

PERMIT

SITE INVESTIGATION REPORT

Havant WRC
Hart Farm Way
Havant

ISSUE 02

CONCEPT

SITE INVESTIGATION REPORT

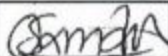
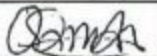
Havant WRC
Hart Farm Way
Havant

Prepared for: Hampshire County Council

Concept: 09/2240 -FR02

13/01/2010

Unit 8, Warple Mews,
Warple Way
London W3 0RF
Tel: 020 8811 2880
Fax: 020 8811 2881
e-mail: si@conceptconsultants.co.uk
www.conceptconsultants.co.uk

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			Name			
			Signature			

CONCEPT SITE INVESTIGATIONS

Unit 8, Warple Mews, Warple Way, London W3 0RF

Tel: 020 8811 2880 Fax: 020 8811 2881

e-mail: si@conceptconsultants.co.uk

CONCEPT SITE INVESTIGATIONS

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1. PROJECT PARTICULARS

Site Address: Havant Waste Recycling Centre (WRC), Harts Farm Way, Havant

Client: Hampshire County Council

Date of Fieldwork: 03/12/2009

2. SCOPE OF WORK:

Site works:

- 6 No. Machine Excavated Trial Pits to a maximum Depth of 2.40m.
- 3 No. Plate Bearing Tests at 1.0m depth below ground level (carried out in. Trial Pits – PB1 to PB3).
- 3 No. In Situ CBR Tests using a Dynamic Cone Penetrometer (DCP) at a depth of 0.5m (carried out in trial pits CBR1 to CBR3).
- 3 No. Mackintosh Probes Tests in the base of Trial Pits PB1 to PB3.

3. FIELDWORK

Machine Excavated Trial Pits

6 No. Trial Pits were machine excavated to a maximum depth of 2.4m to investigate the properties of the soil and facilitate in-situ Testing (Plate Bearing. And DCP Testing (See Below).

Mackintosh probe test were carried out in the base of the 3 No. trial pits (PB1 to PB3), the results of which are reported on the Trial Pit logs in Section 7 of this report.

Plastic tubs, borosilicate jars, vials were taken for chemical and soil analyses in each trial pit. Bulk samples were taken in each trail pit.

All trial pits were backfilled with compacted soil arisings and made good upon completion.

In-Situ California Bearing Ratio Tests (CBR)

3 No. in-situ California bearing Ratio (CBR) tests using a dynamic cone penetrometer (DCP) were carried out in accordance with the Transport Research Laboratory (1991). The testing was carried out at 0.5m depth in Trial Pits CBR1 to CBR3. The results are presented in Section 9 of this report.

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Plate Bearing Tests

Plate bearing tests were carried out in accordance with BS1377:1990, Part 9 within 3 No. Trial Pits (PB1 to PB3) at 1.0m below ground level. A 300mm diameter plate was used to test the vertical deformation of the ground at the base of trial pits PB1 and PB3 (1.0m), and at 1.0m in PB2. The results of the plate bearing tests are illustrated in Section 8 of this report.

Setting Out

During and subsequent to completion of the exploratory hole works the locations and levels for the trial pits were established using precise level and / or GPS survey equipment as appropriate.

4. LABORATORY TESTING

Logging of the samples was carried out in accordance with BS 5930:1999 incorporating Amendment No.1 (Dec '07). All soil tests were carried out in accordance with BS1377 (1990). The results are presented in graphical and tabular format in Section 10 of this report.

All chemical testing has been carried out by Scientifics in accordance with the requirements of UKAS ISO17025 and ISO17020. The results are presented in tabular formats in Section 11 of this report.

REFERENCES

British Standards Institution, Methods of test for soils for civil engineering purposes, British Standard BS 1377: 1990, BSI, London, 1990.

British Standards Institution, Code of practice for site investigations, British Standard BS 5930: 1999, BSI, London, 1999 (*Incl. Amendment No. 1*).

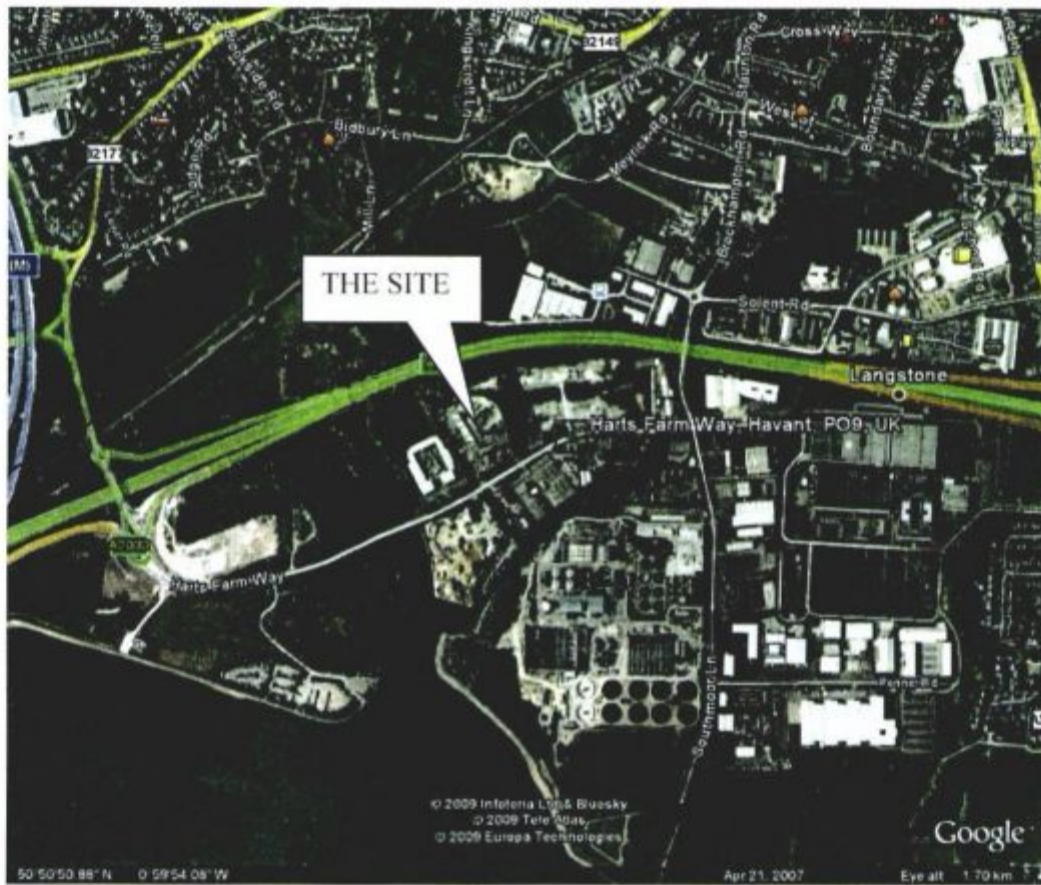
British Standards Institution, Investigation of potentially contaminated sites, British Standard BS10175: 2001, BSI, London, 2001.

Specification for Ground Investigation, Site Investigation Steering Group, Thomas Telford, London, 1999.

Transport Research Laboratory. Operating instructions for the TRL dynamic cone penetrometer (2nd edition). Information Note. Crowthorne: Jones C R and J Rolt (1991).

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5. SITE LOCATION PLAN



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6. EXPLORATORY HOLE LOCATION PLAN

COORDINATES & LEVELS

TP	EASTING (m)	NORTHING (m)	LEVEL (mOD)
CBR1	470513.1	105893.5	3.70
CBR2	470550.0	105873.7	4.00
CBR3	470446.6	105864.2	3.90
PB1	470459.7	105825.5	3.95
PB2	470477.3	105832.6	3.43
PB3	470496.3	105839.5	3.83

NOTES

1. This drawing should not be scaled.

A	Change of levels (mOD)	OS	Drawn	Checked	Passed	Date
No	Revision					

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Unit 8, Warple Mews
Warple Way
London W3 0RF
e-mail: concept@conceptconsultants.co.uk
www.conceptconsultants.co.uk

Client: Hampshire Country Council

Project: Havant WRC

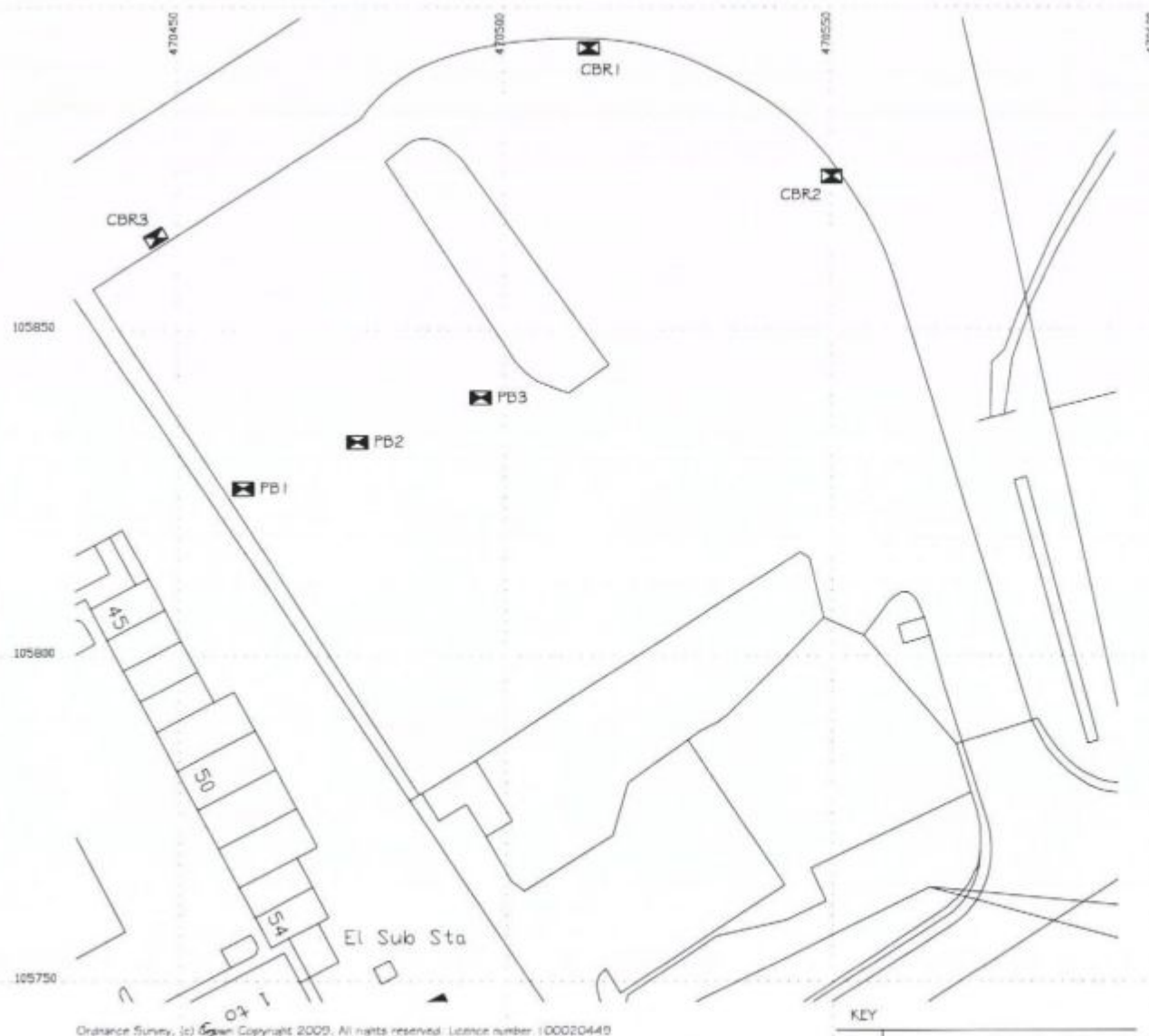
Title: Exploratory Hole
Location Plan

Dwg. No: 09/2240

Status: Issue

Scale: NTS

Drawn	Checked	Passed	Date
OS	MD	MD	December 09



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7. TRIAL PIT LOGS

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8 Warple Mews, Warple Way
London W3 0RF
Telephone: 020 8811 2880 Fax: 020 8811 2881
E-mail: si@conceptconsultants.co.uk



Trial Pit No

CBR1

Project

Havant WRC

Job No 09/2240	Date Started 03/12/09	Ground Level (mOD) 3.70	Co-Ordinates E 470513.1 N 105893.5	Final Depth 0.50m
Client Hampshire County Council	Date Completed 03/12/09		Method/ Plant Used Hand Excavated	Sheet 1 of 1

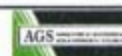
STRATA					SAMPLES & TESTS			Field Records
Water	Level (mOD)	Legend	Depth (Thickness)	Strata Description	Depth	Type No	Test Result	
	3.50		(0.20) 0.20	Brown sandy GRAVEL (MADE GROUND)				
	3.20		(0.30) 0.50	Brown slightly gravelly SAND with frequent brick and concrete fragments. Gravel is subangular to subrounded fine to coarse flint. (MADE GROUND)				
				End of Trial Pit	0.50 0.50 0.50 0.50 0.50	T01 T02 J03 V04 B05		... A concrete boulder and rebar encountered at 0.5m depth in south side of pit

GENERAL REMARKS

1. CBR trial pit hand excavated to a depth of 0.50m below ground level for TRL probing.
2. TRL probing carried out in north side of trial pit at 0.50m below ground level. (See TRL Probe results).
3. Trial pit was dry and stable.
4. Trial pit backfilled with arisings on completion of TRL probing.
5. Trial pit dimensions: 1.10m x 0.60m x 0.50m deep.

Issue No.
02

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8 Warple Mews, Warple Way
London W3 0RF
Telephone: 020 8811 2880 Fax: 020 8811 2881
E-mail: si@conceptconsultants.co.uk



Trial Pit No

CBR2

Project

Havant WRC

Job No 09/2240	Date Started 03/12/09 Date Completed 03/12/09	Ground Level (mOD) 4.00	Co-Ordinates E 470550.0 N 105873.7	Final Depth 1.20m
Client Hampshire County Council	Method/ Plant Used Hand Excavated	Sheet 1 of 1		

STRATA					SAMPLES & TESTS			Field Records
Water	Level (mOD)	Legend	Depth (Thickness)	Strata Description	Depth	Type No	Test Result	
	3.80		(0.20) 0.20	Brown Sandy GRAVEL.. (MADE GROUND)				... Moderate water seepage encountered at 0.50m depth
			(1.00)	Firm, brown and cream gravelly slighty sandy CLAY with frequent weathered chalk fragments, brick and concrete fragments and occasional flint cobble. Gravel is subangular to subrounded fine to coarse black flint. (MADE GROUND)	0.50 0.50 0.50 0.50 0.50	T01 T02 J03 V04 B05		
	2.80		1.20	End of Trial Pit				

GENERAL REMARKS

1. CBR trial pit hand excavated to a depth of 0.50m below ground level for TRL probing.
2. TRL test carried out to at 0.50m below ground level. (See TRL Probe Results)
3. Trial pit extended to 1.20m following test to confirm stratigraphy.
4. Trial pit was dry and stable.
5. Trial pit backfilled with arisings on completion of TRL probing.
6. Trial pit dimensions: 1.10m x 0.60m x 0.50m deep.

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8 Warple Mews, Warple Way
London W3 0RF
Telephone: 020 8811 2880 Fax: 020 8811 2881
E-mail: sii@conceptconsultants.co.uk



Trial Pit No

CBR3

Project

Havant WRC

Job No 09/2240	Date Started 03/12/09 Date Completed 03/12/09	Ground Level (mOD) 3.90	Co-Ordinates E 470446.6 N 105864.2	Final Depth 0.60m
Client Hampshire County Council			Method/ Plant Used Hand Excavated	Sheet 1 of 1

STRATA					SAMPLES & TESTS			Field Records
Water	Level (mOD)	Legend	Depth (Thickness)	Strata Description	Depth	Type No	Test Result	
	3.70		(0.20) 0.20	Brown sandy GRAVEL, (MADE GROUND)				
			(0.40)	Firm, light brown slightly sandy gravelly CLAY with frequent chalk and brick fragments. Gravel is subangular to subrounded fine to coarse flint. (MADE GROUND)				
	3.30		0.60		0.50 0.50 0.50 0.50 0.50	T01 T02 J03 V04 B05		
				End of Trial Pit				

GENERAL REMARKS

1. CBR trial pit hand excavated to a depth of 0.60m below ground level for TRL probing.
2. TRL test carried out at 0.50m below ground level. (See TRL Probe results).
3. Trial pit extended to 0.60m below ground level following test to confirm stratigraphy.
4. Trial pit was dry and stable.
5. Trial pit backfilled with arisings on completion of TRL probing.
6. Trial pit dimensions: 1.20m x 0.60m x 0.60m deep.

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8 Warple Mews, Warple Way
London W3 0RF
Telephone: 020 8811 2880 Fax: 020 8811 2881
E-mail: si@conceptconsultants.co.uk



Trial Pit No

PB1

Project

Havant WRC

Job No 09/2240	Date Started 03/12/09 Date Completed 03/12/09	Ground Level (mOD) 3.95	Co-Ordinates E 470459.7 N 105825.5	Final Depth 1.00m
Client Hampshire County Council			Method/ Plant Used Machine Excavated	Sheet 1 of 1

STRATA					SAMPLES & TESTS			Field Records
Water	Level (mOD)	Legend	Depth (Thickness)	Strata Description	Depth	Type No	Test Result	
	3.83		0.12	Asphalt concrete overlying black fibrous mesh. (MADE GROUND)				
	3.60		0.35	Brown gravelly SAND with frequent brick and concrete fragments. Gravel is subangular to subrounded fine to coarse flint. (MADE GROUND)				
			(0.65)	Firm, light brown slightly gravelly CLAY with frequent chalk fragments, occasional flint cobbles and rare brick and wood fragments. Gravel is angular to subrounded fine to coarse flint. (MADE GROUND) ... with a plastic fibrous mesh at 0.35m				
	2.95		1.00					
				End of Trial Pit	1.00 1.00 1.00 1.00 1.00 1.00	T01 T02 J03 V04 B05 B06		... Macintosh Probe: M50 (1.00m - 1.02m)

GENERAL REMARKS

1. Trial pit was dry and stable.
2. Plate Bearing Test & Macintosh Probe Test carried out at the base of trial pit.
3. Trial pit was backfilled with arisings upon completion of testing and surface reinstated with 300mm mass concrete to ground level.
4. Trial pit dimensions: 1.50m x 0.8m x 1.0m deep

Issue No. 02

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8 Warple Mews, Warple Way
London W3 0RF
Telephone: 020 8811 2880 Fax: 020 8811 2881
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Trial Pit No

PB2

Project

Havant WRC

Job No 09/2240	Date Started 03/12/09 Date Completed 03/12/09	Ground Level (mOD) 3.43	Co-Ordinates E 470477.3 N 105832.6	Final Depth 2.40m
Client Hampshire County Council			Method/ Plant Used Machine Excavated	Sheet 1 of 1

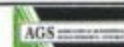
STRATA					SAMPLES & TESTS			Field Records
Water	Level (mOD)	Legend	Depth (Thickness)	Strata Description	Depth	Type No	Test Result	
	3.28		(0.15) 0.15	Asphalt concrete overlying a black fibrous mesh. (MADE GROUND)				
	3.08		(0.20) 0.35	Brown gravelly SAND with frequent brick and concrete fragments. (MADE GROUND)				
			(1.15)	Firm, light brown slightly gravelly CLAY with frequent chalk fragments and rare brick and wood fragments. (MADE GROUND) ... with a layer of pea gravel at 0.45m				... A Ø150mm disused clay pipe encountered at 0.45m depth
				... with a band of soft, dark brown gravelly clay with an organic odour between 1.20m and 1.50m	1.00 1.00 1.00 1.00 1.00 1.00	T01 T02 J03 V04 B05 B06		Macintosh Probe: ... M50 (1.0m - 1.045m)
	1.93		1.50	Structureless, clayey CHALK composed of slightly sandy silty subangular GRAVEL and COBBLE. (POSSIBLE FILL?)	1.40	B07		
			(0.50)					... Moderate water seepage encountered at 1.80m depth
	1.43		2.00	Light brown slightly clayey very sandy subangular to subrounded fine to coarse flint GRAVEL, with occasional fine chalk gravel.				
			(0.40)		2.20	B08		
	1.03		2.40					
				End of Trial Pit				

GENERAL REMARKS

1. Trial pit was dry above 1.80m and stable.
2. Trial pit initially excavated to 1.00m below ground level to facilitate Plate Bearing and Macintosh Probe tests.
3. Excavation progressed to 2.40m below ground level after completion of tests.
4. Moderate water seepage encountered at 1.80m.
5. Trial pit was backfilled with arisings upon completion and surface reinstated with 300mm of concrete to ground level.
6. Trial pit dimensions: 1.7m x 1.0m x 2.40m deep.

