



LABORATORY REPORT



4043

Contract Number: PSL20/3444

Report Date: 22 July 2020

Client's Reference:

Client Name: Soil Hill Quarries Yorkshire Ltd
7 Gaythorn Terrace
Bradford
West Yorkshire
BD14 6LE

For the attention of: Warren Greenwood

Contract Title: Soil Hill Quarry

Date Received: 9/7/2020
Date Commenced: 9/7/2020
Date Completed: 22/7/2020

Notes: Opinions and Interpretations are outside the UKAS Accreditation

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Checked and Approved Signatories:

R Gunson
(Director)

S Royle
(Laboratory Manager)

A Watkins
(Director)

S Eyre
(Senior Technician)

R Berriman
(Quality Manager)

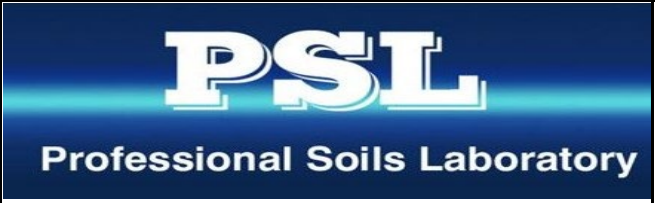
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SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
Bottom Blue	1	B			Grey very gravelly very sandy CLAY.



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SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377 : PART 2 : 1990)

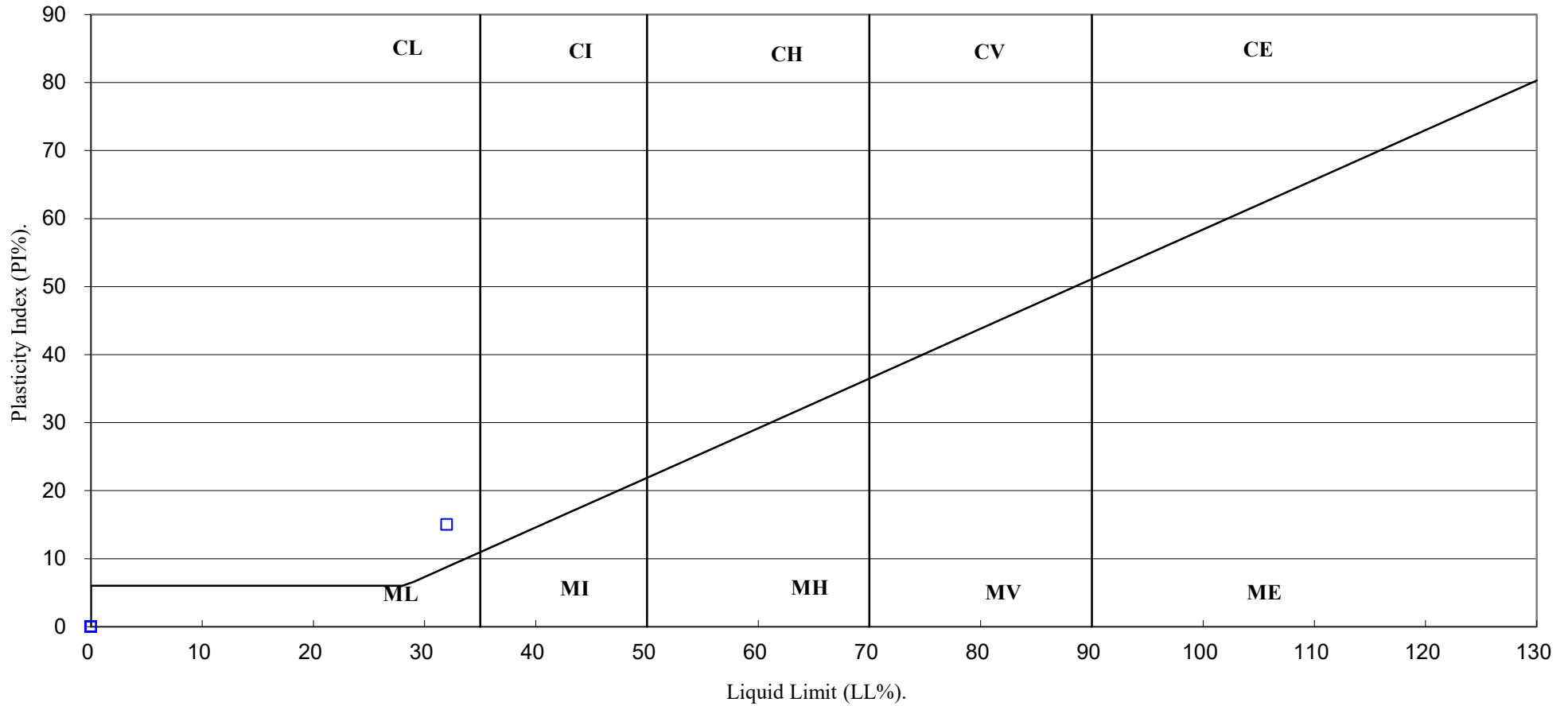
Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content % <small>Clause 3.2</small>	Linear Shrinkage % <small>Clause 6.5</small>	Particle Density Mg/m ³ <small>Clause 8.2</small>	Liquid Limit % <small>Clause 4.3/4</small>	Plastic Limit % <small>Clause 5.3</small>	Plasticity Index % <small>Clause 5.4</small>	Passing .425mm %	Remarks
Bottom Blue	1	B			11		2.63	32	17	15	47	Low plasticity CL.

