RSK GROUP PLC | STATS

BOREHOLE RECORD (Percussive)

Borehole Number: BH2A

Site: 241919- 53 Fitzroy Park

Location: 53 Fitzroy Park

Client: Smarter Building and Construction Limited

Ground Level: 81.22mAOD

Date: 23 Nov 10

Job No: 241919

GROUND WATER | SAMPLES/TESTS | STRATA RECORD | Sheet 2 of 2

Strike	Well	Depth (m)	Depth/Type (m)	SPT 'N' or U Blows	Depth (m)	Level (mAOD)	Key	Description
			10.50 D 17			8.80		
		11	11.05-11.50 SPTLS 18	S N=30 (3,4/5,7,9,9) [3,4](5,7,9,9)				
		12	12.00 D 19					
			12.55-13.00 U 20					
		13	13.30 D 21					…slightly sandy (fine) at 13.3m
			13.55-14.00 SPTLS 22	S N=40 (4,5/8,10,10,12) [4,5](8,10,10,12)				
		14	14.30 D 23					…slightly sandy (fine) at 14.3m
			14.55-15.00 U 24					
		15			15.00	66.22		*End of Borehole at 15.00 m*
		16						
		17						
		18						
		19						

Remarks and Water Observations

Hand dug service pit to 1.2m bgl. Seepage at 4.2m and 6.05m. . Borehole dry at 8.5m at end of 23/11/10; overnight water level (24/11/10) 2.35m bgl. Borehole completed to 15m on 24/11/10; water level at 14.95m bgl. Borehole cased to 3.0m with 150mm casing.

Scale: 1:50

Logged by: CG

Figure:

RSK GROUP PLC STATS

BOREHOLE RECORD (Percussive)

Borehole Number: BH3A

Site: 241919- 53 Fitzroy Park

Location: 53 Fitzroy Park

Client: Smarter Building and Construction Limited

Ground Level: 80.16mAOD

Date: 7 Dec 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
					0.00	80.16	0.70		MADE GROUND: Grass over brown sandy slightly gravelly clay with rootlets. Gravel of fine to coarse flint and brick fragments.
					0.70	79.46	0.40		MADE GROUND: Brown silty CLAY.
		1	1.10-2.00 B 1		1.10	79.06	0.90		MADE GROUND: Soft, wet, dark-grey slightly sandy gravelly organic CLAY. Gravel of fine to coarse subangular to subrounded flint. (INFILLED POND).
		2	2.30 B 2		2.00	78.16	1.50		Soft, becoming firm, brown and grey CLAY with occasional rounded to subrounded flint gravel. (WEATHERED LONDON CLAY FORMATION - POSSIBLY PARTLY REWORKED).
		3			3.50	76.66	0.50		Brown mottled grey-green silty CLAY. (WEATHERED LONDON CLAY FORMATION).
		4			4.00	76.16			***End of Borehole at 4.00 m***
		5							
		6							
		7							
		8							
		9							

Remarks and Water Observations
Water strike at 1.46m bgl, rising to 1.04m bgl.

Scale: 1:50

Logged by: AT

Figure:

RSK GROUP PLC STATS

BOREHOLE RECORD (Percussive)

Borehole Number: BH4A

Site: 241919- 53 Fitzroy Park

Location: 53 Fitzroy Park

Client: Smarter Building and Construction Limited

Ground Level: 80.18mAOD

Date: 7 Dec 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
							1.40		MADE GROUND: Grass over firm, becoming soft, brown slightly gravelly clay with rootlets. Gravel of fine to coarse flint and brick fragments, with occasional ash fragments.
					1.40	78.78	0.90		MADE GROUND: Soft, wet, dark-grey slightly sandy gravelly organic CLAY. Gravel of fine to coarse subangular to subrounded flint. (INFILLED POND).
					2.30	77.88	0.70		Soft, becoming firm, brown and grey CLAY with occasional rounded to subrounded flint gravel. (WEATHERED LONDON CLAY FORMATION - POSSIBLY PARTLY REWORKED).
					3.00	77.18	1.00		Brown mottled grey-green silty CLAY. (WEATHERED LONDON CLAY FORMATION).
					4.00	76.18			***End of Borehole at 4.00 m***

Remarks and Water Observations
Water strike at 1.38m bgl, rising to 1.06m bgl.

Scale: 1:50

Logged by: AT

Figure:

RSK GROUP PLC STATS

BOREHOLE RECORD (Percussive)

Borehole Number: BH5A

Site: 241919- 53 Fitzroy Park

Location: 53 Fitzroy Park

Client: Smarter Building and Construction Limited

Ground Level: 80.44mAOD

Date: 7 Dec 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
								MADE GROUND: Grass over brown slightly sandy gravelly clay with rootlets. Gravel of fine to coarse flint and brick fragments, with occasional ash and ceramic pipe fragments.
					1.60	78.84		Firm brown mottled grey-green silty CLAY. (WEATHERED LONDON CLAY FORMATION).
					4.00	76.44		***End of Borehole at 4.00 m***

1.60

2.40

Remarks and Water Observations
No water encountered.

Scale: 1:50

Logged by: AT

Figure:

RSK GROUP PLC STATS

BOREHOLE RECORD (Percussive)

Borehole Number: BH6A

Site: 241919- 53 Fitzroy Park

Location: 53 Fitzroy Park

Client: Smarter Building and Construction Limited

Ground Level: 82.40mAOD

Date: 18 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
			0.25-0.70 B 1					MADE GROUND: Grass over brown dry (desiccated)sandy slightly gravelly clay with roots. Gravel of fine to coarse flint and brick with occasional fragments of clay tile.
					1.00			
		1	1.05 D 2		1.00	81.40		Dry and desiccated in uppermost part, becoming firm, locally soft, fissured brown mottled grey-green silty CLAY, locally with powdery iron oxide and carbonate precipitate. (WEATHERED LONDON CLAY FORMATION).
			1.20-1.65 SPTLS3	S				…with roots
		2	1.90 D 4	N=9 (1,1/2,3,2,2) [1,1](2,3,2,2)				…slightly sandy (fine) at 1.9m
			2.20-2.65 U 5					
		3	2.90 D 6					
			3.20-3.65 SPTLS7	S				…slightly sandy (fine) and with selenite crystals (generally coarse sand size) between 3.2m and 3.6m
				N=12 (1,2/2,3,3,4) [1,2](2,3,3,4)				
		4	3.90 D 8					
			4.20-4.65 U 9					
		5	4.90 D 10					…slightly sandy (fine) between 4.9m and 5.5m
			5.20-5.65 SPTLS11	S				
				N=16 (2,2/3,4,4,5) [2,2](3,4,4,5)	5.30	77.10		Stiff fissured dark-brownish grey silty CLAY. (LONDON CLAY FORMATION).
▽		6	6.10 D 12					
			6.55-7.00 U 13					
		7	7.50 D 14					…slightly sandy (fine) with shell fragments at 7.5m
		8	8.05-8.50 SPTLS15	S				
				N=20 (2,3/4,5,5,6) [2,3](4,5,5,6)				
		9	9.00 D 16					
			9.55-10.00 U 17					

End of Borehole at 10.00 m

Remarks and Water Observations

Hand dug service pit to 1.2m bgl. Seepage at 6.15m. Borehole cased to 1.5m with 150mm casing. Borehole dry on completion. 0.02m of water in base of hole on completion

Scale: 1:50

Logged by: CG

Figure:

RSK GROUP PLC STATS

BOREHOLE RECORD (Percussive)

Borehole Number: BH7A

Site: 241919- 53 Fitzroy Park

Location: 53 Fitzroy Park

Client: Smarter Building and Construction Limited

Ground Level: 80.65mAOD

Date: 7 Dec 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
					0.40	80.25		MADE GROUND: Grass over brown slightly sandy clay with rootlets and occasional ash fragments.
								Firm fissured brown mottled grey-green silty CLAY, locally with powdery iron oxide and carbonate precipitate. (WEATHERED LONDON CLAY FORMATION). …slightly sandy (fine) at 0.5m
								…locally slightly sandy (fine) between 1.5m and 2.0m
					4.00	76.65		***End of Borehole at 4.00 m***

0.40

3.60

1 2 3 4 5 6 7 8 9

Remarks and Water Observations
No water encountered.

Scale: 1:50

Logged by: AT

Figure:

RSK GROUP PLC | STATS

BOREHOLE RECORD (Percussive)

Borehole Number: BH8A

Site: 241919- 53 Fitzroy Park

Location: 53 Fitzroy Park

Client: Smarter Building and Construction Limited

Ground Level: 82.43mAOD

Date: 15 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	82.38		PAVING SLAB
			0.40-0.70 B 1		0.15	82.28		CONCRETE
					0.85			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	1.10 D 2 1.20-1.65 U 3		1.00	81.43		Firm, locally soft, fissured brown mottled grey-green silty CLAY, locally with powdery iron oxide and carbonate precipitate. (WEATHERED LONDON CLAY FORMATION).
		2	1.95 D 4					..fine roots between 1.1m and 1.9m
			2.20-2.65 SPTLS5 S	N=9 (1,1/2,2,2,3) [1,1](2,2,2,3)				…locally slightly sandy (fine) between 2.2m and 2.9m
		3	2.90 D 6		4.00			
			3.20-3.65 U 7					
		4	3.90 D 8					
			4.20-4.65 SPTLS9 S	N=17 (2,3/4,4,4,5) [2,3](4,4,4,5)				…occasional partings of fine sand/coarse silt between 4.2m and 4.7m
			4.90 D 10					
		5	5.10 D 11 5.20-5.65 U 12		5.00	77.43		Stiff fissured dark-brownish grey silty CLAY. (LONDON CLAY FORMATION).
								…slightly sandy (fine) at 5.1m
		6	6.10 D 13					
			6.55-7.00 SPTLS14 S	N=20 (2,3/4,5,5,6) [2,3](4,5,5,6)				
		7						
			7.50 D 15		5.00			…occasional partings of fine sand/coarse silt at 7.5m
▽								
		8	8.05-8.50 U 16					
		9	9.00 D 17					
			9.55-10.00 U 18 S					

Remarks and Water Observations

Hand dug service pit to 1.2m bgl. Seepage at 1.1m; cased out at 1.6m. Seepage at 7.8m. Borehole cased to 1.6m with 150mm casing. 0.03m of water in base of hole on completion.

End of Borehole at 10.00 m

Scale: 1:50

Logged by: CG

Figure:

RSK GROUP PLC STATS

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	82.25	0.05		PAVING SLAB
			0.40-0.70 B 1		0.10	82.20	0.05		LEAN MIX CONCRETE
		1	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			Firm fissured brown mottled grey-green silty CLAY, locally with powdery iron oxide and carbonate precipitate. (WEATHERED LONDON CLAY FORMATION).
		2	2.20 D 4	S N=10 (1,1/2,2,2,4)					
			2.50-2.95 U 5	[1,1](2,2,2,4)					
		3	3.20 D 6						…selenite crystals (generally coarse sand size)
			3.50-3.95 SPTLS7						…locally slightly sandy (fine) with occasional partings of fine sand/coarse silt between 3.5m and 4.2m
		4	4.20 D 8	S N=13 (1,2/2,3,4,4)			4.60		
			4.50-4.95 U 9	[1,2](2,3,4,4)					
		5	5.20 D 10						…rare pyrite nodules and occasional partings of fine sand/coarse silt between 5.2m and 5.9m
			5.50-5.95SPTLS11						
		6	6.25 D 12	S N=18 (2,3/4,4,5,5)	6.10	76.20			Stiff fissured dark-brownish grey silty CLAY. (LONDON CLAY FORMATION).
▽			6.55-7.00 U 13	[2,3](4,4,5,5)					
		7	7.50 D 14						
		8	8.05-8.50SPTLS15				3.90		…occasional partings of fine sand/coarse silt between 8.0m and 8.5m
				S N=27 (3,3/5,6,8,8)					
		9	9.00 D 16	[3,3](5,6,8,8)					
			9.55-10.00 U 17						

End of Borehole at 10.00 m

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.