Issue No. 02

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8 Warple Mews, Warple Way
London W3 0RF
Telephone: 020 8811 2880 Fax: 020 8811 2881
E-mail: s@conceptconsultants.co.uk



Trial Pit No

PB3

Project

Havant WRC

Job No 09/2240	Date Started 03/12/09 Date Completed 03/12/09	Ground Level (mOD) 3.83	Co-Ordinates E 470496.3 N 105839.5	Final Depth 1.00m
Client Hampshire County Council			Method/ Plant Used Machine Excavated	Sheet 1 of 1

STRATA					SAMPLES & TESTS			Field Records
Water	Level (mOD)	Legend	Depth (Thickness)	Strata Description	Depth	Type No	Test Result	
	3.71		0.12	Asphalt concrete overlying black fibrous mesh. (MADE GROUND)				... Macintosh Probe: M50 (1.0m - 1.025m)
			(0.23)	Brown gravelly SAND with frequent brick and concrete fragments, disused cable and rare wood fragments. (MADE GROUND)				
	3.48		0.35					
			(0.65)	Firm to stiff, dark brown slightly sandy gravelly CLAY with frequent chalk fragments, nylon bag pieces and occasional flint cobble. Gravel is subangular to subrounded fine to coarse flint. (MADE GROUND)				
	2.83		1.00					
				End of Trial Pit	1.00 1.00 1.00 1.00 1.00 1.00	T01 T02 J03 V04 B05 B06		

GENERAL REMARKS

1. Trial pit was dry and stable.
2. Plate Bearing & Macintosh Probe tests were carried out at the base of trial pit.
3. Trial pit was backfilled with arisings upon completion of testing and surface reinstated with 300mm of concrete to ground level.
4. Trial pit dimensions: 2.0m x 1.20m x 1.0m deep.

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02

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CONCEPT SITE INVESTIGATIONS

8. PLATE BEARING TESTS

Client name & address: Hants CC		Samples Received: -	CONCEPT
Project Name: Havant WRC		Project Started: -	
Project No: 320217	Our job/report no: 8752	Testing Started: 03/12/2009 Date Reported: 08/12/2009	
Position no: PB1	Depth: 1.00	Plate diameter: 0.30 m	

Sample Information	Test Data
Environmental conditions: dry	Loading procedure: Incremental
Material Type: Light brown gravelly CLAY with chalk, flint brick and wood (MADE GROUND)	Description of Reaction load: site plant
Temperature (0C): 15	Insitu moisture content(%): 15

Load Increment no:	Load kN	Cumulative settlement mm
Seating load	0.5	0
1	3.5	0.10
2	7.1	0.39
3	14.2	2.30
4		
5		
6		
7		
8		
9		

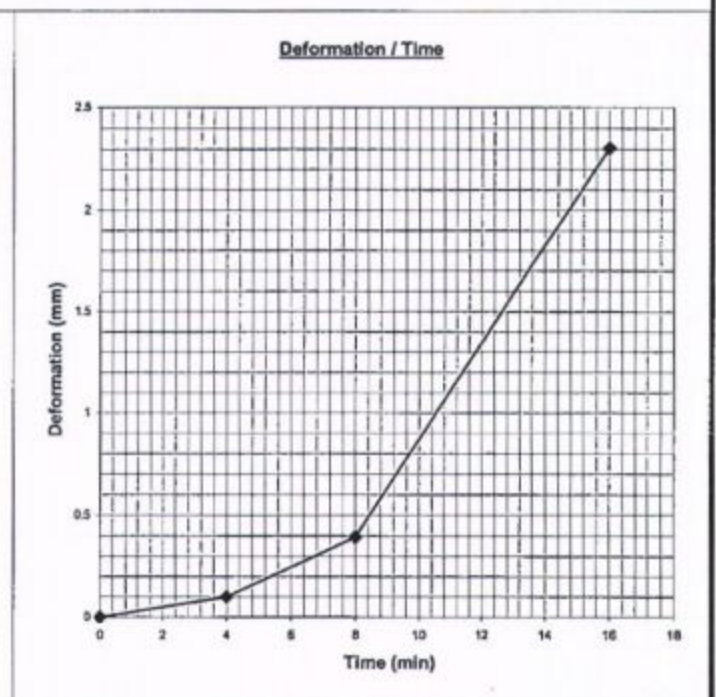
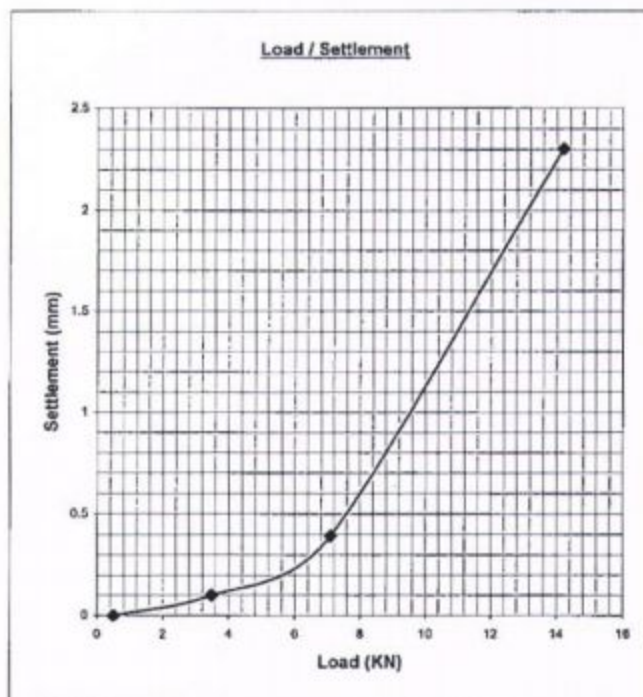


Plate bearing Test

BS1377:Part 9:1990:Clause 4.0

Checked and Approved

Initials: kp

Date: 08/12/2009

Test Report by K4 SOILS LABORATORY Unit 8 Olds Close Olds Approach Watford Herts WD18 9RU

Test Results relate only to the sample numbers shown above. Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr) Bhavika.R.(Qual.Mgr)

All samples connected with this report and any on 'hold' will be stored and disposed off according to Company policy. A copy of this policy is available on request.

MSP-11/R9/Rev2

Client name & address:		Samples Received:	CONCEPT	
Hants CC		Project started:		
Project Name:	Havant WRC	Testing started:		03/12/2009
Project No:	320217	Our job/report no:		8752
Date Reported:		08/12/2009		
Position no:	PB1	Depth:	1.00	
Plate diameter:		0.30 m		

Sample Information Environmental conditions: dry Material Type: Light brown gravelly CLAY with chalk, flint brick and wood (MADE GROUND) Temperature (°C): 15	Test Data Loading procedure: Incremental Description of Reaction load: Site Plant Insitu moisture content(%): 15
---	--

Load Increment no:	Load kN	Settlement mm	Pressure kN/m ²
Seating load	0.5	0	0
1	3.5	0.10	50
2	7.1	0.39	100
3	14.2	2.30	201
4			
5			
6			
7			
8			
9			

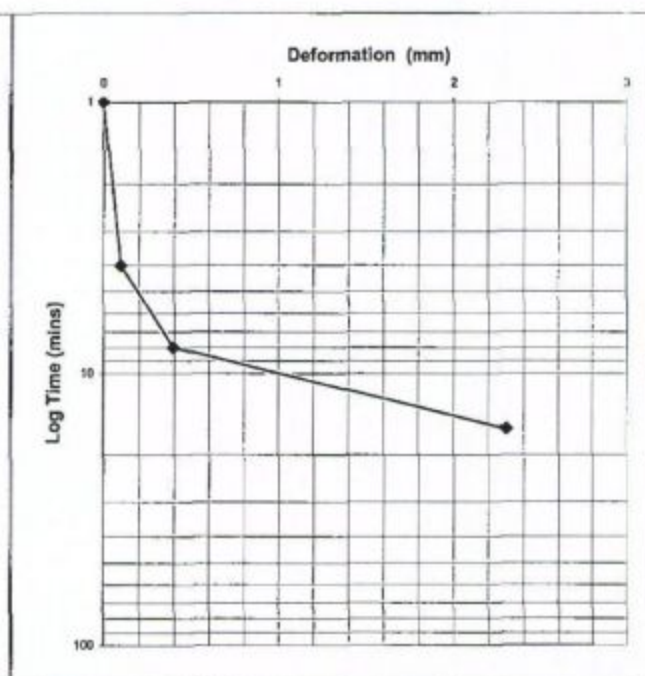
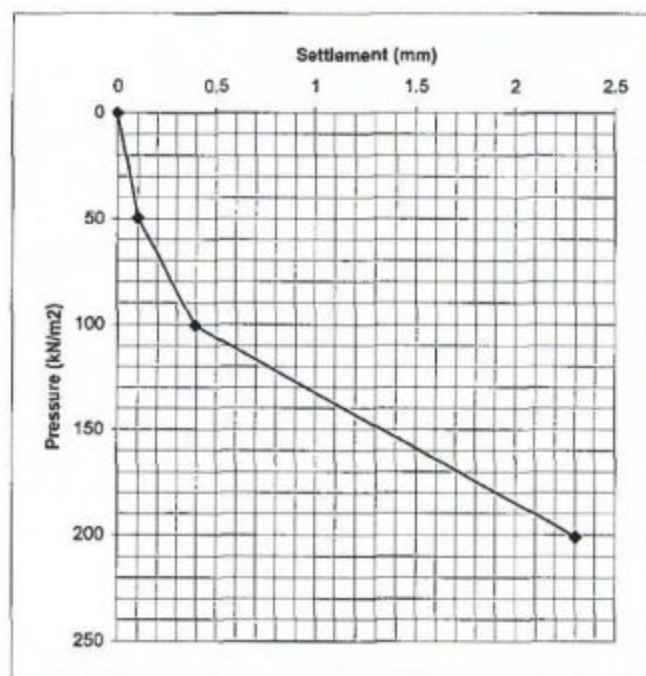


Plate bearing Test

BS1377:Part 9:1990:Clause 4.0

Checked and Approved

Initials: kp

Date: 08/12/2009

Test Report by K4 SOILS LABORATORY Unit 8 Olds Close Olds Approach Watford Herts WD18 9RU

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All samples connected with this report and any on 'hold' will be stored and disposed off according to Company policy. A copy of this policy is available on request.

MSF-11UR

Client name & address: Hants CC		Samples Received: -	CONCEPT
Project Name: Havant WRC		Project Started: -	
Project No: 320217	Our job/report no: 8752	Testing Started: 03/12/2009	
		Date Reported: 08/12/2009	
Position no: PB2	Depth: 1.00	Plate diameter: 0.30 m	

Sample Information	Test Data
Environmental conditions: dry	Loading procedure: Incremental
Material Type: light brown slightly gravelly CLAY with chalk and rare brick fragments (MADE GROUND)	Description of Reaction load: site plant
Temperature (OC): 15	In situ moisture content(%): 18

Load Increment no:	Load kN	Cumulative settlement mm
Seating load	0.5	0
1	3.5	0.36
2	7.1	0.98
3	14.2	1.72
4		
5		
6		
7		
8		
9		

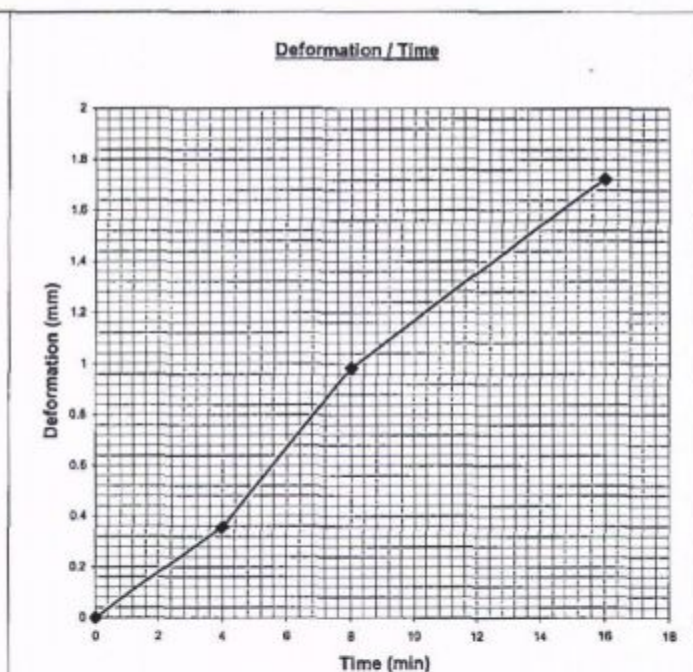
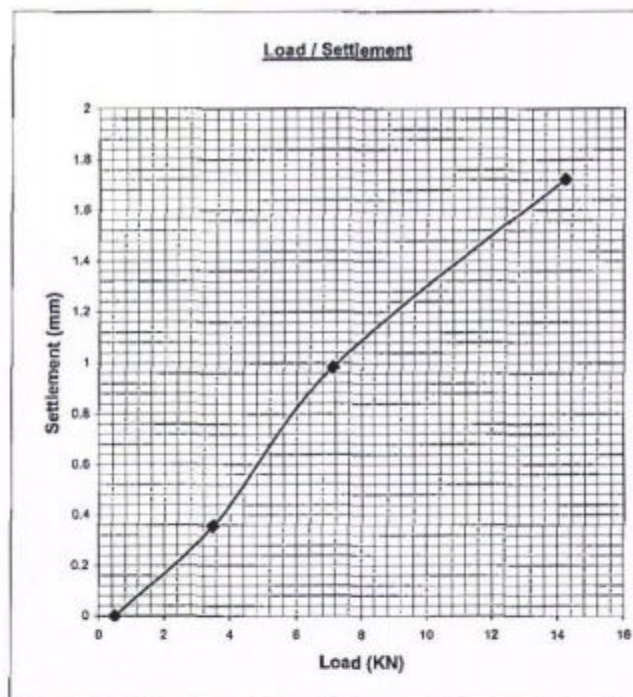


Plate bearing Test

BS1377:Part 9:1990:Clause 4.0

Checked and Approved

Initials: kp
Date: 08/12/2009

Test Report by K4 SOILS LABORATORY Unit 8 Olds Close Olds Approach Watford Herts WD18 9RU

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All samples connected with this report, incl any on 'hold' will be stored and disposed off according to Company policy. A copy of this policy is available on request.

MSP-11/R0/Ren2

Client name & address:		Samples Received:	CONCEPT	
Hants CC		Project started:		
Project Name:	Havant WRC	Testing started:		03/12/2009
Project No:	320217	Our job/report no:		8752
Date Reported:		08/12/2009		
Position no:	PB2	Depth:	1.00	
Plate diameter:		0.30 m		

Sample Information Environmental conditions: dry Material Type: light brown slightly gravelly CLAY with chalk and rare brick fragments (MADE GROUND) Temperature (0C): 15	Test Data Loading procedure: Incremental Description of Reaction load: Site Plant Insitu moisture content(%): 18
---	--

Load Increment no:	Load	Settlement	Pressure
	kN	mm	kN/m2
Seating load	0.5	0	0
1	3.5	0.36	50
2	7.1	0.98	100
3	14.2	1.72	201
4			
5			
6			
7			
8			
9			

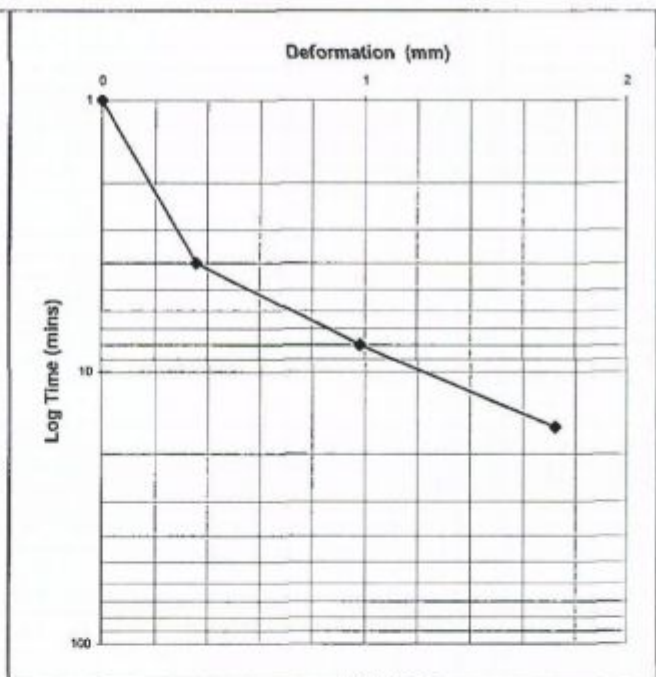
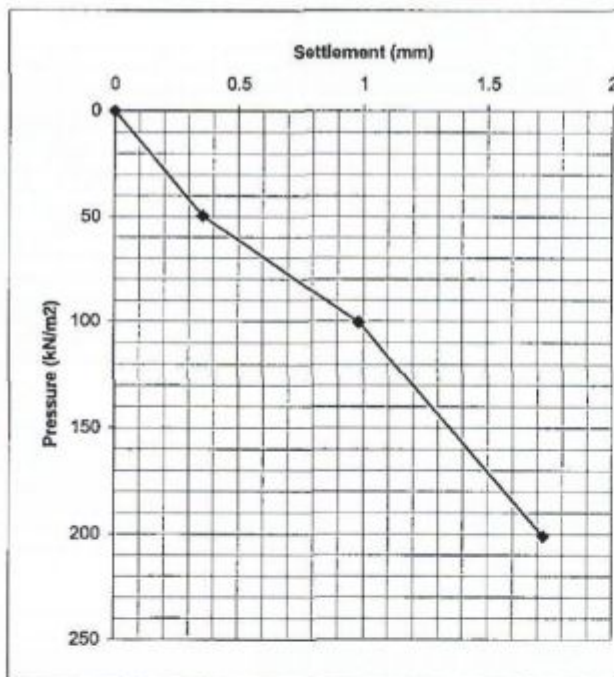


Plate bearing Test

BS1377:Part 9:1990:Clause 4.0

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Date: 08/12/2009

Test Report by K4 SOILS LABORATORY Unit 8 Olds Close Olds Approach Watford Herts WD18 9RU

Test Results relate only to the sample numbers shown above. Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr) Shavika R.(Qual.Mgr)

All samples connected with this report and any on 'hold' will be stored and disposed off according to Company policy. A copy of this policy is available on request.

