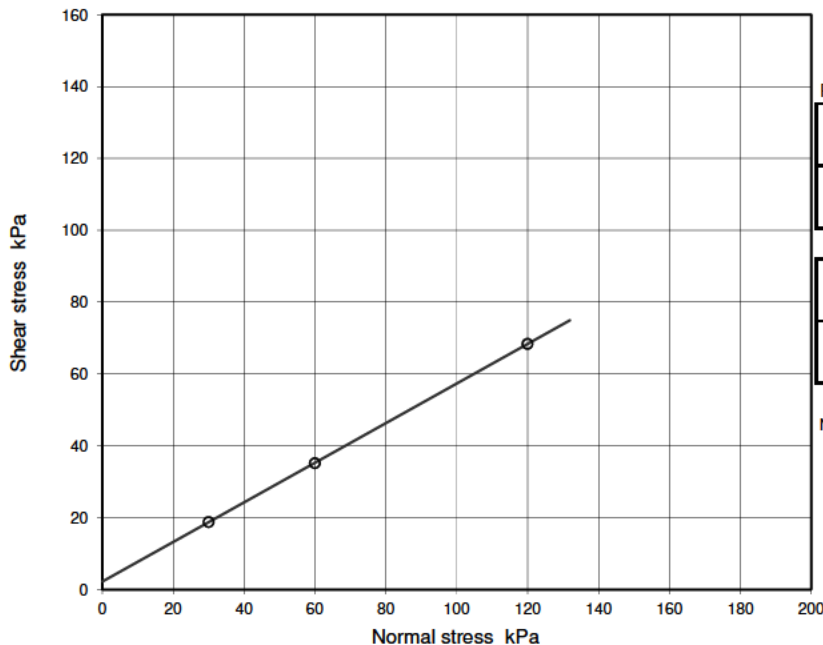
**Determination of shear strength by direct shear (Small shearbox apparatus)
(BS1377 : Part 7 : clause 4 : 1990)**

Project No	A8013-18	Sample Details:	Hole No.	TP/17/03		
Project Name	A1 Alnwick To Ellingham		Depth (m BGL)	2.80 - 3.10		
			Sample No	4	Type	B
			ID			
			Spec Ref			

Soil Description	Grey slightly sandy silty CLAY.	Specimen(s) nominally 60mm x 60mm square
Specimen Type /Preparation	-2mm material. Recompact to maximum achievable density at as received moisture content.	Test(s) carried out in submerged condition
		Particle density, assumed 2.65 Mg/m ³

Specimen Details		No.	1	2	3	4	5	6
Initial	Height	mm	26.1	26.1	26.1			
	Bulk Density	Mg/m ³	2.05	2.05	2.05			
	Water Content	%	11.4	11.4	11.4			
	Dry density	Mg/m ³	1.84	1.84	1.84			
	Voids ratio		0.444	0.444	0.444			
	Degree of Saturation	%	68	68	68			
Consol ¹	Consolidation / Normal Stress applied	kPa	30	60	120			
	Change in height during consolidation	mm	-0.274	-0.780	-0.860			
	Voids ratio after consolidation		0.429	0.401	0.396			
Shear see note 1	Voids ratio at end of test		0.426	0.371	0.375			
	Moisture content at end of test	%	15.5	14.0	13.9			
	Saturation at end of test	%	97	100	98			

Shearing stage							
Rate of displacement	Peak	mm/min	0.035	0.035	0.035		
	Residual	mm/min					
Peak values, (o)	Relative displacement	mm	2.39	4.19	6.13		
	Shear stress	kPa	18.8	35.2	68.3		
Residual values, (x)	No. of reversals						
	Relative displacement	mm					
	Shear stress	kPa					



Shear Strength Parameters

Peak strength, (o)		Regression	Manual
c'	kPa	2.2	-
Ø'	degrees	29	-
Residual strength, (x)			
c' _R	kPa	-	-
Ø' _R	degrees	-	-

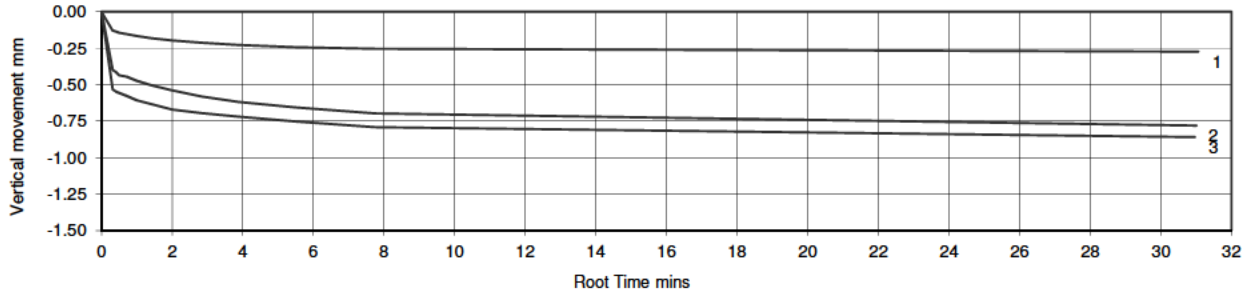
Notes :

1 After shear values based on BS1377. Pt 7 cl. 4.6.1.6 using ØH calculated from consolidation and shear stages

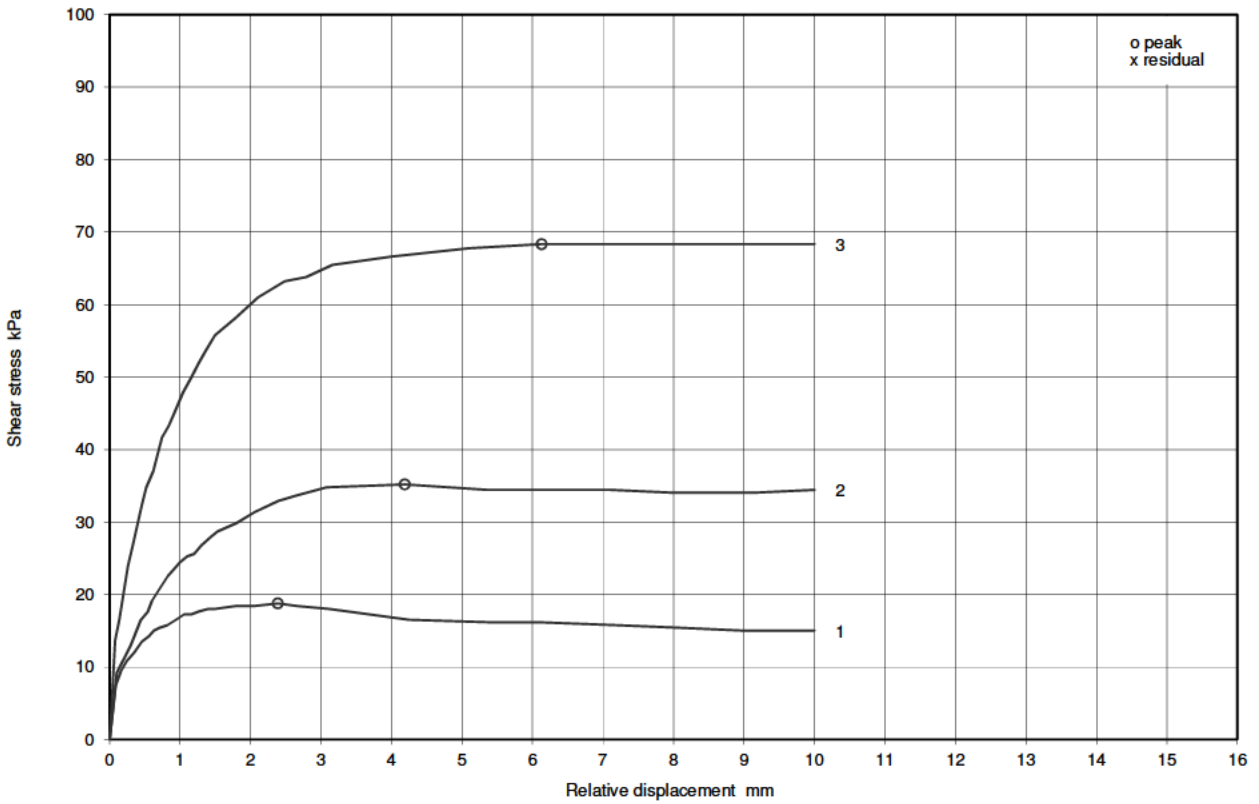
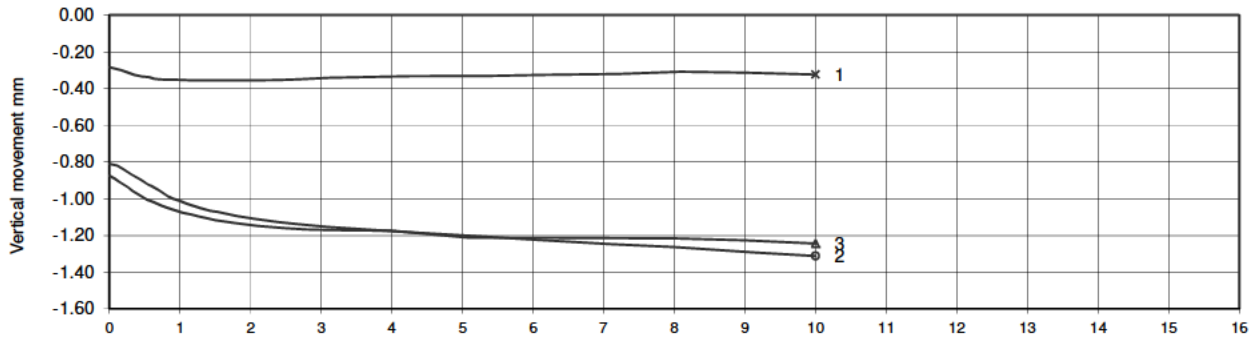
**Determination of shear strength by direct shear (Small shearbox apparatus)
(BS1377 : Part 7 : clause 4 : 1990)**

Project No	A8013-18	Sample Details:	Hole No.	TP/17/03		
Project Name	A1 Alnwick To Ellingham		Depth (m BGL)	2.80 - 3.10		
			Sample No	4	Type	B
			ID			
		Spec Ref				

Consolidation stage(s)



Shearing stage(s)



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Figure

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**Determination of shear strength by direct shear (Small shearbox apparatus)
(BS1377 : Part 7 : clause 4 : 1990)**

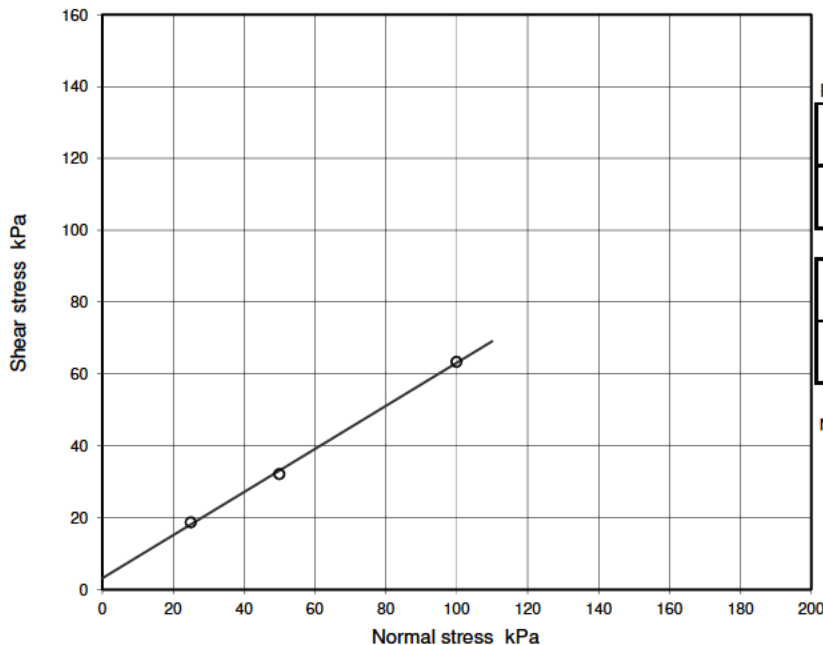
Project No	A8013-18	Sample Details:	Hole No.	TP/17/04		
Project Name	A1 Alnwick To Ellingham		Depth (m BGL)	0.60 - 0.90		
			Sample No	2	Type	B
			ID			
			Spec Ref			

Soil Description	Brown silty CLAY.
Specimen Type /Preparation	-2mm material. Recompact to maximum dry density at as received moisture content.

Specimen(s) nominally 60mm x 60mm square
 Test(s) carried out in submerged condition
 Particle density, assumed 2.65 Mg/m³

Specimen Details		No.	1	2	3	4	5	6
Initial	Height	mm	26.1	26.1	26.1			
	Bulk Density	Mg/m ³	1.79	1.79	1.79			
	Water Content	%	42.1	42.1	42.1			
	Dry density	Mg/m ³	1.26	1.26	1.26			
	Voids ratio		1.102	1.102	1.102			
Consol ¹	Degree of Saturation	%	101	101	101			
	Consolidation / Normal Stress applied	kPa	25	50	100			
	Change in height during consolidation	mm	-1.120	-2.100	-3.264			
Shear see note 1	Voids ratio after consolidation		1.012	0.933	0.839			
	Voids ratio at end of test		0.974	0.885	0.762			
	Moisture content at end of test	%	36.8	33.4	28.7			
	Saturation at end of test	%	100	100	100			

Shearing stage							
Rate of displacement	Peak	mm/min	0.026	0.026	0.026		
	Residual	mm/min					
Peak values, (o)	Relative displacement	mm	6.80	10.00	10.00		
	Shear stress	kPa	18.7	32.2	63.4		
Residual values, (x)	No. of reversals						
	Relative displacement	mm					
	Shear stress	kPa					



Shear Strength Parameters

Peak strength, (o)		Regression	Manual
c'	kPa	3.1	-
Ø'	degrees	31	-
Residual strength, (x)			
c' _R	kPa	-	-
Ø' _R	degrees	-	-

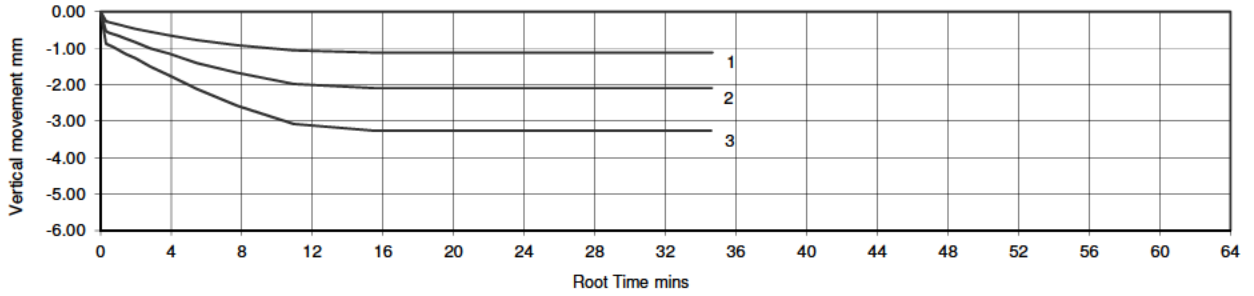
Notes :

1 After shear values based on BS1377. Pt 7 cl. 4.6.1.6 using ØH calculated from consolidation and shear stages

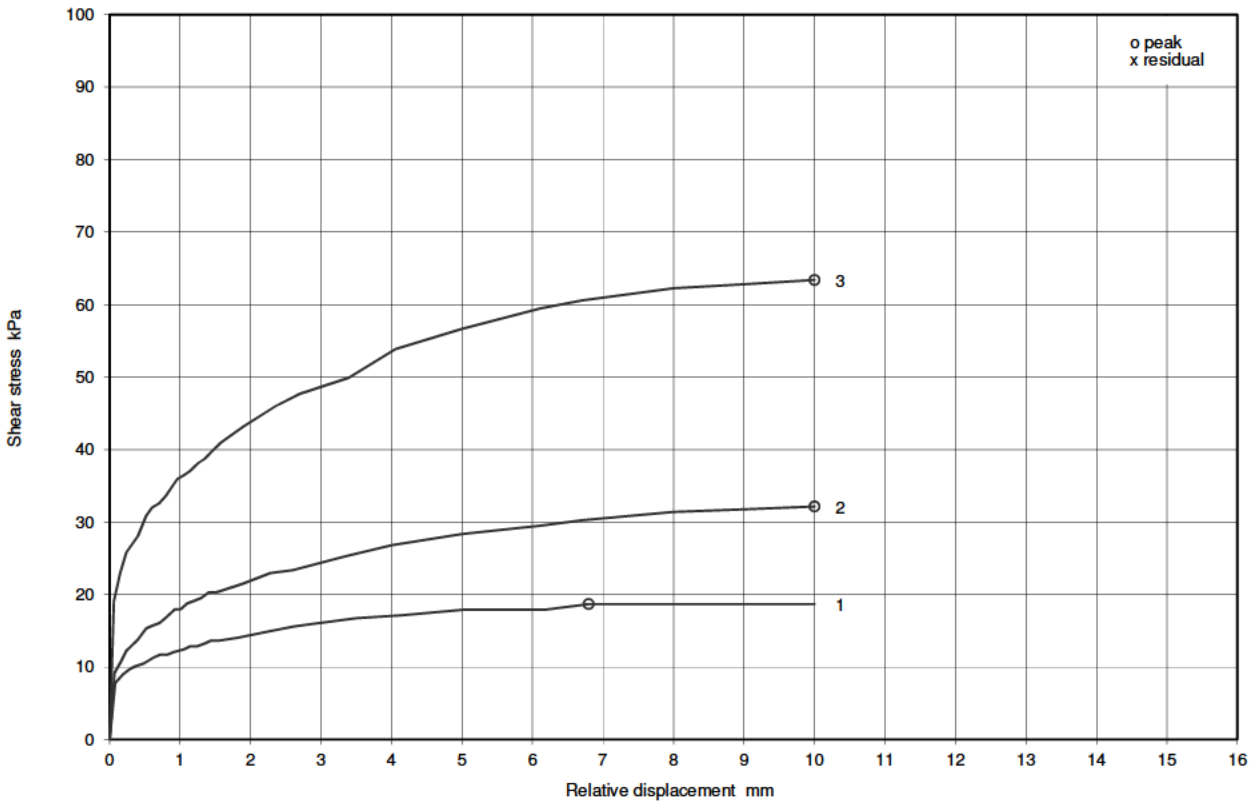
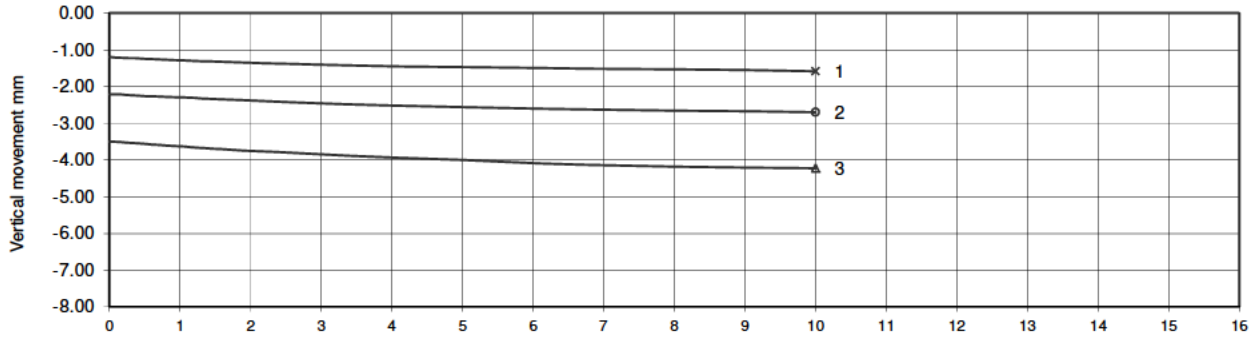
**Determination of shear strength by direct shear (Small shearbox apparatus)
(BS1377 : Part 7 : clause 4 : 1990)**

Project No	A8013-18	Sample Details:	Hole No.	TP/17/04	
Project Name	A1 Alnwick To Ellingham		Depth (m BGL)	0.60 - 0.90	
		Sample No	2	Type	B
		ID			
		Spec Ref			

Consolidation stage(s)



Shearing stage(s)



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Figure

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**Determination of shear strength by direct shear (Small shearbox apparatus)
(BS1377 : Part 7 : clause 4 : 1990)**

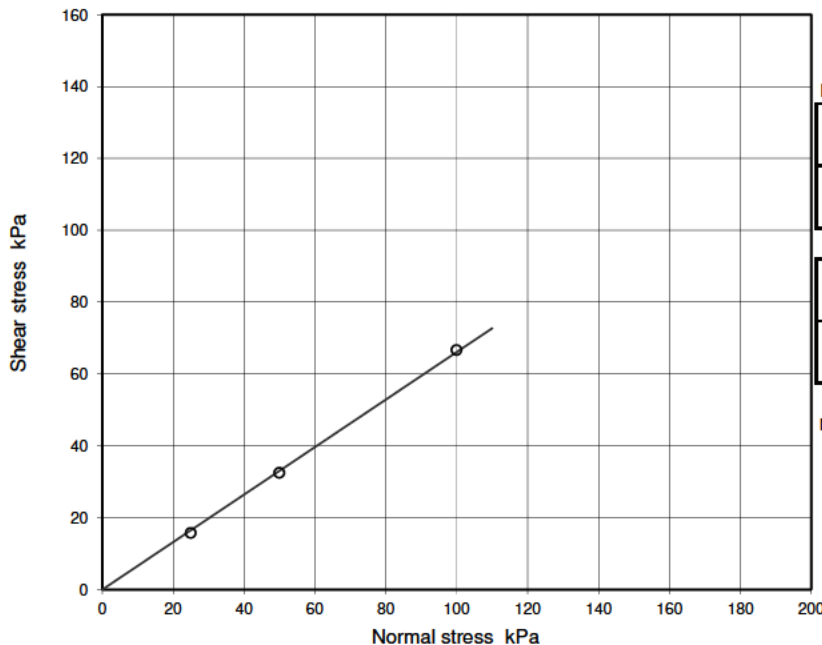
Project No	A8013-18	Sample Details:	Hole No.	TP/17/05		
Project Name	A1 Alnwick To Ellingham		Depth (m BGL)	2.50 - 2.70		
			Sample No	3	Type	B
			ID			
			Spec Ref			

Soil Description	Greyish brown slightly sandy CLAY.
Specimen Type /Preparation	-2mm material. Recompacted using 2.5kg equivalent effort at as received moisture content.

Specimen(s) nominally 60mm x 60mm square
 Test(s) carried out in submerged condition
 Particle density, assumed 2.65 Mg/m³

Specimen Details		No.	1	2	3	4	5	6
Initial	Height	mm	25.1	25.1	25.1			
	Bulk Density	Mg/m ³	2.16	2.16	2.16			
	Water Content	%	10.9	10.9	10.9			
	Dry density	Mg/m ³	1.94	1.94	1.94			
	Voids ratio		0.363	0.363	0.363			
Consol ¹	Degree of Saturation	%	80	80	80			
	Consolidation / Normal Stress applied	kPa	25	50	100			
	Change in height during consolidation	mm	-0.074	-0.668	-0.818			
Shear see note 1	Voids ratio after consolidation		0.359	0.327	0.319			
	Voids ratio at end of test		0.354	0.288	0.294			
	Moisture content at end of test	%	13.4	10.9	11.1			
	Saturation at end of test	%	100	100	100			

Shearing stage							
Rate of displacement	Peak	mm/min	0.041	0.041	0.041		
	Residual	mm/min					
Peak values, (o)	Relative displacement	mm	6.87	10.00	10.00		
	Shear stress	kPa	15.8	32.5	66.6		
Residual values, (x)	No. of reversals						
	Relative displacement	mm					
	Shear stress	kPa					



Shear Strength Parameters

Peak strength, (o)		Regression	Manual
c'	kPa	(-1.3)	0.0
Ø'	degrees	(34)	33½

Residual strength, (x)			
c' _R	kPa	-	-
Ø' _R	degrees	-	-

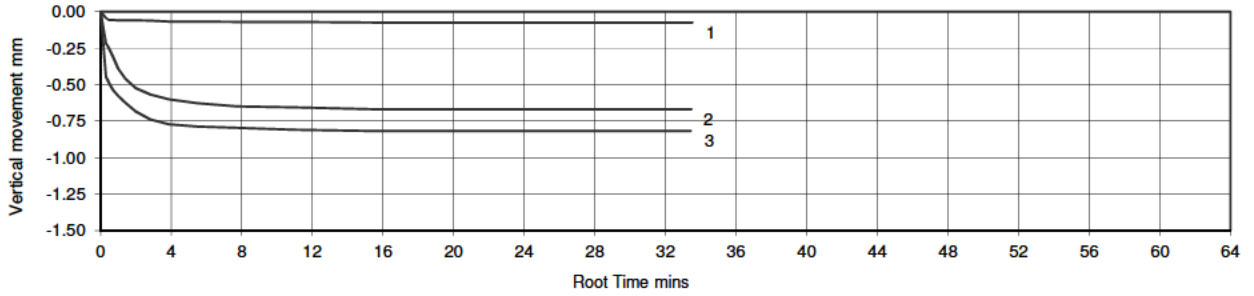
Notes :

1 After shear values based on BS1377. Pt 7 cl. 4.6.1.6 using ØH calculated from consolidation and shear stages

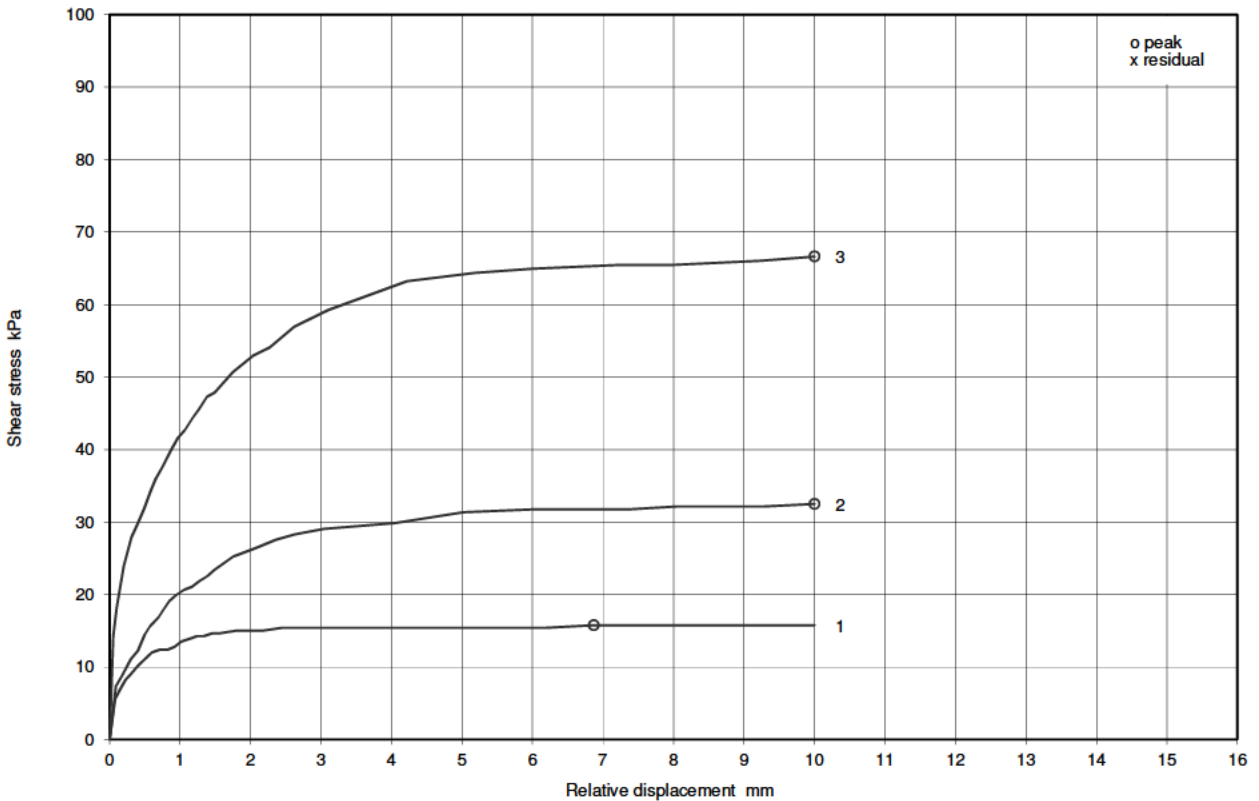
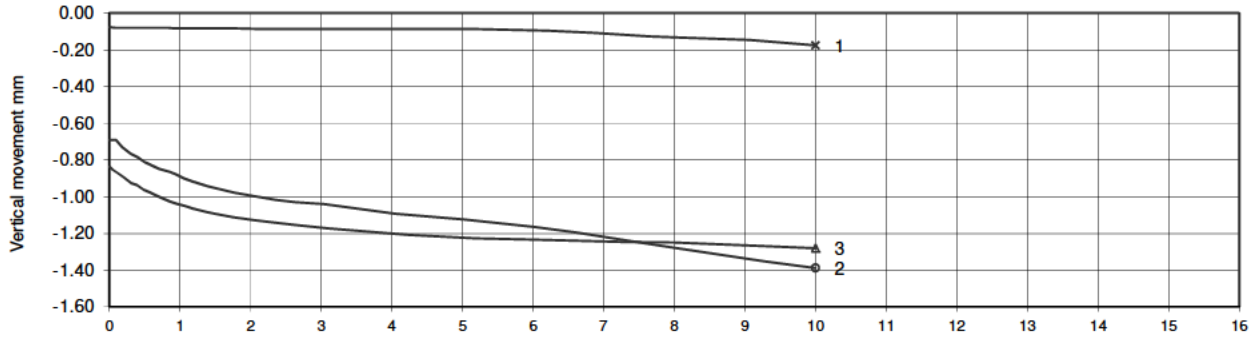
**Determination of shear strength by direct shear (Small shearbox apparatus)
(BS1377 : Part 7 : clause 4 : 1990)**

Project No	A8013-18	Sample Details:	Hole No.	TP/17/05	
Project Name	A1 Alnwick To Ellingham		Depth (m BGL)	2.50 - 2.70	
		Sample No	3	Type	B
		ID			
		Spec Ref			

Consolidation stage(s)



Shearing stage(s)



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Figure

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**Determination of shear strength by direct shear (Small shearbox apparatus)
(BS1377 : Part 7 : clause 4 : 1990)**

Project No	A8013-18	Sample Details:	Hole No.	TP/17/06		
Project Name	A1 Alnwick To Ellingham		Depth (m BGL)	2.20 - 2.40		
			Sample No	2	Type	B
			ID			
			Spec Ref			

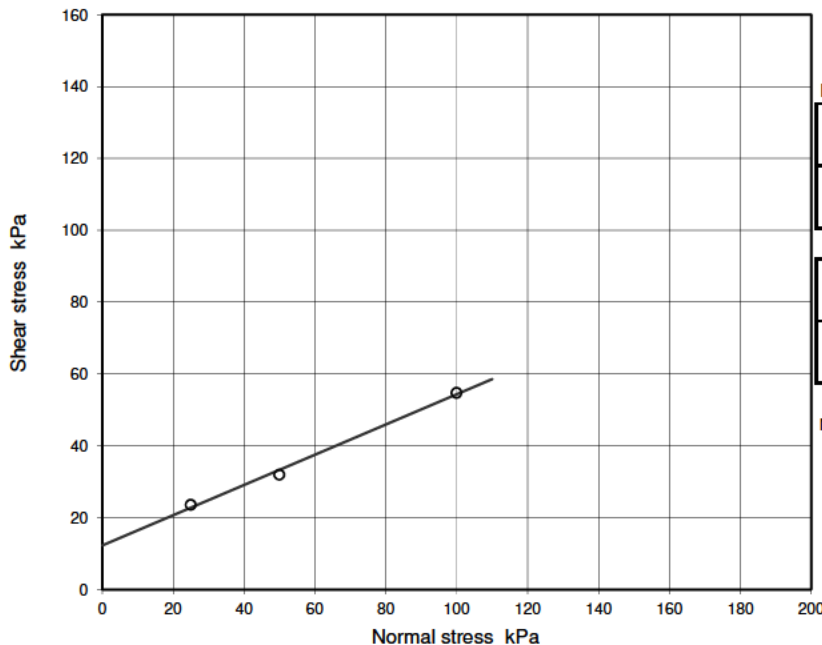
Soil Description	Dark brown slightly sandy slightly gravelly CLAY.
Specimen Type /Preparation	-2mm material. Recompacted to 1.78Mg/m ³ density at as received moisture content.

Specimen(s) nominally 60mm x 60mm square
 Test(s) carried out in submerged condition
 Particle density, assumed 2.65 Mg/m³

Specimen Details		No.	1	2	3	4	5	6
Initial	Height	mm	26.1	26.1	26.1			
	Bulk Density	Mg/m ³	1.99	1.99	1.99			
	Water Content	%	11.9	11.9	11.9			
	Dry density	Mg/m ³	1.78	1.78	1.78			
	Voids ratio		0.488	0.488	0.488			
	Degree of Saturation	%	64	64	64			
Consol ¹	Consolidation / Normal Stress applied	kPa	25	50	100			
	Change in height during consolidation	mm	-0.758	-1.468	-0.870			
	Voids ratio after consolidation		0.445	0.405	0.439			
Shear see note 1	Voids ratio at end of test		0.427	0.379	0.416			
	Moisture content at end of test	%	16.1	14.3	15.7			
	Saturation at end of test	%	100	100	100			

Shearing stage

Rate of displacement	Peak	mm/min	0.045	0.045	0.045			
	Residual	mm/min						
Peak values, (o)	Relative displacement	mm	5.59	4.22	6.16			
	Shear stress	kPa	23.6	32.0	54.8			
Residual values, (x)	No. of reversals							
	Relative displacement	mm						
	Shear stress	kPa						



Shear Strength Parameters

Peak strength, (o)		Regression	Manual
c'	kPa	12	-
Ø'	degrees	23	-
Residual strength, (x)			
c' _R	kPa	-	-
Ø' _R	degrees	-	-

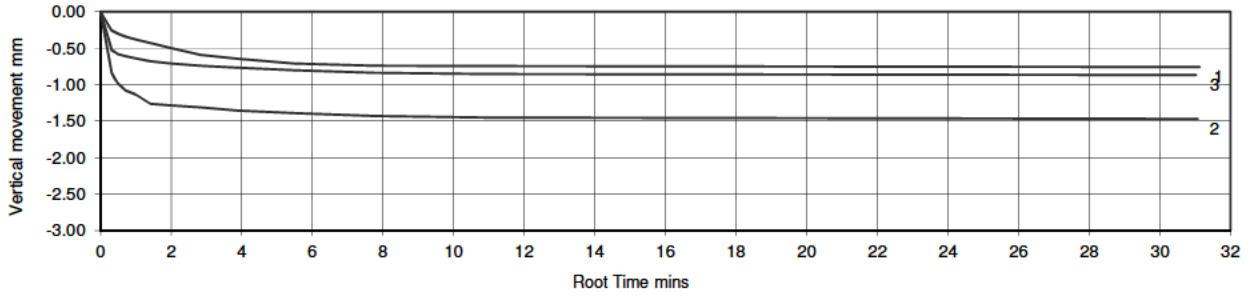
Notes :

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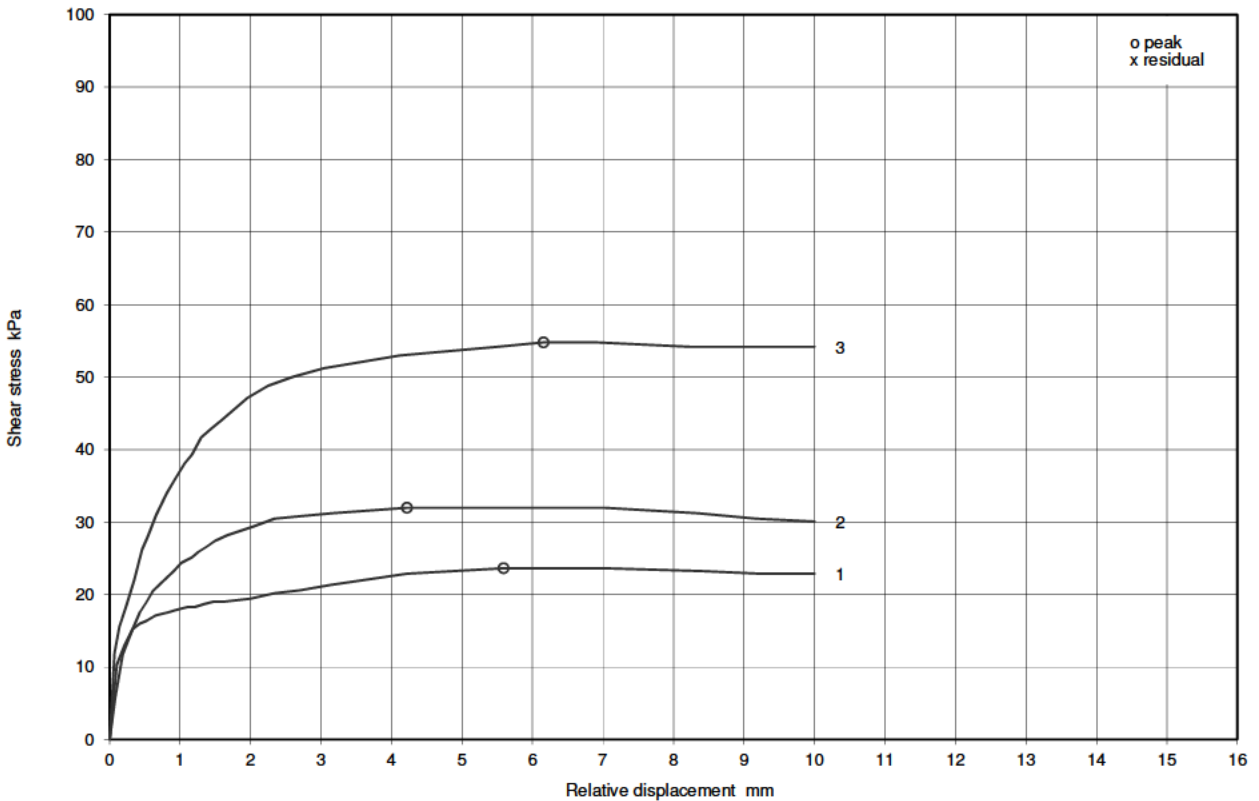
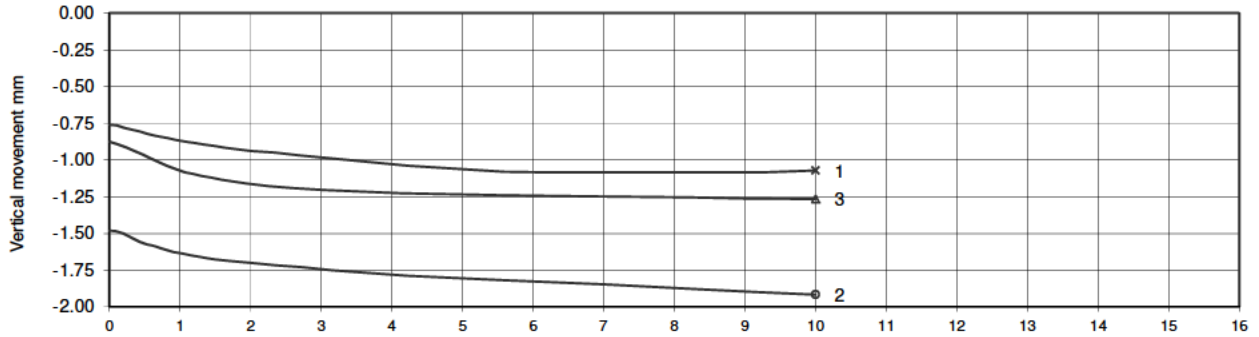
**Determination of shear strength by direct shear (Small shearbox apparatus)
(BS1377 : Part 7 : clause 4 : 1990)**

Project No	A8013-18	Sample Details:	Hole No.	TP/17/06		
Project Name	A1 Alnwick To Ellingham		Depth (m BGL)	2.20 - 2.40		
			Sample No	2	Type	B
			ID			
			Spec Ref			

Consolidation stage(s)



Shearing stage(s)



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**Determination of shear strength by direct shear (Small shearbox apparatus)
(BS1377 : Part 7 : clause 4 : 1990)**

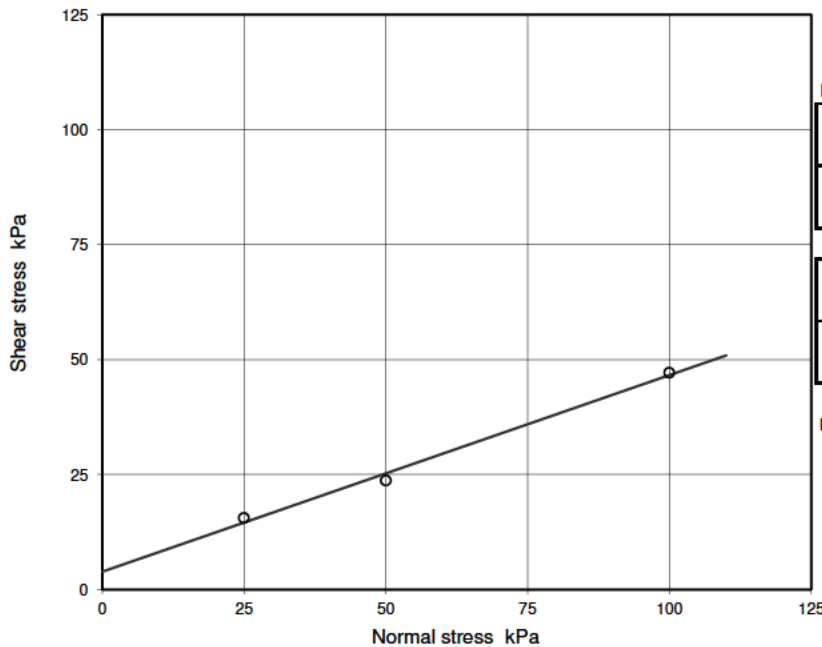
Project No	A8013-18	Sample Details:	Hole No.	TP/17/12		
Project Name	A1iN Morpeth To Felton & Alnwick To Ellingham		Depth (m BGL)	1.50 - 2.00		
			Sample No	8	Type	B
			ID			
			Spec Ref			

Soil Description	Brown silty CLAY.
Specimen Type /Preparation	-2mm material. Recompact to maximum achievable density at as received moisture content.