Scale: 1:50

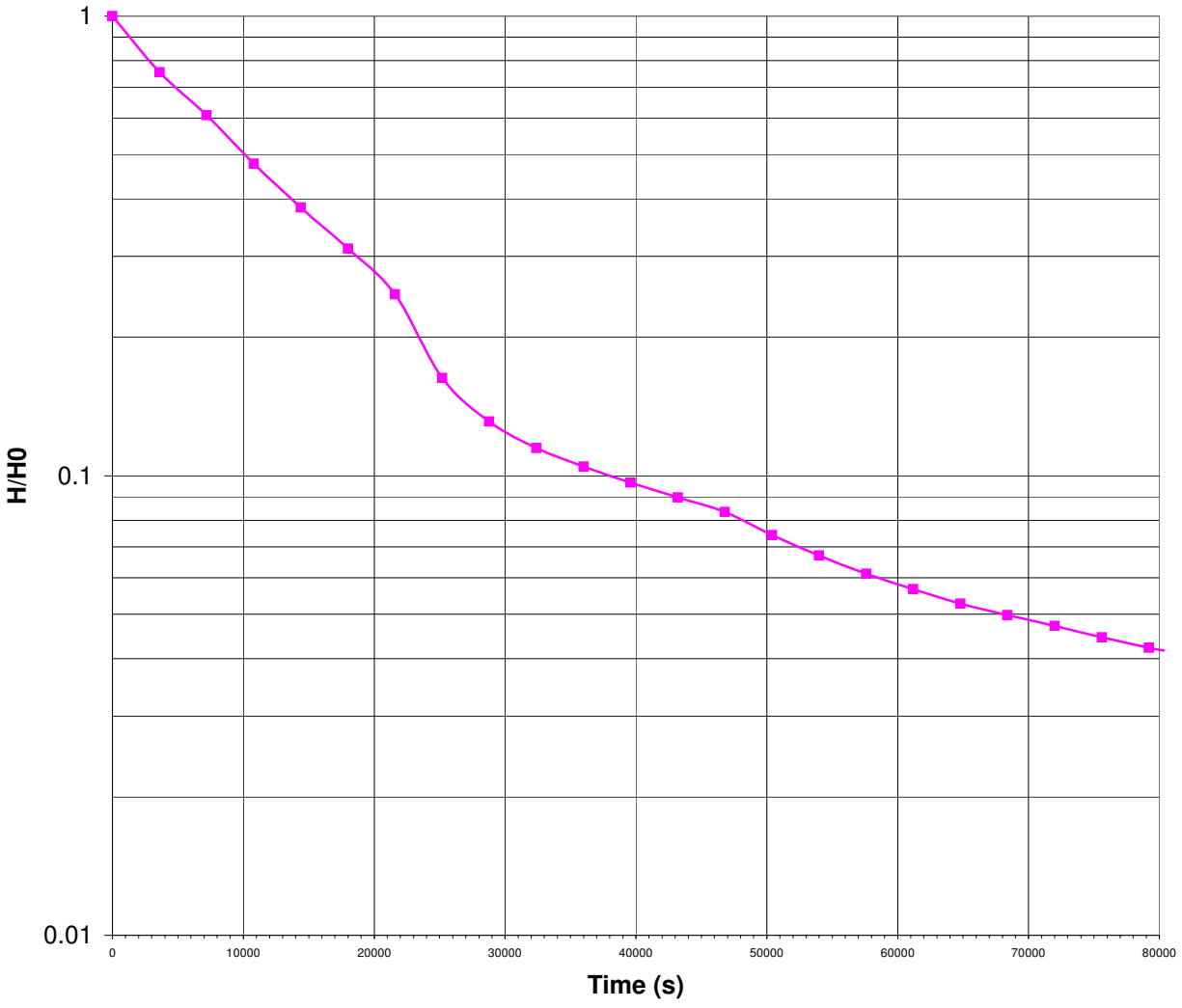
Logged by: CG

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



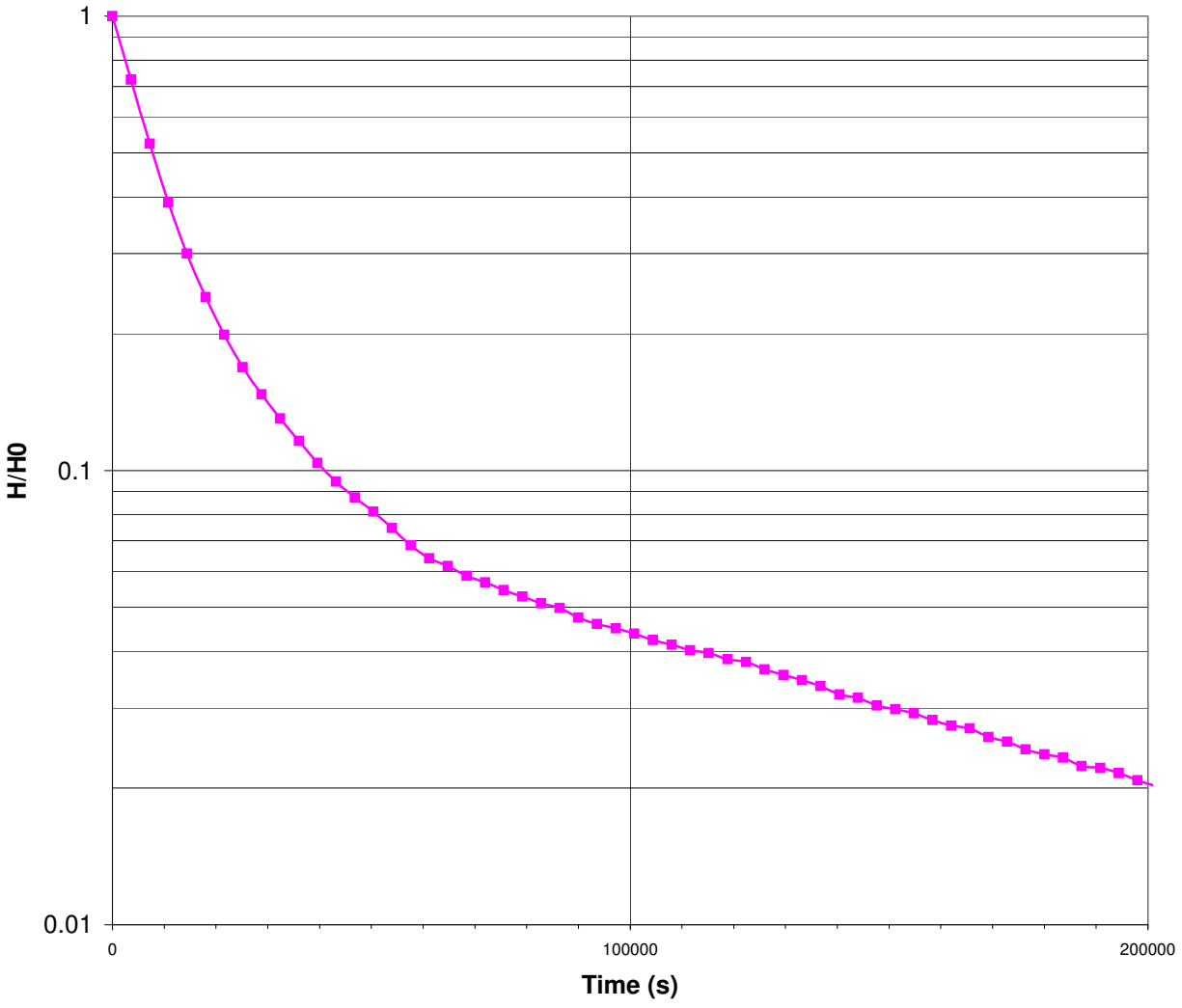
Calculations

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



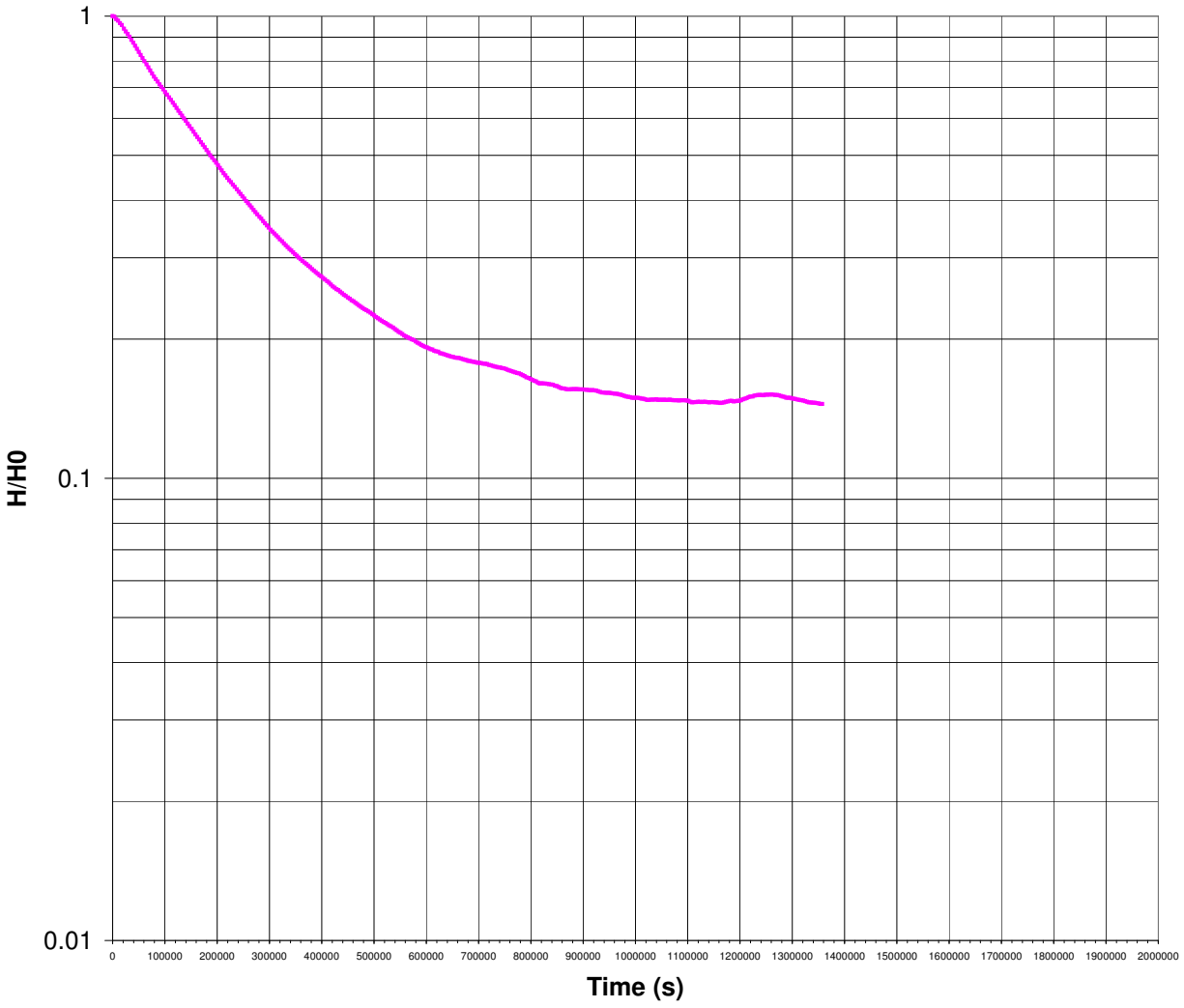
Calculations

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

STATS

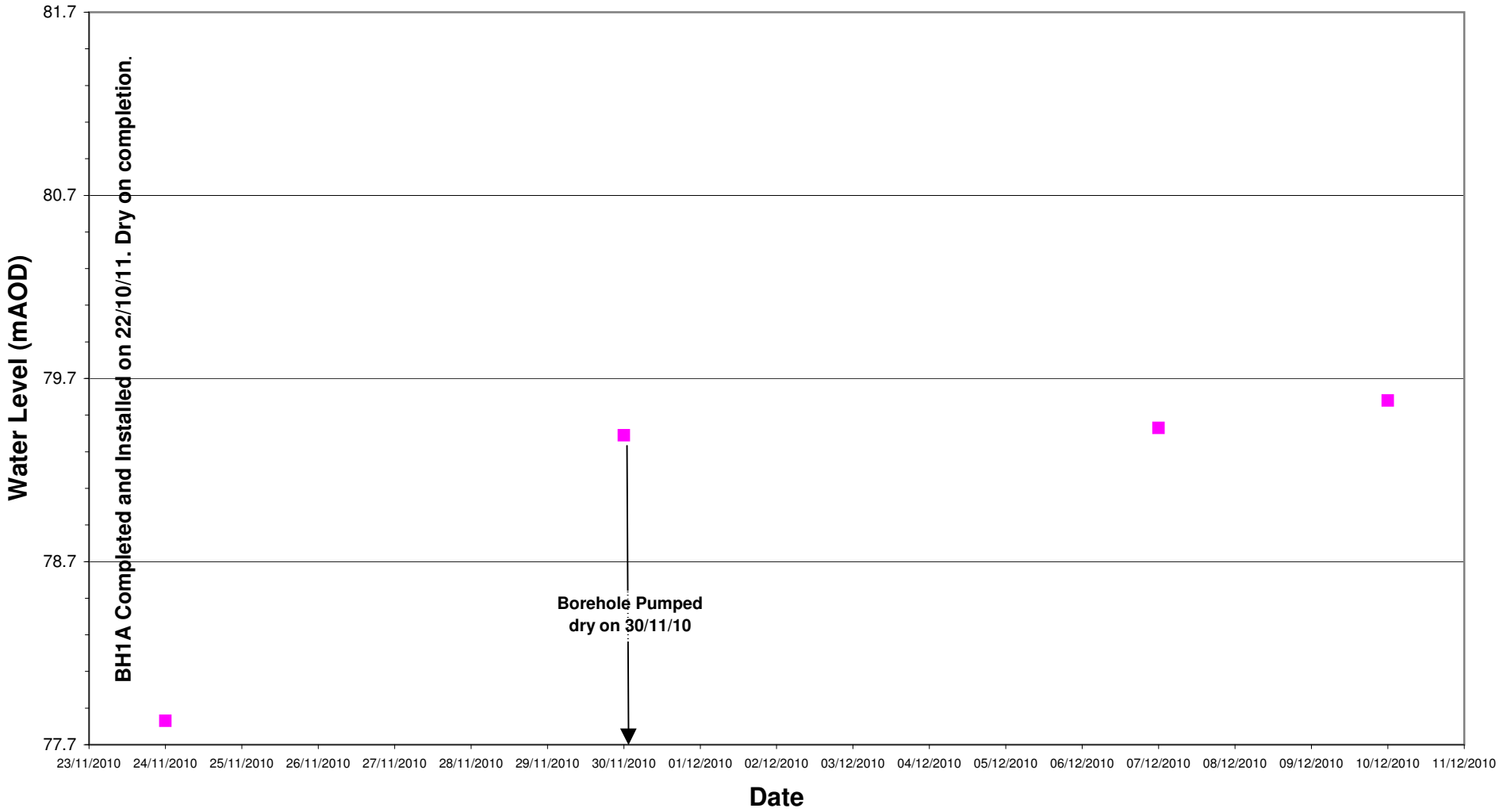
RisingHead Permeability Test to BS 5930:1999

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

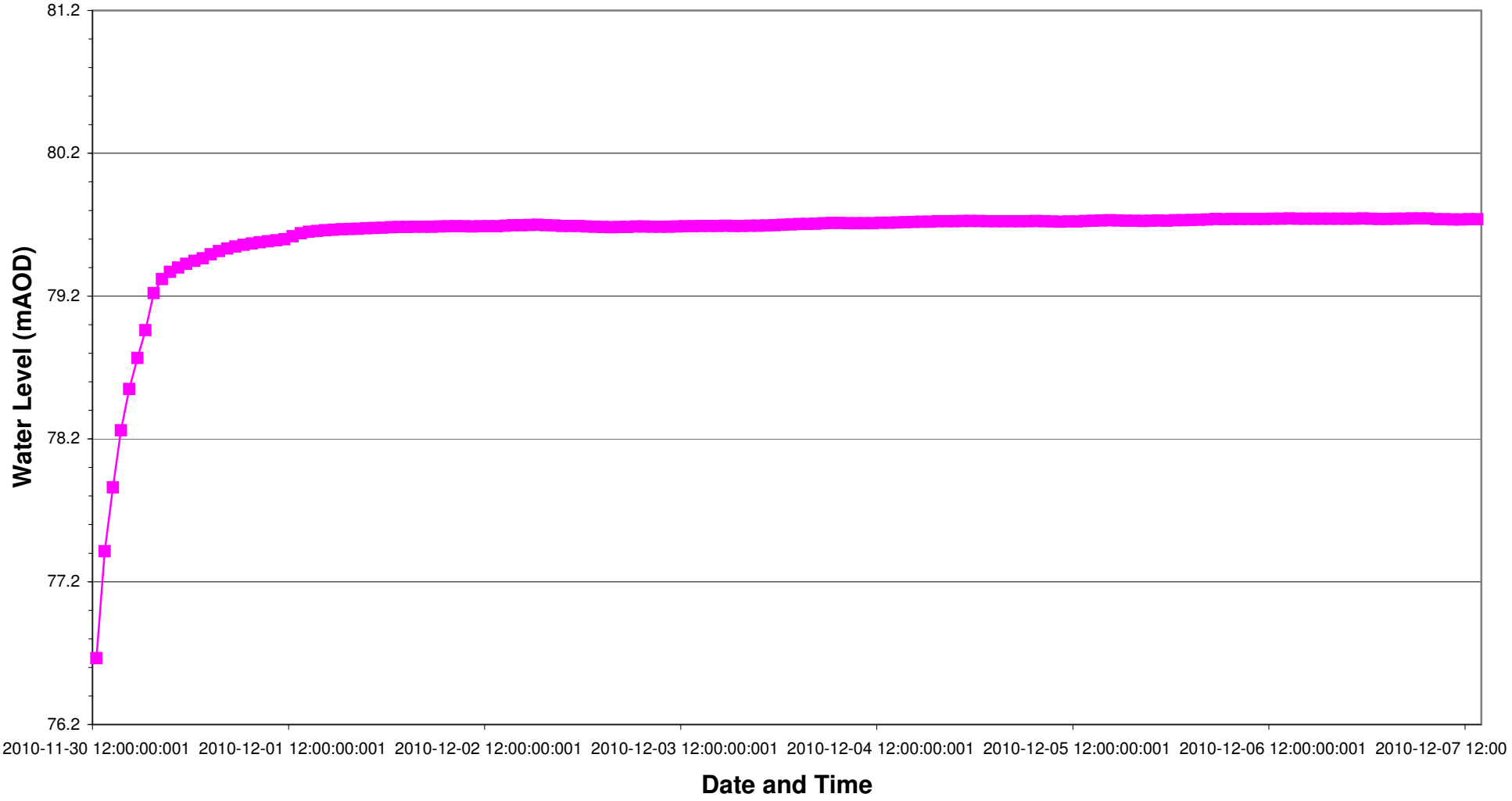


Calculations

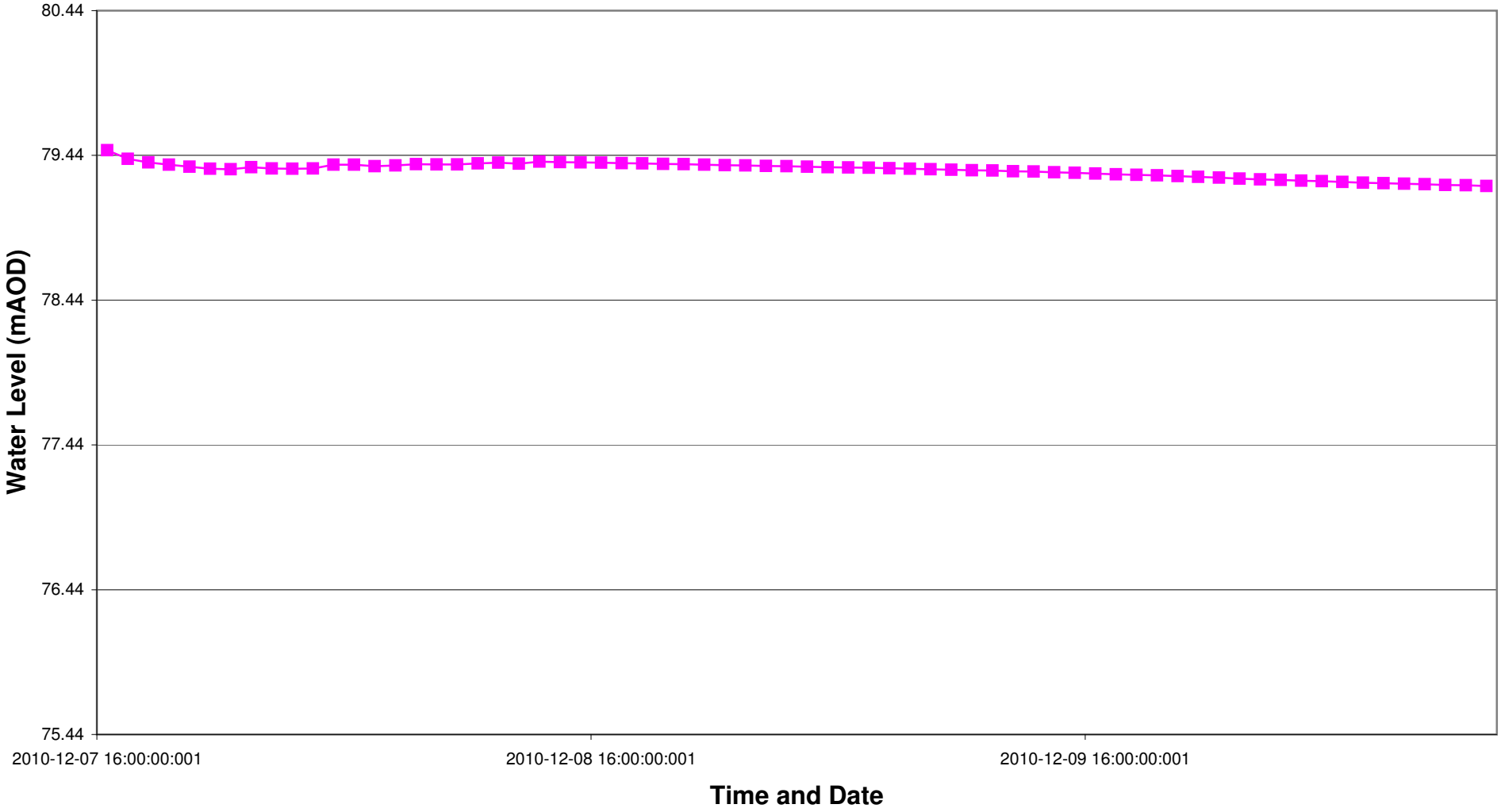
Area of borehole A (m^2)	0.01767
Intake Factor F	0.872591
Permeability k (m/s)	1.37E-08


BH1A Groundwater Levels (Ground Level 81.73mAOD)
Water Level (mAOD)
81.7
80.7
79.7
78.7
77.7
BH1A Completed and Installed on 22/10/11. Dry on completion.
Borehole Pumped dry on 30/11/10
23/11/2010
24/11/2010
25/11/2010
26/11/2010
27/11/2010
28/11/2010
29/11/2010
30/11/2010
01/12/2010
02/12/2010
03/12/2010
04/12/2010
05/12/2010
06/12/2010
07/12/2010
08/12/2010
09/12/2010
10/12/2010
11/12/2010
Date

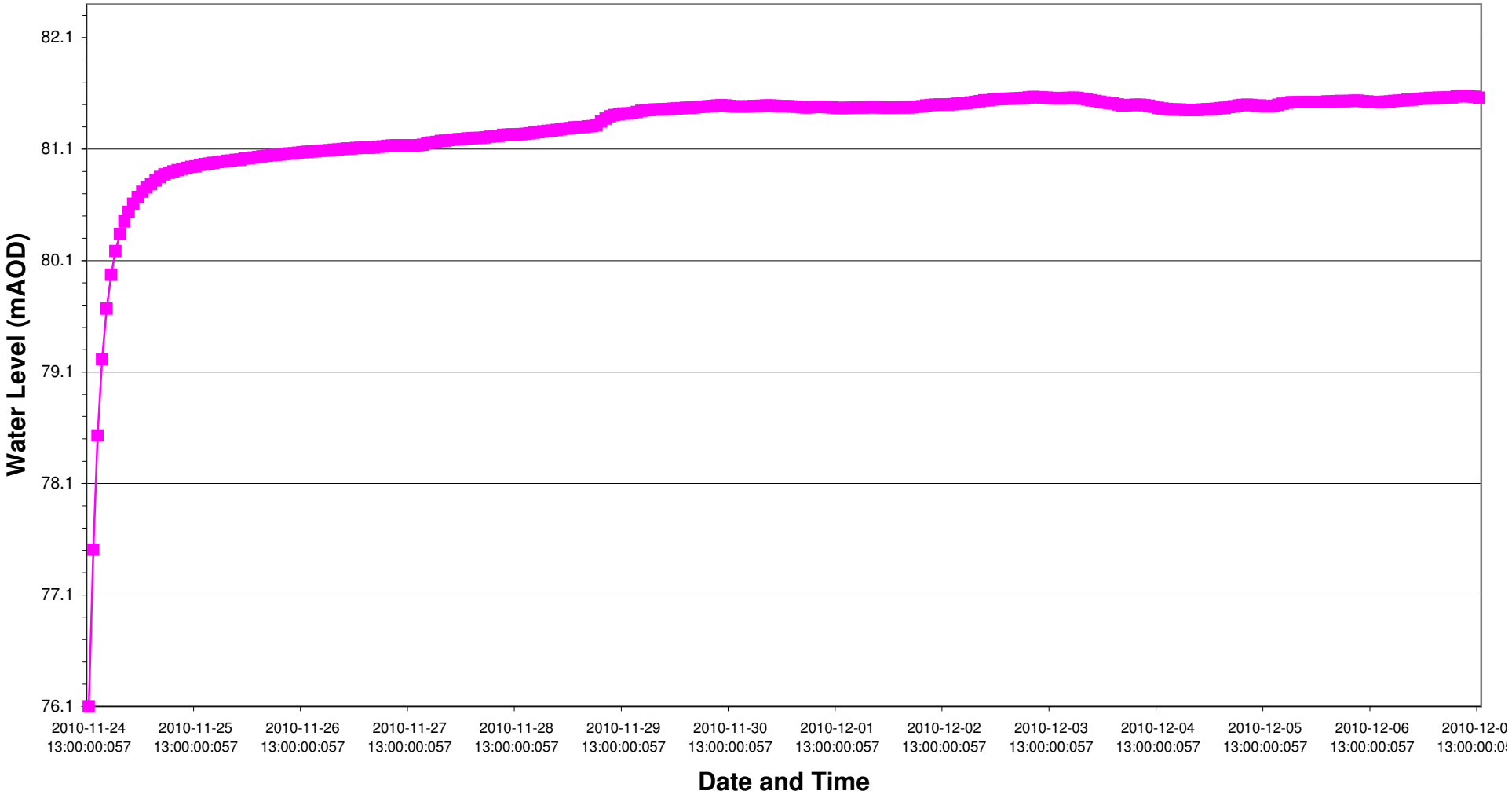
BH2A Rising Head Test (Ground Level 81.22mAOD)

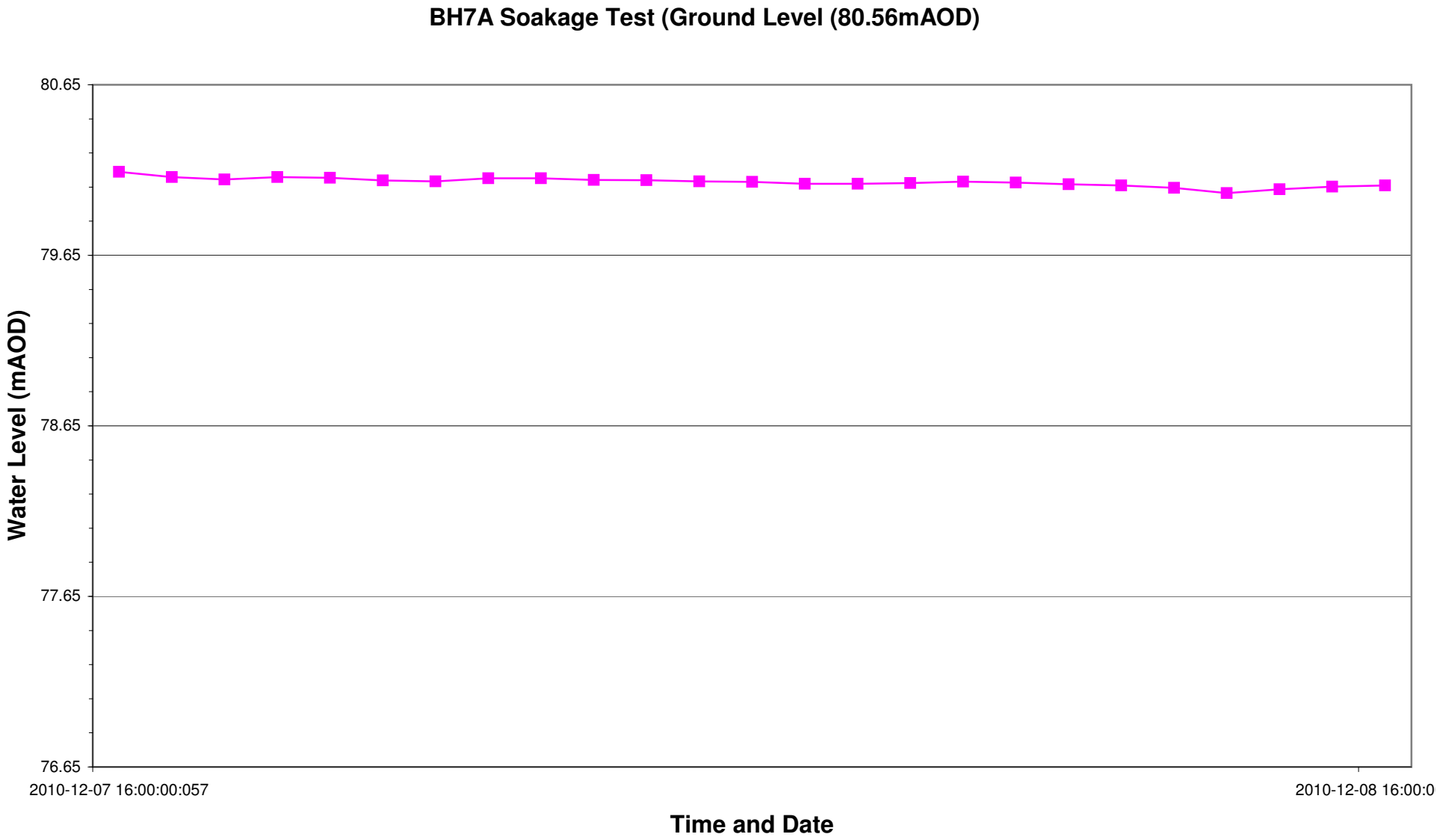


BH5A Soakage Test (Ground Level 80.44mAOD)

