

JE Job No: 14/9660

Test Method No.	Description	Prep Method No. (if appropriate)	Description	UKAS	MCERTS (soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM73	pH in by Metrohm	PM11	1:2.5 soil/water extraction	Yes	Yes	AR	No
TM89	In-house method based on USEPA method OIA-1667. Determination of cyanide by Flow Injection Analyser. ISO17025 accredited method for soils and waters and MCERTS on soils. Accreditation is matrix specific.	PM45	Cyanide & Thiocyanate prep for soils	Yes	Yes	AR	Yes
NONE	No Method Code	PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.			AR	



APPENDIX I

Laboratory Results-Geotechnical



TEST REPORT.

ISSUED BY : SOIL PROPERTY TESTING LTD.
DATE OF ISSUE : 05/09/14 PAGE 1 of 8 Pages
Contract Serial No.
UK14.1639 - 15a Parliament Hill S28039

**CLIENT:**

Environmental Protection
Strategies Ltd
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CB23 6JN

Soil Property Testing

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Stukeley Meadows, Huntingdon,
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SAMPLES SUBMITTED BY:

Environmental Protection

APPROVED SIGNATORIES:

- J.C.GARNER B.Eng (Hons.) FGS
Technical Director
- S.P.TOWNEND FGS
Quality Manager
- T.FOORD BSc (Hons.) FGS
Site Services Manager

SAMPLES LABELLED:

UK14.1639 - 15a Parliament Hill

DATE RECEIVED: 21/08/14

SAMPLES TESTED BETWEEN 21/08/14 and 05/09/14

REMARKS: For the attention of Mr B Virtue
Your Ref: PO-14/3922

- NOTES:**
- 1 All remaining samples or remnants from this contract will be disposed of after 21 days from today, unless we are notified to the contrary.
 - 2 (a) UKAS - United Kingdom Accreditation Service.
(b) Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.
 - 3 Tests marked "NOT UKAS ACCREDITED" in this test report are not included in the UKAS Accreditation Schedule for this testing laboratory.
 - 4 This test report may not be reproduced other than in full except with the prior written approval of the issuing laboratory.



TEST REPORT.

ISSUED BY : SOIL PROPERTY TESTING LTD.

DATE OF ISSUE : As page 1 PAGE 2 of 8

Contract

Serial No.

UK14.1639 - 15a Parliament Hill

S28039

SCHEDULE OF LABORATORY TESTS

Bh./ Tp No.	Sample Ref	Depth (from)	1:Moisture Content Determination																Remarks	
			#:Liquid	Plastic limit																
WS1	D1.8	1.80	*	*																
	D2.8	2.80	*	*																
WS2	D1.0	1.00	*	*																
	D5.0	5.00	*	*																
-	-	-	4	4																<— Total Number of Tests —>

Scheduled by: Environmental Protection

Target Date: 05/09/14



TEST REPORT.

ISSUED BY : SOIL PROPERTY TESTING LTD.

DATE OF ISSUE : As page 1 PAGE 3 of 8

Contract
UK14.1639 - 15a Parliament
Hill

Serial No.
S28039



SUMMARY OF MOISTURE CONTENT, LIQUID LIMIT, PLASTIC LIMIT, PLASTICITY INDEX AND LIQUIDITY INDEX

Borehole/ Pit No.	Depth m.	Sample	Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Liquidity Index (%)	SAMPLE PREPARATION			Description	CLASS	
								Method S/N	Ret'd 0.425mm (%)	Corr'd M/C <0.425mm			Curing Time (hrs.)
WS1	1.80 -2.00	D1.8	28	75	29	45	0.02	N	0(A)		24	Stiff fissured dark yellowish brown CLAY with frequent orange ironstaining, occasional bluish grey mottling, recently active and decayed roots and rare orange silt partings	CV
WS1	2.80 -3.00	D2.8	29	65	26	39	0.08	N	0(A)		24	Stiff fissured dark yellowish brown CLAY with frequent orange silt partings, rare bluish grey mottling, selenite crystals and recently active and decayed roots	CH
WS2	4.00 -1.20	D1.0	32	79	32	47	0.00	N	0(A)		24	Stiff closely fissured dark yellowish brown CLAY with occasional bluish grey mottling, selenite crystals and recently active roots	CV
WS2	5.00 -5.30	D5.0	32	71	26	45	0.13	N	0(A)		24	Firm slightly fissured dark yellowish brown CLAY with occasional orange silt partings and rare selenite crystals	CV

