

FACTUAL REPORT

- **SITE:** Five Mile Lane Improvements
- CLIENT: Vale of Glamorgan Council
- ORDER No: 324432
- DATE: 23 February 2015
- **REPORT No:** C4414



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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 Memeber 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 17th November and 3rd 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.

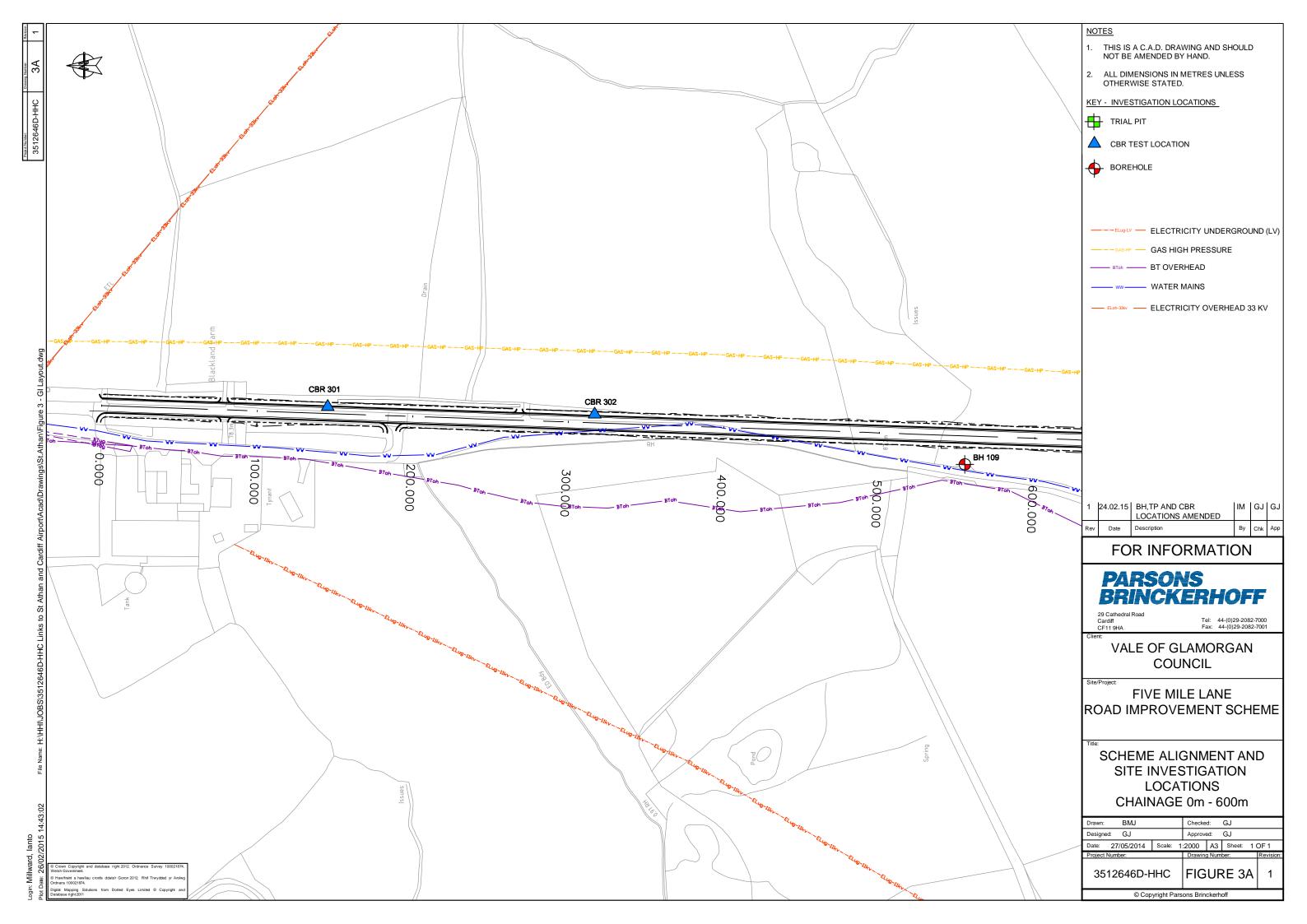
ISO/IEC 17025: (2005): General requirements for the competence of testing and calibration laboratories.

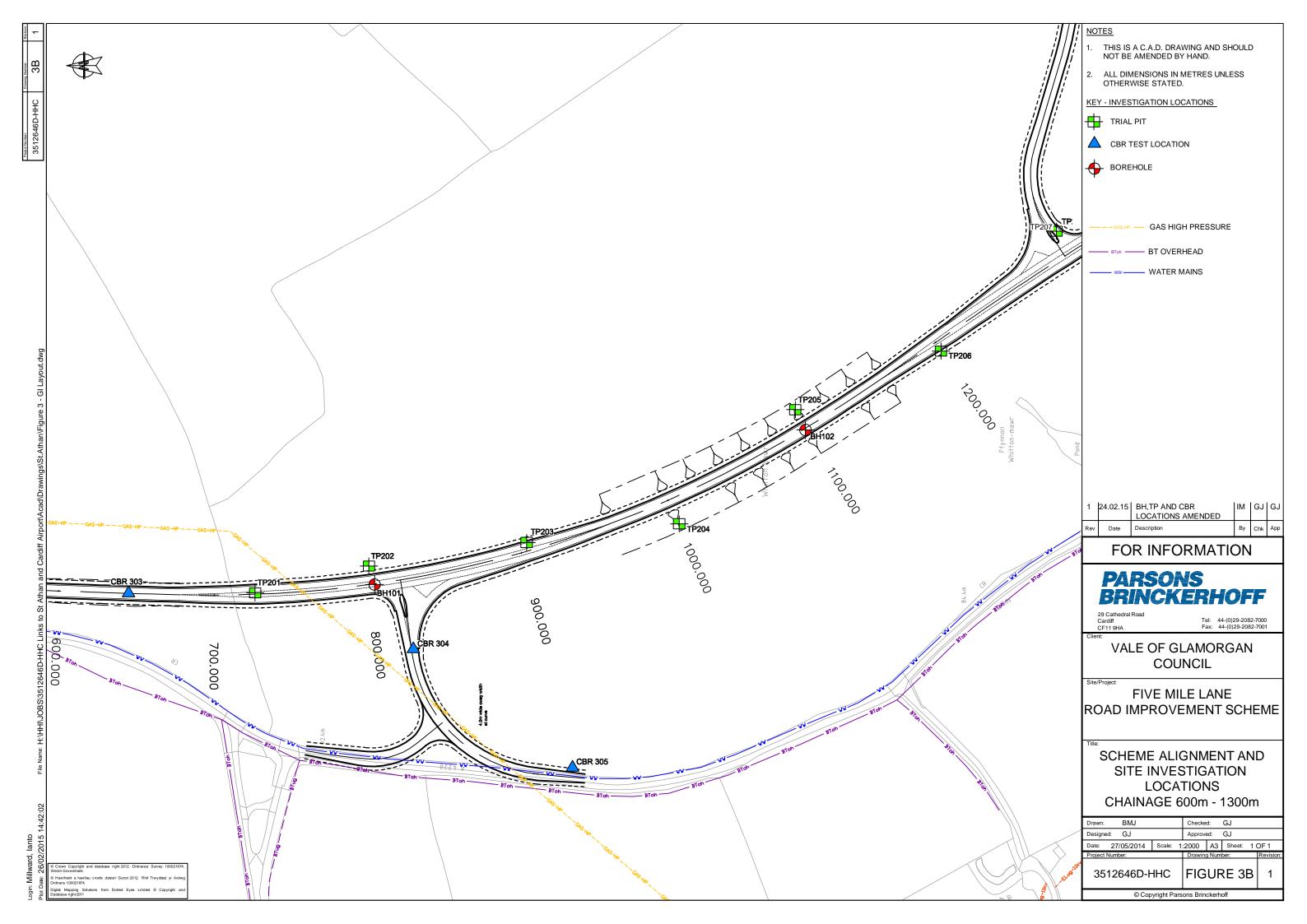
ISRM (International Society for Rock Mechanics), Part 2, Suggested Methods Uniaxial Compressive Strength of Rock Material.

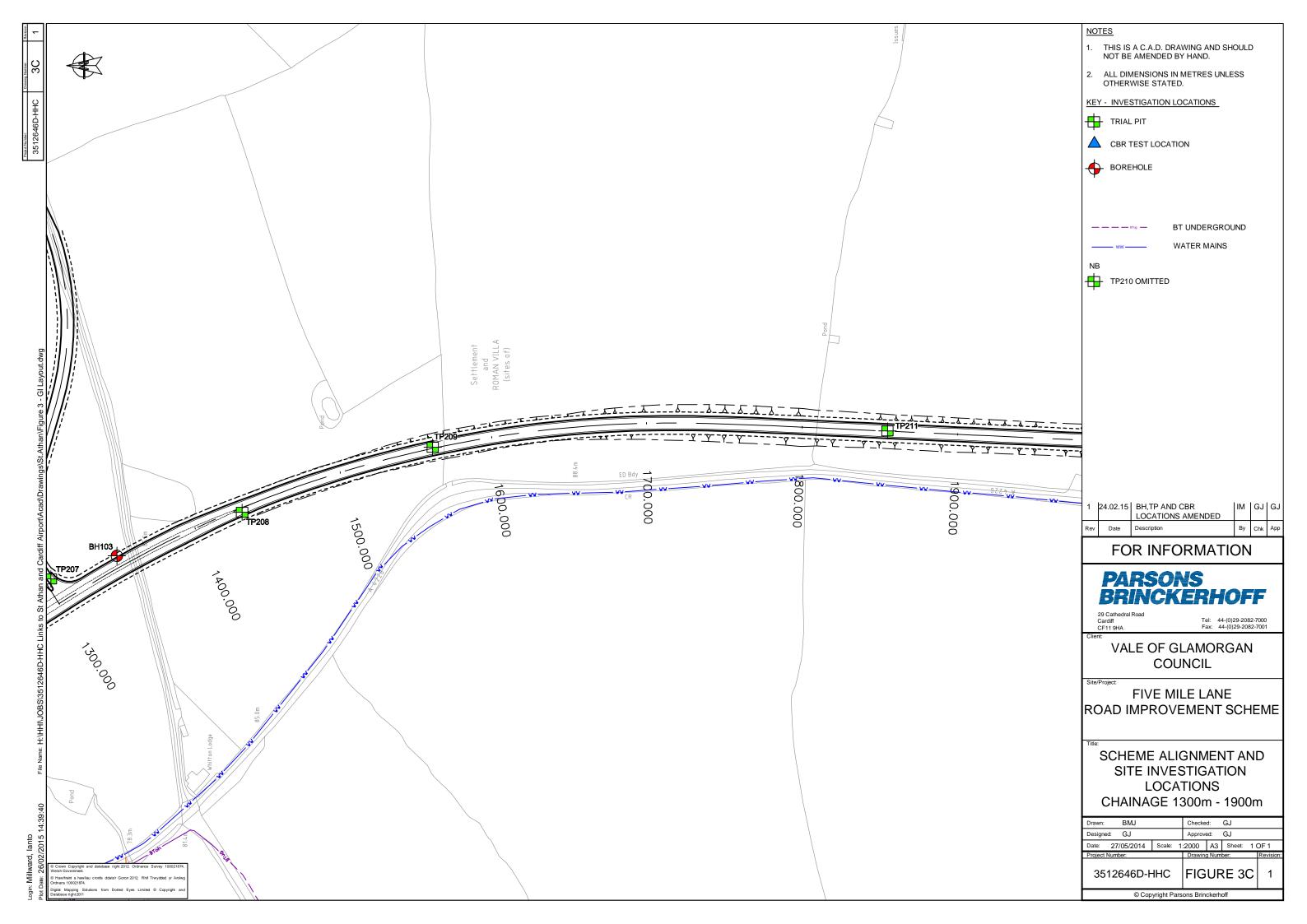
ISRM RTH 325-89 SR12, Suggested Method for Determining Point Load Strength.

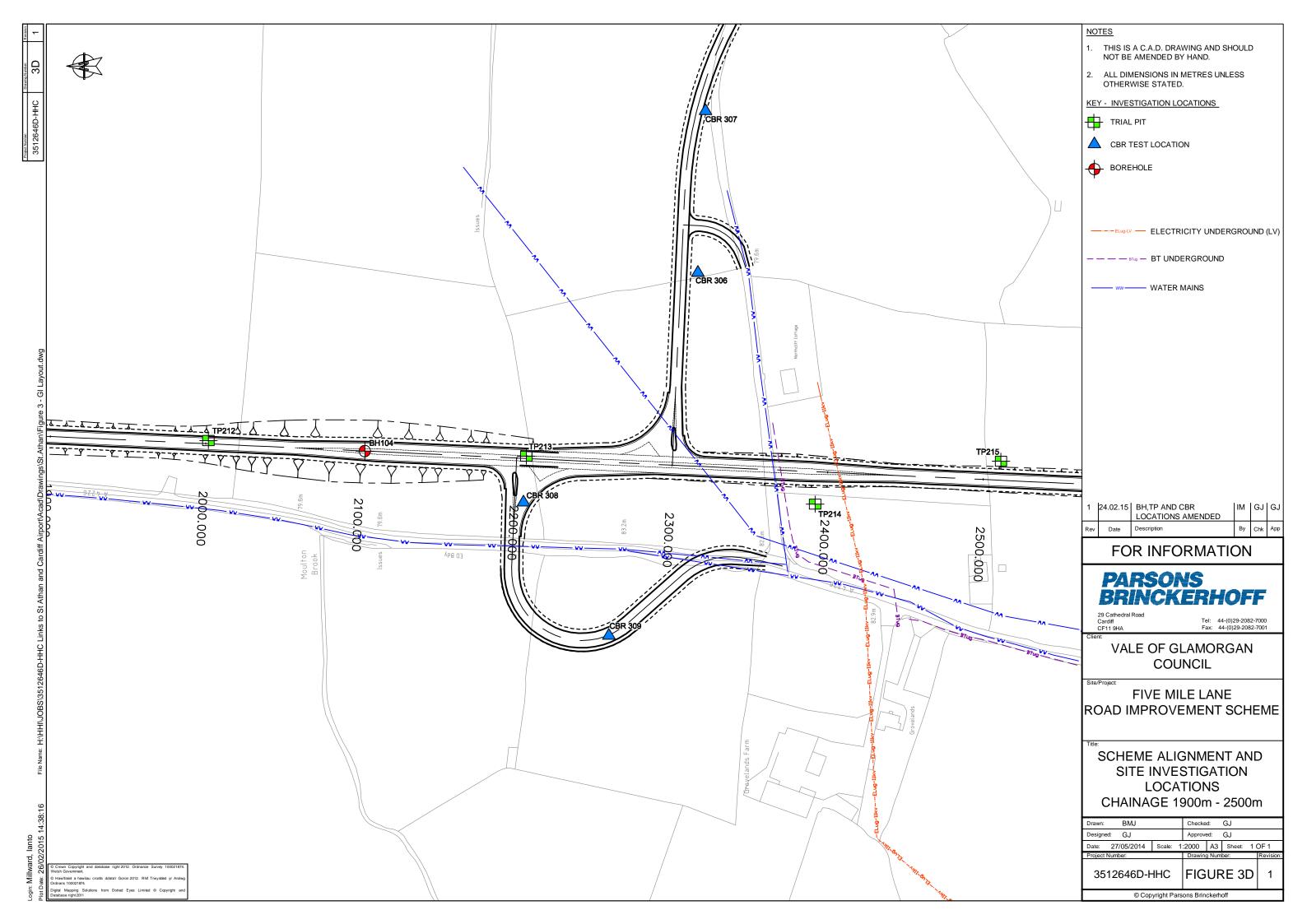
APPENDIX A

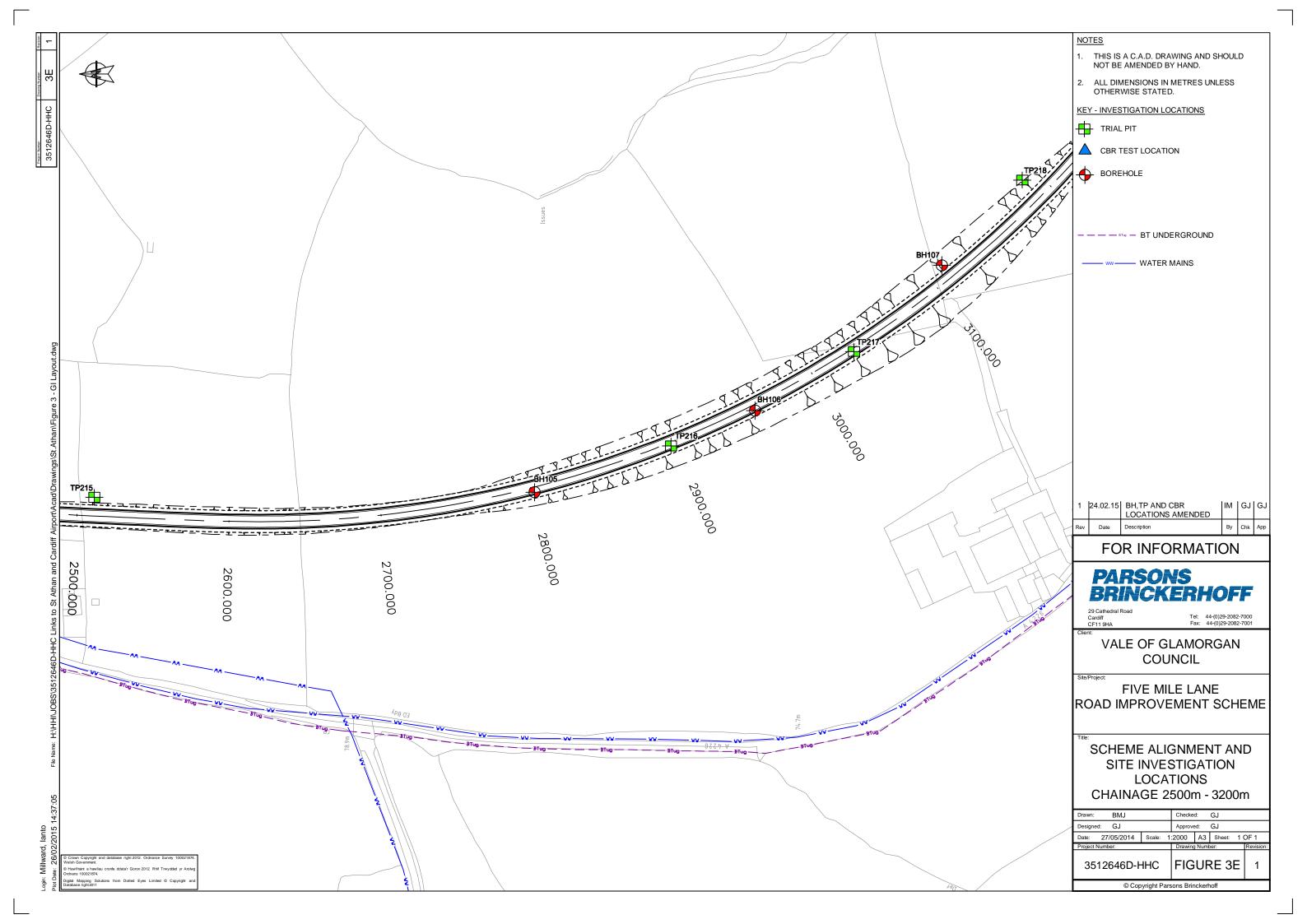
Appendix A – Site Plan

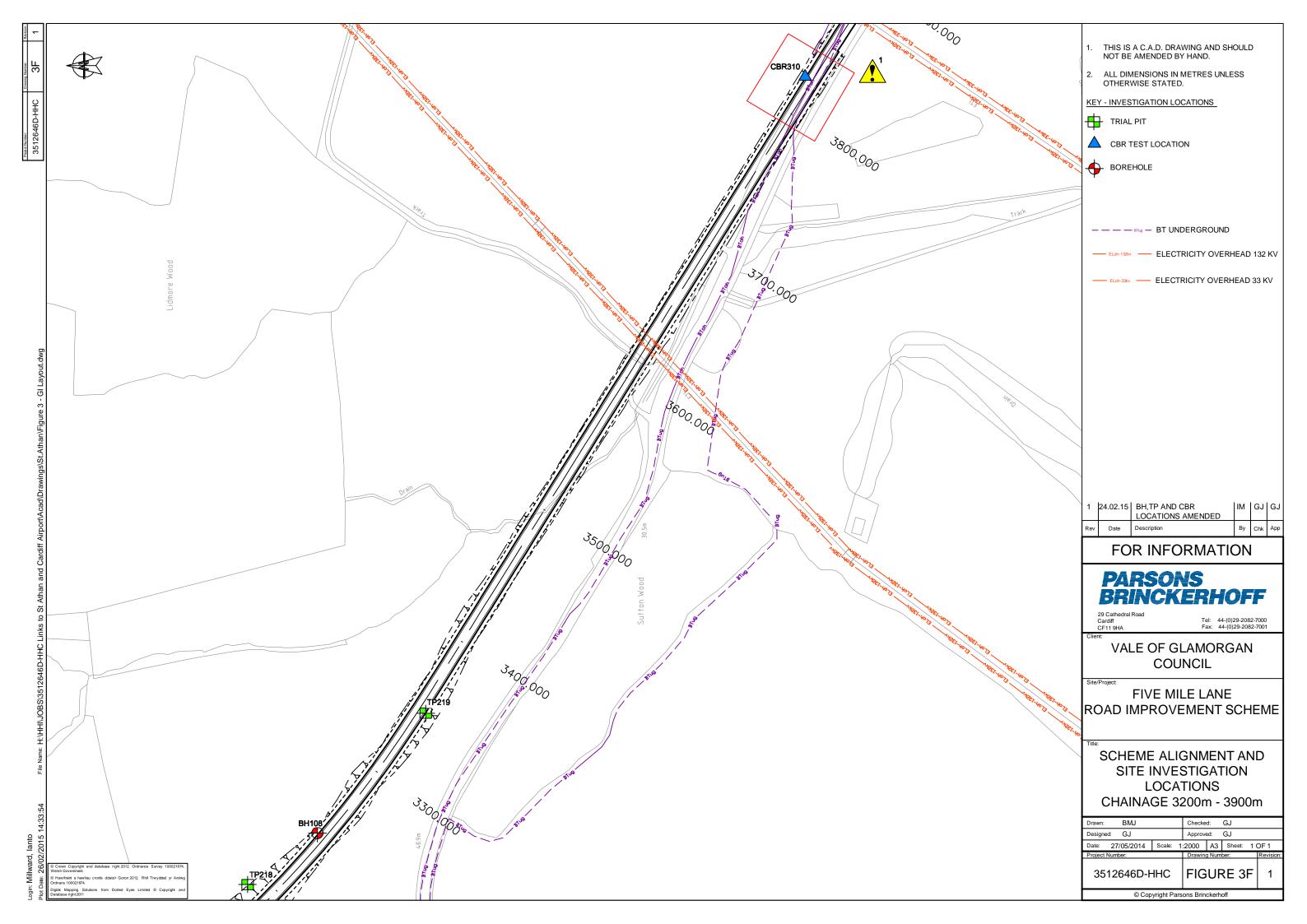












APPENDIX B

Appendix B – Exploratory Hole Data

CC Ground Investigations Ltd 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

С	Core run / sample
Х	Dynamic sample
D	Small disturbed sample
В	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

Initial Water St	rike Leve	after monitoring	3.00m Standing Level								
<u>Insitu Tests</u>											
S 30Split spoon sampler (SPT) followed by N Value (EN ISO 22476-3:2005)C 30Solid cone (CPT) followed by N Value (EN ISO 22476-3:2005)*240Where full test drive not completed, linearly extrapolated N value reported.**No effective penetrationH 30Hand Vane – direct reading in kPa. Re* denotes refusal (i.e. >140 kPa)											
Sample range											
Undisturbed sample	C Core	e run U(T)100 Undisturbed sample	Rotary core sub- sample								
Installation Details											
Porous Tip	Scre	ened Standpipe	Bentonite seal								
Plain standpipe	Grar	nular response zone	Concrete								
Grout Arisings backfill											
	-										
Grout	Arisings backfill Rocks Sedimentary	Metamorphic	Igneous								
	Rocks	Metamorphic	Igneous								
Soils	Rocks Sedimentary	Metamorphic Coarse-grained	Igneous								
Soils Made ground	Rocks Sedimentary Chalk	Coarse-grained									
Soils Made ground Boulders and cobbles	Rocks Sedimentary Chalk Limestone	Coarse-grained	+ + + + Coarse-grained								
Soils Soils Made ground Boulders and cobbles Image: Soils Image: Soils </td <td>Rocks Sedimentary Chalk Chalk Limestone Conglomerat</td> <td>Coarse-grained</td> <td>$\begin{bmatrix} + & + & + \\ - & + & + & + \\ - & + & + & + \\ \hline + & + & + & + \\ + & + & + & + \\ \hline \end{bmatrix}$ Medium-grained</td>	Rocks Sedimentary Chalk Chalk Limestone Conglomerat	Coarse-grained	$\begin{bmatrix} + & + & + \\ - & + & + & + \\ - & + & + & + \\ \hline + & + & + & + \\ + & + & + & + \\ \hline \end{bmatrix}$ Medium-grained								
Soils Soils Made ground Boulders and cobbles 000000000000000000000000000000000000	Rocks Sedimentary Chalk Limestone Conglomerat	Coarse-grained	$\begin{bmatrix} + & + & + \\ - & + & + & + \\ - & + & + & + \\ \hline + & + & + & + \\ + & + & + & + \\ \hline \end{bmatrix}$ Medium-grained								
Soils Soils Made ground Soils	Rocks Sedimentary Chalk Limestone Coglomerat Sedimentary Chalk Limestone Coglomerat Sandstone Sandstone Sandstone Mudstone Shale	Coarse-grained	$\begin{bmatrix} + & + & + \\ - & + & + & + \\ - & + & + & + \\ \hline + & + & + & + \\ + & + & + & + \\ \hline \end{bmatrix}$ Medium-grained								
Soils Made ground Soils Boulders and cobbles 000000000000000000000000000000000000	Rocks Sedimentary Chalk Limestone Conglomerat Conglomerat Chalk Chalk Limestone Conglomerat Sandstone Sandstone Mudstone	e Coarse-grained Medium-grained	$\begin{bmatrix} + & + & + \\ - & + & + & + \\ - & + & + & + \\ \hline + & + & + & + \\ + & + & + & + \\ \hline \end{bmatrix}$ Medium-grained								

CC Ground Investigations Ltd												Bore	ehole No.
RC)T	AR	Y BC	DR	E⊦	I C	LE	LOG				E	BH101
			65 , Fax: 014									She	eet 1 of 2
Proje	ct Nar	ne: Fiv	e Mile Lan	е			Proje	ect No: C4414	Co-ords:	E 307784 N 17	72062		ole Type P+RC
Locat	tion:	Fiv	e Mile Lan	e, Car	diff				Level:	90.07mAD			Scale : 25.00
Client: Vale of Glamorgan Council									Dates:	Start: 18/11/20 End: 21/11/20		Lo	gged By RS
()	Water	Core R	un, Samples &	Testing	Core	TCR	1		Description		Depth	Level	Levend
(m)		No/Type	Depth (m)	Result	Run & Sample	SCR RQD	Install		Description		(m)	(mAD)	Legend
-	• •	B D ES	0.30 - 0.60 0.30					Soft greyish brown slig rootlets. (TOPSOIL) Soft orangish brown rr with occasional rootlet	nottled grey slig		(0.20) - 0.20 (0.40)	89.87	
-		D	0.60					Firm orangish brown s with a high cobble con subangular fine to coa	ntent. Gravel is	angular to	- 0.60	89.47	
- - - - - - - - - - - - - - - - - - -		B CPT	0.80 - 1.20 1.20 - 1.70 1.20 - 1.65	C 12				limestone.			(1.50)		
-		СРТ	2.20 - 2.41	C*238				Very dense grey and c gravelly COBBLES. G medium to coarse lime	ravel is very ar	ngular to angular	- 2.10 (0.30)	87.97	
-		С	2.40 - 2.80			98% 50% 25%		Medium strong grey ca Discontinuities are sul spaced planar and un 2.45-2.50m: Subvertic	bhorizontal very dulating rough.	y closely and closely	- 2.40	87.67	
-		CS C	2.65 - 2.75 2.80 - 3.20	C*272		700/		with orangish brown s 2.50-2.59m: Extremely	taining on disco y weak.	ontinuity surfaces.	(0.00)		
3 —		CPT CS	2.80 - 2.93 3.00 - 3.10	0 212		73% 45% 0%		2.65-2.75m: Subvertic with orangish brown si Stiff dark grey calcare	taining on disco		- 2.90 - 3.00	87.17 87.07	
-		c	3.20 - 3.10			100%		Strong grey LIMESTO subhorizontal closely s 3.10-3.20m: Non intac	NE. Discontinu spaced undulat t, recovered as	ting rough. s angular to	(0.44)		
- - - - - -		CS	3.84 - 4.00			75% 21%		subangular medium to 3.35-3.44m: Subvertic with orangish brown si Medium strong locally MUDSTONE. Disconti spaced undulating rou Extremely weak orang Discontinuities are sub spaced undulating rou	al undulating ro taining on disco weak dark gre inuities are sub igh. jish brown calc bhorizontal extr	ough discontinuity ontinuity surfaces. y calcareous horizontal closely areous SILTSTONE.	- 3.44 - 3.50 - 3.56 - 3.68	86.63 86.57 86.51 86.39	
REMA Equir		Hand dig	ging tools. Lig	ht cable p	percussi	on rig.	Comacch	io MC305 multi-purpose t	track mounted	drilling rig.			

15	4 —	ļ	Ι Ι.						
GINT STD AGS 3_1.GDT 23/2/15	METHOD: Han CASING: 150m GROUNDWAT INSTALLATION	d dug inspection m diameter to 2. ER: Seepage at V: 50mm ID HDP	pit 0.00-1.20m. 0 10m. 140mm dia 0.60m. No rise re	corded. pe: 3.00-6.00m. 50mm	mm) 1.20-2.40m. Wa	terflush rotary o	core drilled (116mn	,	.00m. Bentonite p
CC ROTARY LOG C4414.GF	Groundwater: Date 18/11/14	Strike Depth (m) 0.60	Casing Depth (m) Nil	Depth After Observation (m) 0.60	Hole Progress: Date 18/11/2014 20/11/2014	Hole Depth (m) 2.40 2.40	Casing Depth (m) 2.10 Nil	Water Depth (m) 1.00 0.50	

CC Ground Investigations Ltd ROTARY BOREHOLE LOG													ehole No. 6 H101
													et 2 of 2
			165 , Fax: 014 /e Mile Lan		20 , Em	1811. Tita		ct No: C4414	Co-ords:	E 307784 N 17	2062	Но	le Type P+RC
Locat	ion:	Fiv	ve Mile Lan	e, Car	diff		1		Level:	90.07mAD			Scale : 25.00
Clien	t:	Va	le of Glamo	organ	Counc	;il			Dates:	Start: 18/11/20 End: 21/11/20		Lo	gged By RS
(m)	Water Levels		un, Samples &	-	Core Run &	TCR SCR	Install		Description		Depth (m)	Level (mAD)	Legend
	dwater:		4.00 - 5.00 4.00 - 4.15 4.18 - 4.33 5.00 - 6.00 5.00 - 5.03 5.79 - 6.00 6.00 - 6.14	C*750	h _ De	100% 78% 63% 100% 76% 59%		Medium strong grey LI Subhorizontal very clos rough. Discontinuity surfac Strong grey LIMESTO subhorizontal closely to rough. (continued from 3.68-3.77m: Subvertica smear on discontinuity 3.80-3.84m: Soft orang gravelly clay infill. Grav 4.00-4.16m: Soft dark, softened due to drilling 4.31-4.39m: Medium s mudstone. 4.39-4.41m: Extremely mudstone. Extremely weak dark gp Discontinuities are ran spaced planar rough. Strong grey LIMESTOI subhorizontal closely s Weak dark grey calcar are subhorizontal closely subhorizontal closely s 5.05-5.10m: Non intact subangular medium to 5.10-5.20m: Subvertica: (possibly drilling induca 5.20-5.46m: Weak dar Discontinuities are sub spaced to very closely 5.54-5.58m: Medium s mudstone. 5.58-5.60m: Locally sta 5.73-5.83m: Medium s mudstone. Borehole completed at	sely and closely sely and closely et 2; 2 no. subver ting rough stain. NE. Discontinuit o medium space previous sheet) al undulating rou y surfaces. gish brown slighla grey calcareous disturbance. throng dark grey weak dark grey rey calcareous domly orientate. NE. Discontinuit spaced undulating reous MUDSTO ely spaced undulating spaced undulating spaced undulating spaced undulating spaced undulating spaced undulating throng dark grey alined orangish h ugh discontinuit atined orangish h throng dark grey t 6.00m	esing Depth Wate	(0.84) (0.84) (1.76 (1.10) (1.10) (1.10)	85.55 85.37 85.31 85.17 84.07	
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CC ROTARY LOG C4414.GPJ GINT STD AGS 3_1.GDT 23/2/15

			65 , Fax: 014 e Mile Lan		.20 , Em	iail: m		round.co.uk ect No:						eet 1 o	
ηc		ne. i ivi		C				C4414	Co-ords:	E 307	'883 N 1	71785		Hole Type CP+RC	
cat	tion:	Fiv	e Mile Lan	le, Car	diff				Level:	84.08	mAD			Scale : 25.00	
en	t:	Val	le of Glam	organ	Counc	il			Dates:		17/11/20			gged E PF/RS	
ı)	Water	Core Ru	un, Samples &	Testing	Core Run &	TCR SCR	Install		Description			Depth	Level	Legend	
<u></u>	Levels	No/Type	Depth (m)	Result	Sample			MADE GROUND: So	•	ahtly san	dy elightly	(m)	(mAD)	XXXX	
-		B D	0.30 - 0.50 0.30					 MADE GROUND: Soc gravelly CLAY with fr sub-angular fine to n Soft orangish brown slightly gravelly CLA' Gravel is sub-angula 	requent rootlets < nedium limestone locally greyish br Y with frequent ro	<2mm. Gr e. rown sligh	ravel is	ſ 0.10	83.98		
-		ES B D	0.50 0.70 - 1.10 0.70					From 0.60m: High cc sub-angular limestor		bbles are	9	(1.30)			
		CPT C	1.20 1.40 - 2.00	C*214 C*222		50%		No Recovery.				— 1.40	82.68		
		CPT CS	1.40 1.75 - 1.89			20%		Very weak grey mottl COBBLE. Strong grey LIMEST	ONE with subhor	rizontal ve		(0.30) 	82.38 82.33 82.16		
		C CPT	2.00 - 3.00 2.00 - 2.05	C**		100% 50% 50%		spaced undulating ro 1.89-1.90m: Firm ora gravelly clay infill. Gr Extremely weak oran MUDSTONE with su undulating rough dis Strong grey LIMEST and closely spaced u <10mm soft to firm o 2.18-2.22m: Subvert 2.32-2.35m: Non inta medium to coarse gr	angish brown slig avel is subangul igish brown mottl bhorizontal very continuities. ONE with subhor indulating rough rangish brown si ical undulating ro act, recovered as avel.	htly sand ar fine lim led grey c closely sp rizontal ve discontin ilty clay in bugh disco subangu	nestone. calcareous paced ery closely nuities with nfill. continuity. Jlar	(0.80)	82.08		
]		CS	2.80 - 3.00					2.35-2.53m: 2 no. ve discontinuities with a surfaces.	little clay smear	on disco	ontinuity	2.80	81.28		
-		C CPT CS	3.00 - 3.80 3.00 - 3.04 3.20 - 3.50	C**		94% 56% 56%		2.56-2.70m: 2 no. ve discontinuities (one p Weak orangish brow with subhorizontal m	possibly drilling ir n and grey calca	nduced). areous SIL	LTSTONE	3.00	81.08		
		ССРТ	3.80 - 5.00 3.80 - 3.85					discontinuities. 2.80-3.00m: 2mm wi Strong grey LIMEST and closely spaced u <10mm soft to firm o 3.10-3.20m: Subvert 3.57-3.60m: Soft ora gravelly clay infill. Gr 3.77-3.80m: Soft ora	de calcite vein. ONE with subhor indulating rough rangish brown si ical undulating ro ngish brown mot avel is subangul ngish brown mot	rizontal ve discontin ilty clay in bugh disco ttled grey ar fine lim ttled grey	ery closely nuities with fill. sontinuity. slightly nestone. slightly	(1.32)			

15	4		I	I	I I.		graveny elay min.		igular line lineotol		4
GPJ GINT STD AGS 3_1.GDT 23/2/15	EQ ME CA GR INS	THOD: H SING: 15 OUNDW STALLAT	IT: Hai Hand c 50mm /ATER TION: {	dug inspectior diameter to 1 & Groundwate 50mm ID HDF	i pit 0.00-1.20m. (.40m. 140mm dia er not encountered	d prior to use of waterflu pe: 3.00-6.00m. 50mm	ım) 1.20-1.40m. Wa sh.	terflush rotary c	ore drilled (116mn	,	0m. Bentonite pellet
CC ROTARY LOG C4414.G	Gro	oundwate Date		Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)	Hole Progress: Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	