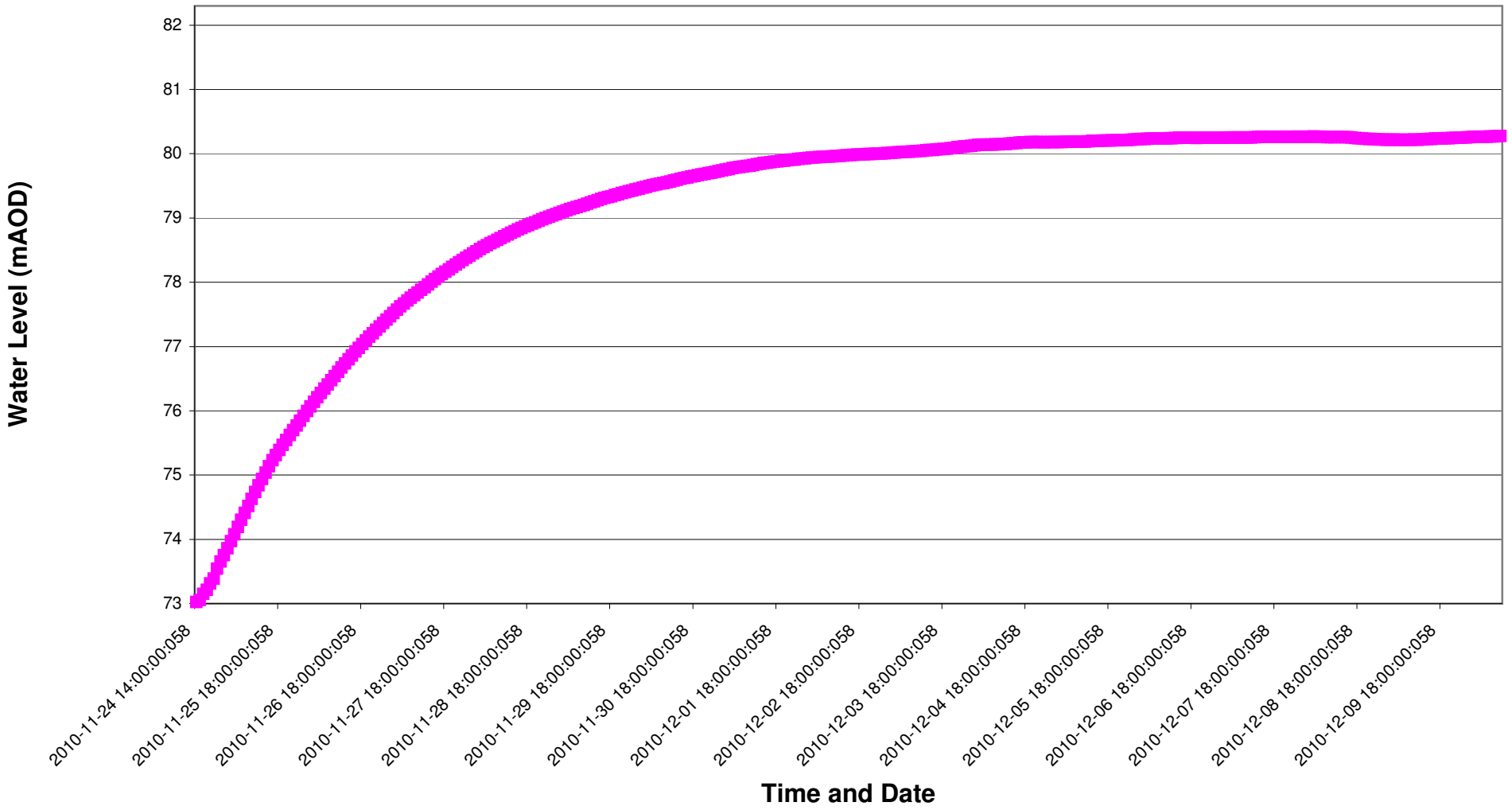


BH6A Rising Head Test (Ground Level 82.4mAOD)




BH7A Soakage Test (Ground Level (80.56mAOD)
80.65
79.65
78.65
77.65
76.65
Water Level (mAOD)
2010-12-07 16:00:00:057
2010-12-08 16:00:0
Time and Date

BH9A Rising Head Test (Ground Level 82.3mAOD)



APPENDIX C

Geotechnical Laboratory Test Records

(this appendix contains 21 pages, including this one)

UKAS TESTING
No 2652

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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HERTS
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HEAD OFFICE:
Bristol

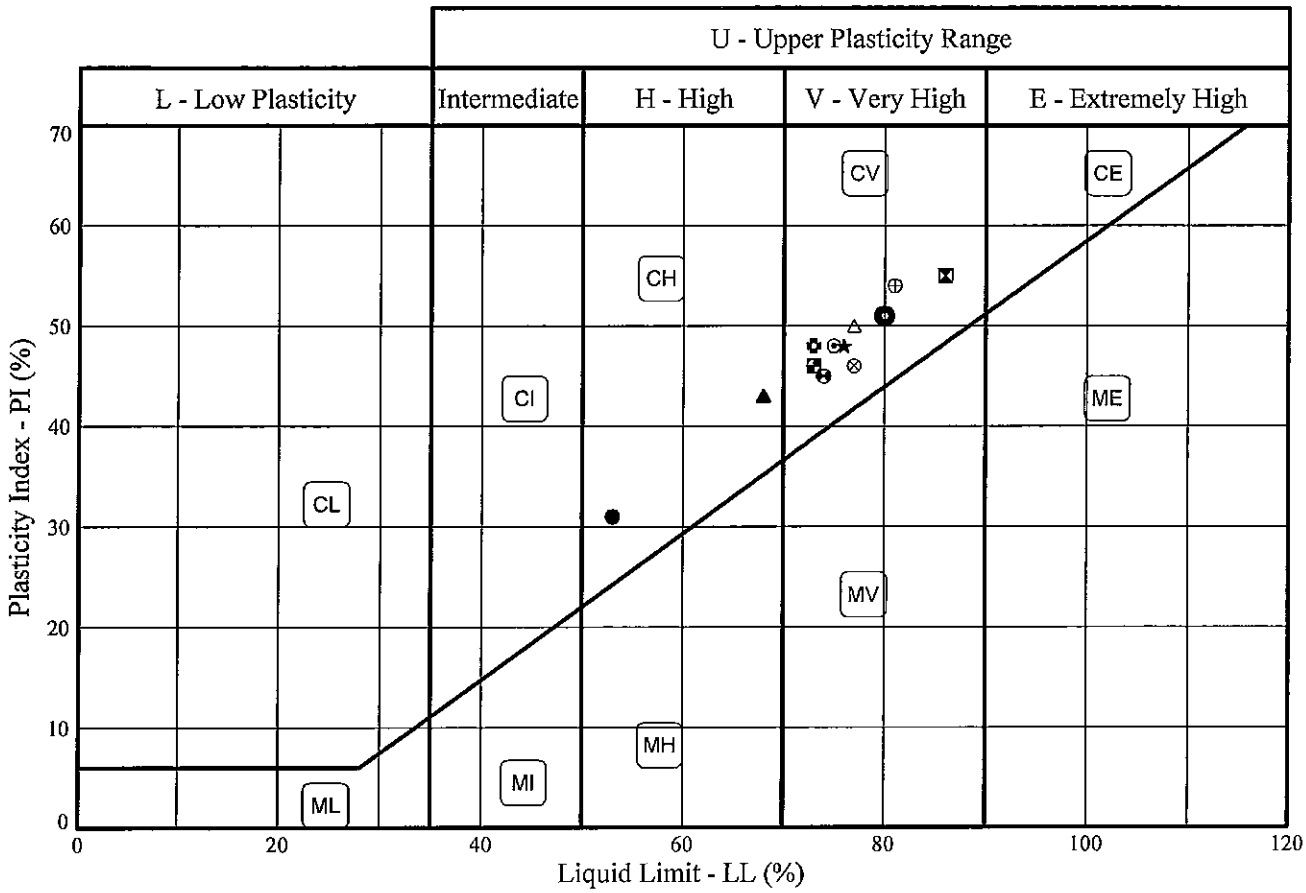
BRANCH OFFICE:
Castleford
West Yorkshire

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**

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.

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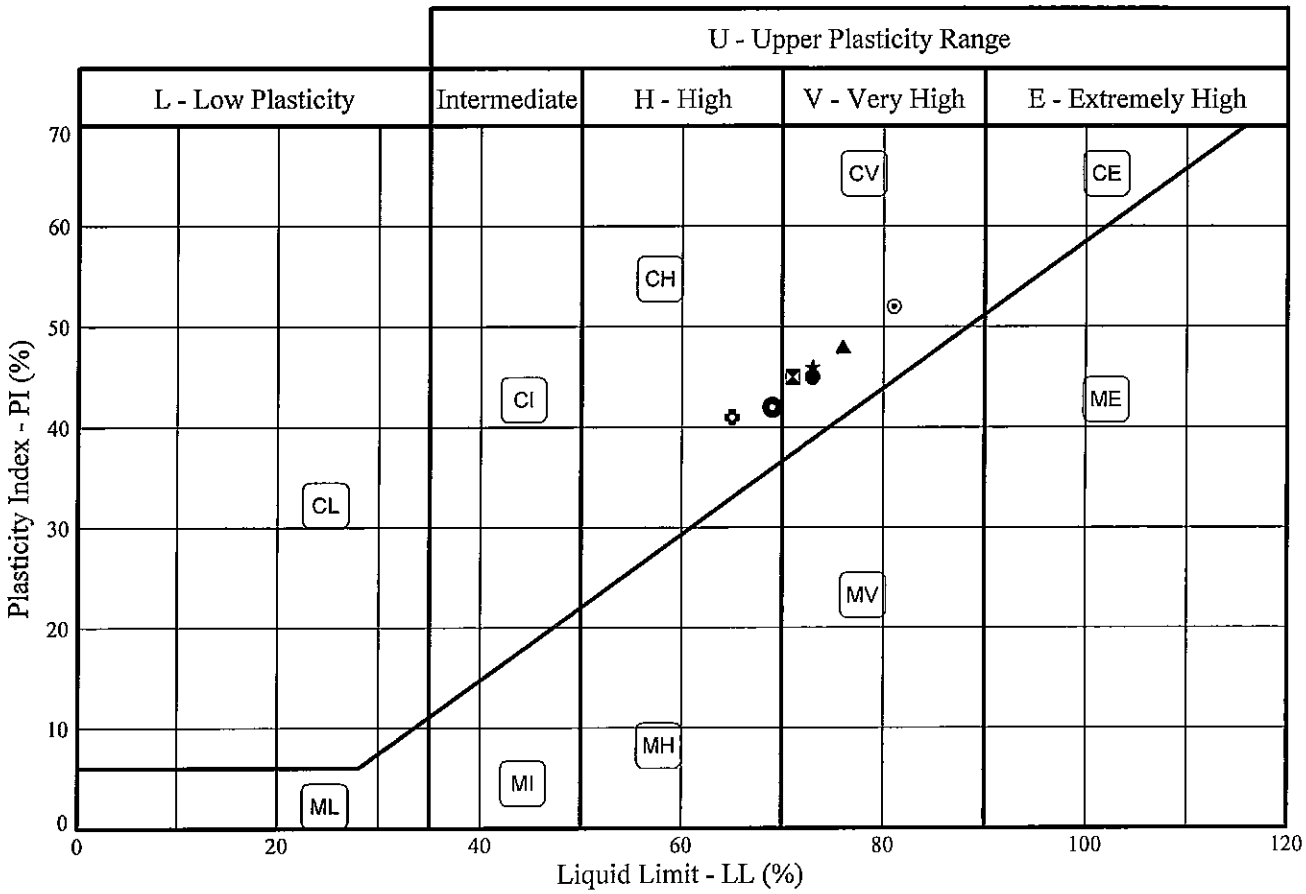
PLASTICITY CHART - PI Vs LL

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)							
●	BH8A	U	1.20	3.2/4.4/5.3/5.4	4.2.3	37	73	28	45	100
⊠	BH8A	D	2.20	3.2/4.4/5.3/5.4	4.2.3	35	71	26	45	100
▲	BH8A	U	5.20	3.2/4.4/5.3/5.4	4.2.3	27	76	28	48	100
★	BH8A	U	8.05	3.2/4.4/5.3/5.4	4.2.3	32	73	27	46	100
⊙	BH9A	D	1.50	3.2/4.4/5.3/5.4	4.2.3	31	81	29	52	100
✿	BH9A	U	2.50	3.2/4.4/5.3/5.4	4.2.3	33	65	24	41	100
◉	BH9A	U	6.55	3.2/4.4/5.3/5.4	4.2.3	30	69	27	42	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.

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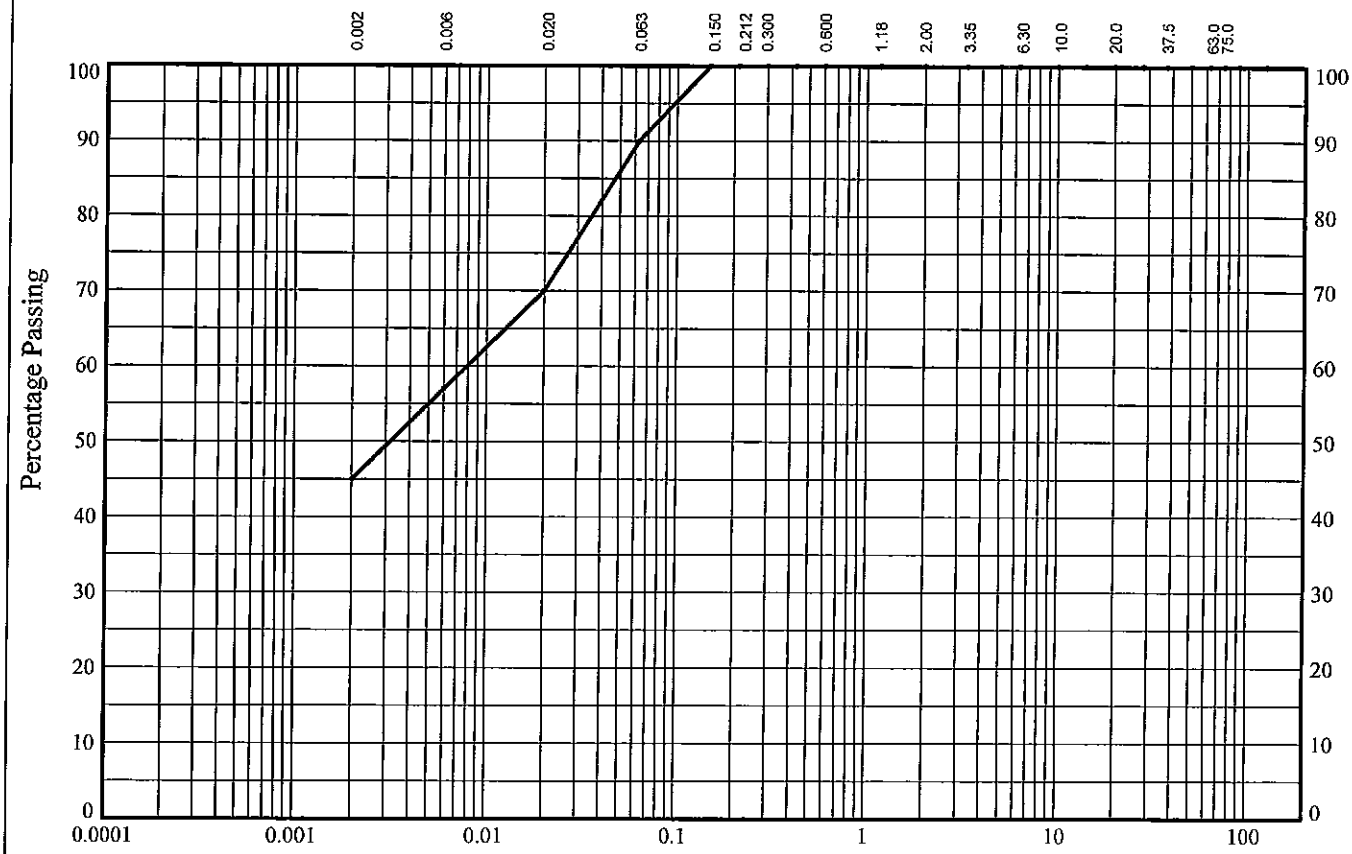
PARTICLE SIZE DISTRIBUTION TEST

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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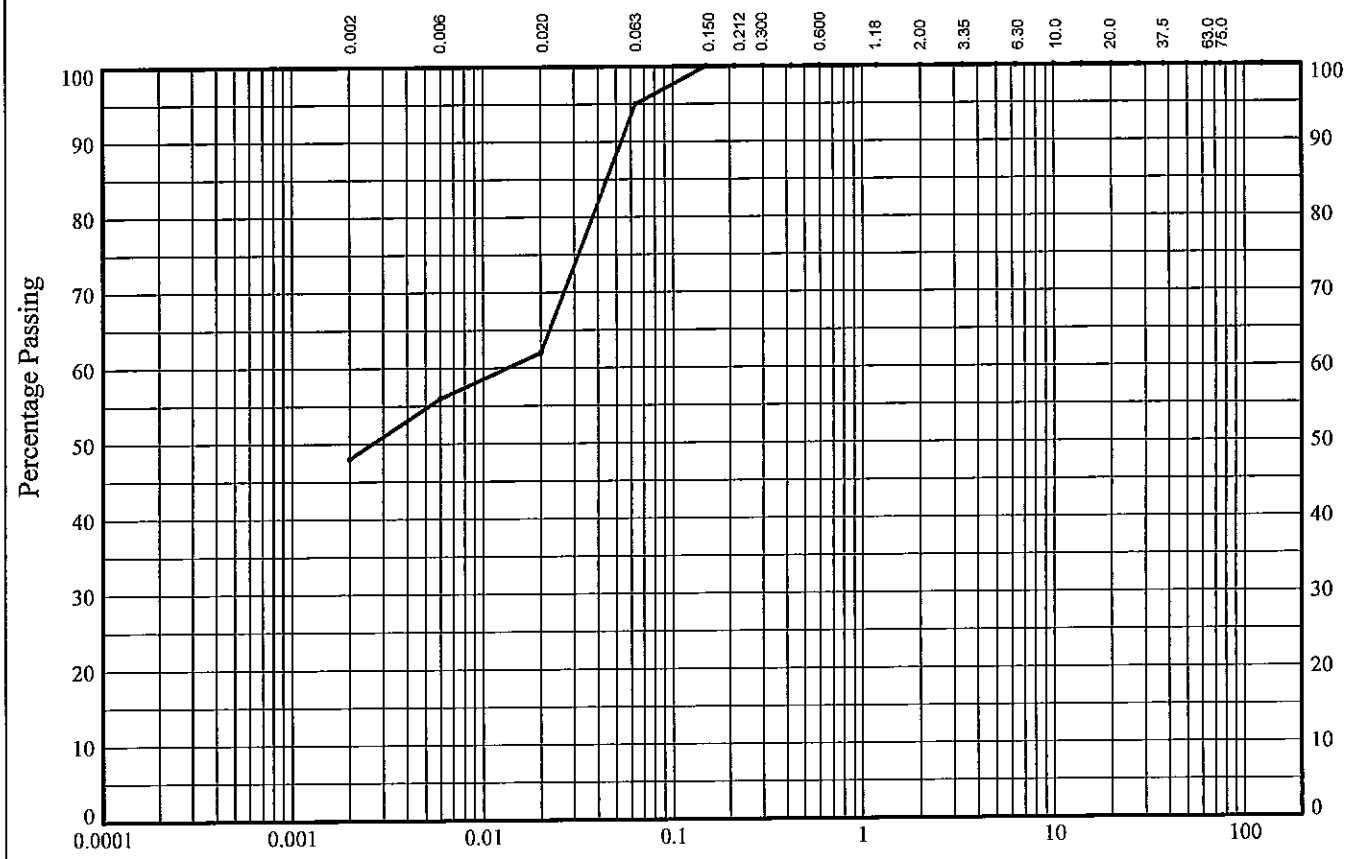
PARTICLE SIZE DISTRIBUTION TEST