MSF-11/R5

Client name & address: Hants CC		Samples Received: -	CONCEPT
Project Name: Havant WRC		Project Started: -	
Project No: 320217	Our job/report no: 8752	Testing Started: 03/12/2009 Date Reported: 08/12/2009	
Position no: PB3	Depth: 1.00	Plate diameter: 0.30 m	

Sample Information	Test Data
Environmental conditions: dry	Loading procedure: Incremental
Material Type: Dark brown slightly sandy gravelly CLAY with chalk and flint gravel/cobble (MADE GROUND)	Description of Reaction load: site plant
Temperature (OC): 15	Insitu moisture content(%): 20

Load Increment no:	Load kN	Cumulative settlement mm
Seating load	0.5	0
1	3.5	2.01
2	7.1	2.57
3	14.2	4.22
4		
5		
6		
7		
8		
9		

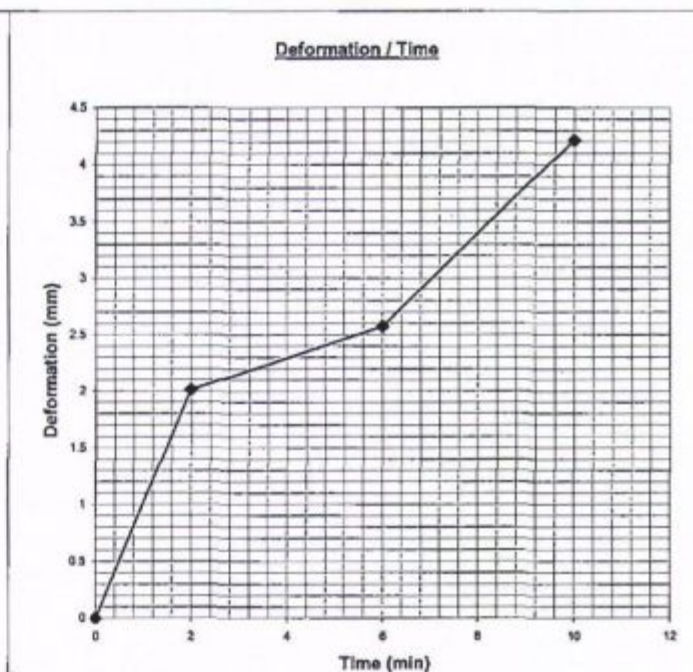
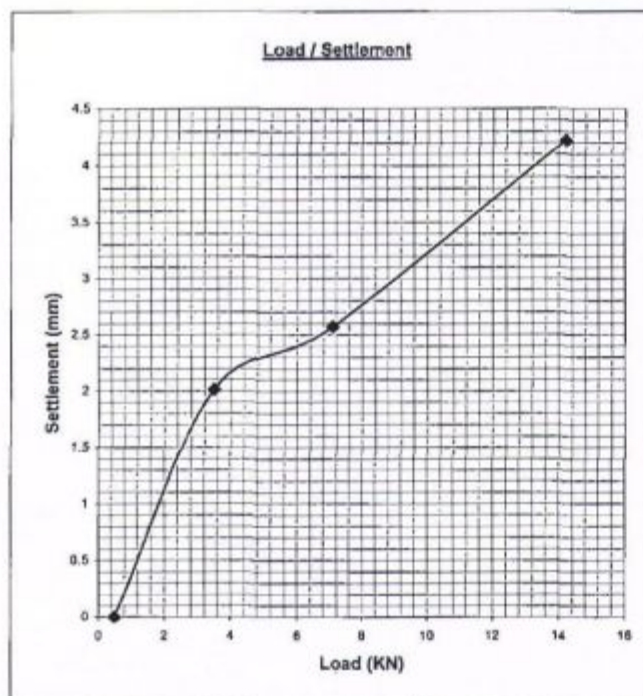


Plate bearing Test

BS1377:Part 9:1990:Clause 4.0

Checked and Approved

Initials: kp

Date: 08/12/2009

Test Report by K4 SOILS LABORATORY Unit 8 Olds Close Olds Approach Watford Herts WD18 9RU

Test Results relate only to the sample numbers shown above. Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr) Bhavika R.(Qual.Mgr)

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MSF-11/R6/Rev2

Client name & address:		Samples Received:	CONCEPT	
Hants CC		Project started:		
Project Name:	Havant WRC	Testing started:		03/12/2009
Project No:	320217	Our job/report no:		8752
Date Reported:		08/12/2009		
Position no:	PB3	Depth:	1.00	
Plate diameter:		0.30 m		

Sample Information Environmental conditions: dry Material Type: Dark brown slightly sandy gravelly CLAY with chalk and flint gravel/cobble (MADE GROUND) Temperature (0C): 15	Test Data Loading procedure: Incremental Description of Reaction load: Site Plant Insitu moisture content(%): 20
---	--

Load Increment no:	Load kN	Settlement mm	Pressure kN/m2
Seating load	0.5	0	0
1	3.5	2.01	50
2	7.1	2.57	100
3	14.2	4.22	201
4			
5			
6			
7			
8			
9			

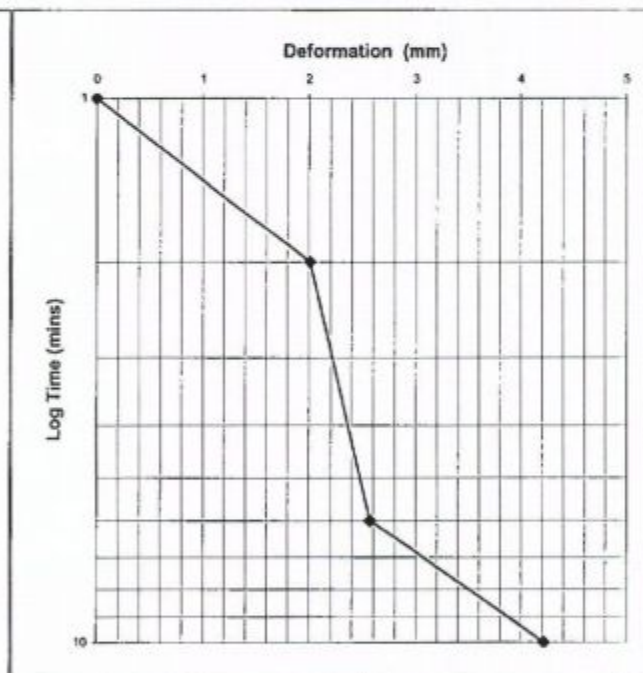
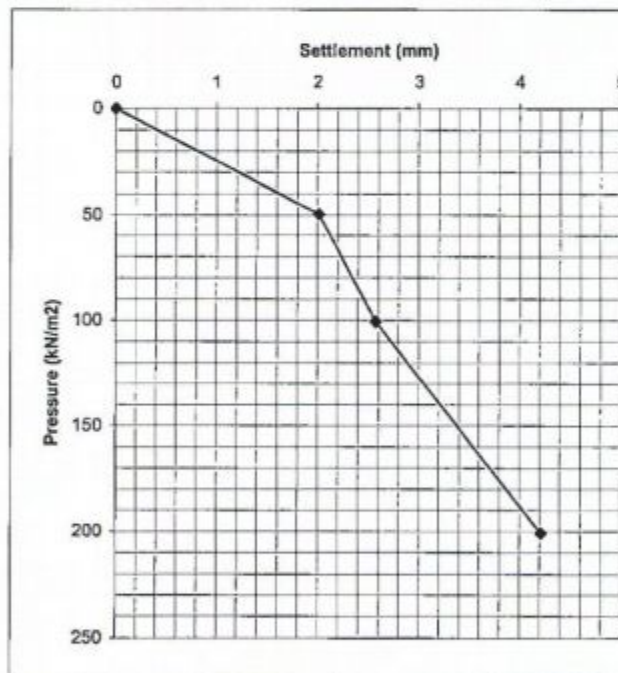


Plate bearing Test

BS1377:Part 9:1990:Clause 4.0

Checked and Approved

Initials: kp

Date: 08/12/2009

Test Report by K4 SOILS LABORATORY Unit 8 Olds Close Olds Approach Watford Herts WD18 9RU

Test Results relate only to the sample numbers shown above. Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr) Bhavika.R.(Qual Mgr)

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MSF-11/RB

CONCEPT SITE INVESTIGATIONS

9. DYNAMIC CONE PENETROMETER TEST RESULTS

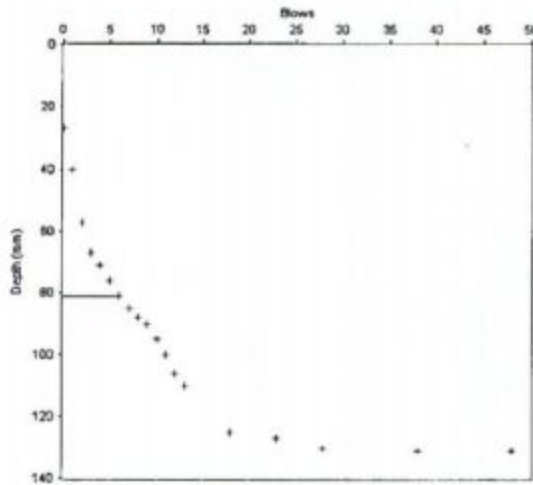
DCP Layer Strength Analysis Report

Project Name: Havant

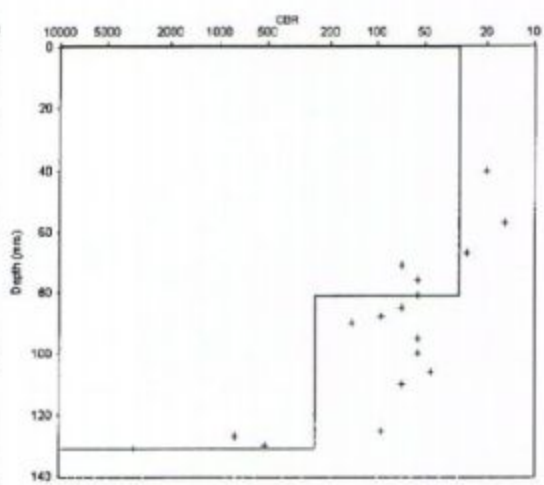
Chainage (km): 0.100
 Direction: CBR1
 Location/Offset: Carriageway
 Cone Angle: 60 degrees
 Zero Error (mm): 75
 Test Date: 07/12/2009

Surface Type: Unpaved
 Thickness (mm): 0
 Base Type:
 Thickness (mm):
 Surface Moisture: Unknown
 Moisture adjustment factor: Not adjusted

Layer Boundaries: Chainage 0.100



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	9.00	30	81	81
2	1.19	251	50	131

CBR Relationship:

TRL equation: $\log_{10}(\text{CBR}) = 2.48 - 1.057 \times \log_{10}(\text{Strength})$

Report produced by

Penetration Data Report

Project Name: Havant

Chainage (km):	0.100
Direction:	CBR1
Location/Offset:	Carriageway
Cone Angle:	60 degrees
Zero Error (mm):	75
Test Date:	07/12/2009

Surface Type:	Unpaved
Thickness (mm):	0
Base Type:	
Thickness (mm):	
Surface Moisture:	Unknown
Moisture adjustment factor:	Not adjusted

[illegible]

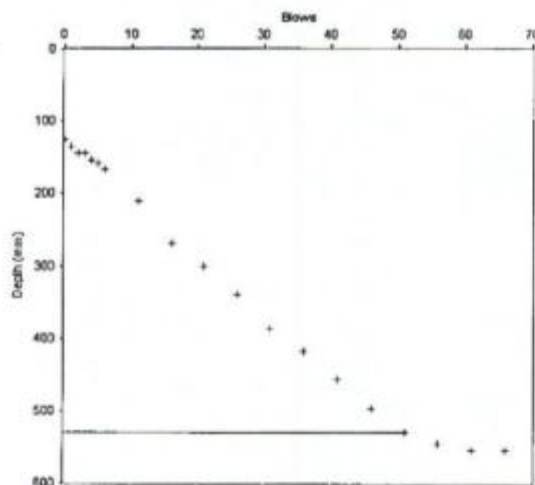
DCP Layer Strength Analysis Report

Project Name: Havant

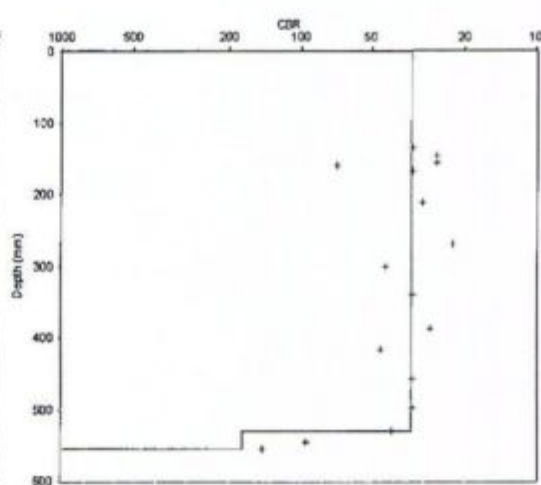
Chainage (km): 0.200
 Direction: CBR2
 Location/Offset: Carriageway
 Cone Angle: 60 degrees
 Zero Error (mm): 75
 Test Date: 07/12/2009

Surface Type: Unpaved
 Thickness (mm): 0
 Base Type:
 Thickness (mm):
 Surface Moisture: Unknown
 Moisture adjustment factor: Not adjusted

Layer Boundaries: Chainage 0.200



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	7.90	34	530	530
2	1.67	176	25	555

CBR Relationship:

TRL equation: $\log_{10}(\text{CBR}) = 2.48 - 1.057 \times \log_{10}(\text{Strength})$

Report produced by

Penetration Data Report

Project Name: Havant

Chainage (km):	0.200
Direction:	CBR2
Location/Offset:	Carriageway
Cone Angle:	60 degrees
Zero Error (mm):	75
Test Date:	07/12/2009

Surface Type:	Unpaved
Thickness (mm):	0
Base Type:	
Thickness (mm):	
Surface Moisture:	Unknown
Moisture adjustment factor:	Not adjusted

[illegible]

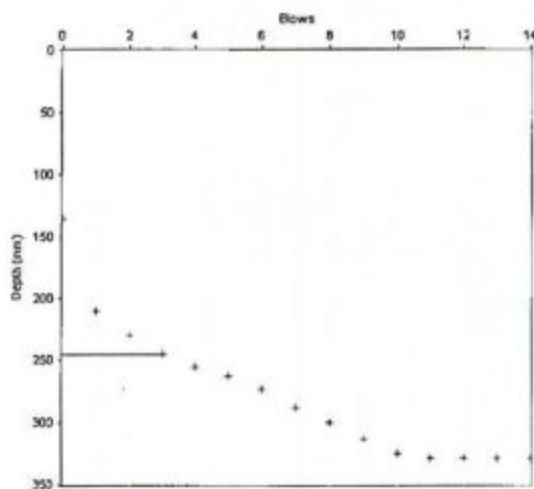
DCP Layer Strength Analysis Report

Project Name: Havant

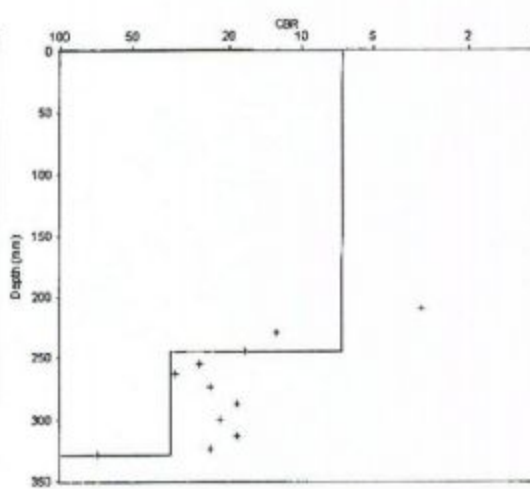
Chainage (km): 0.300
 Direction: CBR3
 Location/Offset: Carriageway
 Cone Angle: 60 degrees
 Zero Error (mm): 75
 Test Date: 07/12/2009

Surface Type: Unpaved
 Thickness (mm): 0
 Base Type:
 Thickness (mm):
 Surface Moisture: Unknown
 Moisture adjustment factor: Not adjusted

Layer Boundaries: Chainage 0.300



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)
1	36.67	7	245	245
2	7.64	35	84	329

CBR Relationship:

TRL equation: $\log_{10}(\text{CBR}) = 2.48 - 1.057 \times \log_{10}(\text{Strength})$

Report produced by

CONCEPT SITE INVESTIGATIONS

10. LABORATORY TEST RESULTS

CONCEPT SITE INVESTIGATIONS									
Site Name:		Havant WRC						Job No. 09/2240	
Client:		Hampshire County Council						Date: 18/12/09	
Determination of Moisture Content and Liquid and Plastic Limits									
Borehole	Sample	Sample	Depth	Description	Natural Moisture Content %	1. Passing 425 µm sieve %	Liquid Limit %	Plastic Limit %	Plasticity Index %
No	type	No.	m						
CBR1	B	05	0.50	Brown silty gravelly SAND with frequent brick and concrete fragments. Gravel is fine to coarse angular to subangular flint (MADE GROUND)	9				
CBR3	B	05	0.50	Light brown slightly sandy slightly gravelly CLAY with brick and concrete and occasional glass fragments. Gravel comprises angular to subangular fine to coarse flint and chalk fragments (MADE GROUND)	18				
PB1	B	05	1.00	Light brown slightly sandy very gravelly CLAY with occasional cobble-sized flint and rare brick fragments. Gravel comprises angular to subangular flint and chalk fragments (MADE GROUND)	16	38	31	18	14
PB2	B	06	1.00	Light brown clayey sandy fine to coarse GRAVEL with occasional brick, concrete fragments and pockets (<100mm) of very weak chalk. Gravel comprises angular to subrounded flint and chalk fragments (MADE GROUND)	9	28	29	18	11
PB2	B	07	1.40	Dark brownish grey slightly sandy slightly gravelly CLAY. Gravel comprises angular to subangular fine to coarse flint and chalk fragments (MADE GROUND)		44	50	25	25
PB2	B	08	2.20	Light brown calcareous clayey sandy fine to coarse angular to subrounded flint GRAVEL	15	17	24	16	8
PB3	B	05	1.00	Yellowish brown silty very sandy fine to coarse GRAVEL with occasional pockets of gravelly clay, very weak chalk and rare brick fragments. Gravel comprises angular to subangular flint and chalk fragments (MADE GROUND)	9				
PB3	B	06	1.00	Yellowish brown silty very sandy fine to coarse GRAVEL with occasional pockets of gravelly clay and very weak chalk, with occasional concrete and brick fragments. Gravel comprises angular to subangular flint and chalk fragments (MADE GROUND)					NP

BS 1377. Part 2: Clause 4.4: 1990 Determination of the liquid limit by the cone penetrometer method.

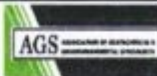
BS 1377. Part 2: Clause 5: 1990 Determination of the plastic limit and plasticity index.

