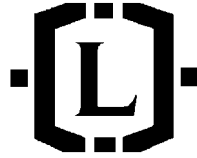


LISTERS

Geotechnical Consultants



Northamptonshire County Council

Geotechnical Investigation

**Church Street
BRIXWORTH
Northamptonshire**

**Report No:09.09.011
October 2009**

MAIN OFFICE & LABORATORIES
Slapton Hill Barn, Blakesley Road, Slapton, Towcester, Northamptonshire NN12 8QD
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GEOTECHNICAL INVESTIGATION REPORT

INTRODUCTION

A ground investigation has been undertaken on land adjoining Church Street, Brixworth, Northamptonshire. A Site Location Plan is provided in Appendix A.

The Ordnance Survey National Grid reference for the site is approximately SP 747 711.

This report describes the work carried out by Listers Geotechnical Consultants, the ground conditions encountered and discusses their implications with regard to the proposed development.

The report discusses the geotechnical implications with regard to the proposed development based on the findings of the fieldwork and subsequent laboratory testing.

Instructions to undertake the investigation were received from Mr R Daniels of Lambert Smith Hampton, the clients agent, in a telephone call on 3rd September 2009.

To our knowledge the site has not been subject to a previous investigation.

This report has been prepared for the sole use of the client and their professional advisors. This report shall not be relied upon by third parties without the express written authority of Listers Geotechnical Consultants. If an unauthorised third party comes into possession of this report they must not rely on it and the authors owe them no duty of care and skill.

SCOPE OF THE INVESTIGATION

The scope of the investigation was to provide an assessment of the geotechnical engineering properties of the ground and to assess the potential waste classification of any soils to be removed from site.

PROPOSALS

It is proposed to redevelop the site to accommodate a children's centre with internal renovation of the existing structure and a small extension on the east of the building to accommodate the new reception area.

SITE INFORMATION AND WALKOVER SURVEY

The site lies in a predominantly residential area, and is currently occupied by a small rectangular building.

The site consists of a rectangular parcel of land, trending approximately east to west.

The site is generally flat lying however it lies on a larger gentle slope down to the south. The site is bordered to the east by a community centre, a small green to the north and an un-named lane to the west. The site fronts onto Church Street to the south.

The building itself is single-storey, rectangular and of brick construction. This building is situated in the west of the site and the remainder of the site is Tarmac covered. The Tarmac is old and cracked and weeds are growing through the cracks.

The Tarmac area of the site is surrounded by a stone wall.

There is a small footpath along the north of the building leading to the green to the north of the site. This area to the north is separated by a stone retaining wall.

No obvious sources of contamination or structural damage were noted on the site during the walkover survey.

GEOLOGY

Published Geology

Reference to published geological information on the area indicates that the site is underlain by the Northampton Sand Formation of Jurassic age. This Formation is generally represented by an orange brown sandy ironstone with lenses of mudstone and limestone occurring up to 8m in thickness in this area.

EXPLORATION AND TESTING

GENERAL

A total of two hand excavated trial pits were put down on 17th September 2009.

SAMPLING STRATEGY

The positions of the exploratory holes were selected by Lambert Smith Hampton.

The position of all exploratory holes undertaken at the site as part of this investigation can be seen on the Exploratory Hole Location Plan included in Appendix A. The results of the laboratory testing are provided in Appendix B.

METHODOLOGY

The trial pits, TP1 to TP2 were excavated by hand to a maximum depth of 1.00m below ground level. On completion, the trial pits were carefully backfilled with arisings in thin layers, ensuring that excavated material was replaced in the same order as it had been removed

Engineering conclusions given in this report are based on data obtained from these sources but it should be noted that variations, which affect these conclusions, may occur between and beyond the test locations. Also water levels may vary with time.

GROUND CONDITIONS

The site and laboratory test work revealed that the general succession of strata can be represented by Made Ground overlying the Northampton Sand Formation. It may be summarised as follows:

Made Ground - encountered at each test location from ground level down to depths of between 0.30m and 0.65m. Represented in general by brown sandy clayey topsoil with abundant fine to medium sub-rounded to angular gravel, ironstone cobbles, brick, concrete and coal ash. This is generally overlain by a 0.1m thick layer of Tarmac.

Northampton sand Formation –

encountered at each test location from between 0.30m and 0.65m depth down to the base of the trial pits at 1.0m depth. Represented in general by soft to firm silty very sandy clay with abundant fine sub-angular ironstone gravels and cobbles.

Classification tests on selected samples revealed moisture contents ranging from 17% to 19% with the fines fraction classified as a soil of very low volume change potential.

Restricted sieve analyses on corresponding samples revealed a granular soil fraction of between 71% and 76%.

Loss on ignition tests revealed an organic content of 8%.

Sulphate and pH Tests

Soluble sulphate tests carried out on samples recovered from the exploratory holes recorded values of 0.06g/l and 0.25g/l, in conjunction with pH values of 7.9 and 8.0.

GROUNDWATER

Groundwater was not encountered during fieldwork down to a depth of 1.0m.

EXISTING FOUNDATIONS

The existing foundations were revealed in the hand excavated trial pits TP1 and TP2. Test positions were selected by the client, Lambert Smith Hampton. The findings may be summarised in the following table:-

Trial Pit	Trial Pit Location	Foundation Depth (m)	Foundation Details	Projection (m)	Foundation Soil Type
TP1	Centre of the east side of the building	0.9	Strip footing	0.16	Northampton Sand Formation
TP2 Profile A – west face	Top of steps in the north of the site	0.2	Strip footing	0.13	Made Ground
TP2 Profile B – north face	Top of steps in the north of the site	0.16	Concrete raft to the steps?	0.10	Made Ground

GEOTECHNICAL ENGINEERING CONCLUSIONS

GROUND CONDITIONS

The site and laboratory test work confirmed the generally expected ground conditions with Made Ground overlying the Northampton Sand Formation.

Some variation was noted to occur within the Made Ground. The Made Ground generally comprised brown sandy clayey topsoil with abundant fine to medium sub-rounded to angular gravel, ironstone cobbles, brick, concrete and coal ash, overlain by a 0.1m thick layer of Tarmac. The depth of the Made Ground varied between 0.3m and 0.65m. This is most likely due to the site being a level site on a larger slope. Therefore some areas of the site may have been in-filled.