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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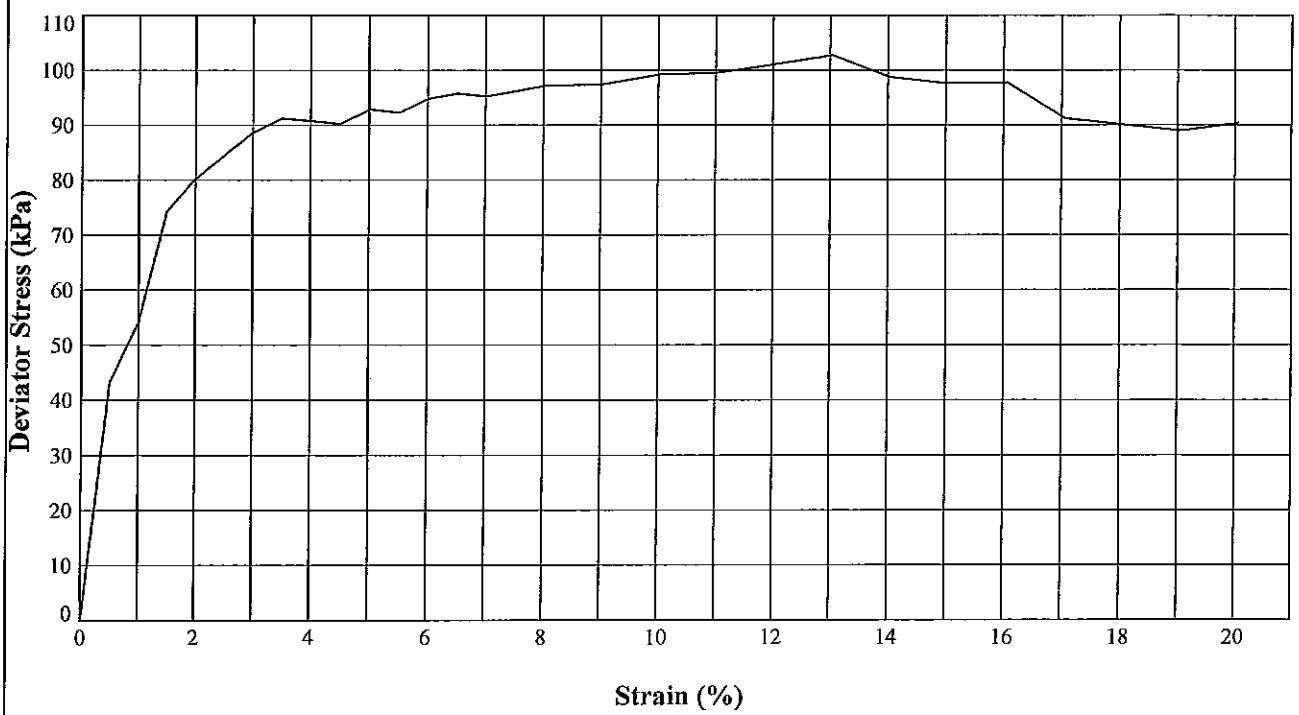
UNCONSOLIDATED QUICK UNDRAINED (SINGLE STAGE) TRIAXIAL COMPRESSION TEST

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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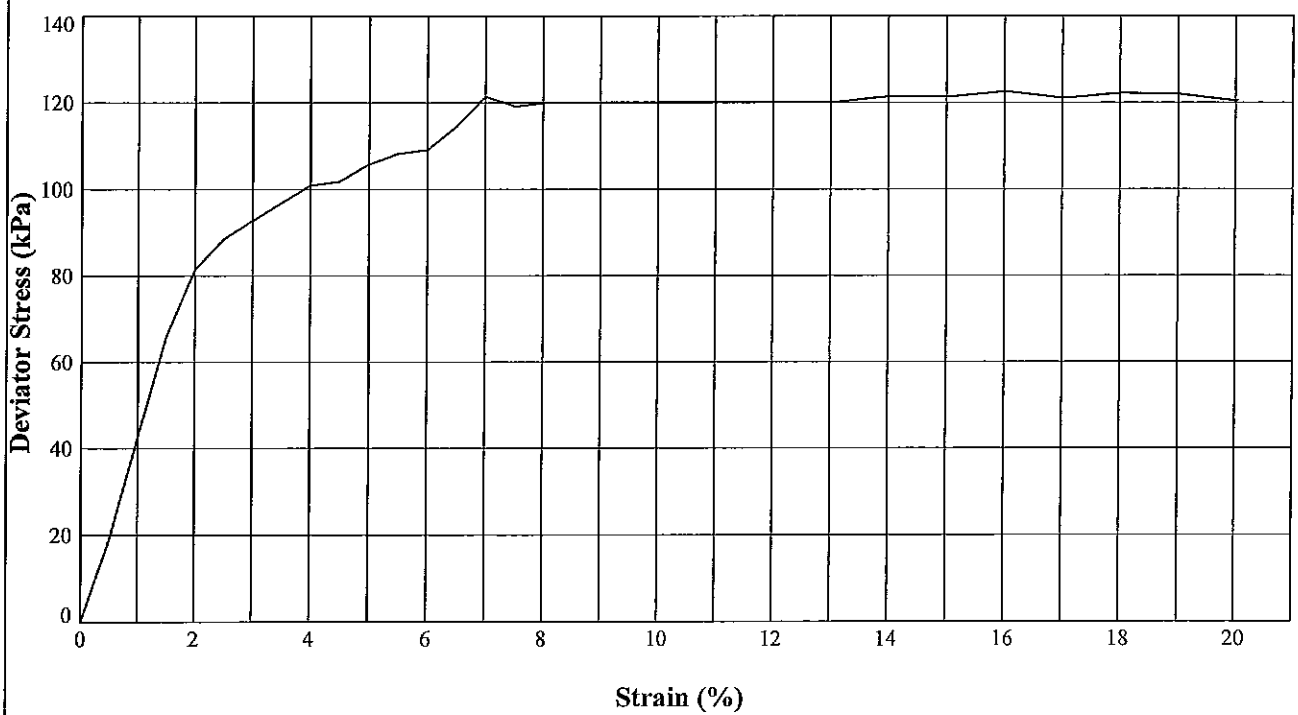
UNCONSOLIDATED QUICK UNDRAINED (SINGLE STAGE) TRIAXIAL COMPRESSION TEST

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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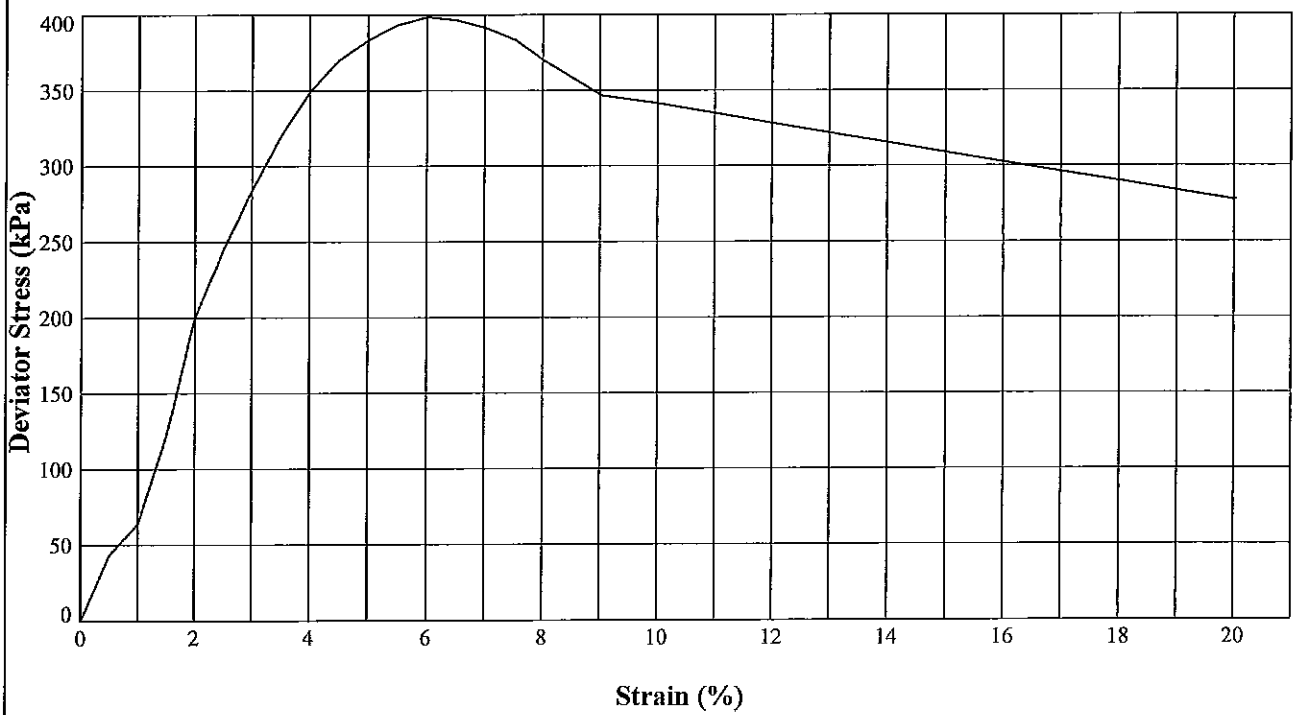
UNCONSOLIDATED QUICK UNDRAINED (SINGLE STAGE) TRIAXIAL COMPRESSION TEST

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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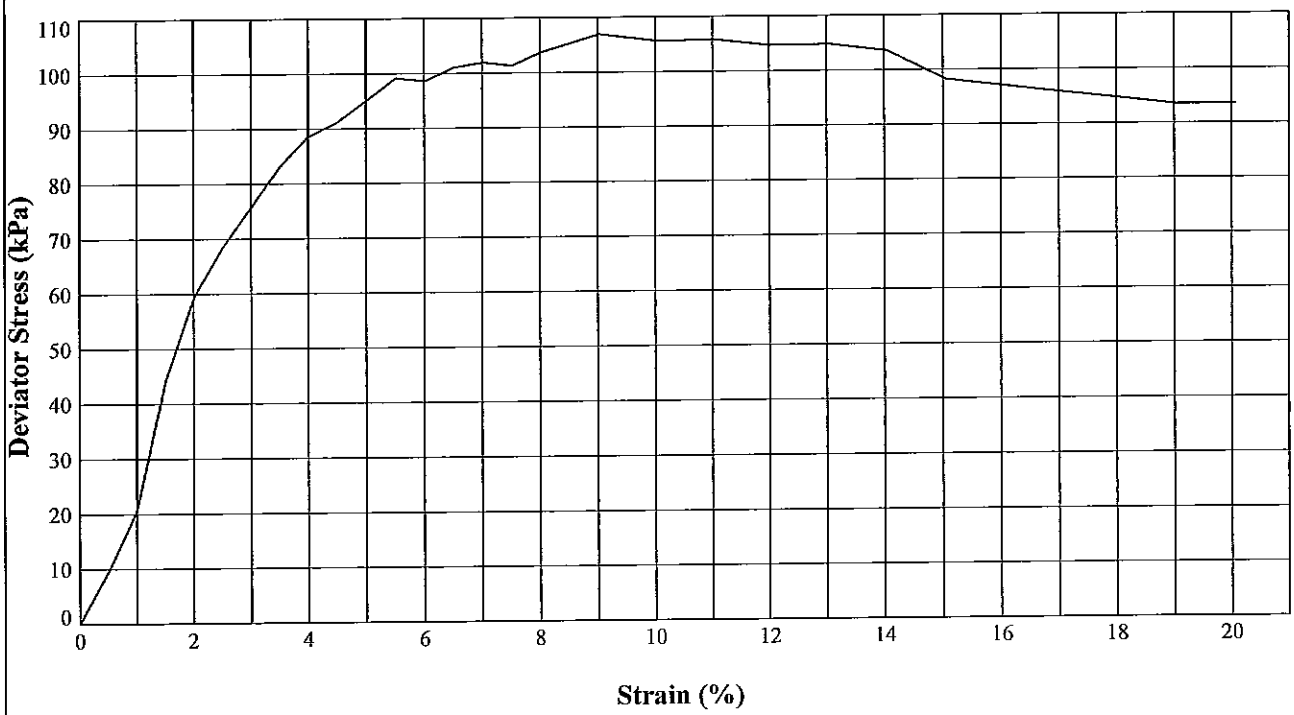
UNCONSOLIDATED QUICK UNDRAINED (SINGLE STAGE) TRIAXIAL COMPRESSION TEST

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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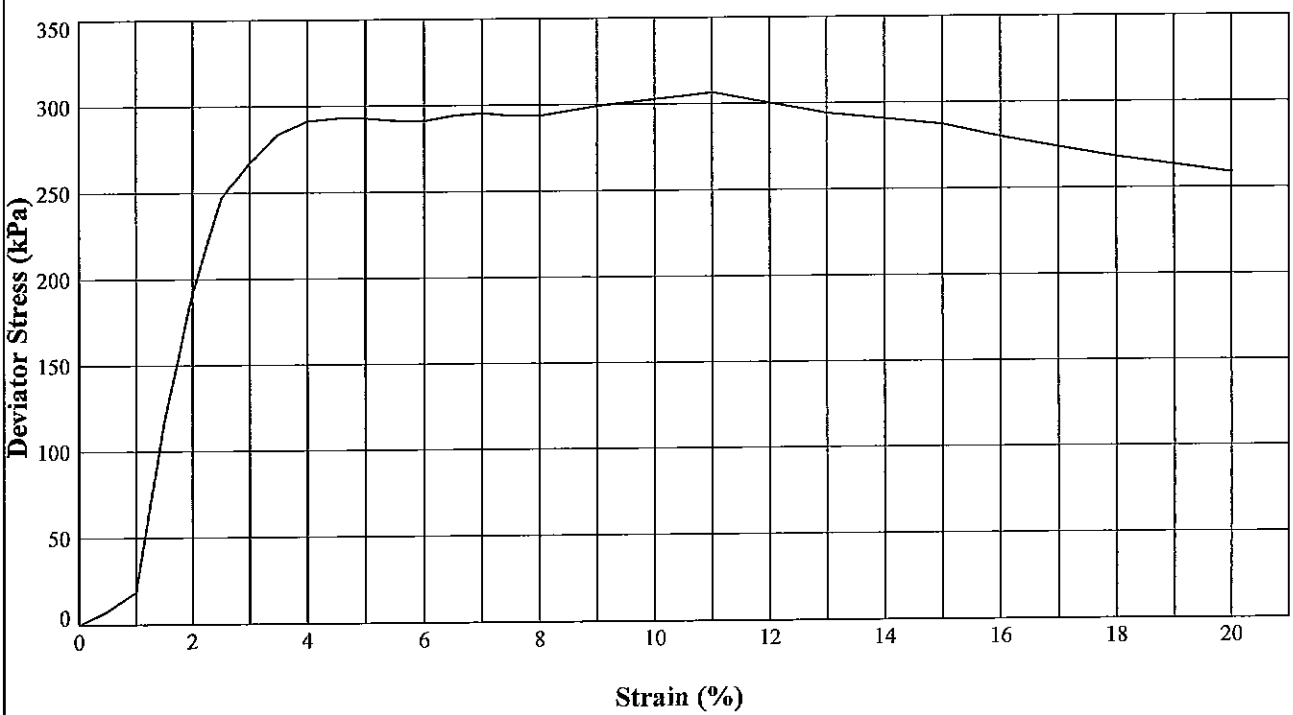
UNCONSOLIDATED QUICK UNDRAINED (SINGLE STAGE) TRIAXIAL COMPRESSION TEST

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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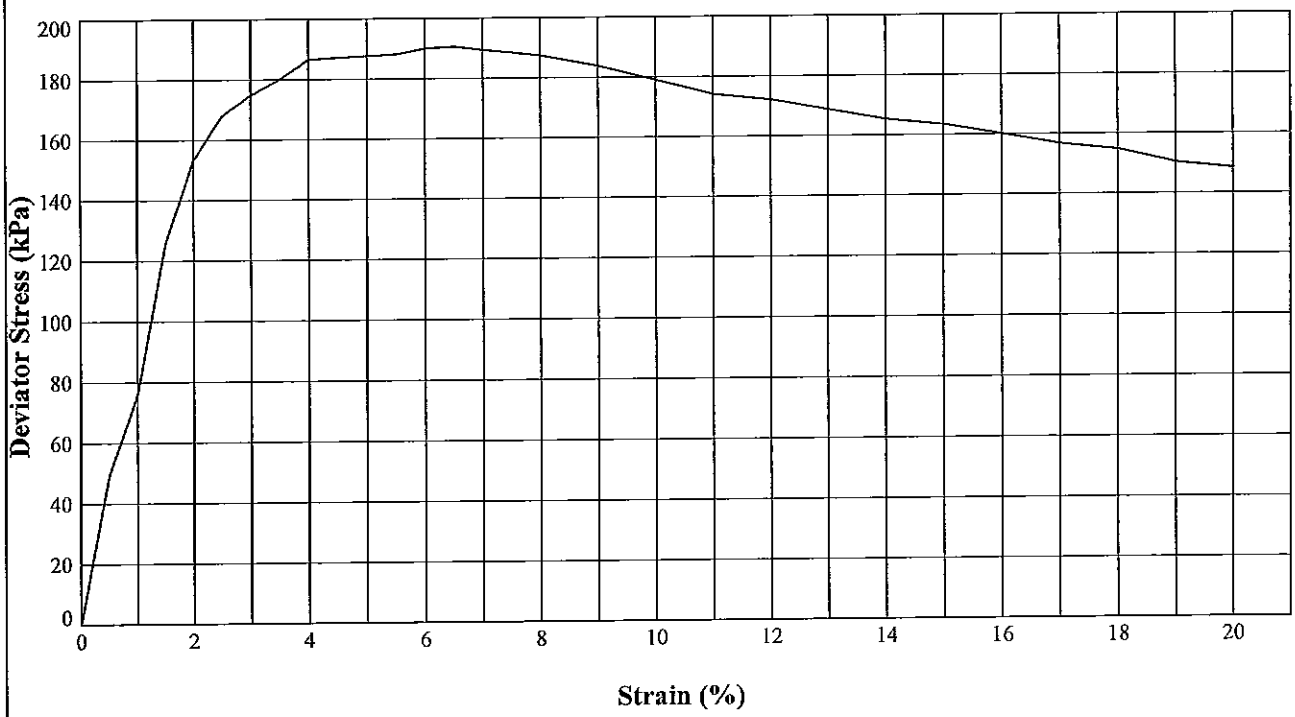
UNCONSOLIDATED QUICK UNDRAINED (SINGLE STAGE) TRIAXIAL COMPRESSION TEST

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		



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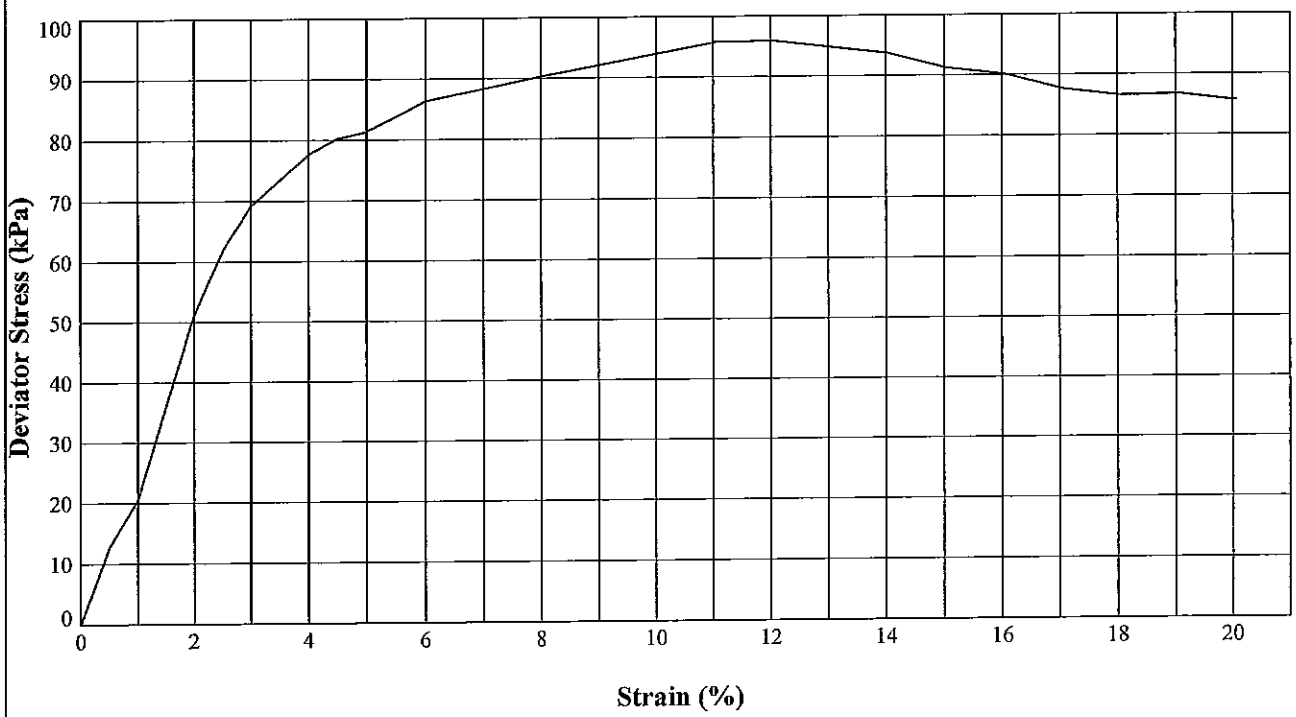
UNCONSOLIDATED QUICK UNDRAINED (SINGLE STAGE) TRIAXIAL COMPRESSION TEST