SYMBOLS : NP : Non Plastic

* : Liquid Limit and Plastic Limit Wet Sieved.

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PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.



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PARTICLE SIZE DISTRIBUTION TEST

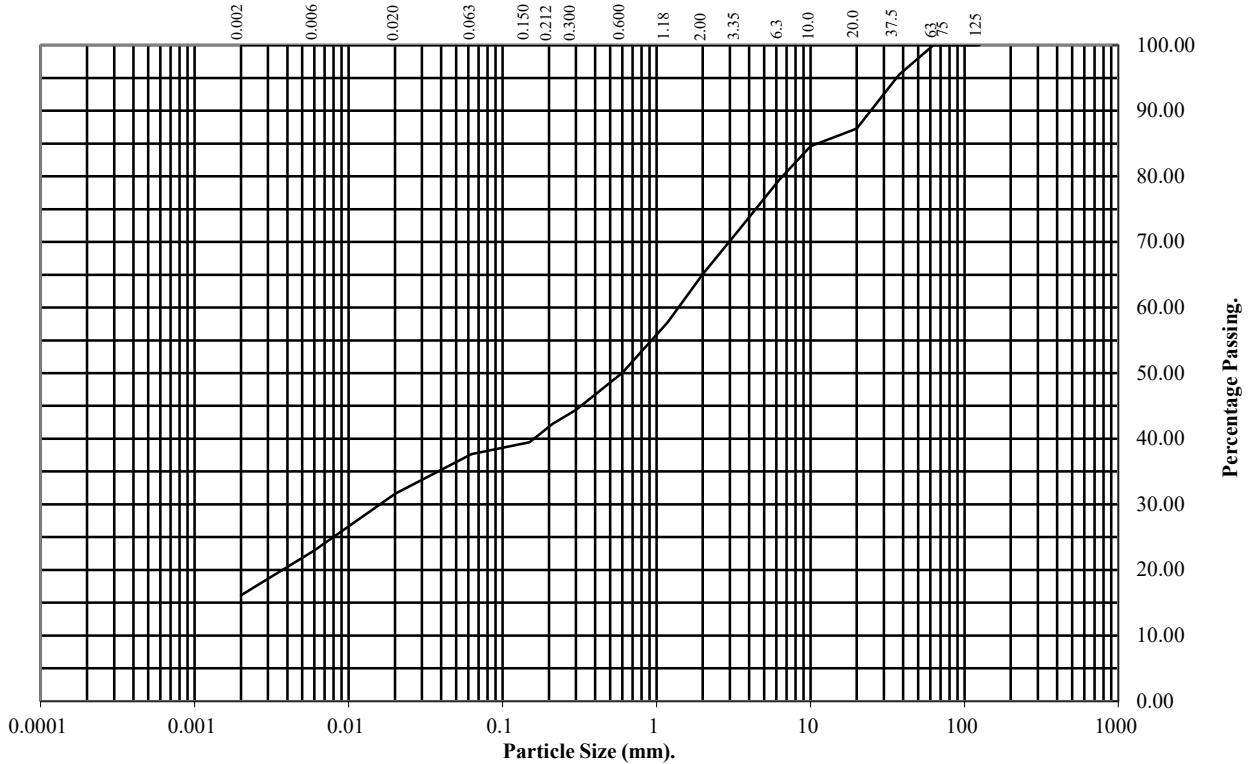
BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number: **Bottom Blue** Top Depth (m):

Sample Number: **1** Base Depth(m):