The Northampton Sand Formation generally comprised soft to firm silty very sandy clay with abundant fine sub-angular ironstone gravels and cobbles. This was encountered down to the base of the trial pits at 1.0m depth.

Groundwater was not encountered during fieldwork down to a depth of 1.0m.

SITE EXCAVATION

Conventional hydraulic plant should be satisfactory for excavating foundation and service trenches within the Made Ground and natural deposits. However specialist breaking plant may be required to assist in the removal of the Tarmac.

In line with recent HSE guidelines, all excavations requiring personnel access should be adequately supported to avoid the risk of collapse. Excavations within the Made Ground and natural deposits are likely to remain stable in the short term. Excavations below 1.0m may be unstable.

Groundwater is not expected to be encountered at depths of approximately 1.0m. however if the excavations are left open, water may accrue and dewatering may be required. Conventional pumping from sumps should be satisfactory in order to maintain a dry excavation.

FOUNDATION SOLUTIONS

Shallow Foundations

The Made Ground is considered unsuitable as a bearing stratum due to its variability, and potential for unacceptable total and differential settlement under applied foundation loadings.

The Northampton Sand Formation is considered to be a suitable bearing stratum for conventional shallow foundations at not less than 1.0m below existing ground level or 0.20m into the top of the formation, whichever is the deeper.

At this depth a safe bearing capacity of 60kPa may be adopted for foundations not exceeding one metre in width. This allows for a factor of safety of three against shear failure and for settlements generally not to exceed 25mm taking place over a number of years.

It should be noted that although the soils were very low shrinkage potential, large trees could have an affect on the soils below the existing foundations, due to the variable clay fraction of the Northampton Sand Formation.

Care should be taken to ensure that any new planting in the development will not affect the new foundations.

GROUND FLOOR SLABS

Provided all Made Ground is stripped off, ground supported floor slabs may be used, placed on a layer of well compacted granular fill.

DISPOSAL OF WASTE MATERIAL

The excavation on site will produce a considerable amount of surplus soil. Under current waste management legislation this soil is classified as waste and needs disposing of at a licensed facility.

Currently, if surplus soil is 'fit for re-use' on the site, exemptions can be sought from the Environment Agency to allow this activity.

If it is decided that the soil should be taken off-site as waste and disposed of, the implementation of the Landfill Directive means that the waste soil requires classification prior to leaving site.

Waste Acceptance Criteria (WAC) Testing Results

To classify the waste soil Waste Acceptance Criteria (WAC) testing has been carried out on one representative samples collected from site. The results show that this soil **passes** the **inert** waste criteria.

The laboratory testing results are presented in Appendix C.

Analytical results relevant to the materials being disposed of should be provided to landfill operators to confirm whether it meets their license agreements and to confirm tipping costs.

Site Waste Management Plan

In England, from 6 April 2008, you must have a site waste management plan (SWMP) for all new construction projects worth more than £300,000.

The level of detail that your SWMP should contain depends on the estimated build cost, excluding VAT.

For projects estimated at between £300,000 and £500,000 (excluding VAT) the SWMP should contain details of the:

- types of waste removed from the site
- identity of the person who removed the waste
- site that the waste is taken to.

For projects estimated at over £500,000 (excluding VAT) the SWMP should contain details of the:

- types of waste removed from the site
- identity of the person who removed the waste and their waste carrier registration number
- a description of the waste
- site that the waste was taken to
- environmental permit or exemption held by the site where the material is taken.

At the end of the project, you must review the plan and record the reasons for any differences between the plan and what actually happened.

SUBSURFACE CONCRETE

With respect to BRE Special Digest 1 'Concrete in Aggressive Ground' (2005), chemical tests on selected soil samples have recorded maximum soluble sulphate concentrations of 0.06g/l and 0.25g/l. The pH values were 7.9 and 8.0.

This would correspond to a Design Sulphate Class of **DS-1**.

In terms of BRE Digest 1 'Concrete in Aggressive Ground' (2005) the former land use on the site means that it should be considered as brownfield land.

The groundwater beneath the site should be considered as mobile.

The chemical test results should be assessed in accord with BRE Special Digest 1 and appropriate action taken for any new sub-surface concrete requirements. Reference to this document indicates that these results correspond to **AC-1** class (ACEC) 'Aggressive Chemical Environment for Concrete' in the ground.

REFERENCES

1. National House Building Council (NHBC) Standards, Chapter 4.2 Building near trees. September 2006.
2. Site Investigations, Code of Practice, BS5930, 1999
3. Soils for Civil engineering Purposes, BS1377, 1990
4. Foundations, BS8004, 2000
5. Concrete in Aggressive Ground, BRE Special Digest 1, 2003

LISTERS 09-09-011

Prepared By: - Emelye Towell
M.geol (Hons),FGS



Signed.....