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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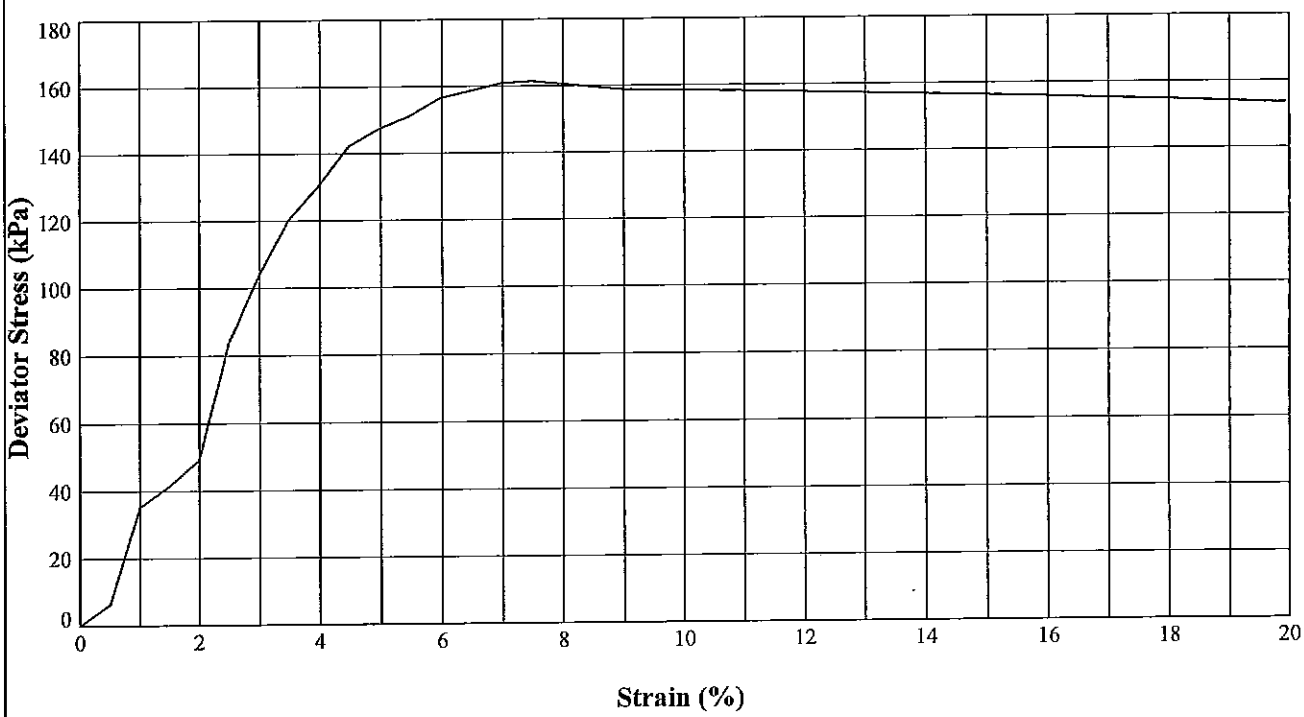
UNCONSOLIDATED QUICK UNDRAINED (SINGLE STAGE) TRIAXIAL COMPRESSION TEST

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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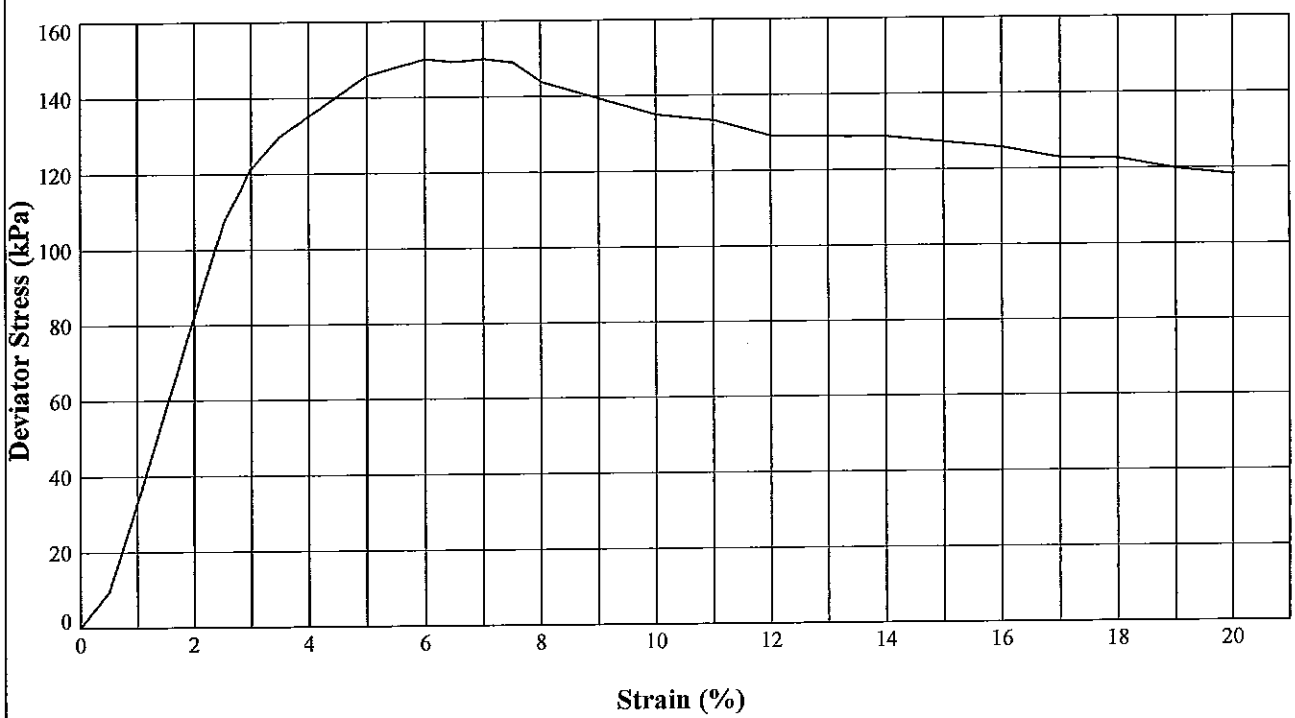
UNCONSOLIDATED QUICK UNDRAINED (SINGLE STAGE) TRIAXIAL COMPRESSION TEST

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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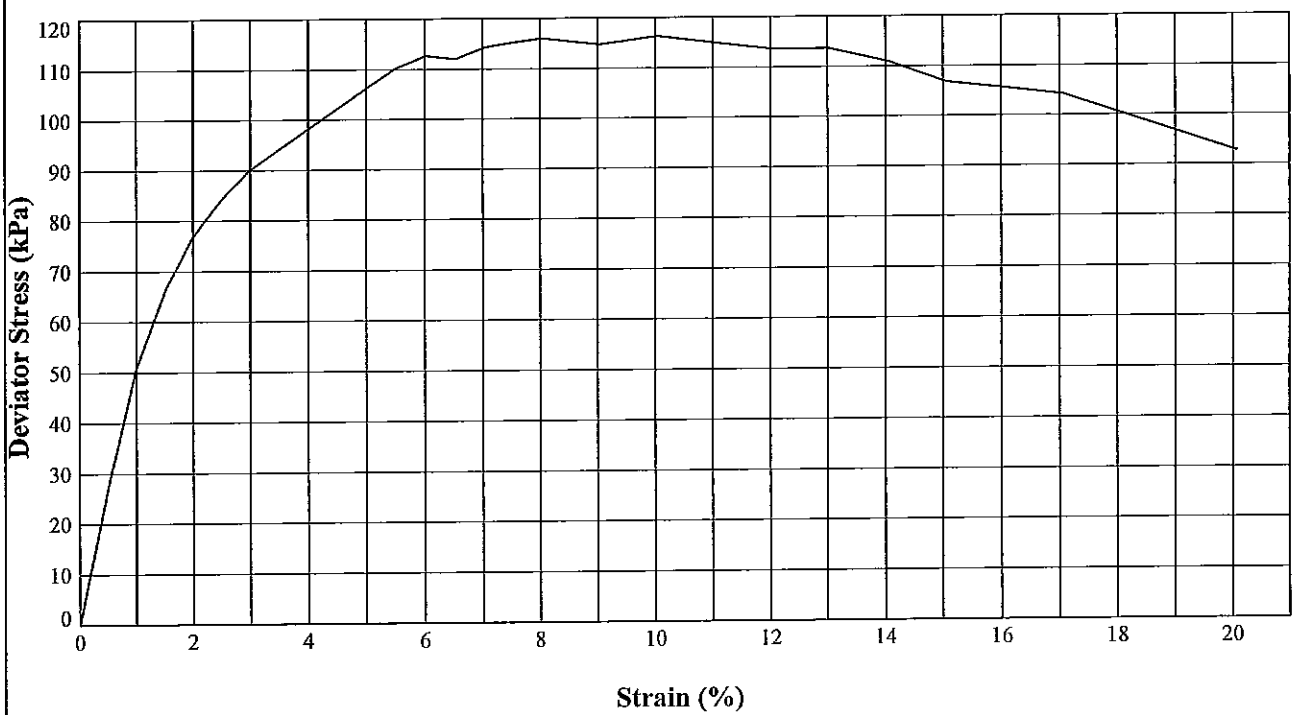
UNCONSOLIDATED QUICK UNDRAINED (SINGLE STAGE) TRIAXIAL COMPRESSION TEST

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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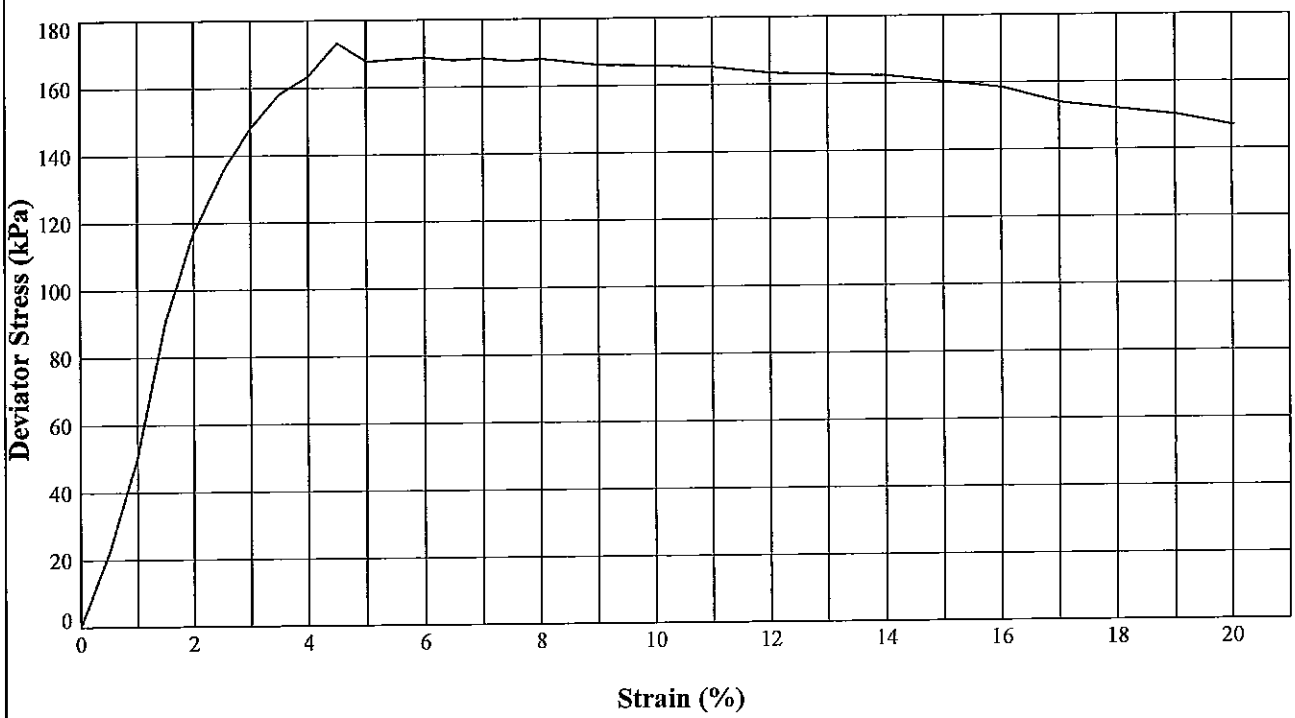
UNCONSOLIDATED QUICK UNDRAINED (SINGLE STAGE) TRIAXIAL COMPRESSION TEST

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		



Approved Signatories: P. KENT S. CAIRNS

STRUCTURAL SOILS 18 Frogmore Road Hemel Hempstead Hertfordshire HP3 9RT	Compiled By		Date
	PAUL KENT		03/12/10
	Contract 53 Fitzroy Park	Contract Ref: 581433	
		Page 17 of 20	AGS

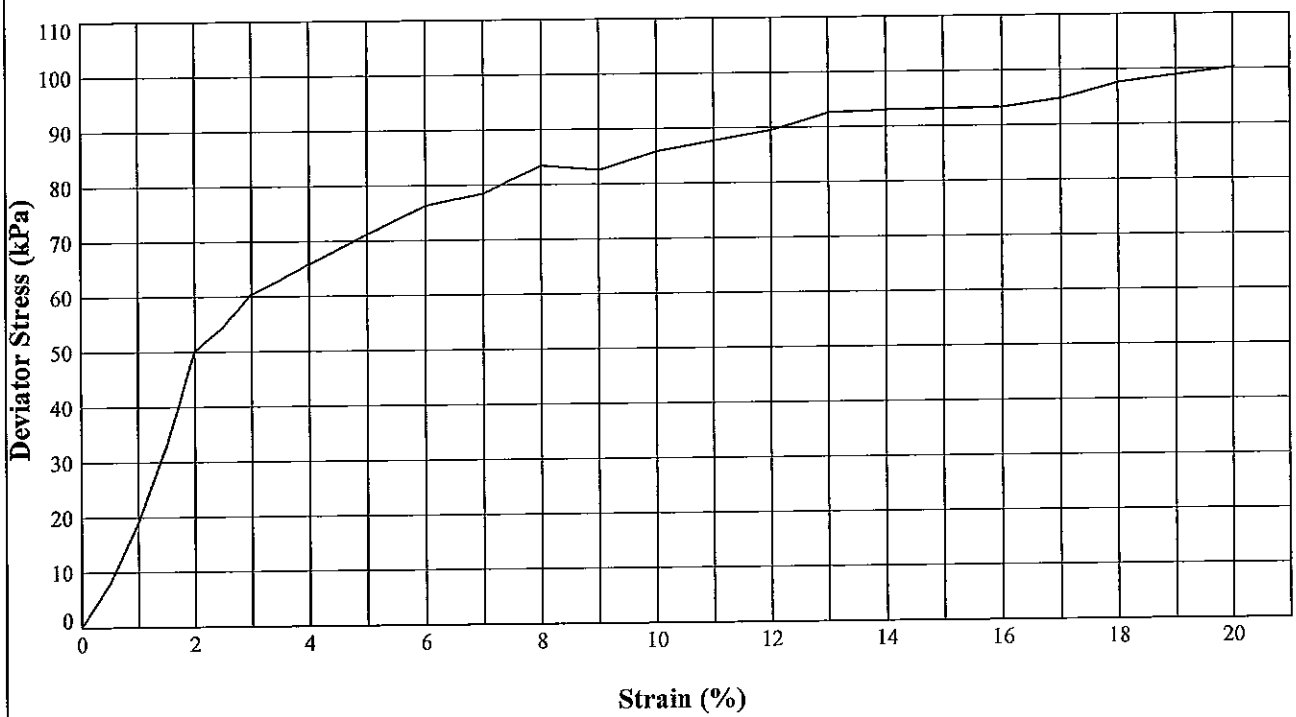
UNCONSOLIDATED QUICK UNDRAINED (SINGLE STAGE) TRIAXIAL COMPRESSION TEST

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

Borehole : **BH8A** Sample Ref: Sample Type: **U** Depth (m): **8.05**

Description : **Brownish black CLAY**

STAGE NUMBER			1	2	3
SAMPLE DETAILS	Sample Condition		Undisturbed		
	Orientation of sample		Vertical		
	Diameter	(mm)	102.67		
	Height	(mm)	209.68		
	Moisture Content	(%)	35		
	Bulk Density	(Mg/m^3)	1.95		
	Dry Density	(Mg/m^3)	1.44		
TEST DETAILS	Membrane Thickness	(mm)	0.24		
	Rate of Axial Displacement	(%/min)	2.00		
	Cell Pressure	(kPa)	160		
	Membrane Correction	(kPa)	0.89		
	Corrected Deviator Stress	(kPa)	100		
	Undrained Shear Strength	(kPa)	50		
	Strain at Failure	(%)	20.0		
	Mode of Failure		Compound		



Approved Signatories: P. KENT S. CAIRNS

STRUCTURAL SOILS
18 Frogmore Road
Hemel Hempstead
Hertfordshire
HP3 9RT

Compiled By	Date
PAUL KENT	03/12/10

Contract: **53 Fitzroy Park**

Contract Ref: **581433**

AGS

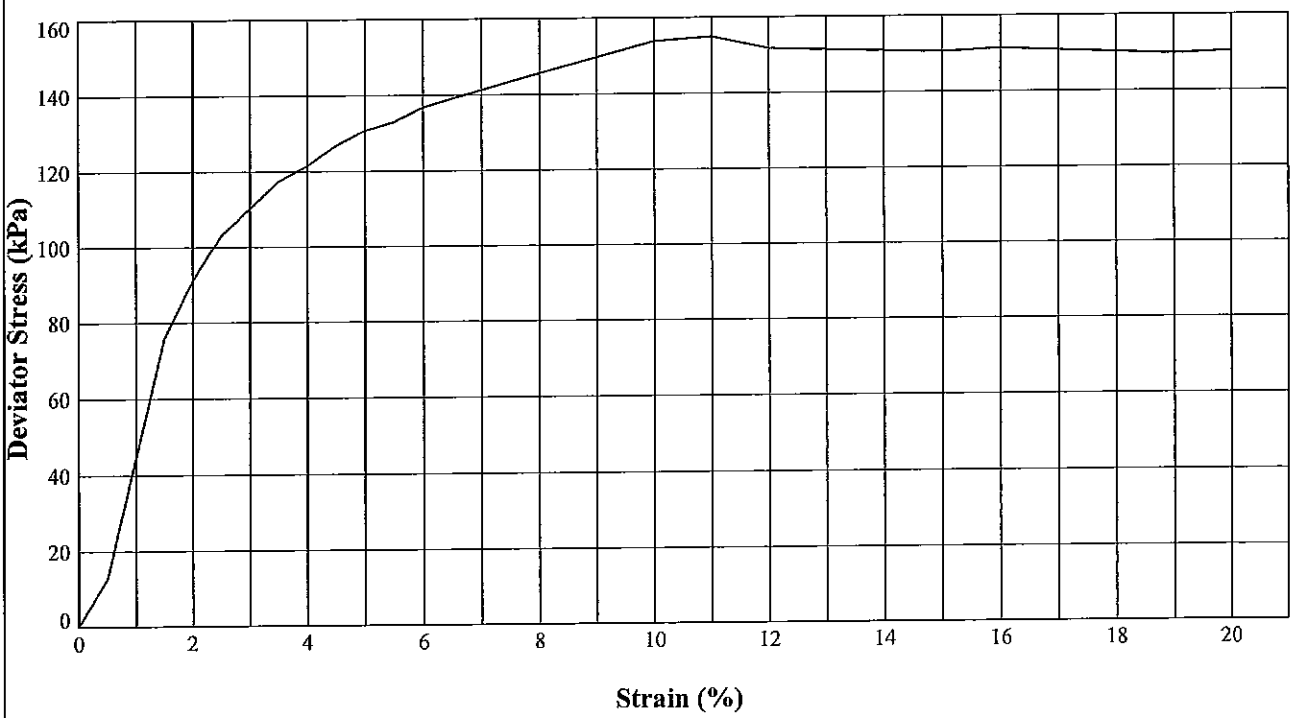
UNCONSOLIDATED QUICK UNDRAINED (SINGLE STAGE) TRIAXIAL COMPRESSION TEST

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

Borehole : **BH9A** Sample Ref: Sample Type: **U** Depth (m): **2.50**

Description : **Brown mottled grey CLAY with traces of roots and rootlets**

STAGE NUMBER			1	2	3
SAMPLE DETAILS	Sample Condition		Undisturbed		
	Orientation of sample		Vertical		
	Diameter	(mm)	102.61		
	Height	(mm)	209.99		
	Moisture Content	(%)	29		
	Bulk Density	(Mg/m^3)	1.97		
	Dry Density	(Mg/m^3)	1.53		
TEST DETAILS	Membrane Thickness	(mm)	0.24		
	Rate of Axial Displacement	(%/min)	2.00		
	Cell Pressure	(kPa)	50		
	Membrane Correction	(kPa)	0.58		
	Corrected Deviator Stress	(kPa)	155		
	Undrained Shear Strength	(kPa)	78		
	Strain at Failure	(%)	11.0		
	Mode of Failure		Compound		