Specimen(s) nominally 60mm x 60mm square
 Test(s) carried out in submerged condition
 Particle density, assumed 2.65 Mg/m³

Specimen Details		No.	1	2	3	4	5	6
Initial	Height	mm	26.1	26.1	26.1			
	Bulk Density	Mg/m ³	2.08	2.08	2.08			
	Water Content	%	15.2	15.2	15.2			
	Dry density	Mg/m ³	1.80	1.80	1.80			
	Voids ratio		0.468	0.468	0.468			
Consol ¹	Degree of Saturation	%	86	86	86			
	Consolidation / Normal Stress applied	kPa	25	50	100			
	Change in height during consolidation	mm	-0.540	-1.116	-2.124			
Shear see note 1	Voids ratio after consolidation		0.438	0.405	0.349			
	Voids ratio at end of test		0.426	0.385	0.326			
	Moisture content at end of test	%	16.1	14.5	12.3			
	Saturation at end of test	%	100	100	100			

Shearing stage								
Rate of displacement	Peak	mm/min	0.030	0.030	0.030			
	Residual	mm/min						
Peak values, (o)	Relative displacement	mm	5.00	8.00	8.00			
	Shear stress	kPa	15.6	23.7	47.1			
Residual values, (x)	No. of reversals							
	Relative displacement	mm						
	Shear stress	kPa						



Shear Strength Parameters

Peak strength, (o)		Regression	Manual
c'	kPa	3.9	-
Ø'	degrees	23	-
Residual strength, (x)			
c' _R	kPa	-	-
Ø' _R	degrees	-	-

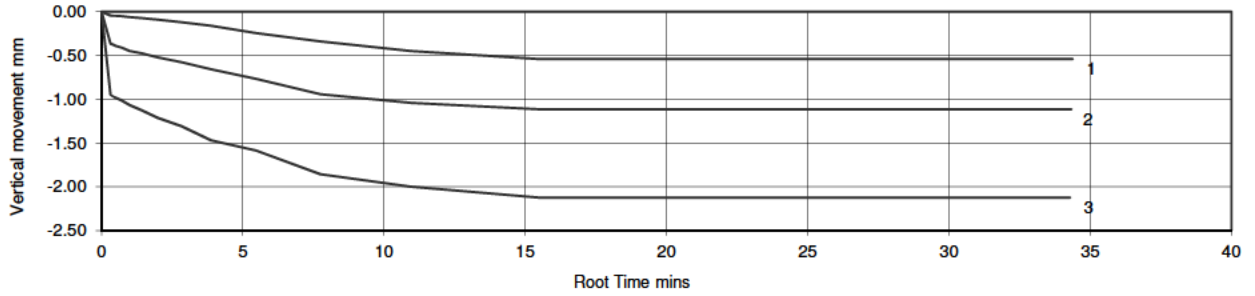
Notes :

1 After shear values based on BS1377. Pt 7 cl. 4.6.1.6 using ØH calculated from consolidation and shear stages

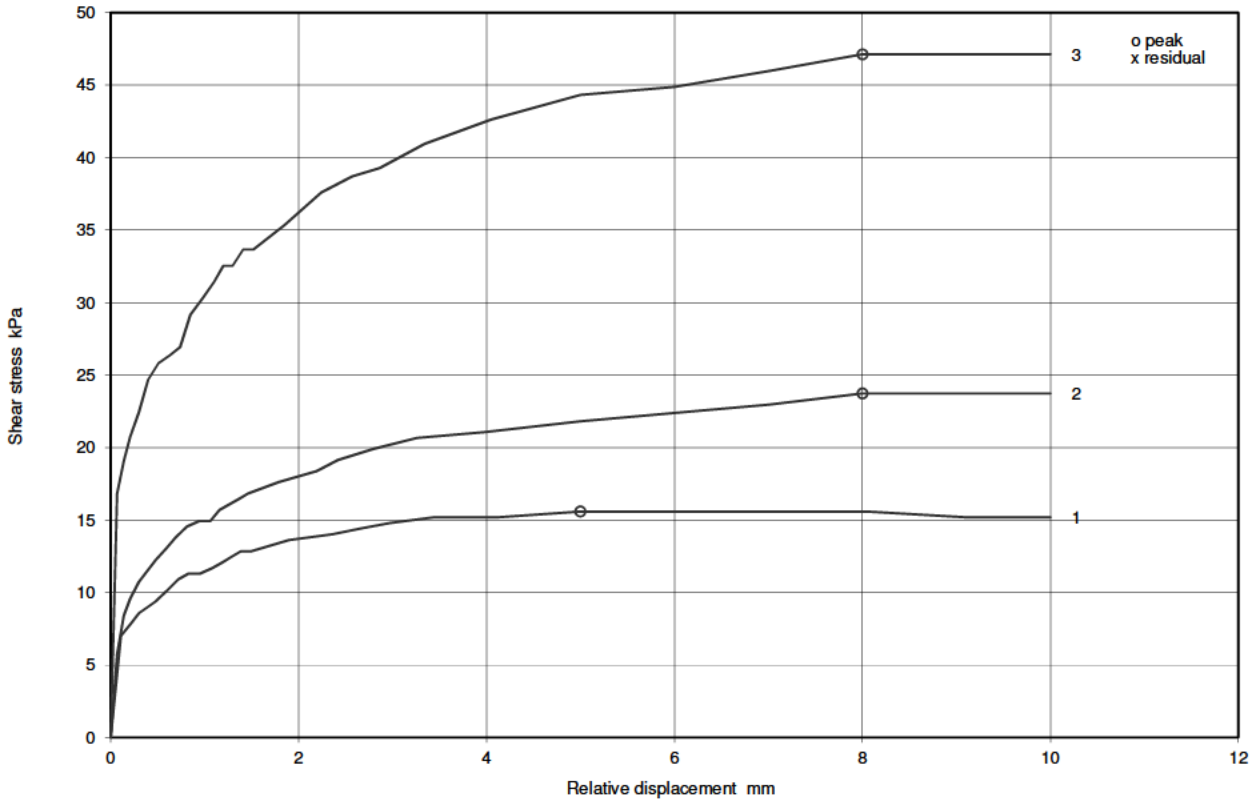
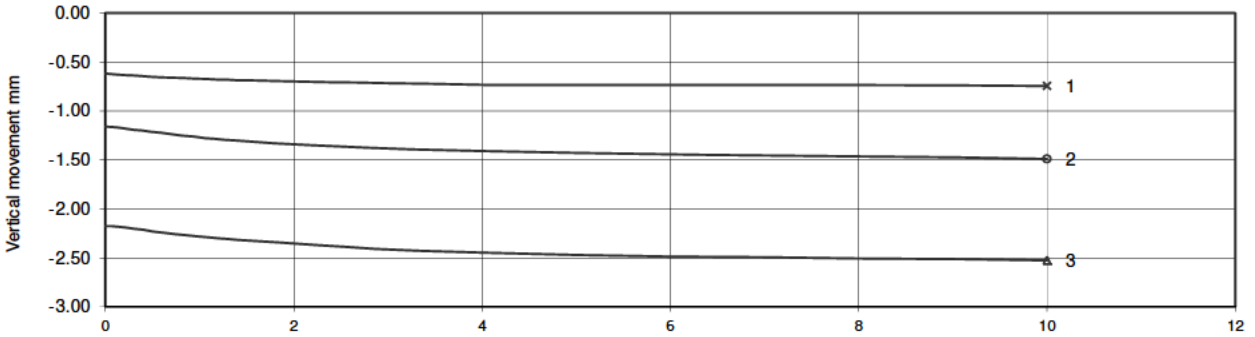
**Determination of shear strength by direct shear (Small shearbox apparatus)
(BS1377 : Part 7 : clause 4 : 1990)**

Project No	A8013-18	Sample Details:	Hole No.	TP/17/12		
Project Name	A1iN Morpeth To Felton & Alnwick To Ellingham		Depth (m BGL)	1.50 - 2.00		
			Sample No	8	Type	B
			ID			
			Spec Ref			

Consolidation stage(s)



Shearing stage(s)



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**Determination of shear strength by direct shear (Small shearbox apparatus)
(BS1377 : Part 7 : clause 4 : 1990)**

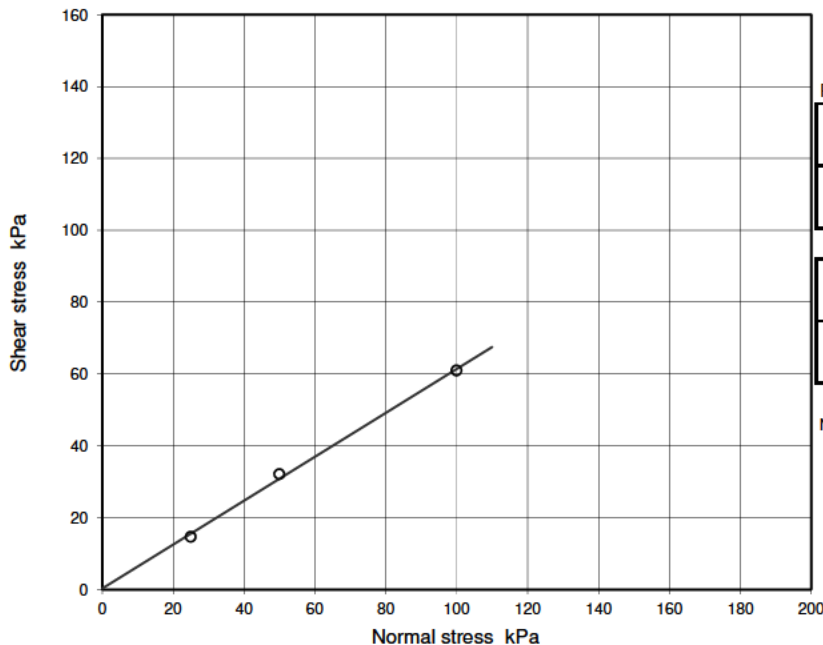
Project No	A8013-18	Sample Details:	Hole No.	TP/17/15		
Project Name	A1 Alnwick To Ellingham		Depth (m BGL)	0.40 - 0.60		
			Sample No	5	Type	B
			ID			
			Spec Ref			

Soil Description	Brown silty CLAY.
Specimen Type /Preparation	-2mm material. Recompacted to maximum dry density at as received moisture content.

Specimen(s) nominally 60mm x 60mm square
 Test(s) carried out in submerged condition
 Particle density, assumed 2.65 Mg/m³

Specimen Details		No.	1	2	3	4	5	6
Initial	Height	mm	26.1	26.1	26.1			
	Bulk Density	Mg/m ³	1.85	1.85	1.85			
	Water Content	%	17.6	17.6	17.6			
	Dry density	Mg/m ³	1.58	1.58	1.58			
	Voids ratio		0.681	0.681	0.681			
Consol ¹	Degree of Saturation	%	68	68	68			
	Consolidation / Normal Stress applied	kPa	25	50	100			
	Change in height during consolidation	mm	-0.158	-0.408	-0.694			
Shear see note 1	Voids ratio after consolidation		0.671	0.655	0.636			
	Voids ratio at end of test		0.690	0.659	0.602			
	Moisture content at end of test	%	24.4	22.4	22.7			
	Saturation at end of test	%	94	90	100			

Shearing stage							
Rate of displacement	Peak	mm/min	0.038	0.038	0.038		
	Residual	mm/min					
Peak values, (o)	Relative displacement	mm	2.89	1.41	7.07		
	Shear stress	kPa	14.6	32.1	60.9		
Residual values, (x)	No. of reversals						
	Relative displacement	mm					
	Shear stress	kPa					



Shear Strength Parameters

Peak strength, (o)		Regression	Manual
c'	kPa	0.2	-
Ø'	degrees	31½	-
Residual strength, (x)			
c' _R	kPa	-	-
Ø' _R	degrees	-	-

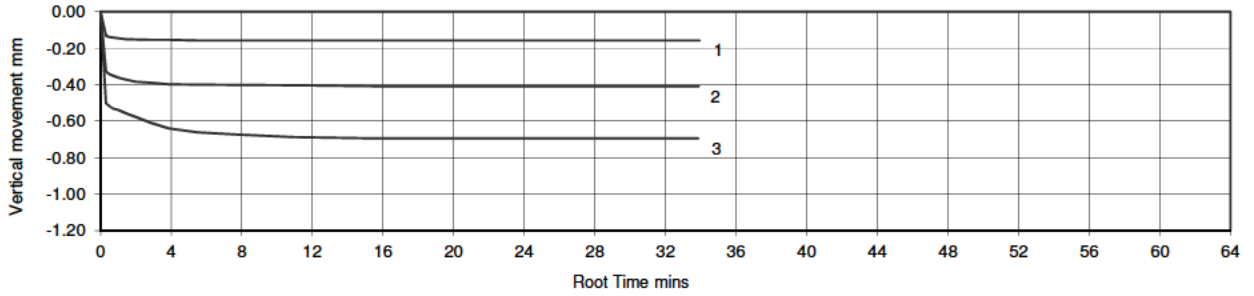
Notes :

1 After shear values based on BS1377. Pt 7 cl. 4.6.1.6 using ØH calculated from consolidation and shear stages

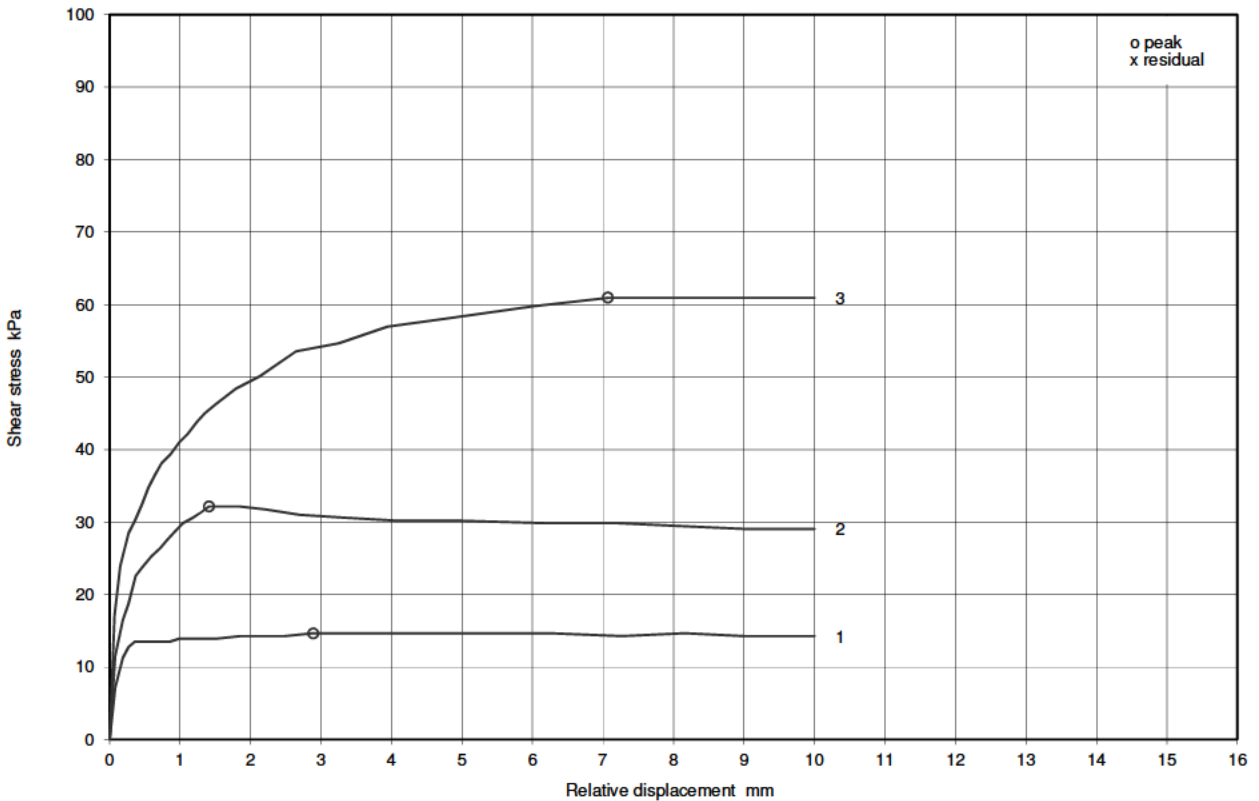
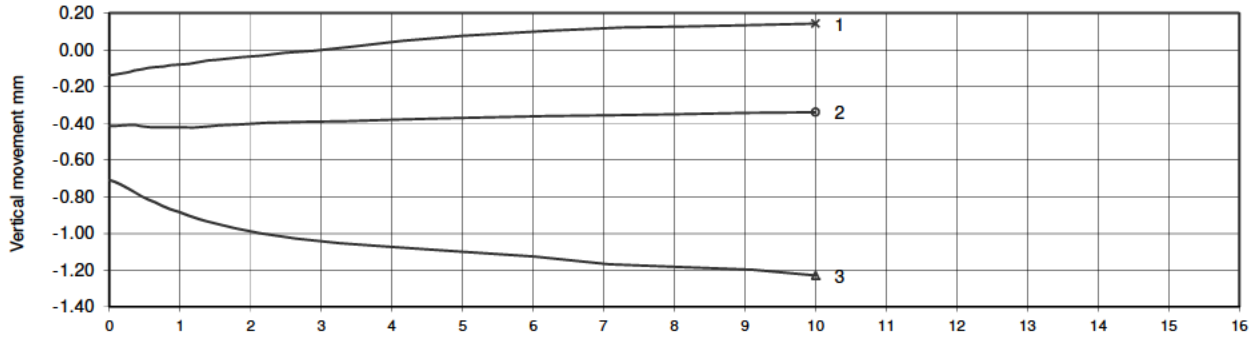
**Determination of shear strength by direct shear (Small shearbox apparatus)
(BS1377 : Part 7 : clause 4 : 1990)**

Project No	A8013-18	Sample Details:	Hole No.	TP/17/15		
Project Name	A1 Alnwick To Ellingham		Depth (m BGL)	0.40 - 0.60		
			Sample No	5	Type	B
			ID			
			Spec Ref			

Consolidation stage(s)



Shearing stage(s)



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**Determination of shear strength by direct shear (Small shearbox apparatus)
(BS1377 : Part 7 : clause 4 : 1990)**

Project No	A8013-18	Sample Details:	Hole No.	TP/17/19		
Project Name	A1 Alnwick To Ellingham		Depth (m BGL)	1.20 - 1.50		
			Sample No	8	Type	B
			ID			
			Spec Ref			

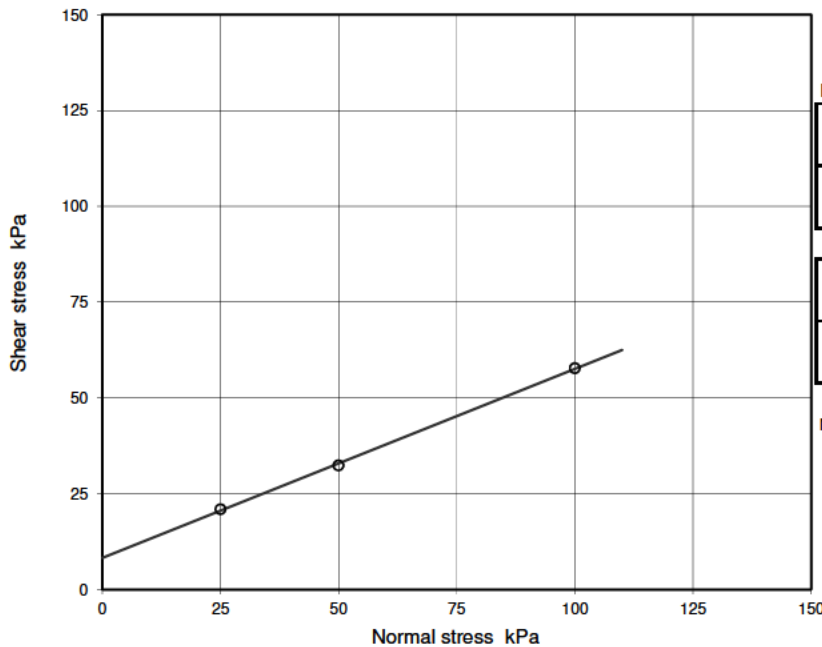
Soil Description	Brown CLAY.
Specimen Type /Preparation	-2mm material. Recompact to maximum achievable density at as received moisture content.

Specimen(s) nominally 60mm x 60mm square
 Test(s) carried out in submerged condition
 Particle density, assumed 2.65 Mg/m³

Specimen Details		No.	1	2	3	4	5	6
Initial	Height	mm	26.1	26.1	26.1			
	Bulk Density	Mg/m ³	2.08	2.08	2.08			
	Water Content	%	17.2	17.2	17.2			
	Dry density	Mg/m ³	1.78	1.78	1.78			
	Voids ratio		0.490	0.490	0.490			
	Degree of Saturation	%	93	93	93			
Consol ¹	Consolidation / Normal Stress applied	kPa	25	50	100			
	Change in height during consolidation	mm	-0.388	-0.758	-1.128			
	Voids ratio after consolidation		0.468	0.447	0.426			
Shear see note 1	Voids ratio at end of test		0.470	0.439	0.408			
	Moisture content at end of test	%	17.5	16.5	15.4			
	Saturation at end of test	%	99	100	100			

Shearing stage

Rate of displacement	Peak	mm/min	0.049	0.049	0.049			
	Residual	mm/min						
Peak values, (o)	Relative displacement	mm	2.40	4.07	9.00			
	Shear stress	kPa	20.9	32.3	57.8			
Residual values, (x)	No. of reversals							
	Relative displacement	mm						
	Shear stress	kPa						



Shear Strength Parameters

Peak strength, (o)		Regression	Manual
c'	kPa	8.2	-
Ø'	degrees	26½	-
Residual strength, (x)			
c' _R	kPa	-	-
Ø' _R	degrees	-	-

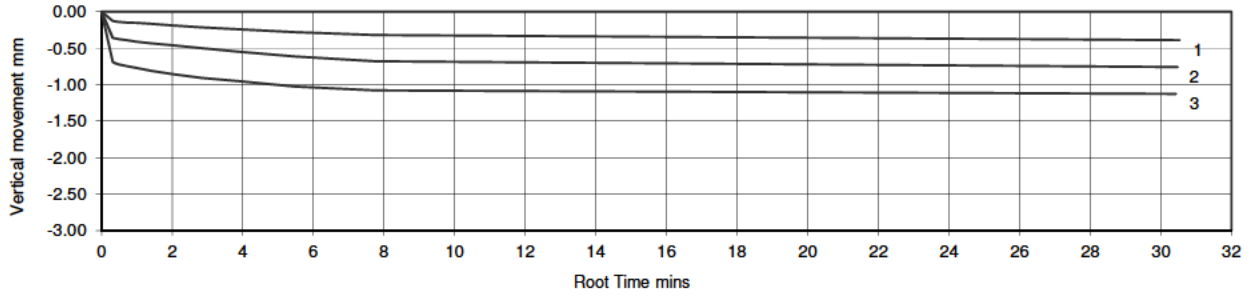
Notes :

1 After shear values based on BS1377. Pt 7 cl. 4.6.1.6 using ØH calculated from consolidation and shear stages

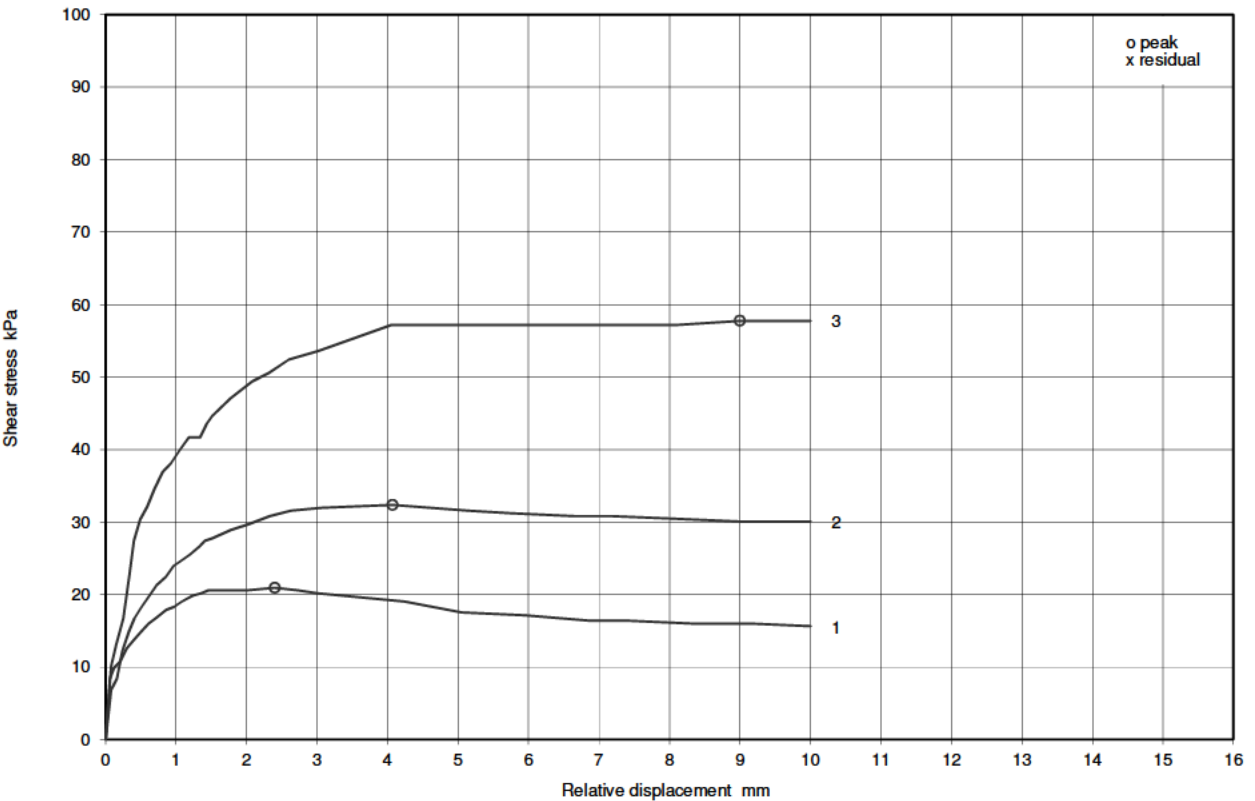
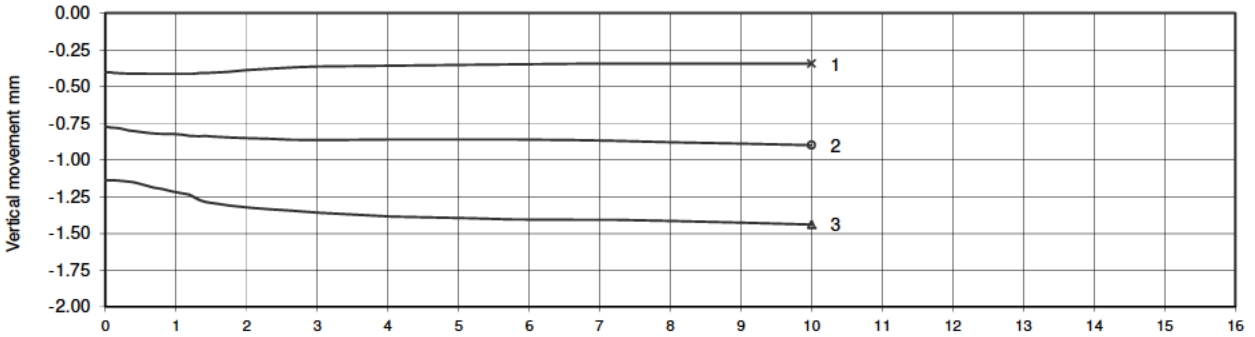
**Determination of shear strength by direct shear (Small shearbox apparatus)
(BS1377 : Part 7 : clause 4 : 1990)**

Project No	A8013-18	Sample Details:	Hole No.	TP/17/19		
Project Name	A1 Alnwick To Ellingham		Depth (m BGL)	1.20 - 1.50		
			Sample No	8	Type	B
			ID			
			Spec Ref			

Consolidation stage(s)



Shearing stage(s)



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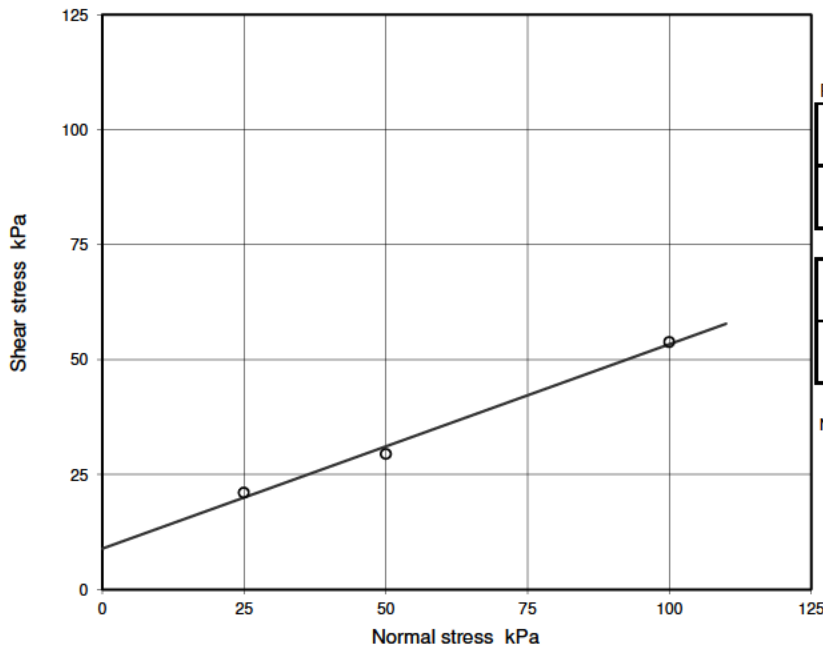
**Determination of shear strength by direct shear (Small shearbox apparatus)
(BS1377 : Part 7 : clause 4 : 1990)**

Project No	A8013-18	Sample Details:	Hole No.	TP/17/22		
Project Name	A1 Alnwick To Ellingham		Depth (m BGL)	2.00 - 2.50		
			Sample No	10	Type	B
			ID			
			Spec Ref			

Soil Description	Greyish brown CLAY.	Specimen(s) nominally 60mm x 60mm square Test(s) carried out in submerged condition Particle density, assumed 2.65 Mg/m ³
Specimen Type /Preparation	-2mm material. Recompactd to a dry density of 1.83Mg/m ³ at as received moisture content.	

