



CC Ground Investigations Ltd

## FACTUAL REPORT

**SITE:** Five Mile Lane Improvements

**CLIENT:** Vale of Glamorgan Council

**ORDER No:** 324432

**DATE:** 23 February 2015

**REPORT No:** C4414



**CONTENTS****REPORT**

<b>1.</b>	<b>INTRODUCTION</b>	<b>1</b>
<b>2.</b>	<b>SITE DESCRIPTION AND GEOLOGY</b>	<b>2</b>
2.1	Site Description	2
2.2	Geology	2
<b>3.</b>	<b>GROUND INVESTIGATION</b>	<b>3</b>
3.1	Fieldwork	3
3.2	In Situ Testing	5
3.3	Logging	6
3.4	Laboratory Testing	7
3.5	Gas & Groundwater Monitoring	8
<b>4.</b>	<b>REFERENCES</b>	<b>9</b>

**APPENDICES****Appendix A – Site Plan****Appendix B – Exploratory Hole Data****Appendix C – Laboratory Test Results****Appendix D – Gas and Groundwater Monitoring****Appendix E – SPT Calibration Data**

## 1. INTRODUCTION

This investigation was carried out by CC Ground Investigations Ltd (CCGI) on the instruction and on behalf of Vale of Glamorgan Council (The Client) under the technical direction of Parsons Brinckerhoff Ltd (The Engineer)

The purpose of the ground investigation was to provide information to assist in the design of road improvements works along the A4266.

The scope of the ground investigation was defined in the Engineer's specification.

This report describes the work carried out by CC Ground Investigations Ltd and presents the findings.

All information, comments and opinions given in this report are based on the ground conditions encountered during the site work, and on the results of laboratory and field tests performed during the investigation. There may however be conditions at or adjacent to the site which have not been taken into account, such as unpredictable soil strata and water conditions between or below exploratory holes. A careful watch should be maintained during any future groundworks and the comments of this report reviewed as necessary.

This report has been prepared for Vale of Glamorgan Council. This report shall not be relied upon or transferred to other parties without the written consent of CC Ground Investigations Ltd. Should any information contained within this report be used by any unauthorised third party it is done so at their own risk and shall not be the responsibility of CC Ground Investigations Ltd.

## **2. SITE DESCRIPTION AND GEOLOGY**

### **2.1 Site Description**

The area of investigation comprises a section of existing road along the A4226, approximately 5km in length. The site extends from Blackland Farm (NGR: 307798, 172867) in the North to the Waycock Cross roundabout (NGR: 309638, 168582) in the South.

### **2.2 Geology**

Geological Records (British Geological Survey (BGS), England and Wales sheet 263, Cardiff, 1:50,000 scale) indicate the site is underlain by solid geology comprising the Porthkerry Member of the Blue Lias Formation. The Levernock Shale Member of the Blue Lias Formation is indicated to the far South of the site. Superficial deposits are not indicated over the site.

### **3. GROUND INVESTIGATION**

#### **3.1 Fieldwork**

Thirty seven exploratory holes were carried out between 17<sup>th</sup> November and 3<sup>rd</sup> December 2014. All exploratory hole locations are shown on the site plan (Appendix A). The exploratory hole locations were set out by CCGI as directed by the Engineer on site.

The fieldwork was carried out in general accordance with BS5930, Amendment 2 (2010).

The boreholes, referenced BH105, BH106 and BH109 (Exploratory Hole Data – Appendix B) were formed using a track mounted Comacchio MC305 multi-purpose rig. Following CAT scanning hand tools were used to excavate an inspection pit to a maximum depth of 0.70m to check for buried services. All hand dug inspection pits were terminated due to shallow bedrock. Bulk, small disturbed and environmental samples were taken and retained from the inspection pits. The boreholes were then advanced using percussive sampling techniques to produce a continuous disturbed sample of 98mm diameter.

On refusal of percussive sampling the boreholes were continued by rotary core drilling techniques utilising a water flush. A double-tube swivel core barrel with a semi-rigid plastic liner was utilised to recover continuous cores of 91mm diameter.

Soil and rock samples were retained in semi-rigid plastic liners, which were capped on site to prevent moisture loss.

The boreholes, referenced BH101 to BH104, BH107 and BH108 (Exploratory Hole Data – Appendix B) were formed using a towable Dando 150 cable percussion drilling rig. Following CAT scanning hand tools were used to excavate an inspection pit to a maximum depth of 1.20m to check for buried services. Bulk, small disturbed and environmental samples were taken and retained from the inspection pits. The boreholes were then advanced using cable percussion techniques to produce small and bulk disturbed samples which were logged on site

On refusal of cable percussive sampling the boreholes were continued by rotary core drilling techniques utilising a water flush. A double-tube swivel core barrel with a semi-rigid plastic liner was utilised to recover continuous cores of 91mm diameter.

Soil and rock samples were retained in semi-rigid plastic liners, which were capped on site to prevent moisture loss.

All boreholes were monitored for groundwater ingress as they were advanced. Upon encountering water, sampling was temporarily stopped to allow the level to stabilise. Water levels were also recorded at the start and finish of each day's work and on completion of the borehole and are presented on the relevant log.

On completion combined gas/water monitoring standpipes were installed in all boreholes. Each installation consisted of a 50mm ID HDPE slotted tube set in a filter response zone of limestone free gravel. The installations were sealed above with a bentonite pellet seal and accessed via a valve assembly. The installations were protected at the surface by a lockable, galvanised steel borehole helmet set in concrete. Installation details are given on the relevant borehole log.

Following CAT scanning, the trial pits, referenced TP201 to TP209 & TP211 to TP219, (Exploratory Hole Data – Appendix B) were excavated by a JCB 3CX mechanical excavator with a 0.60m wide backactor bucket. Bulk and environmental samples were taken and retained from the trial pits.

On completion all trial pits were backfilled with arisings. The ground surface was left slightly mounded to accommodate future settlement.

Subsequent to fieldwork, all exploratory hole positions were surveyed and National Grid co-ordinates and levels are presented on the relevant log.

On completion of fieldwork all samples were brought to CCGI's office for storage.

### **3.2 In Situ Testing**

Standard penetration tests (SPT) were carried out in general accordance with BS EN ISO 22476-3:2005. A split barrel or a solid cone was used depending upon the materials encountered and the split barrel samples retained as small disturbed samples. The SPT N value was taken as the number of blows to penetrate the 300mm test drive following a 150mm seating drive. Where low penetration was recorded the seating drive was terminated at 25 blows and the test drive completed after a further 50 blows. SPT results are summarised as uncorrected N values on the borehole logs. SPT hammer calibration data is presented in Appendix E.

Ten in situ California Bearing Ratio (CBR) tests (Appendix A) were carried out in accordance with BS1377: Part 9. Tests were undertaken at 0.15m and 0.30m depth

in shallow hand excavated trial pits referenced CBR301 to CBR310. Logs of the trial pits and CBR test results are included in Appendix B.

The test force was applied to the CBR plunger via a screw jack, the apparatus being mounted on a Landrover which provided the reaction load. The test force was measured by a calibrated proving ring and the vertical penetration of the plunger by a calibrated dial gauge readable to 0.01mm. The jack applied the load so as to keep the plunger penetration rate at 1mm/min.

The force readings were recorded at intervals of 0.25mm penetration to a maximum total penetration of 7.5mm. On completion of the test, a sample of soil from beneath the central test area was taken for the determination of its moisture content.

California Bearing Ratio test results are presented in appendix B.

### **3.3 Logging**

Soil and rock samples from the exploratory holes were logged by an Engineering Geologist in general accordance with BS5930, Amendment 2 (2010). Bulk, small disturbed and core samples were taken retained at a range of depths. Soil and rock descriptions are presented in the borehole logs together with details of sampling, in situ testing and relevant comments on drilling techniques.



### 3.4 Laboratory Testing

The following laboratory tests were carried out by Professional Soils Laboratory Ltd (UKAS No 4043) in accordance with BS1377:1990, Parts 1 to 8, unless otherwise stated. The results are presented in Appendix C.

Test Type	No. of Tests	Remarks
Natural Moisture Content	16	The results are shown on the summary of soil classification tests.
Liquid and Plastic Limits	19	The results are shown on the plasticity chart and summary of soil classification tests.
Particle Size Distribution (wet sieving method)	23	
Determination of California Bearing Ration (4no soaked tests)	8	
Shear box	15	
Slake Durability	6	
Uniaxial Compressive Strength	7	ISRM Part 2
Point Load Strength	51	ISRM RTH 325-89 SR12
BRE SD1 chemical testing suite for soil	14	Testing carried out by Chemical Testing Laboratories in accordance with BRE Special Digest 1.

A range of chemical tests were carried out on soil and water samples by i2 Analytical (UKAS No. 4041). Testing was carried out in accordance with ISO 17025. The results are tabulated and presented in Appendix C.

Laboratory testing of nine water samples remains to be completed and will be issued as an addendum to this report.

### 3.5 Gas & Groundwater Monitoring

A single return visit has been made by CCGI to monitor and sample groundwater and at all installed boreholes.

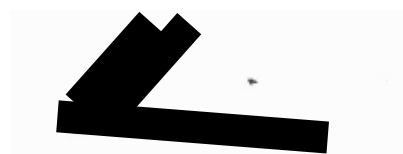
The installations were tested for methane, carbon dioxide, oxygen and hydrogen sulphide using a Gas Analyser GA5000. Installations were monitored for gas flow using a flow pod attached to the instrument and reported as gas flow in litres/hour. Subsequent readings are presented in Appendix D. Readings were taken in accordance with CIRIA 665.

Sampling was also undertaken at five surface water locations:

Grid Reference	Sample Point Ref
ST 07842 71572	SW-A
ST 07749 72350	SW-B
ST 08595 69570	SW-C
ST 08465 69841	SW-D
ST 08880 69418	SW-E

Gas & Groundwater monitoring data is presented in Appendix D.

#### CC GROUND INVESTIGATIONS LIMITED



Christopher Scrivens BSc (Hons) FGS  
**Senior Engineering Geologist**



Rob Clarke. BSc (Hons) MSc (Eng) FGS  
**Director**

#### 4. REFERENCES

British Geological Society, Solid and Drift Sheet 263, Cardiff, 1:50,000 scale

BRE Special Digest 1:2005: Concrete in aggressive ground. Part 1.

BS 5930+A2:1999 (2010), Code of Practice for Site Investigations

BS 1377: Parts 1 to 9 (1990), Methods of Tests of Soils for Civil Engineering Purposes

BS EN ISO 22476: Part 3: (2005), Standard penetration test.

Ciria 665 (20077): Assessing risks posed by hazardous ground gases to buildings.

ISO/IEC 17025: (2005): General requirements for the competence of testing and calibration laboratories.

ISRM (International Society for Rock Mechanics), Part 2, Suggested Methods Uniaxial Compressive Strength of Rock Material.

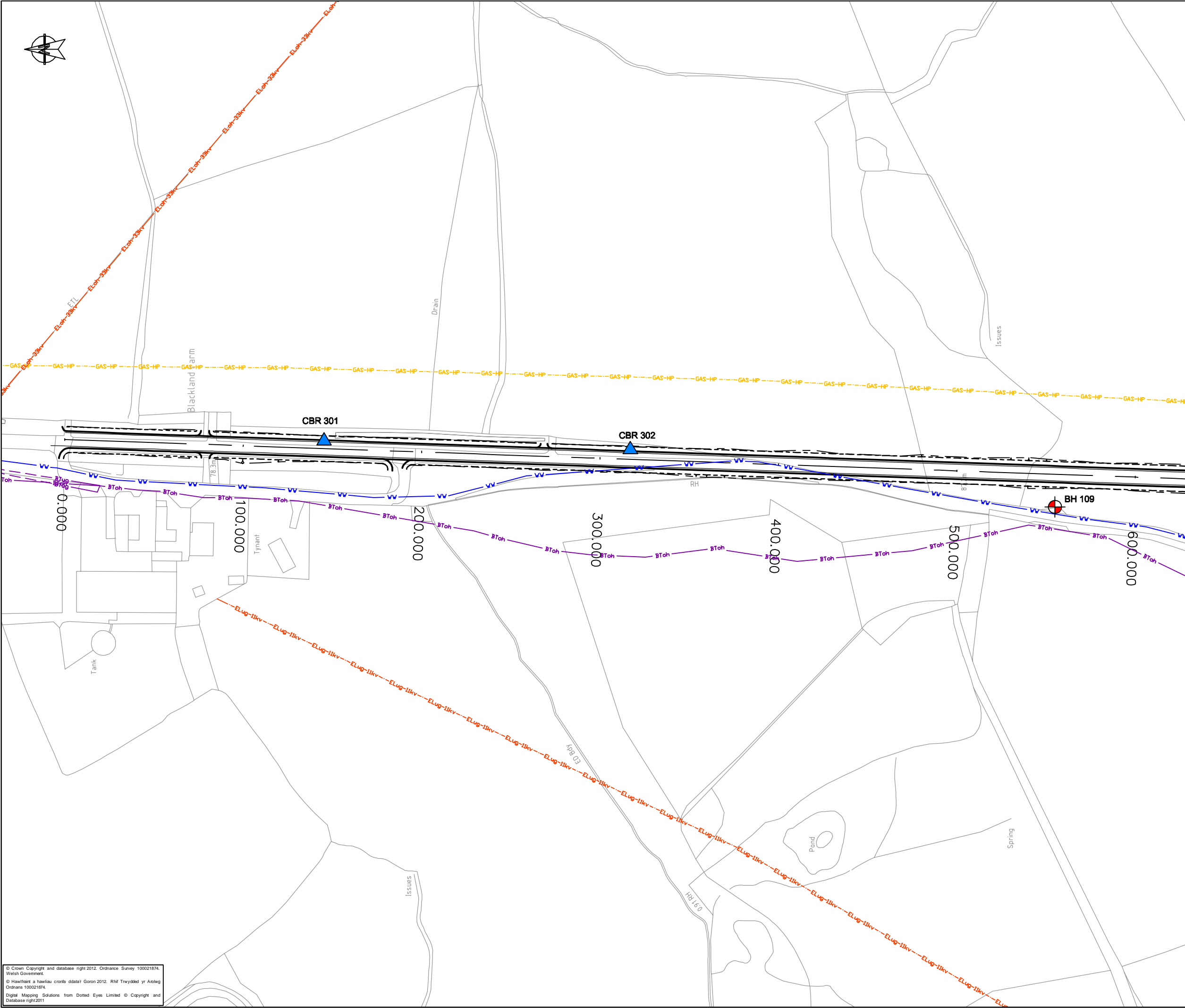
ISRM RTH 325-89 SR12, Suggested Method for Determining Point Load Strength.

**APPENDIX A**

Appendix A – Site Plan



File Name: H:\H\JOBS\3512646D-HHC Links to St Athan and Cardiff Airport\Acad\Drawings\St.Athan\Figure 3 - GI Layout.dwg



- NOTES**
- THIS IS A C.A.D. DRAWING AND SHOULD NOT BE AMENDED BY HAND.
  - ALL DIMENSIONS IN METRES UNLESS OTHERWISE STATED.
- KEY - INVESTIGATION LOCATIONS**
- TRIAL PIT
  - CBR TEST LOCATION
  - BOREHOLE
- LEGEND**
- ELug-LV ELECTRICITY UNDERGROUND (LV)
  - GAS-HP GAS HIGH PRESSURE
  - BToh BT OVERHEAD
  - WW WATER MAINS
  - ELoh-33kv ELECTRICITY OVERHEAD 33 KV

1	24.02.15	BH,TP AND CBR LOCATIONS AMENDED	IM	GJ	GJ
Rev	Date	Description	By	Chk	App

**FOR INFORMATION**

29 Cathedral Road  
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Tel: 44-(0)29-2082-7000  
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Client:  
**VALE OF GLAMORGAN COUNCIL**

Site/Project:  
**FIVE MILE LANE ROAD IMPROVEMENT SCHEME**

Title:  
**SCHEME ALIGNMENT AND SITE INVESTIGATION LOCATIONS CHAINAGE 0m - 600m**

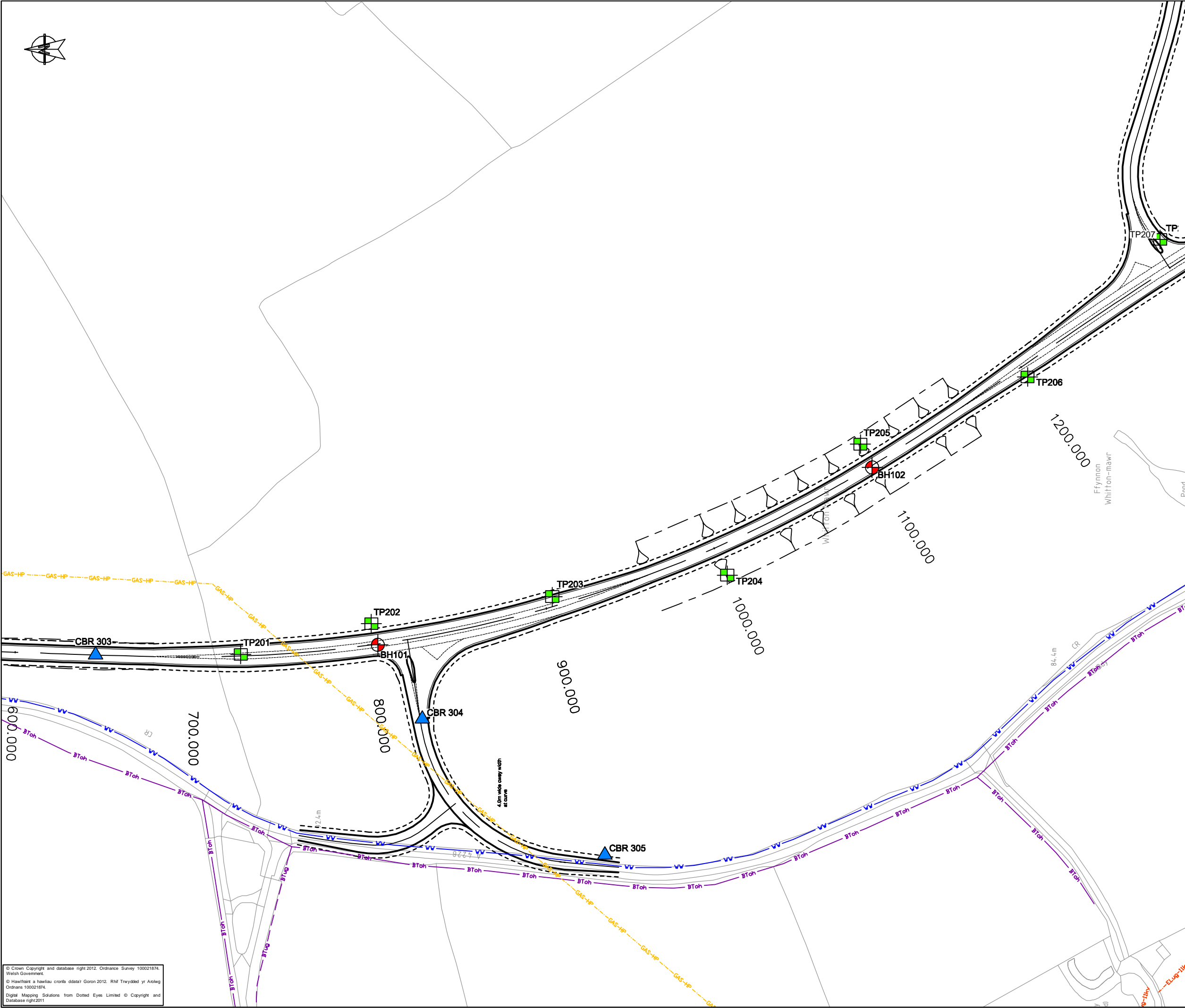
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Designed: GJ	Approved: GJ		
Date: 27/05/2014	Scale: 1:2000	A3	Sheet: 1 OF 1
Project Number: 3512646D-HHC	Drawing Number: FIGURE 3A	Revision: 1	

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**KEY - INVESTIGATION LOCATIONS**

- TRIAL PIT
- CBR TEST LOCATION
- BOREHOLE

**UTILITY LINE KEYS:**

- GAS-HP: GAS HIGH PRESSURE
- BT Oh: BT OVERHEAD
- WW: WATER MAINS

1	24.02.15	BH, TP AND CBR LOCATIONS AMENDED	IM	GJ	GJ
Rev	Date	Description	By	Chk	App

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Client: **VALE OF GLAMORGAN COUNCIL**

Site/Project: **FIVE MILE LANE ROAD IMPROVEMENT SCHEME**

Title: **SCHEME ALIGNMENT AND SITE INVESTIGATION LOCATIONS CHAINAGE 600m - 1300m**

Drawn: BMJ	Checked: GJ		
Designed: GJ	Approved: GJ		
Date: 27/05/2014	Scale: 1:2000	A3	Sheet: 1 OF 1
Project Number: 3512646D-HHC	Figure Number: FIGURE 3B	Revision: 1	

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- KEY - INVESTIGATION LOCATIONS**
- TRIAL PIT
  - CBR TEST LOCATION
  - BOREHOLE
- BT UNDERGROUND**
- WATER MAINS**
- NB**
- TP210 OMITTED

Rev	Date	Description	By	Chk	App
1	24.02.15	BH,TP AND CBR LOCATIONS AMENDED	IM	GJ	GJ

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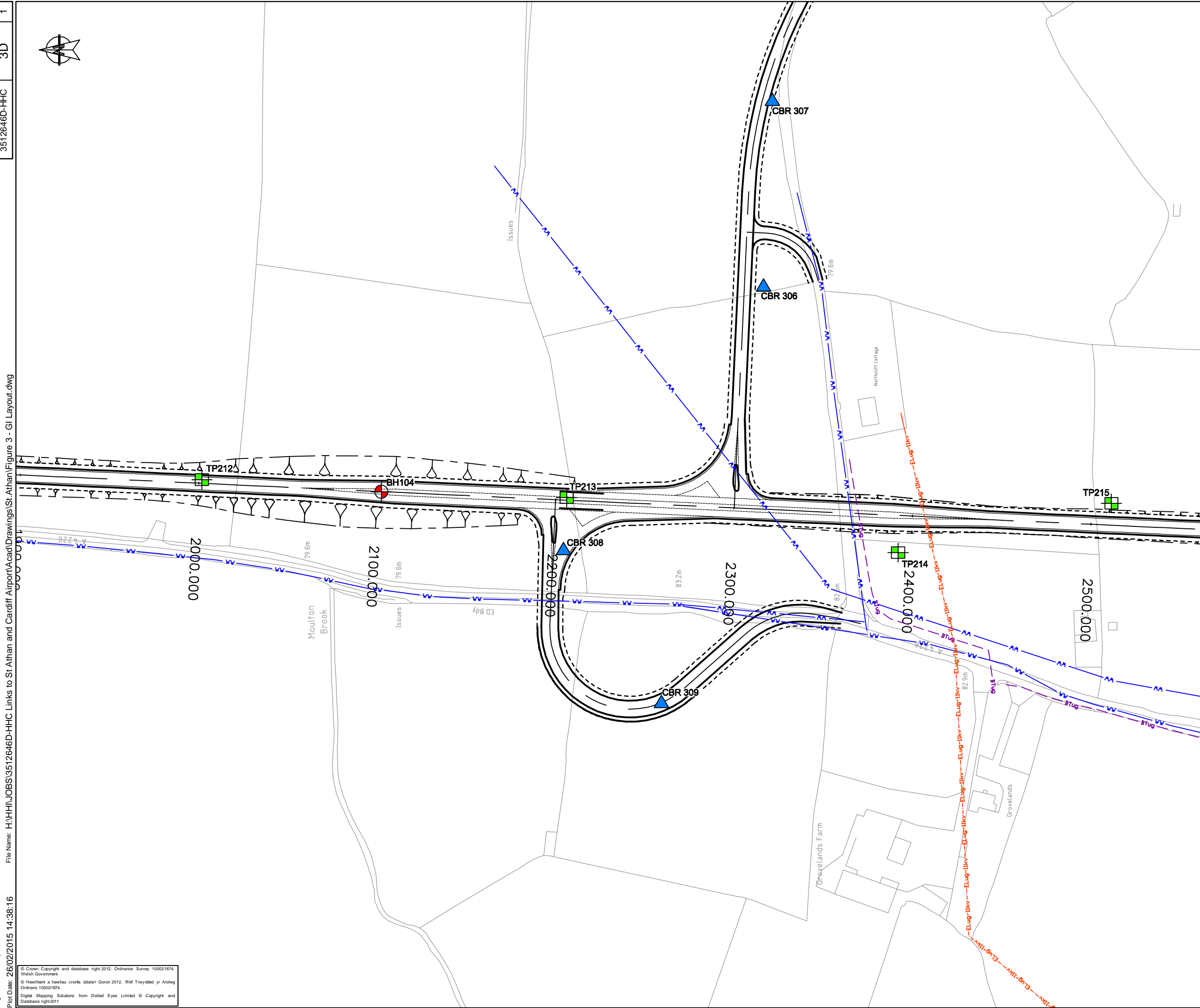
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**FIVE MILE LANE ROAD IMPROVEMENT SCHEME**

Title:  
**SCHEME ALIGNMENT AND SITE INVESTIGATION LOCATIONS CHAINAGE 1300m - 1900m**

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Designed: GJ	Approved: GJ		
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Project Number: 3512646D-HHC	Drawing Number: FIGURE 3C	Revision: 1	

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  - ALL DIMENSIONS IN METRES UNLESS OTHERWISE STATED.
- KEY - INVESTIGATION LOCATIONS**
- TRIAL PIT
  - CBR TEST LOCATION
  - BOREHOLE
- UTILITY LINE LEGEND**
- ELug-LV ELECTRICITY UNDERGROUND (LV)
  - BTug BT UNDERGROUND
  - WW WATER MAINS

1	24.02.15	BH,TP AND CBR LOCATIONS AMENDED	IM	GJ	GJ
Rev	Date	Description	By	Chk	App

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Site/Project:  
**FIVE MILE LANE ROAD IMPROVEMENT SCHEME**

Title:  
**SCHEME ALIGNMENT AND SITE INVESTIGATION LOCATIONS CHAINAGE 1900m - 2500m**

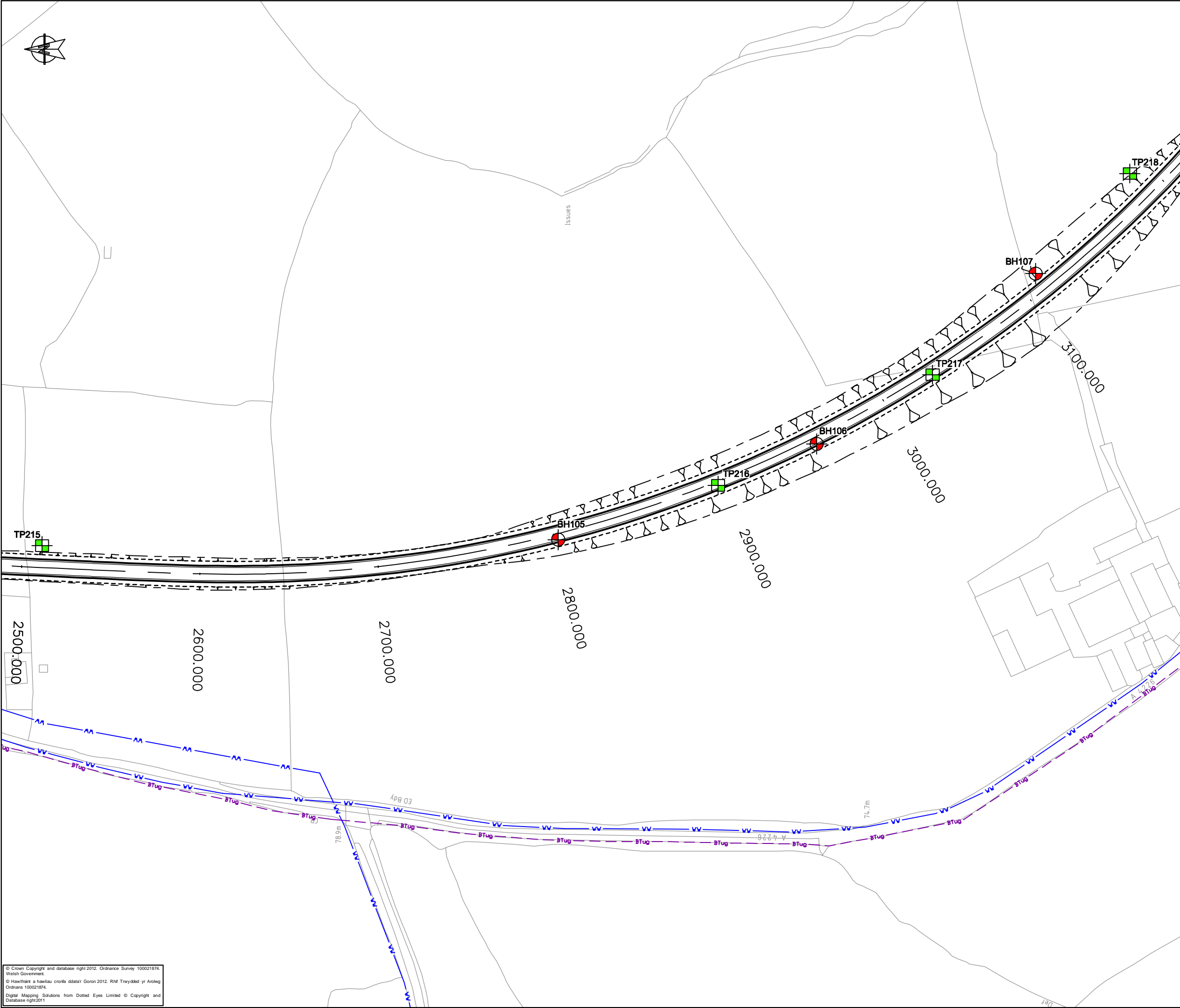
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	Revision: 1

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Plot Date: 26/02/2015 14:37:05



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**KEY - INVESTIGATION LOCATIONS**

- TRIAL PIT
- CBR TEST LOCATION
- BOREHOLE
- BT UNDERGROUND
- WATER MAINS

1	24.02.15	BH, TP AND CBR LOCATIONS AMENDED	IM	GJ	GJ
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Site/Project:  
**FIVE MILE LANE ROAD IMPROVEMENT SCHEME**

Title:  
**SCHEME ALIGNMENT AND SITE INVESTIGATION LOCATIONS  
CHAINAGE 2500m - 3200m**

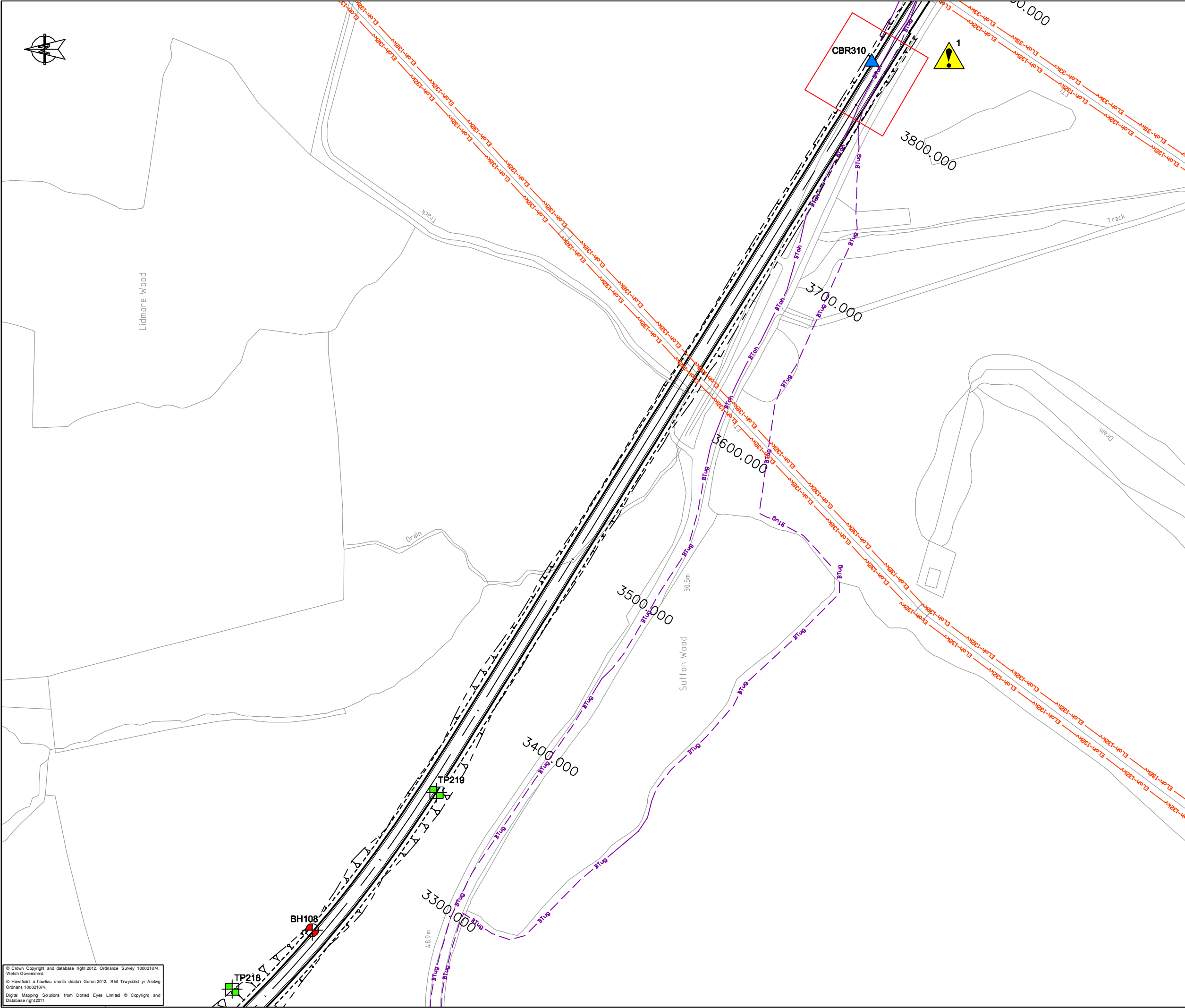
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Designed: GJ	Approved: GJ		
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Project Number:	Drawing Number:	Revision:	
<b>3512646D-HHC</b>	<b>FIGURE 3E</b>	<b>1</b>	

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**KEY - INVESTIGATION LOCATIONS**

- TRIAL PIT
- CBR TEST LOCATION
- BOREHOLE
- BT UNDERGROUND
- ELECTRICITY OVERHEAD 132 KV
- ELECTRICITY OVERHEAD 33 KV

1	24.02.15	BH,TP AND CBR LOCATIONS AMENDED	IM	GJ	GJ
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Site/Project:  
**FIVE MILE LANE ROAD IMPROVEMENT SCHEME**

Title:  
**SCHEME ALIGNMENT AND SITE INVESTIGATION LOCATIONS CHAINAGE 3200m - 3900m**

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Project Number: 3512646D-HHC	Drawing Number: FIGURE 3F	Revision: 1	

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**APPENDIX B**

Appendix B – Exploratory Hole Data

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**KEY TO EXPLORATORY HOLE LOGS**

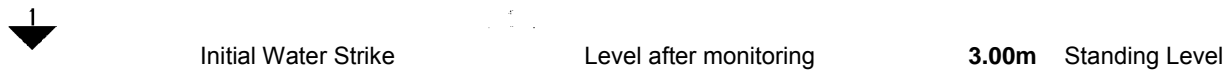
**Logging**

The logging of soils and rocks has been carried out in general accordance with BS 5930:1999 (Amendment No.2, 2010).

**Sample no/type**

- C Core run / sample
- X Dynamic sample
- D Small disturbed sample
- B Large disturbed sample
- U Undisturbed sample
- UT Thin walled undisturbed sample
- W Water sample
- ES Environmental
- SPT Standard Penetration Test carried out
- CPT Solid Cone Penetration Test carried out

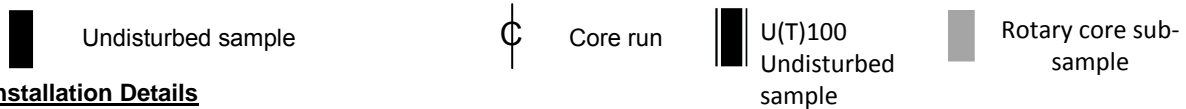
**Water levels**



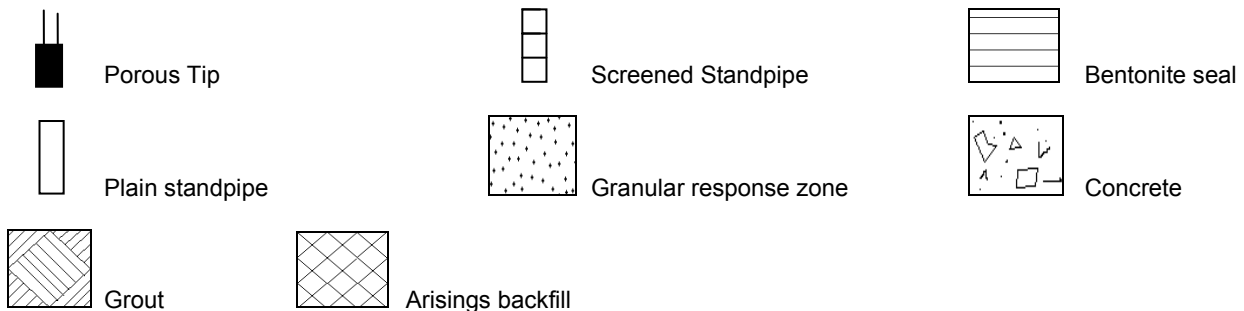
**Insitu Tests**

- S 30 Split spoon sampler (SPT) followed by N Value (EN ISO 22476-3:2005)
- C 30 Solid cone (CPT) followed by N Value (EN ISO 22476-3:2005)
- \*240 Where full test drive not completed, linearly extrapolated N value reported.
- \*\* No effective penetration
- H 30 Hand Vane – direct reading in kPa. Re\* denotes refusal (i.e. >140 kPa)

**Sample range**



**Installation Details**



Soils	Rocks		
	Sedimentary	Metamorphic	Igneous
Made ground Boulders and cobbles Gravel Sand Silt Clay Peat <p>NOTE: Composite soil types will be signified by combined symbols, e.g.,</p> Silty sand	<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Argillaceous</p> <p style="writing-mode: vertical-rl; transform: rotate(180deg);">Arenaceous</p> <p style="writing-mode: vertical-rl; transform: rotate(180deg);">Rudaceous</p> Chalk Limestone Conglomerate Breccia Sandstone Siltstone Mudstone Shale Coal Pyroclastic (volcanic ash) Gypsum, Rocksalt etc.	Coarse-grained Medium-grained Fine-grained	Coarse-grained Medium-grained Fine-grained



# ROTARY BOREHOLE LOG

Telephone: 01452 739165 , Fax: 01452 739220 , Email: mark@ccground.co.uk

Project Name: Five Mile Lane		Project No: <b>C4414</b>	Co-ords: E 307784 N 172062	Hole Type CP+RC
Location: Five Mile Lane, Cardiff			Level: 90.07mAD	Scale 1 : 25.00
Client: Vale of Glamorgan Council			Dates: Start: 18/11/2014 End: 21/11/2014	Logged By RS

(m)	Water Levels	Core Run, Samples & Testing			Core Run & Sample	TCR SCR RQD	Install	Description	Depth (m)	Level (mAD)	Legend
		No/Type	Depth (m)	Result							
1	11	B D ES	0.30 - 0.60 0.30				Soft greyish brown slightly sandy CLAY with frequent rootlets. (TOPSOIL)	(0.20)	89.87		
		D	0.60			Soft orangish brown mottled grey slightly sandy CLAY with occasional rootlets.	(0.40)				
		B	0.80 - 1.20			Firm orangish brown slightly sandy slightly gravelly CLAY with a high cobble content. Gravel is angular to subangular fine to coarse limestone. Cobbles are limestone.	0.60	89.47			
2		B CPT	1.20 - 1.70 1.20 - 1.65	C 12					(1.50)		
		CPT	2.20 - 2.41	C*238			Very dense grey and orangish brown very clayey very gravelly COBBLES. Gravel is very angular to angular medium to coarse limestone. Cobbles are limestone.	2.10 (0.30)	87.97		
		C	2.40 - 2.80			98% 50% 25%	Medium strong grey calcareous MUDSTONE. Discontinuities are subhorizontal very closely and closely spaced planar and undulating rough.	2.40	87.67		
		CS	2.65 - 2.75				2.45-2.50m: Subvertical undulating rough discontinuity with orangish brown staining on discontinuity surfaces.	(0.50)			
3		C CPT	2.80 - 3.20 2.80 - 2.93	C*272		73% 45% 0%	2.50-2.59m: Extremely weak.	2.90	87.17		
		CS	3.00 - 3.10				2.65-2.75m: Subvertical undulating rough discontinuity with orangish brown staining on discontinuity surfaces.	3.00	87.07		
		C	3.20 - 4.00			100% 75% 21%	Stiff dark grey calcareous CLAY.				
4		CS	3.84 - 4.00				3.10-3.20m: Non intact, recovered as angular to subangular medium to coarse gravel.	(0.44)			
							3.35-3.44m: Subvertical undulating rough discontinuity with orangish brown staining on discontinuity surfaces.	3.44	86.63		
							Medium strong locally weak dark grey calcareous MUDSTONE. Discontinuities are subhorizontal closely spaced undulating rough.	3.50 3.56	86.57 86.51	x x x	
							Extremely weak orangish brown calcareous SILTSTONE. Discontinuities are subhorizontal extremely closely spaced undulating rough.	3.68	86.39		

**REMARKS:**

EQUIPMENT: Hand digging tools. Light cable percussion rig. Comacchio MC305 multi-purpose track mounted drilling rig.  
 METHOD: Hand dug inspection pit 0.00-1.20m. Cable percussion (150mm) 1.20-2.40m. Waterflush rotary core drilled (116mm) 2.40-6.00m.  
 CASING: 150mm diameter to 2.10m. 140mm diameter to 2.40m.  
 GROUNDWATER: Seepage at 0.60m. No rise recorded.  
 INSTALLATION: 50mm ID HDPE slotted standpipe: 3.00-6.00m. 50mm ID HDPE plain pipe: 0.00-3.00m Washed gravel response zone: 2.50-6.00m. Bentonite pellet seal: 0.20-2.50m. Concrete and raised cover 0.00-0.20m.

**Groundwater:**

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)
18/11/14	0.60	Nil	0.60

**Hole Progress:**

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
18/11/2014	2.40	2.10	1.00
20/11/2014	2.40	Nil	0.50



# ROTARY BOREHOLE LOG

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Project Name: Five Mile Lane		Project No: <b>C4414</b>	Co-ords: E 307784 N 172062	Hole Type CP+RC
Location: Five Mile Lane, Cardiff			Level: 90.07mAD	Scale 1 : 25.00
Client: Vale of Glamorgan Council			Dates: Start: 18/11/2014 End: 21/11/2014	Logged By RS

(m)	Water Levels	Core Run, Samples & Testing			Core Run & Sample	TCR SCR RQD	Install	Description	Depth (m)	Level (mAD)	Legend
		No/Type	Depth (m)	Result							
5		C	4.00 - 5.00	C*750		100% 78% 63%	Medium strong grey LIMESTONE. Discontinuity set 1; Subhorizontal very closely and closely spaced undulating rough. Discontinuity set 2; 2 no. subvertical extremely closely spaced undulating rough stained orangish brown on discontinuity surfaces. Strong grey LIMESTONE. Discontinuities are subhorizontal closely to medium spaced undulating rough. (continued from previous sheet) 3.68-3.77m: Subvertical undulating rough with a little clay smear on discontinuity surfaces. 3.80-3.84m: Soft orangish brown slightly sandy slightly gravelly clay infill. Gravel is subangular fine limestone. 4.00-4.16m: Soft dark grey calcareous clay (possibly softened due to drilling disturbance). 4.31-4.39m: Medium strong dark grey calcareous mudstone. 4.39-4.41m: Extremely weak dark grey calcareous mudstone. Extremely weak dark grey calcareous MUDSTONE. Discontinuities are randomly orientated extremely closely spaced planar rough. Strong grey LIMESTONE. Discontinuities are subhorizontal closely spaced undulating rough. Weak dark grey calcareous MUDSTONE. Discontinuities are subhorizontal closely spaced undulating rough. Strong grey LIMESTONE. Discontinuities are subhorizontal closely spaced undulating rough.	(0.84)			
	CPT	4.00 - 4.15		4.52				85.55			
	CS	4.18 - 4.33		4.70				85.37			
				4.76				85.31			
				4.90				85.17			
	C	5.00 - 6.00	C**								
	CPT	5.00 - 5.03									
6		CS	5.79 - 6.00		100% 76% 59%	Strong grey LIMESTONE. Discontinuities are subhorizontal closely spaced undulating rough. Discontinuities are subhorizontal closely spaced undulating rough. 5.05-5.10m: Non intact, recovered as angular to subangular medium to coarse gravel. 5.10-5.20m: Subvertical undulating smooth discontinuity (possibly drilling induced). 5.20-5.46m: Weak dark grey calcareous mudstone. Discontinuities are subhorizontal extremely closely spaced to very closely spaced undulating rough. 5.54-5.58m: Medium strong dark grey calcareous mudstone. 5.58-5.60m: Locally stained orangish brown 5.60m: 20° stepped rough discontinuity (possibly drilling induced). 5.70-5.73m: Locally stained orangish brown 5.73-5.83m: Medium strong dark grey calcareous mudstone.	(1.10)				
	CPT	6.00 - 6.14	C**	6.00			84.07				
7							Borehole completed at 6.00m				
8											

**Groundwater:**

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

**Hole Progress:**

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
20/11/2014	6.00	2.40	1.10



# ROTARY BOREHOLE LOG

Telephone: 01452 739165 , Fax: 01452 739220 , Email: mark@ccground.co.uk

Project Name: Five Mile Lane		Project No: <b>C4414</b>	Co-ords: E 307883 N 171785	Hole Type CP+RC
Location: Five Mile Lane, Cardiff			Level: 84.08mAD	Scale 1 : 25.00
Client: Vale of Glamorgan Council			Dates: Start: 17/11/2014 End: 20/11/2014	Logged By PF/RS

(m)	Water Levels	Core Run, Samples & Testing			Core Run & Sample	TCR SCR RQD	Install	Description	Depth (m)	Level (mAD)	Legend
		No/Type	Depth (m)	Result							
1		B	0.30 - 0.50				MADE GROUND: Soft dark brown slightly sandy slightly gravelly CLAY with frequent rootlets <2mm. Gravel is sub-angular fine to medium limestone. Soft orangish brown locally greyish brown slightly sandy slightly gravelly CLAY with frequent rootlets <2mm. Gravel is sub-angular fine limestone.  From 0.60m: High cobble content. Cobbles are sub-angular limestone.	0.10	83.98		
		D	0.30								
		ES	0.50								
		B	0.70 - 1.10								
		D	0.70					(1.30)			
		CPT	1.20	C*214				1.40	82.68		
		C	1.40 - 2.00	C*222		50%	No Recovery.	(0.30)			
		CPT	1.40			20%					
						20%					
		CS	1.75 - 1.89				Very weak grey mottled black calcareous mudstone <b>COBBLE.</b>	1.70	82.38		
								1.75	82.33		
2		C	2.00 - 3.00	C**		100%	Strong grey LIMESTONE with subhorizontal very closely spaced undulating rough discontinuities. 1.89-1.90m: Firm orangish brown slightly sandy slightly gravelly clay infill. Gravel is subangular fine limestone. Extremely weak orangish brown mottled grey calcareous MUDSTONE with subhorizontal very closely spaced undulating rough discontinuities. Strong grey LIMESTONE with subhorizontal very closely spaced undulating rough discontinuities with <10mm soft to firm orangish brown silty clay infill. 2.18-2.22m: Subvertical undulating rough discontinuity. 2.32-2.35m: Non intact, recovered as subangular medium to coarse gravel. 2.35-2.53m: 2 no. very closely spaced undulating rough discontinuities with a little clay smear on discontinuity surfaces. 2.56-2.70m: 2 no. very closely spaced undulating rough discontinuities (one possibly drilling induced). Weak orangish brown and grey calcareous SILTSTONE with subhorizontal medium spaced undulating rough discontinuities. 2.80-3.00m: 2mm wide calcite vein. Strong grey LIMESTONE with subhorizontal very closely spaced undulating rough discontinuities with <10mm soft to firm orangish brown silty clay infill. 3.10-3.20m: Subvertical undulating rough discontinuity. 3.57-3.60m: Soft orangish brown mottled grey slightly gravelly clay infill. Gravel is subangular fine limestone. 3.77-3.80m: Soft orangish brown mottled grey slightly gravelly clay infill. Gravel is subangular fine limestone.	1.92	82.16		
		CPT	2.00 - 2.05			50%			2.00	82.08	
								50%		(0.80)	
			CS	2.80 - 3.00						2.80	81.28
3		C	3.00 - 3.80	C**		94%		3.00	81.08		
		CPT	3.00 - 3.04			56%		(0.20)			
		CS	3.20 - 3.50			56%					
4								(1.32)			
		C	3.80 - 5.00								
		CPT	3.80 - 3.85								

**REMARKS:**

EQUIPMENT: Hand digging tools. Light cable percussion rig. Comacchio MC305 multi-purpose track mounted drilling rig.  
 METHOD: Hand dug inspection pit 0.00-1.20m. Cable percussion (150mm) 1.20-1.40m. Waterflush rotary core drilled (116mm) 1.40-6.00m.  
 CASING: 150mm diameter to 1.40m. 140mm diameter to 3.00m.  
 GROUNDWATER: Groundwater not encountered prior to use of waterflush.  
 INSTALLATION: 50mm ID HDPE slotted standpipe: 3.00-6.00m. 50mm ID HDPE plain pipe: 0.00-3.00m Washed gravel response zone: 2.50-6.00m. Bentonite pellet seal: 0.20-2.50m. Concrete and raised cover 0.00-0.20m.

**Groundwater:**

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)
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**Hole Progress:**

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
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# ROTARY BOREHOLE LOG

Telephone: 01452 739165 , Fax: 01452 739220 , Email: mark@ccground.co.uk

Project Name: Five Mile Lane	Project No: <b>C4414</b>	Co-ords: E 307883 N 171785	Hole Type CP+RC
Location: Five Mile Lane, Cardiff		Level: 84.08mAD	Scale 1 : 25.00
Client: Vale of Glamorgan Council		Dates: Start: 17/11/2014 End: 20/11/2014	Logged By PF/RS

(m)	Water Levels	Core Run, Samples & Testing			Core Run & Sample	TCR SCR RQD	Install	Description	Depth (m)	Level (mAD)	Legend
		No/Type	Depth (m)	Result							
5				C**			3.87-4.09m: Subvertical 2mm wide calcite vein. Strong grey LIMESTONE with subhorizontal very closely and closely spaced undulating rough discontinuities with <10mm soft to firm orangish brown silty clay infill. <i>(continued from previous sheet)</i>	4.32	79.76		
		CS	4.44 - 4.61				4.09-4.14m: Stiff orangish brown mottled grey slightly sandy slightly gravelly CLAY. Gravel is subangular fine calcareous siltstone.	4.44	79.64		
							4.32-4.40m: 70° undulating rough discontinuity. Weak to medium strong grey locally stained orangish brown calcareous SILTSTONE with horizontal closely spaced planar rough discontinuities.	(0.61)			
							4.43-4.44m: Firm orangish brown silty clay infill.				
		C CPT	5.00 - 6.00 5.00 - 5.04	C**		100% 78% 70%		4.81-4.83m: Firm orangish brown silty clay infill.	5.05 5.12		79.03 78.96
6							Medium strong grey LIMESTONE with subhorizontal closely spaced undulating rough discontinuities with <10mm firm orangish brown silty clay infill.				
							4.81-4.83m: Firm orangish brown silty clay infill.				
							Very weak orangish brown mottled grey calcareous MUDSTONE with randomly orientated extremely closely spaced undulating rough fractures.	(0.38)			
							Strong grey LIMESTONE with subhorizontal closely spaced undulating rough discontinuities.	5.50	78.58		
7							5.12-5.22m: Vertical 3mm wide calcite vein.	(0.24)			
							5.38-5.50m: Discontinuities are randomly orientated extremely to very closely spaced undulating rough.	5.74	78.34		
		CS	5.82 - 6.00				Extremely weak dark grey calcareous MUDSTONE with subhorizontal very closely to closely spaced undulating rough discontinuities.	(0.26)			
		CPT	6.00 - 6.04	C*750			Strong grey LIMESTONE with subhorizontal closely spaced undulating rough discontinuities.	6.00	78.08		
8							5.81-5.82m: Firm grey clay infill.				
							Borehole completed at 6.00m				

**Groundwater:**

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

**Hole Progress:**

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
20/11/2014	6.00	3.00	1.40





# ROTARY BOREHOLE LOG

Telephone: 01452 739165 , Fax: 01452 739220 , Email: mark@ccground.co.uk

Project Name: Five Mile Lane		Project No: <b>C4414</b>	Co-ords: E 308026 N 171581	Hole Type CP+RC
Location: Five Mile Lane, Cardiff			Level: 84.88mAD	Scale 1 : 25.00
Client: Vale of Glamorgan Council			Dates: Start: 17/11/2014 End: 19/11/2014	Logged By PF/RS

(m)	Water Levels	Core Run, Samples & Testing			Core Run & Sample	TCR SCR RQD	Install	Description	Depth (m)	Level (mAD)	Legend
		No/Type	Depth (m)	Result							
1							MADE GROUND: Soft dark brown slightly sandy slightly gravelly CLAY with frequent rootlets <2mm. Gravel is sub-angular fine to medium limestone.	0.15	84.73		
		B	0.30 - 0.60				Soft orangish brown locally greyish brown slightly sandy slightly gravelly CLAY with frequent rootlets <2mm. Gravel is sub-angular fine limestone.				
		D	0.30				From 0.45m: High cobble content. Cobbles are sub-angular limestone.				
		B	0.40 - 0.70								
		D	0.40								
		ES	0.50								
		D	0.60								
		B	0.90 - 1.20								
		B	1.20 - 1.70	C 12							
		CPT	1.20 - 1.65						(1.95)		
2							Orangish brown and grey clayey COBBLES. Cobbles are sub-angular limestone.	2.10	82.78		
		CPT	2.20 - 2.41	C*238				(0.30)			
		C	2.40 - 3.00				Strong grey LIMESTONE with subhorizontal very closely spaced undulating rough discontinuities. 2.40-2.62m: Subvertical undulating rough discontinuity.	2.40	82.48		
		CS	2.70 - 2.82				2.67-2.70m: Firm orangish brown silty clay infill.	(0.43)			
3							Weak to medium strong orangish brown mottled grey calcareous MUDSTONE with subhorizontal closely spaced undulating rough discontinuities. 2.86-2.96m: 60° undulating rough discontinuity with a little clay smear on surfaces.	2.83	82.05		
		C	3.00 - 3.30	C**			Strong grey LIMESTONE with subhorizontal very closely spaced undulating rough discontinuities. 3.20-3.23m: Firm orangish brown silty clay infill.	(0.22)			
		CPT	3.00 - 3.07								
		CS	3.15 - 3.26						3.05	81.83	
		C	3.30 - 3.50				3.45-3.50m: Firm orangish brown mottled grey slightly sandy slightly gravelly clay infill. Gravel is subangular fine limestone.	(0.95)			
		CS	3.30 - 3.45				3.50-4.00m: Discontinuities are closely and medium spaced.				
4		C	3.50 - 4.00				3.80-3.82m: Firm orangish brown slightly gravelly clay infill. Gravel is subangular fine limestone.				
		CS	3.58 - 3.80								

**REMARKS:**

EQUIPMENT: Hand digging tools. Light cable percussion rig. Comacchio MC305 multi-purpose track mounted drilling rig.  
 METHOD: Hand dug inspection pit 0.00-1.20m. Cable percussion (150mm) 1.20-2.40m. Waterflush rotary core drilled (116mm) 1.40-6.00m.  
 CASING: 150mm diameter to 1.40m. 140mm diameter to 3.00m.  
 GROUNDWATER: Groundwater not encountered prior to use of waterflush.  
 INSTALLATION: 50mm ID HDPE slotted standpipe: 3.00-6.00m. 50mm ID HDPE plain pipe: 0.00-3.00m Washed gravel response zone: 2.50-6.00m. Bentonite pellet seal: 0.20-2.50m. Concrete and raised cover 0.00-0.20m.

**Groundwater:**

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)
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**Hole Progress:**

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
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# ROTARY BOREHOLE LOG

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Project Name: Five Mile Lane		Project No: <b>C4414</b>	Co-ords: E 308026 N 171581	Hole Type CP+RC
Location: Five Mile Lane, Cardiff		Level: 84.88mAD		Scale 1 : 25.00
Client: Vale of Glamorgan Council		Dates: Start: 17/11/2014 End: 19/11/2014		Logged By PF/RS

(m)	Water Levels	Core Run, Samples & Testing			Core Run & Sample	TCR SCR RQD	Install	Description	Depth (m)	Level (mAD)	Legend
		No/Type	Depth (m)	Result							
5		C CPT	4.00 - 5.00 4.00 - 4.26	C*91			Stiff grey mottled orangish brown slightly sandy slightly gravel CLAY. Gravel is subangular fine calcareous mudstone.	4.00 (0.27)	80.88		
		CS	4.27 - 4.45				Strong grey LIMESTONE with subhorizontal very closely spaced undulating rough discontinuities. Frequent randomly orientated 2-5mm thick calcite veins and occasional 20mm diameter calcite inclusions. 4.44-4.65m: 4 no. 60° subparallel undulating rough discontinuities with <10mm firm orangish brown slightly sandy clay infill. 4.70-4.78m: Firm orangish brown slightly sandy slightly gravelly clay infill. Gravel is subangular fine limestone.	4.27	80.61		
		C CPT	5.00 - 6.00 5.00 - 5.26	C*107			5.00-5.15m: Firm orangish brown mottled grey slightly sandy slightly gravelly clay. Gravel is subangular fine limestone. 5.15-5.60m: Discontinuities are closely and medium spaced. 5.16-5.40m: Subvertical to 80° undulating rough discontinuity. 5.43-5.50m: Weak thinly and thickly laminated orangish brown and grey calcareous mudstone. 5.40-5.60m: Discontinuities are closely spaced. 3-10mm wide calcite vein.	(1.33)			
		CS	5.82 - 6.00				Extremely weak dark grey calcareous MUDSTONE locally tending to very stiff to hard clay, with randomly orientated extremely closely spaced undulating rough discontinuities.	5.60 (0.22)	79.28		
6		CPT	6.00 - 6.08	C**			Strong grey LIMESTONE with subhorizontal to 10° undulating rough discontinuities. Borehole completed at 6.00m	5.82 6.00	79.06 78.88		
7											
8											

**Groundwater:**

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

**Hole Progress:**

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
19/11/2014	6.00	3.30	1.60



# ROTARY BOREHOLE LOG

Telephone: 01452 739165 , Fax: 01452 739220 , Email: mark@ccground.co.uk

Project Name: Five Mile Lane		Project No: <b>C4414</b>	Co-ords: E 308095 N 170839	Hole Type CP+RC
Location: Five Mile Lane, Cardiff			Level: 79.73mAD	Scale 1 : 25.00
Client: Vale of Glamorgan Council			Dates: Start: 20/11/2014 End: 02/12/2014	Logged By RS

(m)	Water Levels	Core Run, Samples & Testing			Core Run & Sample	TCR SCR RQD	Install	Description	Depth (m)	Level (mAD)	Legend
		No/Type	Depth (m)	Result							
1							Soft greyish brown slightly sandy CLAY with frequent rootlets. (TOPSOIL).	(0.20)			
		D ES B	0.30 0.40 - 0.60				Orangish brown and grey slightly clayey slightly sandy GRAVEL. Gravel is very angular to subangular fine to coarse mudstone and limestone.	0.20 (0.60)	79.53		
2		B	0.80 - 1.00				Dark grey LIMESTONE, recovered as very clayey gravel and cobbles. Gravel is very angular to subangular medium to coarse limestone. Cobbles are limestone.	0.80 (0.60)	78.93		
		SPT	1.00 - 1.04	S*349							
3		C CPT	1.40 - 2.50 1.40 - 1.43	C*441		100% 52% 39%	Very stiff orangish brown slightly sandy silty CLAY.	1.40 1.50	78.33 78.23		
		CS	1.98 - 2.20				Strong grey LIMESTONE. Discontinuities are subhorizontal very closely to closely spaced undulating rough. 1.58-1.65m: Very stiff friable orangish brown slightly sandy silty CLAY with occasional subangular fine gravel sized mudstone lithorelicts.	(0.34) 1.84			
4		C CPT	2.50 - 3.00 2.50 - 2.58			64% 44% 26%	Firm dark grey calcareous CLAY with occasional subangular fine gravel sized mudstone lithorelicts.	1.98 (0.22)	77.75		
		CS	3.00 - 4.00				Strong grey LIMESTONE. Discontinuities are subhorizontal medium spaced undulating rough.	2.20	77.53		
3		C CPT	3.00 - 3.08			100% 70% 50%	Extremely weak dark grey calcareous MUDSTONE. Discontinuities are randomly orientated extremely closely spaced undulating rough.	2.31 (0.34)	77.42		
		CS	3.22 - 3.36				Strong grey LIMESTONE. Discontinuities are subhorizontal very closely spaced undulating rough.	2.65 2.80	77.08 76.93		
4							Extremely weak dark grey calcareous MUDSTONE. Discontinuities are randomly orientated extremely closely spaced undulating rough.	3.13-3.22m: Very weak dark grey calcareous mudstone. Discontinuities are subhorizontal closely spaced undulating rough.	(0.80)		
							3.36-3.45m: Weak dark grey calcareous mudstone. Discontinuities are subhorizontal very closely to closely spaced undulating rough and 1 no. 70° undulating rough discontinuity.	3.60	76.13		
4							Very weak to weak dark grey calcareous MUDSTONE. Discontinuities are subhorizontal extremely to very closely spaced undulating rough.	(0.28)			
							3.73-3.76m: Very stiff dark grey calcareous clay. 3.84-3.88m: Very stiff dark grey calcareous clay.	3.88	75.85		

**REMARKS:**

EQUIPMENT: Hand digging tools. Light cable percussion rig. Comacchio MC305 multi-purpose track mounted drilling rig.  
 METHOD: Hand dug inspection pit 0.00-1.20m. Cable percussion (150mm) 1.20-1.40m. Waterflush rotary core drilled (116mm) 1.40-6.00m.  
 CASING: . 140mm diameter to m.  
 GROUNDWATER: Groundwater not encountered prior to use of waterflush.  
 INSTALLATION: 50mm ID HDPE slotted standpipe: 3.00-6.00m. 50mm ID HDPE plain pipe: 0.00-3.00m Washed gravel response zone: 2.50-6.00m. Bentonite pellet seal: 0.20-2.50m. Concrete and raised cover 0.00-0.20m.