Sample Type: **B**



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	95
20	87
10	85
6.3	80
3.35	72
2	65
1.18	58
0.6	50
0.3	44
0.212	42
0.15	39
0.063	38

Particle Diameter	Percentage Passing
0.02	32
0.006	23
0.002	16

Soil Fraction	Total Percentage
Cobbles	0
Gravel	35
Sand	27
Silt	22
Clay	16

Remarks:
See Summary of Soil Descriptions



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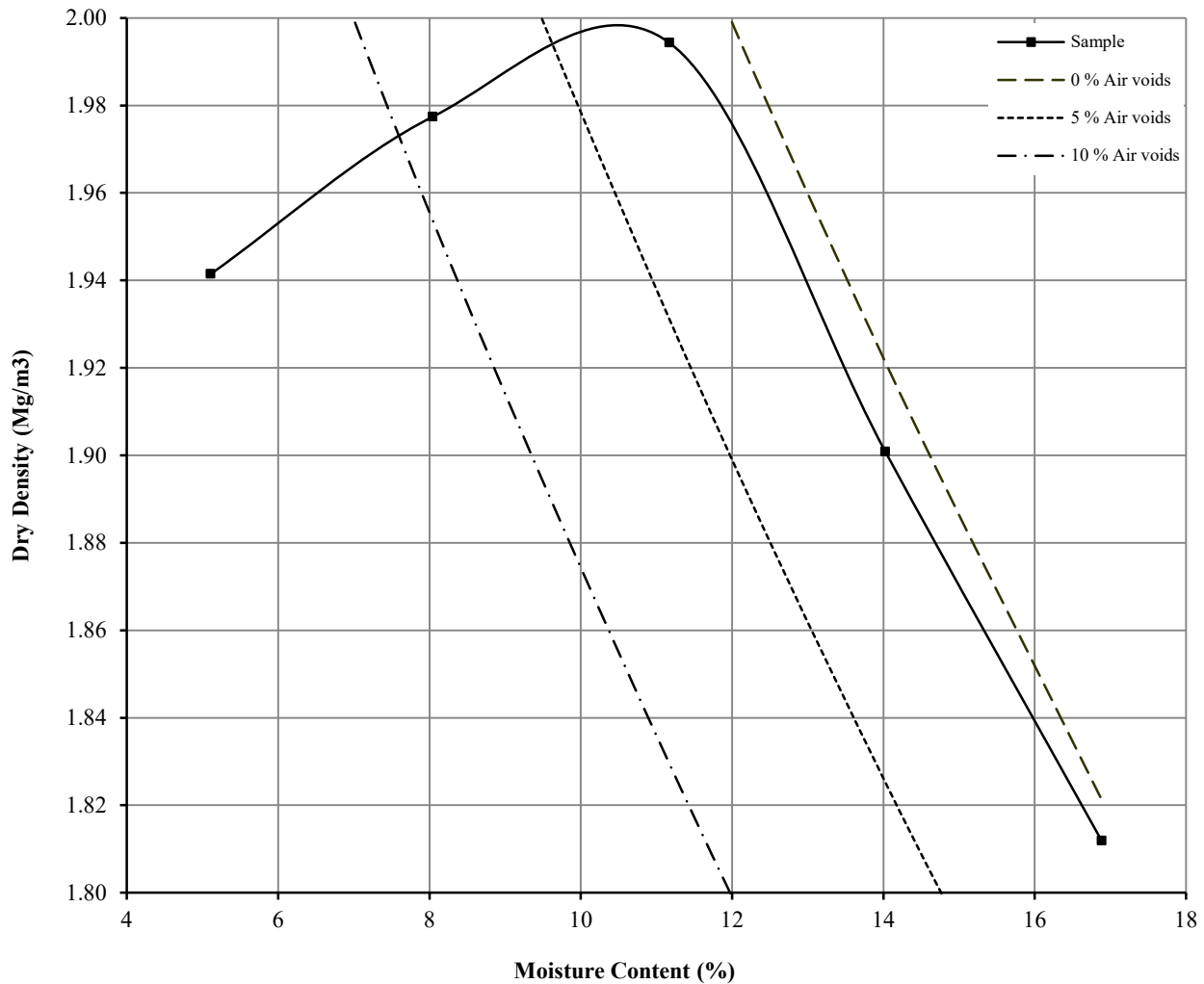
DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

BS 1377 : Part 4 : Clause 3.4 : 1990

Hole Number: **Bottom Blue** Top Depth (m) :

Sample Number: **1** Base Depth (m) :

Sample Type: **B**



Initial Moisture Content:	11	Method of Compaction:	2.5kg	Separate Samples
Particle Density (Mg/m ³):	2.63	Measured	Material Retained on 37.5 mm Test Sieve (%):	5
Maximum Dry Density (Mg/m ³):	1.99		Material Retained on 20.0 mm Test Sieve (%):	8
Optimum Moisture Content (%):	11			
Remarks				
See summary of soil descriptions.				