Specimen Details		No.	1	2	3	4	5	6
Initial	Height	mm	26.1	26.1	26.1			
	Bulk Density	Mg/m ³	2.09	2.09	2.09			
	Water Content	%	14.3	14.3	14.3			
	Dry density	Mg/m ³	1.83	1.83	1.83			
	Voids ratio		0.448	0.448	0.448			
Consol ¹	Degree of Saturation	%	84	84	84			
	Consolidation / Normal Stress applied	kPa	25	50	100			
	Change in height during consolidation	mm	-0.204	-0.620	-1.050			
Shear see note 1	Voids ratio after consolidation		0.437	0.414	0.390			
	Voids ratio at end of test		0.407	0.391	0.376			
	Moisture content at end of test	%	15.3	14.7	14.2			
	Saturation at end of test	%	100	100	100			

Shearing stage								
Rate of displacement	Peak	mm/min	0.054	0.054	0.054			
	Residual	mm/min						
Peak values, (o)	Relative displacement	mm	4.00	4.02	5.00			
	Shear stress	kPa	21.0	29.5	53.8			
Residual values, (x)	No. of reversals							
	Relative displacement	mm						
	Shear stress	kPa						



Shear Strength Parameters

Peak strength, (o)		Regression	Manual
c'	kPa	8.8	-
Ø'	degrees	24	-
Residual strength, (x)			
c' _R	kPa	-	-
Ø' _R	degrees	-	-

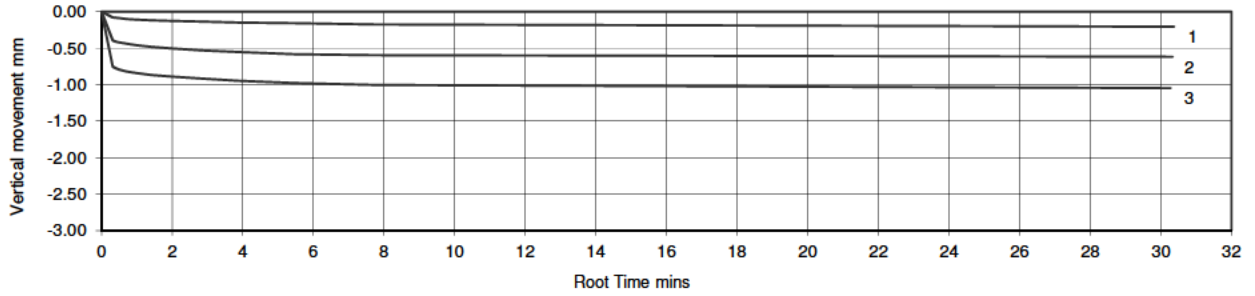
Notes :

1 After shear values based on BS1377. Pt 7 cl. 4.6.1.6 using ØH calculated from consolidation and shear stages

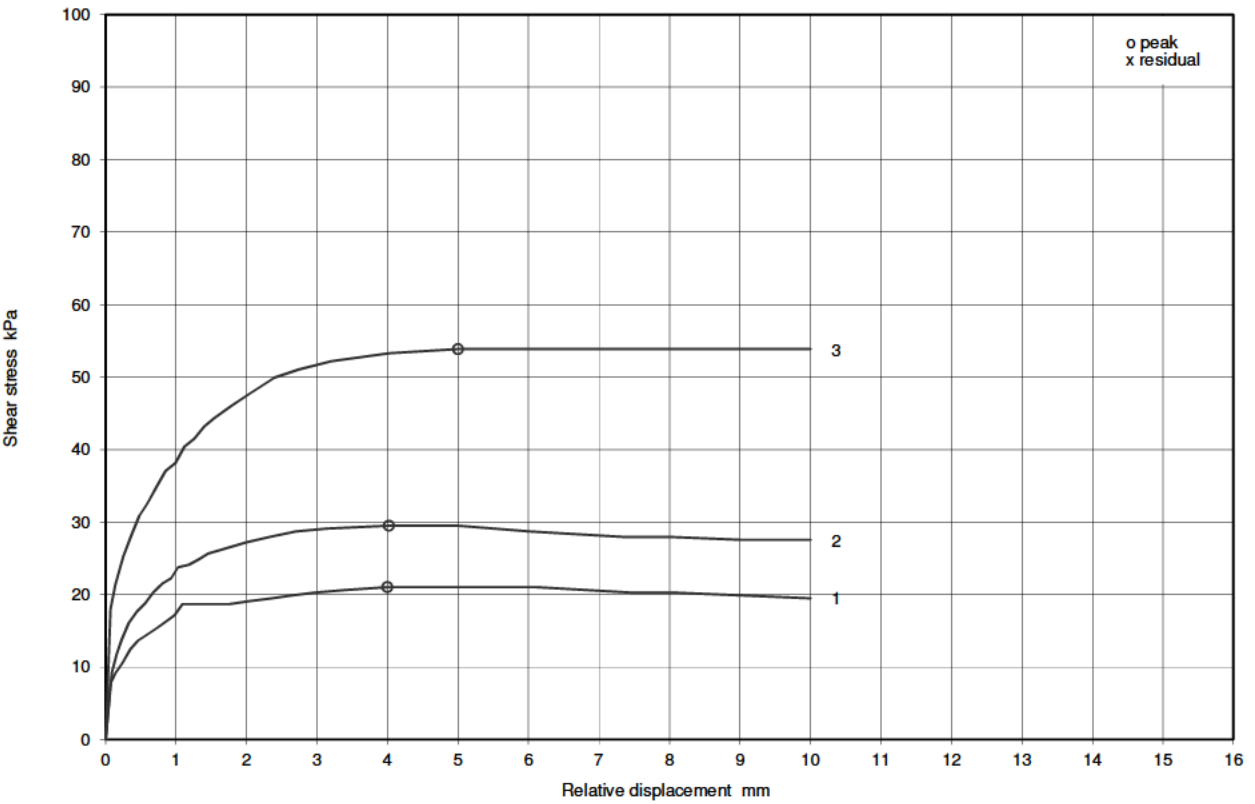
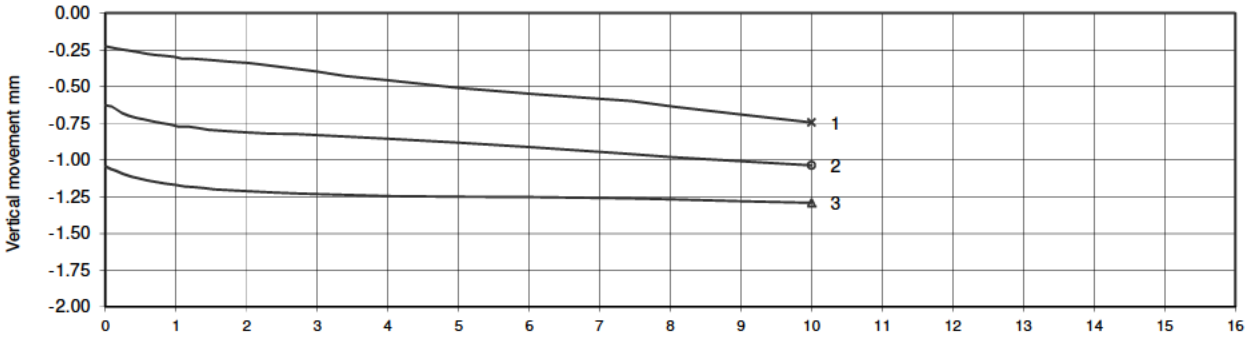
**Determination of shear strength by direct shear (Small shearbox apparatus)
(BS1377 : Part 7 : clause 4 : 1990)**

Project No	A8013-18	Sample Details:	Hole No.	TP/17/22		
Project Name	A1 Alnwick To Ellingham		Depth (m BGL)	2.00 - 2.50		
			Sample No	10	Type	B
			ID			
			Spec Ref			

Consolidation stage(s)



Shearing stage(s)



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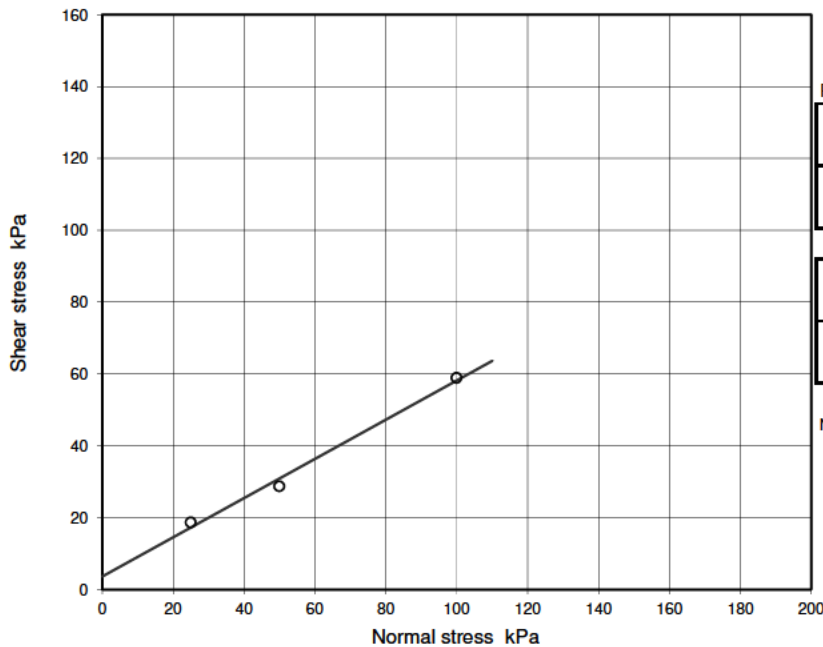
**Determination of shear strength by direct shear (Small shearbox apparatus)
(BS1377 : Part 7 : clause 4 : 1990)**

Project No	A8013-18	Sample Details:	Hole No.	TP/17/23		
Project Name	A1 Alnwick To Ellingham		Depth (m BGL)	0.40 - 1.00		
			Sample No	3	Type	B
			ID			
			Spec Ref			

Soil Description	Dark brown slightly sandy CLAY.	Specimen(s) nominally 60mm x 60mm square
Specimen Type /Preparation	-2mm material. Recompactd to a dry density of 1.79Mg/m ³ at as received moisture content.	Test(s) carried out in submerged condition
		Particle density, assumed 2.65 Mg/m ³

Specimen Details		No.	1	2	3	4	5	6
Initial	Height	mm	26.1	26.1	26.1			
	Bulk Density	Mg/m ³	2.04	2.04	2.04			
	Water Content	%	13.8	13.8	13.8			
	Dry density	Mg/m ³	1.79	1.79	1.79			
	Voids ratio		0.481	0.481	0.481			
	Degree of Saturation	%	76	76	76			
Consof ¹	Consolidation / Normal Stress applied	kPa	25	50	100			
	Change in height during consolidation	mm	-0.064	-0.176	-0.602			
	Voids ratio after consolidation		0.477	0.471	0.447			
Shear see note 1	Voids ratio at end of test		0.497	0.474	0.427			
	Moisture content at end of test	%	18.7	17.9	16.1			
	Saturation at end of test	%	100	100	100			

Shearing stage							
Rate of displacement	Peak	mm/min	0.038	0.038	0.038		
	Residual	mm/min					
Peak values, (o)	Relative displacement	mm	0.44	2.76	7.42		
	Shear stress	kPa	18.7	28.7	58.9		
Residual values, (x)	No. of reversals						
	Relative displacement	mm					
	Shear stress	kPa					



Shear Strength Parameters

Peak strength, (o)		Regression	Manual
c'	kPa	3.6	-
Ø'	degrees	28½	-
Residual strength, (x)			
c' _R	kPa	-	-
Ø' _R	degrees	-	-

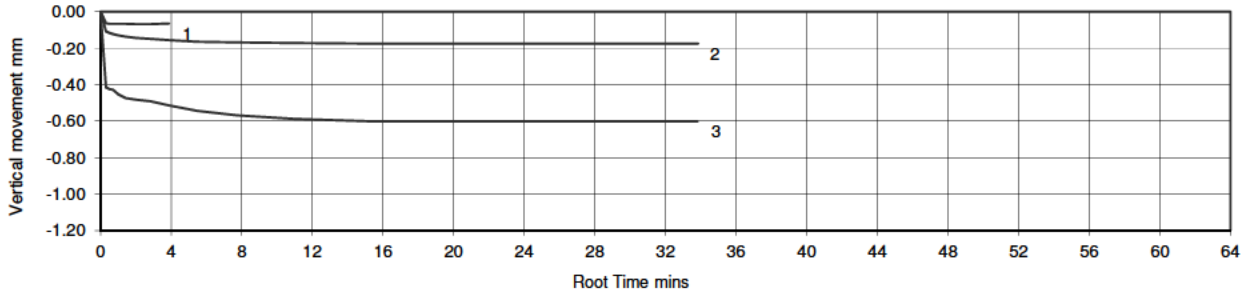
Notes :

1 After shear values based on BS1377. Pt 7 cl. 4.6.1.6 using ØH calculated from consolidation and shear stages

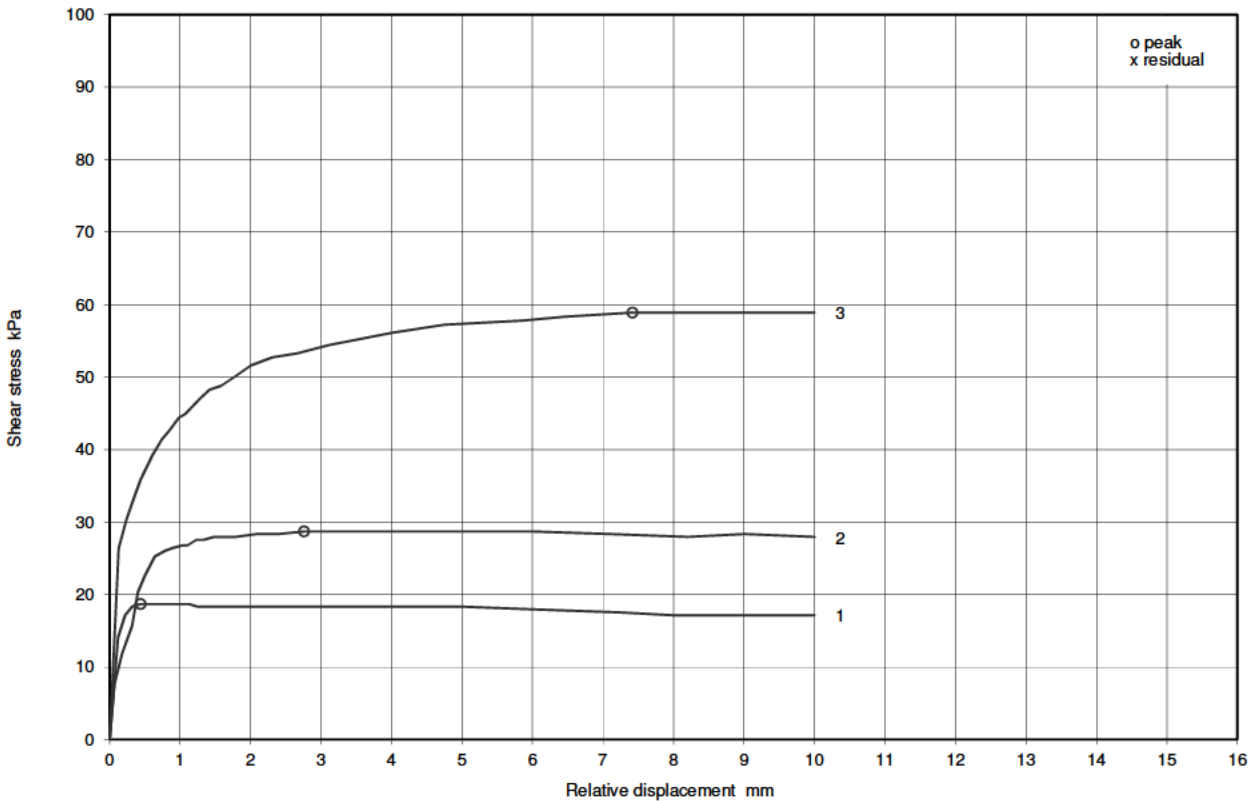
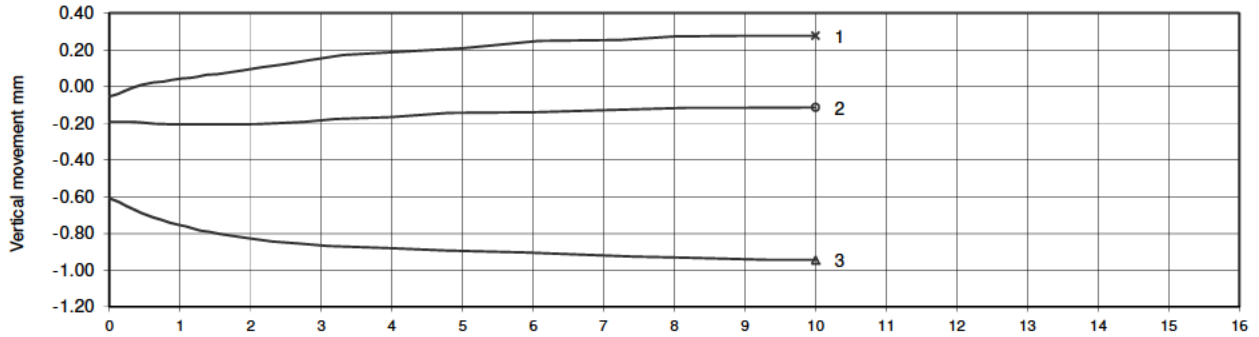
**Determination of shear strength by direct shear (Small shearbox apparatus)
(BS1377 : Part 7 : clause 4 : 1990)**

Project No	A8013-18	Sample Details:	Hole No.	TP/17/23		
Project Name	A1 Alnwick To Ellingham		Depth (m BGL)	0.40 - 1.00		
			Sample No	3	Type	B
			ID			
			Spec Ref			

Consolidation stage(s)



Shearing stage(s)



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**Determination of shear strength by direct shear (Small shearbox apparatus)
(BS1377 : Part 7 : clause 4 : 1990)**

Project No	A8013-18	Sample Details:	Hole No.	TP/17/25		
Project Name	A1 Alnwick To Ellingham		Depth (m BGL)	0.30 - 0.50		
			Sample No	4	Type	B
			ID			
			Spec Ref			

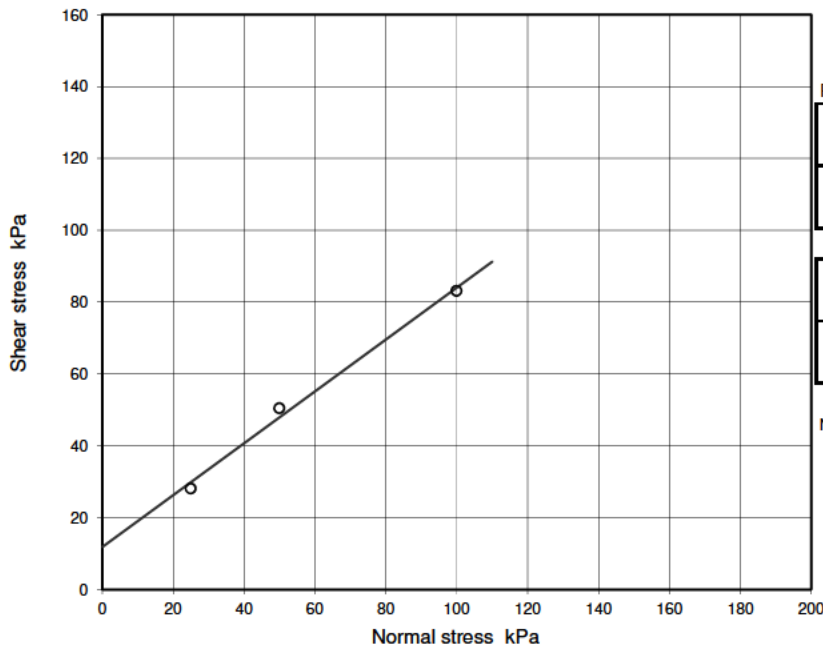
Soil Description	Dark brown slightly sandy CLAY.
Specimen Type /Preparation	-2mm material. Recompacted to maximum dry density at as received moisture content.

Specimen(s) nominally 60mm x 60mm square
 Test(s) carried out in submerged condition
 Particle density, assumed 2.65 Mg/m³

Specimen Details		No.	1	2	3	4	5	6
Initial	Height	mm	26.1	26.1	26.1			
	Bulk Density	Mg/m ³	2.10	2.10	2.10			
	Water Content	%	17.3	17.3	17.3			
	Dry density	Mg/m ³	1.79	1.79	1.79			
	Voids ratio		0.478	0.478	0.478			
	Degree of Saturation	%	96	96	96			
Consol ¹	Consolidation / Normal Stress applied	kPa	25	50	100			
	Change in height during consolidation	mm	-0.256	-0.520	-0.892			
	Voids ratio after consolidation		0.463	0.448	0.427			
Shear see note 1	Voids ratio at end of test		0.482	0.455	0.430			
	Moisture content at end of test	%	18.2	17.2	16.2			
	Saturation at end of test	%	100	100	100			

Shearing stage

Rate of displacement	Peak	mm/min	0.038	0.038	0.038			
	Residual	mm/min						
Peak values, (o)	Relative displacement	mm	2.07	2.44	2.64			
	Shear stress	kPa	28.1	50.5	83.1			
Residual values, (x)	No. of reversals							
	Relative displacement	mm						
	Shear stress	kPa						



Shear Strength Parameters

Peak strength, (o)		Regression	Manual
c'	kPa	12	-
Ø'	degrees	36	-
Residual strength, (x)			
c' _R	kPa	-	-
Ø' _R	degrees	-	-

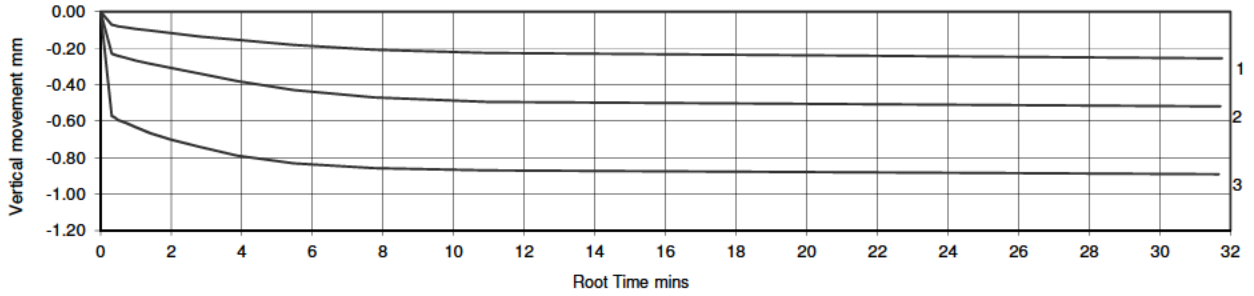
Notes :

1 After shear values based on BS1377. Pt 7 cl. 4.6.1.6 using ØH calculated from consolidation and shear stages

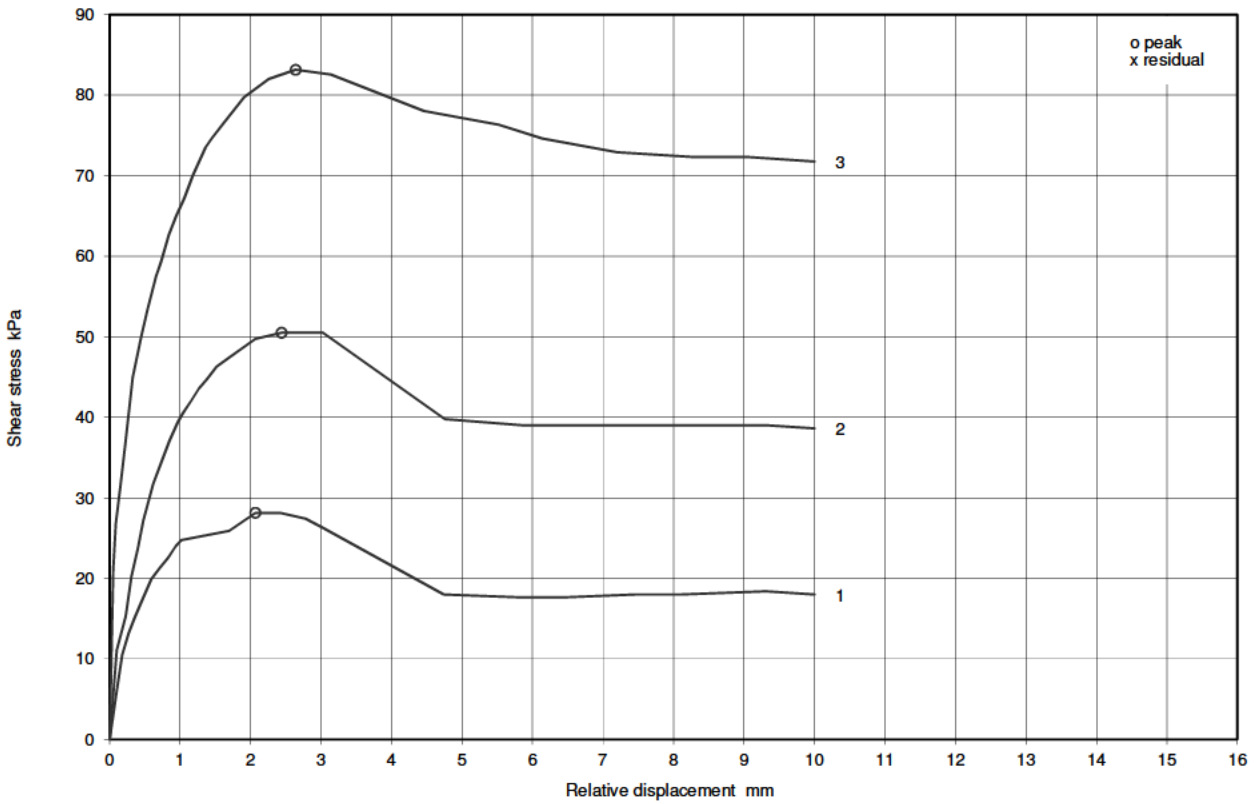
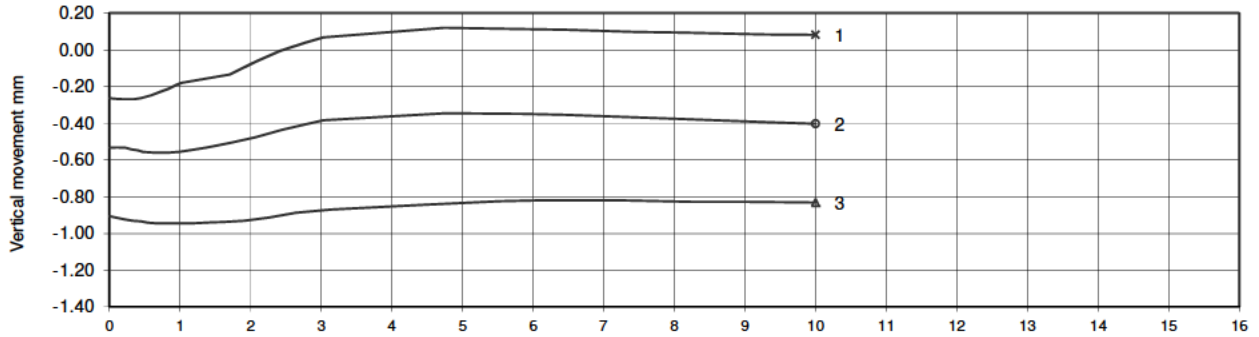
**Determination of shear strength by direct shear (Small shearbox apparatus)
(BS1377 : Part 7 : clause 4 : 1990)**

Project No	A8013-18	Sample Details:	Hole No.	TP/17/25		
Project Name	A1 Alnwick To Ellingham		Depth (m BGL)	0.30 - 0.50		
			Sample No	4	Type	B
			ID			
			Spec Ref			

Consolidation stage(s)



Shearing stage(s)



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**Determination of shear strength by direct shear (Small shearbox apparatus)
(BS1377 : Part 7 : clause 4 : 1990)**

Project No	A8013-18	Sample Details:	Hole No.	TP/17/25		
Project Name	A1iN Morpeth To Felton & Alnwick To Ellingham		Depth (m BGL)	1.00 - 1.35		
			Sample No	7	Type	B
			ID			
			Spec Ref			

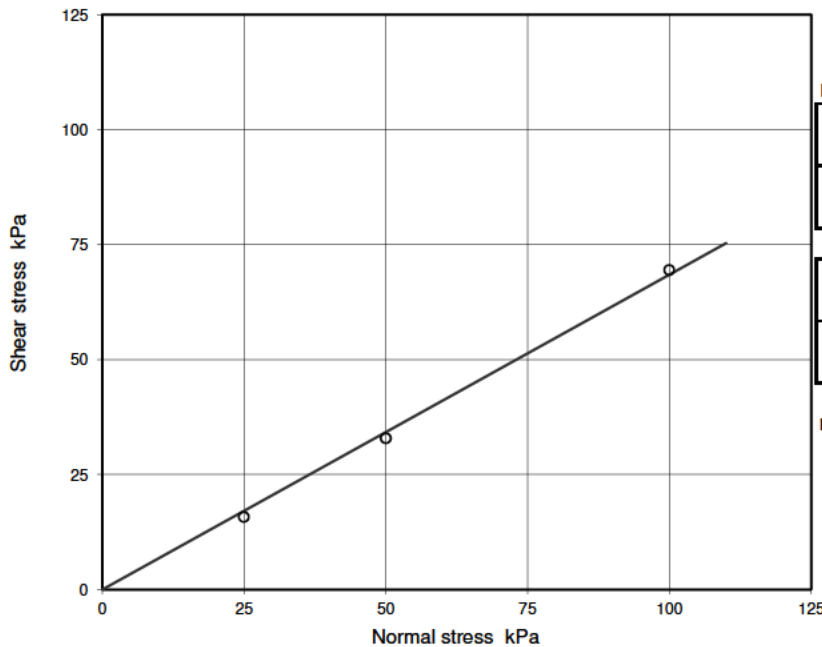
Soil Description	Brown silty CLAY.
Specimen Type /Preparation	-2mm material. Recompactd to maxium density at as received moisture content.

Specimen(s) nominally 60mm x 60mm square
 Test(s) carried out in submerged condition
 Particle density, assumed 2.65 Mg/m³

Specimen Details		No.	1	2	3	4	5	6
Initial	Height	mm	26.1	26.1	26.1			
	Bulk Density	Mg/m ³	2.05	2.05	2.05			
	Water Content	%	17.1	17.1	17.1			
	Dry density	Mg/m ³	1.75	1.75	1.75			
	Voids ratio		0.515	0.515	0.515			
Consol ¹	Degree of Saturation	%	88	88	88			
	Consolidation / Normal Stress applied	kPa	25	50	100			
	Change in height during consolidation	mm	-1.108	-1.708	-2.296			
Shear see note 1	Voids ratio after consolidation		0.451	0.416	0.382			
	Voids ratio at end of test		0.443	0.390	0.356			
	Moisture content at end of test	%	16.7	14.7	13.4			
	Saturation at end of test	%	100	100	100			

Shearing stage

Rate of displacement	Peak	mm/min	0.035	0.035	0.035			
	Residual	mm/min						
Peak values, (o)	Relative displacement	mm	4.64	6.50	10.00			
	Shear stress	kPa	15.8	32.9	69.5			
Residual values, (x)	No. of reversals							
	Relative displacement	mm						
	Shear stress	kPa						



Shear Strength Parameters

Peak strength, (o)		Regression	Manual
c'	kPa	(-2.5)	0.0
Ø'	degrees	(35½)	34½
Residual strength, (x)			
c' _R	kPa	-	-
Ø' _R	degrees	-	-

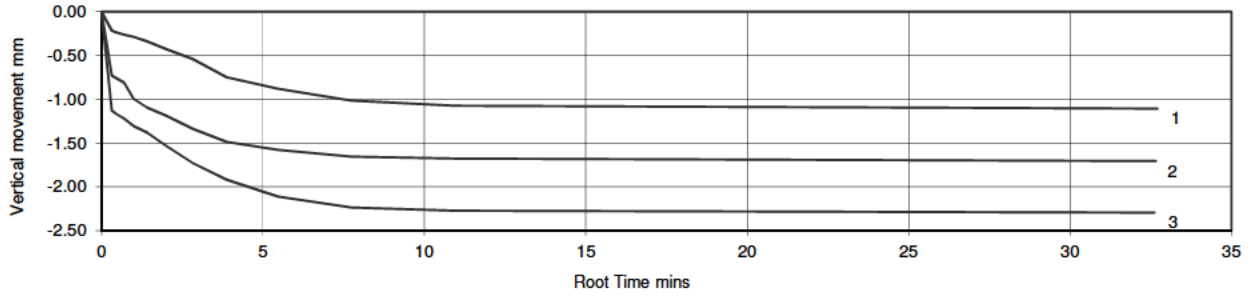
Notes :

1 After shear values based on BS1377. Pt 7 cl. 4.6.1.6 using ØH calculated from consolidation and shear stages

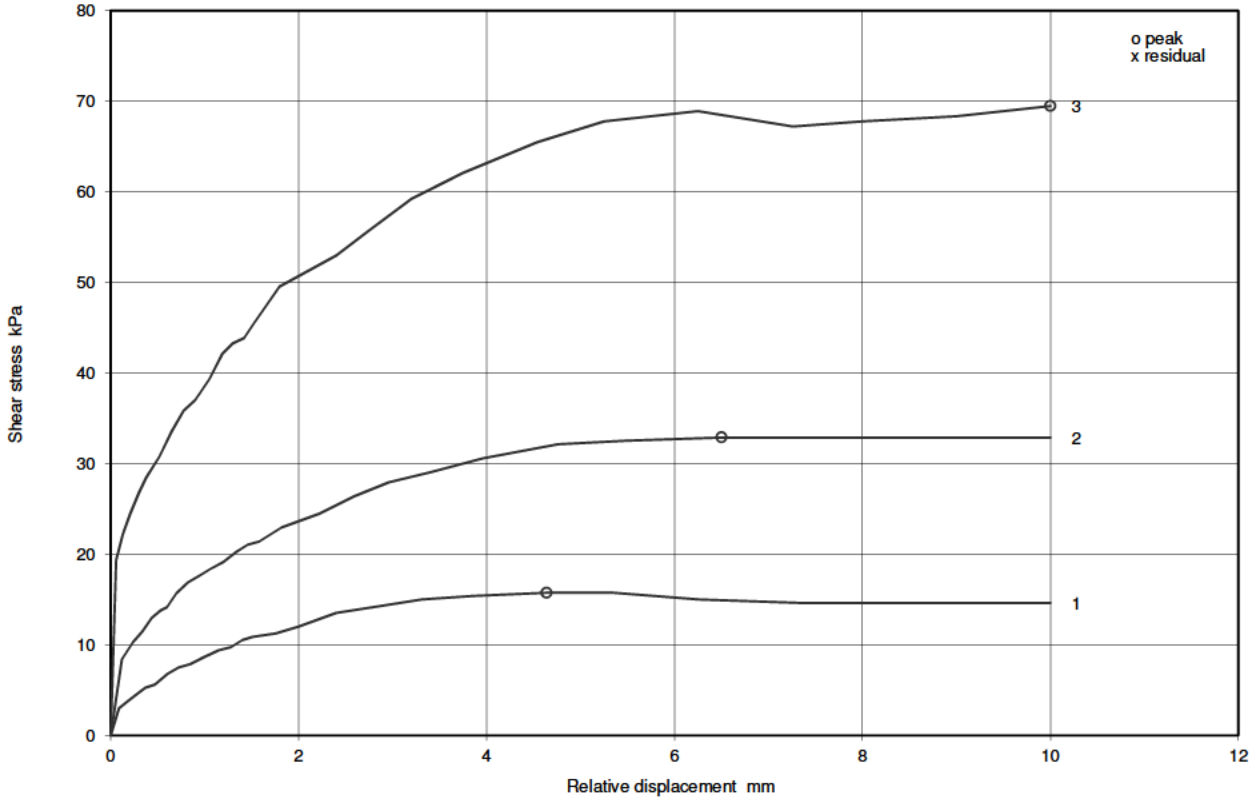
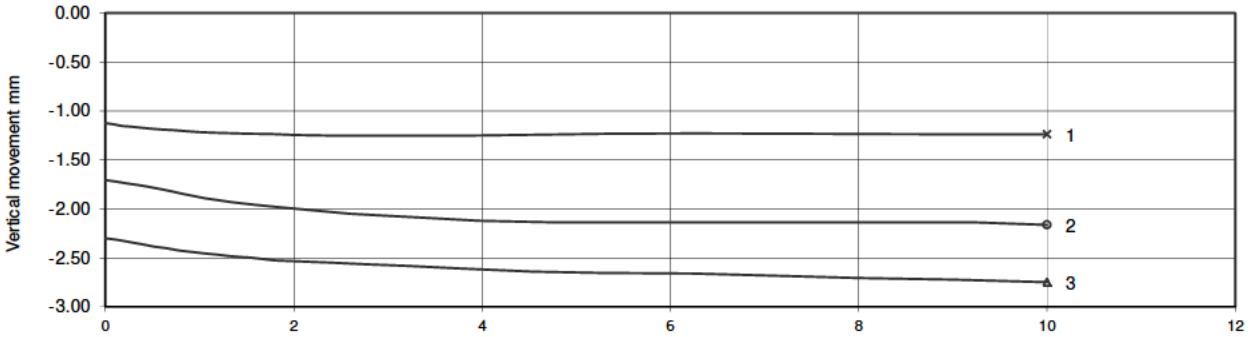
**Determination of shear strength by direct shear (Small shearbox apparatus)
(BS1377 : Part 7 : clause 4 : 1990)**

Project No	A8013-18	Sample Details:	Hole No.	TP/17/25		
Project Name	A1iN Morpeth To Felton & Alnwick To Ellingham		Depth (m BGL)	1.00 - 1.35		
			Sample No	7	Type	B
			ID			
			Spec Ref			

Consolidation stage(s)



Shearing stage(s)



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**Determination of shear strength by direct shear (Small shearbox apparatus)
(BS1377 : Part 7 : clause 4 : 1990)**

Project No	A8013-18	Sample Details:	Hole No.	TP/17/29		
Project Name	A1 Alnwick To Ellingham		Depth (m BGL)	1.50 - 2.50		
			Sample No	7	Type	B
			ID			
			Spec Ref			

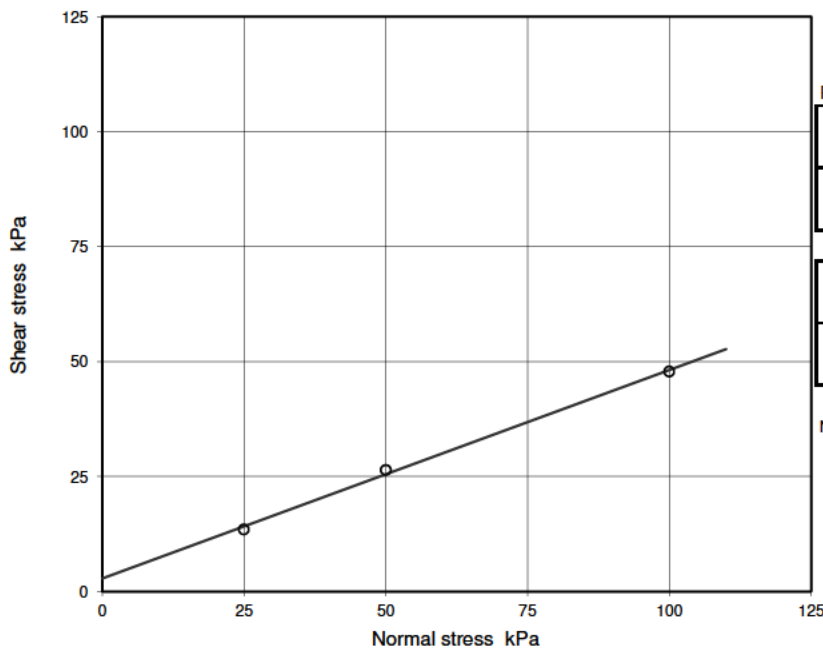
Soil Description	Brown silty CLAY.
Specimen Type /Preparation	-2mm material. Recompact to maximum density at as received moisture content.