Approved Signatories: P. KENT S. CAIRNS

STRUCTURAL SOILS
18 Frogmore Road
Hemel Hempstead
Hertfordshire
HP3 9RT

Compiled By		Date
Paul	PAUL KENT	03/12/10

Contract: **53 Fitzroy Park** Contract Ref: **581433**

AGS

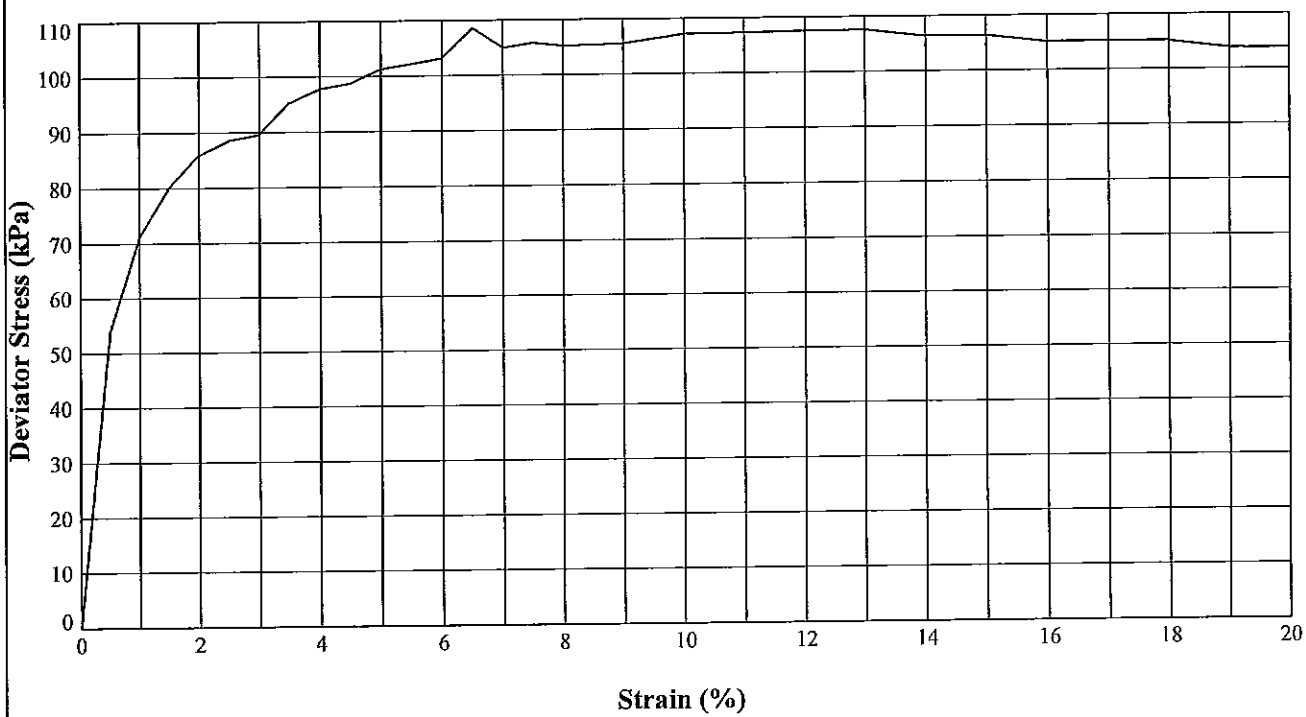
UNCONSOLIDATED QUICK UNDRAINED (SINGLE STAGE) TRIAXIAL COMPRESSION TEST

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

Borehole : **BH9A** 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)	102.85		
	Height	(mm)	208.14		
	Moisture Content	(%)	31		
	Bulk Density	(Mg/m^3)	2.00		
	Dry Density	(Mg/m^3)	1.52		
TEST DETAILS	Membrane Thickness	(mm)	0.24		
	Rate of Axial Displacement	(%/min)	2.00		
	Cell Pressure	(kPa)	130		
	Membrane Correction	(kPa)	0.38		
	Corrected Deviator Stress	(kPa)	109		
	Undrained Shear Strength	(kPa)	54		
	Strain at Failure	(%)	6.5		
	Mode of Failure		Brittle		



Approved Signatories: P. KENT S. CAIRNS

STRUCTURAL SOILS
18 Frogmore Road
Hemel Hempstead
Hertfordshire
HP3 9RT

Compiled By	Date
PAUL KENT	03/12/10

Contract: **53 Fitzroy Park**

Contract Ref: **581433**

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AGS

APPENDIX D

Chemical Laboratory Test Records

(This appendix contains 8 pages, including this)

envirolab
Units 7 & 8 Sandpits Business Park
Mottram Road, Hyde, Cheshire, SK14 3AR

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 10/04101
Issue Number: 1 **Date:** 07 December, 2010

Client: RSK STATS Hemel Hempstead
18 Frogmore Road
Hemel Hempstead
Hertfordshire
UK
HP3 9RT

Project Manager: Clive Gerring
Project Name: 53 Fitzroy Park
Project Ref: 241919
Order No: Not specified
Date Samples Received: 29/11/10
Date Instructions Received: 29/11/10
Date Analysis Completed: 07/12/10

Prepared by:

Melanie Marshall
Laboratory Coordinator

Approved by:

Gill Scott
Laboratory Manager

Notes - Soil analysis
All results are reported as dry weight (<40°C).
Stones >10mm are removed from the sample prior to analysis and results corrected where appropriate.

Notes - General
For soil samples subscript A indicates analysis performed on the sample as received, D indicates analysis performed on dried & crushed sample.
Superscript M indicates method accredited to MCERTS.

Predominant Matrix Codes - 1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER.
Samples with Matrix Code 7 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our MCERTS accreditation.
Secondary Matrix Codes - A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal, E = contains roots/twigs.
IS indicates Insufficient sample for analysis. NDP indicates No Determination Possible. NFI indicates No Fibres Identified.
Superscript # indicates method accredited to ISO 17025.
Accreditation for TPH (C6-C40) applies to the range C6-C36 only.
Analytical results reflect the quality of the sample at the time of analysis only.
Opinions and interpretations expressed are outside the scope of our accreditation.

MCERTS THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME
UKAS TESTING 1247

Envirolab Job Number: 10/04101

Client Project Name: 53 Fitzroy Park

Client Project Ref: 241919

Lab Sample ID	10/04101/1	10/04101/2	10/04101/3	10/04101/4	10/04101/5	10/04101/6	10/04101/7	10/04101/8	Units	Method ref
Client Sample No										
Client Sample ID	BH1A	BH2A	BH6A	BH8A	BH9A	BH2A	BH1A	BH1A		
Depth to Top	0.40	0.45	0.25	0.40	0.40	1.35	1.90	7.50		
Depth To Bottom	0.70	0.90	0.70	0.70	0.70	1.80				
Date Sampled	24-Nov-10	24-Nov-10	24-Nov-10	24-Nov-10	24-Nov-10	24-Nov-10	24-Nov-10	24-Nov-10		
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil		
Sample Matrix Code	6E	4AE	5AE	5AE	5AE	4AE	3	3		
ACM Screen$_A$	NFI	NFI	NFI	NFI	NFI	-	-	-		Visual
pH$_D$ M#	7.6	7.4	7.2	8.2	8.3	7.5	8.0	8.2	pH	A-T-031s
Sulphate (water sol 2:1)$_D$ M#	-	-	-	-	<0.01	0.05	0.23	0.41	g/l	A-T-026s
Organic matter$_D$ M#	-	5.5	2.3	-	3.6	-	-	-	% w/w	A-T-032 OM
Arsenic$_D$ M#	22	18	7	11	11	-	-	-	mg/kg	A-T-024
Boron (water soluble)$_D$ M#	1.7	<1.0	<1.0	<1.0	<1.0	-	-	-	mg/kg	A-T-027s
Cadmium$_D$ M#	0.8	<0.5	<0.5	<0.5	<0.5	-	-	-	mg/kg	A-T-024
Copper$_D$ M#	75	55	19	24	24	-	-	-	mg/kg	A-T-024
Chromium$_D$ M#	37	16	13	19	20	-	-	-	mg/kg	A-T-024
Lead$_D$ M#	329	469	106	190	200	-	-	-	mg/kg	A-T-024
Mercury$_D$	0.56	0.24	0.23	0.57	0.82	-	-	-	mg/kg	A-T-024
Nickel$_D$ M#	32	19	8	13	13	-	-	-	mg/kg	A-T-024
Selenium$_D$ M#	2	1	<1	<1	<1	-	-	-	mg/kg	A-T-024
Zinc$_D$ M#	397	241	54	79	89	-	-	-	mg/kg	A-T-024

Envirolab Job Number: 10/04101

Client Project Name: 53 Fitzroy Park

Client Project Ref: 241919

Lab Sample ID	10/04101/1	10/04101/2	10/04101/3	10/04101/4	10/04101/5	10/04101/6	10/04101/7	10/04101/8	Units	Method ref
Client Sample No										
Client Sample ID	BH1A	BH2A	BH6A	BH8A	BH9A	BH2A	BH1A	BH1A		
Depth to Top	0.40	0.45	0.25	0.40	0.40	1.35	1.90	7.50		
Depth To Bottom	0.70	0.90	0.70	0.70	0.70	1.80				
Date Sampled	24-Nov-10	24-Nov-10	24-Nov-10	24-Nov-10	24-Nov-10	24-Nov-10	24-Nov-10	24-Nov-10		
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil		
Sample Matrix Code	6E	4AE	5AE	5AE	5AE	4AE	3	3		
TPH CWG										
Ali >C5-C6$_A$	-	<0.01	<0.01	-	<0.01	-	-	-	mg/kg	A-T-022s
Ali >C6-C8$_A$	-	<0.01	<0.01	-	<0.01	-	-	-	mg/kg	A-T-022s
Ali >C8-C10$_A$	-	<0.01	<0.01	-	<0.01	-	-	-	mg/kg	A-T-022s
Ali >C10-C12$_A$#	-	<0.1	<0.1	-	<0.1	-	-	-	mg/kg	A-T-023s
Ali >C12-C16$_A$#	-	<0.1	<0.1	-	<0.1	-	-	-	mg/kg	A-T-023s
Ali >C16-C21$_A$#	-	<0.1	<0.1	-	<0.1	-	-	-	mg/kg	A-T-023s
Ali >C21-C35$_A$#	-	<0.1	<0.1	-	16.5	-	-	-	mg/kg	A-T-023s
Total Aliphatics$_A$#	-	<0.1	<0.1	-	16.5	-	-	-	mg/kg	A-T-022+23s
Aro >C5-C7$_A$	-	<0.01	<0.01	-	<0.01	-	-	-	mg/kg	A-T-022s
Aro >C7-C8$_A$	-	<0.01	<0.01	-	<0.01	-	-	-	mg/kg	A-T-022s
Aro >C8-C9$_A$	-	<0.01	0.02	-	0.03	-	-	-	mg/kg	A-T-022s
Aro >C9-C10$_A$	-	<0.01	<0.01	-	<0.01	-	-	-	mg/kg	A-T-022s
Aro >C10-C12$_A$#	-	<0.1	<0.1	-	<0.1	-	-	-	mg/kg	A-T-023s
Aro >C12-C16$_A$#	-	<0.1	<0.1	-	<0.1	-	-	-	mg/kg	A-T-023s
Aro >C16-C21$_A$#	-	17.4	<0.1	-	<0.1	-	-	-	mg/kg	A-T-023s
Aro >C21-C35$_A$#	-	33.7	<0.1	-	<0.1	-	-	-	mg/kg	A-T-023s
Total Aromatics$_A$#	-	51.1	<0.1	-	<0.1	-	-	-	mg/kg	A-T-022+23s
TPH (Ali & Aro)$_A$#	-	51.1	<0.1	-	16.5	-	-	-	mg/kg	A-T-022+23s
BTEX - Benzene$_A$#	-	<0.01	<0.01	-	<0.01	-	-	-	mg/kg	A-T-022s
BTEX - Toluene$_A$#	-	<0.01	<0.01	-	<0.01	-	-	-	mg/kg	A-T-022s
BTEX - Ethyl Benzene$_A$#	-	<0.01	<0.01	-	<0.01	-	-	-	mg/kg	A-T-022s
BTEX - m & p Xylene$_A$#	-	<0.01	0.01	-	0.02	-	-	-	mg/kg	A-T-022s
BTEX - o Xylene$_A$#	-	<0.01	<0.01	-	0.01	-	-	-	mg/kg	A-T-022s
MTBE$_A$#	-	<0.01	<0.01	-	<0.01	-	-	-	mg/kg	A-T-022s

Envirolab Job Number: 10/04101

Client Project Name: 53 Fitzroy Park

Client Project Ref: 241919

Lab Sample ID	10/04101/1	10/04101/2	10/04101/3	10/04101/4	10/04101/5	10/04101/6	10/04101/7	10/04101/8	Units	Method ref
Client Sample No										
Client Sample ID	BH1A	BH2A	BH6A	BH8A	BH9A	BH2A	BH1A	BH1A		
Depth to Top	0.40	0.45	0.25	0.40	0.40	1.35	1.90	7.50		
Depth To Bottom	0.70	0.90	0.70	0.70	0.70	1.80				
Date Sampled	24-Nov-10	24-Nov-10	24-Nov-10	24-Nov-10	24-Nov-10	24-Nov-10	24-Nov-10	24-Nov-10		
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil		
Sample Matrix Code	6E	4AE	5AE	5AE	5AE	4AE	3	3		
PAH 16										
Acenapthene$_A^{M\#}$	<0.01	0.06	<0.01	<0.01	<0.01	-	-	-	mg/kg	A-T-019s
Acenapthylene$_A^{M\#}$	<0.01	0.07	<0.01	<0.01	<0.01	-	-	-	mg/kg	A-T-019s
Anthracene$_A^{M\#}$	0.04	0.32	0.07	<0.01	0.01	-	-	-	mg/kg	A-T-019s
Benzo(a)anthracene$_A^{\#}$	0.07	0.62	0.20	<0.01	<0.01	-	-	-	mg/kg	A-T-019s
Benzo(a)pyrene$_A^{M\#}$	0.04	1.43	0.05	<0.01	<0.01	-	-	-	mg/kg	A-T-019s
Benzo(b)fluoranthene$_A^{M\#}$	0.13	1.07	0.15	<0.01	<0.01	-	-	-	mg/kg	A-T-019s
Benzo(ghi)perylene$_A^{M\#}$	0.18	1.48	0.10	<0.01	<0.01	-	-	-	mg/kg	A-T-019s
Benzo(k)fluoranthene$_A$	0.14	1.26	0.14	<0.01	<0.01	-	-	-	mg/kg	A-T-019s
Chrysene$_A^{M\#}$	0.17	1.49	0.15	<0.01	<0.01	-	-	-	mg/kg	A-T-019s
Dibenzo(ah)anthracene$_A^{\#}$	<0.01	0.11	<0.01	<0.01	<0.01	-	-	-	mg/kg	A-T-019s
Fluoranthene$_A^{M\#}$	0.22	2.75	0.14	<0.01	0.05	-	-	-	mg/kg	A-T-019s
Fluorene$_A^{M\#}$	<0.01	0.05	<0.01	<0.01	<0.01	-	-	-	mg/kg	A-T-019s
Indeno(123-cd)pyrene$_A^{\#}$	<0.01	0.58	<0.01	<0.01	<0.01	-	-	-	mg/kg	A-T-019s
Napthalene$_A^{M\#}$	<0.01	0.10	0.02	0.02	0.02	-	-	-	mg/kg	A-T-019s
Phenanthrene$_A^{M\#}$	0.10	0.82	0.07	<0.01	0.04	-	-	-	mg/kg	A-T-019s
Pyrene$_A^{M\#}$	0.21	2.50	0.11	<0.01	0.05	-	-	-	mg/kg	A-T-019s
Total PAH$_A^{\#}$	1.30	14.7	1.21	0.02	0.18	-	-	-	mg/kg	A-T-019s

Envirolab Job Number: 10/04101

Client Project Name: 53 Fitzroy Park

Client Project Ref: 241919

Lab Sample ID	10/04101/9	10/04101/10	10/04101/11	10/04101/12	10/04101/13	10/04101/14			Units	Method ref
Client Sample No										
Client Sample ID	BH2A	BH6A	BH6A	BH8A	BH8A	BH9A				
Depth to Top	9.00	4.90	8.05	1.10	6.10	3.20				
Depth To Bottom			8.50							
Date Sampled	24-Nov-10	24-Nov-10	24-Nov-10	24-Nov-10	24-Nov-10	24-Nov-10				
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil				
Sample Matrix Code	3	3	3	3	3	3				
pH_D M#	8.9	8.6	8.6	7.6	8.2	7.4			pH	A-T-031s
Sulphate (water sol 2:1)$_D$ M#	0.28	0.17	0.26	0.27	0.28	0.47			g/l	A-T-026s

envirolab
Units 7 & 8 Sandpits Business Park
Mottram Road, Hyde, Cheshire, SK14 3AR

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 10/04194
Issue Number: 1 **Date:** 14 December, 2010

Client:
RSK STATS Hemel Hempstead
18 Frogmore Road
Hemel Hempstead
Hertfordshire
UK
HP3 9RT

Project Manager: Clive Gerring
Project Name: 53 Fitzroy Park
Project Ref: 241919
Order No: Not specified
Date Samples Received: 02/12/10
Date Instructions Received: 02/12/10
Date Analysis Completed: 14/12/10

Prepared by:
Melanie Marshall
Laboratory Coordinator

Approved by:
John Gustafson
Director

Notes - Soil analysis
All results are reported as dry weight (<40°C).
Stones >10mm are removed from the sample prior to analysis and results corrected where appropriate.

Notes - General
For soil samples subscript A indicates analysis performed on the sample as received, D indicates analysis performed on dried & crushed sample.
Superscript M indicates method accredited to MCERTS.

Predominant Matrix Codes - 1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER.
Samples with Matrix Code 7 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our MCERTS accreditation.
Secondary Matrix Codes - A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal, E = contains roots/twigs.
IS indicates Insufficient sample for analysis. NDP indicates No Determination Possible. NFI indicates No Fibres Identified.
Superscript # indicates method accredited to ISO 17025.
Accreditation for TPH (C6-C40) applies to the range C6-C36 only.
Analytical results reflect the quality of the sample at the time of analysis only.
Opinions and interpretations expressed are outside the scope of our accreditation.

UKAS TESTING 1247

Envirolab Job Number: 10/04194

Client Project Name: 53 Fitzroy Park

Client Project Ref: 241919

Lab Sample ID	10/04194/1	10/04194/2	10/04194/3						Units	Method ref
Client Sample No										
Client Sample ID	BH1A	BH2A	Pond							
Depth to Top										
Depth To Bottom										
Date Sampled										
Sample Type	Water - GW	Water - GW	Water - GW							
Sample Matrix Code										
pH (w)$_A^\#$	7.3	7.3	7.5						pH	A-T-031w
Alkalinity (bicarbonate)$_A$	-	500	390						mg/l Ca CO3	A-T-038
Alkalinity (carbonate)$_A$	-	<15	<15						mg/l Ca CO3	A-T-038
Chloride (w)$_A^\#$	-	143	40						mg/l	A-T-026w
Sulphate (w)$_A^\#$	827	1753	66						mg/l	A-T-026w
Calcium (dissolved)$_A^\#$	-	457	95.3						mg/l	A-T-049
Lead (dissolved)$_A^\#$	-	1	-						µg/l	A-T-025
Magnesium (dissolved)$_A^\#$	-	208	23.6						mg/l	A-T-049
Potassium (dissolved)$_A^\#$	-	26.5	14.5						mg/l	A-T-049
Sodium (dissolved)$_A^\#$	-	217	28.6						mg/l	A-T-049
Benzo(a)pyrene (w)$_A^\#$	-	<0.01	-						µg/l	A-T-019w

APPENDIX E

CLEA Software Output Reports

(This appendix contains 13 pages, including this)

Generic Assessment Criteria for Human Health
Residential Scenario – Private Gardens

The human health generic assessment criteria (GAC) have been developed during a period of regulatory review and updating of the Contaminated Land Exposure Assessment (CLEA) project. Hence, the Environment Agency (EA) is in the process of publishing updated reports relating to the CLEA project and the GAC presented in this document may change to reflect these updates. This issue was prepared following the publication of soil guideline value reports and associated publications[1] for mercury, selenium, benzene, toluene, ethylbenzene and xylene in March 2009 plus arsenic and nickel in May 2009. Where available, the published soil guideline values (SGV)[1] have been used as GAC.

1. Model Selection

Soil assessment criteria (SAC) were calculated for compounds where SGV have not been published using CLEA v1.04. Groundwater assessment criteria (GrAC) protective of human health via the inhalation pathway were derived using the RBCA 1.3b model. RSK has updated the inputs within RBCA to reflect the UK guidance[2-5]. The SAC and GrAC collectively are termed GAC.

2. Conceptual Model

In accordance with EA Science Report SC050221/SR3[3], the residential with private garden scenario considers risks to a female child between the ages of 0 and 6 years old. In accordance with Box 3.1, SR3[3], the pathways considered for production of the SAC in the residential with gardens scenario are:

- Direct soil and dust ingestion;
- Consumption of homegrown produce;
- Consumption of soil attached to homegrown produce;
- Dermal contact with soil and indoor dust, and
- Inhalation of indoor and outdoor dust and vapours.

Figure 1 is a conceptual model illustrating these linkages.

The pathway considered in production of the GrAC is the volatilisation of compounds from groundwater and subsequent vapour inhalation by residents whilst indoors. Figure 2 illustrates this linkage. Although the outdoor air inhalation pathway is also valid, this contributes little to the overall risks owing to the dilution in outdoor air.

Within RBCA, the solubility limit of the determinant restricts the extent of volatilisation, which in turn drives the indoor air inhalation pathway. Whilst the same restriction is not built into the CLEA model, the model output cells are flagged red where the soil saturation limit has been exceeded. In accordance with the SGV report for xylene[1], where the soil saturation or solubility limit has been exceeded the GAC has been set at this limit. It should be noted this is a highly conservative assumption. Unless free-phase product is present, concentrations of the chemical are unlikely to be present at sufficient concentration to result in an exceedance of the health criteria value (HCV).

3. Input Selection

Chemical data was obtained from EA Report SC050021/SR7[5] and the health criteria values (HCV) from the UK TOX reports (published 2002 and 2009) where available.

For total petroleum hydrocarbons (TPH), HCV and chemical specific parameters were taken from the TPH Criteria Working Group (TPHCWG). Until further information is available regarding whether the TPH fractions should be considered cumulatively and/or additional data becomes available regarding background exposure, RSK has taken the conservative view that 50% exposure to TPH fractions is derived from background. Thus, the mean daily intake has been set at 50% of the toxicological data. Aromatic hydrocarbons C_5-C_8 were not modelled since benzene and toluene are being modelled separately. The aromatic C_8-C_9 hydrocarbon fraction comprises ethylbenzene, xylene and styrene. Since ethylbenzene and xylene are being modelled separately, the physical, chemical and toxicological data for this band has been taken from styrene. Owing to the lack of UK-specific data, default information in the RBCA model was used to evaluate methyl tertiary butyl ether (MTBE). No published UK data was available for 1,2,4- and 1,3,5-trimethylbenzene, so information was obtained from the US EPA. Toxicity reports were generated by RSK in line with guidance in CLR9[7] for 14 of the 16 USEPA polycyclic aromatic hydrocarbons (PAH). RSK notes that CLR9[7] has been withdrawn and these toxicity reports may need to be updated using additional references included within SR2[2]. However, the data in these documents is considered to remain valid since it broadly follows the approach outlined in SR2. Therefore, the HCV from these reports was used with the chemical data obtained from SR7[5], where available.