METHOD OF PREPARATION : BS 1377:PART 1:1990:7.4 & PART 2:1990:4.2

S = Wet Sieved Specimen
N = prepared from Natural

METHOD OF TEST : BS 1377:PART 2:1990:3.2, 4.4, 5.3, 5.4

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter. A = Assumed, M = Measured

COMMENTS :

REMARKS TO INCLUDE : Sample disturbance, loss of moisture, variation from test procedure, location and origin of test specimen within original sample. Oven drying temperature if not 105-110 deg C.



TEST REPORT.

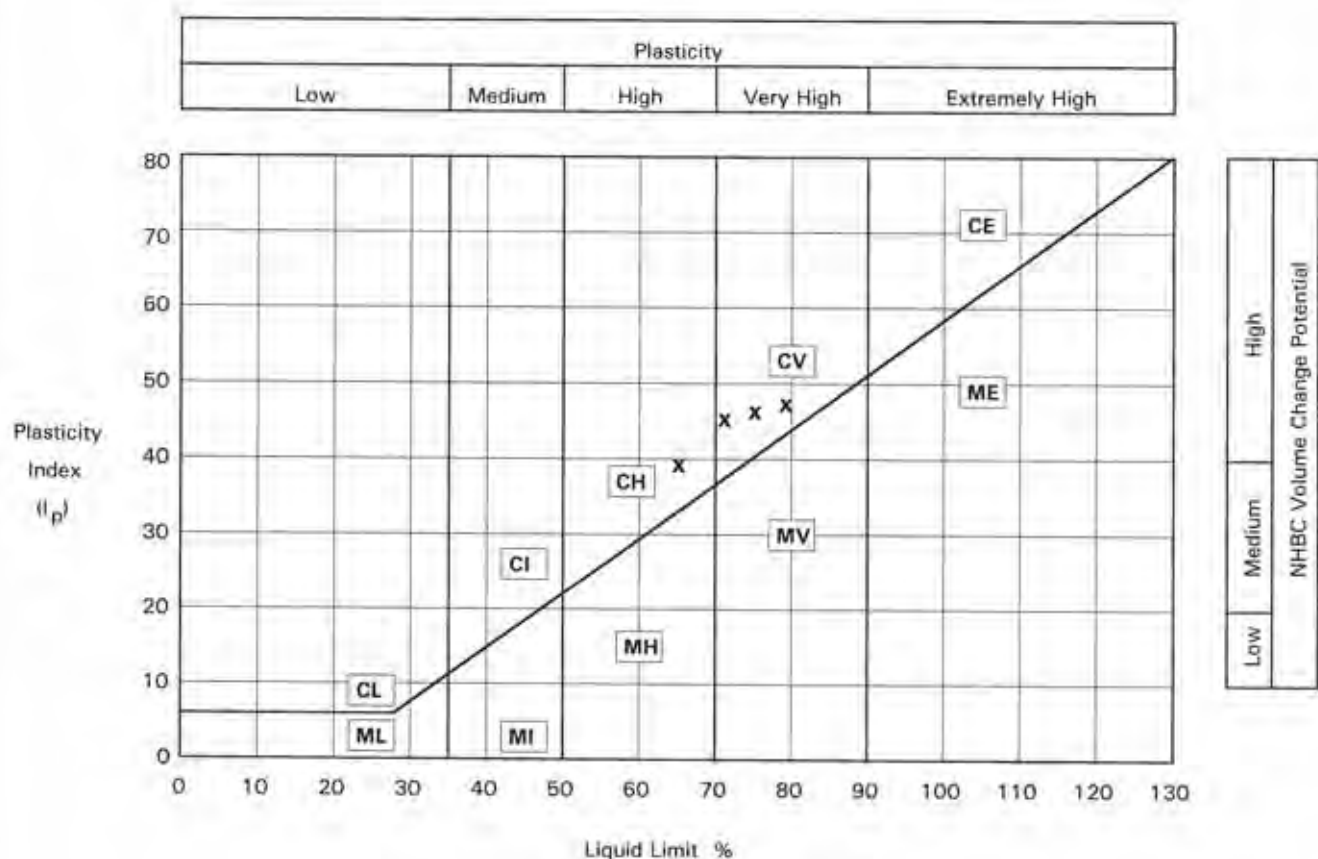
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DATE OF ISSUE : As page 1 PAGE 4 of 8