Specimen(s) nominally 60mm x 60mm square
 Test(s) carried out in submerged condition
 Particle density, assumed 2.65 Mg/m³

Specimen Details		No.	1	2	3	4	5	6
Initial	Height	mm	26.1	26.1	26.1			
	Bulk Density	Mg/m ³	1.93	1.93	1.93			
	Water Content	%	26.9	26.9	26.9			
	Dry density	Mg/m ³	1.52	1.52	1.52			
	Voids ratio		0.743	0.743	0.743			
	Degree of Saturation	%	96	96	96			
Consol ¹	Consolidation / Normal Stress applied	kPa	25	50	100			
	Change in height during consolidation	mm	-0.132	-0.480	-1.198			
	Voids ratio after consolidation		0.734	0.711	0.663			
Shear see note 1	Voids ratio at end of test		0.720	0.687	0.630			
	Moisture content at end of test	%	27.2	25.9	23.8			
	Saturation at end of test	%	100	100	100			

Shearing stage

Rate of displacement	Peak	mm/min	0.054	0.054	0.054			
	Residual	mm/min						
Peak values, (o)	Relative displacement	mm	1.29	3.40	4.00			
	Shear stress	kPa	13.5	26.4	47.8			
Residual values, (x)	No. of reversals							
	Relative displacement	mm						
	Shear stress	kPa						



Shear Strength Parameters

Peak strength, (o)		Regression	Manual
c'	kPa	2.8	-
Ø'	degrees	24½	-
Residual strength, (x)			
c' _R	kPa	-	-
Ø' _R	degrees	-	-

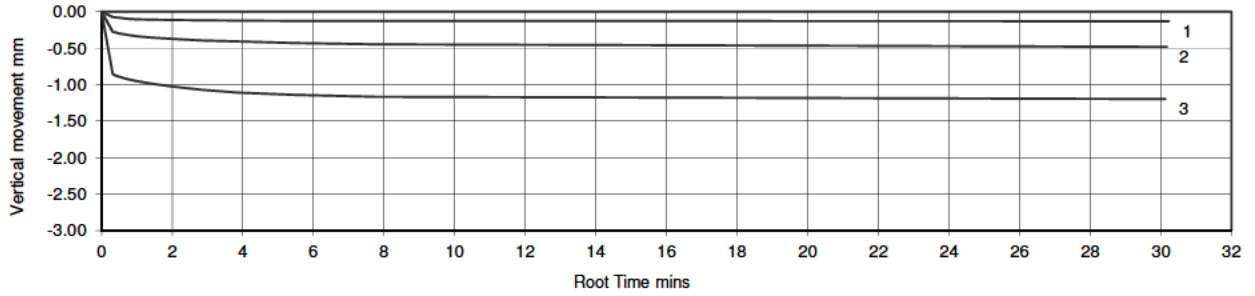
Notes :

1 After shear values based on BS1377. Pt 7 cl. 4.6.1.6 using ØH calculated from consolidation and shear stages

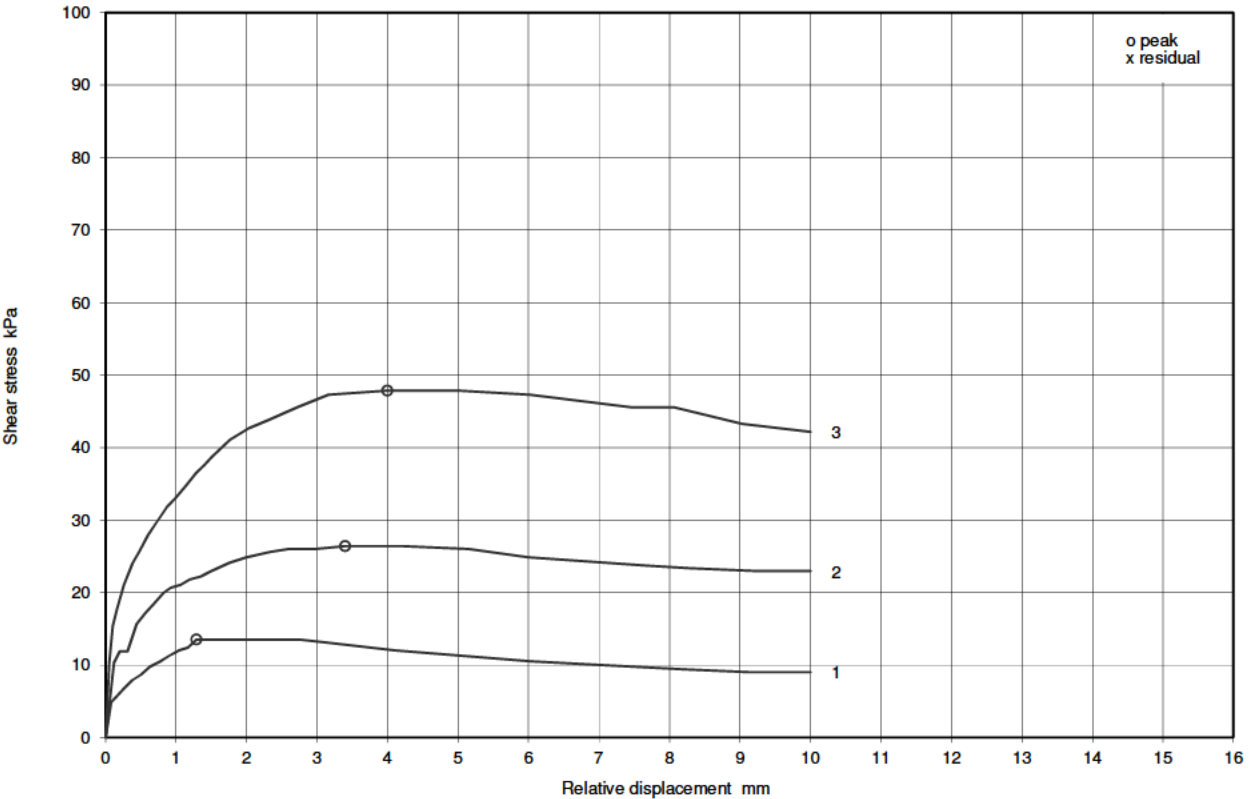
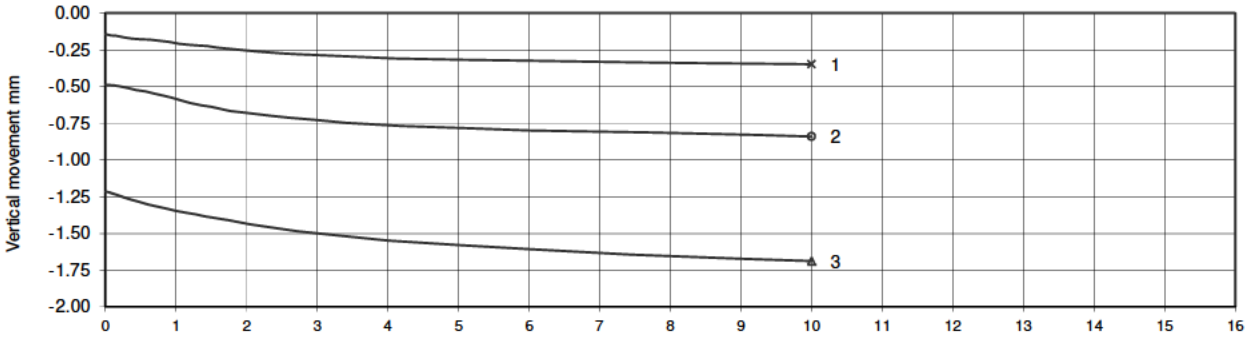
**Determination of shear strength by direct shear (Small shearbox apparatus)
(BS1377 : Part 7 : clause 4 : 1990)**

Project No	A8013-18	Sample Details:	Hole No.	TP/17/29		
Project Name	A1 Alnwick To Ellingham		Depth (m BGL)	1.50 - 2.50		
			Sample No	7	Type	B
			ID			
			Spec Ref			

Consolidation stage(s)



Shearing stage(s)



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Figure

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**Determination of shear strength by direct shear (Small shearbox apparatus)
(BS1377 : Part 7 : clause 4 : 1990)**

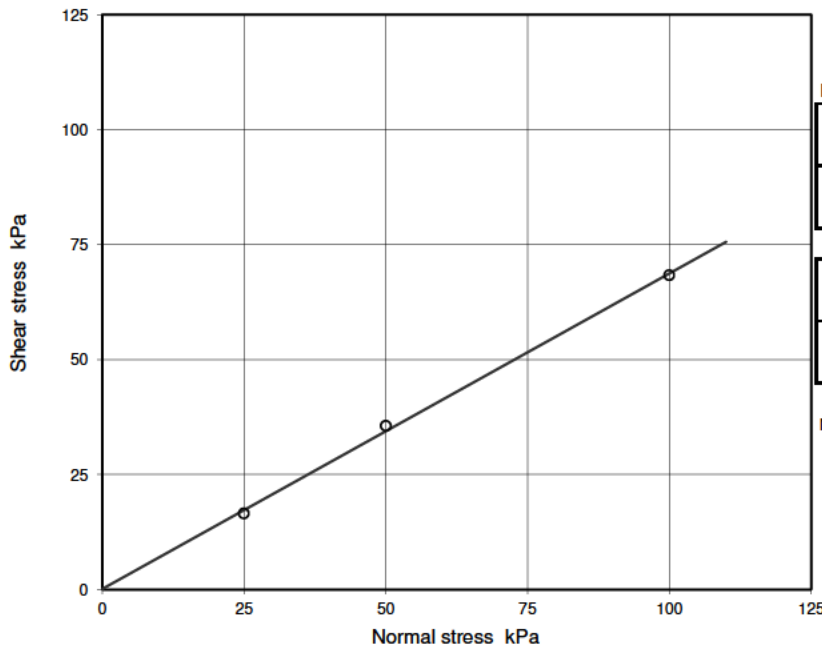
Project No	A8013-18	Sample Details:	Hole No.	TP/17/31		
Project Name	A1iN Morpeth To Felton & Alnwick To Ellingham		Depth (m BGL)	1.70 - 2.50		
			Sample No	6	Type	B
			ID			
			Spec Ref			

Soil Description	Brown silty CLAY.
Specimen Type /Preparation	-2mm material. Recompactd to maxium density at as received moisture content.

Specimen(s) nominally 60mm x 60mm square
 Test(s) carried out in submerged condition
 Particle density, assumed 2.65 Mg/m³

Specimen Details		No.	1	2	3	4	5	6
Initial	Height	mm	26.1	26.1	26.1			
	Bulk Density	Mg/m ³	2.07	2.07	2.07			
	Water Content	%	18.9	18.9	18.9			
	Dry density	Mg/m ³	1.74	1.74	1.74			
	Voids ratio		0.521	0.521	0.521			
Consol ¹	Degree of Saturation	%	96	96	96			
	Consolidation / Normal Stress applied	kPa	25	50	100			
	Change in height during consolidation	mm	-0.720	-1.166	-1.620			
Shear see note 1	Voids ratio after consolidation		0.479	0.453	0.426			
	Voids ratio at end of test		0.479	0.433	0.408			
	Moisture content at end of test	%	18.1	16.3	15.4			
	Saturation at end of test	%	100	100	100			

Shearing stage								
Rate of displacement	Peak	mm/min	0.028	0.028	0.028			
	Residual	mm/min						
Peak values, (o)	Relative displacement	mm	4.15	5.16	9.00			
	Shear stress	kPa	16.5	35.6	68.3			
Residual values, (x)	No. of reversals							
	Relative displacement	mm						
	Shear stress	kPa						



Shear Strength Parameters

Peak strength, (o)		Regression	Manual
c'	kPa	0.1	-
Ø'	degrees	34½	-
Residual strength, (x)			
c' _R	kPa	-	-
Ø' _R	degrees	-	-

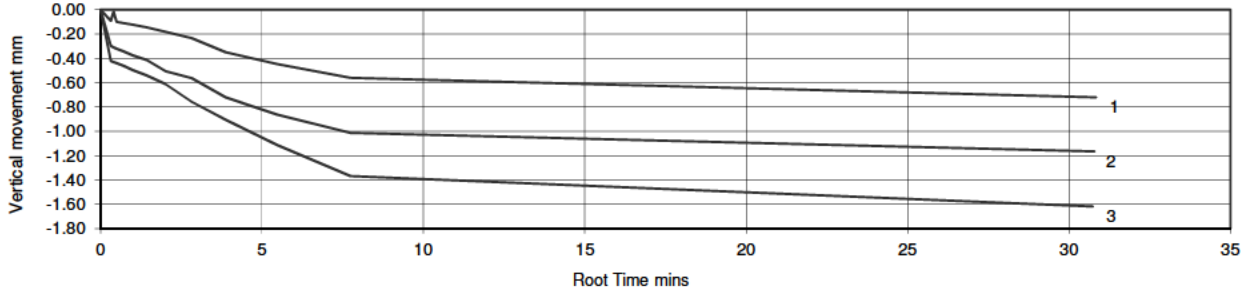
Notes :

1 After shear values based on BS1377. Pt 7 cl. 4.6.1.6 using ØH calculated from consolidation and shear stages

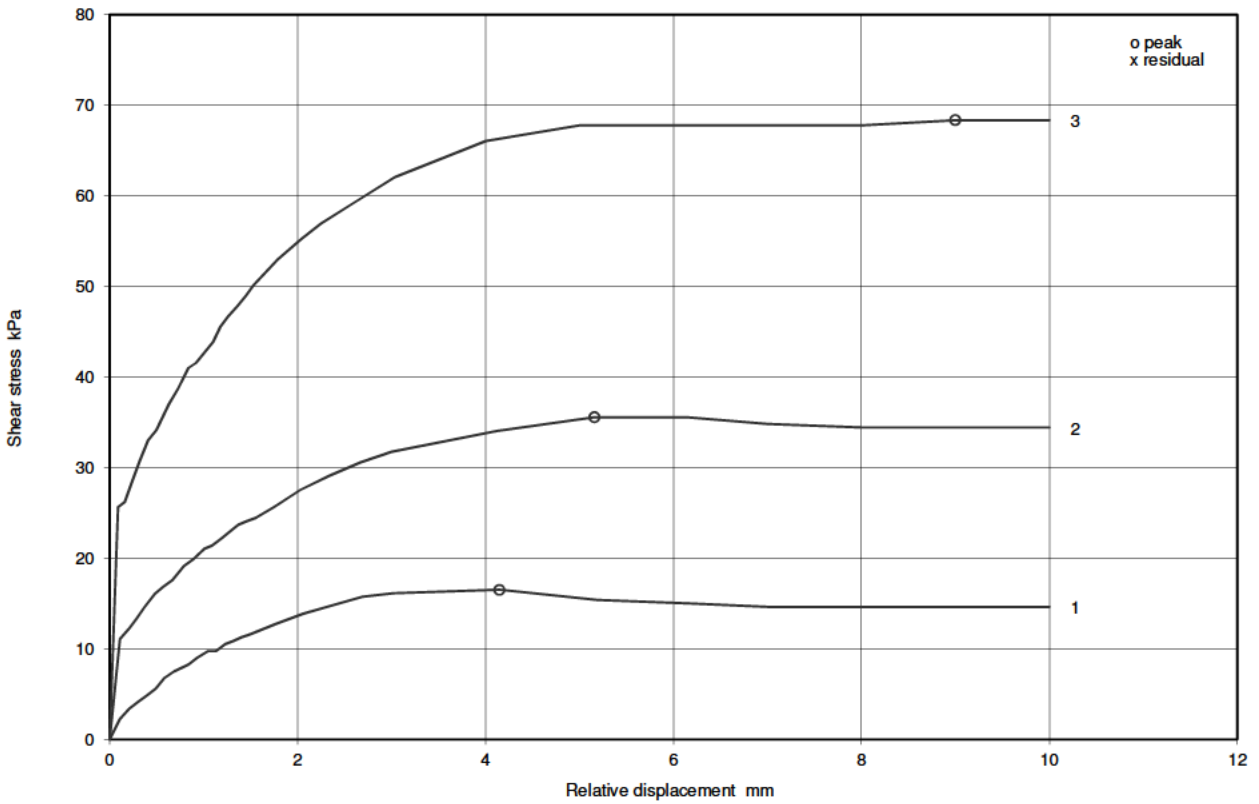
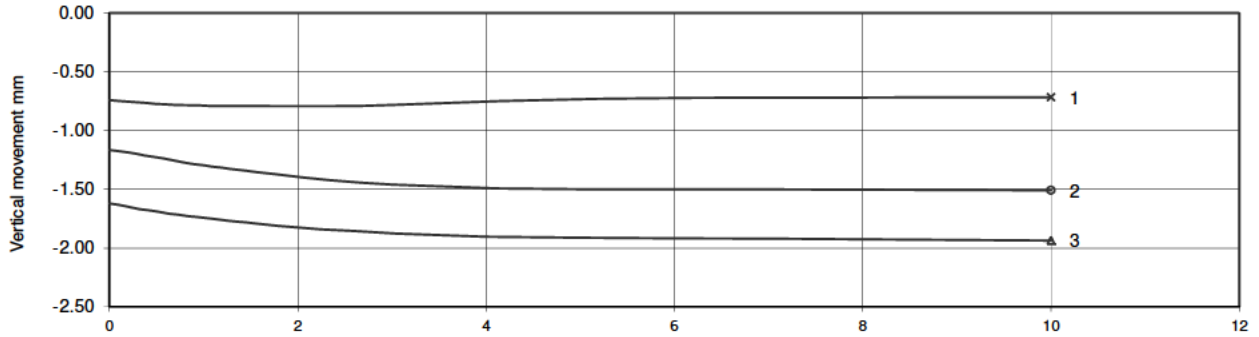
**Determination of shear strength by direct shear (Small shearbox apparatus)
(BS1377 : Part 7 : clause 4 : 1990)**

Project No	A8013-18	Sample Details:	Hole No.	TP/17/31		
Project Name	A1iN Morpeth To Felton & Alnwick To Ellingham		Depth (m BGL)	1.70 - 2.50		
			Sample No	6	Type	B
			ID			
			Spec Ref			

Consolidation stage(s)



Shearing stage(s)



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**Determination of shear strength by direct shear (Small shearbox apparatus)
(BS1377 : Part 7 : clause 4 : 1990)**

Project No	A8013-18	Sample Details:	Hole No.	TP/17/32		
Project Name	A1 Alnwick To Ellingham		Depth (m BGL)	0.70 - 1.20		
			Sample No	7	Type	B
			ID			
			Spec Ref			

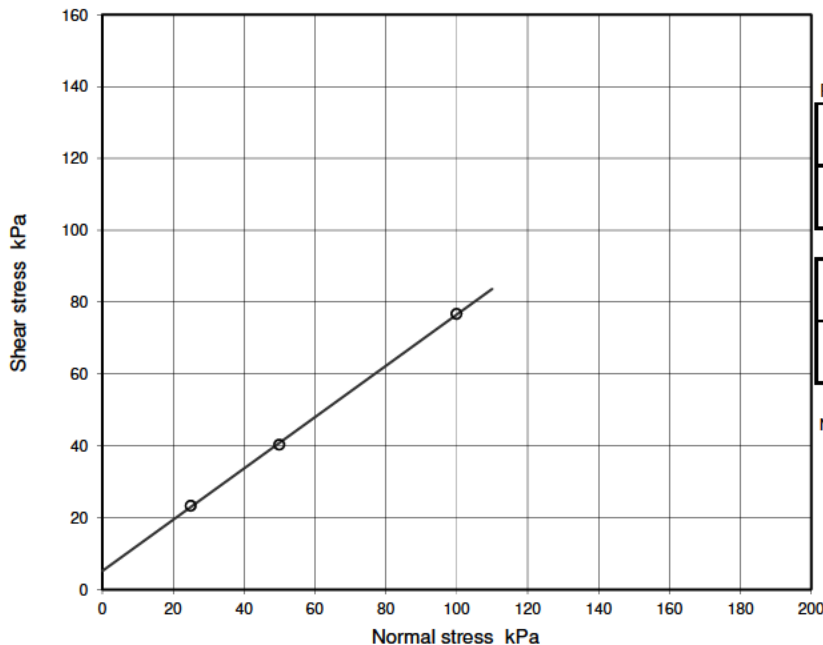
Soil Description	Brown slightly clayey SAND.
Specimen Type /Preparation	-2mm material. Recompactd to a maximum achievable density at as received moisture content.

Specimen(s) nominally 60mm x 60mm square
 Test(s) carried out in submerged condition
 Particle density, assumed 2.65 Mg/m³

Specimen Details		No.	1	2	3	4	5	6
Initial	Height	mm	27.2	27.2	27.2			
	Bulk Density	Mg/m ³	1.77	1.77	1.78			
	Water Content	%	8.4	8.3	8.4			
	Dry density	Mg/m ³	1.64	1.64	1.64			
	Voids ratio		0.619	0.617	0.618			
	Degree of Saturation	%	36	36	36			
Consof ¹	Consolidation / Normal Stress applied	kPa	25	50	100			
	Change in height during consolidation	mm	-0.328	-0.639	-0.676			
	Voids ratio after consolidation		0.599	0.579	0.578			
Shear see note 1	Voids ratio at end of test		0.621	0.609	0.602			
	Moisture content at end of test	%	18.5	18.3	17.6			
	Saturation at end of test	%	79	80	77			

Shearing stage

Rate of displacement	Peak	mm/min	0.600	0.600	0.600			
	Residual	mm/min						
Peak values, (o)	Relative displacement	mm	1.00	5.00	6.00			
	Shear stress	kPa	23.3	40.3	76.7			
Residual values, (x)	No. of reversals							
	Relative displacement	mm						
	Shear stress	kPa						



Shear Strength Parameters

Peak strength, (o)		Regression	Manual
c'	kPa	5.1	-
Ø'	degrees	35½	-
Residual strength, (x)			
c' _R	kPa	-	-
Ø' _R	degrees	-	-

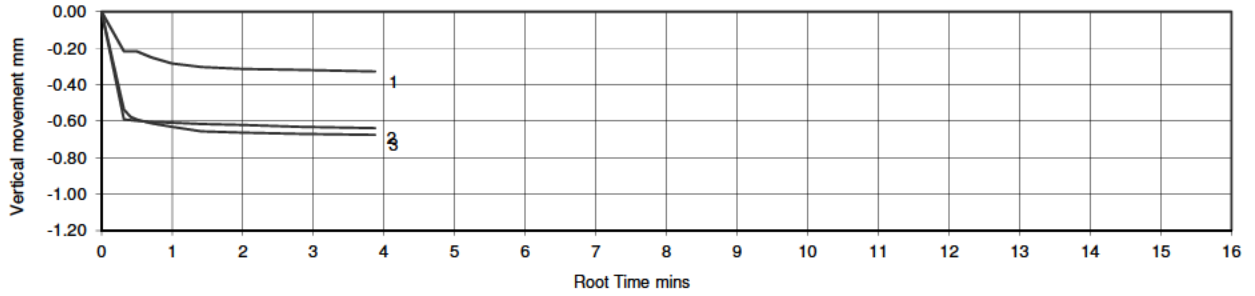
Notes :

1 After shear values based on BS1377. Pt 7 cl. 4.6.1.6 using ØH calculated from consolidation and shear stages

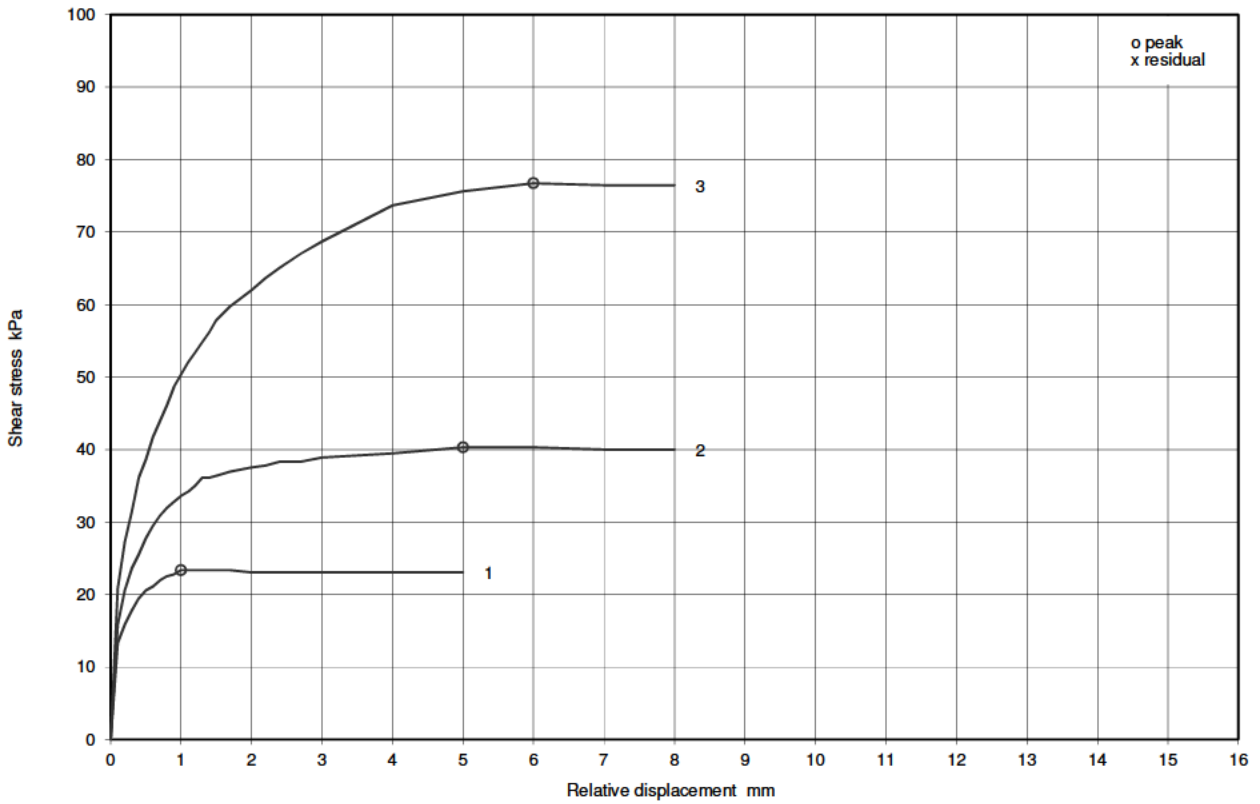
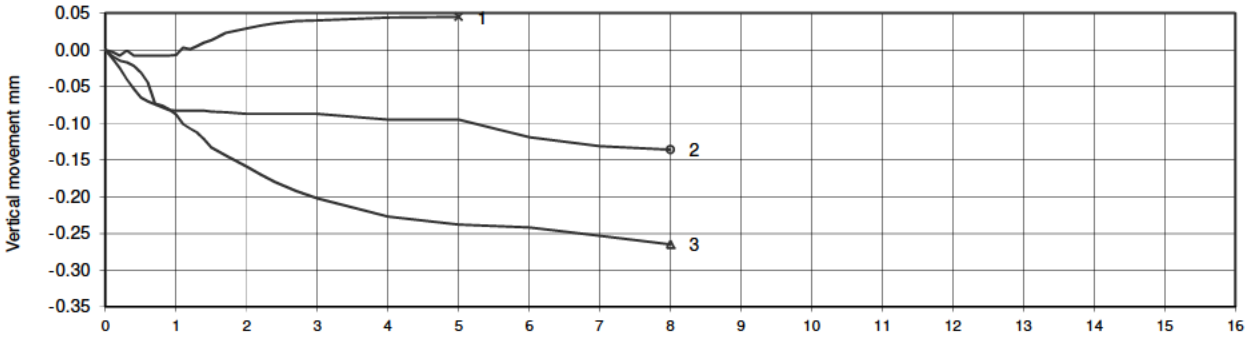
**Determination of shear strength by direct shear (Small shearbox apparatus)
(BS1377 : Part 7 : clause 4 : 1990)**

Project No	A8013-18	Sample Details:	Hole No.	TP/17/32		
Project Name	A1 Alnwick To Ellingham		Depth (m BGL)	0.70 - 1.20		
			Sample No	7	Type	B
			ID			
			Spec Ref			

Consolidation stage(s)



Shearing stage(s)



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**Determination of shear strength by direct shear (Small shearbox apparatus)
(BS1377 : Part 7 : clause 4 : 1990)**

Project No	A8013-18	Sample Details:	Hole No.	TP/17/36		
Project Name	A1 Alnwick To Ellingham		Depth (m BGL)	1.50 - 2.00		
			Sample No	8	Type	B
			ID			
			Spec Ref			

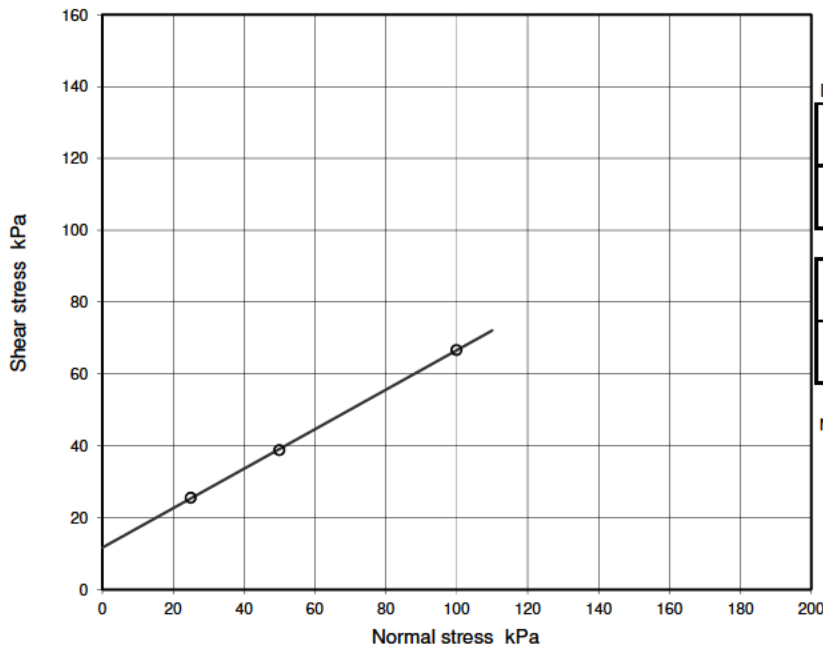
Soil Description	Dark brown slightly gravelly sandy CLAY.
Specimen Type /Preparation	-2mm material. Recompacted to 1.78Mg/m ³ density at as received moisture content.

Specimen(s) nominally 60mm x 60mm square
 Test(s) carried out in submerged condition
 Particle density, assumed 2.65 Mg/m³

Specimen Details		No.	1	2	3	4	5	6
Initial	Height	mm	26.1	26.1	26.1			
	Bulk Density	Mg/m ³	2.05	2.05	2.05			
	Water Content	%	15.3	15.3	15.3			
	Dry density	Mg/m ³	1.78	1.78	1.78			
	Voids ratio		0.488	0.488	0.488			
	Degree of Saturation	%	83	83	83			
Consol ¹	Consolidation / Normal Stress applied	kPa	25	50	100			
	Change in height during consolidation	mm	-0.404	-0.524	-0.542			
	Voids ratio after consolidation		0.465	0.459	0.458			
Shear see note 1	Voids ratio at end of test		0.454	0.451	0.434			
	Moisture content at end of test	%	17.1	16.9	16.4			
	Saturation at end of test	%	100	100	100			

Shearing stage

Rate of displacement	Peak	mm/min	0.059	0.059	0.059			
	Residual	mm/min						
Peak values, (o)	Relative displacement	mm	1.50	1.84	9.05			
	Shear stress	kPa	25.5	38.8	66.7			
Residual values, (x)	No. of reversals							
	Relative displacement	mm						
	Shear stress	kPa						



Shear Strength Parameters

Peak strength, (o)		Regression	Manual
c'	kPa	12	-
Ø'	degrees	29	-
Residual strength, (x)			
c' _R	kPa	-	-
Ø' _R	degrees	-	-

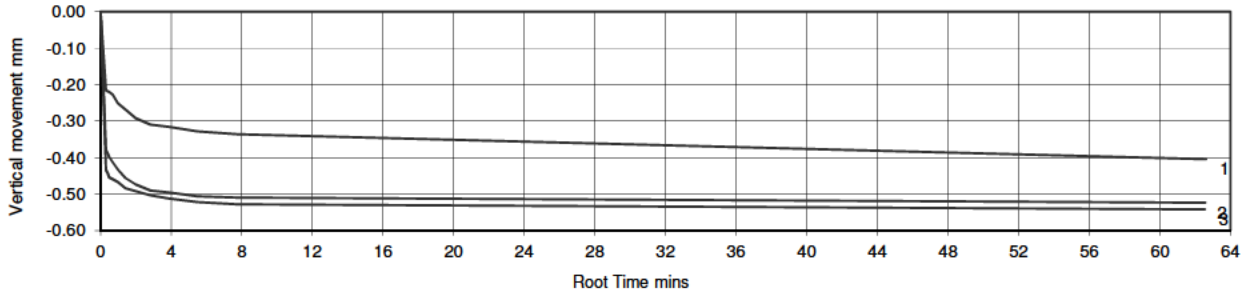
Notes :

1 After shear values based on BS1377. Pt 7 cl. 4.6.1.6 using ØH calculated from consolidation and shear stages

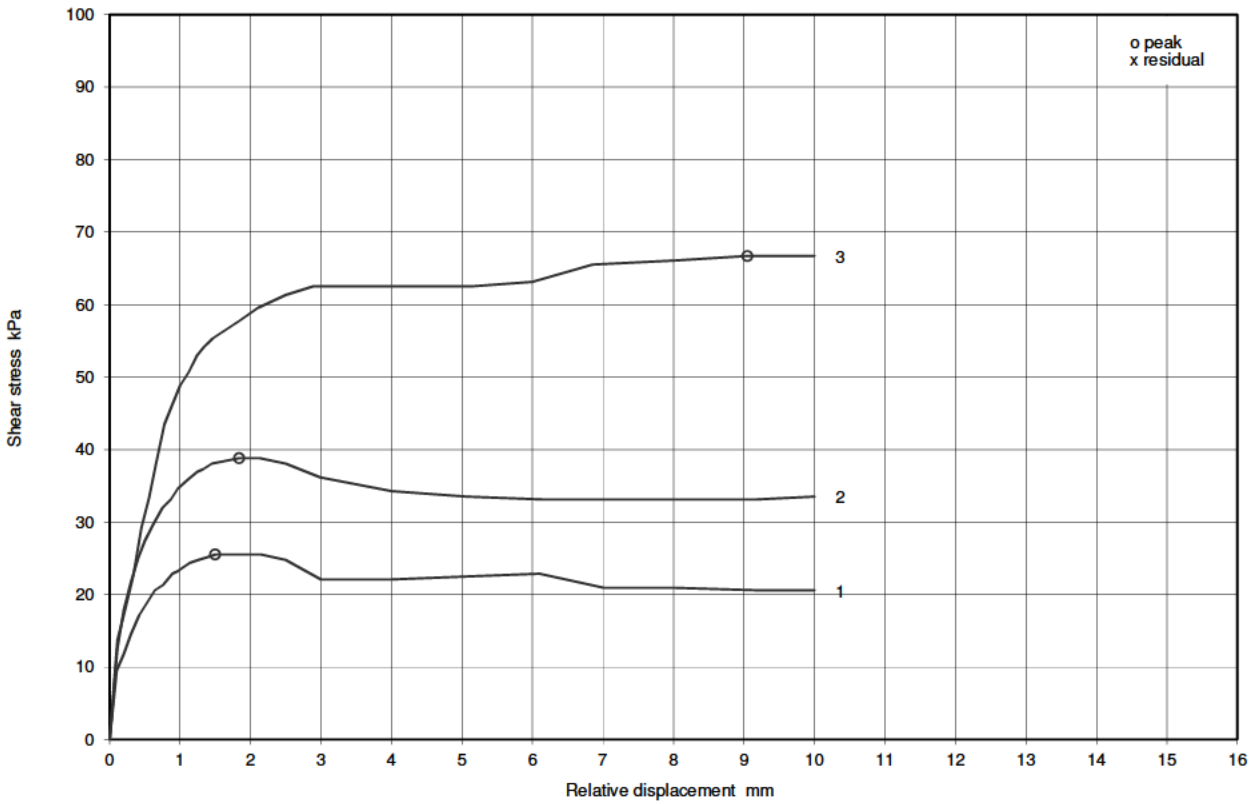
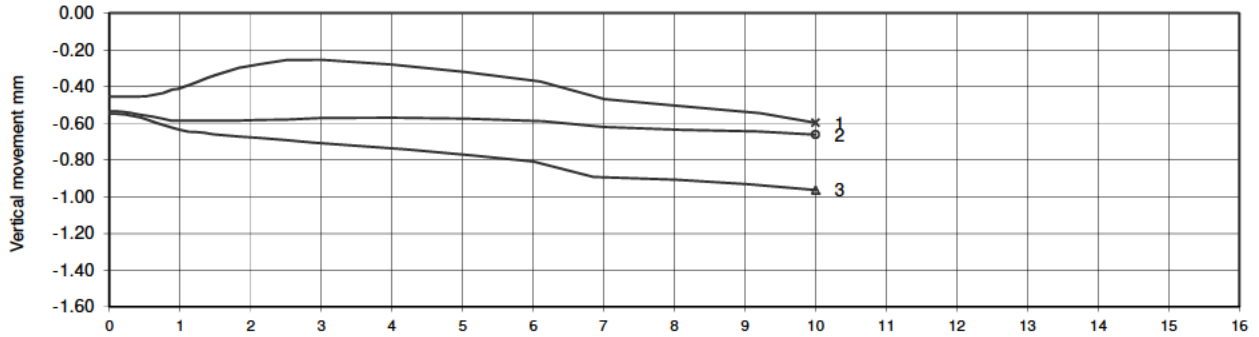
**Determination of shear strength by direct shear (Small shearbox apparatus)
(BS1377 : Part 7 : clause 4 : 1990)**

Project No	A8013-18	Sample Details:	Hole No.	TP/17/36	
Project Name	A1 Alnwick To Ellingham		Depth (m BGL)	1.50 - 2.00	
		Sample No	8	Type	B
		ID			
		Spec Ref			

Consolidation stage(s)



Shearing stage(s)



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Figure

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**Determination of shear strength by direct shear (Small shearbox apparatus)
(BS1377 : Part 7 : clause 4 : 1990)**

Project No	A8013-18	Sample Details:	Hole No.	TP/17/38		
Project Name	A1 Alnwick To Ellingham		Depth (m BGL)	1.60 - 2.00		
			Sample No	7	Type	B
			ID			
			Spec Ref			

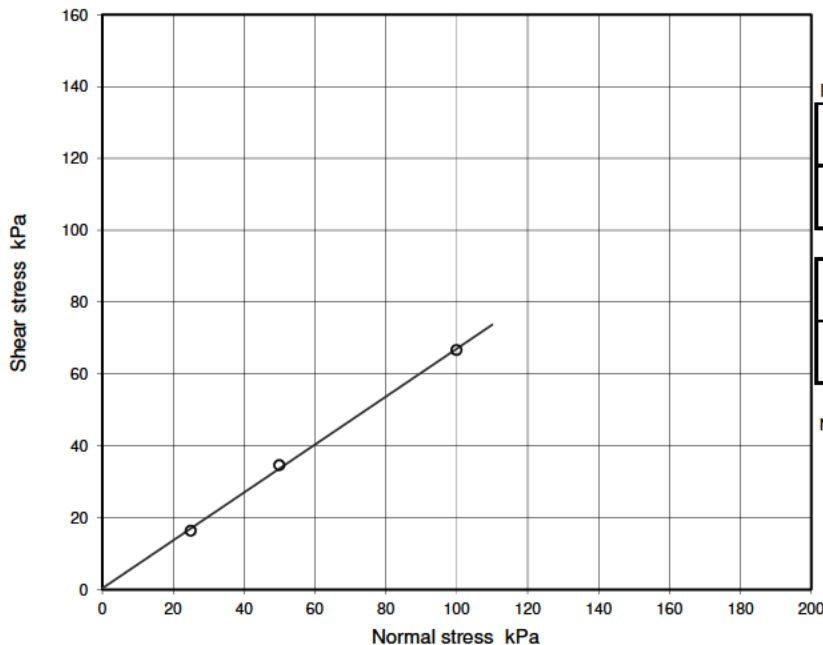
Soil Description	Dark brown sandy CLAY.
Specimen Type /Preparation	-2mm material. Recompactd using 2.5kg equivalent effort at as received moisture content.