RBCA uses toxicity data for the inhalation pathway in different units to the CLEA model and cannot consider separately the mean daily intake (MDI), occupancy periods or breathing rates. Therefore, the HCV was amended to take account of:

- Amendments to the MDI using Table 3.4 of SR2[2];
- A child weighing 13.3kg (average of 0-6 year old female in accordance with Table 4.6 of SR3[3]) and breathing 11.85m^3 (average daily inhalation rate for a 0-6yr old female in accordance with Table 4.14 of SR3[3]; and
- The 50% rule (for petroleum hydrocarbons, trimethylbenzenes and MTBE)[2] where MDI data is not currently available but background exposure is considered important in the overall exposure.

Physical Parameters

For the residential with private gardens scenario, the CLEA default building is a small two-storey terrace house with concrete ground bearing slab. The house is assumed to have a 100m^2 private garden consisting of lawn, flowerbeds and incorporating a 20m^2 plot for growing fruit and vegetables consumed by the residents. SR3[3] notes this residential building type to be the most conservative in terms of protection from vapour intrusion. The building parameters are outlined in Table 5.

The parameters for a sandy loam soil type were used in line with SR3[3]. This includes a value of 6% for the percentage soil organic matter (SOM) within the soil. In RSK's experience, this is rather high for many sites. To avoid undertaking site specific risk assessments for this parameter, RSK has produced an additional set of SAC for an SOM of 1%.

For the GrAC, the depth to groundwater was taken as 2.5m based on RSK's experience of assessing the volatilisation pathway from groundwater.

4. GAC

The SAC were produced using the input parameters in Tables 1 to 5 and the GrAC using input parameters in Table 6. The final selected GAC are presented by pathway in Table 7 and the combined GAC in Table 8.

Figure 1
Conceptual Model for CLEA Residential Scenario – Private Gardens

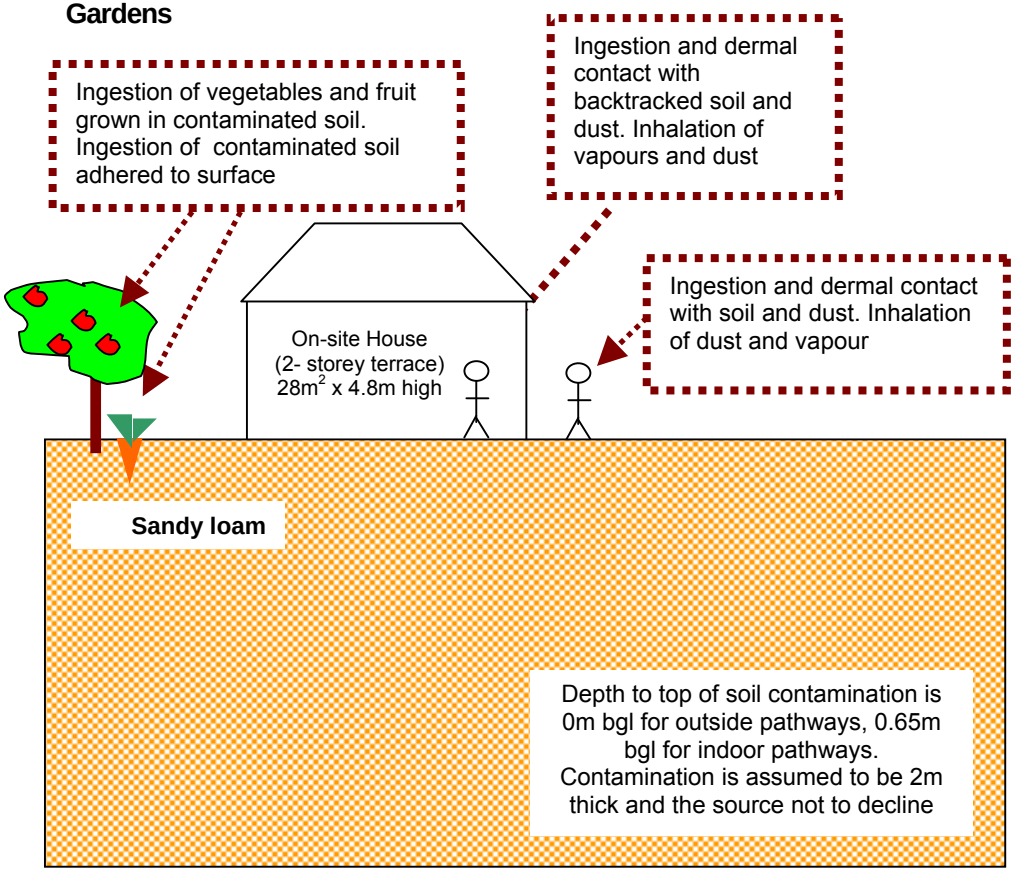

Table 1
Exposure Assessment Parameters for Residential Scenario - Private Gardens – Inputs for RBCA Model

Parameter	Value	Justification
Land use	Residential with homegrown produce	Chosen land use
Receptor	Female child age 1 to 6	Key generic assumption given in Box 3.1, SR3
Building	Small terraced house	Key generic assumption given in Box 3.1, report SC050021/SR3. Two storey small terraced house chosen as it is the most conservative residential building type in terms of protection from vapor intrusion (Section 3.4.6, SR3)
Soil type	Sandy Loam	Most common UK soil type (Section 4.3.1, From Table 3.1, SR3)
Start AC (age class)	1	Range of age classes corresponding to key generic assumption that the critical receptor is a young female child aged zero to six. From Box 3.1, report SC050021/SR3.
End AC (age class)	6	
SOM (%)	(i) 6	Representative of sandy loamy soil according to EA Guidance note dated January 2009 entitled 'Changes We Have Made to the CLEA Framework Documents'
	(ii) 1	To provide SAC for sites where SOM <6% as often observed by RSK
pH	7	Model default

Table 2
Residential with Private Gardens –Homegrown Produce Data for CLEA Model

	Consumption Rate (g FW kg^{-1} BW day^{-1}) by Age Class						Dry Weight Conversion Factor	Homegrown Fraction (average)	Homegrown Fraction (high end)	Soil loading factor	Preparation correction factor
Name	1	2	3	4	5	6	g DW g^{-1} FW	-	-	g g^{-1} DW	-
Green vegetables	7.12	6.85	6.85	6.85	3.74	3.74	0.096	0.05	0.33	1.00E-03	2.00E-01
Root vegetables	10.69	3.30	3.30	3.30	1.77	1.77	0.103	0.06	0.4	1.00E-03	1.00E+00
Tuber vegetables	16.03	5.46	5.46	5.46	3.38	3.38	0.21	0.02	0.13	1.00E-03	1.00E+00
Herbaceous fruit	1.83	3.96	3.96	3.96	1.85	1.85	0.058	0.06	0.4	1.00E-03	6.00E-01
Shrub fruit	2.23	0.54	0.54	0.54	0.16	0.16	0.166	0.09	0.6	1.00E-03	6.00E-01
Tree fruit	3.82	11.96	11.96	11.96	4.26	4.26	0.157	0.04	0.27	1.00E-03	6.00E-01
Justification	Table 4.17, SR3						Table 6.3, SR3	Table 4.19, SR3		Table 6.3, SR3	

Table 3
Residential with Private Gardens – Land Use Data for CLEA Model

Parameter	Unit	Age Class					
		1	2	3	4	5	6
EF (soil and dust ingestion)	day yr^{-1}	180	365	365	365	365	365
EF (consumption of homegrown produce)	day yr^{-1}	180	365	365	365	365	365
EF (skin contact, indoor)	day yr^{-1}	180	365	365	365	365	365
EF (skin contact, outdoor)	day yr^{-1}	180	365	365	365	365	365
EF (inhalation of dust and vapour, indoor)	day yr^{-1}	365	365	365	365	365	365
EF (inhalation of dust and vapour, outdoor)	day yr^{-1}	365	365	365	365	365	365
Justification		Table 3.1, SR3					
Occupancy period (indoor)	hr day^{-1}	23	23	23	23	19	19
Occupancy period (outdoor)	hr day^{-1}	1	1	1	1	1	1
Justification		Table 3.2, SR3					
Soil to skin adherence factor (indoor)	mg cm^{-2} day^{-1}	6.00E-02	6.00E-02	6.00E-02	6.00E-02	6.00E-02	6.00E-02
Soil to skin adherence factor (outdoor)	mg cm^{-2} day^{-1}	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
Justification		Table 8.1, SR3					
Soil and dust ingestion rate	g day^{-1}	1.00E-01	1.00E-01	1.00E-01	1.00E-01	1.00E-01	1.00E-01
Justification		Table 6.2, SR3					

Table 4
Residential with Private Gardens – Receptor Data for CLEA Model

Parameter	Unit	Age Class						Justification
		1	2	3	4	5	6	
Body weight	kg	5.6	9.8	12.7	15.1	16.9	19.7	Table 4.6, SR3
Body height	m	0.7	0.8	0.9	0.9	1	1.1	
Inhalation rate	m^3 day^{-1}	8.5	13.3	12.7	12.2	12.2	12.2	Table 4.14, SR3
Max exposed skin fraction (indoor)	m^2 m^{-2}	0.32	0.33	0.32	0.35	0.35	0.33	Table 4.8, SR3
Max exposed skin fraction (outdoor)	m^2 m^{-2}	0.26	0.26	0.25	0.28	0.28	0.26	

Table 5
Residential with Private Gardens – Soil and Building Inputs for CLEA Model

Parameter	Unit	Value	Justification
SOIL PROPERTIES for sandy loam			
Porosity, total	$cm^3\ cm^{-3}$	0.53	Default soil type is sandy loam, section 4.3.1, SR3. Parameters for sandy loam from Table 4.4, SR3
Porosity, air filled	$cm^3\ cm^{-3}$	0.20	
Porosity, water filled	$cm^3\ cm^{-3}$	0.33	
Residual soil water content	$cm^3\ cm^{-3}$	0.12	
Saturated hydraulic conductivity	$cm\ s^{-1}$	3.56E-03	
van Genuchten shape parameter (*m*)	-	3.20E-01	
Bulk density	$g\ cm^{-3}$	1.21	
Threshold value of wind speed at 10m	$m\ s^{-1}$	7.20	Default value taken from Section 9.2.2, SR3
Empirical function (F_x) for dust model	-	1.22	Value taken from Section 9.2.2, SR3
Ambient soil temperature	K	283	Annual average soil temperature representative of UK surface soils. Section 4.3.1, SR3
AIR DISPERSION MODEL			
Mean annual wind speed (10 m)	$m\ s^{-1}$	5.00	Default value taken from Section 9.2.2, SR3
Air dispersion factor at height of 0.8 m	$g\ m^{-2}\ s^{-1}$ per $kg\ m^{-3}$	2400	Values for a 0.01 ha site, appropriate to a residential land use in Newcastle (most representative city for UK). (from Table 9.1, SR3) Assumed child of 6 is not tall enough to reach 1.6m
Air dispersion factor at height of 1.6 m	$g\ m^{-2}\ s^{-1}$ per $kg\ m^{-3}$	0	
Fraction of site with hard or vegetative cover	$m^2\ m^{-2}$	0.75	Section 3.2.6, SR3 based on residential land use
BUILDING PROPERTIES for small terrace house with ground-bearing floor slab			
Building footprint	m^2	28	From Table 3.3 and 4.21, SR3
Living space air exchange rate	hr^{-1}	0.50	
Living space height (above ground)	m	4.8	
Living space height (below ground)	m	0.0	Assumed no basement
Pressure difference (soil to enclosed space)	Pa	3.1	From Table 3.3, SR3
Foundation thickness	m	0.15	
Floor crack area	cm^2	423	
Dust loading factor	$\mu g\ m^{-3}$	50	Default value for a residential site taken from Section 9.3, SR3
VAPOUR MODEL			
Default soil gas ingress rate	$cm^3\ s^{-1}$	25	Generic flow rate, Section 10.3, SR3
Depth to top of source (beneath building)	cm	50	Section 3.2.6, SR3 states source is 50cm below building or 65cm below ground surface
Depth to top of source (no building)	cm	0	Section 10.2, SR3 assumes impact from 0-1m for outdoor inhalation pathway
Thickness of contaminant layer	cm	200	Model default for indoor air, Section 4.9, SR4
Time average period for surface emissions	years	6	Time period of a 0 to 6 year old, Box 3.5, SR3
User-defined effective air permeability	cm^2	3.05E-08	Calculated for sandy loam using equations in Appendix 1, SR3

Figure 2
GrAC Conceptual Model for RBCA Residential with Gardens Scenario

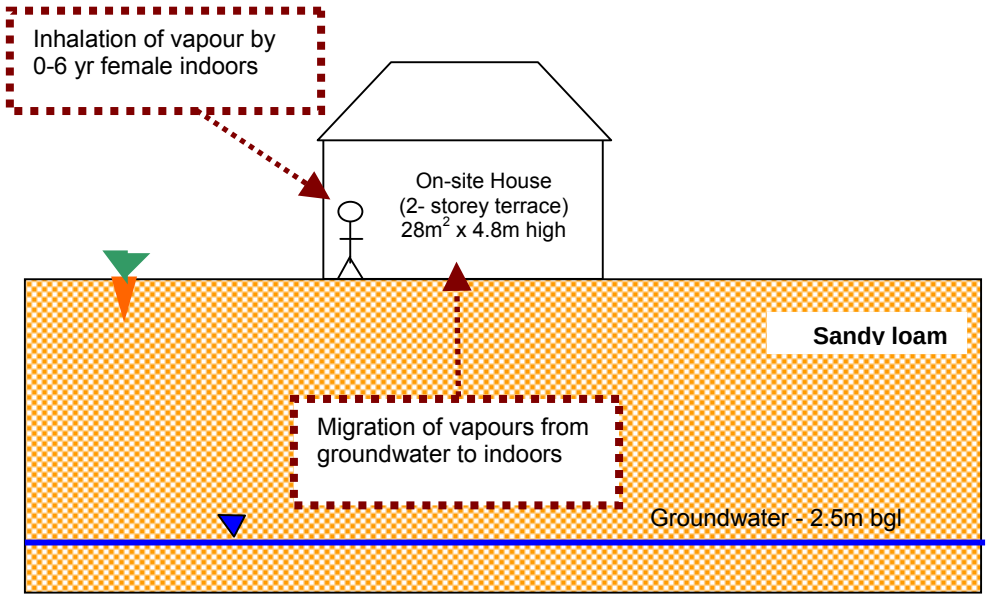

Table 6
Residential with Private Gardens RBCA Inputs

Parameter	Unit	Value	Justification
RECEPTOR			
Averaging time	Years	6	From Box 3.1, SR3
Receptor weight	kg	13.3	Average of CLEA 0-6 year old female data, Table 4.6, SR3
Exposure duration	Years	6	From Box 3.1, report , SR3
Exposure frequency	Days/yr	350	Weighted using occupancy period of 23 hours per day for 365 days of the year
SOIL TYPE – SANDY LOAM			
Total porosity	-	0.53	CLEA value for sandy loam. Parameters for sandy loam from Table 4.4, SR3
Volumetric water content	-	0.33	
Volumetric air content	-	0.20	
Dry bulk density	g cm^{-3}	1.21	
Vertical hydraulic conductivity	cm s^{-1}	3.56E-3	CLEA value for saturated conductivity of sandy loam, Table 4.4, SR3
Vapour permeability	m^2	3.05E-12	Calculated for sandy loam using equations in Appendix 1, SR3
Capillary zone thickness	m	0.1	Professional judgement
Fraction organic carbon	%	(i) 0.0348	Representative of sandy loam according to EA Guidance note dated January 2009 entitled Changes We Have Made to the CLEA Framework Documents
		(ii) 0.0058	To provide SAC for site's where SOM < 6% as often observed by RSK
BUILDING			
Building volume/area ratio	m	4.8	Table 3.3, SR3
Foundation area	m^2	28	
Foundation perimeter	m	22	Calculated assuming building measures 7m x 4m to give 28m^2 foundation area
Building air exchange rate	d^{-1}	12	Table 3.3, SR3
Depth to bottom of foundation slab	m	0.15	
Foundation thickness	m	0.15	
Foundation crack fraction	-	0.0151	Calculated from floor crack area of 423 cm^2 and building footprint of 28m^2 in Table 4.21, SR3
Volumetric water content of cracks	-	0.33	Assumed equal to underlying soil type in assumption that cracks become filled with soil over time. Parameters for sandy loam from Table 4.4, SR3
Volumetric air content of cracks	-	0.2	
Indoor/outdoor differential pressure	Pa	3.1	From Table 3.3, SR3

REFERENCES

1) Environment Agency, 31 March 2009 and May 2009. Science Report SC050021 / benzene SGV, toluene SGV, ethylbenzene SGV, xylene SGV, mercury SGV, selenium SGV, nickel SGV and arsenic SGV. Supplementary information for the derivation of SGV for: benzene, toluene, ethylbenzene, xylene, mercury, selenium, nickel and arsenic. Contaminants in soil: updated collation of toxicological data and intake values for humans: benzene, toluene, ethylbenzene, xylene, mercury, selenium, nickel and arsenic.

2) Environment Agency, January 2009. Science Report SC050021/SR2 Human Health Toxicological Assessment of Contaminants in Soil.

3) Environment Agency, January 2009. Science Report SC050021/SR3 Updated Technical Background to the CLEA Model.

4) Environment Agency, January 2009. Science Report SC050021/SR4 CLEA Software (Version 1.04) Handbook.

5) Environment Agency. 2008. Science Report SC050021/SR7. Compilation of Data for Priority Organic Pollutants for Derivation of Soil Guideline Values.

6) Environment Agency and DEFRA. Contaminants in Soil: Collation of Toxicological Data and Intake Values for Humans. Numbers 1–12, 14, 16–25.

7) Environment Agency. March 2002. CLR 9. Contaminants in soil: Collation of Toxicological Data and Intake Values for Humans.

GENERIC ASSESSMENT CRITERIA FOR HUMAN HEALTH - RESIDENTIAL WITH PRIVATE GARDENS

Table 7
Human Health Generic Assessment Criteria by Pathway for Residential Scenario - Private Gardens