**Groundwater:**

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)
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**Hole Progress:**

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
20/11/2014	1.40	Nil	Dry
01/12/2014	1.40	Nil	0.40
01/12/2014	4.00	2.50	1.60
02/12/2014	4.00	2.50	1.10



# ROTARY BOREHOLE LOG

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Project Name: Five Mile Lane		Project No: <b>C4414</b>	Co-ords: E 308095 N 170839	Hole Type CP+RC
Location: Five Mile Lane, Cardiff			Level: 79.73mAD	Scale 1 : 25.00
Client: Vale of Glamorgan Council			Dates: Start: 20/11/2014 End: 02/12/2014	Logged By RS

(m)	Water Levels	Core Run, Samples & Testing			Core Run & Sample	TCR SCR RQD	Install	Description	Depth (m)	Level (mAD)	Legend
		No/Type	Depth (m)	Result							
5		C	4.00 - 5.00		C	75% 44% 0%	<p>Strong grey LIMESTONE. Discontinuities are subhorizontal very closely spaced undulating rough. (continued from previous sheet)</p> <p>4.00-4.25m: No recovery.</p> <p>4.25-4.30m: Non intact, recovered as angular to subangular fine to coarse gravel.</p>	(0.52)	75.33		
		CPT	4.00 - 4.06					<p>Very weak to weak dark grey calcareous MUDSTONE. Discontinuities are subhorizontal very closely to closely spaced undulating rough.</p>			4.40
		CS	4.63 - 4.68					<p>Strong grey LIMESTONE. Discontinuities are subhorizontal very closely spaced undulating rough.</p>			4.85
		C	5.00 - 6.00					<p>4.90-5.00m: Non intact, recovered as angular to subangular fine to coarse gravel.</p>			(1.15)
	CPT	5.00 - 5.05		<p>5.00-5.03m: Soft clay infill.</p> <p>5.00-5.10m: Subvertical undulating rough discontinuity.</p> <p>5.03-5.25m: Subvertical undulating rough orangish brown stained discontinuity.</p>							
		CS	5.15 - 5.25			100% 65% 50%	<p>5.25-5.32m: Non intact, recovered as subangular fine to medium gravel.</p> <p>5.32-5.41m: Subvertical orangish brown stained discontinuity.</p> <p>5.41-5.47m: Very weak grey mudstone.</p> <p>5.52-5.62m: 70°-80° undulating rough orangish brown stained discontinuity.</p> <p>5.62-5.67m: Very weak dark grey calcareous mudstone.</p>	6.00	74.88		
6		CPT	6.00 - 6.07				<p>5.73-6.00m: Weak grey calcareous MUDSTONE. Discontinuities are subhorizontal-30° undulating rough.</p> <p>Borehole completed at 6.00m</p>	6.00	73.73		
7											
8											

**Groundwater:**

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

**Hole Progress:**

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
02/12/2014	6.00	2.50	1.40

# ROTARY BOREHOLE LOG



Telephone: 01452 739165 , Fax: 01452 739220 , Email: mark@ccground.co.uk

Project Name: Five Mile Lane		Project No: <b>C4414</b>	Co-ords: E 308091 N 170141	Hole Type DS+RC
Location: Five Mile Lane, Cardiff			Level: 72.10mAD	Scale 1 : 25.00
Client: Vale of Glamorgan Council			Dates: Start: 26/11/2014 End: 27/11/2014	Logged By RS

(m)	Water Levels	Core Run, Samples & Testing			Core Run & Sample	TCR SCR RQD	Install	Description	Depth (m)	Level (mAD)	Legend
		No/Type	Depth (m)	Result							
1							Very soft greyish brown slightly sandy slightly gravelly CLAY with frequent rootlets. Gravel is subangular fine to medium limestone. (TOPSOIL)	(0.20)	71.90		
		B ES	0.30				Very soft orangish brown and grey slightly sandy gravelly CLAY with a high cobble content. Gravel is angular to subangular fine to coarse limestone. Cobbles are limestone.	(0.40)	71.50		
		B CPT	0.50 - 0.95	C 15		100% 51% 38%	0.40-0.50m: High boulder content. Boulders are limestone.	0.60	71.42		
		C	0.60 - 1.50				0.50-0.60m: Limestone cobble.	0.68	71.32		
		CS	0.68 - 0.78				Extremely weak dark grey calcareous MUDSTONE. Discontinuities are subhorizontal closely spaced planar smooth.	(0.29)	71.03		
							Strong grey LIMESTONE. Discontinuities are subhorizontal closely spaced undulating rough.	1.07	71.03		
							Firm orangish brown mottled grey calcareous silty CLAY. 0.95-1.07m: Slightly gravelly. Gravel is subangular fine to medium mudstone.				
							Strong grey LIMESTONE. Discontinuities are subhorizontal very closely to closely spaced undulating rough and sub-vertical undulating rough. Frequent bands of weak orangish brown and dark grey calcareous mudstone <200mm.	(0.98)			
		C CPT	1.50 - 2.50	C*200		90% 45% 16%	1.50-1.75m: Drilling disturbed, recovered as clayey gravel. Gravel is angular to subangular fine to coarse limestone.				
							Medium strong thinly laminated dark grey calcareous MUDSTONE. Discontinuities are subhorizontal very closely to closely spaced undulating rough.	2.05	70.05		
2		CS	2.25 - 2.41			2.05-2.26m: Subvertical undulating rough discontinuity.	(0.38)				
						Strong grey LIMESTONE. Discontinuities are subhorizontal very closely to closely spaced undulating rough and sub-vertical undulating rough. Frequent bands of weak orangish brown and dark grey calcareous mudstone <200mm.	2.43	69.67			
		C CPT	2.50 - 3.50	C*500		90% 85% 62%	2.58-2.72m: Subvertical undulating rough orangish brown stained discontinuity.	(0.72)			
		CS	2.73 - 2.86				2.86-3.06m: Subvertical undulating rough orangish brown stained discontinuity.				
							Hard dark grey calcareous CLAY.	3.15	68.95		
3								(0.35)			
		C CPT	3.50 - 4.50	C*600		100% 74% 55%	Medium strong locally weak grey LIMESTONE. Discontinuities are subhorizontal very closely to closely spaced undulating rough and sub-vertical undulating rough. 300-900mm spaced bands of weak orangish brown and dark grey calcareous mudstone <200mm.	3.50	68.60		
		CS	3.50 - 3.58				3.88-4.14m: Very stiff to hard dark grey calcareous clay				
4											

**REMARKS:**

EQUIPMENT: Hand digging tools. Comacchio MC305 multi-purpose track mounted drilling rig.  
 METHOD: Hand dug inspection pit 0.00-0.50m. Dynamic sampling using 113mm sample barrel: 0.50-0.60m. Waterflush rotary core drilled (116mm) 0.60-10.00m.  
 CASING: 140mm diameter to 1.50m.  
 GROUNDWATER: Groundwater not encountered prior to use of waterflush.  
 INSTALLATION: 50mm ID HDPE slotted standpipe: 4.00-10.00m. 50mm ID HDPE plain pipe: 0.00-4.00m Washed gravel response zone: 3.50-10.00m. Bentonite pellet seal: 0.20-3.50m. Concrete and raised cover 0.00-0.20m.

**Groundwater:**

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)
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**Hole Progress:**

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
26/11/2014	2.50	1.50	1.40
27/11/2014	2.50	1.50	1.40



# ROTARY BOREHOLE LOG

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Project Name: Five Mile Lane		Project No: <b>C4414</b>	Co-ords: E 308091 N 170141	Hole Type DS+RC
Location: Five Mile Lane, Cardiff			Level: 72.10mAD	Scale 1 : 25.00
Client: Vale of Glamorgan Council			Dates: Start: 26/11/2014 End: 27/11/2014	Logged By RS

(m)	Water Levels	Core Run, Samples & Testing			Core Run & Sample	TCR SCR RQD	Install	Description	Depth (m)	Level (mAD)	Legend
		No/Type	Depth (m)	Result							
5		C CPT	4.50 - 5.50 4.50 - 4.62	C*500	C	92% 62% 55%	with occasional fine gravel sized mudstone lithorelicts. Medium strong locally weak grey LIMESTONE. Discontinuities are subhorizontal very closely to closely spaced undulating rough and sub-vertical undulating rough. 300-900mm spaced bands of weak orangish brown and dark grey calcareous mudstone <200mm. (continued from previous sheet) 4.22-4.26m: 40° undulating rough discontinuity.				
		CS	5.28 - 5.50								5.03-5.10m: Very weak dark grey calcareous mudstone.
6		C CPT	5.50 - 7.00 5.50 - 5.58	C*500	C	90% 80% 50%	5.29-5.50m: Subvertical undulating rough discontinuity.  5.72-5.80m: Subvertical undulating rough discontinuities. 5.89-5.92m: Subhorizontal-30° undulating rough orangish brown stained discontinuity. 5.98-6.14m: Subvertical undulating rough orangish brown stained discontinuity. 6.14-6.25m: Stiff dark grey calcareous clay. 6.25-6.66m: Subhorizontal discontinuities are very closely to closely spaced. Subvertical undulating rough orangish brown stained discontinuity.				
		CS	6.35 - 6.48								
7		C CPT	7.00 - 8.50 7.00 - 7.05	C*429	C	94% 63% 25%	6.93-7.00m: Weak. Discontinuities are randomly orientated extremely to very closely spaced undulating rough. 7.00-7.20m: Non intact, recovered as subangular medium to coarse gravel.  7.45-7.54m: Subvertical undulating rough orangish brown stained discontinuity. 7.60-7.67m: Subvertical very closely spaced undulating rough discontinuities. 7.71-7.90m: Subvertical undulating rough orangish brown stained discontinuity. 7.90-8.02m: Subvertical undulating rough discontinuity.	(6.50)			
		CS	7.30 - 7.37								
8		C CPT	8.50 - 10.00 8.50 - 8.57	C*375	C	100% 79% 58%	8.26-8.40m: Limestone, thinly interbedded with dark grey medium strong calcareous mudstone.  8.50-8.53m: Non intact, recovered as angular to subangular fine to medium gravel. 8.72-8.94m: Subvertical undulating rough orangish brown stained discontinuity.				
		CS	8.76 - 9.04								

**Groundwater:**

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)
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**Hole Progress:**

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
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# ROTARY BOREHOLE LOG

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Project Name: Five Mile Lane	Project No: <b>C4414</b>	Co-ords: E 308091 N 170141	Hole Type DS+RC
Location: Five Mile Lane, Cardiff		Level: 72.10mAD	Scale 1 : 25.00
Client: Vale of Glamorgan Council		Dates: Start: 26/11/2014 End: 27/11/2014	Logged By RS

(m)	Water Levels	Core Run, Samples & Testing			Core Run & Sample	TCR SCR RQD	Install	Description	Depth (m)	Level (mAD)	Legend
		No/Type	Depth (m)	Result							
9		CS	9.61 - 9.79				Medium strong locally weak grey LIMESTONE. Discontinuities are subhorizontal very closely to closely spaced undulating rough and sub-vertical undulating rough. 300-900mm spaced bands of weak orangish brown and dark grey calcareous mudstone <200mm. <i>(continued from previous sheet)</i> 9.14-9.17m: 30° planar rough discontinuity. 9.21-9.25m: Soft gravelly clay infill. Gravel is subangular fine to medium limestone. 9.24-9.26m: 30° undulating rough discontinuity. 9.47-9.60m: Subvertical undulating rough discontinuity.  9.76-10.00m: Subvertical undulating rough discontinuity.				
10		CPT	10.00 - 10.06	C*429			Borehole completed at 10.00m	10.00	62.10		
11											
12											
13											

**Groundwater:**

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)
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**Hole Progress:**

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
17/11/2014	10.00	1.50	5.40
27/11/2014	10.00	1.50	5.40



# ROTARY BOREHOLE LOG

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Project Name: Five Mile Lane		Project No: <b>C4414</b>	Co-ords: E 308145 N 169996	Hole Type DS+RC
Location: Five Mile Lane, Cardiff			Level: 65.40mAD	Scale 1 : 25.00
Client: Vale of Glamorgan Council			Dates: Start: 27/11/2014 End: 01/12/2014	Logged By RS

(m)	Water Levels	Core Run, Samples & Testing			Core Run & Sample	TCR SCR RQD	Install	Description	Depth (m)	Level (mAD)	Legend
		No/Type	Depth (m)	Result							
1							Very soft greyish brown slightly sandy slightly gravelly CLAY with frequent rootlets. Gravel is subangular fine to medium limestone. (TOPSOIL)	(0.20)	65.20		
		B ES	0.30				Soft orangish brown mottled grey slightly sandy gravelly CLAY with a low cobble content. Gravel is angular to subangular fine to coarse limestone. Cobbles are limestone.	(0.30)			
		B C	0.50			71% 2% 0%	No Recovery.	0.50	64.90		
		C	0.50 - 1.50					(0.30)			
							Firm orangish brown mottled light grey silty CLAY.	0.80	64.60		
							0.90-0.95m: Strong grey Limestone.	(0.90)			
							0.96-1.02m: Strong grey Limestone.				
							1.07-1.12m: Strong grey Limestone.				
							1.20-1.25m: Strong grey Limestone.				
							1.35-1.50m: Stiff.				
2		C CPT	1.50 - 2.50	C*208		100% 45% 10%	Strong grey LIMESTONE. Discontinuities are subhorizontal closely spaced undulating rough.	1.70	63.70		
		CS	1.50 - 1.61				1.85-2.15m: Locally with soft orangish brown slightly gravelly clay infill. Gravel is subangular fine to medium limestone.	(0.68)			
							1.90-1.96m: Subvertical undulating rough discontinuity.	2.38	63.02		
							2.15-2.26m: Subvertical undulating rough orangish brown stained discontinuity.				
							2.26-2.33m: Extremely weak to very weak dark grey calcareous mudstone.	2.46	62.94		
		C CPT	2.50 - 3.50	C*333		98% 48% 15%	Extremely weak to very weak dark grey calcareous MUDSTONE. Discontinuities are subhorizontal extremely closely to closely spaced undulating rough.	2.60			
							Weak orangish brown calcareous SILTSTONE. Discontinuities are subhorizontal very closely spaced undulating rough.	(0.47)	62.80		
							2.50-2.60m: Non intact.				
	3							Strong grey LIMESTONE. Discontinuities are subhorizontal closely spaced undulating rough.	3.07	62.33	
								2.74-2.87m: Subvertical undulating rough orangish brown stained discontinuity.	3.22		
							2.87m: Very stiff friable dark grey calcareous clay.				
							2.98-3.07m: Subvertical undulating rough orangish brown stained discontinuity.				
		CS	3.35 - 3.50				Medium strong dark grey calcareous MUDSTONE. Discontinuities are subhorizontal very closely to closely spaced undulating rough.	(0.70)	61.48		
		C CPT	3.50 - 4.50	C*429		100% 70% 31%	3.15m: Soft to firm dark grey calcareous clay with occasional fine gravel sized mudstone lithorelicts.	3.92			
							Strong grey LIMESTONE. Discontinuities are subhorizontal very closely to closely spaced undulating				

**REMARKS:**

EQUIPMENT: Hand digging tools. Comacchio MC305 multi-purpose track mounted drilling rig.  
 METHOD: Hand dug inspection pit 0.00-0.50m. Waterflush rotary core drilled (116mm) 0.50-10.00m.  
 CASING: 140mm diameter to 1.50m.  
 GROUNDWATER: Groundwater not encountered prior to use of waterflush.  
 INSTALLATION: 50mm ID HDPE slotted standpipe: 4.00-10.00m. 50mm ID HDPE plain pipe: 0.00-4.00m Washed gravel response zone: 3.50-10.00m. Bentonite pellet seal: 0.20-3.50m. Concrete and raised cover 0.00-0.20m.

**Groundwater:**

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)
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**Hole Progress:**

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
27/11/2014	0.00		
27/11/2014	0.50	Nil	Dry
28/11/2014	0.50	Nil	Dry





# ROTARY BOREHOLE LOG

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Project Name: Five Mile Lane		Project No: <b>C4414</b>	Co-ords: E 308145 N 169996	Hole Type DS+RC
Location: Five Mile Lane, Cardiff			Level: 65.40mAD	Scale 1 : 25.00
Client: Vale of Glamorgan Council			Dates: Start: 27/11/2014 End: 01/12/2014	Logged By RS

(m)	Water Levels	Core Run, Samples & Testing			Core Run & Sample	TCR SCR RQD	Install	Description	Depth (m)	Level (mAD)	Legend		
		No/Type	Depth (m)	Result									
5		C CPT	4.50 - 6.00 4.50 - 4.56	C*429	C	100% 62% 58%	[Diagrammatic representation of core]	rough. 3.22-3.29m: Subvertical undulating rough orangish brown stained discontinuity. 3.50-3.60m: Stiff thinly laminated dark grey calcareous clay. 3.60-4.30m: Subvertical undulating rough orangish brown stained discontinuity. 3.81m: Medium strong dark grey calcareous mudstone. Strong grey LIMESTONE. Discontinuities are subhorizontal very closely to closely spaced undulating rough. (continued from previous sheet) 4.06-4.12m: Weak dark grey calcareous mudstone. 4.30-4.36m: Firm thinly laminated dark grey calcareous clay. 4.50-4.70m: Non intact. 4.70-5.13m: Subvertical undulating rough orangish brown stained discontinuity.	(2.18)		[Legend symbols]		
		CS	5.16 - 5.34						5.43m: Stiff thinly laminated dark grey calcareous clay.				
6		CS	5.85 - 6.00		C	100% 67% 33%	[Diagrammatic representation of core]	5.65-5.85m: Subvertical undulating rough orangish brown stained discontinuity. 5.81-5.88m: Medium strong dark grey calcareous mudstone. 5.85-6.00m: Subvertical undulating rough discontinuity.	6.10	59.30	[Legend symbols]		
		C CPT	6.00 - 7.50 6.00 - 6.06	C*429						Weak dark grey calcareous MUDSTONE. Discontinuities are subhorizontal very closely to closely spaced undulating and planar smooth. 6.20-6.23m: Soft dark grey slightly gravelly clay infill. Gravel is subangular fine mudstone.		(0.63)	
		CS	6.23 - 6.32							6.53-6.66m: Hard dark grey calcareous clay.			
7					C	100% 53% 28%	[Diagrammatic representation of core]	Strong grey LIMESTONE. Discontinuities are subhorizontal closely spaced undulating rough. 6.87-6.90m: Extremely weak dark grey calcareous mudstone.	6.73	58.67	[Legend symbols]		
		CS	7.25 - 7.39							7.06-7.10m: Extremely weak orangish brown siltstone. Discontinuities are extremely closely spaced undulating rough. 7.10-7.45m: Discontinuities are very closely to closely spaced. 7.14-7.24m: Subvertical undulating rough orangish brown stained discontinuity. 7.45-7.50m: Very weak dark grey calcareous mudstone. 7.55-7.58m: Subvertical undulating rough discontinuity. 7.58-7.70m: Limestone thinly interbedded with medium strong dark grey calcareous mudstone.		(1.65)	
8		C	7.50 - 9.00		C		[Diagrammatic representation of core]	4.70-5.43m: Limestone is locally medium strong. Discontinuities are subhorizontal closely to medium spaced planar and undulating rough. 7.72-7.84m: 70° undulating rough orangish brown stained discontinuity. 7.84-7.97m: Very weak dark grey calcareous mudstone. 8.15-8.18m: Subhorizontal-60° undulating rough discontinuity. 8.18-8.24m: Stained orangish brown.	8.38	57.02	[Legend symbols]		
										Medium strong dark grey calcareous MUDSTONE. Discontinuities are subhorizontal very closely to closely spaced undulating rough. 8.50-8.54m: Strong grey limestone. 8.62-8.65m: Strong grey limestone.		(0.42)	8.80 56.60

**Groundwater:**

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)
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**Hole Progress:**

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
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# ROTARY BOREHOLE LOG

Telephone: 01452 739165 , Fax: 01452 739220 , Email: mark@ccground.co.uk

Project Name: Five Mile Lane		Project No: <b>C4414</b>	Co-ords: E 308145 N 169996	Hole Type DS+RC
Location: Five Mile Lane, Cardiff			Level: 65.40mAD	Scale 1 : 25.00
Client: Vale of Glamorgan Council			Dates: Start: 27/11/2014 End: 01/12/2014	Logged By RS

(m)	Water Levels	Core Run, Samples & Testing			Core Run & Sample	TCR SCR RQD	Install	Description	Depth (m)	Level (mAD)	Legend
		No/Type	Depth (m)	Result							
9		CS	8.90 - 9.00		C	97% 49% 18%		8.68-8.80m: 2 no. subvertical undulating rough discontinuities. Strong grey LIMESTONE. Discontinuities are subhorizontal closely spaced undulating rough. <i>(continued from previous sheet)</i> 8.80-9.00m: Medium strong. 9.00-9.20m: Weak dark grey calcareous mudstone. Discontinuities are extremely closely to closely spaced planar and undulating smooth. 9.05-9.20m: Subvertical-80° undulating smooth discontinuity. 9.22-9.37m: Subvertical closely spaced incipient discontinuity. 9.43-9.60m: Weak to medium strong dark grey calcareous mudstone. Discontinuities are subhorizontal very closely to closely spaced undulating rough. 9.51-9.60m: Subvertical undulating rough discontinuity. 9.60-9.69m: 2 no. subparallel subvertical-70° undulating rough discontinuities. 9.69-9.75m: Weak dark grey calcareous mudstone. 9.75-9.95m: 3 no. subvertical-70° undulating rough discontinuities. 9.95-10.00m: Medium strong dark grey calcareous mudstone. Borehole completed at 10.00m	(1.20)	55.40	
		C	9.00 - 10.00	C*429							
		CPT	9.00 - 9.07								
		CS	9.22 - 9.37								
10		CPT	10.00 - 10.06	C*500					10.00	55.40	
11											
12											
13											

**Groundwater:**

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)
28/11/2014	9.00	Nil	1.20
01/12/2014	9.00	Nil	5.10
01/12/2014	10.00	1.50	2.20

**Hole Progress:**

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
28/11/2014	9.00	Nil	1.20
01/12/2014	9.00	Nil	5.10
01/12/2014	10.00	1.50	2.20



# ROTARY BOREHOLE LOG

Telephone: 01452 739165 , Fax: 01452 739220 , Email: mark@ccground.co.uk

Project Name: Five Mile Lane		Project No: <b>C4414</b>	Co-ords: E 308240 N 169874	Hole Type CP+RC
Location: Five Mile Lane, Cardiff			Level: 57.33mAD	Scale 1 : 25.00
Client: Vale of Glamorgan Council			Dates: Start: 19/11/2014 End: 25/11/2014	Logged By RS

(m)	Water Levels	Core Run, Samples & Testing			Core Run & Sample	TCR SCR RQD	Install	Description	Depth (m)	Level (mAD)	Legend
		No/Type	Depth (m)	Result							
1	11						Soft greyish brown slightly sandy CLAY with frequent rootlets. (TOPSOIL)	(0.20)	57.13		
		B	0.30 - 0.60			Very soft to soft orangish brown mottled grey slightly sandy slightly gravelly silty CLAY with occasional rootlets. Gravel is subangular fine mudstone.	0.20				
		D ES	0.50								
		B D	0.80 - 0.90 0.80			0.80-2.20m: Gravel is angular to subangular fine to coarse limestone. High cobble content. Cobbles are limestone.					
2		B CPT	1.20 - 1.70 1.20 - 1.65	C 34				(2.00)	55.13		
		B CPT	2.20 - 2.70 2.20 - 2.65	C 46		Firm orangish brown and grey slightly sandy gravelly CLAY with a high cobble content. Gravel is angular to subangular fine to coarse limestone. Cobbles are limestone.	2.20				
3		C CPT	2.90 - 3.20 2.90	C*429	0% 0% 0%		Dark grey LIMESTONE, recovered as very clayey gravel and cobbles. Gravel is angular to subangular medium to coarse limestone. Cobbles are limestone. No recovery.	2.80 2.90	54.53 54.43		
		C	3.20 - 3.50		0% 0% 0%			(0.60)			
		C CS	3.50 - 4.00 3.65 - 3.75		100% 20% 20%		Medium strong dark grey calcareous MUDSTONE. Discontinuities are subhorizontal-20° closely spaced undulating rough. 3.50-3.60m: Drilling disturbed, recovered as very soft dark grey gravelly clay. Gravel is angular to subangular fine to coarse calcareous mudstone. 3.65-3.75m: Subvertical undulating rough discontinuity.	3.50 (0.40) 3.90	53.83 53.43		
4											

**REMARKS:**

EQUIPMENT: Hand digging tools. Light cable percussion rig. Comacchio MC305 multi-purpose track mounted drilling rig.  
 METHOD: Hand dug inspection pit 0.00-0.90m. Cable percussion (150mm) 1.20-2.90m. Waterflush rotary core drilled (116mm) 2.90-10.00m.  
 CASING: 150mm diameter to 2.80m. 140mm diameter to 4.50m.  
 GROUNDWATER: Seepage at 0.60m. No rise recorded.  
 INSTALLATION: 50mm ID HDPE slotted standpipe: 4.00-10.00m. 50mm ID HDPE plain pipe: 0.00-4.00m Washed gravel response zone: 3.50-10.00m. Bentonite pellet seal: 0.20-3.50m. Concrete and raised cover 0.00-0.20m.

**Groundwater:**

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)
19/11/14	0.60	Nil	0.60

**Hole Progress:**

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
19/11/2014	2.90	2.80	2.60
21/11/2014	2.90	Nil	2.60
21/11/2014	4.00	2.90	1.20
24/11/2014	4.00	2.90	2.60

# ROTARY BOREHOLE LOG



Telephone: 01452 739165 , Fax: 01452 739220 , Email: mark@ccground.co.uk

Project Name: Five Mile Lane		Project No: <b>C4414</b>	Co-ords: E 308240 N 169874	Hole Type CP+RC
Location: Five Mile Lane, Cardiff			Level: 57.33mAD	Scale 1 : 25.00
Client: Vale of Glamorgan Council			Dates: Start: 19/11/2014 End: 25/11/2014	Logged By RS

(m)	Water Levels	Core Run, Samples & Testing			Core Run & Sample	TCR SCR RQD	Install	Description	Depth (m)	Level (mAD)	Legend
		No/Type	Depth (m)	Result							
5		C	4.00 - 4.80	C*100	C	100%	Firm grey mottled orangish brown silty calcareous CLAY. (continued from previous sheet)	(0.20)	53.23	x x	
		CPT	4.00 - 4.30			20%		4.10			
		CS	4.17 - 4.25			20%		4.17			
								Hard indistinctly thinly laminated dark grey calcareous CLAY.	4.30	53.03	
								Strong grey LIMESTONE. Discontinuities are subhorizontal closely spaced undulating rough.	(0.55)		
								Firm indistinctly thinly laminated dark grey calcareous CLAY with occasional subangular fine gravel sized mudstone lithorelicts.			
			C	4.80 - 6.10	C*273	C	94%	Extremely weak thinly laminated dark grey MUDSTONE. Discontinuities are subhorizontal and randomly orientated extremely closely spaced undulating rough.	4.85	52.48	5
			CPT	4.80 - 4.97			69%		(0.32)		
			CS	5.17 - 5.33				Strong grey LIMESTONE. Discontinuities are subhorizontal very closely and closely spaced undulating rough.	5.17	52.16	
								5.17-5.33m: Subvertical undulating rough discontinuity.	(0.55)		
							5.33-5.48m: 20°-subvertical-subhorizontal curved undulating rough discontinuity, forming boundary with extremely weak orangish brown mudstone.				
							5.48-5.62m: Weak dark grey calcareous mudstone.	5.72	51.61		
							5.62-5.71m: Subvertical undulating rough discontinuity.	(0.31)			
							Extremely weak thinly laminated dark grey calcareous MUDSTONE. Discontinuities are subhorizontal extremely closely spaced undulating rough.				
		CS	6.03 - 6.10	C*600	C	100%	Strong grey LIMESTONE. Discontinuities are subhorizontal closely spaced undulating rough.	6.03	51.30	6	
		C	6.10 - 7.10			68%		6.10			
		CPT	6.10 - 6.21			19%		(0.25)			
							Extremely weak dark grey calcareous MUDSTONE. Discontinuities are subhorizontal very closely spaced undulating rough.	6.35	50.98		
							Strong grey LIMESTONE. Discontinuities are subhorizontal very closely to closely spaced undulating rough.				
							6.40-6.57m: Subvertical undulating rough orangish brown stained discontinuity.				
							6.64-6.69m: Medium strong grey calcareous mudstone.	(1.15)			
							6.75-7.04m: Weak dark grey calcareous mudstone.				
		CS	6.84 - 6.95		C	100%	7.10-7.18m: Extremely weak dark grey calcareous mudstone. Discontinuities are randomly orientated extremely closely spaced undulating rough.			7	
		C	7.10 - 7.50	C*426		63%		7.18-7.26m: Subvertical undulating rough discontinuity.			
		CPT	7.10 - 7.22			63%		7.26-7.38m: Extremely weak dark grey calcareous mudstone. Discontinuities are subhorizontal extremely closely to very closely spaced undulating rough.			
							Weak dark grey calcareous MUDSTONE. Discontinuities are subhorizontal extremely to very closely spaced undulating rough.	7.50	49.83		
							Strong grey LIMESTONE. Discontinuities are subhorizontal very closely to closely spaced undulating rough.	(0.45)			
							8.03-8.14m: Very weak dark grey calcareous mudstone. Discontinuities are randomly orientated extremely closely spaced undulating rough.	7.95	49.38		
							8.14-8.22m: Subvertical undulating rough orangish brown stained discontinuity.	(0.27)			
							Weak dark grey calcareous MUDSTONE. Discontinuities are subhorizontal very closely to closely spaced undulating rough.	8.22	49.11		
							8.41-8.50m: Strong grey limestone.				
		CS	8.41 - 8.50	C*600	C	83%	Strong grey LIMESTONE. Discontinuities are subhorizontal very closely to closely spaced undulating rough.			8	
		C	8.50 - 8.90			55%					
		CPT	8.50 - 8.61			0%					

**Groundwater:**

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

**Hole Progress:**

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)



# ROTARY BOREHOLE LOG

Telephone: 01452 739165 , Fax: 01452 739220 , Email: mark@ccground.co.uk

Project Name: Five Mile Lane		Project No: <b>C4414</b>	Co-ords: E 308240 N 169874	Hole Type CP+RC
Location: Five Mile Lane, Cardiff			Level: 57.33mAD	Scale 1 : 25.00
Client: Vale of Glamorgan Council			Dates: Start: 19/11/2014 End: 25/11/2014	Logged By RS

(m)	Water Levels	Core Run, Samples & Testing			Core Run & Sample	TCR SCR RQD	Install	Description	Depth (m)	Level (mAD)	Legend
		No/Type	Depth (m)	Result							
9		C	8.90 - 10.00				8.72-8.73m: Soft orangish brown clay infill. 8.80-8.90m: Medium strong. Weak dark grey calcareous MUDSTONE. Discontinuities are subhorizontal very closely to closely spaced undulating rough. <i>(continued from previous sheet)</i> 8.90-9.07m: Non intact, recovered as angular to subangular fine to coarse gravel. 9.23-9.25m: Soft orangish brown clay infill.	(1.78)			
		CS	9.25 - 9.39				9.50-9.60m: Medium strong.				
10		CS CPT	9.92 - 10.00 10.00 - 10.18	C*500			9.66-9.77m: Subvertical undulating rough orangish brown stained discontinuity. 9.80-9.90m: Subvertical undulating rough orangish brown stained discontinuity. 9.90-9.92m: Soft orangish brown clay infill. Borehole completed at 10.00m	10.00	47.33		
11											
12											
13											

**Groundwater:**

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)
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**Hole Progress:**

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
24/11/2014	8.90	4.50	7.00
25/11/2014	8.90	4.50	7.90
25/11/2014	10.00	4.50	8.10



# ROTARY BOREHOLE LOG

Telephone: 01452 739165 , Fax: 01452 739220 , Email: mark@ccground.co.uk

Project Name: Five Mile Lane		Project No: <b>C4414</b>	Co-ords: E 308330 N 169776	Hole Type CP+RC
Location: Five Mile Lane, Cardiff			Level: 44.21mAD	Scale 1 : 25.00
Client: Vale of Glamorgan Council			Dates: Start: 18/11/2014 End: 26/11/2014	Logged By RS

(m)	Water Levels	Core Run, Samples & Testing			Core Run & Sample	TCR SCR RQD	Install	Description	Depth (m)	Level (mAD)	Legend
		No/Type	Depth (m)	Result							
1							Soft greyish brown slightly sandy CLAY with frequent rootlets. (TOPSOIL)	(0.20)	44.01		
		B	0.30 - 0.70				Soft orangish brown mottled grey silty CLAY with occasional rootlets.	0.20			
		D	0.40					(0.40)			
		ES	0.50					0.60	43.61		
2		B	0.80 - 1.20				Firm orangish brown and grey slightly sandy slightly gravelly CLAY with a low cobble content. Gravel is angular to subangular fine to coarse limestone. Cobbles are limestone.		43.61		
		D	0.80								
		B SPT	1.20 - 1.70 1.20 - 1.65	S 18				(2.20)			
3		B SPT	2.20 - 2.70 2.20 - 2.65	C 30			2.20-2.80m: High cobble content. Cobbles are limestone.		41.41		
		B SPT	2.80 - 3.20 2.80 - 3.25	S*53			Extremely weak to very weak grey calcareous MUDSTONE, recovered as slightly sandy clayey angular to subangular fine to coarse gravel.	2.80			
4		B	3.20 - 3.70					(0.90)	40.51		
		SPT	3.70	S*273			Strong grey LIMESTONE. Discontinuities are subhorizontal closely spaced undulating rough.	3.70			
		C	3.80 - 5.00				(continued on next sheet)	3.88			40.33

**REMARKS:**

EQUIPMENT: Hand digging tools. Light cable percussion rig. Comacchio MC305 multi-purpose track mounted drilling rig.  
 METHOD: Hand dug inspection pit 0.00-1.20m. Cable percussion (150mm) 1.20-3.70m. Waterflush rotary core drilled (116mm) 3.70-10.00m.  
 CASING: 150mm diameter to 3.00m. 140mm diameter to m.  
 GROUNDWATER: Encountered at 3.00m. Rising to 2.45m following twenty minute monitoring period.  
 INSTALLATION: 50mm ID HDPE slotted standpipe: 4.00-10.00m. 50mm ID HDPE plain pipe: 0.00-4.00m Washed gravel response zone: 3.50-10.00m. Bentonite pellet seal: 0.20-3.50m. Concrete and raised cover 0.00-0.20m.

**Groundwater:**

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)
18/11/14	3.00	2.80	2.45

**Hole Progress:**

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
18/11/2014	3.20	3.00	2.60
19/11/2014	3.20	3.00	2.40
19/11/2014	3.70	3.00	2.40
25/11/2014	3.80	Nil	0.70



# ROTARY BOREHOLE LOG

Telephone: 01452 739165 , Fax: 01452 739220 , Email: mark@ccground.co.uk

Project Name: Five Mile Lane		Project No: <b>C4414</b>	Co-ords: E 308330 N 169776	Hole Type CP+RC
Location: Five Mile Lane, Cardiff			Level: 44.21mAD	Scale 1 : 25.00
Client: Vale of Glamorgan Council			Dates: Start: 18/11/2014 End: 26/11/2014	Logged By RS

(m)	Water Levels	Core Run, Samples & Testing			Core Run & Sample	TCR SCR RQD	Install	Description	Depth (m)	Level (mAD)	Legend	
		No/Type	Depth (m)	Result								
5							Extremely weak to very weak orangish brown SILTSTONE. Discontinuities are subhorizontal and randomly orientated extremely closely spaced undulating rough with a little clay smear on discontinuity surfaces. (continued from previous sheet) 4.08-4.66m: Grey. 4.38-4.52m: Subvertical undulating smooth discontinuity. 4.44-4.49m: Strong grey limestone.	(0.78)				
		CS	4.66 - 4.75				Strong grey LIMESTONE. Discontinuities are subhorizontal extremely closely spaced undulating smooth. 4.66-4.88m: Subvertical undulating rough discontinuity. 4.76-4.79m: Discontinuity infilled with soft clayey gravel. Gravel is subangular fine to medium limestone.	4.66 (0.22) 4.88	39.55 39.33			
		C CPT	5.00 - 6.20 5.00 - 5.14	C*273		92% 22% 0%		Extremely weak grey calcareous MUDSTONE. Discontinuities are randomly orientated extremely closely spaced undulating rough. 5.00-5.25m: Drilling disturbed, recovered as soft slightly gravelly clay. Gravel is angular to subangular fine to medium mudstone.	(0.37) 5.25	38.96		
		CS	5.44 - 5.49					Very weak to weak dark grey calcareous MUDSTONE. Discontinuities are subhorizontal extremely closely to closely spaced undulating rough. Locally planar smooth. With orangish brown staining on discontinuity surfaces.	(0.95)			
6							5.32-5.38m: Strong dark grey mudstone. 5.64-5.68m: 30° undulating rough discontinuity. 5.80-5.88m: Extremely weak, locally tending to clayey gravel. 6.00-6.04m: Extremely weak, locally tending to clayey gravel. 6.05-6.20m: 45° undulating rough discontinuity. 6.11-6.20m: Extremely weak, locally tending to clayey gravel.	6.20	38.01			
		C CPT	6.20 - 7.50 6.20 - 6.41	C*150		77% 32% 18%		Very weak to weak dark grey calcareous MUDSTONE. Discontinuities are subhorizontal very closely to closely spaced undulating rough. 6.20-6.65m: Drilling disturbed, recovered as subangular medium to coarse gravel. 6.75-6.83m: Strong grey limestone. 6.83-7.10m: Discontinuities are subhorizontal extremely to very closely spaced undulating rough. 6.95-7.05m: Soft gravelly clay infill. Gravel is subangular fine mudstone. 7.02-7.09m: 2 no. intersecting 45° and 55° undulating rough discontinuities. 7.13-7.30m: Subvertical-80° undulating rough discontinuity. 7.25-7.50m: Medium strong. 7.38-7.39m: Discontinuity infilled with soft gravelly clay. Gravel is subangular fine mudstone. 7.50-7.56m: Strong. 7.77-7.99m: Non intact, recovered as clayey subangular fine to coarse gravel.				
		CS	7.39 - 7.50					8.06-8.13m: 2 no. parallel 60° very closely spaced undulating smooth discontinuities. 8.13-8.23m: Non intact, recovered as clayey subangular fine to coarse gravel. 8.30-8.38m: Non intact, recovered as clayey subangular fine to coarse gravel. 8.38-8.50m: Medium strong. 8.50-8.60m: Drilling disturbed, recovered as subangular medium to coarse gravel.	(3.80)			
7												
		C CPT	7.50 - 8.50 7.50 - 7.70	C*158		100% 42% 15%						
		CS	8.35 - 8.50									
8												
		C CPT	8.50 - 9.40 8.50 - 8.65	C*300		83% 37% 11%						
		CS	8.69 - 8.77									

**Groundwater:**

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)
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**Hole Progress:**

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
25/11/2014	7.50	3.80	2.40
26/11/2014	7.50	3.80	2.60



# ROTARY BOREHOLE LOG

Telephone: 01452 739165 , Fax: 01452 739220 , Email: mark@ccground.co.uk

Project Name: Five Mile Lane	Project No: <b>C4414</b>	Co-ords: E 308330 N 169776	Hole Type CP+RC
Location: Five Mile Lane, Cardiff	Level: 44.21mAD	Scale 1 : 25.00	
Client: Vale of Glamorgan Council	Dates: Start: 18/11/2014 End: 26/11/2014	Logged By RS	

(m)	Water Levels	Core Run, Samples & Testing			Core Run & Sample	TCR SCR RQD	Install	Description	Depth (m)	Level (mAD)	Legend
		No/Type	Depth (m)	Result							
9		C	9.40 - 10.00				8.83-8.87m: Strong grey limestone. Very weak to weak dark grey calcareous MUDSTONE. Discontinuities are subhorizontal very closely to closely spaced undulating rough. (continued from previous sheet) 8.98-9.02m: Discontinuity infilled with soft gravelly clay. Gravel is subangular fine mudstone.				
					100% 50% 0%						
10		CS CPT	9.88 - 9.97 10.00 - 10.13	C*333			9.70-9.73m: Discontinuity infilled with soft gravelly clay. Gravel is subangular fine mudstone. 9.78-9.88m: Subvertical undulating rough discontinuity.	10.00	34.21		
							Borehole completed at 10.00m				
11											
12											
13											

**Groundwater:**

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

**Hole Progress:**

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
26/11/2014	10.00	4.50	2.60





# ROTARY BOREHOLE LOG

Telephone: 01452 739165 , Fax: 01452 739220 , Email: mark@ccground.co.uk

Project Name: Five Mile Lane	Project No: <b>C4414</b>	Co-ords: E N	Hole Type DS+RC
Location: Five Mile Lane, Cardiff	Level: mAD		Scale 1 : 25.00
Client: Vale of Glamorgan Council	Dates: Start: 03/12/2014 End: 03/12/2014		Logged By RS

(m)	Water Levels	Core Run, Samples & Testing			Core Run & Sample	TCR SCR RQD	Install	Description	Depth (m)	Level (mAD)	Legend
		No/Type	Depth (m)	Result							
1							Very soft greyish brown slightly sandy slightly gravelly CLAY with frequent rootlets. Gravel is subangular fine to medium limestone. (TOPSOIL)	(0.20)			
							Soft orangish brown mottled grey slightly sandy slightly gravelly silty CLAY. Gravel is subangular fine to medium limestone. High cobble content and low boulder content of limestone.	(0.50)			
							Firm orangish brown mottled grey slightly sandy slightly gravelly silty CLAY. Gravel is subangular fine to medium limestone. Low cobble content of limestone.	(0.70) (0.30)			
						100% 0% 0%		Stiff orangish brown mottled grey slightly sandy slightly gravelly silty CLAY. Gravel is subangular fine to medium limestone.	1.00		
2							1.80-2.10m: Very stiff to hard.				
						100% 29% 9%	Strong grey LIMESTONE. Discontinuities are subhorizontal closely spaced undulating rough. Very stiff to hard dark grey calcareous CLAY.	2.10 2.19			
							Extremely weak dark grey calcareous MUDSTONE. Discontinuities are subhorizontal and randomly orientated extremely closely spaced undulating rough. 2.66-2.69m: Hard dark grey calcareous clay.	2.43			
3							2.66-2.69m: Hard dark grey calcareous clay.	(0.92)			
							3.20-3.35m: Very stiff dark grey calcareous clay. Strong grey LIMESTONE. Discontinuities are subhorizontal very closely spaced undulating rough.	3.35			
4						84% 31% 15%		(0.66)			

**REMARKS:**

EQUIPMENT: Hand digging tools. Comacchio MC305 multi-purpose track mounted drilling rig.  
 METHOD: Hand dug inspection pit 0.00-0.70m. Dynamic sampling using 113mm sample barrel: 0.70-1.10m. Waterflush rotary core drilled (116mm) 1.10-5.00m.  
 CASING: 140mm diameter to 2.00m.  
 GROUNDWATER: Groundwater not encountered prior to use of waterflush.  
 INSTALLATION: 50mm ID HDPE slotted standpipe: 3.00-5.00m. 50mm ID HDPE plain pipe: 0.00-3.00m Washed gravel response zone: 2.50-5.00m. Bentonite pellet seal: 0.20-2.50m. Concrete and raised cover 0.00-0.20m.

**Groundwater:**

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)
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**Hole Progress:**

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
03/12/2014	0.00		



# ROTARY BOREHOLE LOG

Telephone: 01452 739165 , Fax: 01452 739220 , Email: mark@ccground.co.uk

Project Name: Five Mile Lane		Project No: <b>C4414</b>	Co-ords: E N	Hole Type DS+RC
Location: Five Mile Lane, Cardiff			Level: mAD	Scale 1 : 25.00
Client: Vale of Glamorgan Council			Dates: Start: 03/12/2014 End: 03/12/2014	Logged By RS

(m)	Water Levels	Core Run, Samples & Testing			Core Run & Sample	TCR SCR RQD	Install	Description	Depth (m)	Level (mAD)	Legend
		No/Type	Depth (m)	Result							
5							Hard thinly laminated dark grey calcareous CLAY.	4.01 (0.29)			
							4.30-4.39m: 45°-subvertical undulating rough discontinuity.	4.30			
							Strong grey LIMESTONE. Discontinuities are subhorizontal closely spaced undulating rough.	(0.53)			
							4.39-4.54m: Extremely weak dark grey calcareous mudstone. Discontinuities are subhorizontal extremely closely spaced undulating rough and smooth.	4.83			
							4.54-4.83m: Limestone thinly interbedded with very weak dark grey calcareous mudstone.	5.00			
							Very weak dark grey calcareous MUDSTONE. Discontinuities are extremely to very closely spaced subhorizontal planar rough.				
							Borehole completed at 5.00m				

**Groundwater:**

Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)

**Hole Progress:**

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
03/12/2014	5.00	2.00	1.70



# TRIAL PIT LOG

Telephone: 01452 739165 , Fax: 01452 739220 , Email: mark@ccground.co.uk

Project Name: Five Mile Lane	Project No: <b>C4414</b>	Co-ords: E 307778 N 172139 Level: 91.43mAD	Date 18/11/2014
Location: Five Mile Lane, Cardiff	Dimensions: 2.40m Depth 1.30m		Scale 1 : 25
Client: Vale of Glamorgan Council		Logged By PF	

(m)	Water Levels	Samples & In Situ Testing			Description	Depth (m)	Level (mAD)	Legend
		No/Type	Depth (m)	Result				
1		B ES	0.50		Topsoil of soft dark brown slightly sandy CLAY with low cobble content and frequent rootlets <2mm. Cobbles are sub-angular limestone.	0.15	91.28	
					Firm grey, greyish brown slightly sandy slightly gravelly CLAY with high cobble content and frequent rootlets <2mm. Gravel is sub-angular fine to coarse limestone. Cobbles are sub-angular limestone.	(0.45)		
					Orangish brown and grey slightly clayey slightly gravelly COBBLES and BOULDERS. Gravel is sub-angular fine to coarse limestone. Cobbles and boulders are sub-angular tabular limestone.	0.60		
					Trial pit completed at 1.30m	1.30		
2								
3								
4								

**REMARKS:**

EQUIPMENT: JCB 3CX Mechanical Excavator.  
 METHOD: Trial pits excavated using 0.60m wide backactor bucket.  
 GROUNDWATER: Water seepage at 1.30m.  
 STABILITY: Trial pit sides remained stable and vertical throughout.  
 BACKFILL: Trial pit backfilled with arisings  
 REMARKS: Pit terminated on hard stratum - Limestone.



# TRIAL PIT LOG

Telephone: 01452 739165 , Fax: 01452 739220 , Email: mark@ccground.co.uk

Project Name: Five Mile Lane	Project No: <b>C4414</b>	Co-ords: E 307796 N 172066 Level: 90.04mAD	Date 18/11/2014
Location: Five Mile Lane, Cardiff	Dimensions: 2.45m Depth 1.30m		Scale 1 : 25
Client: Vale of Glamorgan Council		Logged By PF	

(m)	Water Levels	Samples & In Situ Testing			Description	Depth (m)	Level (mAD)	Legend
		No/Type	Depth (m)	Result				
1		B	0.20		Topsoil of soft dark brown slightly sandy CLAY with low cobble content and frequent rootlets <2mm. Cobbles are sub-angular limestone.	(0.30)	89.74	
			0.30		Soft orangish brown locally greyish brown slightly sandy slightly gravelly CLAY with frequent rootlets <2mm. Gravel is sub-angular fine limestone.	(0.35)		
		B ES	0.50		Orangish brown and grey slightly clayey slightly gravelly COBBLES and BOULDERS. Gravel is sub-angular fine to coarse limestone. Cobbles and boulders are sub-angular tabular limestone.	0.65	89.39	
					Trial pit completed at 1.30m	1.30	88.74	
2								
3								
4								

**REMARKS:**

EQUIPMENT: JCB 3CX Mechanical Excavator.  
 METHOD: Trial pits excavated using 0.60m wide backactor bucket.  
 GROUNDWATER: Water seepage at 1.30m.  
 STABILITY: Trial pit sides remained stable and vertical throughout.  
 BACKFILL: Trial pit backfilled with arisings  
 REMARKS: Pit terminated on hard stratum - Limestone.



# TRIAL PIT LOG

Telephone: 01452 739165 , Fax: 01452 739220 , Email: mark@ccground.co.uk

Project Name: Five Mile Lane	Project No: <b>C4414</b>	Co-ords: E 307811 N 171964 Level: 87.27mAD	Date 18/11/2014
Location: Five Mile Lane, Cardiff	Dimensions: 2.40m Depth 1.20m 0.60m		Scale 1 : 25
Client: Vale of Glamorgan Council		Logged By PF	

(m)	Water Levels	Samples & In Situ Testing			Description	Depth (m)	Level (mAD)	Legend
		No/Type	Depth (m)	Result				
1		B ES	0.50		Topsoil of soft dark brown slightly sandy CLAY with low cobble content and frequent rootlets <2mm. Cobbles are sub-angular limestone.	(0.20)	87.07	
					Grey and orangish brown slightly clayey slightly gravelly COBBLES with occasional boulders. Gravel is sub-angular fine to coarse limestone, cobbles and boulders are sub-angular limestone.	0.20		
					Trial pit completed at 1.20m	1.20		
2								
3								
4								

**REMARKS:**

EQUIPMENT: JCB 3CX Mechanical Excavator.  
 METHOD: Trial pits excavated using 0.60m wide backactor bucket.  
 GROUNDWATER: Water seepage at 1.20m.  
 STABILITY: Trial pit sides remained stable and vertical throughout.  
 BACKFILL: Trial pit backfilled with arisings  
 REMARKS: Pit terminated on hard stratum - Limestone.



# TRIAL PIT LOG

Telephone: 01452 739165 , Fax: 01452 739220 , Email: mark@ccground.co.uk

Project Name: Five Mile Lane	Project No: <b>C4414</b>	Co-ords: E 307823 N 171866 Level: 85.36mAD	Date 18/11/2014
Location: Five Mile Lane, Cardiff	Dimensions: 2.40m Depth 2.10m		Scale 1 : 25
Client: Vale of Glamorgan Council		Logged By PF	

(m)	Water Levels	Samples & In Situ Testing			Description	Depth (m)	Level (mAD)	Legend
		No/Type	Depth (m)	Result				
1		B	0.20		Topsoil of soft dark brown slightly sandy CLAY with low cobble content and frequent rootlets <2mm. Cobbles are sub-angular limestone.	(0.30)	85.06	
		B ES	0.50		Soft orangish brown locally greyish brown slightly sandy slightly gravelly CLAY with frequent rootlets <2mm. Gravel is sub-angular fine limestone.	0.30		
		B	1.00			(1.00)		
2					Orangish brown and grey slightly clayey slightly gravelly COBBLES and BOULDERS. Gravel is sub-angular fine to coarse limestone. Cobbles and boulders are sub-angular tabular limestone.	1.30	84.06	
						(0.80)		
					Trial pit completed at 2.10m	2.10	83.26	
3								
4								

**REMARKS:**

EQUIPMENT: JCB 3CX Mechanical Excavator.  
 METHOD: Trial pits excavated using 0.60m wide backactor bucket.  
 GROUNDWATER: Water seepage at 2.10m.  
 STABILITY: Trial pit sides remained stable and vertical throughout.  
 BACKFILL: Trial pit backfilled with arisings  
 REMARKS: Pit terminated on hard stratum - Limestone.



# TRIAL PIT LOG

Telephone: 01452 739165 , Fax: 01452 739220 , Email: mark@ccground.co.uk

Project Name: Five Mile Lane	Project No: <b>C4414</b>	Co-ords: E 307896 N 171792 Level: 84.03mAD	Date 18/11/2014
Location: Five Mile Lane, Cardiff	Dimensions: 2.45m Depth 1.60m		Scale 1 : 25
Client: Vale of Glamorgan Council		Logged By PF	

(m)	Water Levels	Samples & In Situ Testing			Description	Depth (m)	Level (mAD)	Legend
		No/Type	Depth (m)	Result				
1		B	0.20		Topsoil of soft dark brown slightly sandy CLAY with low cobble content and frequent rootlets <2mm. Cobbles are sub-angular limestone.	(0.30)	83.73	
		ES			Soft orangish brown locally greyish brown slightly sandy CLAY with frequent rootlets <2mm. Gravel is sub-angular fine limestone.	0.30		
		B	0.50			(0.50)	83.23	
		B	1.00		Grey and orangish brown slightly clayey slightly gravelly COBBLES with occasional boulders. Gravel is sub-angular fine to coarse limestone, cobbles and boulders are sub-angular limestone.	0.80		
						(0.80)		
					Trial pit completed at 1.60m	1.60	82.43	
2								
3								
4								

**REMARKS:**

EQUIPMENT: JCB 3CX Mechanical Excavator.  
 METHOD: Trial pits excavated using 0.60m wide backactor bucket.  
 GROUNDWATER: Water seepage at 1.60m.  
 STABILITY: Trial pit sides remained stable and vertical throughout.  
 BACKFILL: Trial pit backfilled with arisings  
 REMARKS: Pit terminated on hard stratum - Limestone.



# TRIAL PIT LOG

Telephone: 01452 739165 , Fax: 01452 739220 , Email: mark@ccground.co.uk

Project Name: Five Mile Lane	Project No: <b>C4414</b>	Co-ords: E 307934 N 171698 Level: 81.25mAD	Date 18/11/2014
Location: Five Mile Lane, Cardiff	Dimensions: 2.40m Depth 1.10m		Scale 1 : 25
Client: Vale of Glamorgan Council		Logged By PF	

(m)	Water Levels	Samples & In Situ Testing			Description	Depth (m)	Level (mAD)	Legend
		No/Type	Depth (m)	Result				
1					Topsoil of soft dark brown slightly sandy CLAY with frequent rootlets <2mm.	(0.30)	80.95	
		B	0.20		Soft orangish brown and brown slightly sandy slightly gravelly CLAY. Gravel is sub-angular fine to coarse limestone.	0.30		
		B ES	0.50			(0.50)		
					Grey and orangish brown slightly clayey slightly gravelly COBBLES with occasional boulders. Gravel is sub-angular fine to coarse limestone, cobbles and boulders are sub-angular limestone.	0.80 (0.30)		
					Trial pit completed at 1.10m	1.10	80.15	
2								
3								
4								

**REMARKS:**

EQUIPMENT: JCB 3CX Mechanical Excavator.  
 METHOD: Trial pits excavated using 0.60m wide backactor bucket.  
 GROUNDWATER: Water seepage at 1.10m.  
 STABILITY: Trial pit sides remained stable and vertical throughout.  
 BACKFILL: Trial pit backfilled with arisings  
 REMARKS: Pit terminated on hard stratum - Limestone.





# TRIAL PIT LOG

Telephone: 01452 739165 , Fax: 01452 739220 , Email: mark@ccground.co.uk

Project Name: Five Mile Lane	Project No: <b>C4414</b>	Co-ords: E 308011 N 171624 Level: 83.61mAD	Date 18/11/2014
Location: Five Mile Lane, Cardiff	Dimensions: 2.45m Depth 1.40m	Scale 1 : 25	
Client: Vale of Glamorgan Council	0.60m		Logged By PF

(m)	Water Levels	Samples & In Situ Testing			Description	Depth (m)	Level (mAD)	Legend
		No/Type	Depth (m)	Result				
1		B	0.10		Topsoil of soft dark brown slightly sandy CLAY with frequent rootlets <2mm.	0.15	83.46	
		ES			Soft orangish brown locally greyish brown slightly sandy slightly gravelly CLAY with frequent rootlets <2mm. Gravel is sub-angular fine limestone.	(0.75)		
		B	0.40					
		B	0.80		Grey and orangish brown slightly clayey slightly gravelly COBBLES with occasional boulders. Gravel is sub-angular fine to coarse limestone, cobbles and boulders are sub-angular limestone.	0.90	82.71	
		B	1.20			(0.50)		
					1.40	82.21		
				Trial pit completed at 1.40m				
2								
3								
4								

**REMARKS:**

EQUIPMENT: JCB 3CX Mechanical Excavator.  
 METHOD: Trial pits excavated using 0.60m wide backactor bucket.  
 GROUNDWATER: Water seepage at 1.40m.  
 STABILITY: Trial pit sides remained stable and vertical throughout.  
 BACKFILL: Trial pit backfilled with arisings  
 REMARKS: Pit terminated on hard stratum - Limestone.



# TRIAL PIT LOG

Telephone: 01452 739165 , Fax: 01452 739220 , Email: mark@ccground.co.uk

Project Name: Five Mile Lane	Project No: <b>C4414</b>	Co-ords: E 308054 N 171501 Level: 87.13mAD	Date 19/11/2014
Location: Five Mile Lane, Cardiff	Dimensions: 2.45m Depth 1.20m		Scale 1 : 25
Client: Vale of Glamorgan Council		Logged By PF	

(m)	Water Levels	Samples & In Situ Testing			Description	Depth (m)	Level (mAD)	Legend		
		No/Type	Depth (m)	Result						
1					Topsoil of soft dark brown slightly sandy CLAY with frequent rootlets <2mm.	(0.30)	86.83			
					B ES	0.20			Soft orangish brown and greyish brown slightly gravelly CLAY with occasional rootlets <1mm. Gravel is sub angular fine to medium limestone.	0.30
					B	0.50			Orangish brown and grey slightly clayey slightly gravelly COBBLES and BOULDERS. Gravel is sub-angular fine to coarse limestone. Cobbles and boulders are sub-angular tabular limestone.	0.60
									Trial pit completed at 1.20m	1.20
2										
3										
4										

**REMARKS:**

EQUIPMENT: JCB 3CX Mechanical Excavator.  
 METHOD: Trial pits excavated using 0.60m wide backactor bucket.  
 GROUNDWATER: Water seepage at 1.20m.  
 STABILITY: Trial pit sides remained stable and vertical throughout.  
 BACKFILL: Trial pit backfilled with arisings  
 REMARKS: Pit terminated on hard stratum - Limestone.



# TRIAL PIT LOG

Telephone: 01452 739165 , Fax: 01452 739220 , Email: mark@ccground.co.uk

Project Name: Five Mile Lane	Project No: <b>C4414</b>	Co-ords: E 308096 N 171378 Level: 87.86mAD	Date 19/11/2014
Location: Five Mile Lane, Cardiff	Dimensions: 2.50m Depth 1.90m		Scale 1 : 25
Client: Vale of Glamorgan Council		Logged By PF	

(m)	Water Levels	Samples & In Situ Testing			Description	Depth (m)	Level (mAD)	Legend
		No/Type	Depth (m)	Result				
1		B	0.20		Topsoil of soft dark brown slightly sandy CLAY with frequent rootlets <2mm.	(0.35)	87.51	
		B ES	0.50		Soft orangish brown locally greyish brown slightly sandy slightly gravelly CLAY with frequent rootlets <2mm and occasional partially decomposed organic material <5mm. Gravel is sub-angular fine limestone.	0.35 (0.35)		
					Orangish brown and grey slightly gravelly COBBLES and BOULDERS with occasional laminated clay pockets <100mm. Gravel is sub-angular fine to coarse limestone. Cobbles and boulders are sub angular tabular limestone.	0.70		
2					Trial pit completed at 1.90m	(1.20) 1.90	85.96	
3								
4								

**REMARKS:**

EQUIPMENT: JCB 3CX Mechanical Excavator.  
 METHOD: Trial pits excavated using 0.60m wide backactor bucket.  
 GROUNDWATER: Water seepage at 1.90m.  
 STABILITY: Trial pit sides remained stable and vertical throughout.  
 BACKFILL: Trial pit backfilled with arisings  
 REMARKS: Pit terminated on hard stratum - Limestone.



# TRIAL PIT LOG

Telephone: 01452 739165 , Fax: 01452 739220 , Email: mark@ccground.co.uk

Project Name: Five Mile Lane	Project No: <b>C4414</b>	Co-ords: E 308106 N 171086 Level: 86.12mAD	Date 19/11/2014
Location: Five Mile Lane, Cardiff	Dimensions: 2.40m Depth 0.90m		Scale 1 : 25
Client: Vale of Glamorgan Council			Logged By PF

(m)	Water Levels	Samples & In Situ Testing			Description	Depth (m)	Level (mAD)	Legend
		No/Type	Depth (m)	Result				
1		B ES	0.10		Topsoil of soft dark brown slightly sandy CLAY with frequent rootlets <2mm.	(0.20)	85.92	
					Soft orangish brown locally greyish brown slightly sandy slightly gravelly CLAY with medium cobble content and frequent rootlets <2mm. Gravel is sub-angular fine limestone. Cobbles are sub angular limestone.	(0.40)		
		B	0.50		Orangish brown and grey slightly clayey slightly gravelly COBBLES and BOULDERS. Gravel is sub-angular fine to coarse limestone. Cobbles and boulders are sub-angular tabular limestone.	0.60 (0.30)	85.52	
					Trial pit completed at 0.90m	0.90	85.22	
2								
3								
4								

**REMARKS:**

EQUIPMENT: JCB 3CX Mechanical Excavator.  
 METHOD: Trial pits excavated using 0.60m wide backactor bucket.  
 GROUNDWATER: Water seepage at 0.90m.  
 STABILITY: Trial pit sides remained stable and vertical throughout.  
 BACKFILL: Trial pit backfilled with arisings  
 REMARKS: Pit terminated on hard stratum - Limestone.