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UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

WITHOUT MEASUREMENT OF PORE PRESSURE

BS1377 : Part7 : 1990: Clause 8

Hole Number:

Bottom Blue

Top Depth (m):

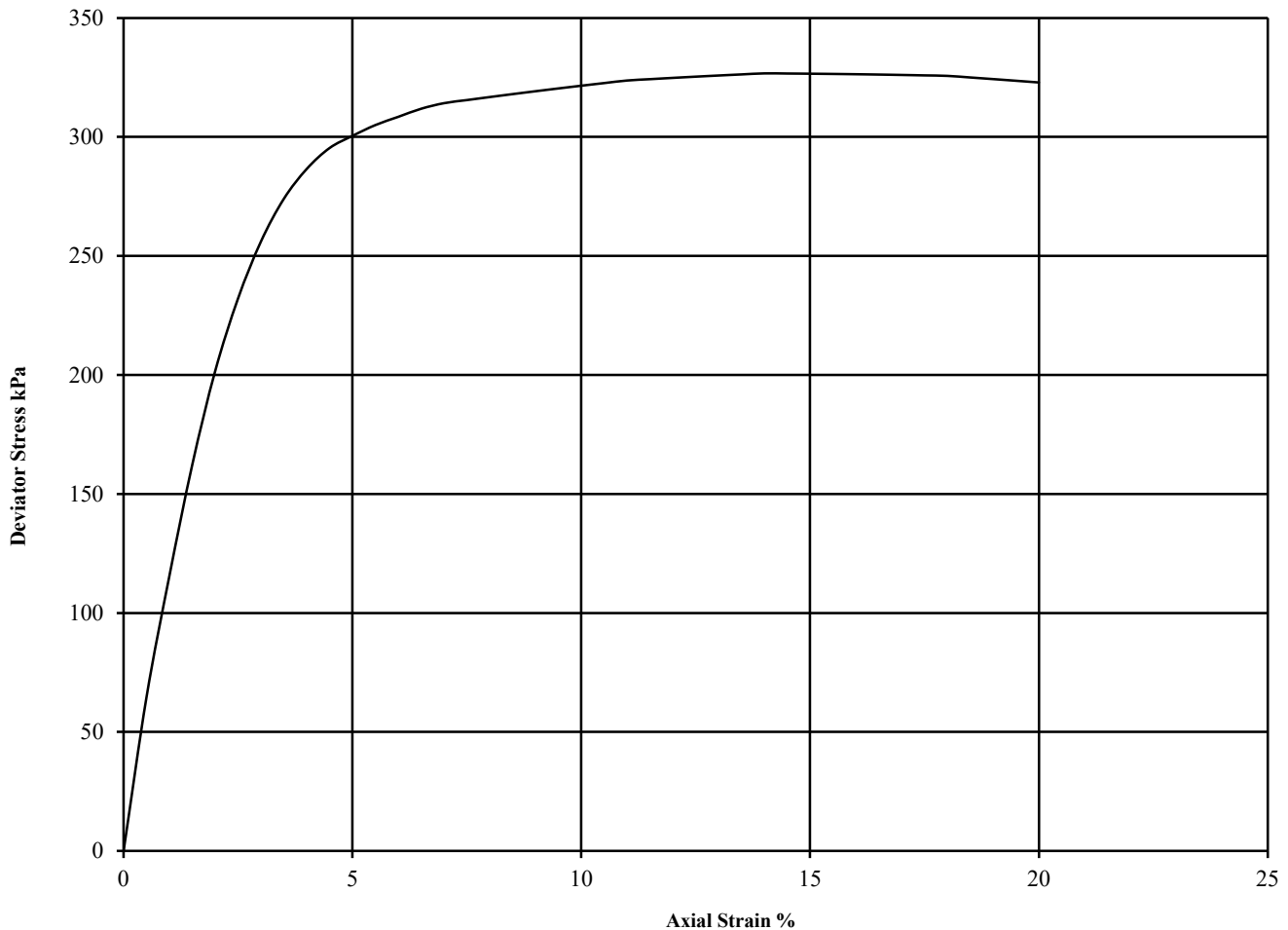
Sample Number:

1

Base Depth (m):

Sample Type

B



Diameter (mm):		100			Height (mm):		200		Test:	UU Single Stage		Remarks:
Specimen	Moisture Content (%)	Bulk Density (Mg/m ³)	Dry Density (Mg/m ³)	Cell Pressure (kPa)	Corr. Max. Deviator Stress (kPa)	θ_3	$(\theta_1 - \theta_3)_f$	$\frac{1}{2}(\theta_1 - \theta_3)_f$	Shear Strength Cu (kPa)	Failure Strain (%)	Mode of Failure	Disturbed Sample Remoulded with 2.5kg effort Rate of strain = 2 %/min Latex Membrane used 0.2 mm thick, Correction applied 0.35 See summary of soil descriptions
1	11	2.19	1.97	200	327				163	14.0	Plastic	



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PERMEABILITY IN A TRIAXIAL CELL

BS 1377 : Part 6 : 1990: Clause 6

Hole Number: Bottom Blue Top Depth (m) :

Sample Number: 1 Base Depth (m) :

Sample Type: B Lift Number:

Date Grid Reference:

Description of Specimen	
See summary of soil descriptions	
Remarks	
Remoulded with 2.5kg rammer	

Initial Specimen Conditions		
Height	mm	100.42
Diameter	mm	100.50
Area	mm ²	7932.72
Volume	cm ³	796.60
Mass	g	1737
Dry Mass	g	1570
Bulk Density	Mg/m ³	2.18
Dry Density	Mg/m ³	1.97
Moisture Content	%	11
Voids Ratio	-	0.344
Specific Gravity	Mg/m ³	2.65
(assumed/measured)	-	assumed

Final Specimen Conditions		
Moisture Content	%	14
Bulk Density	Mg/m ³	2.24
Dry Density	Mg/m ³	1.97

Test Setup		
Date Started		10/07/2020
Date Finished		16/07/2020
Top Drain Used		Y
Base Drain Used		Y
Method of Saturation		By back pressure
Direction Of Flow		Vertically Downwards
Saturation Time	Days	1
Consolidation Time	Days	1
Permeability Time	Days	1



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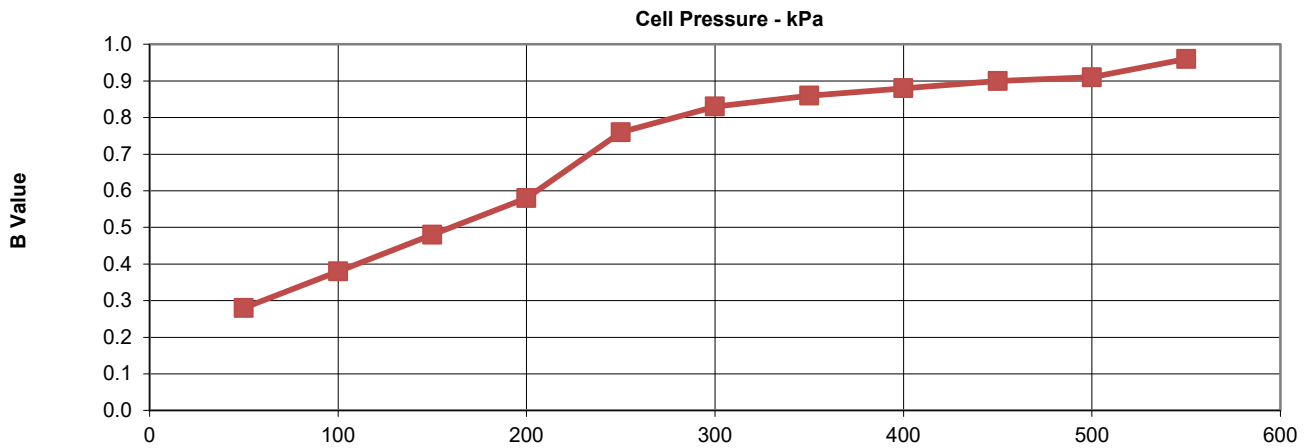
PSL20/3444