CC Ground Investigations Ltd												
ROT	ARY BO	ORE⊦	IOLE	ELOG			В	H102				
Telephone: 01	452 739165 , Fax: 014	452 739220 , Em	nail: mark@cco	ground.co.uk			She	et 2 of 2				
Project Na	me: Five Mile Lar	ne	Proj	ect No: C4414	Co-ords: E 307883 N 17	71785		le Type P+RC				
Location:	Five Mile Lar	ne, Cardiff		04414	Level: 84.08mAD		Scale 1 : 25.00					
Client:	Vale of Glam	organ Cound	cil		Dates: Start: 17/11/20	14		gged By				
	Our Dur Ourster	Testing Core	TCR		End: 20/11/20		<u> </u>	PF/RS				
(m) Water Levels	Core Run, Samples & No/Type Depth (m)	Result Sample	SCR Install		Description al 2mm wide calcite vein.	Depth (m)	Level (mAD)	Legend				
	CS 4.44 - 4.61 C 5.00 - 6.00 CPT 5.00 - 5.04	C**	78% 70%	and closely spaced un <10mm soft to firm ora (continued from previou 4.09-4.14m: Stiff orang sandy slightly gravelly calcareous siltstone. 4.32-4.40m: 70° undul Weak to medium stror brown calcareous SILT spaced planar rough d 4.43-4.44m: Firm oran Medium strong grey LI closely spaced undula <10mm firm orangish I 4.81-4.83m: Firm oran Very weak orangish parts	gish brown mottled grey slightly CLAY. Gravel is subangular fine ating rough discontinuity. In the subangular fine ag grey locally stained orangish FSTONE with horizontal closely iscontinuities. gish brown silty clay infill. MESTONE with subhorizontal ting rough discontinuities with brown silty clay infill. gish brown silty clay infill. own mottled grey calcareous	(0.61)	79.76 79.64 79.03 78.96					
6	CS 5.82 - 6.00 CPT 6.00 - 6.04	C*750		MUDSTONE with rand spaced undulating rou Strong grey LIMESTO spaced undulating rou 5.12-5.22m: Vertical 30 5.38-5.50m: Discontine extremely to very close Extremely weak dark g subhorizontal very close rough discontinuities.	lomly orientated extremely closely gh fractures. NE with subhorizontal closely gh discontinuities. mm wide calcite vein. uities are randomly orientated ely spaced undulating rough. grey calcareous MUDSTONE with sely to closely spaced undulating NE with subhorizontal closely gh discontinuities. clay infill.	(0.38) 5.50 (0.24) 5.74 (0.26) 6.00	78.58 78.34 78.08					
								- -7 - - - - - - - - - - - - - -				
8 — - - - - - - - - - - - - - - - - - - -			epth After ervation (m)	Hole Progress: Date Ho 20/11/2014	(m) (m) (r Depth m) .40						

CC ROTARY LOG C4414 GPJ GINT STD AGS 3_1.GDT 23/2/15

	RC	ЭΤ	AR	tigations Lt YBC 65 , Fax: 014	DR								C	C	E	ehole No. 3H103 eet 1 of 2
_				e Mile Lan		,(-	t No: C4414	Co-ords:	E 308	026 N 17	1581		ole Type CP+RC
	Loca	tion:	Fiv	e Mile Lan	e, Car	diff					Level:	84.88r	mAD			Scale : 25.00
	Clien	it:	Va	le of Glam	organ	Cound	cil				Dates:		17/11/20 ⁻ 19/11/20 ⁻			gged By PF/RS
╞	(m)	Water	Core Ru No/Type	u n, Samples & Depth (m)		Core Run & Sample		Insta	all		Description	Enu.	19/11/20	Depth (m)	Level (mAD)	Legend
			B D ES D B	0.30 - 0.60 0.30 0.40 - 0.70 0.40 0.50 0.60 0.90 - 1.20						MADE GROUND: Soft gravelly CLAY with free sub-angular fine to mer Soft orangish brown low slightly gravelly CLAY Gravel is sub-angular f From 0.45m: High cobl sub-angular limestone.	quent rootlets - dium limestone cally greyish b with frequent re fine limestone. ble content. Co	<2mm. Gra e. rown sligh ootlets <2	avel is/ tly sandy mm.	- 0.15	84.73	· · · · · · · · · · · · · · · · · · ·
	1		B CPT	1.20 - 1.70 1.20 - 1.65	C 12									(1.95)		
	-		СРТ	2.20 - 2.41	C*238					Orangish brown and gr sub-angular limestone.		BBLES. Co	obbles are	2.10	82.78	
	-		C CS	2.40 - 3.00						Strong grey LIMESTON and closely spaced und 2.40-2.62m: Subvertica 2.67-2.70m: Firm orang	dulating rough al undulating ro	discontinu ough disco	uities. ontinuity.	- 2.40 (0.43)	82.48	
	- 3 — - - - - -		C CPT CS CS CS CS	3.00 - 3.30 3.00 - 3.07 3.15 - 3.26 3.30 - 3.50 3.30 - 3.45 3.50 - 4.00 3.58 - 3.80	C**					Weak to medium stron calcareous MUDSTON spaced undulating roug 2.86-2.96m: 60° undula little clay smear on sur Strong grey LIMESTOI and closely spaced und 3.20-3.23m: Firm orang sandy slightly gravelly limestone.	IE with subhori gh discontinuit ating rough dis faces. NE with subhoo dulating rough gish brown silt gish brown mo clay infill. Grav	izontal clo ies. scontinuity rizontal ve discontinu y clay infill ottled grey vel is suba	sely with a rry closely uities	2.83 (0.22) 3.05 (0.95)	82.05 81.83	-3
CC ROTARY LOG C4414.GPJ GINT STD AGS 3_1.GDT 23/2/15	EQUII METH CASIN GROU	NG: 150n JNDWAT ALLATIO	nm diame ER: Grou N: 50mm	eter to 1.40m. undwater not e	140mm d ncounter ted stand	percussi . Cable liameter red prior lpipe: 3.0	to 3.00 to use 00-6.00	om. of wat	terflus	3.50-4.00m: Discontinu spaced. 3.80-3.82m: Firm orang infill. Gravel is subangu MC305 multi-purpose tr m) 1.20-2.40m. Waterflu sh. D HDPE plain pipe: 0.00	gish brown slig ular fine limest rack mounted o sh rotary core	ghtly grave cone. drilling rig. drilled (11	illy clay 6mm) 1.40-6		00m. Be	entonite pellet
CC ROTARY LOG C4414.G		dwater: ate	Strike (n		ing Dept (m)		epth Af ervatio			Hole Progress: Date Hol	le Depth C (m)	Casing Dep (m)		Depth n)		

			tigations Li								Bore	ehole No.
RC)T/	٩R	Y BC	ЭR	EHC)LE	LOG					BH103
			165 , Fax: 014		220 , Email: n			1				eet 2 of 2
Proje	Ct Nai	ne: Fiv	ve Mile Lan	e		Proje	ect No: C4414	Co-ords:	E 308026 N 17	71581		le Type P+RC
Locat	tion:	Fiv	ve Mile Lan	ie, Car	diff			Level:	84.88mAD			Scale : 25.00
Clien	t:	Va	ale of Glam	organ	Council			Dates:	Start: 17/11/20 End: 19/11/20			gged By PF/RS
(m)	Water		un, Samples &			R Install		Description	EIIU. 19/11/20	Depth	Level	Legend
	Levels	No/Type C CPT	 Depth (m) 4.00 - 5.00 4.00 - 4.26 	Result C*91	Sample RQE) : 目:::	Stiff grey mottled orang gravel CLAY. Gravel is	gish brown sligh	tly sandy slightly	(m) 4.00	(mAD) 80.88	
-		CS	4.27 - 4.45				Strong grey LIMESTOI spaced undulating rou	NE with subhoria	zontal very closely	(0.27) - 4.27	80.61	
					- -		randomly orientated 2- occasional 20mm dian 4.44-4.65m: 4 no. 60° discontinuities with <10	-5mm thick calci neter calcite incl subparallel undu	te veins and usions. ulating rough			
							sandy clay infill. 4.70-4.78m: Firm oran gravelly clay infill. Grav	igish brown sligh	itly sandy slightly	(1.33)		
5		C CPT	5.00 - 6.00 5.00 - 5.26	C*107			5.00-5.15m: Firm oran sandy slightly gravelly limestone.	clay. Gravel is s	subangular fine	(1.00)		
							5.15-5.60m: Discontinu spaced. 5.16-5.40m: Subvertica discontinuity.	al to 80° undulat	ting rough			
-							5.43-5.50m: Weak thin brown and grey calcard 5.40-5.60m: Discontinu wide calcite vein.	eous mudstone. uities are closely	y spaced. 3-10mm	5.60 (0.22)	79.28	
		CS	5.82 - 6.00				Extremely weak dark g locally tending to very orientated extremely cl	stiff to hard clay	, with randomly	5.82	79.06	
6 —		СРТ	6.00 - 6.08	C**			discontinuities. Strong grey LIMESTOI undulating rough disco	NE with subhoria	0 0	6.00	78.88	6
							Borehole completed at					
7 -												-7
												-
8 -												
-												-
_												
-												-
Groun	dwater:						Hole Progress:					
Da	ite	Strike (r	Depth Cas m)	sing Dept (m)	th Depth A Observati	After on (m)	Date	ole Depth Ca (m) 6.00	(m) (r Depth m) .60		

CC ROTARY LOG C4414.GPJ GINT STD AGS 3_1.GDT 23/2/15

			tigations Lt					LOG					ehole No. 6 H104
													et 1 of 2
			65 , Fax: 014 e Mile Lan		20 , Em	ail: ma		ct No:					le Type
Tioje		10.110		C				C4414	Co-ords: E 308	095 N 17	0839		P+RC
Locat	ion:	Fiv	e Mile Lan	e, Caro	diff				Level: 79.73	mAD			Scale : 25.00
Client	t:	Val	le of Glamo	organ (Counc	il			Dates:	20/11/20		Lo	gged By
					Core	TCR			End:	02/12/20			RS
(m)	Water Levels		un, Samples & Depth (m)	-	Run & Sample	SCR	Install		Description		Depth (m)	Level (mAD)	Legend
_		110,1900		liteount	Campic	-	5.0.	Soft greyish brown slig rootlets. (TOPSOIL).	htly sandy CLAY with fre	equent	(0.20)		<u>x1 1/2</u> <u>x1 1/2</u>
		D ES B	0.30 0.40 - 0.60					Orangish brown and gr	ry angular to subangular		(0.60)	79.53	
- - 1		В	0.80 - 1.00	C*240					, recovered as very cla very angular to subang stone. Cobbles are lime	ular	- 0.80	78.93	
		SPT	1.00 - 1.04	S*349							(0.60)	78.33	
-		C CPT	1.40 - 2.50 1.40 - 1.43	C*441		100% 52% 39%		Very stiff orangish brow Strong grey LIMESTON subhorizontal very clos rough. 1.58-1.65m: Very stiff fr	NE. Discontinuities are ely to closely spaced ur riable orangish brown sl	ndulating	- 1.50 (0.34)	78.23	
-							$\exists \Box$	 sandy silty CLAY with c sized mudstone lithorel 	licts.	· /	1.84	77.89	
2 —		CS	1.98 - 2.20		Ç			Firm dark grey calcared subangular fine gravel Strong grey LIMESTON subhorizontal medium	sized mudstone lithorel	icts.	- 1.98 (0.22)	77.75	
-								Extremely weak dark gr Discontinuities are rand spaced undulating roug	rey calcareous MUDST domly orientated extrem	ONE.	- 2.20 - 2.31	77.53 77.42	
_		C CPT	2.50 - 3.00 2.50 - 2.58			64% 44%		Strong grey LIMESTON subhorizontal very clos	NE. Discontinuities are ely spaced undulating r	ough.	(0.34)		
-			2.00 2.00			26%			,		- 2.65 - 2.80	77.08 76.93	
3 —		C CPT	3.00 - 4.00 3.00 - 3.08			100% 70% 50%		subhorizontal very clos	dark grey calcareous n	C	(0.00)		3
-		CS	3.22 - 3.36					Discontinuities are sublundulating rough. 3.36-3.45m: Weak dark	horizontal closely space k grey calcareous muds	ed tone.	(0.80)		
-								Discontinuities are subl spaced undulating roug discontinuity. Very weak to weak dart Discontinuities are subl	gh and 1 no. 70° undula	ting rough 	3.60	76.13	
4								closely spaced undulat	ing rough. lark grey calcareous cla	y. (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. Benton seal: 0.20-2.50m. Concrete and raised cover 0.00-0.20m.													ntonite pellet
Groun Da	dwater: te	Strike (n	Depth Cas	ing Depth (m)	ו De Obse	epth Afte		20/11/2014 01/12/2014 01/12/2014	e Depth Casing De (m) (m) 1.40 Nil 1.40 Nil 4.00 2.50 4.00 2.50	(r D 0. 1.	Depth m) 0ry 40 60 10		

15	
23/2/	ſ
GDT.	
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AGS 3	
STD /	
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t.GPJ	ŀ
C441	
LOG	
TARY	
CC ROTAR	
8	L

CC Ground	l Investigat	ions Lto	b								Bore	hole No.
ROT	ARY	BC	DRE	Ξŀ	10	LE	LOG				В	H104
Telephone: 014	52 7 <u>39165</u> , I	-ax: 0145	52 73922	0 , Em	ail: ma	ark@ccgr	ound.co.uk				She	et 2 of 2
Project Nar	ne: Five M	ile Lane	e			Proje	ct No: C4414	Co-ords:	E 308095 N 17	0839		le Type P+RC
Location:	Five M	ile Lane	e, Card	iff				Level:	79.73mAD			Scale : 25.00
Client:	Vale of	Glamo	organ C	Counc	il			Dates:	Start: 20/11/20		Lo	ged By RS
() Water	Core Run, Sa	moles & T	Testing	Core	TCR				End: 02/12/20	14 Depth	Level	RO
I (m) I	No/Type De	oth (m)	Result S	Run & Sample		Install		Description		(m)	(mAD)	Legend
-	C 4.00 CPT 4.00) - 5.00) - 4.06		l l l	75% 44% 0%		Strong grey LIMESTOI subhorizontal very clos (continued from previou 4.00-4.25m: No recover	sely spaced und <i>us sheet)</i> ery.	dulating rough.	(0.52)		
-							4.25-4.30m: Non intact subangular fine to coal Very weak to weak dar Discontinuities are sub	rse gravel. k grey calcared	ous MUDSTONE.	4.40	75.33	
-	CS 4.63	3 - 4.68					spaced undulating rou	gh.		(0.45)	74.88	
- 5 — -) - 6.00) - 5.05			100% 65%		Strong grey LIMESTO subhorizontal very clos 4.90-5.00m: Non intact subangular fine to coal	sely spaced und t, recovered as rse gravel.	dulating rough.	4.00	74.00	
-	CS 5.1	5 - 5.25		-	50%		5.00-5.03m: Soft clay i 5.00-5.10m: Subvertica 5.03-5.25m: Subvertica stained discontinuity.	al undulating ro al undulating ro	ough orangish brown			
-							5.25-5.32m: Non intact medium gravel. 5.32-5.41m: Subvertica discontinuity.	al orangish bro	wn stained	(1.15)		
-							5.41-5.47m: Very weak 5.52-5.62m: 70°-80° ui stained discontinuity.	ndulating rough	orangish brown			
6 —	CPT 6.00) - 6.07					5.62-5.67m: Very weal Discontinuities are sub discontinuity. 5.73-6.00m: Weak gre Discontinuities are sub	v calcareous M	IUDSTONE.	6.00	73.73	6
-							Borehole completed at					-
-												-
- - 7 —												- - 7
-												-
-												-
-												-
8 —												8
-												-
-												-
												-
Groundwater: Date	Strike Deptr (m)	n Casi	ng Depth (m)		epth Aft ervatior		Hole Progress: Date Ho 02/12/2014	le Depth C (m) 6.00	(m) (i	⁻ Depth m) 40		

									LOG					H105 et 1 of
			65 , Fax: 014 e Mile Lan		20 , Em	ail: ma	-		ound.co.uk ct No:					le Typ
				-				,	C4414	Co-ords:	E 308091 N 17	70141		S+RC
_oca	tion:	Fiv	e Mile Lan	e, Car	diff					Level:	72.10mAD			Scale : 25.0
Clier	nt:	Val	e of Glam	organ	Counc	il				Dates:	Start: 26/11/20	14	Lo	gged E
		0.5	<u> </u>		Core	TCR	1			Batoo.	End: 27/11/20			RS
(m)	Water Levels	Core Ru No/Type	in, Samples & Depth (m)		Run & Sample	SCR	Inst	all		Description		Depth (m)	Level (mAD)	Legend
-	_						5	1.01	Very soft greyish brown CLAY with frequent roc medium limestone. (TC	otlets. Gravel i		(0.20)		<u>1' 71'</u> 7 <u>71'</u>
-		Р	0.20						Very soft orangish brov CLAY with a high cobb	vn and grey sl		- 0.20	71.90	
-		B ES	0.30						subangular fine to coar limestone.	se limestone.	Cobbles are	(0.40)		
-	-	B CPT	0.50 0.50 - 0.95	C 15		100%			0.40-0.50m: High bould		oulders are	0.60	71.50	
-		C CS	0.60 - 1.50 0.68 - 0.78			51% 38%			0.50-0.60m: Limestone Extremely weak dark g	rey calcareou	s MUDSTONE.	0.68	71.42 71.32	
-	-				1				Discontinuities are sub smooth.		,	(0.29)		^^ *×
1 —					C .				Strong grey LIMESTON subhorizontal closely s	paced undula	ting rough.	1.07	71.03	××
-	-						\square		Firm orangish brown m 0.95-1.07m: Slightly gra	ottled grey ca avelly. Gravel	Icareous silty CLAY. is subangular fine to			
-					l I				medium mudstone. Strong grey LIMESTON					
-	-	с	1.50 - 2.50	C*200		90%			subhorizontal very clos rough and sub-vertical of weak orangish brown	undulating rou	ugh. Frequent bands	(0.08)		
-		CPT	1.50 - 1.70			45% 16%			mudstone <200mm. 1.50-1.75m: Drilling dis			(0.98)		
-	-								gravel. Gravel is angula limestone.	ar to subangu	lar fine to coarse			
- 2 —					C		\square							
-					l I				Medium strong thinly la MUDSTONE. Discontir	minated dark	grey calcareous	2.05	70.05	
-		CS	2.25 - 2.41						closely to closely space 2.05-2.26m: Subvertica	ed undulating	rough.	(0.38)		
-			2 50 2 50	0*500					Strong grey LIMESTON			2.43	69.67	
-	-	C CPT	2.50 - 3.50 2.50 - 2.62	C*500		90% 85% 62%			subhorizontal very clos rough and sub-vertical of weak orangish brown	undulating rou	ugh. Frequent bands			
-	1	cs	2.73 - 2.86			5270			mudstone <200mm. 2.58-2.72m: Subvertica			(0.72)		
-	-								stained discontinuity. 2.86-3.06m: Subvertice					
3 —	1				C ·				stained discontinuity.					
-	-						\square	E	Hard dark grey calcare	ous CLAY.		- 3.15	68.95	<u></u> '
-	-						Ħ	E				(0.35)		
-		C CPT CS	3.50 - 4.50 3.50 - 3.58 3.60 - 3.82	C*600	- - C	100% 74% 55%			Medium strong locally Discontinuities are sub spaced undulating roug rough. 300-900mm spa	horizontal ver gh and sub-ve aced bands of	y closely to closely rtical undulating weak orangish	- 3.50	68.60	
-	-				1				brown and dark grey ca 3.88-4.14m: Very stiff to					

J GINT STD AGS 3_1.GDT	METHOD: Han CASING: 140m GROUNDWAT INSTALLATION	d dug inspection m diameter to 1. ER: Groundwate V: 50mm ID HDP	pit 0.00-0.50m. E 50m. r not encountered	C305 multi-purpose tra Dynamic sampling using d prior to use of waterflu pe: 4.00-10.00m. 50mn er 0.00-0.20m.	g 113mm sample Ба ush.	arřel: 0.50-0.60m			
CC ROTARY LOG C4414.GPJ	Groundwater: Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)	Hole Progress: Date 26/11/2014 27/11/2014	Hole Depth (m) 2.50 2.50	Casing Depth (m) 1.50 1.50	Water Depth (m) 1.40 1.40	

			65 , Fax: 014 e Mile Lan					ct No: C4414	Co-ords:	E 308091 N 17	0141	Hole Typ DS+RC
loca	tion:	Fiv	e Mile Lan	e, Car	diff				Level:	72.10mAD		Scale 1 : 25.00
Clien	t:	Val	e of Glamo	organ (Cound	cil			Dates:	Start: 26/11/20 End: 27/11/20		Logged E RS
(m)	Water Levels		In, Samples &		Core Run &	TCR SCR ROD	Install		Description		Depth (m)	Level (mAD)
	Levels	CCPT CS CS CCPT CS CS CS CS CS CS CS CS	Depth (m) 4.50 - 5.50 4.50 - 4.62 5.28 - 5.50 5.50 - 7.00 5.50 - 5.58 6.35 - 6.48 7.00 - 8.50 7.00 - 7.05 7.30 - 7.37 8.12 - 8.28 8.50 - 10.00 8.50 - 8.57	Result C*500 C*500 C*429		92% 62% 55% 90% 80% 50% 90% 80% 50%		 with occasional fine gr Medium strong locally Discontinuities are sul spaced undulating rou- rough. 300-900mm sp brown and dark grey of <i>(continued from previo</i> 4.22-4.26m: 40° undu 5.03-5.10m: Very weat 5.29-5.50m: Subvertion 5.89-5.92m: Subhorizzi brown stained discont 5.89-5.92m: Subhorizzi brown stained discont 5.89-6.14m: Subvertion 5.89-6.14m: Subvertion 5.89-6.14m: Subvertion 5.98-6.14m: Subvertion 6.14-6.25m: Stiff dark 6.25-6.66m: Subhorizzi closely to closely space orangish brown stained 6.93-7.00m: Weak. Di- orientated extremely to rough. 7.00-7.20m: Non intace medium to coarse grave 7.45-7.54m: Subvertion stained discontinuity. 7.90-8.02m: Subvertion 8.26-8.40m: Limeston medium strong calcar 8.50-8.53m: Non intace 	ravel sized muds weak grey LIME bhorizontal very c igh and sub-verti- aced bands of we calcareous mudsi- aced bands of we calcareous mudsi- lating rough disco- al undulating rou- cal und	STONE. closely to closely cal undulating eak orangish tone <200mm. ontinuity. areous mudstone. ugh discontinuities. ting rough orangish ugh orangish brown clay. ies are very undulating rough randomly aced undulating subangular ugh orangish brown paced undulating ugh orangish brown paced undulating ugh orangish brown paced undulating ugh orangish brown ugh discontinuity. ded with dark grey	(m) (6.50)	
-		CS	8.76 - 9.04		Ġ	79% 58%		8.72-8.94m: Subvertic stained discontinuity.	Ū	igh orangish brown		
	dwater: ate	Strike (m		ing Deptl (m)		epth Aft ervatior		Hole Progress:	ole Depth Ca (m)		Depth n)	· · ·

CC Ground	Investigations Lte	d							Bore	hole No.
ROT/	ARY BC	DREH	OL	-E	LOG					H105
Telephone: 014	52 739165 , Fax: 014	52 739220 , Ema	ail: mark@	@ccgro	ound.co.uk				She	et 3 of 3
Project Nan	ne: Five Mile Lan	e	F	Projec	t No: C4414	Co-ords:	E 308091 N 1	70141	Ho D	le Type S+RC
Location:	Five Mile Lan	e, Cardiff				Level:	72.10mAD			Scale 25.00
Client:	Vale of Glamo	organ Counci	I			Dates:	Start: 26/11/20	14	Log	ged By
		Cara				Dales.	End: 27/11/20	14		RS
(m) Water Levels	Core Run, Samples & No/Type Depth (m)	Testing Core Run & Result Sample	TCR SCR In RQD	nstall		Description		Depth (m)	Level (mAD)	Legend
9	CS 9.61 - 9.79				Medium strong locally of Discontinuities are sub spaced undulating roug rough. 300-900mm spa brown and dark grey ca (continued from previou 9.14-9.17m: 30° planar 9.21-9.25m: Soft grave fine to medium limesto 9.24-9.26m: 30° undula 9.47-9.60m: Subvertica	horizontal very gh and sub-ver aced bands of v alcareous mud: <i>s sheet</i>) rough discont Ily clay infill. G ne. ating rough dis al undulating ro	/ closely to closely tical undulating weak orangish stone <200mm. inuity. iravel is subangular continuity. bugh discontinuity.			
10 —	CPT 10.00 - 10.06	C*429			Borehole completed at	10.00m		10.00	62.10	
					Hole Progress:					
Date	Strike Depth Casi (m)	ing Depth Dep (m) Obser	oth After vation (m	n)	Date Hol 17/11/2014	e Depth C (m) 10.00 10.00	(m) 1.50 5	r Depth m) .40 .40		

