

BOREHOLE RECORD (Percussive)

**Borehole
Number:**
BH9A

Site:
241919- 53 Fitzroy Park

Location:
53 Fitzroy Park

Client:
Smarter Building and Construction Limited

Ground Level:
82.30mAOD

Date:
17 Nov 10

Job No:
241919

GROUND WATER

SAMPLES/TESTS

STRATA RECORD

Sheet 1 of 1

Strike	Well	Depth (m)	Depth/Type (m)	SPT 'N' or U Blows	Depth (m)	Level (mAOD)	Key	Description
					0.05 0.10	82.25 82.20	0.05 0.05	PAVING SLAB
			0.40-0.70 B 1					LEAN MIX CONCRETE
			1.25 D 2				1.40	MADE GROUND: Brown slightly sandy slightly gravelly clay with roots. Gravel of fine to coarse flint and brick with occasional fragments of clay tile and ash.
			1.50-1.95 SPTLS3		1.50	80.80		
			2.20 D 4					Firm fissured brown mottled grey-green silty CLAY, locally with powdery iron oxide and carbonate precipitate. (WEATHERED LONDON CLAY FORMATION).
			2.50-2.95 U 5	N=10 (1,1/2,2,2,4) [1,1](2,2,2,4)				
			3.20 D 6					...selenite crystals (generally coarse sand size)
			3.50-3.95 SPTLS7				4.60	...locally slightly sandy (fine) with occasional partings of fine sand/coarse silt between 3.5m and 4.2m
			4.20 D 8					...rare pyrite nodules and occasional partings of fine sand/coarse silt between 5.2m and 5.9m
			4.50-4.95 U 9	N=13 (1,2/2,3,4,4) [1,2](2,3,4,4)				
			5.20 D 10					
			5.50-5.95 SPTLS11					
			6.25 D 12		6.10	76.20		Stiff fissured dark-brownish grey silty CLAY. (LONDON CLAY FORMATION).
			6.55-7.00 U 13	N=18 (2,3/4,4,5,5) [2,3](4,4,5,5)				
			7.50 D 14					
			8.05-8.50 SPTLS15				3.90	...occasional partings of fine sand/coarse silt between 8.0m and 8.5m
			9.00 D 16	N=27 (3,3/5,6,8,8) [3,3](5,6,8,8)				
			9.55-10.00 U 17					

Remarks and Water Observations

Hand dug service pit to 1.2m bgl. Seepage at 7.15m. Borehole cased to 1.6m with 150mm casing. Borehole dry on completion.

End of Borehole at 10.00 m

Scale: 1:50

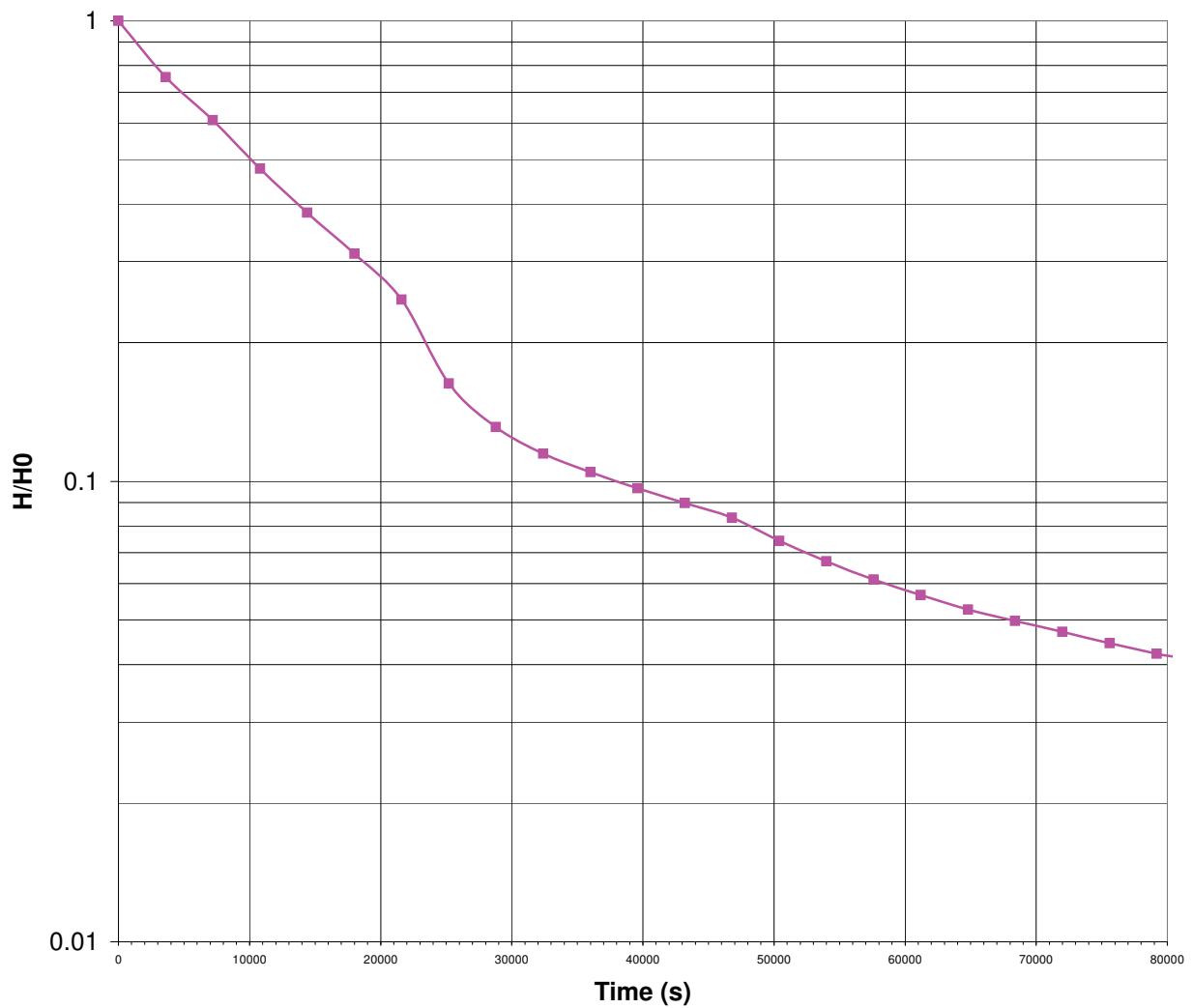
Logged by: CG

Figure:

STATS

RisingHead Permeability Test to BS 5930:1999

Location	53 Fitzroy Park	Borehole No	BH2A
Client	Smarter Building and Construction Ltd	Depth to top response zone (m)	2
Job Number	241919-01(00)	Depth to bottom response zone (m)	5
Date	13-Dec-10	Diameter of Borehole (m)	0.15
Operator	CG	Depth to water table (m bgl)	1.5



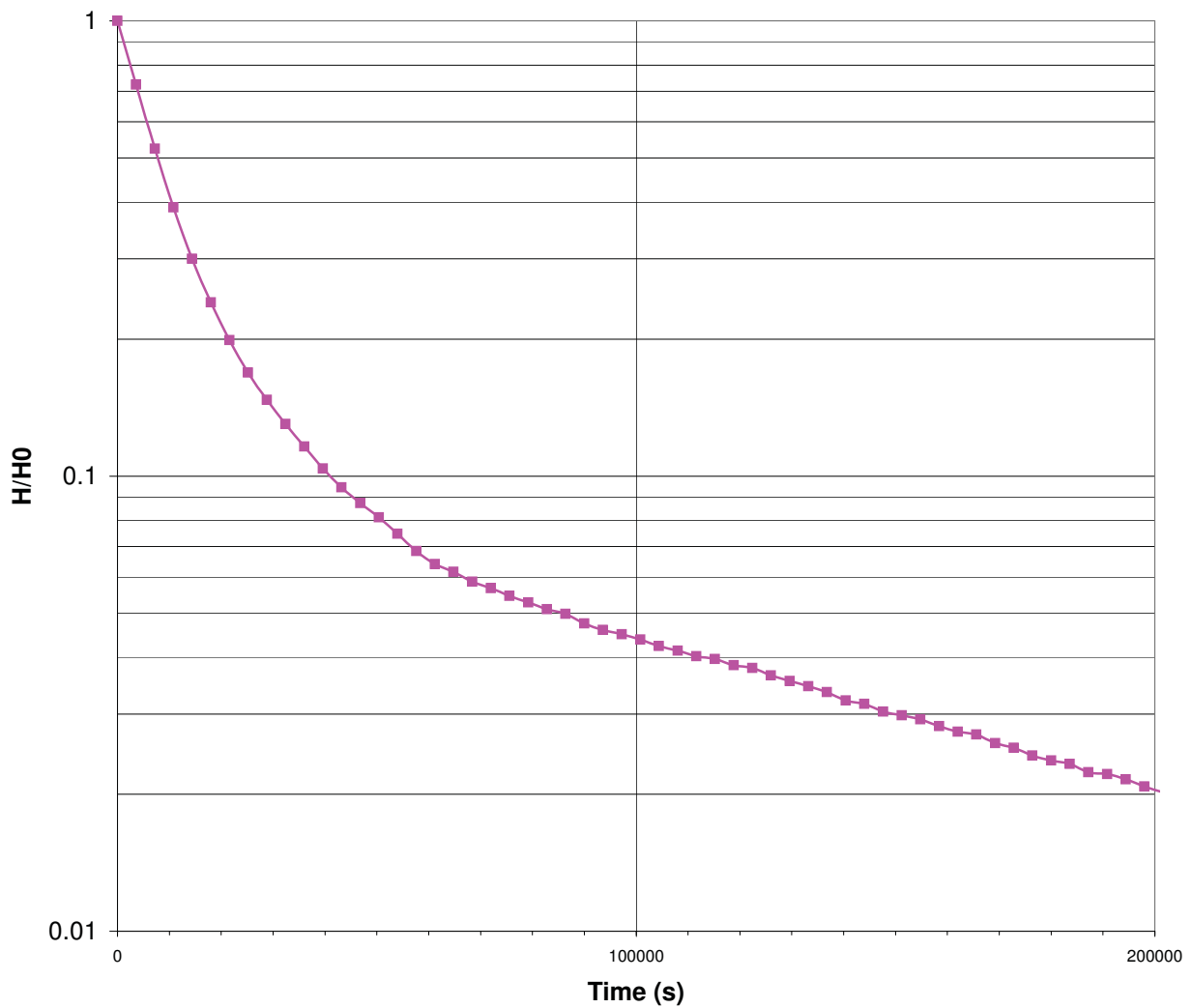
Calculations

Area of borehole A (m ²)	0.01767
Intake Factor F	5.108968
Permeability k (m/s)	1.98E-07

STATS

RisingHead Permeability Test to BS 5930:1999

Location	53 Fitzroy Park	Borehole No	BH6A
Client	Smarter Building and Construction Ltd	Depth to top response zone (m)	5.5
Job Number	241919-01(00)	Depth to bottom response zone (m)	6.5
Date	13-Dec-10	Diameter of Borehole (m)	0.15
Operator	CG	Depth to water table (m bgl)	1.2