Specimen(s) nominally 60mm x 60mm square
 Test(s) carried out in submerged condition
 Particle density, assumed 2.65 Mg/m³

Specimen Details		No.	1	2	3	4	5	6
Initial	Height	mm	25.8	25.8	25.8			
	Bulk Density	Mg/m ³	1.90	1.90	1.90			
	Water Content	%	12.3	12.4	12.4			
	Dry density	Mg/m ³	1.69	1.69	1.69			
	Voids ratio		0.569	0.570	0.571			
Consol ¹	Degree of Saturation	%	57	58	58			
	Consolidation / Normal Stress applied	kPa	25	50	100			
	Change in height during consolidation	mm	-0.100	-0.272	-0.442			
Shear see note 1	Voids ratio after consolidation		0.563	0.554	0.544			
	Voids ratio at end of test		0.559	0.538	0.506			
	Moisture content at end of test	%	20.0	19.8	18.7			
	Saturation at end of test	%	95	98	98			

Shearing stage

Rate of displacement	Peak	mm/min	0.059	0.059	0.059			
	Residual	mm/min						
Peak values, (o)	Relative displacement	mm	5.11	10.00	9.34			
	Shear stress	kPa	16.4	34.6	66.7			
Residual values, (x)	No. of reversals							
	Relative displacement	mm						
	Shear stress	kPa						



Shear Strength Parameters

Peak strength, (o)		Regression	Manual
c'	kPa	0.3	-
Ø'	degrees	33½	-
Residual strength, (x)			
c' _R	kPa	-	-
Ø' _R	degrees	-	-

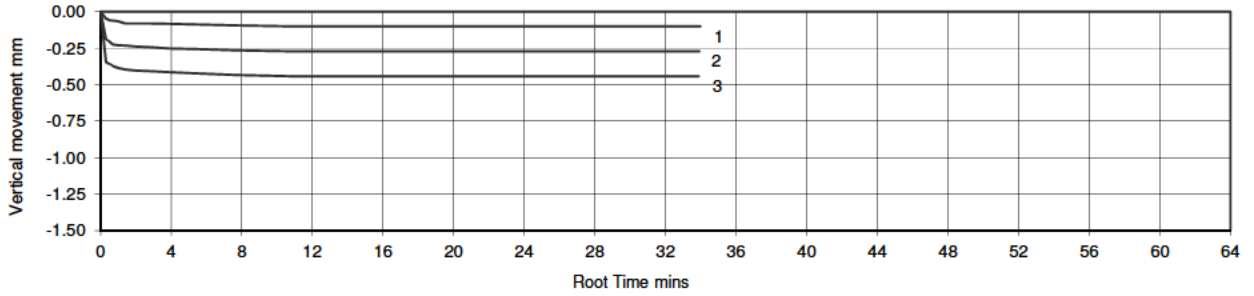
Notes :

1 After shear values based on BS1377. Pt 7 cl. 4.6.1.6 using ØH calculated from consolidation and shear stages

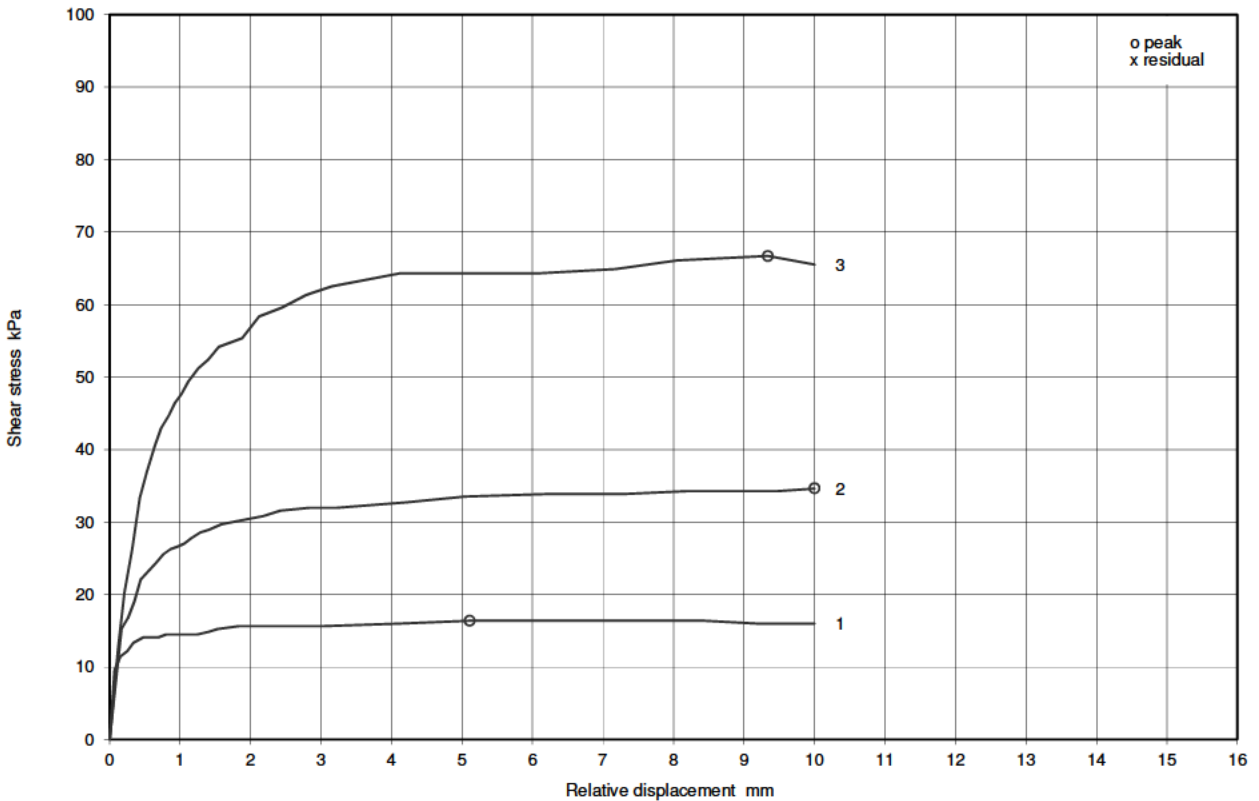
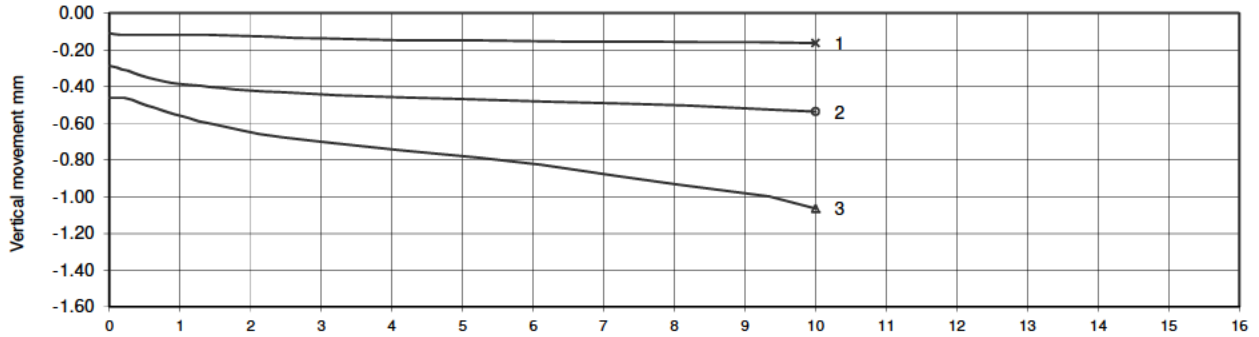
**Determination of shear strength by direct shear (Small shearbox apparatus)
(BS1377 : Part 7 : clause 4 : 1990)**

Project No	A8013-18	Sample Details:	Hole No.	TP/17/38		
Project Name	A1 Alnwick To Ellingham		Depth (m BGL)	1.60 - 2.00		
			Sample No	7	Type	B
			ID			
			Spec Ref			

Consolidation stage(s)



Shearing stage(s)



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Figure

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**Determination of shear strength by direct shear (Small shearbox apparatus)
(BS1377 : Part 7 : clause 4 : 1990)**

Project No	A8013-18	Sample Details:	Hole No.	TP/17/39		
Project Name	A1 Alnwick To Ellingham		Depth (m BGL)	0.60 - 1.00		
			Sample No	5	Type	B
			ID			
			Spec Ref			

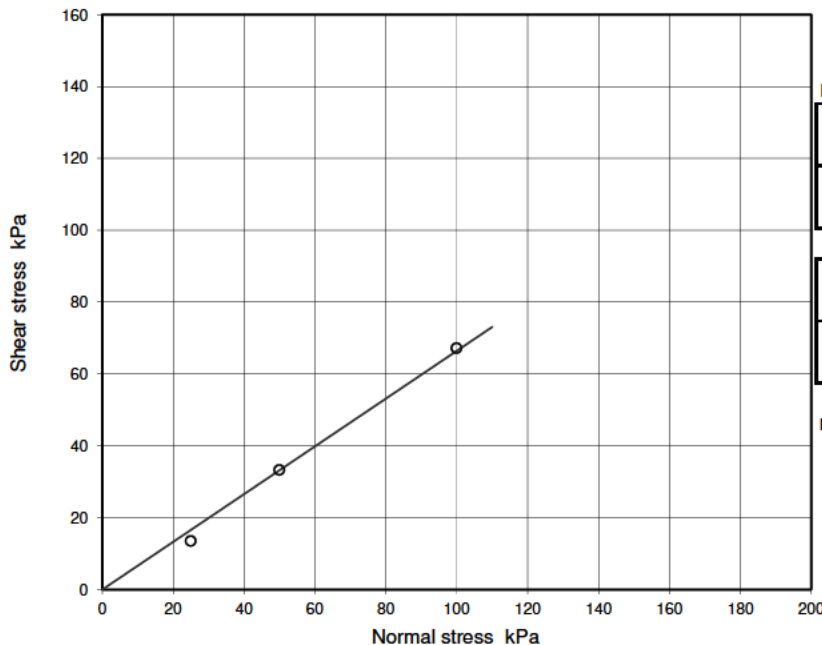
Soil Description	Brown slightly gravelly sandy CLAY.
Specimen Type /Preparation	-2mm material. Recompacted using 2.5kg equivalent effort at as received moisture content.

Specimen(s) nominally 60mm x 60mm square
 Test(s) carried out in submerged condition
 Particle density, assumed 2.65 Mg/m³

Specimen Details		No.	1	2	3	4	5	6
Initial	Height	mm	26.4	26.4	26.4			
	Bulk Density	Mg/m ³	1.63	1.63	1.63			
	Water Content	%	7.9	8.0	7.8			
	Dry density	Mg/m ³	1.51	1.51	1.51			
	Voids ratio		0.756	0.758	0.755			
	Degree of Saturation	%	28	28	27			
Consol ¹	Consolidation / Normal Stress applied	kPa	25	50	100			
	Change in height during consolidation	mm	-1.336	-2.100	-2.570			
	Voids ratio after consolidation		0.667	0.618	0.584			
Shear see note 1	Voids ratio at end of test		0.609	0.550	0.533			
	Moisture content at end of test	%	20.1	18.5	17.0			
	Saturation at end of test	%	88	89	85			

Shearing stage

Rate of displacement	Peak	mm/min	0.045	0.049	0.049			
	Residual	mm/min						
Peak values, (o)	Relative displacement	mm	8.13	8.04	10.00			
	Shear stress	kPa	13.5	33.3	67.2			
Residual values, (x)	No. of reversals							
	Relative displacement	mm						
	Shear stress	kPa						



Shear Strength Parameters

Peak strength, (o)		Regression	Manual
c'	kPa	(-3.4)	0.0
Ø'	degrees	(35½)	33½
Residual strength, (x)			
c' _R	kPa	-	-
Ø' _R	degrees	-	-

Notes :

1 After shear values based on BS1377. Pt 7 cl. 4.6.1.6 using ØH calculated from consolidation and shear stages

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Figure

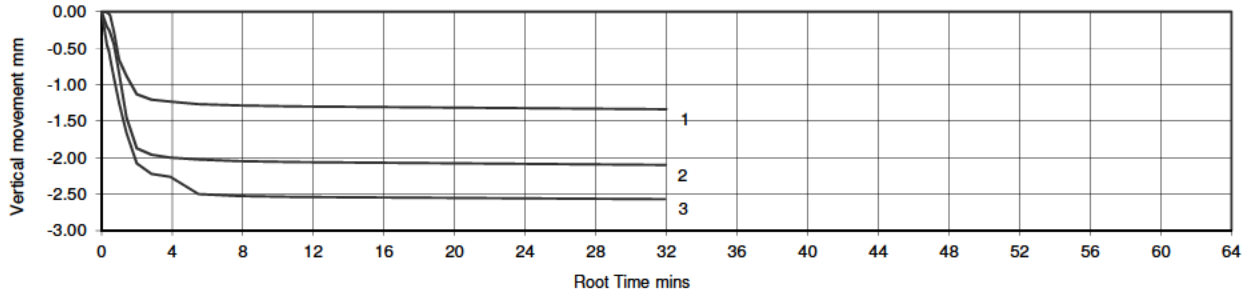
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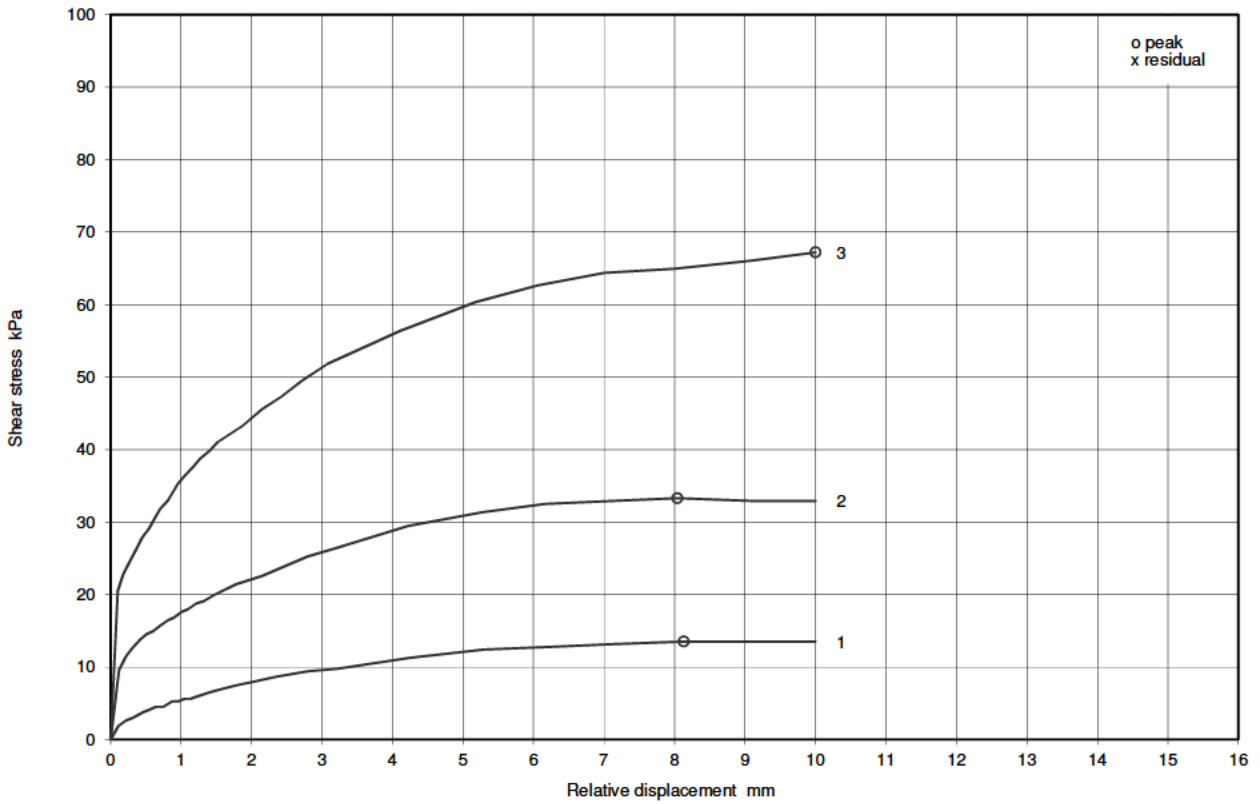
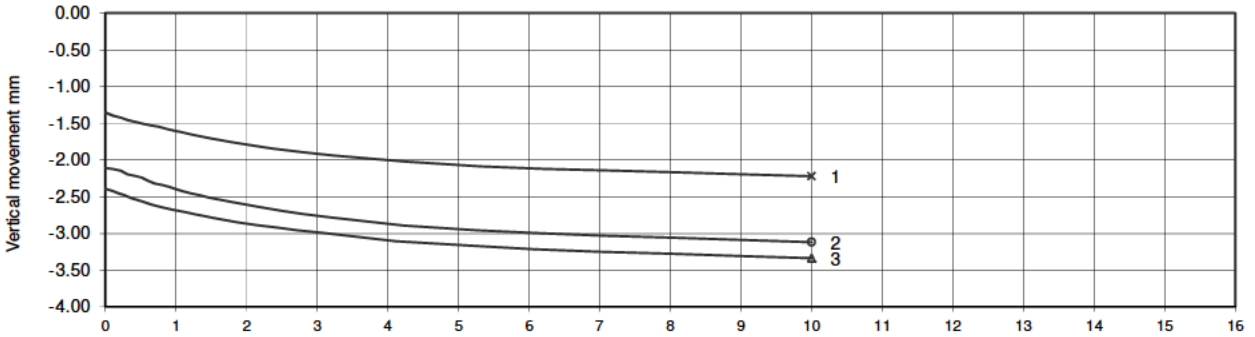
**Determination of shear strength by direct shear (Small shearbox apparatus)
(BS1377 : Part 7 : clause 4 : 1990)**

Project No	A8013-18	Sample Details:	Hole No.	TP/17/39	
Project Name	A1 Alnwick To Ellingham		Depth (m BGL)	0.60 - 1.00	
		Sample No	5	Type	B
		ID			
		Spec Ref			

Consolidation stage(s)



Shearing stage(s)



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**Determination of shear strength by direct shear (Small shearbox apparatus)
(BS1377 : Part 7 : clause 4 : 1990)**

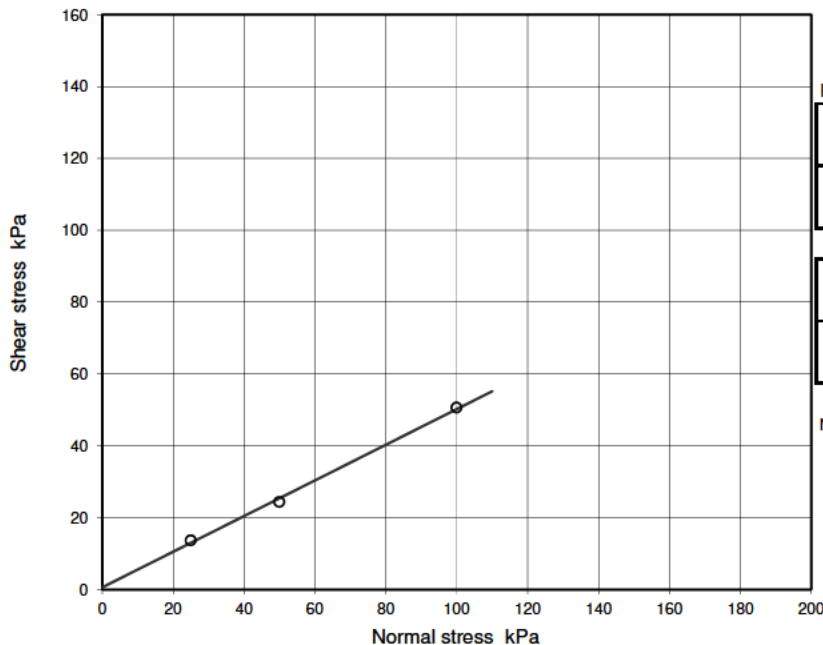
Project No	A8013-18	Sample Details:	Hole No.	TP/17/40		
Project Name	A1 Alnwick To Ellingham		Depth (m BGL)	2.00 - 2.50		
			Sample No	8	Type	B
			ID			
			Spec Ref			

Soil Description	Greyish brown slightly sandy CLAY.
Specimen Type /Preparation	-2mm material. Recompactd to a dry density of 1.72Mg/m ³ at as received moisture content.

Specimen(s) nominally 60mm x 60mm square
 Test(s) carried out in submerged condition
 Particle density, assumed 2.65 Mg/m³

Specimen Details		No.	1	2	3	4	5	6
Initial	Height	mm	26.1	26.1	26.1			
	Bulk Density	Mg/m ³	1.91	1.91	1.91			
	Water Content	%	11.1	11.1	11.1			
	Dry density	Mg/m ³	1.72	1.72	1.72			
	Voids ratio		0.541	0.541	0.541			
	Degree of Saturation	%	54	54	54			
Consol ¹	Consolidation / Normal Stress applied	kPa	25	50	100			
	Change in height during consolidation	mm	-0.720	-1.124	-1.740			
	Voids ratio after consolidation		0.498	0.475	0.438			
Shear see note 1	Voids ratio at end of test		0.485	0.448	0.391			
	Moisture content at end of test	%	16.9	15.9	14.8			
	Saturation at end of test	%	92	94	100			

Shearing stage							
Rate of displacement	Peak	mm/min	0.026	0.026	0.026		
	Residual	mm/min					
Peak values, (o)	Relative displacement	mm	3.78	6.20	10.00		
	Shear stress	kPa	13.7	24.4	50.6		
Residual values, (x)	No. of reversals						
	Relative displacement	mm					
	Shear stress	kPa					



Shear Strength Parameters

Peak strength, (o)		Regression	Manual
c'	kPa	0.6	-
Ø'	degrees	26½	-
Residual strength, (x)			
c' _R	kPa	-	-
Ø' _R	degrees	-	-

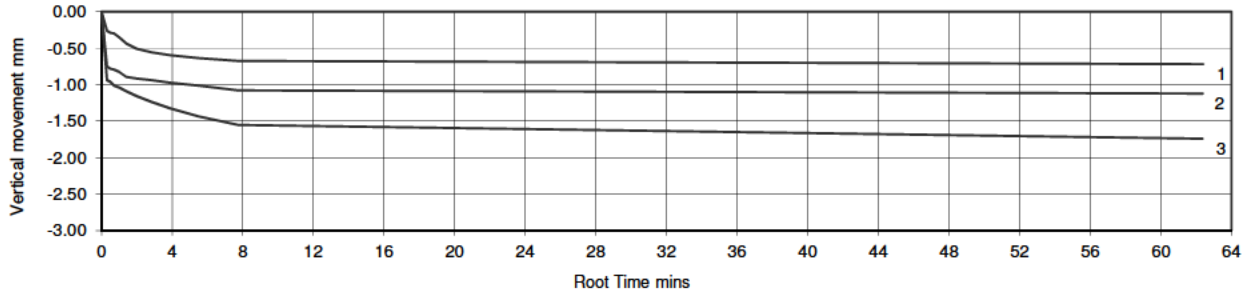
Notes :

1 After shear values based on BS1377. Pt 7 cl. 4.6.1.6 using ØH calculated from consolidation and shear stages

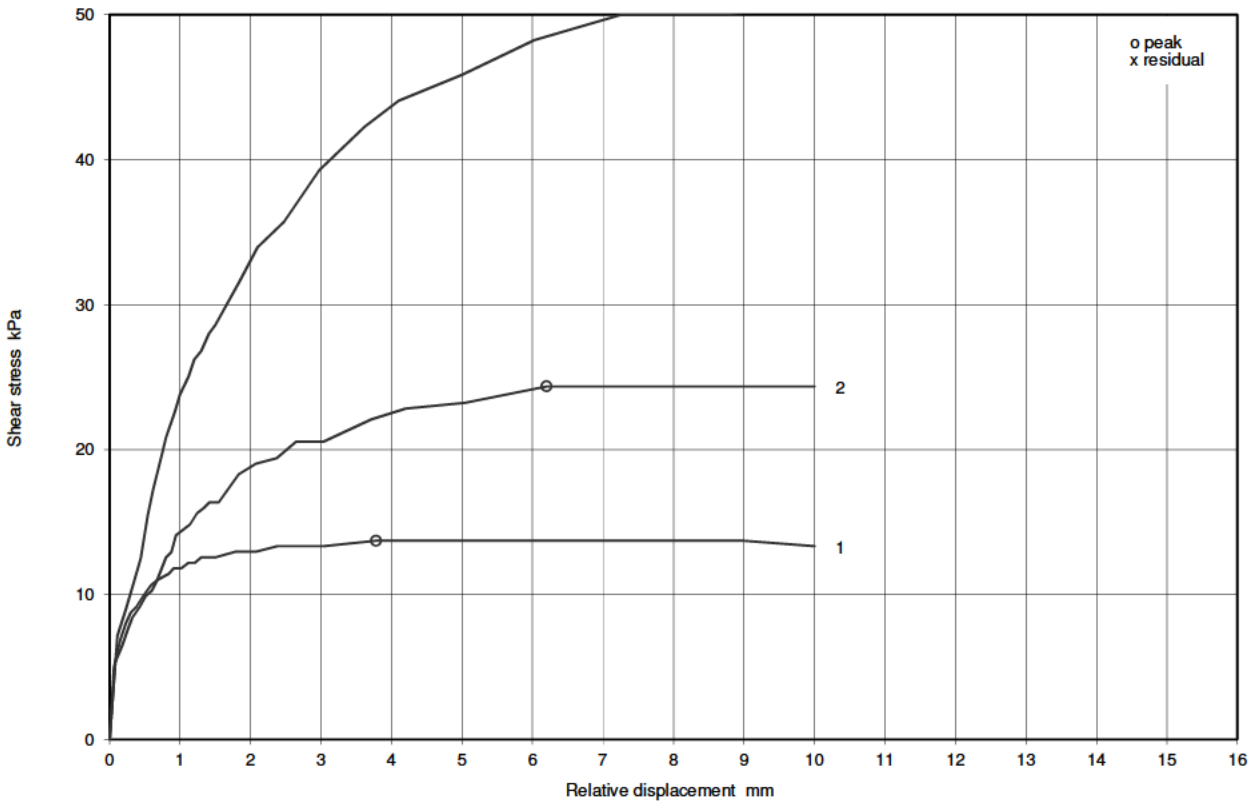
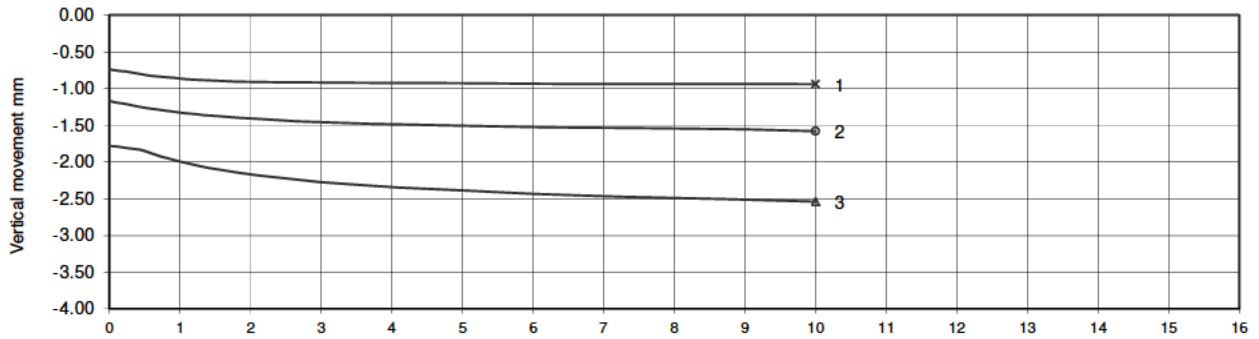
**Determination of shear strength by direct shear (Small shearbox apparatus)
(BS1377 : Part 7 : clause 4 : 1990)**

Project No	A8013-18	Sample Details:	Hole No.	TP/17/40		
Project Name	A1 Alnwick To Ellingham		Depth (m BGL)	2.00 - 2.50		
			Sample No	8	Type	B
			ID			
			Spec Ref			

Consolidation stage(s)



Shearing stage(s)



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**Determination of shear strength by direct shear (Small shearbox apparatus)
(BS1377 : Part 7 : clause 4 : 1990)**

Project No	A8013-18	Sample Details:	Hole No.	TP/17/43		
Project Name	A1iN Morpeth To Felton & Alnwick To Ellingham		Depth (m BGL)	1.00 - 1.50		
			Sample No	8	Type	B
			ID			
			Spec Ref			

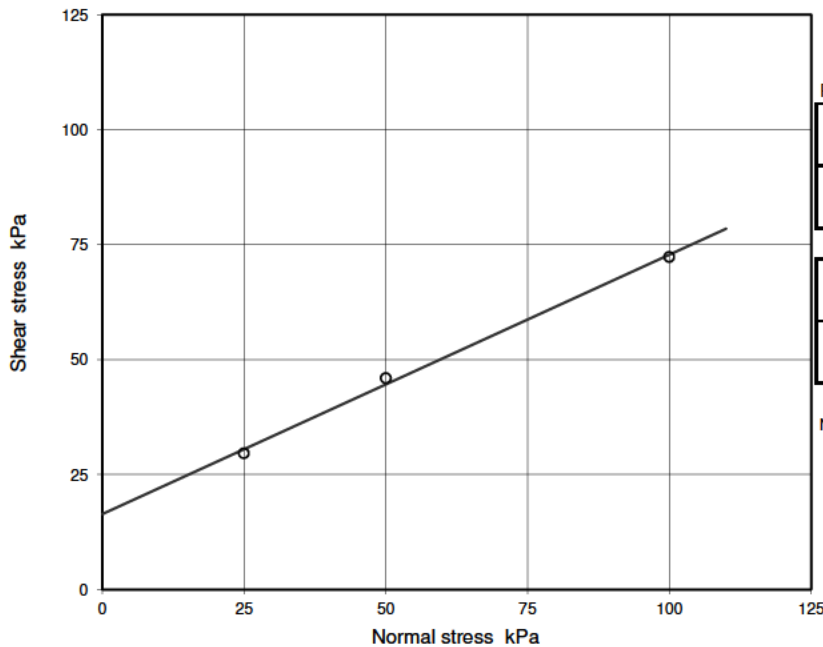
Soil Description	Greyish brown slightly sandy slightly gravelly CLAY.
Specimen Type /Preparation	-2mm material. Recompactd using 2.5Kg equivalent effort at an air dried practical moisture content.

Specimen(s) nominally 60mm x 60mm square
 Test(s) carried out in submerged condition
 Particle density, assumed 2.65 Mg/m³

Specimen Details		No.	1	2	3	4	5	6
Initial	Height	mm	25.9	25.9	25.9			
	Bulk Density	Mg/m ³	2.22	2.22	2.22			
	Water Content	%	13.1	13.0	13.1			
	Dry density	Mg/m ³	1.96	1.96	1.96			
	Voids ratio		0.351	0.350	0.350			
	Degree of Saturation	%	99	99	99			
Consol ¹	Consolidation / Normal Stress applied	kPa	25	50	100			
	Change in height during consolidation	mm	-0.144	-0.316	-0.568			
	Voids ratio after consolidation		0.343	0.334	0.321			
Shear see note 1	Voids ratio at end of test		0.348	0.341	0.317			
	Moisture content at end of test	%	13.1	12.9	12.0			
	Saturation at end of test	%	100	100	100			

Shearing stage

Rate of displacement	Peak	mm/min	0.032	0.032	0.032			
	Residual	mm/min						
Peak values, (o)	Relative displacement	mm	1.78	2.17	2.43			
	Shear stress	kPa	29.6	45.9	72.4			
Residual values, (x)	No. of reversals							
	Relative displacement	mm						
	Shear stress	kPa						



Shear Strength Parameters

Peak strength, (o)		Regression	Manual
c'	kPa	16	-
Ø'	degrees	29½	-
Residual strength, (x)			
c' _R	kPa	-	-
Ø' _R	degrees	-	-

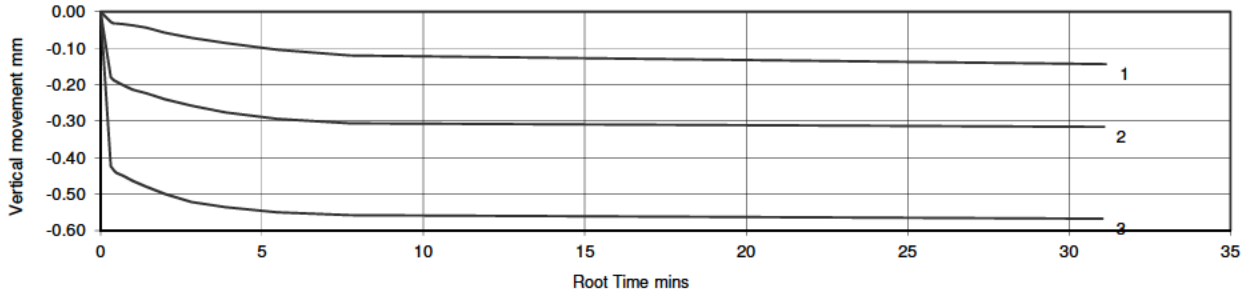
Notes :

1 After shear values based on BS1377. Pt 7 cl. 4.6.1.6 using ØH calculated from consolidation and shear stages

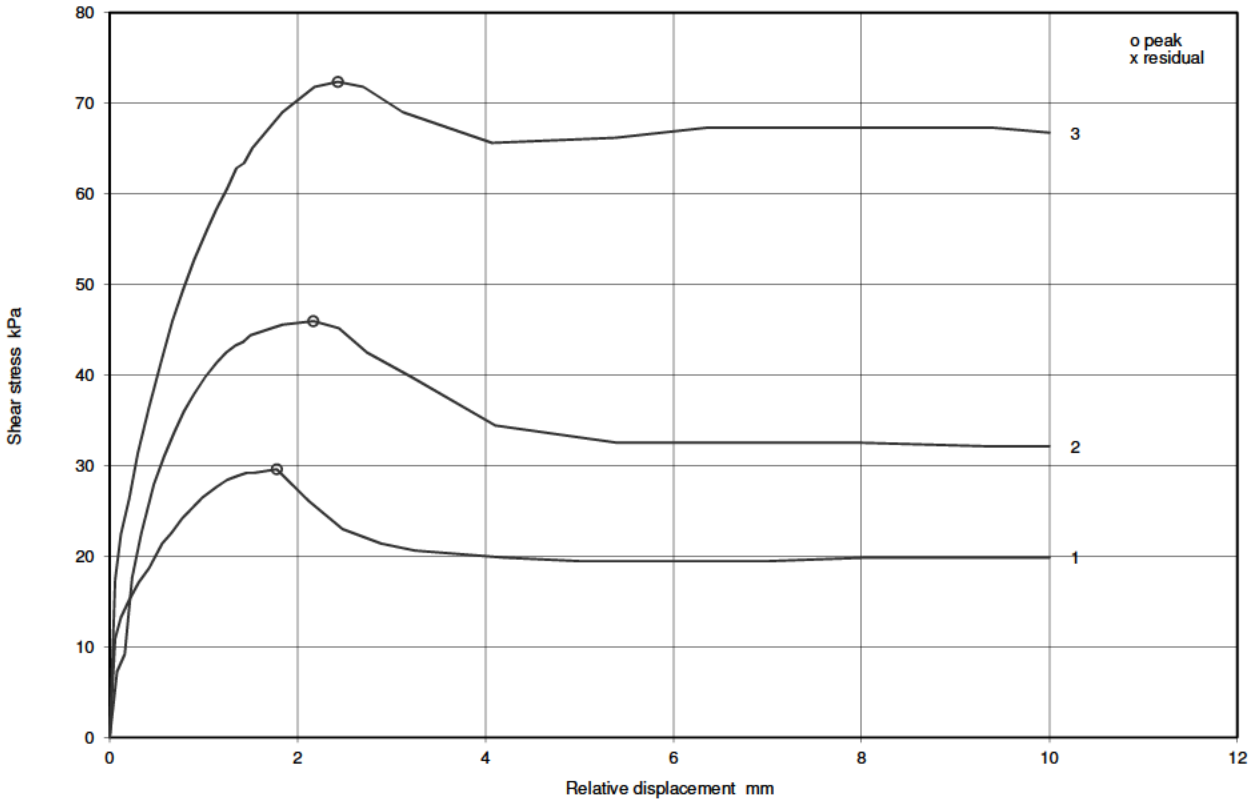
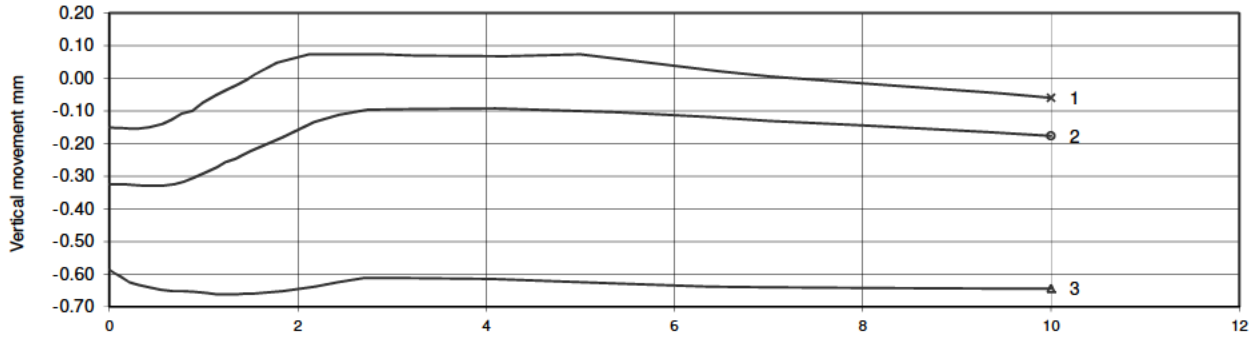
**Determination of shear strength by direct shear (Small shearbox apparatus)
(BS1377 : Part 7 : clause 4 : 1990)**

Project No	A8013-18	Sample Details:	Hole No.	TP/17/43		
Project Name	A1iN Morpeth To Felton & Alnwick To Ellingham		Depth (m BGL)	1.00 - 1.50		
			Sample No	8	Type	B
			ID			
			Spec Ref			

Consolidation stage(s)



Shearing stage(s)



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**Determination of shear strength by direct shear (Small shearbox apparatus)
(BS1377 : Part 7 : clause 4 : 1990)**

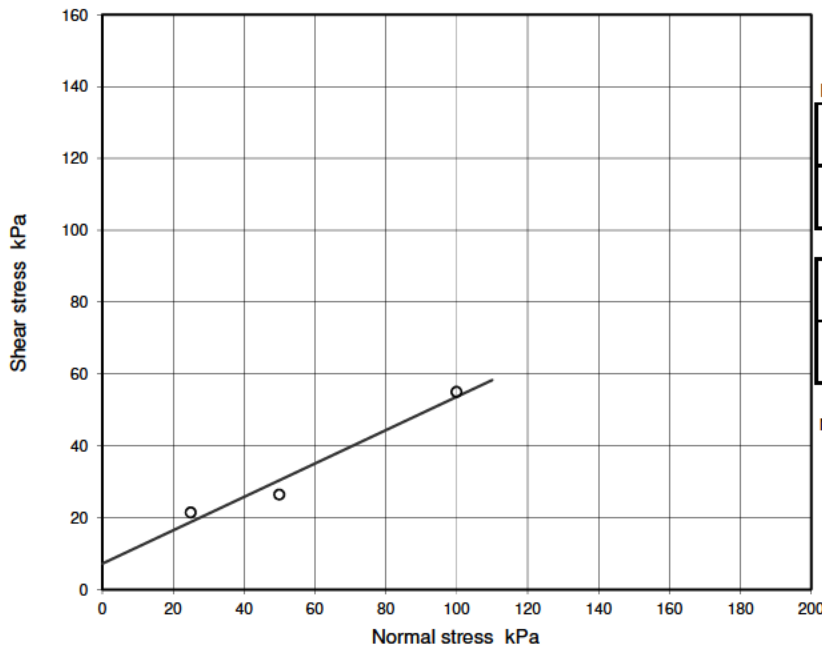
Project No	A8013-18	Sample Details:	Hole No.	TP/17/44		
Project Name	A1 Alnwick To Ellingham		Depth (m BGL)	0.50 - 0.70		
			Sample No	5	Type	B
			ID			
			Spec Ref			

Soil Description	Greyish brown slightly sandy CLAY.
Specimen Type /Preparation	-2mm material. Recompacted using 2.5kg equivalent effort at as received moisture content.