CC ROTARY LOG C4414.GPJ GINT STD AGS 3_1.GDT 23/2/15

oje	ct Nar	ne: Fiv	re Mile Lan	ie			I	Proj	ect No:	Co-ords:	E 308145 N 1	60006		ole Typ
~~~	tion:	Eiv	e Mile Lan		diff				C4414	00-0103.	E 500145 N 1	00000		S+RC
ua	uon.	FIV		ie, Car	um					Level:	65.40mAD			: 25.0
en	t:		le of Glam		Counc	il				Dates:	Start: 27/11/20 End: 01/12/20		Lo	gged I RS
)	Water Levels		un, Samples &		Core Run &	TCR SCR	In	stall		Description		Depth (m)	Level (mAD)	Legen
-	201010	No/Type	Depth (m)	Result	Sample	RQD	·D,		Very soft greyish brov CLAY with frequent ro medium limestone. (T	otlets. Gravel i		(0.20)	65.20	<u>1'</u> 7 ₁ 1' 7 <u>1</u> 1' 7 <u>1</u> 1
-		B ES	0.30						Soft orangish brown r CLAY with a low cobb subangular fine to co	le content. Gra	vel is angular to	(0.30)	03.20	
-		B C	0.50 0.50 - 1.50			71% 2% 0%			limestone. No Recovery.			0.50	64.90	-~~~.
-									Firm orangish brown 0.90-0.95m: Strong g	0 0	ey silty CLAY.	0.80	64.60	× ×
					- (-)				0.96-1.02m: Strong g 1.07-1.12m: Strong g	rey Limestone.				× - × × - × - ×
-									1.20-1.25m: Strong g 1.35-1.50m: Stiff.	rey Limestone.		(0.90)		
-		C CPT	1.50 - 2.50 1.50 - 1.61	C*208		100% 45% 10%						- 1.70	63.70	- × ×
		CS	1.70 - 1.78						Strong grey LIMESTC subhorizontal closely 1.85-2.15m: Locally w gravelly clay infill. Gra limestone. 1.90-1.96m: Subvertio	spaced undula /ith soft orangis ivel is subangu	ting rough. h brown slightly lar fine to medium	(0.68)	03.70	
-		с	2.50 - 3.50	C*333					2.15-2.26m: Subvertion stained discontinuity. 2.26-2.33m: Extremel calcareous mudstone Extremely weak to ve	cal undulating n y weak to very ry weak dark gr	ough orangish brown weak dark grey rey calcareous	/ 2.38 ┌ 2.46	63.02 62.94	
-		СРТ	2.50 - 2.65	0.333		98% 48% 15%			MUDSTONE. Discont closely to closely spa Weak orangish browr Discontinuities are su undulating rough.	ced undulating calcareous SI	rough. LTSTONE.	2.60	62.80	
					(-)				2.50-2.60m: Non inta Strong grey LIMESTC subhorizontal closely 2.74-2.87m: Subvertic stained discontinuity.	NE. Discontinu spaced undulat	ting rough.	3.07	62.33 62.18	
-		cs	3.35 - 3.50		-				2.87m: Very stiff friab 2.98-3.07m: Subvertion stained discontinuity.	cal undulating r	ough orangish brown		52.10	
-		C CPT CS	3.50 - 4.50 3.50 - 3.56 3.60 - 3.79	C*429		100% 70% 31%			Medium strong dark g Discontinuities are su spaced undulating rou 3.15m: Soft to firm da occasional fine grave Strong grey LIMESTO	bhorizontal ver ugh. rk grey calcare sized mudstor	y closely to closely ous clay with ne lithorelicts.	(0.70)		
_									subhorizontal very clo			3.92	61.48	

GP,									
C4414.G	Groundwater: Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)	Hole Progress: Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	
CC ROTARY LOG					27/11/2014 27/11/2014 28/11/2014	0.00 0.50 0.50	Nil Nil	Dry Dry	

			igations Lt		E⊦	10	LE	LOG		C	C	E	ehole N 8H106	5
			65 , Fax: 014 e Mile Lan		20 , Em	nail: ma		ound.co.uk ct No:					eet 2 of	
								C4414	Co-ords:	E 308145 N 16	69996	C	)S+ŔĊ	
Loca	tion:	FIV	e Mile Lan	e, Car	diff				Level:	65.40mAD			Scale : 25.00	)
Clier	nt:	Val	e of Glam	organ	Cound	cil			Dates:	Start: 27/11/20 End: 01/12/20		Lo	gged B RS	3y
(m)	Water		ın, Samples &		Core Run &	TCR SCR	Install		Description		Depth (m)	Level (mAD)	Legend	ı
Ξ.	a contraction of the second se	C C C C C C C C C C C C C C C C C C C	<ul> <li>4.50 - 6.00</li> <li>4.50 - 4.56</li> <li>5.16 - 5.34</li> <li>5.85 - 6.00</li> <li>6.00 - 7.50</li> <li>6.00 - 6.06</li> <li>6.23 - 6.32</li> <li>7.25 - 7.39</li> <li>7.50 - 9.00</li> </ul>	C*429 C*429		RQD 100% 62% 58% 100% 67% 33% 100% 67% 33% 28%		rough. 3.22-3.29m: Subvertic: stained discontinuity. 3.60-4.30m: Subvertic: stained discontinuity. 3.81m: Medium strong Strong grey LIMESTO subhorizontal very clos rough. (continued from 4.06-4.12m: Weak dar 4.30-4.36m: Firm think clay. 4.50-4.70m: Non intac 4.70-5.13m: Subvertic: stained discontinuity. 5.43m: Stiff thinly lamid 5.65-5.85m: Subvertic: stained discontinuity. 5.81-5.88m: Medium s mudstone. 5.85-6.00m: Subvertic: Weak dark grey calcar are subhorizontal very undulating and planar 6.20-6.23m: Soft dark Gravel is subangular fi 6.53-6.66m: Hard dark Strong grey LIMESTO subhorizontal closely s 6.87-6.90m: Extremely mudstone. 7.06-7.10m: Extremely biscontinuities are ext rough. 7.10-7.45m: Discontinu spaced. 7.14-7.24m: Subvertic: 7.58-7.50m: Very weal 7.55-7.58m: Subvertic: 7.58-7.70m: Limestone strong dark grey calcar 4.70-5.43m: Limestone Discontinuities are sub spaced diacontinuity. 7.84-7.97m: Very weal 7.52-7.58m: Subvertic: 8.58-7.58m: Subvertic: 7.58-7.70m: Limestone biscontinuity. 7.84-7.97m: Very weal 7.72-7.84m: 70° undul discontinuity. 8.18-8.24m: Stained o Medium strong dark grey Discontinuity. 8.18-8.24m: Strong gre 8.62-8.65m: Strong gre	I aminated dari al undulating ro based to a closely services sheet is grey calcared y laminated dari grey calcared y laminated dari t. al undulating ro al undulating ro trong dark grey al undulating ro trong dark grey al undulating ro trong dark grey al undulating ro trosely to close smooth. grey slightly gr ine mudstone. grey slightly gr ine mudstone. grey calcareoo NE. Discontinu, spaced undulating ro weak orangisl remely closely uities are very al undulating ro k dark grey cal al undulating ro borizontal clos dulating rough. ating rough ora k dark grey calcareous phorizontal very gh. ey limestone. ey limestone.	k grey calcareous bugh orangish brown areous mudstone. ities are spaced undulating the same space dundulating the space dundulating the space dundulating the same space dundulating the same space dundulating the same space dundulating the same space dundulating closely clay infill. us clay. ities are ing rough. space dundulating closely to closely bugh orangish brown careous mudstone. space dundulating closely to closely bugh orangish brown careous mudstone. bugh discontinuity. dided with medium te. itim strong. tely to medium angish brown stained careous mudstone. ating rough MUDSTONE. r closely to closely	<ul> <li>(III)</li> <li>(2.18)</li> <li>(2.18)</li> <li>(0.63)</li> <li>(0.63)</li> <li>(1.65)</li> <li>(1.65)</li></ul>	59.30 58.67 57.02 56.60		
SC ROTARY LOG C		(n	'Y	(111)	UDS	ະເນສແບΓ	· (111 <i>)</i>		(11)	(11) (	,			

CC C	Ground	Inves	tigations Lt	d								Во	rehole No.
RC	)T	٩R	Y BC	DR	Eŀ	lO	LE	LOG					BH106
			65 , Fax: 014		20 , Em	ail: ma							neet 3 of 3
Proje	ct Nar	ne: Fiv	e Mile Lan	е			Projec	ct No: <b>C4414</b>	Co-ords:	E 308145 N	16999		lole Type DS+RC
Locat	tion:	Fiv	e Mile Lan	e, Car	diff				Level:	65.40mAD			Scale 1 : 25.00
Clien	t:	Va	le of Glamo	organ	Counc	il			Dates:	Start: 27/11 End: 01/12		L	ogged By RS
(m)	Water Levels	Core Ro No/Type	un, Samples & Depth (m)		Core Run & Sample	TCR SCR RQD	Install		Description		Dep (m		
9 —		CS C	8.90 - 9.00 9.00 - 10.00	C*429		97%		8.68-8.80m: 2 no. subv discontinuities. Strong grey LIMESTOI	NE. Discontinui	ities are			9
- - - - - - -		CPT	9.00 - 9.07 9.22 - 9.37			49% 18%		subhorizontal closely s (continued from previou 8.80-9.00m: Medium s 9.00-9.20m: Weak dar Discontinuities are extr planar and undulating s 9.05-9.20m: Subvertica discontinuity. 9.22-9.37m: Subvertica discontinuity.	paced undulati <i>is sheet</i> ) trong. k grey calcarec remely closely f smooth. al-80° undulatir al closely space	ing rough. ous mudstone. to closely spaced ng smooth ed incipient	(1.20	)	
- - - - - - - -		СРТ	10.00 - 10.06	C*500				9.43-9.60m: Weak to n calcareous mudstone. yery closely to closely i 9.51-9.60m: Subvertica 9.60-9.69m: 2 no. subp rough discontinuities. 9.69-9.75m: Weak dar 9.75-9.95m: 3 no. suby discontinuities. 9.95-10.00m: Medium mudstone. Borehole completed at	Discontinuities spaced undulat al undulating ro barallel subvert k grey calcarec vertical-70° und strong dark gre	are subhorizonta ting rough. Jugh discontinuity ical-70° undulatin bus mudstone. Julating rough	10.0	00 55.40	
- - - - - - -													- 11 - - - - - -
- - 12 - - - -													- - 12 - - - - - -
- - - 13 — - - - - - -													- - - -13 - - - - - - - -
<b>Groun</b> Da	dwater: Ite		Depth Cas n)	ing Dept (m)	h De Obse	epth Aftervation	er i (m)	28/11/2014 01/12/2014	le Depth C (m) 9.00 9.00 10.00	asing Depth V (m) Nil Nil 1.50	Vater Dept (m) 1.20 5.10 2.20	1	. L

CC ROTARY LOG C4414.GPJ GINT STD AGS 3_1.GDT 23/2/15

			tigations Lt					_						ehole N	
<b>२</b> (	וו	٩R	A R(	JR	FF	1C	)L	F	LOG					3H107	
			65 , Fax: 014		20 , Em	nail: m								eet 1 of	
Proje	ct Nar	ne: Fiv	e Mile Lan	е			P	rojec	t No: <b>C4414</b>	Co-ords:	E 308240 N 16	69874		ole Typ CP+RC	
_oca	tion:	Fiv	e Mile Lan	e, Car	diff					Level:	57.33mAD			Scale : 25.00	)
Clien	t:	Va	le of Glam	organ	Cound	cil				<b>.</b>	Start: 19/11/20	14	Lo	gged E	δv
				. 0.						Dates:	End: 25/11/20			RS	,
(m)	Water	Core Ru	ın, Samples &	Testing	Core Run &	TCR SCR	Inst			Description		Depth	Level	Logond	
(m)	Levels	No/Type	Depth (m)	Result	Sample				<u> </u>	Description		(m)	(mAD)	Legend	
-							₩. ₩.	~^` ~ 	Soft greyish brown sli rootlets. (TOPSOIL)			(0.20)	57.13	$\begin{bmatrix} \frac{1}{2} & \frac{1}{2} & \frac{1}{2} & \frac{1}{2} \end{bmatrix}$	Į Į
-		В	0.30 - 0.60						Very soft to soft orang sandy slightly gravelly Gravel is subangular	silty CLAY wit		0.20	57.15		
-		D ES	0.50												*_ *_ *_
-		в	0.80 - 0.90						0.80-2.20m: Gravel is	angular to sub	angular fine to			× ×	*
_		D	0.80						coarse limestone. Hig limestone.					×°_×- ×°_×- ×_×-	
-		_					Ħ					(2.00)			
-		B CPT	1.20 - 1.70 1.20 - 1.65	C 34								(2.00)			
-															1
-															
-							E							×°_×-	7
- -															
-														×	7
-		B CPT	2.20 - 2.70 2.20 - 2.65	C 46					Firm orangish brown	and grey slightl ble content. Gr	y sandy gravelly avel is angular to	- 2.20	55.13		1
-							F		subangular fine to coalimestone.						+
-												(0.60)			
-															+
-								E	Dark grey LIMESTON and cobbles. Gravel i			2.80	54.53 54.43		t
3 —		C CPT	2.90 - 3.20 2.90	C*429		0% 0%		E)	coarse limestone. Co			2.50	54.45		_
-					¢	0%			No recovery.			(0.00)			F
-		С	3.20 - 3.50		, ¢	0% 0% 0%						(0.60)			F
-		с	3.50 - 4.00			100%			Medium strong dark g			3.50	53.83		
_		CS	3.65 - 3.75			20% 20%			Discontinuities are su undulating rough. 3.50-3.60m: Drilling d			(0.40)			
-					     				dark grey gravelly cla fine to coarse calcare	y. Gravel is ang ous mudstone.	gular to subangular	- 3.90	53.43	× *	
+ <u> </u>									3.65-3.75m: Subvertio	cal undulating r	ough discontinuity.			<u> </u>	Ł

#### **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.

19/11/14         0.60         19/11/2014         2.90         2.80         2.60           21/11/2014         2.90         Nil         2.60           21/11/2014         2.90         Nil         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	Groundwater: Date	Strike Depth (m)	Casing Depth (m)	Depth After Observation (m)	Hole Progress: Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
	19/11/14	0.60	Nil	0.60	21/11/2014	2.90	Nil	2.60

			tigations Lf		E⊦	łO	LE	LOG		C			ehole No. <b>3H107</b>
			65 , Fax: 014									She	eet 2 of 3
Proje	ect Nan	ne: Fiv	e Mile Lan	e			Proje	ect No: <b>C4414</b>	Co-ords:	E 308240 N 1	69874		ole Type CP+RC
Loca	tion:	Fiv	e Mile Lan	e, Car	diff				Level:	57.33mAD			Scale : 25.00
Client: Vale of Glamorgan Council									Dates:	Start: 19/11/2 End: 25/11/2		Lo	gged By RS
(m)	Water Levels	Core R No/Type	un, Samples & Depth (m)		Core Run & Sample	TCR SCR RQD	Install		Description		Depth (m)	Level (mAD)	Legend
- - - - - - 5 - - - - - - - - - - -		CPT CS CPT CS	4.00 - 4.30 4.17 - 4.25 4.80 - 6.10 4.80 - 4.97 5.17 - 5.33	C*273		20% 20% 94% 69% 45%		(continued from previo Hard indistinctly thinly CLAY.     Strong grey LIMESTC subhorizontal closely : Firm indistinctly thinly CLAY with occasional mudstone lithorelicts.     Extremely weak thinly Discontinuities are sul extremely closely spare Strong grey LIMESTC subhorizontal very clo rough.     5.17-5.33m: Subvertio 5.33-5.48m: 20°-subv undulating rough disc	Iaminated dark spaced undulati laminated dark subangular find laminated dark subangular find laminated dark bhorizontal and ced undulating in NE. Discontinu sely and closely cal undulating re ertical-subhoriz ontinuity, formir	ities are ing rough. grey calcareous e gravel sized grey MUDSTONE. randomly orientated rough. ities are y spaced undulating ough discontinuity. ontal curved g boundary with	$\begin{array}{c} 4.10 \\ 4.17 \\ 4.30 \\ \end{array}$ $(0.55) \\ -4.85 \\ (0.32) \\ -5.17 \\ (0.55) \\ \end{array}$	53.23 53.16 53.03 52.48 52.16	
- - - - - - - - - - - - - - -		CS CPT CS	6.03 - 6.10 6.10 - 7.10 6.10 - 6.21 6.84 - 6.95	C*600		100% 68% 19%		extremely weak orang 5.48-5.62m: Weak da 5.62-5.71m: Subvertic Extremely weak thinly MUDSTONE. Discont closely spaced undula Strong grey LIMESTO subhorizontal closely Extremely weak dark et Discontinuities are sui undulating rough. Strong grey LIMESTO subhorizontal very clo rough. 6.40-6.57m: Subvertic stained discontinuity. 6.64-6.69m: Medium s 6.75-7.04m: Weak da	rk grey calcared al undulating ro laminated dark inuities are sub iting rough. NE. Discontinu spaced undulat grey calcareous bhorizontal very NE. Discontinu sely to closely s cal undulating ro strong grey calc	bus mudstone. bugh discontinuity. grey calcareous horizontal extremely ities are ing rough. MUDSTONE. closely spaced ities are spaced undulating bugh orangish brown areous mudstone.	5.72 (0.31) 6.03 6.10 (0.25) 6.35 (1.15)	51.61 51.30 51.23 50.98	
7 — - - - - - - -		C CPT CS C	7.10 - 7.50 7.10 - 7.22 7.38 - 7.50 7.50 - 8.50	C*426		100% 63% 63% 86% 51% 10%		7.10-7.18m: Extremely mudstone. Discontinu extremely closely spar 7.18-7.26m: Subvertic 7.26-7.38m: Extremely mudstone. Discontinu closely to very closely Weak dark grey calca are subhorizontal extr undulating rough.	ities are randon ced undulating ro al undulating ro y weak dark gre ities are subhor spaced undula reous MUDSTC	nly orientated rough. Jugh discontinuity. Jy calcareous izontal extremely ting rough. DNE. Discontinuities	∫ 7.50 (0.45)	49.83	
8 — - - - - - - -		CS C CPT	8.41 - 8.50 8.50 - 8.90 8.50 - 8.61	C*600	- ()	83% 55% 0%		Strong grey LIMESTC subhorizontal very clo rough. 8.03-8.14m: Very wea Discontinuities are rar spaced undulating rou 8.14-8.22m: Subvertic stained discontinuity. Weak dark grey calca are subhorizontal very undulating rough. 8.41-8.50m: Strong gr	sely to closely s k dark grey cald domly orientate igh. al undulating ro reous MUDSTC v closely to close	spaced undulating careous mudstone. ed extremely closely ough orangish brown DNE. Discontinuities	- 7.95 (0.27) 8.22	49.38	
	idwater: ate		Depth Cas n)	ing Deptl (m)		epth Aft ervatior		Hole Progress: Date Ho	ole Depth C (m)	asing Depth Wat (m)	er Depth (m)		

			tigations Li		E۲	10	LE	LOG		C	C		ehole No. S <b>H107</b>
			65 , Fax: 014 re Mile Lar		220 , En	nail: ma		ound.co.uk					et 3 of 3 le Type
								C4414	Co-ords:	E 308240 N 16	69874		P+RC
Loca	ition:	Fiv	e Mile Lar	ie, Car	diff				Level:	57.33mAD			Scale : 25.00
Clier	nt:	Va	le of Glam	organ	Cound	cil			Dates:	Start: 19/11/20 End: 25/11/20		Lo	gged By RS
(m)	Water	Core R	u <b>n, Samples &amp;</b> Depth (m)		Core Run & Sample	TCR SCR RQD	Install		Description		Depth (m)	Level (mAD)	Legend
9		C CS CS CPT	9.92 - 10.00 9.92 - 9.39 9.92 - 10.00 10.00 - 10.18			91% 86% 51%		8.72-8.73m: Soft oran 8.80-8.90m: Medium s Weak dark grey calca are subhorizontal very undulating rough. <i>(cor</i> 8.90-9.07m: Non intac subangular fine to coa 9.23-9.25m: Soft oran 9.50-9.60m: Medium s 9.66-9.77m: Subvertic stained discontinuity. 9.80-9.90m: Subvertic stained discontinuity. 9.90-9.92m: Soft oran Borehole completed a	strong. reous MUDST v closely to clos <i>tifinued from pr</i> it, recovered a rrse gravel. gish brown cla strong. al undulating r gish brown cla	ONE. Discontinuities sely spaced evious sheet) s angular to y infill. ough orangish brown ough orangish brown	(1.78)	47.33	-9 -9 -9 -1(
12 -													- - - - - - - - - - - - - - - - - - -
Grour	ate	Strike (r	Depth Cas n)	sing Dept (m)	h D Obs	epth Aft	ier n (m)	24/11/2014 25/11/2014	ole Depth ( (m) 8.90 8.90 10.00	(m) ( 4.50 7 4.50 7	r Depth m) .00 .90 .10		

RC		٩R	tigations Lt YBC 65 , Fax: 014	DR						C	C	E	ehole N <b>3H108</b> eet 1 of	
			e Mile Lan		20 , LII			ct No: C4414	Co-ords:	E 308330 N 16	9776		ole Type CP+RC	
Locat	ion:	Fiv	e Mile Lan	e, Car	diff		I		Level:	44.21mAD			Scale : 25.00	)
Clien	t:	Va	le of Glam	organ (	Cound	cil			Dates:	Start: 18/11/20 End: 26/11/20		Lo	gged B RS	y
(m)	Water Levels	Core Ru No/Type	un, Samples & Depth (m)	Testing Result	Core Run & Sample	TCR SCR RQD	Install		Description		Depth (m)	Level (mAD)	Legend	
-		B D ES	0.30 - 0.70 0.40 0.50		oumpic			Soft greyish brown sli rootlets. (TOPSOIL) Soft orangish brown n occasional rootlets.			(0.20) 0.20 (0.40)	44.01		
- - 1		B D	0.80 - 1.20 0.80					Firm orangish brown a gravelly CLAY with a angular to subangular are limestone.	low cobble con	tent. Gravel is	- 0.60	43.61		; - - - - - - - - - - - - - - - - - - -
- - - - - - -		B SPT	1.20 - 1.70 1.20 - 1.65	S 18							(2.20)			
-	1 Ž	B SPT	2.20 - 2.70 2.20 - 2.65	C 30				2.20-2.80m: High cob	ble content. Co	obbles are limestone.				
	<b>1</b> <u>−</u>	B SPT	2.80 - 3.20 2.80 - 3.25	S*53				Extremely weak to ver MUDSTONE, recover to subangular fine to o	éd as slightly s		- 2.80	41.41		3
-		В	3.20 - 3.70								(0.90)			
-		SPT C	3.70 3.80 - 5.00	S*273		100% 32% 0%		Strong grey LIMESTC subhorizontal closely (continued on next sh	spaced undula		- 3.70	40.51 40.33		

### 23/2/15 **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)	Hole Progress: Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	
18/11/14	3.00	2.80	2.45	18/11/2014 19/11/2014	3.20 3.20	3.00 3.00	2.60 2.40	
				19/11/2014 25/11/2014	3.70 3.80	3.00 Nil	2.40 0.70	
				25/11/2014	3.00	INII	0.70	

CC ROTARY LOG C4414.GPJ GINT STD AGS 3_1.GDT

			<b>Y B</b> (								E	ehole No <b>3H108</b> eet 2 of 3
rojec	ct Nan	ne: Fiv	e Mile Lan	е				ct No: <b>C4414</b>	Co-ords: E 308330	N 169776	C	ole Type CP+RC
ocati			e Mile Lan						Level: 44.21mAI	)	1	Scale : 25.00
lient	:	Val	le of Glam	organ (	Cound	cil			Dates: Start: 18/ End: 26/		Lo	gged By RS
m \	Water Levels	Core Ru No/Type	un, Samples & Depth (m)	Testing Result	Core Run & Sample	TCR SCR RQD	Install		Description	Depth (m)	Level (mAD)	Legend
		CS CPT CS CPT CS	4.66 - 4.75 5.00 - 6.20 5.00 - 5.14 5.44 - 5.49 6.20 - 7.50 6.20 - 6.41	C*273		92% 22% 0% 77% 32% 18%		SILTSTONE. Discon randomly orientated rough with a little cla (continued from previ 4.08-4.66m: Grey. 4.38-4.52m: Subvert 4.44-4.49m: Strong g Strong grey LIMEST subhorizontal extrem smooth. 4.66-4.88m: Subvert 4.76-4.79m: Disconti Gravel is subangular Extremely weak grey Discontinuities are ra spaced undulating rc 5.00-5.25m: Drilling of gravelly clay. Gravel medium mudstone. Very weak to weak d Discontinuities are si closely spaced undu With orangish brown 5.32-5.38m: Strong of 5.60-5.68m: 30° und 5.80-5.88m: Extreme gravel.	ical undulating smooth disconting grey limestone.	es. (0.78) huity. 4.66 (0.22) 4.88 (0.37) osely 5.25 (0.95) es. (0.95) ey 6.20	39.55 39.33 38.96 38.01	
	hystor	CS CPT CS CPT CS	7.39 - 7.50 7.50 - 8.50 7.50 - 7.70 8.35 - 8.50 8.50 - 9.40 8.50 - 8.65 8.69 - 8.77	C*158 C*300		100% 42% 15% 83% 37% 11%		6.11-6.20m: Extreme gravel. Very weak to weak d Discontinuities are si spaced undulating ro 6.20-6.65m: Drilling of medium to coarse gravel 6.83-7.10m: Disconti to very closely space 6.95-7.05m: Soft gra fine mudstone. 7.02-7.09m: 2 no. int rough discontinuities 7.13-7.30m: Subvert discontinuity. 7.25-7.50m: Medium 7.38-7.39m: Disconti Gravel is subangular 7.50-7.56m: Strong. 7.77-7.99m: Non inta fine to coarse gravel 8.06-8.13m: 2 no. pa undulating smooth d 8.13-8.23m: Non inta fine to coarse gravel 8.30-8.38m: Non inta fine to coarse gravel 8.38-8.50m: Medium 8.50-8.60m: Drilling of medium to coarse gravel	disturbed, recovered as subang avel. grey limestone. nuities are subhorizontal extrer ed undulating rough. velly clay infill. Gravel is subang ersecting 45° and 55° undulatir ical-80° undulating rough strong. nuity infilled with soft gravelly c fine mudstone. act, recovered as clayey subang iscontinuities. act, recovered as clayey subang isc, recovered as clayey subang act, recovered as clayey subang ist, recovered as clayey subang strong.	JE. JE. Jely ular nely gular lay. gular (3.80) gular gular		