Checked By: - Dr Mark Cowley
B.Sc, M.Sc, Ph.D, M.C.S.M, FGS, C.Geol, C.Sci

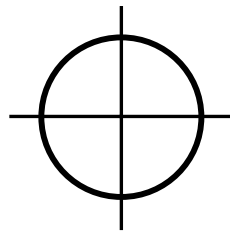
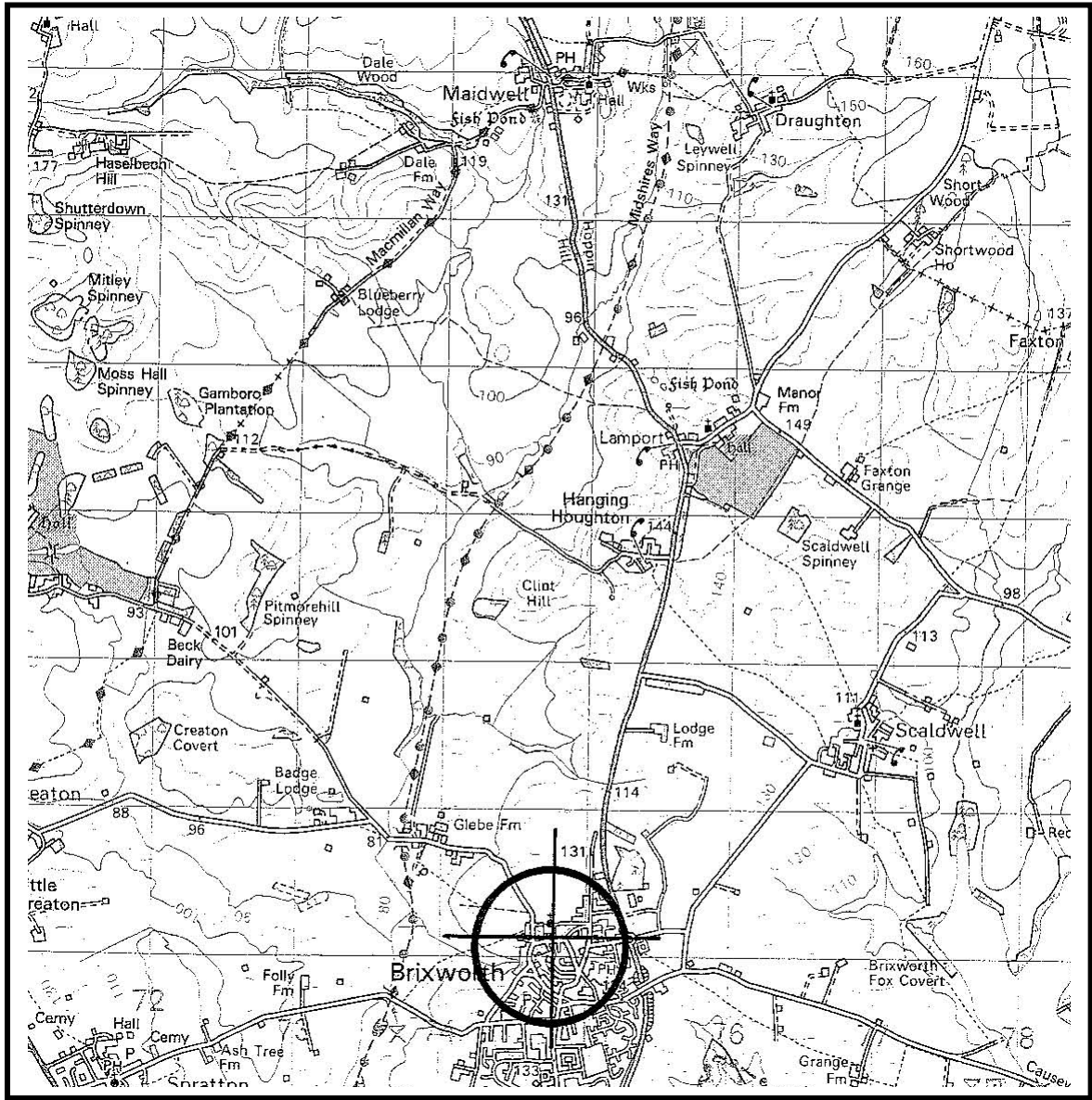


Signed.....

For and on behalf of Listers Geotechnical Consultants

APPENDIX 'A'

Site Work



Site Location

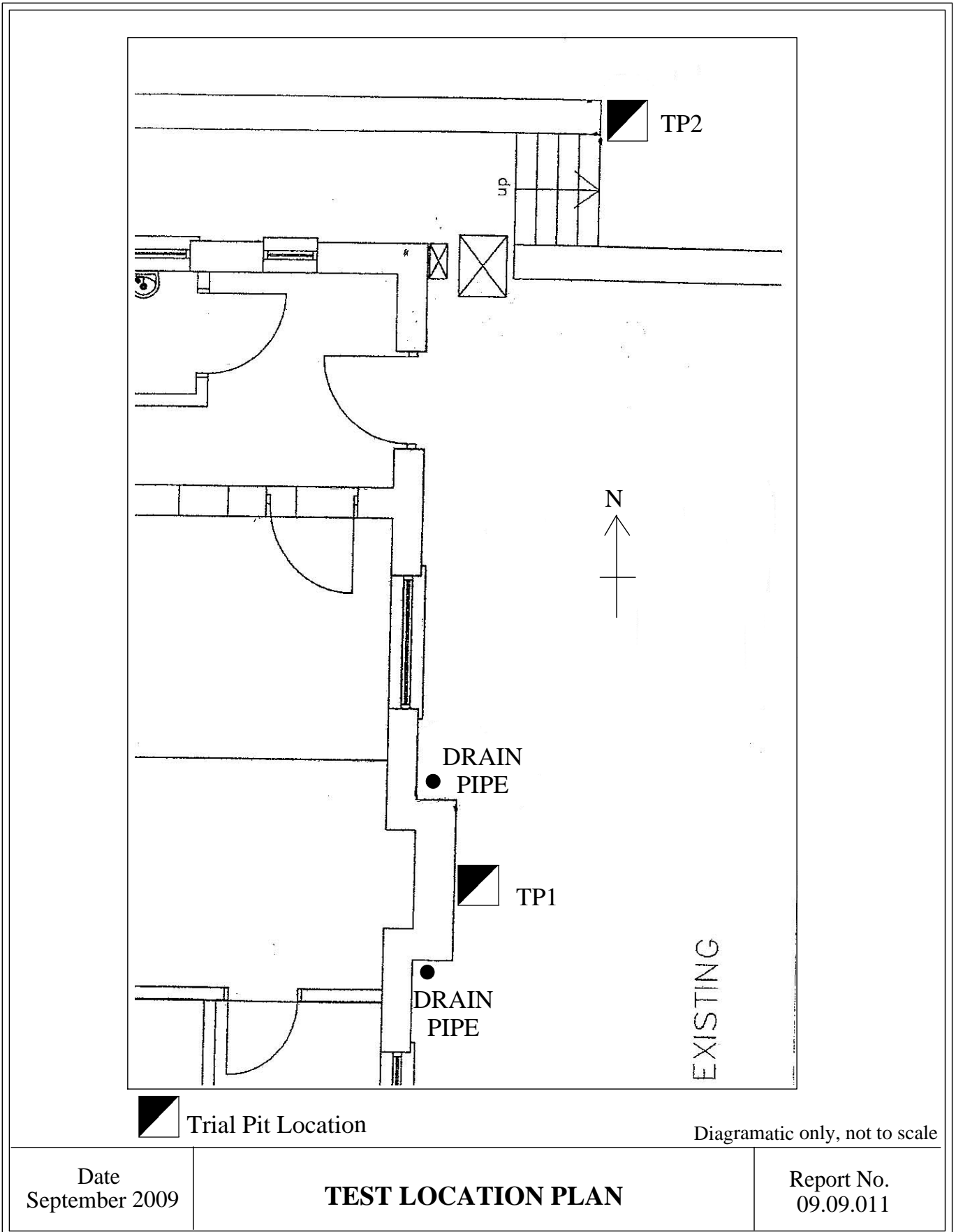
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Crown Copyright