Specimen(s) nominally 60mm x 60mm square
 Test(s) carried out in submerged condition
 Particle density, assumed 2.65 Mg/m³

Specimen Details		No.	1	2	3	4	5	6
Initial	Height	mm	25.1	25.1	25.1			
	Bulk Density	Mg/m ³	2.08	2.08	2.08			
	Water Content	%	18.2	18.2	18.2			
	Dry density	Mg/m ³	1.76	1.76	1.76			
	Voids ratio		0.509	0.509	0.509			
	Degree of Saturation	%	95	95	95			
Consol ¹	Consolidation / Normal Stress applied	kPa	25	50	100			
	Change in height during consolidation	mm	-0.046	-0.480	-0.912			
	Voids ratio after consolidation		0.506	0.480	0.454			
Shear see note 1	Voids ratio at end of test		0.517	0.461	0.428			
	Moisture content at end of test	%	19.5	17.4	16.1			
	Saturation at end of test	%	100	100	100			

Shearing stage			1	2	3	4	5	6
Rate of displacement	Peak	mm/min	0.030	0.030	0.030			
	Residual	mm/min						
Peak values, (o)	Relative displacement	mm	0.99	6.00	8.16			
	Shear stress	kPa	21.4	26.4	55.0			
Residual values, (x)	No. of reversals							
	Relative displacement	mm						
	Shear stress	kPa						



Shear Strength Parameters

Peak strength, (o)		Regression	Manual
c'	kPa	7.1	-
Ø'	degrees	25	-
Residual strength, (x)			
c' _R	kPa	-	-
Ø' _R	degrees	-	-

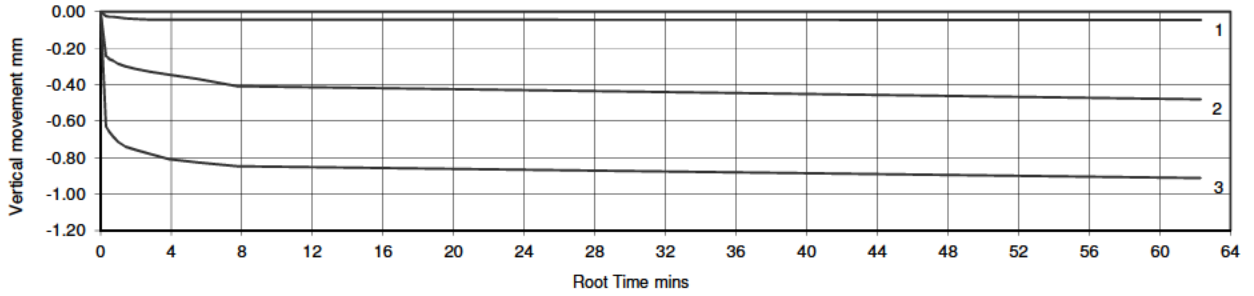
Notes :

1 After shear values based on BS1377. Pt 7 cl. 4.6.1.6 using ØH calculated from consolidation and shear stages

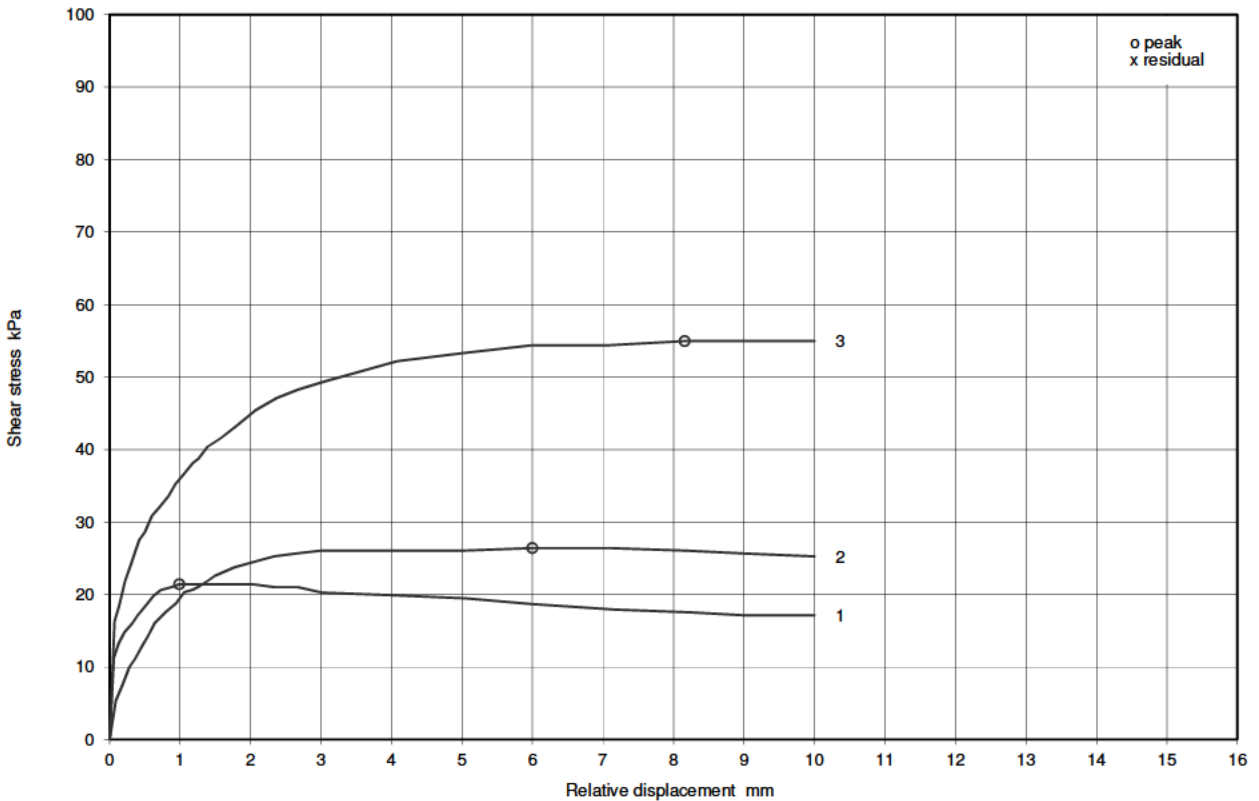
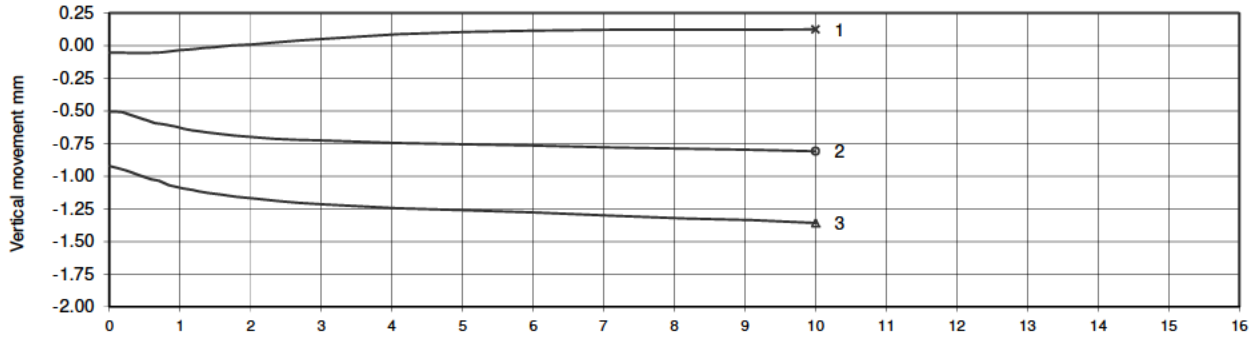
**Determination of shear strength by direct shear (Small shearbox apparatus)
(BS1377 : Part 7 : clause 4 : 1990)**

Project No	A8013-18	Sample Details:	Hole No.	TP/17/44		
Project Name	A1 Alnwick To Ellingham		Depth (m BGL)	0.50 - 0.70		
			Sample No	5	Type	B
			ID			
			Spec Ref			

Consolidation stage(s)



Shearing stage(s)



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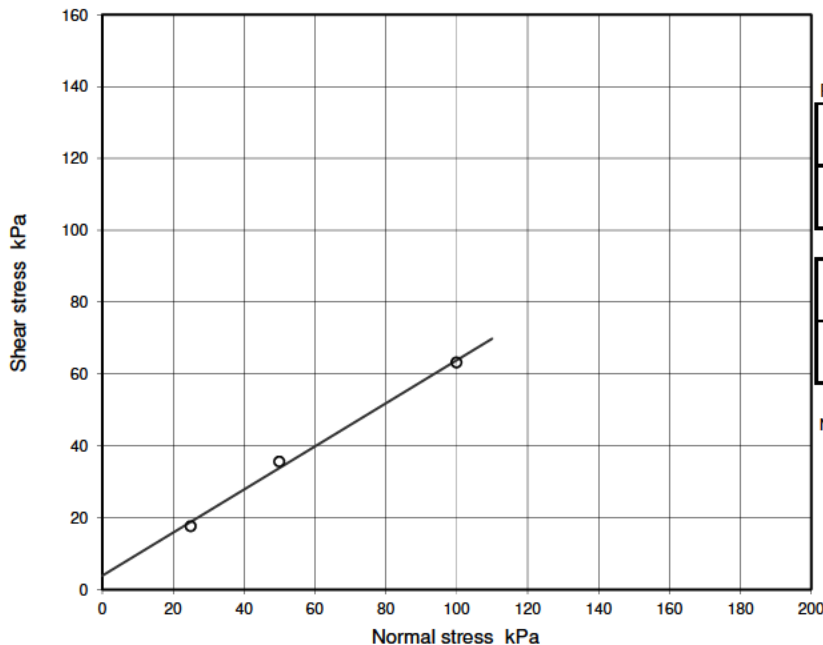
**Determination of shear strength by direct shear (Small shearbox apparatus)
(BS1377 : Part 7 : clause 4 : 1990)**

Project No	A8013-18	Sample Details:	Hole No.	TP/17/45		
Project Name	A1 Alnwick To Ellingham		Depth (m BGL)	1.00 - 1.50		
			Sample No	8	Type	B
			ID			
			Spec Ref			

Soil Description	Brown slightly sandy CLAY.	Specimen(s) nominally 60mm x 60mm square
Specimen Type /Preparation	-2mm material. Recompactd to a dry density of 1.79Mg/m ³ at as received moisture content.	Test(s) carried out in submerged condition
		Particle density, assumed 2.65 Mg/m ³

Specimen Details		No.	1	2	3	4	5	6
Initial	Height	mm	26.1	26.1	26.1			
	Bulk Density	Mg/m ³	2.10	2.10	2.10			
	Water Content	%	17.1	17.1	17.1			
	Dry density	Mg/m ³	1.79	1.79	1.79			
	Voids ratio		0.480	0.480	0.480			
	Degree of Saturation	%	94	94	94			
Consof ¹	Consolidation / Normal Stress applied	kPa	25	50	100			
	Change in height during consolidation	mm	-0.102	-0.356	-0.908			
	Voids ratio after consolidation		0.475	0.460	0.429			
Shear see note 1	Voids ratio at end of test		0.475	0.453	0.421			
	Moisture content at end of test	%	17.9	17.1	15.9			
	Saturation at end of test	%	100	100	100			

Shearing stage							
Rate of displacement	Peak	mm/min	0.059	0.059	0.059		
	Residual	mm/min					
Peak values, (o)	Relative displacement	mm	1.17	2.08	2.25		
	Shear stress	kPa	17.6	35.6	63.2		
Residual values, (x)	No. of reversals						
	Relative displacement	mm					
	Shear stress	kPa					



Shear Strength Parameters

Peak strength, (o)		Regression	Manual
c'	kPa	3.8	-
Ø'	degrees	31	-
Residual strength, (x)			
c' _R	kPa	-	-
Ø' _R	degrees	-	-

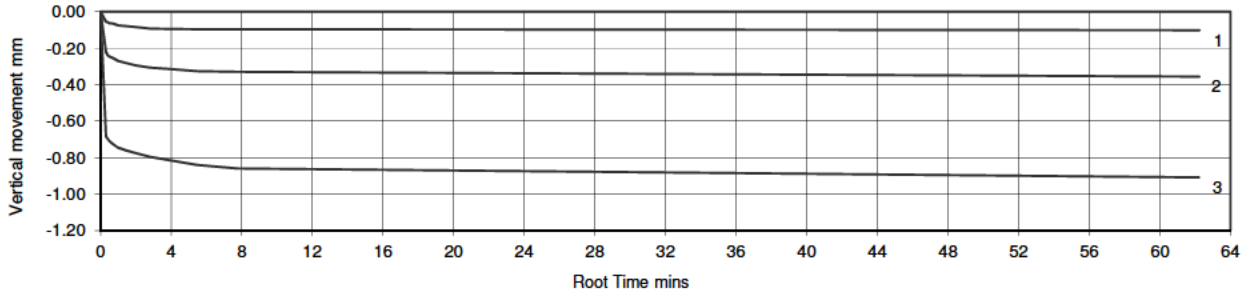
Notes :

1 After shear values based on BS1377. Pt 7 cl. 4.6.1.6 using ØH calculated from consolidation and shear stages

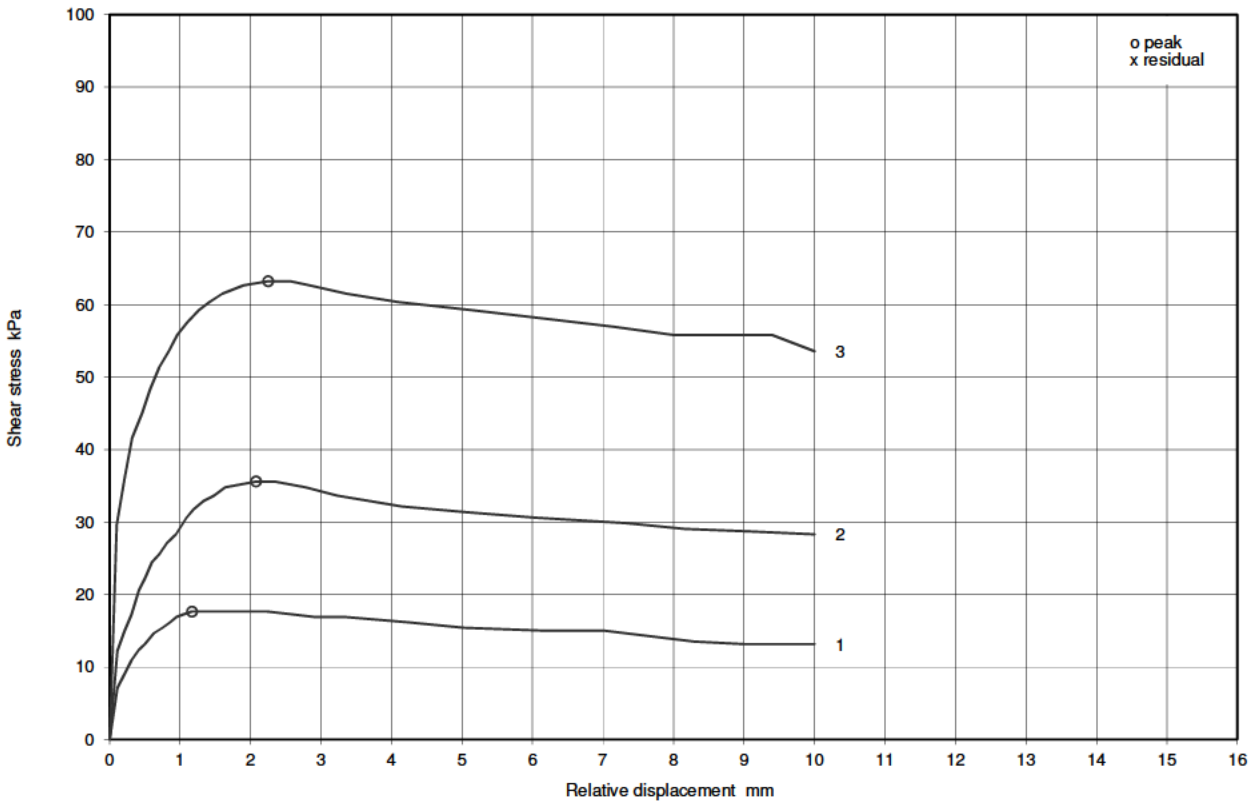
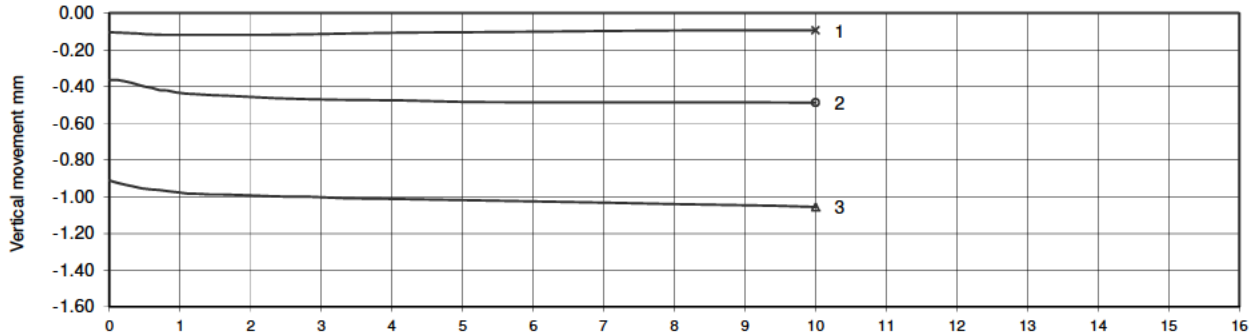
**Determination of shear strength by direct shear (Small shearbox apparatus)
(BS1377 : Part 7 : clause 4 : 1990)**

Project No	A8013-18	Sample Details:	Hole No.	TP/17/45		
Project Name	A1 Alnwick To Ellingham		Depth (m BGL)	1.00 - 1.50		
			Sample No	8	Type	B
			ID			
			Spec Ref			

Consolidation stage(s)



Shearing stage(s)



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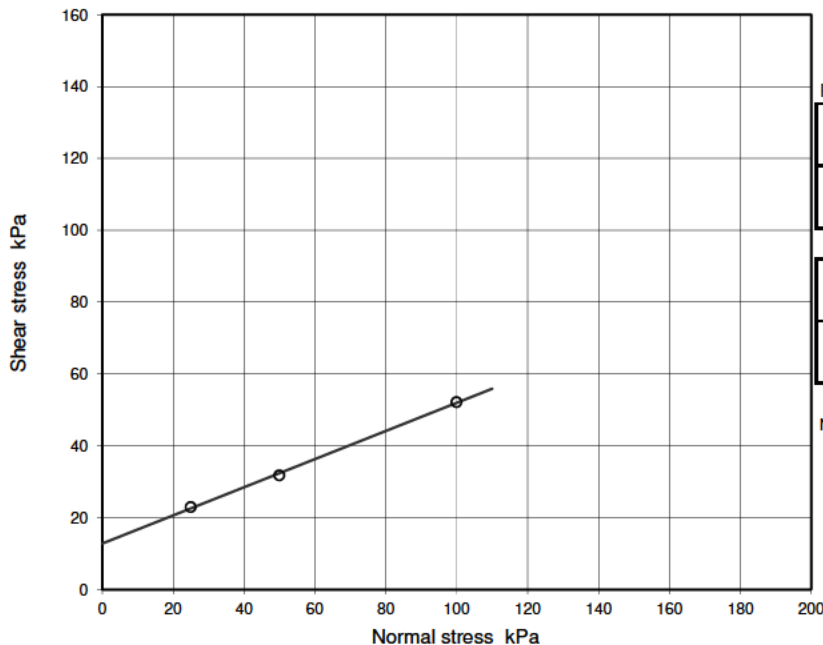
**Determination of shear strength by direct shear (Small shearbox apparatus)
(BS1377 : Part 7 : clause 4 : 1990)**

Project No	A8013-18	Sample Details:	Hole No.	TP/17/46		
Project Name	A1 Alnwick To Ellingham		Depth (m BGL)	1.00 - 1.20		
			Sample No	7	Type	B
			ID			
			Spec Ref			

Soil Description	Brown slightly sandy CLAY.	Specimen(s) nominally 60mm x 60mm square
Specimen Type /Preparation	-2mm material. Recompactd to a dry density of 1.66Mg/m ³ at as received moisture content.	Test(s) carried out in submerged condition
		Particle density, assumed 2.65 Mg/m ³

Specimen Details		No.	1	2	3	4	5	6
Initial	Height	mm	26.1	26.1	26.1			
	Bulk Density	Mg/m ³	1.94	1.94	1.94			
	Water Content	%	16.6	16.6	16.6			
	Dry density	Mg/m ³	1.66	1.66	1.66			
	Voids ratio		0.596	0.596	0.596			
	Degree of Saturation	%	74	74	74			
Consof ¹	Consolidation / Normal Stress applied	kPa	25	50	100			
	Change in height during consolidation	mm	-0.534	-0.724	-1.458			
	Voids ratio after consolidation		0.564	0.552	0.507			
Shear see note 1	Voids ratio at end of test		0.543	0.514	0.479			
	Moisture content at end of test	%	20.5	19.4	18.1			
	Saturation at end of test	%	100	100	100			

Shearing stage			1	2	3	4	5	6
Rate of displacement	Peak	mm/min	0.059	0.059	0.059			
	Residual	mm/min						
Peak values, (o)	Relative displacement	mm	4.16	5.36	7.28			
	Shear stress	kPa	23.0	31.8	52.2			
Residual values, (x)	No. of reversals							
	Relative displacement	mm						
	Shear stress	kPa						



Shear Strength Parameters

Peak strength, (o)		Regression	Manual
c'	kPa	13	-
Ø'	degrees	21½	-
Residual strength, (x)			
c' _R	kPa	-	-
Ø' _R	degrees	-	-

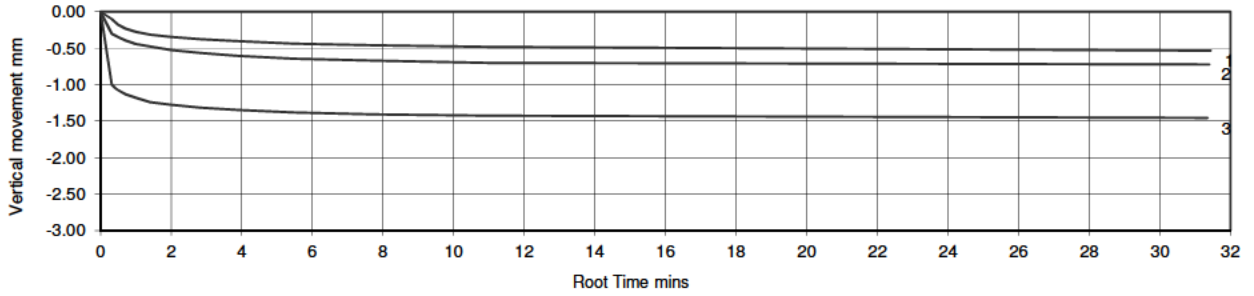
Notes :

1 After shear values based on BS1377. Pt 7 cl. 4.6.1.6 using ØH calculated from consolidation and shear stages

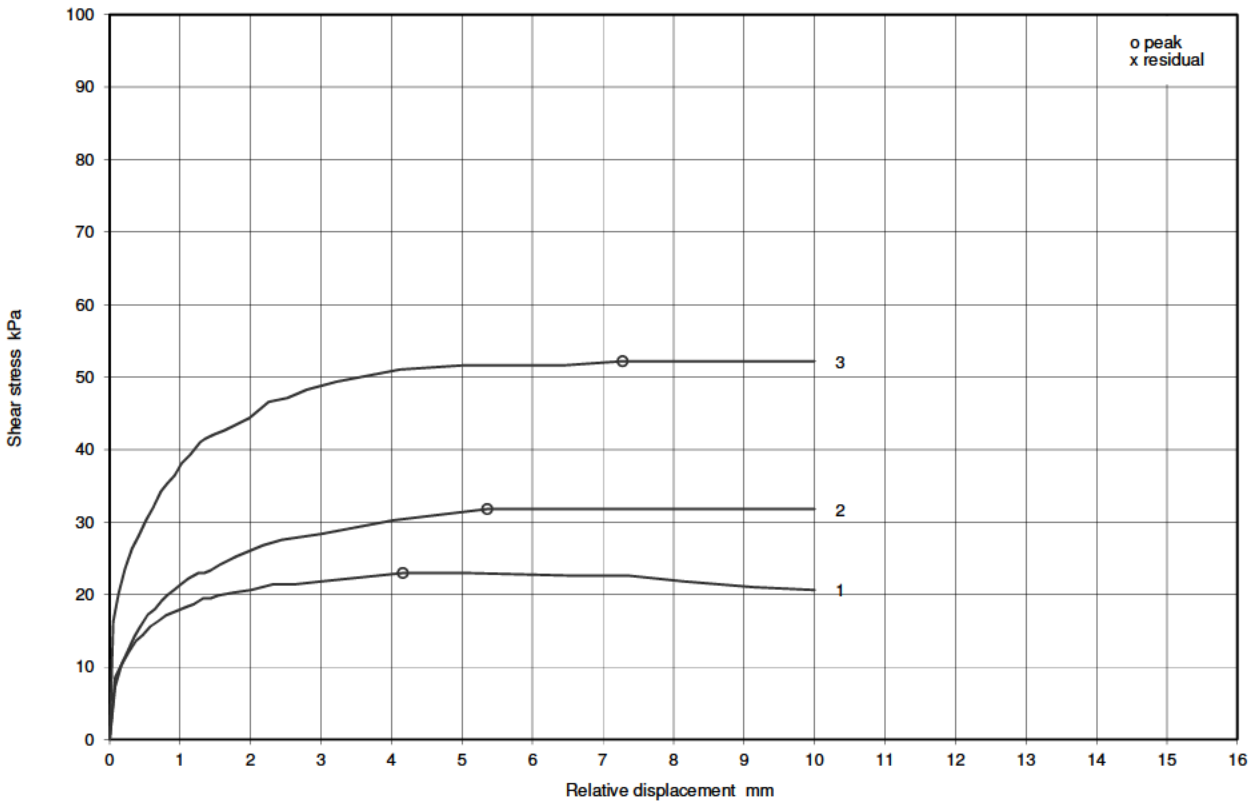
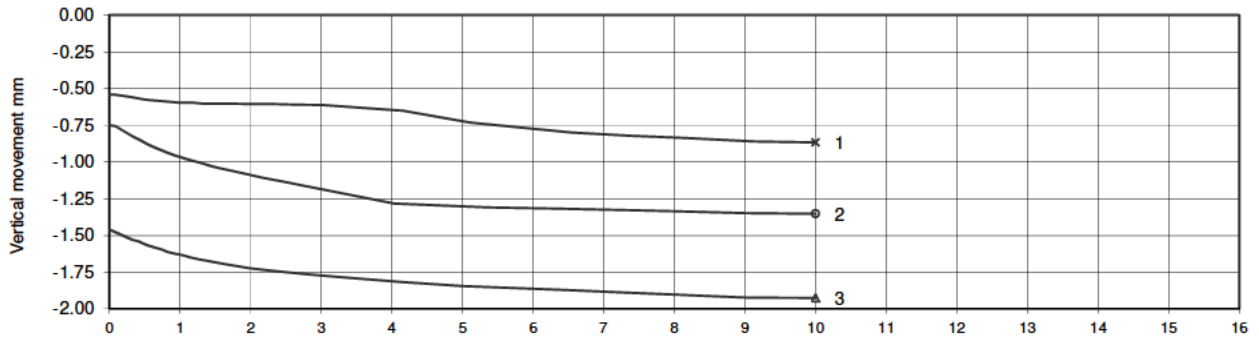
**Determination of shear strength by direct shear (Small shearbox apparatus)
(BS1377 : Part 7 : clause 4 : 1990)**

Project No	A8013-18	Sample Details:	Hole No.	TP/17/46		
Project Name	A1 Alnwick To Ellingham		Depth (m BGL)	1.00 - 1.20		
			Sample No	7	Type	B
			ID			
			Spec Ref			

Consolidation stage(s)



Shearing stage(s)



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**Determination of shear strength by direct shear (Small shearbox apparatus)
(BS1377 : Part 7 : clause 4 : 1990)**

Project No	A8013-18	Sample Details:	Hole No.	TP/17/47		
Project Name	A1iN Morpeth To Felton & Alnwick To Ellingham		Depth (m BGL)	2.50 - 2.80		
			Sample No	3	Type	B
			ID			
			Spec Ref			

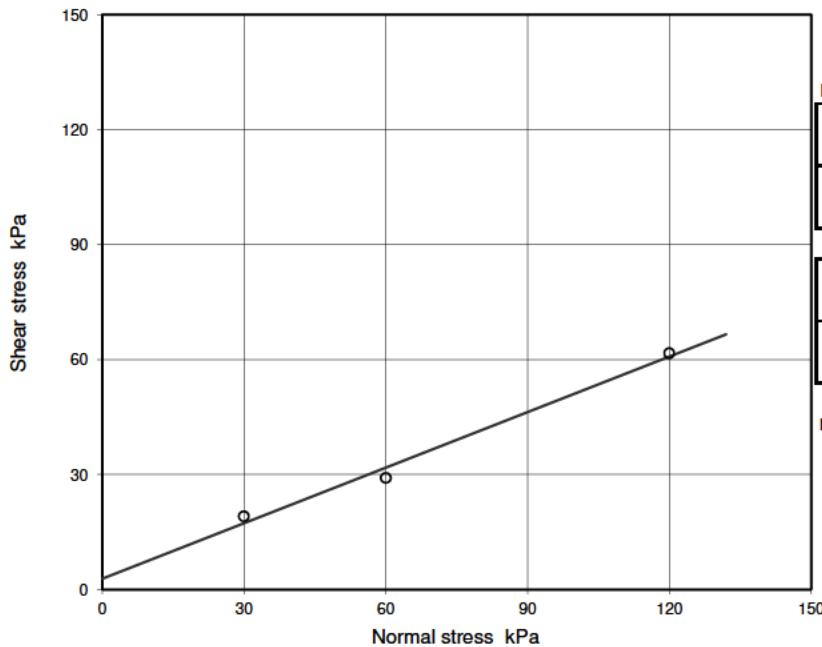
Soil Description	Greyish brown slightly sandy slightly gravelly CLAY.
Specimen Type /Preparation	-2mm material. Recompactd to a dry density of 1.85Mg/m ³ at as received moisture content.

Specimen(s) nominally 60mm x 60mm square
 Test(s) carried out in submerged condition
 Particle density, assumed 2.65 Mg/m³

Specimen Details		No.	1	2	3	4	5	6
Initial	Height	mm	26.1	26.1	26.1			
	Bulk Density	Mg/m ³	2.13	2.13	2.13			
	Water Content	%	15.2	15.2	15.2			
	Dry density	Mg/m ³	1.85	1.85	1.85			
	Voids ratio		0.433	0.433	0.433			
	Degree of Saturation	%	93	93	93			
Consol ¹	Consolidation / Normal Stress applied	kPa	30	60	120			
	Change in height during consolidation	mm	-0.392	-0.804	-1.356			
	Voids ratio after consolidation		0.411	0.388	0.358			
Shear see note 1	Voids ratio at end of test		0.401	0.372	0.345			
	Moisture content at end of test	%	15.1	14.1	13.0			
	Saturation at end of test	%	100	100	100			

Shearing stage

Rate of displacement	Peak	mm/min	0.030	0.030	0.030			
	Residual	mm/min						
Peak values, (o)	Relative displacement	mm	4.50	10.00	6.00			
	Shear stress	kPa	19.1	29.1	61.7			
Residual values, (x)	No. of reversals							
	Relative displacement	mm						
	Shear stress	kPa						



Shear Strength Parameters

Peak strength, (o)		Regression	Manual
c'	kPa	2.8	-
Ø'	degrees	26	-
Residual strength, (x)		Regression	Manual
c' _R	kPa	-	-
Ø' _R	degrees	-	-

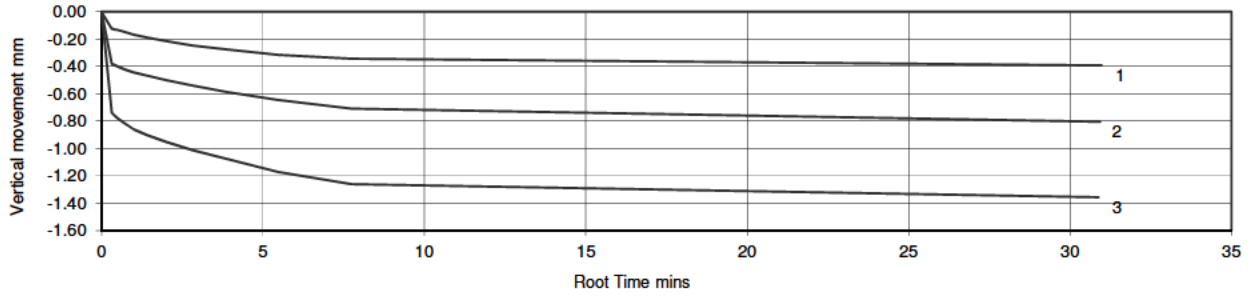
Notes :

1 After shear values based on BS1377. Pt 7 cl. 4.6.1.6 using ØH calculated from consolidation and shear stages

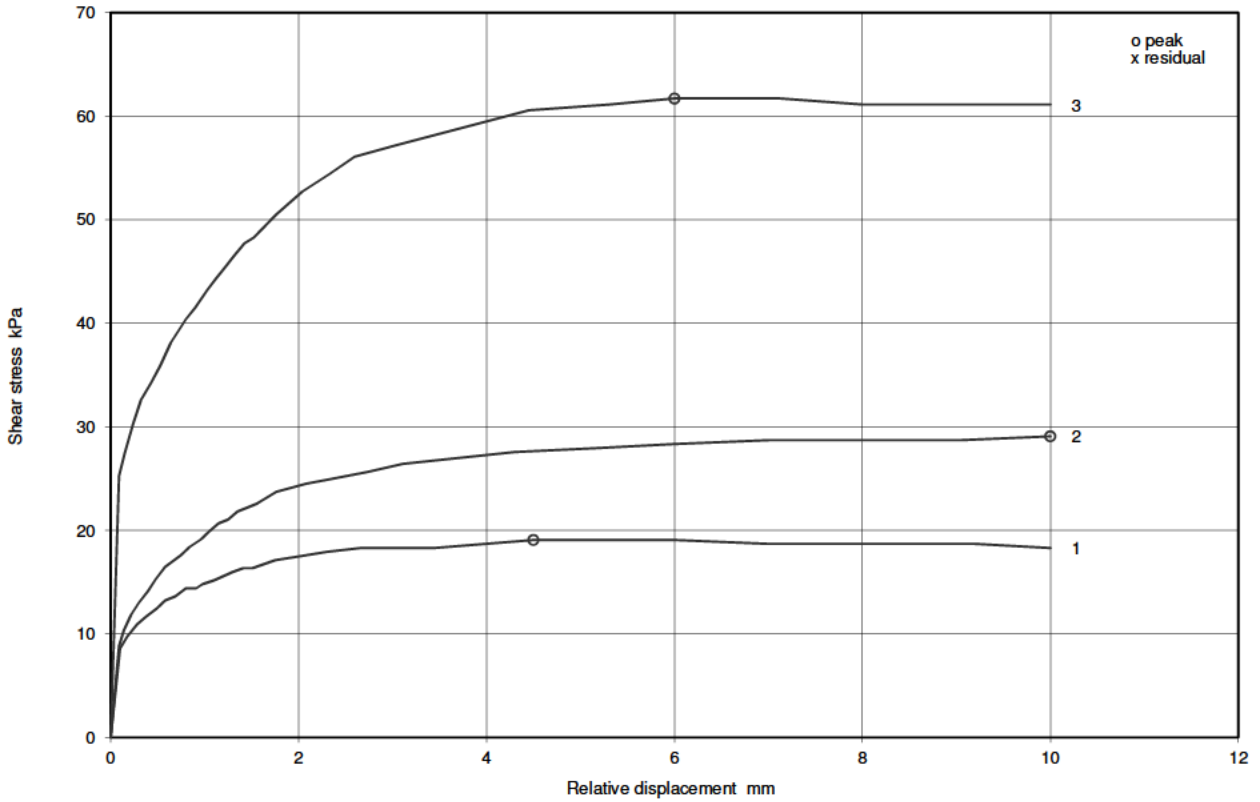
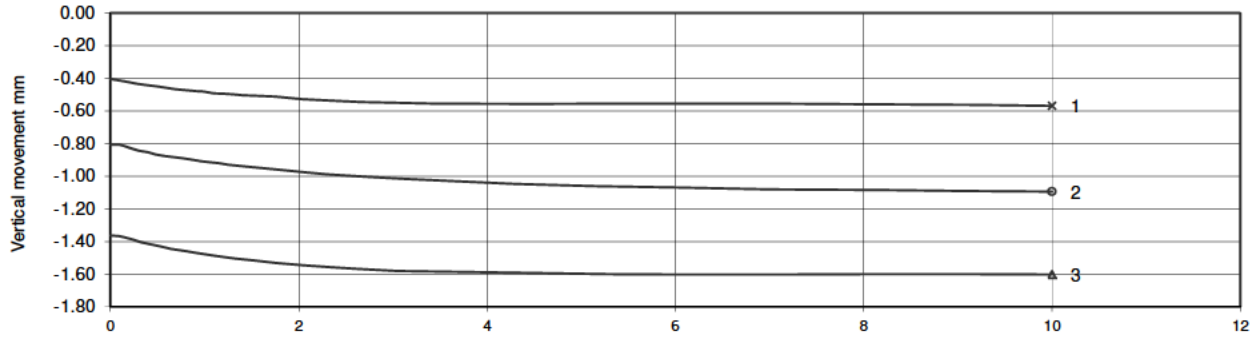
**Determination of shear strength by direct shear (Small shearbox apparatus)
(BS1377 : Part 7 : clause 4 : 1990)**

Project No	A8013-18	Sample Details:	Hole No.	TP/17/47		
Project Name	A1iN Morpeth To Felton & Alnwick To Ellingham		Depth (m BGL)	2.50 - 2.80		
			Sample No	3	Type	B
			ID			
			Spec Ref			

Consolidation stage(s)



Shearing stage(s)



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**Determination of shear strength by direct shear (Small shearbox apparatus)
(BS1377 : Part 7 : clause 4 : 1990)**

Project No	A8013-18	Sample Details:	Hole No.	TP/17/48		
Project Name	A1iN Morpeth To Felton & Alnwick To Ellingham		Depth (m BGL)	3.00 - 3.20		
			Sample No	3	Type	B
			ID			
			Spec Ref			

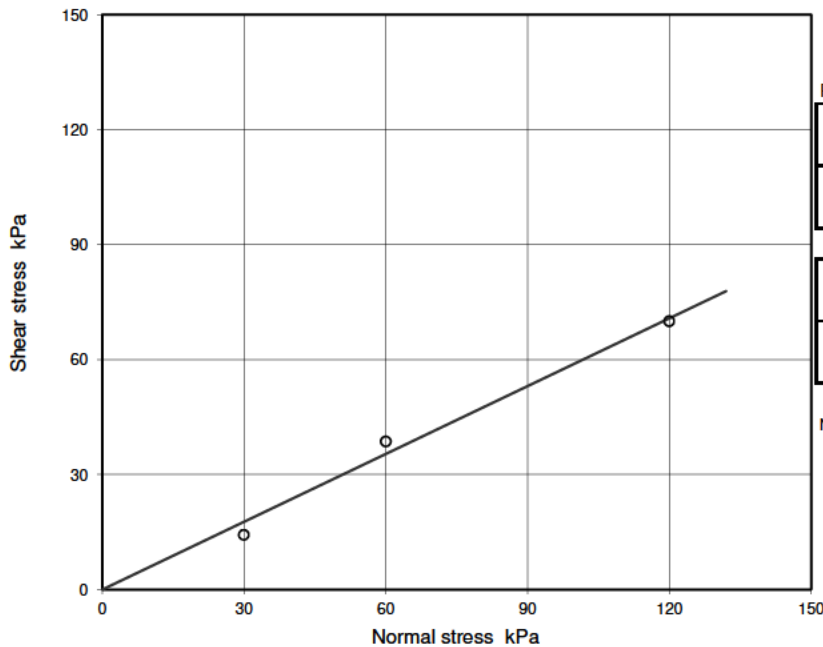
Soil Description	Greyish brown CLAY.
Specimen Type /Preparation	-2mm material. Recompactd to maxium density at as received moisture content.

