

Trentside Geotechnical Testing

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Geotechnical Testing

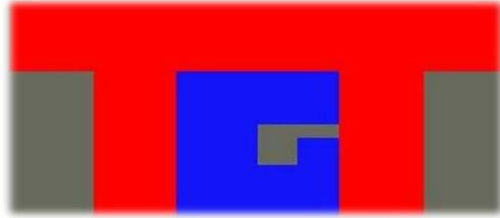
Client : Soil Investigation (Eastern)

Site Name : Arc Car Wash, Towers Place, South Shields

Client Reference : BG2578

Laboratory Reference : TGT1442

Date of Completion : 18-Sep



Content Summary

Lab Reference : TGT1442

Client Reference : BG2578

For the attention of : Sandra Brown

This report comprises of the following : 2 Pages of Results

- 1 Moisture / Shear Strength
- 1 Plasticity Profile
- 2 CBR Results
- 1 Limitations of Report

Notes :

General

Please refer to report summary notes for details pertaining to methods undertaken and their subsequent accreditations

Samples were supplied by Customer

All tests performed in-house unless otherwise stated

Deviant Samples

Samples were received in suitable containers	Yes
A date and time of sampling was provided	Yes
Arrived damage/denaturing free	Yes

Laboratory Testing Results

BS 1377 : 1990



Job Number : TGT1442
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 Site Name : Arc Car Wash, Towers Place, South Shields

Date Received : 14/09/2015
 Date Testing Started : 14/09/2015
 Date Testing Completed : 18/09/2015
 Laboratory Used : Trencside Geotechnical, CO9 4HS

Sample Ref			Sample Type	Moisture Content (%) [1]	Soil Fraction > 0.425mm (%) [2]	Liquid Limit (%) [3]	Plastic Limit (%) [4]	Plasticity Index (%) [5]	Liquidity Index (%) [5]	Modified Plasticity Index (%) [6]	Soil Class [7]	Filter Paper Contact Time (h) [8]	Soil Sample Suction (kPa)	Insitu Shear Vane Strength (kPa) [9]	Organic Content (%) [10]	pH Value [11]	Sulphate Content		
BH/TP/WS	Depth (m)	UID															SO ₃ [12]	SO ₄ [13]	Class [14]
BH1	1.0	15-2417	D	34	<5									101					
BH1	1.5	15-2418	D	33	<5	43	19	24	0.58	24	CI					7.4	0.22	0.26	DS-1
BH1	2.0	15-2419	D	32	<5									123					
BH1	2.5	15-2420	D	30	<5	46	18	28	0.44	28	CI								
BH1	3.0	15-2421	D	27	<5									> 140					
BH1	4.0	15-2422	D	25	<5	49	20	29	0.18	29	CI			> 140					

Notes :-

[1] BS 1377 : Part 2 : 1990, Test No 3.2	[7] BS 5930 : 1981 : Figure 31 - Plasticity Chart for the classification of fine soils	[12] BS 1377 : Part 3 : 1990, Test No 5.6
[2] Estimated if <5%, otherwise measured	[8] In-house method S9a adapted from BRE IP 4/93	[13] SO ₄ = 1.2 x SO ₃
[3] BS 1377 : Part 2 : 1990, Test No 4.4	[9] Values of shear strength were determined in situ by using a Pilcon hand vane or Geonor vane (GV).	[14] BRE Special Digest One (Concrete in Aggressive Ground) 2005
[4] BS 1377 : Part 2 : 1990, Test No 5.3		Note that if the SO ₄ content falls into the DS-4 or DS-5 class, it would be prudent to consider the sample as falling into the DS-4m or DS-5m class respectively unless water soluble magnesium testing is undertaken to prove otherwise
[5] BS 1377 : Part 2 : 1990, Test No 5.4	[10] BS 1377 : Part 3 : 1990, Test No 4	
[6] BRE Digest 240 : 1993	[11] BS 1377 : Part 2 : 1990, Test No 9	