Contract
UK14.1639 - 15a Parliament
Hill

Serial No.
S28039

PLOT OF PLASTICITY INDEX AGAINST LIQUID LIMIT USING CASAGRANDE CLASSIFICATION CHART



METHOD OF PREPARATION: BS 1377:PART 1:1990:7.4 & PART 2:1990:4.2

METHOD OF TEST : BS 1377:PART 2:1990:3.2, 4.4, 5.3, 5.4

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter

COMMENTS : VOLUME CHANGE POTENTIAL: NHBC Standards Chapter 4.2 Unmodified Plasticity Index PLASTICITY CHART BS5930:1999:Figure 18



TEST REPORT.

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DATE OF ISSUE : As page 1 PAGE 5 of 8

Contract
UK14.1639 - 15a Parliament
Hill

Serial No.
S28039



DETERMINATION OF MOISTURE CONTENT, LIQUID LIMIT AND PLASTIC LIMIT AND DERIVATION OF PLASTICITY INDEX AND LIQUIDITY INDEX

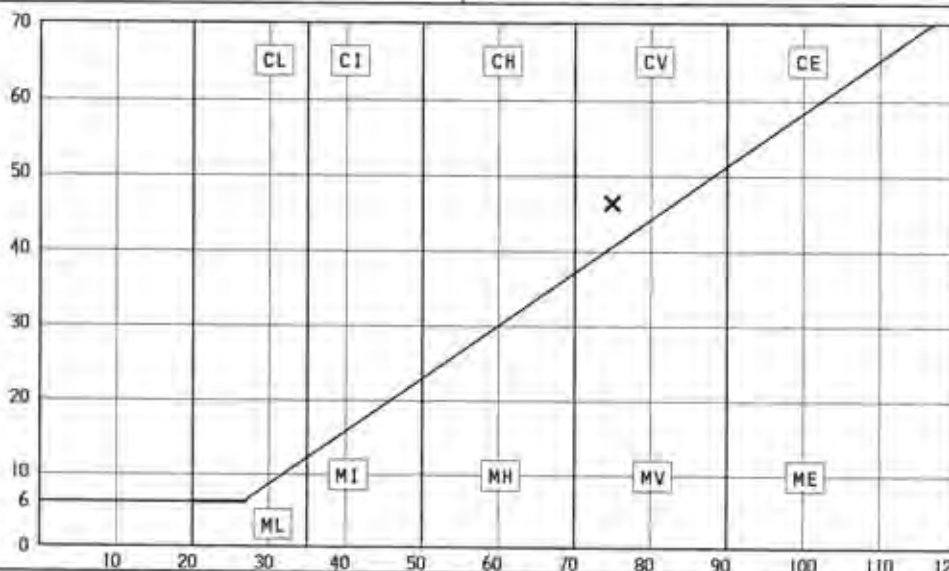
Borehole/ Pit No.	Depth m.	Sample	Moisture Content %	Description	Remarks
WS1	1.80 -2.00	D1.8	28	Stiff fissured dark yellowish brown CLAY with frequent orange ironstaining, occasional bluish grey mottling, recently active and decayed roots and rare orange silt partings	

PREPARATION		Liquid Limit	75 %
Method of Preparation	Specimen from Natural Soil	Plastic Limit	29 %
Sample retained 0.425 sieve	(Assumed)	Plasticity Index	46 %
Corrected moisture content for material passing 0.425mm	%	Liquidity Index	-0.02
Curing Time	24 Hours	Clay Content	Not analysed. %
		Derived Activity (PI/CC)	Not analysed.