# TRIAL PIT LOG

Telephone: 01452 739165 , Fax: 01452 739220 , Email: mark@ccground.co.uk

Project Name: Five Mile Lane	Project No: <b>C4414</b>	Co-ords: E 308101 N 170940 Level: 84.26mAD	Date 19/11/2014
Location: Five Mile Lane, Cardiff	Dimensions: 2.40m Depth 0.90m		Scale 1 : 25
Client: Vale of Glamorgan Council		Logged By PF	

(m)	Water Levels	Samples & In Situ Testing			Description	Depth (m)	Level (mAD)	Legend
		No/Type	Depth (m)	Result				
1		B ES	0.20		Topsoil of soft dark brown slightly sandy CLAY with frequent rootlets <2mm.	(0.25)	84.01	
					Soft orangish brown locally greyish brown slightly sandy slightly gravelly CLAY with high cobble content, occasional boulders and frequent rootlets <2mm. Gravel is sub-angular fine limestone. Cobbles and boulders are sub angular limestone.	0.25		
		B	0.60			(0.65)		
		Trial pit completed at 0.90m						
2								
3								
4								

**REMARKS:**

EQUIPMENT: JCB 3CX Mechanical Excavator.  
 METHOD: Trial pits excavated using 0.60m wide backactor bucket.  
 GROUNDWATER: Water seepage at 0.90m.  
 STABILITY: Trial pit sides remained stable and vertical throughout.  
 BACKFILL: Trial pit backfilled with arisings  
 REMARKS: Pit terminated on hard stratum - Limestone.



# TRIAL PIT LOG

Telephone: 01452 739165 , Fax: 01452 739220 , Email: mark@ccground.co.uk

Project Name: Five Mile Lane	Project No: <b>C4414</b>	Co-ords: E 308091 N 170735 Level: 82.24mAD	Date 19/11/2014
Location: Five Mile Lane, Cardiff	Dimensions: 2.45m Depth 1.40m		Scale 1 : 25
Client: Vale of Glamorgan Council		Logged By PF	

(m)	Water Levels	Samples & In Situ Testing			Description	Depth (m)	Level (mAD)	Legend	
		No/Type	Depth (m)	Result					
1		B ES	0.10		Topsoil of soft dark brown slightly sandy CLAY with frequent rootlets <2mm.	(0.20)	82.04		
					Orangish brown and grey slightly clayey slightly gravelly COBBLES and BOULDERS. Gravel is sub-angular fine to coarse limestone. Cobbles and boulders are sub-angular tabular limestone.	0.20			
		B	0.50			Firm orangish brown and grey slightly sandy slightly gravelly CLAY with a medium cobble content. Gravel is sub-angular fine to coarse limestone. Cobbles are sub-angular limestone.	0.45		81.79
						Orangish brown and grey slightly clayey slightly gravelly COBBLES and BOULDERS. Gravel is sub-angular fine to coarse limestone. Cobbles and boulders are sub-angular tabular limestone.	(0.25)		81.54
							0.70		
					(0.70)				
					1.40	80.84			
				Trial pit completed at 1.40m					

**REMARKS:**

EQUIPMENT: JCB 3CX Mechanical Excavator.  
 METHOD: Trial pits excavated using 0.60m wide backactor bucket.  
 GROUNDWATER: Water seepage at 1.40m.  
 STABILITY: Trial pit sides remained stable and vertical throughout.  
 BACKFILL: Trial pit backfilled with arisings  
 REMARKS: Pit terminated on hard stratum - Limestone.



# TRIAL PIT LOG

Telephone: 01452 739165 , Fax: 01452 739220 , Email: mark@ccground.co.uk

Project Name: Five Mile Lane	Project No: <b>C4414</b>	Co-ords: E 308061 N 170550 Level: 82.02mAD	Date 20/11/2014
Location: Five Mile Lane, Cardiff	Dimensions: 2.50m Depth 1.80m		Scale 1 : 25
Client: Vale of Glamorgan Council		Logged By PF	

(m)	Water Levels	Samples & In Situ Testing			Description	Depth (m)	Level (mAD)	Legend
		No/Type	Depth (m)	Result				
1		B	0.10		Topsoil of soft dark brown slightly sandy CLAY with frequent rootlets <2mm.	(0.20)	81.82	
		ES			Soft orangish brown and greyish brown slightly sandy slightly gravelly CLAY with frequent rootlets <1mm and root remnants <3mm. Gravel is sub-angular fine to medium limestone.	0.20		
		B	0.50		0.60-0.90m: High cobble content with occasional boulders. Cobbles and boulders are sub-rounded to sub-angular limestone.	(1.10)		
		B	1.00		0.90-1.30m: Locally grey. Medium cobble content.	1.30		
					Orangish brown and grey slightly gravelly COBBLES and BOULDERS with occasional laminated clay pockets <100mm. Gravel is sub-angular fine to coarse limestone. Cobbles and boulders are sub angular tabular limestone.	(0.50)		
2				Trial pit completed at 1.80m	1.80	80.22		
3								
4								

**REMARKS:**

EQUIPMENT: JCB 3CX Mechanical Excavator.  
 METHOD: Trial pits excavated using 0.60m wide backactor bucket.  
 GROUNDWATER: Water seepage at 1.80m.  
 STABILITY: Trial pit sides remained stable and vertical throughout.  
 BACKFILL: Trial pit backfilled with arisings  
 REMARKS: Pit terminated on hard stratum - Limestone.

# TRIAL PIT LOG



Pit No  
**TP215**  
Sheet 1 of 1

Telephone: 01452 739165 , Fax: 01452 739220 , Email: mark@ccground.co.uk

Project Name: Five Mile Lane	Project No: <b>C4414</b>	Co-ords: E 308088 N 170430 Level: 79.65mAD	Date 20/11/2014
Location: Five Mile Lane, Cardiff	Dimensions: 2.45m Depth 1.60m		Scale 1 : 25
Client: Vale of Glamorgan Council		Logged By PF	

(m)	Water Levels	Samples & In Situ Testing			Description	Depth (m)	Level (mAD)	Legend
		No/Type	Depth (m)	Result				
1		B ES	0.30		Topsoil of soft dark brown slightly sandy CLAY with frequent rootlets <2mm.	(0.20)	79.45	
					Firm orangish brown and grey slightly sandy slightly gravelly CLAY with a medium cobble content. Gravel is sub-angular fine to coarse limestone. Cobbles are sub-angular limestone.	0.20		
		B	1.10		Orangish brown and grey slightly clayey slightly gravelly COBBLES and BOULDERS. Gravel is sub-angular fine to coarse limestone. Cobbles and boulders are sub-angular tabular limestone.	0.60	79.05	
					Orangish brown and grey slightly gravelly COBBLES and BOULDERS with occasional laminated clay pockets <100mm. Gravel is sub-angular fine to coarse limestone. Cobbles and boulders are sub angular tabular limestone.	1.00	78.65	
				Trial pit completed at 1.60m	1.60	78.05		
2								
3								
4								

**REMARKS:**

EQUIPMENT: JCB 3CX Mechanical Excavator.  
 METHOD: Trial pits excavated using 0.60m wide backactor bucket.  
 GROUNDWATER: Water seepage at 1.60m.  
 STABILITY: Trial pit sides remained stable and vertical throughout.  
 BACKFILL: Trial pit backfilled with arisings  
 REMARKS: Pit terminated on hard stratum - Limestone.





# TRIAL PIT LOG

Telephone: 01452 739165 , Fax: 01452 739220 , Email: mark@ccground.co.uk

Project Name: Five Mile Lane	Project No: <b>C4414</b>	Co-ords: E 308122 N 170052 Level: 68.53mAD	Date 20/11/2014
Location: Five Mile Lane, Cardiff	Dimensions: 2.60m Depth 1.20m 0.65m		Scale 1 : 25
Client: Vale of Glamorgan Council			Logged By PF

(m)	Water Levels	Samples & In Situ Testing			Description	Depth (m)	Level (mAD)	Legend
		No/Type	Depth (m)	Result				
1		B	0.10		Topsoil of soft dark brown slightly sandy CLAY with frequent rootlets <2mm.	(0.20)	68.33	
					Orangish brown and grey slightly clayey slightly gravelly COBBLES and BOULDERS. Gravel is sub-angular fine to coarse limestone. Cobbles and boulders are sub-angular tabular limestone.	0.20		
					0.50-1.20m: Locally orangish brown and grey gravelly clay with medium cobble content. Gravel is sub-angular to sub-rounded fine to coarse limestone. Cobbles are limestone.	(1.00)		
					Trial pit completed at 1.20m	1.20	67.33	
2								
3								
4								

**REMARKS:**

EQUIPMENT: JCB 3CX Mechanical Excavator.  
 METHOD: Trial pits excavated using 0.60m wide backactor bucket.  
 GROUNDWATER: Water seepage at 1.20m.  
 STABILITY: Trial pit sides remained stable and vertical throughout.  
 BACKFILL: Trial pit backfilled with arisings  
 REMARKS: Pit terminated on hard stratum - Limestone.



# TRIAL PIT LOG

Telephone: 01452 739165 , Fax: 01452 739220 , Email: mark@ccground.co.uk

Project Name: Five Mile Lane	Project No: <b>C4414</b>	Co-ords: E 308184 N 169931 Level: 61.95mAD	Date 20/11/2014
Location: Five Mile Lane, Cardiff	Dimensions: 2.45m Depth 2.00m		Scale 1 : 25
Client: Vale of Glamorgan Council		Logged By PF	

(m)	Water Levels	Samples & In Situ Testing			Description	Depth (m)	Level (mAD)	Legend
		No/Type	Depth (m)	Result				
1		B	0.10		Topsoil of soft dark brown slightly sandy CLAY with frequent rootlets <2mm.	(0.25)	61.70	
		B ES	0.50		Soft brown slightly sandy slightly gravelly CLAY. Gravel is sub-rounded to sub-angular fine to coarse limestone.	(0.55)		
						Orangish brown and grey slightly clayey slightly gravelly COBBLES and BOULDERS. Gravel is sub-angular fine to coarse limestone. Cobbles and boulders are sub-angular tabular limestone.	0.80	61.15
2		B	1.70		1.60-1.80m: Clay. Locally reddish brown. High cobble content and occasional boulders.	(1.20)	59.95	
					Trial pit completed at 2.00m	2.00		
3								
4								

**REMARKS:**

EQUIPMENT: JCB 3CX Mechanical Excavator.  
 METHOD: Trial pits excavated using 0.60m wide backactor bucket.  
 GROUNDWATER: Water seepage at 2.00m.  
 STABILITY: Trial pit sides remained stable and vertical throughout.  
 BACKFILL: Trial pit backfilled with arisings  
 REMARKS: Pit terminated on hard stratum - Limestone.



# TRIAL PIT LOG

Telephone: 01452 739165 , Fax: 01452 739220 , Email: mark@ccground.co.uk

Project Name: Five Mile Lane	Project No: <b>C4414</b>	Co-ords: E 308296 N 169821 Level: 51.05mAD	Date 20/11/2014
Location: Five Mile Lane, Cardiff	Dimensions: 2.40m Depth 2.20m 0.60m		Scale 1 : 25
Client: Vale of Glamorgan Council			Logged By PF

(m)	Water Levels	Samples & In Situ Testing			Description	Depth (m)	Level (mAD)	Legend
		No/Type	Depth (m)	Result				
1		B	0.10		Topsoil of soft dark brown slightly sandy CLAY with frequent rootlets <2mm.	(0.20)		
		B	0.50		Firm orangish brown and grey slightly sandy slightly gravelly CLAY with a medium cobble content. Gravel is sub-angular fine to coarse limestone. Cobbles are sub-angular limestone.	0.20 (0.40)	50.85	
					Orangish brown and grey slightly clayey slightly gravelly COBBLES and BOULDERS. Gravel is sub-angular fine to coarse limestone. Cobbles and boulders are sub-angular tabular limestone.	0.60	50.45	
2		B	2.00		Very stiff orangish brown mottled reddish brown and greyish brown slightly sandy slightly gravelly silty CLAY with locally low cobble content. Gravel is sub-angular fine to coarse mudstone. Cobbles are extremely weak sub angular mudstone.	1.90 (0.20)	49.15	
					Orangish brown and grey slightly clayey slightly gravelly COBBLES and BOULDERS. Gravel is sub-angular fine to coarse limestone. Cobbles and boulders are sub-angular tabular limestone.	2.10 2.20	48.95 48.85	
					Trial pit completed at 2.20m			
3								
4								

**REMARKS:**

EQUIPMENT: JCB 3CX Mechanical Excavator.  
 METHOD: Trial pits excavated using 0.60m wide backactor bucket.  
 GROUNDWATER: Water seepage at 2.20m.  
 STABILITY: Trial pit sides remained stable and vertical throughout.  
 BACKFILL: Trial pit backfilled with arisings  
 REMARKS: Pit terminated on hard stratum - Limestone.



# TRIAL PIT LOG

Telephone: 01452 739165 , Fax: 01452 739220 , Email: mark@ccground.co.uk

Project Name: Five Mile Lane	Project No: <b>C4414</b>	Co-ords: E 308407 N 169706 Level: 38.87mAD	Date 20/11/2014
Location: Five Mile Lane, Cardiff	Dimensions: 2.80m Depth 3.40m		Scale 1 : 25
Client: Vale of Glamorgan Council		Logged By PF	

(m)	Water Levels	Samples & In Situ Testing			Description	Depth (m)	Level (mAD)	Legend
		No/Type	Depth (m)	Result				
1		B ES	0.10		Topsoil of soft dark brown slightly sandy CLAY with frequent rootlets <2mm.	(0.20)	38.67	
		B	0.50		Firm orangish brown and grey slightly sandy slightly gravelly CLAY with a medium cobble content with occasional boulders. Gravel is sub-angular fine to coarse limestone. Cobbles are sub-angular limestone.	0.20		
		B	1.00		0.80-1.70m: Cobbles and boulders absent. Laminated. 0.90m: Locally reddish brown.			
2		B	2.10		1.70-2.00m: Rare boulders.	(3.20)		
					2.00-3.40m: Gravelly. High cobble content. Gravel and cobbles are sub angular mudstone. 2.10-3.40m: Occasional cobbles of limestone.			
3		B	3.00					
Trial pit completed at 3.40m						3.40	35.47	
4								

**REMARKS:**

EQUIPMENT: JCB 3CX Mechanical Excavator.  
 METHOD: Trial pits excavated using 0.60m wide backactor bucket.  
 GROUNDWATER: Water seepage at 3.40m.  
 STABILITY: Trial pit sides remained stable and vertical throughout.  
 BACKFILL: Trial pit backfilled with arisings  
 REMARKS: Pit terminated on hard stratum - Limestone.



# INSPECTION PIT LOG

Telephone: 01452 739165 , Fax: 01452 739220 , Email: mark@ccground.co.uk

Project Name: Five Mile Lane	Project No: <b>C4414</b>	Co-ords: E 307801 N 172719 Level: 76.59mAD	Date 24/11/2014
Location: Five Mile Lane, Cardiff		Dimensions: <span style="border: 1px solid black; padding: 2px;">m</span>	Scale 1 : 12.5
Client: Vale of Glamorgan Council		Depth 0.30m	Logged By PF

(m)	Water Levels	Samples & In Situ Testing			Description	Depth (m)	Level (mAD)	Legend
		No/Type	Depth (m)	Result				
1	Dry				MADE GROUND: Soft dark brown slightly sandy slightly gravelly CLAY with frequent rootlets <2mm. Gravel is sub-angular fine to medium limestone.	(0.20)		
					Soft orangish brown locally greyish brown slightly sandy slightly gravelly CLAY with frequent rootlets <2mm. Gravel is sub-angular fine limestone.	0.20 (0.10)	76.39	
					Inspection pit completed at 0.30m	0.30	76.29	
2								2

**REMARKS:**

EQUIPMENT: Hand digging tools.  
 METHOD: Hand dug inspection pit: 0.00-0.30m.  
 GROUNDWATER: None encountered.  
 REMARKS: In Situ CBR test carried out at 0.15 and 0.30m. (See separate sheet).



# INSPECTION PIT LOG

Telephone: 01452 739165 , Fax: 01452 739220 , Email: mark@ccground.co.uk

Project Name: Five Mile Lane	Project No: <b>C4414</b>	Co-ords: E 307796 N 172548 Level: 79.08mAD	Date 24/11/2014
Location: Five Mile Lane, Cardiff	Dimensions: <span style="border: 1px solid black; display: inline-block; width: 100px; height: 30px; vertical-align: middle;"></span> m		Scale 1 : 12.5
Client: Vale of Glamorgan Council	Depth 0.30m	€ <span style="border: 1px solid black; display: inline-block; width: 100px; height: 30px; vertical-align: middle;"></span>	Logged By PF

(m)	Water Levels	Samples & In Situ Testing			Description	Depth (m)	Level (mAD)	Legend
		No/Type	Depth (m)	Result				
1	Dry				MADE GROUND: Soft dark brown slightly sandy slightly gravelly CLAY with frequent rootlets <2mm. Gravel is sub-angular fine to medium limestone.	(0.20)		
					Soft orangish brown locally greyish brown slightly sandy slightly gravelly CLAY with frequent rootlets <2mm. Gravel is sub-angular fine limestone.	0.20 (0.10)	78.88	
					Inspection pit completed at 0.30m	0.30	78.78	
2								2

**REMARKS:**

EQUIPMENT: Hand digging tools.  
 METHOD: Hand dug inspection pit: 0.00-0.30m.  
 GROUNDWATER: None encountered.  
 REMARKS: In Situ CBR test carried out at 0.15 and 0.30m. (See separate sheet).



# INSPECTION PIT LOG

Telephone: 01452 739165 , Fax: 01452 739220 , Email: mark@ccground.co.uk

Project Name: Five Mile Lane	Project No: <b>C4414</b>	Co-ords: E 307779 N 172220 Level: 91.41mAD	Date 24/11/2014
Location: Five Mile Lane, Cardiff	Client: Vale of Glamorgan Council	Dimensions: <input type="text"/> m Depth 0.30m	Scale 1 : 12.5 Logged By PF

(m)	Water Levels	Samples & In Situ Testing			Description	Depth (m)	Level (mAD)	Legend
		No/Type	Depth (m)	Result				
1	Dry				MADE GROUND: Soft dark brown slightly sandy slightly gravelly CLAY with frequent rootlets <2mm. Gravel is sub-angular fine to medium limestone.	(0.10)	91.31	
					Soft orangish brown locally greyish brown slightly sandy slightly gravelly CLAY with frequent rootlets <2mm. Gravel is sub-angular fine limestone.	0.10		
					Inspection pit completed at 0.30m	(0.20)	91.11	
2					0.30			

**REMARKS:**

EQUIPMENT: Hand digging tools.  
 METHOD: Hand dug inspection pit: 0.00-0.30m.  
 GROUNDWATER: None encountered.  
 REMARKS: In Situ CBR test carried out at 0.15 and 0.30m. (See separate sheet).



# INSPECTION PIT LOG

Telephone: 01452 739165 , Fax: 01452 739220 , Email: mark@ccground.co.uk

Project Name: Five Mile Lane	Project No: <b>C4414</b>	Co-ords: E 307743 N 172037 Level: 89.99mAD	Date 24/11/2014
Location: Five Mile Lane, Cardiff		Dimensions: <span style="border: 1px solid black; display: inline-block; width: 100px; height: 20px; vertical-align: middle;"></span> m	Scale 1 : 12.5
Client: Vale of Glamorgan Council		Depth 0.30m	Logged By PF

(m)	Water Levels	Samples & In Situ Testing			Description	Depth (m)	Level (mAD)	Legend
		No/Type	Depth (m)	Result				
1	Dry				MADE GROUND: Soft dark brown slightly sandy slightly gravelly CLAY with frequent rootlets <2mm. Gravel is sub-angular fine to medium limestone.	(0.20)		
					Soft orangish brown locally greyish brown slightly sandy slightly gravelly CLAY with low cobble content and frequent rootlets <2mm. Gravel is sub-angular fine limestone. Cobbles are sub-angular limestone.	0.20 (0.10)	89.79	
					Inspection pit completed at 0.30m	0.30	89.69	
2								2

**REMARKS:**

EQUIPMENT: Hand digging tools.  
 METHOD: Hand dug inspection pit: 0.00-0.30m.  
 GROUNDWATER: None encountered.  
 REMARKS: In Situ CBR test carried out at 0.15 and 0.30m. (See separate sheet).





# INSPECTION PIT LOG

Telephone: 01452 739165 , Fax: 01452 739220 , Email: mark@ccground.co.uk

Project Name: Five Mile Lane	Project No: <b>C4414</b>	Co-ords: E 307667 N 171935 Level: 88.59mAD	Date 24/11/2014
Location: Five Mile Lane, Cardiff		Dimensions: <input type="text"/> m	Scale 1 : 12.5
Client: Vale of Glamorgan Council		Depth 0.30m	Logged By PF

(m)	Water Levels	Samples & In Situ Testing			Description	Depth (m)	Level (mAD)	Legend
		No/Type	Depth (m)	Result				
1	Dry				MADE GROUND: Soft dark brown slightly sandy slightly gravelly CLAY with frequent rootlets <2mm. Gravel is sub-angular fine to medium limestone.	(0.20)		
					Soft orangish brown locally greyish brown slightly sandy slightly gravelly CLAY with low cobble content and frequent rootlets <2mm. Gravel is sub-angular fine limestone. Cobbles are sub-angular limestone.	0.20 (0.10)	88.39	
					Inspection pit completed at 0.30m	0.30	88.29	
2								

**REMARKS:**

EQUIPMENT: Hand digging tools.  
 METHOD: Hand dug inspection pit: 0.00-0.30m.  
 GROUNDWATER: None encountered.  
 REMARKS: In Situ CBR test carried out at 0.15 and 0.30m. (See separate sheet).



# INSPECTION PIT LOG

Telephone: 01452 739165 , Fax: 01452 739220 , Email: mark@ccground.co.uk

Project Name: Five Mile Lane	Project No: <b>C4414</b>	Co-ords: E 308211 N 170625 Level: 80.52mAD	Date 25/11/2014
Location: Five Mile Lane, Cardiff		Dimensions: <input type="text"/> m	Scale 1 : 12.5
Client: Vale of Glamorgan Council		Depth 0.30m	Logged By PF

(m)	Water Levels	Samples & In Situ Testing			Description	Depth (m)	Level (mAD)	Legend
		No/Type	Depth (m)	Result				
1	Dry				MADE GROUND: Soft dark brown slightly sandy slightly gravelly CLAY with frequent rootlets <2mm. Gravel is sub-angular fine to medium limestone.	(0.20)		
					Soft orangish brown locally greyish brown slightly sandy slightly gravelly CLAY with low cobble content and frequent rootlets <2mm. Gravel is sub-angular fine limestone. Cobbles are sub-angular limestone.	0.20 (0.10)	80.32	
					Inspection pit completed at 0.30m	0.30	80.22	
2								

**REMARKS:**

EQUIPMENT: Hand digging tools.  
 METHOD: Hand dug inspection pit: 0.00-0.30m.  
 GROUNDWATER: None encountered.  
 REMARKS: In Situ CBR test carried out at 0.15 and 0.30m. (See separate sheet).



# INSPECTION PIT LOG

Telephone: 01452 739165 , Fax: 01452 739220 , Email: mark@ccground.co.uk

Project Name: Five Mile Lane	Project No: <b>C4414</b>	Co-ords: E 308314 N 170620 Level: 77.07mAD	Date 25/11/2014
Location: Five Mile Lane, Cardiff		Dimensions: <span style="border: 1px solid black; display: inline-block; width: 100px; height: 30px; vertical-align: middle;"></span> m	Scale 1 : 12.5
Client: Vale of Glamorgan Council		Depth 0.30m	Logged By PF

(m)	Water Levels	Samples & In Situ Testing			Description	Depth (m)	Level (mAD)	Legend
		No/Type	Depth (m)	Result				
1	Dry				MADE GROUND: Soft dark brown slightly sandy slightly gravelly CLAY with frequent rootlets <2mm. Gravel is sub-angular fine to medium limestone.	(0.10)	76.97	
					Soft orangish brown locally greyish brown slightly sandy slightly gravelly CLAY with frequent rootlets <2mm. Gravel is sub-angular fine limestone.	(0.20)		
						Inspection pit completed at 0.30m	0.30	76.77
2								2

**REMARKS:**

EQUIPMENT: Hand digging tools.  
 METHOD: Hand dug inspection pit: 0.00-0.30m.  
 GROUNDWATER: None encountered.  
 REMARKS: In Situ CBR test carried out at 0.15 and 0.30m. (See separate sheet).



# INSPECTION PIT LOG

Telephone: 01452 739165 , Fax: 01452 739220 , Email: mark@ccground.co.uk

Project Name: Five Mile Lane	Project No: <b>C4414</b>	Co-ords: E 308062 N 170737 Level: 82.32mAD	Date 25/11/2014
Location: Five Mile Lane, Cardiff		Dimensions: <span style="border: 1px solid black; padding: 2px;">m</span>	Scale 1 : 12.5
Client: Vale of Glamorgan Council		Depth 0.30m	Logged By PF

(m)	Water Levels	Samples & In Situ Testing			Description	Depth (m)	Level (mAD)	Legend
		No/Type	Depth (m)	Result				
1	Dry				MADE GROUND: Soft dark brown slightly sandy slightly gravelly CLAY with frequent rootlets <2mm. Gravel is sub-angular fine to medium limestone.	(0.10)	82.22	
					Soft orangish brown locally greyish brown slightly sandy slightly gravelly CLAY with low cobble content and frequent rootlets <2mm. Gravel is sub-angular fine limestone. Cobbles are sub-angular limestone.	(0.20)		
					Inspection pit completed at 0.30m	0.30	82.02	
2								2

**REMARKS:**

EQUIPMENT: Hand digging tools.  
 METHOD: Hand dug inspection pit: 0.00-0.30m.  
 GROUNDWATER: None encountered.  
 REMARKS: In Situ CBR test carried out at 0.15 and 0.30m. (See separate sheet).



# INSPECTION PIT LOG

Telephone: 01452 739165 , Fax: 01452 739220 , Email: mark@ccground.co.uk

Project Name: Five Mile Lane	Project No: <b>C4414</b>	Co-ords: E 307976 N 170682 Level: 82.36mAD	Date 25/11/2014
Location: Five Mile Lane, Cardiff		Dimensions: <span style="border: 1px solid black; display: inline-block; width: 100px; height: 30px; vertical-align: middle;"></span> m	Scale 1 : 12.5
Client: Vale of Glamorgan Council		Depth 0.30m	Logged By PF

(m)	Water Levels	Samples & In Situ Testing			Description	Depth (m)	Level (mAD)	Legend
		No/Type	Depth (m)	Result				
1	Dry				MADE GROUND: Soft dark brown slightly sandy slightly gravelly CLAY with frequent rootlets <2mm. Gravel is sub-angular fine to medium limestone.	(0.20)		
					Soft orangish brown locally greyish brown slightly sandy slightly gravelly CLAY with low cobble content and frequent rootlets <2mm. Gravel is sub-angular fine limestone. Cobbles are sub-angular limestone.	0.20 (0.10)	82.16	
					Inspection pit completed at 0.30m	0.30	82.06	
2								2

**REMARKS:**

EQUIPMENT: Hand digging tools.  
 METHOD: Hand dug inspection pit: 0.00-0.30m.  
 GROUNDWATER: None encountered.  
 REMARKS: In Situ CBR test carried out at 0.15 and 0.30m. (See separate sheet).



# INSPECTION PIT LOG

Telephone: 01452 739165 , Fax: 01452 739220 , Email: mark@ccground.co.uk

Project Name: Five Mile Lane	Project No: <b>C4414</b>	Co-ords: E 308817 N 169463 Level: 21.90mAD	Date 25/11/2014
Location: Five Mile Lane, Cardiff		Dimensions: <span style="border: 1px solid black; display: inline-block; width: 100px; height: 30px; vertical-align: middle;"></span> m	Scale 1 : 12.5
Client: Vale of Glamorgan Council		Depth 0.30m	Logged By PF

(m)	Water Levels	Samples & In Situ Testing			Description	Depth (m)	Level (mAD)	Legend
		No/Type	Depth (m)	Result				
1	Dry				MADE GROUND: Soft dark brown slightly sandy slightly gravelly CLAY with frequent rootlets <2mm. Gravel is sub-angular fine to medium limestone.	(0.25)		
					Soft orangish brown locally greyish brown slightly sandy slightly gravelly CLAY with frequent rootlets <2mm. Gravel is sub-angular fine limestone. Cobbles are sub-angular limestone. Inspection pit completed at 0.30m	0.25 0.30	21.65 21.60	
2								

**REMARKS:**

EQUIPMENT: Hand digging tools.  
 METHOD: Hand dug inspection pit: 0.00-0.30m.  
 GROUNDWATER: None encountered.  
 REMARKS: In Situ CBR test carried out at 0.15 and 0.30m. (See separate sheet).

## **APPENDIX C**

### Appendix C – Laboratory Test Results



# LABORATORY REPORT



4043

**Contract Number: PSL14/6467**

Client's Reference: Report Date: 09 January 2015

Client Name: CC Ground Investigations Ltd  
Unit A2 Innsworth Technology Park.  
Innsworth Lane  
Gloucester  
GL3 1DL

**For the attention of: Chris Scrivens**

Contract Title: 5 Mile Lane

Date Received: 10/12/2014  
Date Commenced: 10/12/2014  
Date Completed: 9/1/2015

**Notes: Observations and Interpretations are outside the UKAS Accreditation**

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

Checked and Approved Signatories:

R Gunson  
(Director)

A Watkins  
(Director)

M Beastall  
(Laboratory Manager)

D Lambe  
(Senior Technician)

S Royle  
(Senior Technician)


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Page 1 of



# SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Depth m	Description of Sample
TP201		B	0.50	Brown slightly gravelly slightly sandy CLAY.
TP202		B	0.50	Brown slightly gravelly slightly sandy CLAY.
TP203		B	0.50	Brown slightly sandy very clayey silty GRAVEL of cobbles.
TP204		B	1.00	Brown gravelly slightly sandy CLAY.
TP205		B	0.50	Brown slightly gravelly slightly sandy CLAY.
TP205		B	1.00	Brown slightly sandy clayey GRAVEL of cobbles.
TP206		B	0.50	Brown slightly gravelly slightly sandy CLAY.
TP207		B	0.80	Brown slightly sandy very clayey silty GRAVEL of cobbles.
TP207		B	1.20	Brown clayey GRAVEL of cobbles.
TP208		B	0.50	Brown slightly sandy CLAY.
TP209		B	0.50	Brown slightly gravelly slightly sandy CLAY.
TP211		B	0.50	Brown slightly sandy very clayey silty GRAVEL with many cobbles.
TP212		B	0.60	Brown slightly sandy very clayey silty GRAVEL with many cobbles.
TP213		B	0.50	Brown slightly gravelly slightly sandy CLAY.
TP214		B	0.50	Brown slightly gravelly slightly sandy CLAY.
TP214		B	1.00	Brown slightly sandy CLAY.
TP215		B	0.30	Brown slightly gravelly slightly sandy CLAY.
TP215		B	1.10	Brown slightly gravelly slightly sandy CLAY.
TP217		B	0.50	Brown slightly gravelly slightly sandy CLAY.

 <b>Professional Soils Laboratory</b>	Compiled by	Date	Checked by	Date	Approved by	Date
	[REDACTED]	09/01/15	[REDACTED]	09/01/15	[REDACTED]	09/01/15
	5 MILE LANE.				Contract No:	PSL14/6467
					Client Ref:	C4414

# SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Depth m	Description of Sample
TP217		B	1.70	Brown gravelly slightly sandy CLAY.
TP218		B	0.50	Brown slightly gravelly slightly sandy CLAY.
TP218		B	2.00	Brown highly weathered MUDSTONE.
TP219		B	1.00	Brown slightly gravelly slightly sandy CLAY.
TP219		B	2.10	Brown highly weathered MUDSTONE.



Compiled by	Date	Checked by	Date	Approved by	Date
[REDACTED]	09/01/15	[REDACTED]	09/01/15	[REDACTED]	09/01/15
<b>5 MILE LANE.</b>				Contract No:	<b>PSL14/6467</b>
				Client Ref:	<b>C4414</b>


# SUMMARY OF SOIL CLASSIFICATION TESTS

(B.S. 1377 : PART 2 : 1990)

Hole Number	Sample Number	Sample Type	Depth m	Moisture Content % <small>Clause 3.2</small>	Bulk Density Mg/m <sup>3</sup> <small>Clause 7.2</small>	Dry Density Mg/m <sup>3</sup> <small>Clause 7.2</small>	Particle Density Mg/m <sup>3</sup> <small>Clause 8.2</small>	Liquid Limit % <small>Clause 4.3/4.4</small>	Plastic Limit % <small>Clause 5.3</small>	Plasticity Index % <small>Clause 5.4</small>	% Passing .425mm	Remarks
TP201		B	0.50	32				75	31	44	96	Very high plasticity CV.
TP202		B	0.50	39				79	33	46	95	Very high plasticity CV.
TP203		B	0.50	30				64	28	36	28	High plasticity CH.
TP204		B	1.00	44				72	30	42	83	Very high plasticity CV.
TP205		B	0.50	34				69	30	39	99	High plasticity CH.
TP206		B	0.50	30				64	28	36	97	High plasticity CH.
TP207		B	0.80	41				68	29	39	37	High plasticity CH.
TP208		B	0.50	45				78	33	45	99	Very high plasticity CV.
TP209		B	0.50	41				80	33	47	96	Very high plasticity CV.
TP211		B	0.50	23				65	29	36	31	High plasticity CH.
TP212		B	0.60	27				65	28	37	39	High plasticity CH.
TP213		B	0.50	31				69	29	40	96	High plasticity CH.
TP214		B	0.50	39				76	32	44	98	Very high plasticity CV.
TP215		B	0.30	50				79	32	47	93	Very high plasticity CV.
TP217		B	0.50	38				80	33	47	97	Very high plasticity CV.
TP217		B	1.70	31				66	28	38	81	High plasticity CH.
TP218		B	2.00	23				57	28	29	92	High plasticity CH.
TP219		B	1.00	29				73	30	43	94	Very high plasticity CV.
TP219		B	2.10	25				58	28	30	97	High plasticity CH.

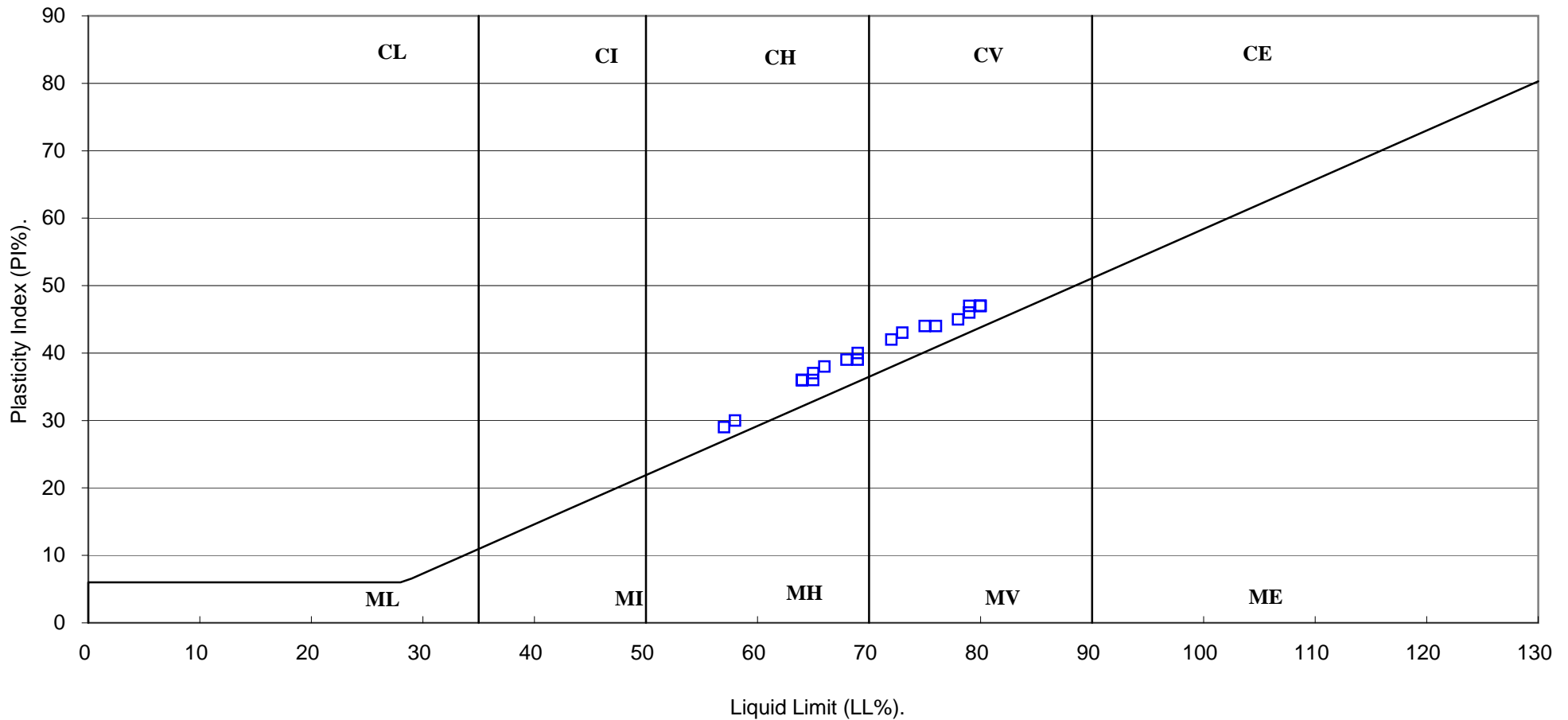
SYMBOLS : NP : Non Plastic

\* : Liquid Limit and Plastic Limit Wet Sieved.

 <b>Professional Soils Laboratory</b>	Compiled by	Date	Checked by	Date	Approved by	Date	
	██████████	09/01/15	██████████	09/01/15	██████████	09/01/15	
	5 MILE LANE.					Contract No:	PSL14/6467
						Client Ref:	C4414

# PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.

(B.S.5930 : 1999)



Compiled by	Date	Checked by	Date	Approved by	Date
[Redacted]	09/01/15	[Redacted]	09/01/15	[Redacted]	09/01/15
5 MILE LANE.				Contract No:	PSL14/6467
				Client Ref:	C4414

# Particle Size Distribution Test

BS1377 : Part 2 : 1990

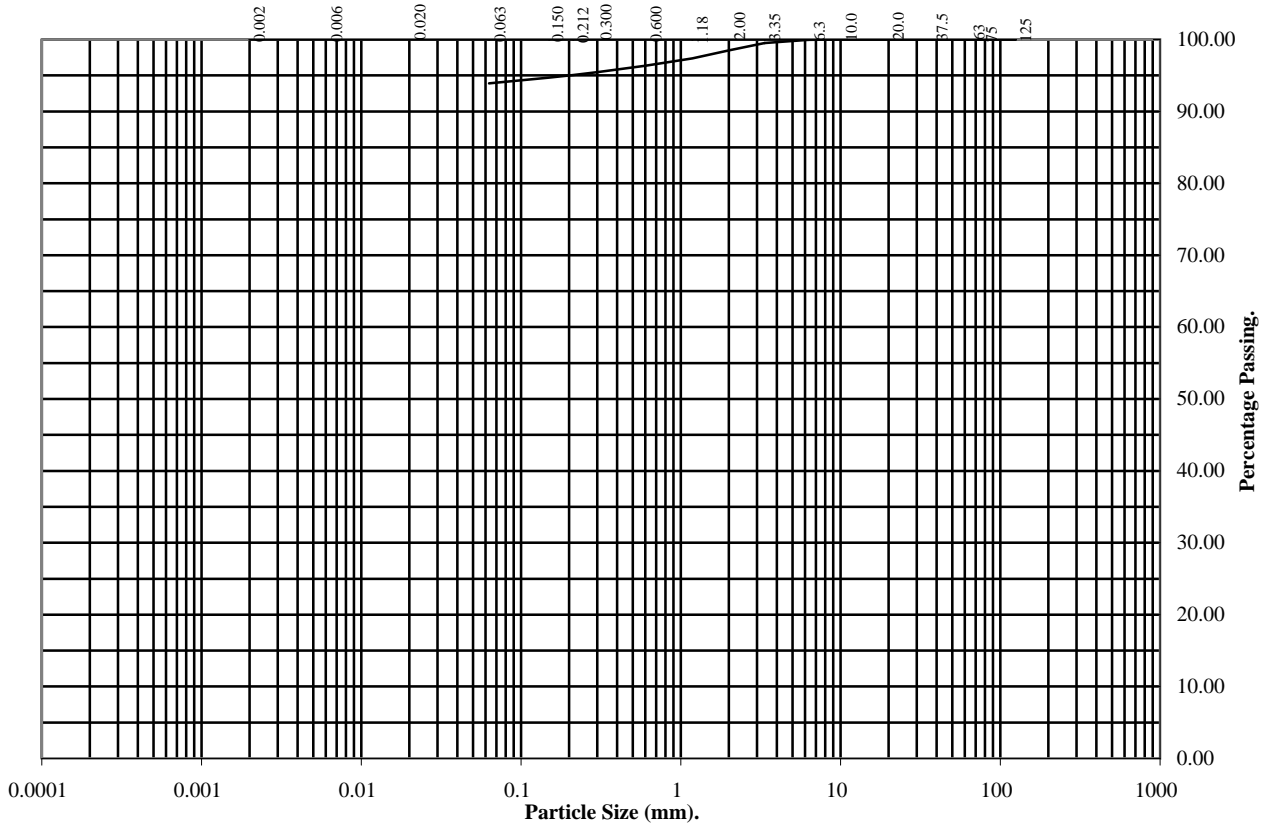
Wet Sieve, Clause 9.2

Hole Number: **TP201**

Depth (m): **0.50**

Sample Number:

Sample Type: **B**



BS Test Sieve	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	100
3.35	100
2	98
1.18	97
0.6	96
0.3	95
0.212	95
0.15	95
0.063	94

Soil Fraction	Total Percentage
Cobbles	0
Gravel	2
Sand	4
Silt / Clay	94

**Remarks:**  
See summary of soil descriptions.

Checked By	Date	Approved By	Date
[Redacted]	09/01/15	[Redacted]	09/01/15

 <b>Professional Soils Laboratory</b>	<b>5 MILE LANE.</b>	<b>Contract No.:</b> <b>PSL14/6467</b>
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# Particle Size Distribution Test

BS1377 : Part 2 : 1990

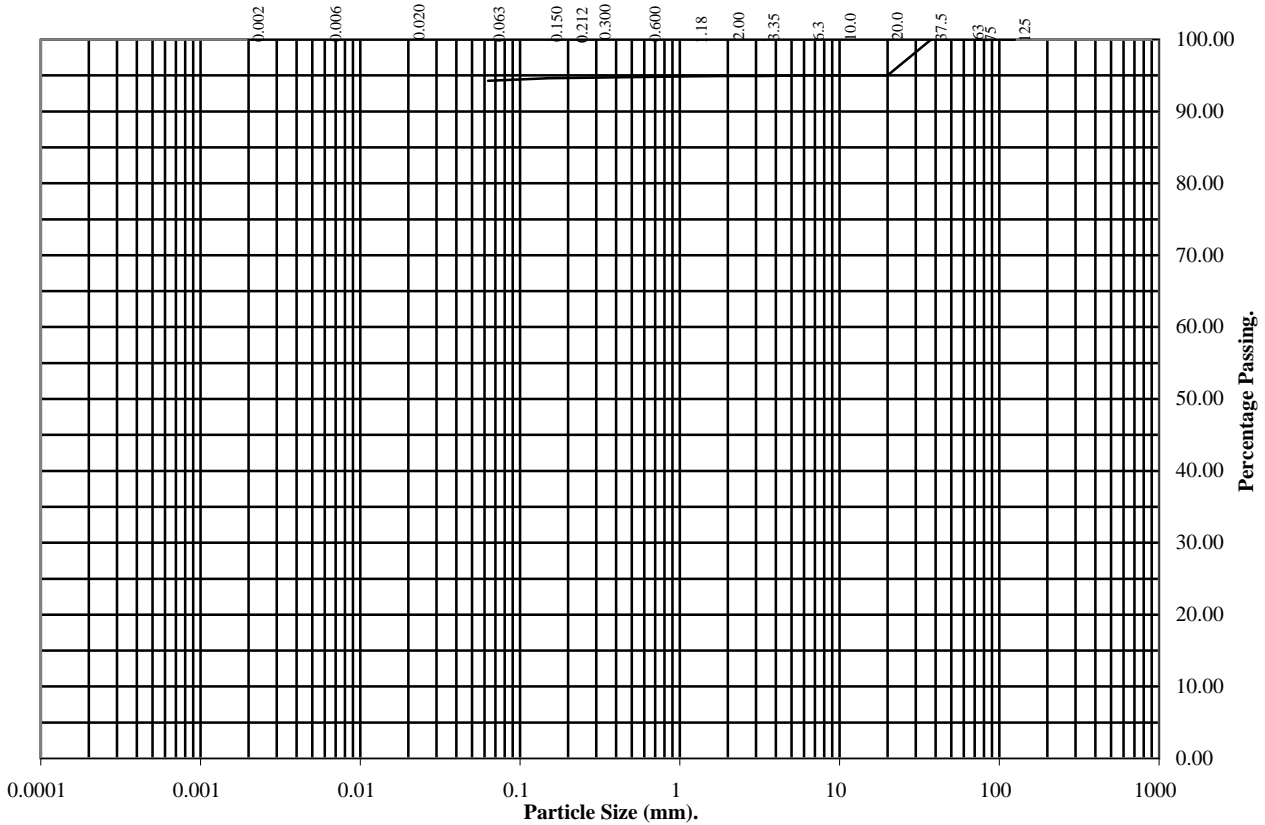
Wet Sieve, Clause 9.2

Hole Number: TP202

Depth (m): 0.50

Sample Number:

Sample Type: B




BS Test Sieve	Percentage Passing
125	100
75	100
63	100
37.5	100
20	95
10	95
6.3	95
3.35	95
2	95
1.18	95
0.6	95
0.3	95
0.212	95
0.15	95
0.063	94

Soil Fraction	Total Percentage
Cobbles	0
Gravel	5
Sand	1
Silt / Clay	94

**Remarks:**  
See summary of soil descriptions.

Checked By	Date	Approved By	Date
[Redacted]	09/01/15	[Redacted]	09/01/15

 <b>Professional Soils Laboratory</b>	<b>5 MILE LANE.</b>	<b>Contract No.:</b> <b>PSL14/6467</b>
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# Particle Size Distribution Test

BS1377 : Part 2 : 1990

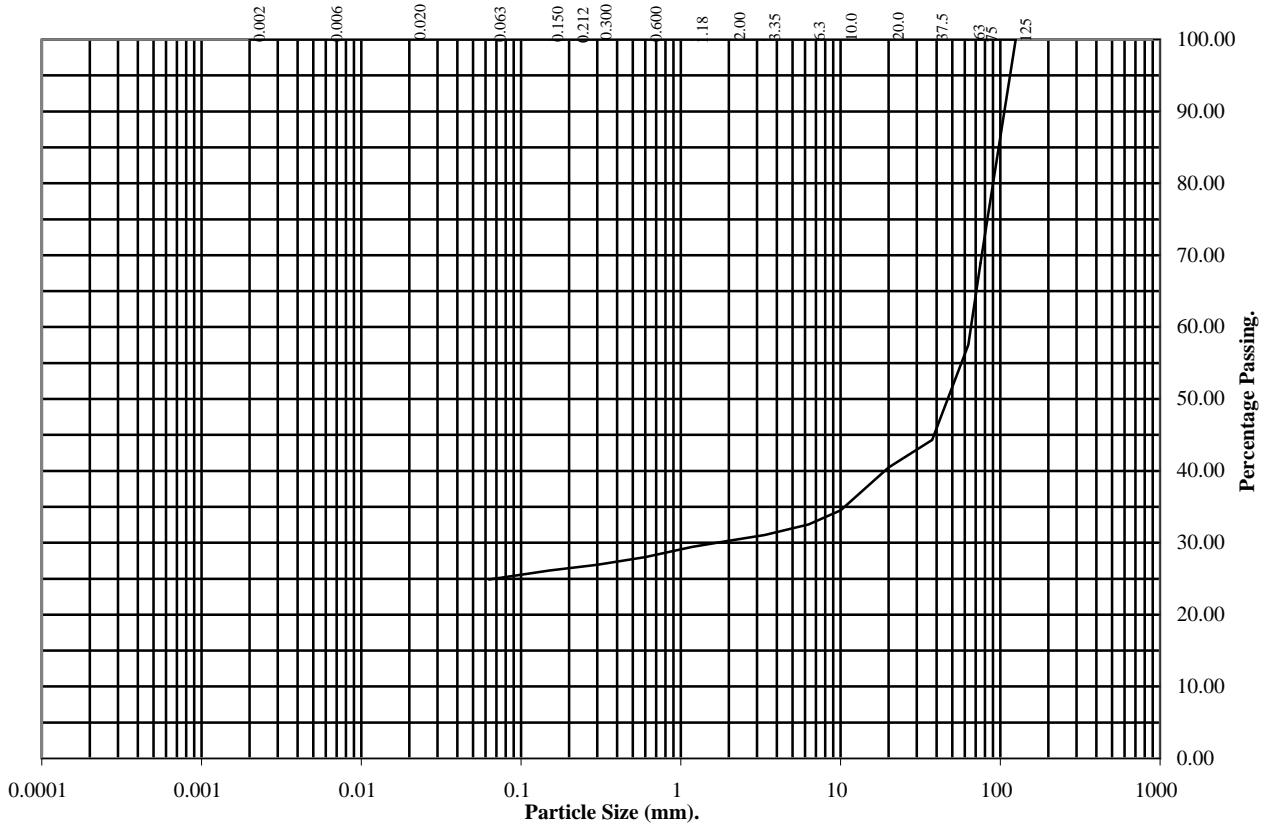
Wet Sieve, Clause 9.2

Hole Number: TP203

Depth (m): 0.50

Sample Number:

Sample Type: B



BS Test Sieve	Percentage Passing
125	100
75	69
63	58
37.5	44
20	40
10	34
6.3	33
3.35	31
2	30
1.18	29
0.6	28
0.3	27
0.212	27
0.15	26
0.063	25

Soil Fraction	Total Percentage
Cobbles	42
Gravel	28
Sand	5
Silt / Clay	25

**Remarks:**  
See summary of soil descriptions.

Checked By	Date	Approved By	Date
[Redacted]	09/01/15	[Redacted]	09/01/15

 <b>Professional Soils Laboratory</b>	<b>5 MILE LANE.</b>	<b>Contract No.:</b> <b>PSL14/6467</b>
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# Particle Size Distribution Test

BS1377 : Part 2 : 1990

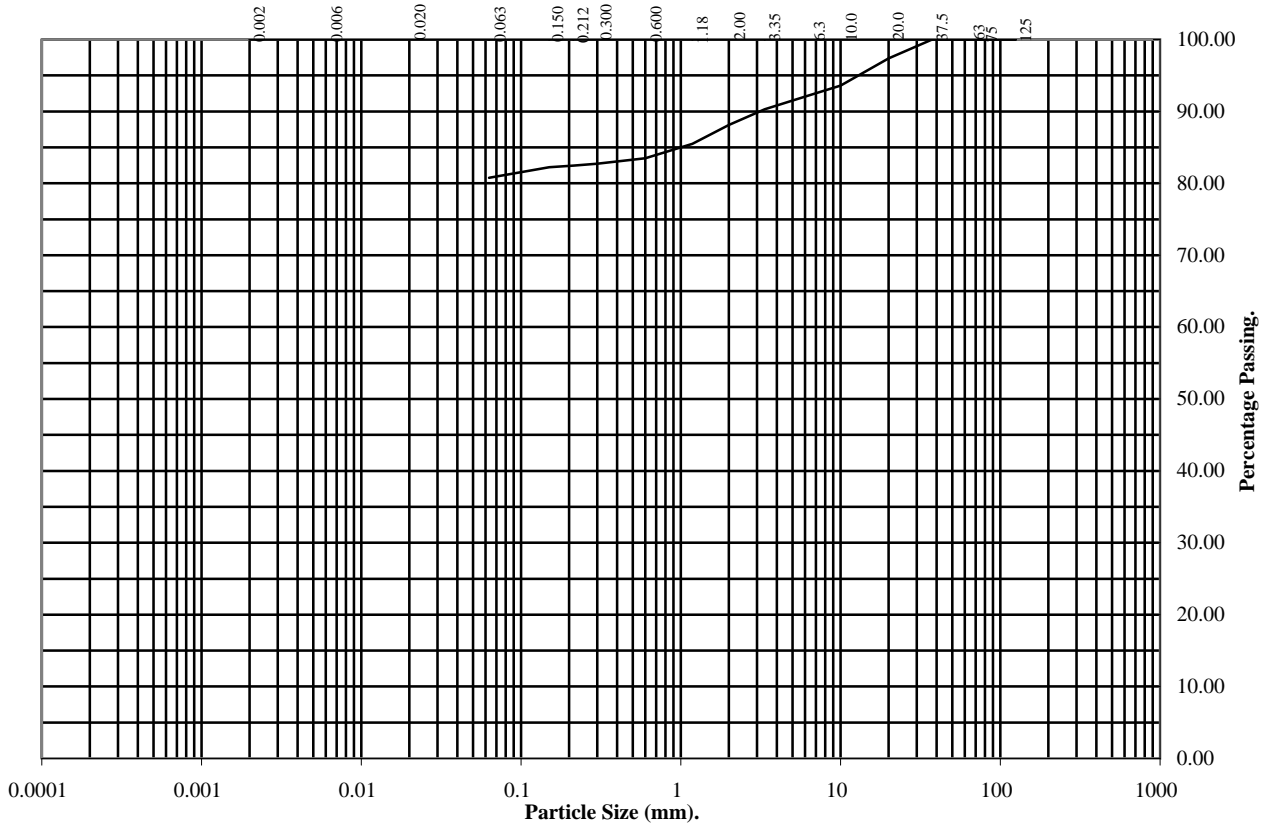
Wet Sieve, Clause 9.2

Hole Number: **TP204**

Depth (m): **1.00**

Sample Number:

Sample Type: **B**




BS Test Sieve	Percentage Passing
125	100
75	100
63	100
37.5	100
20	97
10	94
6.3	92
3.35	90
2	88
1.18	85
0.6	83
0.3	83
0.212	82
0.15	82
0.063	81

Soil Fraction	Total Percentage
Cobbles	0
Gravel	12
Sand	7
Silt / Clay	81

**Remarks:**  
See summary of soil descriptions.

Checked By	Date	Approved By	Date
[Redacted]	09/01/15	[Redacted]	09/01/15

 <b>Professional Soils Laboratory</b>	<b>5 MILE LANE.</b>	<b>Contract No.:</b> <b>PSL14/6467</b>
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# Particle Size Distribution Test

BS1377 : Part 2 : 1990

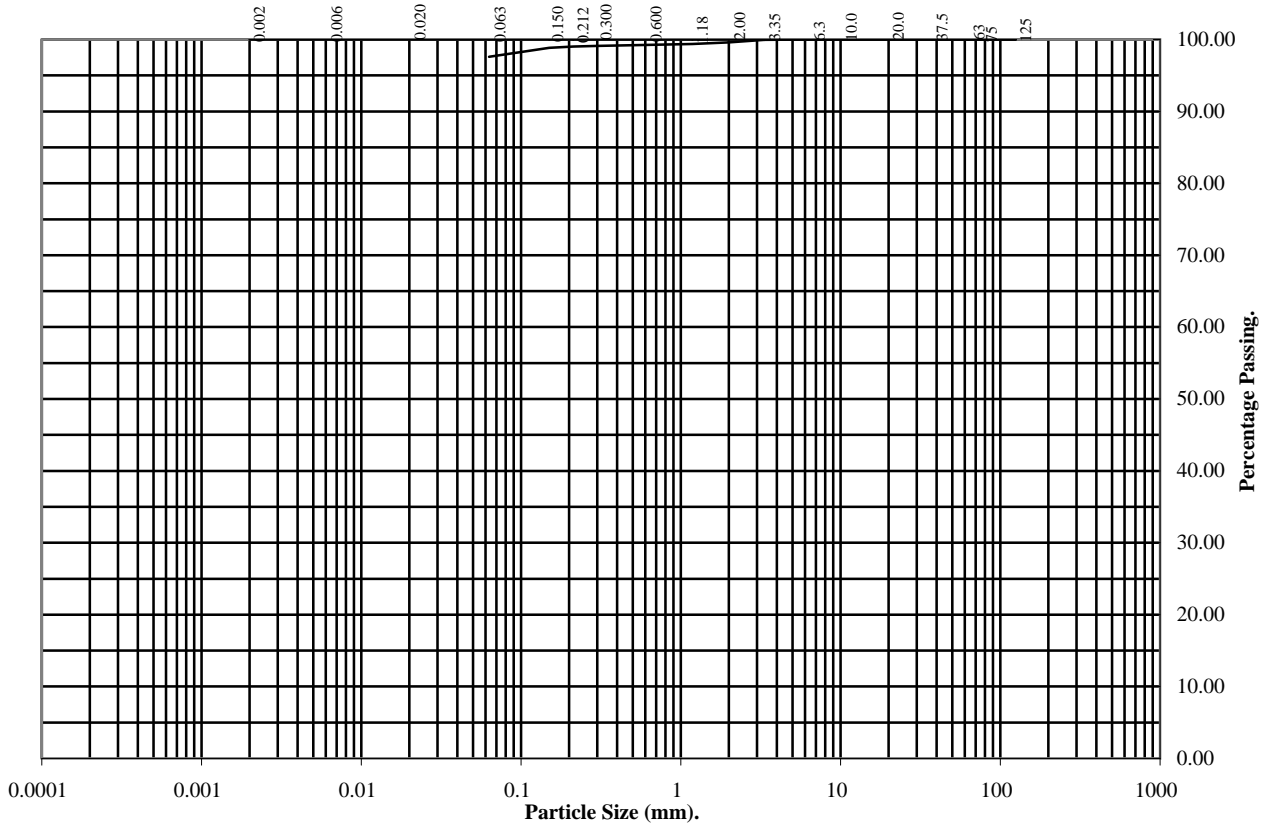
Wet Sieve, Clause 9.2

Hole Number: **TP205**

Depth (m): **0.50**

Sample Number:

Sample Type: **B**




BS Test Sieve	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	100
3.35	100
2	100
1.18	99
0.6	99
0.3	99
0.212	99
0.15	99
0.063	98

Soil Fraction	Total Percentage
Cobbles	0
Gravel	0
Sand	2
Silt / Clay	98

**Remarks:**  
See summary of soil descriptions.

Checked By	Date	Approved By	Date
[Redacted]	09/01/15	[Redacted]	09/01/15

 <b>Professional Soils Laboratory</b>	<b>5 MILE LANE.</b>	<b>Contract No.:</b> <b>PSL14/6467</b>
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# Particle Size Distribution Test

BS1377 : Part 2 : 1990

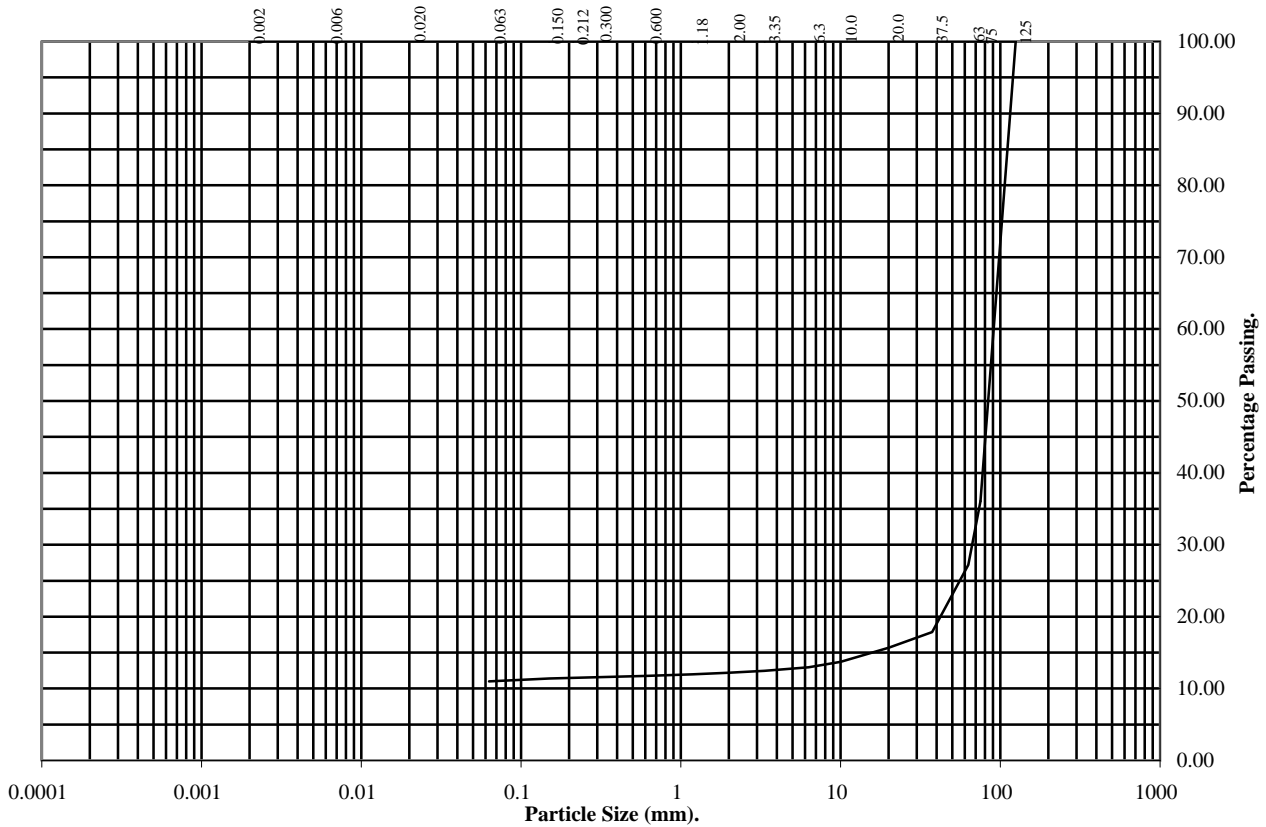
Wet Sieve, Clause 9.2

Hole Number: TP205

Depth (m): 1.00

Sample Number:

Sample Type: B




BS Test Sieve	Percentage Passing
125	100
75	36
63	27
37.5	18
20	16
10	14
6.3	13
3.35	12
2	12
1.18	12
0.6	12
0.3	12
0.212	11
0.15	11
0.063	11

Soil Fraction	Total Percentage
Cobbles	73
Gravel	15
Sand	1
Silt / Clay	11

**Remarks:**  
See summary of soil descriptions.

Checked By	Date	Approved By	Date
[Redacted]	09/01/15	[Redacted]	09/01/15

 <b>Professional Soils Laboratory</b>	<b>5 MILE LANE.</b>	<b>Contract No.:</b> <b>PSL14/6467</b>
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# Particle Size Distribution Test

BS1377 : Part 2 : 1990

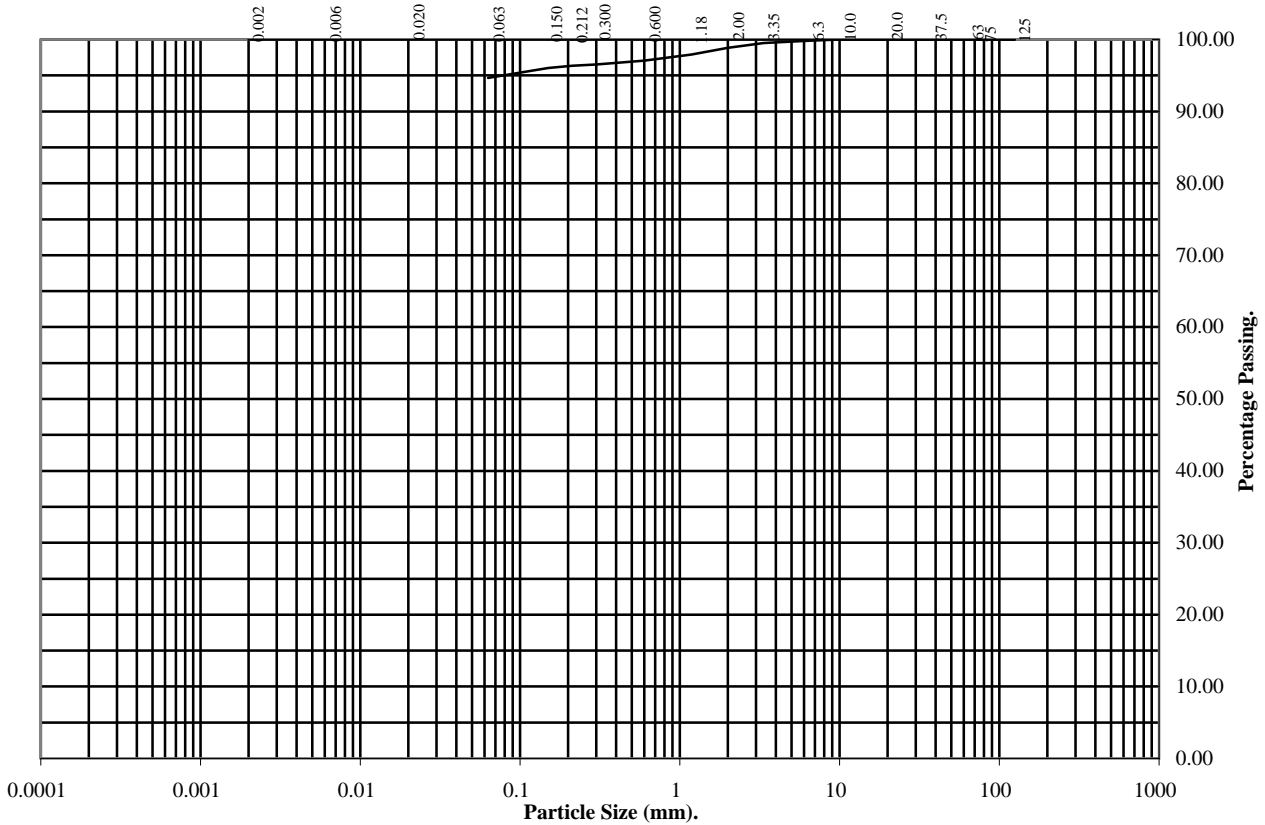
Wet Sieve, Clause 9.2

Hole Number: TP206

Depth (m): 0.50

Sample Number:

Sample Type: B



BS Test Sieve	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	100
3.35	100
2	99
1.18	98
0.6	97
0.3	97
0.212	96
0.15	96
0.063	95

Soil Fraction	Total Percentage
Cobbles	0
Gravel	1
Sand	4
Silt / Clay	95

**Remarks:**  
See summary of soil descriptions.

Checked By	Date	Approved By	Date
[Redacted]	09/01/15	[Redacted]	09/01/15

	<p>5 MILE LANE.</p>	<p>Contract No.: PSL14/6467</p>
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# Particle Size Distribution Test

BS1377 : Part 2 : 1990

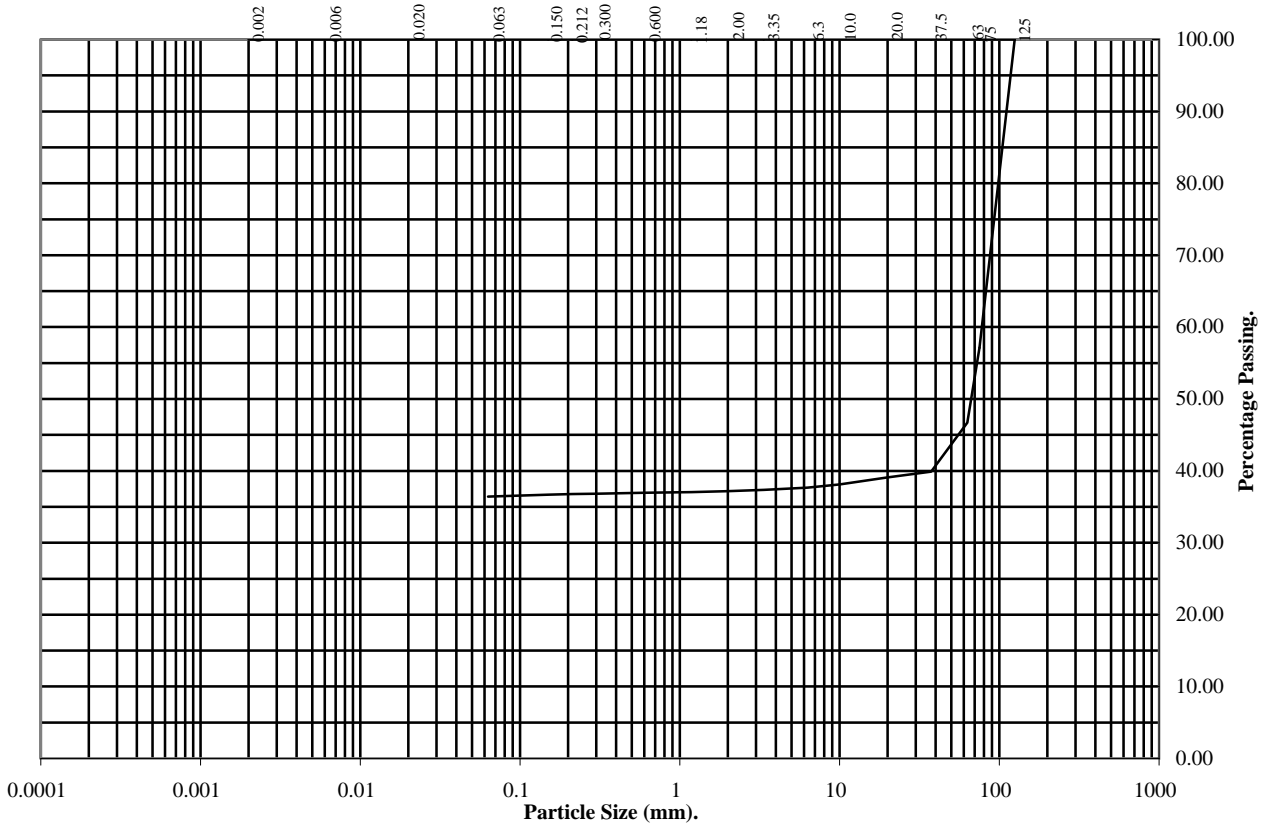
Wet Sieve, Clause 9.2

Hole Number: **TP207**

Depth (m): **0.80**

Sample Number:

Sample Type: **B**




BS Test Sieve	Percentage Passing
125	100
75	57
63	47
37.5	40
20	39
10	38
6.3	38
3.35	37
2	37
1.18	37
0.6	37
0.3	37
0.212	37
0.15	37
0.063	36

Soil Fraction	Total Percentage
Cobbles	53
Gravel	10
Sand	1
Silt / Clay	36

**Remarks:**  
See summary of soil descriptions.

Checked By	Date	Approved By	Date
[Redacted]	09/01/15	[Redacted]	09/01/15

 <b>Professional Soils Laboratory</b>	<b>5 MILE LANE.</b>	<b>Contract No.:</b> <b>PSL14/6467</b>
---	---------------------	---

# Particle Size Distribution Test

BS1377 : Part 2 : 1990

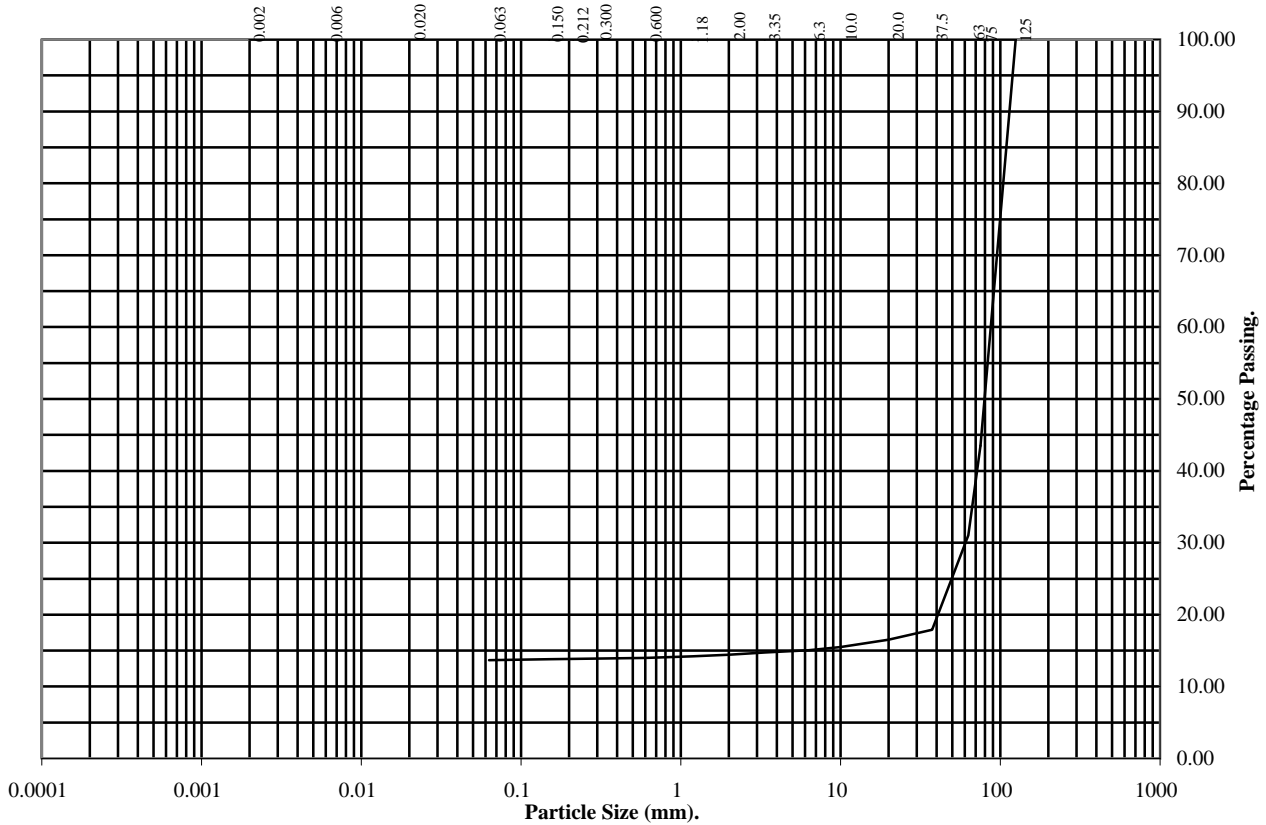
Wet Sieve, Clause 9.2

Hole Number: TP207

Depth (m): 1.20

Sample Number:

Sample Type: B



BS Test Sieve	Percentage Passing
125	100
75	43
63	31
37.5	18
20	17
10	15
6.3	15
3.35	15
2	14
1.18	14
0.6	14
0.3	14
0.212	14
0.15	14
0.063	14

Soil Fraction	Total Percentage
Cobbles	69
Gravel	17
Sand	0
Silt / Clay	14

**Remarks:**  
See summary of soil descriptions.

Checked By	Date	Approved By	Date
[Redacted]	09/01/15	[Redacted]	09/01/15

 <b>Professional Soils Laboratory</b>	<b>5 MILE LANE.</b>	<b>Contract No.:</b> <b>PSL14/6467</b>
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# Particle Size Distribution Test

BS1377 : Part 2 : 1990

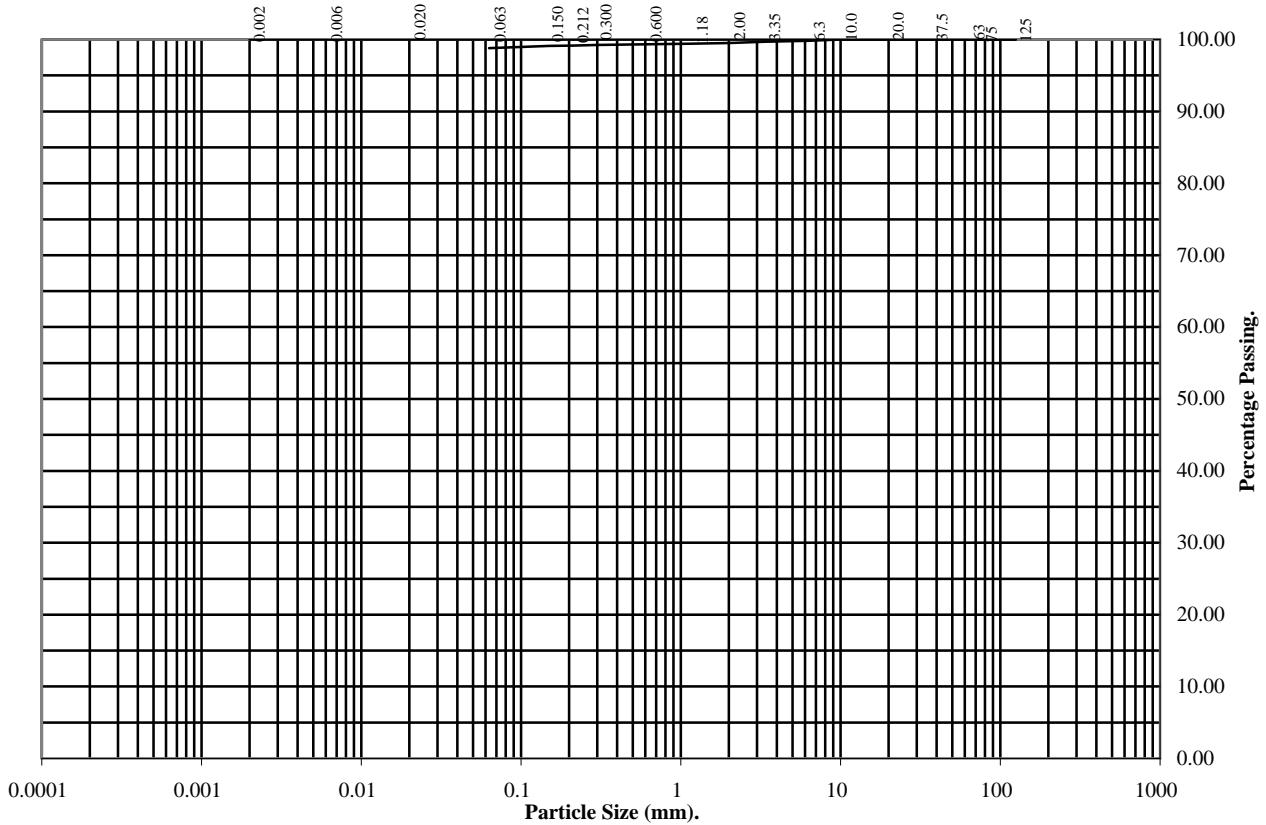
Wet Sieve, Clause 9.2

Hole Number: TP208

Depth (m): 0.50

Sample Number:

Sample Type: B



BS Test Sieve	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	100
3.35	100
2	100
1.18	99
0.6	99
0.3	99
0.212	99
0.15	99
0.063	99

Soil Fraction	Total Percentage
Cobbles	0
Gravel	0
Sand	1
Silt / Clay	99

**Remarks:**  
See summary of soil descriptions.

Checked By	Date	Approved By	Date
[Signature]	09/01/15	[Signature]	09/01/15

	<p>5 MILE LANE.</p>	<p>Contract No.: PSL14/6467</p>
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# Particle Size Distribution Test

BS1377 : Part 2 : 1990

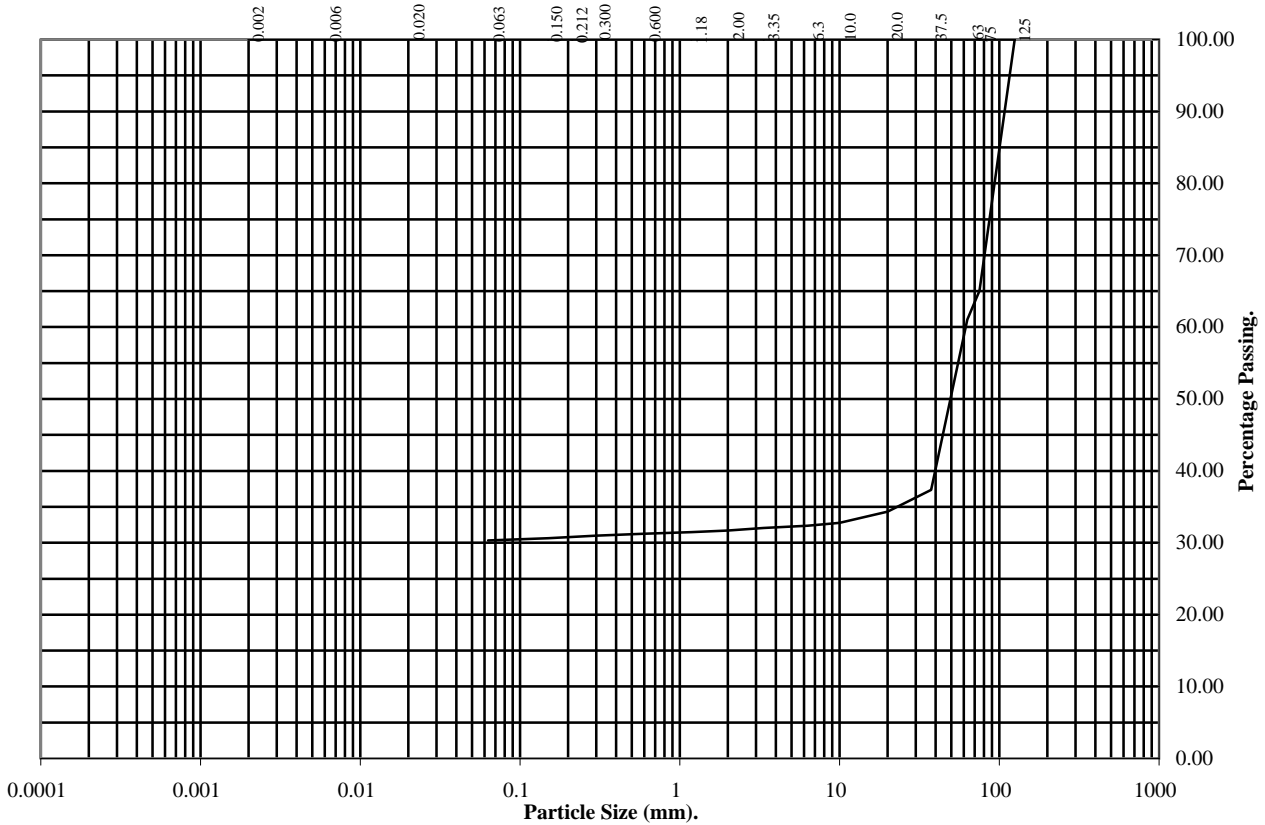
Wet Sieve, Clause 9.2

Hole Number: TP211

Depth (m): 0.50

Sample Number:

Sample Type: B



BS Test Sieve	Percentage Passing
125	100
75	65
63	61
37.5	37
20	34
10	33
6.3	32
3.35	32
2	32
1.18	31
0.6	31
0.3	31
0.212	31
0.15	31
0.063	30

Soil Fraction	Total Percentage
Cobbles	39
Gravel	29
Sand	2
Silt / Clay	30

**Remarks:**  
See summary of soil descriptions.

Checked By	Date	Approved By	Date
[Redacted]	09/01/15	[Redacted]	09/01/15

	<p>5 MILE LANE.</p>	<p>Contract No.: PSL14/6467</p>
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# Particle Size Distribution Test

BS1377 : Part 2 : 1990

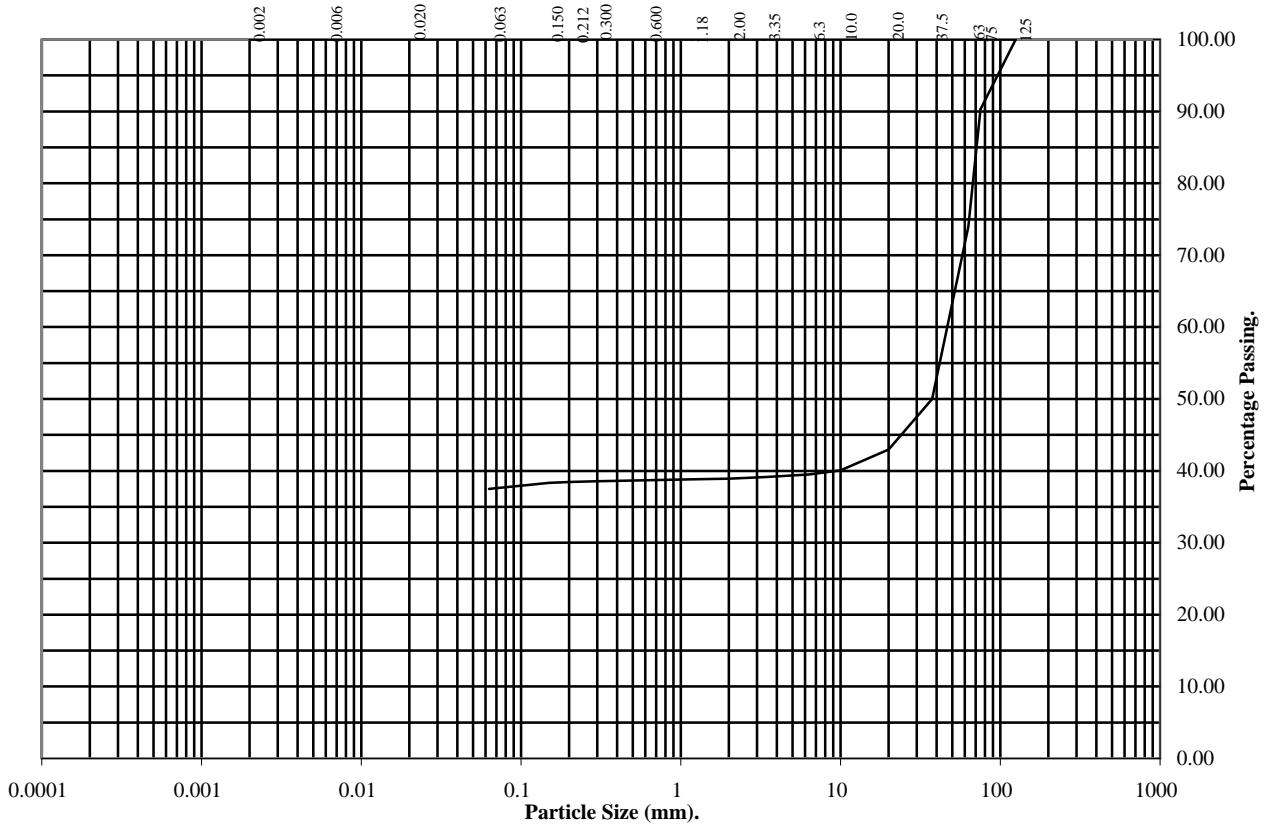
Wet Sieve, Clause 9.2

Hole Number: TP212

Depth (m): 0.60

Sample Number:

Sample Type: B




BS Test Sieve	Percentage Passing
125	100
75	90
63	74
37.5	50
20	43
10	40
6.3	39
3.35	39
2	39
1.18	39
0.6	39
0.3	39
0.212	38
0.15	38
0.063	38

Soil Fraction	Total Percentage
Cobbles	26
Gravel	35
Sand	1
Silt / Clay	38

**Remarks:**  
See summary of soil descriptions.

Checked By	Date	Approved By	Date
[Redacted]	09/01/15	[Signature]	09/01/15

 <b>Professional Soils Laboratory</b>	<b>5 MILE LANE.</b>	<b>Contract No.:</b> <b>PSL14/6467</b>
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# Particle Size Distribution Test

BS1377 : Part 2 : 1990

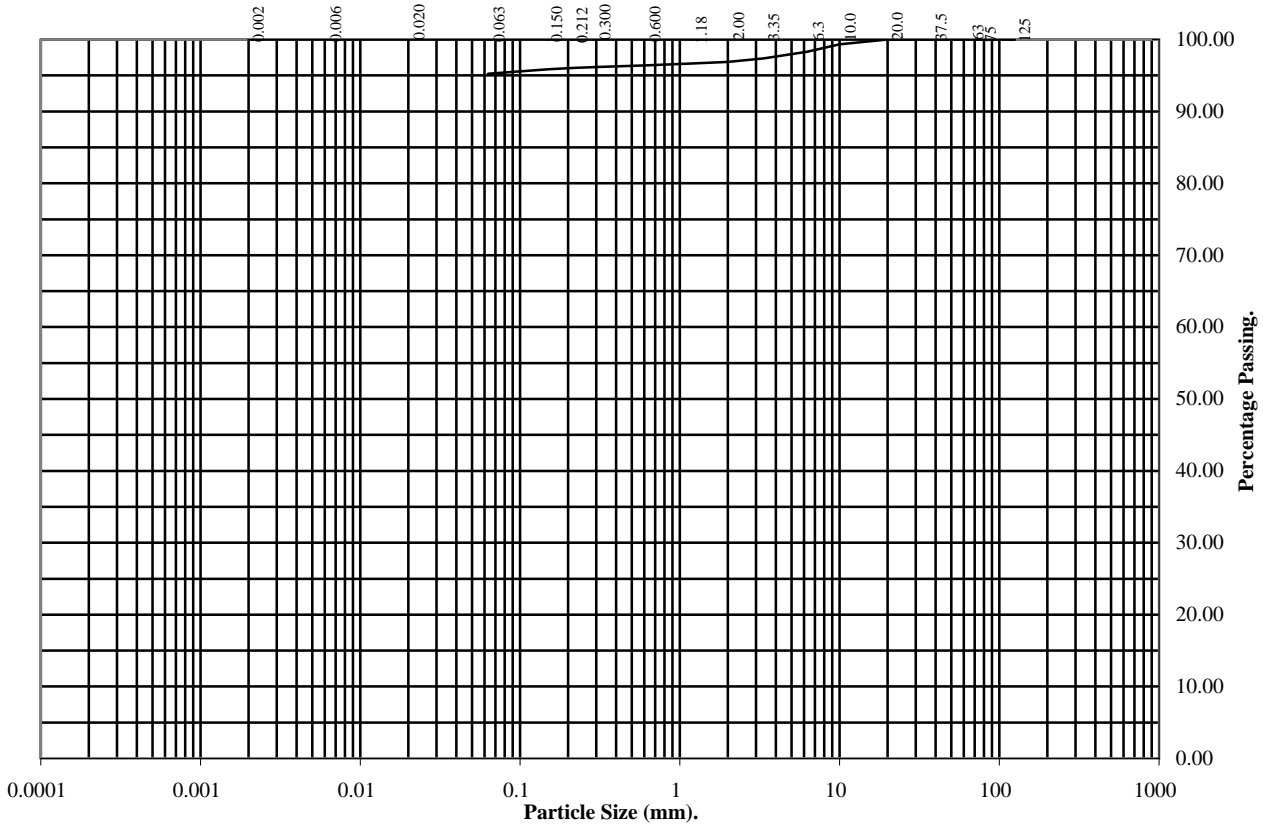
Wet Sieve, Clause 9.2

Hole Number: TP213

Depth (m): 0.50

Sample Number:

Sample Type: B




BS Test Sieve	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	99
6.3	98
3.35	97
2	97
1.18	97
0.6	96
0.3	96
0.212	96
0.15	96
0.063	95

Soil Fraction	Total Percentage
Cobbles	0
Gravel	3
Sand	2
Silt / Clay	95

**Remarks:**  
See summary of soil descriptions.

Checked By	Date	Approved By	Date
[Redacted]	[Redacted]	[Redacted]	09/01/15

 <b>Professional Soils Laboratory</b>	<b>5 MILE LANE.</b>	<b>Contract No.:</b> <b>PSL14/6467</b>
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# Particle Size Distribution Test

BS1377 : Part 2 : 1990

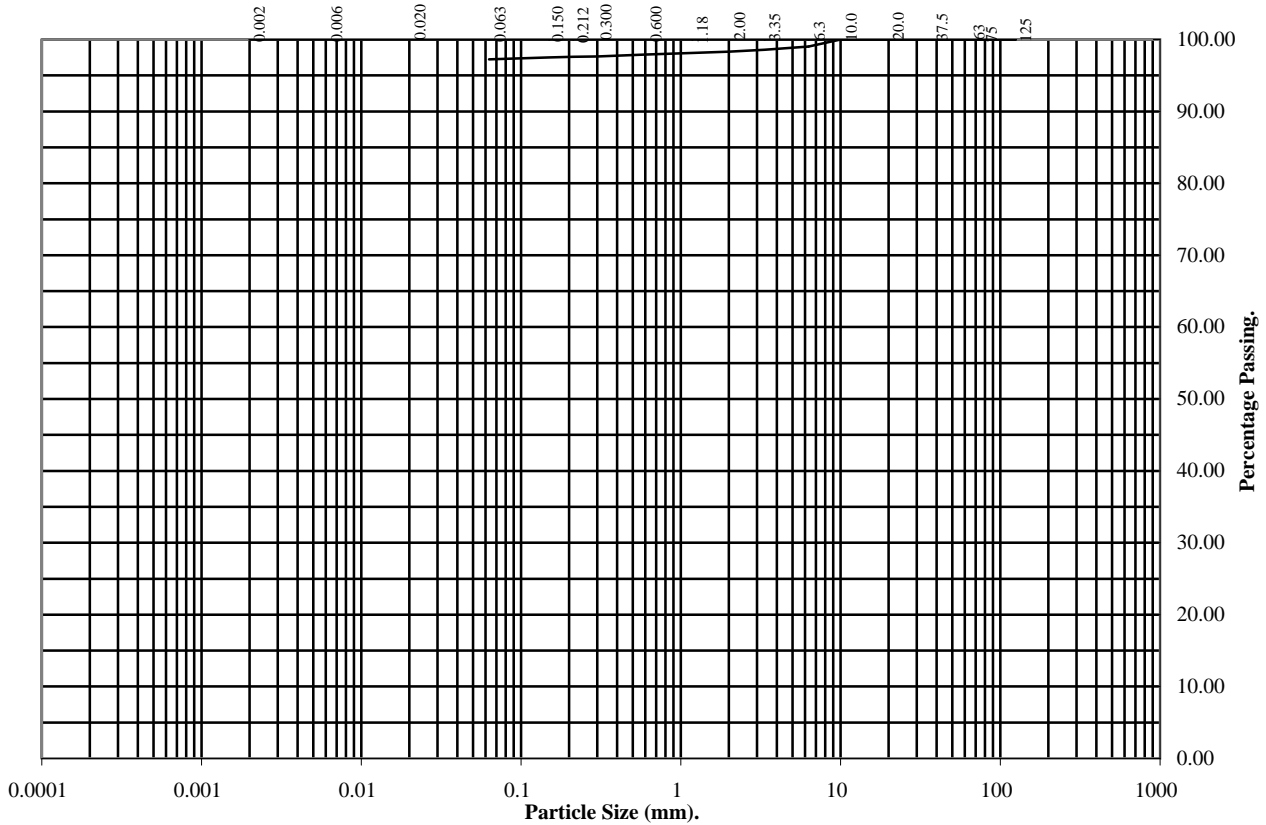
Wet Sieve, Clause 9.2

Hole Number: TP214

Depth (m): 0.50

Sample Number:

Sample Type: B



BS Test Sieve	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	99
3.35	99
2	98
1.18	98
0.6	98
0.3	98
0.212	98
0.15	98
0.063	97

Soil Fraction	Total Percentage
Cobbles	0
Gravel	2
Sand	1
Silt / Clay	97

**Remarks:**  
See summary of soil descriptions.

Checked By	Date	Approved By	Date
			09/01/15

 <b>Professional Soils Laboratory</b>	<b>5 MILE LANE.</b>	<b>Contract No.:</b> <b>PSL14/6467</b>
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# Particle Size Distribution Test

BS1377 : Part 2 : 1990

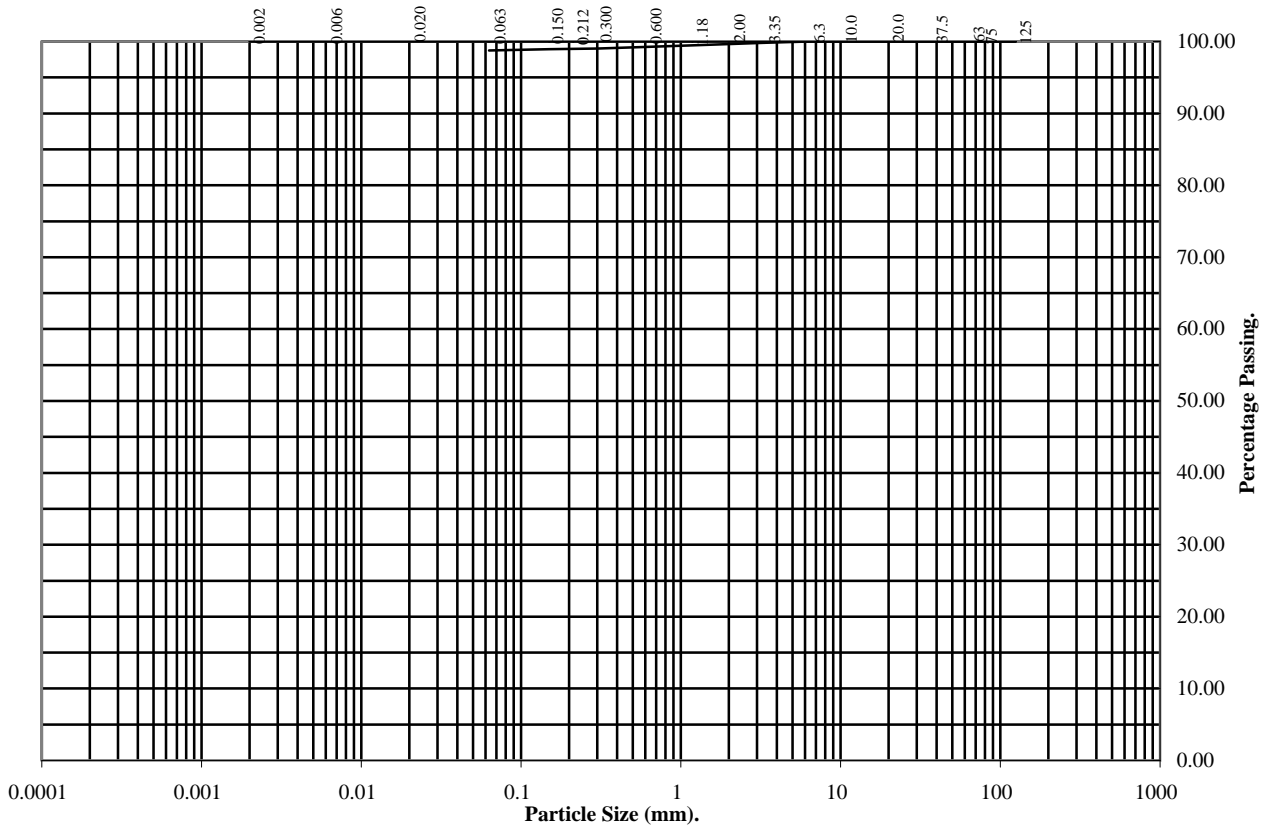
Wet Sieve, Clause 9.2

Hole Number: TP214

Depth (m): 1.00

Sample Number:

Sample Type: B




BS Test Sieve	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	100
3.35	100
2	100
1.18	99
0.6	99
0.3	99
0.212	99
0.15	99
0.063	99

Soil Fraction	Total Percentage
Cobbles	0
Gravel	0
Sand	1
Silt / Clay	99

**Remarks:**  
See summary of soil descriptions.

Checked By	Date	Approved By	Date
			09/01/15

 <b>Professional Soils Laboratory</b>	<b>5 MILE LANE.</b>	<b>Contract No.:</b> <b>PSL14/6467</b>
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# Particle Size Distribution Test

BS1377 : Part 2 : 1990

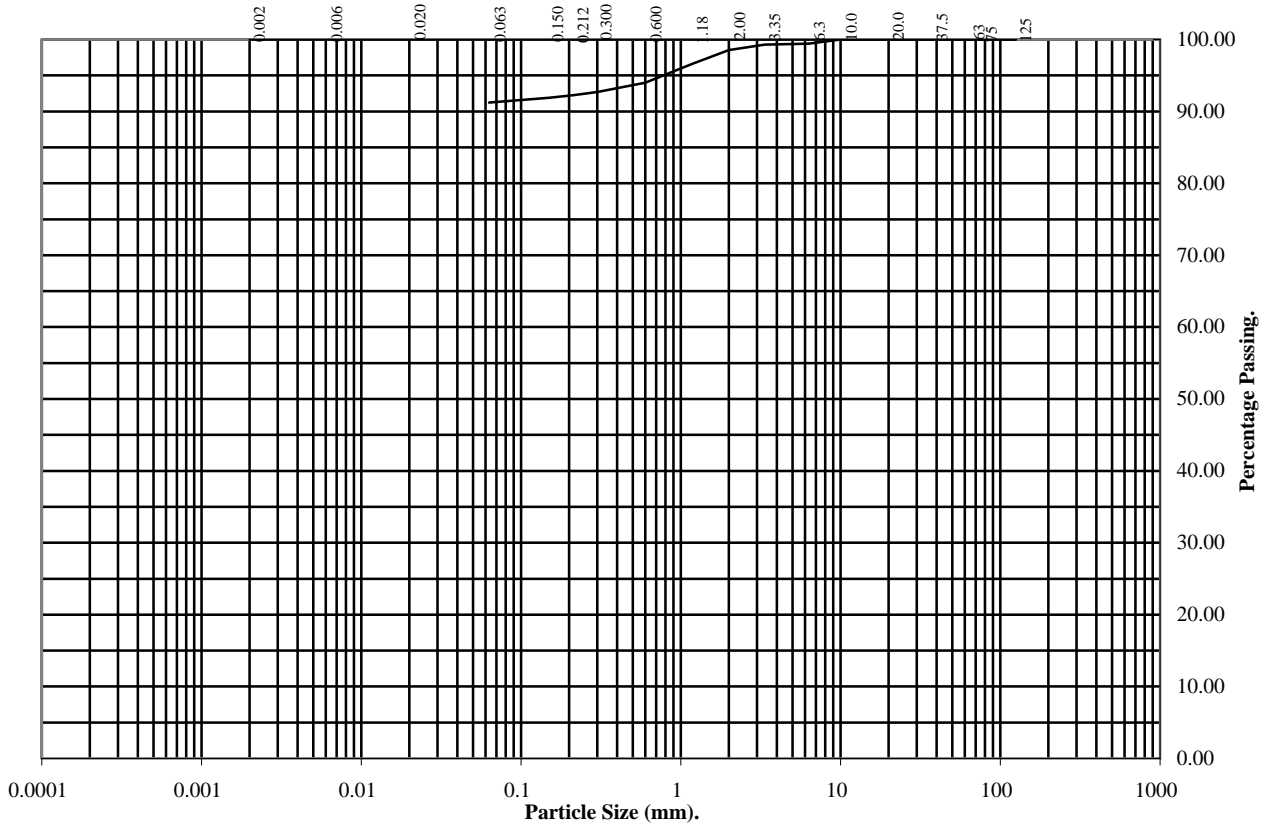
Wet Sieve, Clause 9.2

Hole Number: TP215

Depth (m): 0.30

Sample Number:

Sample Type: B




BS Test Sieve	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	99
3.35	99
2	99
1.18	97
0.6	94
0.3	93
0.212	92
0.15	92
0.063	91

Soil Fraction	Total Percentage
Cobbles	0
Gravel	1
Sand	8
Silt / Clay	91

**Remarks:**  
See summary of soil descriptions.

Checked By	Date	Approved By	Date
[Redacted]	[Redacted]	[Redacted]	09/01/15

 <b>Professional Soils Laboratory</b>	<b>5 MILE LANE.</b>	<b>Contract No.:</b> <b>PSL14/6467</b>
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# Particle Size Distribution Test

BS1377 : Part 2 : 1990

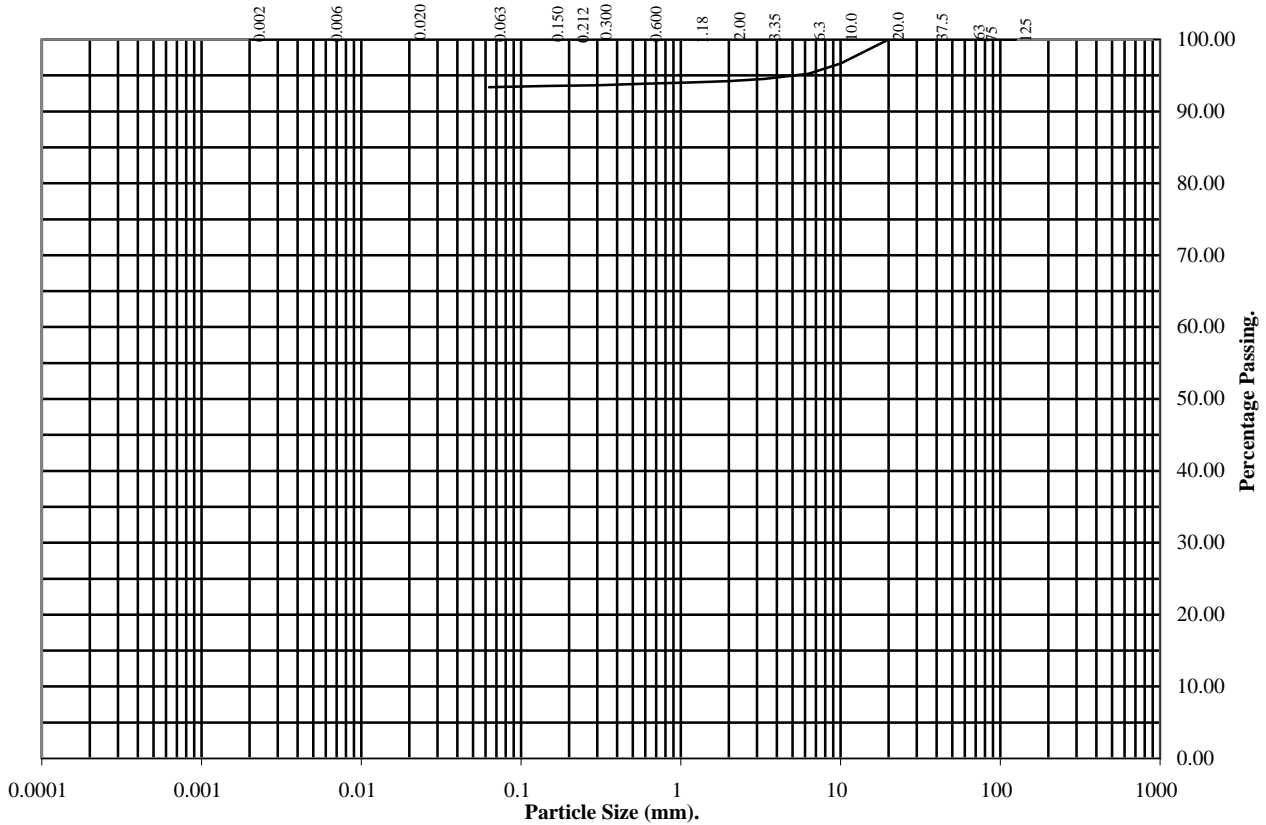
Wet Sieve, Clause 9.2

Hole Number: **TP215**

Depth (m): **1.10**

Sample Number:

Sample Type: **B**



BS Test Sieve	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	97
6.3	95
3.35	95
2	94
1.18	94
0.6	94
0.3	94
0.212	94
0.15	94
0.063	93

Soil Fraction	Total Percentage
Cobbles	0
Gravel	6
Sand	1
Silt / Clay	93

**Remarks:**  
See summary of soil descriptions.

Checked By	Date	Approved By	Date
			09/01/15

 <b>Professional Soils Laboratory</b>	<b>5 MILE LANE.</b>	<b>Contract No.:</b> <b>PSL14/6467</b>
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# Particle Size Distribution Test

BS1377 : Part 2 : 1990

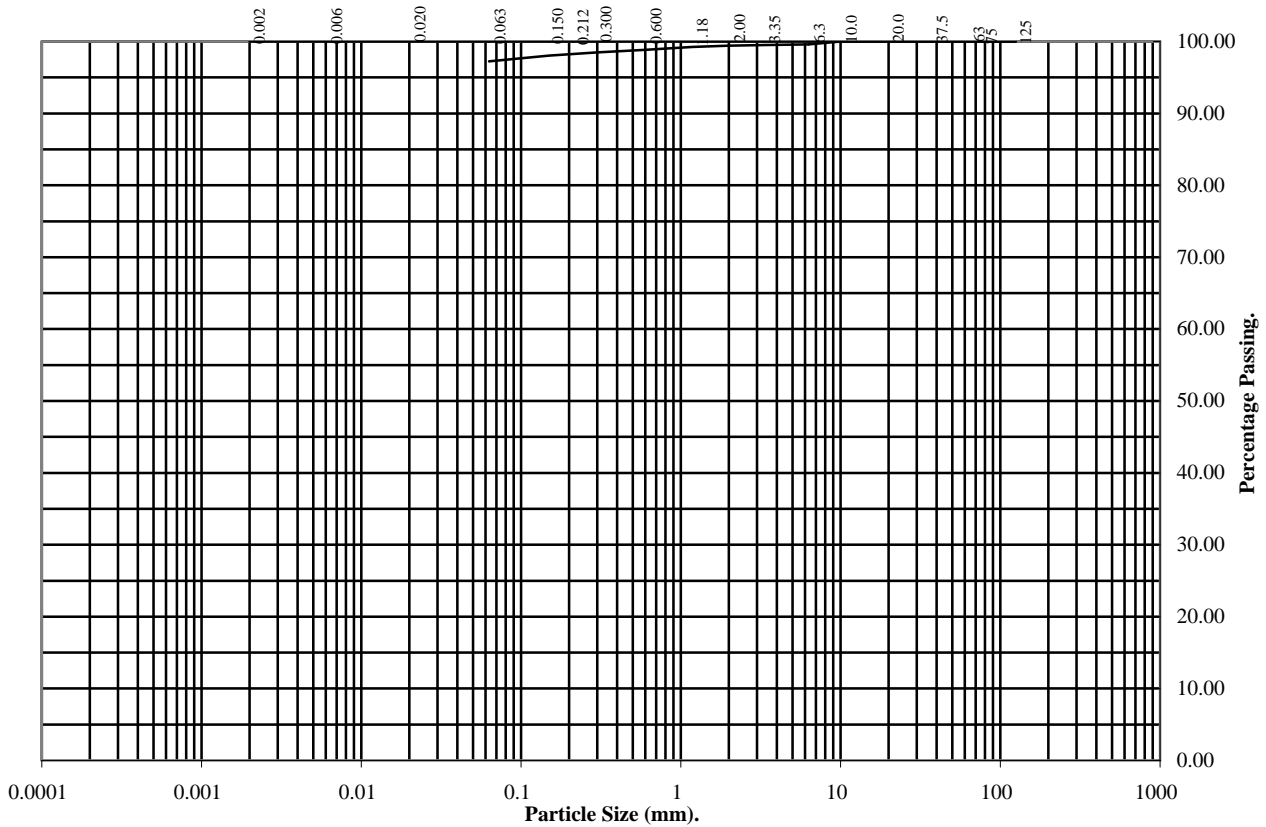
Wet Sieve, Clause 9.2

Hole Number: TP217

Depth (m): 0.50

Sample Number:

Sample Type: B




BS Test Sieve	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	100
3.35	100
2	99
1.18	99
0.6	99
0.3	98
0.212	98
0.15	98
0.063	97

Soil Fraction	Total Percentage
Cobbles	0
Gravel	1
Sand	2
Silt / Clay	97

**Remarks:**  
See summary of soil descriptions.

Checked By	Date	Approved By	Date
			09/01/15

 <b>Professional Soils Laboratory</b>	<b>5 MILE LANE.</b>	<b>Contract No.:</b> <b>PSL14/6467</b>
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# Particle Size Distribution Test

BS1377 : Part 2 : 1990

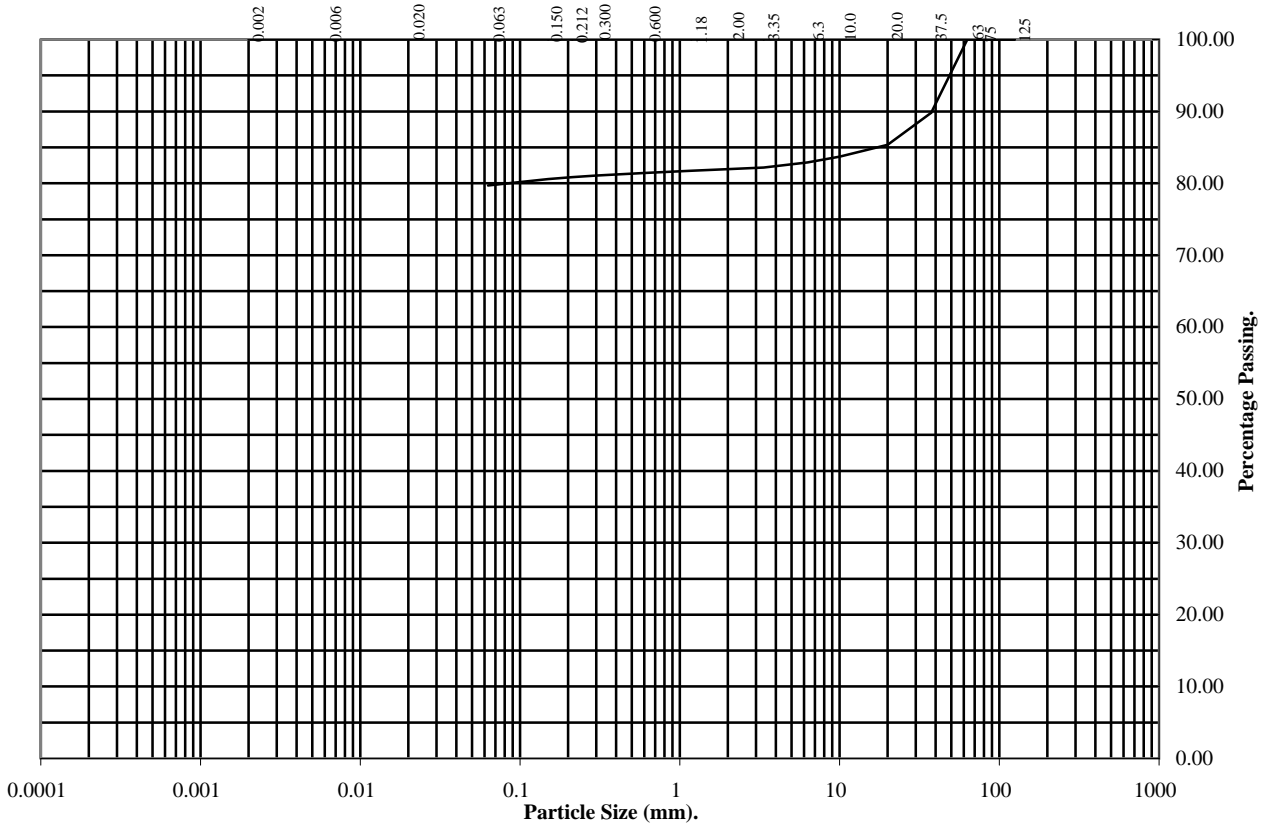
Wet Sieve, Clause 9.2

Hole Number: **TP217**

Depth (m): **1.70**

Sample Number:

Sample Type: **B**




BS Test Sieve	Percentage Passing
125	100
75	100
63	100
37.5	90
20	85
10	84
6.3	83
3.35	82
2	82
1.18	82
0.6	81
0.3	81
0.212	81
0.15	81
0.063	80

Soil Fraction	Total Percentage
Cobbles	0
Gravel	18
Sand	2
Silt / Clay	80

**Remarks:**  
See summary of soil descriptions.

Checked By	Date	Approved By	Date
			09/01/15

 <b>Professional Soils Laboratory</b>	<b>5 MILE LANE.</b>	<b>Contract No.:</b> <b>PSL14/6467</b>
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# Particle Size Distribution Test

BS1377 : Part 2 : 1990

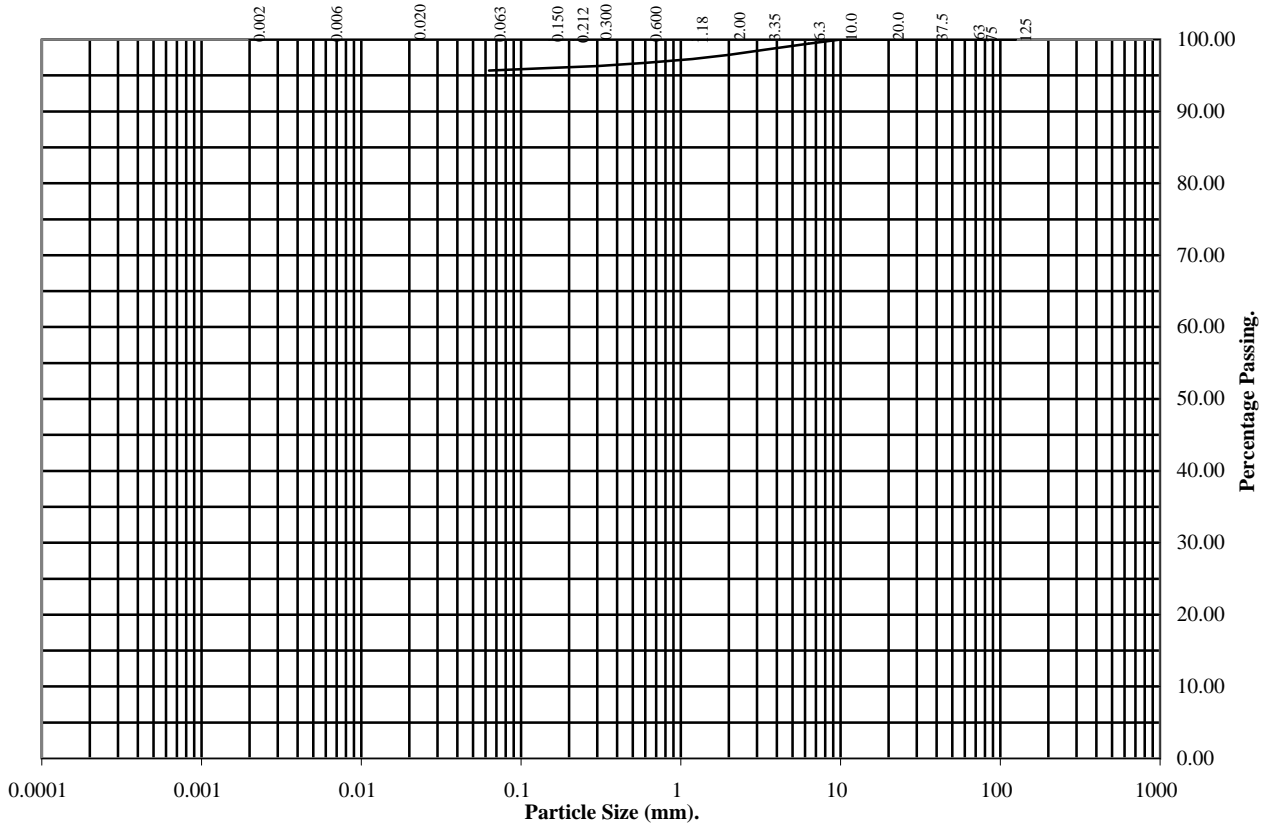
Wet Sieve, Clause 9.2

Hole Number: TP218

Depth (m): 0.50

Sample Number:

Sample Type: B



BS Test Sieve	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	99
3.35	99
2	98
1.18	97
0.6	97
0.3	96
0.212	96
0.15	96
0.063	96

Soil Fraction	Total Percentage
Cobbles	0
Gravel	2
Sand	2
Silt / Clay	96

**Remarks:**  
See summary of soil descriptions.

Checked By	Date	Approved By	Date
			09/01/15

 <b>Professional Soils Laboratory</b>	<b>5 MILE LANE.</b>	<b>Contract No.:</b> <b>PSL14/6467</b>
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# Particle Size Distribution Test

BS1377 : Part 2 : 1990

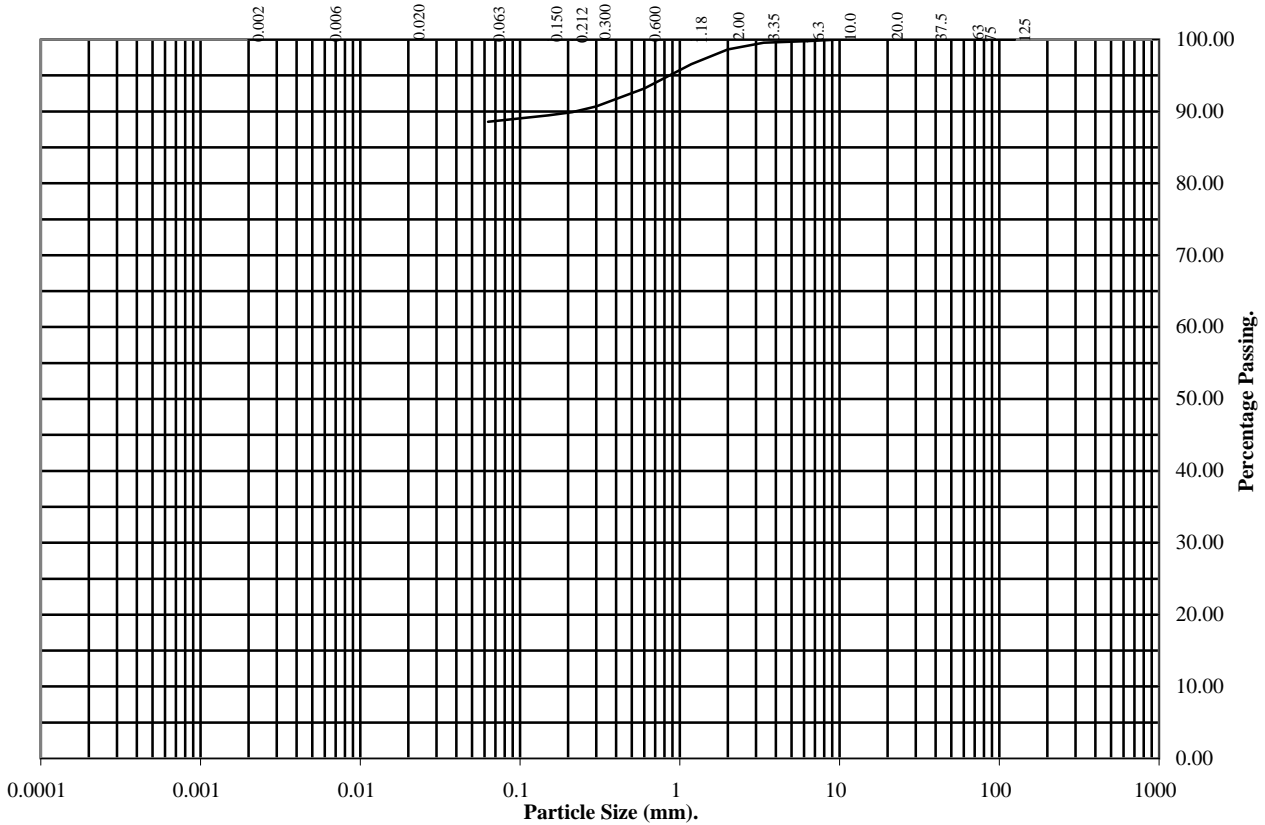
Wet Sieve, Clause 9.2

Hole Number: **TP218**

Depth (m): **2.00**

Sample Number:

Sample Type: **B**




BS Test Sieve	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	100
3.35	100
2	99
1.18	97
0.6	93
0.3	91
0.212	90
0.15	89
0.063	89

Soil Fraction	Total Percentage
Cobbles	0
Gravel	1
Sand	10
Silt / Clay	89

**Remarks:**  
See summary of soil descriptions.

Checked By	Date	Approved By	Date
			09/01/15

 <b>Professional Soils Laboratory</b>	<b>5 MILE LANE.</b>	<b>Contract No.:</b> <b>PSL14/6467</b>
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# Particle Size Distribution Test

BS1377 : Part 2 : 1990

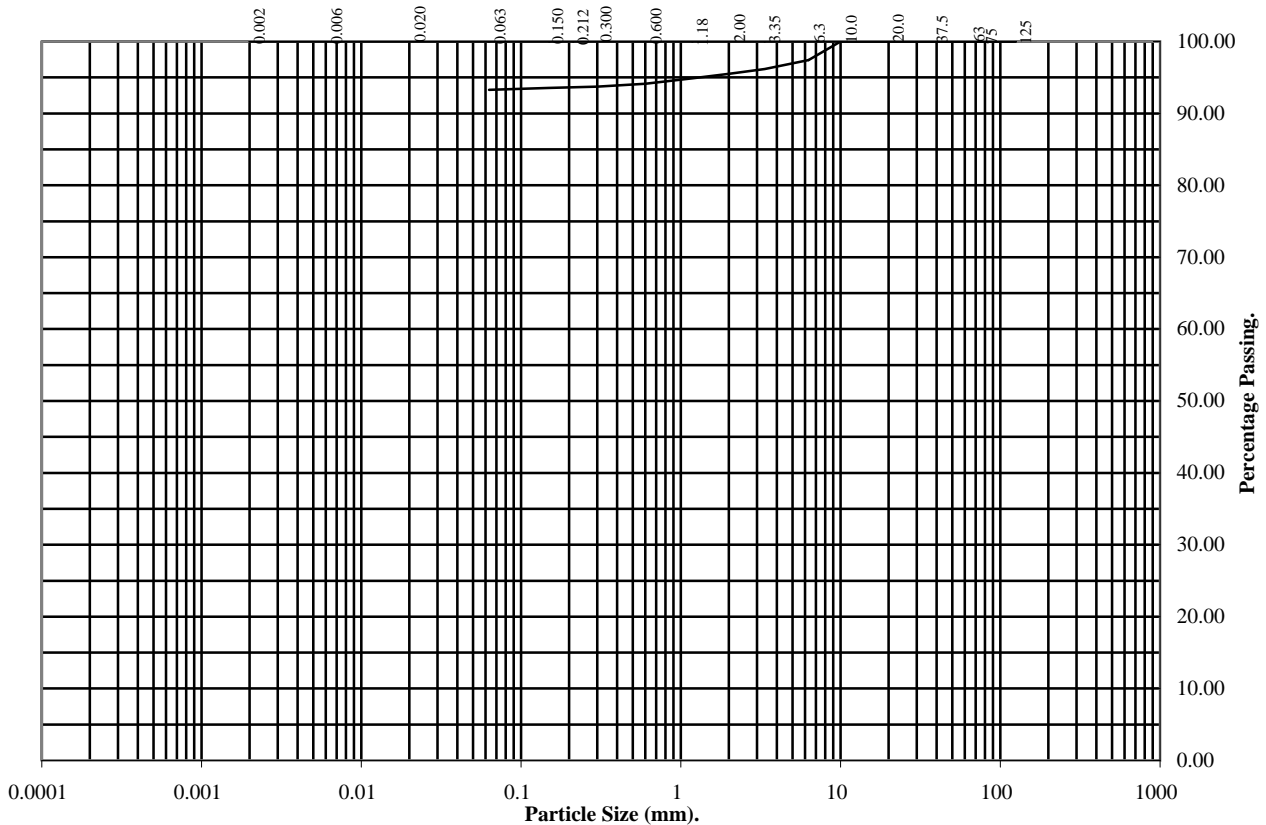
Wet Sieve, Clause 9.2

Hole Number: TP219

Depth (m): 1.00

Sample Number:

Sample Type: B




BS Test Sieve	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	97
3.35	96
2	96
1.18	95
0.6	94
0.3	94
0.212	94
0.15	94
0.063	93

Soil Fraction	Total Percentage
Cobbles	0
Gravel	4
Sand	3
Silt / Clay	93

**Remarks:**  
See summary of soil descriptions.

Checked By	Date	Approved By	Date
			09/01/15

 <b>Professional Soils Laboratory</b>	<b>5 MILE LANE.</b>	<b>Contract No.:</b> <b>PSL14/6467</b>
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# Particle Size Distribution Test

BS1377 : Part 2 : 1990

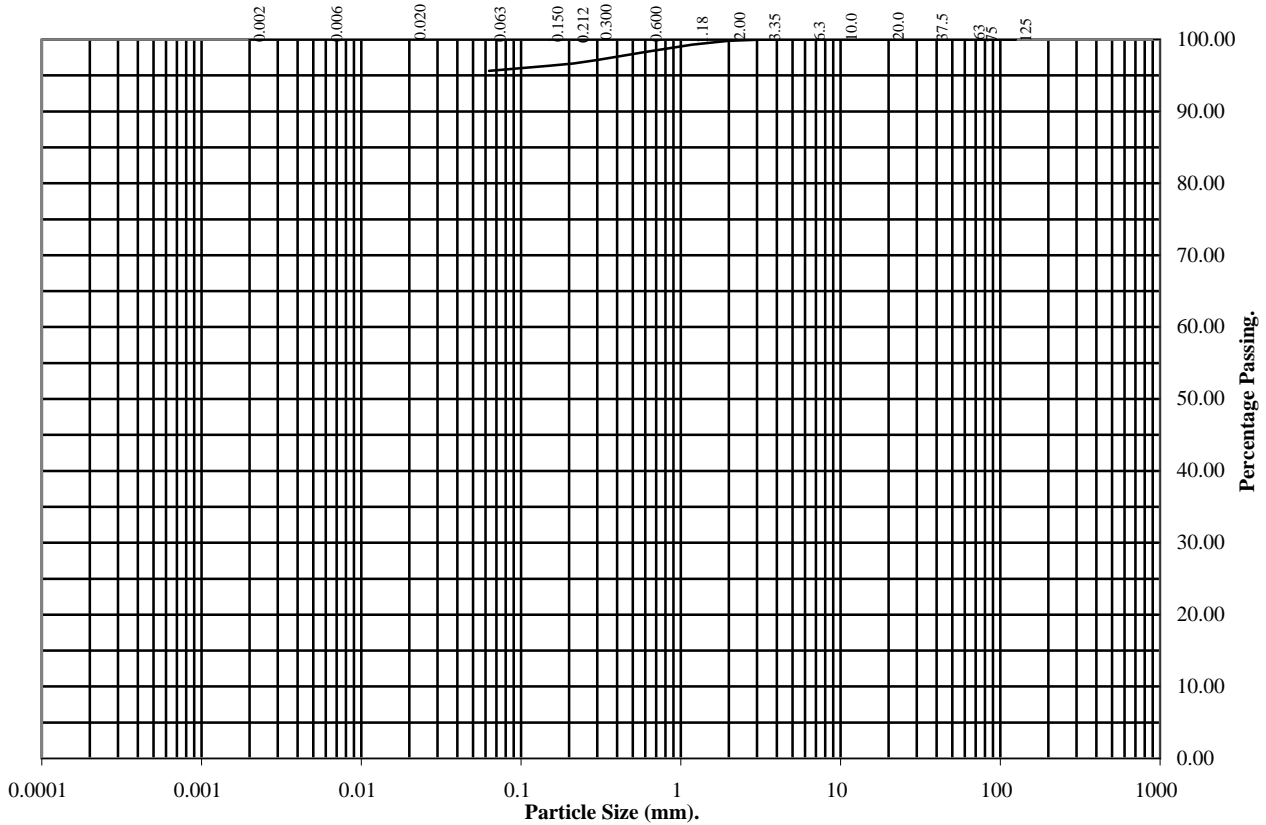
Wet Sieve, Clause 9.2

Hole Number: TP219

Depth (m): 2.10

Sample Number:

Sample Type: B




BS Test Sieve	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	100
3.35	100
2	100
1.18	99
0.6	98
0.3	97
0.212	97
0.15	96
0.063	96

Soil Fraction	Total Percentage
Cobbles	0
Gravel	0
Sand	4
Silt / Clay	96

**Remarks:**  
See summary of soil descriptions.

Checked By	Date	Approved By	Date
			09/01/15

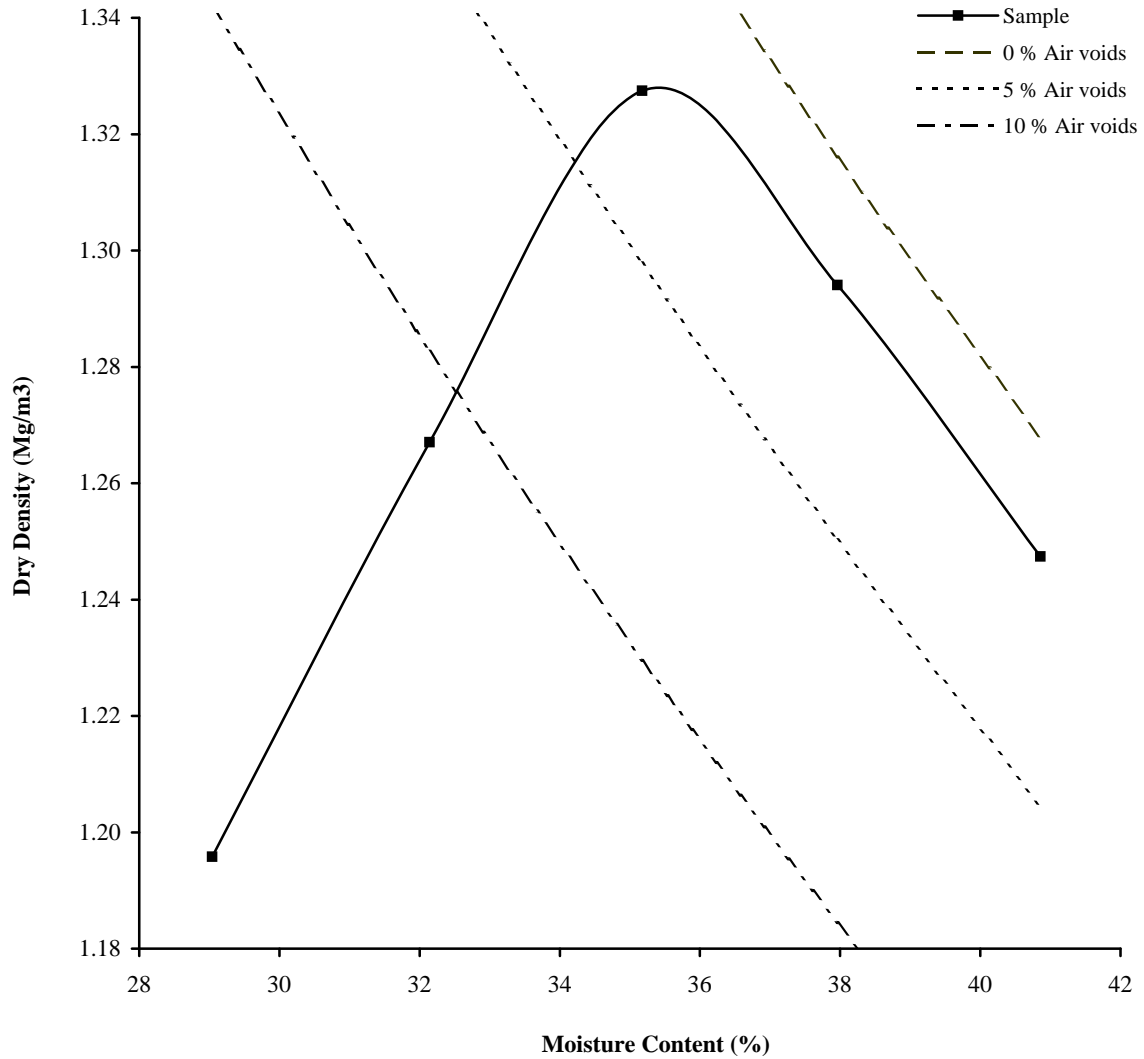
 <b>Professional Soils Laboratory</b>	<b>5 MILE LANE.</b>	<b>Contract No.:</b> <b>PSL14/6467</b>
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# Dry Density/Moisture Content Relationship Test

BS 1377 : Part 4 : 1990

Hole Number: TP217 Depth (m) : 0.50

Sample Number: Sample Type: B



Initial Moisture Content:	38	Method of Compaction	2.5kg / Separate Sample	
Particle Density (Mg/m <sup>3</sup> ):	2.63	Assumed	Material Retained on 37.5 mm Test Sieve (%):	0
Maximum Dry Density (Mg/m <sup>3</sup> ):	1.33		Material Retained on 20.0 mm Test Sieve (%):	0
Optimum Moisture Content (%):	35			
Remarks	See Summary of Soil Descriptions.			

Checked By	Date	Approved By	Date
[Redacted]	[Redacted]	[Redacted]	09/01/15

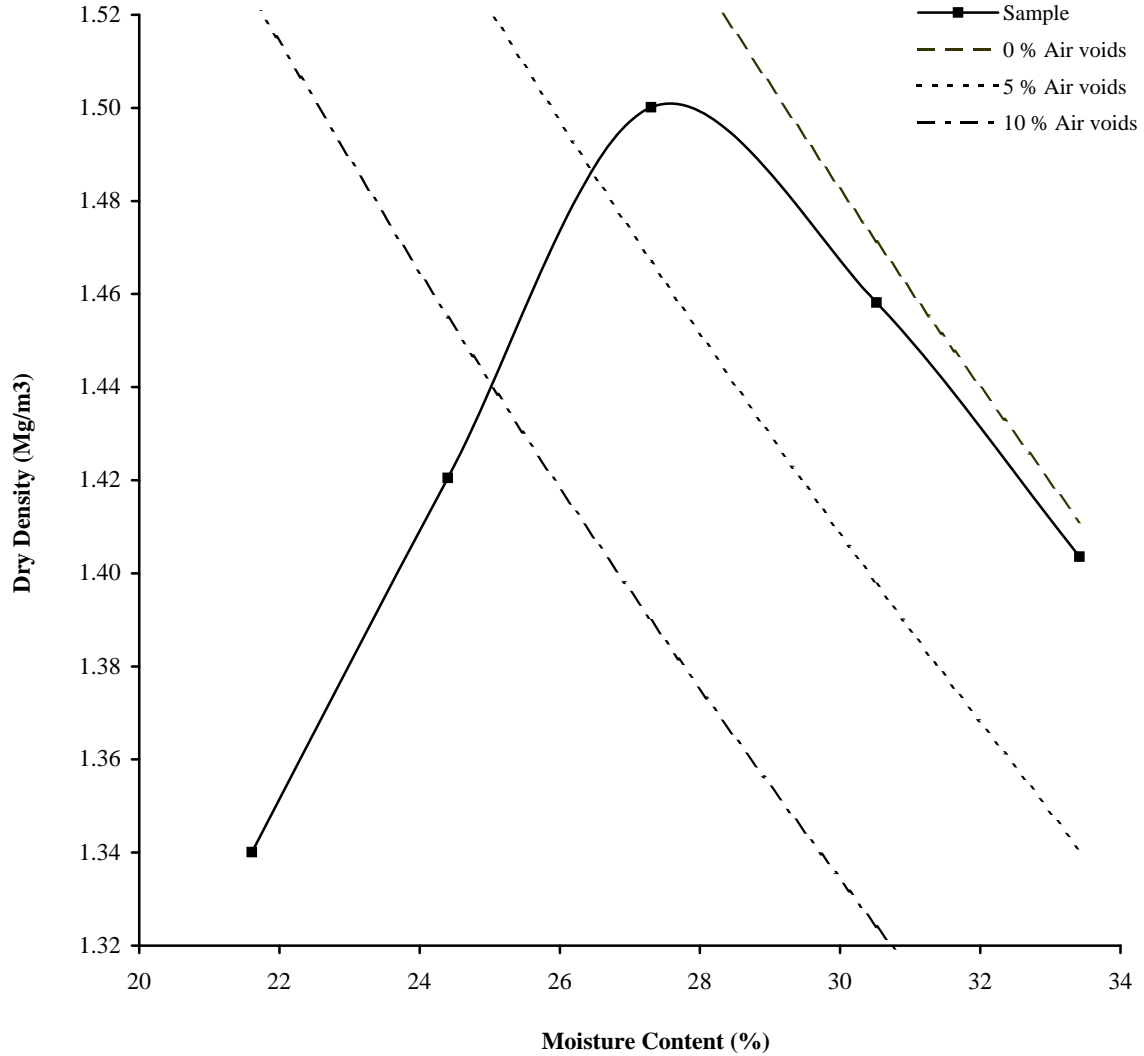
 <b>Professional Soils Laboratory</b>	<b>5 MILE LANE.</b>	<b>Contract No.</b> <b>PSL14/6467</b>
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# Dry Density/Moisture Content Relationship Test

BS 1377 : Part 4 : 1990

Hole Number: TP217 Depth (m) : 1.70

Sample Number: Sample Type: B



Initial Moisture Content:	31	Method of Compaction	2.5kg / Separate Sample	
Particle Density (Mg/m <sup>3</sup> ):	2.67	Assumed	Material Retained on 37.5 mm Test Sieve (%):	10
Maximum Dry Density (Mg/m <sup>3</sup> ):	1.50		Material Retained on 20.0 mm Test Sieve (%):	5
Optimum Moisture Content (%):	27			
Remarks	See Summary of Soil Descriptions.			

Checked By	Date	Approved By	Date
[Redacted]	[Redacted]	[Redacted]	09/01/15

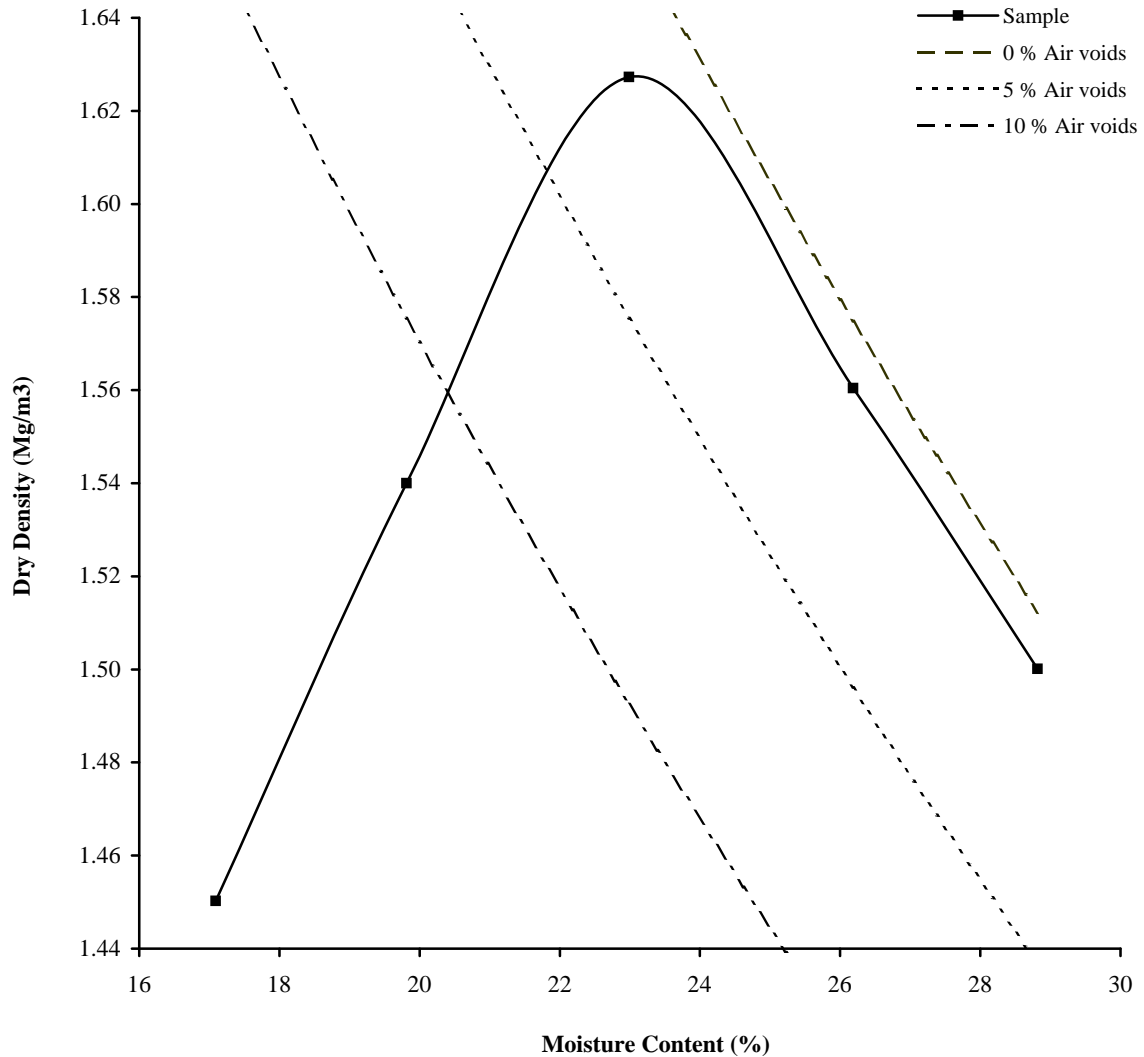
 <b>Professional Soils Laboratory</b>	<b>5 MILE LANE.</b>	<b>Contract No.</b> <b>PSL14/6467</b>
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# Dry Density/Moisture Content Relationship Test

BS 1377 : Part 4 : 1990

Hole Number: TP218 Depth (m) : 2.00

Sample Number: Sample Type: B



Initial Moisture Content:	23	Method of Compaction	2.5kg / Separate Sample	
Particle Density (Mg/m <sup>3</sup> ):	2.68	Assumed	Material Retained on 37.5 mm Test Sieve (%):	0
Maximum Dry Density (Mg/m <sup>3</sup> ):	1.63		Material Retained on 20.0 mm Test Sieve (%):	0
Optimum Moisture Content (%):	23			
Remarks	See Summary of Soil Descriptions.			

Checked By	Date	Approved By	Date
			09/01/15

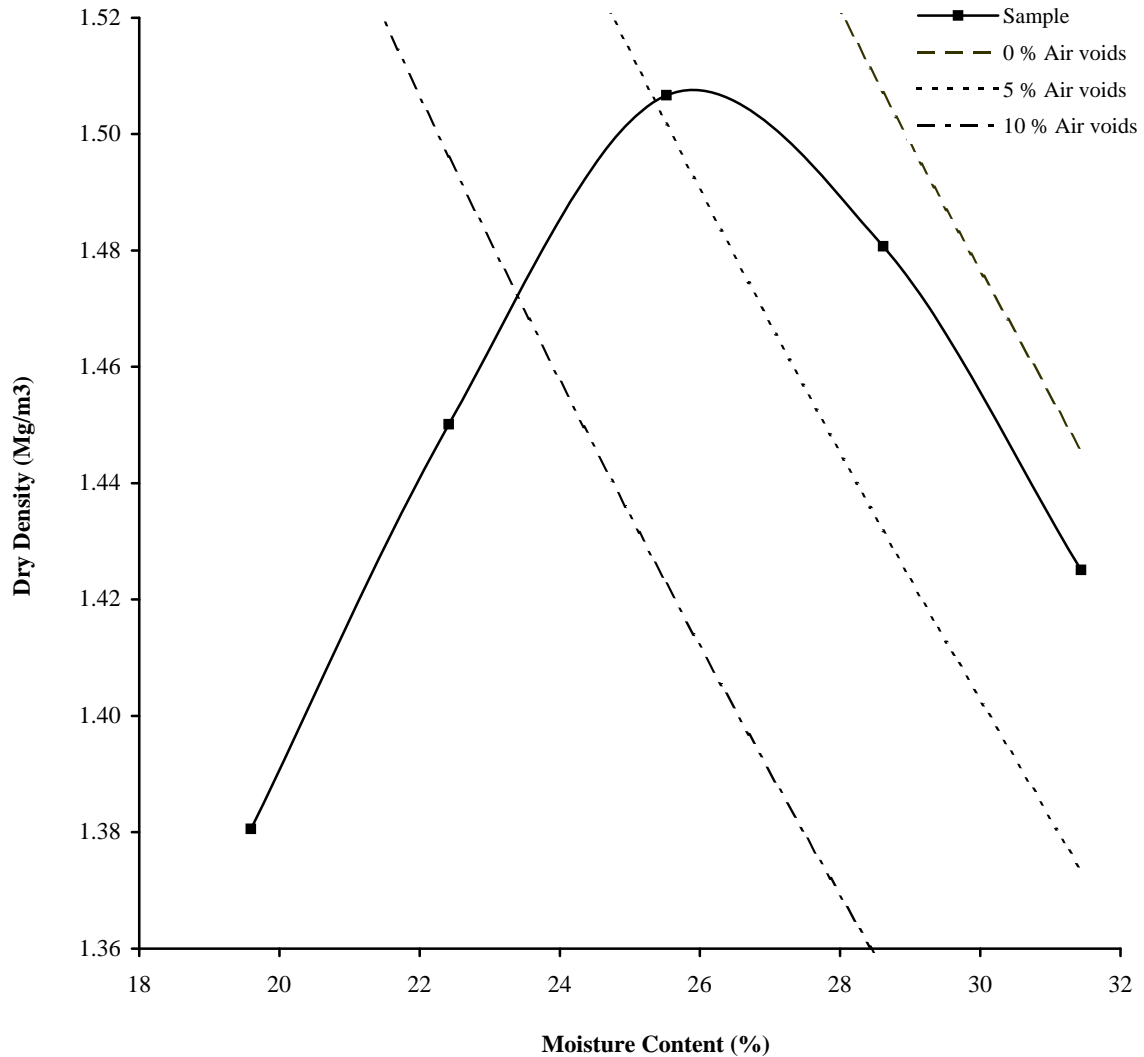
 <b>Professional Soils Laboratory</b>	<b>5 MILE LANE.</b>	<b>Contract No.</b> <b>PSL14/6467</b>
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# Dry Density/Moisture Content Relationship Test

BS 1377 : Part 4 : 1990

Hole Number: TP219 Depth (m) : 1.00

Sample Number: Sample Type: B



Initial Moisture Content:	29	Method of Compaction	2.5kg / Separate Sample	
Particle Density (Mg/m <sup>3</sup> ):	2.65	Assumed	Material Retained on 37.5 mm Test Sieve (%):	0
Maximum Dry Density (Mg/m <sup>3</sup> ):	1.51		Material Retained on 20.0 mm Test Sieve (%):	0
Optimum Moisture Content (%):	26			
Remarks	See Summary of Soil Descriptions.			

Checked By	Date	Approved By	Date
			09/01/15

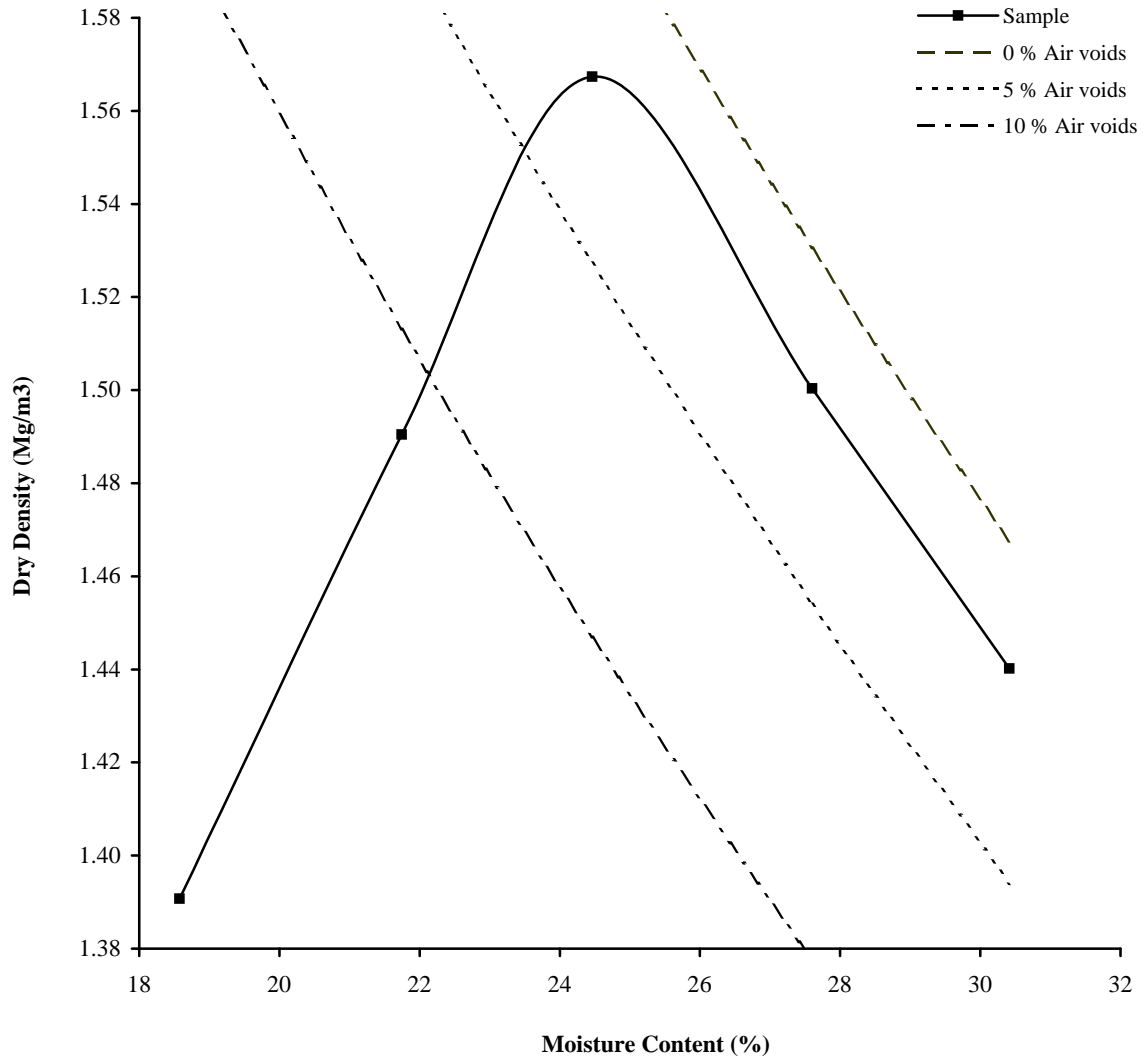
	<b>5 MILE LANE.</b>	<b>Contract No.</b> <b>PSL14/6467</b>
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# Dry Density/Moisture Content Relationship Test

BS 1377 : Part 4 : 1990

Hole Number: TP219 Depth (m) : 2.10

Sample Number: Sample Type: B



Initial Moisture Content:	24	Method of Compaction	2.5kg / Separate Sample	
Particle Density (Mg/m <sup>3</sup> ):	2.65	Assumed	Material Retained on 37.5 mm Test Sieve (%):	0
Maximum Dry Density (Mg/m <sup>3</sup> ):	1.57		Material Retained on 20.0 mm Test Sieve (%):	0
Optimum Moisture Content (%):	25			
Remarks	See Summary of Soil Descriptions.			

Checked By	Date	Approved By	Date
			09/01/15

 <b>Professional Soils Laboratory</b>	<b>5 MILE LANE.</b>	<b>Contract No.</b> <b>PSL14/6467</b>
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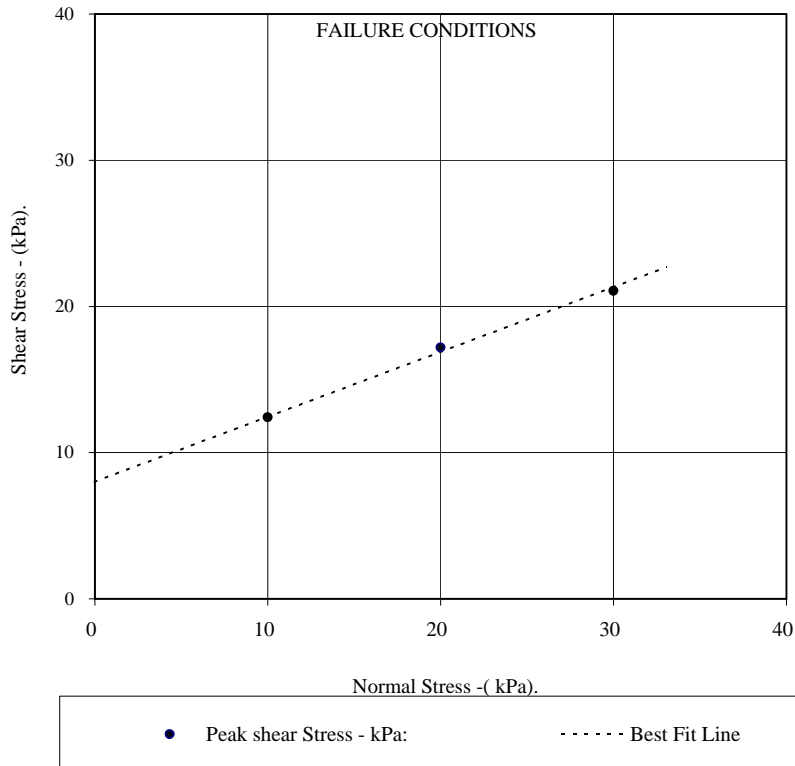


# CONSOLIDATED DRAINED SHEARBOX TEST.

BS1377:Part 7 :1990.

Hole Number: **TP201**      Depth (m): **0.50**      Sample Number: **B**

Sample Type:	Recompacted with 2.5kg Effort		
Particle Density - Mg/m <sup>3</sup> :	2.65 (Assumed)		
Specimen Tested:	Submerged Material tested passing 2mm		
Sample Description:	See summary of soil descriptions.		
<b>STAGE</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>Initial Conditions</b>			
Height - mm:	24.98	24.98	24.98
Length - mm:	60.01	60.01	60.01
Moisture Content - %:	33	33	33
Bulk Density - Mg/m <sup>3</sup> :	1.86	1.86	1.86
Dry Density - Mg/m <sup>3</sup> :	1.40	1.40	1.40
Voids Ratio:	0.893	0.893	0.892
Normal Pressure- kPa	10	20	30
<b>Consolidation</b>			
Consolidated Height - mm:	24.92	24.89	24.74
<b>Shear</b>			
Rate of Strain (mm/min)	0.027	0.027	0.027
Strain at peak shear stress (%)	3.30	2.40	3.20
Peak shear Stress - kPa:	12	17	21
<b>Final Consolidated Conditions</b>			
Moisture Content - %:	36	35	35
Bulk Density - Mg/m <sup>3</sup> :	1.86	1.86	1.88
Dry Density - Mg/m <sup>3</sup> :	1.36	1.38	1.39
<b>PEAK</b>			
Angle of Shearing Resistance:( $\theta$ )			<b>24.0</b>
Effective Cohesion - kPa:			<b>8</b>



Checked by [REDACTED]      Date 12/01/2015

Approved by [REDACTED]      Date 12/01/2015



5 MILE LANE.

Contract No.: **PSL14/6467**  
Client Ref Number: **C4414**

# CONSOLIDATED DRAINED SHEARBOX TEST.

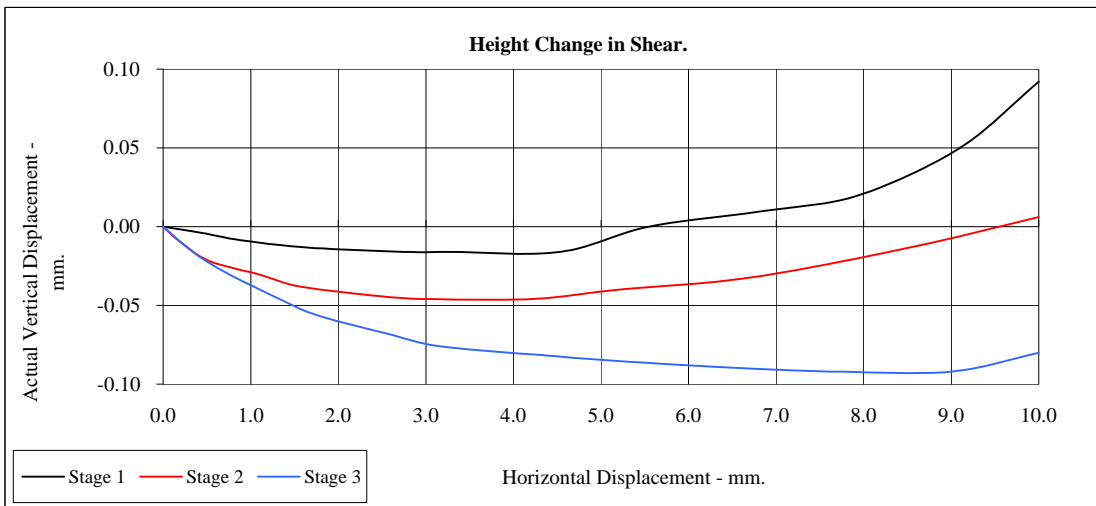
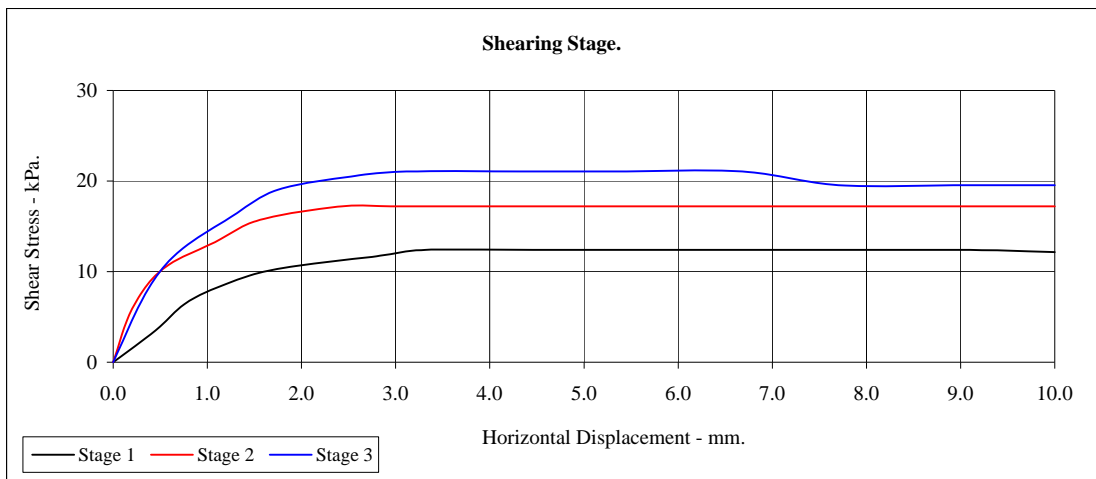
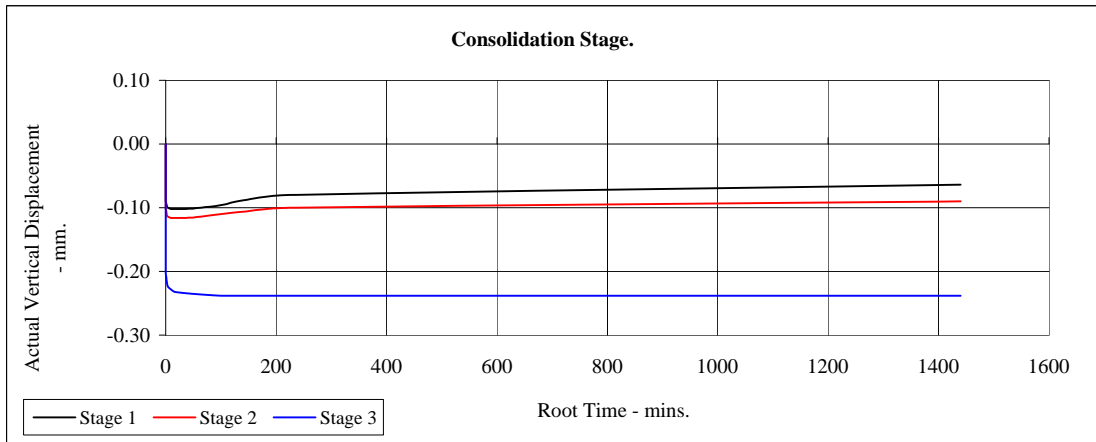
BS1377:Part 7:4.5 :1990.

Hole Number: **TP201**

Depth (m):

**0.50**

Sample Number: **B**



**5 MILE LANE.**

Contract No.:  
**PSL14/6467**

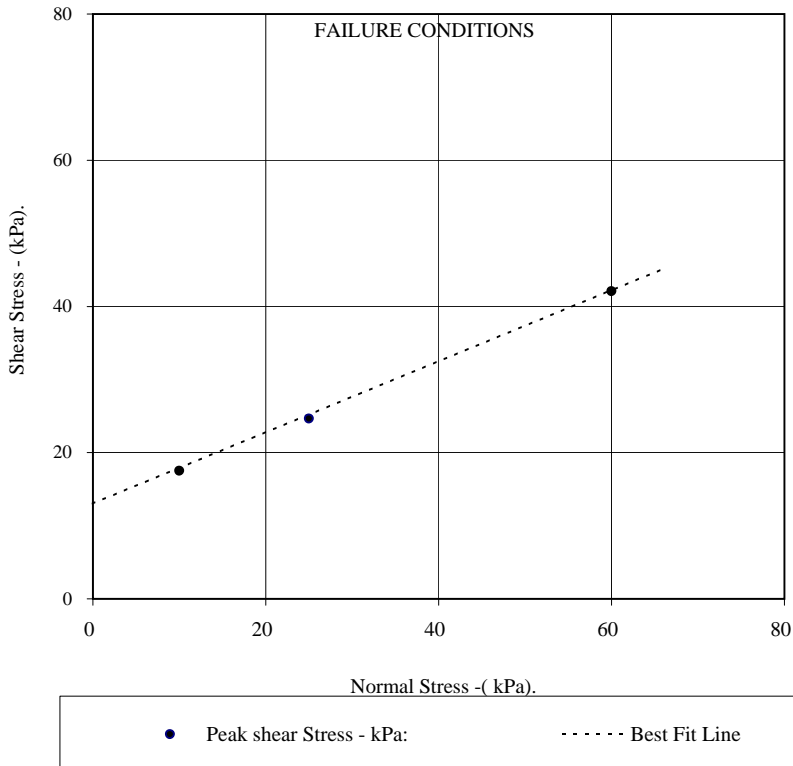
Client Ref Number:  
**C4414**

# CONSOLIDATED DRAINED SHEARBOX TEST.

BS1377:Part 7 :1990.

Hole Number: **TP202**      Depth (m): **0.50**      Sample Number: **B**

Sample Type:	Recompacted with 2.5kg Effort		
Particle Density - Mg/m <sup>3</sup> :	2.65 (Assumed)		
Specimen Tested:	Submerged Material tested passing 2mm		
Sample Description:	See summary of soil descriptions.		
<b>STAGE</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>Initial Conditions</b>			
Height - mm:	20.13	20.13	20.13
Length - mm:	59.90	59.90	59.90
Moisture Content - %:	35	35	35
Bulk Density - Mg/m <sup>3</sup> :	1.84	1.84	1.84
Dry Density - Mg/m <sup>3</sup> :	1.36	1.36	1.36
Voids Ratio:	0.954	0.954	0.954
Normal Pressure- kPa	10	25	60
<b>Consolidation</b>			
Consolidated Height - mm:	20.09	19.87	19.63
<b>Shear</b>			
Rate of Strain (mm/min)	0.028	0.028	0.028
Strain at peak shear stress (%)	2.10	2.00	2.80
Peak shear Stress - kPa:	18	25	42
<b>Final Consolidated Conditions</b>			
Moisture Content - %:	36	36	35
Bulk Density - Mg/m <sup>3</sup> :	1.84	1.86	1.88
Dry Density - Mg/m <sup>3</sup> :	1.35	1.37	1.40
<b>PEAK</b>			
Angle of Shearing Resistance:(θ)			<b>26.0</b>
Effective Cohesion - kPa:			<b>13</b>



Checked by [REDACTED]      Date 12/01/2015

Approved by [REDACTED]      Date 12/01/2015



5 MILE LANE.

Contract No.:  
**PSL14/6467.**  
Client Ref Number:  
**C4414**

# CONSOLIDATED DRAINED SHEARBOX TEST.

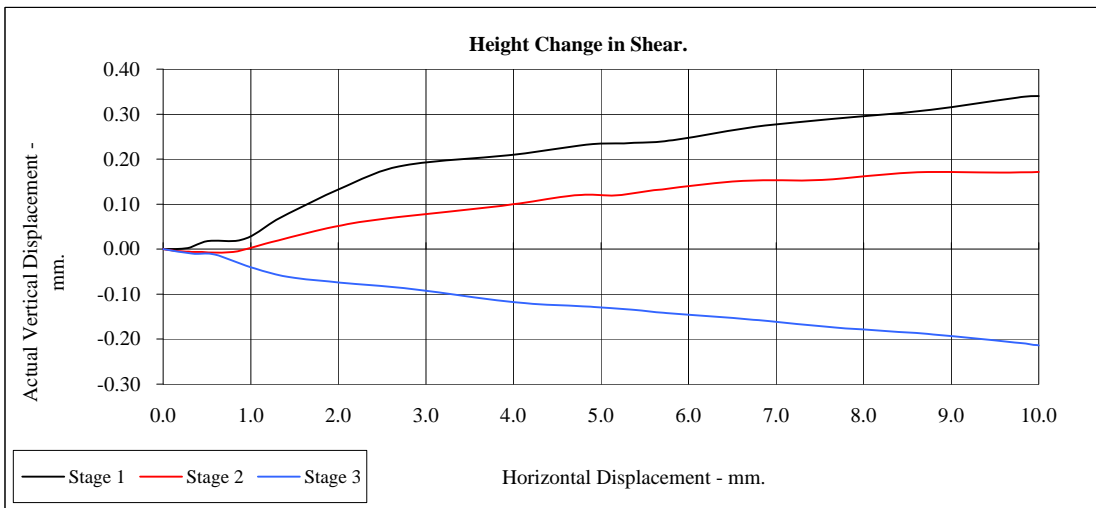
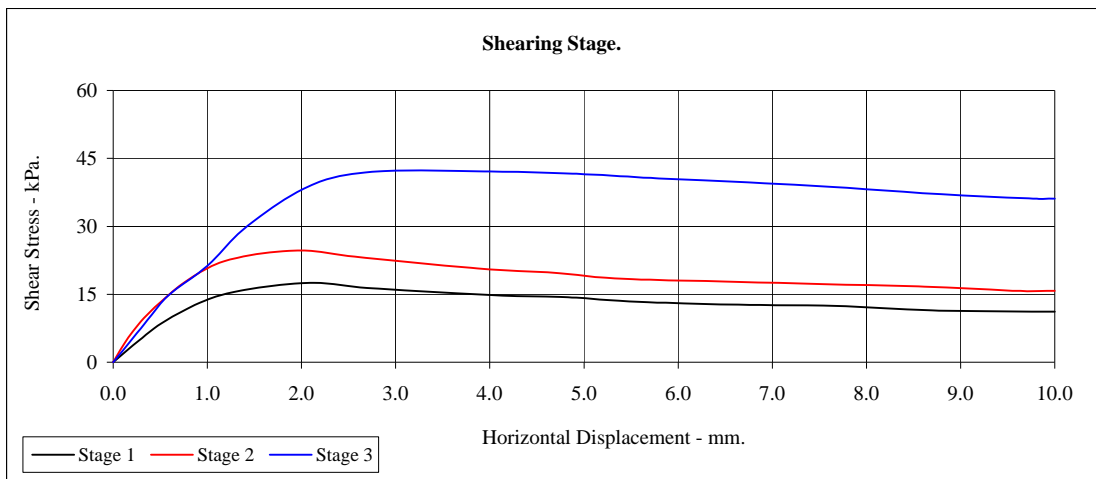
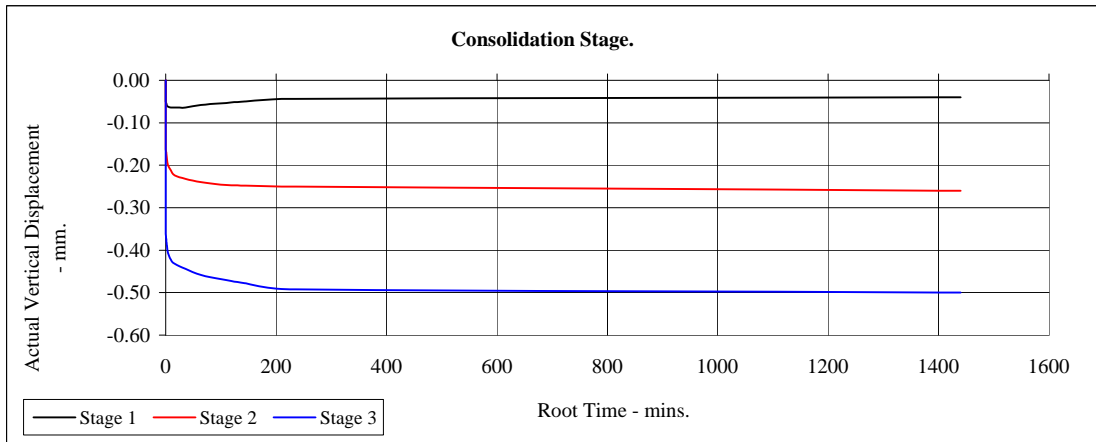
BS1377:Part 7:4.5 :1990.

Hole Number: **TP202**

Depth (m):

**0.50**

Sample Number: **B**



**5 MILE LANE.**

Contract No.:  
**PSL14/6467.**

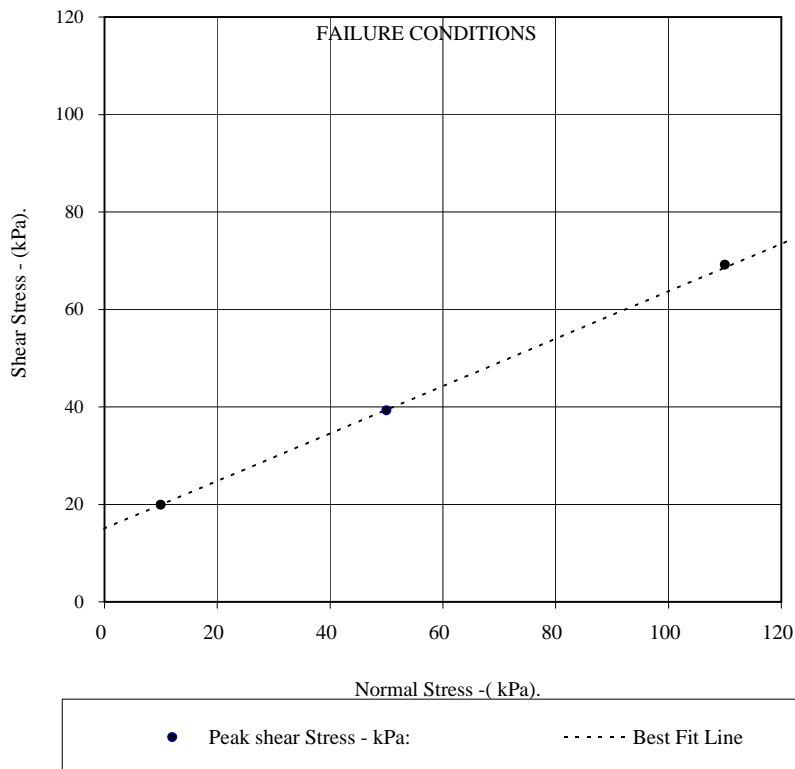
Client Ref Number:  
**C4414**

# CONSOLIDATED DRAINED SHEARBOX TEST.

BS1377:Part 7 :1990.

Hole Number: **TP203**      Depth (m): **0.50**      Sample Number: **B**

Sample Type:	Recompacted with 2.5kg Effort		
Particle Density - Mg/m <sup>3</sup> :	2.65 (Assumed)		
Specimen Tested:	Submerged Material tested passing 2mm		
Sample Description:	See summary of soil descriptions.		
<b>STAGE</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>Initial Conditions</b>			
Height - mm:	24.98	24.98	24.98
Length - mm:	60.01	60.01	60.01
Moisture Content - %:	33	33	33
Bulk Density - Mg/m <sup>3</sup> :	1.84	1.84	1.85
Dry Density - Mg/m <sup>3</sup> :	1.39	1.39	1.40
Voids Ratio:	0.909	0.906	0.899
Normal Pressure- kPa	10	50	110
<b>Consolidation</b>			
Consolidated Height - mm:	24.96	24.79	24.54
<b>Shear</b>			
Rate of Strain (mm/min)	0.027	0.027	0.027
Strain at peak shear stress (%)	3.30	4.20	4.40
Peak shear Stress - kPa:	20	39	69
<b>Final Consolidated Conditions</b>			
Moisture Content - %:	37	34	33
Bulk Density - Mg/m <sup>3</sup> :	1.84	1.86	1.88
Dry Density - Mg/m <sup>3</sup> :	1.34	1.39	1.41
<b>PEAK</b>			
Angle of Shearing Resistance:( $\theta$ )			<b>26.0</b>
Effective Cohesion - kPa:			<b>15</b>



Checked by [REDACTED]      Date 12/01/2015

Approved by [REDACTED]      Date 12/01/2015



5 MILE LANE.

Contract No.:  
**PSL14/6467**  
Client Ref Number:  
**C4414**

# CONSOLIDATED DRAINED SHEARBOX TEST.

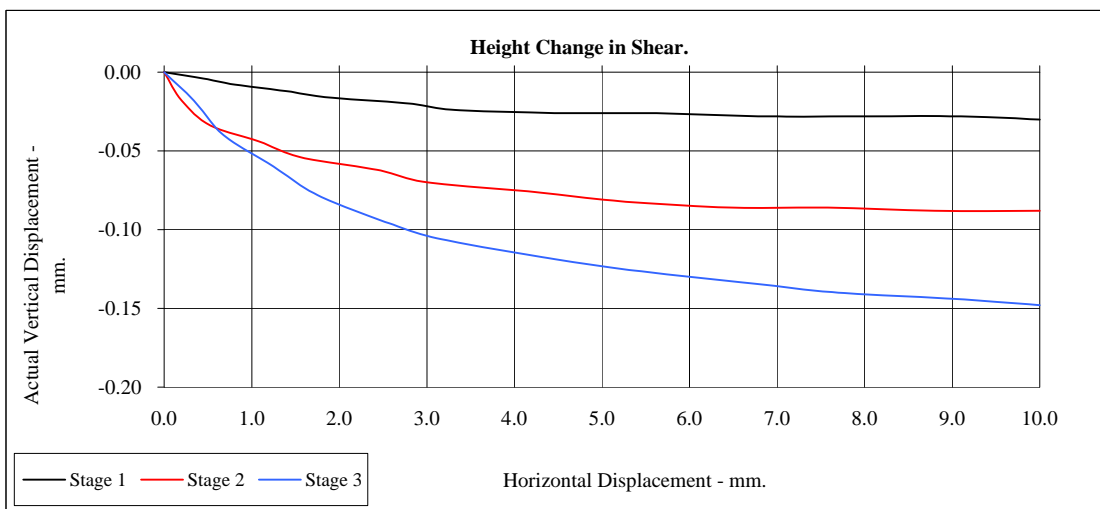
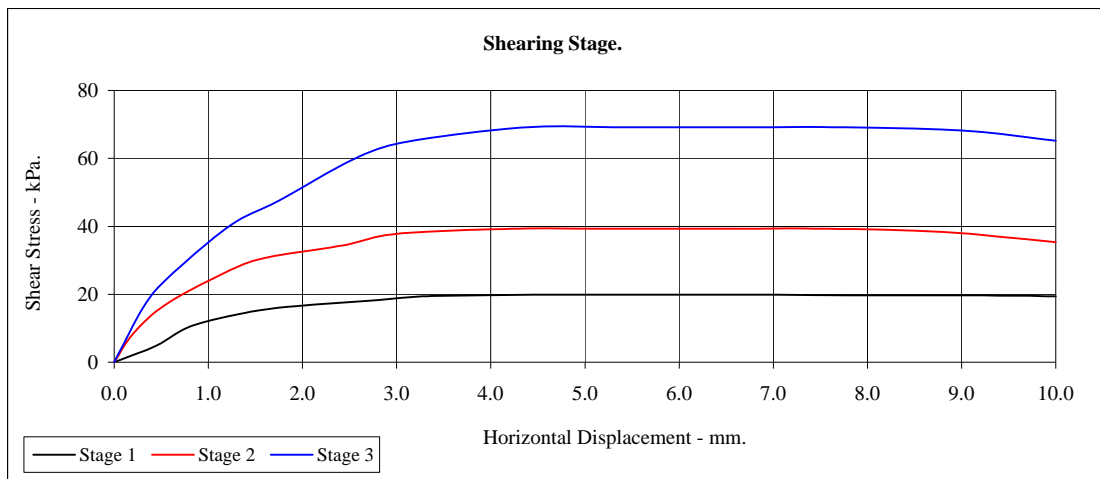
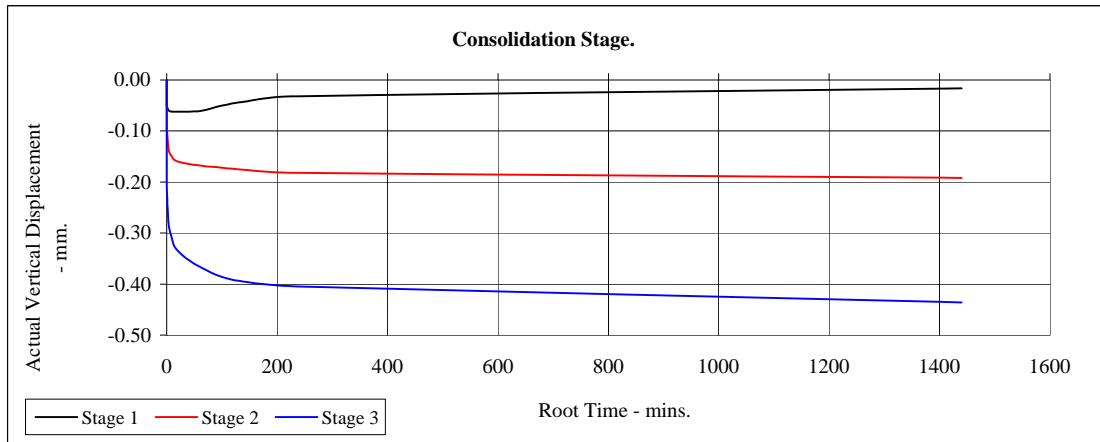
BS1377:Part 7:4.5 :1990.

Hole Number: **TP203**

Depth (m):

**0.50**

Sample Number: **B**



5 MILE LANE.

Contract No.:  
**PSL14/6467**

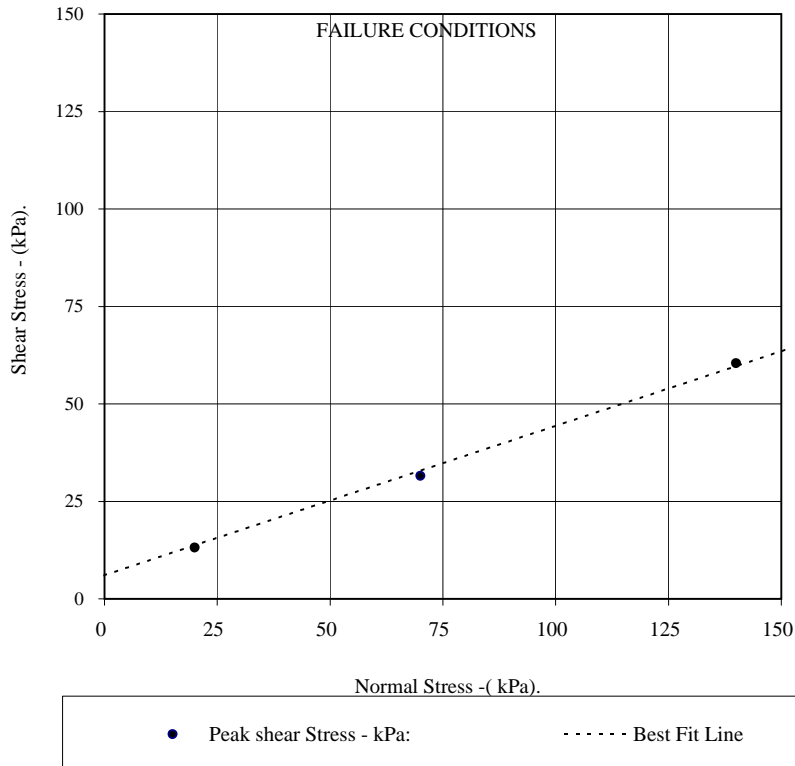
Client Ref Number:  
**C4414**

# CONSOLIDATED DRAINED SHEARBOX TEST.

BS1377:Part 7 :1990.