Key

D	Disturbed sample
B	Bulk sample
U	U100 (undisturbed sample)
W	Water sample
ENP	Essentially Non-Plastic
U/S	Underside Foundation

Comments :-

Technician :- CW
 Checked By :- GW
 Date Checked :- 20-Sep-15

Laboratory Testing Results

BS 1377 : 1990



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BH/TP/WS	Depth (m)	UID															SO ₃ [12]	SO ₄ [13]	Class [14]
BH2	1.0	15-2423	D	36	<5									122					
BH2	1.5	15-2424	D	28	<5	47	17	30	0.36	30	CI					7.8	0.24	0.29	DS-1
BH2	2.0	15-2425	D	27	<5									128					
BH2	2.5	15-2426	D	27	<5	51	19	32	0.25	32	CH								
BH2	3.0	15-2427	D	29	<5									109					
BH2	4.0	15-2428	D	25	<5	60	19	41	0.16	41	CH			> 140					
BH2	5.0	15-2429	D	24	<5									> 140					
BH2	6.0	15-2430	D	25	<5									< 140					

Notes :-

- | | | |
|--|---|--|
| [1] BS 1377 : Part 2 : 1990, Test No 3.2 | [7] BS 5930 : 1981 : Figure 31 - Plasticity Chart for the classification of fine soils | [12] BS 1377 : Part 3 : 1990, Test No 5.6 |
| [2] Estimated if <5%, otherwise measured | [8] In-house method S9a adapted from BRE IP 4/93 | [13] SO ₄ = 1.2 x SO ₃ |
| [3] BS 1377 : Part 2 : 1990, Test No 4.4 | [9] Values of shear strength were determined in situ by using a Pilcon hand vane or Geonor vane (GV). | [14] BRE Special Digest One (Concrete in Aggressive Ground) 2005 |
| [4] BS 1377 : Part 2 : 1990, Test No 5.3 | | Note that if the SO ₄ content falls into the DS-4 or DS-5 class, it would be prudent to consider the sample as falling into the DS-4m or DS-5m class respectively unless water soluble magnesium testing is undertaken to prove otherwise |
| [5] BS 1377 : Part 2 : 1990, Test No 5.4 | [10] BS 1377 : Part 3 : 1990, Test No 4 | |
| [6] BRE Digest 240 : 1993 | [11] BS 1377 : Part 2 : 1990, Test No 9 | |

Key

- D Disturbed sample
- B Bulk sample
- U U100 (undisturbed sample)
- W Water sample
- ENP Essentially Non-Plastic
- U/S Underside Foundation

Comments :-

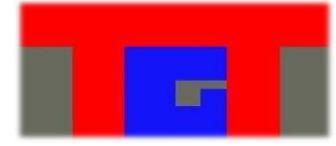
Technician :- CW

Checked By :- GW

Date Checked :- 20-Sep-15

Laboratory Testing Results

Moisture Content/Shear Strength Profile



Job Number : TGT1442

Client : Soil Investigation (Eastern)