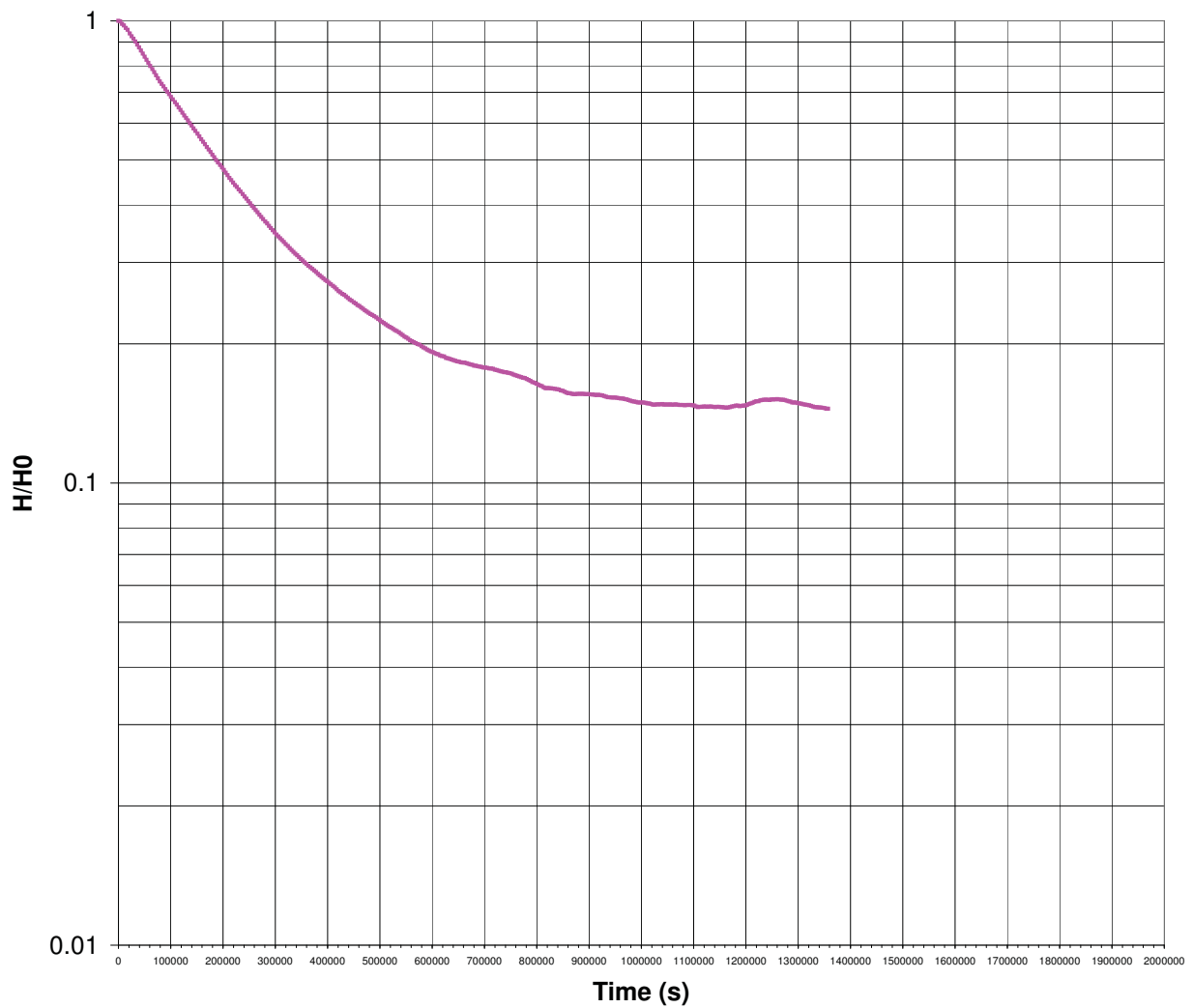
Calculations

Area of borehole A (m ²)	0.01767
Intake Factor F	0.804857
Permeability k (m/s)	1.83E-07

STATS

RisingHead Permeability Test to BS 5930:1999

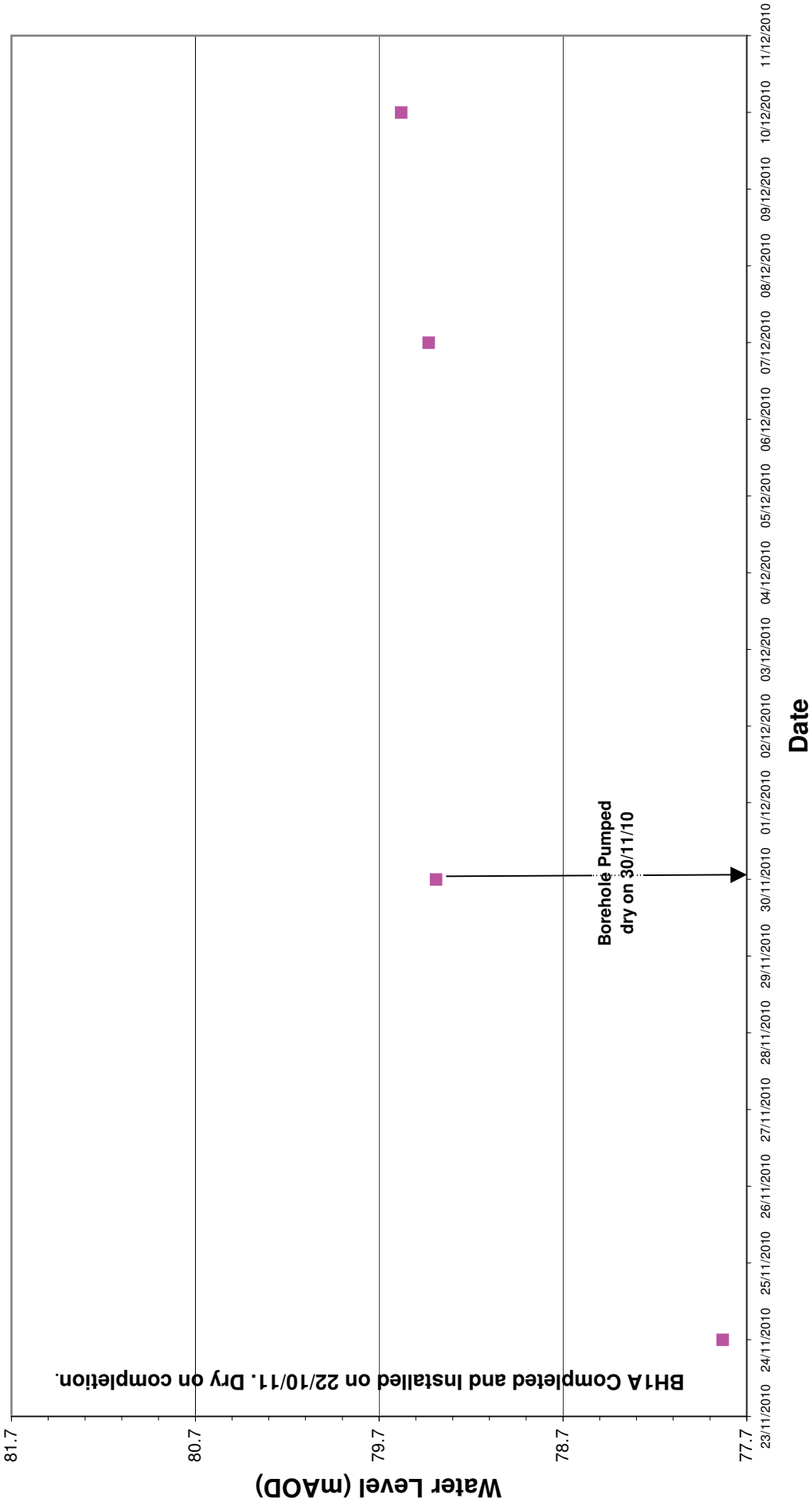
Location	53 Fitzroy Park	Borehole No	BH9A
Client	Smarter Building and Construction Ltd	Depth to top response zone (m)	7.5
Job Number	241919-01(00)	Depth to bottom response zone (m)	9.5
Date	13-Dec-10	Diameter of Borehole (m)	0.15
Operator	CG	Depth to water table (m bgl)	0.8



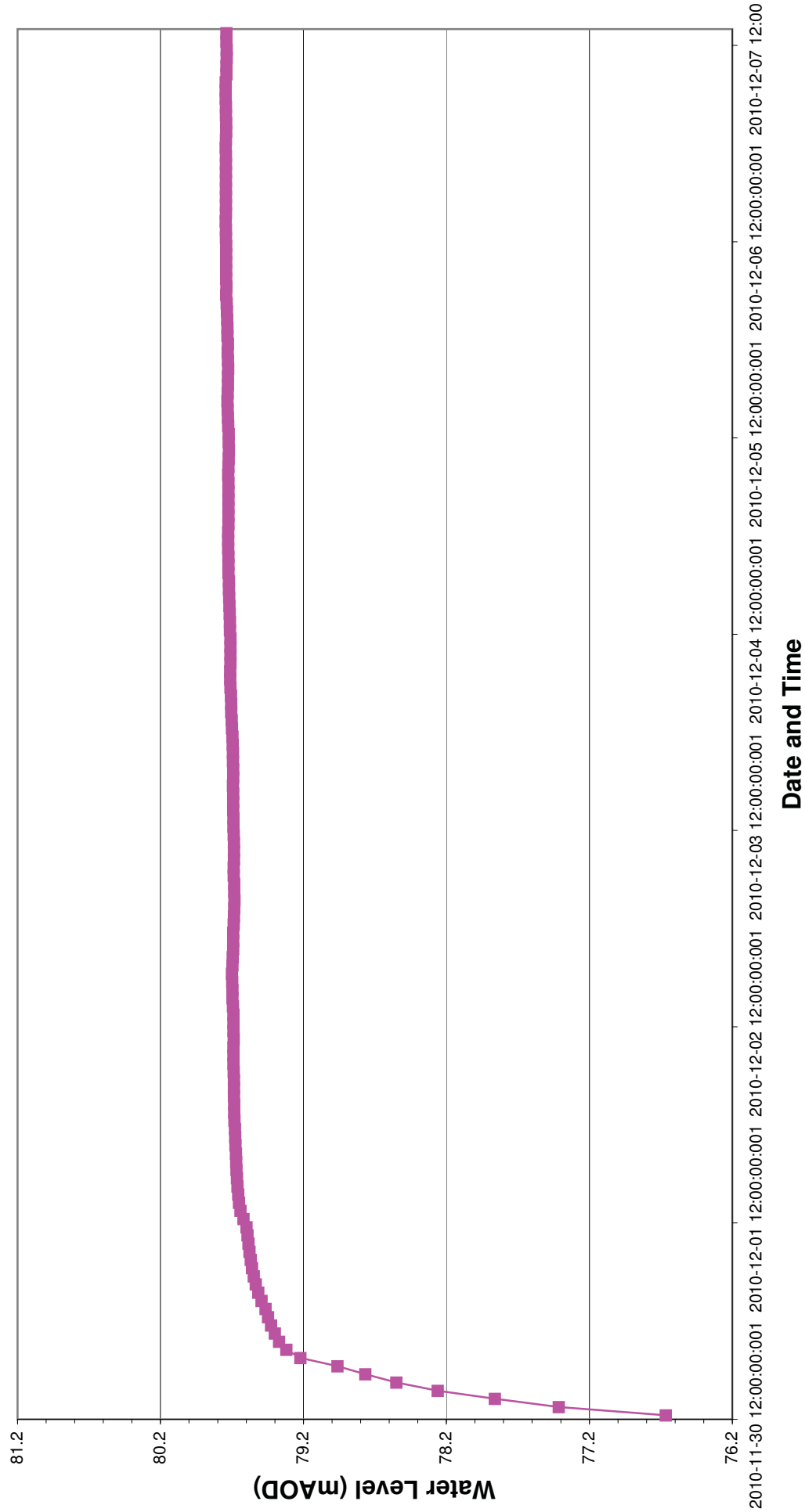
Calculations

Area of borehole A (m ²)	0.01767
Intake Factor F	0.872591
Permeability k (m/s)	1.37E-08