Date
October 2009

SITE LOCATION MAP

Report No.
09.09.011



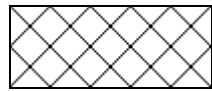
Date
September 2009

TEST LOCATION PLAN

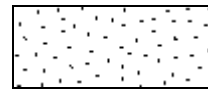
Report No.
09.09.011

1.0 SOIL/ROCK SYMBOLS

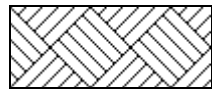
1.1 Soils



Made Ground



Sand



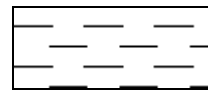
Topsoil



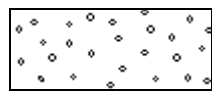
Silt



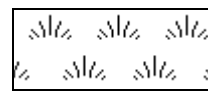
Boulders and Cobbles



Clay

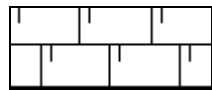


Gravel

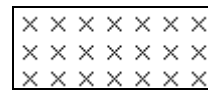


Peat

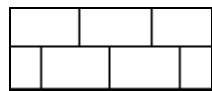
1.2 Rocks, Sedimentary



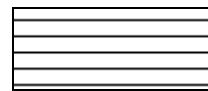
Chalk



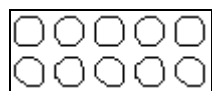
Siltstone



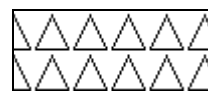
Limestone



Mudstone



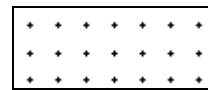
Conglomerate



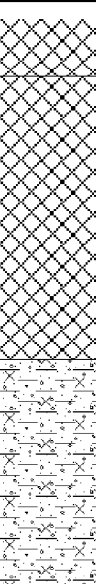
Breccia



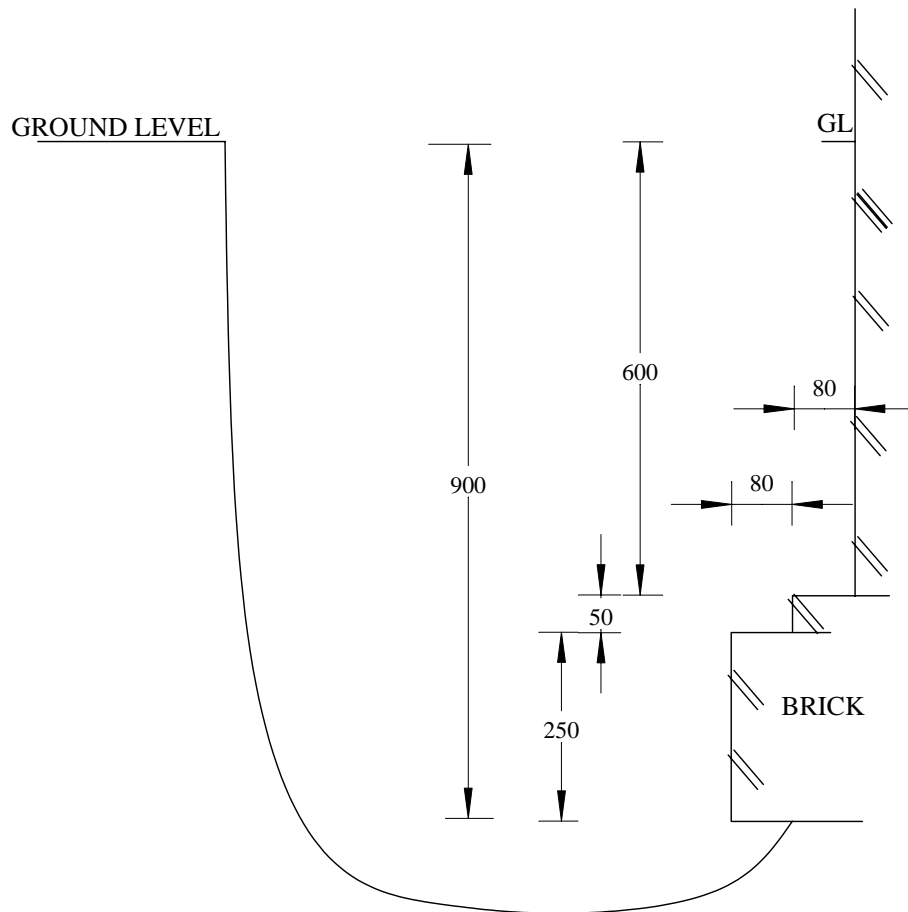
Coal



Sandstone

LOCATION: Proposed Childrens Centre, Church Street, Brixworth, Northamptonshire		TRIAL PIT: TP1					
		Date of Excavation: 17/09/2009					
Description of Strata	Strata Change		Samples		Hand Vane (kPa)	Water Level -m	
	Legend	Depth -m		Depth -m			Type
		Scale	Strata				
TARMAC		0.00	(0.10)	0.50	D	Dry	
MADE GROUND Brown sandy slightly clayey TOPSOIL with abundant ironstone cobbles, occasional fine to medium subrounded and angular gravel, tarmac and roots		0.10	(0.50)				
NORTHAMPTON SAND FORMATION Soft to firm orange brown slightly silty very sandy CLAY with occasional fine subangular ironstone gravel, and medium roots		0.60	(0.40)				
Trial Pit terminated at 1.00 m		1.00	1.00	1.00	D		
Remarks 1. Method of excavation: Hand equipment 2. Trial pit dimensions: 0.4 x 0.4 x 1.0m 3. Foundation profile revealed		2.00	<div style="display: flex; flex-direction: column; gap: 5px;"> ∇ Water Strike ▼ Water (Standing Level) W Water Sample B Bulk Sample D Small Disturbed Sample V Vane Test P Penetrometer Test M Mexe Penetrometer CBR CBR Sample UF Under Foundations </div>				
Date October 2009	TRIAL PIT LOG			Report No. 09.09.011 Client Ref:			