Hole Number: **TP204**      Depth (m): **1.00**      Sample Number: **B**

Sample Type:	Recompacted with 2.5kg Effort		
Particle Density - Mg/m <sup>3</sup> :	2.65 (Assumed)		
Specimen Tested:	Submerged Material tested passing 2mm		
Sample Description:	See summary of soil descriptions.		
<b>STAGE</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>Initial Conditions</b>			
Height - mm:	20.13	20.13	20.13
Length - mm:	59.90	59.90	59.90
Moisture Content - %:	40	40	40
Bulk Density - Mg/m <sup>3</sup> :	1.74	1.74	1.75
Dry Density - Mg/m <sup>3</sup> :	1.25	1.25	1.25
Voids Ratio:	1.125	1.122	1.119
Normal Pressure- kPa	20	70	140
<b>Consolidation</b>			
Consolidated Height - mm:	19.87	19.61	19.19
<b>Shear</b>			
Rate of Strain (mm/min)	0.026	0.026	0.026
Strain at peak shear stress (%)	4.50	7.60	10.00
Peak shear Stress - kPa:	13	32	60
<b>Final Consolidated Conditions</b>			
Moisture Content - %:	40	37	35
Bulk Density - Mg/m <sup>3</sup> :	1.76	1.79	1.83
Dry Density - Mg/m <sup>3</sup> :	1.26	1.30	1.36
<b>PEAK</b>			
Angle of Shearing Resistance:( $\theta$ )			<b>21.0</b>
Effective Cohesion - kPa:			<b>6</b>



Checked by      Date 12/01/2015

Approved by      Date 12/01/2015



5 MILE LANE.

Contract No.:  
**PSL14/6467.**

Client Ref Number:  
**C4414**

# CONSOLIDATED DRAINED SHEARBOX TEST.

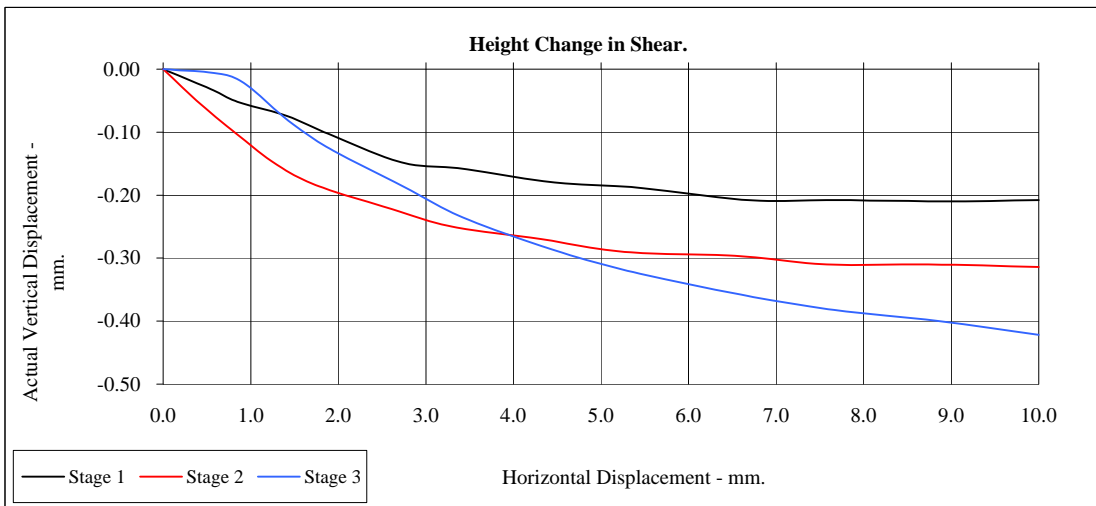
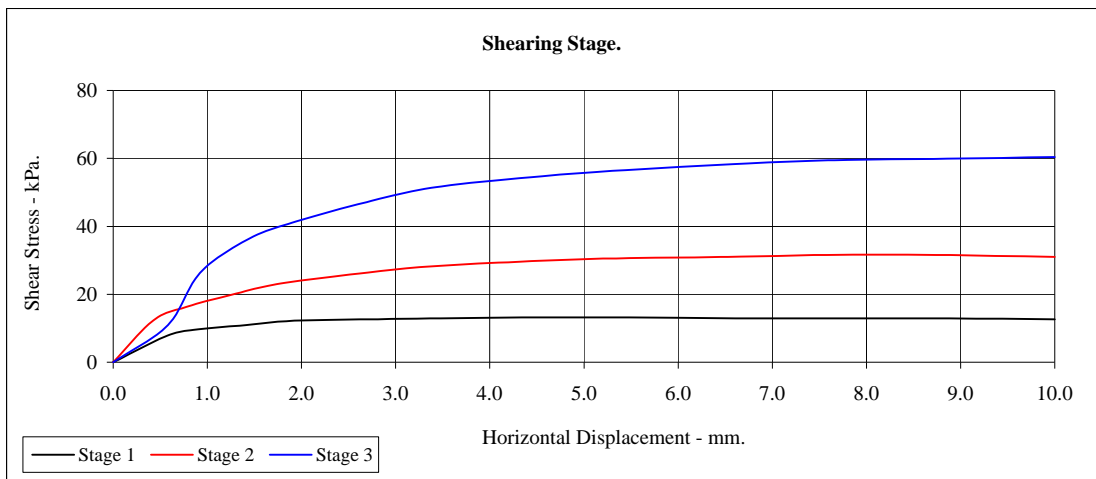
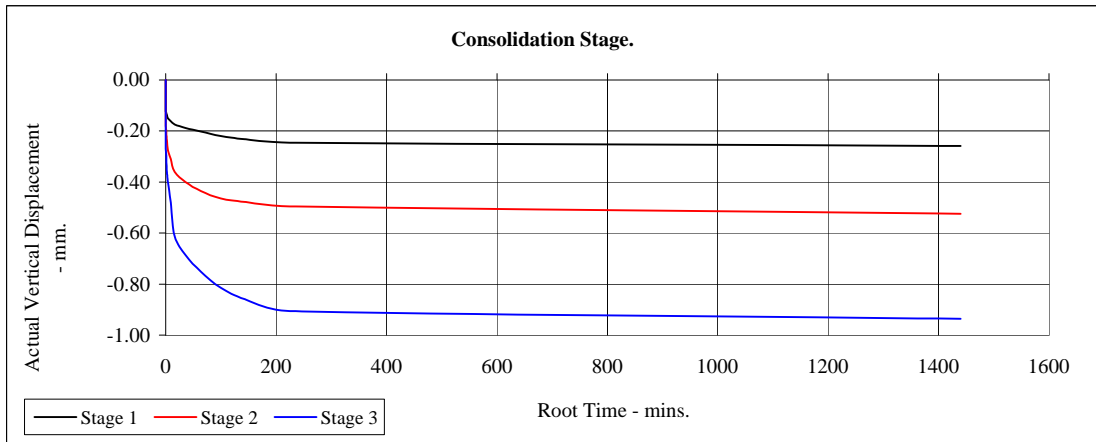
BS1377:Part 7:4.5 :1990.

Hole Number: **TP204**

Depth (m):

**1.00**

Sample Number: **B**



**5 MILE LANE.**

Contract No.:  
**PSL14/6467.**

Client Ref Number:  
**C4414**

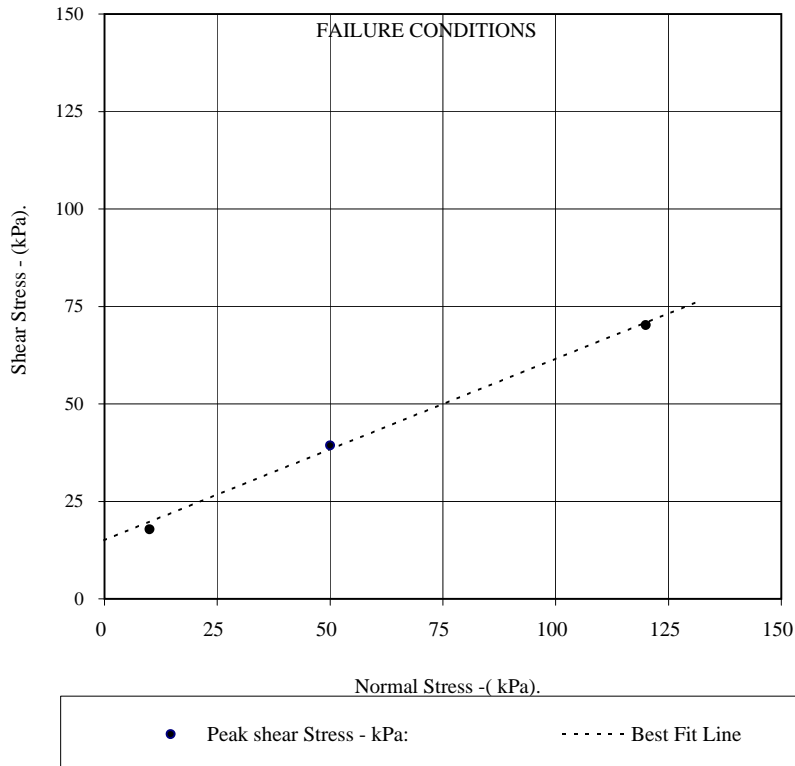


# CONSOLIDATED DRAINED SHEARBOX TEST.

BS1377:Part 7 :1990.

Hole Number: **TP205**      Depth (m): **0.50**      Sample Number: **B**

Sample Type:	Recompacted with 2.5kg Effort		
Particle Density - Mg/m <sup>3</sup> :	2.65 (Assumed)		
Specimen Tested:	Submerged Material tested passing 2mm		
Sample Description:	See summary of soil descriptions.		
<b>STAGE</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>Initial Conditions</b>			
Height - mm:	24.98	24.98	24.98
Length - mm:	60.01	60.01	60.01
Moisture Content - %:	32	32	32
Bulk Density - Mg/m <sup>3</sup> :	1.83	1.84	1.84
Dry Density - Mg/m <sup>3</sup> :	1.39	1.40	1.40
Voids Ratio:	0.904	0.899	0.895
Normal Pressure- kPa	10	50	120
<b>Consolidation</b>			
Consolidated Height - mm:	24.90	24.53	24.11
<b>Shear</b>			
Rate of Strain (mm/min)	0.028	0.028	0.028
Strain at peak shear stress (%)	2.50	2.10	4.20
Peak shear Stress - kPa:	18	39	70
<b>Final Consolidated Conditions</b>			
Moisture Content - %:	37	34	32
Bulk Density - Mg/m <sup>3</sup> :	1.84	1.87	1.91
Dry Density - Mg/m <sup>3</sup> :	1.34	1.39	1.44
<b>PEAK</b>			
Angle of Shearing Resistance:( $\theta$ )			<b>25.0</b>
Effective Cohesion - kPa:			<b>15</b>



Checked by [REDACTED]      Date 12/01/2015

Approved by [REDACTED]      Date 12/01/2015



5 MILE LANE.

Contract No.:  
**PSL14/6467**  
Client Ref Number:  
**C4414**

# CONSOLIDATED DRAINED SHEARBOX TEST.

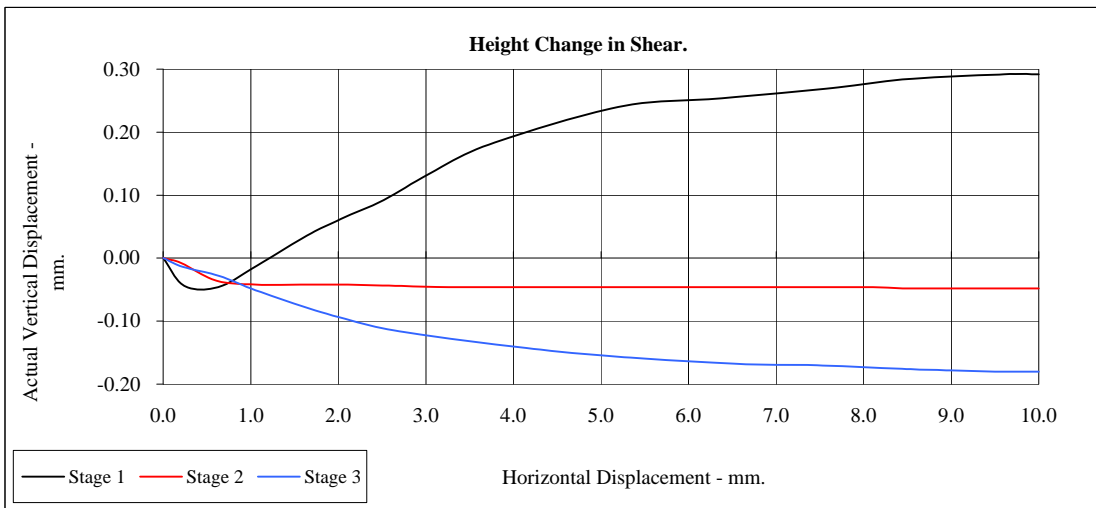
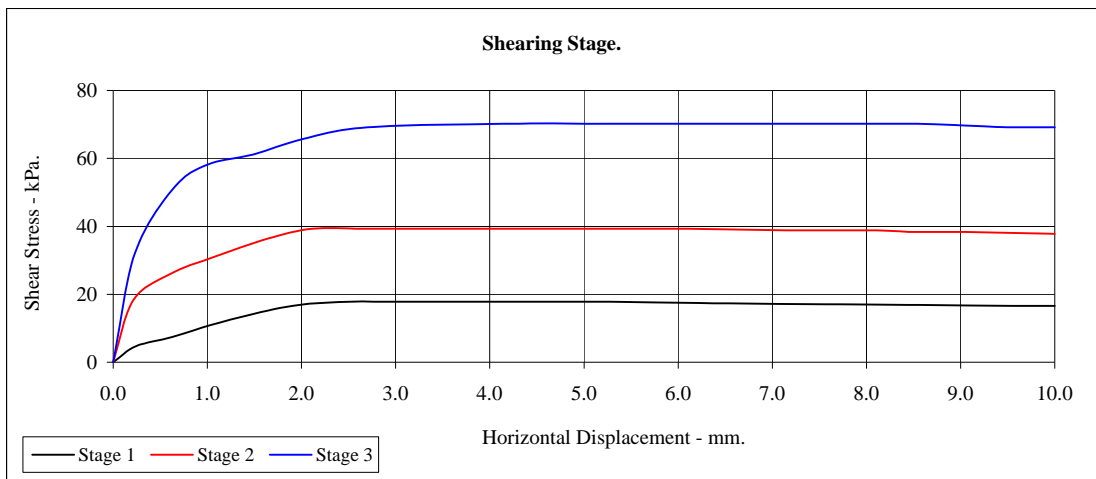
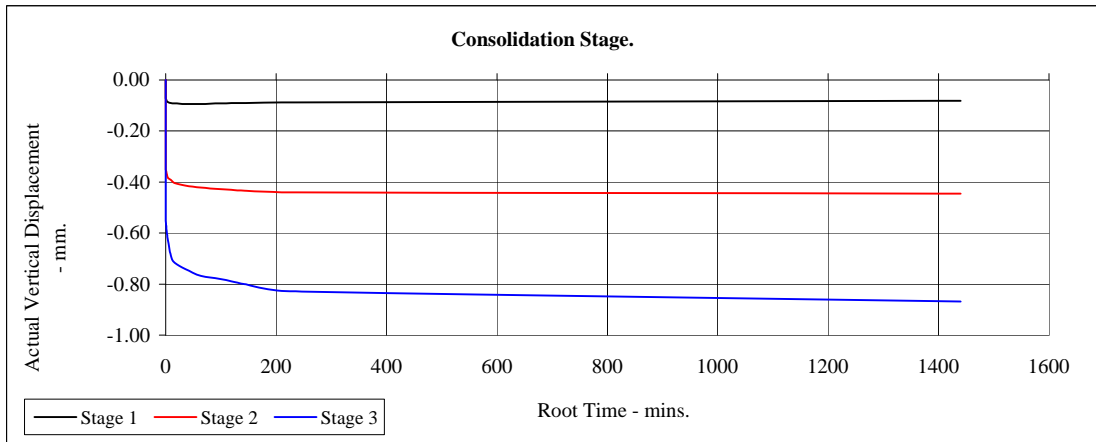
BS1377:Part 7:4.5 :1990.

Hole Number: **TP205**

Depth (m):

**0.50**

Sample Number: **B**



**5 MILE LANE.**

Contract No.:  
**PSL14/6467**

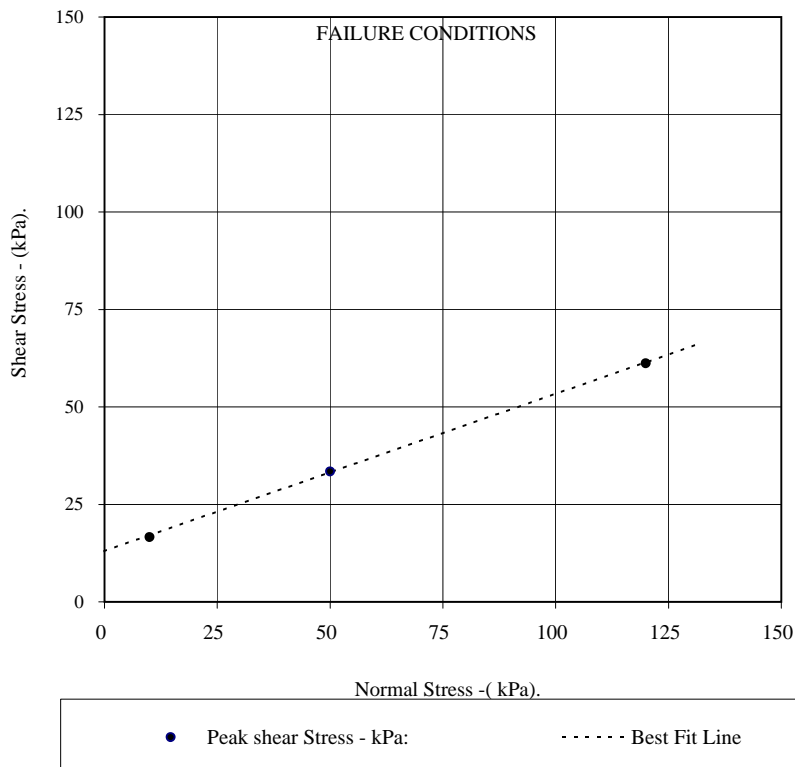
Client Ref Number:  
**C4414**

# CONSOLIDATED DRAINED SHEARBOX TEST.

BS1377:Part 7 :1990.

Hole Number: **TP206**      Depth (m): **0.50**      Sample Number: **B**

Sample Type:	Recompacted with 2.5kg Effort		
Particle Density - Mg/m <sup>3</sup> :	2.65 (Assumed)		
Specimen Tested:	Submerged Material tested passing 2mm		
Sample Description:	See summary of soil descriptions.		
<b>STAGE</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>Initial Conditions</b>			
Height - mm:	24.98	24.98	24.98
Length - mm:	60.01	60.01	60.01
Moisture Content - %:	39	39	39
Bulk Density - Mg/m <sup>3</sup> :	1.78	1.78	1.78
Dry Density - Mg/m <sup>3</sup> :	1.28	1.29	1.28
Voids Ratio:	1.066	1.062	1.063
Normal Pressure- kPa	10	50	120
<b>Consolidation</b>			
Consolidated Height - mm:	24.89	24.60	24.08
<b>Shear</b>			
Rate of Strain (mm/min)	0.031	0.031	0.031
Strain at peak shear stress (%)	6.10	7.80	6.90
Peak shear Stress - kPa:	17	33	61
<b>Final Consolidated Conditions</b>			
Moisture Content - %:	43	42	40
Bulk Density - Mg/m <sup>3</sup> :	1.78	1.81	1.85
Dry Density - Mg/m <sup>3</sup> :	1.25	1.27	1.32
<b>PEAK</b>			
Angle of Shearing Resistance:( $\theta$ )			<b>22.0</b>
Effective Cohesion - kPa:			<b>13</b>



Checked by

Date

12/01/2015

Approved by

Date

12/01/2015



5 MILE LANE.

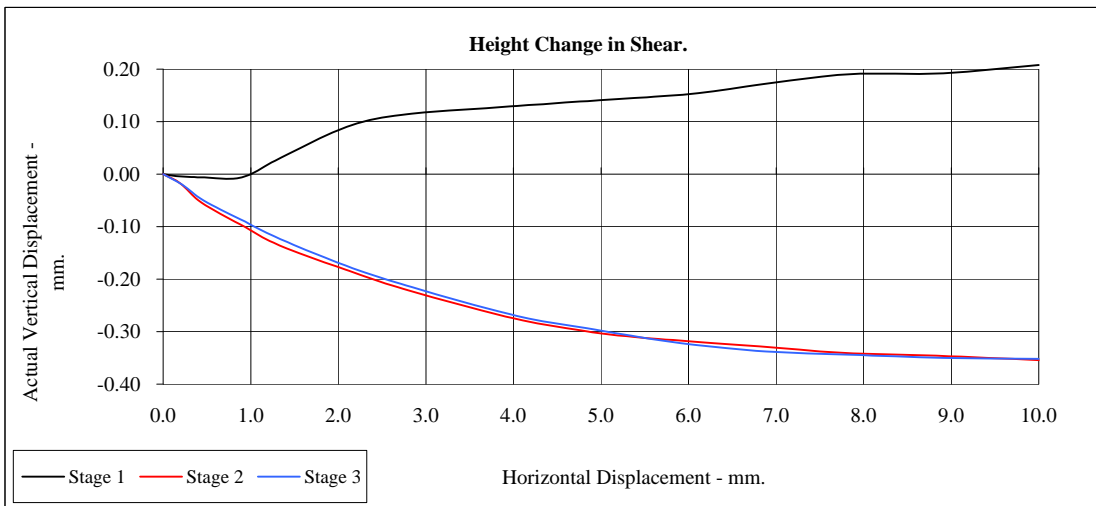
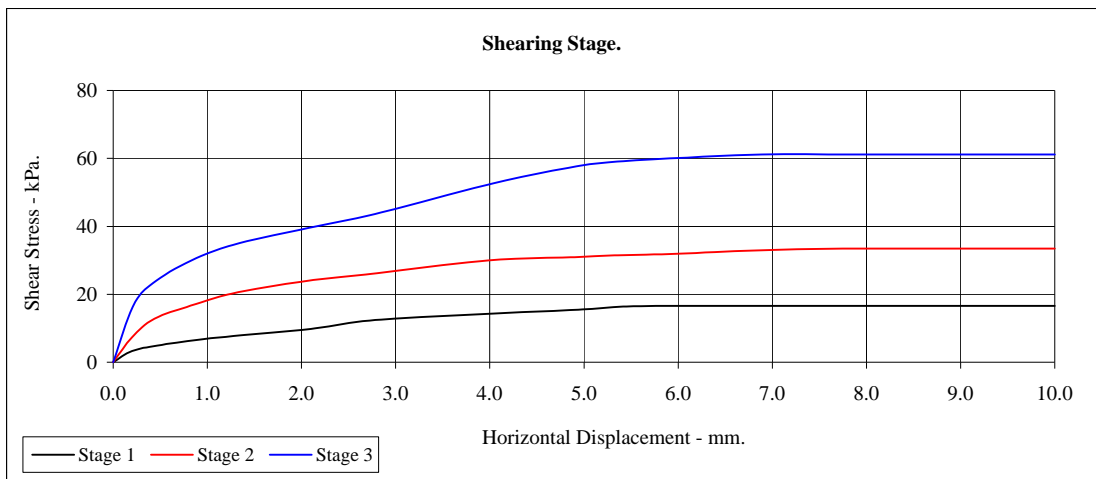
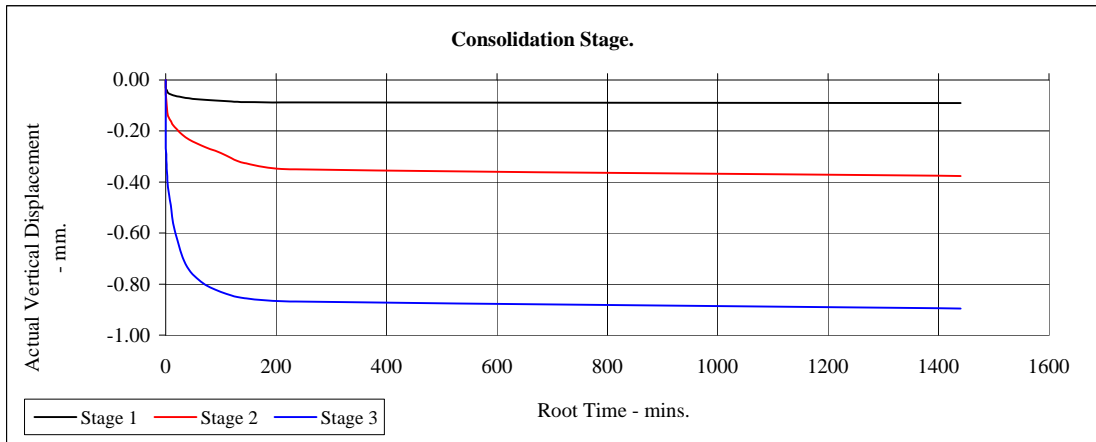
Contract No.:  
**PSL14/6467**

Client Ref Number:  
**C4414**

# CONSOLIDATED DRAINED SHEARBOX TEST.

BS1377:Part 7:4.5 :1990.

Hole Number: **TP206**      Depth (m): **0.50**      Sample Number: **B**



**5 MILE LANE.**

Contract No.:  
**PSL14/6467**

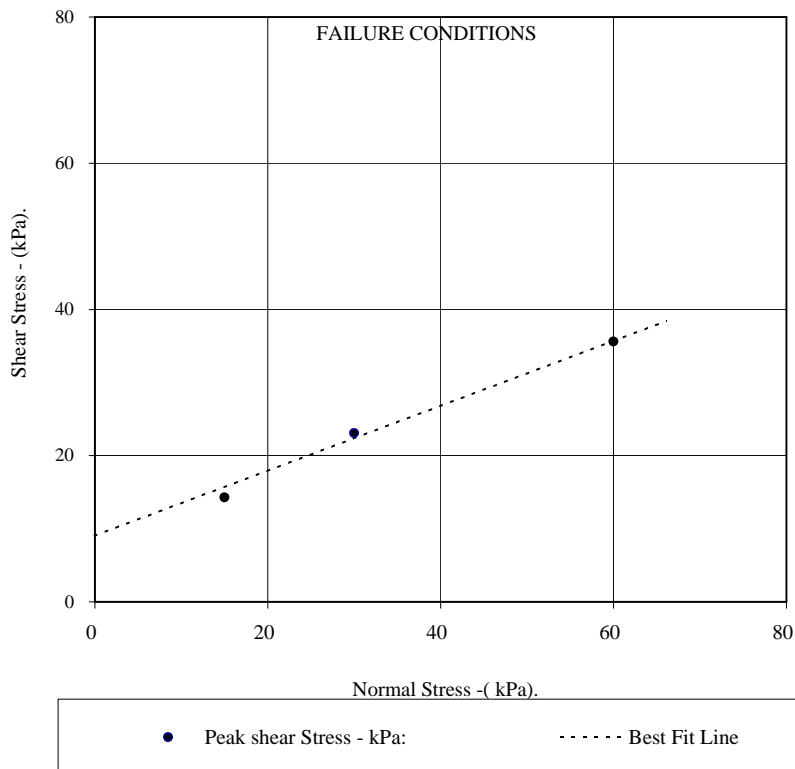
Client Ref Number:  
**C4414**

# CONSOLIDATED DRAINED SHEARBOX TEST.

BS1377:Part 7 :1990.

Hole Number: **TP207**      Depth (m): **0.80**      Sample Number: **B**

Sample Type:	Recompacted with 2.5kg Effort		
Particle Density - Mg/m <sup>3</sup> :	2.65 (Assumed)		
Specimen Tested:	Submerged Material tested passing 2mm		
Sample Description:	See summary of soil descriptions.		
<b>STAGE</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>Initial Conditions</b>			
Height - mm:	24.98	24.98	24.98
Length - mm:	60.01	60.01	60.01
Moisture Content - %:	37	37	37
Bulk Density - Mg/m <sup>3</sup> :	1.82	1.82	1.82
Dry Density - Mg/m <sup>3</sup> :	1.33	1.34	1.34
Voids Ratio:	0.989	0.984	0.984
Normal Pressure- kPa	15	30	60
<b>Consolidation</b>			
Consolidated Height - mm:	24.91	24.69	24.37
<b>Shear</b>			
Rate of Strain (mm/min)	0.028	0.028	0.028
Strain at peak shear stress (%)	1.00	2.00	2.00
Peak shear Stress - kPa:	14	23	36
<b>Final Consolidated Conditions</b>			
Moisture Content - %:	39	38	38
Bulk Density - Mg/m <sup>3</sup> :	1.83	1.85	1.87
Dry Density - Mg/m <sup>3</sup> :	1.31	1.34	1.35
<b>PEAK</b>			
Angle of Shearing Resistance:(θ)			<b>24.0</b>
Effective Cohesion - kPa:			<b>9</b>



Checked by [REDACTED]      Date 12/01/2015

Approved by [REDACTED]      Date 12/01/2015



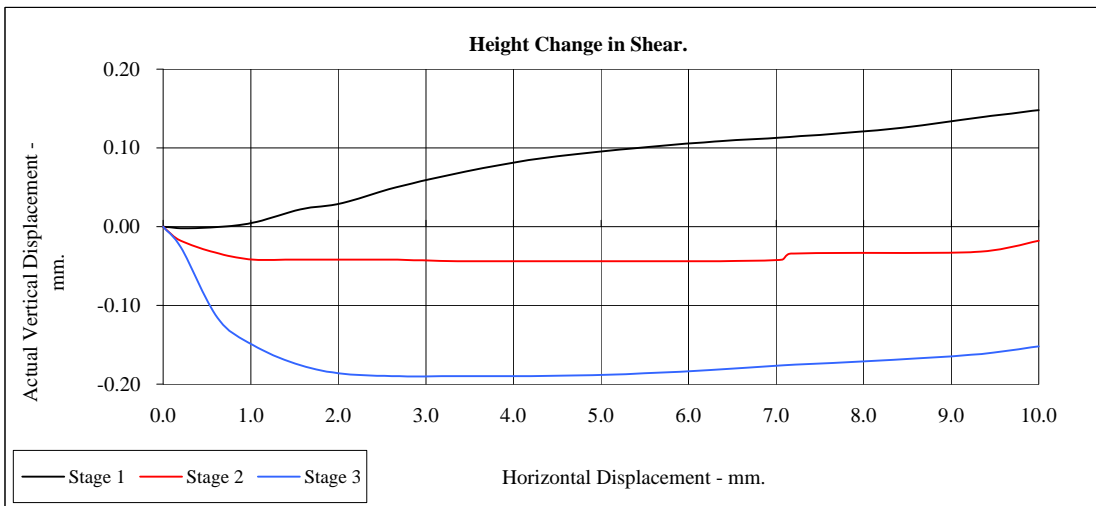
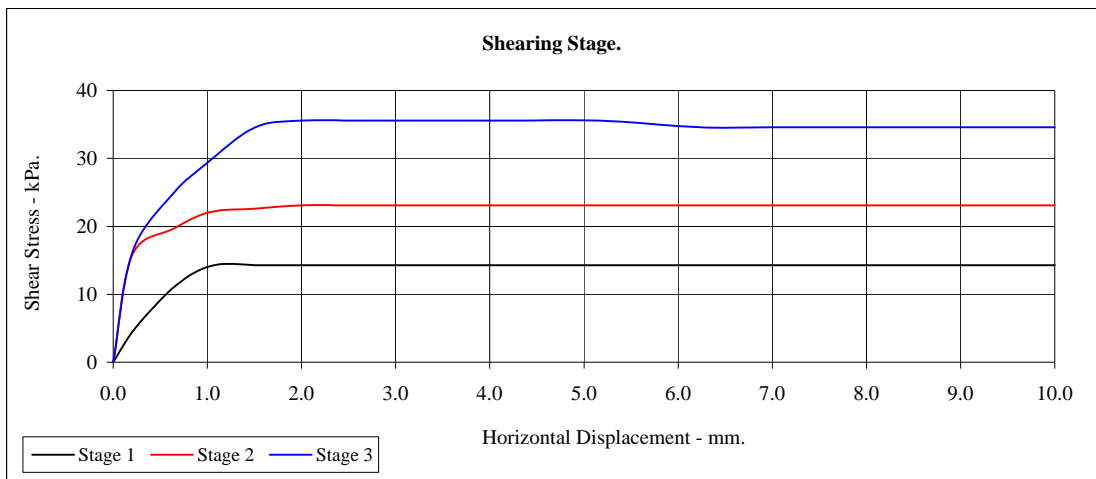
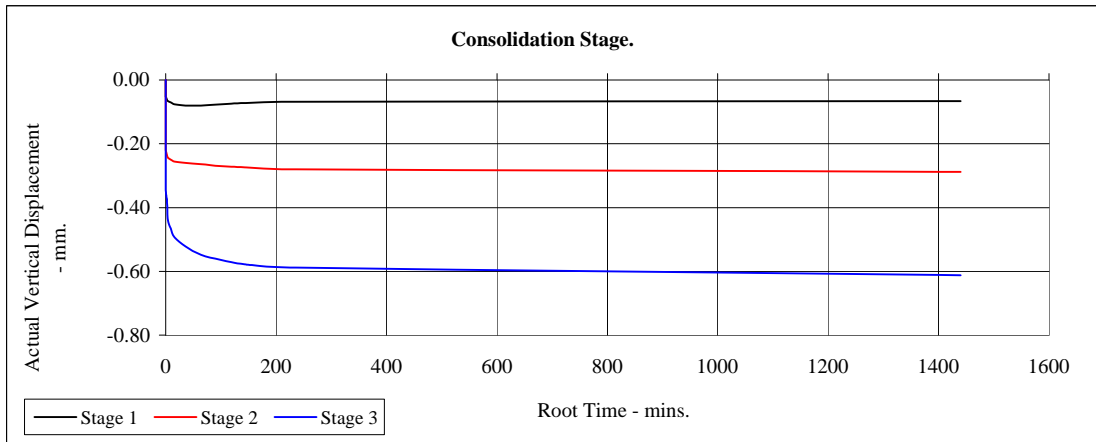
5 MILE LANE.

Contract No.:  
**PSL14/6467**  
Client Ref Number:  
**C4414**

# CONSOLIDATED DRAINED SHEARBOX TEST.

BS1377:Part 7:4.5 :1990.

Hole Number: **TP207**      Depth (m): **0.80**      Sample Number: **B**



**5 MILE LANE.**

Contract No.:  
**PSL14/6467**

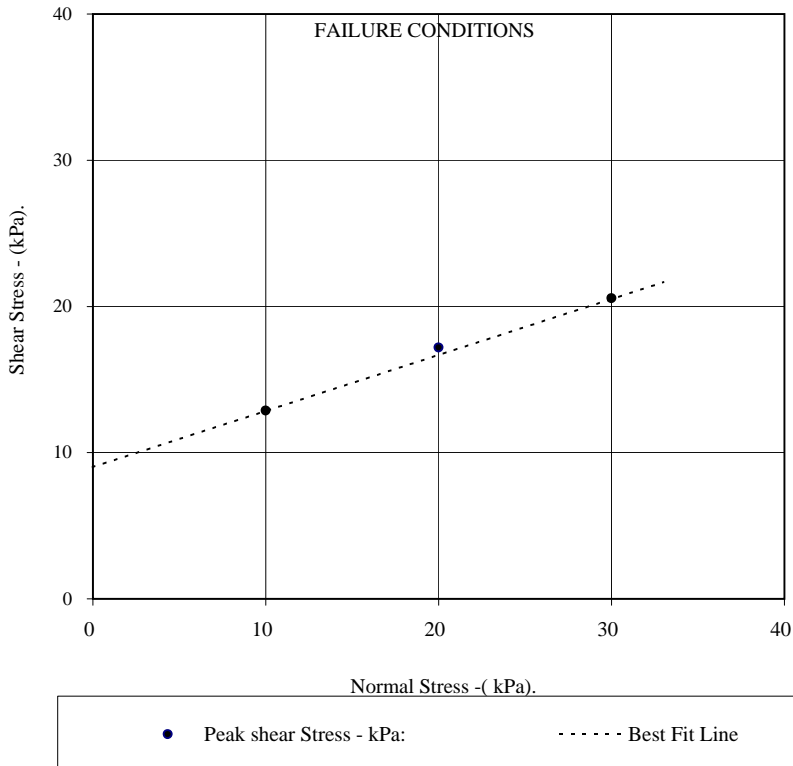
Client Ref Number:  
**C4414**

# CONSOLIDATED DRAINED SHEARBOX TEST.

BS1377:Part 7 :1990.

Hole Number: **TP211**      Depth (m): **0.50**      Sample Number: **B**

Sample Type:	Recompacted with 2.5kg Effort		
Particle Density - Mg/m <sup>3</sup> :	2.65 (Assumed)		
Specimen Tested:	Submerged Material tested passing 2mm		
Sample Description:	See summary of soil descriptions.		
<b>STAGE</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>Initial Conditions</b>			
Height - mm:	24.98	24.98	24.98
Length - mm:	60.01	60.01	60.01
Moisture Content - %:	27	27	27
Bulk Density - Mg/m <sup>3</sup> :	1.87	1.87	1.87
Dry Density - Mg/m <sup>3</sup> :	1.47	1.47	1.47
Voids Ratio:	0.800	0.800	0.799
Normal Pressure- kPa	10	20	30
<b>Consolidation</b>			
Consolidated Height - mm:	25.21	25.09	25.05
<b>Shear</b>			
Rate of Strain (mm/min)	0.320	0.320	0.320
Strain at peak shear stress (%)	2.00	2.00	4.00
Peak shear Stress - kPa:	13	17	21
<b>Final Consolidated Conditions</b>			
Moisture Content - %:	33	32	31
Bulk Density - Mg/m <sup>3</sup> :	1.85	1.86	1.87
Dry Density - Mg/m <sup>3</sup> :	1.40	1.41	1.42
<b>PEAK</b>			
Angle of Shearing Resistance:( $\theta$ )			<b>21.0</b>
Effective Cohesion - kPa:			<b>9</b>



Checked by [Redacted]      Date 12/01/2015

Approved by [Redacted]      Date 12/01/2015



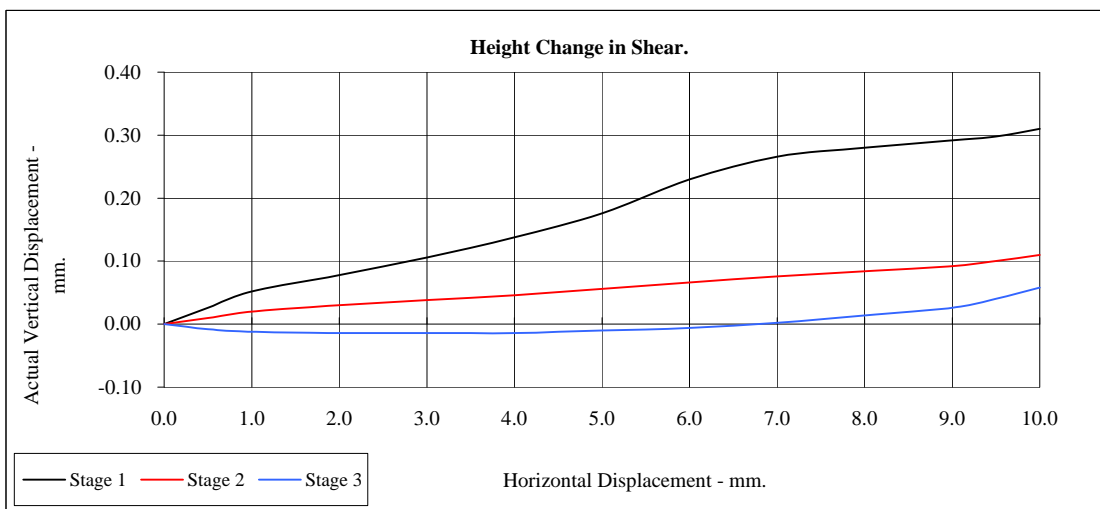
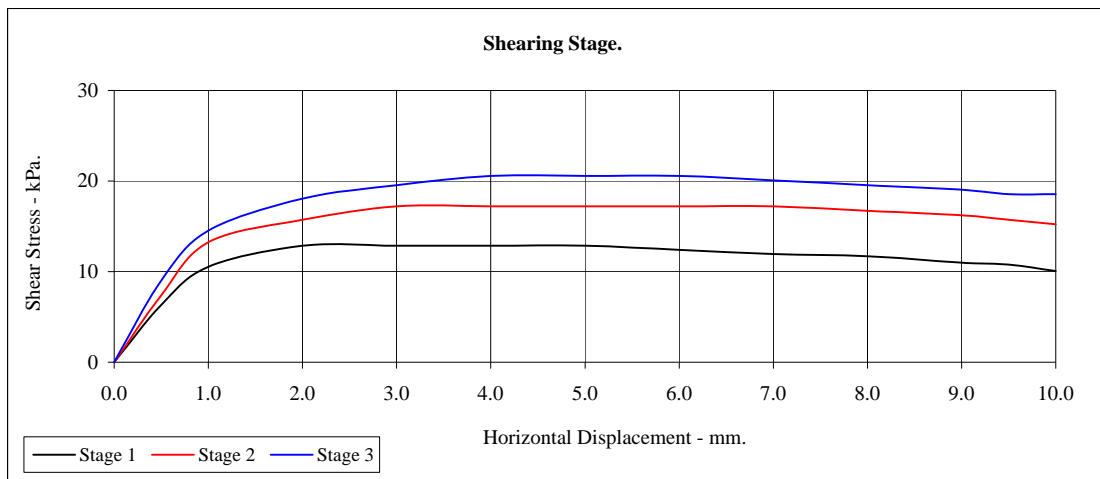
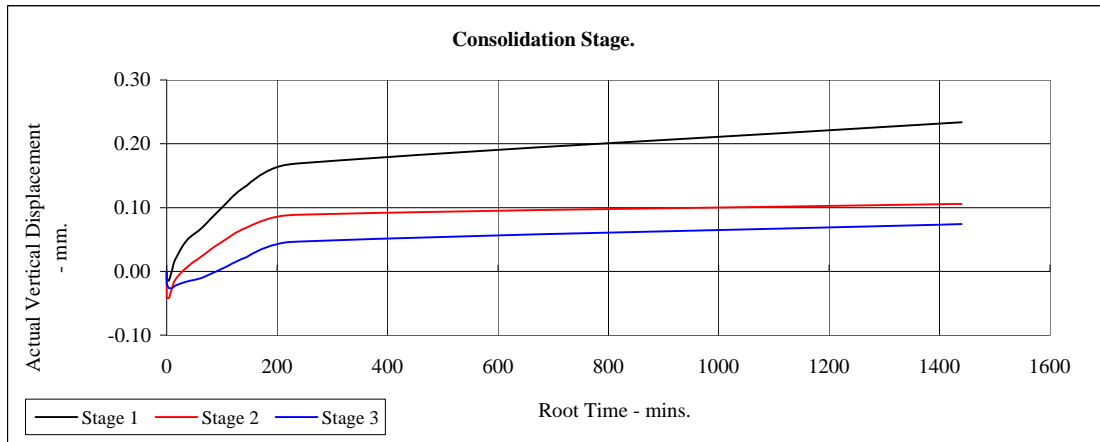
5 MILE LANE.

Contract No.: **PSL14/6467**  
Client Ref Number: **C4414**

# CONSOLIDATED DRAINED SHEARBOX TEST.

BS1377:Part 7:4.5 :1990.

Hole Number: **TP211**      Depth (m): **0.50**      Sample Number: **B**



**5 MILE LANE.**

Contract No.:  
**PSL14/6467**

Client Ref Number:  
**C4414**

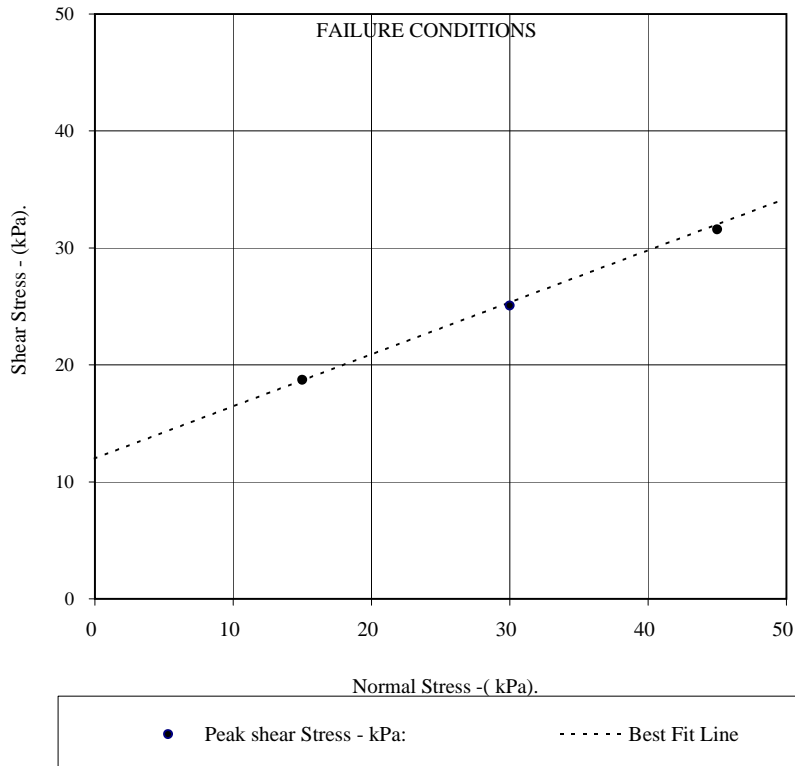


# CONSOLIDATED DRAINED SHEARBOX TEST.

BS1377:Part 7 :1990.

Hole Number: **TP212**      Depth (m): **0.60**      Sample Number: **B**

Sample Type:	Recompacted with 2.5kg Effort		
Particle Density - Mg/m <sup>3</sup> :	2.65 (Assumed)		
Specimen Tested:	Submerged Material tested passing 2mm		
Sample Description:	See summary of soil descriptions.		
<b>STAGE</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>Initial Conditions</b>			
Height - mm:	24.98	24.98	24.98
Length - mm:	60.01	60.01	60.01
Moisture Content - %:	32	32	32
Bulk Density - Mg/m <sup>3</sup> :	1.83	1.84	1.84
Dry Density - Mg/m <sup>3</sup> :	1.39	1.39	1.40
Voids Ratio:	0.909	0.903	0.899
Normal Pressure- kPa	15	30	45
<b>Consolidation</b>			
Consolidated Height - mm:	24.99	24.90	24.77
<b>Shear</b>			
Rate of Strain (mm/min)	0.029	0.029	0.029
Strain at peak shear stress (%)	4.00	4.00	4.00
Peak shear Stress - kPa:	19	25	32
<b>Final Consolidated Conditions</b>			
Moisture Content - %:	34	33	32
Bulk Density - Mg/m <sup>3</sup> :	1.83	1.84	1.85
Dry Density - Mg/m <sup>3</sup> :	1.37	1.39	1.40
<b>PEAK</b>			
Angle of Shearing Resistance:( $\theta$ )			<b>24.0</b>
Effective Cohesion - kPa:			<b>12</b>



Checked by [REDACTED]      Date 12/01/2015

Approved by [REDACTED]      Date 12/01/2015



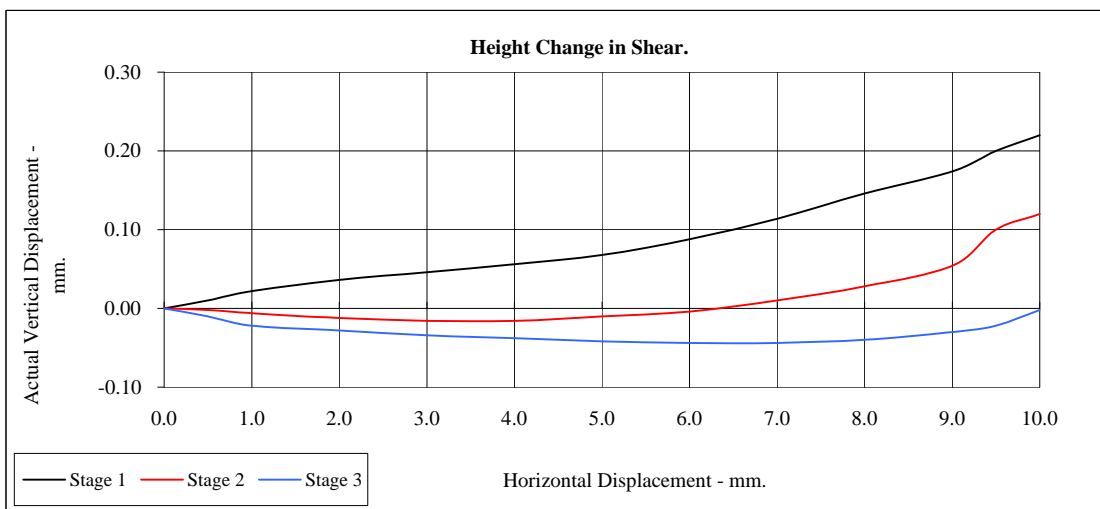
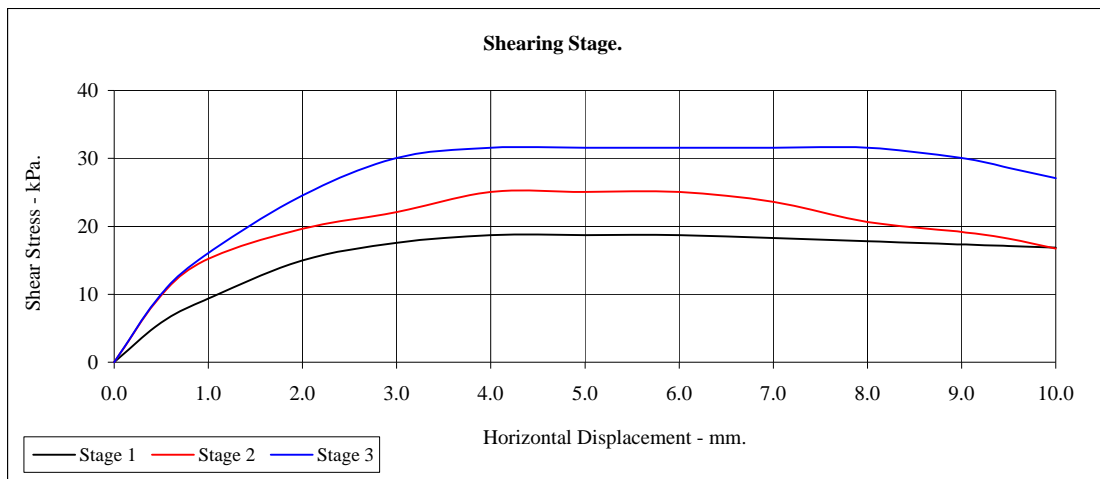
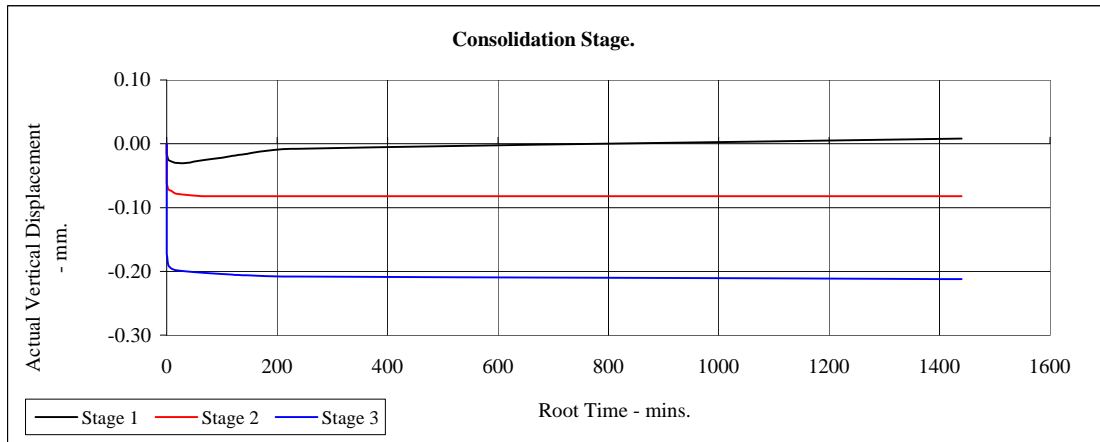
5 MILE LANE.

Contract No.:  
**PSL14/6467**  
Client Ref Number:  
**C4414**

# CONSOLIDATED DRAINED SHEARBOX TEST.

BS1377:Part 7:4.5 :1990.

Hole Number: **TP212**      Depth (m): **0.60**      Sample Number: **B**



**5 MILE LANE.**

Contract No.:  
**PSL14/6467**

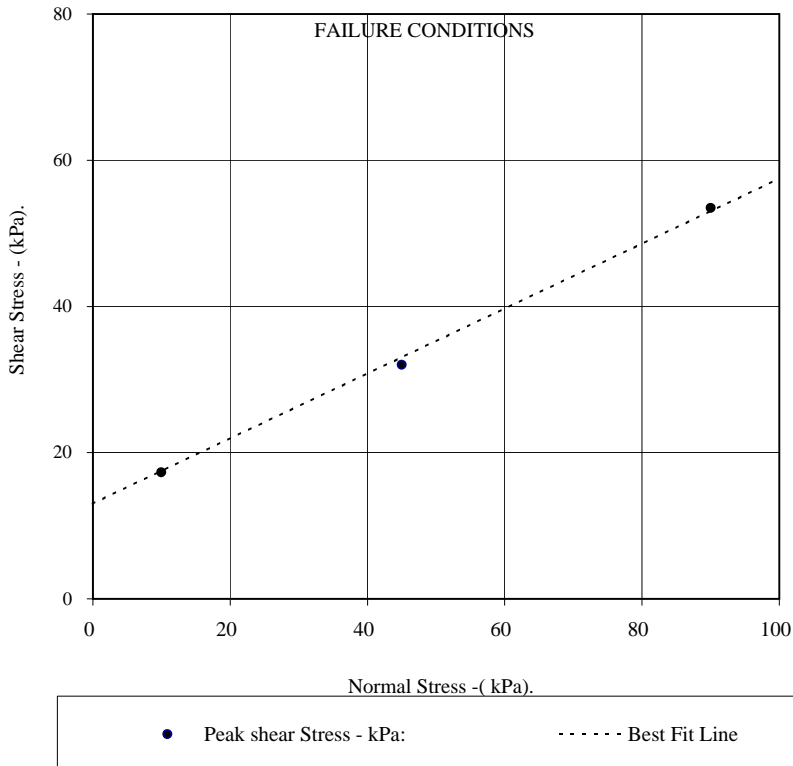
Client Ref Number:  
**C4414**

# CONSOLIDATED DRAINED SHEARBOX TEST.

BS1377:Part 7 :1990.

Hole Number: **TP213**      Depth (m): **0.50**      Sample Number: **B**

Sample Type:	Recompacted with 2.5kg Effort		
Particle Density - Mg/m <sup>3</sup> :	2.65 (Assumed)		
Specimen Tested:	Submerged Material tested passing 2mm		
Sample Description:	See summary of soil descriptions.		
<b>STAGE</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>Initial Conditions</b>			
Height - mm:	20.13	20.13	20.13
Length - mm:	59.90	59.90	59.90
Moisture Content - %:	25	25	25
Bulk Density - Mg/m <sup>3</sup> :	1.88	1.88	1.89
Dry Density - Mg/m <sup>3</sup> :	1.50	1.50	1.51
Voids Ratio:	0.764	0.762	0.759
Normal Pressure- kPa	10	45	90
<b>Consolidation</b>			
Consolidated Height - mm:	20.21	20.04	19.74
<b>Shear</b>			
Rate of Strain (mm/min)	0.034	0.034	0.034
Strain at peak shear stress (%)	2.00	2.00	2.50
Peak shear Stress - kPa:	17	32	53
<b>Final Consolidated Conditions</b>			
Moisture Content - %:	33	31	30
Bulk Density - Mg/m <sup>3</sup> :	1.87	1.89	1.92
Dry Density - Mg/m <sup>3</sup> :	1.41	1.44	1.48
<b>PEAK</b>			
Angle of Shearing Resistance:( $\theta$ )			<b>24.0</b>
Effective Cohesion - kPa:			<b>13</b>



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Date  
12/01/2015

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Date  
12/01/2015



5 MILE LANE.

Contract No.:  
**PSL14/6467.**

Client Ref Number:  
**C4414**

# CONSOLIDATED DRAINED SHEARBOX TEST.

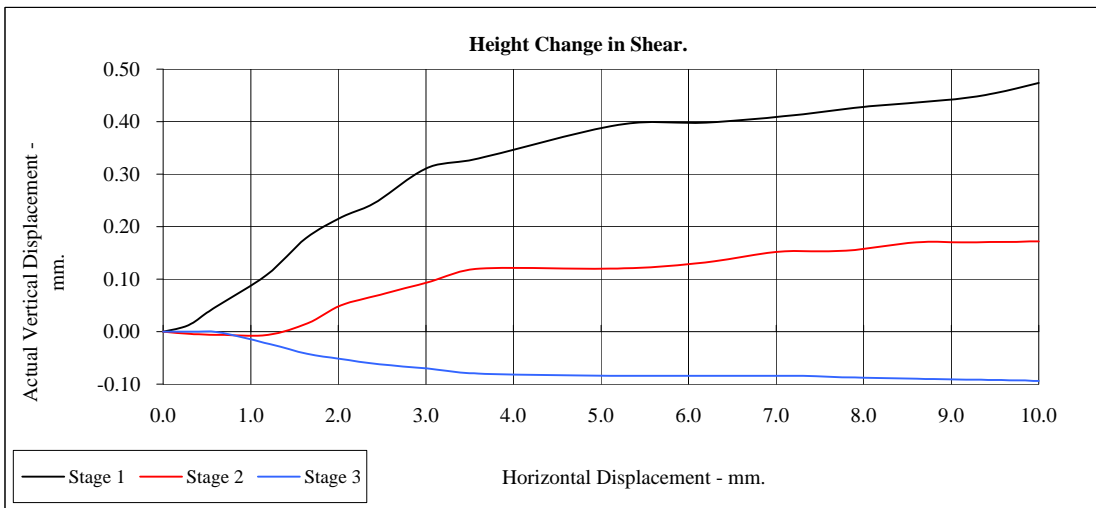
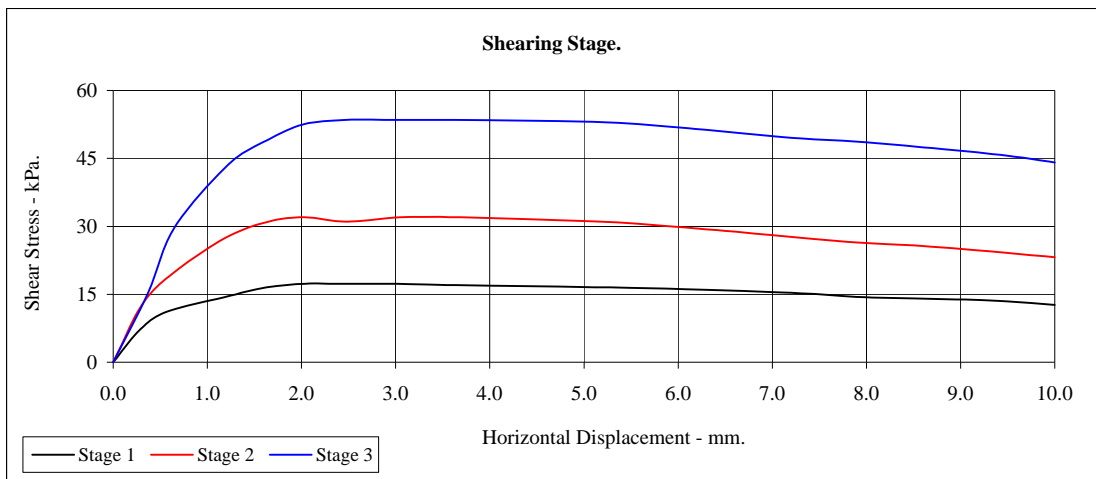
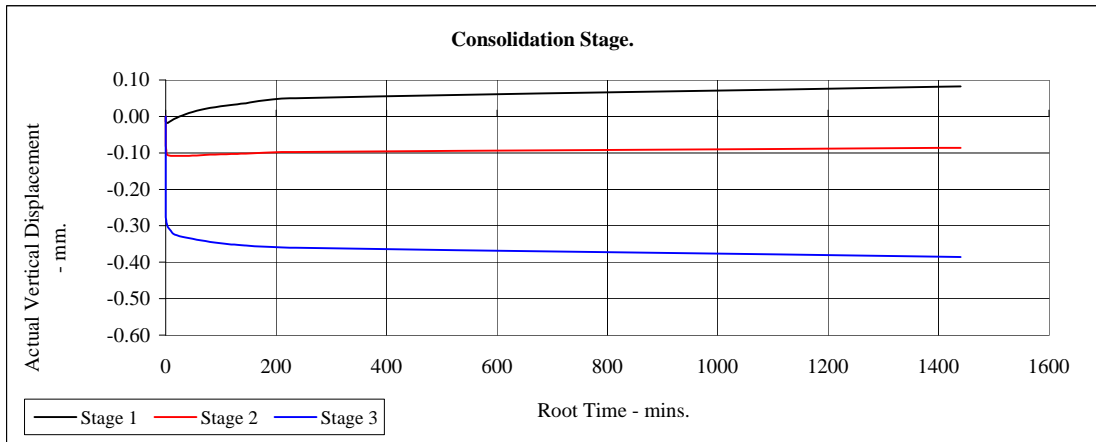
BS1377:Part 7:4.5 :1990.