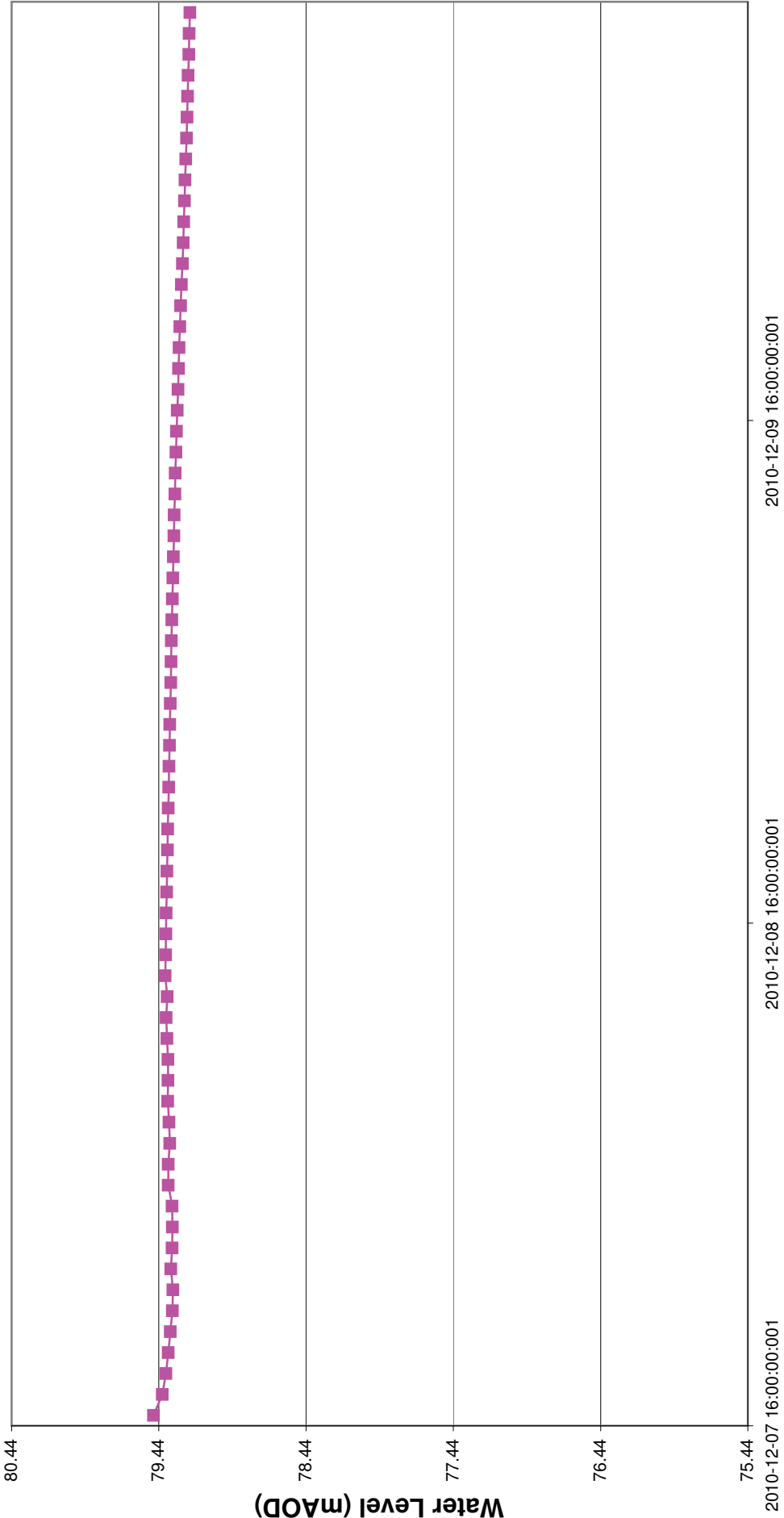
BH1A Groundwater Levels (Ground Level 81.73mAOD)



BH2A Rising Head Test (Ground Level 81.22mAOD)



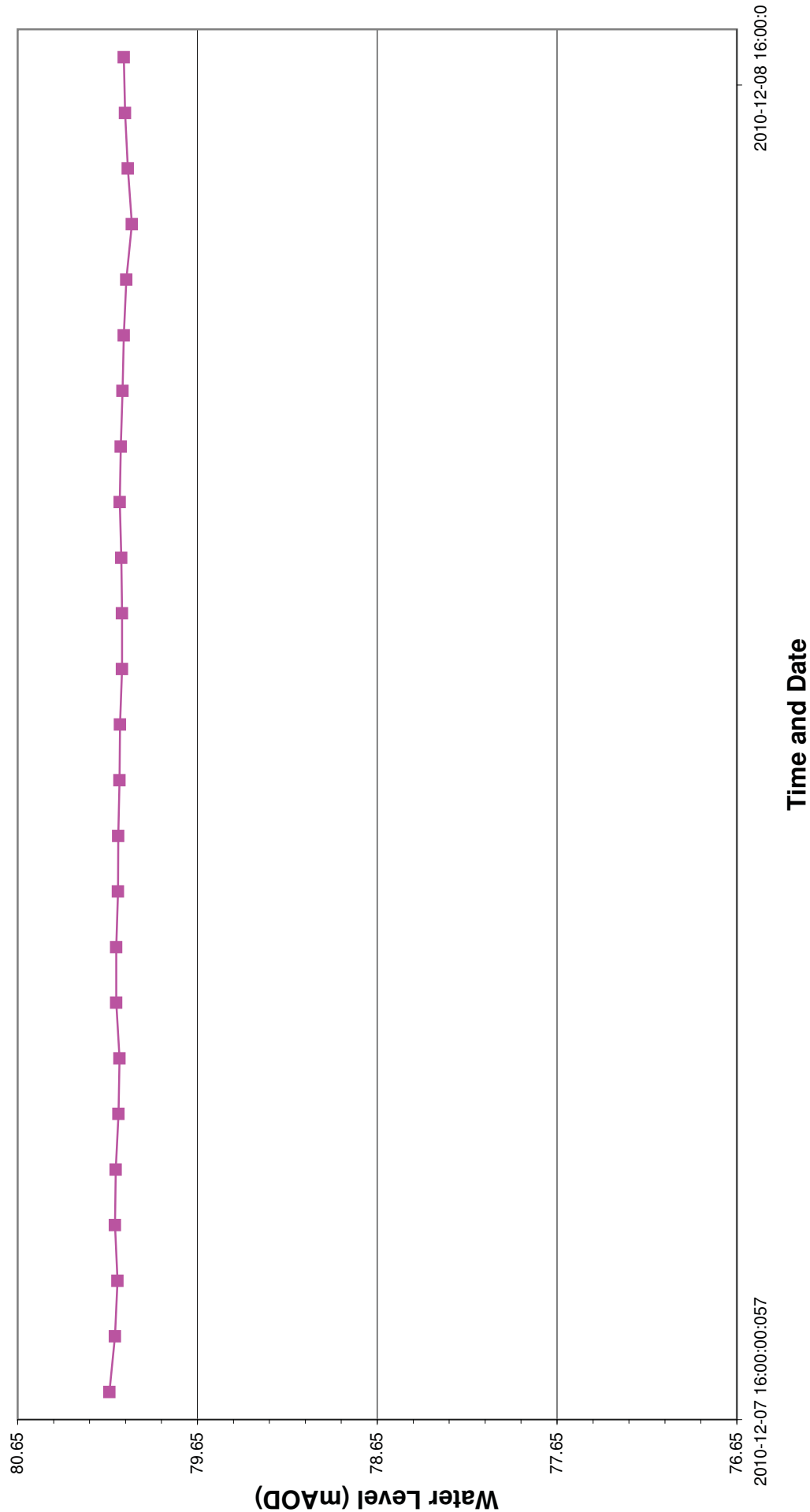
BH5A Soakage Test (Ground Level 80.44mAOD)



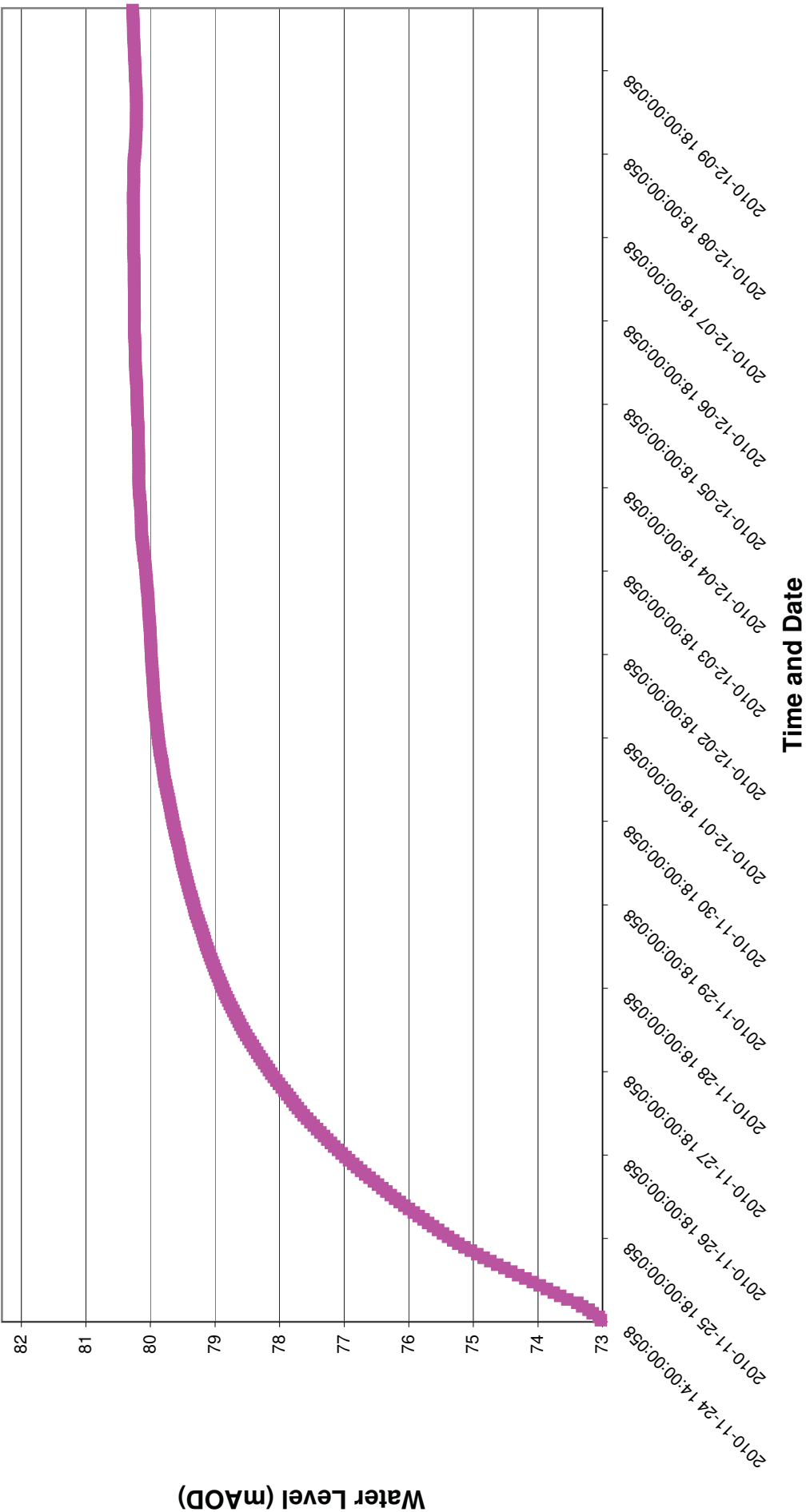
BH6A Rising Head Test (Ground Level 82.4mAOD)



BH7A Soakage Test (Ground Level (80.56mAOD))



BH9A Rising Head Test (Ground Level 82.3mAOD)



APPENDIX C

Geotechnical Laboratory Test Records

(this appendix contains 21 pages, including this one)



Clive Gerring
RSK STATS GEOCONSULT LIMITED
18 Frogmore Road
Hemel Hempstead
Herts
HP3 9RT

STRUCTURAL SOILS LTD

SITE INVESTIGATION

SOIL, ROCK &
MATERIAL TESTING

GEOTECHNICAL
CONSULTANCY

CONTAMINATED
LAND ASSESSMENT

3rd December 2010

TESTING REPORT

YOUR REF: 241919

SITE: 53 Fitzroy Park

CERTIFICATE NUMBER: 581433

DATE SAMPLES RECEIVED: 26th November 2010

DATE TESTING COMMENCED: 26th November 2010

DATE OF SAMPLE DISPOSAL: 3rd January 2011

INSTRUCTIONS: Please carry out Moisture Content, Atterberg Limits, Particle Size Distribution and Quick Undrained Triaxial tests on samples provided.

I have pleasure in enclosing the test report for the above project that you submitted to us for testing.

Yours sincerely

Paul Kent
Laboratory Manager

Enc.