Client Reference : BG2578

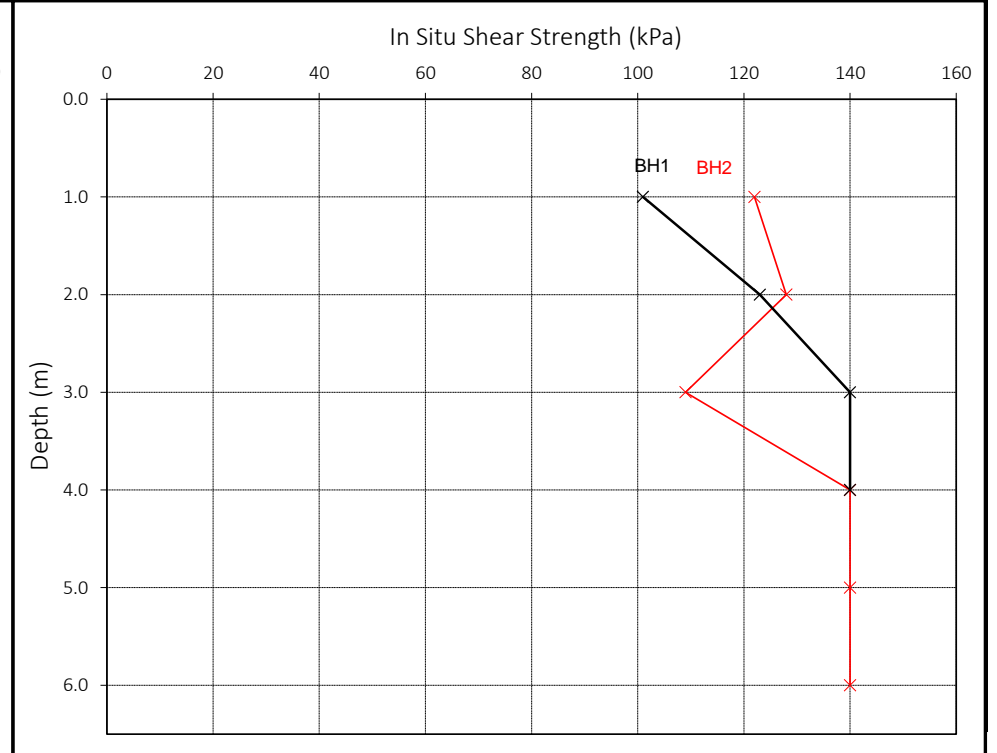
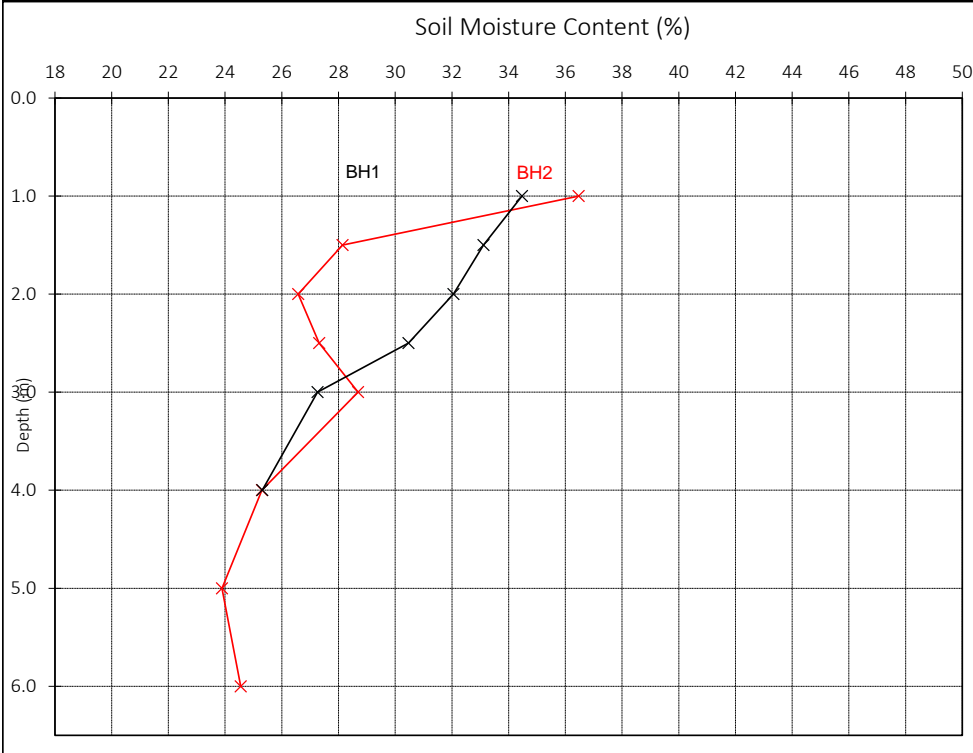
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Notes :-

1. If the Soil Fraction > 0.425mm exceeds 5% the Equivalent Moisture Content of the remainder (calculated in accordance with BS 1377: Part 2 : 1990, cl.3.2.4 note 1) is also plotted and the alternative profile additionally shown as an appropriately coloured broken line.
2. If plotted, 0.4 LL and PL+2 (after Driscoll, 1983) should only be applied to London Clay (and similarly over consolidated clays) at shallow depths.