Hole Number: **TP213**

Depth (m):

**0.50**

Sample Number: **B**



**5 MILE LANE.**

Contract No.:  
**PSL14/6467.**

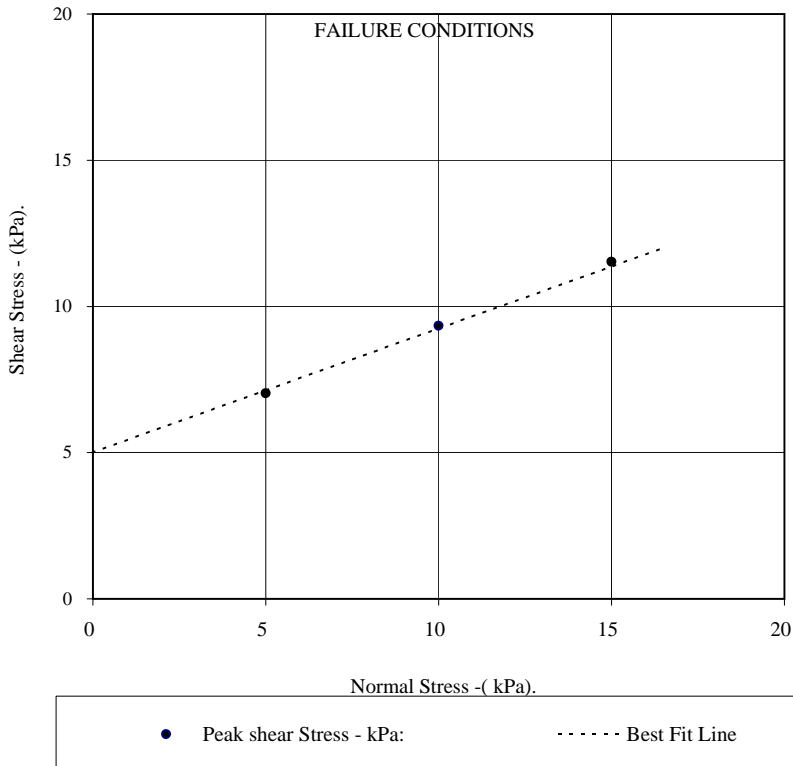
Client Ref Number:  
**C4414**

# CONSOLIDATED DRAINED SHEARBOX TEST.

BS1377:Part 7 :1990.

Hole Number: **TP217**      Depth (m): **0.50**      Sample Number: **B**

Sample Type:	Recompacted with 2.5kg Effort		
Particle Density - Mg/m <sup>3</sup> :	2.65 (Assumed)		
Specimen Tested:	Submerged Material tested passing 2mm		
Sample Description:	See summary of soil descriptions.		
<b>STAGE</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>Initial Conditions</b>			
Height - mm:	24.98	24.98	24.98
Length - mm:	60.01	60.01	60.01
Moisture Content - %:	34	34	34
Bulk Density - Mg/m <sup>3</sup> :	1.85	1.86	1.86
Dry Density - Mg/m <sup>3</sup> :	1.38	1.39	1.39
Voids Ratio:	0.918	0.910	0.907
Normal Pressure- kPa	5	10	15
<b>Consolidation</b>			
Consolidated Height - mm:	25.14	25.11	24.79
<b>Shear</b>			
Rate of Strain (mm/min)	0.025	0.025	0.025
Strain at peak shear stress (%)	1.10	1.60	1.00
Peak shear Stress - kPa:	7	9	12
<b>Final Consolidated Conditions</b>			
Moisture Content - %:	38	37	35
Bulk Density - Mg/m <sup>3</sup> :	1.84	1.85	1.88
Dry Density - Mg/m <sup>3</sup> :	1.34	1.35	1.39
<b>PEAK</b>			
Angle of Shearing Resistance:( $\theta$ )			<b>23.0</b>
Effective Cohesion - kPa:			<b>5</b>



Checked by [REDACTED]      Date 12/01/2015

Approved by [REDACTED]      Date 12/01/2015



5 MILE LANE.

Contract No.:  
**PSL14/6467**  
Client Ref Number:  
**C4414**

# CONSOLIDATED DRAINED SHEARBOX TEST.

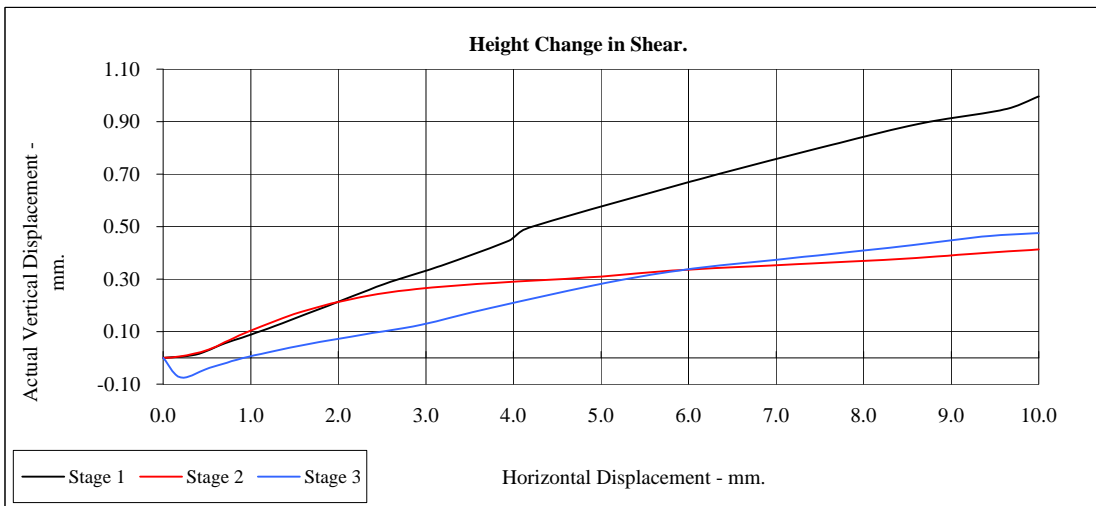
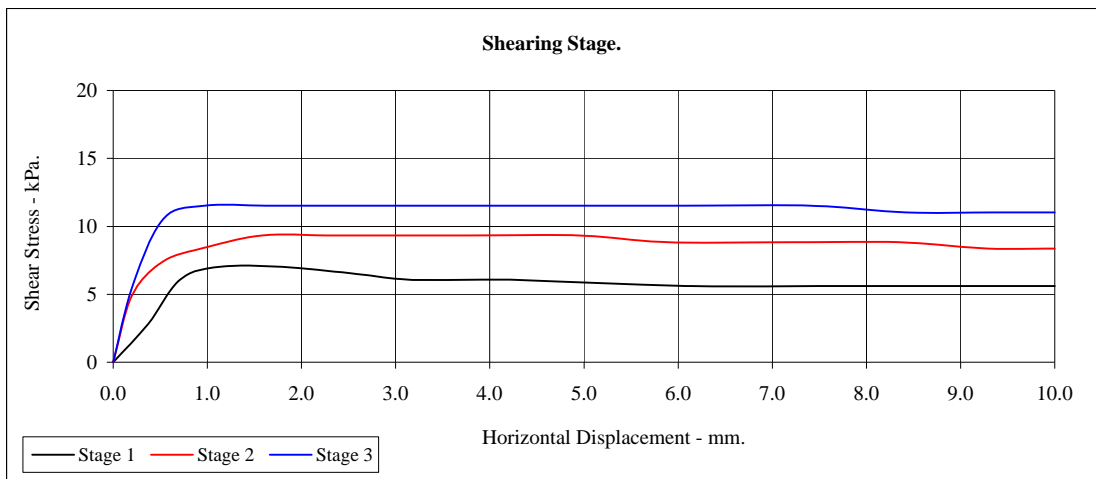
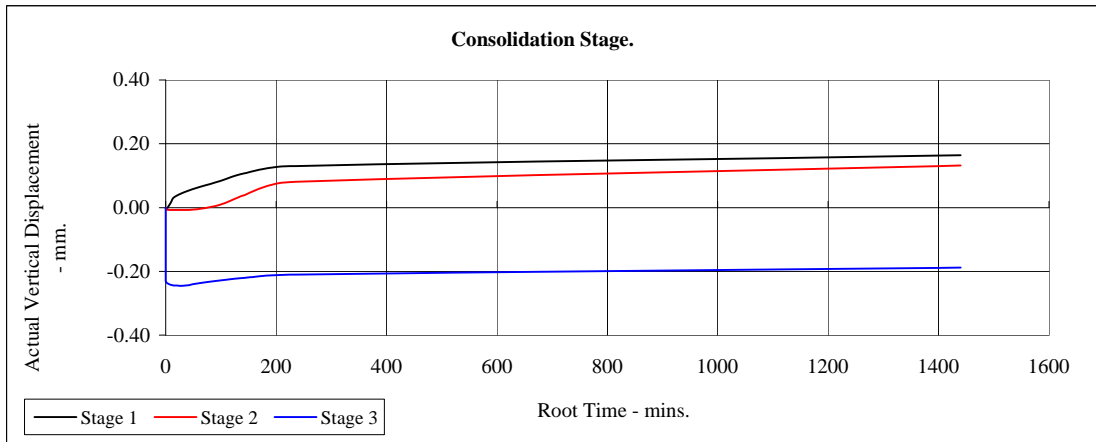
BS1377:Part 7:4.5 :1990.

Hole Number: **TP217**

Depth (m):

**0.50**

Sample Number: **B**



**5 MILE LANE.**

Contract No.:  
**PSL14/6467**

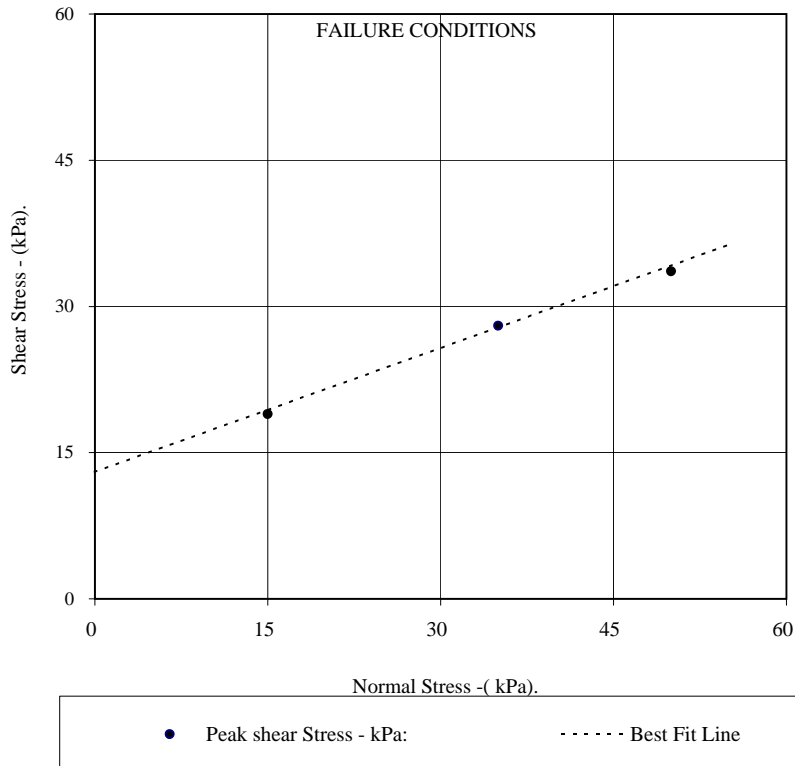
Client Ref Number:  
**C4414**

# CONSOLIDATED DRAINED SHEARBOX TEST.

BS1377:Part 7 :1990.

Hole Number: **TP217**      Depth (m): **1.70**      Sample Number: **B**

Sample Type:	Recompacted with 2.5kg Effort		
Particle Density - Mg/m <sup>3</sup> :	2.65 (Assumed)		
Specimen Tested:	Submerged Material tested passing 2mm		
Sample Description:	See summary of soil descriptions.		
<b>STAGE</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>Initial Conditions</b>			
Height - mm:	24.98	24.98	24.98
Length - mm:	60.01	60.01	60.01
Moisture Content - %:	33	33	33
Bulk Density - Mg/m <sup>3</sup> :	1.83	1.83	1.83
Dry Density - Mg/m <sup>3</sup> :	1.38	1.38	1.38
Voids Ratio:	0.925	0.924	0.924
Normal Pressure- kPa	15	35	50
<b>Consolidation</b>			
Consolidated Height - mm:	24.89	24.80	24.70
<b>Shear</b>			
Rate of Strain (mm/min)	0.032	0.032	0.032
Strain at peak shear stress (%)	4.00	3.00	3.00
Peak shear Stress - kPa:	19	28	34
<b>Final Consolidated Conditions</b>			
Moisture Content - %:	34	32	31
Bulk Density - Mg/m <sup>3</sup> :	1.84	1.85	1.85
Dry Density - Mg/m <sup>3</sup> :	1.37	1.40	1.41
<b>PEAK</b>			
Angle of Shearing Resistance:( $\theta$ )			<b>23.0</b>
Effective Cohesion - kPa:			<b>13</b>



Checked by [REDACTED]      Date 12/01/2015

Approved by [REDACTED]      Date 12/01/2015



5 MILE LANE.

Contract No.:  
**PSL14/6467**

Client Ref Number:  
**C4414**

# CONSOLIDATED DRAINED SHEARBOX TEST.

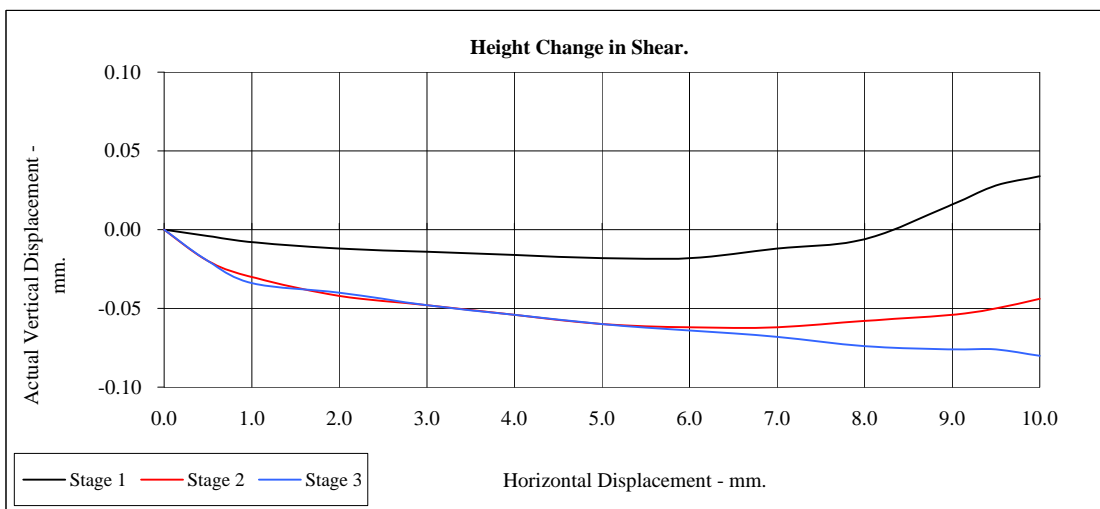
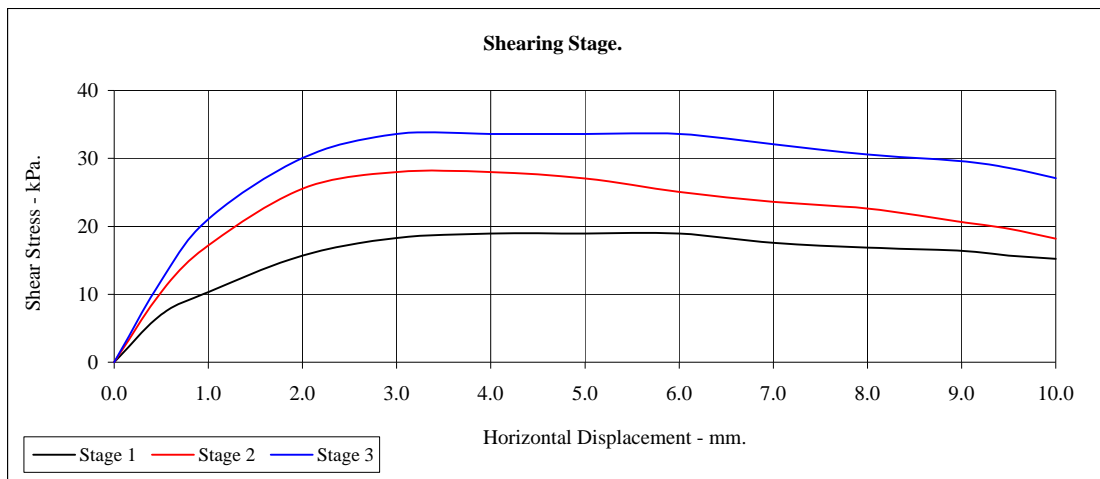
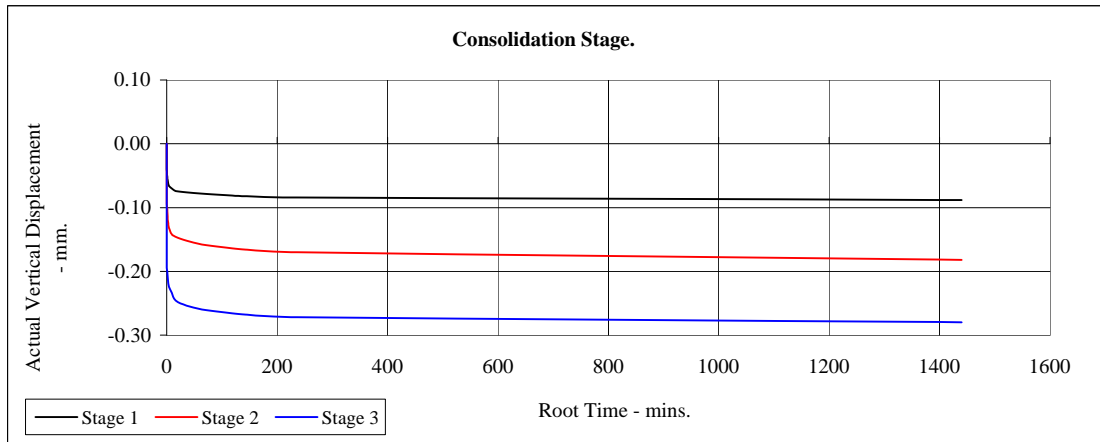
BS1377:Part 7:4.5 :1990.

Hole Number: **TP217**

Depth (m):

**1.70**

Sample Number: **B**



5 MILE LANE.

Contract No.:  
**PSL14/6467**

Client Ref Number:  
**C4414**

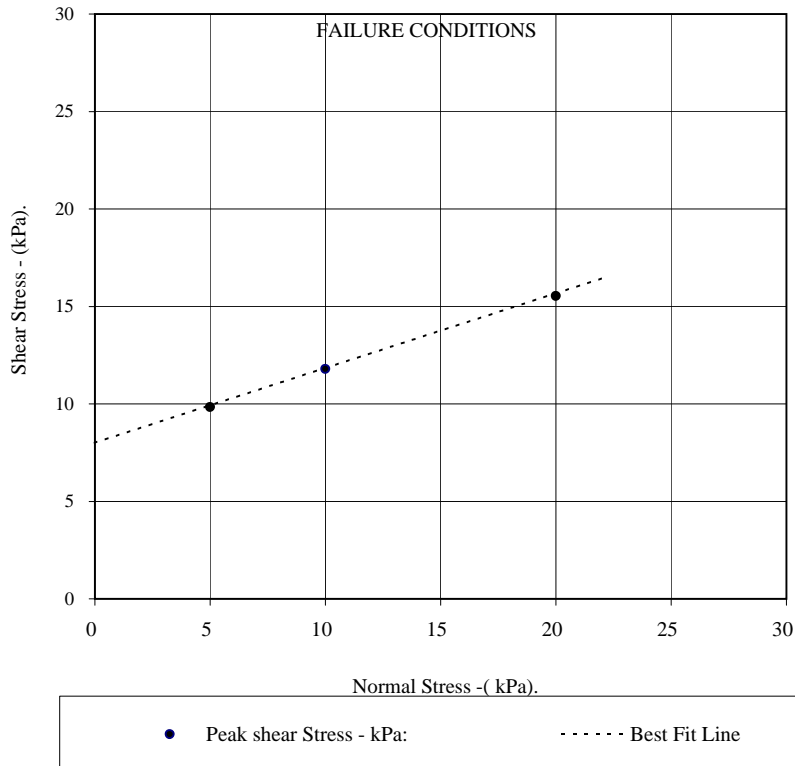


# CONSOLIDATED DRAINED SHEARBOX TEST.

BS1377:Part 7 :1990.

Hole Number: **TP218**      Depth (m): **0.50**      Sample Number: **B**

Sample Type:	Recompacted with 2.5kg Effort		
Particle Density - Mg/m <sup>3</sup> :	2.65 (Assumed)		
Specimen Tested:	Submerged Material tested passing 2mm		
Sample Description:	See summary of soil descriptions.		
<b>STAGE</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>Initial Conditions</b>			
Height - mm:	24.98	24.98	24.98
Length - mm:	60.01	60.01	60.01
Moisture Content - %:	28	28	28
Bulk Density - Mg/m <sup>3</sup> :	1.77	1.77	1.78
Dry Density - Mg/m <sup>3</sup> :	1.38	1.39	1.39
Voids Ratio:	0.916	0.913	0.910
Normal Pressure- kPa	5	10	20
<b>Consolidation</b>			
Consolidated Height - mm:	25.26	25.16	25.04
<b>Shear</b>			
Rate of Strain (mm/min)	0.032	0.032	0.032
Strain at peak shear stress (%)	2.00	2.00	2.00
Peak shear Stress - kPa:	10	12	16
<b>Final Consolidated Conditions</b>			
Moisture Content - %:	32	31	31
Bulk Density - Mg/m <sup>3</sup> :	1.75	1.76	1.77
Dry Density - Mg/m <sup>3</sup> :	1.33	1.35	1.35
<b>PEAK</b>			
Angle of Shearing Resistance:( $\theta$ )			<b>21.0</b>
Effective Cohesion - kPa:			<b>8</b>



Checked by Date 12/01/2015

Approved by Date 12/01/2015



5 MILE LANE.

Contract No.:  
**PSL14/6467**

Client Ref Number:  
**C4414**

# CONSOLIDATED DRAINED SHEARBOX TEST.

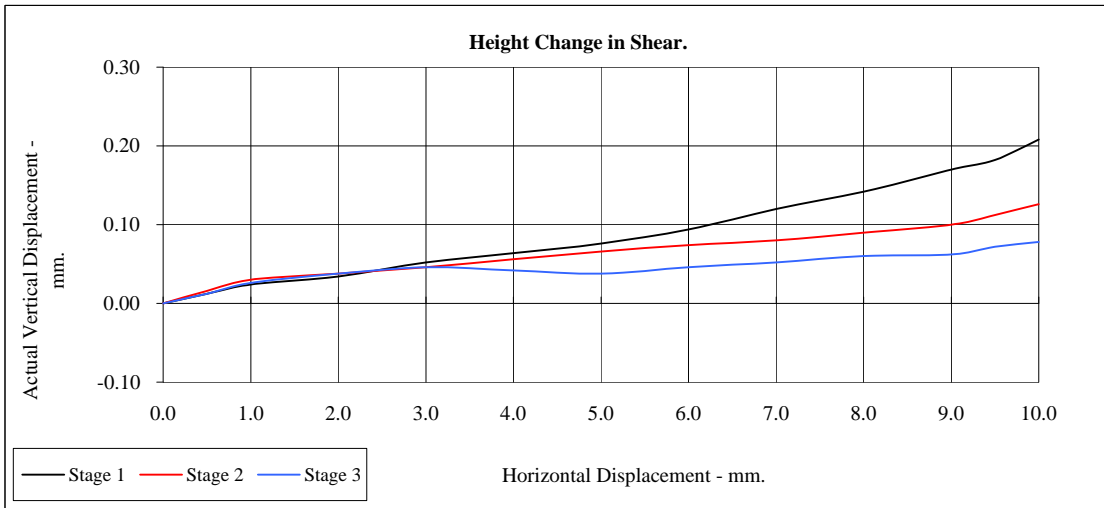
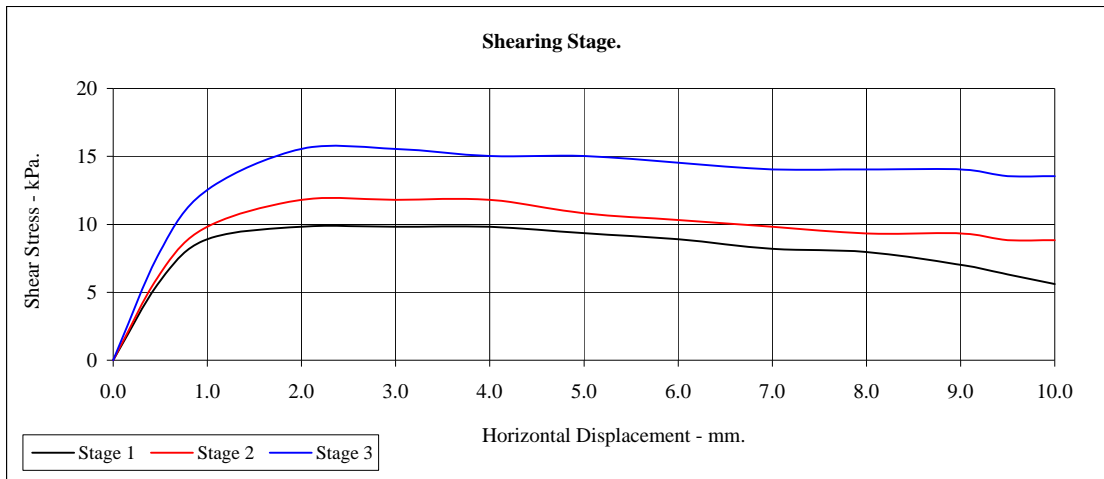
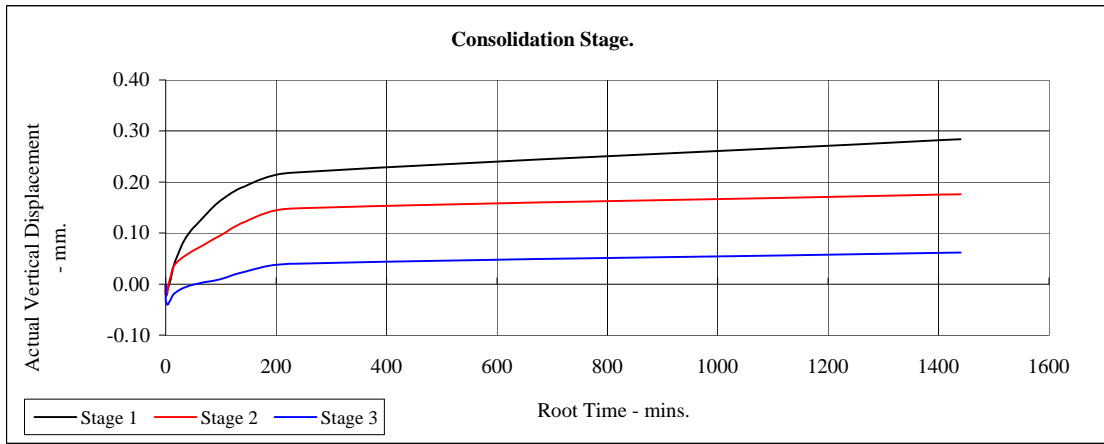
BS1377:Part 7:4.5 :1990.

Hole Number: **TP218**

Depth (m):

**0.50**

Sample Number: **B**



**5 MILE LANE.**

Contract No.:  
**PSL14/6467**

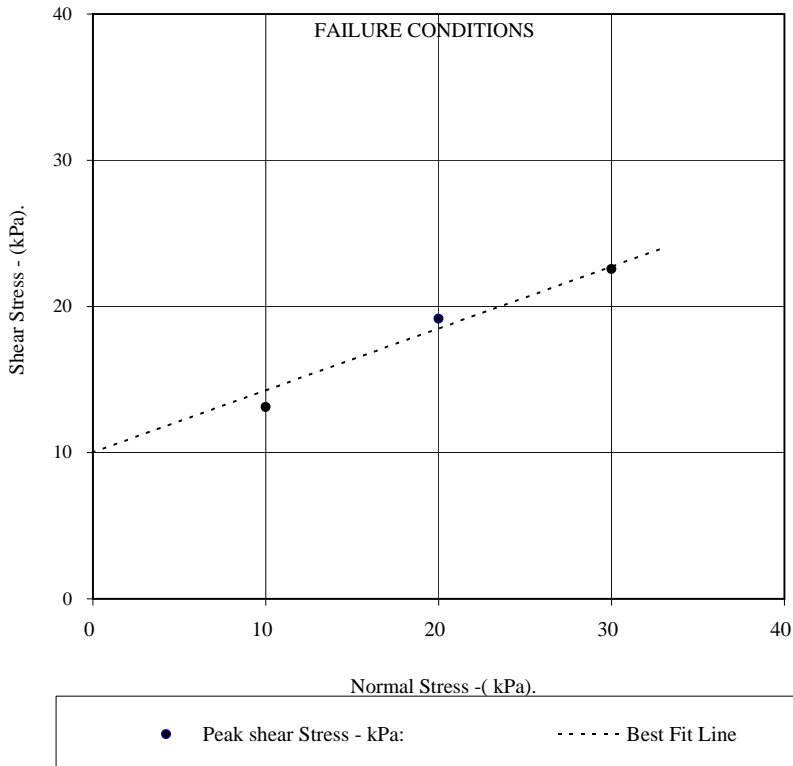
Client Ref Number:  
**C4414**

# CONSOLIDATED DRAINED SHEARBOX TEST.

BS1377:Part 7 :1990.

Hole Number: **TP219**      Depth (m): **1.00**      Sample Number: **B**

Sample Type:	Recompacted with 2.5kg Effort		
Particle Density - Mg/m <sup>3</sup> :	2.65 (Assumed)		
Specimen Tested:	Submerged Material tested passing 2mm		
Sample Description:	See summary of soil descriptions.		
<b>STAGE</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>Initial Conditions</b>			
Height - mm:	24.98	24.98	24.98
Length - mm:	60.01	60.01	60.01
Moisture Content - %:	31	31	31
Bulk Density - Mg/m <sup>3</sup> :	1.86	1.86	1.86
Dry Density - Mg/m <sup>3</sup> :	1.42	1.42	1.42
Voids Ratio:	0.867	0.866	0.865
Normal Pressure- kPa	10	20	30
<b>Consolidation</b>			
Consolidated Height - mm:	25.07	24.94	24.60
<b>Shear</b>			
Rate of Strain (mm/min)	0.027	0.027	0.027
Strain at peak shear stress (%)	2.80	2.40	1.80
Peak shear Stress - kPa:	13	19	23
<b>Final Consolidated Conditons</b>			
Moisture Content - %:	35	33	32
Bulk Density - Mg/m <sup>3</sup> :	1.85	1.86	1.89
Dry Density - Mg/m <sup>3</sup> :	1.37	1.40	1.43
<b>PEAK</b>			
Angle of Shearing Resistance:( $\theta$ )			<b>23.0</b>
Effective Cohesion - kPa:			<b>10</b>



Checked by [REDACTED]      Date 12/01/2015

Approved by [REDACTED]      Date 12/01/2015



5 MILE LANE.

Contract No.:  
**PSL14/6467**

Client Ref Number:  
**C4414**

# CONSOLIDATED DRAINED SHEARBOX TEST.

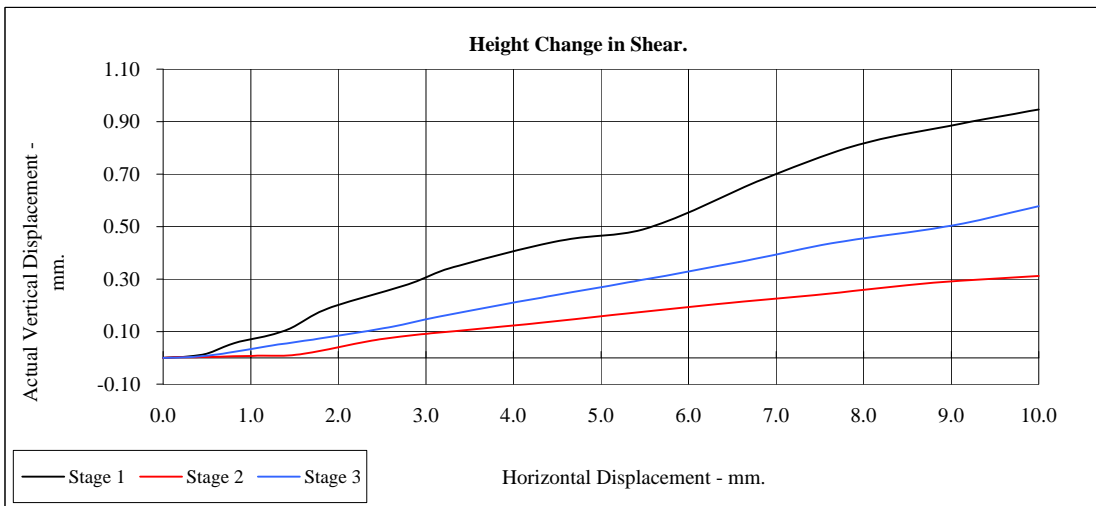
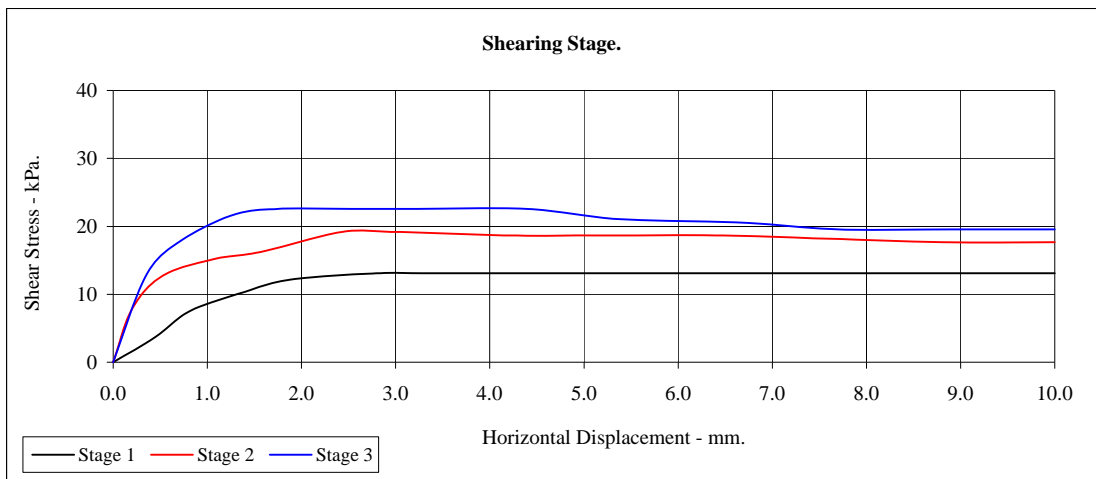
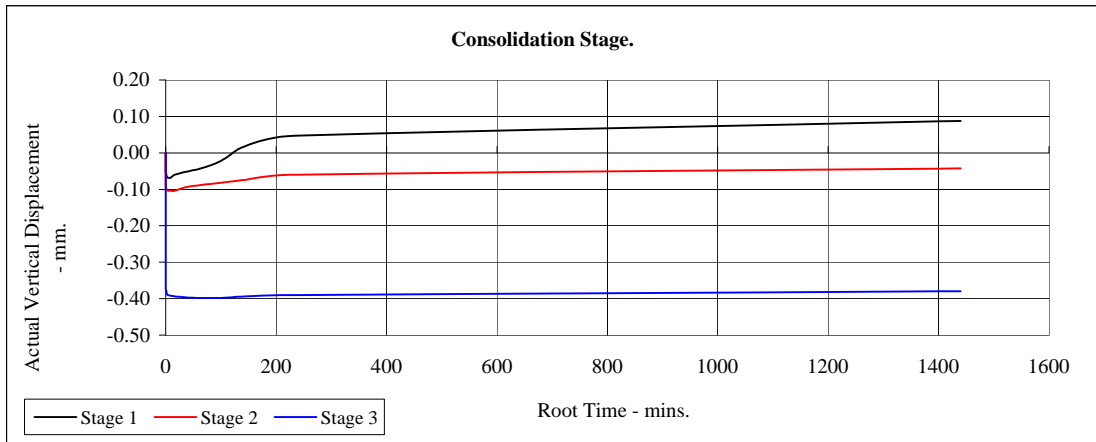
BS1377:Part 7:4.5 :1990.

Hole Number: **TP219**

Depth (m):

**1.00**

Sample Number: **B**



**5 MILE LANE.**

Contract No.:  
**PSL14/6467**

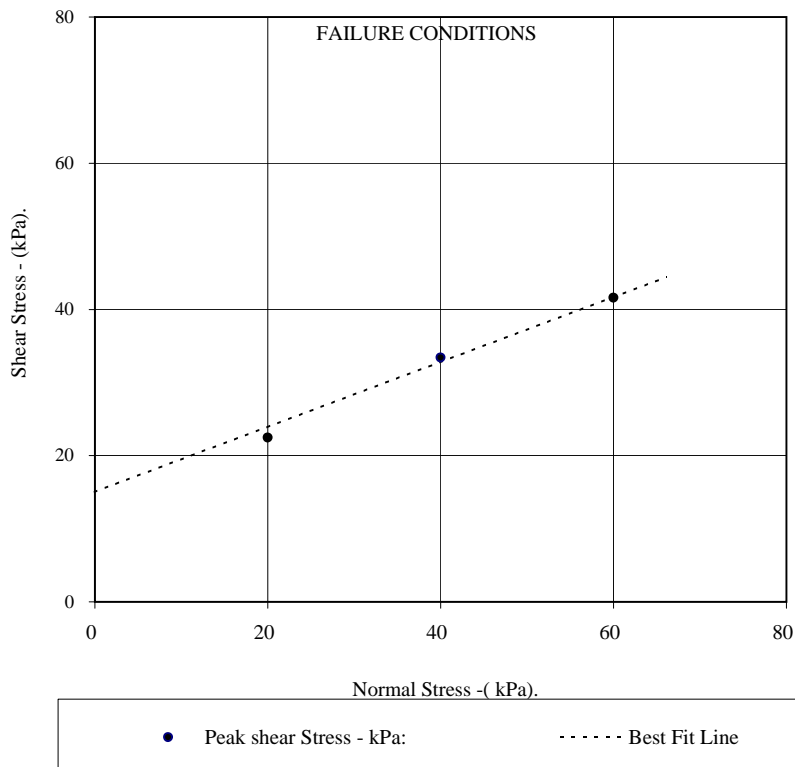
Client Ref Number:  
**C4414**

# CONSOLIDATED DRAINED SHEARBOX TEST.

BS1377:Part 7 :1990.

Hole Number: **TP219**      Depth (m): **2.10**      Sample Number: **B**

Sample Type:	Recompacted with 2.5kg Effort		
Particle Density - Mg/m <sup>3</sup> :	2.65 (Assumed)		
Specimen Tested:	Submerged Material tested passing 2mm		
Sample Description:	See summary of soil descriptions.		
<b>STAGE</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>Initial Conditions</b>			
Height - mm:	24.98	24.98	24.98
Length - mm:	60.01	60.01	60.01
Moisture Content - %:	31	31	31
Bulk Density - Mg/m <sup>3</sup> :	1.86	1.86	1.86
Dry Density - Mg/m <sup>3</sup> :	1.42	1.42	1.42
Voids Ratio:	0.867	0.866	0.865
Normal Pressure- kPa	20	40	60
<b>Consolidation</b>			
Consolidated Height - mm:	24.83	24.68	24.49
<b>Shear</b>			
Rate of Strain (mm/min)	0.024	0.024	0.024
Strain at peak shear stress (%)	1.20	5.10	3.10
Peak shear Stress - kPa:	22	33	42
<b>Final Consolidated Conditions</b>			
Moisture Content - %:	29	29	27
Bulk Density - Mg/m <sup>3</sup> :	1.87	1.88	1.89
Dry Density - Mg/m <sup>3</sup> :	1.45	1.46	1.49
<b>PEAK</b>			
Angle of Shearing Resistance:( $\theta$ )			<b>24.0</b>
Effective Cohesion - kPa:			<b>15</b>



Checked by [REDACTED]      Date 12/01/2015

Approved by [REDACTED]      Date 12/01/2015



5 MILE LANE.

Contract No.:  
**PSL14/6467**

Client Ref Number:  
**C4414**

# CONSOLIDATED DRAINED SHEARBOX TEST.

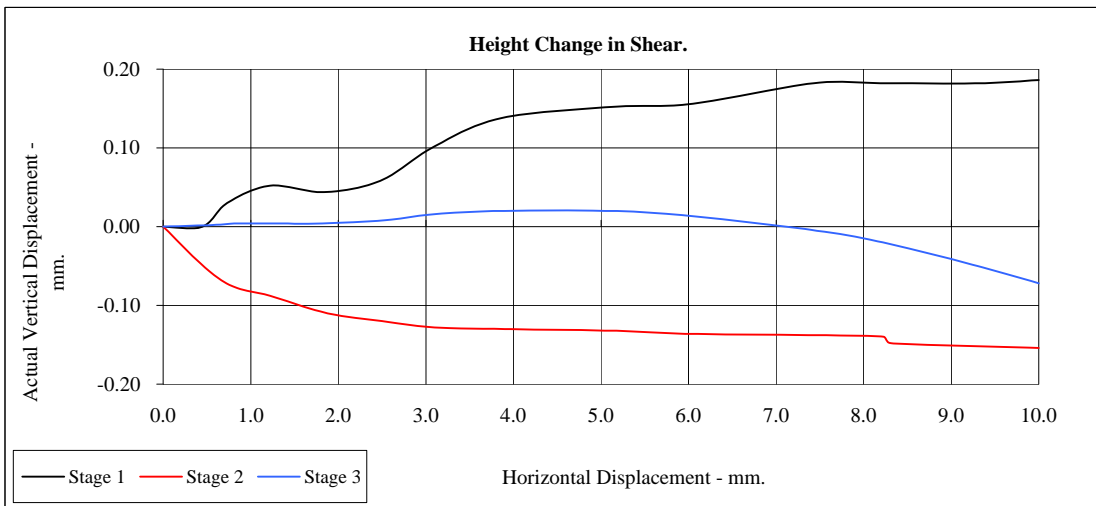
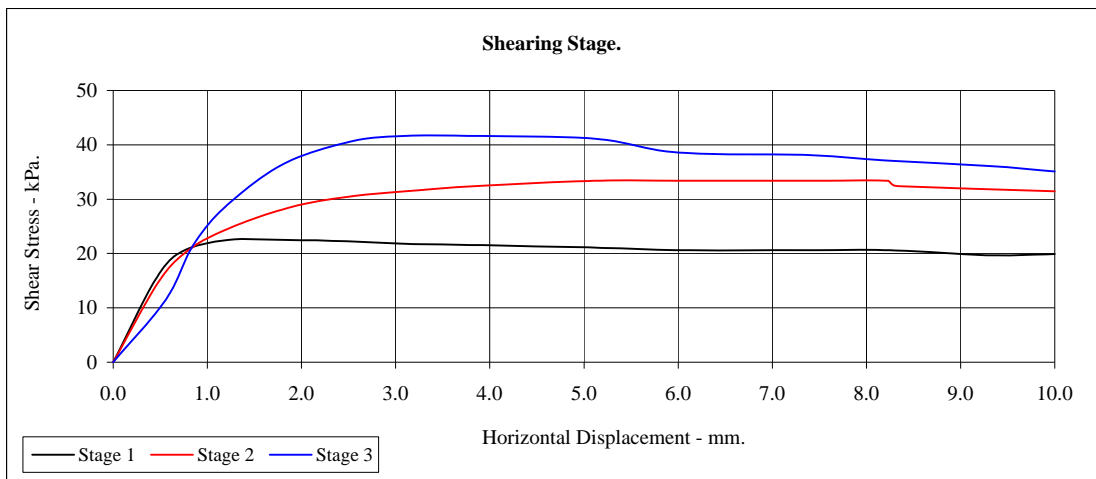
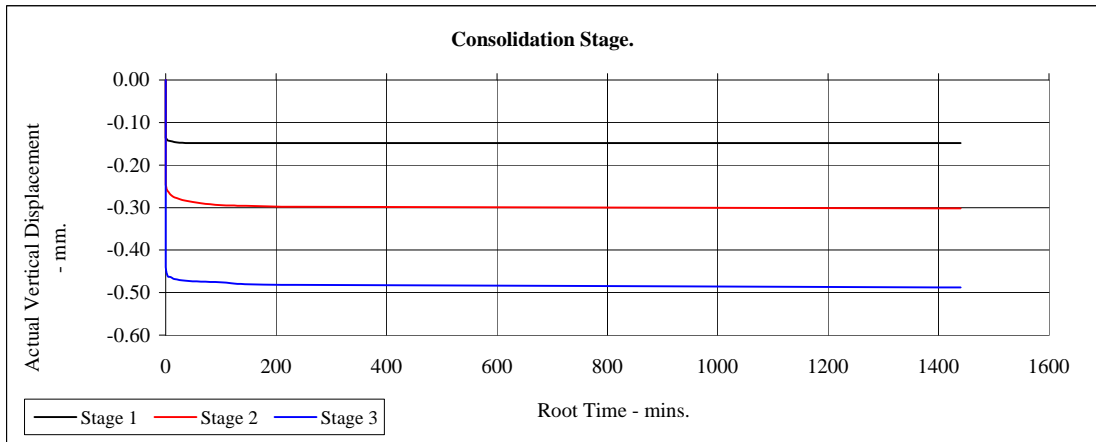
BS1377:Part 7:4.5 :1990.

Hole Number: **TP219**

Depth (m):

**2.10**

Sample Number: **B**



**5 MILE LANE.**

Contract No.:  
**PSL14/6467**

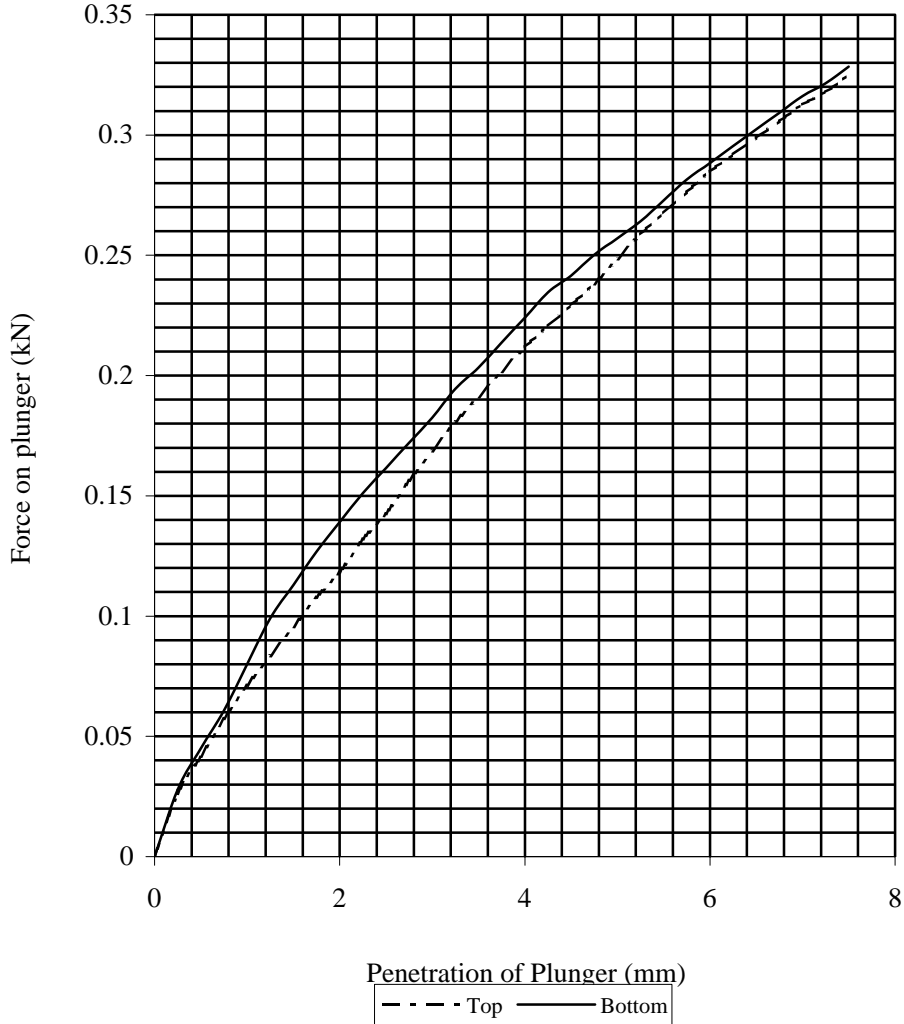
Client Ref Number:  
**C4414**

# California Bearing Ratio Test.

BS 1377 : Part 4 : 1990

**Hole Number:** TP208      **Depth (m):** 0.20

**Sample Number:**                      **Sample Type:** B



Initial Sample Conditions		Test Conditions		Method of compaction		2.5Kg Rammer	
Moisture Content:	47	Surcharge Kg:	4.00	Final Moisture Content %	C.B.R. Value %		
Bulk Density Mg/m3:	1.65	Soaking Time hrs	0	Sample Top	47	Sample Top	1.2
Dry Density Mg/m3:	1.12	Swelling mm:	0	Sample Bottom	48	Sample Bottom	1.3
Percentage retained on 20mm BS test sieve:	0	Remarks: Brown slightly gravelly slightly sandy CLAY.					

<b>Checked by</b>	<b>Date</b>	<b>Approved By</b>	<b>Date</b>
[Redacted]	12/01/15	[Redacted]	12/01/15

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5 MILE LANE.

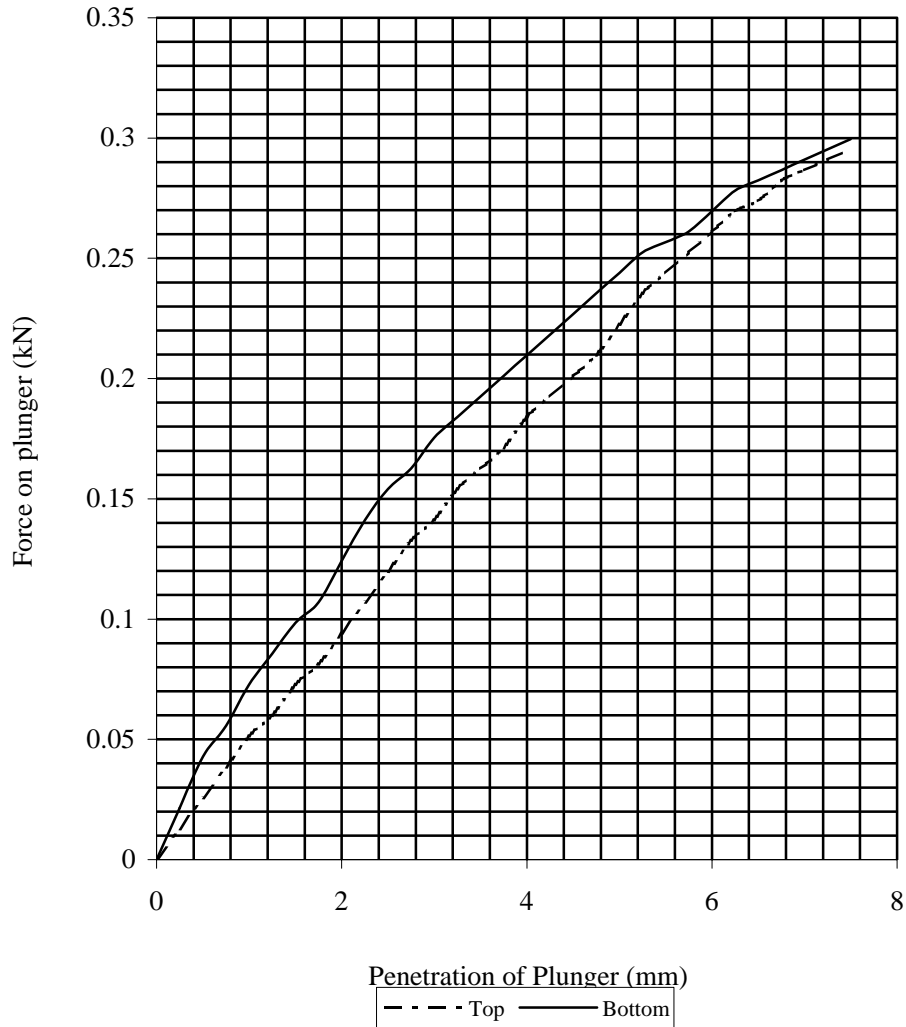
**Contract No.**  
**PSL14/6467**

# California Bearing Ratio Test.

BS 1377 : Part 4 : 1990

**Hole Number:** TP208      **Depth (m):** 0.20

**Sample Number:**                      **Sample Type:** B



Initial Sample Conditions		Test Conditions		Method of compaction		2.5Kg Rammer	
Moisture Content:	48	Surcharge Kg:	4.00	Final Moisture Content %		C.B.R. Value %	
Bulk Density Mg/m3:	1.65	Soaking Time hrs	0	Sample Top	49	Sample Top	1.1
Dry Density Mg/m3:	1.11	Swelling mm:	0	Sample Bottom	49	Sample Bottom	1.2
Percentage retained on 20mm BS test sieve:	0	Remarks: Brown slightly gravelly slightly sandy CLAY. <b>Soaked for 96 Hours</b>					

<b>Checked by</b>	<b>Date</b>	<b>Approved By</b>	<b>Date</b>
[Redacted]	12/01/15	[Redacted]	12/01/15



5 MILE LANE.

**Contract No.**  
**PSL14/6467**

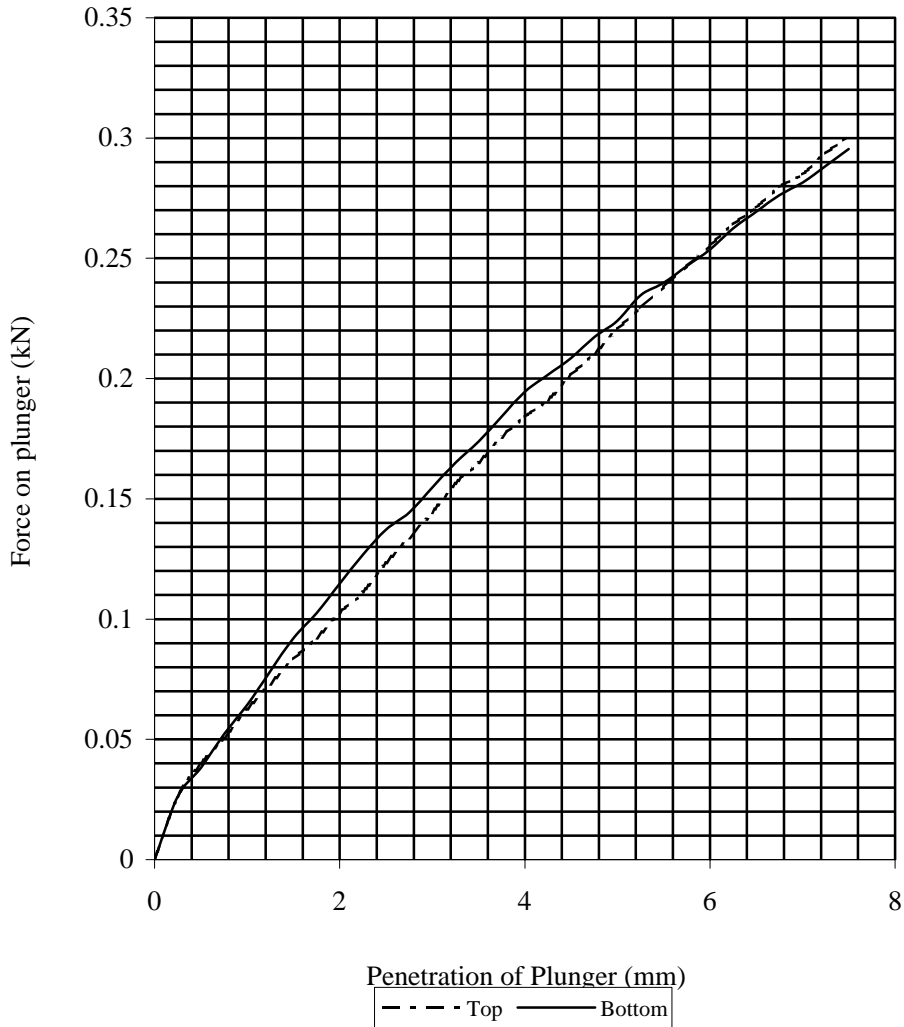


# California Bearing Ratio Test.

BS 1377 : Part 4 : 1990

**Hole Number:** TP209      **Depth (m):** 0.20

**Sample Number:**                      **Sample Type:** B



Initial Sample Conditions		Test Conditions		Method of compaction		2.5Kg Rammer	
Moisture Content:	48	Surcharge Kg:	4.00	Final Moisture Content %	C.B.R. Value %		
Bulk Density Mg/m <sup>3</sup> :	1.63	Soaking Time hrs	0	Sample Top	47	Sample Top	1.1
Dry Density Mg/m <sup>3</sup> :	1.10	Swelling mm:	0	Sample Bottom	48	Sample Bottom	1.1
Percentage retained on 20mm BS test sieve:	0	Remarks: Brown slightly gravelly slightly sandy CLAY.					

Checked by	Date	Approved By	Date
[Redacted]	12/01/15	[Redacted]	12/01/15

PSL

Professional Soils Laboratory

5 MILE LANE.

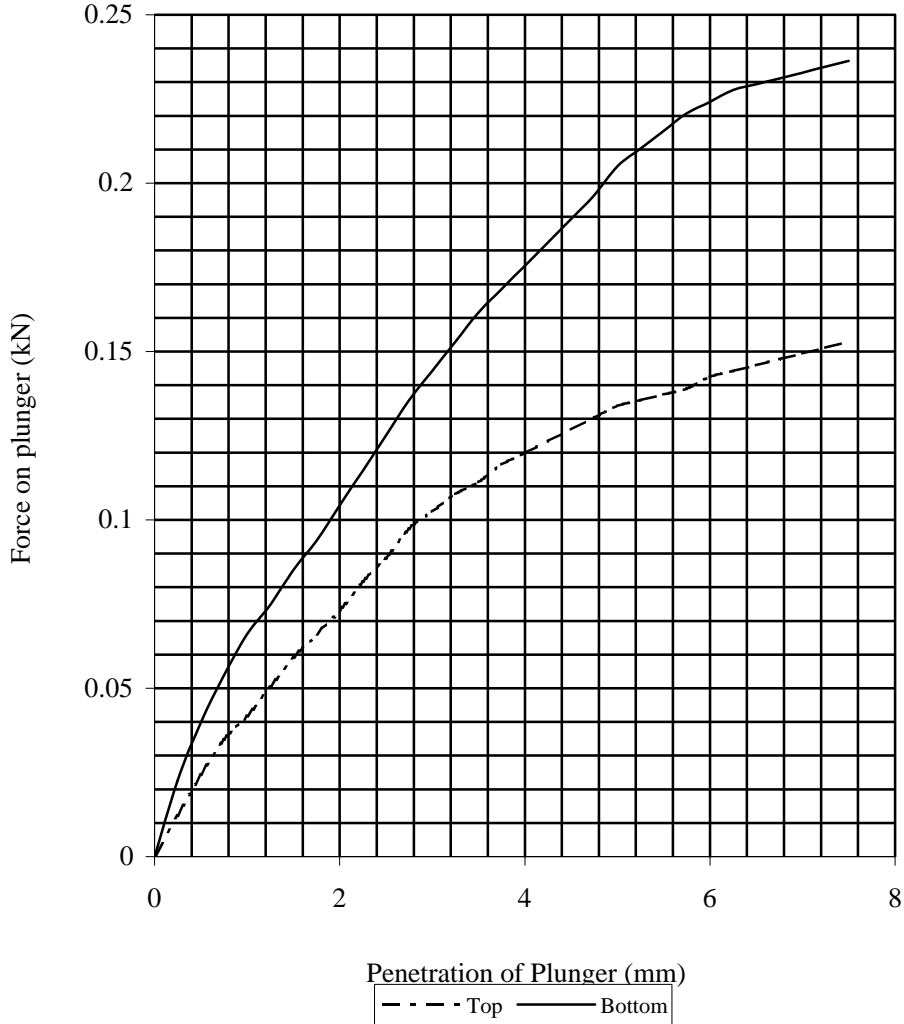
**Contract No.**  
**PSL14/6467**

# California Bearing Ratio Test.

BS 1377 : Part 4 : 1990

**Hole Number:** TP209      **Depth (m):** 0.20

**Sample Number:**                      **Sample Type:** B



Initial Sample Conditions		Test Conditions		Method of compaction		2.5Kg Rammer	
Moisture Content:	49	Surcharge Kg:	4.00	Final Moisture Content %		C.B.R. Value %	
Bulk Density Mg/m3:	1.65	Soaking Time hrs	0	Sample Top	51	Sample Top	0.7
Dry Density Mg/m3:	1.11	Swelling mm:	0	Sample Bottom	49	Sample Bottom	1.0
Percentage retained on 20mm BS test sieve:	0	Remarks: Brown slightly gravelly slightly sandy CLAY. <b>Soaked for 96 hours</b>					

<b>Checked by</b>	<b>Date</b>	<b>Approved By</b>	<b>Date</b>
[Redacted]	12/01/15	[Redacted]	12/01/15



5 MILE LANE.

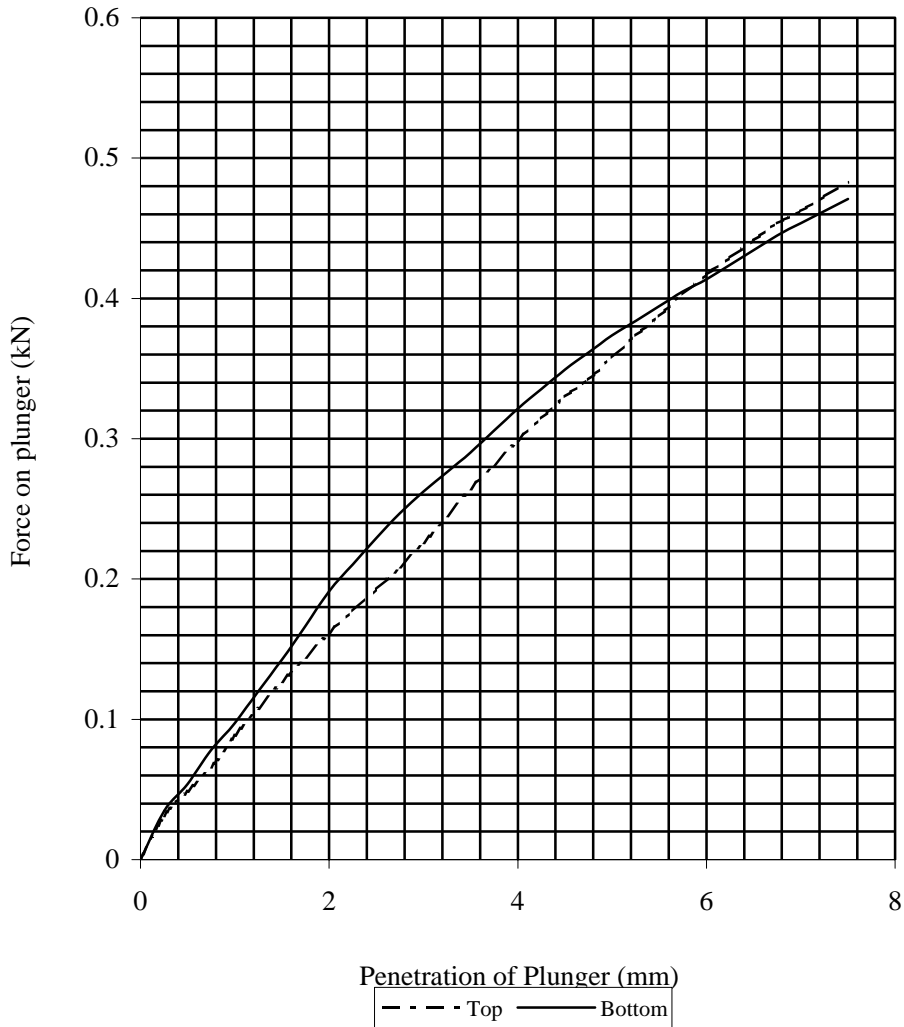
**Contract No.**  
**PSL14/6467**

# California Bearing Ratio Test.

BS 1377 : Part 4 : 1990

**Hole Number:** TP214      **Depth (m):** 0.10

**Sample Number:**                      **Sample Type:** B



Initial Sample Conditions		Test Conditions		Method of compaction		2.5Kg Rammer	
Moisture Content:	45	Surcharge Kg:	4.00	Final Moisture Content %	C.B.R. Value %		
Bulk Density Mg/m3:	1.67	Soaking Time hrs	0	Sample Top	46	Sample Top	1.8
Dry Density Mg/m3:	1.15	Swelling mm:	0	Sample Bottom	44	Sample Bottom	1.9
Percentage retained on 20mm BS test sieve:	0	Remarks: Brown slightly gravelly slightly sandy CLAY.					