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HP3 9RT
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HEAD OFFICE:
Bristol

BRANCH OFFICE:
Castleford
West Yorkshire

SUMMARY OF MOISTURE CONTENT TESTING

Exploratory Position ID	Depth (m)	Sample Ref	Sample Type	Moisture Content (%)
BH1A	1.10		D	18
BH1A	2.20		U	39
BH1A	4.20		U	32
BH1A	9.55		U	28
BH2A	2.10		D	34
BH2A	3.10		D	35
BH2A	4.35		U	36
BH2A	12.55		U	31
BH2A	14.55		U	31
BH6A	1.20		D	29
BH6A	2.20		U	33
BH6A	6.55		U	31
BH6A	9.55		U	29
BH8A	1.20		U	37
BH8A	2.20		D	35
BH8A	5.20		U	27
BH8A	8.05		U	32
BH9A	1.50		D	31
BH9A	2.50		U	33
BH9A	6.55		U	30



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Date

Checked By

Date

Paul

03/12/10

Paul

3.12.10

Contract:

53 Fitzroy Park

Contract Ref:

581433

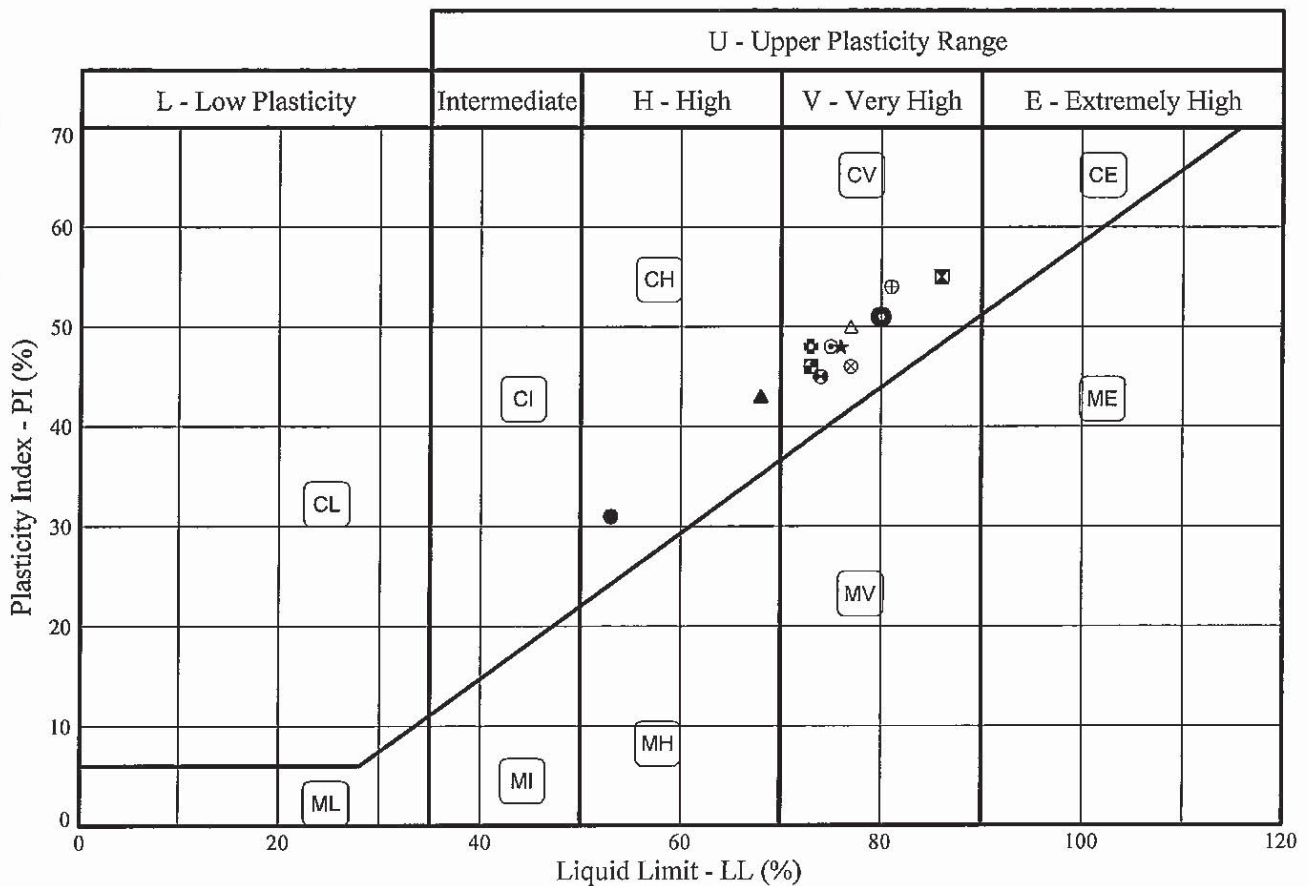
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PLASTICITY CHART - PI Vs LL

In accordance with clause 42.3 of BS5930:1981
Testing in accordance with BS1377-2:1990



Sample Identification				BS Test Method #	Preparation Method +	MC %	LL %	PL %	PI %	<425um %
Exploratory Position ID	Sample	Depth (m)								
●	BH1A	D	1.10	3.2/4.4/5.3/5.4	4.2.3	18	53	22	31	100
■	BH1A	U	2.20	3.2/4.4/5.3/5.4	4.2.3	39	86	31	55	100
▲	BH1A	U	4.20	3.2/4.4/5.3/5.4	4.2.3	32	68	25	43	100
★	BH1A	U	9.55	3.2/4.4/5.3/5.4	4.2.3	28	76	28	48	100
⊙	BH2A	D	2.10	3.2/4.4/5.3/5.4	4.2.3	34	75	27	48	100
⊕	BH2A	D	3.10	3.2/4.4/5.3/5.4	4.2.3	35	73	25	48	100
⊗	BH2A	U	4.35	3.2/4.4/5.3/5.4	4.2.3	36	80	29	51	100
△	BH2A	U	12.55	3.2/4.4/5.3/5.4	4.2.3	31	77	27	50	100
⊗	BH2A	U	14.55	3.2/4.4/5.3/5.4	4.2.3	31	77	31	46	100
⊕	BH6A	D	1.20	3.2/4.4/5.3/5.4	4.2.3	29	81	27	54	100
□	BH6A	U	2.20	3.2/4.4/5.3/5.4	4.2.3	33	73	27	46	100
⊗	BH6A	U	6.55	3.2/4.4/5.3/5.4	4.2.3	31	74	29	45	100
⊕	BH6A	U	9.55	3.2/4.4/5.3/5.4	4.2.3	29	73	27	46	100

Tested in accordance with the following clauses of BS1377-2:1990.

3.2 - Moisture Content
4.3 - Cone Penetrometer Method
4.4 - One Point Cone Penetrometer Method
4.6 - One Point Casagrande Method
5.3 - Plastic Limit Method
5.4 - Plasticity Index

+ Tested in accordance with the following clauses of BS1377-2:1990.

4.2.3 - Natural State
4.2.4 - Wet Sieved

Key: * = Non standard test, NP = Non plastic.

Approved Signatories: P. KENT S. CAIRNS



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Contract		Contract Ref:
53 Fitzroy Park		581433
Page		3 of 20
		AGS

In accordance with clause 42.3 of BS5930:1981
Testing in accordance with BS1377-2:1990

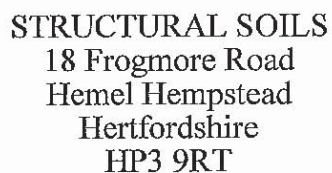
Testing in accordance with BS1377-2:1990

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- 3.2 - Moisture Content
- 4.3 - Cone Penetrometer Method
- 4.4 - One Point Cone Penetrometer Method
- 4.6 - One Point Casagrande Method
- 5.3 - Plastic Limit Method
- 5.4 - Plasticity Index

4.2.3 - Natural State
4.2.4 - Wet Sieved

Approved Signatories: P. KENT S. CAIRNS



Date _____

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03/12/10

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PARTICLE SIZE DISTRIBUTION TEST

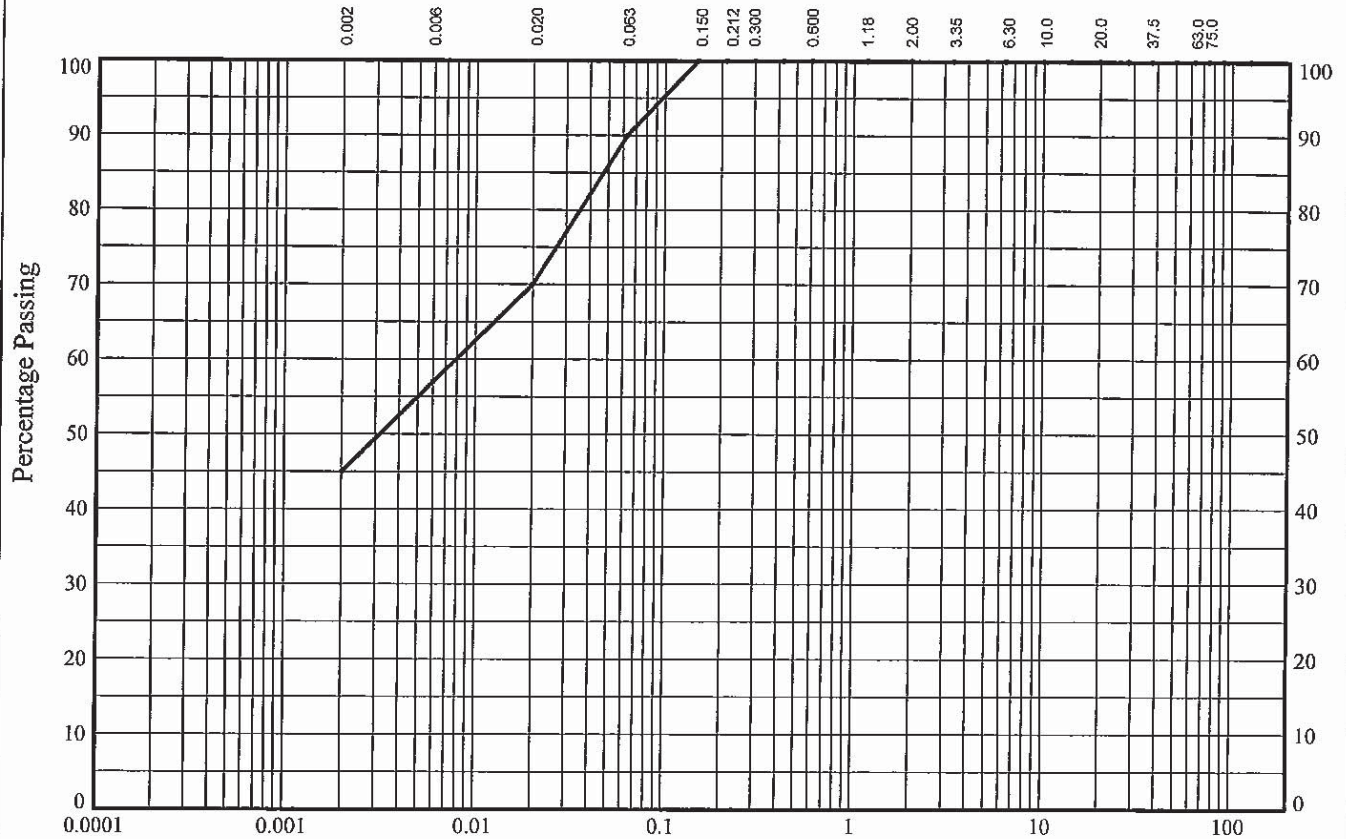
In accordance with clauses 9.2,9.4 of BS1377:Part 2:1990

Borehole : **BH2A**

Sample Ref:

Sample Type: **U**

Depth (m): **2.35**



CLAY	fine	medium	coarse	fine	medium	coarse	fine	medium	coarse	COBBLES
	SILT			SAND			GRAVEL			

BS Test Sieve (mm)	Percentage Passing
125	100
90	100
75	100
63	100
50	100
37.5	100
28	100
20	100
14	100
10	100
6.3	100
5	100
3.35	100
2	100
1.18	100
0.6	100
0.425	100
0.3	100
0.212	100
0.15	100
0.063	90

Particle Diameter	Percentage Passing
0.02	70
0.006	57
0.002	45

Soil Fraction	Sieve Percentage
GRAVEL	0
SAND	10
SILT	45
CLAY	45

Soil Description:

Brown mottled grey slightly sandy CLAY with occasional pockets of fine sand

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PARTICLE SIZE DISTRIBUTION TEST