Unless otherwise stated, values of Shear Strength were determined in situ by using a Pilcon Hand Vane the calibration of which is limited to a maximum reading of 140 kPa.

Comments :-

Checked By :- GW

Date Checked :- 20-Sep-15

Laboratory Testing Results

Plasticity Chart for the classification of fine soils and the finer part of coarse soils
In Compliance with BS5930 : 1999



Job Number : TGT1442

Client : Soil Investigation (Eastern)

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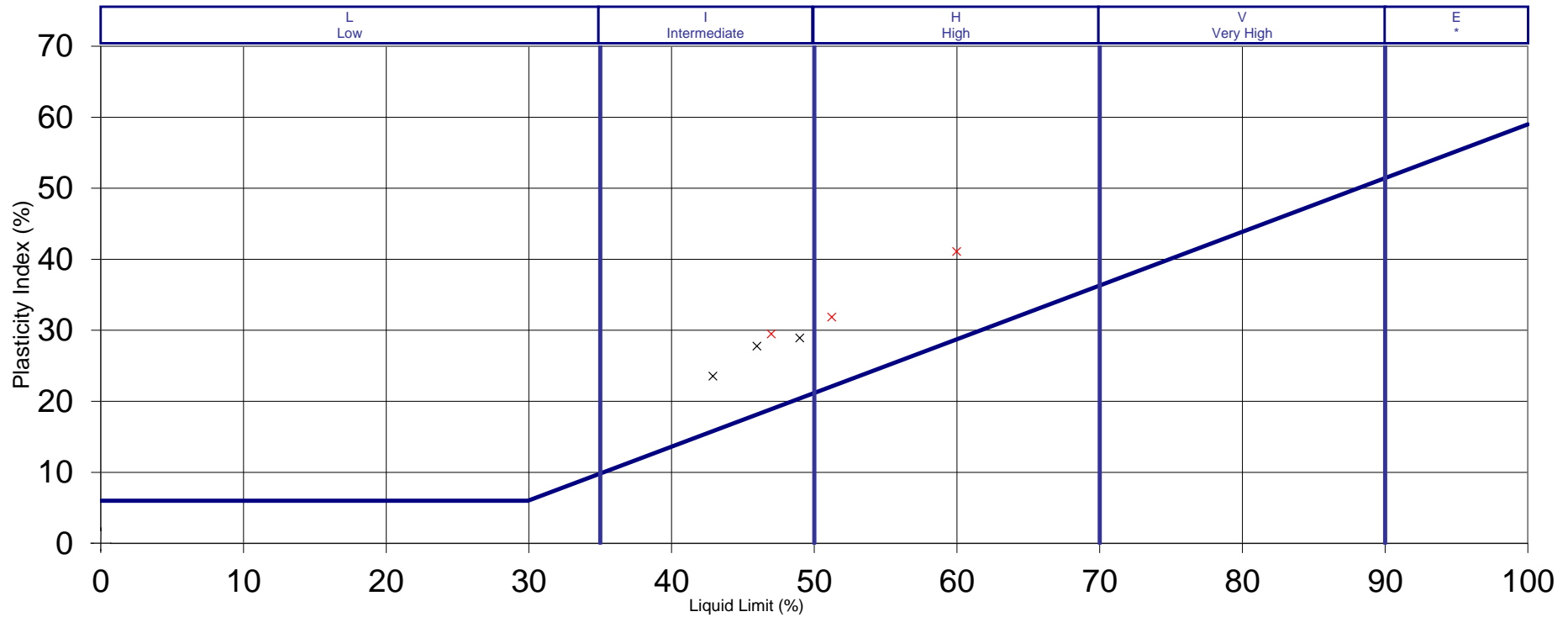
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Notes :-

SILT (M-SOIL), M, plots below A-Line

CLAY, C, plots above A-Line JM and C may be combined as FINE SOIL, F.