Date	lwater: e	Strike (n		ing Deptł (m)		epth Aft ervation		Hole Progress: Date + 25/11/2014 26/11/2014	lole Depth (m)         Casing Depth (m)           7.50         3.80           7.50         3.80	Water Depth (m) 2.40 2.60		

CC ROTARY LOG C4414.GPJ GINT STD AGS 3_1.GDT 23/2/15

			tigations Lt		F۲	ЧО		LOG					ehole No <b>H108</b>	).
			65 , Fax: 014									She	et 3 of 3	3
			e Mile Lan		20 , LII			C4414	Co-ords:	E 308330 N 16	69776	Ho	le Type P+RC	_
Loca	ition:	Fiv	e Mile Lan	e, Car	diff				Level:	44.21mAD			Scale : 25.00	
Clier	nt:	Va	le of Glamo	organ	Cound	cil			Dates:	Start: 18/11/20 End: 26/11/20		Lo	gged By RS	_
(m)	Water Levels	Core Ru No/Type	un, Samples & Depth (m)		Core Run & Sample	TCR SCR ROD	Install		Description		Depth (m)	Level (mAD)	Legend	
9		C CS CPT	9.40 - 10.00 9.88 - 9.97 10.00 - 10.13			100% 50% 0%		8.83-8.87m: Strong gre Very weak to weak dar Discontinuities are sub spaced undulating rou <i>sheet</i> ) 8.98-9.02m: Discontini Gravel is subangular fi 9.70-9.73m: Discontini Gravel is subangular fi 9.78-9.88m: Subvertica Borehole completed at	rk grey calcare shorizontal ver gh. <i>(continued</i> uity infilled with ine mudstone. uity infilled with ine mudstone. al undulating r	y closely to closely from previous n soft gravelly clay. n soft gravelly clay.	- 10.00	34.21		-9 -9 -1 -1 -1
	ndwater: ate	Strike (n	Depth Cas n)	ing Dept (m)	h Do Obs	epth Aft ervatior	er ı (m)	Date	le Depth ( (m) 10.00	(m) (	r Depth m) .60			

			igations Lf		E۲	ΗC	) F	LOG	C		Borehole No. BH109
			65 , Fax: 014								Sheet 1 of 2
			e Mile Lan					ect No: <b>C4414</b>	Co-ords: E N		Hole Type DS+RC
Loca	ition:	Fiv	e Mile Lan	e, Car	diff		1		Level: mAD		Scale 1 : 25.00
Clier	nt:	Val	e of Glam	organ	Cound	cil			Dates: Start: 03/12/2 End: 03/12/2		Logged By RS
(m)	Water Levels	Core Ru No/Type	In, Samples &		Core Run &	TCR SCR	Install		Description	Depth (m)	Level (mAD)
1	ARKS: PMENT: HOD: Har NG: 1400 UNDWAT	Hand digg nd dug ins nm diame ER: Grou	ging tools. Co pection pit 0.0 ter to 2.00m. indwater not e	macchio 00-0.70m	. Dynam red prior	100% 0% 0% 100% 29% 9% 84% 31% 15%	of waterfl	CLÁY with frequent ro medium limestone. (T Soft orangish brown m gravelly silty CLAY. Gr limestone. High cobble of limestone. Low cobble Stiff orangish brown m gravelly silty CLAY. Gr limestone. Low cobble Stiff orangish brown m gravelly silty CLAY. Gr limestone. 1.80-2.10m: Very stiff Strong grey LIMESTO subhorizontal closely s Very stiff to hard dark Extremely weak dark of Discontinuities are sut extremely closely space 2.66-2.69m: Hard dark 3.20-3.35m: Very stiff Strong grey LIMESTO subhorizontal very closely subhorizontal very closely space 2.66-2.69m: Hard dark	ottled grey slightly sandy slightly ravel is subangular fine to medium e content and low boulder content nottled grey slightly sandy slightly ravel is subangular fine to medium e content of limestone. nottled grey slightly sandy slightly ravel is subangular fine to medium to hard. NE. Discontinuities are spaced undulating rough. grey calcareous CLAY. grey calcareous MUDSTONE. ohorizontal and randomly orientated ced undulating rough. < grey calcareous clay. NE. Discontinuities are spaced undulating rough. < grey calcareous clay.	(0.20) (0.20) (0.50) (0.50) (0.30) 1.00 (1.10) 2.10 (1.10) 2.10 (0.24) 2.43 (0.92) 3.35 (0.66) drilled (1160)	mm) 1.10-5.00m.
seal:	0.20-2.50	)m. Concr	ete and raised						0-3.00m Washed gravel response z		
Ξ.	ndwater: ate	Strike I (m	Depth Cas ı)	ing Depti (m)	h De Obse	epth Af ervatio	fter n (m)	Hole Progress: Date Ho 03/12/2014	ole Depth Casing Depth Wat (m) (m) 0.00	er Depth (m)	

CC Ground Investigations Ltd		Borehole No.
ROTARY BOREHOL	.E LOG	BH109
Telephone: 01452 739165 , Fax: 01452 739220 , Email: mark@		Sheet 2 of 2
Project Name: Five Mile Lane	Project No: C4414 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 No/Type Depth (m) Result Sample RQD		Level mAD) Legend
Correction       No/Type       Depth (m)       Result       Sample       RdD         -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -	Hard thinly laminated dark grey calcareous CLAY.       4.01         4.01       4.01         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 fundiatione. Discontinuities are subhorizontal closely spaced undulating rough and smooth.       4.84         4.54-4.83m: Limestone.       4.83         4rk grey calcareous mudstone.       5.00         Discontinuities are extremely to very closely spaced subhorizontal planar rough.       5.00         Borehole completed at 5.00m       5.00	
Groundwater: Date Strike Depth Casing Depth Depth After (m) (m) Observation (m	n) Hole Progress: Date Hole Depth Casing Depth Water Depth (m) (m) (m) 03/12/2014 5.00 2.00 1.70	1 1

CC (	Ground	Invest	igations Lt	d									
			۹ IT L		3								^p it No <b>P201</b>
Telepho	one: 014	52 7391	65 . Fax: 014	52 73922	20 , Email: mark	@ccarou	nd.co.uk					She	et 1 of 1
			e Mile Lan			Project			Co-ords: E 3 Level: 91.	807778 N 17 43mAD	2139		Date 11/2014
Loca	tion:	Fiv	e Mile Lan	e, Caro	liff		04414		Dimensions:				Scale
Clier	4.		a of Clam						Depth E 1.30m G				1 : 25
Clien	l.	va	e of Glamo	organ c	Jouncii							LO	gged By PF
(m)	Water Levels	Samp No/Type	Depth (m)	esting Result			D	escription			Depth (m)	Level (mAD)	Legend
		по/Туре	Deptn (m)	Result	frequent rootle	ts <2mm.	Cobbles are	sub-angula			- 0.15	91.28	<u>A</u> I _X <u>A</u> I _X
-					content and fre limestone. Col	equent roo	tlets <2mm.	Gravel is s	ravelly CLAY with I ub-angular fine to c	oarse			
-		в	0.50								(0.45)		
-		ES		-	Orangish brow BOULDERS. ( boulders are s	Gravel is si	ub-angular fi	ine to coars	gravelly COBBLES e limestone. Cobbl	and es and	- 0.60	90.83	
-						-					(0.70)		
-													
-				-	Trial pit compl	eted at 1.3	0m				- 1.30	90.13	
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3 —													- —3
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-													-
-													
4	ARKS:	1		ı							1		' └─4
EQUIP	MENT: J		Mechanical Ex		e backactor buck	et							
GROU	NDWAT	ER: Wate	r seepage at 1	.30m.									
		-	s remained sta filled with arisi		vertical throughou	ut.							
			ed on hard stra	-	estone.								

0.00	Ground	Invest	tigations Li	td										
					•								Pit No	
	KIA	Lŀ	ידר L	O(	, ,							Т	P202	
Telepho	one: 014	52 7391	65 , Fax: 014	152 73922	20 , Email: marł	@ccground.co	uk					She	eet 1 of	1
Proje	ct Nar	ne: Fiv	e Mile Lar	ne		Project No:		Co-ords:	E 30	)7796 N 1	72066		Date	
-						C44	14	Level:		4mAD			11/201	4
Loca	tion:	Fiv	e Mile Lar	ne, Caro	diff			Dimensio	ons:	2.45	n		Scale 1 : 25	
Clien	+-	\/a	le of Glam	organ (	Council			Depth 1.30m	0.65m				gged B	V
Cilei	ι.	va	le of Glam	organit	Jourien				0.0				PF	у
(m)	Water Levels		les & In Situ T				Description				Depth (m)	Level (mAD)	Legend	
	Leveis	No/Type	Depth (m)	Result			tly sandy CLAY v		conte	nt and	(11)	(IIIAD)	<u>, 17</u> . <u>, 17</u>	-
		_	0.00		frequent rootle	ets <2mm. Cobble	es are sub-angula	ar limestone.			(0.30)		<u>1</u> 711 7	
-		В	0.20		Soft orangish	brown locally gre	yish brown slightl	v sandv slightl	v arav	ellv CLAY	0.30	89.74		$\vdash$
-					with frequent r	ootlets <2mm. G	ravel is sub-angu	lar fine limesto	one.	- <b>,</b> -	(0.35)			F
-		B ES	0.50										<u> </u>	Ļ
-					Orangish brow BOULDERS.	n and grey slight Gravel is sub-and	ly clayey slightly Jular fine to coars	gravelly COBE se limestone. C	BLES a	ind s and	0.65	89.39	10 F	-
-					boulders are s	ub-angular tabul	ar limestone.							Ē
1 —											(0.65)		¥ O	-1
-													S)	
-					Trial pit compl	eted at 1 30m					1.30	88.74	300	F
-														╞
-														Ē
-														F
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RFM/	ARKS:													4
EQUIP	MENT: J		Mechanical E											
			vated using 0 r seepage at ⁻		e backactor buck	et.								

STABILITY: Trial pit sides remained stable and vertical throughout.

BACKFILL: Trial pit backfilled with arisings

CC (	Ground	Inves	tigations Lt	d								Pit No	
TR	2IA	IF	אר L	$\cap$	ì							P203	
						k@ccground.co.uk						et 1 of	
			e Mile Lan		o, Email. mai	Project No: C441		Co-ords: E 3 Level: 87.2	07811 N 17 27mAD	71964		Date 11/201	
Loca	tion:	Fiv	e Mile Lan	e, Carc	liff	6441	4	Dimensions:	27111AD 2.40m			Scale	•
								Depth E				1:25	
Clien	t:	Va	le of Glamo	organ C	Council			Depth E 1.20m G			Lo	gged B PF	у
(m)	Water Levels	<b>Samp</b> No/Type	les & In Situ Te Depth (m)	esting Result			Description			Depth (m)	Level (mAD)	Legend	
		по/туре		Result	Topsoil of sof	t dark brown slightly ets <2mm. Cobbles a	sandy CLAY	with low cobble contain ar limestone.	ent and	(0.20)		<u>XIIZ</u> <u>XIZ</u>	_
-				_	Grey and ora	ngish brown slightly o bulders. Gravel is sub sub-angular limestor	clayey slightly clayey slightly	gravelly COBBLES	with , cobbles and	- 0.20	87.07		- - - - -
- - - - 1		B ES	0.50							(1.00)			- - - - - -
-				-	Trial pit comp	leted at 1.20m				- 1.20	86.07		-
-													-
2													- 2
-													-
- - 3 —													- - 3
													-
-													-
METHO GROUI STABIL BACKF	MENT: J DD: Trial NDWATE LITY: Tria	pits exca ER: Wate al pit side I pit back	er seepage at 1	60m wide .20m. Ible and v ngs	backactor buck ertical throughc estone.						·		-4

CC TP LOG C4414.GPJ GINT STD AGS 3_1.GDT 23/2/15

RIA	LF	NT L	.00	6							P204
				20 , Email: marł	@ccground.co.uk					She	eet 1 o
ject Na	me: Fiv	e Mile Lan	ie		Project No: <b>C4414</b>	Co-ord: Level:		7823 N ⁻ 6mAD	171866	18/	Date /11/20
ation:	Fiv	e Mile Lan	ie, Carc	diff		Dimens Depth	Г	2.40	m		Scale 1 : 25
ent:	Val	e of Glam	organ (	Council		2.10m	0.60m			Lo	gged E PF
Water	Samp	les & In Situ T	esting		Descri	ntion			Depth	Level	Legend
Levels	No/Type	Depth (m)	Result	Topsoil of soft	dark brown slightly sandy C		ole conter	t and	(m)	(mAD)	
-	В	0.20			ets <2mm. Cobbles are sub-			it and	(0.30)		$\begin{bmatrix} \frac{1}{1} & \frac{1}{1} & \frac{1}{1} \\ \frac{1}{1} & \frac{1}{1} & \frac{1}{1} \end{bmatrix}$
-				Soft orangish with frequent r	brown locally greyish brown ootlets <2mm. Gravel is sub	slightly sandy slig angular fine lime	htly grave stone.	IIy CLAY	0.30	85.06	
-	B ES	0.50									
									(1.00)		
-	В	1.00									
-			-	BOULDERS. (	n and grey slightly clayey sl Gravel is sub-angular fine to	coarse limestone	BBLES ar . Cobbles	nd and	- 1.30	84.06	
-				boulders are s	ub-angular tabular limeston	е.			(0.80)		
-											K B d
			-	Trial pit compl	eted at 2.10m				2.10	83.26	200
-											
-											
-											
-											
-											
-											
-											
]											
ARKS:											

STABILITY: Trial pit sides remained stable and vertical throughout.

BACKFILL: Trial pit backfilled with arisings

CC (	Ground	Invest	igations L	td								Pit No
TF	<b>XIA</b>	IF	NT L	$\mathbf{O}$	-							P205
						k@aagraund.aa.ul	,				She	eet 1 of 1
			e Mile Lar		20 , Email. mai	k@ccground.co.ul Project No:		Co-ords: E 30	07896 N 1	71792		Date
-,-						C441	4		)3mAD			11/2014
Loca	tion:	Fiv	e Mile Lar	ne, Caro	diff	1		Dimensions:	2.45r	n		Scale
								Depth E 1.60m 22.00				1:25
Clien	it:	vai	e of Glam	organ (	Jouncil			0			LO	gged By PF
()	Water	Sampl	les & In Situ T	esting			Description			Depth	Level	
(m)	Levels	No/Type	Depth (m)	Result	Topooil of cof	dark brown alightly	Description	with low cobble conte	ant and	(m)	(mAD)	
-						ets <2mm. Cobbles			and and	(0.30)		$\frac{1}{1} \frac{1}{1} \frac{1}$
-		B ES	0.20		O ofference sink		I. I			0.30	83.73	$\underbrace{\underbrace{v}}_{ij} \underbrace{v}_{ij} \underbrace{v}_{ij}$
-					rootlets <2mm	n. Gravel is sub-ang	ular fine limes	ly sandy CLAY with f tone.	requent			
-		В	0.50							(0.50)		
-												
-					Grey and orar	ngish brown slightly	clayey slightly	gravelly COBBLES v to coarse limestone,	with	0.80	83.23	
1 —		В	1.00			sub-angular limesto		to coarse infestorie,	copples and			
-		D	1.00									
-										(0.80)		
-												
-										1.60	82.43	
-					I rial pit comp	leted at 1.60m						-
-												
2 —												-2
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-												-
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-												
3 —												
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-												-
-												-
-												
-												-
-												
4 —												
	ARKS:	00.000										
			Mechanical E		e backactor buck	et.						

GROUNDWATER: Water seepage at 1.60m.

STABILITY: Trial pit sides remained stable and vertical throughout.

BACKFILL: Trial pit backfilled with arisings

CC (	Ground	Invest	igations Lt	d							Pit No	
TF	<b>XIA</b>	LF	יד L	$\mathbf{O}(\mathbf{r})$							P206	
						@ccground.co.uk				She	eet 1 of	1
			e Mile Lan		lo , Email: mari	Project No:	Co-ords: E 3	307934 N 1	71698		Date	
			·			C4414		.25mAD			/11/201	4
Loca	tion:	Fiv	e Mile Lan	e, Caro	111		Dimensions:		n		Scale 1 : 25	
Clien	t:	Val	e of Glam	organ (	Council		Depth و 1.10m لؤ ح			Lo	gged By PF	y
(m)	Water	Samp	les & In Situ T	esting		Descript			Depth	Level		_
(m)	Levels	No/Type	Depth (m)	Result	Topsoil of soft	Descript dark brown slightly sandy CL		ts <2mm	(m)	(mAD)		
-					100301101301	dank blown siightly sandy OL	AT with requent roote	.5 ~211111.	(0.30)		$\frac{1}{1} \cdot \frac{\sqrt{1}}{\sqrt{1}} \cdot \frac{\sqrt{1}}{\sqrt{1}}$	-
-		В	0.20	-	Soft orangish	brown and brown slightly sand	dy slightly gravelly CLA	Y. Gravel is	0.30	80.95		-
-					sub-angular fir	ne to coarse limestone.	,					-
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$												-
												-
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.												-
boulders are sub-angular limestone.												-1 -
1 — boulders are sub-angular innestone.												
-												-
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2 —												- 2
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4	RKS			. 1								4
EQUIP	MENT: J		Mechanical Ex									
METH	DD: Trial	pits exca	vated using 0.	.60m wide	backactor buck	et.						

GROUNDWATER: Water seepage at 1.10m.

STABILITY: Trial pit sides remained stable and vertical throughout.

BACKFILL: Trial pit backfilled with arisings

			tigations Lt		_								Pit No	
ΤF	RIA	LF	ידר L	00	5							Т	P207	
Teleph	one: 014	52 7391	65 , Fax: 014	52 73922	0, Email: marl	k@ccground.c	o.uk					She	eet 1 of	[:] 1
			e Mile Lan			Project No:				8011 N 1 1mAD	71624		Date 11/201	4
Loca	tion:	Fiv	e Mile Lan	e, Carc	liff			Dimensio		2.45n	۱		Scale	
Clien	. <del>t</del> .	Val	le of Glam	organ (	Council			Depth 1.40m	0.60m				1 : 25 gged B	
Olici		va		organic					ö				PF	y
(m)	Water Levels		les & In Situ T				Description				Depth (m)	Level (mAD)	Legend	
	201010	No/Type	Depth (m)	Result	Topsoil of soft	dark brown slig	ghtly sandy CLAY	with frequent ro	otlets <	<2mm.		(112.02)	<u>XII</u> <u>XII</u>	
-		B ES	0.10	-	Soft orangish with frequent	brown locally gr ootlets <2mm.	reyish brown slight Gravel is sub-angu	ly sandy slightly lar fine limesto	y grave ne.	elly CLAY	0.15	83.46		- - -
-		В	0.40								(0.75)			
-	B 0.80 Grey and orangish brown slightly clayey slightly gravelly COBBLES with occasional boulders. Gravel is sub-angular fine to coarse limestone, cobbles													
1 —				-	occasional bo	ngish brown slig ulders. Gravel is sub-angular lime	s sub-angular fine	gravelly COBB to coarse limes	LES w stone, c	ith cobbles and	- 0.90	82.71	$r^{\circ}$	-1
-		В	1.20			J. J					(0.50)			
-				-	Trial pit compl	eted at 1.40m					- 1.40	82.21		-
-														_
2 —														- 2
-														_
-														_
-														-
3 —														- 3
-														_
-														-
-														-
4 —														4
REM/	ARKS:													-
			Mechanical Ex wated using 0		backactor buck	et.								

GROUNDWATER: Water seepage at 1.40m.

STABILITY: Trial pit sides remained stable and vertical throughout.

BACKFILL: Trial pit backfilled with arisings

CC (	Ground	Inves	tigations Lt	d								Pit No	
TF	RIA	LF	ידר L	00	5							P208	
						<@ccground.co.uk					She	eet 1 o	f 1
			e Mile Lan			Project No:		Co-ords: E 30	8054 N ⁻	171501		Date	
						C4414			3mAD			/11/201	14
Loca	tion:	Fiv	e Mile Lan	ie, Caro	diff			Dimensions:	2.45	m		Scale 1 : 25	
Clier	it:	Va	le of Glam	organ (	Council			Depth E 1.20m 8				gged E	3y
	Water	Samp	les & In Situ T	estina						Depth	Level	PF	
(m)		No/Type		Result		Descr	•			(m)	(mAD)	Legend	
-		_			Topsoil of soft	dark brown slightly sandy o	CLAY v	vith frequent rootlets	<2mm.	(0.30)		$\frac{1}{1} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2}$	·
-	-	B ES	0.20		Soft orangish	brown and greyish brown s	liahtlv c	aravelly CLAY with or	casional	0.30	86.83		
-					rootlets <1mm	. Gravel is sub angular fine	to me	dium 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.													
BOULDERS. Gravel is sub-angular fine to coarse limestone. Cobbles and boulders are sub-angular tabular limestone.													
												20	- - 1
-					Trial pit compl	eted at 1.20m				1.20	85.93		-
-	]												_
-													-
-													-
-													-
-													-
2 —													2
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-	-												_
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-													-
_													
-													-
-													-
-													
-	-												-
-	-												-
4 -		1		1 I						1	1	1	-4
	ARKS: MENT: J	СВ ЗСХ	Mechanical Ex	cavator									
					e backactor buck	et.							
GROU	NDWAT	ER: Wate	er seepage at 1	1.20m.									

STABILITY: Trial pit sides remained stable and vertical throughout.

BACKFILL: Trial pit backfilled with arisings

CC (	Ground	Inves	tigations Lt	td								Pit No
ТС	ΝΙΛ		PIT L	$\cap$	2							'P209
												eet 1 of 1
			65 , Fax: 014 e Mile Lan		20 , Email: mark	@ccground.co.uk Project No:		Co-ords: E 30	18006 N 1	71270		Date
FIUJE	CLINA	ne. riv		le		C4414			36mAD	11370	19/	/11/2014
Loca	tion:	Fiv	e Mile Lan	ie, Carc	diff			Dimensions:	2.50n	n		Scale
								Depth E				1 : 25
Clien	t:	Va	le of Glam	organ (	Council			Depth E 1.90m 资			Lo	gged By PF
(m)	Water	Samp	les & In Situ T			Desc	ription			Depth	Level	Legend
	Levels	No/Type	Depth (m)	Result	Topsoil of soft	dark brown slightly sandy	•	with frequent rootlets	<2mm.	(m)	(mAD)	. <u>11.</u> . <u>11.</u>
		В	0.20							(0.35)		<u>1/ 1/ 1/</u>
-		Б	0.20	-	O off a new winds I					- 0.35	87.51	
-		В	0.50		with frequent r	brown locally greyish brown ootlets <2mm and occasio n. Gravel is sub-angular fin	nal par	tially decomposed or	elly CLAY ganic	(0.35)		
-		ES	0.50					sione.				
-					Orangish brow occasional lan	n and grey slightly gravely	y COBE	BLES and BOULDER	S with ne to coarse	0.70	87.16	STA .
-	image: state of the state o											
-												S-
-										(1.20)		<u>k</u> oj
-												30-
-												
-												
2 —					Trial pit comple	eted at 1.90m				- 1.90	85.96	
2 -												- 2
-												-
-												
-												-
-												
-												-
3 —												-3
-												-
-												
-												-
-												-
-												
-												-
4 —												
REM/	RKS:											
			Mechanical Ex		e backactor buck	ot						
			er seepage at 1		Jackaciol Duck	<i>с</i> .						

GROUNDWATER: Water seepage at 1.90m. STABILITY: Trial pit sides remained stable and vertical throughout.

BACKFILL: Trial pit backfilled with arisings

CC (	Ground	Inves	tigations Lt	d							Pit No	
TF	RIA	LF	ידר L	00	5					Т	P211	
						@ccground.co.uk				She	eet 1 of	1
			e Mile Lan		,	Project No:		Co-ords: E 308106 N	171086		Date	
						C4414		Level: 86.12mAD		_	11/201	4
Loca	tion:	Fiv	e Mile Lan	e, Caro	diff			Dimensions: 2.4	Dm		Scale 1 : 25	
Clier	it:	Va	le of Glamo	organ (	Council			Depth E 0.90m & O			gged B	у
	Water	Samp	les & In Situ Te	esting					Depth	Level		
(m)				Result			•		(m)	(mAD)	Legend	
Image: Water Levels       Samples & In Situ Testing No/Type       Depth (m)       Result       Description       Depth (m)       Levels         0       No/Type       Depth (m)       Result       Topsoil of soft dark brown slightly sandy CLAY with frequent rootlets <2mm.										85.92 85.52 85.22		
EQUIP			Mechanical Ex avated using 0.		e backactor buck	et.						-4
GROU	NDWAT	ER: Wate	er seepage at 0	.90m.								

STABILITY: Trial pit sides remained stable and vertical throughout.