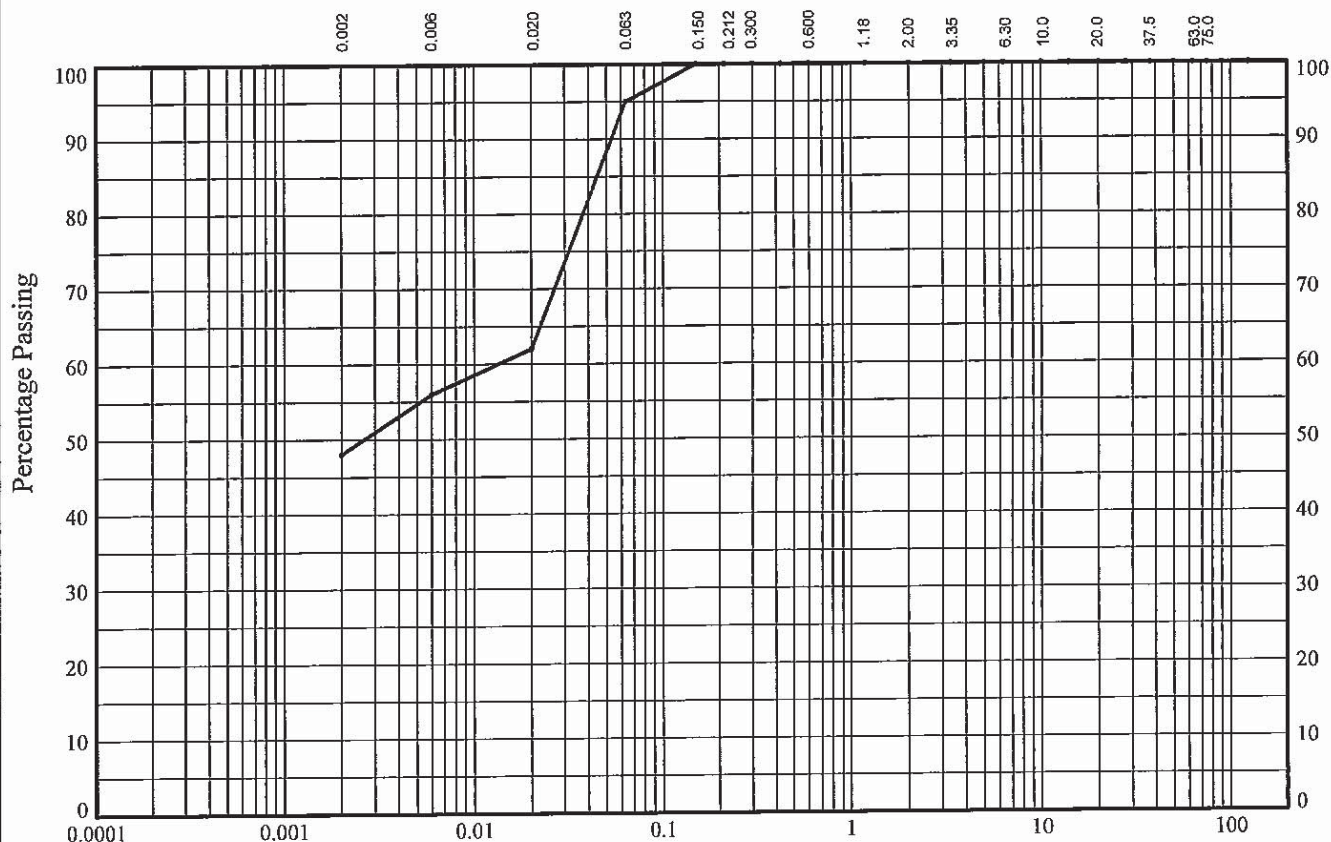
In accordance with clauses 9.2,9.4 of BS1377:Part 2:1990

Borehole : **BH6A**

Sample Ref:

Sample Type: **D**

Depth (m): **3.90**



CLAY	fine	medium	coarse	fine	medium	coarse	fine	medium	coarse	COBBLES
	SILT			SAND			GRAVEL			

BS Test Sieve (mm)	Percentage Passing
125	100
90	100
75	100
63	100
50	100
37.5	100
28	100
20	100
14	100
10	100
6.3	100
5	100
3.35	100
2	100
1.18	100
0.6	100
0.425	100
0.3	100
0.212	100
0.15	100
0.063	95

Particle Diameter	Percentage Passing
0.02	62
0.006	56
0.002	48

Soil Fraction	Sieve Percentage
GRAVEL	0
SAND	5
SILT	47
CLAY	48

Soil Description:

Brown mottled grey CLAY with some pockets of silt

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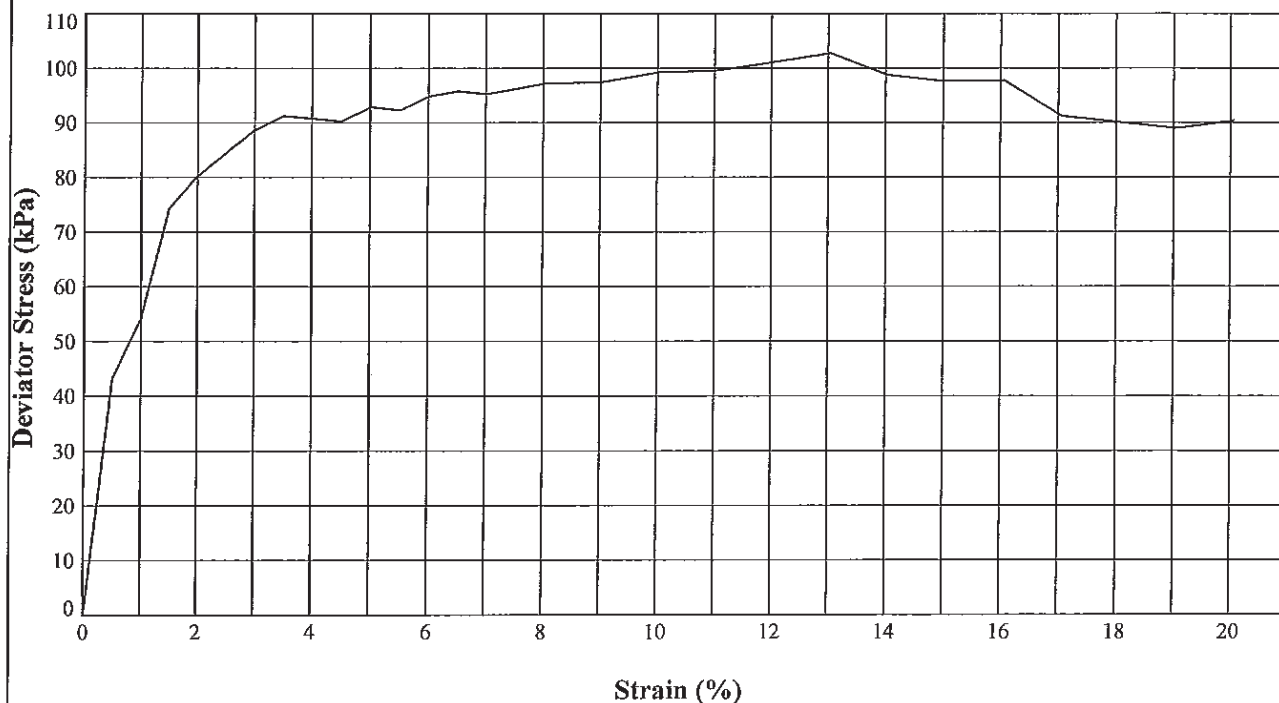
UNCONSOLIDATED QUICK UNDRAINED (SINGLE STAGE) TRIAXIAL COMPRESSION TEST

In accordance with BS1377:Part 7:1990, Clause 8

Borehole : **BH1A** Sample Ref: Sample Type: **U** Depth (m): **2.20**

Description : **Brown mottled grey slightly gravelly (fine to medium) CLAY**

STAGE NUMBER		1	2	3
SAMPLE DETAILS	Sample Condition	Undisturbed		
	Orientation of sample	Vertical		
	Diameter (mm)	102.47		
	Height (mm)	209.36		
	Moisture Content (%)	40		
	Bulk Density (Mg/m ³)	2.02		
	Dry Density (Mg/m ³)	1.45		
TEST DETAILS	Membrane Thickness (mm)	0.24		
	Rate of Axial Displacement (%/min)	2.01		
	Cell Pressure (kPa)	44		
	Membrane Correction (kPa)	0.65		
	Corrected Deviator Stress (kPa)	103		
	Undrained Shear Strength (kPa)	51		
	Strain at Failure (%)	13.0		
	Mode of Failure	Compound		



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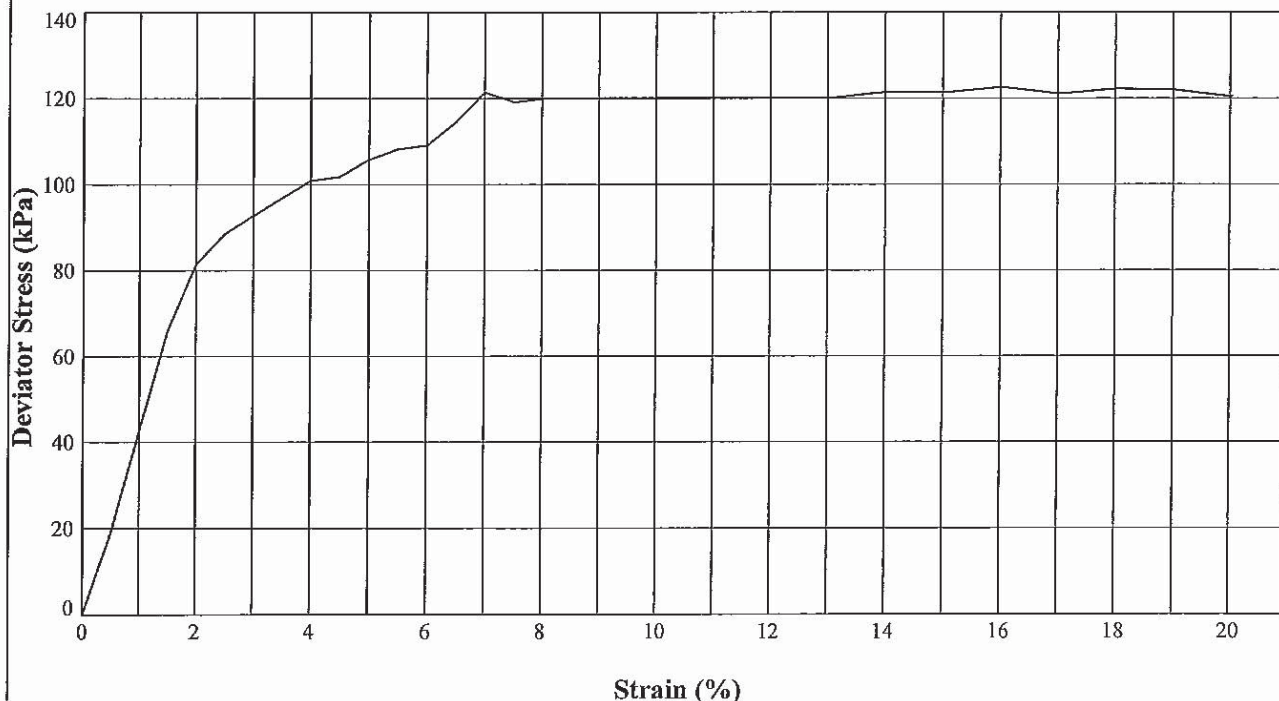
UNCONSOLIDATED QUICK UNDRAINED (SINGLE STAGE) TRIAXIAL COMPRESSION TEST

In accordance with BS1377:Part 7:1990, Clause 8

Borehole : **BH1A** Sample Ref: Sample Type: **U** Depth (m): **4.20**

Description : **Brown mottled grey CLAY**

STAGE NUMBER		1	2	3
SAMPLE DETAILS	Sample Condition	Undisturbed		
	Orientation of sample	Vertical		
	Diameter (mm)	102.81		
	Height (mm)	209.56		
	Moisture Content (%)	31		
	Bulk Density (Mg/m ³)	1.93		
	Dry Density (Mg/m ³)	1.47		
TEST DETAILS	Membrane Thickness (mm)	0.24		
	Rate of Axial Displacement (%/min)	2.00		
	Cell Pressure (kPa)	84		
	Membrane Correction (kPa)	0.75		
	Corrected Deviator Stress (kPa)	123		
	Undrained Shear Strength (kPa)	61		
	Strain at Failure (%)	16.0		
	Mode of Failure	Compound		