C = CLAY

Plasticity
Index %
(I_p)

M = SILT



High
Medium
Low
NHBC Volume Change Potential

Liquid Limit %

METHOD OF PREPARATION: BS 1377:PART 1:1990:7.4 & PART 2:1990:4.2

METHOD OF TEST : BS 1377:PART 2:1990:3.2, 4.4, 5.3, 5.4

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter

COMMENTS : PLASTICITY CHART BS5930:1999:Figure 18
VOLUME CHANGE POTENTIAL: NHBC Standards Chapter 4.2 Unmodified Plasticity Index
NOTE: Modified Plasticity Index I'p = Ip x (% less than 425 microns/100)



TEST REPORT.

ISSUED BY : SOIL PROPERTY TESTING LTD.

DATE OF ISSUE : As page 1 PAGE 6 of 8

Contract
UK14.1639 - 15a Parliament
Hill

Serial No.
S28039



DETERMINATION OF MOISTURE CONTENT, LIQUID LIMIT AND PLASTIC LIMIT AND DERIVATION OF PLASTICITY INDEX AND LIQUIDITY INDEX

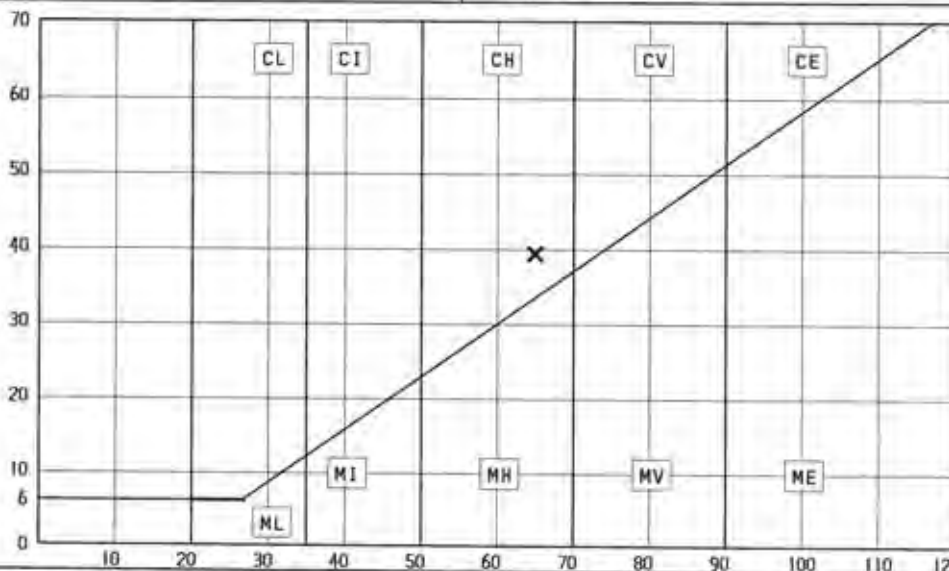
Borehole/ Pit No.	Depth m.	Sample	Moisture Content %	Description	Remarks
WS1	2.80 -3.00	12.8	29	Stiff fissured dark yellowish brown CLAY with frequent orange silt partings, rare bluish grey mottling, selenite crystals and recently active and decayed roots	Oven dried at a maximum of 80°C due to the presence of selenite

PREPARATION		Liquid Limit	65 %
Method of Preparation	Specimen from Natural Soil	Plastic Limit	26 %
Sample retained 0.425 sieve (Assumed)	0 %	Plasticity Index	39 %
Corrected moisture content for material passing 0.425mm	%	Liquidity Index	0.08
Curing Time	24 Hours	Clay Content	Not analysed. %
		Derived Activity (PI/CC)	Not analysed.