TRIAL PIT ONE

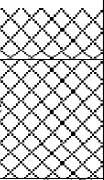
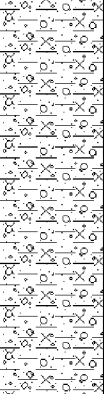


Scale 1:10 All Dimensions in Millimeters

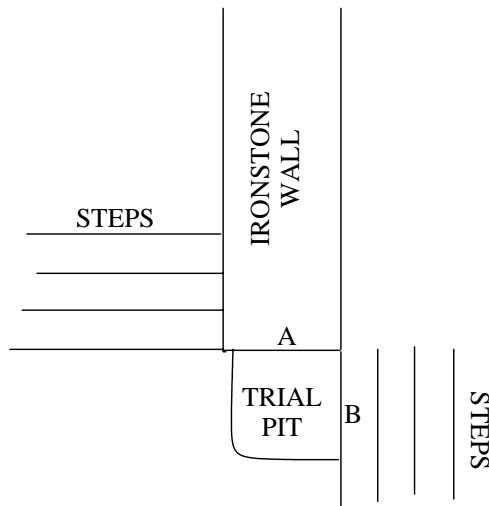
Date
October 2009

TRIAL PIT PROFILE

Report No.
09.09.011

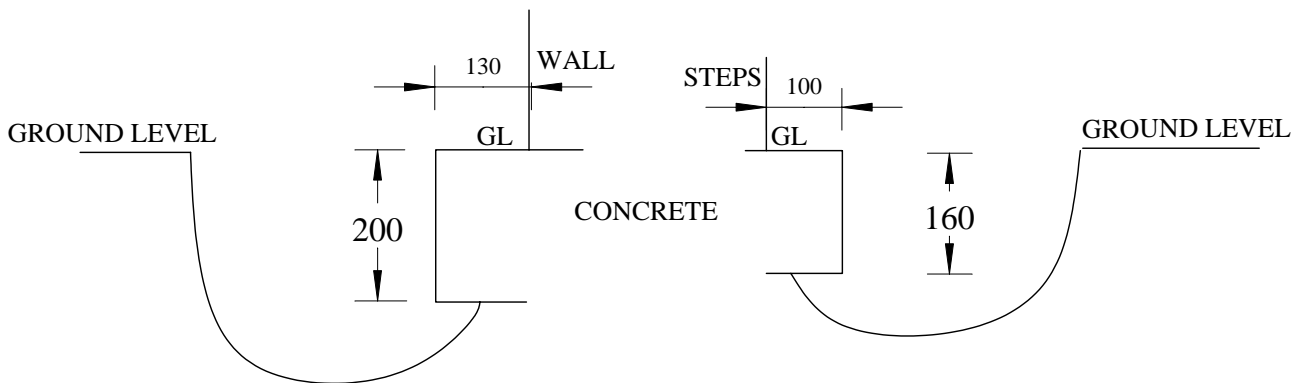
LOCATION: Proposed Childrens Centre, Church Street, Brixworth, Northamptonshire		TRIAL PIT: TP2					
		Date of Excavation: 17/09/2009					
Description of Strata	Strata Change		Samples		Hand Vane (kPa)	Water Level -m	
	Legend	Depth -m		Depth -m			Type
		Scale	Strata				
TARMAC		0.00	(0.09)	0.50	D	Dry	
MADE GROUND Light brown very clayey TOPSOIL with abundant fine to medium subrounded and angular gravel, brick, concrete and coal ash		0.09	(0.21)				
NORTHAMPTON SAND FORMATION Soft to firm light brown slightly silty very sandy CLAY with abundant fine weak ironstone cobbles and gravels		0.30	(0.70)	1.00	D	Dry	
<i>Trial Pit terminated at 1.00 m</i>		1.00	1.00				
Remarks 1. Method of excavation: Hand equipment 2. Trial pit dimensions: 0.3 x 0.3 x 1.0m 3. Foundation profile revealed		2.00	<div style="display: flex; justify-content: space-between;"> <div style="width: 40%;"> <p>▽ Water Strike</p> <p>▼ Water (Standing Level)</p> <p>W Water Sample</p> <p>B Bulk Sample</p> <p>D Small Disturbed Sample</p> <p>V Vane Test</p> <p>P Penetrometer Test</p> <p>M Mexe Penetrometer</p> <p>CBR CBR Sample</p> <p>UF Under Foundations</p> </div> <div style="width: 55%;"> </div> </div>				
Date October 2009	TRIAL PIT LOG			Report No. 09.09.011 Client Ref:			

TRIAL PIT TWO



PROFILE A

PROFILE B



Scale 1:10 All Dimensions in Millimeters

Date
October 2009

TRIAL PIT PROFILE

Report No.
09.09.011

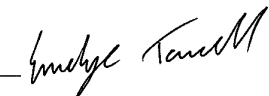
APPENDIX 'B'
Laboratory Test Work

GroundTech Laboratories

Geotechnical Testing Facility

Slapton Hill Barn, Blakesley Road, Slapton, Towcester, Northants. NN12 8QD

Telephone:- 01327 860947/860060 Fax:- 01327 860430 Email: groundtech@listersgeotechnics.co.uk