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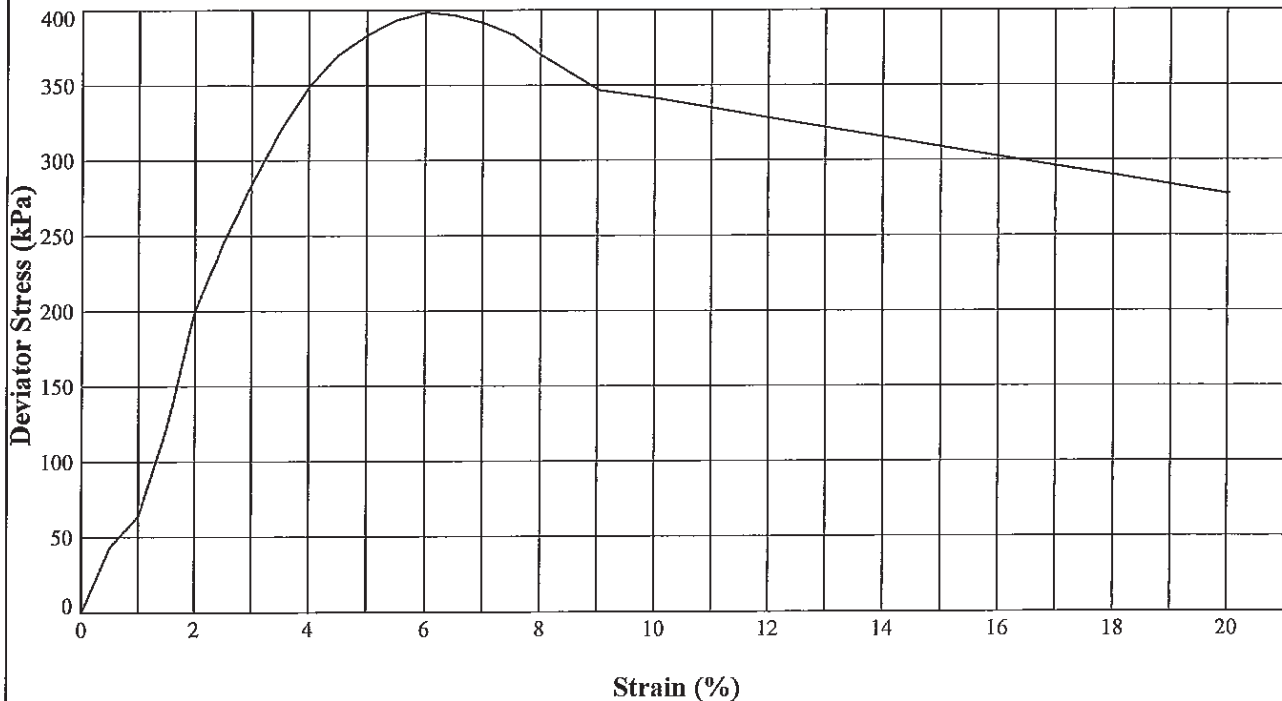
UNCONSOLIDATED QUICK UNDRAINED (SINGLE STAGE) TRIAXIAL COMPRESSION TEST

In accordance with BS1377:Part 7:1990, Clause 8

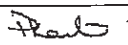
Borehole : **BH1A** Sample Ref: Sample Type: **U** Depth (m): **9.55**

Description : **Brownish black CLAY**

STAGE NUMBER		1	2	3
SAMPLE DETAILS	Sample Condition	Undisturbed		
	Orientation of sample	Vertical		
	Diameter (mm)	102.61		
	Height (mm)	209.57		
	Moisture Content (%)	29		
	Bulk Density (Mg/m ³)	2.01		
	Dry Density (Mg/m ³)	1.56		
TEST DETAILS	Membrane Thickness (mm)	0.24		
	Rate of Axial Displacement (%/min)	2.00		
	Cell Pressure (kPa)	190		
	Membrane Correction (kPa)	0.36		
	Corrected Deviator Stress (kPa)	399		
	Undrained Shear Strength (kPa)	200		
	Strain at Failure (%)	6.0		
	Mode of Failure	Brittle		



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	Contract		Contract Ref:
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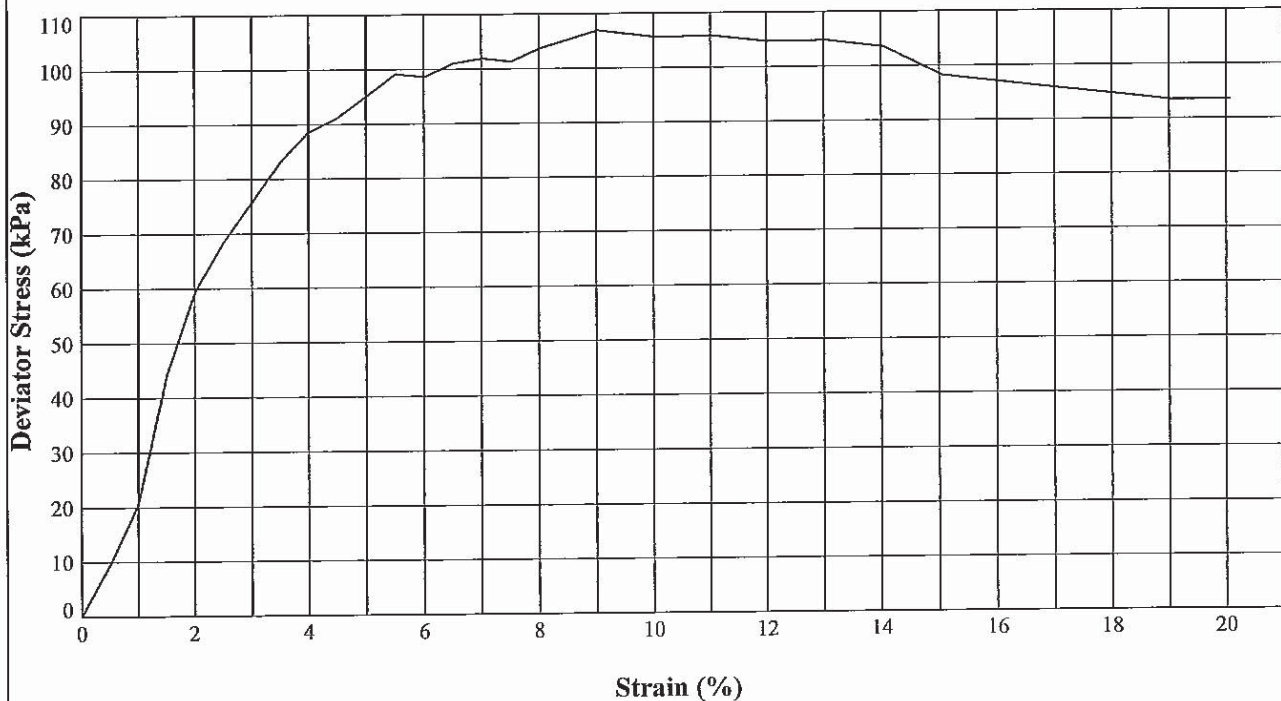
UNCONSOLIDATED QUICK UNDRAINED (SINGLE STAGE) TRIAXIAL COMPRESSION TEST

In accordance with BS1377:Part 7:1990, Clause 8

Borehole : **BH2A** Sample Ref: Sample Type: **U** Depth (m): **4.35**

Description : **Brown mottled grey CLAY**

STAGE NUMBER		1	2	3
SAMPLE DETAILS	Sample Condition	Undisturbed		
	Orientation of sample	Vertical		
	Diameter (mm)	102.84		
	Height (mm)	209.34		
	Moisture Content (%)	37		
	Bulk Density (Mg/m ³)	1.89		
	Dry Density (Mg/m ³)	1.38		
TEST DETAILS	Membrane Thickness (mm)	0.24		
	Rate of Axial Displacement (%/min)	2.00		
	Cell Pressure (kPa)	87		
	Membrane Correction (kPa)	0.49		
	Corrected Deviator Stress (kPa)	107		
	Undrained Shear Strength (kPa)	54		
	Strain at Failure (%)	9.0		
	Mode of Failure	Brittle		



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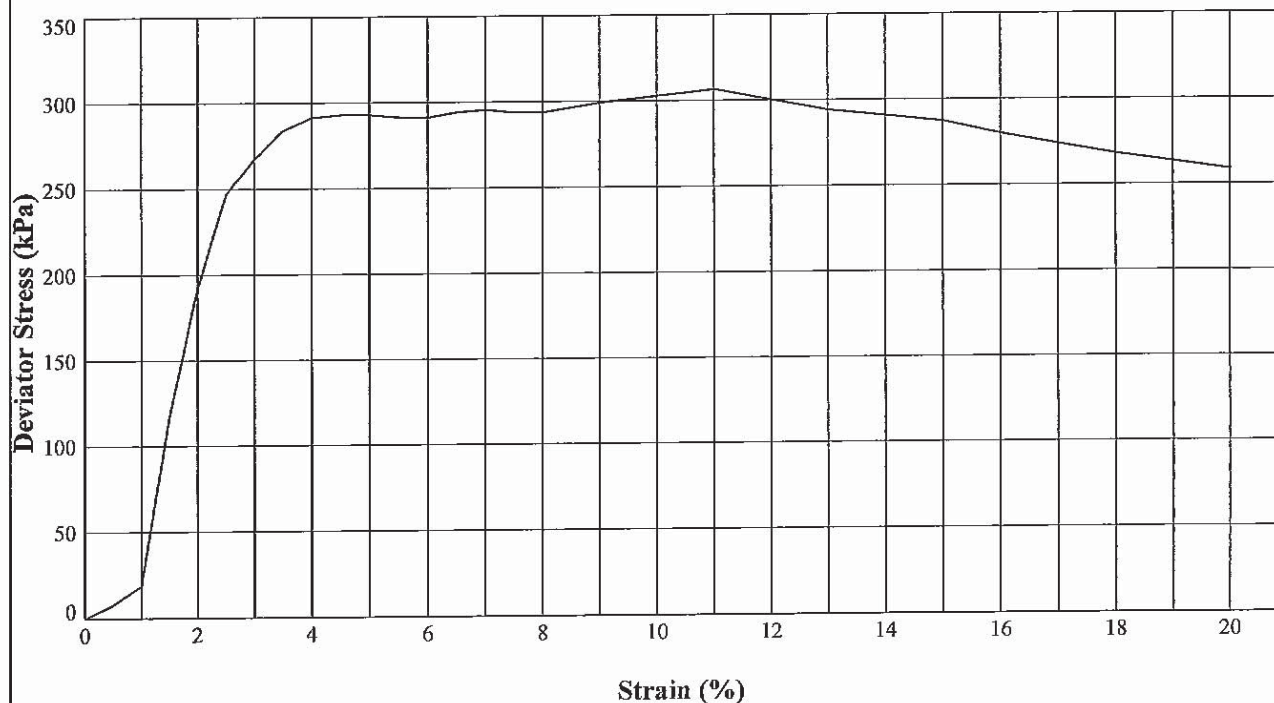
UNCONSOLIDATED QUICK UNDRAINED (SINGLE STAGE) TRIAXIAL COMPRESSION TEST

In accordance with BS1377:Part 7:1990, Clause 8

Borehole : **BH2A** Sample Ref: Sample Type: **U** Depth (m): **12.55**

Description : **Brownish black CLAY**

STAGE NUMBER		1	2	3
SAMPLE DETAILS	Sample Condition	Undisturbed		
	Orientation of sample	Vertical		
	Diameter (mm)	102.99		
	Height (mm)	209.78		
	Moisture Content (%)	30		
	Bulk Density (Mg/m ³)	1.99		
	Dry Density (Mg/m ³)	1.53		
TEST DETAILS	Membrane Thickness (mm)	0.24		
	Rate of Axial Displacement (%/min)	2.00		
	Cell Pressure (kPa)	250		
	Membrane Correction (kPa)	0.57		
	Corrected Deviator Stress (kPa)	307		
	Undrained Shear Strength (kPa)	153		
	Strain at Failure (%)	11.0		
	Mode of Failure	Brittle		