BS 1377. Part 2: Clause 3.2: 1990 Determination of the moisture content by the oven drying method

Date - samples received:

Date - samples tested:

Checked by:



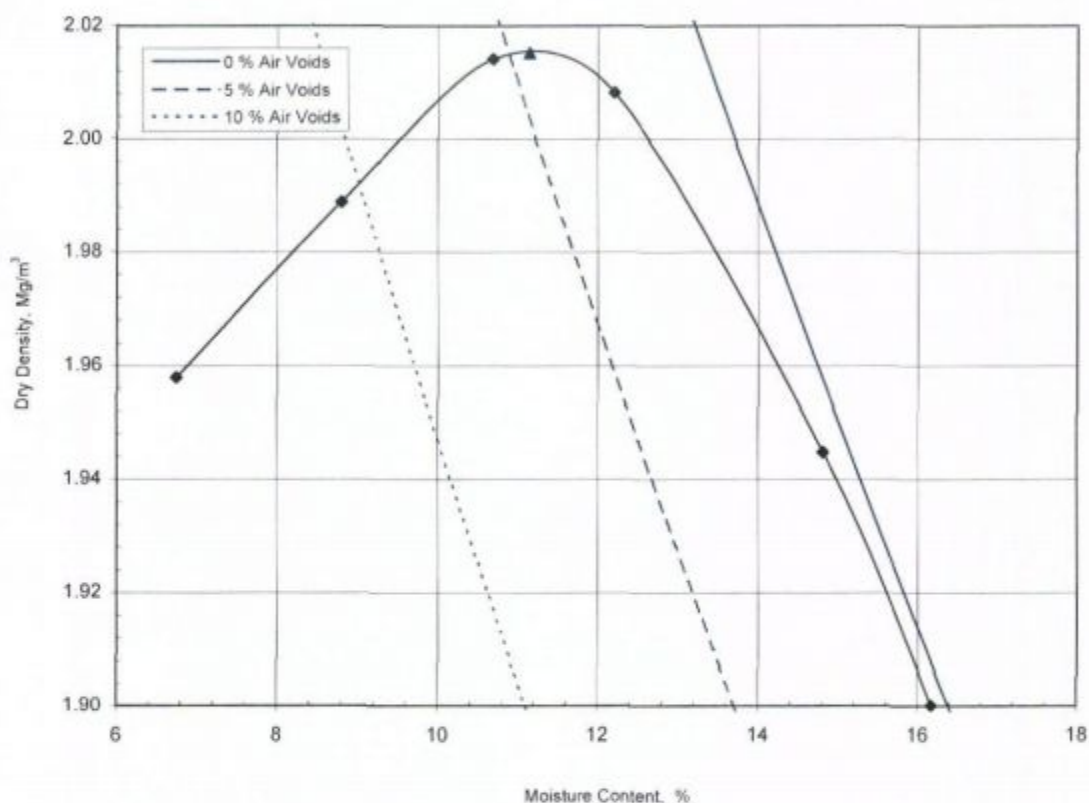


CONCEPT

Unit 5 Warple Mews Warple Way London W3 0RF

Tel: 020 8811 2880 Fax: 020 8811 2881

CONCEPT	Dry Density / Moisture Content Relationship BS 1377 : Part 4 : 1990 : Clause 3	Job Ref	09/2240
		Borehole / Pit No	PB2
Site Name	Havant WRC	Sample No	08
		Depth	2.20 m
Soil Description	Light brown calcareous clayey sandy fine to coarse angular to subrounded flint GRAVEL	Sample Type	B



Preparation		Air dried
Test Method		4.5 kg rammer
Mould Type		CBR
Samples Used		Single Sample
Mass Retained on 37.5 mm Sieve	%	4
Mass Retained on 20.0 mm Sieve	%	21
Particle Density - Assumed	Mg/m³	2.76
Maximum Dry Density	Mg/m³	2.02
Optimum Moisture Content	%	11

K4 SOILS LABORATORY

Unit 8 Olds Close Olds Approach Watford Herts
WD18 9RU Tel 01923711288 Fax 01923711311
E-mail: k4soils@aol.com

Approved Signatories:

K.Phaure(Tech Mgr) J.Phaure(Lab Mgr)

Test results relate only to the sample numbers shown above

Checked and Approved

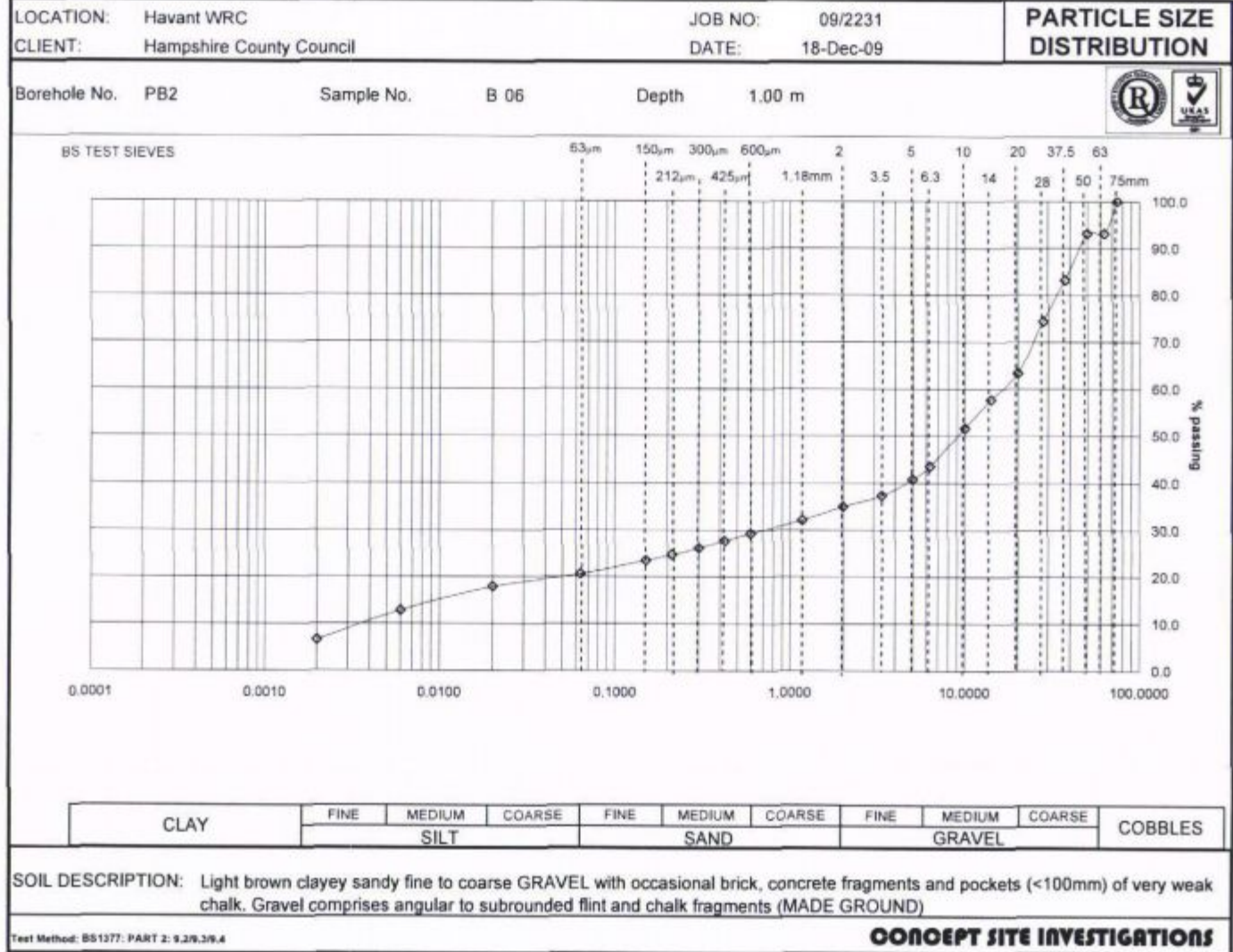
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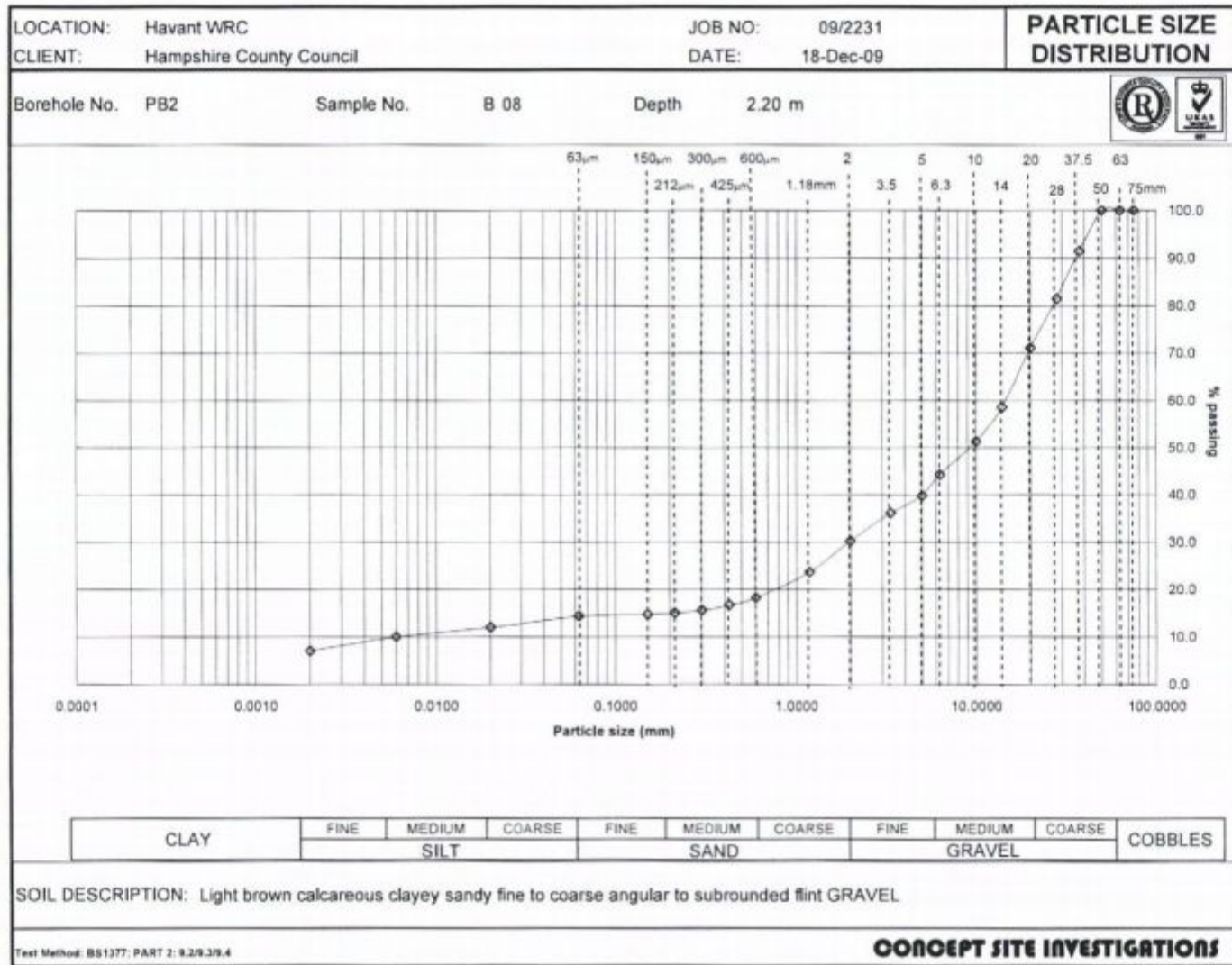
Date: 08/01/2010



All samples connected with this report, incl any on 'hold' will be disposed off according to company policy. A copy of this policy is available on request. Sheet2/2

2519





LOCATION: Havant WRC
CLIENT: Hampshire County Council

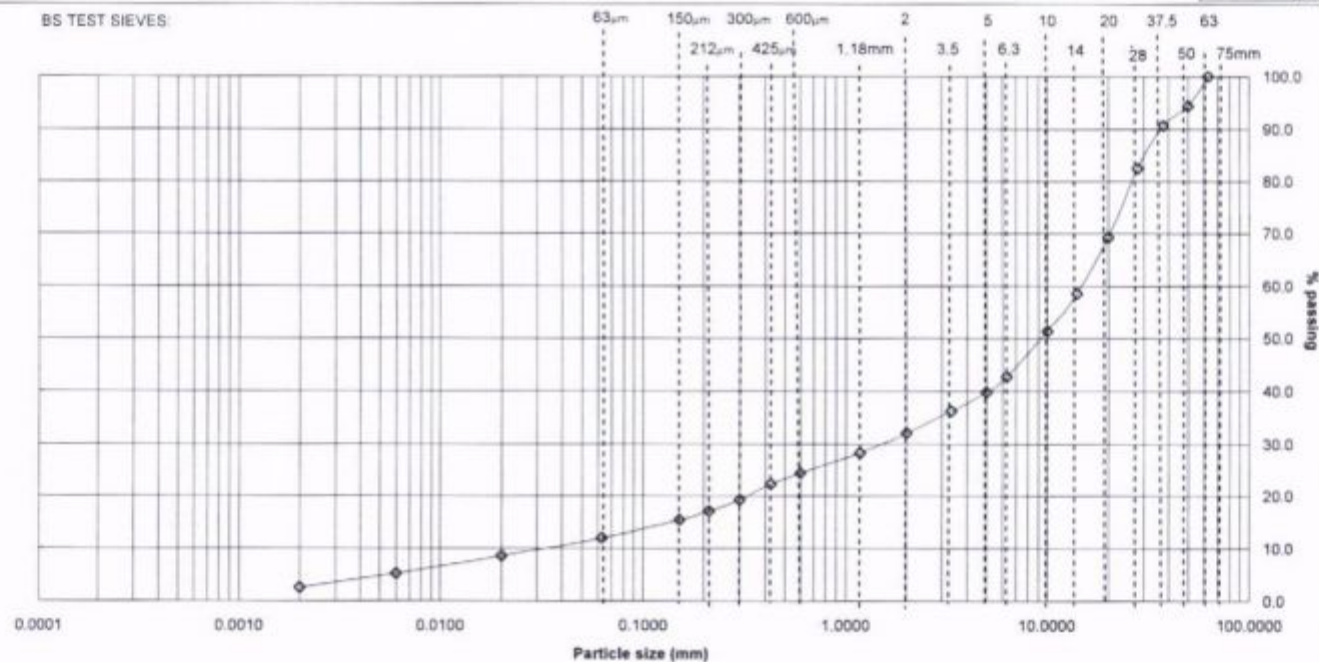
JOB NO: 09/2231
DATE: 18-Dec-09

PARTICLE SIZE DISTRIBUTION

Borehole No. PB3 Sample No. B 06 Depth 1.00 m



BS TEST SIEVES:



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	COBBLES
	SILT			SAND			GRAVEL			

SOIL DESCRIPTION: Yellowish brown silty very sandy fine to coarse GRAVEL with occasional pockets of gravelly clay and very weak chalk, with occasional concrete and brick fragments. Gravel comprises angular to subangular flint and chalk fragments (MADE GROUND)

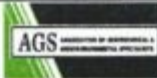
Test Method: BS 1377: PART 2: 9.2/9.3/9.4

CONCEPT SITE INVESTIGATIONS

CONCEPT SITE INVESTIGATIONS									
Site Name: Havant WRC							Job No.: 09/2231		
Carried out for: Hampshire County Council							Date: 18-Dec-09		
Sulphate Content of Soil									
Borehole No	Sample Type	Sample No	Depth m	Description	% dry mass passing 2mm sieve	pH	Sulphate 2:1 water soil g/l SO ₄	Sulphate Total % SO ₄	
CBR1	B	05	0.50	Brown silty gravelly SAND with frequent brick and concrete fragments. Gravel is fine to coarse angular to subangular flint (MADE GROUND)	18	10.71			
CBR3	B	05	0.50	Light brown slightly sandy slightly gravelly CLAY with brick and concrete and occasional glass fragments. Gravel comprises angular to subangular fine to coarse flint and chalk fragments (MADE GROUND)	60	7.86			
PB1	B	05	1.00	Light brown slightly sandy very gravelly CLAY with occasional cobble-sized flint and rare brick fragments. Gravel comprises angular to subangular flint and chalk fragments (MADE GROUND)	40	8.12			
PB2	B	06	1.00	Light brown clayey sandy fine to coarse GRAVEL with occasional brick, concrete fragments and pockets (<100mm) of very weak chalk. Gravel comprises angular to subrounded flint and chalk fragments (MADE GROUND)	35	8.28	0.30		
PB2	B	08	2.20	Light brown calcareous clayey sandy fine to coarse angular to subrounded flint GRAVEL	30	7.76	0.07		
PB3	B	05	1.00	Yellowish brown silty very sandy fine to coarse GRAVEL with occasional pockets of gravelly clay, very weak chalk and rare brick fragments. Gravel comprises angular to subangular flint and chalk fragments (MADE GROUND)	22	8.60	0.41		

BS 1377: Part 3: Clause 5.5: 1990 (Issue 2 April 1996)
Determination of the sulphate content of soil & ground water: gravimetric method.

Date - samples received:
Date - samples tested:
Checked by:



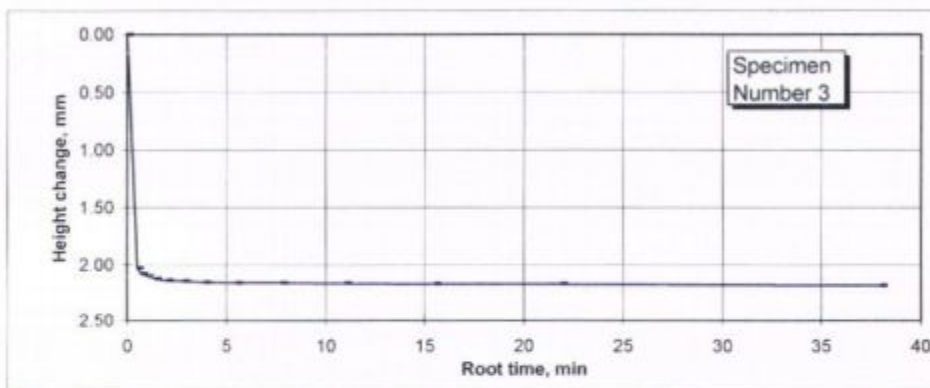
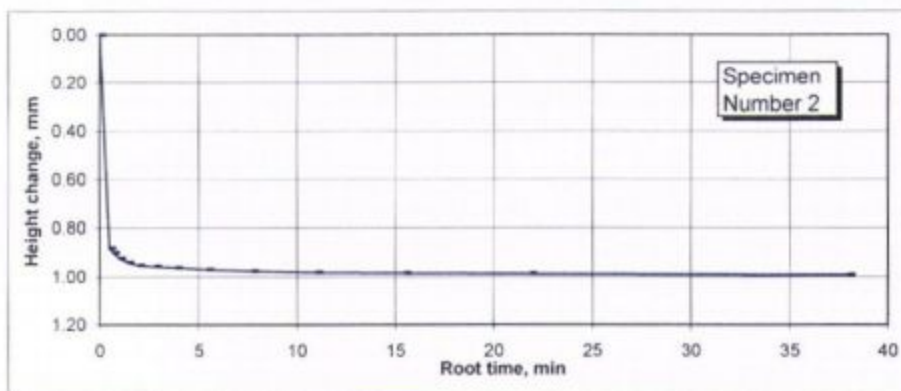
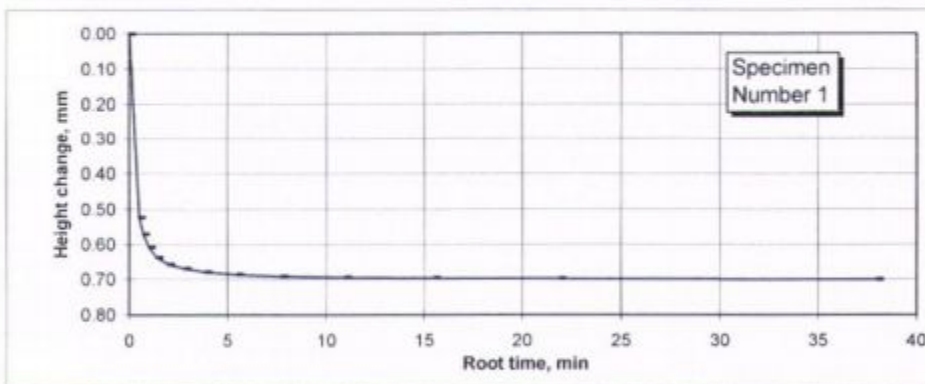


CONCEPT
Unit 8 Warple Mews Warple Way London W3 0RF
Tel: 020 8811 2880 Fax: 020 8811 2881

CONCEPT SITE INVESTIGATIONS																																																																																																																																																																																																																
Site Name:	Havant WRC	Job No.	09/2240																																																																																																																																																																																																													
Carried out For:	Hampshire County Council	Date:	23/12/2009																																																																																																																																																																																																													
CALIFORNIA BEARING RATIO (CBR)																																																																																																																																																																																																																
BS 1377 Part 4 Clause 7.0: 1990 Determination of the California Bearing Ratio (CBR)																																																																																																																																																																																																																
BH/TP No	CBR2	Description: Light brown very sandy very clayey fine to coarse GRAVEL with chalk fragments, occasional cobble-sized flint, brick, metal and textile fragments (MADE GROUND)																																																																																																																																																																																																														
Sample Type	B																																																																																																																																																																																																															
Sample No	5.00																																																																																																																																																																																																															
Depth (m)	0.50																																																																																																																																																																																																															
Preparation Procedure: 2.5 kg Rammer with specified effort (3 layers - 62 blows per layer)																																																																																																																																																																																																																
Test Results		Readings																																																																																																																																																																																																														
Soaked/Unsoaked	Soaked																																																																																																																																																																																																															
Surcharge	4kg																																																																																																																																																																																																															
Rate of Strain	1mm/min																																																																																																																																																																																																															
Mean Calibration N/div	1																																																																																																																																																																																																															
Soaking Time (days)	2.5																																																																																																																																																																																																															
Final Swell (mm)	-0.43																																																																																																																																																																																																															
Weight retained on 37mm sieve (%)	3.4																																																																																																																																																																																																															
Weight retained on 20mm sieve (%)	18.9																																																																																																																																																																																																															
Natural Moisture Content (%)	16																																																																																																																																																																																																															
Moisture Content from Top (%)	17																																																																																																																																																																																																															
Moisture Content from Bottom (%)	18																																																																																																																																																																																																															
Bulk Density (Unsoaked) (Mg/m ³)	2.10																																																																																																																																																																																																															
Dry Density (Unsoaked) (Mg/m ³)	1.81																																																																																																																																																																																																															
Dry Density (Soaked) (Mg/m ³)	1.81																																																																																																																																																																																																															
CBR Test Graph																																																																																																																																																																																																																
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Client name & address: Hampshire County Council		Samples Rec: 11/12/2009	CONCEPT
Project Name: Havant WRC		Project Started: 14/12/2009	
Project No: 09/2240	Our Job / report no: 8862	Testing Started: 06/01/2010	
Sample description: Light brown calcareous clayey sandy fine to coarse angular to subrounded flint GRAVEL		Date Reported: 08/01/2010	
		Sample no/ type: B08	BH no: PB2
		Sample size: 60mmx60mm	Depth: 2.20