PROJECT INFORMATION		SAMPLE INFORMATION		
Site Location:-	Proposed Childrens Centre, Church Street Brixworth, Northamptonshire	Laboratory Tests Undertaken:-		
Client:-	Northamptonshire County Council	TEST TYPE	TEST METHOD	TESTED
Client Reference:-	-	Natural Moisture Contents (MC%)	(BS 1377:Part 2:1990 Clause 3.2)	✓
Date Samples Received:-	21 September 2009	Liquid Limits (%)	(BS 1377:Part 2:1990 Clause 4.3)	✓
Date Testing Completed:-	30 September 2009	Plastic Limits (%)	(BS 1377:Part 2:1990 Clause 5.3)	✓
		Plasticity Index (%)	(BS 1377:Part 2:1990 Clause 5.4)	✓
		Linear Shrinkage (%)	(BS 1377:Part 2:1990 Clause 6.5)	
		PSD - Wet Sieving	(BS 1377:Part 2:1990 Clause 9.2)	✓
		Engineering Sample Descriptions	(BS 5930 : Section 6)	
		Passing 425/63 (µm)	-	✓
		Hydrometer	(BS 1377:Part 2:1990 Clause 9.5)	
		Loss on Ignition (%)	-	✓
		Soil Suctions (kPa)	BRE Digest IP 4/93, 1993	
		Bulk Density (Mg/m ³)	(BS 1377:Part 2:1990 Clause 7.2)	
		Strength Tests	(BS 1377:Part 7:1990 Clause 8 & 9)	
		Soluble Sulphate Content (SO ⁴ g/l)	(BS 1377:Part 3:1990 Clause 5.3)	✓
		pH value	(BS 1377:Part 3:1990 Clause 9.4)	✓
		California Bearing Ratios (CBR)	(BS 1377:Part 4:1990 Clause 7)	
		Compaction Tests	(BS 1377:Part 4:1990 Clauses 3.0-3.6)	
The results relate only to the samples tested				
This test-report may not be reproduced, except with full and written approval of GROUNDTECH LABORATORIES		Laboratory testing in accord with BS EN ISO/IEC 17025-2000 and Quality Management in accord with ISO 9001		
Signed on behalf of GroundTech Laboratories:-  Technical Signatory				Quality Assured to ISO 9001
Report Date September 2009	GEOTECHNICAL LABORATORY TEST RESULTS			Project Ref 09.09.011

GroundTech Laboratories

Geotechnical Testing Facility

Slapton Hill Barn, Blakesley Road, Slapton, Towcester, Northants. NN12 8QD

Telephone:- 01327 860947/860060

Fax:- 01327 860430

Email: groundtech@listersgeotechnics.co.uk

**Quality Assured
to ISO 9001**

SAMPLES				CLASSIFICATION TESTS							CLASSIFICATION TESTS							STRENGTH TESTS					CHEMICAL TESTS							
Test Location	Sample Type	Sample Depth -m	Test Type	MC %	LL %	PL %	PI %	Passing 425 µm %	Modified PI %	Class	Passing 63 µm %	MC/LL	PL+2%	Liquidity Index	Loss on Ignition %	Soil Suction kPa	Bulk Density Mg/m ³	Test Type	Cell Pressure kN/m ²	Deviator Stress kN/m ²	Apparent Cohesion kN/m ²	φ	pH Value	Soluble Sulphate Content SO ₄ g/l						
TP 1	D	0.50	PSD	15											9								7.9	0.25						
	D	1.00	PI/63	17	31	19	12	60	7	CL	29	0.55	21	-0.18																
TP 2	D	0.50	PI/63	19	31	20	11	58	7	CL	27	0.61	22	-0.08	8															
	D	1.00	PI/63	18	28	17	11	56	6	CL	24	0.65	19	0.11									8.0	0.06						
Symbols:				U	Undisturbed Sample					R	Remoulded					PI	Plasticity Index					T	Triaxial Undrained					L	100mm specimen	
				D	Disturbed Sample					63	Passing 63µm					F	Filter Paper Suction Tests					M	Multistage Triaxial					S	38mm specimen	
				B	Bulk Sample					H	Hydrometer					HP	Hand Penetrometer													
				W	Water Sample					PSD	Wet Sieving					V	Vane Test													
Report Date October 2009				LABORATORY TEST RESULTS																	Project Ref 09.09.011		Client Ref -							