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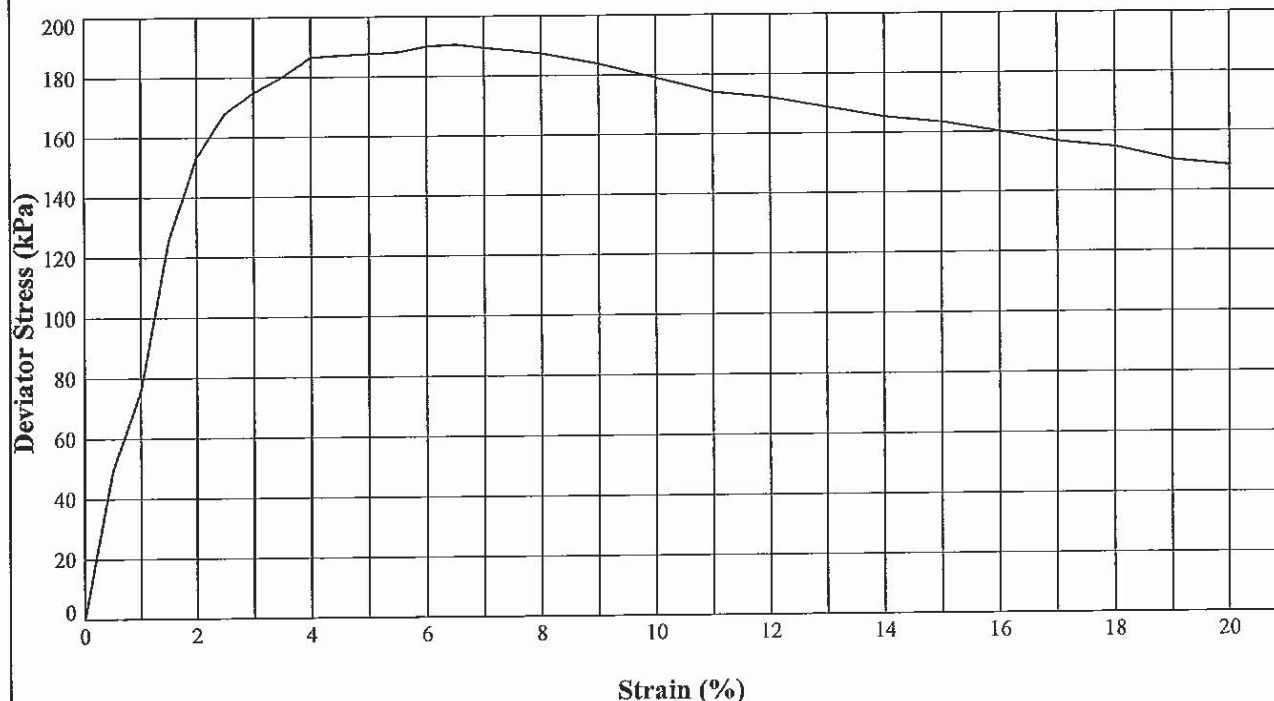
UNCONSOLIDATED QUICK UNDRAINED (SINGLE STAGE) TRIAXIAL COMPRESSION TEST

In accordance with BS1377:Part 7:1990, Clause 8

Borehole : **BH2A** Sample Ref: Sample Type: **U** Depth (m): **14.55**

Description : **Brownish black CLAY**

STAGE NUMBER		1	2	3
SAMPLE DETAILS	Sample Condition	Undisturbed		
	Orientation of sample	Vertical		
	Diameter (mm)	102.84		
	Height (mm)	209.73		
	Moisture Content (%)	30		
	Bulk Density (Mg/m ³)	1.96		
	Dry Density (Mg/m ³)	1.51		
TEST DETAILS	Membrane Thickness (mm)	0.24		
	Rate of Axial Displacement (%/min)	2.00		
	Cell Pressure (kPa)	290		
	Membrane Correction (kPa)	0.38		
	Corrected Deviator Stress (kPa)	191		
	Undrained Shear Strength (kPa)	95		
	Strain at Failure (%)	6.5		
	Mode of Failure	Brittle		



Approved Signatories: P. KENT S. CAIRNS



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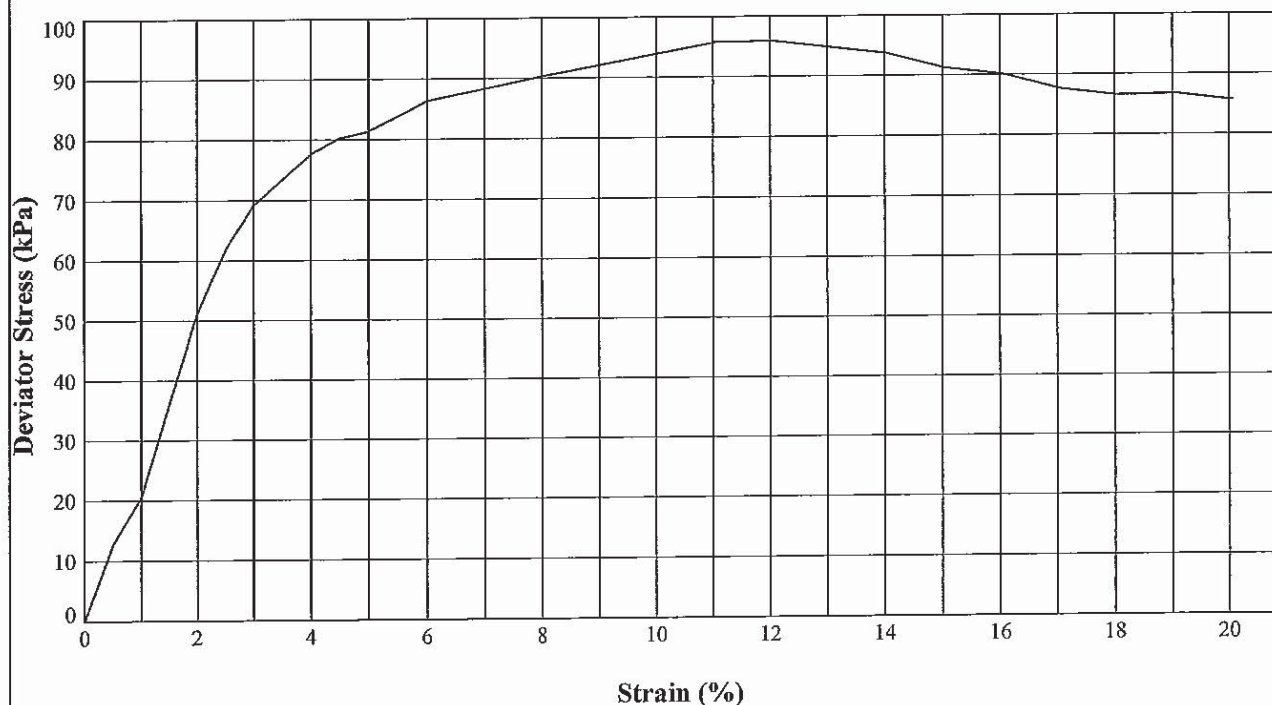
UNCONSOLIDATED QUICK UNDRAINED (SINGLE STAGE) TRIAXIAL COMPRESSION TEST

In accordance with BS1377:Part 7:1990, Clause 8

Borehole : **BH6A** Sample Ref: Sample Type: **U** Depth (m): **2.20**

Description : **Brown mottled grey CLAY with occasional pockets of fine sand**

STAGE NUMBER		1	2	3
SAMPLE DETAILS	Sample Condition	Undisturbed		
	Orientation of sample	Vertical		
	Diameter (mm)	102.97		
	Height (mm)	209.40		
	Moisture Content (%)	32		
	Bulk Density (Mg/m ³)	1.87		
	Dry Density (Mg/m ³)	1.41		
TEST DETAILS	Membrane Thickness (mm)	0.24		
	Rate of Axial Displacement (%/min)	2.00		
	Cell Pressure (kPa)	44		
	Membrane Correction (kPa)	0.61		
	Corrected Deviator Stress (kPa)	96		
	Undrained Shear Strength (kPa)	48		
	Strain at Failure (%)	12.0		
	Mode of Failure	Compound		



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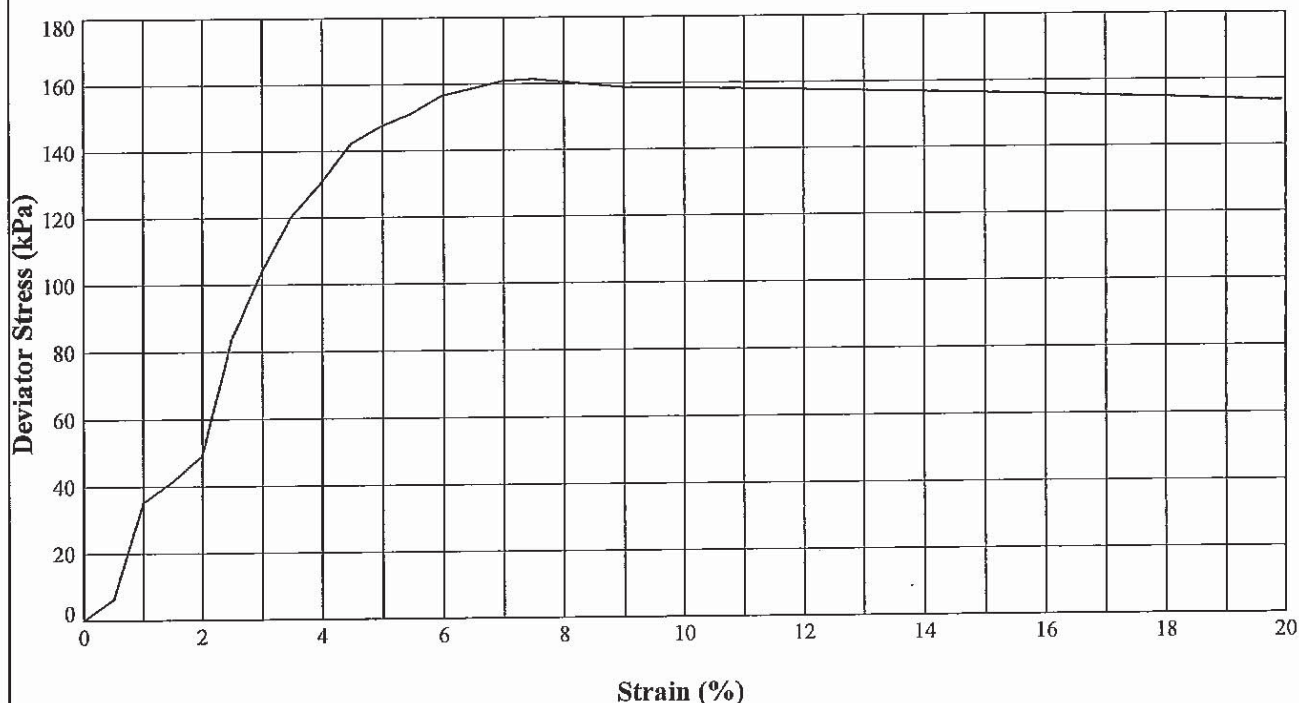
UNCONSOLIDATED QUICK UNDRAINED (SINGLE STAGE) TRIAxIAL COMPRESSION TEST

In accordance with BS1377:Part 7:1990, Clause 8

Borehole : **BH6A** Sample Ref: Sample Type: **U** Depth (m): **6.55**

Description : **Brownish black CLAY**

STAGE NUMBER		1	2	3
SAMPLE DETAILS	Sample Condition	Undisturbed		
	Orientation of sample	Vertical		
	Diameter (mm)	102.05		
	Height (mm)	200.73		
	Moisture Content (%)	31		
	Bulk Density (Mg/m ³)	1.96		
	Dry Density (Mg/m ³)	1.50		
TEST DETAILS	Membrane Thickness (mm)	0.24		
	Rate of Axial Displacement (%/min)	2.00		
	Cell Pressure (kPa)	130		
	Membrane Correction (kPa)	0.43		
	Corrected Deviator Stress (kPa)	162		
	Undrained Shear Strength (kPa)	81		
	Strain at Failure (%)	7.5		
	Mode of Failure	Compound		