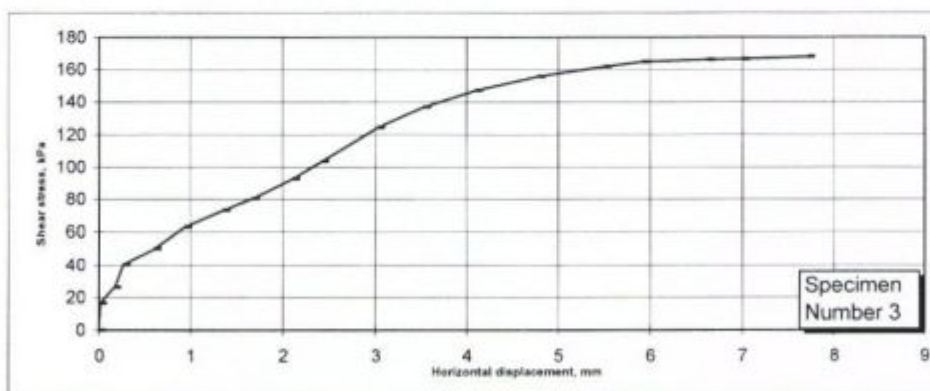
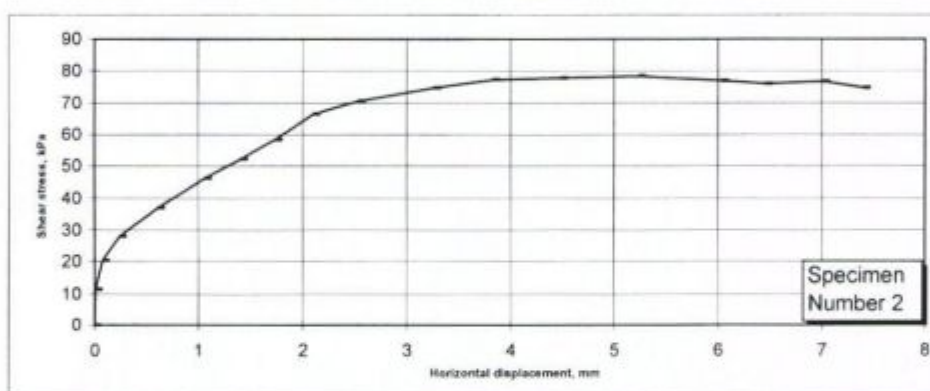
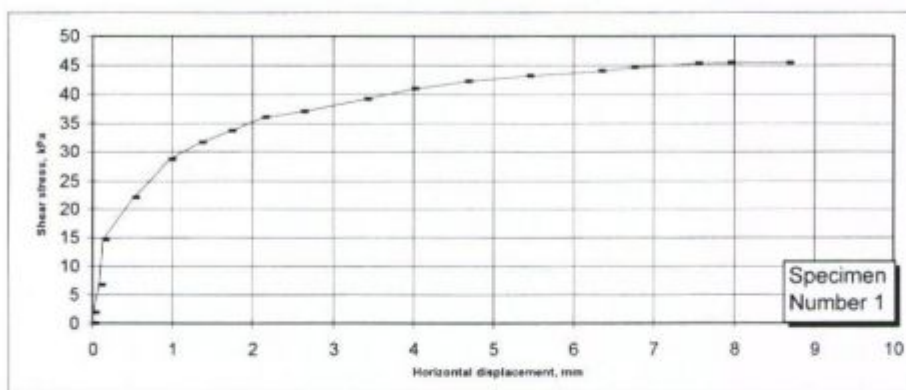
Consolidation Stage



*Set of three specimens	Consolidated Drained Peak		Approved by Initials : kp Date : 08/01/2010
	BS 1377 : Part 7 : Clause 4. : 1990		
	Determination of shear strength by direct shear (small shearbox apparatus)		
Test Report by K4 SOILS LABORATORY Unit 8 Olds Close Olds Approach Watford Herts WD18 9RU			Sheet 2/5
Test Results relate only to the sample numbers shown above. Approved Signatories: K. Phaire (Tech Mgr) J. Phaire (Lab Mgr)			
All samples connected with this report and any on 'hold' will be stored and disposed off according to Company policy. A copy of this policy is available on request.			

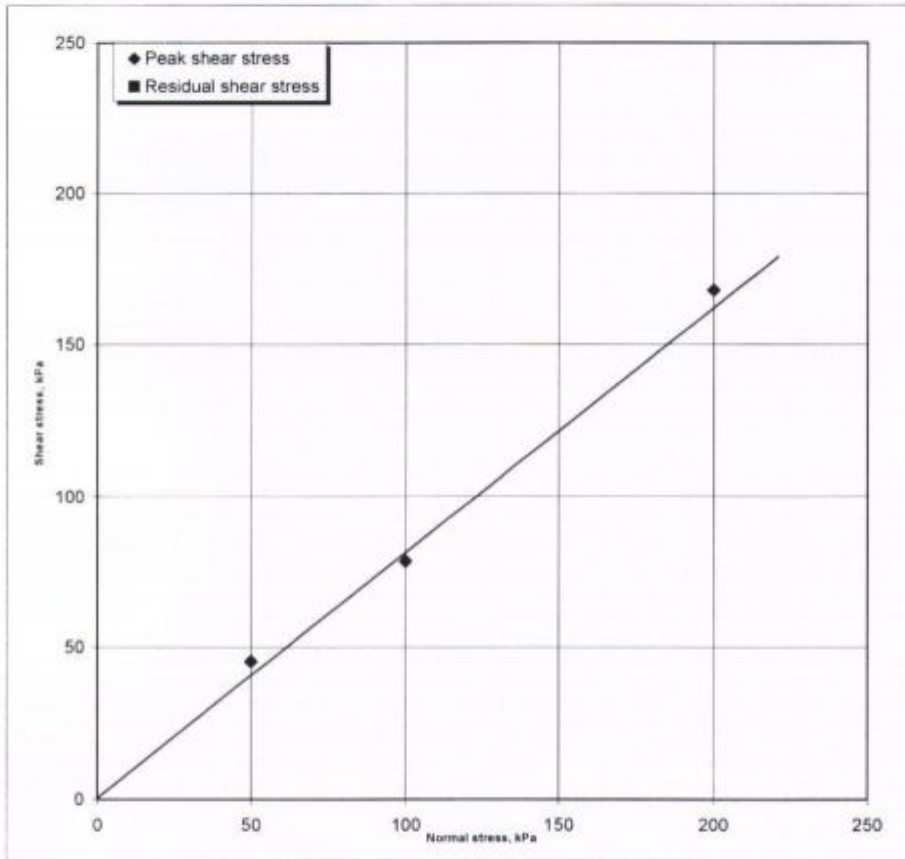
Client name & address: Concept		Samples Rec: 11/12/2009	CONCEPT
Project Name: Havant WRC		Project Started: 14/12/2009	
Project No: 09/2240		Testing Started: 06/01/2010	
Our Job / report no: 8862		Date Reported: 08/01/2010	
Sample description: Pale brown silty sandy clayey GRAVEL (gravel is fmc and sub angular to sub rounded)		Sample no/ type: B08	
		Sample size: 60mmx60mm	BH no: PB2
			Depth: 2.20

Shearing Stage



*Set of three specimens	Consolidated/Drained Peak		Approved by Initials : kp Date : 10/08/2011
	BS 1377 : Part 7 : Clause 4.: 1990		
	Determination of shear strength by direct shear (small shearbox apparatus)		
Test Report by K4 SOILS LABORATORY Unit 8 Olds Close Olds Approach Watford Herts WD18 9RU			
Test Results relate only to the sample numbers shown above. Approved Signatories: K.Phaure (Tech Mgr) J.Phaure (Lab Mgr)			
All samples connected with this report, incl any on 'hold' will be stored and disposed off according to Company policy A copy of this policy is available on request.			

Client name & address: Hampshire County Council		Samples Rec: 11/12/2009	CONCEPT
Project Name: Havant WRC		Project Started: 14/12/2009	
Project No: 09/2240	Our Job / report no: 8862	Testing Started: 06/01/2010	
Sample description: Light brown calcareous clayey sandy fine to coarse angular to subrounded flint GRAVEL		Date Reported: 10/08/2011	
		Sample no/ type: B08	BH no: PB2
		Sample size: 60mmx60mm	Depth: 2.20



*Set of three specimens	Consolidated Drained Peak		Approved by Initials : kp Date : 10/08/2011
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Sheet 4/5

CONCEPT SITE INVESTIGATIONS

11. CHEMICAL TEST RESULTS



ALcontrol Laboratories

Heron Drive
Langley
Slough
SL3 8XP

Tel: +44 (0)1753 212500
Fax: +44 (0)1753 212501
E-Mail: langley@alcontrol.com
Website: www.alcontrol.com

Concept Site Investigations
Unit 8
Warple Mews
Warple Way
London
W3 0RF

Attention: Jon Roberts

CERTIFICATE OF ANALYSIS

Date: 04 January 2010
Job: L_CONSIT_LON-2
Sample Delivery Group (SDG): 091214-75 Report No.: 68435
Your Reference: po 320244
Location: Havant WRC

A total of 6 samples was received on Saturday December 12, 2009 and completed on Monday January 04, 2010. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley

Operations Director - Land UK & Ireland



Validated

ALcontrol Laboratories Analytical Services

SDG: 091214-75
 Job: L_CONSIT_LON-2
 Client Reference: po 320244
 Location: Havant WRC

Customer: Concept Site Investigations
 Attention: Jon Roberts
 Order No.: 320244
 Report No: 68435

SOLID

Results Legend	Sample ID	Depth (m)	Container	Total
X Test				
N No Determination Possible				
	PB3	1.00 - 1.20	60g VOC 1kg TUB	
	PB2	1.00 - 1.20	120g Amber Jar 1kg TUB	
	PB1	1.00 - 1.20	120g Amber Jar 60g VOC 1kg TUB	
	CBR3	0.50 - 0.50	120g Amber Jar 1kg TUB	
	CBR2	0.50 - 0.50	120g Amber Jar 1kg TUB	
	CBR1	0.50 - 0.50	120g Amber Jar 1kg TUB	
Alkali Metals by iCap-OES (Soil)	All			0
Ammonium as NH ₄ in 2:1 Extract BRE	All			6
Ammonium Soil by Titration	All			0
ANC at pH4 and ANC at pH 6	All			6
Anions by Kone	All			0
Anions by Kone (w)	All			2
Asbestos Presence Screen	All			0
Boron Water Soluble	All			6
CEN 2:1 Readings	All			0
CEN 8:1 Readings	All			2
Chloride (soluble)	All			0
Cyanide Comp/Free/Total/Thiocyanate	All			6
Dissolved Metals by ICP-MS	All			0
Dissolved Organic and Inorganic Car	All			2
Dissolved Organic/Inorganic Carbon	All			0
Easily Liberated Sulphide	All			2
EPH by FID	All			6
Fluoride	All			0
GRO BTEX MTBE GC (S)	All			2
Hexavalent Chromium (s)	All			0
Loss on Ignition in soils	All			6
Mercury Dissolved	All			0
Metals by iCap-OES (Soil)	Arsenic			2
	Cadmium			0
	Chromium			6
	Copper			0
	Lead			6
	Mercury			0
	Nickel			6
	Selenium			0

SDG:	091214-75
Job:	L_CONSIT_LON-2
Client Reference:	po 320244
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Customer: Concept Site Investigations
Attention: Jon Roberts
Order No.: 320244
Report No: 68435

		Total	
PB3	1.00 - 1.00	60g VOC	
		1kg TUB	
PB2	1.00 - 1.00	120g Amber Jar	
		1kg TUB	
PB1	1.00 - 1.00	120g Amber Jar	
		60g VOC	
		1kg TUB	
CBR3	0.50 - 0.50	120g Amber Jar	
		1kg TUB	
CBR2	0.50 - 0.50	120g Amber Jar	
		1kg TUB	
CBR1	0.50 - 0.50	120g Amber Jar	
		1kg TUB	
		120g Amber Jar	
Metals by iCap-OES (Soil)	Vanadium		0
	Zinc		4
Mineral Oil	All		6
NO3, NO2 and TON by KONE (s)	All		0
PAH by GCMS	All		2
PAH Value of soil	All		0
PCBs by GCMS	All		6
pH	All		0
Phenols by HPLC (S)	All		6
Phenols by HPLC (W)	All		0
Sample description	All		2
Total Dissolved Solids	All		0
Total Organic Carbon	All		2
Total Sulphate	All		0
Total Sulphur	All		6
Water Soluble Sulphate 2:1	All		0

Validated

ALcontrol Laboratories Analytical Services

SDG:	091214-75	Customer:	Concept Site Investigations
Job:	L_CONSIT_LON-2	Attention:	Jon Roberts
Client Reference:	po 320244	Order No.:	320244
Location:	Havant WRC	Report No:	68435

Sample Descriptions

Grain Sizes:
 <0.063mm very fine,
 0.063mm - 0.1mm fine,
 0.1mm - 2mm medium,
 2mm - 10mm coarse,
 >10mm very coarse

Sample ID	Depth	Colour	Description	Grain size	Inclusions
CBR1	0.50 - 0.50	Brown	Sand	0.063 - 0.1 mm	Stones
CBR2	0.50 - 0.50	Beige	Sandy Clay	0.063 - 0.1 mm	Stones
CBR3	0.50 - 0.50	Brown	Sandy Clay	0.063 - 0.1 mm	Stones
PB1	1.00 - 1.00	Brown	Sandy Clay	0.063 - 0.1 mm	Stones
PB2	1.00 - 1.00	Brown	Sand	0.063 - 0.1 mm	Stones
PB3	1.00 - 1.00	Brown	Sand	0.063 - 0.1 mm	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

Validated

ALcontrol Laboratories Analytical Services

SDG: 091214-75
 Job: L_CONSIT_LON-2
 Client Reference: po 320244
 Location: Havant WRC

Customer: Concept Site Investigations
 Attention: Jon Roberts
 Order No.: 320244
 Report No: 68435

Test Completion dates

SDG reference: 091214-75

Sample ID	Depth	Type	Total Sulphate	Total Organic Carbon	Total Dissolved Solids	Sample description	Phenols by HPLC (W)	Phenols by HPLC (S)	pH	PCBs by GC/MS	PAH Value of soil	PAH by GC/MS	NO3, NO2 and TON by KONE (N)	Mosses/Moist	Mosses/Moist	Metals by ICap-CES (Soil)	Mercury Dissolved	Loss on Ignition in acids	Hexavalent Chromium (S)	GR0 BTEX MTBE GC (S)	Fluoride	EPH by FID	Eschli Liberated Sulphide	Dissolved Organic Carbon	Dissolved Metals by ICP-MS	Cyanide Comp/Fresh/Total/Thiocyanate	Chloride (soluble)	CEN 8.1 Readings	CEN 2.1 Readings	Boron Water Soluble	Asbestos Presence Screen	Asbestos by Kone (W)	ANC at pH4 and ANC at pH 6	Ammonium Soil by Titration	Ammonium as NHA in 2.1 Extract BR	Alkali Metals by ICap-CES (Soil)	
CBR1	0.50 - 0.55	SOLID	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009
CBR2	0.50 - 0.55	SOLID	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009
CBR3	0.55 - 0.50	SOLID	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009
PB1	1.00 - 1.00	SOLID	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009
PB2	1.00 - 1.00	SOLID	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009
PB3	1.00 - 1.00	SOLID	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009	22/12/2009

Validated

ALcontrol Laboratories Analytical Services

SDG: 091214-75
 Job: L_CONSIT_LON-2
 Client Reference: po 320244
 Location: Havant WRC

Customer: Concept Site Investigations
 Attention: Jon Roberts
 Order No.: 320244
 Report No: 68435

Results Legend			Sample Identity	CBR1	CBR2	CBR3	PB1	PB2	PB3
# ISO17025 accredited. M - CBR1's accredited. sub-contraction test. ** True result refers to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %. The results of the individual compounds within the sample are not corrected for this recovery.			Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	0.50 - 0.50 Soil/Solid 12/12/2009 091214-75 735102	0.50 - 0.50 Soil/Solid 03/12/2009 12/12/2009 091214-75 735109	0.50 - 0.50 Soil/Solid 03/12/2009 12/12/2009 091214-75 735118	1.00 - 1.00 Soil/Solid 12/12/2009 091214-75 735128	1.00 - 1.00 Soil/Solid 12/12/2009 091214-75 735136	1.00 - 1.00 Soil/Solid 12/12/2009 091214-75 735141
Component	LOD/Units	Method							
Moisture	%	PM114					15.6		11.7
Moisture Content Ratio (%)	%	PM114					18.5		13.3
Dry Matter Content Ratio (%)	%	PM114					84.4		88.3
Asbestos Presence Screen	-	TM001	No ACM Detected	No ACM Detected	No ACM Detected	No ACM Detected	No ACM Detected	No ACM Detected	No ACM Detected
Exchangeable Ammonium as NH4	<15 mg/kg	TM024	<15.0 M	<15.0 M	<15.0 M	<15.0 M	<15.0 M	<15.0 M	37.6 M
Ammoniacal Nitrogen as N	<15 mg/kg	TM024	<15.0	<15.0	<15.0	<15.0	<15.0	<15.0	29.3
Mineral Oil	<1 mg/kg	TM061					43.1 #		45.5 #
% Surrogate Recovery**	%	TM061	91.5	93.2	91.5	91.6	92.6	90.3	
EPH Range Organics (C10 - C40)	<35 mg/kg	TM061	149 M	232 M	210 M	123 M	863 M	219 M	
Phenols Monochloric	<0.025 mg/kg	TM062 (S)	<0.0250 M	<0.0250 M	<0.0250 M	<0.0250 M	<0.0250 M	<0.0250 M	<0.0250 M
Chloride 2:1 water/soil extract BRE	<0.001 g/l	TM097	0.0372	0.00577	0.0186	0.0200	0.0483	0.0235	
Water Soluble Sulphate as SO4	<0.003 g/l	TM098	0.173 M	0.137 M	0.0500 M	0.0532 M	0.151 M	0.170 M	
Soluble Sulphate 2:1 extract as SO4 BRE	<0.003 g/l	TM098	0.173	0.137	0.0500	0.0532	0.151	0.170	
Nitrate soil BRE extract	0.0003 g/l	TM102	<0.000300	<0.000300	<0.000300	<0.000300	<0.000300	<0.000300	<0.000300
Total Organic Carbon on Solid	<0.2 %	TM132				<0.200 #		<0.200 #	
Total Sulphur	<0.02 %	TM132	0.118 #	0.0550 #	0.0350 #	<0.0200 #	0.0810 #	0.0430 #	
pH value of soil	1 pH Units	TM133	11.40 M	10.86 M	8.62 M	9.03 M	11.04 M	9.29 M	
Hexavalent Chromium	<0.6 mg/kg	TM151	<0.600 #	<0.600 #	<0.600 #	<0.600 #	<0.600 #	<0.600 #	<0.600 #
Total Cyanide	<1 mg/kg	TM153	<1.00 M	<1.00 M	<1.00 M	<1.00 M	<1.00 M	<1.00 M	<1.00 M
Free Cyanide	<1 mg/kg	TM153	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	
Thiocyanate	<1 mg/kg	TM153	<1.00 M	<1.00 M	<1.00 M	<1.00 M	<1.00 M	<1.00 M	<1.00 M
PCB congener 28	<3 µg/kg	TM168				<3.00 M		<3.00 M	
PCB congener 52	<3 µg/kg	TM168				<3.00 M		<3.00 M	
PCB congener 101	<3 µg/kg	TM168				<3.00 M		<3.00 M	
PCB congener 118	<3 µg/kg	TM168				<3.00 M		<3.00 M	
PCB congener 138	<3 µg/kg	TM168				<3.00 M		<3.00 M	
PCB congener 153	<3 µg/kg	TM168				<3.00 M		<3.00 M	
PCB congener 180	<3 µg/kg	TM168				<3.00 M		<3.00 M	
Total of 7 Congener PCBs	<3 µg/kg	TM168				<3.00		<3.00	
Easily Liberated Sulphide	<15 mg/kg	TM180	<15.0 #	<15.0 #	<15.0 #	<15.0 #	<15.0 #	<15.0 #	<15.0 #
Arsenic	<0.6 mg/kg	TM181	4.61 M	3.31 M	5.89 M	2.59 M	5.52 M	6.50 M	
Cadmium	<0.02 mg/kg	TM181	<0.0200 M	<0.0200 M	0.226 M	0.0900 M	<0.0200 M	0.200 M	
Chromium	<0.9 mg/kg	TM181	8.71 M	10.4 M	13.7 M	7.82 M	6.62 M	18.0 M	
Copper	<1.4 mg/kg	TM181	5.94 M	11.3 M	15.1 M	5.30 M	5.60 M	13.1 M	
Lead	<0.7 mg/kg	TM181	9.31 M	15.5 M	43.3 M	9.17 M	10.9 M	30.0 M	
Mercury	<0.14 mg/kg	TM181	0.166 M	0.264 M	0.281 M	0.263 M	0.391 M	0.197 M	
Nickel	<0.2 mg/kg	TM181	6.68 M	9.68 M	10.2 M	7.64 M	7.96 M	8.49 M	
Selenium	<1 mg/kg	TM181	<1.00 #	<1.00 #	<1.00 #	<1.00 #	<1.00 #	<1.00 #	<1.00 #
Vanadium	<0.2 mg/kg	TM181			16.8 #	10.7 #	12.5 #	17.7 #	