BACKFILL: Trial pit backfilled with arisings

0.00	Fround	Inves	tigations Lt	td									_
												Pit No <b>P212</b>	
						k@ccground.co					She	eet 1 of	1
			e Mile Lan		20 , Elliali. mair	Project No:	.uk	Co-ords: E 30	)8101 N 17	70940		Date	-
••••			•	C		C44	414		26mAD			11/2014	1
Locat	tion:	Fiv	ve Mile Lan	ie, Carc	liff			Dimensions:	2.40m			Scale 1 : 25	
Clien	t:	Val	le of Glam	organ (	Council			0.90m R O			Lo	gged By PF	/
(m)	Water		oles & In Situ Te	esting			Description	-		Depth	Level	Legend	$\dashv$
(11)	Levels	No/Type	Depth (m)	Result	Topsoil of sof	t dark brown sligt		with frequent rootlets	~?mm	(m)	(mAD)		
4	ł				Topson or som	. Gark brown siign	Illy salluy OLAT	With frequent rooners	<2mm.	(0.25)			
-		B ES	0.20		with high cobb	ole content, occas	sional boulders a	tly sandy slightly grave and frequent rootlets <	2mm. Gravel	0.25	84.01		
		В	0.60		is sub-angular	fine limestone.	Cobbles and bou	ılders are sub angular	limestone.	(0.65)			
-			0.00										
1 —					Trial pit compl	eted at 0.90m				- 0.90	83.36	<u> </u>	-1
_													
2 —													-2
-													
- 3													-3
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-												-	
-													
	ł				l								
4	1				ł								
		· · · · ·								I			-4
EQUIP METHO GROUI STABIL	MENT: J OD: Trial NDWATE LITY: Tria	l pits exca ER: Wate al pit side	er seepage at 0 es remained sta	).60m wide 0.90m. able and v	e backactor buck								
			<filled arisi<br="" with="">ed on hard stra</filled>		iestone.								

CC (	Ground	l Invest	tigations L	td									Pit No
TE	210		NT L	$\cap C$	2								'P213
													et 1 of 1
			e Mile Lar		20 , Email: marl	k@ccground.co.uk Project No:		Co-ords	: F 30	8091 N	170735		Date
i i oje		110.111				C4414		Level:		4mAD	110100		11/2014
Loca	tion:	Fiv	e Mile Lar	ne, Caro	liff	1		Dimens	ions:	2.45	m		Scale
								Depth	ш				1 : 25
Clien	it:	Val	e of Glam	organ (	Council			1.40m	0.65m			Lo	gged By PF
(m)	Water	Samp	les & In Situ T	esting		Des	scription				Depth	Level	Legend
(11)	Levels	No/Type	Depth (m)	Result	Topsoil of soft	dark brown slightly sand	•	with frequent	rootlets	<2mm	(m)	(mAD)	XXXX
-		B ES	0.10			aun brown olignay bana	.,	inter in oquorit	10011010		(0.20)	02.04	
-		ES			BOULDERS.	vn and grey slightly clayey Gravel is sub-angular fine sub-angular tabular limest	e to coars	gravelly COB e limestone.	BLES a Cobbles	nd s and	0.20	82.04	
B 0.50 B 0.50 Cobble content. Gravel is sub-angular fine to coarse limestone. Cobbles are (0.25) Sub-angular limestone. Cobbles and Corangish brown and grey slightly clayey slightly gravelly COBBLES and 0.70											81.79		
BOULDERS. Gravel is sub-angular fine to coarse limestone. Cobbles and boulders are sub-angular tabular limestone.												81.54	
-				-	Trial pit compl	eted at 1.40m					1.40	80.84	
-													-
- 2													2
-													-
-													-
-													_
-													-
3 —													-3
-													-
-													-
-													-
- 4													
REM/	ARKS:												
EQUIP	MENT:		Mechanical Ex		backactor buck	et							
	JD. ma	pits exca	wateu using 0	.oom wide	DACKACIOI DUCK	σι.							

GROUNDWATER: Water seepage at 1.40m.

STABILITY: Trial pit sides remained stable and vertical throughout.

BACKFILL: Trial pit backfilled with arisings

<u> </u>			liantional I	hal							
			tigations Lt							1	Pit No
TF	RIA	LF	ידר L	.00	6					Т	P214
Telepho	one: 014	52 7391	65 , Fax: 014	52 7392	20 , Email: marł	@ccground.co.uk				She	eet 1 of 1
-			e Mile Lan			Project No:		Co-ords: E 308061 N 1	70550		Date
						C4414		Level: 82.02mAD		20/	11/2014
Loca	tion:	Fiv	e Mile Lan	ie, Caro	liff	•		Dimensions: 2.50n	า		Scale
								Depth E			1 : 25
Clien	t:	Val	le of Glam	organ (	Council			1.80m &		Lo	gged By PF
(m)	Water	Samp	les & In Situ T		Depth	Level	Legend				
(111)	Levels	No/Type	Depth (m)	with fragment reatilate <0mm	(m)	(mAD)					
-		B ES	0.10	vith frequent rootlets <2mm. sandy slightly gravelly CLAY with n. Gravel is sub-angular fine to	(0.20) — 0.20	81.82					
- - -		В	0.50		are sub-round	igh cobble content with o ed to sub-angular limesto ocally grey. Medium cobb	I boulders. Cobbles and boulders	(1.10)			
1		В	1.00		occasional lan	/n and grey slightly gravel ninated clay pockets <100 bbles and boulders are su	mm. Gr	LES and BOULDERS with avel is sub-angular fine to coarse ar tabular limestone.	— 1.30 (0.50)	80.72	
-					Trial pit compl	eted at 1.80m			1.80	80.22	<u>x 9</u>
2											2  - - - - - - - - - - - - - - - 3
-											

-4

REMARKS:

4

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

	Ground	Invest	tigations Lt	td								
			-		•							Pit No
┣	KIA		ידר L	O(	Ż						Т	P215
Teleph	one: 014	152 7391	65 , Fax: 014	52 73922	20 , Email: mark	@ccground.co.uk					She	eet 1 of 1
			e Mile Lan			Project No:		Co-ords: E 30	08088 N 1	70430		Date
						C4414		Level: 79.6	65mAD		20/	11/2014
Loca	tion:	Fiv	e Mile Lan	ne, Caro	diff			Dimensions:	2.45r	n		Scale
Olion	.4.							Depth E 1.60m 60				1 : 25
Clier	11:	va	le of Glam	organ (	Jouncii			0			LO	gged By PF
()	Water	Samp	les & In Situ T	esting						Depth	Level	
(m)	Levels	No/Type	Depth (m)	Result	Topooil of ooff			with frequent restlets	<0mm	(m)	(mAD)	
· ·	-				Topson of soft	dark brown slightly sand	Y CLAY V	with frequent rootiets	<2mm.	(0.20)		$\frac{\underline{x}}{\underline{y}} = \frac{\underline{x}}{\underline{y}} = \frac{\underline{x}}{\underline{y}}$
-					Firm orangish	brown and grey slightly s t. Gravel is sub-angular fi	andy slig	htly gravelly CLAY v	vith a medium	0.20	79.45	
-	-	B ES	0.30		sub-angular lir	nestone.				(0.40)		
-	-									0.00	70.05	
-						n and grey slightly clayey Gravel is sub-angular fine				0.60	79.05	Joy f
boulders are sub-angular tabular limestone.												Rod
 1 -									<b>A W</b>	1.00	78.65	
· -	-	в	1.10		occasional lan	0mm. Gr	BLES and BOULDER avel is sub-angular f	ine to coarse			vo e .	
-					limestone. Col	obles and boulders are su	ub angula	ar tabular limestone.		(0.60)		
-	-									(0.00)		
-	-											
-	1				Trial pit compl	eted at 1.60m				1.60	78.05	
	-											-
2 —												-2
2 -	-											
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-	1											
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	-											-
		1		I						I	1	' └-4
	ARKS: MENT: J	ICB 3CX	Mechanical Ex	xcavator.								
					e backactor buck	et.						

GROUNDWATER: Water seepage at 1.60m.

STABILITY: Trial pit sides remained stable and vertical throughout.

BACKFILL: Trial pit backfilled with arisings

CC (	Ground	Invest	tigations Lt	td									I F	Pit No	٦
TE	Ν	IF	PIT L	$\cap$	2									P216	
						•	•							et 1 of 1	
			65 , Fax: 014 e Mile Lan		20 , Email: mark	Record Project N			Co-ords: I	= 208122	N 17	70052		Date	-
FIUje	GUNA			e		-	<b>.</b> 			= 306122 68.53mA[		0052		11/2014	
Loca	tion:	Fiv	e Mile Lan	ie, Caro	Jiff	1			Dimensior		2.60m			Scale 1 : 25	
Clien	t.	Va	le of Glam	organ (	Council				Depth 1.20m	0.65m				gged By	_
Olici		va								0				PF	
(m)	Water Levels		les & In Situ T				Desc	ription				Depth (m)	Level (mAD)	Legend	
	LUTUL	No/Type		Result	Topsoil of soft	dark brown	slightly sandy	CLAY	with frequent roc	otlets <2mm.			(117.2)	<u><u>x</u>t 1_X <u>x</u>t 1_X</u>	-
-		В	0.10		BOULDERS. (	Gravel is sub	o-angular fine t	to coars	gravelly COBBL se limestone. Co	ES and bbles and		(0.20) - 0.20	68.33		
-					boulders are s										
-					0.50-1.20m: Lo content. Grave are limestone.	el is sub-ang	ish brown and jular to sub-rou	grey gr unded fi	avelly clay with ne to coarse lim	medium cobl estone. Cob	ble bles	(1.00)			
-															
1	Trial pit completed at 1 20m														
Trial pit completed at 1.20m         1.20         67.33															
-	Trial pit completed at 1.20m     1.20     67.33														
-														-	
-														-	
-														-	
2 —														-2	2
-														-	
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-														_	
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3 —														-	3
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-														_	
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-														-	
-														-	
4															4
	RKS:	00.000													
			Mechanical Ex avated using 0.		e backactor buck	et.									
			er seepage at 1		vertical throughou	ut									
BACK	FILL: Tria	l pit back	filled with arisi	ings		ut.									
REMA	RKS: Pit	terminate	ed on hard stra	atum - Lim	iestone.										

#### CC Ground Investigations Ltd Pit No TRIAL PIT LOG **TP217** Sheet 1 of 1 Telephone: 01452 739165 , Fax: 01452 739220 , Email: mark@ccground.co.uk Project Name: Five Mile Lane Project No: Co-ords: E 308184 N 169931 Date 20/11/2014 C4414 Level: 61.95mAD Five Mile Lane, Cardiff Location: Dimensions: Scale 2.45m 1:25 Depth 0.65m 2.00m Client: Vale of Glamorgan Council Logged By PF Samples & In Situ Testing Water Depth Level Description (m) Legend Levels (m) (mAD) Depth (m) No/Type Result Topsoil of soft dark brown slightly sandy CLAY with frequent rootlets <2mm. <u>vr</u>v <u>vrv</u> В 0.10 (0.25) 1/ 1/ 1 0.25 61.70 Soft brown slightly sandy slightly gravelly CLAY. Gravel is sub-rounded to sub-angular fine to coarse limestone. 0 в 0.50 (0.55) ES 0.80 61.15 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. (1.20)1.60-1.80m: Clay. Locally reddish brown. High cobble content and occasional boulders R 1 70

Trial pit completed at 2.00m

2.00

59.95

2

-3

4

2

3

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.

80

						accurate as uk						<b>P218</b> eet 1 of 1	
			e Mile Lar		20 , Email. mair	Project No:	Co-ord	s: E 30	08296 N ⁻	169821		Date	
,						C4414	Level:	51.0	)5mAD		20/	11/2014	
Loca	tion:	Fiv	e Mile Lar	ne, Caro	diff		Dimen	sions:	2.40	m		Scale	
							Depth 2.20m	0.60m				1 : 25	
Clier	IT:	Val	le of Glam	organ (	Jouncil		2.2011	0.0			LO	gged By PF	
(m)	Water	Samp No/Type	les & In Situ T			Descript	ion			Depth (m)	Level (mAD)	Legend	
	Lovoio			Result	Topsoil of soft	dark brown slightly sandy CL	AY with frequer	nt rootlets	<2mm.		(112.12)	<u>ZIJ</u> X <u>ZIJ</u> X	
		В	0.10		Firm orangish	brown and grey slightly sandy	slightly gravell		vith a medium	(0.20) 	50.85	<u> </u>	
						t. Gravel is sub-angular fine to				(0.40)			
	B 0.50 Orangish brown and grey slightly clayey slightly gravelly COBBLES and												
									0.60	50.45	ST.		
	BOULDERS. Gravel is sub-angular fine to coarse limestone. Cobbles and boulders are sub-angular tabular limestone.												
•										(1.30)		<u>k</u> oj	
	-											20-	
	-												
												bool	
	-												
2 —	1	в	2.00		slightly gravell	gish brown mottled reddish br y silty CLAY with locally low c	obble content. (	Gravel is	sub-angular	— 1.90 (0.20)	49.15		
	-	Б	2.00		fine to coarse	mudstone. Cobbles are extrem n and grey slightly clayey slig	mely weak sub a	angular n	nudstone.	2.10	48.95		
				-	BOULDERS.	Gravel is sub-angular fine to c ub-angular tabular limestone.	oarse limestone	e. Cobble	s and	2.20	48.85		
	-				Trial pit compl							-	
	-											-	
	]												
	-											-	
3 -	1												
	+											-	
	-												
	-											-	
•	1												
	-											-	
4													
RFM	ARKS:											4	
EQUIF	MENT:		Mechanical E										
METH	OD: Tria	pits exca	wated using 0	.60m wide	e backactor buck	et.							

GROUNDWATER: Water seepage at 2.20m.

STABILITY: Trial pit sides remained stable and vertical throughout.

BACKFILL: Trial pit backfilled with arisings

	2 round	Invoit	igotiono L	td									
			igations L									Pit No	
TF	RIA	LF	ידר L	.00	6						Т	P219	)
Telepho	one: 014	52 7391	65 , Fax: 014	152 73922	20 , Email: mark	@ccground.co.uk					She	eet 1 o	f 1
Proje	ect Nar	ne: Five	e Mile Lar	ne		Project No:		Co-ords: E 3	08407 N 16	69706		Date	
						C4414		Level: 38.8	37mAD		20/	'11/20 <i>'</i>	14
Loca	tion:	Five	e Mile Lar	ne, Caro	diff			Dimensions:	2.80m			Scale	
								Depth E 3.40m C				1:25	
Clien	IT:	vai	e of Glam	organ (	Jouncil			0.4000 N			LO	gged E PF	3y
(m)	Water	Sampl No/Type	les & In Situ T			Descr	iption			Depth (m)	Level (mAD)	Legend	1
	201010	NO/ Type	Depth (m)	Result	Topsoil of soft	dark brown slightly sandy (	CLAY v	with frequent rootlets	s <2mm.		((2))	<u>x11</u> , <u>x11</u> ,	
-		B ES	0.10							(0.20) 0.20	38.67	$\frac{I_{f}}{I_{f}} = \frac{\chi^{\chi} \cdot I_{f}}{\chi^{\chi}} = \frac{\chi^{\chi} \cdot I_{f}}{\chi^{\chi}}$	<u>i</u>
-		20			cobble conten	brown and grey slightly sar t with occasional boulders. obles are sub-angular limes	Gravel	htly gravelly CLAY is sub-angular fine	vith a medium to coarse	0.20	30.07		-
-		в	0.50										
-	-	D	0.50										-
-													-
-	-					obbles and boulders absen reddish brown.	nt. Lam	inated.					- - -
1 —	1	в	1.00		0.90m. Locally								1
-													. <u>-</u>
-	-												 
-	1												
-													· - -
-	-				1.70-2.00m: R	are boulders							-
-	-				1.70-2.0011.1					(3.20)			
2 —													2
-	-	в	2.10		mudstone.	ravelly. High cobble conter		el and cobbles are	sub angular				
-	-		2.1.0		2.10-3.40m: O	ccasional cobbles of limest	tone.						
-	1												.]- 
-	-												
-													
	1												-
-	-												· -
3 —	1	В	3.00										3
	1												1
-	-												-
-					Trial pit compl	eted at 3.40m				3.40	35.47	<u> </u>	+
	1												F
-	-												+
-	1												F
4 —													L ₄

REMARKS:

EQUIPMENT: JCB 3CX Mechanical Excavator.

METHOD: Trial pits excavated using 0.60m wide backactor bucket.

GROUNDWATER: Water seepage at 3.40m.

 $\label{eq:stable} \ensuremath{\mathsf{STABILITY}}\xspace: \ensuremath{\mathsf{Trial}}\xspace \ensuremath{\mathsf{pits}}\xspace \ensuremath{\mathsf{stable}}\xspace \ensuremath{stable}\xspace \ensuremath{\mathsf{stable}}\xspace \ensuremath{\mathsf{stab$ 

BACKFILL: Trial pit backfilled with arisings

REMARKS: Pit terminated on hard stratum - Limestone.

CC TP LOG C4414.GPJ GINT STD AGS 3_1.GDT 23/2/15

INSPECTION PIT LOG         Telephone: 01452 739165 , Fax: 01452 739220 , Email: mark@ccground.co.uk         Project Name: Five Mile Lane       Project No:       Co-orc         Ctat14       Level:         Location:       Five Mile Lane, Cardiff       Dimen         Client:       Vale of Glamorgan Council       Depth         0.30m       0.30m         (m)       Vater       Samples & In Situ Testing       Description         (m)       Vater       Depth (m)       Result       MADE GROUND: Soft dark brown slightly sandy slightly grightly sandy slightly sandy slightly sandy slightly sandy slightly and with frequent rootlets <2mm. Gravel is sub-angular fine to medi         -       -       Dry       -       Soft orangish brown locally greyish brown slightly sandy slightly sandy slightly and with frequent rootlets <2mm. Gravel is sub-angular fine lim         -       -       -       -       -         -       -       -       -       -         -       -       -       -       -         -       -       -       -       -         -       -       -       -       -         -       -       -       -       -         -       -       -       -       -	E  avelly CLAY with um limestone.  (0.  ghtly gravelly CLAY estone. (0.  (0.  (0.  (0.  (0.  (0.  (0.  (0	719 24	
Project Name: Five Mile Lane       Project No: C4414       Co-ord Level: Level:         Location:       Five Mile Lane, Cardiff       Dimen         Client:       Vale of Glamorgan Council       Depth         (m)       Water Levels       Samples & In Situ Testing       Description         (m)       Mater       No/Type       Depth (m)       Result         MADE GROUND: Soft dark brown slightly sandy slightly gr frequent rootlets <2mm. Gravel is sub-angular fine to media with frequent rootlets <2mm. Gravel is sub-angular fine lim	76.59mAD         Isions:       m         E       C         avelly CLAY with um limestone.       0.         ghtly gravelly CLAY estone.       0.	24 Level (mAD) 0.20) 0.20 0.10)	A/11/2014 Scale 1 : 12.5 Dgged By PF
Location:       Five Mile Lane, Cardiff       Dimen         Client:       Vale of Glamorgan Council       Depth         (m)       Water Levels       Samples & In Situ Testing       Description         No/Type       Depth (m)       Result       MADE GROUND: Soft dark brown slightly sandy slightly gr frequent rootlets <2mm. Gravel is sub-angular fine to medi	E  avelly CLAY with um limestone.  (0.  ghtly gravelly CLAY estone. (0.  (0.  (0.  (0.  (0.  (0.  (0.  (0	Depth Level (m) (mAD) 0.20) 0.20 76.39 0.10)	1 : 12.5 pgged By PF Legend 
Client: Vale of Glamorgan Council       0.30m         (m)       Water Levels       Samples & In Situ Testing       Description         No/Type       Depth (m)       Result       MADE GROUND: Soft dark brown slightly sandy slightly gr frequent rootlets <2mm. Gravel is sub-angular fine to medi	avelly CLAY with um limestone. (0. ghtly gravelly CLAY estone. (0.	Depth (m) Level (mAD 0.20) 0.20 76.39 0.10)	PF
(m) Levels No/Type Depth (m) Result MADE GROUND: Soft dark brown slightly sandy slightly gr frequent rootlets <2mm. Gravel is sub-angular fine to medi Soft orangish brown locally greyish brown slightly sandy sli with frequent rootlets <2mm. Gravel is sub-angular fine lim	avelly CLAY with um limestone. (0. ghtly gravelly CLAY estone. (0.	(m) (mAD) 0.20) 0.20 76.39 0.10)	
MADE GROUND: Soft dark brown slightly sandy slightly gr frequent rootlets <2mm. Gravel is sub-angular fine to medi Soft orangish brown locally greyish brown slightly sandy sli with frequent rootlets <2mm. Gravel is sub-angular fine lim	avelly CLAY with um limestone. (0. ghtly gravelly CLAY estone. (0.	0.20) 0.20 76.39 0.10)	

			igations Lt									⊃it No
IN	SP	<b>EC</b>	CIT	NF	PIT LO	ЭG					CI	3R302
Telepho	one: 014	52 7391	65 , Fax: 014	52 73922	20 , Email: mark	@ccground.co.uk					She	eet 1 of 1
Proje	ect Nar	ne: Five	e Mile Lan	ie		Project No: C4414		Co-ords: E 30 Level: 79.0	7796 N 17 8mAD	2548	24/	Date 11/2014
Loca	tion:	Five	e Mile Lan	ie, Caro	Jiff	1		Dimensions:	m		Scale 1 : 12.5	
Clien	ıt:	Val	e of Glam	organ (	Council			0.30m E				gged By PF
(m)	Water	Sampl No/Type	es & In Situ T			D	Description			Depth (m)	Level (mAD)	Legend
1         -	Dry	No/Type	Depth (m)	Result	Soft orangish with frequent rootle	ND: Soft dark brown sl tts <2mm. Gravel is su brown locally greyish b ootlets <2mm. Gravel i completed at 0.30m	b-angular f	ine to medium limesto	ne.	(0.20) - 0.20 (0.10) - 0.30	78.88 78.78	
2 —												
EQUIP METHO GROU	2											

			igations Lt									Pit No
IN	SP	<b>EC</b>	CIT	NF	PIT LO	ЭG					CI	BR303
Teleph	one: 014	52 7391	65 , Fax: 014	52 73922	20 , Email: mark	@ccground.co	o.uk				She	et 1 of 1
			e Mile Lan			Project No:		Co-ords: E 30	07779 N 1	72220		Date
						C4	414	Level: 91.4		11/2014		
Loca	tion:	Fiv	e Mile Lan	ie, Caro	liff			Dimensions: Depth	m			Scale :12.5
Clier	nt:	Val	e of Glam	organ (	Council			0.30m E			Lo	gged By PF
(m)	Water	Samp No/Type	les & In Situ T				Description			Depth (m)	Level (mAD)	Legend
	Levels	No/ I ype	Depth (m)	Result	MADE GROUI frequent rootle	ND: Soft dark br ts <2mm. Grave	own slightly sand el is sub-angular f	y slightly gravelly CL ine to medium limest	AY with tone.	(0.10)	(11/12)	
-	_				Soft orangish I	prown locally gre	evish brown slight	ly sandy slightly grav ular fine limestone.		0.10	91.31	
-	-									(0.20)		
-	Dry			-	Inspection pit of	completed at 0.3	30m			0.30	91.11	 
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-	1											-
-												_
-												-
-	-											-
-												
2 —												
	ARKS:											2
EQUIP	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).

			ations Lt			~ ~						Pit No
IN	SP	EC	IIO	NF	PIT LO	JG						3R304
					20 , Email: mark	@ccground.co	.uk					et 1 of 1
Proje	ect Nar	ne: Five	Mile Lan	е		Project No: C44	414		307743 N 17 .99mAD	2037		Date 11/2014
Loca	tion:	Five	Mile Lan	e, Carc	liff	1		Dimensions Depth	: m		Scale 1 : 12.5	
Clien	it:	Vale	of Glamo	organ C	Council			•	Ξ		Lo	gged By PF
(m)	Water Levels		s & In Situ Te	esting Result			Description			Depth (m)	Level (mAD)	Legend
	Dry		Depth (m)		Soft orangish I with low cobble limestone. Cob	ts <2mm. Grave	l is sub-angular f yish brown slight quent rootlets <2 gular limestone.	y slightly gravelly C ine to medium lime ly sandy slightly gr 2mm. Gravel is sub	stone. avelly CLAY	(0.20) - 0.20 (0.10) - 0.30	89.79 89.69	
2 —												_2