C = CLAY

Plasticity Index % (I_p)

M = SILT



High	NHBC Volume Change Potential
Medium	
Low	

Liquid Limit %

METHOD OF PREPARATION: BS 1377:PART 1:1990:7.4 & PART 2:1990:4.2

METHOD OF TEST : BS 1377:PART 2:1990:3.2, 4.4, 5.3, 5.4

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter

COMMENTS : PLASTICITY CHART BS5930:1999:Figure 18
VOLUME CHANGE POTENTIAL: NHBC Standards Chapter 4.2 Unmodified Plasticity Index
NOTE: Modified Plasticity Index I'_p = I_p × (% less than 425 microns/100)



TEST REPORT.

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DATE OF ISSUE : As page 1 PAGE 7 of 8

Contract
UK14.1639 - 15a Parliament
Hill

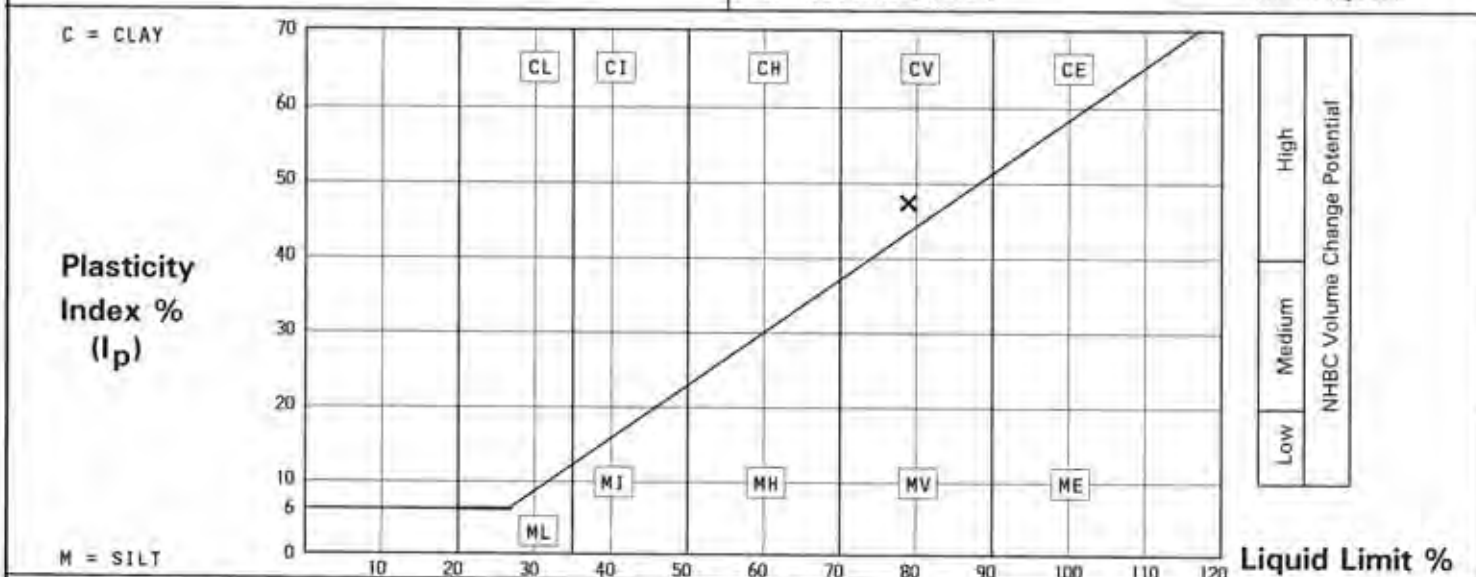
Serial No.
S28039



DETERMINATION OF MOISTURE CONTENT, LIQUID LIMIT AND PLASTIC LIMIT AND DERIVATION OF PLASTICITY INDEX AND LIQUIDITY INDEX

Borehole/ Pit No.	Depth m.	Sample	Moisture Content %	Description	Remarks
WS2	1.00 -1.20	D1.0	32	Stiff closely fissured dark yellowish brown CLAY with occasional bluish grey mottling, selenite crystals and recently active roots	Oven dried at a maximum of 80°C due to the presence of selenite