Specimen(s) nominally 60mm x 60mm square
 Test(s) carried out in submerged condition
 Particle density, assumed 2.65 Mg/m³

Specimen Details		No.	1	2	3	4	5	6
Initial	Height	mm	26.1	26.1	26.1			
	Bulk Density	Mg/m ³	2.04	2.04	2.04			
	Water Content	%	14.3	14.3	14.3			
	Dry density	Mg/m ³	1.78	1.78	1.78			
	Voids ratio		0.489	0.489	0.489			
	Degree of Saturation	%	78	78	78			
Consol ¹	Consolidation / Normal Stress applied	kPa	30	60	120			
	Change in height during consolidation	mm	-0.360	-0.840	-1.220			
	Voids ratio after consolidation		0.468	0.441	0.419			
Shear see note 1	Voids ratio at end of test		0.432	0.429	0.407			
	Moisture content at end of test	%	16.3	15.2	14.3			
	Saturation at end of test	%	100	94	93			

Shearing stage

Rate of displacement	Peak	mm/min	0.035	0.035	0.035			
	Residual	mm/min						
Peak values, (o)	Relative displacement	mm	4.62	2.80	4.36			
	Shear stress	kPa	14.3	38.6	70.0			
Residual values, (x)	No. of reversals							
	Relative displacement	mm						
	Shear stress	kPa						



Shear Strength Parameters

Peak strength, (o)		Regression	Manual
c'	kPa	(-1.4)	0.0
Ø'	degrees	(31)	30½
Residual strength, (x)			
c' _R	kPa	-	-
Ø' _R	degrees	-	-

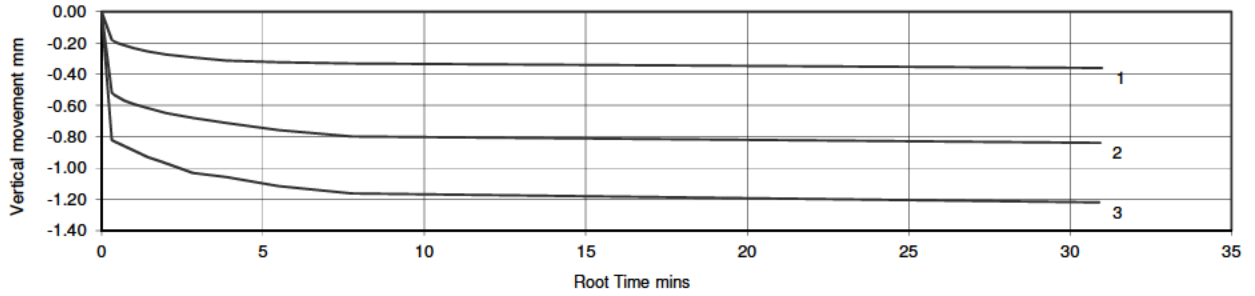
Notes :

1 After shear values based on BS1377. Pt 7 cl. 4.6.1.6 using ØH calculated from consolidation and shear stages

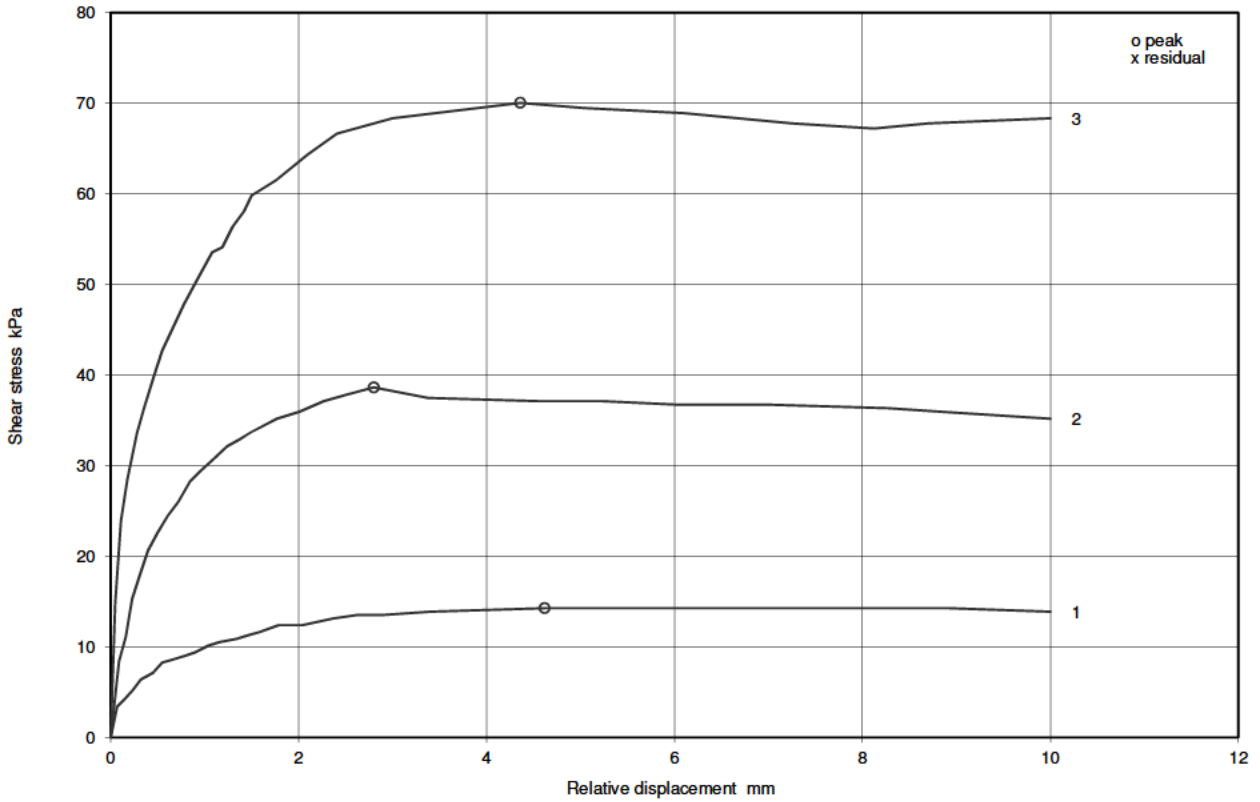
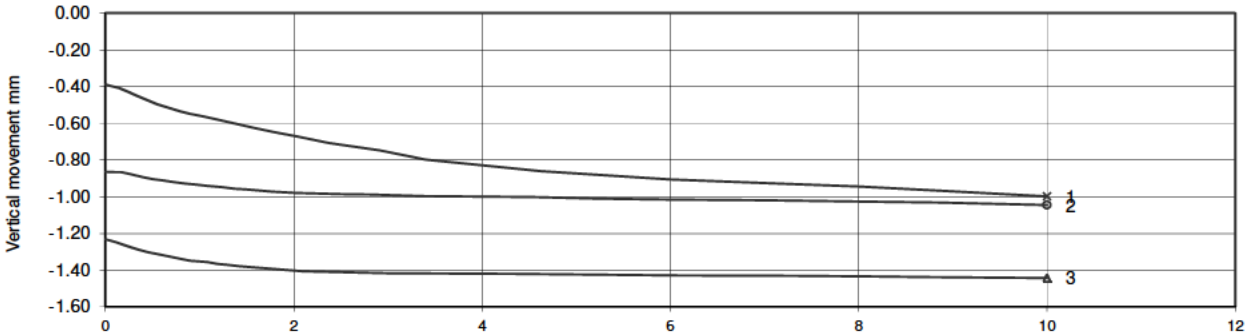
**Determination of shear strength by direct shear (Small shearbox apparatus)
(BS1377 : Part 7 : clause 4 : 1990)**

Project No	A8013-18	Sample Details:	Hole No.	TP/17/48		
Project Name	A1iN Morpeth To Felton & Alnwick To Ellingham		Depth (m BGL)	3.00 - 3.20		
			Sample No	3	Type	B
			ID			
			Spec Ref			

Consolidation stage(s)



Shearing stage(s)



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Figure

SSB

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Point Load Index Test

All specimens tested at as received water content unless shown otherwise

Test Type

D - Diametral, A - Axial, I - Irregular Lump, B - Block

Direction (U = unknown or random)

L - parallel to planes of weakness

P - perpendicular to planes of weakness

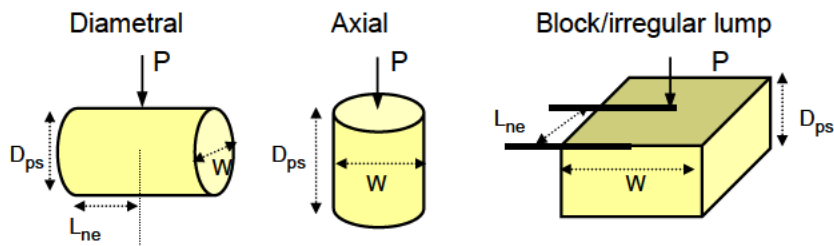
Dimensions

Dps - Distance between platens (platen separation)

Dps' - at failure

Lne - Length from platens to nearest free end

W - Width of shortest dimension perpendicular to load, P



Borehole	Depth, m	Sample Ref	Sample Type	Specimen Ref	Specimen Depth	Rock type	Test Type see ISRM Fig 5 and 8		Failure Valid (Y/N)	Dimensions				LOAD P kN	De equivalent diameter, mm	Point Load Index MPa F = (De/50)0.45		Remarks
							Type (D, A, I, B)	Direction (L, P or U)		Lne mm	W mm	Dps mm	Dps' mm			Is	Is(50)	
BH/17/01	4.65	12	CS	1		SILTSTONE	I	L	N	50.0	89.6	62.0	61.0	14.30	83.42	2.05	2.59	
BH/17/01	5.38	13	CS	1		SILTSTONE	I	L	Y	49.0	89.7	56.0	53.0	7.40	77.80	1.22	1.49	No sufficient intact for axial
BH/17/01	5.62	14	CS	1		SANDSTONE	I	L	N	54.0	89.4	49.0	48.0	1.10	73.92	0.20	0.24	No sufficient intact for axial
BH/17/01	6.17	15	CS	1		SILTSTONE	I	L	N	42.0	84.3	46.0	45.0	0.10	69.50	0.02	0.02	No sufficient intact for axial
BH/17/01	6.96	16	CS	1		SANDSTONE	A	P	N		91.7	79.0	67.0	12.90	88.45	1.65	2.13	
BH/17/01	7.61	17	CS	1		SILTSTONE	I	P	Y	40.0	80.4	43.0	35.0	4.40	59.86	1.23	1.33	No sufficient intact for axial
BH/17/01	7.75	18	CS	1		SILTSTONE	I	P	Y	40.0	58.4	20.0	19.0	3.30	37.59	2.34	2.05	Insufficient for axial
BH/17/01	8.13	19	CS	1		SILTSTONE	I	P	Y	44.0	69.4	37.0	27.0	5.70	48.84	2.39	2.36	No sufficient intact for axial
BH/17/01	9.29	20	CS	1		SANDSTONE	I	U	Y	42.0	59.8	45.0	44.0	0.70	57.88	0.21	0.22	
BH/17/01	9.69	21	CS	1		SANDSTONE	A	U	Y		88.1	38.0	37.0	3.00	64.42	0.72	0.81	
BH/17/01	10.83	22	CS	1		SANDSTONE	A	P	Y		89.4	39.0	35.0	3.50	63.12	0.88	0.98	
BH/17/01	11.12	23	CS	1		MUDSTONE	A	P	Y		87.8	49.0	38.0	6.00	65.18	1.41	1.59	

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Point Load Index Test

All specimens tested at as received water content unless shown otherwise

Test Type

D - Diametral, A - Axial, I - Irregular Lump, B - Block

Direction (U = unknown or random)

L - parallel to planes of weakness

P - perpendicular to planes of weakness

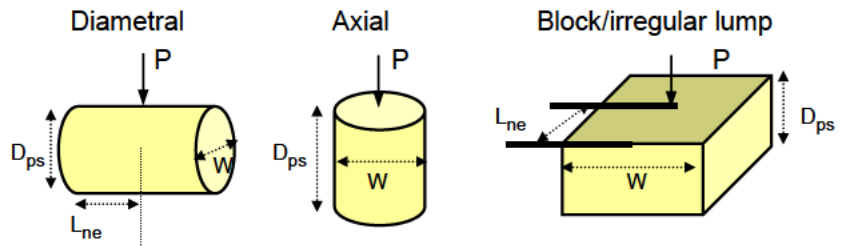
Dimensions

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Dps' - at failure

Lne - Length from platens to nearest free end

W - Width of shortest dimension perpendicular to load, P



Borehole	Depth, m	Sample Ref	Sample Type	Specimen Ref	Specimen Depth	Rock type	Test Type see ISRM Fig 5 and 8		Failure Valid (Y/N)	Dimensions				LOAD P kN	De equivalent diameter, mm	Point Load Index MPa $F = (De/50)0.45$		Remarks
							Type (D, A, I, B)	Direction (L, P or U)		Lne mm	W mm	Dps mm	Dps' mm			Is	Is(50)	
BH/17/01	11.62	24	CS	1		SANDSTONE	A	P	Y		89.6	40.0	37.0	7.80	64.97	1.85	2.08	
BH/17/01	12.31	25	CS	1		MUDSTONE	A	P	Y		89.2	56.0	53.0	5.10	77.58	0.85	1.03	
BH/17/01	14.10	26	CS	1		MUDSTONE	A	P	Y		82.7	43.0	36.0	2.90	61.57	0.77	0.84	
BH/17/01	14.62	27	CS	1		MUDSTONE	I	U	N	43.0	75.0	56.0	55.0	2.90	72.47	0.55	0.65	No sufficient intact for axial
BH/17/02	5.56	12	CS	1		SANDSTONE	I	U	Y	30.0	49.5	33.0	32.0	0.90	44.91	0.45	0.43	Non-intact could not test axial
BH/17/02	5.70	11	CS	1		MUDSTONE	I	U	Y	43.0	68.0	46.0	42.0	0.10	60.30	0.03	0.03	Non-intact could not test axial
BH/17/02	6.75	13	CS	1		MUDSTONE	I	P	Y	35.0	42.4	24.0	23.0	0.10	35.24	0.08	0.07	Not enough material for Axial
BH/17/02	10.10	14	CS	1		SANDSTONE	A	P	Y		90.0	36.0	31.0	7.70	59.60	2.17	2.35	
BH/17/02	10.95	15	CS	1		SANDSTONE	I	P	Y	40.0	52.3	30.0	28.0	5.10	43.18	2.74	2.56	Not enough material for Axial
BH/17/02	11.50	16	CS	1		MUDSTONE	I	P	Y	42.0	81.0	29.0	28.0	0.10	53.74	0.03	0.04	Not enough material for Axial
BH/17/02	12.40	17	CS	1		SANDSTONE	A	U	Y		89.0	56.0	55.0	2.40	78.95	0.39	0.47	
BH/17/02	13.86	18	CS	1		SANDSTONE	A	P	Y		89.2	29.0	27.0	6.20	55.38	2.02	2.12	

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Point Load Index Test

All specimens tested at as received water content unless shown otherwise

Test Type

D - Diametral, A - Axial, I - Irregular Lump, B - Block

Direction (U = unknown or random)

L - parallel to planes of weakness

P - perpendicular to planes of weakness

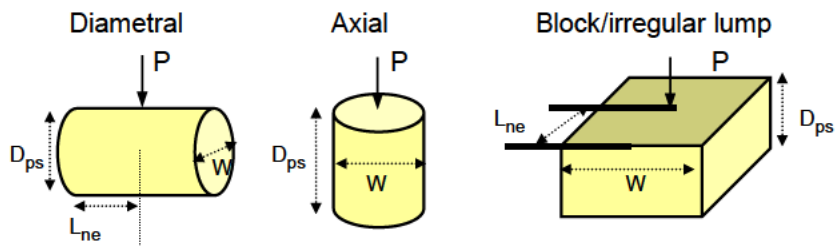
Dimensions

Dps - Distance between platens (platen separation)

Dps' - at failure

Lne - Length from platens to nearest free end

W - Width of shortest dimension perpendicular to load, P



Borehole	Depth, m	Sample Ref	Sample Type	Specimen Ref	Specimen Depth	Rock type	Test Type see ISRM Fig 5 and 8		Failure Valid (Y/N)	Dimensions				LOAD P kN	De equivalent diameter, mm	Point Load Index MPa F = (De/50)0.45		Remarks
							Type (D, A, I, B)	Direction (L, P or U)		Lne mm	W mm	Dps mm	Dps' mm			Is	Is(50)	
BH/17/02	14.00	19	CS	1		SANDSTONE	A	P	Y		89.3	37.0	34.0	4.20	62.18	1.09	1.20	
BH/17/02	14.55	20	CS	1		SANDSTONE	A	P	N		89.0	52.0	48.0	10.90	73.75	2.00	2.39	
BH/17/03	4.33	12	CS	1		MUDSTONE	A	P	Y		88.0	45.0	44.0	0.10	70.21	0.02	0.02	
BH/17/03	4.73	13	CS	1		MUDSTONE	I	P	Y	42.0	41.5	31.0	30.0	0.10	39.81	0.06	0.06	Not enough material for axial
BH/17/03	5.58	14	CS	1		MUDSTONE	A	U	Y		88.3	52.0	51.0	0.10	75.72	0.02	0.02	
BH/17/03	5.90	15	CS	1		SILTSTONE	A	U	Y		83.3	40.0	38.0	8.10	63.48	2.01	2.24	
BH/17/03	6.34	16	CS	1		SILTSTONE	A	U	Y		87.3	49.0	45.0	15.10	70.72	3.02	3.53	
BH/17/03	6.62	17	CS	1		SILTSTONE	A	U	Y		86.7	60.0	58.0	22.00	80.02	3.44	4.25	
BH/17/03	7.02	18	CS	1		SILTSTONE	A	U	Y		86.6	48.0	40.0	12.60	66.41	2.86	3.25	
BH/17/03	8.06	19	CS	1		MUDSTONE	A	U	Y		89.8	44.0	43.0	0.10	70.12	0.02	0.02	
BH/17/03	8.70	20	CS	1		MUDSTONE	A	U	Y		89.2	53.0	52.0	0.10	76.85	0.02	0.02	
BH/17/03	9.25	21	CS	1		MUDSTONE	A	U	N		90.4	44.0	48.0	0.10	74.33	0.02	0.02	

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Point Load Index Test

All specimens tested at as received water content unless shown otherwise

Test Type

D - Diametral, A - Axial, I - Irregular Lump, B - Block

Direction (U = unknown or random)

L - parallel to planes of weakness

P - perpendicular to planes of weakness

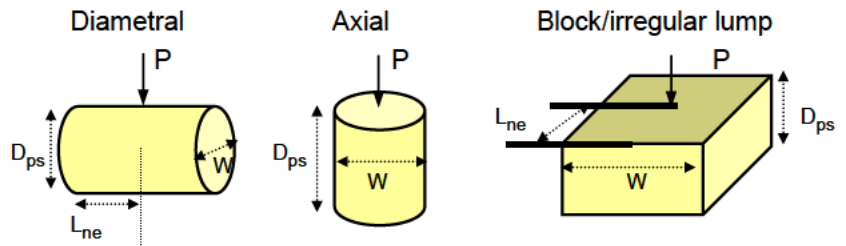
Dimensions

Dps - Distance between platens (platen separation)

Dps' - at failure

Lne - Length from platens to nearest free end

W - Width of shortest dimension perpendicular to load, P



Borehole	Depth, m	Sample Ref	Sample Type	Specimen Ref	Specimen Depth	Rock type	Test Type see ISRM Fig 5 and 8		Failure Valid (Y/N)	Dimensions				LOAD P kN	De equivalent diameter, mm	Point Load Index MPa $F = (De/50)0.45$		Remarks
							Type (D, A, I, B)	Direction (L, P or U)		Lne mm	W mm	Dps mm	Dps' mm			Is	Is(50)	
BH/17/03	9.68	22	CS	1		MUDSTONE	A	U	Y		89.9	53.0	52.0	0.10	77.15	0.02	0.02	
BH/17/04	4.25	13	CS	1		SANDSTONE	A	P	Y		89.7	51.0	49.0	1.60	74.81	0.29	0.34	
BH/17/04	4.80	14	CS	1		SANDSTONE	A	P	Y		90.2	53.0	51.0	2.60	76.53	0.44	0.54	
BH/17/04	4.96	15	CS	1		SANDSTONE	A	U	Y		89.4	31.0	30.0	0.10	58.44	0.03	0.03	
BH/17/04	6.64	16	CS	1		LAMINATED SILTSTONE	A	P	Y		92.4	27.0	26.0	1.80	55.31	0.59	0.62	
BH/17/04	7.10	17	CS	1		SANDSTONE	A	P	Y		89.6	52.0	51.0	0.10	76.28	0.02	0.02	
BH/17/04	7.36	18	CS	1		LAMINATED SANDSTONE	A	P	Y		88.9	45.0	34.0	0.10	62.04	0.03	0.03	
BH/17/04	7.63	19	CS	1		SANDSTONE	A	P	N		89.2	35.0	33.0	0.70	61.22	0.19	0.20	
BH/17/04	8.46	20	CS	1		LAMINATED SANDSTONE	A	U	Y		89.3	36.0	35.0	0.10	63.08	0.03	0.03	
BH/17/04	9.34	21	CS	1		LAMINATED SANDSTONE	A	P	Y		88.5	55.0	49.0	2.90	74.31	0.53	0.63	
BH/17/04	9.58	22	CS	1		LAMINATED SANDSTONE	A	P	Y		91.8	44.0	42.0	4.20	70.06	0.86	1.00	
BH/17/05A	2.40	1	CS	1		SILTSTONE	A	U	Y		89.0	38.0	35.0	6.60	62.98	1.66	1.85	

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Point Load Index Test

All specimens tested at as received water content unless shown otherwise

Test Type

D - Diametral, A - Axial, I - Irregular Lump, B - Block

Direction (U = unknown or random)

L - parallel to planes of weakness

P - perpendicular to planes of weakness

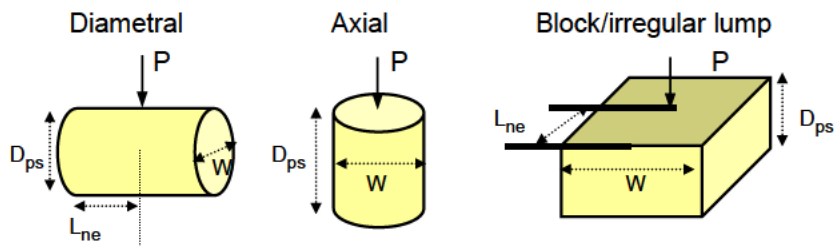
Dimensions

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Lne - Length from platens to nearest free end

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Borehole	Depth, m	Sample Ref	Sample Type	Specimen Ref	Specimen Depth	Rock type	Test Type see ISRM Fig 5 and 8		Failure Valid (Y/N)	Dimensions				LOAD P kN	De equivalent diameter, mm	Point Load Index MPa F = (De/50)0.45		Remarks
							Type (D, A, I, B)	Direction (L, P or U)		Lne mm	W mm	Dps mm	Dps' mm			Is	Is(50)	
BH/17/05A	3.10	2	CS	1		SANDSTONE	A	U	Y		88.0	45.0	44.0	10.00	70.21	2.03	2.36	
BH/17/05A	4.10	3	CS	1		SANDSTONE	A	P	Y		87.9	40.0	33.0	0.80	60.77	0.22	0.24	
BH/17/05A	4.63	4	CS	1		SANDSTONE	A	P	Y		88.8	49.0	43.0	5.00	69.73	1.03	1.19	
BH/17/05A	5.09	5	CS	1		SANDSTONE	A	P	Y		88.7	51.0	37.0	6.50	64.64	1.56	1.75	
BH/17/05A	6.60	6	CS	1		SANDSTONE	A	P	Y		86.5	37.0	35.0	4.50	62.09	1.17	1.29	
BH/17/05A	7.65	7	CS	1		MUDSTONE	A	P	Y		88.7	24.0	23.0	0.10	50.97	0.04	0.04	
BH/17/05A	8.94	8	CS	1		MUDSTONE	A	U	Y		89.5	36.0	35.0	23.30	63.15	5.84	6.49	
BH/17/05A	9.85	9	CS	1		MUDSTONE	A	U	Y		89.5	39.0	38.0	0.10	65.80	0.02	0.03	
BH/17/06	19.97	21	CS	1		SILTSTONE	A	U	Y		89.9	59.0	58.0	1.10	81.48	0.17	0.21	
BH/17/11	1.63	6	CS	1		LIMESTONE	A	P	Y		89.6	36.0	34.0	12.60	62.28	3.25	3.59	
BH/17/11	2.35	7	CS	1		LIMESTONE	A	U	Y		90.0	33.0	31.0	12.10	59.60	3.41	3.69	
BH/17/11	3.26	8	CS	1		LIMESTONE	A	U	Y		89.7	49.0	48.0	6.80	74.04	1.24	1.48	

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Point Load Index Test

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D - Diametral, A - Axial, I - Irregular Lump, B - Block

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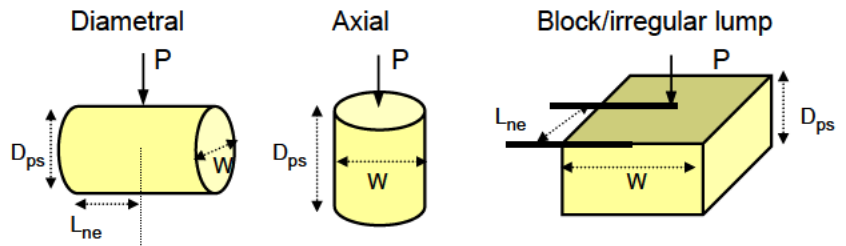
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Borehole	Depth, m	Sample Ref	Sample Type	Specimen Ref	Specimen Depth	Rock type	Test Type see ISRM Fig 5 and 8		Failure Valid (Y/N)	Dimensions				LOAD P kN	De equivalent diameter, mm	Point Load Index MPa $F = (De/50)0.45$		Remarks
							Type (D, A, I, B)	Direction (L, P or U)		Lne mm	W mm	Dps mm	Dps' mm			Is	Is(50)	
BH/17/11	3.56	9	CS	1		LIMESTONE	A	U	Y		88.8	34.0	32.0	11.10	60.15	3.07	3.33	
BH/17/11	7.14	10	CS	1		LIMESTONE	A	U	Y		89.5	34.0	31.0	13.20	59.44	3.74	4.04	
BH/17/11	8.07	11	CS	1		LIMESTONE	A	U	Y		89.5	36.0	35.0	9.40	63.15	2.36	2.62	
BH/17/11	8.83	12	CS	1		MUDSTONE	A	P	Y		90.1	68.0	64.0	0.10	85.69	0.01	0.02	
BH/17/11	9.38	13	CS	1		LAMINATED MUDSTONE	A	P	Y		88.9	40.0	39.0	0.10	66.44	0.02	0.03	
BH/17/11	9.76	14	CS	1		MUDSTONE	A	P	Y		91.4	47.0	45.0	0.10	72.37	0.02	0.02	
BH/17/13	6.58	12	CS	1		SANDSTONE	A	P	Y		89.3	48.0	44.0	4.60	70.73	0.92	1.07	
BH/17/13	7.00	13	CS	1		SANDSTONE	A	P	Y		89.4	29.0	28.0	0.70	56.46	0.22	0.23	
BH/17/13	7.70	14	CS	1		SANDSTONE	I	P	Y	45.0	73.5	50.0	44.0	3.70	64.17	0.90	1.01	
BH/17/13	9.00	15	CS	1		SANDSTONE	A	P	Y		89.7	47.0	45.0	8.20	71.69	1.60	1.88	
BH/17/13	10.00	16	CS	1		SANDSTONE	A	P	N		89.4	55.0	54.0	2.90	78.40	0.47	0.58	
BH/17/13	11.00	17	CS	1		SILTSTONE	I	P	Y	39.0	78.7	26.0	25.0	0.90	50.05	0.36	0.36	Non-intact could not test axial

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Point Load Index Test

All specimens tested at as received water content unless shown otherwise

Test Type

D - Diametral, A - Axial, I - Irregular Lump, B - Block

Direction (U = unknown or random)

L - parallel to planes of weakness

P - perpendicular to planes of weakness

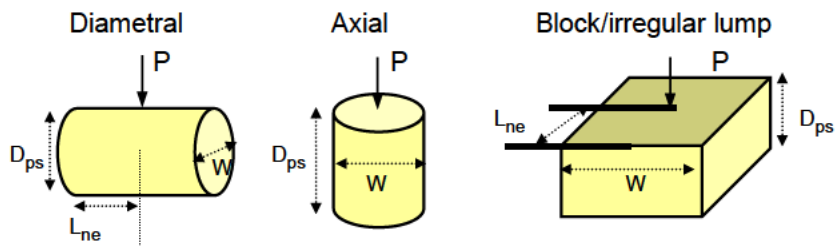
Dimensions

Dps - Distance between platens (platen separation)

Dps' - at failure

Lne - Length from platens to nearest free end

W - Width of shortest dimension perpendicular to load, P



Borehole	Depth, m	Sample Ref	Sample Type	Specimen Ref	Specimen Depth	Rock type	Test Type see ISRM Fig 5 and 8		Failure Valid (Y/N)	Dimensions				LOAD P kN	De equivalent diameter, mm	Point Load Index MPa $F = (De/50)0.45$		Remarks
							Type (D, A, I, B)	Direction (L, P or U)		Lne mm	W mm	Dps mm	Dps' mm			Is	Is(50)	
BH/17/13	12.08	18	CS	1		COAL	A	U	Y		90.0	52.0	51.0	0.10	76.45	0.02	0.02	
BH/17/13	12.42	19	CS	1		LIMESTONE	A	U	Y		89.8	37.0	36.0	13.00	64.16	3.16	3.53	
BH/17/13	13.00	20	CS	1		LIMESTONE	A	P	Y		88.8	38.0	35.0	7.70	62.91	1.95	2.16	
BH/17/13	14.00	21	CS	1		SANDSTONE	I	P	Y		56.6	22.0	21.0	0.10	38.90	0.07	0.06	Not enough material intact for axial.
BH/17/13	14.15	22	CS	1		SILTSTONE	I	P	Y	42.0	82.8	27.0	24.0	1.90	50.30	0.75	0.75	Non-intact could not test axial
BH/17/13	14.70	23	CS	1		MUDSTONE	I	U	Y	41.0	81.1	24.0	23.0	0.10	48.73	0.04	0.04	Non-intact could not test axial
BH/17/14	5.68	13	CS	1		SANDSTONE	A	P	Y		89.3	40.0	38.0	1.00	65.73	0.23	0.26	
BH/17/14	6.13	14	CS	1		SANDSTONE	A	L	N		90.4	56.0	54.0	1.70	78.84	0.27	0.34	
BH/17/14	7.00	15	CS	1		SANDSTONE	A	U	Y		89.3	43.0	42.0	7.00	69.10	1.47	1.70	
BH/17/14	8.24	16	CS	1		SANDSTONE	A	L	N		89.1	44.0	43.0	1.20	69.84	0.25	0.29	Failed along a pre-existing vein
BH/17/14	8.42	17	CS	1		SANDSTONE	A	P	Y		88.9	56.0	55.0	0.10	78.90	0.02	0.02	
BH/17/14	9.12	18	CS	1		SANDSTONE	A	P	Y		89.7	45.0	43.0	4.50	70.08	0.92	1.07	

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Project No A8013-18
Project Name A1 ALNWICK TO ELLINGHAM

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Point Load Index Test

All specimens tested at as received water content unless shown otherwise

Test Type

D - Diametral, A - Axial, I - Irregular Lump, B - Block

Direction (U = unknown or random)

L - parallel to planes of weakness

P - perpendicular to planes of weakness

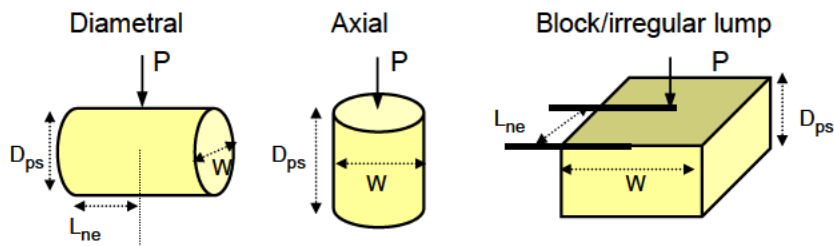
Dimensions

Dps - Distance between platens (platen separation)

Dps' - at failure

Lne - Length from platens to nearest free end

W - Width of shortest dimension perpendicular to load, P



Borehole	Depth, m	Sample Ref	Sample Type	Specimen Ref	Specimen Depth	Rock type	Test Type see ISRM Fig 5 and 8		Failure Valid (Y/N)	Dimensions				LOAD P kN	De equivalent diameter, mm	Point Load Index MPa F = (De/50)0.45		Remarks
							Type (D, A, I, B)	Direction (L, P or U)		Lne mm	W mm	Dps mm	Dps' mm			Is	Is(50)	
BH/17/14	9.50	19	CS	1		SANDSTONE	A	U	Y		88.5	67.0	66.0	0.10	86.24	0.01	0.02	
BH/17/14	10.00	20	CS	1		MUDSTONE	A	P	Y		89.2	30.0	28.0	0.10	56.39	0.03	0.03	
BH/17/14	11.23	21	CS	1		SANDSTONE	A	P	Y		89.2	30.0	19.0	4.40	46.45	2.04	1.97	
BH/17/14	12.50	22	CS	1		MUDSTONE	A	P	Y		80.0	42.0	38.0	2.90	62.21	0.75	0.83	
BH/17/14	12.61	23	CS	1		MUDSTONE	A	P	N		88.2	63.0	60.0	2.10	82.09	0.31	0.39	
BH/17/14	13.66	24	CS	1		MUDSTONE	A	P	Y		83.5	51.0	34.0	1.80	60.12	0.50	0.54	
BH/17/14	14.07	25	CS	1		MUDSTONE	A	P	Y		85.2	43.0	42.0	2.00	67.50	0.44	0.50	
BH/17/14	14.50	26	CS	1		MUDSTONE	A	P	Y		83.3	52.0	38.0	3.20	63.48	0.79	0.88	

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Figure
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Uniaxial Compressive Strength Of Rock - Summary of Results

Hole No.	Sample				Rock Type	Specimen Dimensions ²			Bulk Density ² Mg/m ³	Water Content ¹ %	Uniaxial Compression ³				Remarks
	No.	Depth (m)		type		Dia. mm	Height mm	H/D			Load Rate kN/min	Time to failure secs	Mode of failure	UCS MPa	
		from	to												
BH/17/02	17	12.40	12.70	CS	SANDSTONE	89.5	234.9	2.6	2.43	0.5	45	421	multiple shear	50.9	
BH/17/03	17	6.62	6.96	CS	SILTSTONE	86.8	183.7	2.1	3.39	0.4	20	472	axial cleavage	27.6	Outside ISRM
BH/17/04	14	4.80	4.96	CS	SANDSTONE	89.7	166.4	1.9	2.31	0.1	30	359	multiple shear	28.8	Not tested to ISRM specification. Sample failed along pre-existing fractures.
BH/17/05A	2	3.10	3.58	CS	SANDSTONE	88.1	236.3	2.7	2.35	3.6	45	441	shear	55.6	
BH/17/05A	3	4.10	4.40	CS	SANDSTONE	87.4	235.8	2.7	2.34	3.1	45	280	multiple shear	35.9	
BH/17/05A	8	8.94		CS	SILTSTONE	89.4	237.9	2.7	2.69	0.2	150	381	fragmented	153	
BH/17/06	21	19.97	20.30	CS	SILTSTONE	89.9	236.0	2.6	2.62	0.3	120	198	shear	63	
BH/17/11	11	8.07	8.30	CS	LIMESTONE	89.7	164.0	1.8	2.70	0.2	60	566	axial cleavage	90.3	Outside ISRM Specification
BH/17/13	19	12.42	13.00	CS	LIMESTONE	89.6	235.4	2.6	2.66	0.7	75	281	multiple shear	55.8	
BH/17/14	14	6.13	6.35	CS	SANDSTONE	89.7	166.4	1.9	2.31	0.1	30	359	multiple shear	28.8	Outside ISRM Specification

Notes : Test Specification : International Society for Rock Mechanics, The complete ISRM suggested methods for Rock Characterization Testing and Monitoring, 2007



1 ISRM p87 test 1, water content at 105 ± 3 oC, specimen as received at the laboratory

2 ISRM p86 clause (vii), Caliper method used for determination of bulk volume and derivation of bulk density

3 ISRM p153 part 1, determination of Uniaxial Compressive Strength (UCS) of Rock Materials

above notes apply unless annotated otherwise in the remarks

Mode of failure :
 S - Single shear MS - multiple shear
 AC - Axial cleavage F - Fragmented

QA Ref RLR 2 Rev 2.16 Apr 15	 1157	 SOCOTEC	Project No A8013-18 Project Name A1 ALNWICK TO ELLINGHAM	Figure RUCS
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INDEX PROPERTIES OF ROCK - SUMMARY OF RESULTS

Hole No.	Sample				Water Content1 %	Saturation and Caliper 2		Saturation and Buoyancy 3		Bulk density Mg/m3	Remarks
	No.	Depth (m)		type		Dry density Mg/m3	Porosity %	Dry density Mg/m3	Porosity %		
		from	to								
BH/17/01	12	4.65	4.78	CS	0.2						
BH/17/01	13	5.38	5.48	CS	1.3						
BH/17/01	14	5.62	5.76	CS	1.4						
BH/17/01	15	6.17	6.26	CS	2.1						
BH/17/01	16	6.96	7.04	CS	1.1						
BH/17/01	17	7.61	7.65	CS	1.4						
BH/17/01	18	7.75	7.78	CS	1.4						
BH/17/01	19	8.13	8.18	CS	1.6						
BH/17/01	20	9.29	9.50	CS	0.7						
BH/17/01	21	9.69	10.00	CS	0.6						
BH/17/01	22	10.83	11.00	CS	1						
BH/17/01	23	11.12	11.27	CS	1.1						
BH/17/01	24	11.62	11.72	CS	1						
BH/17/01	25	12.31	12.40	CS	1.1						
BH/17/01	26	14.10	14.16	CS	1.1						
BH/17/01	27	14.62	14.72	CS	1.2						
BH/17/02	12	5.56	6.75	CS	2.3						
BH/17/02	11	5.70	5.90	CS	6.2						
BH/17/02	13	6.75	6.86	CS	2.7						
BH/17/02	14	10.10	10.25	CS	0.8						
BH/17/02	15	10.95	11.09	CS	1.4						
BH/17/02	16	11.50	11.60	CS	2.8						

Notes :

Test Specification : International Society for Rock Mechanics, The complete ISRM suggested methods for Rock Characterization Testing and Monitoring, 2007

- 1 ISRM p87 test 1, water content at 105 ± 3 oC, specimen as received at the laboratory
- 2 ISRM p87 test 2, Porosity/density determination using saturation and caliper techniques
- 3 ISRM p88 test 3, Porosity/density determination using saturation and buoyancy techniques

above notes apply unless annotated otherwise in the remarks

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RLR 1
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Figure
RINDX

INDEX PROPERTIES OF ROCK - SUMMARY OF RESULTS

Hole No.	Sample				Water Content ¹ %	Saturation and Caliper ²		Saturation and Buoyancy ³		Bulk density Mg/m ³	Remarks
	No.	Depth (m)		type		Dry density Mg/m ³	Porosity %	Dry density Mg/m ³	Porosity %		
		from	to								
BH/17/02	17	12.40	12.70	CS	0.5						
BH/17/02	18	13.86	13.99	CS	1.1						
BH/17/02	19	14.00	14.20	CS	1						
BH/17/02	20	14.55	14.71	CS	1.1						
BH/17/03	12	4.33	4.43	CS	7.6						
BH/17/03	13	4.73	4.80	CS	5						
BH/17/03	14	5.58	5.74	CS	7.9						
BH/17/03	15	5.90	6.00	CS	0.7						
BH/17/03	16	6.34	6.62	CS	0.5						
BH/17/03	17	6.62	6.96	CS	0.4						
BH/17/03	18	7.02	7.40	CS	0.5						
BH/17/03	19	8.06	8.42	CS	4.6						
BH/17/03	20	8.70	8.90	CS	6.5						
BH/17/03	21	9.25	9.35	CS	5.7						
BH/17/03	22	9.68	9.80	CS	5.1						
BH/17/04	13	4.25	4.40	CS	0.9						
BH/17/04	14	4.80	4.96	CS	5.5						
BH/17/04	15	4.96	5.10	CS	3.4						
BH/17/04	16	6.64	6.70	CS	2.9						
BH/17/04	17	7.10	7.20	CS	6.8						
BH/17/04	18	7.36	7.48	CS	5.4						
BH/17/04	19	7.63	7.88	CS	6.7						


Notes :
 Test Specification : International Society for Rock Mechanics, The complete ISRM suggested methods for Rock Characterization Testing and Monitoring, 2007
 1 ISRM p87 test 1, water content at 105 ± 3 oC, specimen as received at the laboratory
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		Project Name A1 ALNWICK TO ELLINGHAM	RINDX
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INDEX PROPERTIES OF ROCK - SUMMARY OF RESULTS

Hole No.	Sample				Water Content ¹ %	Saturation and Caliper 2		Saturation and Buoyancy 3		Bulk density Mg/m ³	Remarks
	No.	Depth (m)		type		Dry density Mg/m ³	Porosity %	Dry density Mg/m ³	Porosity %		
		from	to								
BH/17/04	20	8.46	8.64	CS	5.8						
BH/17/04	21	9.34	9.47	CS	4.8						
BH/17/04	22	9.58	9.77	CS	4.2						
BH/17/05A	1	2.40	2.52	CS	0.3						
BH/17/05A	2	3.10	3.58	CS	2.9						
BH/17/05A	3	4.10	4.40	CS	3.7						
BH/17/05A	4	4.63	4.73	CS	1.1						
BH/17/05A	5	5.09	5.20	CS	2.9						
BH/17/05A	6	6.60	6.70	CS	3.1						
BH/17/05A	7	7.65	7.72	CS	3.2						
BH/17/05A	8	8.50	8.94	CS	0.1						
BH/17/05A	9	9.85	9.95	CS	3.1						
BH/17/06	21	19.97	20.30	CS	0.4						
BH/17/11	6	1.63	1.71	CS	0.3						
BH/17/11	7	2.35	2.50	CS	0.2						
BH/17/11	8	3.26	3.34	CS	0.2						
BH/17/11	9	3.56	3.68	CS	0.2						
BH/17/11	10	7.14	7.26	CS	0.7						
BH/17/11	11	8.07	8.30	CS	0.6						
BH/17/11	12	8.83	8.99	CS	6.5						
BH/17/11	13	9.38	9.52	CS	5.5						
BH/17/11	14	9.76	9.86	CS	5.7						


Notes :
 Test Specification : International Society for Rock Mechanics, The complete ISRM suggested methods for Rock Characterization Testing and Monitoring, 2007
 1 ISRM p87 test 1, water content at 105 ± 3 oC, specimen as received at the laboratory
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QA Ref RLR 1 Rev 2.2 Nov 17		Project No A8013-18	Figure
		Project Name A1 ALNWICK TO ELLINGHAM	RINDX
SOCOTEC UK Limited			Printed: 18/01/2019 12:01

INDEX PROPERTIES OF ROCK - SUMMARY OF RESULTS

Hole No.	Sample				Water Content ¹ %	Saturation and Caliper 2		Saturation and Buoyancy 3		Bulk density Mg/m ³	Remarks
	No.	Depth (m)		type		Dry density Mg/m ³	Porosity %	Dry density Mg/m ³	Porosity %		
		from	to								
BH/17/13	12	6.58	6.77	CS	0.6						
BH/17/13	13	7.00	7.14	CS	0.6						
BH/17/13	14	7.70	7.82	CS	0.6						
BH/17/13	15	9.00	9.18	CS	0.3						
BH/17/13	16	10.00	10.07	CS	2.2						
BH/17/13	17	11.00	11.06	CS	2.8						
BH/17/13	18	12.08	12.16	CS	4.1						
BH/17/13	19	12.42	13.00	CS	0.4						
BH/17/13	20	13.00	13.17	CS	1.2						
BH/17/13	21	14.00	14.15	CS	2.2						
BH/17/13	22	14.15	14.36	CS	2.3						
BH/17/13	23	14.70	14.77	CS	2.9						
BH/17/14	13	5.68	5.90	CS	4.3						
BH/17/14	14	6.13	6.35	CS	0.1						
BH/17/14	15	7.00	7.16	CS	0.7						
BH/17/14	16	8.24	8.42	CS	0.7						
BH/17/14	17	8.42	8.80	CS	0.6						
BH/17/14	18	9.12	9.29	CS	0.3						
BH/17/14	19	9.50	9.57	CS	1.9						
BH/17/14	20	10.00	10.13	CS	4						
BH/17/14	21	11.23	11.33	CS	3.2						
BH/17/14	22	12.50	12.61	CS	4.1						

Notes :
 Test Specification : International Society for Rock Mechanics, The complete ISRM suggested methods for Rock Characterization Testing and Monitoring, 2007
 1 ISRM p87 test 1, water content at 105 ± 3 oC, specimen as received at the laboratory
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		Project Name A1 ALNWICK TO ELLINGHAM	RINDX
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TEST REPORT



1252

Report No. EFS/192867 (Ver. 1)

SOCOTEC UK Doncaster
Askern Road
Carcroft
Doncaster
South Yorkshire
DN6 8DG

Site: A8013-18 A1 Alnwick to Ellingham

The 10 samples described in this report were registered for analysis by SOCOTEC UK Limited on 21-Nov-2018. This report supersedes any versions previously issued by the laboratory.