Validated

ALcontrol Laboratories Analytical Services

SDG: 091214-75
 Job: L_CONSIT_LON-2
 Client Reference: po 320244
 Location: Havant WRC

Customer: Concept Site Investigations
 Attention: Jon Roberts
 Order No.: 320244
 Report No: 68435

Results Legend			Sample Identity	CBR1	CBR2	CBR3	PB1	PB2	PB3
# ISO17025 accredited. M ISO17025 accredited. * subcontracted test. - This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %. The results of the individual components within the sample are not corrected for this recovery.			Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	0.50 - 0.50 Soil/Solid 12/12/2009 091214-75 735102	0.50 - 0.50 Soil/Solid 03/12/2009 12/12/2009 091214-75 735109	0.50 - 0.50 Soil/Solid 03/12/2009 12/12/2009 091214-75 735118	1.00 - 1.00 Soil/Solid 12/12/2009 091214-75 735128	1.00 - 1.00 Soil/Solid 12/12/2009 091214-75 735136	1.00 - 1.00 Soil/Solid 12/12/2009 091214-75 735141
Component	LOD/Units	Method							
Zinc	<1.9 mg/kg	TM181	27.8	57.0	60.5	25.7	37.1	60.8	
			M	M	M	M	M	M	M
ANC pH_4 dry soil	<0.03 mol/kg	TM182				4.43		1.46	
						#		#	#
ANC pH_5 dry soil	<0.03 mol/kg	TM182				0.593		0.230	
						#		#	#
PAH Total 17 (inc Coronene)	10 mg/kg	TM213				<10.0		<10.0	
Total Sulphate %	<0.0048 %	TM221	0.313	0.0984	0.0501	0.0301	0.150	0.0721	
Boron Water Soluble	<1 mg/kg	TM222	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	
			M	M	M	M	M	M	M
Magnesium	<8 mg/kg	TM224	4160	2900	1160	787	2240	687	
Ammoniacal Nitrogen as N BRE	<0.0003 g/l	TM248	0.000949	0.00135	0.000746	0.00274	0.00195	0.00448	

Validated

ALcontrol Laboratories Analytical Services

SDG: 091214-75
 Job: L_CONSIT_LON-2
 Client Reference: po 320244
 Location: Havant WRC

Customer: Concept Site Investigations
 Attention: Jon Roberts
 Order No.: 320244
 Report No: 68435

GRO BTEX MTBE GC (S)

Results Legend			Sample Identity	PB1	FB3				
# ISO17025 accredited. M UKAS accredited. * subcontracted test. ** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %. The results of the individual components within the sample are not corrected for this recovery.			Depth (m)	1.00 - 1.00	1.00 - 1.00				
			Sample Type	Soil/Solid	Soil/Solid				
			Date Sampled						
			Date Received	12/12/2009	12/12/2009				
			SDG Ref	091214-75	091214-75				
			Lab Sample No.(s)	735128	735141				
Component	LOD/Units	Method							
MTBE	<5 µg/kg	TM089		<5.00	<5.00				
				#	#				
Benzene	<10 µg/kg	TM089		<10.0	<10.0				
				M	M				
Toluene	<2 µg/kg	TM089		<2.00	<2.00				
				M	M				
Ethyl Benzene	<3 µg/kg	TM089		<3.00	<3.00				
				M	M				
m & p Xylene	<6 µg/kg	TM089		<6.00	<6.00				
				M	M				
o Xylene	<3 µg/kg	TM089		<3.00	<3.00				
				M	M				
Sum m&p and o Xylene	<10 µg/kg	TM089		<10.0	<10.0				
				M	M				
Sum of BTEX	<10 µg/kg	TM089		<10.0	<10.0				
				M	M				
Surrogate Recovery %**	%	TM089		122.00	91.00				

Validated

ALcontrol Laboratories Analytical Services

SDG: 091214-75
 Job: L_CONSIT_LON-2
 Client Reference: po 320244
 Location: Havant WRC

Customer: Concept Site Investigations
 Attention: Jon Roberts
 Order No.: 320244
 Report No: 68435

PAH by GCMS

Results Legend			Sample Identity	CBR1	CBR2	CBR3	PB1	PB2	PB3
# ISO17025 accredited M UKAS accredited * substracted test ** This result relates to the % recovery of the sample standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual components within the sample are not corrected for this recovery			Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	0.50 - 0.50 Soil/Solid 12/12/2009 091214-75 735102	0.50 - 0.50 Soil/Solid 03/12/2009 12/12/2009 091214-75 735109	0.50 - 0.50 Soil/Solid 03/12/2009 12/12/2009 091214-75 735116	1.00 - 1.00 Soil/Solid 12/12/2009 091214-75 735128	1.00 - 1.00 Soil/Solid 12/12/2009 091214-75 735136	1.00 - 1.00 Soil/Solid 12/12/2009 091214-75 735141
Component	LOD/Units	Method							
Naphthalene-d8**	%	TM218		95.5	99.9	98.6	96.4	102	104
Acenaphthene-d10**	%	TM218		93.4	98.8	96.6	94.5	100	102
Phenanthrene-d10**	%	TM218		92.7	96.9	95.7	93.7	99.4	100
Chrysene-d12**	%	TM218		89.6	98.0	93.0	91.1	93.8	93.7
Perylene-d12**	%	TM218		93.6	101	96.8	95.0	101	103
Naphthalene (S)	<9 µg/kg	TM218		<9.00	9.17	<9.00	<9.00	<9.00	39.7
Acenaphthylene (S)	<12 µg/kg	TM218		<12.0	14.4	<12.0	<12.0	<12.0	<12.0
Acenaphthene (S)	<8 µg/kg	TM218		<8.00	9.21	<8.00	<8.00	9.89	<8.00
Fluorene (S)	<10 µg/kg	TM218		<10.0	<10.0	<10.0	<10.0	13.2	<10.0
Phenanthrene (S)	<15 µg/kg	TM218		42.7	92.8	76.7	18.5	93.2	27.5
Anthracene (S)	<16 µg/kg	TM218		16.1	38.6	19.6	<16.0	27.0	<16.0
Fluoranthene (S)	<17 µg/kg	TM218		132	257	159	25.3	176	30.9
Pyrene (S)	<15 µg/kg	TM218		179	335	143	23.0	165	<15.0
Benz(a)anthracene (S)	<14 µg/kg	TM218		111	161	111	<14.0	144	30.8
Chrysene (S)	<10 µg/kg	TM218		85.5	143	90.5	14.1	143	19.9
Benzo(b)fluoranthene (S)	<15 µg/kg	TM218		122	148	173	30.0	157	31.2
Benzo(k)fluoranthene (S)	<14 µg/kg	TM218		49.5	74.7	57.2	<14.0	66.0	<14.0
Benzo(a)pyrene (S)	<15 µg/kg	TM218		85.5	161	133	23.5	119	25.0
Indeno(123cd)pyrene (S)	<18 µg/kg	TM218		53.5	88.8	94.0	<18.0	64.2	<18.0
Dibenzo(ah)anthracene (S)	<23 µg/kg	TM218		<23.0	26.9	29.1	<23.0	25.6	<23.0
Benzo(ghi)perylene (S)	<24 µg/kg	TM218		68.0	105	125	<24.0	81.4	24.1
PAH 16 EPA Total	<118 µg/kg	TM218		945	1680	1210	134	1280	229

ALcontrol Laboratories Analytical Services
CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST



WAC ANALYTICAL RESULTS

REF-CEN12457-3

Client Reference po 320244
Mass Sample taken (kg) 0.207
Mass of dry sample (kg) 0.175
Particle Size <4mm >95%

Site Location Havant WRC
Moisture Content Ratio (%) 18.5
Dry Matter Content Ratio (%) 84.4

Case

SDG 091214-75
Lab Sample Number(s) 735133
Sampled Date
Sample Identity PB1
Depth (m) 1.00 - 1.00

Landfill Waste Acceptance
Criteria Limits

Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous Landfill	Hazardous Waste Landfill
3	5	6
-	-	10
6	-	-
1	-	-
500	-	-
100	-	-
-	>6	-
-	-	-
-	-	-

Solid Waste Analysis

Total Organic Carbon (%) <0.200
Loss on Ignition (%) 1.42
Sum of BTEX (mg/kg) <0.01
Sum of 7 PCBs (mg/kg) <0.003
Mineral Oil (mg/kg) 43.1
PAH Sum of 17 (mg/kg) <10.0
pH (pH Units) 9.03
ANC to pH 6 (mol/kg) 0.593
ANC to pH 4 (mol/kg) 4.43

Eluate Analysis

	C2	Conc ⁿ in 2:1 eluate	C8	Conc ⁿ in 8:1 eluate	A2	2:1 conc ⁿ leached	A2-10	Cumulative conc ⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l				mg/kg						
Arsenic	0.00237		0.0033		0.00474		0.0316		0.5	2	25
Barium	0.0233		0.00398		0.0466		0.068		20	100	300
Cadmium	<0.01		<0.01		<0.02		<0.1		0.04	1	5
Chromium	0.00158		0.00123		0.00317		0.0128		0.5	10	70
Copper	0.00843		0.00271		0.0169		0.0354		2	50	100
Mercury Dissolved (CVAF)	<0.00001		<0.00001		<0.00002		<0.0001		0.01	0.2	2
Molybdenum	0.0159		0.000625		0.0319		0.0285		0.5	10	30
Nickel	0.00322		0.00123		0.00645		0.0152		0.4	10	40
Lead	0.000747		0.000492		0.0015		0.00529		0.5	10	50
Antimony	0.00131		0.00162		0.00262		0.0158		0.06	0.7	5
Selenium	0.00293		0.00137		0.00586		0.016		0.1	0.5	7
Zinc	0.0043		0.000949		0.00862		0.0144		4	50	200
Chloride	30.7		<2		61.5		44.7		800	15000	25000
Fluoride	0.556		<0.5		1.11		<5		10	150	500
Sulphate (soluble)	126		12.3		252		289		1000	20000	50000
Total Dissolved Solids	228		43.8		456		706		4000	60000	100000
Total Monohydric Phenols (W)	<0.015		<0.015		<0.03		<0.15		1	-	-
Dissolved Organic Carbon	9.82		3		19.7		40		500	800	1000

Leach Test Information

	2:1	8:1
Date Prepared	17-Dec-2009	22-Dec-2009
pH (pH Units)	8.144	9.246
Conductivity (µS/cm)	415.00	76.20
Temperature (°C)	20.00	15.20
Volume Leachant (Litres)	0.318	1.400
Volume of Eluate VE1 (Litres)	0.255	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable

Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation

ALcontrol Certification does not apply to leachates

WAC ANALYTICAL RESULTS

REF-CEN12457-3

Client Reference po 320244
Mass Sample taken (kg) 0.198
Mass of dry sample (kg) 0.175
Particle Size <4mm >95%

Site Location Havant WRC
Moisture Content Ratio (%) 13.3
Dry Matter Content Ratio (%) 88.3

Case
SDG 091214-75
Lab Sample Number(s) 735146
Sampled Date
Sample Identity PB3
Depth (m) 1.00 - 1.00

Landfill Waste Acceptance Criteria Limits

Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous Landfill	Hazardous Waste Landfill
3	5	6
-	-	10
6	-	-
1	-	-
500	-	-
100	-	-
-	>6	-
-	-	-
-	-	-

Solid Waste Analysis

Total Organic Carbon (%) <0.200
Loss on Ignition (%) 1.60
Sum of BTEX (mg/kg) <0.01
Sum of 7 PCBs (mg/kg) <0.003
Mineral Oil (mg/kg) 45.5
PAH Sum of 17 (mg/kg) <10.0
pH (pH Units) 9.29
ANC to pH 6 (mol/kg) 0.230
ANC to pH 4 (mol/kg) 1.46

Eluate Analysis	C2	Conc ⁿ in 2:1 eluate	C8	Conc ⁿ in 8:1 eluate	A2	2:1 conc ⁿ leached	A2-10	Cumulative conc ⁿ leached	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	mg/l				mg/kg						
Arsenic		0.0214		0.0188		0.0429		0.192	0.5	2	25
Barium		0.0307		0.0047		0.0613		0.0864	20	100	300
Cadmium		<0.01		<0.01		<0.02		<0.1	0.04	1	5
Chromium		0.00471		0.00204		0.00942		0.0245	0.5	10	70
Copper		0.0259		0.0104		0.0517		0.127	2	50	100
Mercury Dissolved (CVAF)		<0.00001		<0.00001		<0.00002		<0.0001	0.01	0.2	2
Molybdenum		0.0244		0.00221		0.0488		0.0557	0.5	10	10
Nickel		0.00626		0.00209		0.0125		0.0272	0.4	10	40
Lead		0.000456		0.00126		0.000913		0.0114	0.5	10	50
Antimony		0.0122		0.0148		0.0244		0.144	0.06	0.7	5
Selenium		0.00309		0.00257		0.00618		0.0265	0.1	0.5	2
Zinc		0.00196		0.00142		0.00392		0.015	4	50	200
Chloride		26.4		<2		52.8		40	800	15000	25000
Fluoride		<0.5		<0.5		<1		<5	10	150	500
Sulphate (soluble)		215		23.1		430		522	1000	20000	50000
Total Dissolved Solids		321		66.7		643		1050	4000	60000	100000
Total Monohydric Phenols (W)		<0.015		<0.015		<0.03		<0.15	1	-	-
Dissolved Organic Carbon		17.3		4.9		34.6		67.8	500	800	1000

Leach Test Information

	2:1	8:1
Date Prepared	17-Dec-2009	22-Dec-2009
pH (pH Units)	8.894	9.450
Conductivity (µS/cm)	599.00	116.10
Temperature (°C)	20.10	18.30
Volume Leachant (Litres)	0.327	1.400
Volume of Eluate V _L (Litres)	0.265	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable

Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation

Merits Certification does not apply to leachates

Table of Results - Appendix

SDG Number : 091214-75

Client : Concept Site Investigations

Client Ref : po 320244

REPORT KEY

Results expressed as (e.g.) 1.03E-07 is equivalent to 1.03x10⁻⁷

NDP	No Determination Possible	#	ISO 17025 Accredited	*	Subcontracted Test	M	MCERTS Accredited
NFD	No Fibres Detected	PFD	Possible Fibres Detected	Δ	Result previously reported (Incremental reports only)	EC	Equivalent Carbon (Aromatics C8-C15)

Note: Method detection limits are not always achievable due to various circumstances beyond our control

Method No	Reference	Description	Wet/Dry Sample ¹
PM001		Preparation of Samples for Metals Analysis	Dry
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material	Wet
PM114		Leaching Procedure for CEN Two Stage Batch Test 2:1/8:1 Cumulative	
TM001	In - house Method	Determination of asbestos containing material by screening on solids	
TM018	BS 1377: Part 3 1990	Determination of Loss on Ignition	Dry
TM024	Method 4500A & B, AWWA/APHA, 20th Ed., 1999	Determination of Exchangeable Ammonium and Ammoniacal Nitrogen as N by titration on solids	Wet
TM061	Method for the Determination of EPH, Massachusetts Dept. of EP, 1998	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)	Dry
TM062	MEWAM BOOK 124 1988, HMSO/ Method 17.7, Second Site property, March 2003	Determination of Phenolic compounds by HPLC with electro-chemical detection	
TM062 (5)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC	Wet
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) and BTEX (MTBE) compounds by Headspace GC-FID (C4-C12)	
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water	
TM097	Modified: US EPA Method 325.1 & 325.2	Determination of Chloride using the Kone Analyser	Dry
TM098	Method 4500E, AWWA/APHA, 20th Ed., 1999	Determination of Sulphate using the Kone Analyser	Dry
TM102	Method 4500H, AWWA/APHA, 20th Ed., 1999	Determination of Total Oxidised Nitrogen using the Kone Analyser	Dry
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser	
TM123	BS 2690: Part 121:1981	The Determination of Total Dissolved Solids in Water	
TM132	In - house Method	ELTRA CS800 Operators Guide	Dry
TM133	BS 1377: Part 3 1990; BS 6068-2.5	Determination of pH in Soil and Water using the GLPH pH Meter	Wet
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser	Wet
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS	
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the "Skalar SANS+ System" Segmented Flow Analyser	Wet
TM168	EPA Method 8082, Polychlorinated Biphenyls by Gas Chromatography	Determination of WHO12 and EC7 Polychlorinated Biphenyl Congeners by GC-MS in Soils	Dry
TM180	Sulphide in waters and waste waters 1991 ISBN 01 175 7186 SCA rec. 2007 (unpublished)	The Determination Of Easily Liberated Sulphide In Soil Samples by Ion Selective Electrode Technique	Wet
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES	Dry
TM182	CEN/TC 292 - WI 292046-characterization of waste-leaching Behaviour Tests- Acid and Base Neutralization Capacity Test	Determination of Acid Neutralisation Capacity (ANC) Using Autotitration in Soils	Dry
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry	
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers	Dry
TM213	In-house Method	Rapid Determination of PAHs by GC-FID	Wet
TM218	Microwave extraction - EPA method 3546	Microwave extraction - EPA method 3546	Wet
TM221	Inductively Coupled Plasma - Atomic Emission Spectroscopy. An Atlas of Spectral Information: Winge, Fassel, Peterson and Floyd	Determination of Acid extractable Sulphate in Soils by IRIS Emission Spectrometer	Dry
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer	Dry

Table of Results - Appendix

SDG Number : 091214-75

Client : Concept Site Investigations

Client Ref : po 320244

REPORT KEY

Results expressed as (e.g.) 1.03E-07 is equivalent to 1.03x10⁻⁷

NDP	No Determination Possible	#	ISO 17025 Accredited	*	Subcontracted Test	M	MCERTS Accredited
NFD	No Fibres Detected	PFD	Possible Fibres Detected	*	Result previously reported (Incremental reports only)	EC	Equivalent Carbon (Aromatics C8-C35)

Note: Method detection limits are not always achievable due to various circumstances beyond our control

Method No	Reference	Description	Wet/Dry Sample ¹
TM224	US EPA Method 601GB	Determination of Alkaline Metals by iCap 6500 Duo ICP-OES	Dry
TM248	In-House Method	Determination of Ammonium BRE (2:1 Extract) on solids	Wet

¹ Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.