Client Ref

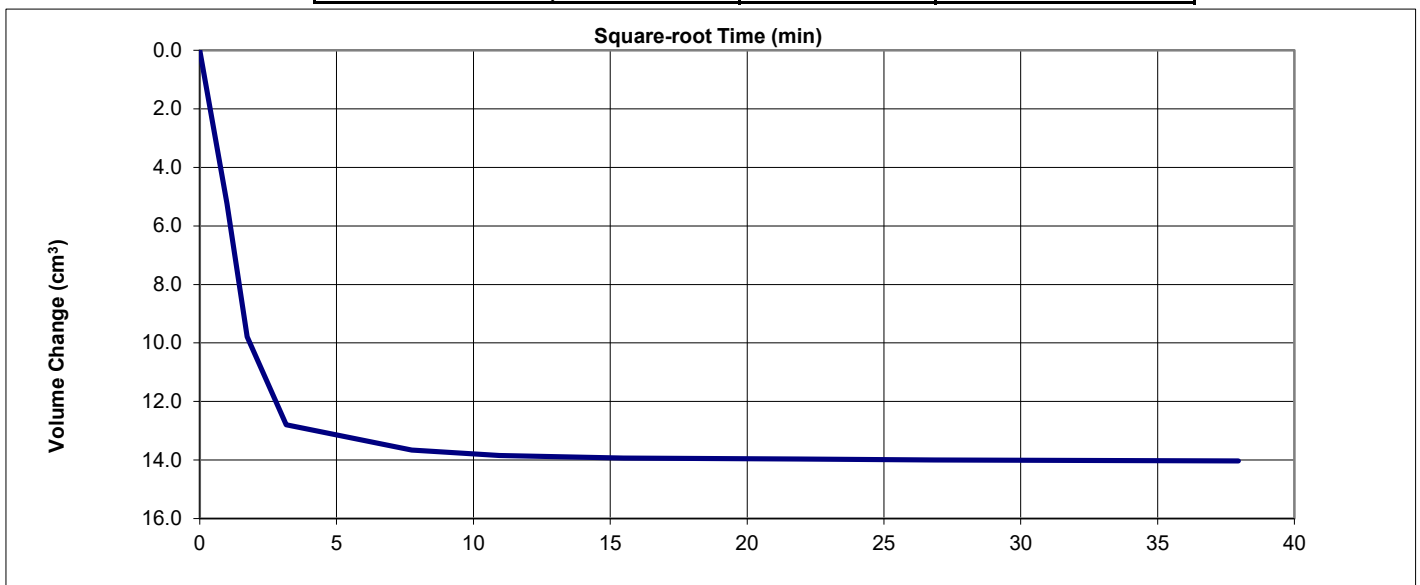
PERMEABILITY IN A TRIAXIAL CELL

BS 1377 : Part 6 : 1990 Clause 6

Specimen Details		
Hole Number		Bottom Blue
Sample Depth	m	
Sample No,		1
Grid Reference		
Lift Number		
Saturation		
Cell Pressure Incr.	kPa	50
Back Pressure Incr.	kPa	50
Differential Pressure	kPa	10
Final Cell Pressure	kPa	550
Final B Value	-	0.96



Consolidation		
Effective Pressure	kPa	100
Cell Pressure	kPa	700
Back Pressure	kPa	600
Final PWP	kPa	603
PWP dissipation	%	96