PREPARATION		Liquid Limit	79 %
Method of Preparation	Specimen from Natural Soil	Plastic Limit	32 %
Sample retained 0.425 sieve (Assumed)	0 %	Plasticity Index	47 %
Corrected moisture content for material passing 0.425mm	%	Liquidity Index	0.00
Curing Time	24 Hours	Clay Content	Not analysed. %
		Derived Activity (PI/CC)	Not analysed.



METHOD OF PREPARATION: BS 1377:PART 1:1990:7.4 & PART 2:1990:4.2

METHOD OF TEST : BS 1377:PART 2:1990:3.2, 4.4, 5.3, 5.4

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter

COMMENTS : PLASTICITY CHART BS8930:1999:Figure 18
VOLUME CHANGE POTENTIAL: NHBC Standards Chapter 4.2 Unmodified Plasticity Index
NOTE: Modified Plasticity Index I'_p = I_p x (% less than 425 microns/100)



TEST REPORT.

ISSUED BY : SOIL PROPERTY TESTING LTD.

DATE OF ISSUE : As page 1 PAGE 8 of 8

Contract
UK14.1639 - 15a Parliament
Hill

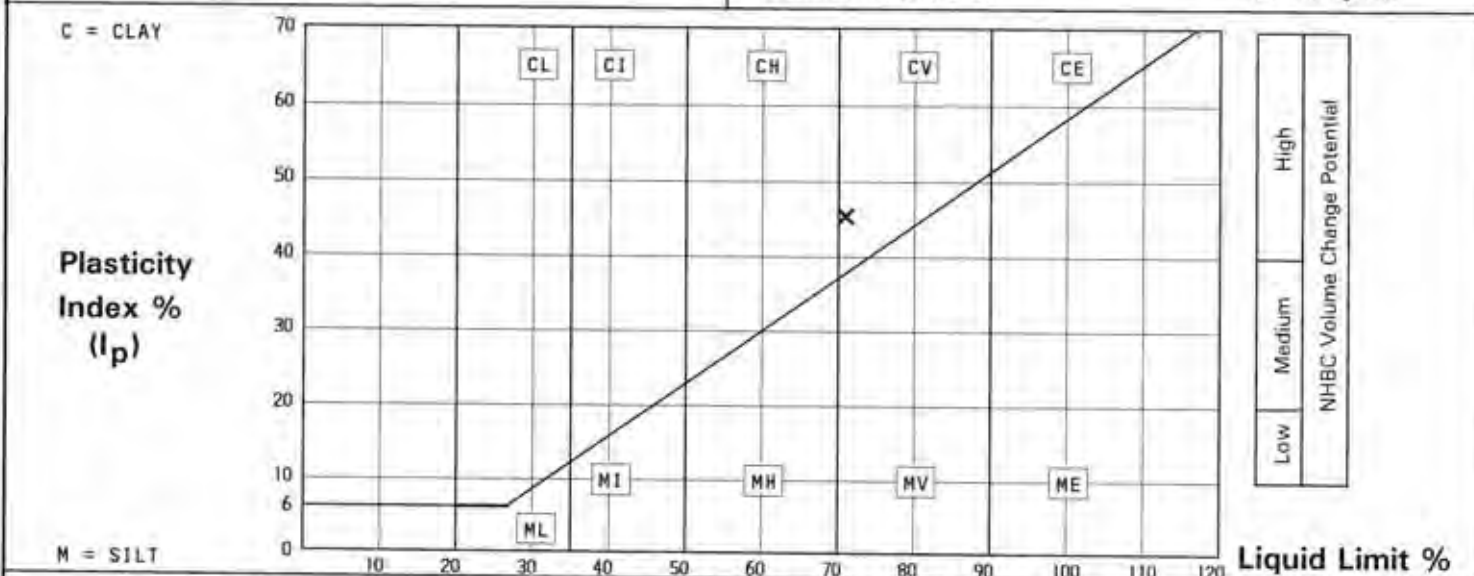
Serial No.
S28039



DETERMINATION OF MOISTURE CONTENT, LIQUID LIMIT AND PLASTIC LIMIT AND DERIVATION OF PLASTICITY INDEX AND LIQUIDITY INDEX

Borehole/ Pit No.	Depth m.	Sample	Moisture Content %	Description	Remarks
WS2	5.00 -5.10	D5.0	32	Firm slightly fissured dark yellowish brown CLAY with occasional orange silt partings and rare selenite crystals	Oven dried at a maximum of 80°C due to the presence of selenite

PREPARATION		Liquid Limit	71 %
Method of Preparation	Specimen from Natural Soil	Plastic Limit	26 %
Sample retained 0.425 sieve	(Assumed)	Plasticity Index	45 %
Corrected moisture content for material passing 0.425mm	%	Liquidity Index	0.13
Curing Time	24 Hours	Clay Content	Not analysed. %
		Derived Activity (PI/CC)	Not analysed.



METHOD OF PREPARATION: BS 1377:PART 1:1990:7.4 & PART 2:1990:4.2