EQUIP METHO GROUI	OD: Han NDWATI	ER: None e	ction pit: 0.0 ncountered.		and 0.30m. (See	separate sheet).						

NS	SP	<b>ECTION</b>	Pľ	ГLOG			CE	3R305
				nail: mark@ccground.co.uk			She	et 1 of 1
		ne: Five Mile Lane	00220, 21	Project No:	Co-ords: E 307667 N	171935		Date
-				C4414	Level: 88.59mAD		24/	11/2014
Locatio	on:	Five Mile Lane, 0	Cardiff		Dimensions: m			Scale
Olianati				-11	Depth 0.30m Ε			: 12.5
Client:		Vale of Glamorga	an Coun	CII	0.3011 2		LO	gged By PF
(m) \	Nater	Samples & In Situ Testin	g	Descript		Depth	Level	Legend
(III) L	evels	No/Type Depth (m) Re	Sult MAR	DE GROUND: Soft dark brown slightly s		(m)	(mAD)	XXXXX
			freq	uent rootlets <2mm. Gravel is sub-angu	ar fine to medium limestone.	(0.20)		
						(0.20)		
-			Soft	orangish brown locally greyish brown sl	ightly sandy slightly gravelly CLAY	0.20	88.39	
_	Dry		_ lime	low cobble content and frequent rootlet stone. Cobbles are sub-angular limesto	s <2mm. Gravel is sub-angular fine ne.	(0.10)	88.29	<u> </u>
			Insp	ection pit completed at 0.30m				
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2								
		land digging tools.						
		d dug inspection pit: 0.00-0.	30m.					
		ER: None encountered.		20m (See concrete these)				
	.s: in S	Situ CBR test carried out at (	J. 15 and U.	oom. (See separate Sheet).				

	(0.20)	25, ] 1 Lo	eet 1 of 1 Date /11/2014 Scale 1 : 12.5 ogged By PF Legend
C4414     Level:     80.5       Location:     Five Mile Lane, Cardiff     Dimensions:       Client:     Vale of Glamorgan Council     Depth       (m)     Water     Samples & In Situ Testing     Description       (m)     Water     Depth (m)     Result       MADE GROUND: Soft dark brown slightly sandy slightly gravely CLA frequent rootlets <2mm. Gravel is sub-angular fine to medium limestor	2mAD m Deptr (m) Y with he. (0.20) Uly CLAY gular fine (0.10)	25. 1 Lo Level (mAD) 80.32	/11/2014 Scale 1 : 12.5 ogged By PF
Client:     Vale of Glamorgan Council     Depth 0.30m     Depth 0.30m     Depth 0.30m     Depth 0.30m     E       (m)     Water Levels     Samples & In Situ Testing No/Type     Depth (m)     Result     Description       (m)     Water Levels     Depth (m)     Result     MADE GROUND: Soft dark brown slightly sandy slightly gravelly CLA frequent rootlets <2mm. Gravel is sub-angular fine to medium limestor	Y with he. (0.20) Ily CLAY gular fine (0.10)	1 Lo	1 : 12.5 ogged By PF
Client: Vale of Glamorgan Council       0.30m       E         (m)       Water Levels       Samples & In Situ Testing       Description         No/Type       Depth (m)       Result       MADE GROUND: Soft dark brown slightly sandy slightly gravelly CLA frequent rootlets <2mm. Gravel is sub-angular fine to medium limestor         Drv       Drv       Soft orangish brown locally greyish brown slightly sandy slightly grave with low cobble content and frequent rootlets <2mm. Gravel is sub-angular limestone.	(m) Y with ne. (0.20) Ily CLAY gular fine (0.10)	Level (mAD) 80.32	PF
(m)       Levels       No/Type       Depth (m)       Result       MADE GROUND: Soft dark brown slightly sandy slightly gravelly CLA frequent rootlets <2mm. Gravel is sub-angular fine to medium limesto         -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -	(m) Y with ne. (0.20) Ily CLAY gular fine (0.10)	(mAD) 80.32	Legend
Levels No/Type Depth (m) Result     MADE GROUND: Soft dark brown slightly sandy slightly gravelly CLA     frequent rootlets <2mm. Gravel is sub-angular fine to medium limestor     Soft orangish brown locally greyish brown slightly sandy slightly grave     with low cobble content and frequent rootlets <2mm. Gravel is sub-angular limestone.	(m) Y with ne. (0.20) Ily CLAY gular fine (0.10)	(mAD) 80.32	
Frequent rootlets <2mm. Gravel is sub-angular fine to medium limesto	ne. (0.20) Ily CLAY 0.20 gular fine (0.10)		

CC Ground Investigations Ltd				F	Pit No	
<b>INSPECTION F</b>	VIT I OG			CE	3R307	7
Telephone: 01452 739165 , Fax: 01452 7392					et 1 of	
Project Name: Five Mile Lane	Project No:	Co-ords: E 308314 N 17	70620		Date	
	C4414	Level: 77.07mAD			11/201	4
Location: Five Mile Lane, Card	Jiff	Dimensions: m			Scale : 12.5	
Client: Vale of Glamorgan (	Council	Depth 0.30m E			gged B	
	Jourici				ууец Б PF	у
(m) Water Samples & In Situ Testing	Description		Depth	Level	Legend	
(m) Levels No/Type Depth (m) Result	MADE GROUND: Soft dark brown slightly sand	y slightly gravelly CLAY with	(m)	(mAD)		
	frequent rootlets <2mm. Gravel is sub-angular f Soft orangish brown locally greyish brown slight	ine to medium limestone.	(0.10) - 0.10	76.97		{ ↓
	with frequent rootlets <2mm. Gravel is sub-ang	ular fine limestone.	(0.00)		 	-
			(0.20)			
- Dry	Inspection pit completed at 0.30m		0.30	76.77	<u> </u>	+
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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 a	and 0.30m. (See separate sheet).					

CC (	Ground	Inves	tigations Li	d									Pit No
INI	<b>CD</b>		חודי		PIT L(	$\mathcal{A}$							BR308
													et 1 of 1
			65 , Fax: 014 e Mile Lan		20 , Email: mark	@ccgrour Project I			Co-ords: E 30	18062 N 17	0737		Date
		ne. i iv				-	C4414			32mAD	0757		11/2014
Loca	tion:	Fiv	e Mile Lan	e, Caro	diff				Dimensions:	m			Scale
									Depth				: 12.5
Clier	nt:	Va	le of Glam	organ (	Council				0.30m E			Lo	gged By PF
(m)	Water	Samp	les & In Situ T				De	scription			Depth	Level	Legend
	Leveis	No/Type	Depth (m)	Result	MADE GROUI	ND: Soft da	ark brown slig	htly sandy	slightly gravelly CL	AY with	(m)	(mAD)	
	-			-					ne to medium limest		(0.10) - 0.10	82.22	
					with low cobble limestone. Cob	e content a	nd frequent ro	ootlets <2	ly sandy slightly grav mm. Gravel is sub-a	ngular fine			
-											(0.20)		
-	Dry			-	Inspection pit	completed	at 0.30m				0.30	82.02	<u> </u>
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-	1												
2 —													_2
REM	ARKS:												

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).

CC INS PIT LOG C4414.GPJ GINT STD AGS 3_1.GDT 23/2/15

			tigations L									Pit No
IN	SP	EC	CIT	NF	PIT L(	ЭG					C	3R309
Teleph	one: 014	52 7391	65 , Fax: 014	52 7392	20 , Email: mark	@ccground.co.uk					She	et 1 of 1
Proje	ect Nar	ne: Fiv	e Mile Lar	ie		Project No: C4414	Co-ords Level:		07976 N 17 36mAD	0682		Date 11/2014
Loca	tion:	Fiv	e Mile Lar	ie, Car	diff	1	Dimensi	ons:	m			Scale : 12.5
Clier	nt:	Val	le of Glam	organ	Council		Depth 0.30m	E				gged By
	10/-1	Somo	les & In Situ T	octing						Denth		PF
(m)	Water Levels	Samp No/Type	Depth (m)	Result		Descripti				Depth (m)	Level (mAD)	Legend
-	-				MADE GROUI frequent rootle	ND: Soft dark brown slightly sa ts <2mm. Gravel is sub-angul	andy slightly grav ar fine to medium	elly CL 1 limest	AY with cone.	(0.20)		
-	Dry				with low cobble limestone. Cob	brown locally greyish brown sl e content and frequent rootlets obles are sub-angular limestor	s <2mm. Gravel is	tly grav s sub-a	velly CLAY Ingular fine	0.20 (0.10) 0.30	82.16 82.06	
_					Inspection pit of	completed at 0.30m						_
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2 —												-2
REMA	REMARKS:											
METH	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).											

		I Investigations									Pit No	
IN	SP	ECTIC	DN F	<b>NT L</b>	OG					CI	3R310	
				20 , Email: mar	k@ccground.co.uk						eet 1 of 2	1
Proje	ect Nar	ne: Five Mile L	ane		Project No: C4414	Co-ord Level:		08817 N 16 90mAD	69463		Date 11/2014	•
Loca	tion:	Five Mile L	ane, Caro	diff		Dimen: Depth	sions:	m			Scale : 12.5	
Clien	it:	Vale of Gla	amorgan (	Council		0.30m	E			Lo	gged By PF	
(m)	Water	Samples & In Sit			Descrip	otion			Depth (m)	Level (mAD)	Legend	
	201010	No/Type Depth (n	n) Result	MADE GROU	IND: Soft dark brown slightly ets <2mm. Gravel is sub-ang	sandy slightly gra	avelly CL	AY with	()	(11,2)		
-									(0.25)	21.65		
-	Dry			with frequent sub-angular li	brown locally greyish brown s rootlets <2mm. Gravel is sub mestone. completed at 0.30m				- 0.30	21.60		
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2 —												2
EQUIP METHO	REMARKS: EQUIPMENT: Hand digging tools. METHOD: Hand dug inspection pit: 0.00-0.30m.											
		ER: None encounter Situ CBR test carried		and 0.30m. (See	e 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)



D Lambe (Senior Technician) S Royle (Senior Technician) M Beastall (Laboratory Manager)

5 – 7 Hexthorpe Road, Hexthorpe, Doncaster DN4 0AR tel: +44 (0)844 815 6641 fax: +44 (0)844 815 6642 e-mail: rgunson@prosoils.co.uk awatkins@prosoils.co.uk Page 1 of

# SUMMARY OF LABORATORY SOIL DESCRIPTIONS

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

	Compiled by	Date	Checked by	Date	Approved by	Date
Pol		09/01/15		09/01/15		09/01/15
Professional Soils Laboratory		5 MILE	Contract No:	PSL14/6467		
		5 MILL	Client Ref:	C4414		

# SUMMARY OF LABORATORY SOIL DESCRIPTIONS

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

	Compiled by	Date	Checked by	Date	Approved by	Date
est.		09/01/15		09/01/15		09/01/15
Professional Soils Laboratory		5 MILE	Contract No:	PSL14/6467		
		5 MILF	Client Ref:	C4414		

## SUMMARY OF SOIL CLASSIFICATION TESTS

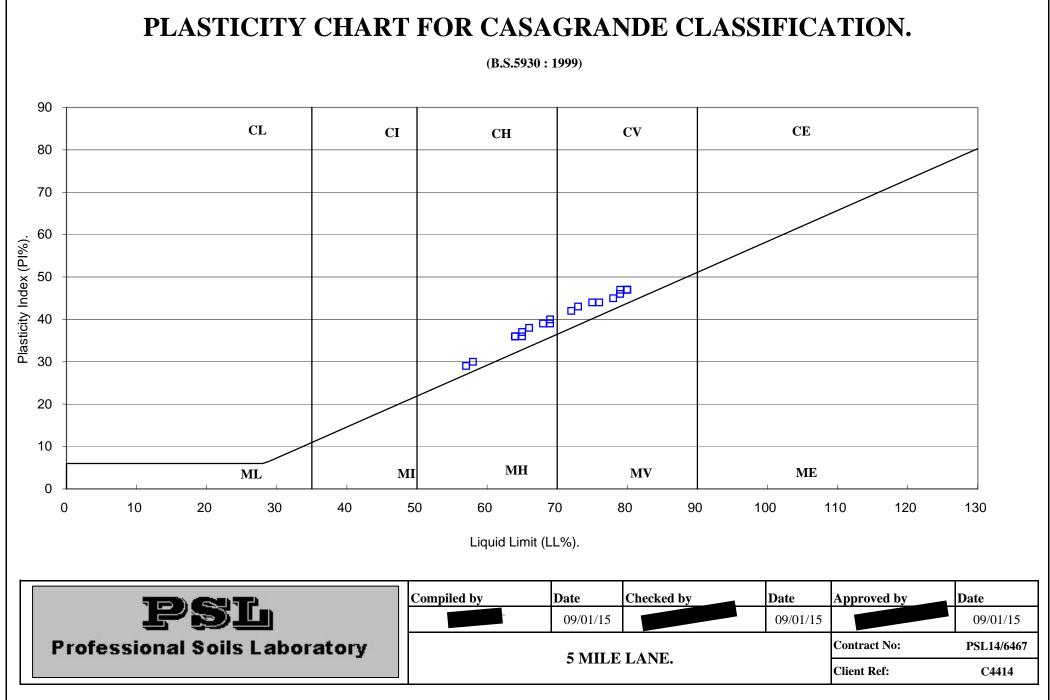
(B.S. 1377 : PART 2 : 1990)

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

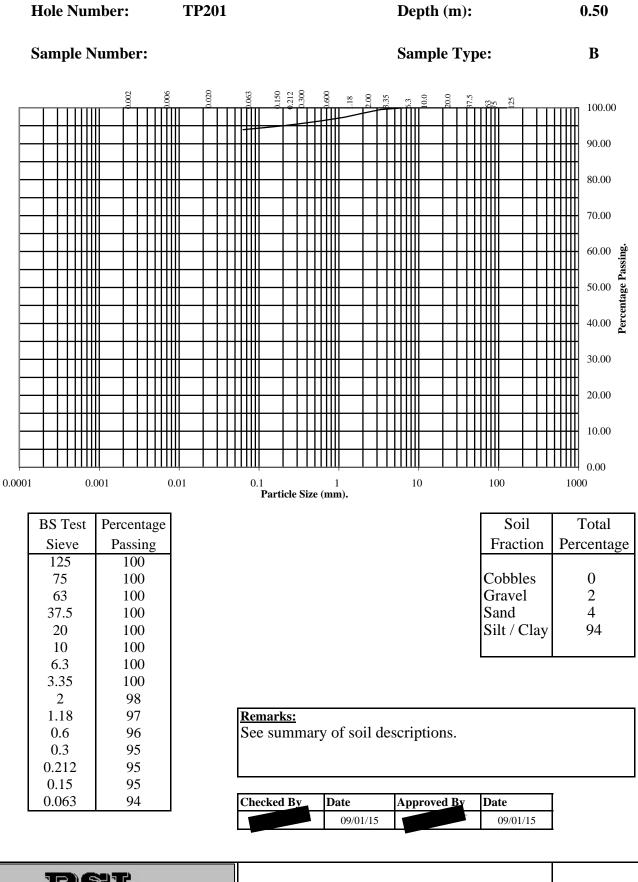
SYMBOLS : NP : Non Plastic

* : Liquid Limit and Plastic Limit Wet Sieved.

	Compiled by	Date	Checked by	Date	Approved by	Date
e pol		09/01/15		09/01/15		09/01/15
Professional Soils Laboratory		Contract No:	PSL14/6467			
		Client Ref:	C4414			



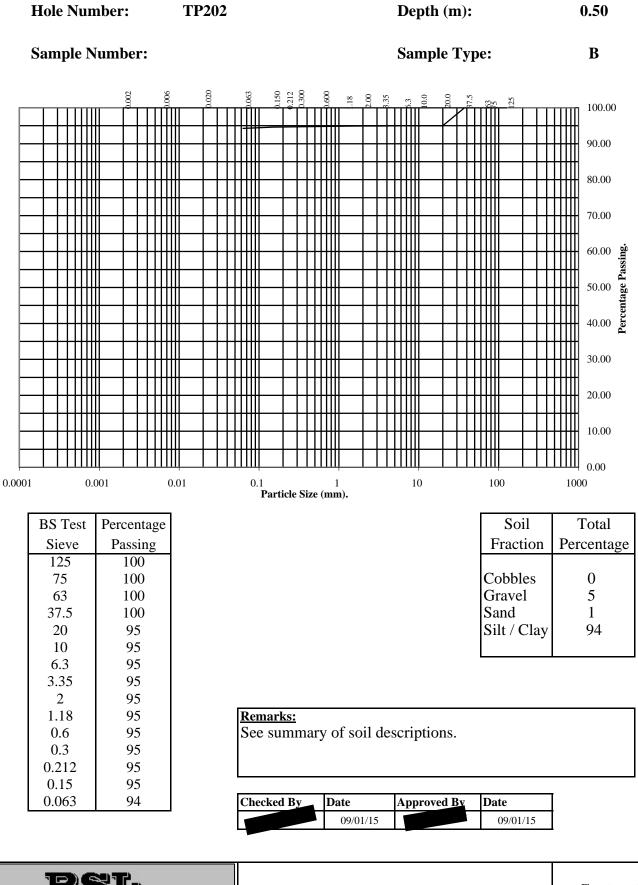
BS1377 : Part 2 : 1990



Professional Soils Laboratory 5 MILE LANE. Contract No.: PSL14/6467
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BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

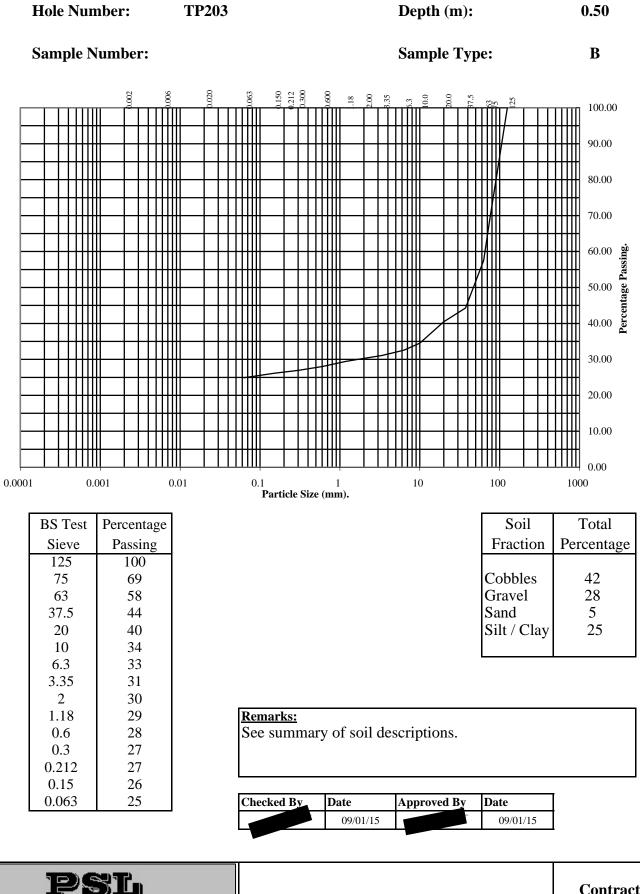


	Contract No.: PSL14/6467
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BS1377 : Part 2 : 1990

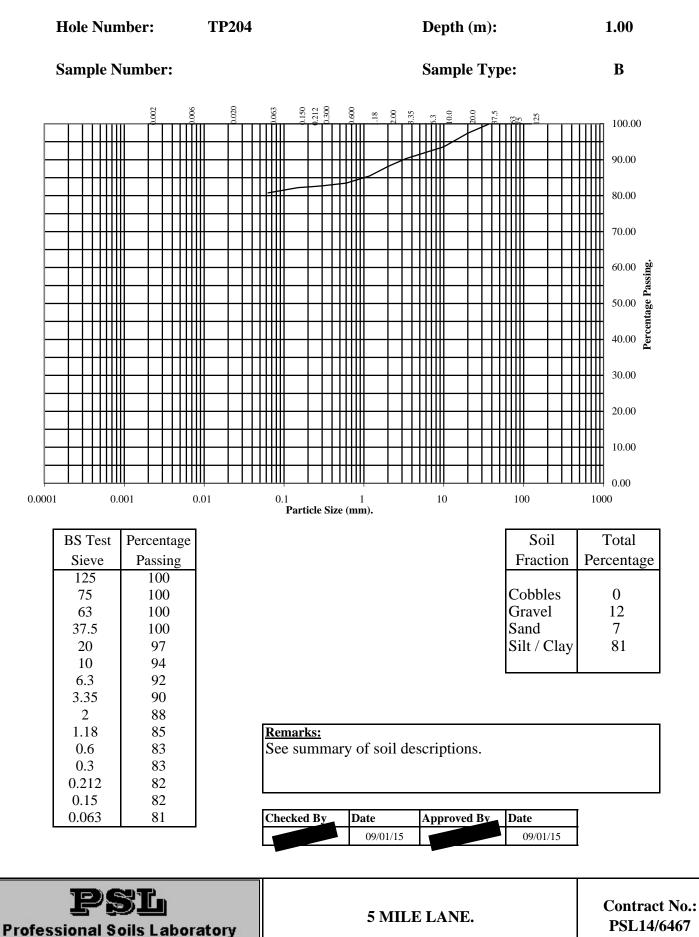
Wet Sieve, Clause 9.2



Professional Soils Laboratory

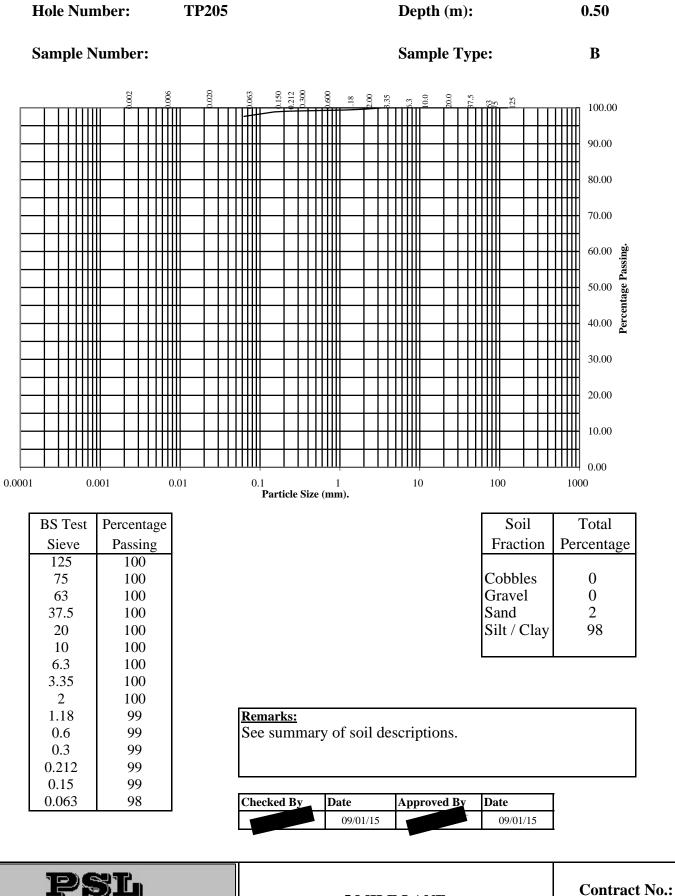
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BS1377 : Part 2 : 1990



BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2



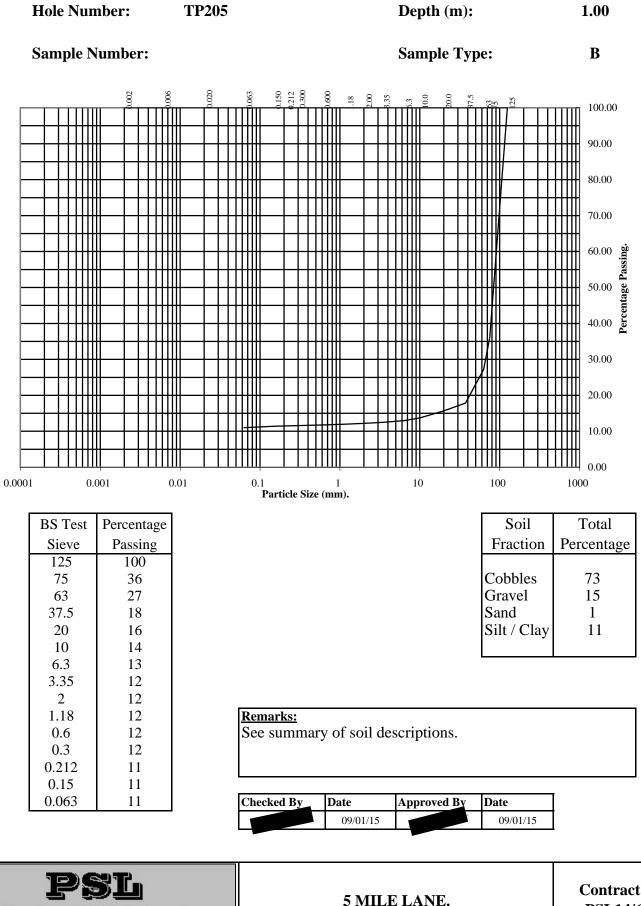
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PSL14/6467

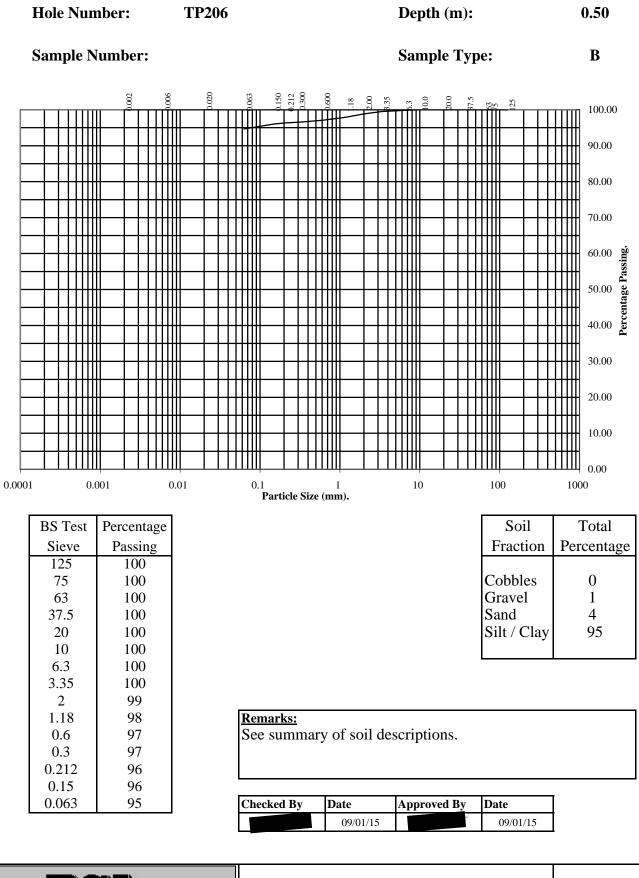
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2



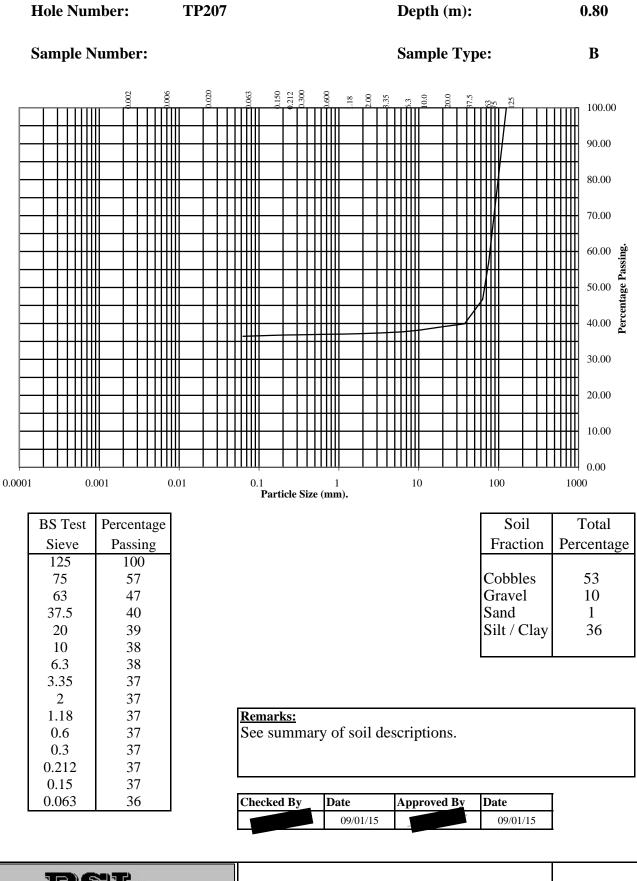
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BS1377 : Part 2 : 1990



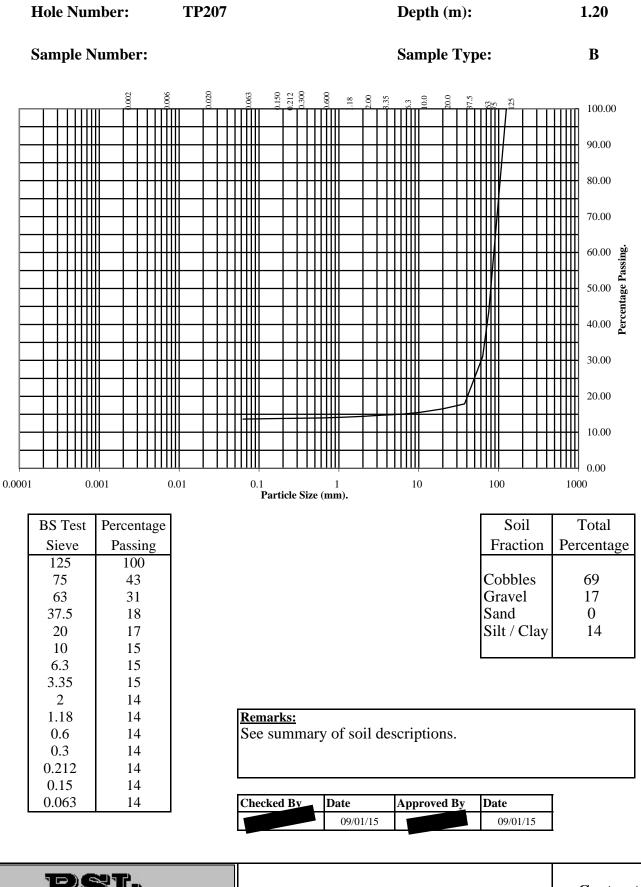


BS1377 : Part 2 : 1990



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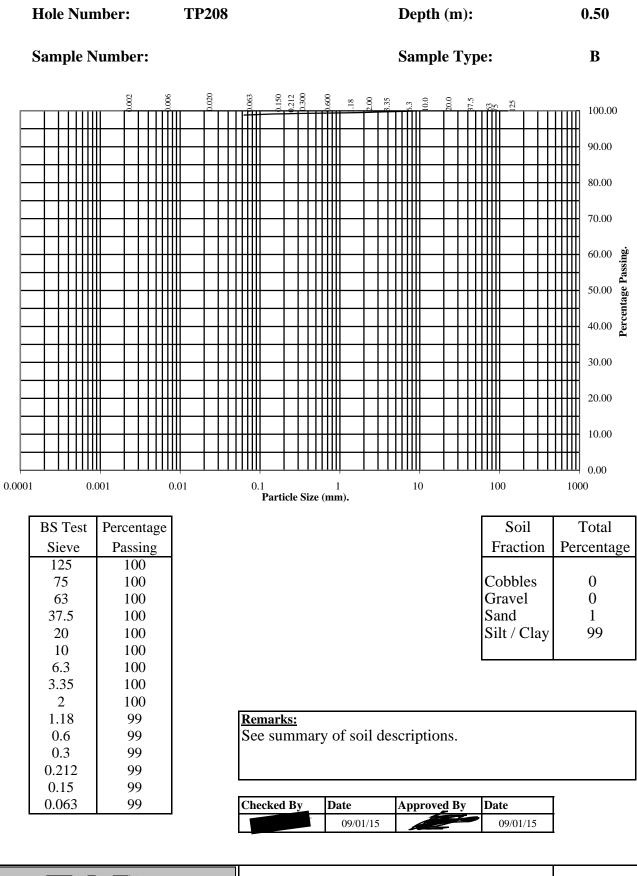
BS1377 : Part 2 : 1990



PSL Professional Soils Laboratory	5 MILE LANE.	Contract No.: PSL14/6467
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BS1377 : Part 2 : 1990

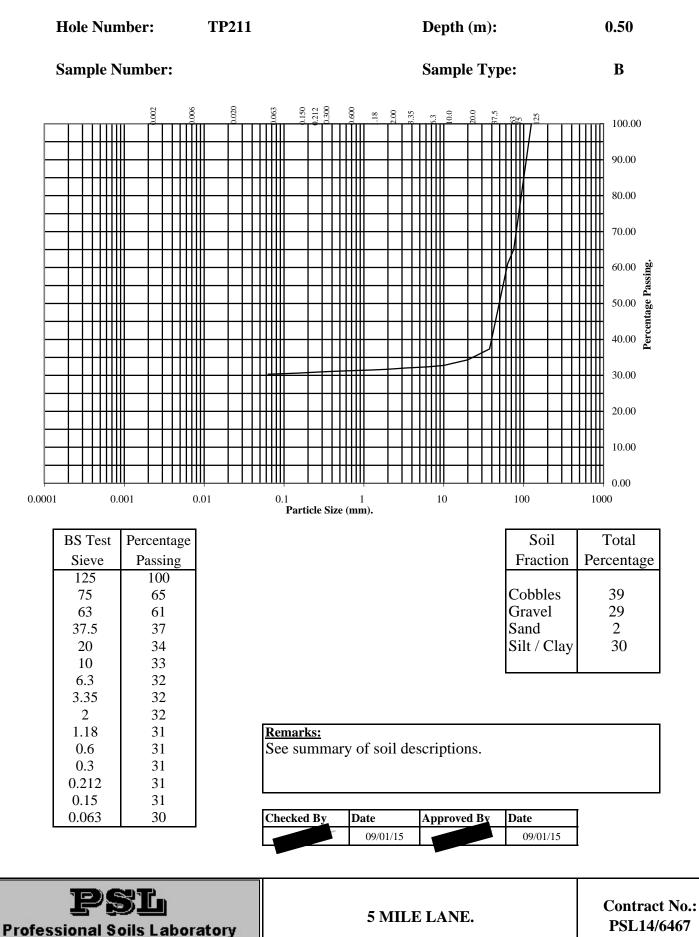
Wet Sieve, Clause 9.2





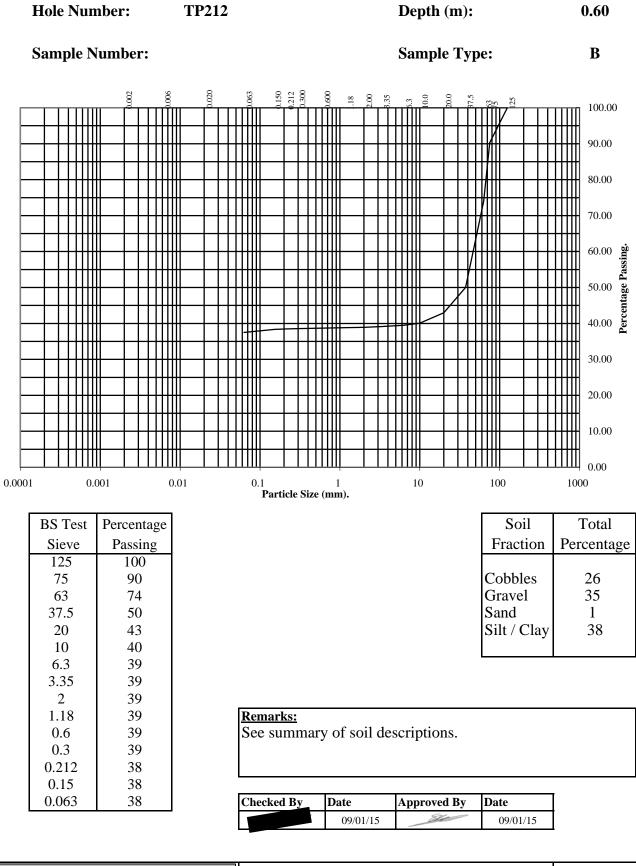
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BS1377 : Part 2 : 1990



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Wet Sieve, Clause 9.2

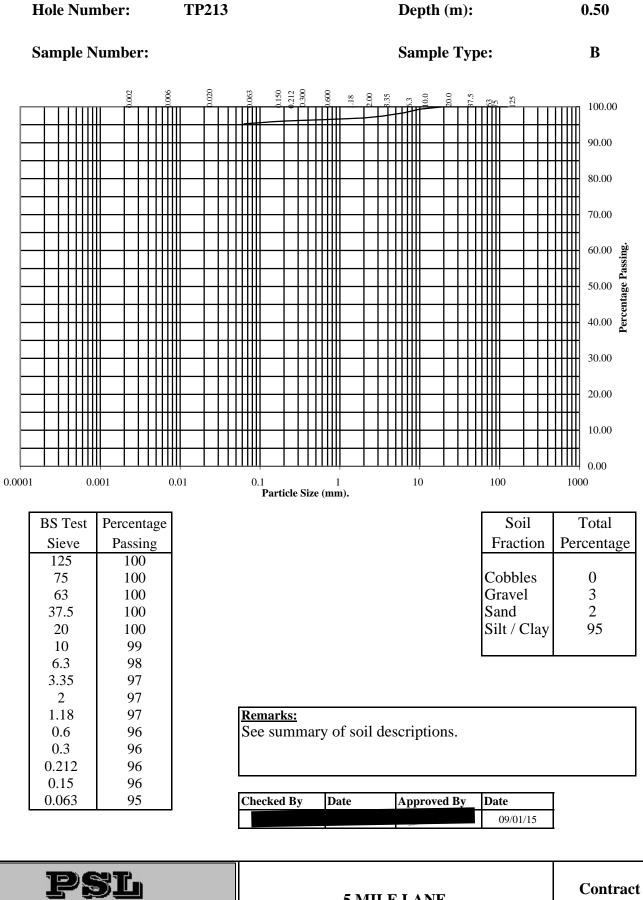




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Wet Sieve, Clause 9.2

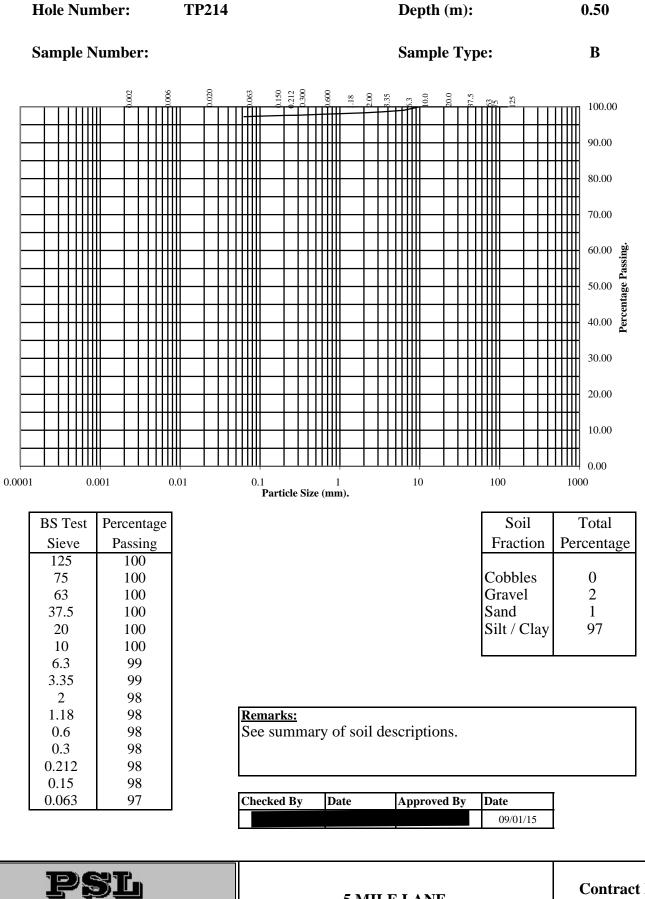


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#### **5 MILE LANE.**

BS1377 : Part 2 : 1990

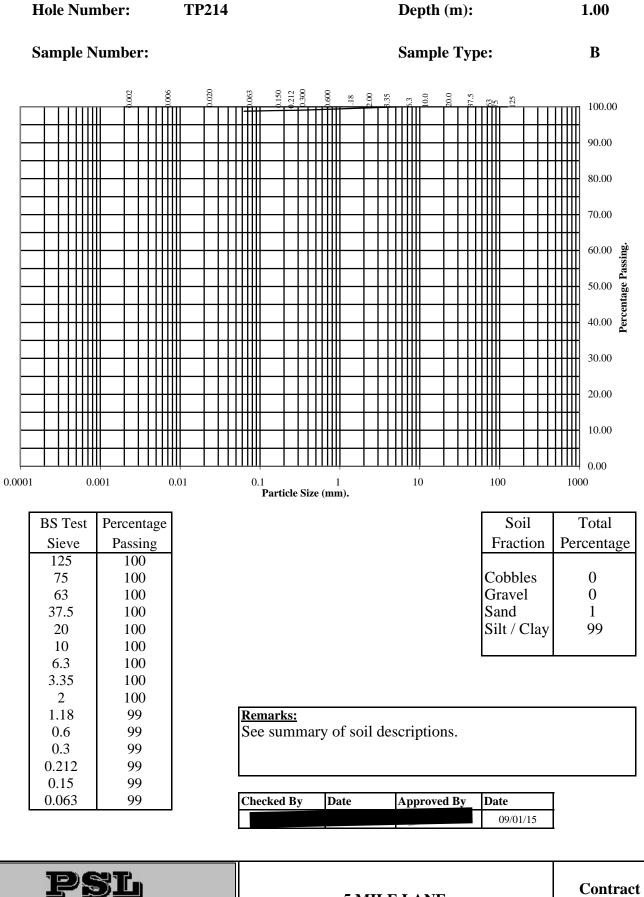
Wet Sieve, Clause 9.2



#### **5 MILE LANE.**

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

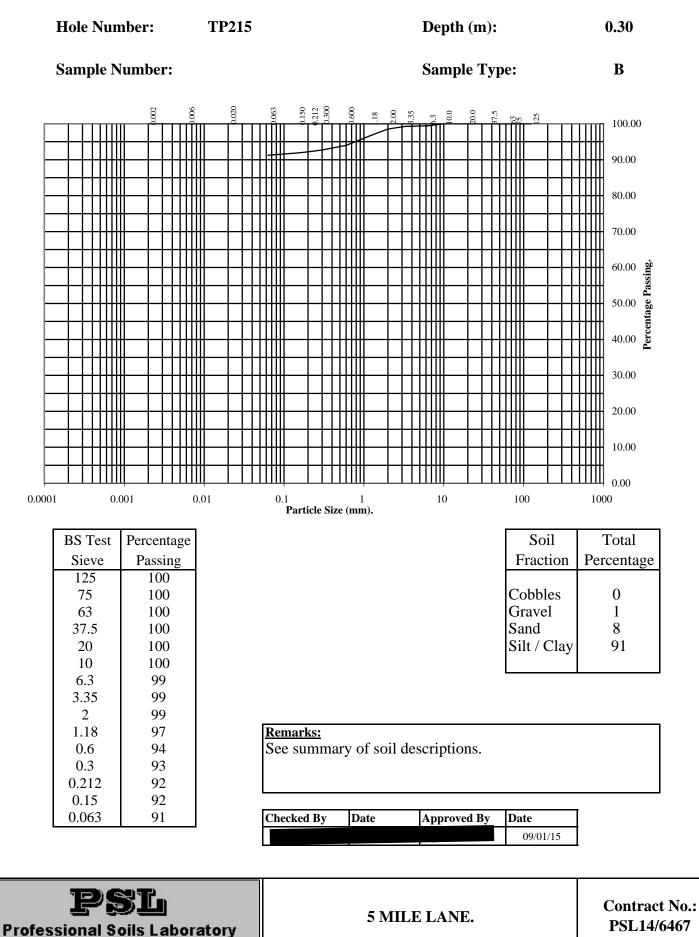


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**5 MILE LANE.** 

BS1377 : Part 2 : 1990

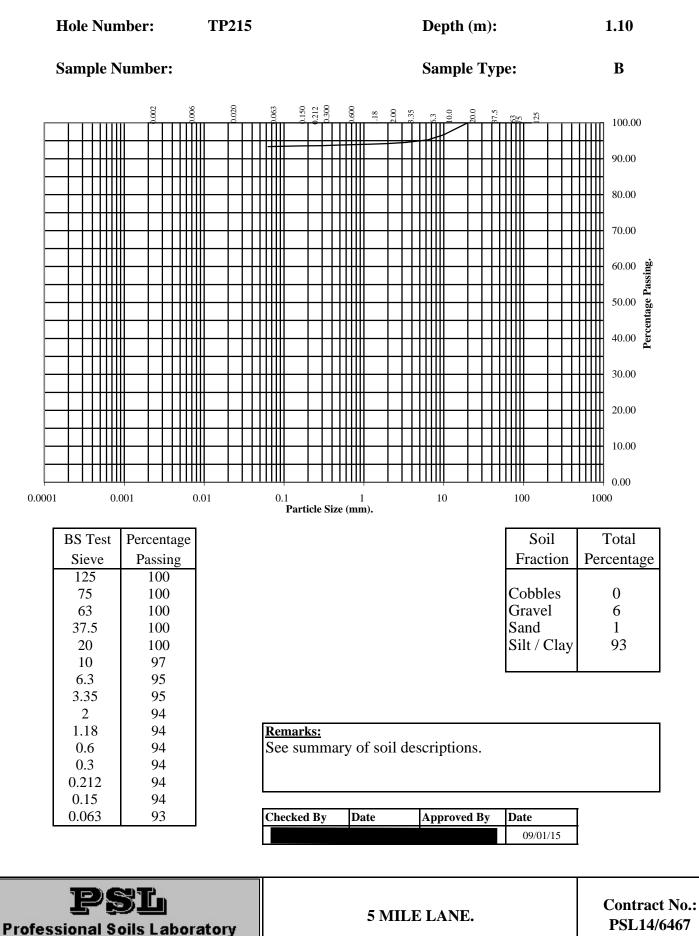
Wet Sieve, Clause 9.2



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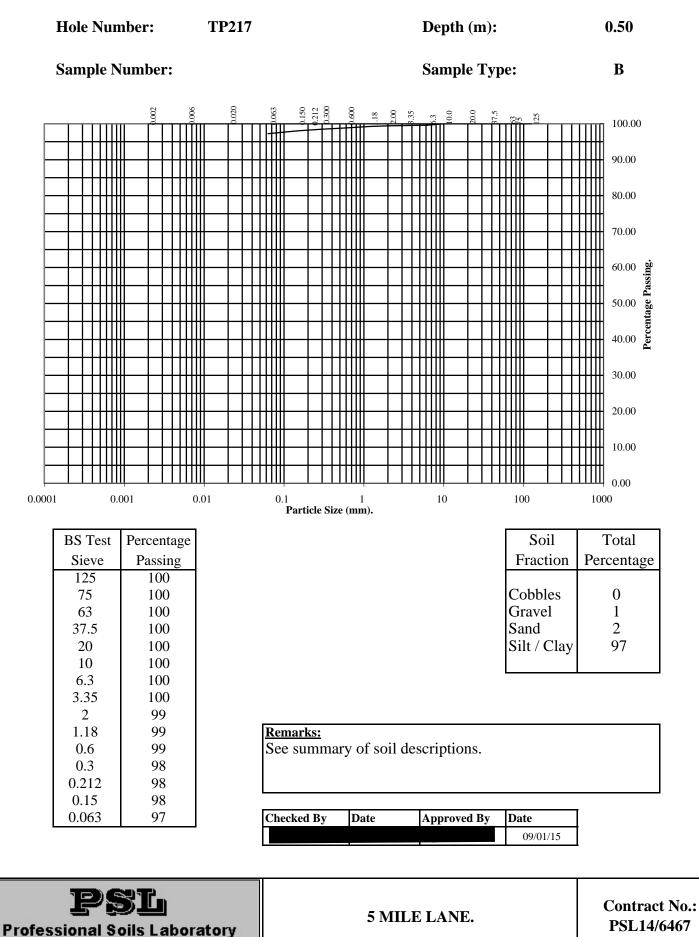
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Wet Sieve, Clause 9.2

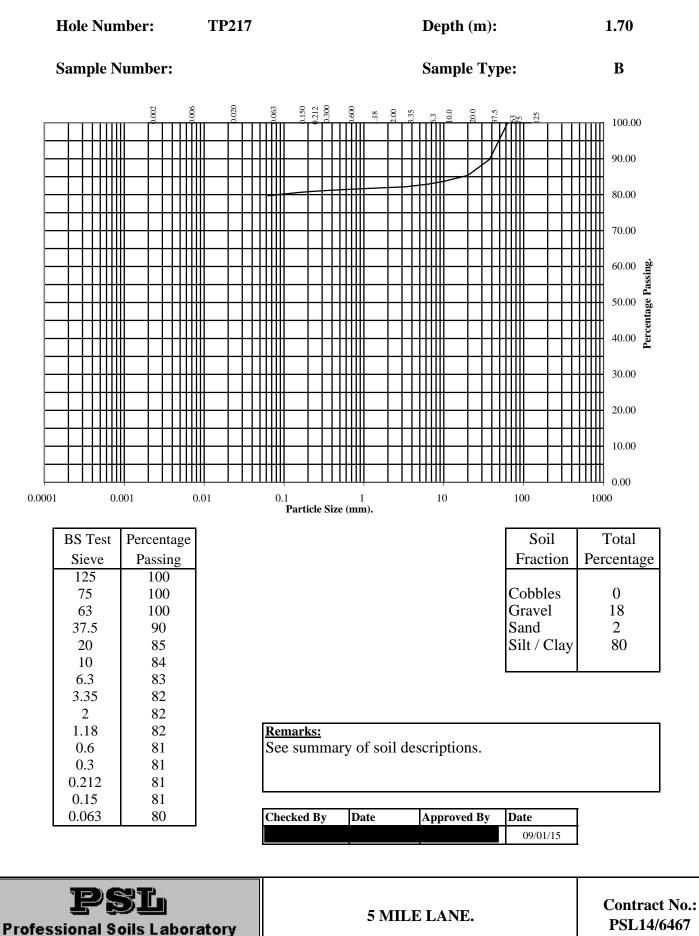


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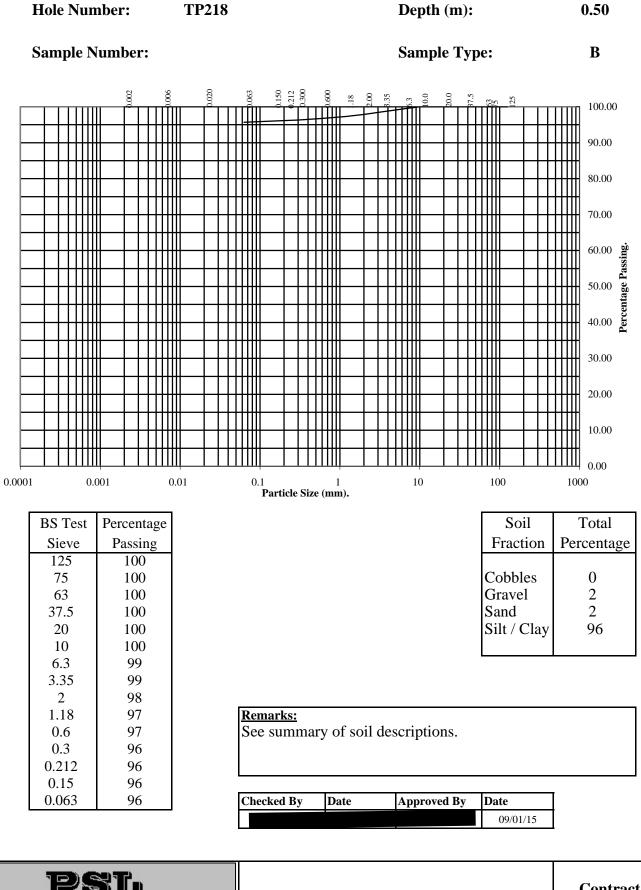


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BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

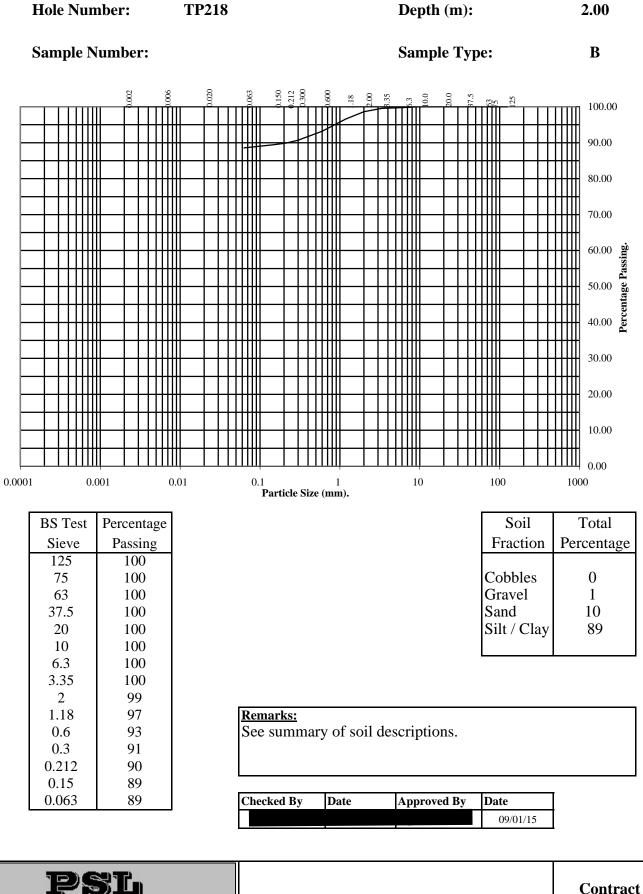


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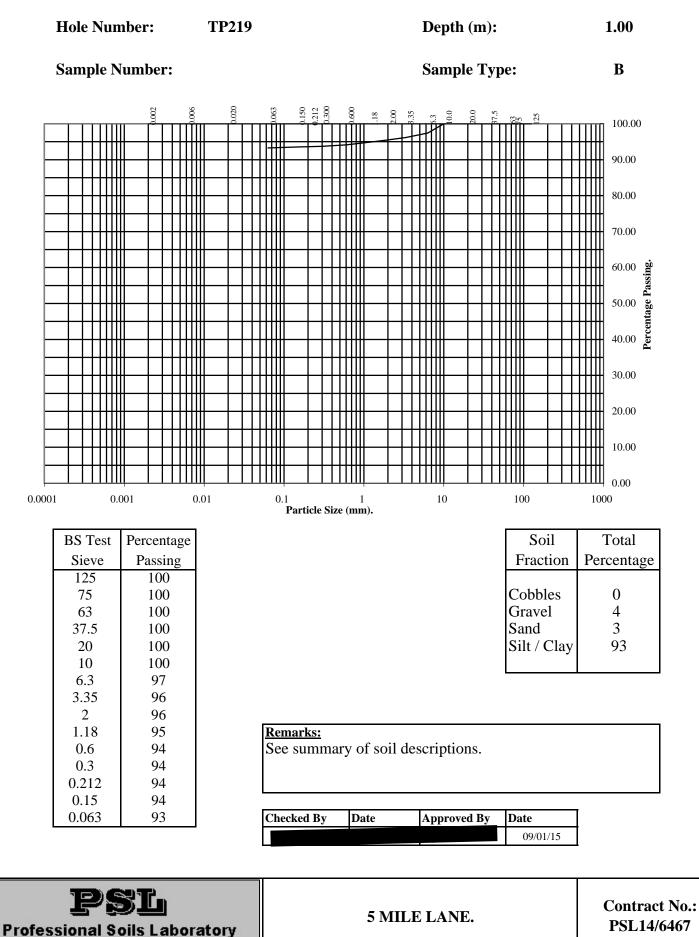
Wet Sieve, Clause 9.2



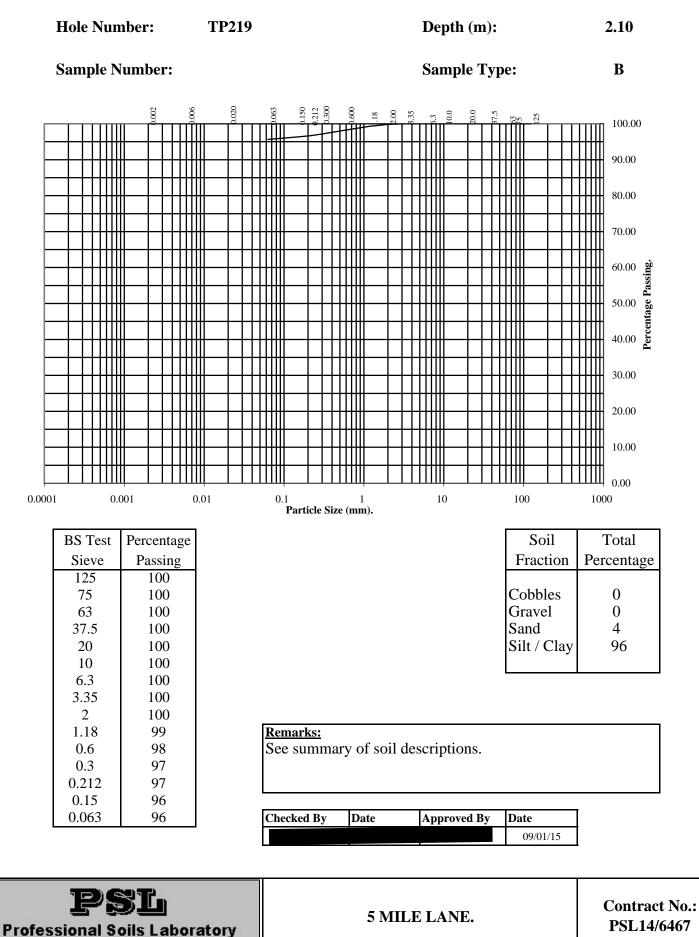
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#### 5 MILE LANE.

BS1377 : Part 2 : 1990



BS1377 : Part 2 : 1990



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

Hole Number: Depth (m) : **TP217** 0.50 Sample Number: Sample Type: B 1.34 Sample 0 % Air voids -5 % Air voids - 10 % Air voids 1.32 1.30 1.28 Dry Density (Mg/m3) 1.26 1.24 1.22 1.20 1.18 30 32 34 40 28 36 38 42

Moisture Content (%)

Initial Moisture Content: 38		Method of Con	npaction	2.5kg / Separate Sample		
Particle Density (Mg/m3):	2.63	Assumed	Material Retained on 37.5 mm Test Sieve (%):			
Maximum Dry Density (Mg/m3)	):	1.33	Material Retained on 20.0 mm Test Sieve (%):			
Optimum Moisture Content (%)		35				
Remarks See S	Summary of Soil	Descriptions.				

	Checked By	Date	Approved By	Date
				09/01/15
<b>PSL</b> Professional Soils Laboratory	5 MILE LANE.		Contra PSL14	

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

Hole Number: Depth (m) : **TP217** 1.70 Sample Number: Sample Type: B 1.52 Sample 0 % Air voids -5 % Air voids 1.50 - 10 % Air voids 1.48 1.46 Dry Density (Mg/m3) 1.44 1.42 1.40 1.38 1.36 1.34 1.32 22 24 28 32 20 26 30 34

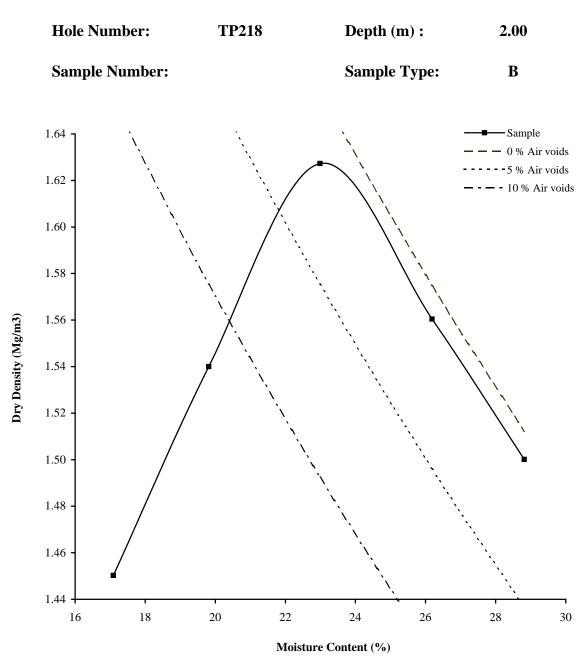
Moisture Content (%)

Initial Moisture Content:	31	Method of Con	npaction 2.5kg / Separate Sample		
Particle Density (Mg/m3):	2.67	Assumed	Material Retained on 37.5 mm Test Sieve (%):		10
Maximum Dry Density (Mg/m3)	):	1.50	Material Retained on 20.0 mm Test Sieve (%):		5
Optimum Moisture Content (%):		27			
Remarks See S	Summary of Soil	Descriptions.			

	Checked By	Date	Approved By	Date
				09/01/15
<b>PSL</b> Professional Soils Laboratory	5 MILE LANE.		Contra PSL14	

## **Dry Density/Moisture Content Relationship Test**

BS 1377 : Part 4 : 1990



Method of Compaction Initial Moisture Content: 23 2.5kg / Separate Sample Particle Density (Mg/m3): 2.68 Assumed Material Retained on 37.5 mm Test Sieve (%): 0 Maximum Dry Density (Mg/m3): 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>PSL</b> Professional Soils Laboratory	5 MILE LANE.		Contra PSL14	

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

Hole Number: Depth (m) : **TP219** 1.00 Sample Number: Sample Type: B 1.52 Sample 0 % Air voids 5 % Air voids 10 % Air voids 1.50 1.48 1.46 Dry Density (Mg/m3) 1.44 1.42 1.40 1.38 1.36 18 20 22 24 30 26 28 32

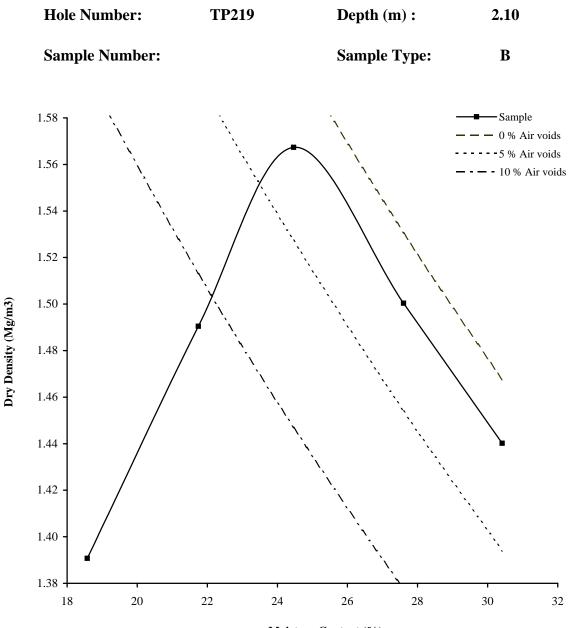
Moisture Content (%)

Initial Moisture Content:	29	Method of Con	npaction 2.5kg / Separate Sample		
Particle Density (Mg/m3):	2.65	Assumed	Material Retained on 37.5 mm Test Sieve (%):		0
Maximum Dry Density (Mg/m3)	):	1.51	Material Retained on 20.0 mm Test Sieve (%):		0
Optimum Moisture Content (%):		26			
Remarks See Summary of Soil Descripti		Descriptions.			

	Checked By	Date	Approved By	Date
				09/01/15
<b>PSL</b> Professional Soils Laboratory	5 MILE LANE.		Contra PSL14	

## **Dry Density/Moisture Content Relationship Test**

BS 1377 : Part 4 : 1990



Moisture Content (%)

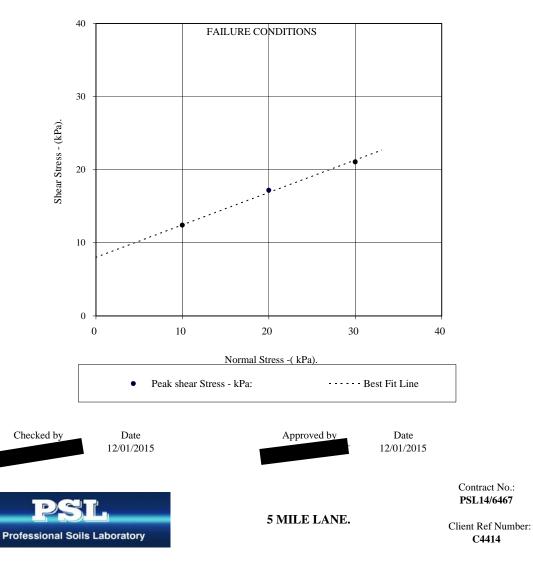
Initial Moisture Content:	24	Method of Compaction		mpaction 2.5kg / Separate Sample	
Particle Density (Mg/m3):	2.65	Assumed	Material Retained on 37.5 mm Test Sieve (%):		0
Maximum Dry Density (Mg/m3)	imum Dry Density (Mg/m3): 1.57 Material Retained on 20.0 mm Test Sieve (%		Retained on 20.0 mm Test Sieve (%):	0	
Optimum Moisture Content (%):		25			
Remarks See Summary of Soil I		Descriptions.			

	Check	cked By	Date	Approved By	Date
					09/01/15
<b>PSL</b> Professional Soils Laboratory	5 MILE LANE.			Contra PSL14	

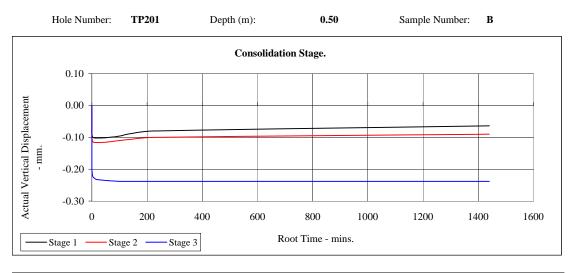
#### CONSOLIDATED DRAINED SHEARBOX TEST.

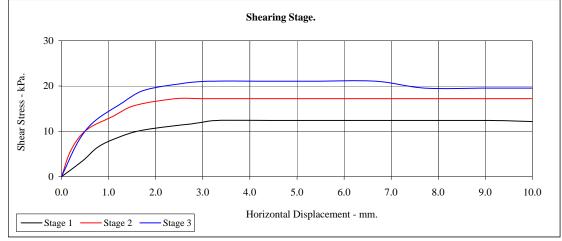
BS1377:Part 7 :1990.

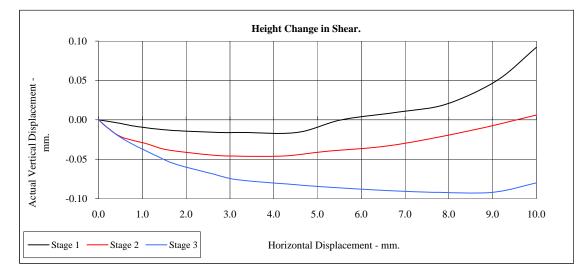
Hole Number: TP201	Depth (m):	0.50	Sample Number:	В
Sample Type:		Recompacted	l with 2.5kg Effort	
Particle Density - Mg/m3:	2	2.65 (Assumed)	)	
Specimen Tested:	Submerged			
	Material tested passi	ng 2mm		
Sample Description:	See summary of soi	l descriptions.		
STAGE		1	2	3
Initial Conditions				
Height - mm:		24.98	24.98	24.98
Length - mm:		60.01	60.01	60.01
Moisture Content - %:		33	33	33
Bulk Density - Mg/m3:		1.86	1.86	1.86
Dry Density - Mg/m3:		1.40	1.40	1.40
Voids Ratio:		0.893	0.893	0.892
Normal Pressure- kPa		10	20	30
Consolidation		·		
Consolidated Height - mm:		24.92	24.89	24.74
Shear				
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 Conditons</b>				
Moisture Content - %:		36	35	35
Bulk Density - Mg/m3:		1.86	5 1.86	1.88
Dry Density - Mg/m3:		1.36	5 1.38	1.39
PEAK				
Angle of Shearing Resistance:(0	)			24.0
Effective Cohesion - kPa:				



#### CONSOLIDATED DRAINED SHEARBOX TEST. BS1377:Part 7:4.5 :1990.







Contract No.: **PSL14/6467** 



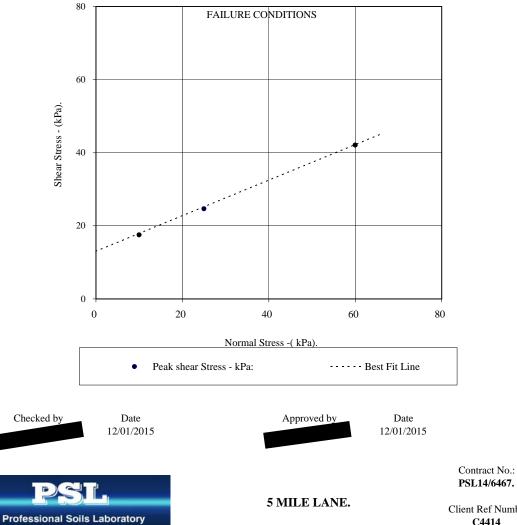
**5 MILE LANE.** 

Client Ref Number: C4414

#### CONSOLIDATED DRAINED SHEARBOX TEST.

BS1377:Part 7 :1990.

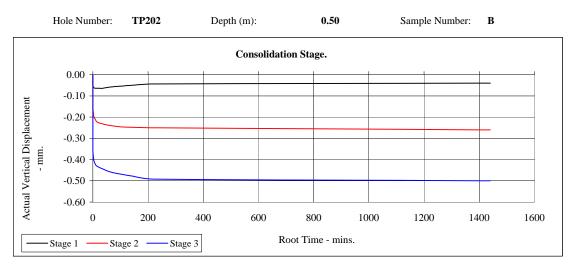
Hole Number:	<b>TP202</b>	Depth (m):	0.50	Sample Number:	В
Sample Type:			Recompact	ed with 2.5kg Effort	
Particle Density - Mg	/m3:	2	.65 (Assume	d)	
Specimen Tested:		Submerged Material tested passir	ng 2mm		
Sample Description:		See summary of soil			
STAGE			1	2	3
Initial Conditions					
Height - mm:			20.1	3 20.13	20.13
Length - mm:			59.9	0 59.90	59.90
Moisture Content - %	:		3	5 35	35
Bulk Density - Mg/m	3:		1.8	4 1.84	1.84
Dry Density - Mg/m3	3:		1.3	6 1.36	1.36
Voids Ratio:			0.95	0.954	0.954
Normal Pressure- kPa	ı		1	0 25	60
Consolidation					
Consolidated Height	- mm:		20.0	9 19.87	19.63
Shear					
Rate of Strain (mm/r	nin)		0.02	0.028	0.028
Strain at peak shear s	tress (%)		2.1	0 2.00	2.80
Peak shear Stress - kl			1	8 25	42
Final Consolidated	Conditons				
Moisture Content - %	:		3	6 36	35
Bulk Density - Mg/m	3:		1.8	34 1.86	1.88
Dry Density - Mg/m3	3:		1.3	35 1.37	1.40
PEAK					
Angle of Shearing Re	esistance:( <del>0)</del>				26.0
Effective Cohesion -	kPa:				13

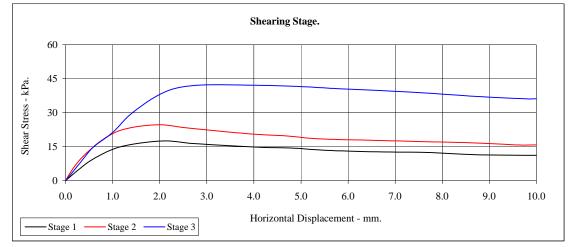


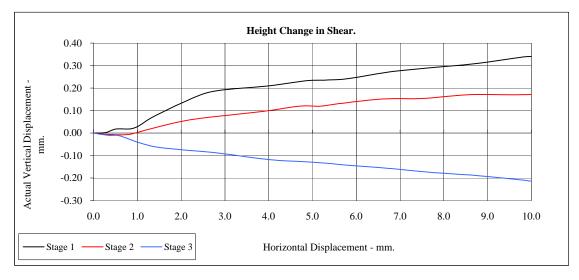
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C4414

#### CONSOLIDATED DRAINED SHEARBOX TEST. BS1377:Part 7:4.5 :1990.









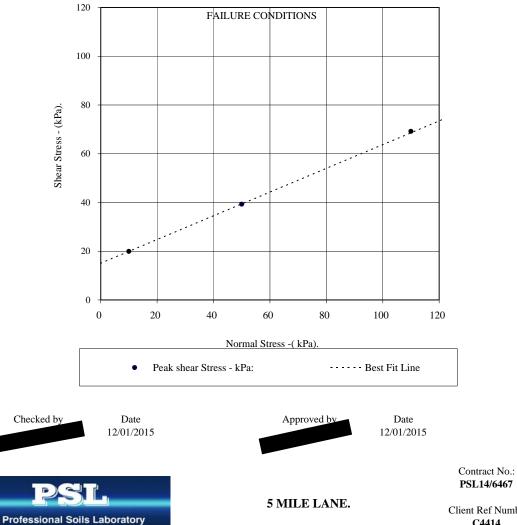


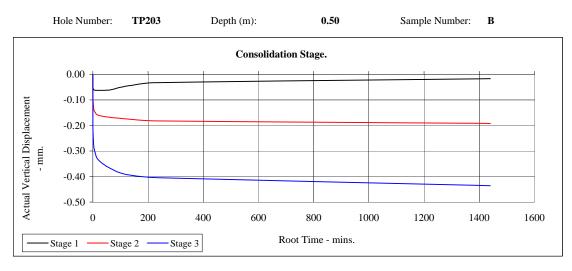
**5 MILE LANE.** 

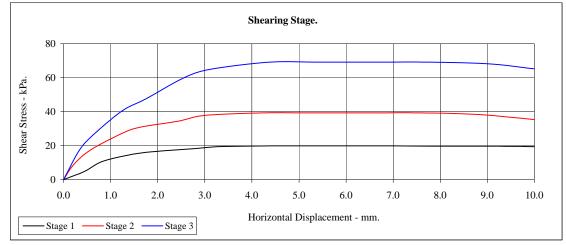
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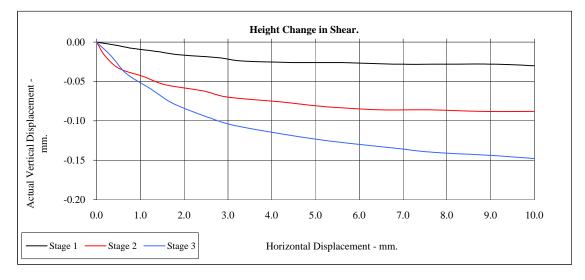
BS1377:Part 7 :1990.

Hole Number:	TP203	Depth (m):	0.50	Sample Number:	В
Sample Type:			Recompacte	ed with 2.5kg Effort	
Particle Density - Mg/m3	3:	2	.65 (Assume	d)	
Specimen Tested:		Submerged Material tested passin	g 2mm		
Sample Description:		See summary of soil	descriptions.		
STAGE			1	2	3
Initial Conditions					
Height - mm:			24.98	8 24.98	24.98
Length - mm:			60.0	1 60.01	60.01
Moisture Content - %:			3.	3 33	33
Bulk Density - Mg/m3:			1.84	4 1.84	1.85
Dry Density - Mg/m3:			1.3	9 1.39	1.40
Voids Ratio:			0.90	0.906	0.899
Normal Pressure- kPa			10	50	110
Consolidation					
Consolidated Height - m	m:		24.90	5 24.79	24.54
Shear					
Rate of Strain (mm/min)	)		0.02	0.027	0.027
Strain at peak shear stres	s (%)		3.30	0 4.20	4.40
Peak shear Stress - kPa:			20	39	69
Final Consolidated Cor	nditons				
Moisture Content - %:			3'	7 34	33
Bulk Density - Mg/m3:			1.8	34 1.86	1.88
Dry Density - Mg/m3:			1.3	34 1.39	1.41
PEAK					
Angle of Shearing Resist	tance:(0)				26.0
Effective Cohesion - kPa	ı:				15









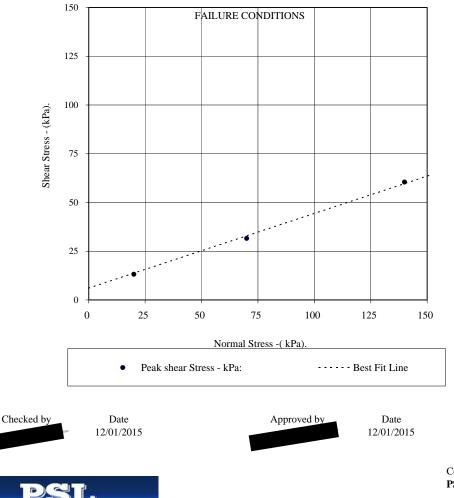
Contract No.: **PSL14/6467** 



**5 MILE LANE.** 

BS1377:Part 7 :1990.

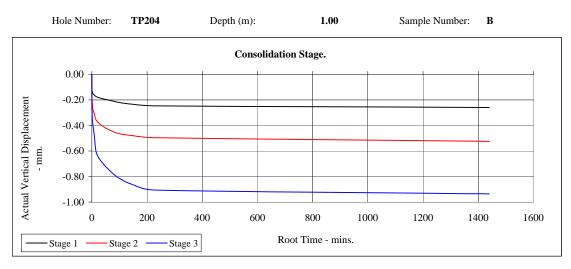
Hole Number:	TP204	Depth (m):	1.00	Sample Number:	В
Sample Type:			Recompacted	d with 2.5kg Effort	
Particle Density - Mg/	m3:	2	.65 (Assumed	)	
Specimen Tested:		Submerged Material tested passin	g 2mm		
Sample Description:		See summary of soil	descriptions.		
STAGE			1	2	3
Initial Conditions					
Height - mm:			20.13	20.13	20.13
Length - mm:			59.90	59.90	59.90
Moisture Content - %:			40	40	40
Bulk Density - Mg/m3	:		1.74	1.74	1.75
Dry Density - Mg/m3:			1.25	1.25	1.25