The analysis was completed by: 30-Nov-2018

Tests where the accreditation is set to N or No, and any individual data items marked with a * are not UKAS accredited. Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

The following tables are contained in this report:

Table 1 Main Analysis Results (Page 2)
Analytical and Deviating Sample Overview (Page 3)
Table of Method Descriptions (Page 4)
Table of Report Notes (Page 5)
Table of Sample Descriptions (Appendix A Page 1 of 1)

On behalf of
SOCOTEC UK Lim
Becky Batham

Operations Manager
Energy & Waste Services

Date of Issue: 30-Nov-2018

Tests marked '^' have been subcontracted to another laboratory.

Where samples have been flagged as deviant on the Analytical and Deviating Sample Overview, for any reason, the data may not be representative of the sample at the point of sampling and the validity of the data may be affected. SOCOTEC UK Limited accepts no responsibility for any sampling not carried out by our personnel.

Units :	mg/kg	mg/l	%	%	%	pH Units												
Method Codes :	ICPACIDS	ICPWSS	LOI(%MM)	TSBRE1	WSLM40	WSLM50												
Method Reporting Limits :	20	10	0.2	0.005	0.1													
UKAS Accredited :	Yes	Yes	No	No	No	No												

LAB ID Number	Client Sample Description	Sample Date	SO4-- (acid sol)	SO4-- (H2O sol) mg/l	BS1377 Loss on Ignition @ 440C	Total Sulphur.	Organic Mat % BS1377	pH (BS1377)										
1933696	TP-17-12 D 5 0.60			20			1.1	8.1										
1933697	TP-17-13 D 4 0.50		127	18		0.037	0.5	7.7										
1933698	TP-17-15 D 8 1.60				3.2													
1933699	TP-17-16 D 6 1.00		258	23		0.118		8.4										
1933700	TP-17-17 D 7 1.20				4.3		3.0											
1933701	TP-17-19 D 4 0.50				2.5													
1933702	TP-17-25 D 6 1.00		299	49		0.047		8.4										
1933703	TP-17-29 D 1 0.20			16				7.7										
1933704	TP-17-32 B 7 0.70		1130	409		0.085		8.3										
1933705	TP-17-36 D 3 0.50		417	17		0.041		7.9										

 <p>Bretby Business Park, Ashby Road Burton-on-Trent, Staffordshire, DE15 0YZ Tel +44 (0) 1283 554400 Fax +44 (0) 1283 554422</p>	Client Name	SOCOTEC UK Doncaster		Sample Analysis				
	Contact	Neil Cooke						
	A8013-18 A1 Alnwick to Ellingham				Date Printed	30-Nov-2018		
					Report Number	EFS/192867		
Table Number					1			

Customer SOCOTEC UK Doncaster
Site A8013-18 A1 Alnwick to Ellingham
Report No S192867

Consignment No S79563
Date Logged 21-Nov-2018
In-House Report Due 27-Nov-2018

Please note the results for any subcontracted analysis (identified with a '^') is likely to take up to an additional five working days.

ID Number	Description	MethodID	ClstServ	ICPACIDS	ICPWSS	LoI(%MM)	TSBRE1	WSLMA0	WSLMS0
		Sampled	REPORT A	SO4-- (acid sol)	SO4-- (H2O sol) mg/l	BS1377 Loss on Ignition @ 440C	Total Sulphur.	Organic Mat % BS1377	pH (BS1377)
				✓	✓				
CL/1933696	TP-17-12 0.60	D	D		D			D	D
CL/1933697	TP-17-13 0.50	D	D	D	D		D	D	D
CL/1933698	TP-17-15 1.60	D	D			D			
CL/1933699	TP-17-16 1.00	D	D	D	D		D		D
CL/1933700	TP-17-17 1.20	D	D			D		D	
CL/1933701	TP-17-19 0.50	D	D			D			
CL/1933702	TP-17-25 1.00	D	D	D	D		D		D
CL/1933703	TP-17-29 0.20	D	D	D	D				D
CL/1933704	TP-17-32 0.70	D	D	D	D		D		D
CL/1933705	TP-17-36 0.50	D	D	D	D		D		D

Note: We will endeavour to prioritise samples to complete analysis within holding time; however any delay could result in samples becoming deviant whilst being processed in the laboratory.

If sampling dates are missing or matrices unclassified then results will not be ISO 17025 accredited. Please contact us as soon as possible to provide missing information in order to reinstate accreditation.

Deviating Sample Key	
A	The sample was received in an inappropriate container for this analysis
B	The sample was received without the correct preservation for this analysis
C	Headspace present in the sample container
D	The sampling date was not supplied so holding time may be compromised - applicable to all analysis
E	Sample processing did not commence within the appropriate holding time
F	Sample processing did not commence within the appropriate handling time
Requested Analysis Key	
■	Analysis Required
■	Analysis dependant upon trigger result - Note: due date may be affected if triggered
□	No analysis scheduled
^	Analysis Subcontracted - Note: due date may vary

Where individual results are flagged see report notes for status.

Method Descriptions

Matrix	MethodID	Analysis Basis	Method Description
Soil	ICPACIDS	Oven Dried @ < 35°C	Determination of Total Sulphate in soil samples by Hydrochloric Acid extraction followed by ICPOES detection
Soil	ICPWSS	Oven Dried @ < 35°C	Determination of Water Soluble Sulphate in soil samples by water extraction followed by ICPOES detection
Soil	LOI(%MM)	Oven Dried @ < 35°C	Determination of loss on ignition for soil samples at specified temperature by gravimetry
Soil	TSBRE1	Oven Dried @ < 35°C	Determination of Total Carbon and/or Total Sulphur in solid samples by high temperature combustion/infrared detection
Soil	WSLM40	Oven Dried @ < 35°C	Acid Dichromate oxidation of the sample followed by Titrimetric analysis of the extract
Soil	WSLM50	Oven Dried @ < 35°C	Determination of pH of 2.5:1 deionised water to soil extracts using pH probe.

Where individual results are flagged see report notes for status.

Report Notes

Generic Notes

Soil/Solid Analysis

Unless stated otherwise,

- Results expressed as mg/kg have been calculated on the basis indicated in the Method Description table.
All results on MCERTS reports are reported on a 105°C dry weight basis with the exception of pH and conductivity.
- Sulphate analysis not conducted in accordance with BS1377
- Water Soluble Sulphate is on a 2:1 water:soil extract

Waters Analysis

Unless stated otherwise results are expressed as mg/l

Nil: Where "Nil" has been entered against Total Alkalinity or Total Acidity this indicates that a measurement was not required due to the inherent pH of the sample.

Oil analysis specific

Unless stated otherwise,

- Results are expressed as mg/kg
- SG is expressed as g/cm³@ 15°C

Gas (Tedlar bag) Analysis

Unless stated otherwise, results are expressed as ug/l

Asbestos Analysis

CH Denotes Chrysotile

TR Denotes Tremolite

CR Denotes Crocidolite

AC Denotes Actinolite

AM Denotes Amosite

AN Denotes Anthophyllite

NAIIS No Asbestos Identified in Sample

NADIS No Asbestos Detected In Sample

Symbol Reference

^ Sub-contracted analysis.

\$\$ Unable to analyse due to the nature of the sample

¶ Samples submitted for this analyte were not preserved on site in accordance with laboratory protocols.

This may have resulted in deterioration of the sample(s) during transit to the laboratory.

Consequently the reported data may not represent the concentration of the target analyte present in the sample at the time of sampling

¥ Results for guidance only due to possible interference

& Blank corrected result

I.S Insufficient sample to complete requested analysis

I.S(g) Insufficient sample to re-analyse, results for guidance only

Intf Unable to analyse due to interferences

N.D Not determined

N.Det Not detected

N.F No Flow

NS Information Not Supplied

Req Analysis requested, see attached sheets for results

P Raised detection limit due to nature of the sample

* All accreditation has been removed by the laboratory for this result

‡ MCERTS accreditation has been removed for this result

§ accreditation has been removed for this result as it is a non-accredited matrix

Note: The Laboratory may only claim that data is accredited when all of the requirements of our Quality System have been met. Where these requirements have not been met the laboratory may elect to include the data in its final report and remove the accreditation from individual data items if it believes that the validity of the data has not been affected. If further details are required of the circumstances which have led to the removal of accreditation then please do not hesitate to contact the laboratory.

TEST REPORT



1252

Report No. EFS/192873 (Ver. 1)

SOCOTEC UK Doncaster
Askern Road
Carcroft
Doncaster
South Yorkshire
DN6 8DG

Site: A8013-18 A1 Alnwick to Ellingham

The 6 samples described in this report were registered for analysis by SOCOTEC UK Limited on 21-Nov-2018. This report supersedes any versions previously issued by the laboratory.

The analysis was completed by: 27-Nov-2018

Tests where the accreditation is set to N or No, and any individual data items marked with a * are not UKAS accredited. Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

The following tables are contained in this report:

Table 1 Main Analysis Results (Page 2)
Analytical and Deviating Sample Overview (Page 3)
Table of Method Descriptions (Page 4)
Table of Report Notes (Page 5)
Table of Sample Descriptions (Appendix A Page 1 of 1)

On behalf of
SOCOTEC UK Lim
Becky Batham

Operations Manager
Energy & Waste Services

Date of Issue: 27-Nov-2018

Tests marked 'A' have been subcontracted to another laboratory.

Where samples have been flagged as deviant on the Analytical and Deviating Sample Overview, for any reason, the data may not be representative of the sample at the point of sampling and the validity of the data may be affected.

SOCOTEC UK Limited accepts no responsibility for any sampling not carried out by our personnel.

Where individual results are flagged see report notes for status.

Customer SOCOTEC UK Doncaster
Site A8013-18 A1 Alnwick to Ellingham
Report No S192873

Consignment No S79563
Date Logged 21-Nov-2018
In-House Report Due 27-Nov-2018

Please note the results for any subcontracted analysis (identified with a '^') is likely to take up to an additional five working days.

ID Number	Description	MethodID	ClusSern	ICPACIDS	ICPWSS	TSBRE1	MSLM50
		Sampled	REPORT A	SO4-- (acid sol)	SO4-- (H2O sol) mg/l	Total Sulphur.	pH (BS1377)
				✓	✓		
CL/1933717	BH-17-03 2.70	D	D		D		D
CL/1933718	BH-17-04 2.00-2.45	D	D		D		D
CL/1933719	BH-17-05 1.80	D	D	D	D	D	D
CL/1933720	TP-17-06 2.00-2.45	D	D		D		D
CL/1933721	BH-17-06 5.60	D	D		D		D
CL/1933722	BH-17-07 5.50	D	D		D		D

Note: We will endeavour to prioritise samples to complete analysis within holding time; however any delay could result in samples becoming deviant whilst being processed in the laboratory.

If sampling dates are missing or matrices unclassified then results will not be ISO 17025 accredited. Please contact us as soon as possible to provide missing information in order to reinstate accreditation.

Deviating Sample Key	
A	The sample was received in an inappropriate container for this analysis
B	The sample was received without the correct preservation for this analysis
C	Headspace present in the sample container
D	The sampling date was not supplied so holding time may be compromised - applicable to all analysis
E	Sample processing did not commence within the appropriate holding time
F	Sample processing did not commence within the appropriate handling time
Requested Analysis Key	
■	Analysis Required
■	Analysis dependant upon trigger result - Note: due date may be affected if triggered
□	No analysis scheduled
^	Analysis Subcontracted - Note: due date may vary

Where individual results are flagged see report notes for status.

Method Descriptions

Matrix	MethodID	Analysis Basis	Method Description
Soil	ICPACIDS	Oven Dried @ < 35°C	Determination of Total Sulphate in soil samples by Hydrochloric Acid extraction followed by ICPOES detection
Soil	ICPWSS	Oven Dried @ < 35°C	Determination of Water Soluble Sulphate in soil samples by water extraction followed by ICPOES detection
Soil	TSBRE1	Oven Dried @ < 35°C	Determination of Total Carbon and/or Total Sulphur in solid samples by high temperature combustion/infrared detection
Soil	WSLM50	Oven Dried @ < 35°C	Determination of pH of 2.5:1 deionised water to soil extracts using pH probe.

Where individual results are flagged see report notes for status.

Report Notes

Generic Notes

Soil/Solid Analysis

Unless stated otherwise,

- Results expressed as mg/kg have been calculated on the basis indicated in the Method Description table.
All results on MCERTS reports are reported on a 105°C dry weight basis with the exception of pH and conductivity.
- Sulphate analysis not conducted in accordance with BS1377
- Water Soluble Sulphate is on a 2:1 water:soil extract

Waters Analysis

Unless stated otherwise results are expressed as mg/l

Nil: Where "Nil" has been entered against Total Alkalinity or Total Acidity this indicates that a measurement was not required due to the inherent pH of the sample.

Oil analysis specific

Unless stated otherwise,

- Results are expressed as mg/kg
- SG is expressed as g/cm³@ 15°C

Gas (Tedlar bag) Analysis

Unless stated otherwise, results are expressed as ug/l

Asbestos Analysis

CH Denotes Chrysotile

TR Denotes Tremolite

CR Denotes Crocidolite

AC Denotes Actinolite

AM Denotes Amosite

AN Denotes Anthophyllite

NAIIS No Asbestos Identified in Sample

NADIS No Asbestos Detected In Sample

Symbol Reference

^ Sub-contracted analysis.

\$\$ Unable to analyse due to the nature of the sample

¶ Samples submitted for this analyte were not preserved on site in accordance with laboratory protocols.

This may have resulted in deterioration of the sample(s) during transit to the laboratory.

Consequently the reported data may not represent the concentration of the target analyte present in the sample at the time of sampling

¥ Results for guidance only due to possible interference

& Blank corrected result

I.S Insufficient sample to complete requested analysis

I.S(g) Insufficient sample to re-analyse, results for guidance only

Intf Unable to analyse due to interferences

N.D Not determined

N.Det Not detected

N.F No Flow

NS Information Not Supplied

Req Analysis requested, see attached sheets for results

P Raised detection limit due to nature of the sample

* All accreditation has been removed by the laboratory for this result

‡ MCERTS accreditation has been removed for this result

§ accreditation has been removed for this result as it is a non-accredited matrix

Note: The Laboratory may only claim that data is accredited when all of the requirements of our Quality System have been met. Where these requirements have not been met the laboratory may elect to include the data in its final report and remove the accreditation from individual data items if it believes that the validity of the data has not been affected. If further details are required of the circumstances which have led to the removal of accreditation then please do not hesitate to contact the laboratory.

TEST REPORT



1252

Report No. EFS/192876 (Ver. 1)

SOCOTEC UK Doncaster
Askern Road
Carcroft
Doncaster
South Yorkshire
DN6 8DG

Site: A8013-18 A1 Alnwick to Ellingham

The 1 sample described in this report were registered for analysis by SOCOTEC UK Limited on 21-Nov-2018. This report supersedes any versions previously issued by the laboratory.

The analysis was completed by: 27-Nov-2018

Tests where the accreditation is set to N or No, and any individual data items marked with a * are not UKAS accredited. Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

The following tables are contained in this report:

Table 1 Main Analysis Results (Page 2)
Analytical and Deviating Sample Overview (Page 3)
Table of Method Descriptions (Page 4)
Table of Report Notes (Page 5)
Table of Sample Descriptions (Appendix A Page 1 of 1)

On behalf of
SOCOTEC UK Lim
Becky Batham

Operations Manager
Energy & Waste Services

Date of Issue: 27-Nov-2018

Tests marked '^' have been subcontracted to another laboratory.

Where samples have been flagged as deviant on the Analytical and Deviating Sample Overview, for any reason, the data may not be representative of the sample at the point of sampling and the validity of the data may be affected.

SOCOTEC UK Limited accepts no responsibility for any sampling not carried out by our personnel.

Where individual results are flagged see report notes for status.

Customer SOCOTEC UK Doncaster
Site A8013-18 A1 Alnwick to Ellingham
Report No S192876

Consignment No S79563
Date Logged 21-Nov-2018
In-House Report Due 27-Nov-2018

Please note the results for any subcontracted analysis (identified with a '^') is likely to take up to an additional five working days.

ID Number	Description	MethodID	ClstSern	ICFACIDS	ICPWSS	TSBRE1	WSL M40	WSL M50
		Sampled	REPORT A	SO4-- (acid sol) %	SO4-- (H2O sol) mg/l	Total Sulphur.	Organic Mat % BS1377	pH (BS1377)
CL/1933744	TP-17-20 1.40	D	D	D	D	D	D	D

Note: We will endeavour to prioritise samples to complete analysis within holding time; however any delay could result in samples becoming deviant whilst being processed in the laboratory.

If sampling dates are missing or matrices unclassified then results will not be ISO 17025 accredited. Please contact us as soon as possible to provide missing information in order to reinstate accreditation.

Deviating Sample Key	
A	The sample was received in an inappropriate container for this analysis
B	The sample was received without the correct preservation for this analysis
C	Headspace present in the sample container
D	The sampling date was not supplied so holding time may be compromised - applicable to all analysis
E	Sample processing did not commence within the appropriate holding time
F	Sample processing did not commence within the appropriate handling time
Requested Analysis Key	
 	Analysis Required
 	Analysis dependant upon trigger result - Note: due date may be affected if triggered
 	No analysis scheduled
^	Analysis Subcontracted - Note: due date may vary

Where individual results are flagged see report notes for status.

Method Descriptions

Matrix	MethodID	Analysis Basis	Method Description
Soil	ICPACIDS	Oven Dried @ < 35°C	Determination of Total Sulphate in soil samples by Hydrochloric Acid extraction followed by ICPOES detection
Soil	ICPWSS	Oven Dried @ < 35°C	Determination of Water Soluble Sulphate in soil samples by water extraction followed by ICPOES detection
Soil	TSBRE1	Oven Dried @ < 35°C	Determination of Total Carbon and/or Total Sulphur in solid samples by high temperature combustion/infrared detection
Soil	WSLM40	Oven Dried @ < 35°C	Acid Dichromate oxidation of the sample followed by Titrimetric analysis of the extract
Soil	WSLM50	Oven Dried @ < 35°C	Determination of pH of 2.5:1 deionised water to soil extracts using pH probe.

Where individual results are flagged see report notes for status.

Report Notes

Generic Notes

Soil/Solid Analysis

Unless stated otherwise,

- Results expressed as mg/kg have been calculated on the basis indicated in the Method Description table.
All results on MCERTS reports are reported on a 105°C dry weight basis with the exception of pH and conductivity.
- Sulphate analysis not conducted in accordance with BS1377
- Water Soluble Sulphate is on a 2:1 water:soil extract

Waters Analysis

Unless stated otherwise results are expressed as mg/l

Nil: Where "Nil" has been entered against Total Alkalinity or Total Acidity this indicates that a measurement was not required due to the inherent pH of the sample.

Oil analysis specific

Unless stated otherwise,

- Results are expressed as mg/kg
- SG is expressed as g/cm³@ 15°C

Gas (Tedlar bag) Analysis

Unless stated otherwise, results are expressed as ug/l

Asbestos Analysis

CH Denotes Chrysotile

TR Denotes Tremolite

CR Denotes Crocidolite

AC Denotes Actinolite

AM Denotes Amosite

AN Denotes Anthophyllite

NAIIS No Asbestos Identified in Sample

NADIS No Asbestos Detected In Sample

Symbol Reference

^ Sub-contracted analysis.

\$\$ Unable to analyse due to the nature of the sample

¶ Samples submitted for this analyte were not preserved on site in accordance with laboratory protocols.

This may have resulted in deterioration of the sample(s) during transit to the laboratory.

Consequently the reported data may not represent the concentration of the target analyte present in the sample at the time of sampling

¥ Results for guidance only due to possible interference

& Blank corrected result

I.S Insufficient sample to complete requested analysis

I.S(g) Insufficient sample to re-analyse, results for guidance only

Intf Unable to analyse due to interferences

N.D Not determined

N.Det Not detected

N.F No Flow

NS Information Not Supplied

Req Analysis requested, see attached sheets for results

P Raised detection limit due to nature of the sample

* All accreditation has been removed by the laboratory for this result

‡ MCERTS accreditation has been removed for this result

§ accreditation has been removed for this result as it is a non-accredited matrix

Note: The Laboratory may only claim that data is accredited when all of the requirements of our Quality System have been met. Where these requirements have not been met the laboratory may elect to include the data in its final report and remove the accreditation from individual data items if it believes that the validity of the data has not been affected. If further details are required of the circumstances which have led to the removal of accreditation then please do not hesitate to contact the laboratory.

TEST REPORT



1252

Report No. EFS/193467 (Ver. 1)

SOCOTEC UK Doncaster
Askern Road
Carcroft
Doncaster
South Yorkshire
DN6 8DG

Site: A8013-18 A1 Morpeth to Felton & Alnwick to Ellingham

The 4 samples described in this report were registered for analysis by SOCOTEC UK Limited on 05-Dec-2018. This report supersedes any versions previously issued by the laboratory.

The analysis was completed by: 13-Dec-2018

Tests where the accreditation is set to N or No, and any individual data items marked with a * are not UKAS accredited. Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

The following tables are contained in this report:

Table 1 Main Analysis Results (Page 2)
Analytical and Deviating Sample Overview (Page 3)
Table of Method Descriptions (Page 4)
Table of Report Notes (Page 5)
Table of Sample Descriptions (Appendix A Page 1 of 1)

On behalf of
SOCOTEC UK Lim
Becky Batham

Operations Manager
Energy & Waste Services

Date of Issue: 13-Dec-2018

Tests marked '^' have been subcontracted to another laboratory.

Where samples have been flagged as deviant on the Analytical and Deviating Sample Overview, for any reason, the data may not be representative of the sample at the point of sampling and the validity of the data may be affected.

SOCOTEC UK Limited accepts no responsibility for any sampling not carried out by our personnel.

Customer SOCOTEC UK Doncaster
Site A8013-18 A1 Morpeth to Felton & Alnwick to Ellingham
Report No S193467

Consignment No S81086
Date Logged 05-Dec-2018
In-House Report Due 12-Dec-2018

Please note the results for any subcontracted analysis (identified with a '^') is likely to take up to an additional five working days.

ID Number	Description	MethodID	CustServ	Dep. OHT	DO Cl if SO4(W)>3000	DO NO3 if pH<5.5	SO4-- (acid sol)	ICPACIDS	ICPBRE	ICPWSS	SO4-- (H2O sol) mg/l	KONECL	Chloride:(2:1)	KamNO3	Nitrate (BRE 2:1): mg/l	LOI(%MM)	BS1377 Loss on Ignition @ 440C	TSBRE1	Total Sulphur.	VSLM40	Organic Mat % BS1377	VSLM50	pH (BS1377)	
																								REPORT A
								✓		✓														
CL/1936178	TP/17/01 0.40	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
CL/1936179	TP/17/09A 0.40	D	D				D	D	D	D	D	D	D	D	D			D					D	D
CL/1936180	TP/17/ 39 0.60	D	D				D	D	D	D	D	D	D	D	D			D					D	D
CL/1936181	TP/17/ 08 0.40	D	D													D					D			

Note: We will endeavour to prioritise samples to complete analysis within holding time; however any delay could result in samples becoming deviant whilst being processed in the laboratory.

If sampling dates are missing or matrices unclassified then results will not be ISO 17025 accredited. Please contact us as soon as possible to provide missing information in order to reinstate accreditation.

Deviating Sample Key	
A	The sample was received in an inappropriate container for this analysis
B	The sample was received without the correct preservation for this analysis
C	Headspace present in the sample container
D	The sampling date was not supplied so holding time may be compromised - applicable to all analysis
E	Sample processing did not commence within the appropriate holding time
F	Sample processing did not commence within the appropriate handling time
Requested Analysis Key	
■	Analysis Required
■	Analysis dependant upon trigger result - Note: due date may be affected if triggered
□	No analysis scheduled
^	Analysis Subcontracted - Note: due date may vary

Where individual results are flagged see report notes for status.

Method Descriptions

Matrix	MethodID	Analysis Basis	Method Description
Soil	ICPACIDS	Oven Dried @ < 35°C	Determination of Total Sulphate in soil samples by Hydrochloric Acid extraction followed by ICPOES detection
Soil	ICPWSS	Oven Dried @ < 35°C	Determination of Water Soluble Sulphate in soil samples by water extraction followed by ICPOES detection
Soil	LOI(%MM)	Oven Dried @ < 35°C	Determination of loss on ignition for soil samples at specified temperature by gravimetry
Soil	TSBRE1	Oven Dried @ < 35°C	Determination of Total Carbon and/or Total Sulphur in solid samples by high temperature combustion/infrared detection
Soil	WSLM40	Oven Dried @ < 35°C	Acid Dichromate oxidation of the sample followed by Titrimetric analysis of the extract
Soil	WSLM50	Oven Dried @ < 35°C	Determination of pH of 2.5:1 deionised water to soil extracts using pH probe.

Where individual results are flagged see report notes for status.

Report Notes

Generic Notes

Soil/Solid Analysis

Unless stated otherwise,

- Results expressed as mg/kg have been calculated on the basis indicated in the Method Description table.
All results on MCERTS reports are reported on a 105°C dry weight basis with the exception of pH and conductivity.
- Sulphate analysis not conducted in accordance with BS1377
- Water Soluble Sulphate is on a 2:1 water:soil extract

Waters Analysis

Unless stated otherwise results are expressed as mg/l

Nil: Where "Nil" has been entered against Total Alkalinity or Total Acidity this indicates that a measurement was not required due to the inherent pH of the sample.

Oil analysis specific

Unless stated otherwise,

- Results are expressed as mg/kg
- SG is expressed as g/cm³@ 15°C

Gas (Tedlar bag) Analysis

Unless stated otherwise, results are expressed as ug/l

Asbestos Analysis

CH Denotes Chrysotile

TR Denotes Tremolite

CR Denotes Crocidolite

AC Denotes Actinolite

AM Denotes Amosite

AN Denotes Anthophyllite

NAIIS No Asbestos Identified in Sample

NADIS No Asbestos Detected In Sample

Symbol Reference

^ Sub-contracted analysis.

\$\$ Unable to analyse due to the nature of the sample

¶ Samples submitted for this analyte were not preserved on site in accordance with laboratory protocols.

This may have resulted in deterioration of the sample(s) during transit to the laboratory.

Consequently the reported data may not represent the concentration of the target analyte present in the sample at the time of sampling

¥ Results for guidance only due to possible interference

& Blank corrected result

I.S Insufficient sample to complete requested analysis

I.S(g) Insufficient sample to re-analyse, results for guidance only

Intf Unable to analyse due to interferences

N.D Not determined

N.Det Not detected

N.F No Flow

NS Information Not Supplied

Req Analysis requested, see attached sheets for results

P Raised detection limit due to nature of the sample

* All accreditation has been removed by the laboratory for this result

‡ MCERTS accreditation has been removed for this result

§ accreditation has been removed for this result as it is a non-accredited matrix

Note: The Laboratory may only claim that data is accredited when all of the requirements of our Quality System have been met. Where these requirements have not been met the laboratory may elect to include the data in its final report and remove the accreditation from individual data items if it believes that the validity of the data has not been affected. If further details are required of the circumstances which have led to the removal of accreditation then please do not hesitate to contact the laboratory.

TEST REPORT



1252

Report No. EFS/193468 (Ver. 1)

SOCOTEC UK Doncaster
Askern Road
Carcroft
Doncaster
South Yorkshire
DN6 8DG

Site: A8013-18 A1 Morpeth to Felton & Alnwick to Ellingham

The 8 samples described in this report were registered for analysis by SOCOTEC UK Limited on 05-Dec-2018. This report supersedes any versions previously issued by the laboratory.

The analysis was completed by: 12-Dec-2018

Tests where the accreditation is set to N or No, and any individual data items marked with a * are not UKAS accredited. Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

The following tables are contained in this report:

Table 1 Main Analysis Results (Page 2)
Analytical and Deviating Sample Overview (Page 3)
Table of Method Descriptions (Page 4)
Table of Report Notes (Page 5)
Table of Sample Descriptions (Appendix A Page 1 of 1)

On behalf of
SOCOTEC UK Lim
Becky Batham

Operations Manager
Energy & Waste Services

Date of Issue: 12-Dec-2018

Tests marked 'A' have been subcontracted to another laboratory.

Where samples have been flagged as deviant on the Analytical and Deviating Sample Overview, for any reason, the data may not be representative of the sample at the point of sampling and the validity of the data may be affected.

SOCOTEC UK Limited accepts no responsibility for any sampling not carried out by our personnel.

Customer SOCOTEC UK Doncaster
Site A8013-18 A1 Morpeth to Felton & Alnwick to Ellingham
Report No S193468

Consignment No S81086
Date Logged 05-Dec-2018
In-House Report Due 12-Dec-2018

Please note the results for any subcontracted analysis (identified with a '^') is likely to take up to an additional five working days.

ID Number	Description	MethodID	DistServ	Dep. Out	DO Mg if SO4(M)>3000	DO NO3 if pH<5.5	SO4-- (acid sol)	ICPACIDS	ICPBRE	ICPWSS	KONECL	KamNO3	LOI(%MM)	TSBRE1	VSL M50
		Sampled	REPORT A	DO Cl if pH<5.5											
							✓			✓					
CL/1936182	BH/17/01 4.30	D	D	D	D	D	D	D	D	D	D	D		D	D
CL/1936183	BH/17/02 3.20	D	D				D	D	D	D	D	D		D	D
CL/1936184	BH/17/08 2.20-2.65	D	D				D	D	D	D	D	D		D	D
CL/1936185	BH/17/14 4.50-4.55	D	D				D	D	D	D	D	D		D	D
CL/1936186	TP/17/10 1.40	D	D				D	D	D	D	D	D		D	D
CL/1936187	TP/17/11 2.00	D	D				D	D	D	D	D	D		D	D
CL/1936188	TP/17/12 0.20	D	D				D	D	D	D	D	D		D	D
CL/1936189	TP/17/43 1.60	D	D										D		

Note: We will endeavour to prioritise samples to complete analysis within holding time; however any delay could result in samples becoming deviant whilst being processed in the laboratory.

If sampling dates are missing or matrices unclassified then results will not be ISO 17025 accredited. Please contact us as soon as possible to provide missing information in order to reinstate accreditation.

Deviating Sample Key	
A	The sample was received in an inappropriate container for this analysis
B	The sample was received without the correct preservation for this analysis
C	Headspace present in the sample container
D	The sampling date was not supplied so holding time may be compromised - applicable to all analysis
E	Sample processing did not commence within the appropriate holding time
F	Sample processing did not commence within the appropriate handling time
Requested Analysis Key	
■	Analysis Required
■	Analysis dependant upon trigger result - Note: due date may be affected if triggered
□	No analysis scheduled
^	Analysis Subcontracted - Note: due date may vary

Where individual results are flagged see report notes for status.

Method Descriptions

Matrix	MethodID	Analysis Basis	Method Description
Soil	ICPACIDS	Oven Dried @ < 35°C	Determination of Total Sulphate in soil samples by Hydrochloric Acid extraction followed by ICPOES detection
Soil	ICPWSS	Oven Dried @ < 35°C	Determination of Water Soluble Sulphate in soil samples by water extraction followed by ICPOES detection
Soil	LOI(%MM)	Oven Dried @ < 35°C	Determination of loss on ignition for soil samples at specified temperature by gravimetry
Soil	TSBRE1	Oven Dried @ < 35°C	Determination of Total Carbon and/or Total Sulphur in solid samples by high temperature combustion/infrared detection
Soil	WSLM50	Oven Dried @ < 35°C	Determination of pH of 2.5:1 deionised water to soil extracts using pH probe.

Where individual results are flagged see report notes for status.

Report Notes

Generic Notes

Soil/Solid Analysis

Unless stated otherwise,

- Results expressed as mg/kg have been calculated on the basis indicated in the Method Description table.
All results on MCERTS reports are reported on a 105°C dry weight basis with the exception of pH and conductivity.
- Sulphate analysis not conducted in accordance with BS1377
- Water Soluble Sulphate is on a 2:1 water:soil extract

Waters Analysis

Unless stated otherwise results are expressed as mg/l

Nil: Where "Nil" has been entered against Total Alkalinity or Total Acidity this indicates that a measurement was not required due to the inherent pH of the sample.

Oil analysis specific

Unless stated otherwise,

- Results are expressed as mg/kg
- SG is expressed as g/cm³@ 15°C

Gas (Tedlar bag) Analysis

Unless stated otherwise, results are expressed as ug/l

Asbestos Analysis

CH Denotes Chrysotile

TR Denotes Tremolite

CR Denotes Crocidolite

AC Denotes Actinolite

AM Denotes Amosite

AN Denotes Anthophyllite

NAIIS No Asbestos Identified in Sample

NADIS No Asbestos Detected In Sample

Symbol Reference

^ Sub-contracted analysis.

\$\$ Unable to analyse due to the nature of the sample

¶ Samples submitted for this analyte were not preserved on site in accordance with laboratory protocols.

This may have resulted in deterioration of the sample(s) during transit to the laboratory.

Consequently the reported data may not represent the concentration of the target analyte present in the sample at the time of sampling

¥ Results for guidance only due to possible interference

& Blank corrected result

I.S Insufficient sample to complete requested analysis

I.S(g) Insufficient sample to re-analyse, results for guidance only

Intf Unable to analyse due to interferences

N.D Not determined

N.Det Not detected

N.F No Flow

NS Information Not Supplied

Req Analysis requested, see attached sheets for results

P Raised detection limit due to nature of the sample

* All accreditation has been removed by the laboratory for this result

‡ MCERTS accreditation has been removed for this result

§ accreditation has been removed for this result as it is a non-accredited matrix

Note: The Laboratory may only claim that data is accredited when all of the requirements of our Quality System have been met. Where these requirements have not been met the laboratory may elect to include the data in its final report and remove the accreditation from individual data items if it believes that the validity of the data has not been affected. If further details are required of the circumstances which have led to the removal of accreditation then please do not hesitate to contact the laboratory.

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