GroundTech Laboratories

Geotechnical Testing Facility

Slapton Hill Barn, Blakesley Road, Slapton, Towcester, Northants. NN12 8QD

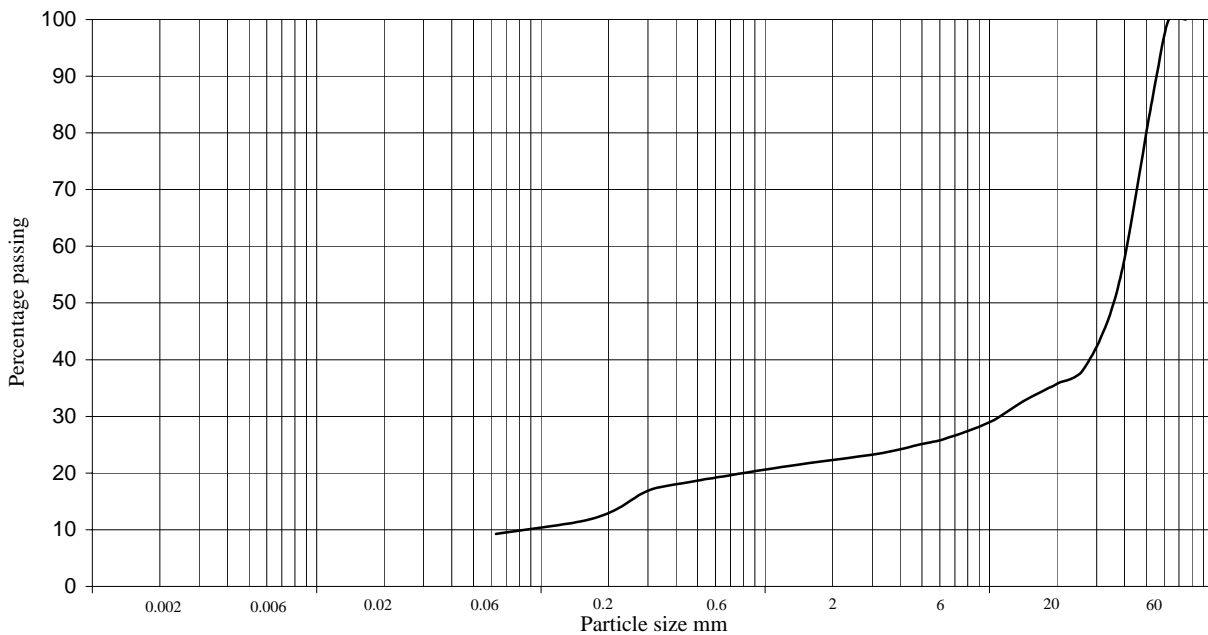
Telephone:- 01327 860947/860060

Fax:- 01327 860430

Email: groundtech@listersgeotechnics.co.uk

**Quality Assured
ISO 9001**

		Test Method: BS 1377 : Part 2 : 1990 : 9.2			
		BS test sieve	Cumulative Passing - %	Hydrometer Particle Diameter	Cumulative Passing - %
Client:	Lambert Smith	75mm			
Site:	Proposed Childrens Centre, Church Street, Brixworth, Northamptonshire	63mm			
Test Location:	TP 1	50mm	85.69		
Sample Depth:	0.50m	37.5mm	52.86		
Sample Description:		26.5mm	38.58		
		20mm	35.74		
		14mm	32.56		
		10mm	28.95		
		6.3mm	26.05		
		5mm	25.11		
Hydrometer No.:		3.5mm	23.53		
SG Gs:		2mm	22.28		
Water Visc. (N):		1.18mm	21.04		
Dry Mass of Soil after pretreatment (g):		600µm	19.17		
		425µm	18.18		
		300µm	16.87		
		212µm	13.36		
		150µm	11.47		
		63µm	9.29		



CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	COBBLES
	SILT			SAND			GRAVEL			

Report Date October 2009	PARTICLE SIZE DISTRIBUTION	Client Ref	Project Ref 09.09.011
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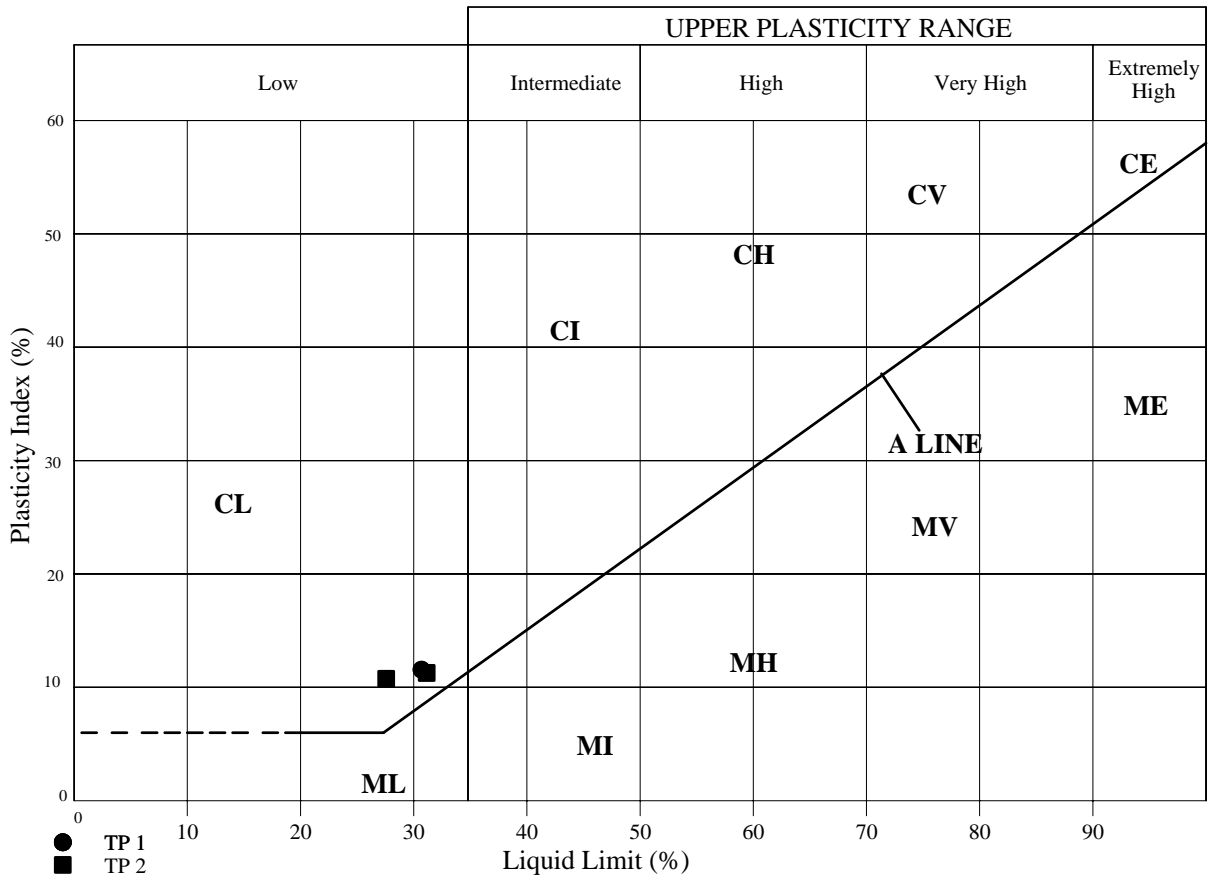
GroundTech Laboratories

Geotechnical Testing Facility

Slapton Hill Barn, Blakesley Road, Slapton, Towcester, Northants. NN12 8QD
 Telephone:- 01327 860947/860060 Fax:- 01327 860430

Quality Assured to ISO9001

Site: Proposed Childrens Centre, Church Street, Brixworth, Northamptonshire



Date
October 2009

PLASTICITY CHART

Lab. Ref. 09.09.011
Client Ref.