Extractable Petroleum Hydrocarbons (EPH) By GC-FID EPH (DRO) (C10-C40)

SDG Number	091214-75	Client	L_CONSIT_LON		
Matrix (Units)	mg/kg	Client Ref	po 320244		
Sample No	Sample ID	Depth	Matrix	EPH	Interpretation
754924	CBR1	0.50 - 0.50	SOLID	149	Biodegraded Diesel/PAH's/Possible Bitumen/Tar
755253	CBR3	0.50 - 0.50	SOLID	210	Biodegraded Diesel/PAH's/Possible Bitumen/Tar
755376	PB3	1.00 - 1.00	SOLID	219	Biodegraded Diesel/PAH's/Possible Bitumen/Tar
758719	CBR2	0.50 - 0.50	SOLID	232	Biodegraded Diesel/PAH's/Possible Bitumen/Tar
755559	PB1	1.00 - 1.00	SOLID	123	Biodegraded Diesel/PAH's/Possible Bitumen/Tar
755459	PB2	1.00 - 1.00	SOLID	663	Biodegraded Diesel/PAH's/Possible Bitumen/Tar

Extractable Petroleum Hydrocarbons (formally Diesel Range Organics) :- Any compound extractable in n-hexane within the carbon range C10-C40, includes Aliphatic (Min Oil), Aromatic (PAHs) and naturally occurring compounds.

APPENDIX

APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following:
NRA Leach tests, flash point, ammonium as NH_4 by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported.
For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
14. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
15. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
16. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
17. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as $\mu\text{g/kg}$ or $\mu\text{g/l}$. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKEN SVOC	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM/EA	SOLID PHASE EXTRACTION	GC MS
TRIAZINE HERBS	DCM/EA	SOLID PHASE EXTRACTION	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
SAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
UNSAPONIFIABLE	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	DCM	LIQUID/LIQUID EXTRACTION	EZ FLASH

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Last updated 25 June 2009

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type

Common Name

Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

CONCEPT SITE INVESTIGATIONS

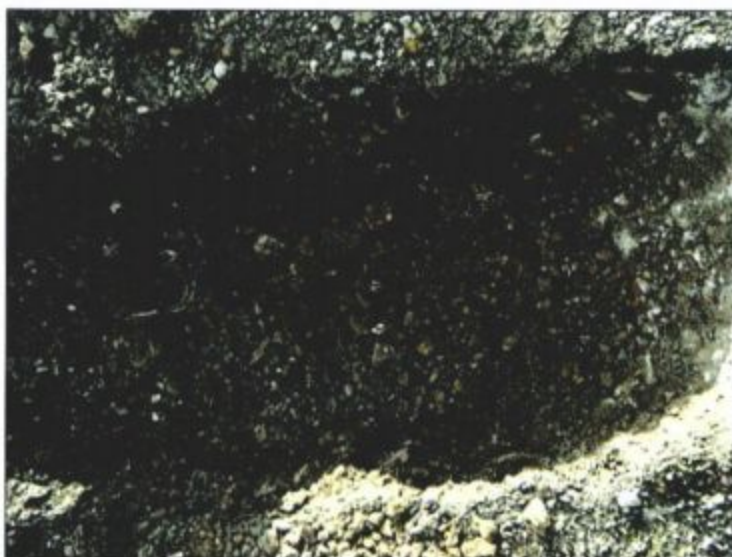
12. PHOTOGRAPHS

Unit 8, Warple Mews
Warple Way
London W3 0RF

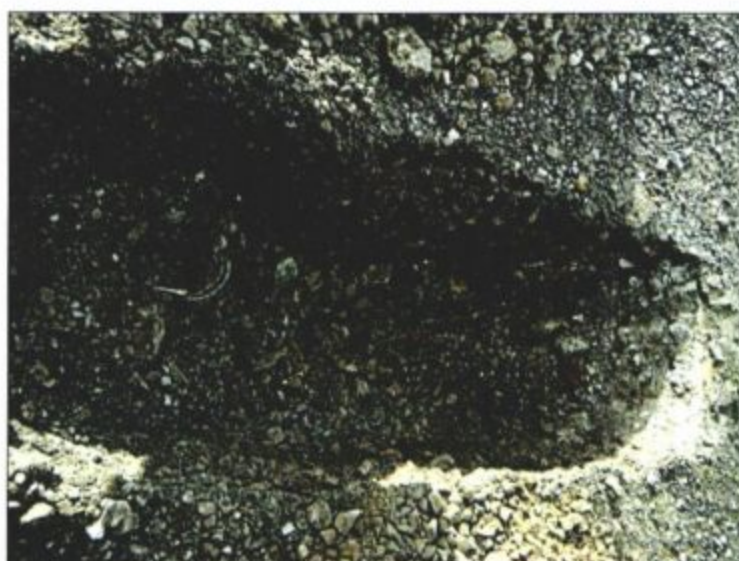
CONCEPT SITE INVESTIGATIONS

Tel: 020 8811 2880
Fax: 020 8811 2881
email: si@conceptconsultants.co.uk

Site Name	Havant WRC	Job No.	09/2240	HOLE TYPE	CBR1
Carried out for	Hampshire County Council	Date	03/12/2009	Photograph	1 & 2



Photograph No 1



Photograph No 2

CONCEPT SITE INVESTIGATIONS

Site Name	Havant WRC	Job No.	09/2240	HOLE TYPE	CBR1
Carried out for	Hampshire County Council	Date	03/12/2009	Photograph	3 & 4



Photograph No 3



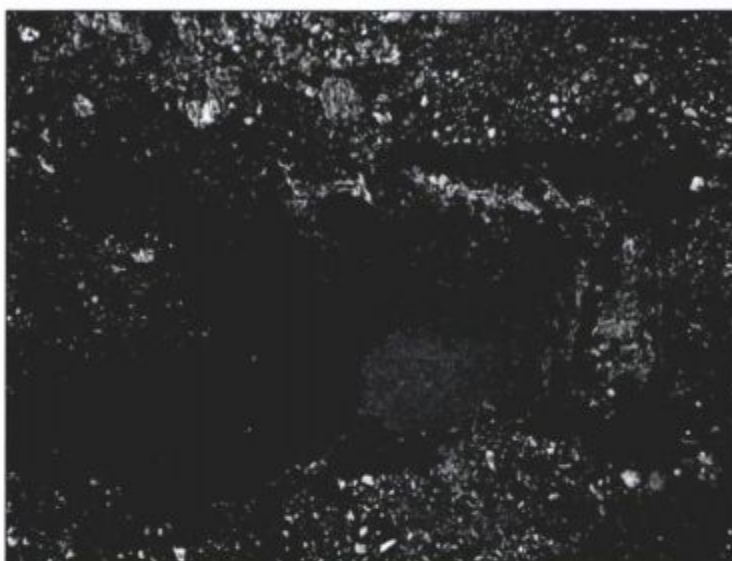
Photograph No 4

Unit 8, Warple Mews
Warple Way
London W3 0RF

CONCEPT SITE INVESTIGATIONS

Tel: 020 8811 2880
Fax: 020 8811 2881
email: si@conceptconsultants.co.uk

Site Name	Havant WRC	Job No.	09/2240	HOLE TYPE	CBR2
Carried out for	Hampshire County Council	Date	03/12/2009	Photograph	5 & 6



Photograph No 5



Photograph No 6

Unit 8, Warple Mews
Warple Way
London W3 0RF

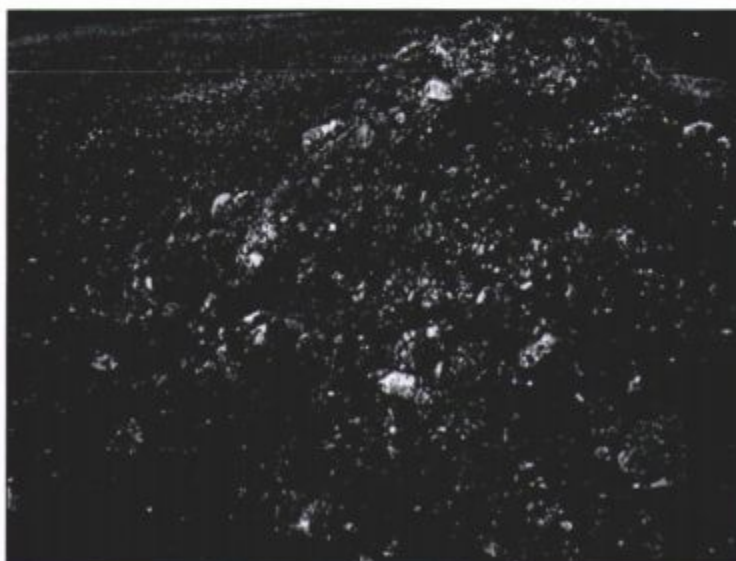
CONCEPT SITE INVESTIGATIONS

Tel: 020 8811 2880
Fax: 020 8811 2881
email: si@conceptconsultants.co.uk

Site Name	Havant WRC	Job No.	09/2240	HOLE TYPE	CBR2
Carried out for	Hampshire County Council	Date	03/12/2009	Photograph	7 & 8



Photograph No 7



Photograph No 8

Unit 8, Warple Mews
Warple Way
London W3 0RF

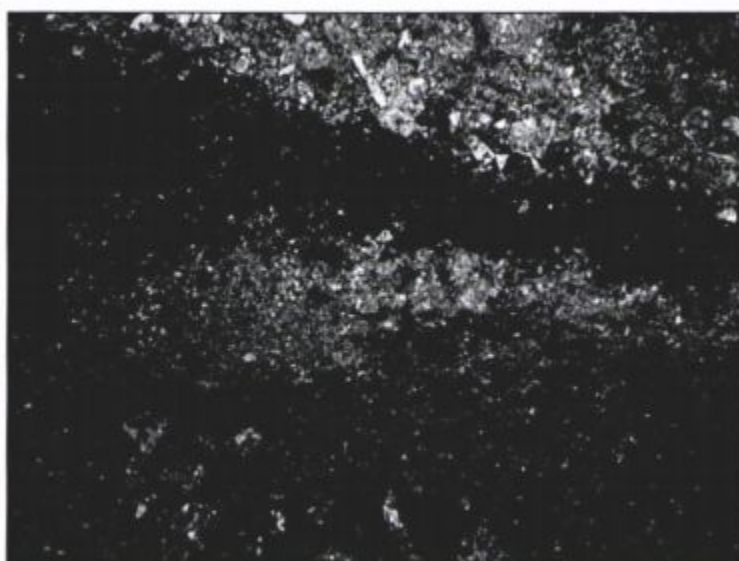
CONCEPT SITE INVESTIGATIONS

Tel: 020 8811 2880
Fax: 020 8811 2881
email: si@conceptconsultants.co.uk

Site Name	Havant WRC	Job No.	09/2240	HOLE TYPE	CBR3
Carried out for	Hampshire County Council	Date	03/12/2009	Photograph	9 & 10



Photograph No 9



Photograph No 10

Site Name	Havant WRC	Job No.	09/2240	HOLE TYPE	PB1
Carried out for	Hampshire County Council	Date	03/12/2009	Photograph	11 & 12



Photograph No 11



Photograph No 12

Unit 8, Warple Mews
Warple Way
London W3 0RF

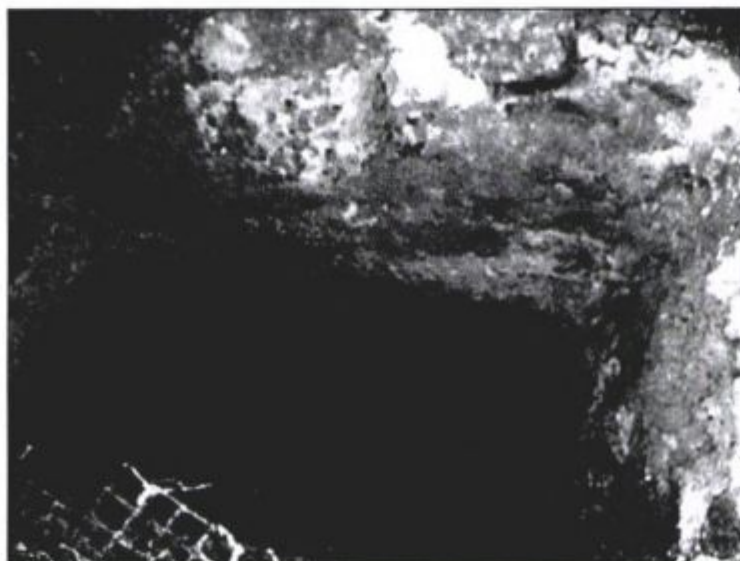
CONCEPT SITE INVESTIGATIONS

Tel: 020 8811 2880
Fax: 020 8811 2881
email: si@conceptconsultants.co.uk

Site Name	Havant WRC	Job No.	09/2240	HOLE TYPE	PB2
Carried out for	Hampshire County Council	Date	03/12/2009	Photograph	13 & 14



Photograph No 13



Photograph No 14

Site Name	Havant WRC	Job No.	09/2240	HOLE TYPE	PB3
Carried out for	Hampshire County Council	Date	03/12/2009	Photograph	15 & 16



Photograph No 15



Photograph No 16

APPENDIX B

BGS BOREHOLE INFORMATION

PROJECT: PROPOSED INCINERATOR
LOCATION: Havant

GROUND LEVEL: 8.03 2.43m

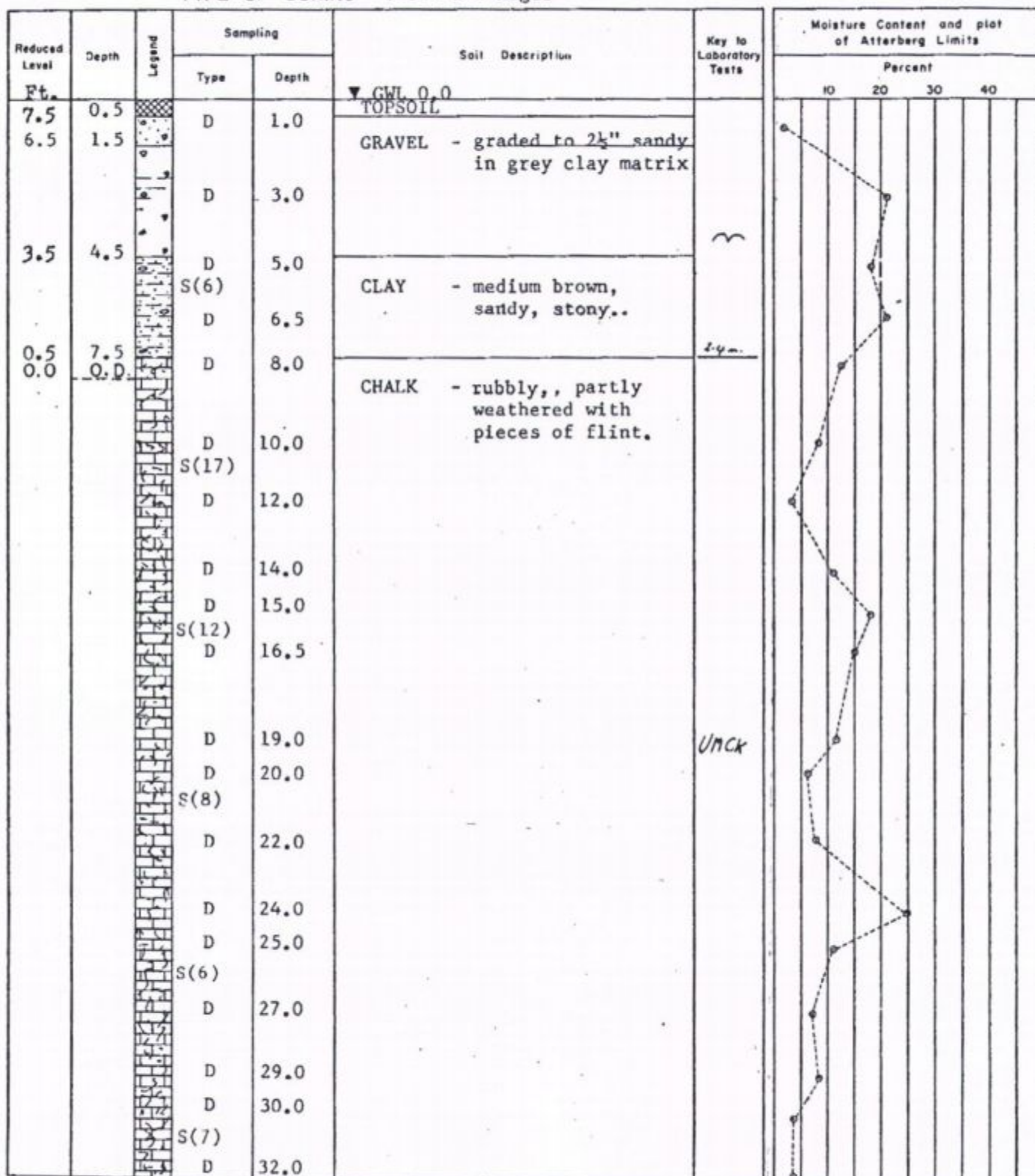
INCLINATION: Vertical

SCALE OF LOG: 1" = 4'

DIA. OF CASING: 154 mm. to metres
mm. to metres

DATE DRILLED: 19/20/21/22/23.3.71.

TYPE OF BORING: Shell and Auger



SHEET 1 OF 3

Borehole No. 1



British Geological Survey
NATURAL ENVIRONMENT RESEARCH COUNCIL

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[SU70NW BJ 101.]

PROJECT: PROPOSED INCINERATOR

LOCATION: Havant

GROUND LEVEL: 8.03

INCLINATION: Vertical

SCALE OF LOG: 1" = 4'

DIA. OF CASING: 154 mm. to metres

mm. to metres

DATE DRILLED: 19/20/21/22/23.3.71.

TYPE OF BORING: Shell and Auger

SU70NW/Box 101 A

~~7-53-0580~~

7-46-0585

Reduced Level Ft.	Depth	Log	Sampling		Soil Description	Key to Laboratory Tests	Moisture Content and plot of Atterberg Limits			
			Type	Depth			Percent			
							10	20	30	40
25.0	33.0				CHALK -					
					rubbly, partly weathered, with pieces of flint					
			D	34.0						
			D	35.0						
			S(6)		large pieces weathered white with traces of flint.					
			D	36.5						
			D	38.0						
			D	40.0						
			S(8)							
			D	41.5						
			D	44.0						
			D	45.0						
			S(9)							
			D	46.5						
			D	49.0						
			D	50.0						
			S(13)							
			D	51.5						
			D	54.0						
			D	55.0						
			S(18)							
			D	56.5						
50.0	58.0									
			D	59.0						
			D	60.0						
			S(58)		blocky, brittle, slightly weathered, white/brown					
			D	61.6						
			D	64.0						

UMCK

Ground water encountered at 8.0'
Quantity

SHEET 2 OF 3

Borehole No. 1

British
Geological Survey

NATURAL ENVIRONMENT RESEARCH COUNCIL

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[SU70NW BJ 101.]

PROJECT: PROPOSED INCINERATOR
 LOCATION: Havant
 GROUND LEVEL: 8.03
 INCLINATION: Vertical
 SCALE OF LOG: 1" = 4'

SU70NW/B0X101 A
 70460585

DIA. OF CASING: 154 mm. to metres
 mm. to metres
 DATE DRILLED: 19/20/21/22/23.3.71.

TYPE OF BORING: Shell and Auger

Reduced Level Ft.	Depth	Legend	Sampling		Soil Description	Key to Laboratory Tests	Moisture Content and plot of Atterberg Limits			
			Type	Depth			Percent			
							10	20	30	40
63.5	71.5		U4	65.0	CHALK - large pieces, weathered white with traces of flint.	Tx Cv				
			D	66.0						
			D	68.0		UMCK				
			U4	70.0						
			D	71.5		21.8				
					BOTTOM OF BOREHOLE	R.I.M.				

Ground water encountered at
 Quantity

SHEET 3 OF 3

Borehole No. 1



British Geological Survey
 NATURAL ENVIRONMENT RESEARCH COUNCIL

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[SU70NW BJ 101.]

PROJECT: PROPOSED INCINERATOR.