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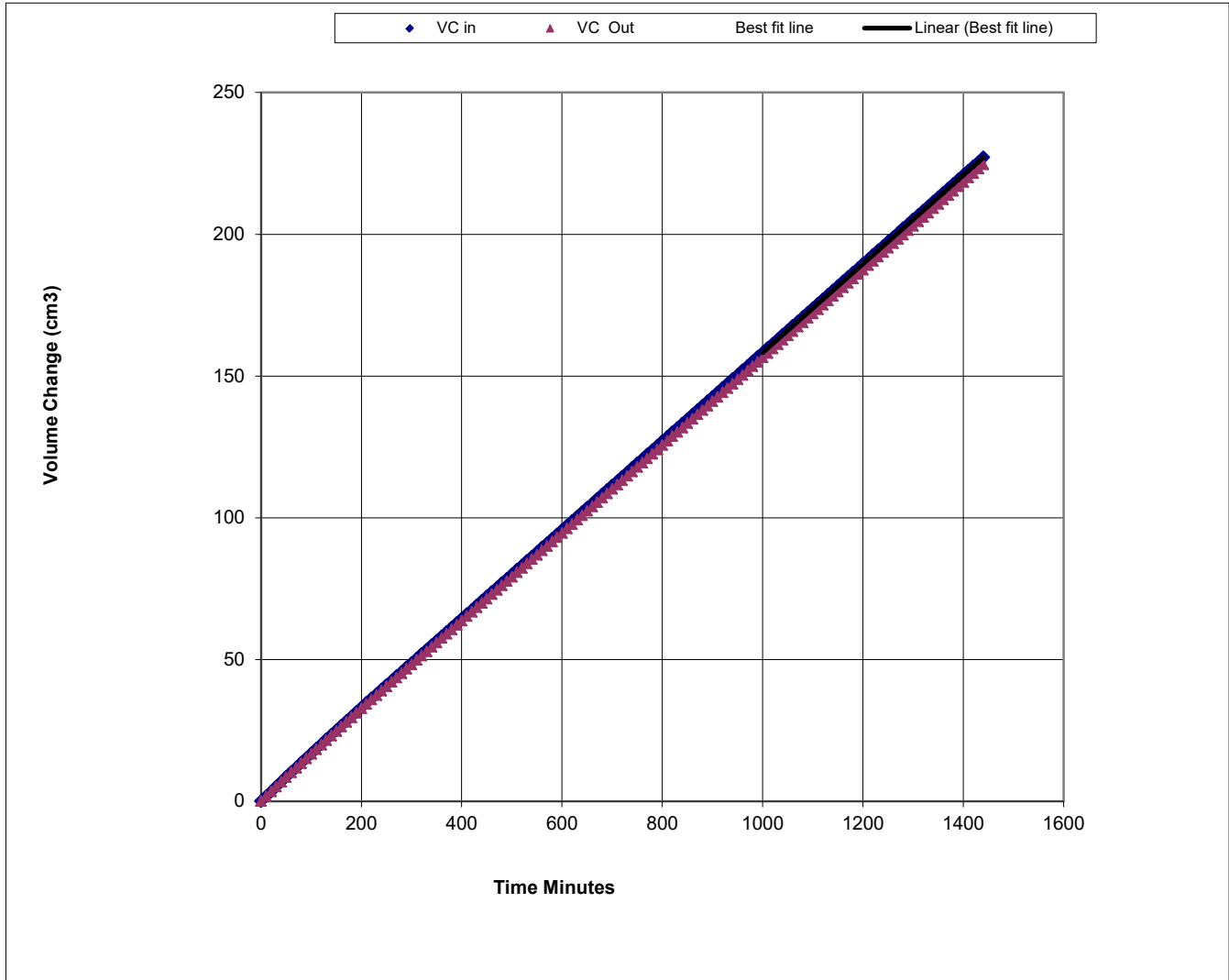
Contract No.
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PERMEABILITY IN A TRIAXIAL CELL

BS 1377 : Part 6 : 1990 Clause 6

Specimen Details		
Hole Number		Bottom Blue
Sample Depth	m	
Sample No.		1
Grid Reference		
Lift Number		

Permeability Stage



Permeability Stage		
Cell Pressure	kPa	700
Mean Effective Stress	kPa	100
Back Pressure Diff.	kPa	20
Mean Rate of Flow	ml/min	0.1564
Average Temperature	'C	20
Vertical Permeability Kv	m/s	1.6E-08



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TEST REPORT

DETERMINATION OF DISPERSIBILITY - PINHOLE METHOD - BS1377: Part 5: 1990: CLAUSE 6.2

Project No	N9374-20	Sample Details:	Hole No.	Sample 1
Project Name	Soil Hill Quarry		Depth (m BGL)	
			No.	
			Type	
		ID	PSL20/3444	

Soil Description : Dark brown slightly sandy CLAY.

Natural Moisture Content (%) : 15

Liquid Limit (%) :

Plastic Limit (%) :

The sample was passed over a 2.00mm sieve and all coarse material was removed.

Test Specimen Details

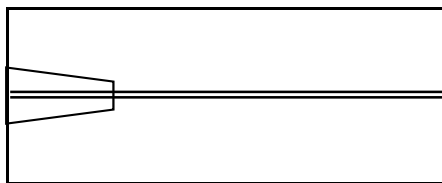
Moisture Content (%) : 19

Bulk Density (Mg/m3) : 2.300


Dry Density (Mg/m3) : 1.940

Head of Water (mm)	Rate of Flow (mL/s)	Duration (s)	Discharge Appearance
50	0.77	10.28	Clear
180	1.26	10.31	Clear
380	1.79	10.57	Clear
1020	3.01	10.28	Clear

The diameter of the pinhole showed no significant measurable change.



The soil would be classified as ND2.