Compound		GrAC (mg/l)	SAC Appropriate to Pathway SOM 1% (mg/kg) Oral	Inhalation	Combined	Soil Saturation Limit (mg/kg)	SAC Appropriate to Pathway SOM 6% (mg/kg) Oral	Inhalation	Combined	Soil Saturation Limit (mg/kg)
Metals										
Arsenic	(b,c)	-	3.24E+01	8.50E+01	2.35E+01	NR	3.24E+01	8.50E+01	2.35E+01	NR
Cadmium		-	6.21E+01	4.25E+01	2.93E+01	NR	6.21E+01	4.25E+01	2.93E+01	NR
Chromium (hexavalent)		-	2.78E+02	4.25E+01	3.76E+01	NR	2.78E+02	4.25E+01	3.76E+01	NR
Copper		-	8.96E+03	6.08E+03	4.74E+03	NR	8.96E+03	6.08E+03	4.74E+03	NR
Lead	(a)	-	4.50E+02	-	-	NR	4.50E+02	-	-	NR
Elemental Mercury (Hg^0)	(b,d)	9.40E-03	-	1.70E-01	-	4.31E+00	-	1.02E+00	-	2.58E+01
Inorganic Mercury (Hg^{2+})	(b)	-	1.81E+02	2.55E+03	1.69E+02	NR	1.81E+02	2.55E+03	1.69E+02	NR
Methyl Mercury (Hg^{4+})	(b)	2.00E+01	1.39E+01	1.59E+01	7.40E+00	7.33E+01	1.39E+01	6.53E+01	1.14E+01	3.04E+02
Nickel	(b,d)	-	5.31E+02	1.27E+02	1.19E+02	NR	5.31E+02	1.27E+02	1.19E+02	NR
Selenium	(b,c)	-	3.51E+02	-	-	NR	3.51E+02	-	-	NR
Zinc	(c)	-	2.53E+04	-	-	NR	2.53E+04	-	-	NR
Cyanide		-	2.66E+01	3.97E+00	3.68E+00	NR	2.66E+01	3.97E+00	3.68E+00	NR
Volatile Organic Compounds										
Benzene	(b)	2.60E+01	1.12E-01	2.69E-01	7.92E-02	1.22E+03	4.89E-01	1.04E+00	3.32E-01	4.71E+03
Toluene	(b)	1.90E+03	1.47E+02	6.26E+02	1.19E+02	8.69E+02	7.59E+02	3.14E+03	6.11E+02	4.36E+03
Ethylbenzene	(b)	2.60E+02	1.06E+02	1.70E+02	6.52E+01	5.18E+02	5.70E+02	9.32E+02	3.54E+02	2.84E+03
Xylene - m	(b)	8.40E+01	2.02E+02	5.56E+01	4.36E+01	6.25E+02	1.09E+03	3.07E+02	2.40E+02	3.46E+03
Xylene - o		1.00E+02	1.85E+02	5.98E+01	4.52E+01	4.78E+02	9.96E+02	3.27E+02	2.46E+02	2.62E+03
Xylene - p		8.70E+01	1.91E+02	5.34E+01	4.17E+01	5.76E+02	1.02E+03	2.94E+02	2.28E+02	3.17E+03
Total xylene		8.40E+01	2.02E+02	5.56E+01	4.36E+01	6.25E+02	1.09E+03	3.07E+02	2.40E+02	3.46E+03
Methyl t-Butyl ether		2.20E+03	1.75E+00	1.84E+02	1.75E+00	1.66E+04	7.41E+00	3.70E+02	7.37E+00	3.34E+04
Trichloroethene		1.80E+00	2.83E+00	1.10E-01	1.06E-01	1.54E+03	1.40E+01	5.11E-01	4.93E-01	7.14E+03
Tetrachloroethene		3.60E+00	1.06E+01	1.60E+00	1.39E+00	4.24E+02	5.55E+01	8.21E+00	7.15E+00	2.18E+03
1,1,1-Trichloroethane		2.60E+01	3.20E+02	6.33E+00	6.21E+00	1.43E+03	1.55E+03	2.84E+01	2.79E+01	6.39E+03
1,1,1,2Tetrachloroethane		1.40E+01	5.19E+00	1.08E+00	8.93E-01	2.60E+03	2.78E+01	5.83E+00	4.82E+00	1.40E+04
1,1,2,2-Tetrachloroethane		1.40E+01	2.70E+00	2.76E+00	1.37E+00	2.67E+03	1.30E+01	1.24E+01	6.34E+00	1.20E+04
Carbon Tetrachloride		5.50E-02	1.05E+00	1.81E-02	1.79E-02	1.52E+03	5.44E+00	8.99E-02	8.92E-02	7.54E+03
1,2-Dichloroethane		3.00E-01	3.06E-02	6.46E-03	5.34E-03	3.41E+03	1.05E-01	1.60E-02	1.39E-02	8.43E+03
Vinyl Chloride		1.90E-02	3.69E-03	5.43E-04	4.73E-04	1.36E+03	1.21E-02	1.07E-03	9.86E-04	2.69E+03
1,2,4-Trimethylbenzene		7.50E-02	3.39E+01	7.42E-01	7.38E-01	1.03E+02	1.87E+02	4.19E+00	4.17E+00	5.85E+02
1,3,5-Trimethylbenzene		4.70E-02	1.45E+01	4.60E-01	4.56E-01	9.47E+01	7.94E+01	2.59E+00	2.56E+00	5.33E+02
Semi-Volatile Organic Compounds										
Acenaphthene		3.20E+00	2.05E+02	7.34E+00	7.08E+00	1.32E+02	7.49E+02	4.32E+01	4.09E+01	7.89E+02
Acenaphthylene		4.20E+00	1.23E+01	5.45E-01	5.22E-01	3.89E+02	5.32E+01	3.21E+00	3.03E+00	2.31E+03
Anthracene		2.10E-02	4.26E+04	1.39E+03	1.34E+03	3.60E+00	5.15E+04	7.40E+03	6.47E+03	2.16E+01
Benzo(a)anthracene		3.80E-03	1.42E+01	8.09E+00	5.16E+00	1.71E+00	1.57E+01	2.05E+01	8.90E+00	1.03E+01
Benzo(b)fluoranthene		2.00E-03	1.47E+01	2.50E+01	9.25E+00	1.22E+00	1.58E+01	2.87E+01	1.02E+01	7.29E+00
Benzo(g,h,i)perylene		2.60E-04	2.35E+03	5.38E+04	2.25E+03	1.87E-02	2.40E+03	5.63E+04	2.30E+03	1.12E-01
Benzo(k)fluoranthene		8.00E-04	1.50E+01	2.66E+01	9.60E+00	6.87E-01	1.59E+01	2.91E+01	1.03E+01	4.12E+00
Chrysene		2.00E-03	1.37E+02	1.95E+02	8.03E+01	4.40E-01	1.55E+02	2.72E+02	9.90E+01	2.64E+00
Dibenzo(a,h)anthracene		6.00E-04	1.53E+00	2.37E+00	9.28E-01	3.93E-03	1.59E+00	2.85E+00	1.02E+00	2.36E-02
Fluoranthene		2.30E-01	1.12E+02	1.51E+01	1.33E+01	1.89E+01	1.50E+02	7.18E+01	4.85E+01	1.13E+02
Fluorene		1.90E+00	2.35E+03	8.85E+01	8.53E+01	1.53E+02	6.86E+03	5.23E+02	4.86E+02	9.13E+02
Indeno(1,2,3-cd)pyrene		2.00E-04	1.45E+01	2.43E+01	9.08E+00	6.14E-02	1.58E+01	2.86E+01	1.02E+01	3.68E-01
Phenanthrene		5.30E-01	2.39E+03	1.17E+03	7.85E+02	7.06E+01	3.03E+03	6.33E+03	2.05E+03	4.23E+02
Pyrene		1.30E-01	1.08E+03	1.44E+02	1.27E+02	2.20E+00	1.49E+03	6.93E+02	4.73E+02	1.32E+01
Benzo(a)pyrene		3.80E-03	1.49E+00	2.62E+00	9.49E-01	9.11E-01	1.58E+00	2.90E+00	1.02E+00	5.46E+00
Naphthalene		1.90E+01	2.68E+01	1.64E+00	1.54E+00	7.64E+01	1.43E+02	9.27E+00	8.71E+00	4.32E+02
Phenol	(c)	-	4.40E+02	-	-	4.16E+04	1.98E+03	-	-	1.74E+05

GENERIC ASSESSMENT CRITERIA FOR HUMAN HEALTH - RESIDENTIAL WITH PRIVATE GARDENS

Table 7
Human Health Generic Assessment Criteria by Pathway for Residential Scenario - Private Gardens

Compound		GrAC (mg/l)	SAC Appropriate to Pathway SOM 1% (mg/kg) Oral	Inhalation	Combined	Soil Saturation Limit (mg/kg)	SAC Appropriate to Pathway SOM 6% (mg/kg) Oral	Inhalation	Combined	Soil Saturation Limit (mg/kg)
Total Petroleum Hydrocarbons										
Aliphatic hydrocarbons EC_5-EC_6		1.00E+01	8.97E+03	2.47E+01	2.47E+01	3.69E+02	4.31E+04	8.04E+01	8.03E+01	1.20E+03
Aliphatic hydrocarbons >EC_6-EC_8		5.40E+00	1.52E+04	5.11E+01	5.10E+01	1.69E+02	6.62E+04	2.39E+02	2.39E+02	7.93E+02
Aliphatic hydrocarbons >EC_8-EC_{10}		2.30E-01	3.14E+03	1.11E+01	1.11E+01	8.46E+01	4.12E+03	6.29E+01	6.27E+01	4.79E+02
Aliphatic hydrocarbons >EC_{10}-EC_{12}		3.40E-02	3.99E+03	5.36E+01	5.35E+01	5.02E+01	4.34E+03	3.18E+02	3.12E+02	2.98E+02
Aliphatic hydrocarbons >EC_{12}-EC_{16}		7.60E-04	4.39E+03	2.48E+02	2.45E+02	2.22E+01	4.41E+03	1.49E+03	1.34E+03	1.33E+02
Aliphatic hydrocarbons >EC_{16}-EC_{21}	(c)	-	8.84E+04	-	-	9.15E+00	8.84E+04	-	-	5.49E+01
Aliphatic hydrocarbons >EC_{21}-EC_{35}	(c)	-	8.84E+04	-	-	6.45E+00	8.84E+04	-	-	3.87E+01
Aromatic hydrocarbons >EC_8-EC_9		6.50E+01	1.66E+02	2.65E+02	1.33E+02	6.20E+02	8.50E+02	1.54E+03	7.02E+02	3.61E+03
Aromatic hydrocarbons >EC_9-EC_{10}		7.40E+00	5.53E+01	1.77E+01	1.60E+01	6.20E+02	2.83E+02	1.03E+02	9.17E+01	3.61E+03
Aromatic hydrocarbons >EC_{10}-EC_{12}		2.50E+01	8.04E+01	9.74E+01	5.84E+01	3.72E+02	3.90E+02	5.74E+02	3.04E+02	2.19E+03
Aromatic hydrocarbons >EC_{12}-EC_{16}		5.80E+00	1.40E+02	5.05E+02	1.29E+02	1.70E+02	6.01E+02	3.00E+03	5.67E+02	1.01E+03
Aromatic hydrocarbons >EC_{16}-EC_{21}	(c)	-	8.84E+04	-	-	5.99E+01	8.84E+04	-	-	3.59E+02
Aromatic hydrocarbons >EC_{21}-EC_{35}	(c)	-	1.11E+03	-	-	4.82E+00	1.29E+03	-	-	2.89E+01

Notes:
-' Generic assessment criteria not calculated owing to low volatility of substance and therefore no pathway, or an absence of toxicological data.
EC - equivalent carbon. GrAC - groundwater assessment criteria. SAC - soil assessment criteria.

The CLEA model output is colour coded depending upon whether the soil saturation limit has been exceeded.

Calculated SAC exceeds soil saturation limit and may significantly effect the interpretation of any exceedances since the contribution of the indoor and outdoor vapour pathway to total exposure is >10%. This shading has also been used for the RBCA output where the theoretical solubility limit has been exceeded. SAC/GrAC is set at soil saturation/solubility limit.

Calculated SAC exceeds soil saturation limit but will not effect the SSV significantly since the contribution of the indoor and outdoor vapour pathway to total exposure is <10%.

Calculated SAC does not exceed the soil saturation limit.

For consistency where the theoretical solubility limit within RBCA has been exceeded in production of the GrAC, these cellls have also been hatched red.
The SAC for organic compounds are dependant upon soil organic matter (SOM) (%) content. To obtain SOM from total organic carbon (TOC) (%) divide by 0.58. 1% SOM is 0.58% TOC. DL Rowell Soil Science: Methods and Applications, Longmans, 1994.
SAC for TPH fractions, polycyclic aromatic hydrocarbons, MTBE, BTEX and trimethylbenzene compounds were produced using an attenuation factor for the indoor air inhalation pathway of 10 to reduce conservatism associated with the vapour inhalation pathway, section 10.1.1, SR3

(a) GAC taken as former Soil Guideline Value owing to uncertainty regarding toxicological approach to be adopted by the Environment Agency.
(b) GAC taken from the Environment Agency SGV reports published March and May 2009.
(c) SAC for selenium, zinc, phenol, aliphatic and aromatic hydrocarbons >EC16 does not include inhalation pathway owing to absence of toxicity data. SAC for arsenic is only based on oral contribution (rather than combined) owing to the relative small contribution from inhalation in accordance with the SGV report.
(d) SAC for elemental mercury and nickel is based on the inhalation pathway only owing to an absence of toxicity for elemental mercury andr in accordance with the SGV report for nickel.

Table 8
Human Health Generic Assessment Criteria for Residential Scenario - Private Gardens

Compound	GrAC for Groundwater (mg/l)	SAC for Soil SOM 1% (mg/kg)	SAC for Soil SOM 6% (mg/kg)
Metals			
Arsenic	-	32	32
Cadmium	-	29	29
Chromium (hexavalent)	-	38	38
Copper	-	4,700	4,700
Lead	-	450	450
Elemental Mercury (Hg^0)	0.009	0.17	1.0
Inorganic Mercury (Hg^{2+})	-	170	170
Methyl Mercury (Hg^{4+})	20	7.4	11
Nickel	-	130	130
Selenium	-	350	350
Zinc	-	25,000	25,000
Cyanide	-	3.7	3.7
Volatile Organic Compounds			
Benzene	26	0.08	0.33
Toluene	1,900	120	610
Ethylbenzene	260	65	350
Xylene - m	84	44	240
Xylene - o	100	45	250
Xylene - p	87	42	230
Total xylene	84	44	240
Methyl t-Butyl ether	2,200	1.8	7.4
Trichloroethene	1.8	0.11	0.49
Tetrachloroethene	3.6	1.4	7.2
1,1,1-Trichloroethane	26	6.2	28
1,1,1,2Tetrachloroethane	14	0.89	4.8
1,1,2,2-Tetrachloroethane	14	1.4	6.3
Carbon Tetrachloride	0.06	0.02	0.09
1,2-Dichloroethane	0.3	0.005	0.01
Vinyl Chloride	0.02	0.0005	0.001
1,2,4-Trimethylbenzene	0.08	0.74	4.2
1,3,5-Trimethylbenzene	0.05	0.46	2.6
Semi-Volatile Organic Compounds			
Acenaphthene	3.2	7.1	41
Acenaphthylene	4.2	0.52	3.0
Anthracene	0.02	1,300	6,500
Benzo(a)anthracene	0.004	5.2	8.9
Benzo(b)fluoranthene	0.002	9.3	10
Benzo(g,h,i)perylene	0.0003	2,300	2,300
Benzo(k)fluoranthene	0.0008	9.6	10
Chrysene	0.002	80	99
Dibenzo(a,h)anthracene	0.0006	0.93	1.0
Fluoranthene	0.23	13	49
Fluorene	1.9	85	490
Indeno(1,2,3-cd)pyrene	0.0002	9.1	10
Phenanthrene	0.53	790	2,100
Pyrene	0.13	130	470
Benzo(a)pyrene	0.004	0.95	1.0
Naphthalene	19	1.5	8.7
Phenol	-	440	2,000
Total Petroleum Hydrocarbons			
Aliphatic hydrocarbons EC_5-EC_6	10	25	80
Aliphatic hydrocarbons >EC_6-EC_8	5.4	51	240
Aliphatic hydrocarbons >EC_8-EC_{10}	0.23	11	63
Aliphatic hydrocarbons >EC_{10}-EC_{12}	0.03	50	300
Aliphatic hydrocarbons >EC_{12}-EC_{16}	0.0008	22	130
Aliphatic hydrocarbons >EC_{16}-EC_{21}	-	88,000	88,000
Aliphatic hydrocarbons >EC_{21}-EC_{35}	-	88,000	88,000
Aromatic hydrocarbons >EC_8-EC_9	65	130	700
Aromatic hydrocarbons >EC_9-EC_{10}	7.4	16	92
Aromatic hydrocarbons >EC_{10}-EC_{12}	25	58	300
Aromatic hydrocarbons >EC_{12}-EC_{16}	5.8	130	570
Aromatic hydrocarbons >EC_{16}-EC_{21}	-	88,000	88,000
Aromatic hydrocarbons >EC_{21}-EC_{35}	-	1,100	1,300

Notes:
'-' Generic assessment criteria not calculated owing to low volatility of substance and therefore no pathway, or an absence of toxicological data.
EC - equivalent carbon. GrAC - groundwater assessment criteria. SAC - soil assessment criteria.

The SAC for organic compounds are dependent on Soil Organic Matter (SOM) (%) content. To obtain SOM from total organic carbon (TOC) (%) divide by 0.58. 1% SOM is 0.58% TOC. DL Rowell Soil Science: Methods and Applications, Longmans, 1994.
SAC for TPH fractions, polycyclic aromatic hydrocarbons, MTBE, BTEX and trimethylbenzene compounds were produced using an attenuation factor for the indoor air inhalation pathway of 10 to reduce conservatism associated with the vapour inhalation pathway, section 10.1.1, SR3.
SAC for aliphatic C10-C12 and C12-C16 is taken as soil saturation limit in acordance with CLEA. For consistency with CLEA, the GrAC for aliphatic and aromatic C12-C16 hydrocarbons and all PAH (acenaphthylene) has been set as the theoretical solubility limit.

Calculated SAC exceeds soil saturation limit (SSL), thus SSL taken as SAC in line with recently published SGV. For consistency where the GrAC exceeds the solubility limit, GrAC has been set at the solubility limit. These are highly conservative since concentrations of the chemical are very unlikely to be at sufficient concentration to result in an exceedance of the health criteria value at the point of exposure (i.e. indoor air) provided free-phase product is absent.

APPENDIX F

HASWASTE Assessment

(This appendix contains 2 pages, including this)

As cmpds (AsS), Cd (CdO), CrVI cmpds ($FeCrO_4$), Cu (Cu_2O), Inorg Hg cmpds (HgO), Pb cmpds ($PbSO_4$), Ni ($NiCO_3$), Se cmpds (SeS) and Zn as ZnO. Also Ba ($BaCO_3$), Be cmpds ($BeSO_4$), Co (CoO), Mn (MnO_2) and Mo (MoO_3).

HASWASTE v4. Envirolab's Contaminated Land Soil Hazardous Waste Assessment Tool.

Envirolab, Sandpits Business Park, Mottram Road, Hyde, Cheshire SK14 3AR.

envirolab

Site Code and Name															
TP/WS/BH		BH1A	BH2A	BH6A	BH8A	BH9A									
Depth (m)		0.40	0.45	0.25	0.40	0.40									
Envirolab reference															
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Arsenic		22	18	7	11	11									
CrVI or Chromium		37	16	13	19	20									
Copper		75	55	19	24	24									
Lead		329	469	106	190	200									
Nickel		32	19	8	13	13									
Zinc		397	241	54	79	89									
Cadmium															
Mercury															
Selenium															
Barium															
Beryllium															
Cobalt															
Manganese															
Molybdenum															
Total USEPA 16 PAHs															
Acenaphthene		0.01	0.06	0.01	0.01	0.01									
Acenaphthylene		0.01	0.07	0.01	0.01	0.01									
Anthracene		0.04	0.32	0.07	0.01	0.01									
Benzo(a)anthracene		0.07	0.62	0.20	0.01	0.01									
Benzo(a)pyrene		0.04	1.43	0.05	0.01	0.01									
Benzo(b)fluoranthene		0.13	1.07	0.15	0.01	0.01									
Benzo(ghi)perylene		0.18	1.48	0.10	0.01	0.01									
Benzo(k)fluoranthene		0.14	1.26	0.14	0.01	0.01									
Chrysene		0.17	1.49	0.15	0.01	0.01									
Dibenzo(ah)anthracene		0.01	0.11	0.01	0.01	0.01									
Fluoranthene		0.22	2.75	0.14	0.01	0.05									
Fluorene		0.01	0.05	0.01	0.01	0.01									
Indeno(123cd)pyrene		0.01	0.58	0.01	0.01	0.01									
Naphthalene		0.01	0.10	0.02	0.02	0.02									
Phenanthrene		0.10	0.82	0.07	0.01	0.04									
Pyrene		0.21	2.50	0.11	0.01	0.05									
Benzo(j)fluoranthene															
Benzene															
Toluene															
Ethylbenzene															
Xylenes															
Trimethylbenzenes															
Chlorobenzene															
1,2-Dichlorobenzene															
1,3-Dichlorobenzene															
1,4-Dichlorobenzene															
1,2,4-Trichlorobenzene															
2-Chlorotoluene															
4-Chlorotoluene															
Trichloroethene (TCE)															
Oil in Waste Carcinogenic H7															
Total TPH	≥1,000mg/kg		51.1	0.1		16.5									
Petrol or (C6-C10)	≥1,000mg/kg														
Diesel or (C10-C25) or (conservative C10-C35)	≥10,000mg/kg														
Lube Oil or (C25+) or (conservative C21+)	≥1,000mg/kg														
8 IARC H7 Carcinogenic PAHs marker test (applicable to LRO only)	≥1%	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Kerosene															
Kerosene															
Creosote															
Creosote															
pH Corrosive H8 (Irritant H4)															
pH (soil)	≤2 H8 ≥11.5	7.6	7.4	7.2	8.2	8.3									
pH (leachate)	≤2 H8 ≥11.5														
Alkali Reserve (gNaOH/100g)															
H4 Alkali Reserve test	≥13	7.6	7.4	7.2	8.2	8.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
H8 Alkali Reserve test	≥14.5	7.6	7.4	7.2	8.2	8.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Produces Toxic Gases H12															
Total Sulphide	≥1,400mg/kg														
Free Cyanide	≥1,200mg/kg														
Thiocyanate	≥2,600mg/kg														
Elemental/Free Sulphur															
PCBs Total															
Phenols Total by HPLC															
Phenol															
Cresols															
Xylenols															
1-Naphthol															
Resourcinol															
2,3,5,6-Tetrachlorophenol															
2,4,5-Trichlorophenol															
2,4,6-Trichlorophenol															
2,4-Dichlorophenol															
4-Chloro-3-methylphenol															
Pentachlorophenol															
Bis(2-ethylhexyl)phthalate															
Butylbenzylphthalate															
Di-n-butylphthalate															
Visual Fibre Screen or Asbestos ID (enter Y or N)	H7≥0.1%; H5≥3%; H6≥25%	N	N	N	N	N									
Hazard Codes	Thresholds	%	%	%	%	%	%	%	%	%	%	%	%	%	%
Irritant H4	≥10%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Irritant H4	≥20%	0.006	0.004	0.002	0.003	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Harmful H5	≥25%	0.063	0.084	0.019	0.033	0.036	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Toxic H6 (Harmful H5)	≥0.1%H5<7%; H6≥7%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Toxic H6 (Harmful H5)	≥3%H5<25%; H6≥25%	0.010	0.006	0.003	0.004	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Carcinogenic H7	≥0.1%	0.012	0.005	0.004	0.006	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Carcinogenic H7	≥1%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Corrosive H8 (Irritant H4)	≥5%H4<10%; H8≥10%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Toxic for Reproduction H10	≥0.5%	0.048	0.068	0.015	0.028	0.029	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Toxic for Reproduction H10	≥5%	0.048	0.068	0.015	0.028	0.029	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Mutagenic H11	≥0.1%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Mutagenic H11	≥1%	0.006	0.004	0.002	0.003	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ecotoxic H14	≥1.0	0.448	0.381	0.105	0.166	0.177	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
New Ecotoxic H14 individual substance specific thresholds	≥0.0025%	0.00001	0.00006	0.00002	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
New Ecotoxic H14 individual substance specific thresholds	≥0.025%	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Consider other individual contaminants on a case by case basis.

Table 3.2 of Annex VI of the CLP Regulation including 1st ATP (sometimes called ATSP1).