Key :- BH1

BH2

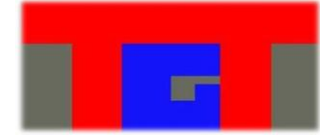
Comments :-

Checked By :- GW

Date Checked :- 20-Sep-15

CALIFORNIA BEARING RATIO

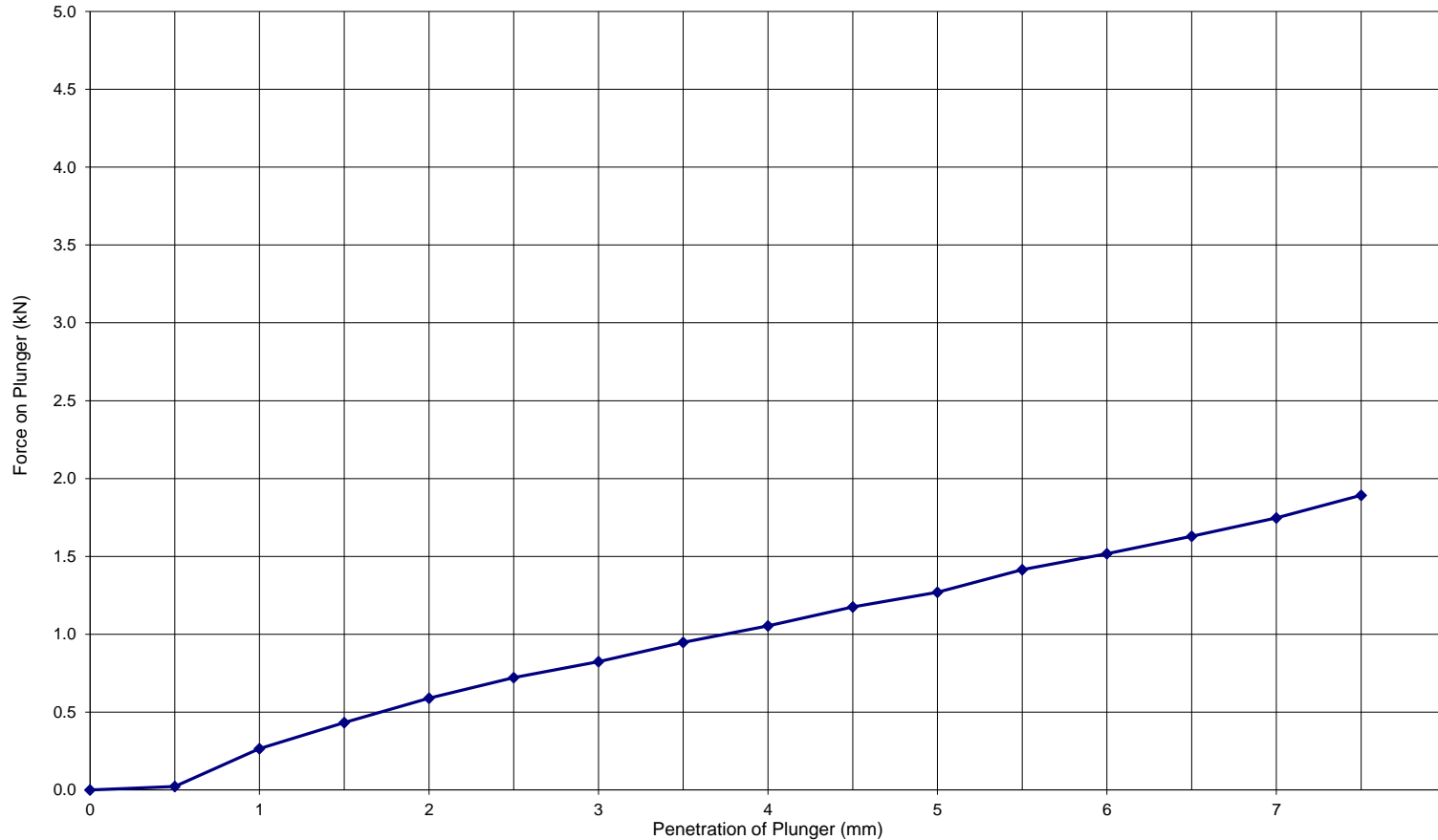
BS EN 1377-4:1990



Job Number : TGT1442
 Test Number : CBR 01
 Sample ID : BH1
 Sample Depth : 0.4m

Site Name : Arc Car Wash, South Shields
 Description : See Material Log

Type of Testing : Laboratory
 Date : 14-Sep-15
 Tested By : KW & CT
 Laboratory : Trentside Geotechnical CO9 4HS



Density (Mg/m³)	
Bulk Density :	2.22
Dry Density :	2.08

Soaking Details (If required)	
Surcharge (kg) :	8
Soaking Time (hr) :	72
Swell (mm) :	0.00

Moisture Content (%)	
Top :	6.9
Bottom :	n/a

Preparation Details	
Layers (#) :	3
Rammer (kg) :	4.5
Blows :	62
Sieve (mm) :	20
Removed (%) :	17.8

Bearing Value % @	
Top (2.5mm) :	5.4
Top (5.0mm) :	6.4
Base (2.5mm) :	n/a
Base (5.0mm) :	n/a
Accepted CBR Value (%)	
6	