SLR 5.6.2 Iss/Rev 2.0 19-Apr-2018		Approved	R Clark	Date	21-Jul
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ANALYTICAL TEST REPORT

Contract no: 87368
Contract name: Soil Hill Quarry
Client reference: PSL20/3444
Clients name: Professional Soils Laboratory
Clients address: 5/7 Hexthorpe Road
Doncaster
DN4 0AR

Samples received: 14 July 2020
Analysis started: 14 July 2020
Analysis completed: 20 July 2020
Report issued: 20 July 2020

Notes: Opinions and interpretations expressed herein are outside the UKAS accreditation scope. Unless otherwise stated, Chemtech Environmental Ltd was not responsible for sampling. All testing carried out at Unit 6 Parkhead, Stanley, DH9 7YB, except for subcontracted testing. Methods, procedures and performance data are available on request. Results reported herein relate only to the material supplied to the laboratory. This report shall not be reproduced except in full, without prior written approval. Samples will be disposed of 6 weeks from initial receipt unless otherwise instructed.

Key: U UKAS accredited test
M MCERTS & UKAS accredited test
\$ Test carried out by an approved subcontractor
I/S Insufficient sample to carry out test
N/S Sample not suitable for testing

Approved by:

Dave Bowerbank
Customer Support Hero

Chemtech Environmental Limited

SAMPLE INFORMATION

MCERTS (Soils):

Soil descriptions are only intended to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions. MCERTS accreditation applies for sand, clay and loam/topsoil, or combinations of these whether these are derived from naturally occurring soils or from made ground, as long as these materials constitute the major part of the sample. Other materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

All results are reported on a dry basis. Samples dried at no more than 30°C in a drying cabinet.
Analytical results are inclusive of stones.

Lab ref	Sample id	Depth (m)	Sample description	Material removed	% Removed	% Moisture
87368-1	1	-	Clayey Sand with Gravel	-	-	7.7

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SOILS

Lab number	87368-1		
Sample id	1		
Depth (m)	-		
Date sampled	02/07/2020		
Test	Method	Units	
pH	CE004 ^M	units	3.0
Magnesium (2:1 water soluble)	CE061	mg/l Mg	35
Chloride (2:1 water soluble)	CE049 ^U	mg/l Cl	4.6
Nitrate (2:1 water soluble)	CE049 ^U	mg/l NO ₃	1.5
Sulphate (2:1 water soluble)	CE061 ^M	mg/l SO ₄	503
Sulphate (total)	CE062 ^M	mg/kg SO ₄	2183
Sulphur (total)	CE119	mg/kg S	9379

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METHOD DETAILS

METHOD	SOILS	METHOD SUMMARY	SAMPLE	STATUS	LOD	UNITS
CE004	pH	Based on BS 1377, pH Meter	As received	M	-	units
CE061	Magnesium (2:1 water soluble)	Aqueous extraction, ICP-OES	Dry		1	mg/l Mg
CE049	Chloride (2:1 water soluble)	Aqueous extraction, IC-COND	Dry	U	1	mg/l Cl
CE049	Nitrate (2:1 water soluble)	Aqueous extraction, IC-COND	Dry	U	1	mg/l NO ₃
CE061	Sulphate (2:1 water soluble)	Aqueous extraction, ICP-OES	Dry	M	10	mg/l SO ₄
CE062	Sulphate (total)	Acid extraction, ICP-OES	Dry	M	100	mg/kg SO ₄
CE119	Sulphur (total)	Acid extraction, ICP-OES	Dry		100	mg/kg S

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DEVIATING SAMPLE INFORMATION

Comments

Sample deviation is determined in accordance with the UKAS note "Guidance on Deviating Samples" and based on reference standards and laboratory trials.

For samples identified as deviating, test result(s) may be compromised and may not be representative of the sample at the time of sampling.

Chemtech Environmental Ltd cannot be held responsible for the integrity of sample(s) received if Chemtech Environmental Ltd did not undertake the sampling. Such samples may be deviating.

Key

N	No (not deviating sample)
Y	Yes (deviating sample)
NSD	Sampling date not provided
NST	Sampling time not provided (waters only)
EHT	Sample exceeded holding time(s)
IC	Sample not received in appropriate containers
HP	Headspace present in sample container
NCF	Sample not chemically fixed (where appropriate)
OR	Other (specify)

Lab ref	Sample id	Depth (m)	Deviating	Tests (Reason for deviation)
87368-1	1	-	N	