Voids Ratio:			1.12:	5 1.122	1.119
Normal Pressure- kPa			20	70	140
Consolidation			·	•	
Consolidated Height -	mm:		19.87	19.61	19.19
Shear					
Rate of Strain (mm/m	in)		0.020	6 0.026	0.026
Strain at peak shear str	ress (%)		4.50	7.60	10.00
Peak shear Stress - kPa	a:		13	32	60
Final Consolidated C	onditons				
Moisture Content - %:			40	37	35
Bulk Density - Mg/m3	:		1.70	5 1.79	1.83
Dry Density - Mg/m3:			1.20	5 1.30	1.36
PEAK					
Angle of Shearing Res	istance:(0)				21.0
Effective Cohesion - k	Pa:				6

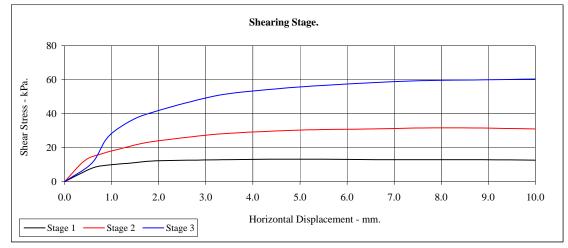


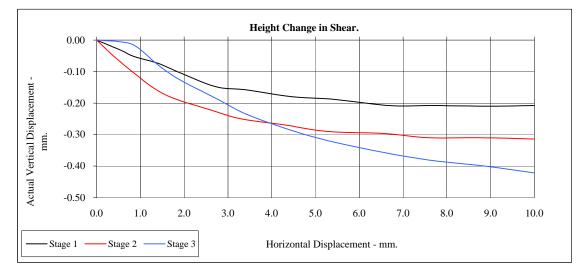
**Professional Soils Laboratory** 

5 MILE LANE.

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







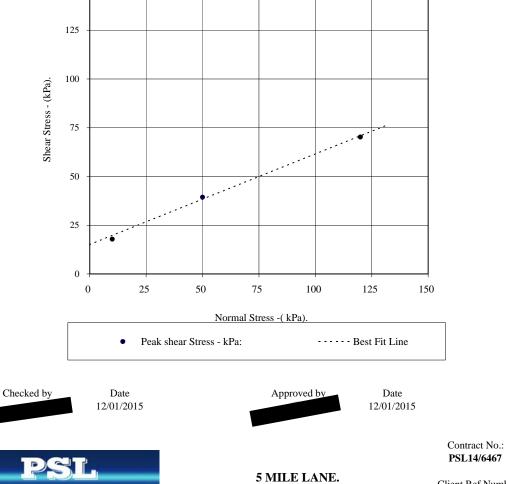
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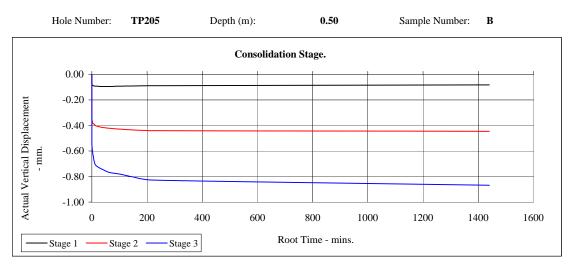
**5 MILE LANE.** 

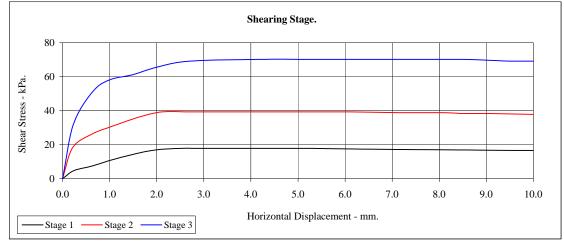
BS1377:Part 7 :1990.

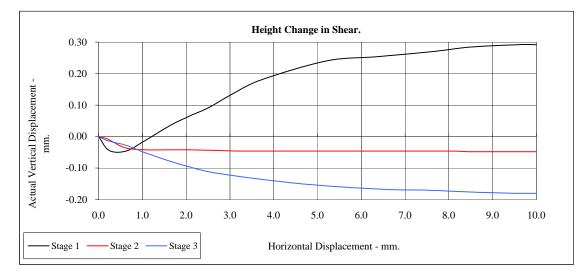
Hole Number: TP205	Depth (m):	0.50	Sample Number:	В
Sample Type:		Recompacted	with 2.5kg Effort	
Particle Density - Mg/m3:	2.65	(Assumed)		
Specimen Tested:	Submerged Material tested passing 2m			
Sample Description:	See summary of soil desc	riptions.		
STAGE		1	2	3
Initial Conditions				
Height - mm:		24.98	24.98	24.98
Length - mm:		60.01	60.01	60.01
Moisture Content - %:		32	32	32
Bulk Density - Mg/m3:		1.83	1.84	1.84
Dry Density - Mg/m3:		1.39	1.40	1.40
Voids Ratio:		0.904	0.899	0.895
Normal Pressure- kPa		10	50	120
Consolidation				
Consolidated Height - mm:		24.90	24.53	24.11
Shear				
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
Final Consolidated Conditons				
Moisture Content - %:		37	34	32
Bulk Density - Mg/m3:		1.84	1.87	1.91
Dry Density - Mg/m3:		1.34	1.39	1.44
PEAK				
Angle of Shearing Resistance:(0)				25.0
Effective Cohesion - kPa:				15



**Professional Soils Laboratory** 







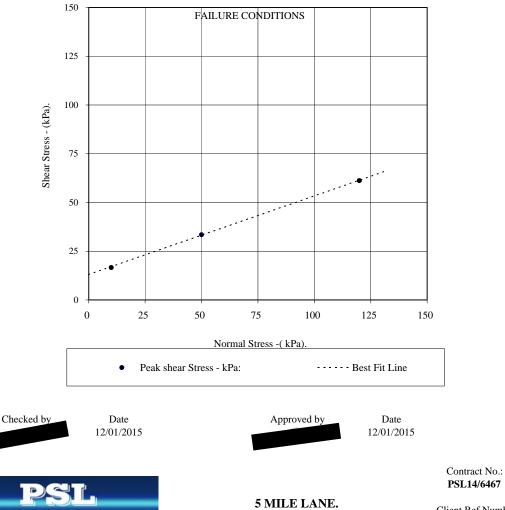
Contract No.: **PSL14/6467** 



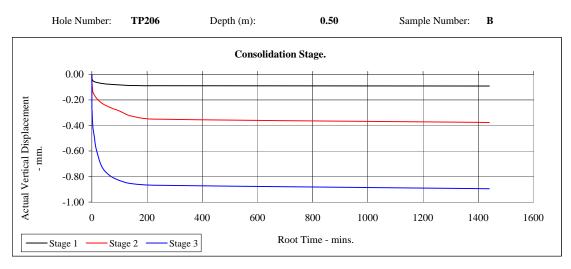
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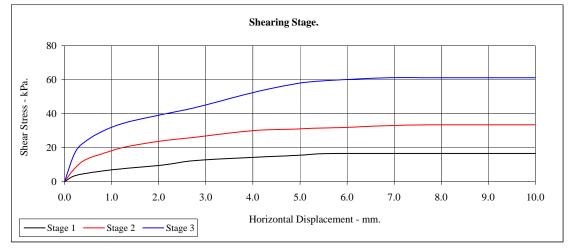
BS1377:Part 7 :1990.

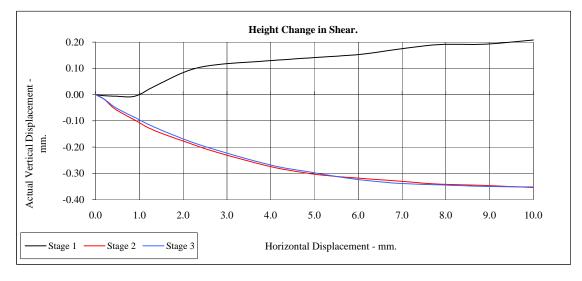
Hole Number:	TP206	Depth (m):	0.50	Sample Number:	В
Sample Type:			Recompacte	d with 2.5kg Effort	
Particle Density - Mg	g/m3:	2	.65 (Assumed	l)	
Specimen Tested:		Submerged Material tested passin	ng 2mm		
Sample Description:		See summary of soil	descriptions.		
STAGE			1	2	3
Initial Conditions					
Height - mm:			24.98	3 24.98	24.98
Length - mm:			60.01	60.01	60.01
Moisture Content - %	:		39	39	39
Bulk Density - Mg/m	13:		1.78	1.78	1.78
Dry Density - Mg/m3	3:		1.28	1.29	1.28
Voids Ratio:			1.06	6 1.062	1.063
Normal Pressure- kPa	a		10	50	120
Consolidation					
Consolidated Height	- mm:		24.89	24.60	24.08
Shear					
Rate of Strain (mm/n	nin)		0.03	1 0.031	0.031
Strain at peak shear s	tress (%)		6.10	7.80	6.90
Peak shear Stress - kl	Pa:		17	33	61
Final Consolidated	Conditons				
Moisture Content - %	:		43	42	40
Bulk Density - Mg/m	13:		1.7	8 1.81	1.85
Dry Density - Mg/m3	3:		1.2	5 1.27	1.32
PEAK				•	
Angle of Shearing Re	esistance:(0)				22.0
Effective Cohesion -	kPa:				13



**Professional Soils Laboratory** 







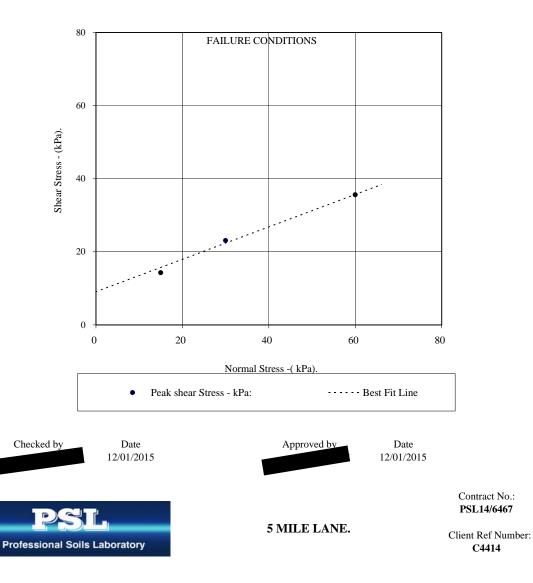
Contract No.: **PSL14/6467** 

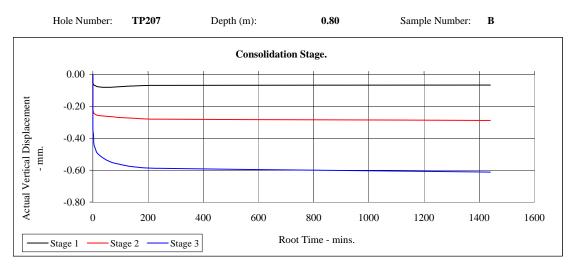


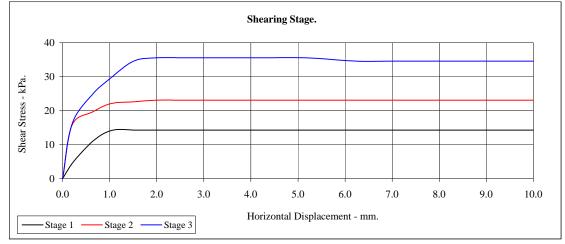
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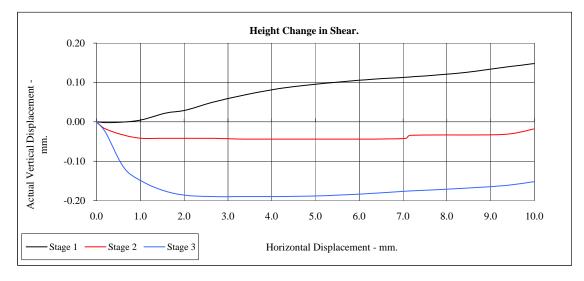
BS1377:Part 7 :1990.

Hole Number:	<b>TP207</b>	Depth (m):	0.80	Sample Number:	В
Sample Type:			Recompacted	with 2.5kg Effort	
Particle Density - M	g/m3:	2.65	(Assumed)		
Specimen Tested:		Submerged Material tested passing 2n	nm		
Sample Description:		See summary of soil dese			
STAGE			1	2	3
Initial Conditions					
Height - mm:			24.98	24.98	24.98
Length - mm:			60.01	60.01	60.01
Moisture Content - 9	%:		37	37	37
Bulk Density - Mg/r	n3:		1.82	1.82	1.82
Dry Density - Mg/m	3:		1.33	1.34	1.34
Voids Ratio:			0.989	0.984	0.984
Normal Pressure- kF	Pa		15	30	60
Consolidation					
Consolidated Height	t - mm:		24.91	24.69	24.37
Shear					
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 - k	:Pa:		14	23	36
Final Consolidated	Conditons				
Moisture Content - 9	%:		39	38	38
Bulk Density - Mg/r	n3:		1.83	1.85	1.87
Dry Density - Mg/m	3:		1.31	1.34	1.35
PEAK			•		
Angle of Shearing R	esistance:(0)				24.0
Effective Cohesion -					9









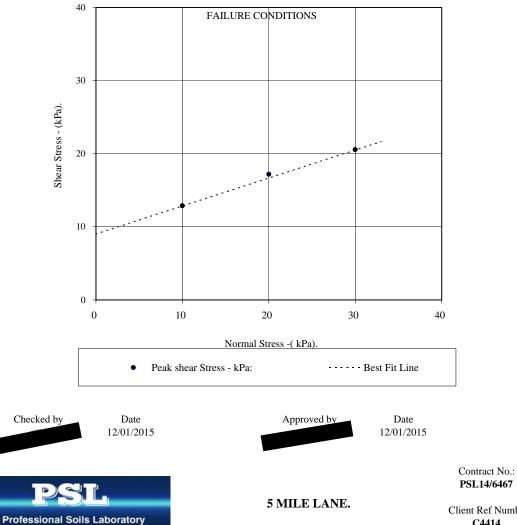
Contract No.: **PSL14/6467** 

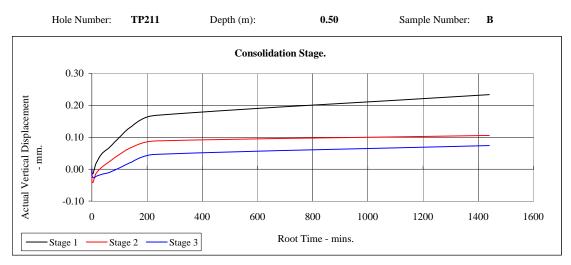


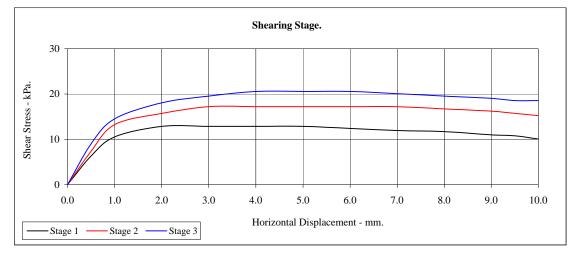
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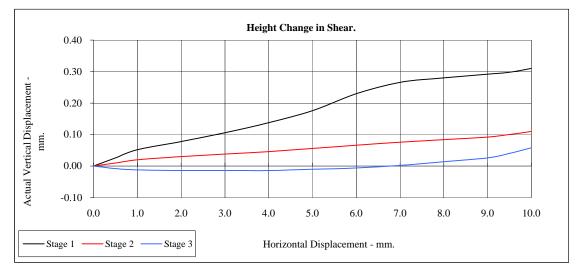
BS1377:Part 7 :1990.

Hole Number:	TP211	Depth (m):	0.50	Sample Number:	В
Sample Type:			Recompacte	ed with 2.5kg Effort	
Particle Density - Mg	/m3:	2	2.65 (Assume	d)	
Specimen Tested:		Submerged Material tested passir	ng 2mm		
Sample Description:		See summary of soil	descriptions.		
STAGE			1	2	3
Initial Conditions					
Height - mm:			24.98	8 24.98	24.98
Length - mm:			60.0	1 60.01	60.01
Moisture Content - %	:		2'	7 27	27
Bulk Density - Mg/m.	3:		1.8	7 1.87	1.87
Dry Density - Mg/m3	:		1.4	7 1.47	1.47
Voids Ratio:			0.80	0.800	0.799
Normal Pressure- kPa			10	20	30
Consolidation					
Consolidated Height -	mm:		25.2	1 25.09	25.05
Shear					
Rate of Strain (mm/n	nin)		0.32	0.320	0.320
Strain at peak shear st	ress (%)		2.00	2.00	4.00
Peak shear Stress - kP	'a:		13	3 17	21
Final Consolidated (	Conditons				
Moisture Content - %	:		3.	3 32	31
Bulk Density - Mg/m	3:		1.8	35 1.86	1.87
Dry Density - Mg/m3	:		1.4	1.41	1.42
PEAK					
Angle of Shearing Re	sistance:(0)				21.0
Effective Cohesion - I	«Pa:				9









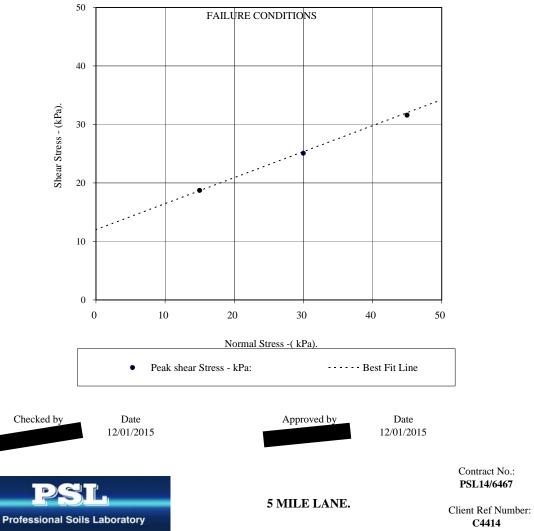
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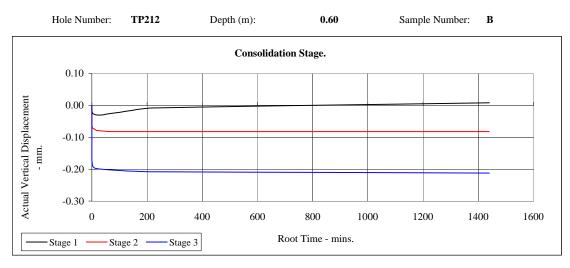


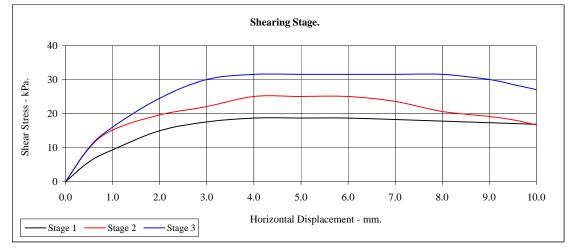
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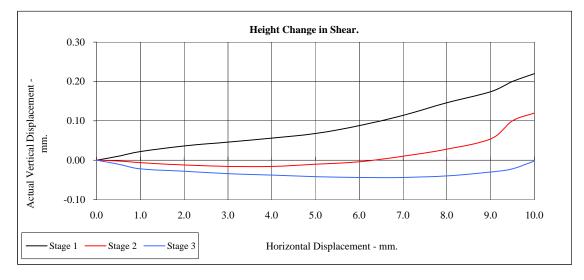
BS1377:Part 7 :1990.

Hole Number:	TP212	Depth (m):	0.60	Sample Number:	В
Sample Type:			Recompacte	ed with 2.5kg Effort	
Particle Density - Mg	/m3:	2	.65 (Assume	d)	
Specimen Tested:		Submerged Material tested passin	g 2mm		
Sample Description:		See summary of soil	descriptions.		
STAGE			1	2	3
Initial Conditions					
Height - mm:			24.98	8 24.98	24.98
Length - mm:			60.0	1 60.01	60.01
Moisture Content - %	:		32	2 32	32
Bulk Density - Mg/m	3:		1.8.	3 1.84	1.84
Dry Density - Mg/m3	3:		1.3	9 1.39	1.40
Voids Ratio:			0.90	0.903	0.899
Normal Pressure- kPa	a		1:	5 30	45
Consolidation			•		
Consolidated Height	- mm:		24.9	9 24.90	24.77
Shear					
Rate of Strain (mm/r	nin)		0.02	0.029	0.029
Strain at peak shear s	tress (%)		4.00	0 4.00	4.00
Peak shear Stress - kI	Pa:		19	9 25	32
Final Consolidated	Conditons				
Moisture Content - %	:		34	4 33	32
Bulk Density - Mg/m	3:		1.8	33 1.84	1.85
Dry Density - Mg/m3	3:		1.3	1.39	1.40
PEAK					
Angle of Shearing Re	esistance:(0)				24.0
Effective Cohesion -	kPa:				12









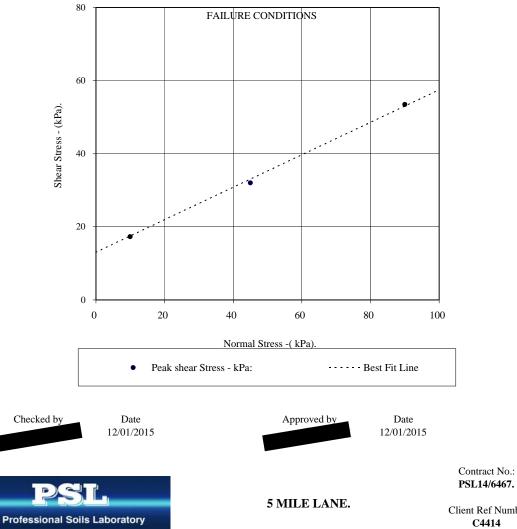
Contract No.: **PSL14/6467** 

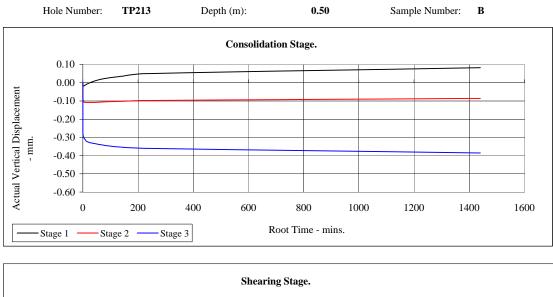


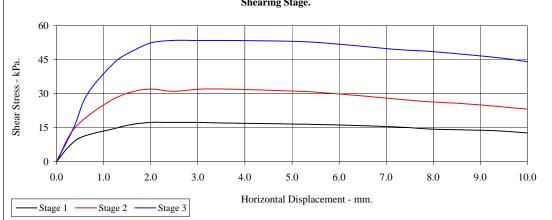
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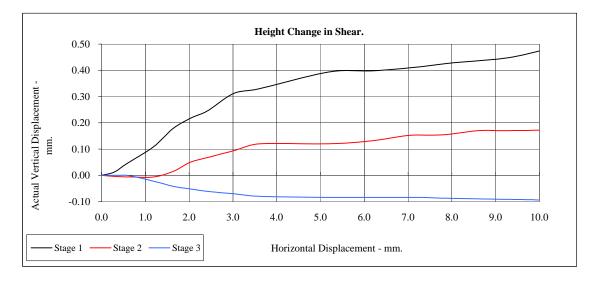
BS1377:Part 7 :1990.

Hole Number:	FP213	Depth (m):	0.50	Sample Number:	В
Sample Type:			Recompacte	ed with 2.5kg Effort	
Particle Density - Mg/m3	:	2	.65 (Assume	d)	
Specimen Tested:		Submerged Material tested passin	g 2mm		
Sample Description:		See summary of soil	0		
STAGE			1	2	3
Initial Conditions					
Height - mm:			20.1	3 20.13	20.13
Length - mm:			59.9	0 59.90	59.90
Moisture Content - %:			2:	5 25	25
Bulk Density - Mg/m3:			1.8	8 1.88	1.89
Dry Density - Mg/m3:			1.5	0 1.50	1.51
Voids Ratio:			0.76	64 0.762	0.759
Normal Pressure- kPa			1	0 45	90
Consolidation			·		
Consolidated Height - mr	n:		20.2	1 20.04	19.74
Shear					
Rate of Strain (mm/min)			0.03	0.034	0.034
Strain at peak shear stress	(%)		2.0	0 2.00	2.50
Peak shear Stress - kPa:			1'	7 32	53
Final Consolidated Con	ditons				
Moisture Content - %:			3	3 31	30
Bulk Density - Mg/m3:			1.8	37 1.89	1.92
Dry Density - Mg/m3:			1.4	41 1.44	1.48
PEAK					
Angle of Shearing Resista	ance:(0)				24.0
Effective Cohesion - kPa:					13









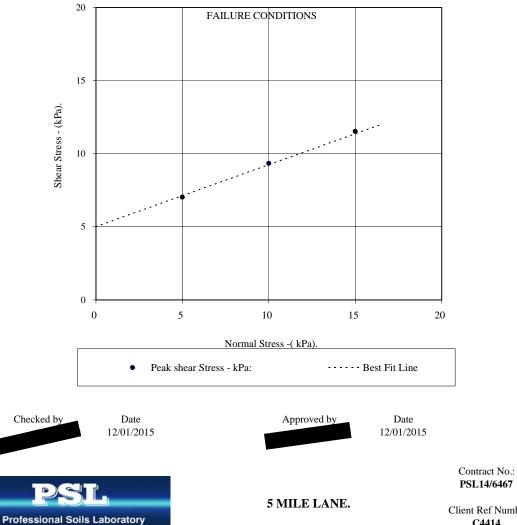
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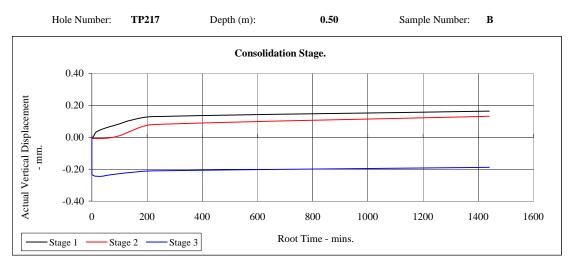


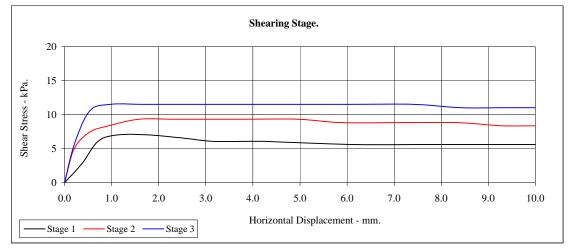
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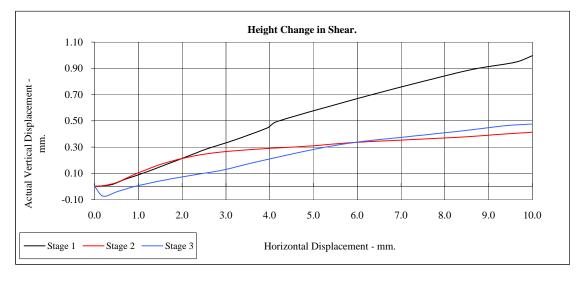
BS1377:Part 7 :1990.

Hole Number:	TP217	Depth (m):	0.50	Sample Number:	В
Sample Type:			Recompacted	d with 2.5kg Effort	
Particle Density - Mg	/m3:	2.65	(Assumed)	)	
Specimen Tested:		Submerged			
		Material tested passing 2m	m		
Sample Description:		See summary of soil desc	riptions.		
STAGE			1	2	3
Initial Conditions		· · · · · · · · · · · · · · · · · · ·			
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	3:		1.85	1.86	1.86
Dry Density - Mg/m3	3:		1.38	1.39	1.39
Voids Ratio:			0.918	3 0.910	0.907
Normal Pressure- kP	a		5	10	15
Consolidation				· · ·	
Consolidated Height	- mm:		25.14	25.11	24.79
Shear					
Rate of Strain (mm/n	nin)		0.025	0.025	0.025
Strain at peak shear s	tress (%)		1.10	1.60	1.00
Peak shear Stress - k	Pa:		7	9	12
Final Consolidated	Conditons				
Moisture Content - %	:		38	37	35
Bulk Density - Mg/m	3:		1.84	1.85	1.88
Dry Density - Mg/m3	3:		1.34	1.35	1.39
PEAK		· · · · · · · · · · · · · · · · · · ·			
Angle of Shearing Re	esistance:(0)				23.0
Effective Cohesion -	kPa:				5









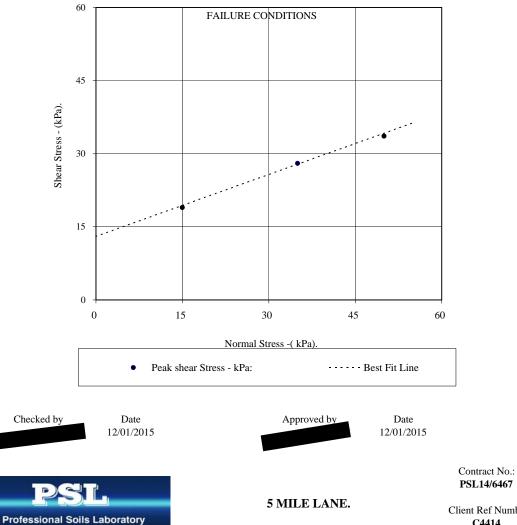
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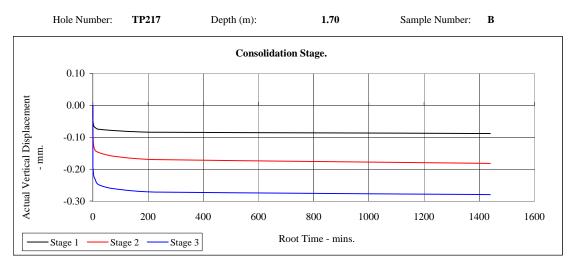


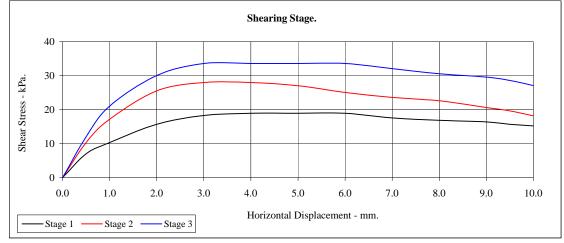
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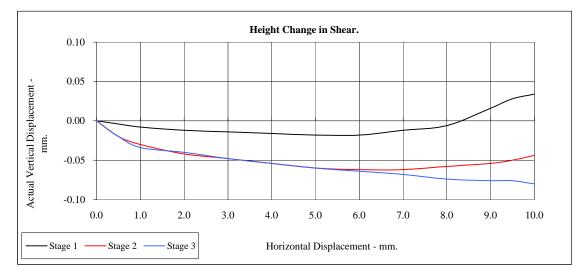
BS1377:Part 7 :1990.

Hole Number:	TP217	Depth (m):	1.70	Sample Number:	В
Sample Type:			Recompacte	ed with 2.5kg Effort	
Particle Density - Mg/r	n3:	2.	65 (Assumed	1)	
Specimen Tested:		Submerged			
		Material tested passing	g 2mm		
Sample Description:		See summary of soil	descriptions.		
STAGE			1	2	3
Initial Conditions					
Height - mm:			24.98	3 24.98	24.98
Length - mm:			60.0	60.01	60.01
Moisture Content - %:			33	3 33	33
Bulk Density - Mg/m3:			1.83	3 1.83	1.83
Dry Density - Mg/m3:			1.38	3 1.38	1.38
Voids Ratio:			0.92	5 0.924	0.924
Normal Pressure- kPa			1.	5 35	50
Consolidation			·		
Consolidated Height - 1	nm:		24.89	24.80	24.70
Shear					
Rate of Strain (mm/mi	n)		0.03	2 0.032	0.032
Strain at peak shear stre	ess (%)		4.00	3.00	3.00
Peak shear Stress - kPa	:		19	28	34
Final Consolidated Co	onditons				
Moisture Content - %:			34	4 32	31
Bulk Density - Mg/m3:			1.8	4 1.85	1.85
Dry Density - Mg/m3:			1.3	1.40	1.41
PEAK					
Angle of Shearing Resi	stance:(0)				23.0
Effective Cohesion - kl	Pa:				13









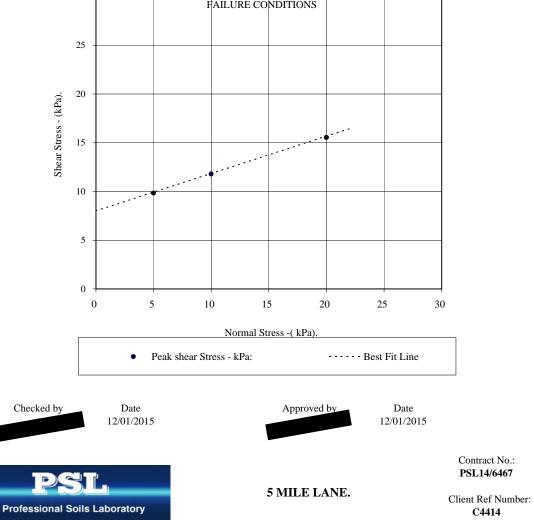
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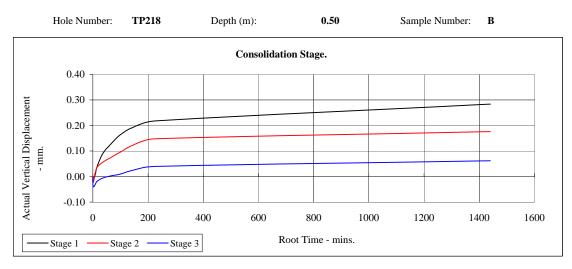


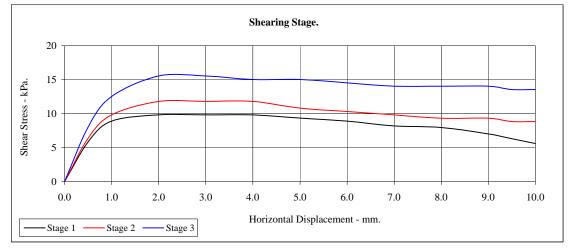
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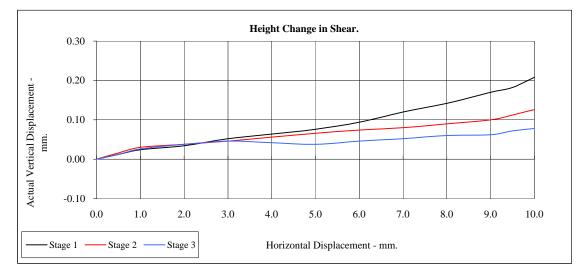
BS1377:Part 7 :1990.

Hole Number:	TP218	Depth (m):	0.50	Sample Number:	В
Sample Type:			Recompacted	with 2.5kg Effort	
Particle Density - Mg/	′m3:	2.6	5 (Assumed)		
Specimen Tested:		Submerged Material tested passing	2mm		
Sample Description:		See summary of soil d			
STAGE			1	2	3
Initial Conditions					
Height - mm:			24.98	24.98	24.98
Length - mm:			60.01	60.01	60.01
Moisture Content - %:	:		28	28	28
Bulk Density - Mg/m3	3:		1.77	1.77	1.78
Dry Density - Mg/m3:	:		1.38	1.39	1.39
Voids Ratio:			0.916	0.913	0.910
Normal Pressure- kPa			5	10	20
Consolidation					
Consolidated Height -	mm:		25.26	25.16	25.04
Shear					
Rate of Strain (mm/m	nin)		0.032	0.032	0.032
Strain at peak shear st			2.00	2.00	2.00
Peak shear Stress - kP	a:		10	12	16
Final Consolidated C					
Moisture Content - %:			32	31	31
Bulk Density - Mg/m2			1.75	1.76	1.77
Dry Density - Mg/m3	:		1.33	1.35	1.35
PEAK					
Angle of Shearing Res					21.0
Effective Cohesion - k	xPa:				8
30		FAILURE CO	NDITIONS		









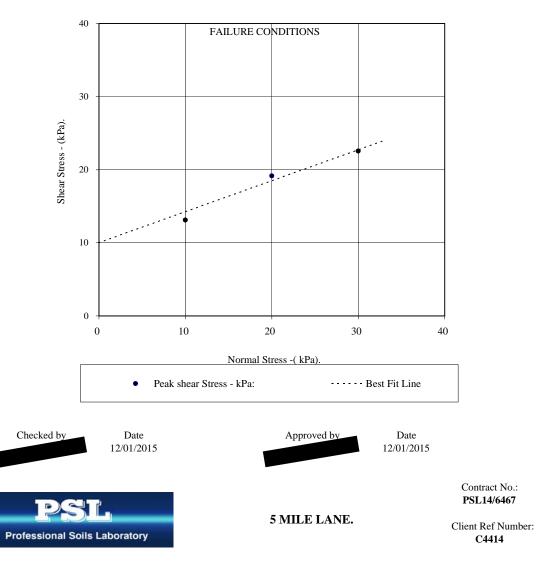
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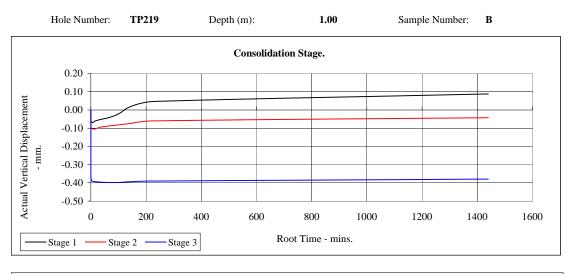


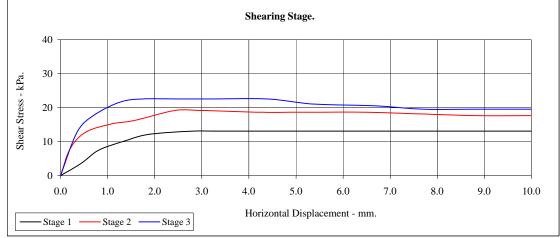
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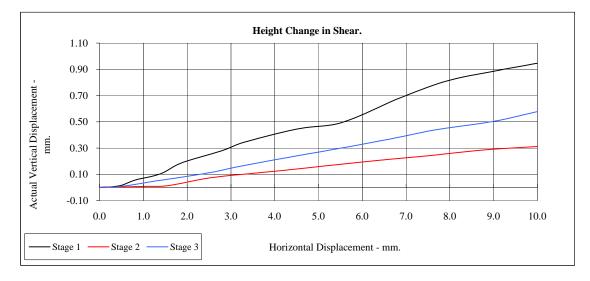
BS1377:Part 7 :1990.

Hole Number: TP219	Depth (m):	1.00	Sample Number:	В
Sample Type:		Recompacted	with 2.5kg Effort	
Particle Density - Mg/m3:	2	2.65 (Assumed)		
Specimen Tested:	Submerged			
	Material tested passir	ng 2mm		
Sample Description:	See summary of soil	descriptions.		
STAGE		1	2	3
Initial Conditions				
Height - mm:		24.98	24.98	24.98
Length - mm:		60.01	60.01	60.01
Moisture Content - %:		31	31	31
Bulk Density - Mg/m3:		1.86	1.86	1.86
Dry Density - Mg/m3:		1.42	1.42	1.42
Voids Ratio:		0.867	0.866	0.865
Normal Pressure- kPa		10	20	30
Consolidation				
Consolidated Height - mm:		25.07	24.94	24.60
Shear				
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
Final Consolidated Conditons				
Moisture Content - %:		35	33	32
Bulk Density - Mg/m3:		1.85	1.86	1.89
Dry Density - Mg/m3:		1.37	1.40	1.43
PEAK				
Angle of Shearing Resistance:(0)				23.0
Effective Cohesion - kPa:				10









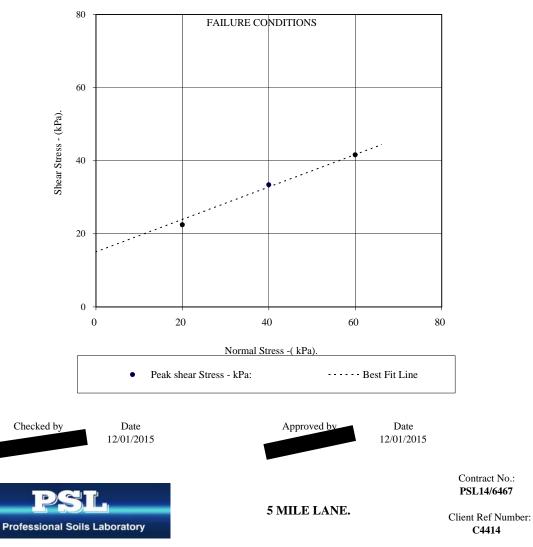
Contract No.: **PSL14/6467** 

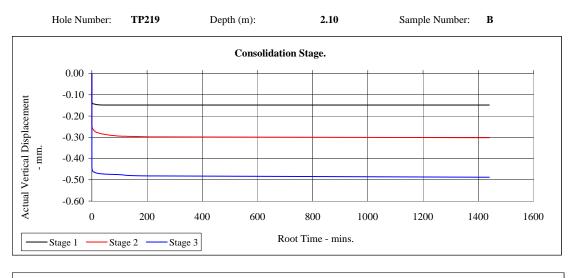


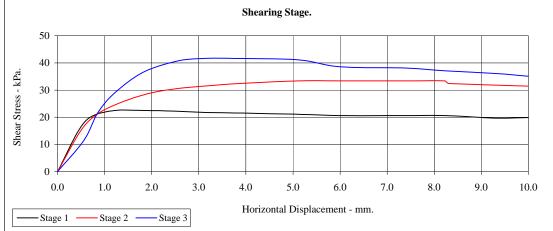
**5 MILE LANE.** 

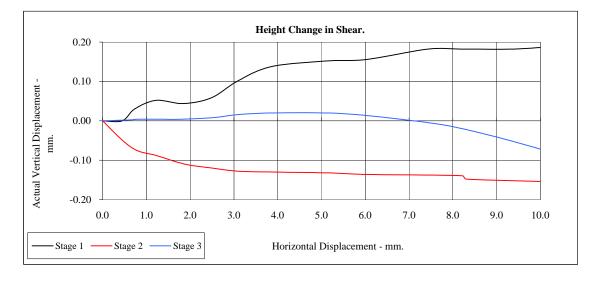
BS1377:Part 7 :1990.

Hole Number: TP219	Depth (m):	2.10	Sample Number:	В
Sample Type:		Recompacted	with 2.5kg Effort	
Particle Density - Mg/m3:	2.65	(Assumed)		
Specimen Tested:	Submerged Material tested passing 2mn	1		
Sample Description:	See summary of soil descri	ptions.		
STAGE		1	2	3
Initial Conditions				
Height - mm:		24.98	24.98	24.98
Length - mm:		60.01	60.01	60.01
Moisture Content - %:		31	31	31
Bulk Density - Mg/m3:		1.86	1.86	1.86
Dry Density - Mg/m3:		1.42	1.42	1.42
Voids Ratio:		0.867	0.866	0.865
Normal Pressure- kPa		20	40	60
Consolidation				
Consolidated Height - mm:		24.83	24.68	24.49
Shear				
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
Final Consolidated Conditons				
Moisture Content - %:		29	29	27
Bulk Density - Mg/m3:		1.87	1.88	1.89
Dry Density - Mg/m3:		1.45	1.46	1.49
PEAK				
Angle of Shearing Resistance:(0)				24.0
Effective Cohesion - kPa:				15





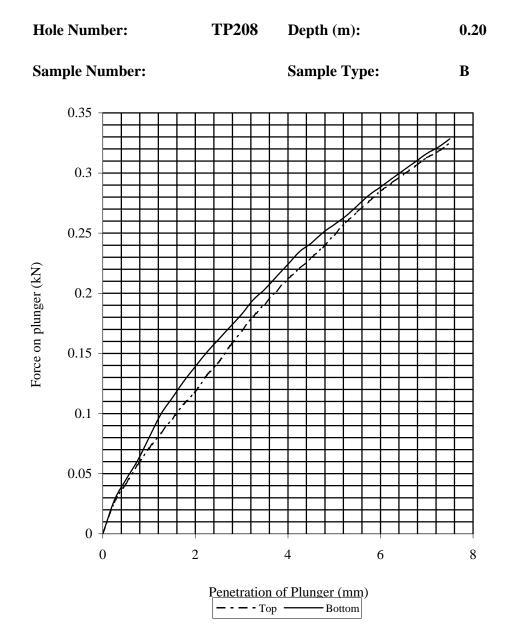




Contract No.: **PSL14/6467** 



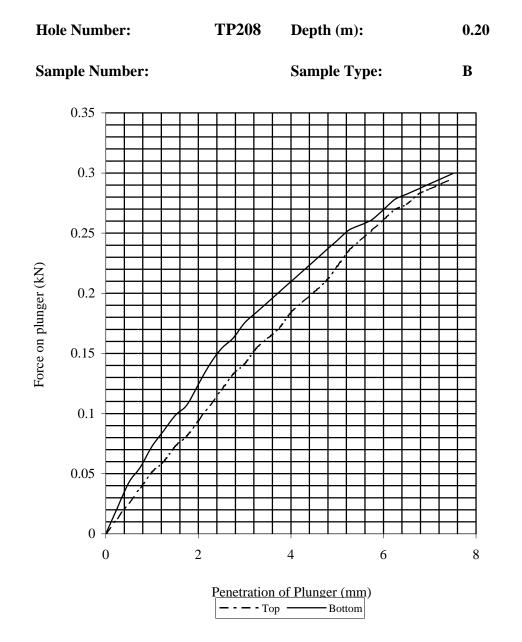
**5 MILE LANE.** 



Initial Sample Condition	ns	Test Conditions		Method of compaction		2.5Kg Rammer	
Moisture Content:	47	Surcharge Kg:	4.00	Final Moisture Content %		ure 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	0	Remarks:	emarks: Brown slightly gravelly slightly sandy CLAY.				
20mm BS test sieve:	0						

Checked by	Date	Approved By	Date
	12/01/15		12/01/15

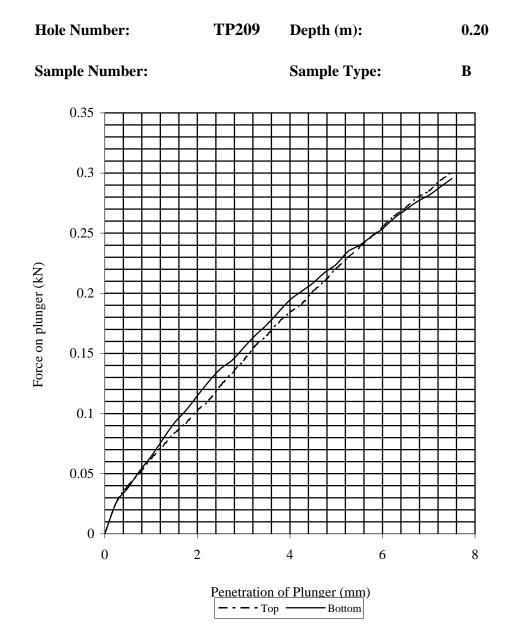
<b>PSL</b> Professional Soils Laboratory	5 MILE LANE.	Contract No. PSL14/6467
---------------------------------------------	--------------	----------------------------



Initial Sample Conditio	ns	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	0	Remarks:	Remarks: Brown slightly gravelly slightly sandy CLAY.				
20mm BS test sieve:	0		Soaked for 96 Hours				

Checked by	Date	Approved By	Date
	12/01/15		12/01/15

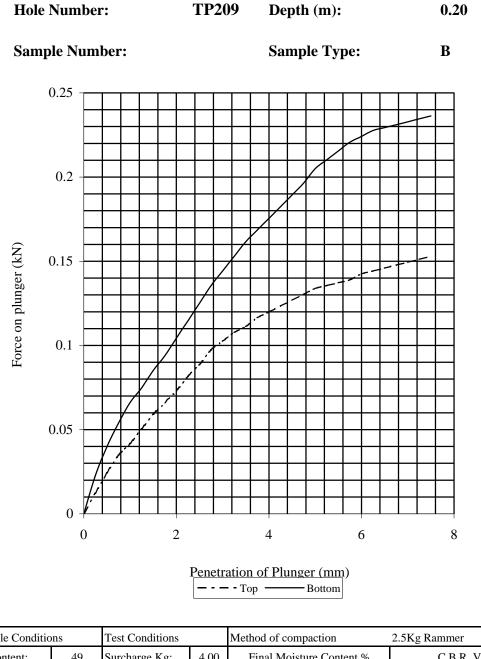
<b>PSL</b> Professional Soils Laboratory	5 MILE LANE.	Contract No. PSL14/6467
---------------------------------------------	--------------	----------------------------



Initial Sample Conditio	ns	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:	1.63	Soaking Time hrs	0	Sample Top	47	Sample Top	1.1
Dry Density Mg/m3:	1.10	Swelling mm:	0	Sample Bottom	48	Sample Bottom	1.1
Percentage retained on	0	Remarks:	emarks: Brown slightly gravelly slightly sandy CLAY.				
20mm BS test sieve:	0						

Checked by	Date	Approved By	Date
	12/01/15		12/01/15

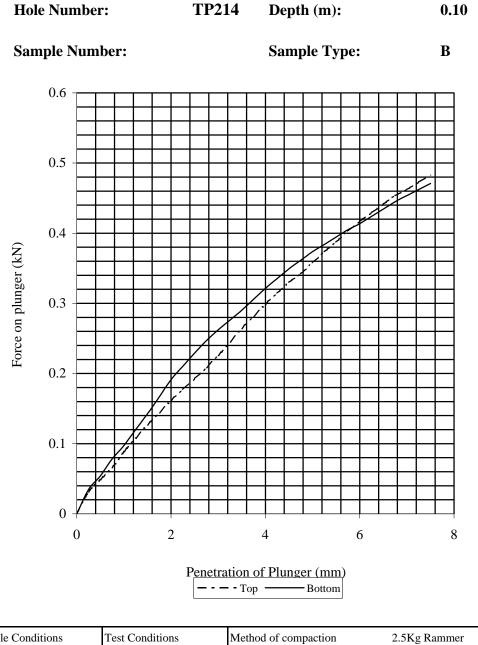
<b>PSL</b> Professional Soils Laboratory	5 MILE LANE.	Contract No. PSL14/6467
---------------------------------------------	--------------	----------------------------



Initial Sample Conditio	ns	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	0	Remarks:	Remarks: Brown slightly gravelly slightly sandy CLAY.				
20mm BS test sieve:	0	Soaked for 96 hours					

Checked by	Date	Approved By	Date
	12/01/15		12/01/15

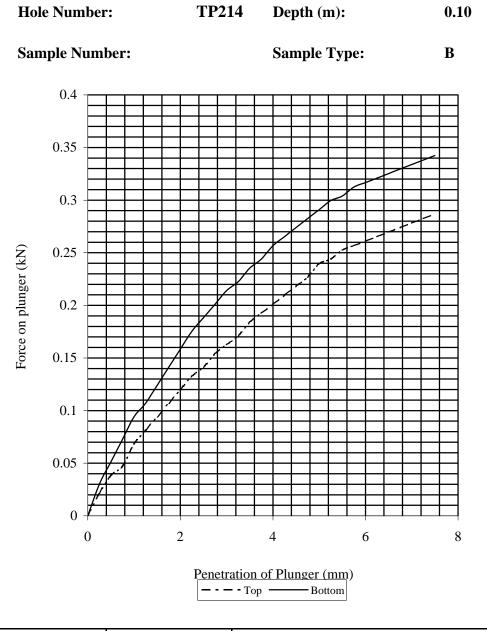
<b>PSL</b> Professional Soils Laboratory	5 MILE LANE.	Contract No. PSL14/6467
---------------------------------------------	--------------	----------------------------



Initial Sample Conditions		Test Conditions		Method of compaction		2.5Kg Rammer	
Moisture Content:	45	Surcharge Kg:	4.00	00 Final Moisture Content %		C.B.R. Value %	
Bulk Density Mg/m3:	1.67	Soaking Time hrs	king Time hrs 0 Sample Top 46 S		Sample Top	1.8	
Dry Density Mg/m3:	1.15	Swelling mm:	ng mm: 0 Sample Bottom 44		Sample Bottom	1.9	
Percentage retained on	0	Remarks:	Brown	slightly gravelly	slightly sandy	CLAY.	
20mm BS test sieve:							

Checked by	Date	Approved By	Date
	12/01/15		12/01/15

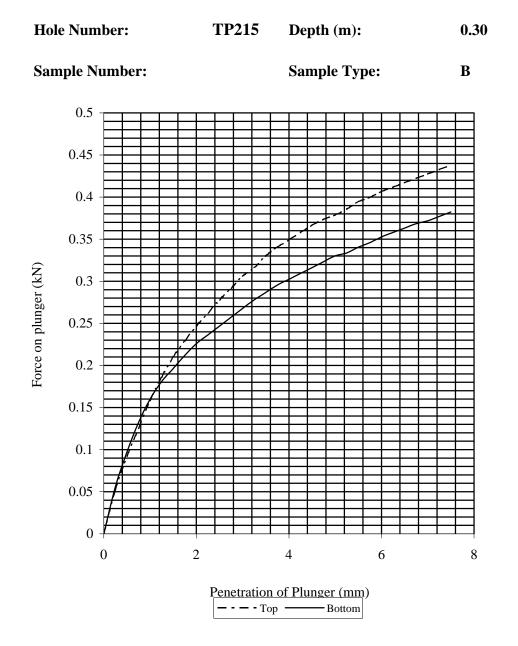
<b>PSL</b> Professional Soils Laboratory	5 MILE LANE.	Contract No. PSL14/6467
---------------------------------------------	--------------	----------------------------



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	aking Time hrs 0 Sample Top 47 S		Sample Top	1.2	
Dry Density Mg/m3:	1.13	Swelling mm:	0 Sample Bottom 47 S		Sample Bottom	1.5	
Percentage retained on	0	Remarks:	Remarks: Brown slightly gravelly slightly sandy CLAY.				
20mm BS test sieve:	0		Soaked for 96 hours				

Checked by	Date	Approved By	Date
	12/01/15		12/01/15

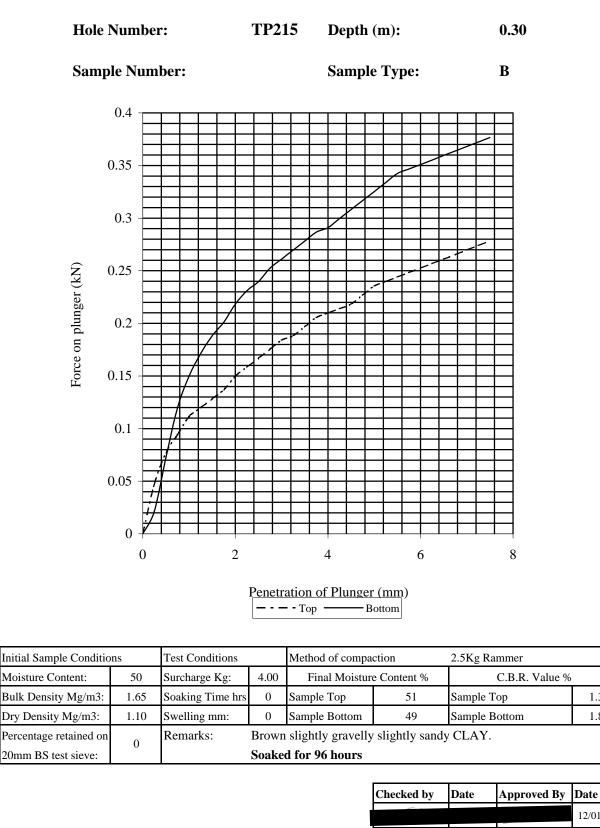
<b>PSL</b> Professional Soils Laboratory	5 MILE LANE.	Contract No. PSL14/6467
---------------------------------------------	--------------	----------------------------



Initial Sample Condition	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.					

Checked by	Date	Approved By	Date
	12/01/15		12/01/15

BS 1377 : Part 4 : 1990



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

1.3

1.8

12/01/15



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

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











Branch Office: Soil Engineering Geoservices Limited, Parkside Lane, Dewsbury Road, Leeds, LS11-55X No. 2727976 Regd. Office: Henderson House, Langley Place, Burscough, Lancashire, L40 8JS. No. 4636339



# **TEST REPORT**



s	Serial number:	LT1495	Date of is	ssue: 02/02/201	.5	Page	e1of9	UKAS TESTING 1265
Issued by	Parkside L Dewsbury		imited,		Authorised signa	atory		7
	Leeds						<u> </u>	
	LS11 5SX.	0113 2711111			M. J. Baldwin		(Technical Dire	
	Tel: Fax:	0113 2711111 0113 2760472			R. J. Rogers S. Kirk		(Principal Engir	
	Email:	enquiries@soil-e	ngineering.co.u	lk	S. K. Sharda	V	(Laboratory Ma (Assistant Labo	nager) ratory Manager)
Customer na	ame	Professional	Soils Laboratory					
Address		5-7 Hexthor	e Road					
		Hexthorpe						
		Doncaster						
		DN4 0AR						
Contract nam	ıe	Five Mile Lar	e					
Your referenc	e	PSL14/6540						
Dates of rece	ipt of samples	09/01/201	5					
Dates of testi		16/01/201	5 to 30/0	1/2015				
	-	e standard named o						
		d by the Laboratory	-	-				
Testing was p	erformed on 6	number of samples	received in good	condition.				
Opinions and	interpretation	s expressed herein a	re outside the sco	ope of our UKAS	accreditation.			
Results repor	ted relate only	to the samples test	ed.					
	'Not UKAS' in summary of te	this report are not i sts.	icluded in the UK	(AS accreditatio	n schedule for ou	r labo	ratory. These re	sults will appear in
Samples will <b>t</b> contrary	be retained for	28 days from date o	f issue of this rep	port and then be	disposed of, unle	ess We	e receive written	instruction to the
			. ▲					
Quality Contro	ol Check perfor	med by		•	S. Kirk (Den	utvla	aboratory Quality	/ Manager)
Louis course					2	,		

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## Key to Laboratory Summary Sheets

Common to all summari				
Sample Type	u	Undisturbed sample	D	Small disturbed sample
	Р	Piston sample	В	Bulk disturbed sample
	TW	Thin walled sample	BLK	Block sample
	L	Liner sample	С	Rock core
		L Amalgamated sample		