LOCATION: Havant,

GROUND LEVEL: 8.26

INCLINATION: Vertical.

SCALE OF LOG: 1"=4'

SU70NW/Box 101 B

7048 0583

DIA. OF CASING: 154 mm. to metres:

mm. to metres:

DATE DRILLED: 20/21/22.3.1971.

TYPE OF BORING: Shell and Auger,

Reduced Level	Depth ft.	Legend	Sampling		Soil Description	Key to Laboratory Tests	Moisture Content and plot of Atterberg Limits			
			Type	Depth ft.			Per cent			
7.8	0.5				G.W.L. 0.5' TOPSOIL.		10	20	30	40
					GRAVEL - very dense, clayey.					
			D	2.0						
4.3	4.0		D	4.0						
			S(53)	5.0	very dense.					
			D	6.0						
			D	8.0						
0.0	0.0		D	10.0						
			D	12.0						
5.7	14.0		D	14.0						
			S(19)	15.0	with weathered chalk, medium dense	4-3m				
			D	16.0						
			D	18.0						
			S(10)	20.0		UMICK				
			D	22.0						
15.7	24.0		D	24.0						
			U4	25.0	CHALK - white, weathered.	Tx				
			D	26.0		Cv				
			D	28.0						
21.7	30.0		D	30.0						
			S(15)	30.0	rubbly, partly weathered.					
			D	32.0						

Ground water encountered at 0.5' Quantity

SHEET 1, OF 2

Borehole No. 2



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[SU70NW BJ 101.]

SU 70NW/Box 101 B

7048 0583

PROJECT: PROPOSED INCINERATOR

LOCATION: Havant.

GROUND LEVEL:

DIA. OF CASING: 154 mm. to metre

INCLINATION: Vertical.

mm. to metre

SCALE OF LOG: 1" = 4'

DATE DRILLED: 20/21/22.3.1971.

TYPE OF BORING: Shell and Auger.

Reduced Level	Depth ft.	Legend	Sampling		Soil Description	Key to Laboratory Tests	Moisture Content and plot of Atterberg Limits				
			Type	Depth ft.			Percent				
					CHALK - white, rubbly, partly weathered.		10	20	30	40	
			D	34.0							
			S(10)	35.0							
			D	36.0							
			D	38.0							
			U4	40.0		Tx Cv					
			D	42.0							
			D	44.0		UMCK					
36.7	45.0		S(4)	45.0							
			D	48.0	extremely soft, structureless, containing lumps of intact chalk.						
			S(4)	49.0							
42.2	50.5					15.4m					
					BOTTOM OF BOREHOLE.						

Ground water encountered at
Quantity

SHEET 2 OF 2

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[SU70NW BJ 101.]

SU 70NW/Box 101 C

7-50 0580

PROJECT: PROPOSED INCINERATOR.

LOCATION: Havant.

GROUND LEVEL: 7.73

INCLINATION: Vertical.

SCALE OF LOG: 1" = 4'

DIA. OF CASING: 154 mm. to metres

mm. to metres

DATE DRILLED: 22/23.3.1971.

TYPE OF BORING: Shell and Auger.

Reduced Level	Depth ft.	Legend	Sampling		Soil Description	Key to Laboratory Tests	Moisture Content and plot of Atterberg Limits			
			Type	Depth ft.			Percent			
7.2	0.5				G.W.L. 0.5' TOPSOIL.					
			D	2.0	GRAVEL - very dense, graded to 3", sandy, clayey					
			S(50)							
			D	4.0						
2.7	5.0		S(60)	5.0						
1.7	6.0		D	6.0	with pieces of chalk.					
					clayey.					
0.0	0.0		D	8.0						
			D	10.0						
			S(31)							
4.3	12.0		D	12.0						
			D	14.0	with chalk.					
7.3	15.0		S(6)	15.0						
8.3	16.0		D	16.0	medium dense.					
					large.					
			D	18.0						
			D	20.0						
			S(26)							
			D	22.0						
16.3	24.0		D	24.0						
			S(8)	25.0	with pieces of chalk.					
18.3	26.0		D	26.0		7.9m				
					CHALK - white, stoney, weathered.					
			D	28.0						
			D	30.0		U7CK				
			U4							
			D	32.0						

Ground water encountered at 0.5'
Quantity

SHEET 1 OF 2.

Borehole No 3

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[SU70NW BJ 101.]

PROJECT: PROPOSED INCINERATOR

LOCATION: Havant

GROUND LEVEL: 6.89

INCLINATION: Vertical

SCALE OF LOG: 1" = 4'

SU 70 NW/B0x101 D

7053 0577

DIA. OF CASING: 154 mm. to metres

mm. to metres

DATE DRILLED: 24/25.3.71.

TYPE OF BORING: Shell and Auger

Reduced Level Ft.	Depth	Legend	Sampling		Soil Description	Key to Laboratory Tests	Moisture Content and plot of Atterberg Limits			
			Type	Depth			Percent			
							10	20	30	40
5.9	1.0				▼ GWL 0.5 TOPSOIL					
		x	D	2.0	GRAVEL - silty graded to 1½ ins. medium dense.					53%
		x	S(16)							
		x	D	4.0						
		x	S(30)	5.0						
		x	D	6.0						
0.0	O.D.									
1.1	8.0	x	D	8.0		24				
			D	10.0	CHALK - weathered, white with large pieces flint, dense.					
			S(38)							
			D	12.0						
			D	14.0						
7.1	15.0		S(5)	15.0		UMCK				
			D	16.0	extremely soft, structureless, containing small lumps of intact chalk.					
			D	18.0						
			D	20.0						
			U4							
			D	22.0		Tx Cv				
			D	24.0						
			D	25.0						
			D	26.0						
			D	28.0						
			D	30.0						
			U4							
			D	32.0						

Ground water encountered at 0.5'
Quantity

SHEET 1 OF 2

Borehole No. 4

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[SU70NW BJ 101.]

PROJECT: PROPOSED INCINERATOR
LOCATION: Havant

50 70 NW / Box 101 D

7053 0577

GROUND LEVEL: 6.89

DIA. OF CASING: mm. to metres

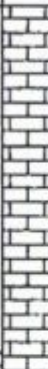
INCLINATION: Vertical

mm. to metres

SCALE OF LOG: 1" = 4'

DATE DRILLED: 25.3.71

TYPE OF BORING:

Reduced Level Ft.	Depth	Legend	Sampling		Soil Description	Key to Laboratory Tests	Moisture Content and plot of Atterberg Limits			
			Type	Depth			Percent			
							10	20	30	40
33.1	40.0		D	34.0	CHALK - extremely soft, structureless containing lumps of intact chalk.	Urck				
			S(6)	35.0						
			D	36.0						
			D	38.0						
			S(7)	39.0						
					BOTTOM OF BOREHOLE	12.2m				

Ground water encountered at
Quantity

SHEET 2 OF 2

Borehole No. 4



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[SU70NW BJ 101.]

PROJECT: PROPOSED INCINERATOR

LOCATION: Havant

GROUND LEVEL: 8.47

INCLINATION: Vertical

SCALE OF LOG: 1" = 4'

SU70NW/Bx 101 E

7049 0586

DIA. OF CASING: 154 mm. to metre
mm. to metre

DATE DRILLED: 24.3.71.

TYPE OF BORING: Shell and Auger

Reduced Level Ft.	Depth	Legend	Sampling		Soil Description	Key to Laboratory Tests	Moisture Content and plot of Atterberg Limits			
			Type	Depth			Percent			
							10	20	30	40
7.5	1.0		D	1.0	TOPSOIL					
			D	3.0	GRAVEL - loose, sandy, with pieces of chalk and flints.					
			D	5.0						
			S(4)							
					▼ GWL 7.0'					
0.0	O.D.		D	9.0						
			D	10.0						
			S(8)							
			D	14.0						
			D	15.0						
			S(9)							
			D	19.0						
			D	20.0						
			S(7)							
			D	24.0						
			D	25.0						
			S(6)							
			D	29.0						
			D	30.0						
			S(7)							

Ground water encountered at 7.0
Quantity

SHEET 1 OF 2

Borehole No. 5

PROJECT: PROPOSED INCINERATOR
 LOCATION: Havant
 GROUND LEVEL: 8.47
 INCLINATION: Vertical
 SCALE OF LOG: 1" = 4'

SU 70NW/Box 101 E
 7049 0586

DIA. OF CASING: 154 mm. to metre
 mm. to metre
 DATE DRILLED: 24.3.71.

TYPE OF BORING: Shell and Auger

Reduced Level Ft.	Depth	Legend	Sampling		Soil Description	Key to Laboratory Tests	Moisture Content and plot of Atterberg Limits			
			Type	Depth			Percent			
24.5	33.0				GRAVEL - loose, sandy with pieces of chalk and flint.	Tx Cv				
			D	34.0	CHALK - structureless, remoulded containing lumps of intact chalk and flints.					
			U4	35.0						
			D	36.5						
			D	39.0						
			D	40.0						
		S(8)								
33.5	42.0		D	41.5						
					BOTTOM OF BOREHOLE.					

Ground water encountered at
 Quantity

SHEET 2 OF 2

Borehole No. 5



PROJECT: PROPOSED INCINERATOR
LOCATION: Havant

SU70NW/Box 101 F

7050 0584

GROUND LEVEL: 7.88

DIA. OF CASING: 154 mm. to metres

INCLINATION: Vertical

mm. to metres

SCALE OF LOG: 1" = 4'

DATE DRILLED: 19/20.3.71.

TYPE OF BORING: Shell and Auger

Reduced Level Ft.	Depth	Legend	Sampling		Soil Description	Key to Laboratory Tests	Moisture Content and plot of Atterberg Limits			
			Type	Depth			Percent			
					▼ GWL 0.0'		10	20	30	40
7.4	0.5				TOPSOIL					
			D	2.0	CLAY - soft brown with pieces of flint.					
			D	4.0						
1.88	6.0		D	6.0						
0.0	0.0		D	8.0	silty, stoney					
2.1	10.0		D	10.0						
		C(19)			with traces of chalk.					
4.1	12.0		D	12.0						
			D	14.0	CHALK - white, weathered with pieces of flint.					
7.1	15.0		C(66)	15.0						
			D	16.0	FLINT - weathered very dense.					
10.1	18.0		D	18.0						
					in clay matrix					
12.1	20.0		D	20.0						
		S(18)			CHALK - crumbly, partly weathered.					
14.1	22.0		D	22.0						
			D	24.0	CLAY - brown, chalky, stony.					
17.1	25.0		U4	25.0						
			D	26.0	CHALK - wet weathered with pieces of flint.					
			D	28.0						
21.1	29.0									
		S(9)		30.0	structureless, remoulded, containing lumps of intact chalk					
			D	32.0						

Ground water encountered at 0.0'
Quantity

SHEET 1 OF 2

Borehole No. 6A

PROJECT: PROPOSED INCINERATOR
LOCATION: Havant

GROUND LEVEL: 7.88

INCLINATION: Vertical

SCALE OF LOG: 1" = 4'

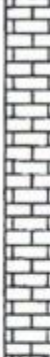
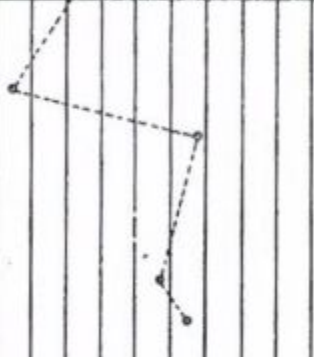
SU70NW/Box 101 F

7050 0584

DIA. OF CASING: 154 mm. to metres
mm. to metres

DATE DRILLED: 19/20.3.71.

TYPE OF BORING: Shell and Auger

Reduced Level Ft.	Depth	Legend	Sampling		Soil Description	Key to Laboratory Tests	Moisture Content and plot of Atterberg Limits								
			Type	Depth			Percent								
32.1	40.0		D	34.0	CHALK - structureless, re-moulded containing lumps of intact chalk.	UMCK		10	20	30	40				
			S(6)	35.0											
			D	38.0											
			S(12)	39.0											
					BOTTOM OF BOREHOLE	12.2									

Ground water encountered at
Quantity

SHEET 2 OF 2

Borehole No. 6A



PROJECT: PROPOSED INCINERATOR
 LOCATION: Havant
 GROUND LEVEL: 7.39
 INCLINATION: Vertical
 SCALE OF LOG: 1" = 4'

SU70NW/Box 101 G
 7053 0581

DIA. OF CASING: 154 mm. to metres
 mm. to metres
 DATE DRILLED: 23/24.3.71.

TYPE OF BORING: Shell and Auger

Reduced Level Ft.	Depth	Legend	Sampling		Soil Description	Key to Laboratory Tests	Moisture Content and plot of Atterberg Limits			
			Type	Depth			Percent			
6.9	0.5				▼ GWL 0.5' TOPSOIL					
			D	2.0	FLINT - Weathered gravel graded to 5ins in grey clay matrix, very stiff.					
			D	4.0						
			S(16)	5.0						
			D	6.0						
0.0	0.0									
			D	8.0	CLAY - Soft, grey, chalky, with flint pebbles.					
1.6	9.0		D U4	10.0						
			D	12.0						
6.6	14.0		D	14.0	FLINT - weathered gravel to 3ins.					
			D	16.0						
10.6	18.0		D	18.0	Chalky.					
			D	20.0						
			S(21)	22.0						
			D	24.0						
17.6	25.0		D	25.0	Chalky, clayey.					
18.6	26.0		D	26.0						
			D	28.0	CHALK - White weathered with pieces of flint.					
			D	30.0						
			U4							
			D	32.0						

Ground water encountered at 0.5'
 Quantity

SHEET 1 OF 2

Borehole No. 8

SU 70 NW/Box 101 G

7053 0581

PROJECT: PROPOSED INCINERATOR

LOCATION: Havant

GROUND LEVEL: 7.39

INCLINATION: Vertical

SCALE OF LOG: 1" = 4'

DIA. OF CASING: 154 mm. to metres

mm. to metres

DATE DRILLED: 23/24.3.71.

TYPE OF BORING: Shell and Auger

Reduced Level Ft.	Depth	Legend	Sampling		Soil Description	Key to Laboratory Tests	Moisture Content and plot of Atterberg Limits			
			Type	Depth			Percent			
							10	20	30	40
32.6	40.0		D	34.0	CHALK - rubbly, partly weathered with pieces of chalk.	Umck				
			S(17)	35.0						
			D	36.0						
			D	38.0						
			D	39.0						
					BOTTOM OF BOREHOLE	12-2				

Ground water encountered at
Quantity

SHEET 2 OF 2

Borehole No. 8

PROJECT: PROPOSED INCINERATOR
LOCATION: Havant

GROUND LEVEL: 7.85

INCLINATION: Vertical

SCALE OF LOG: 1" = 4'

SU 70NW/Box 101 H

7049 0585

DIA. OF CASING: 154 mm. to metre
mm. to metre

DATE DRILLED: 17/18.3.71.

TYPE OF BORING: Shell and Auger

Reduced Level Ft.	Depth	Legend	Sampling		Soil Description	Key to Laboratory Tests	Moisture Content and plot of Atterberg Limits			
			Type	Depth			Percent			
7.4	0.5				TOPSOIL					
			D	2.0	CLAY - Soft, brown grey, stony.					
			U4	2.0	CLAY - Soft, brown grey, stony.					
4.4	3.5		D	4.0	GRAVEL - in clay matrix with chalk					
3.9	4.0		U4	5.0	GRAVEL - in clay matrix with chalk					
2.9	5.0		D	6.0	CHALK - hard and brittle with pieces of flint.					
0.0	0.0		D	8.0	CHALK - hard and brittle with pieces of flint.					
			S(21)	10.0	CHALK - hard and brittle with pieces of flint.					
			D	12.0	CHALK - hard and brittle with pieces of flint.					
			D	14.0	CHALK - hard and brittle with pieces of flint.					
			S(21)	15.0	CHALK - hard and brittle with pieces of flint.					
10.2	18.0		D	18.0	CLAY - very stiff brown with pieces of chalk.					
			D	20.0	CLAY - very stiff brown with pieces of chalk.					
			S(23)	20.0	CLAY - very stiff brown with pieces of chalk.					
			D	22.0	CLAY - very stiff brown with pieces of chalk.					
16.2	24.0		D	24.0	CHALK - white, blocky, medium-hard, stony.					
			S(25)	25.0	CHALK - white, blocky, medium-hard, stony.					
			D	26.0	CHALK - white, blocky, medium-hard, stony.					
			D	28.0	CHALK - white, blocky, medium-hard, stony.					
			D	30.0	CHALK - white, blocky, medium-hard, stony.					
			U4	30.0	CHALK - white, blocky, medium-hard, stony.					
			D	32.0	CHALK - white, blocky, medium-hard, stony.					

Ground water encountered at 3.0
Quantity

SHEET 1 OF 2

Borehole No. 9A



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[SU70NW BJ 101.]

PROJECT: PROPOSED INCINERATOR

LOCATION: Havant

GROUND LEVEL: 7.85

INCLINATION: Vertical

SCALE OF LOG: 1" = 4'

SU 70NW/Box 101 H

7049 0585

DIA. OF CASING: 154 mm. to me

mm. to me

DATE DRILLED: 17/18.3.71.

TYPE OF BORING: Shell and Auger

Reduced Level Ft.	Depth	Legend	Sampling		Soil Description	Key to Laboratory Tests	Moisture Content and p of Atterberg Limits			
			Type	Depth			Percent			
							10	20	30	4
			D	34.0	CHALK - white, rubbly, partly weathered.	UMCK				
			S(17)	35.0						
			D	36.0						
			U4	38.5						
32.2	40.0					Tx Cv 12.6m				
					BOTTOM OF BOREHOLE					

Ground water encountered at
Quantity

SHEET 2 OF 2

Borehole No. 9A

SU70NW/Box 101 I

7059 0580

PROJECT: PROPOSED INCINERATOR

LOCATION: Havant

GROUND LEVEL: 7.58

INCLINATION: Vertical

SCALE OF LOG: 1" = 4'

DIA. OF CASING: 154 mm. to metr
mm. to metr

DATE DRILLED: 25.3.71

TYPE OF BORING: Shell and Auger

Reduced Level Ft.	Depth	Legend	Sampling		Soil Description	Key to Laboratory Tests	Moisture Content and plasticity of Atterberg Limits			
			Type	Depth			Percent			
							10	20	30	40
6.6	1.0				TOPSOIL					
			D	1.5	in soft					
					▼ GWL 2.0' GRAVEL - brown clay matrix.	0.8m				
			D	3.0						
			D	5.0	CHALK - rubbly, white partly weathered with pieces of flint					
			S(20)							
0.0	0.0									
			D	9.0						
2.4	10.0		D	10.0						
			S(8)		with pieces of flint, weathered, structureless, remoulded.					
			D	14.0						
7.4	15.0		S(6)	15.0		UMck				
			D	16.0	with pieces of flint, extremely soft structureless.					
			D	19.0						
11.4	19.0		D	20.0						
			S(9)		with pieces of flint					
			D	21.5						
			D	24.0						
			U4	25.0	Structureless, remoulded containing lumps of intact chalk.	Tx				
			D	26.5						
			D	28.0						
			D	30.0						
			S(9)							

Ground water encountered at 2.0'
Quantity

SHEET 1 OF 2

Borehole No. 10



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[SU70NW BJ 101.]

PROJECT: PROPOSED INCINERATOR

LOCATION: Havant

GROUND LEVEL: 7.58

INCLINATION: Vertical

SCALE OF LOG: 1" = 4'

SU 70NW / Box 101 I

7059 0580

DIA. OF CASING: 154 mm. to metre:

mm. to metre

DATE DRILLED: 25.3.71.

TYPE OF BORING: Shell and Auger

Reduced Level Ft.	Depth	Legend	Sampling		Soil Description	Key to Laboratory Tests	Moisture Content and plot of Atterberg Limits			
			Type	Depth			Percent			
							10	20	30	40
			D	34.0	CHALK - with pieces of flint, structureless, re-moulded, containing lumps of intact chalk	UMCK				
			D	35.0						
		S(12)								
			D	38.0						
			D	40.0	BOTTOM OF BOREHOLE					
		S(12)								
34.4	42.0									

Ground water encountered at
Quantity

SHEET 2 OF 2

Borehole No. 10