Checked by	Date	Approved By	Date
[Redacted]	12/01/15	[Redacted]	12/01/15



5 MILE LANE.

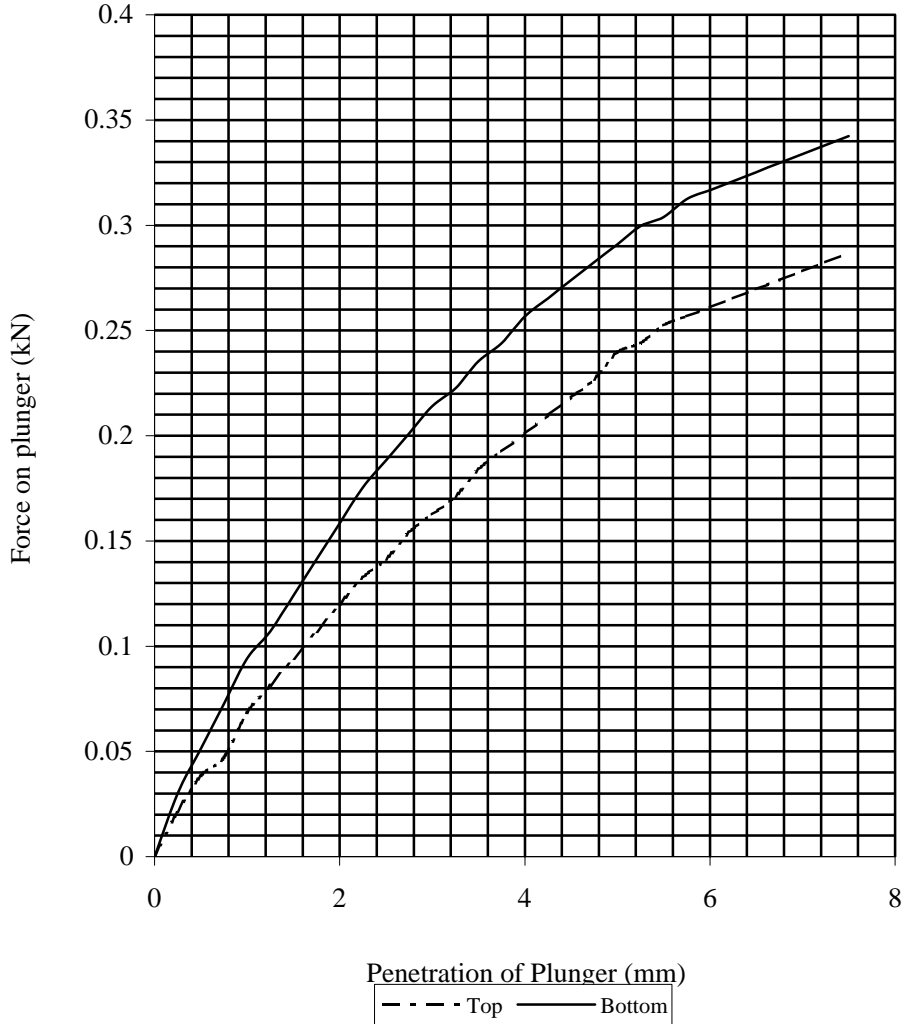
**Contract No.**  
**PSL14/6467**

# California Bearing Ratio Test.

BS 1377 : Part 4 : 1990

**Hole Number:** TP214      **Depth (m):** 0.10

**Sample Number:**                      **Sample Type:** B



Initial Sample Conditions		Test Conditions		Method of compaction		2.5Kg Rammer	
Moisture Content:	47	Surcharge Kg:	4.00	Final Moisture Content %		C.B.R. Value %	
Bulk Density Mg/m3:	1.65	Soaking Time hrs	0	Sample Top	47	Sample Top	1.2
Dry Density Mg/m3:	1.13	Swelling mm:	0	Sample Bottom	47	Sample Bottom	1.5
Percentage retained on 20mm BS test sieve:	0	Remarks: Brown slightly gravelly slightly sandy CLAY. <b>Soaked for 96 hours</b>					

<b>Checked by</b>	<b>Date</b>	<b>Approved By</b>	<b>Date</b>
[Redacted]	12/01/15	[Redacted]	12/01/15

PSL

Professional Soils Laboratory

5 MILE LANE.

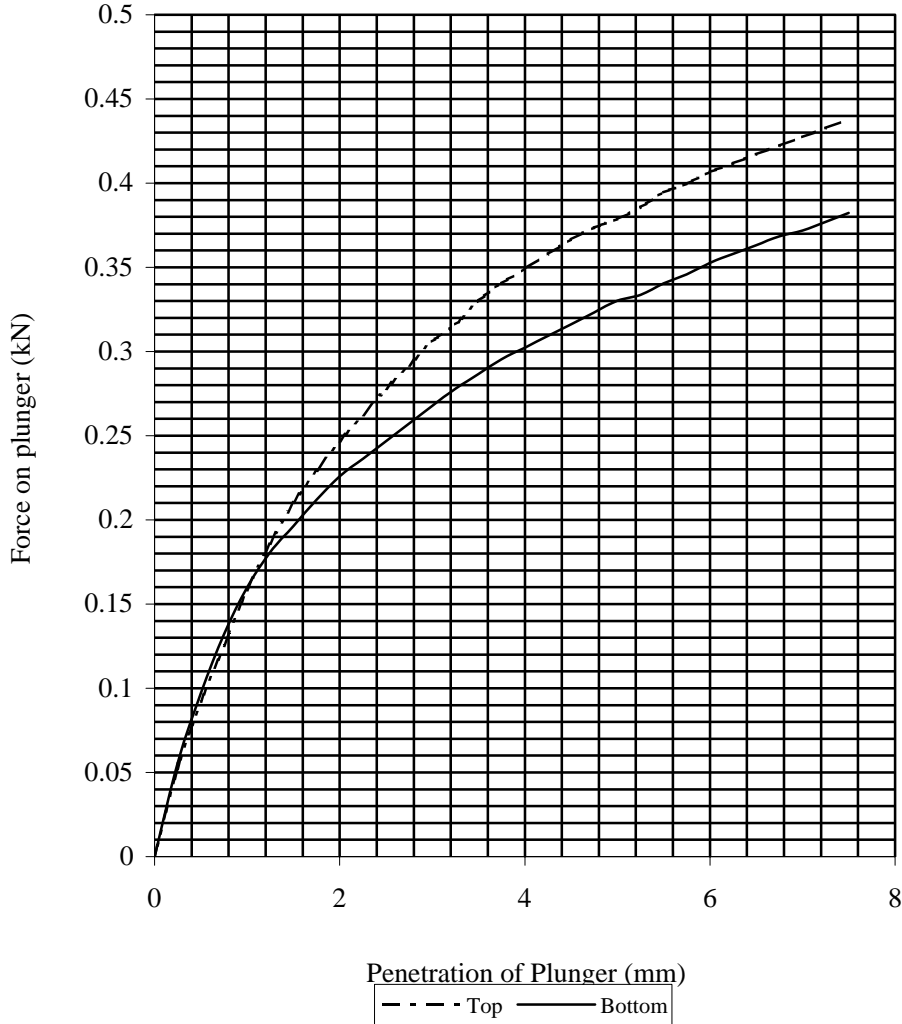
**Contract No.**  
**PSL14/6467**

# California Bearing Ratio Test.

BS 1377 : Part 4 : 1990

**Hole Number:** TP215      **Depth (m):** 0.30

**Sample Number:**                      **Sample Type:** B



Initial Sample Conditions		Test Conditions		Method of compaction		2.5Kg Rammer	
Moisture Content:	48	Surcharge Kg:	4.00	Final Moisture Content %	C.B.R. Value %		
Bulk Density Mg/m3:	1.68	Soaking Time hrs	0	Sample Top	47	Sample Top	2.1
Dry Density Mg/m3:	1.13	Swelling mm:	0	Sample Bottom	48	Sample Bottom	1.9
Percentage retained on 20mm BS test sieve:	0	Remarks: Brown slightly gravelly slightly sandy CLAY.					

<b>Checked by</b>	<b>Date</b>	<b>Approved By</b>	<b>Date</b>
[Redacted]	12/01/15	[Redacted]	12/01/15

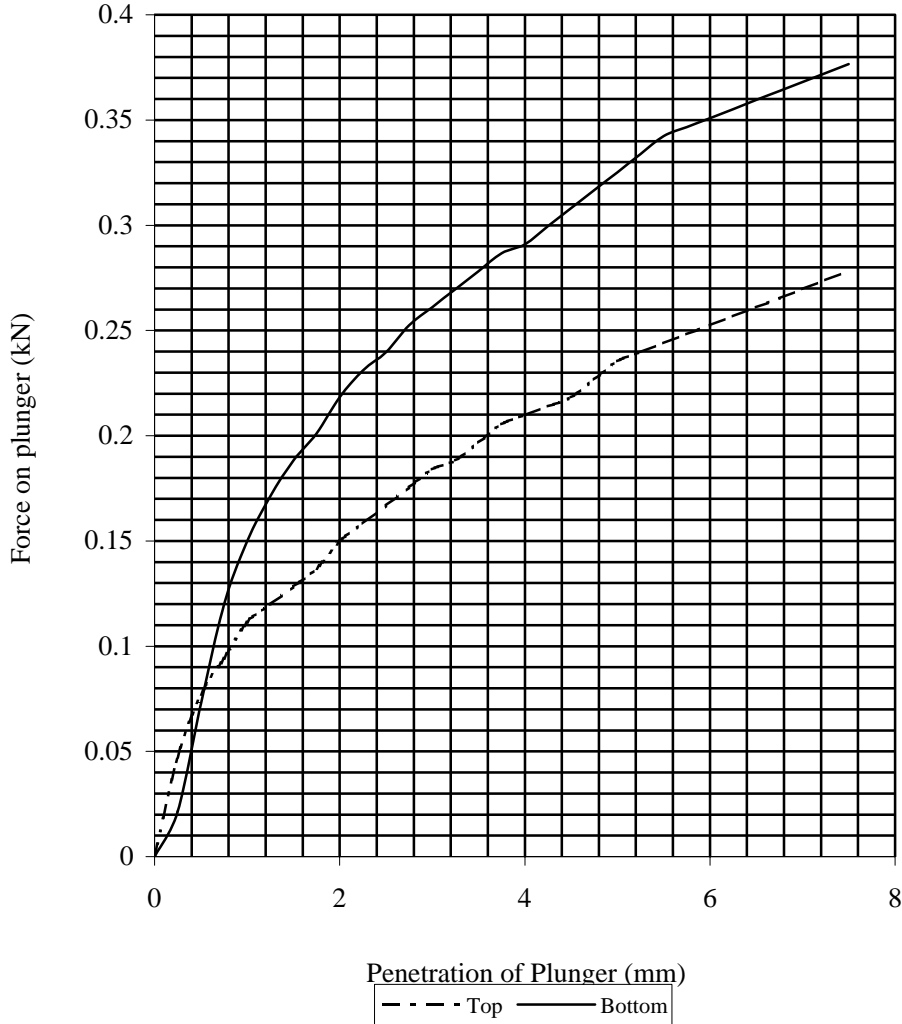
	<p>5 MILE LANE.</p>	<p><b>Contract No.</b> <b>PSL14/6467</b></p>
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# California Bearing Ratio Test.

BS 1377 : Part 4 : 1990

**Hole Number:** TP215      **Depth (m):** 0.30

**Sample Number:**                      **Sample Type:** B



Initial Sample Conditions		Test Conditions		Method of compaction		2.5Kg Rammer	
Moisture Content:	50	Surcharge Kg:	4.00	Final Moisture Content %		C.B.R. Value %	
Bulk Density Mg/m3:	1.65	Soaking Time hrs	0	Sample Top	51	Sample Top	1.3
Dry Density Mg/m3:	1.10	Swelling mm:	0	Sample Bottom	49	Sample Bottom	1.8
Percentage retained on 20mm BS test sieve:	0	Remarks: Brown slightly gravelly slightly sandy CLAY. <b>Soaked for 96 hours</b>					

Checked by	Date	Approved By	Date
[REDACTED]	[REDACTED]	[REDACTED]	12/01/15



5 MILE LANE.

**Contract No.**  
**PSL14/6467**



Our ref. LT1495

02 February 2015

Professional Soils Laboratory  
5-7 Hexthorpe Road  
Hexthorpe  
Doncaster  
DN4 0AR

Soil Engineering Geoservices Limited  
Parkside Lane, Dewsbury Road  
Leeds, LS11 5SX  
Tel: 0113 271 1111  
[www.soil-engineering.co.uk](http://www.soil-engineering.co.uk)

For the attention of Mr. Mark Beastall

Dear Mr. Mark Beastall

Please find enclosed the report for the project Five Mile Lane, your order number/ref. PSL14/6540

Also enclosed is our invoice for the above.

If we can be of any further assistance please do not hesitate to contact the undersigned.

Yours sincerely,  
for Soil Engineering Geoservices Limited

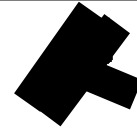


Mr. S. Kirk  
Laboratory Manager



Issued by Soil Engineering Geoservices Limited,  
Parkside Lane,  
Dewsbury Road,  
Leeds  
LS11 5SX.  
Tel: 0113 2711111  
Fax: 0113 2760472  
Email: enquiries@soil-engineering.co.uk

Authorised signatory



M. J. Baldwin (Technical Director)  
R. J. Rogers (Principal Engineer)  
S. Kirk v (Laboratory Manager)  
S. K. Sharda (Assistant Laboratory Manager)

Customer name Professional Soils Laboratory  
Address 5-7 Hexthorpe Road  
Hexthorpe  
Doncaster  
DN4 0AR

Contract name Five Mile Lane  
Your reference PSL14/6540

Dates of receipt of samples 09/01/2015

Dates of testing 16/01/2015 to 30/01/2015

Testing was performed to the standard named on individual test results.

Sampling was not performed by the Laboratory of Soil Engineering.

Testing was performed on 6 number of samples received in good condition.

Opinions and interpretations expressed herein are outside the scope of our UKAS accreditation.

Results reported relate only to the samples tested.

Tests marked 'Not UKAS' in this report are not included in the UKAS accreditation schedule for our laboratory. These results will appear in italics on any summary of tests.

Samples will be retained for 28 days from date of issue of this report and then be disposed of, unless we receive written instruction to the contrary

Quality Control Check performed by



S. Kirk (Deputy Laboratory Quality Manager)



## Key to Laboratory Summary Sheets

### Common to all summaries

Sample Type	U	Undisturbed sample	D	Small disturbed sample
	P	Piston sample	B	Bulk disturbed sample
	TW	Thin walled sample	BLK	Block sample
	L	Liner sample	C	Rock core
	AMAL	Amalgamated sample		

Test status Any result in *italics* indicates a test that is not within the scope of the UKAS accreditation for this laboratory.

### Summary of Laboratory Soil Tests: Index / Classification Tests

Particle density	p	Small pyknometer method	g	Gas jar method
Plastic index	N/P	Non plastic, although liquid limit will have been determined if requested		
Particle size (PSD)	<sup>1</sup>	Following value in silt column denotes combined clay and silt fraction		
	p	Following value in clay column denotes sedimentation by pipette, else sedimentation is by hydrometer.		

### Summary of Laboratory Soil Tests: Strength and Permeability Tests

Triaxial	UU	Single stage unconsolidated quick undrained	UUM	Multi stage unconsolidated quick undrained
	UU3	Set of 3 unconsolidated quick undrained	CU	Single stage consolidated undrained
	CUM	Multi stage consolidated undrained	CU3	Set of 3 consolidated undrained
	CD	Single stage consolidated drained	CDM	Multi stage consolidated drained
	CD3	Set of 3 consolidated drained		
Note that single stage tests are reported assuming $f = 0$ for total stress and $c' = 0$ for effective stress				
Consol	Oed	One-dimensional oedometer	Hyd	Hydraulic cell consolidation
	$m_v$	coefficient of compressibility quoted for $p_0$ to $p_0 + 100\text{kPa}$ , where determined		
Permeability	C	Constant head permeability	T	Triaxial permeability
Shearbox	SSB	Small shear box	LSB	Large shear box
	p	Peak value	r	Residual value
	RS	Ring shear		

### Summary of Laboratory Soil Re-Use Test

MCV	s	MCV value at natural or specified moisture content	int	Intercept of calibration line in MCV calibration
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### Summary of Laboratory Rock Strength Tests

Point Load (Combination of)	Type	D	Diametral	A	Axial
		I	Irregular lump	B	Block
		L	Test performed parallel to planes of weakness		
		P	Test performed perpendicular to planes of weakness		
		X	Invalid failure of point load (not broken between points of load application)		

### Summary of Laboratory Rock Materials Tests

Ten% fines	w	Soaked test	d	Dry test
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### Point Load Index Result


Point Load (Combination of)	Type	D	Diametral	A	Axial
		I	Irregular lump	B	Block
		L	Parallel to planes of weakness		
		P	Perpendicular to planes of weakness		
		X	Invalid failure of point load (not broken between points of load application)		
Dimensions	W	Diameter of core or average smallest width perpendicular to axis of loading in a block or irregular lump			
	D	Distance between platens when just in contact with specimen			
	D'	Distance between platens at point of failure			
	De	Equivalent core diameter	Is	$P/De^2$	
	Is(50)	$F \times Is$	F	$(De/S0)^{0.45}$	
	Is(50) point load strength index corrected for a diametral test of core diameter 50mm				
	For Axial/Lump tests $De^2 = (4/\pi) \times (W \times D')$			For Diametral tests $De^2 = D \times D'$	


Important note: summary sheets are provided for convenience and in no way replace individual test result sheets which shall, without exception, be regarded as the definitive result.





Project Name	Five Mile Lane	<b>Summary Of Laboratory Rock Material Tests</b>
Project No.	LT1495	
Engineer	Professional Soils Laboratory	
Employer	Professional Soils Laboratory	


Hole ID	Sample depth m	Sample no.	Sample type	Specimen depth m	Specimen no.	Water Content	Saturated MC	Rock Particle Density	CCV	Slake Durability ID2	Slake Durability ID1	Ten % fines	ACV	Soundness value			
						%	%	Mg/m <sup>3</sup>		%	%	%	%	%			
BH105	2.20		C	2.20	1					90.4	96.7						
BH105	6.00		C	6.00	1					98.8	99.1						
BH107	5.00		C	5.00	1					9.8	43.6						
BH107	8.70		C	8.70	1					40.1	73.3						
BH108	3.30		C	3.30	1					9.1	43.7						
BH108	7.00		C	7.00	1					81.0	95.9						


Project Name	Five Mile Lane	<b>Determination Of Slake Durability</b>	Hole ID	BH105
Project No.	LT1495		Sample Depth	2.20m
Engineer	Professional Soils Laboratory		Sample Number	
Employer	Professional Soils Laboratory		Sample Type	C
Description	Light grey MUDSTONE and dark grey LIMESTONE	I.S.R.M. Suggested methods	Specimen Depth	2.20m
			Specimen Number	1
Slaking Fluid			Tap water	
Temperature		°C	20	
Number of lumps if other than 10			10	
Maximum grain size		mm	<1.00	
<b>Test data</b>				
Mass of wet specimen and drum		g	2301.75	
Mass of dry specimen and drum	A	g	2274.52	
<b>First cycle</b>				
Water level checked against mark at 20mm below axis			Yes	
Period of rotation		minutes	9.32	
Mass of dry specimen and drum	B	g	2257.25	
<b>Second cycle</b>				
Water level checked against mark at 20mm below axis			Yes	
Period of rotation		minutes	9.30	
Mass of dry specimen and drum	C	g	2224.64	
Mass of drum	D	g	1752.22	
<b>Calculations and results</b>				
Slake durability index	$I_{d1}$	%	96.7	
Slake durability index	$I_{d2}$	%	90.4	
<b>Remarks on retained specimen</b>				
1st cycle	Some lumps broken and retained in drum			
2nd cycle	No further change			
<b>Remarks on specimen passing drum</b>				
1st cycle	Thin layer of slaked sample			
2nd cycle	Thicker layer of slaked sample			
Approved by:	Leeds Laboratory	Report No.: LT1495		 <b>SOIL ENGINEERING</b> Part of the Bachy Soletanche Group
Stuart Kirk		Page 4 of 9	Print date 02/02/2015	
Revision No.	2.03	Issue Date	20/11/2012	

Project Name	Five Mile Lane	<b>Determination Of Slake Durability</b>  I.S.R.M. Suggested methods	Hole ID BH105
Project No.	LT1495		Sample Depth 6.00m
Engineer	Professional Soils Laboratory		Sample Number
Employer	Professional Soils Laboratory		Sample Type C
Description	Grey SANDSTONE		Specimen Depth 6.00m
			Specimen Number 1
Slaking Fluid			Tap water
Temperature		°C	19.4
Number of lumps if other than 10			10
Maximum grain size		mm	<1.00
<b>Test data</b>			
Mass of wet specimen and drum		g	2308.81
Mass of dry specimen and drum	A	g	2301.35
<b>First cycle</b>			
Water level checked against mark at 20mm below axis			Yes
Period of rotation		minutes	9.32
Mass of dry specimen and drum	B	g	2296.94
<b>Second cycle</b>			
Water level checked against mark at 20mm below axis			Yes
Period of rotation		minutes	9.31
Mass of dry specimen and drum	C	g	2295.22
Mass of drum	D	g	1784.85
<b>Calculations and results</b>			
Slake durability index	$I_{d1}$	%	99.1
Slake durability index	$I_{d2}$	%	98.8
<b>Remarks on retained specimen</b>			
1st cycle	All lumps fully intact		
2nd cycle	All lumps intact with more rounding		
<b>Remarks on specimen passing drum</b>			
1st cycle	Thin layer of fine slaked sample with some coarse particles		
2nd cycle	Thicker layer of fine slaked sample with some coarse particles		
Approved by:	Leeds Laboratory	Report No.: LT1495	
Stuart Kirk		Page 5 of 9	Print date 02/02/2015
Revision No.	2.03	Issue Date	20/11/2012
			 <b>soil engineering</b> Part of the Bachy Soletanche Group

Project Name	Five Mile Lane	<b>Determination Of Slake Durability</b>	Hole ID	BH107
Project No.	LT1495		Sample Depth	5.00m
Engineer	Professional Soils Laboratory		Sample Number	
Employer	Professional Soils Laboratory		Sample Type	C
Description	Thinly laminated grey MUDSTONE	I.S.R.M. Suggested methods	Specimen Depth	5.00m
			Specimen Number	1
Slaking Fluid			Tap water	
Temperature		°C	20	
Number of lumps if other than 10			10	
Maximum grain size		mm	<1.00	
<b>Test data</b>				
Mass of wet specimen and drum		g	2332.98	
Mass of dry specimen and drum	A	g	2259.40	
<b>First cycle</b>				
Water level checked against mark at 20mm below axis			Yes	
Period of rotation		minutes	9.32	
Mass of dry specimen and drum	B	g	1991.87	
<b>Second cycle</b>				
Water level checked against mark at 20mm below axis			Yes	
Period of rotation		minutes	9.30	
Mass of dry specimen and drum	C	g	1831.46	
Mass of drum	D	g	1784.90	
<b>Calculations and results</b>				
Slake durability index	$I_{d1}$	%	43.6	
Slake durability index	$I_{d2}$	%	9.8	
<b>Remarks on retained specimen</b>				
1st cycle	Most lumps broken			
2nd cycle	All lumps broken and a small amount of sample retained in drum			
<b>Remarks on specimen passing drum</b>				
1st cycle	Thick layer of slaked sample			
2nd cycle	Thicker layer of slaked sample			
Approved by:	Leeds Laboratory	Report No.: LT1495		 <b>SOIL ENGINEERING</b> Part of the Bachy Soletanche Group
Stuart Kirk		Page 6 of 9	Print date 02/02/2015	
	Revision No. 2.03	Issue Date	20/11/2012	

Project Name Five Mile Lane		<b>Determination Of Slake Durability</b>  I.S.R.M. Suggested methods	Hole ID BH107
Project No. LT1495			Sample Depth 8.70m
Engineer Professional Soils Laboratory			Sample Number
Employer Professional Soils Laboratory			Sample Type C
Description Thinly laminated grey MUDSTONE			Specimen Depth 8.70m
			Specimen Number 1
Slaking Fluid		Tap water	
Temperature		°C	19.4
Number of lumps if other than 10			10
Maximum grain size		mm	<1.00
<b>Test data</b>			
Mass of wet specimen and drum		g	2277.54
Mass of dry specimen and drum		A g	2236.41
<b>First cycle</b>			
Water level checked against mark at 20mm below axis			Yes
Period of rotation		minutes	9.32
Mass of dry specimen and drum		B g	2107.14
<b>Second cycle</b>			
Water level checked against mark at 20mm below axis			Yes
Period of rotation		minutes	9.31
Mass of dry specimen and drum		C g	1946.22
Mass of drum		D g	1752.18
<b>Calculations and results</b>			
Slake durability index		I <sub>d1</sub> %	73.3
Slake durability index		I <sub>d2</sub> %	40.1
<b>Remarks on retained specimen</b>			
1st cycle	All lumps broken and some passed through mesh of drum.		
2nd cycle	All lumps broken and more passed through mesh of drum		
<b>Remarks on specimen passing drum</b>			
1st cycle	Thick layer of fine slaked sample		
2nd cycle	Thicker layer of fine slaked sample		
<b>Approved by:</b>			
Leeds Laboratory		Report No.: LT1495	
Stuart Kirk	Page 7 of 9		Print date 02/02/2015
Revision No. 2.03	Issue Date 20/11/2012		 <b>SOIL ENGINEERING</b> Part of the Bachy Soletanche Group

Project Name	Five Mile Lane	<b>Determination Of Slake Durability</b>  I.S.R.M. Suggested methods	Hole ID	BH108
Project No.	LT1495		Sample Depth	3.30m
Engineer	Professional Soils Laboratory		Sample Number	
Employer	Professional Soils Laboratory		Sample Type	C
Description	Grey MUDSTONE		Specimen Depth	3.30m
			Specimen Number	1
Slaking Fluid			Tap water	
Temperature		°C	18.1	
Number of lumps if other than 10			10	
Maximum grain size		mm	<1.00	
Test data				
Mass of wet specimen and drum		g	2227.69	
Mass of dry specimen and drum	A	g	2164.23	
First cycle				
Water level checked against mark at 20mm below axis			Yes	
Period of rotation		minutes	9.33	
Mass of dry specimen and drum	B	g	1932.32	
Second cycle				
Water level checked against mark at 20mm below axis			Yes	
Period of rotation		minutes		
Mass of dry specimen and drum	C	g	1789.74	
Mass of drum	D	g	1752.27	
Calculations and results				
Slake durability index	$I_{d1}$	%	43.7	
Slake durability index	$I_{d2}$	%	9.1	
Remarks on retained specimen				
1st cycle	Some lumps broken and retained in drum			
2nd cycle	No further change			
Remarks on specimen passing drum				
1st cycle	Thicker layer of slaked sample			
2nd cycle	Thicker layer of fine slaked sample with some coarse particles			
Approved by:	Leeds Laboratory	Report No.: LT1495		 <b>SOIL engineering</b> Part of the Bachy Soletanche Group
Stuart Kirk		Page 8 of 9	Print date 02/02/2015	
	Revision No. 2.03	Issue Date	20/11/2012	

Project Name Five Mile Lane		<b>Determination Of Slake Durability</b>  I.S.R.M. Suggested methods	Hole ID BH108
Project No. LT1495			Sample Depth 7.00m
Engineer Professional Soils Laboratory			Sample Number
Employer Professional Soils Laboratory			Sample Type C
Description Grey MUDSTONE			Specimen Depth 7.00m
			Specimen Number 1
Slaking Fluid		Tap water	
Temperature °C		18.1	
Number of lumps if other than 10		10	
Maximum grain size mm		<1.00	
Test data			
Mass of wet specimen and drum		g	2309.19
Mass of dry specimen and drum		A g	2289.14
First cycle			
Water level checked against mark at 20mm below axis		Yes	
Period of rotation		minutes	9.33
Mass of dry specimen and drum		B g	2268.67
Second cycle			
Water level checked against mark at 20mm below axis		Yes	
Period of rotation		minutes	9.31
Mass of dry specimen and drum		C g	2193.30
Mass of drum		D g	1784.74
Calculations and results			
Slake durability index		I <sub>d1</sub> %	95.9
Slake durability index		I <sub>d2</sub> %	81.0
Remarks on retained specimen			
1st cycle	Some lumps broken and retained in drum		
2nd cycle	No further change		
Remarks on specimen passing drum			
1st cycle	Thin layer of slaked sample		
2nd cycle	No further change		
Approved by:	Leeds Laboratory	Report No.: LT1495	
Stuart Kirk		Page 9 of 9	Print date 02/02/2015
Revision No. 2.03	Issue Date 20/11/2012	 <b>SOIL ENGINEERING</b> Part of the Bachy Soletanche Group	





# LABORATORY REPORT



4043

**Contract Number: PSL14/6540**

Client's Reference:

Report Date: 06 January 2015

Client Name: CC Ground Investigations Ltd  
Unit A2 Innsworth Technology Park.  
Innsworth Lane  
Gloucester  
GL3 1DL

**For the attention of: Chris Scrivens**

Contract Title: 5 Mile Lane

Date Received: 12/12/2014

Date Commenced: 12/12/2014

Date Completed: 6/1/2015

**Notes: Observations and Interpretations are outside the UKAS Accreditation**

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

Checked and Approved Signatories:

R Gunson  
(Director)

A Watkins  
(Director)

M Beastall  
(Laboratory Manager)

D Lambe  
(Senior Technician)

S Royle  
(Senior Technician)

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Page 1 of

## SUMMARY OF POINT LOAD TEST RESULTS

### POINT LOAD TEST - ISRM

Borehole Number	Depth (m)	Test Type	Orientation	Dimensions (mm)		Area (mm <sup>2</sup> )	D <sub>e</sub> <sup>2</sup>	D <sub>e</sub> (mm)	Failure Load (P)		I <sub>s</sub> (MPa)	Corr Fac F	I <sub>s50</sub> (MPa)	Failure Type	Remarks
			Par / Perp	W	D				MPa	kN					
BH101	2.65	A	Par	89	43	1849	4872.69	69.80	>30	40.05	8.219	1.162	>8.5	Valid	
BH101	3.20	A	Par	89	44	1936	4986.01	70.61	>30	40.05	8.032	1.168	>8.5	Valid	
BH101	3.80	A	Par	89	43	1849	4872.69	69.80	>30	40.05	8.219	1.162	>8.5	Valid	
BH101	4.18-4.33	A	Par	89	45	2025	5099.32	71.41	>30	40.05	7.854	1.174	>8.5	Valid	
BH101	4.60	A	Par	89	44	1936	4986.01	70.61	>30	40.05	8.032	1.168	>8.5	Valid	
BH101	5.20	A	Par	89	42	1764	4759.37	68.99	>30	40.05	8.415	1.156	>8.5	Valid	
BH102	2.40	A	Par	89	49	2401	5552.60	74.52	>30	40.05	7.213	1.197	>8.5	Valid	
BH102	2.80-3.00	A	Par	89	39	1521	4419.41	66.48	>30	40.05	9.062	1.137	>8.5	Valid	
BH102	3.50	A	Par	89	49	2401	5552.60	74.52	>30	40.05	7.213	1.197	>8.5	Valid	
BH102	4.44-4.61	A	Par	89	44	1936	4986.01	70.61	>30	40.05	8.032	1.168	>8.5	Valid	
BH102	4.80	A	Par	89	47	2209	5325.96	72.98	>30	40.05	7.520	1.186	>8.5	Valid	
BH102	5.30	A	Par	89	44	1936	4986.01	70.61	>30	40.05	8.032	1.168	>8.5	Valid	
BH103	2.60	A	Par	89	51	2601	5779.23	76.02	>30	40.05	6.930	1.207	>8.5	Valid	
BH103	2.95	A	Par	89	53	2809	6005.87	77.50	>30	40.05	6.668	1.218	>8.5	Valid	
BH103	3.50	A	Par	89	41	1681	4646.05	68.16	>30	40.05	8.620	1.150	>8.5	Valid	
BH103	4.50	A	Par	89	51	2601	5779.23	76.02	>30	40.05	6.930	1.207	>8.5	Valid	
BH103	5.40	A	Par	89	46	2116	5212.64	72.20	>30	40.05	7.683	1.180	>8.5	Valid	
BH103	5.70	A	Par	89	44	1936	4986.01	70.61	>30	40.05	8.032	1.168	>8.5	Valid	
BH104	1.15	A	Par	89	43	1849	4872.69	69.80	>30	40.05	8.219	1.162	>8.5	Valid	
BH104	2.50	A	Par	89	48	2304	5439.28	73.75	>30	40.05	7.363	1.191	>8.5	Valid	
BH104	2.70	A	Par	89	44	1936	4986.01	70.61	>30	40.05	8.032	1.168	>8.5	Valid	
BH104	3.75	A	Par	89	42	1764	4759.37	68.99	>30	40.05	8.415	1.156	>8.5	Valid	
BH104	4.60	A	Par	89	45	2025	5099.32	71.41	>30	40.05	7.854	1.174	>8.5	Valid	
BH104	5.50	A	Par	89	40	1600	4532.73	67.33	>30	40.05	8.836	1.143	>8.5	Valid	
BH105	1.50	A	Par	89	45	2025	5099.32	71.41	>30	40.05	7.854	1.174	>8.5	Valid	
BH105	2.20	A	Par	89	42	1764	4759.37	68.99	>30	40.05	8.415	1.156	>8.5	Valid	
BH105	2.70	A	Par	89	43	1849	4872.69	69.80	>30	40.05	8.219	1.162	>8.5	Valid	
BH105	3.60-3.82	A	Par	89	44	1936	4986.01	70.61	>30	40.05	8.032	1.168	>8.5	Valid	
BH105	5.28-5.50	A	Par	89	48	2304	5439.28	73.75	>30	40.05	7.360	1.191	>8.5	Valid	
BH105	7.00	A	Par	89	44	1936	4986.01	70.61	>30	40.05	8.032	1.168	>8.5	Valid	

\*Note All testing carried out on samples at as received water content

Par = parallel, Perp = perpendicular

# PSL

## Professional Soils Laboratory

FIVE MILE LANE.

Contract No:

PSL14/6540

Client Ref:

N/A

Checked By



Date

06/01/2015 Approved By



Date

06/01/2015

## SUMMARY OF POINT LOAD TEST RESULTS

### POINT LOAD TEST - ISRM

Borehole Number	Depth (m)	Test Type	Orientation	Dimensions (mm)		$D_e^2$	$D_e$ (mm)	Failure Load (P)		$I_s$ (MPa)	Corr Fac F	$I_{s50}$ (MPa)	Failure	Remarks
			Par / Perp	L	D			MPa	kN				Type	
BH101	2.65	D	Perp		89	7921	89.00	>30	40.05	5.056	1.296	>6.6	Valid	
BH101	3.20	D	Perp		89	7921	89.00	>30	40.05	5.056	1.296	>6.6	Valid	
BH101	3.80	D	Perp		89	7921	89.00	>30	40.05	5.056	1.296	>6.6	Valid	
BH101	4.18-4.33	D	Perp		89	7921	89.00	>30	40.05	5.056	1.296	>6.6	Valid	
BH101	4.60	D	Perp		89	7921	89.00	>30	40.05	5.056	1.296	>6.6	Valid	
BH101	5.20	D	Perp		89	7921	89.00	>30	40.05	5.056	1.296	>6.6	Valid	
BH102	2.40	D	Perp		89	7921	89.00	>30	40.05	5.056	1.296	>6.6	Valid	
BH102	2.80-3.00	D	Perp		89	7921	89.00	>30	40.05	5.056	1.296	>6.6	Valid	
BH102	3.50	D	Perp		89	7921	89.00	>30	40.05	5.056	1.296	>6.6	Valid	
BH102	4.44-4.61	D	Perp		89	7921	89.00	>30	40.05	5.056	1.296	>6.6	Valid	
BH102	4.80	D	Perp		89	7921	89.00	>30	40.05	5.056	1.296	>6.6	Valid	
BH102	5.30	D	Perp		89	7921	89.00	>30	40.05	5.056	1.296	>6.6	Valid	
BH103	2.60	D	Perp		89	7921	89.00	>30	40.05	5.056	1.296	>6.6	Valid	
BH103	2.70	D	Perp		89	7921	89.00	>30	40.05	5.056	1.296	>6.6	Valid	
BH103	3.50	D	Perp		89	7921	89.00	>30	40.05	5.056	1.296	>6.6	Valid	
BH103	4.50	D	Perp		89	7921	89.00	>30	40.05	5.056	1.296	>6.6	Valid	
BH103	5.40	D	Perp		89	7921	89.00	>30	40.05	5.056	1.296	>6.6	Valid	
BH103	5.70	D	Perp		89	7921	89.00	>30	40.05	5.056	1.296	>6.6	Valid	
BH104	1.15	D	Perp		89	7921	89.00	>30	40.05	5.056	1.296	>6.6	Valid	
BH104	2.50	D	Perp		89	7921	89.00	>30	40.05	5.056	1.296	>6.6	Valid	
BH104	2.70	D	Perp		89	7921	89.00	>30	40.05	5.056	1.296	>6.6	Valid	
BH104	3.75	D	Perp		89	7921	89.00	>30	40.05	5.056	1.296	>6.6	Valid	
BH104	4.60	D	Perp		89	7921	89.00	>30	40.05	5.056	1.296	>6.6	Valid	
BH104	5.50	D	Perp		89	7921	89.00	>30	40.05	5.056	1.296	>6.6	Valid	
BH105	1.50	D	Perp		89	7921	89.00	>30	40.05	5.056	1.296	>6.6	Valid	
BH105	2.20	D	Perp		89	7921	89.00	>30	40.05	5.056	1.296	>6.6	Valid	
BH105	2.70	D	Perp		89	7921	89.00	>30	40.05	5.056	1.296	>6.6	Valid	
BH105	3.60-3.82	D	Perp		89	7921	89.00	>30	40.05	5.056	1.296	>6.6	Valid	
BH105	5.28-5.50	D	Perp		89	7921	89.00	>30	40.05	5.056	1.296	>6.6	Valid	
BH105	7.00	D	Perp		89	7921	89.00	>30	40.05	5.056	1.296	>6.6	Valid	

\*Note All testing carried out on samples at as received water content

Par = parallel, Perp = perpendicular

# PSL

## Professional Soils Laboratory

FIVE MILE LANE.

Contract No:

PSL14/6540

Client Ref:

N/A

Checked By

Date

06/01/2015

Approved By

Date

06/01/2015

## SUMMARY OF POINT LOAD TEST RESULTS

### POINT LOAD TEST - ISRM

Borehole Number	Depth (m)	Test Type	Orientation	Dimensions (mm)		Area (mm <sup>2</sup> )	D <sub>e</sub> <sup>2</sup>	D <sub>e</sub> (mm)	Failure Load (P)		I <sub>s</sub> (MPa)	Corr Fac F	I <sub>s50</sub> (MPa)	Failure Type	Remarks
			Par / Perp	W	D				MPa	kN					
BH105	8.12-8.28	A	Par	89	43	1849	4872.69	69.80	30.000	40.05	8.219	1.162	>8.5	Valid	
BH105	9.30	A	Par	89	44	1936	4986.01	70.61	30.000	40.05	8.032	1.168	>8.5	Valid	
BH106	2.20	A	Par	89	48	2304	5439.28	73.75	30.000	40.05	7.363	1.191	>8.5	Valid	
BH106	3.15	A	Par	89	45	2025	5099.32	71.41	30.000	40.05	7.854	1.174	>8.5	Valid	
BH106	3.70	A	Par	89	44	1936	4986.01	70.61	30.000	40.05	8.032	1.168	>8.5	Valid	
BH106	5.00	A	Par	89	42	1764	4759.37	68.99	30.000	40.05	8.415	1.156	>8.5	Valid	
BH106	6.40	A	Par	89	39	1521	4419.41	66.48	30.000	40.05	9.062	1.137	>8.5	Valid	
BH106	7.80	A	Par	89	39	1521	4419.41	66.48	30.000	40.05	9.062	1.137	>8.5	Valid	
BH106	9.50	A	Par	89	49	2401	5552.60	74.52	30.000	40.05	7.213	1.197	>8.5	Valid	
BH107	3.70	A	Par	89	44	1936	4986.01	70.61	30.000	40.05	8.032	1.168	>8.5	Valid	
BH107	5.00	A	Par	89	47	2209	5325.96	72.98	2.396	3.20	0.601	1.186	0.71	Valid	
BH107	5.17-5.33	A	Par	89	44	1936	4986.01	70.61	30.000	40.05	8.032	1.168	>8.5	Valid	
BH107	6.84-6.95	A	Par	89	41	1681	4646.05	68.16	1.222	1.63	0.351	1.150	0.40	Valid	
BH107	7.70	A	Par	89	43	1849	4872.69	69.80	30.000	40.05	8.219	1.162	>8.5	Valid	
BH107	9.25-9.39	A	Par	89	44	1936	4986.01	70.61	30.000	40.05	8.032	1.168	>8.5	Valid	
BH108	4.30	A	Par	89	46	2116	5212.64	72.20	0.952	1.27	0.244	1.180	0.29	Valid	
BH108	5.10	A	Par	89	42	1764	4759.37	68.99	0.884	1.18	0.248	1.156	0.29	Valid	
BH108	6.00	A	Par	89	41	1681	4646.05	68.16	30.000	40.05	8.620	1.150	>8.5	Valid	
BH108	8.35-8.50	A	Par	89	44	1936	4986.01	70.61	30.000	40.05	8.032	1.168	>8.5	Valid	
BH108	9.00	A	Par	89	46	2116	5212.64	72.20	30.000	40.05	7.683	1.180	>8.5	Valid	
BH108	9.80	A	Par	89	44	1936	4986.01	70.61	30.000	40.05	8.032	1.168	>8.5	Valid	

\*Note All testing carried out on samples at as received water content

Par = parallel, Perp = perpendicular



**FIVE MILE LANE.**

**Contract No:**

**PSL14/6540**

**Client Ref:**

**N/A**

Checked By



Date

06/01/2015

Approved By



Date

06/01/2015

## SUMMARY OF POINT LOAD TEST RESULTS

### POINT LOAD TEST - ISRM

Borehole Number	Depth (m)	Test Type	Orientation	Dimensions (mm)		D <sub>e</sub> <sup>2</sup>	D <sub>e</sub>	Failure Load (P)		I <sub>s</sub>	Corr Fac	I <sub>s50</sub>	Failure	Remarks
			Par / Perp	L	D			MPa	kN				(MPa)	
BH105	8.12-8.28	D	Perp		89	7921	89.00	>30	40.05	5.056	1.296	>6.6	Valid	
BH105	9.30	D	Perp		89	7921	89.00	>30	40.05	5.056	1.296	>6.6	Valid	
BH106	2.20	D	Perp		89	7921	89.00	>30	40.05	5.056	1.296	>6.6	Valid	
BH106	3.15	D	Perp		89	7921	89.00	>30	40.05	5.056	1.296	>6.6	Valid	
BH106	3.70	D	Perp		89	7921	89.00	>30	40.05	5.056	1.296	>6.6	Valid	
BH106	5.00	D	Perp		89	7921	89.00	>30	40.05	5.056	1.296	>6.6	Valid	
BH106	6.40	D	Perp		89	7921	89.00	>30	40.05	5.056	1.296	>6.6	Valid	
BH106	7.80	D	Perp		89	7921	89.00	>30	40.05	5.056	1.296	>6.6	Valid	
BH106	9.50	D	Perp		89	7921	89.00	>30	40.05	5.056	1.296	>6.6	Valid	
BH107	3.70	D	Perp		89	7921	89.00	>30	40.05	5.056	1.296	>6.6	Valid	
BH107	5.00	D	Perp		89	7921	89.00	1.215	1.62	0.205	1.296	0.27	Valid	
BH107	5.17-5.33	D	Perp		89	7921	89.00	>30	40.05	5.056	1.296	>6.6	Valid	
BH107	6.84-6.95	D	Perp		89	7921	89.00	0.396	0.53	0.067	1.296	0.09	Valid	
BH107	7.70	D	Perp		89	7921	89.00	>30	40.05	5.056	1.296	>6.6	Valid	
BH107	9.25-9.39	D	Perp		89	7921	89.00	>30	40.05	5.056	1.296	>6.6	Valid	
BH108	4.30	D	Perp		89	7921	89.00	0.147	0.20	0.025	1.296	0.03	Valid	
BH108	5.10	D	Perp		89	7921	89.00	0.348	0.46	0.059	1.296	0.08	Valid	
BH108	6.00	D	Perp		89	7921	89.00	>30	40.05	5.056	1.296	>6.6	Valid	
BH108	8.35-8.50	D	Perp		89	7921	89.00	>30	40.05	5.056	1.296	>6.6	Valid	
BH108	9.00	D	Perp		89	7921	89.00	>30	40.05	5.056	1.296	>6.6	Valid	
BH108	9.80	D	Perp		89	7921	89.00	>30	40.05	5.056	1.296	>6.6	Valid	

\*Note All testing carried out on samples at as received water content

Par = parallel, Perp = perpendicular



FIVE MILE LANE.

Contract No:

PSL14/6540

Client Ref:

N/A

Checked By



Date

06/01/2015

Approved By



Date

06/01/2015




5/7 Hexthorpe Road  
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e-mail: awatkins@prosoils.co.uk

Date: 05-Jan-15  
Contract Number: PSL14/6540  
Location: FIVE MILE LANE.  
Sample Type: Core  
Sample Preparation: Cutting & GRINDING  
Operator: J.Melville

### Determination of Unconfined Compressive Strength.

ISRM Suggested Methods, pp 111 –116, 1981.

Borehole Number	Depth Top (m)	Depth Bottom (m)	Diameter (mm)	Length (mm)	Height: ratio	Initial mass g	Bulk Density Mg/m3	MC %	Dry Density Mg/m3	Load Failure	UCS(MPA)	Mode OF FAILURE	Date Tested	Remarks
BH102	2.80	3.00	89.00	180.00	2.0	2812	2.51	1.0	2.49	101.5	16.3	Brittle	06-Jan-15	
BH102	4.44	4.61	89.00	145.00	1.6	2370	2.63	0.6	2.61	297.4	47.8	Brittle	06-Jan-15	
BH105	3.60	3.82	89.00	170.00	1.9	2750	2.60	1.1	2.57	187.1	30.1	Brittle	06-Jan-15	
BH105	5.28	5.50	89.00	175.00	2.0	2695	2.48	1.4	2.44	111.4	17.9	Brittle	06-Jan-15	
BH105	8.12	8.28	89.00	170.00	1.9	2625	2.48	1.9	2.44	107.8	17.3	Brittle	06-Jan-15	
BH107	9.25	9.39	89.00	160.00	1.8	2073	2.08	0.7	2.07	244.6	39.3	Brittle	06-Jan-15	
BH108	8.35	8.50	89.00	165.00	1.9	2161	2.10	1.2	2.08	183.9	29.6	Brittle	06-Jan-15	

Checked by:  .....

Date 06/01/2015

Approved by:  .....

Date 06/01/2015



## Certificate of Analysis

Certificate Number 14-23251

23-Dec-14

*Client* Professional Soils Laboratory Ltd  
5/7 Hexthorpe Road  
Hexthorpe  
DN4 0AR

*Our Reference* 14-23251

*Client Reference* PSL14/6467

*Contract Title* 5 Mile Lane

*Description* 14 Soil samples.

*Date Received* 15-Dec-14

*Date Started* 15-Dec-14

*Date Completed* 23-Dec-14

*Test Procedures* Identified by prefix DETSn (details on request).

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

*Approved By*

A black rectangular box redacting the signature of Rob Brown.

Rob Brown  
Business Manager



# Summary of Chemical Analysis

## Soil Samples

Our Ref 14-23251  
 Client Ref PSL14/6467  
 Contract Title 5 Mile Lane

Lab No	747081	747082	747083	747084	747085	747086	747087	747088	747089	747090	747091
Sample ID	TP201	TP202	TP203	TP204	TP205	TP206	TP207	TP211	TP212	TP213	TP217
Depth	0.50	0.50	0.50	1.00	0.50	0.50	0.80	0.50	0.60	0.50	0.50
Other ID											
Sample Type	B	B	B	B	B	B	B	B	B	B	B
Sampling Date	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units											
<b>Metals</b>														
Magnesium Aqueous Extract	DETSC 2076*	10	mg/l	< 10	< 10	< 10	< 10	< 10	< 10	< 10	13	< 10	< 10	< 10
<b>Inorganics</b>														
pH	DETSC 2008#			7.8	8.1	8.4	7.5	7.3	7.7	7.5	6.8	7.9	8.1	7.8
Chloride Aqueous Extract	DETSC 2055	1	mg/l	8.1	7.4	8.0	7.5	6.7	8.7	8.7	8.0	8.9	7.0	7.7
Nitrate Aqueous Extract as NO3	DETSC 2055	1	mg/l	1.0	< 1.0	2.1	1.5	2.6	1.9	2.0	2.4	1.3	1.1	7.9
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	< 10	< 10	< 10	19	49	19	18	63	21	19	49



## Summary of Chemical Analysis Soil Samples

Our Ref 14-23251  
Client Ref PSL14/6467  
Contract Title 5 Mile Lane

<b>Lab No</b>	747092	747093	747094
<b>Sample ID</b>	TP218	TP219	TP219
<b>Depth</b>	2.00	1.00	2.10
<b>Other ID</b>			
<b>Sample Type</b>	B	B	B
<b>Sampling Date</b>	n/s	n/s	n/s
<b>Sampling Time</b>	n/s	n/s	n/s

Test	Method	LOD	Units			
<b>Metals</b>						
Magnesium Aqueous Extract	DETSC 2076*	10	mg/l	< 10	< 10	< 10
<b>Inorganics</b>						
pH	DETSC 2008#			8.2	8.2	8.3
Chloride Aqueous Extract	DETSC 2055	1	mg/l	7.4	7.2	69
Nitrate Aqueous Extract as NO3	DETSC 2055	1	mg/l	1.5	1.9	2.9
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	12	< 10	210

## Information in Support of the Analytical Results

Our Ref 14-23251  
Client Ref PSL14/6467  
Contract 5 Mile Lane

### Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
747081	TP201 0.50 SOIL		PT 500ml	Sample date not supplied	
747082	TP202 0.50 SOIL		PT 500ml	Sample date not supplied	
747083	TP203 0.50 SOIL		PT 500ml	Sample date not supplied	
747084	TP204 1.00 SOIL		PT 500ml	Sample date not supplied	
747085	TP205 0.50 SOIL		PT 500ml	Sample date not supplied	
747086	TP206 0.50 SOIL		PT 500ml	Sample date not supplied	
747087	TP207 0.80 SOIL		PT 500ml	Sample date not supplied	
747088	TP211 0.50 SOIL		PT 500ml	Sample date not supplied	
747089	TP212 0.60 SOIL		PT 500ml	Sample date not supplied	
747090	TP213 0.50 SOIL		PT 500ml	Sample date not supplied	
747091	TP217 0.50 SOIL		PT 500ml	Sample date not supplied	
747092	TP218 2.00 SOIL		PT 500ml	Sample date not supplied	
747093	TP219 1.00 SOIL		PT 500ml	Sample date not supplied	
747094	TP219 2.10 SOIL		PT 500ml	Sample date not supplied	

Key: P-Plastic T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time and/or inappropriate containers are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

### Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

### Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

**APPENDIX D**

Appendix D – Gas and Groundwater Monitoring

## Peak Gas and Groundwater Monitoring

Borehole	Date	Barometric Pressure (mb)	Carbon Dioxide (%)	Methane (%)	Oxygen (min) (%)	Hydrogen Sulphide (ppm)	Carbon Monoxide (ppm)	Gas Flow (min/max) (Litres/hour)	Water Level (m)	Comments
BH101	19/12/14	1009.00	2.80	0.00	4.00	0.00	0.00	-0.3/-0.2	3.38	Water sample taken
BH102	19/12/14	1010.00	0.30	0.00	22.10	0.00	0.00	-0.2/-0.1	0.52	Water sample taken
BH103	15/12/14	1001.00	-	-	-	-	-	-0.3	0.00	Unable to monitor gas levels as water at GL. Water sample taken
BH104	23/12/14	1009.00	-	-	-	-	-	+7.6/+11.5	0.15	Unable to monitor gas levels as water at GL. Water sample taken
BH105	18/12/14	1002.00	4.20	0.00	1.20	0.00	0.00	+2.6/+2.7	7.76	Water sample taken
BH106	18/12/14	1003.00	0.10	0.00	22.00	0.00	0.00	-0.4/-0.5	6.69	Water sample taken
BH107	18/12/14	1004.00	4.40	0.00	5.10	0.00	0.00	+1.9	8.34	Water sample taken
BH108	23/12/14	1012.00	1.30	0.00	17.70	0.00	0.00	+1.4/+2.4	3.96	Water sample taken
BH109	23/12/14	1007.00	0.50	0.00	20.90	0.00	2.00	-0.3	3.17	Water sample taken



CC Ground Investigations Ltd

Contract Name:

Five Mile Lane Improvements

Contract ID:

C4414

Client:

Vale of Glamorgan Council

Instrument used:

GA5000 Gas analyser.  
Geotechnical Instruments dip meter.

**APPENDIX E**

Appendix E – SPT Calibration Data

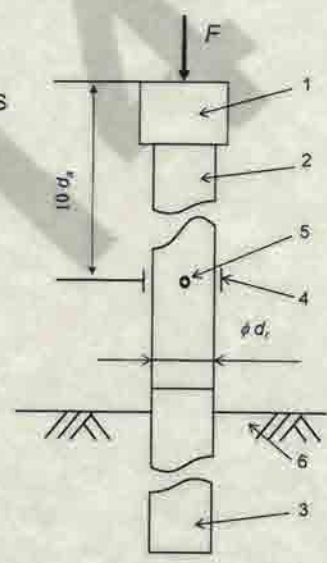
# SPT Calibration Report

## Energy Measurement Report



www.equipgroup.com

Type of Hammer: SPT HAMMER  
 Client: CC GROUND INVESTIGATIONS  
 Test No: EQU1045  
 Test Depth (m): 11.05  
 Date of Test: 16 May 2014  
 Valid until: 16 May 2015  
 Hammer ID: R04

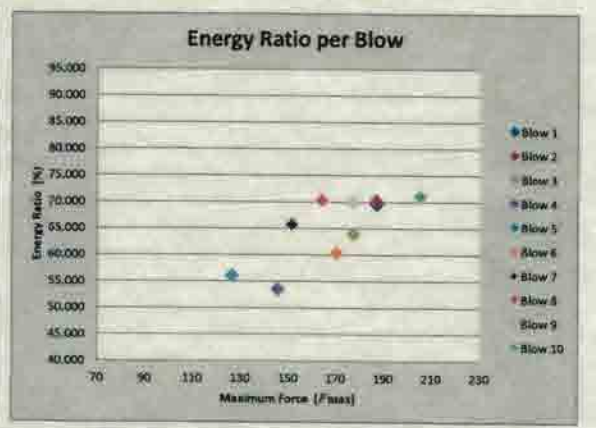
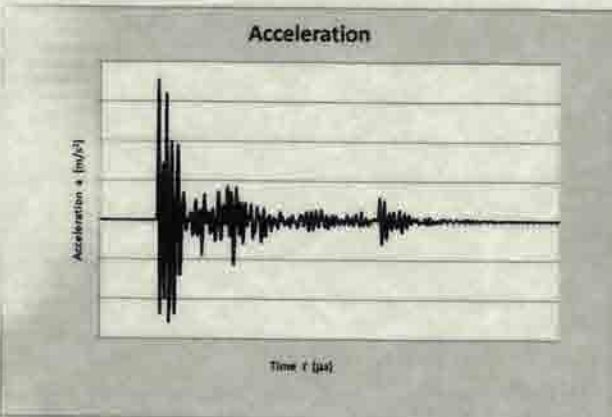
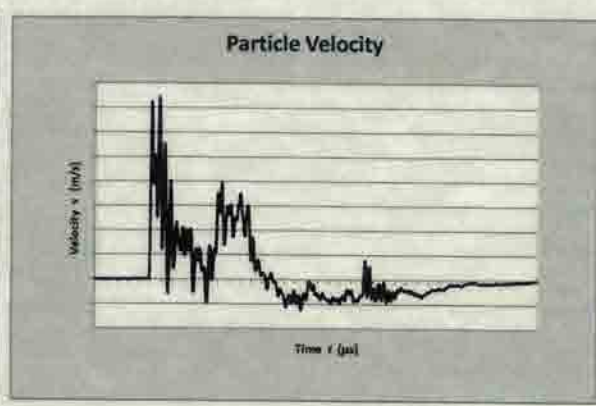
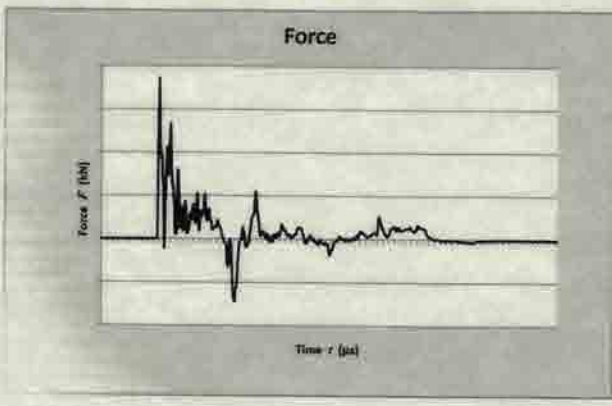


**Key**  
 1 Anvil  
 2 Part of instrumented rod  
 3 Drive Rod  
 4 Strain Gauge  
 5 Accelerometer  
 6 Ground  
 F: Force  
 d<sub>r</sub>: Diameter of rod

Mass of the hammer:  $m = 63.5\text{kg}$   
 Falling height:  $h = 0.76\text{m}$   
 $E_{\text{theor}} = m \times g \times h = 473\text{J}$

**Characteristics of the instrumented rod**  
 Diameter:  $d_r = 0.052\text{ m}$   
 Length of the instrumented rod:  $0.558\text{ m}$   
 Area:  $A = 11.61\text{ cm}^2$   
 Modulus:  $E_s = 206843\text{ MPa}$

Fig. B.1 and B.2 BS EN ISO 22476-3 : 2005 + A1 : 2011



Observations:  
 1.

$E_{\text{meas}} = 0.306\text{ kN-m}$   
 $E_{\text{theor}} = 0.473\text{ kN-m}$

Energy Ratio =  $\frac{E_{\text{meas}}}{E_{\text{theor}}} = 64.71\%$

Equip SPT Analyzer Operators: MH  
 Prepared by: [Redacted] Checked by: [Redacted] Date: 20/05/2014