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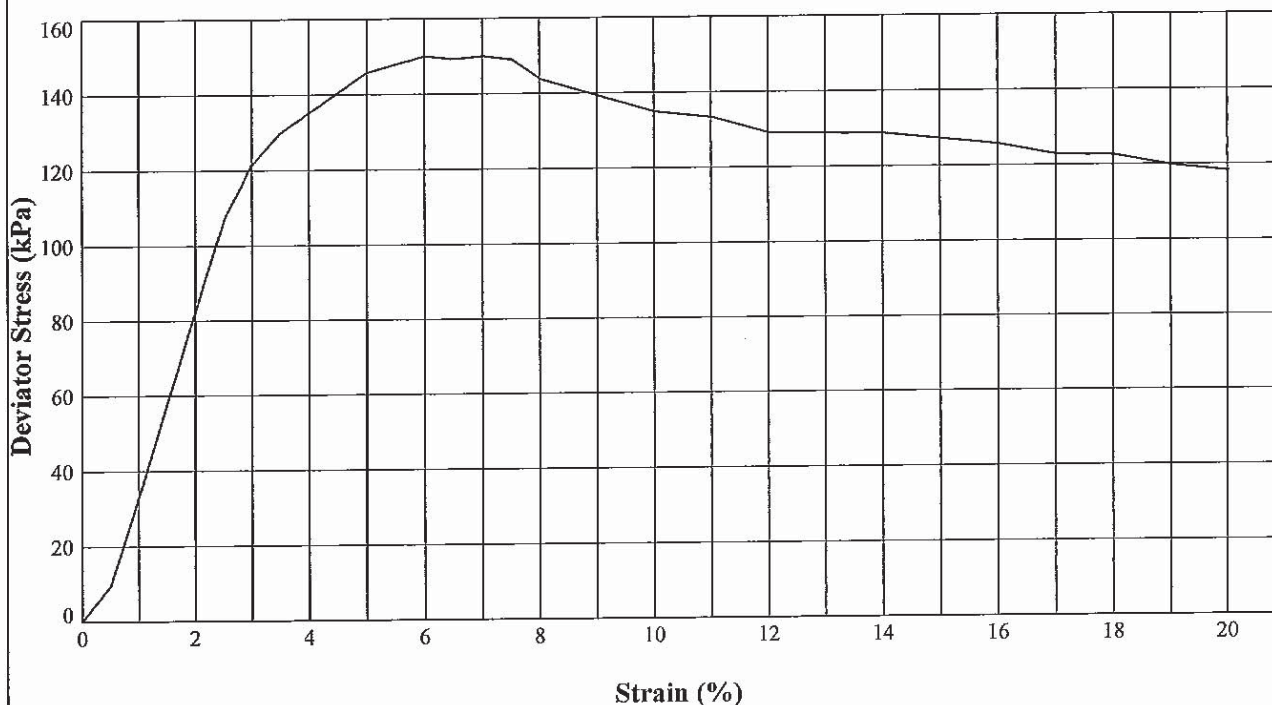
UNCONSOLIDATED QUICK UNDRAINED (SINGLE STAGE) TRIAXIAL COMPRESSION TEST

In accordance with BS1377:Part 7:1990, Clause 8

Borehole : **BH6A** Sample Ref: Sample Type: **U** Depth (m): **9.55**

Description : **Brownish black CLAY**

STAGE NUMBER		1	2	3
SAMPLE DETAILS	Sample Condition	Undisturbed		
	Orientation of sample	Vertical		
	Diameter (mm)	103.21		
	Height (mm)	209.71		
	Moisture Content (%)	31		
	Bulk Density (Mg/m ³)	1.96		
	Dry Density (Mg/m ³)	1.50		
TEST DETAILS	Membrane Thickness (mm)	0.24		
	Rate of Axial Displacement (%/min)	2.00		
	Cell Pressure (kPa)	190		
	Membrane Correction (kPa)	0.36		
	Corrected Deviator Stress (kPa)	150		
	Undrained Shear Strength (kPa)	75		
	Strain at Failure (%)	6.0		
	Mode of Failure	Brittle		



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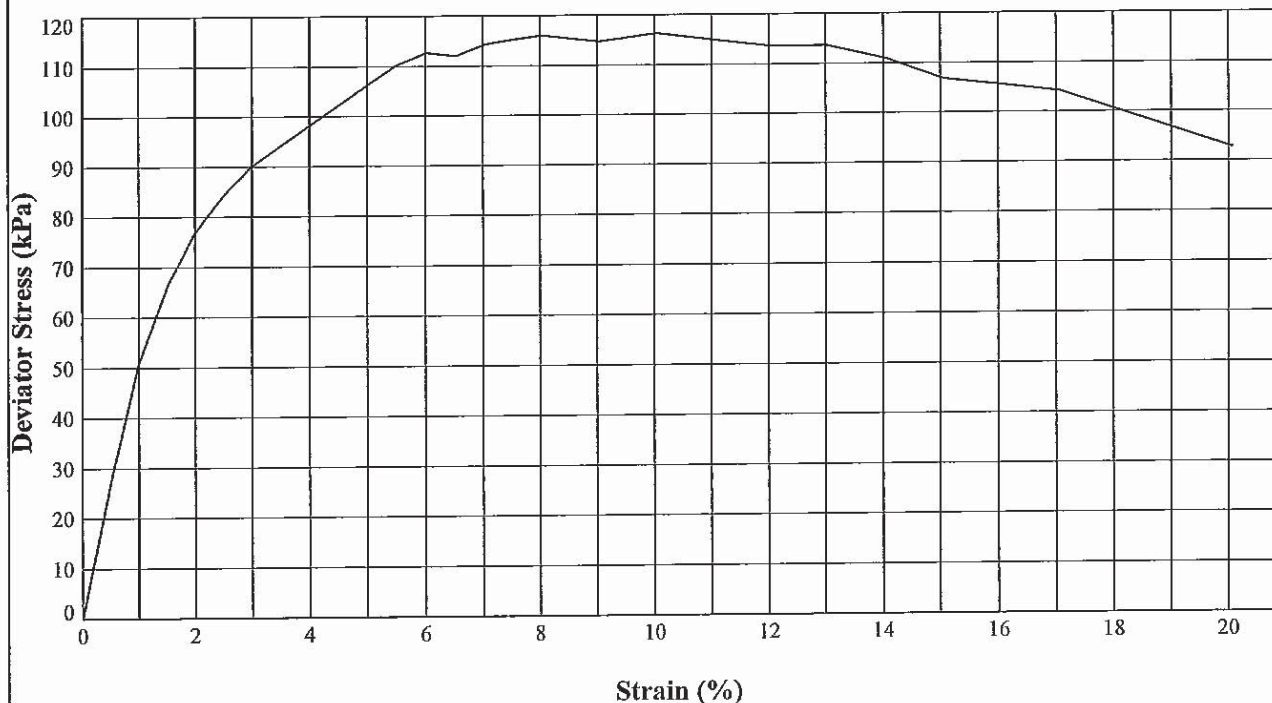
UNCONSOLIDATED QUICK UNDRAINED (SINGLE STAGE) TRIAXIAL COMPRESSION TEST

In accordance with BS1377:Part 7:1990, Clause 8

Borehole : **BH8A** Sample Ref: Sample Type: **U** Depth (m): **1.20**

Description : **Brown mottled grey CLAY with occasional pockets of fine sand**

STAGE NUMBER		1	2	3
SAMPLE DETAILS	Sample Condition	Undisturbed		
	Orientation of sample	Vertical		
	Diameter (mm)	102.59		
	Height (mm)	209.17		
	Moisture Content (%)	36		
	Bulk Density (Mg/m ³)	1.87		
	Dry Density (Mg/m ³)	1.37		
TEST DETAILS	Membrane Thickness (mm)	0.24		
	Rate of Axial Displacement (%/min)	2.00		
	Cell Pressure (kPa)	24		
	Membrane Correction (kPa)	0.54		
	Corrected Deviator Stress (kPa)	116		
	Undrained Shear Strength (kPa)	58		
	Strain at Failure (%)	10.0		
	Mode of Failure	Compound		



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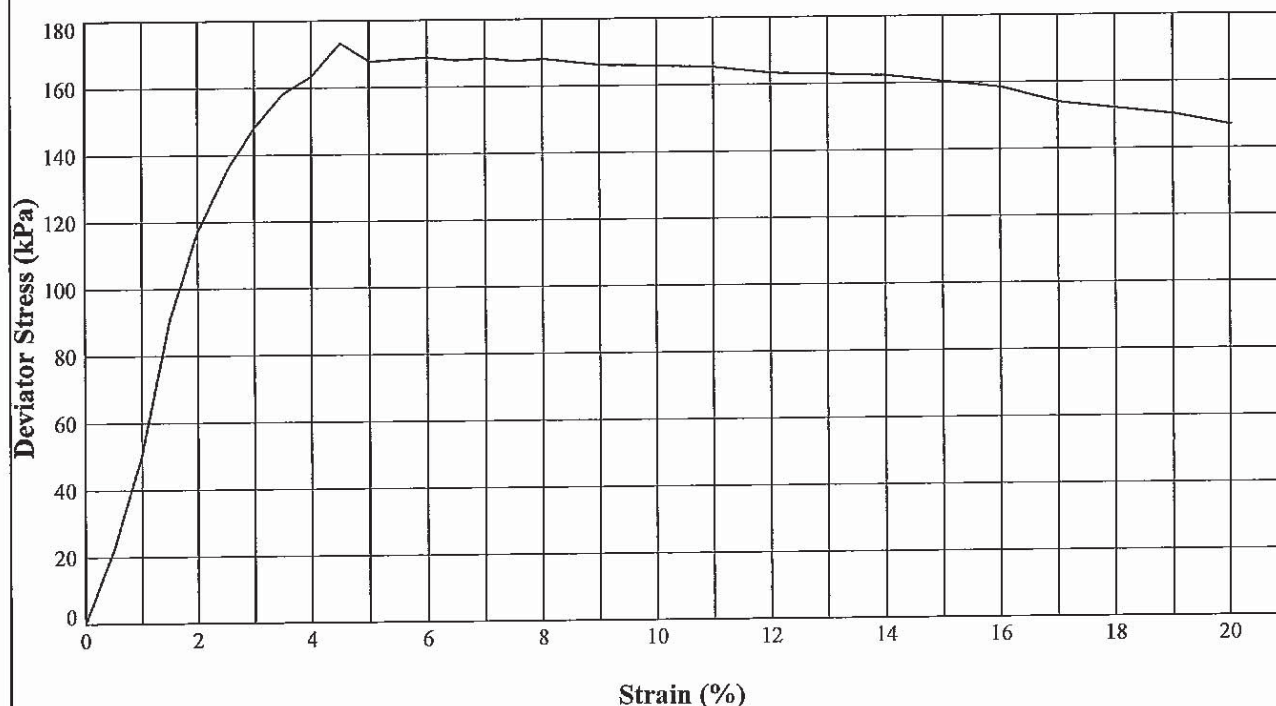
UNCONSOLIDATED QUICK UNDRAINED (SINGLE STAGE) TRIAXIAL COMPRESSION TEST

In accordance with BS1377:Part 7:1990, Clause 8

Borehole : **BH8A** Sample Ref: Sample Type: **U** Depth (m): **5.20**

Description : **Brownish black CLAY with occasional pockets of silty fine sand**

STAGE NUMBER		1	2	3
SAMPLE DETAILS	Sample Condition	Undisturbed		
	Orientation of sample	Vertical		
	Diameter (mm)	102.91		
	Height (mm)	209.55		
	Moisture Content (%)	28		
	Bulk Density (Mg/m ³)	1.99		
	Dry Density (Mg/m ³)	1.55		
TEST DETAILS	Membrane Thickness (mm)	0.24		
	Rate of Axial Displacement (%/min)	2.00		
	Cell Pressure (kPa)	105		
	Membrane Correction (kPa)	0.29		
	Corrected Deviator Stress (kPa)	173		
	Undrained Shear Strength (kPa)	87		
	Strain at Failure (%)	4.5		
	Mode of Failure	Compound		



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