METHOD OF TEST : BS 1377:PART 2:1990:3.2, 4.4, 5.3, 5.4

TYPE OF SAMPLE KEY : U = Undisturbed, B = Bulk, D = Disturbed, J = Jar, W = Water, SPT = Split Spoon Sample, C = Core Cutter

COMMENTS : PLASTICITY CHART BS5930:1999:Figure 18
VOLUME CHANGE POTENTIAL: NHBC Standards Chapter 4.3 Unmodified Plasticity Index
NOTE: Modified Plasticity Index I'_p = I_p × (% less than 425 microns/100)



APPENDIX J

Tier I Screening Criteria

EPS Tier 1 Qualitative Risk Assessment

Generic Assessment Criteria - Residential Land Use

Contaminant	Tier 1 Soil Targets			Tier 1 Groundwater Targets	
	Human Health	Controlled Waters		Controlled Waters	
		LGWRP	HGWRP	LGWRP	HGWRP
Unit	mg/kg			ug/l	
Arsenic	32	n/c	n/c	50	10
Cadmium	10	n/c	n/c	5	5
Chromium	3000	n/c	n/c	250	50
Chromium VI	4.3	n/c	n/c	n/c	n/c
Copper	2330	n/c	n/c	28	28
Mercury	170	n/c	n/c	1	1
Nickel	130	n/c	n/c	200	50
Lead	200	n/c	n/c	250	10
Selenium	350	n/c	n/c	10	10
Zinc	3750	n/c	n/c	500	500
Benzene	0.33	0.252	0.008	30	1
Toluene	6.10E+02	1.17	1.17	50	50
Ethylbenzene	3.50E+02	15.0	10.0	300	200
Xylene	2.30E+02	0.885	0.885	30	30
MTBE	-	0.138	0.0276	75	15
Benzo(a)Pyrene	8.30E-01	10	1.44	0.7	0.1
Naphthalene	1.50E+00	0.934	0.02	10	0.1
Dibenz(ah)anthracene	7.60E-01	n/c	n/c	n/c	n/c
Aliphatic C5-C6	3.00E+01	5.27	1.05	50	10
Aliphatic C6-C8	7.30E+01	23.2	4.64	50	10
Aliphatic C8-C10	1.90E+01	175	35.1	50	10
Aliphatic C10-C12	9.30E+01	1380	276	50	10
Aliphatic C12-C16	7.40E+02	27500	5490	50	10
Aliphatic C16-C35	4.50E+04	3.46E+06	6.91E+05	50	10
Aromatic C8-C10	2.70E+01	8.74	1.75	50	10
Aromatic C10-C12	6.90E+01	13.8	2.76	50	10
Aromatic C12-C16	1.40E+02	27.5	5.5	50	10
Aromatic C16-C21	2.50E+02	86.9	17.4	50	10
Aromatic C21-C35	8.90E+02	690	138	50	10