Calculations :-

$$p = \frac{m_3 - m_2}{V} \times 1000$$

$$p_d = \frac{100}{100 + w} \times p$$

$$w = \frac{m_2 - m_3}{m_3 - m_1} \times 100 (\%)$$

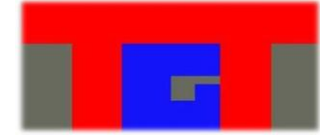
Comments :-

Checked By :- GW

Date Checked :- 31-Aug-15

CALIFORNIA BEARING RATIO

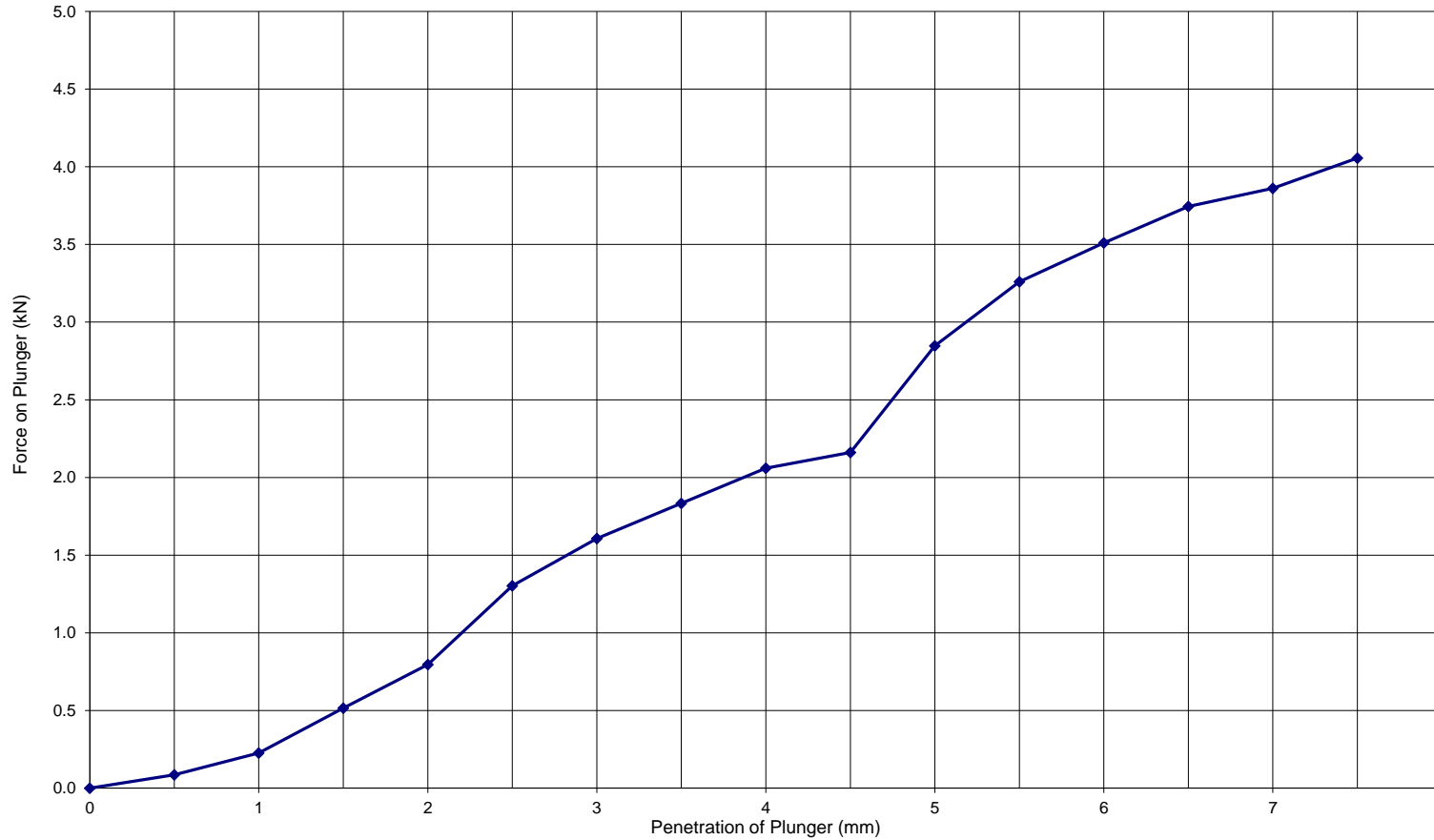
BS EN 1377-4:1990



Job Number : TGT1442
 Test Number : CBR 02
 Sample ID : BH1
 Sample Depth : 0.7m

Site Name : Arc Car Wash, South Shields
 Description : See Material Log

Type of Testing : Laboratory
 Date : 14-Sep-15
 Tested By : KW & CT
 Laboratory : Trentside Geotechnical CO9 4HS



Density (Mg/m³)	
Bulk Density :	2.15
Dry Density :	1.76

Soaking Details (If required)	
Surcharge (kg) :	8
Soaking Time (hr) :	72
Swell (mm) :	0.68

Moisture Content (%)	
Top :	22.1
Bottom :	n/a

Preparation Details	
Layers (#) :	3