Test status		esult in <i>italics</i> indicates a test that is not within the	e scope of th	he UKAS accreditation for this laboratory.
Summary of Laboratory S	Soil Tests:	Index / Classification Tests		
Particle density	р	Small pyknometer method	9	Gas jar method
Plastic index	N/P	Non plastic, although liquid limit will have been	determined	if requested
Particle size (PSD)	1	Following value in silt column denotes combined	d clay and si	It fraction
	р	Following value in clay column denotes sedimen	tation by pi	pette, else sedimentation is by hydrometer.
Summary of Laboratory S	Soil Tests:	Strength and Permeability Tests		
Triaxial	uu	Single stage unconsolidated quick undrained	иим	Multi stage unconsolidated quick undrained
	นนร	Set of 3 unconsolidated quick undrained	cu	Single stage consolidated undrained
	сим	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 stre	ess and $c' = 0$ for effective stress
Consol	Oed	One-dimensional oedometer	Hyd	Hydraulic cell consolidation
	m,	coefficient of compressibility quoted for p0 to p0		
Permeability	С	Constant head permeability	т 100ла ц, ч	Triaxial permeability
Shearbox	SSB	Small shear box	LSB	Large shear box
SHOULDOX	р	Peak value		Residual value
	P RS	Ring shear	r	Residual value
Summary of Laboratory S				· · · · · · · · · · · · · · · · · · ·
MCV	s ock Stren	MCV value at natural or specified moisture conte	int nt	Intercept of calibration line in MCV calibration
Point Load Type	D	V Diametral	А	Axial
(Combination of)	-	Irregular lump	В	Biock
, , ,	L	Test performed parallel to planes of weakness	-	
	P	Test performed perpendicular to planes of weakn	iess	
	x	Invalid failure of point load (not broken between p		d application)
ummary of Laboratory R				
en% fines	W	Soaked test	d	Drytost
oint Load Index Result	••		u	Dry test
	5			A1 1
oint Load Type	D	Diametral	A	Axial
(Combination of)	1 •	Irregular lump	В	Block
	L	Parallel to planes of weakness	P	Perpendicular to planes of weakness
<b>-</b>	Х	Invalid failure of point load (not broken between p		
Dimensions	W	Diameter of core or average smallest width perpe		• • •
	D	Distance between platens when just in contact w	ith specime	n
	D'	Distance between platens at point of failure		
	De	Equivalent core diameter	Is	P/De ²
	ls(50)	F x ls	F	(De/S0) ^{0.45}
		point load strength index corrected for a diametral	test of core	diameter 50mm
	ls(50)			
		ial/Lump tests De ² = (4/Pi) x (W x D')	For Dia	metral tests $De^2 = D \times D'$
	For Ax sheets ar	ial/Lump tests De ² = (4/Pi) x (W x D')		
nportant note: summary garded as the definitive	For Ax sheets ar	ial/Lump tests De ² = (4/Pi) x (W x D') e provided for convenience and in no way replace i	individual te	metral tests De ² = D x D'

Project Name	Five Mile Lane     Summary Of Laboratory       LT1695     Rock Material Tests														 	
Project No.	LT1495					R	ock	Mat	erial	Test	ts					
Engineer	Profession	al Soils	Labora	atory												 
Employer	Profession															
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	E Ten % fines	* ACV	<ul> <li>Soundness value</li> </ul>		
 BH105	<u> </u>	S	S S	2.20	<u>5</u> 1	%	%	Mg/m³		% 90.4	% 96.7	kN	⁵⁶	%		
BH105	6.00		c	6.00	1					98.8	99.1					 
										9.8	43.6					 
BH107	5.00		С	5.00	1											 
BH107	8.70		С	8.70	1	v. v.				40.1	73.3					 
BH108	3.30		С	3.30	1					9.1	43.7					 
BH108	7,00		с	7.00	1			End		81.0	95.9					 
Approved by: Stuart Kirk			Leeds	Laboratory 2.04		3 of 9	sue Date		Print date	t No.: L	T1 495	··			eng	

Project Name	Five Mile Lane		Determination Of Slake	Hole ID BH105
Project No.	LT1495		Durability	Sample Depth
Engineer	Professional Soi	ls Laboratory		2.20m Sample Number
Employer	Professional Soi	is Laboratory	I.S.R.M. Suggested methods	Sample Type C
Description	Light grey MUDS	FONE and dark grey LIMEST	DNE	Specimen Depth
				2.20m Specimen Number
				1 Tau united
Slaking Fluid			·····	Tap water
Temperature			°C	20
Number of lum	nps if other than 1	.0		10
Maximum grai	n size		mm	<1.00
Test data				
Mass of wet sp	ecimen and drun	n	9	2301.75
Mass of dry sp	ecimen and drum	)	A 9	2274.52
First cycle				,
Water level che	ecked against ma	rk at 20mm below axis		Yes
Period of rotati	on		minutes	9.32
Mass of dry sp	ecimen and drun	ו	B 9	2257.25
Second cycle				
Water level che	ecked against ma	ark at 20mm below axis		Yes
Period of rotati	ion		minutes	9.30
Mass of dry sp	ecimen and drun	1	C 9	2224.64
Mass of drum	<u></u> ,		D 9	1752.22
Calculations ar	nd results			
Slake durability	y index		l _{d1} %	96.7
Slake durability	y index		l _{d2} %	90.4
Remarks on re 1st cycle	tained specimen Some lumps br	oken and retained in drur	n	
2nd cycle	No further chai	nge		
Remarks on sp 1st cycle	pecimen passing Thin layer of sla			
2nd cycle	Thicker layer o	f slaked sample		
Approved by:		Leeds Laboratory	Report No.: LT1495	
Stuart Kirk		Page	e 4 of 9 Print date 02/02/2015	SOIL ENGINEERING
		Revision No. 2.03	Issue Date 20/11/2012	Part of the Bachy Soletanche Group

Project Name	Five Mile Lane		Determinatio	n Of Slake	Hole ID BH105
Project No.	LT1495		Durabi	lity	Sample Depth
					6.00m
Engineer	Professional So	oils Laboratory			Sample Number
Employer	Professional So	ils Laboratory	I.S.R.M. Suggeste	ed methods	Sample Type C
Description	Grey SANDSTON	IE	I <u> </u>		Specimen Depth 6,00m
					Specimen Number
					1
Slaking Fluid	n				Tap water
Temperature	<u></u>			°C	19.4
Number of lum	ps if other than	10			10
Maximum graiı	n size		······································	mm	<1.00
Test data					
Mass of wet sp	ecimen and dru	m		9	2308.81
Mass of dry spe	ecimen and drur	n	A	g	2301.35
First cycle					
Water level che	ecked against m	ark at 20mm below axis			Yes
Period of rotation	on			minutes	9.32
Mass of dry spe	ecimen and drur	n	В	9	2296.94
Second cycle					
Water level che	ecked against m	ark at 20mm below axis			Yes
Period of rotation				minutes	9.31
Mass of dry spe	ecimen and drur	n	С	g	2295.22
Mass of drum			D	9	1784.85
Calculations an	d results				
Slake durability			l _{d1}	%	99.1
Slake durability	/ index	<u></u>	l _{d2}	%	98.8
Remarks on ret 1st cycle	ained specimen All lumps fully				
2nd cycle	All lumps intac	t with more rounding			
Remarks on sp 1st cycle	ecimen passing Thin layer of fil	drum ne slaked sample with son	ne coarse particles		
2nd cycle	Thicker layer o	f fine slaked sample with	some coarse particles		
				03 1 I I 4 4 5	s <b>49 100</b> 000,
Approved by: Stuart Kirk		Leeds Laboratory	e 5 of 9	lo.: LT1495	soil engineering

Project Name Five Mile Lane	Determination Of Slake	Hole ID BH107
Project No. LT1495	Durability	Sample Depth
		5.00m
Engineer Professional Soils Laboratory		Sample Number
Employer Professional Soils Laboratory	I.S.R.M. Suggested methods	Sample Type C
Description Thinly laminated grey MUDSTONE		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
Test data		
Mass of wet specimen and drum	g	2332.98
Mass of dry specimen and drum	A 9	2259.40
First cycle		
Water level checked against mark at 20mm below axis		Yes
Period of rotation	minutes	9.32
Mass of dry specimen and drum	В 9	1991.87
Second cycle		
Water level checked against mark at 20mm below axis		Yes
Period of rotation	minutes	9.30
Mass of dry specimen and drum	C 9	1831.46
Mass of drum	D 9	1784.90
Calculations and results		
Slake durability index	l _{di} %	43.6
Slake durability index	I _{d2} %	9.8
Remarks on retained specimen 1st cycle Most lumps broken		
2nd cycle All lumps broken and a small amonut of	sample retained in drum	
Remarks on specimen passing drum 1st cycle Thick layer of slaked sample		
2nd cycle Thicker layer of slaked sample		
Approved by: Leeds Laboratory	Report No.: LT1495	
Stuart Kirk Pag	Print date 02/02/2015	SOIL ENGINEERING
Revision No. 2.03	Issue Date 20/11/2012	Part of the Bachy Soletanche Gi

Project Name	Five Mile Lane		Determination Of Slak	Hole ID
Project No.	LT1495		Durability	BH107 Sample Depth
				8.70m
Engineer	Professional Soils	Laboratory		Sample Number
Employer	Professional Soils	Laboratory	I.S.R.M. Suggested methods	Sample Type C
Description	Thinly laminated gre	y MUDSTONE		Specimen Depth 8.70m
				Specimen Number
ALL PL 1			······································	1
Slaking Fluid			•c	Tap water
Temperature			<del>ک</del>	19.4
	ps if other than 10			10
Maximum grair	n size		mm	<1.00
Test data			1	
	ecimen and drum		9	2277.54
	ecimen and drum		A g	2236.41
First cycle				· · · · · · · · · · · · · · · · · · ·
		at 20mm below axis		Yes
Period of rotatio			minutes	9.32
	cimen and drum		B g	2107.14
Second cycle				
Water level che	cked against mark	at 20mm below axis		Yes
Period of rotatio	on		minutes	9.31
Mass of dry spe	ecimen and drum		C g	1946.22
Mass of drum			D g	1752.18
Calculations and	d results			
Slake durability	index		l _{d1} %	73.3
Slake durability	index		I _{d2} %	40.1
	ained specimen All lumps broken a	and some passed throu	igh mesh of drum.	
2nd cycle	All lumps broken a	nd more passed throu	gh mesh of drum	
	ecimen passing dru Thick layer of fine		Ang gan an a	
2nd cycle	Thicker layer of fin	ne slaked sample		
				1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Approved by:	Lee	eds Laboratory	Report No.: LT1495	

Project Name	Five Mile Lane	Determination Of Slake	Hole ID BH108
Project No.	LT1495	Durability	Sample Depth
Fasineer	Drafaggional Calls Laboratory		3.30m Sample Number
Engineer	Professional Soils Laboratory		sample Number
Employer	Professional Soils Laboratory	I.S.R.M. Suggested methods	Sample Type C
Description	Grey MUDSTONE		Specimen Depth 3.30m
			Specimen Number
			<u> </u>
Slaking Fluid			Tap water
Temperature	. 'f . th		18.1
	os if other than 10		10
Maximum grain	SIZE	mm	<1.00
Test data		1	
· · ·	cimen and drum	9	2227.69
	cimen and drum	Ag	2164.23
First cycle			
	cked against mark at 20mm below		Yes
Period of rotatio		minutes	9.33
	cimen and drum	B g	1932.32
Second cycle			
Water level cheo	ked against mark at 20mm below	axis	Yes
Period of rotatio	n	minutes	
Mass of dry spe	cimen and drum	C 9	1789.74
Mass of drum	· · · · · · · · · · · · · · · · · · ·	D 9	1752.27
Calculations and	results		
Slake durability	index	I _{d1} %	43.7
Slake durability	ndex	I _{d2} %	9.1
Remarks on reta 1st cycle	ined specimen Some lumps broken and retained ii	n drum	
2nd cycle	No further change		
	cimen passing drum 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>(</b>
tuart Kirk		Page 8 of 9 Print date 02/02/2015	SOIL ENGINEERING
	Revision No. 2.03	Issue Date 20/11/2012	Part of the Bachy Soletanche Grou

Project Name	Five Mile Lane	Determination Of Sla	ke Hole ID
Project No.	LT1495	Durability	BH108 Sample Depth
_			7.00m
Engineer	Professional Soils Laboratory		Sample Number
Employer	Professional Soils Laboratory	I.S.R.M. Suggested methods	Sample Type C
Description	Grey MUDSTONE		Specimen Depth 7.00m
			Specimen Number
			<u> </u>
Slaking Fluid			Tap water
Temperature		<u>ع،</u>	18.1
	ps if other than 10		10
Maximum grair	i size	mm	<1.00
Test data	· · · · · · · · · · · · · · · · · · ·	T	
-	ecimen and drum	9	2309.19
	cimen and drum	A g	2289.14
First cycle			
	cked against mark at 20mm b		Yes
Period of rotation	n	minutes	9.33
	cimen and drum	B 9	2268.67
Second cycle			
	cked against mark at 20mm b		Yes
Period of rotatio	on	minutes	9.31
	cimen and drum	C 9	2193.30
Mass of drum		Dg	1784.74
Calculations and	d results		
Slake durability	index	۱ _{d1} %	95.9
Slake durability	index	I _{d2} %	81.0
Remarks on reta 1st cycle	ained specimen Some lumps broken and retai	ned in drum	
2nd cycle	No further change		
	cimen passing drum Thin layer of slaked sample		
2nd cycle	No further change		
Approved by:	Leeds Laborat	<b>I</b>	
Stuart Kirk	Revision No.	Page 9 of 9         Print date         02/02/2015           2.03         Issue Date         20/11/2012	SOIL ENGINEERING



## 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: Date Commenced:	12/12/2014 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)



D Lambe (Senior Technician)

e-mail: rgunson@prosoils.co.uk awatkins@prosoils.co.uk S Royle (Senior Technician) M Beastall (Laboratory Manager)

5 – 7 Hexthorpe Road, Hexthorpe, Doncaster DN4 0AR tel: +44 (0)844 815 6641 fax: +44 (0)844 815 6642

Page 1 of

## POINT LOAD TEST - ISRM

Borehole	Depth	Test Type	Orientation	Dimensi	ons (mm)	Area	D _e ²	D _e	Failure I	Load (P)	I _s	Corr Fac	I _{s50}	Failure	Remarks
Number	(m)	rest type	Par / Perp	w	D	(mm2)		(mm)	MPa	kN	(MPa)	F	(MPa)	Туре	
BH101	2.65	А	Par	89	43	1849	4872.69	69.80	>30	40.05	8.219	1.162	>8.5	Valid	
BH101	3.20	А	Par	89	44	1936	4986.01	70.61	>30	40.05	8.032	1.168	>8.5	Valid	
BH101	3.80	А	Par	89	43	1849	4872.69	69.80	>30	40.05	8.219	1.162	>8.5	Valid	
BH101	4.18-4.33	А	Par	89	45	2025	5099.32	71.41	>30	40.05	7.854	1.174	>8.5	Valid	
BH101	4.60	А	Par	89	44	1936	4986.01	70.61	>30	40.05	8.032	1.168	>8.5	Valid	
BH101	5.20	А	Par	89	42	1764	4759.37	68.99	>30	40.05	8.415	1.156	>8.5	Valid	
BH102	2.40	А	Par	89	49	2401	5552.60	74.52	>30	40.05	7.213	1.197	>8.5	Valid	
BH102	2.80-3.00	А	Par	89	39	1521	4419.41	66.48	>30	40.05	9.062	1.137	>8.5	Valid	
BH102	3.50	А	Par	89	49	2401	5552.60	74.52	>30	40.05	7.213	1.197	>8.5	Valid	
BH102	4.44-4.61	А	Par	89	44	1936	4986.01	70.61	>30	40.05	8.032	1.168	>8.5	Valid	
BH102	4.80	А	Par	89	47	2209	5325.96	72.98	>30	40.05	7.520	1.186	>8.5	Valid	
BH102	5.30	А	Par	89	44	1936	4986.01	70.61	>30	40.05	8.032	1.168	>8.5	Valid	
BH103	2.60	А	Par	89	51	2601	5779.23	76.02	>30	40.05	6.930	1.207	>8.5	Valid	
BH103	2.95	А	Par	89	53	2809	6005.87	77.50	>30	40.05	6.668	1.218	>8.5	Valid	
BH103	3.50	А	Par	89	41	1681	4646.05	68.16	>30	40.05	8.620	1.150	>8.5	Valid	
BH103	4.50	А	Par	89	51	2601	5779.23	76.02	>30	40.05	6.930	1.207	>8.5	Valid	
BH103	5.40	А	Par	89	46	2116	5212.64	72.20	>30	40.05	7.683	1.180	>8.5	Valid	
BH103	5.70	А	Par	89	44	1936	4986.01	70.61	>30	40.05	8.032	1.168	>8.5	Valid	
BH104	1.15	А	Par	89	43	1849	4872.69	69.80	>30	40.05	8.219	1.162	>8.5	Valid	
BH104	2.50	А	Par	89	48	2304	5439.28	73.75	>30	40.05	7.363	1.191	>8.5	Valid	
BH104	2.70	А	Par	89	44	1936	4986.01	70.61	>30	40.05	8.032	1.168	>8.5	Valid	
BH104	3.75	А	Par	89	42	1764	4759.37	68.99	>30	40.05	8.415	1.156	>8.5	Valid	
BH104	4.60	А	Par	89	45	2025	5099.32	71.41	>30	40.05	7.854	1.174	>8.5	Valid	
BH104	5.50	А	Par	89	40	1600	4532.73	67.33	>30	40.05	8.836	1.143	>8.5	Valid	
BH105	1.50	А	Par	89	45	2025	5099.32	71.41	>30	40.05	7.854	1.174	>8.5	Valid	
BH105	2.20	А	Par	89	42	1764	4759.37	68.99	>30	40.05	8.415	1.156	>8.5	Valid	
BH105	2.70	А	Par	89	43	1849	4872.69	69.80	>30	40.05	8.219	1.162	>8.5	Valid	
BH105	3.60-3.82	А	Par	89	44	1936	4986.01	70.61	>30	40.05	8.032	1.168	>8.5	Valid	
BH105	5.28-5.50	А	Par	89	48	2304	5439.28	73.75	>30	40.05	7.360	1.191	>8.5	Valid	
BH105	7.00	А	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

**Contract No:** 



**Professional Soils Laboratory** 

Checked By

FIVE MILE LANE.

Date

06/01/2015 Approved B



Date

PSL14/6540

06/01/2015

N/A

**Client Ref:** 

## POINT LOAD TEST - ISRM

Borehole	Depth	Test Type	Orientation	Dimensi	ons (mm)	D _e ²	D _e	Failure I	_oad (P)	I _s	Corr Fac	I _{s50}	Failure	Remarks
Number	(m)	rest type	Par / Perp	L	D		(mm)	MPa	kN	(MPa)	F	(MPa)	Туре	
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

PSL

Professional Soils Laboratory

Par = parallel, Perp = perpendicular



**Contract No:** 

PSL14/6540

Date

**Client Ref:** 

N/A

**Date** 06/01/20

FIVE MILE LANE.

Checked By

06/01/2015 Approved B

06/01/2015

## POINT LOAD TEST - ISRM

Borehole	Depth	Test Type	Orientation	Dimensi	ons (mm)	Area	D _e ²	D _e	Failure L	oad (P)	I _s	Corr Fac	I _{s50}	Failure	Remarks
Number	(m)	rest type	Par / Perp	w	D	(mm2)		(mm)	MPa	kN	(MPa)	F	(MPa)	Туре	
BH105	8.12-8.28	А	Par	89	43	1849	4872.69	69.80	30.000	40.05	8.219	1.162	>8.5	Valid	
BH105	9.30	А	Par	89	44	1936	4986.01	70.61	30.000	40.05	8.032	1.168	>8.5	Valid	
BH106	2.20	А	Par	89	48	2304	5439.28	73.75	30.000	40.05	7.363	1.191	>8.5	Valid	
BH106	3.15	А	Par	89	45	2025	5099.32	71.41	30.000	40.05	7.854	1.174	>8.5	Valid	
BH106	3.70	А	Par	89	44	1936	4986.01	70.61	30.000	40.05	8.032	1.168	>8.5	Valid	
BH106	5.00	А	Par	89	42	1764	4759.37	68.99	30.000	40.05	8.415	1.156	>8.5	Valid	
BH106	6.40	А	Par	89	39	1521	4419.41	66.48	30.000	40.05	9.062	1.137	>8.5	Valid	
BH106	7.80	А	Par	89	39	1521	4419.41	66.48	30.000	40.05	9.062	1.137	>8.5	Valid	
BH106	9.50	А	Par	89	49	2401	5552.60	74.52	30.000	40.05	7.213	1.197	>8.5	Valid	
BH107	3.70	А	Par	89	44	1936	4986.01	70.61	30.000	40.05	8.032	1.168	>8.5	Valid	
BH107	5.00	А	Par	89	47	2209	5325.96	72.98	2.396	3.20	0.601	1.186	0.71	Valid	
BH107	5.17-5.33	А	Par	89	44	1936	4986.01	70.61	30.000	40.05	8.032	1.168	>8.5	Valid	
BH107	6.84-6.95	А	Par	89	41	1681	4646.05	68.16	1.222	1.63	0.351	1.150	0.40	Valid	
BH107	7.70	А	Par	89	43	1849	4872.69	69.80	30.000	40.05	8.219	1.162	>8.5	Valid	
BH107	9.25-9.39	А	Par	89	44	1936	4986.01	70.61	30.000	40.05	8.032	1.168	>8.5	Valid	
BH108	4.30	А	Par	89	46	2116	5212.64	72.20	0.952	1.27	0.244	1.180	0.29	Valid	
BH108	5.10	А	Par	89	42	1764	4759.37	68.99	0.884	1.18	0.248	1.156	0.29	Valid	
BH108	6.00	А	Par	89	41	1681	4646.05	68.16	30.000	40.05	8.620	1.150	>8.5	Valid	
BH108	8.35-8.50	А	Par	89	44	1936	4986.01	70.61	30.000	40.05	8.032	1.168	>8.5	Valid	
BH108	9.00	А	Par	89	46	2116	5212.64	72.20	30.000	40.05	7.683	1.180	>8.5	Valid	
BH108	9.80	А	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



**Professional Soils Laboratory** 

Par = parallel, Perp = perpendicular



**Contract No:** 

PSL14/6540

Date

**Client Ref:** 

N/A



06/01/

06/01/2015

Checked By

Date

## POINT LOAD TEST - ISRM

Borehole	Depth	Test Type	Orientation	Dimensi	ons (mm)	D _e ²	D _e	Failure L	oad (P)	I _s	Corr Fac	I _{s50}	Failure	Remarks
Number	(m)	Test Type	Par / Perp	L	D		(mm)	MPa	kN	(MPa)	F	(MPa)	Туре	
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

PSL

**Professional Soils Laboratory** 

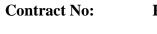
Checked By

Date

FIVE MILE LANE.

06/01/2015 Approved By

Par = parallel, Perp = perpendicular



PSL14/6540

Client Ref: N/A



06/01/2015



### **Professional Soils Laboratory**

05-Jan-15 PSL14/6540 FIVE MILE LANE.

J.Melville

Cutting & GRINDING

Core

Date:
Contract Number:
Location:
Sample Type:
Sample Preparation:
Operator:

5/7 Hexthorpe Road Hexthorpe, Doncaster, DN4 0AR tel: +44 (0)844 8156641 fax: +44 (0)844 8156642 e-mail: awatkins@prosoils.co.uk

Determination of Unconfined Compressive Strength.

ISRM Suggested Methods, pp 111 –116, 1981.

Borehole	Depth	Depth	Diameter	Length	Height:	Initial	Bulk Density	MC	Dry Density			Mode	Date	Remarks
Number	Top (m)	Bottom (m)	(mm)	(mm)	ratio	mass g	Mg/m3	%	Mg/m3	Load Failure	UCS(MPA)	OF FAILURE	Tested	Reillaiks
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	
									İ					
									İ					

Checked by:



Approved by:

Date 06/01/2015

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

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
		C	Other ID											
		Samp	le Type	В	В	В	В	В	В	В	В	В	В	В
		Sampli	ng Date	n/s										
		Sampli	ng Time	n/s										
Test	Method	LOD	Units											
Metals														
Magnesium Aqueous Extract	DETSC 2076*	10	mg/l	< 10	< 10	< 10	< 10	< 10	< 10	< 10	13	< 10	< 10	< 10
Inorganics														
рН	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

			Lab No	747092	747093	747094
		Sa	mple ID	TP218	TP219	TP219
			Depth	2.00	1.00	2.10
		C	Other ID			
		Samp	ole Type	В	В	В
		Sampli	ng Date	n/s	n/s	n/s
		Sampli	ng Time	n/s	n/s	n/s
Test	Method	LOD	Units			
Metals						
Magnesium Aqueous Extract	DETSC 2076*	10	mg/l	< 10	< 10	< 10
Inorganics						
рН	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



Inannronriato

## Information in Support of the Analytical Results

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

#### **Containers Received & Deviating Samples**

		Date			container for
Lab No	Sample ID	Sampled	<b>Containers Received</b>	Holding time exceeded for tests	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

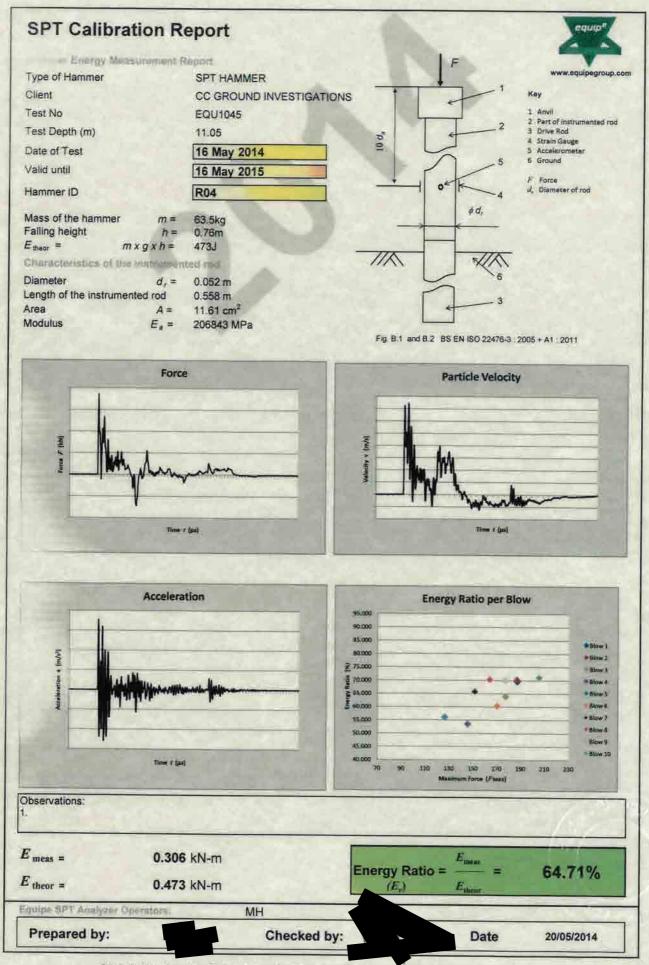
Appendix D – Gas and Groundwater Monitoring

	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			
			Contract			Five Mile Lane Improvements							
				Contra			C4414						
				Client	:		Vale of Glamorgan Council						
CC Groun	CC Ground Investigations Ltd Instrument used:						GA5000 Gas analyser. Geotechnical Instruments dip meter.						

## APPENDIX E

Appendix E – SPT Calibration Data

## **Equipe Group**



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