Notes:

LGWRP - Low Groundwater Resource Potential
 HGWRP - High Groundwater Resource Potential
 >SOL - GAC exceeds solubility saturation limit
 n/c - not calculated

Tier 1 Soil Targets

Targets for Human Health have been taken from available Soil Guideline Values (SGVs), derived using standard sandy loam soil with 6% SOM. For contaminants where SGVs are not currently available, GACs from LQM & CIEH 'Generic Assessment Criteria for Human Health Risk Assessment - 2nd edition (2009)' derived using standard sandy loam soil with 1% SOM were used as alternatives. The SGV for lead has now been withdrawn and in this case it has been considered most appropriate to use the Category 4 Screening Level (C4SL) issued by DEFRA in December 2009. For sites where ground conditions differ significantly from sandy loam or site-specific SOM and pH are available, the Tier 1 human health targets may be revised.

Targets for Controlled waters have been derived using EA Remedial Targets Worksheet (v3.1) - using standard Sandy Loam ground conditions as described in Science Report SC050021/SR3, assuming no degradation for a 10m compliance distance with criteria of EQS or UKDWS for LGWRP and HGWRP respectively (see notes for Tier 1 GW targets)

Tier 1 Groundwater Targets

For LGWRP, targets have been taken as Freshwater EQS where available. For Ethylbenzene and BaP the WHO Health limit has been used and for MTBE and individual TPH fractions a 5 times multiplier of taste threshold and UKDWS has been taken respectively.

For HGWRP, targets have been taken as UKDWS where available, with the exception of Copper and Zinc where the EQS is lower than the DWS and therefore the EQS has been used as the groundwater target. For Ethylbenzene the upper WHO ATO limit has been used. For Toluene and Xylene, the WHO ATO limit is higher than the EQS and so the lower value has been taken. For MTBE the taste threshold has been taken.



APPENDIX K

Example Method Statement for Construction Workers Encountering Unexpected Contamination

METHOD STATEMENT

ACTIONS TO BE TAKEN IN THE EVENT OF DISCOVERING UNEXPECTED CONTAMINATION DURING INTRUSIVE GROUNDWORKS

If at any point during intrusive groundworks at a site, evidence of unforeseen contamination is encountered in the form of significant noxious odours, discolouration, or instability within soils or sheen / discolouration in groundwater, the following actions will be taken:

- Intrusive works in the immediate area of the impacted ground will be suspended and the continuation of work in other areas of the site will be considered within the context of the site specific health & safety plan.
- Environmental Protection Strategies Ltd (EPS) will be contacted and appraised of the situation so that arrangements can be made to characterise the impact and determine what action may be necessary in addition to the scheduled site works. Where possible / health & safety plan permits, digital photographs of the impacted ground will be taken and emailed to EPS at the address below to assist in the initial assessment.
- It may well be necessary for EPS to attend site to undertake visual inspection and obtain samples for field and/or laboratory analysis, although the actions taken will be dependent on the nature of what is encountered.
- In cases where EPS consider the unforeseen contamination likely to pose a significant risk of significant harm to adjacent site users or local environmental receptors, the local authority and the Environment Agency will be informed of the situation and the actions being taken.
- Once appropriate action has been agreed and undertaken a written summary will be produced by EPS for submission to the Local Authority (and where relevant, the Environment Agency) in accordance with planning requirements. The submission will include details of work undertaken, analytical results of investigative and validation samples obtained and conclusions and recommendations for any further actions considered necessary.
- Where regulatory bodies have been involved, site works should only recommence following their agreement and in all cases should only recommence when the site manager considers it safe to do so within the context of the site specific health & safety plan.

EPS Contact Details:

Principal Contact	Giles Lock	Director	Tel: 0781 253 9656
Secondary Contact	Will Evans	Director	Tel: 0781 253 9655

Email: info@epstrategies.co.uk (automatically forwarded to both of the above and office based personnel)