Rammer (kg) :	4.5
Blows :	62
Sieve (mm) :	20
Removed (%) :	0.0

Bearing Value % @	
Top (2.5mm) :	9.8
Top (5.0mm) :	14.3
Base (2.5mm) :	n/a
Base (5.0mm) :	n/a

Accepted CBR Value (%)	
14	

Calculations :-

$$p = \frac{m_3 - m_2}{V} \times 1000$$

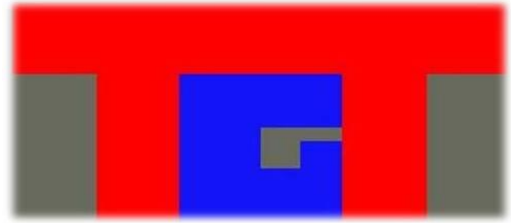
$$p_d = \frac{100}{100 + w} \times p$$

$$w = \frac{m_2 - m_3}{m_3 - m_1} \times 100 (\%)$$

Comments :-

Checked By :- GW

Date Checked :- 20-Sep-15



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This report shall not be reproduced, except in full, without the written approval of the testing laboratory.

Where our involvement consists exclusively of testing samples, the results and comments (if provided) relate only to the samples tested.

Any samples that are deemed to be subject to deviation will be recorded as such within the test summary.