GroundTech Laboratories

Geotechnical Testing Facility

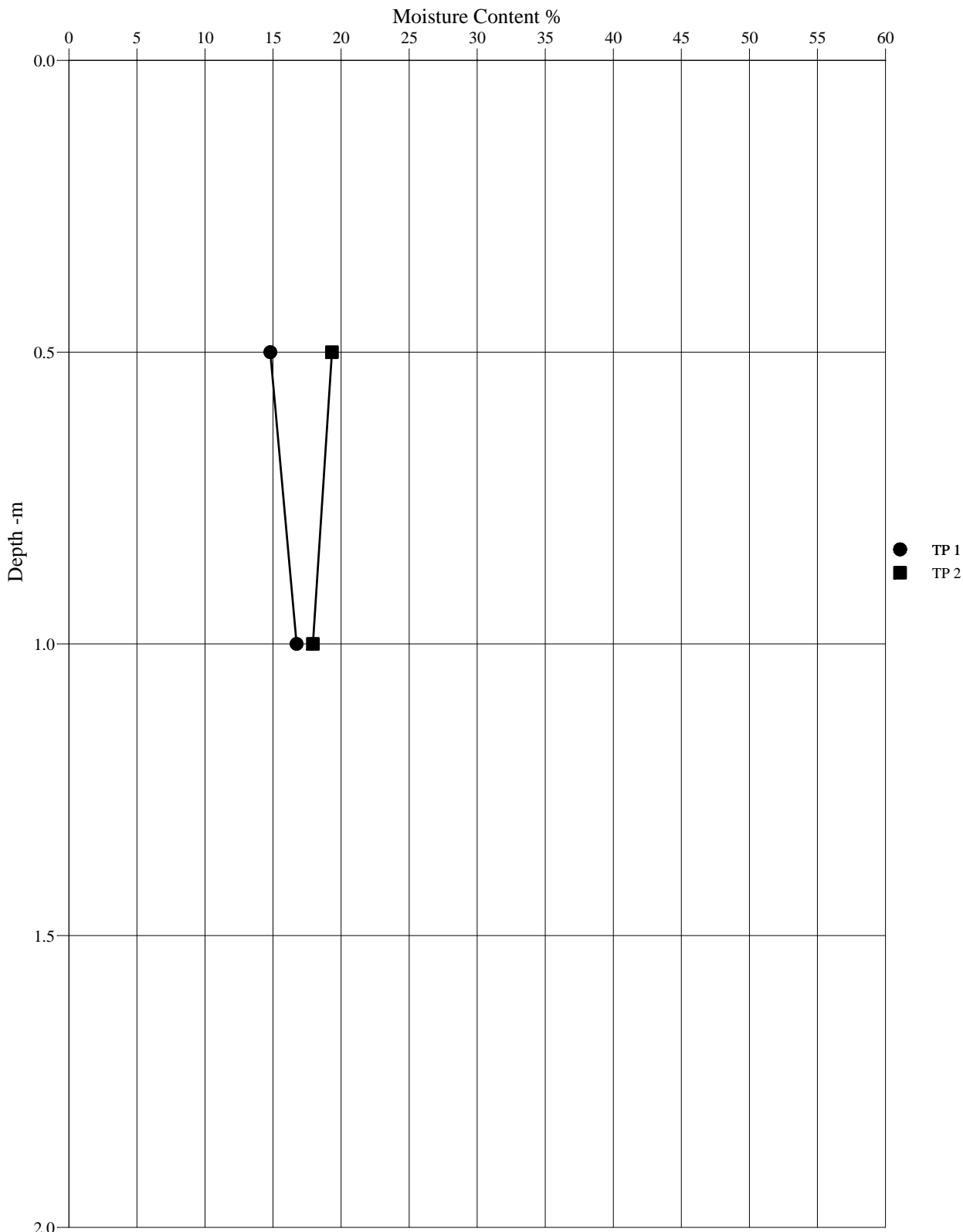
Slapton Hill Barn, Blakesley Road, Slapton, Towcester, Northants. NN12 8QD

Telephone:- 01327 860947/860060

Fax:- 01327 860430

Quality Assured to ISO9001

Site: Proposed Childrens Centre, Church Street, Brixworth, Northamptonshire



Date
October 2009

MOISTURE CONTENT v DEPTH

Lab Ref. 09.09.011

Client Ref.

APPENDIX 'C'
WAC Testing

LABORATORY TEST REPORT

Waste Acceptance Criteria Waste Parameters

Listers Geotechnical Consultants
 Slapton Hill Barn, Blakesley Road
 Slapton, Towcester
 Northamptonshire
 NN12 8QD
 FAO Emelye Towell

Results of analysis of 1 sample
received 22 October 2009
09-09-011/475 - Church Street Brixworth

Report Date
 02 November 2009

Login Batch No

Chemtest LIMS ID

Sample ID

Sample No

Depth

Matrix

Determinand↓

SOP↓

*

CAS No↓

Units↓

 Inert waste
 landfill

 Limit values
 Stable
 non-reactive
 hazardous
 waste in
 non-hazardous
 landfill

 Hazardous
 waste landfill

79239

AE41750

TP1

1

SOIL

Determinand↓	SOP↓	*	CAS No↓	Units↓	Inert waste landfill	Limit values Stable non-reactive hazardous waste in non-hazardous landfill	Hazardous waste landfill	79239 AE41750 TP1 1 SOIL
Total Organic Carbon	2625	M		%	3	5	6	2.1
Loss on ignition	2610	N		%			10	6.92
Benzene	2760	M	71432	µg kg ⁻¹				< 1
Toluene	2760	M	108883	µg kg ⁻¹				< 1
Ethyl benzene	2760	M	100414	µg kg ⁻¹				< 1
m- & p-Xylene	2760	M	1330207	µg kg ⁻¹				< 1
o-Xylene	2760	M	95476	µg kg ⁻¹				< 1
Total BTEX	2761	M		mg kg ⁻¹	6			<0.005
PCB 28	2810	N	7012375	mg kg ⁻¹				<0.1
PCB 52	2810	N	35693993	mg kg ⁻¹				<0.1
PCB 101	2810	N	37680732	mg kg ⁻¹				<0.1
PCB 118	2810	N	31508006	mg kg ⁻¹				<0.1
PCB 138	2810	N	35065282	mg kg ⁻¹				<0.1
PCB 153	2810	N	35065271	mg kg ⁻¹				<0.1
PCB 180	2810	N	35065293	mg kg ⁻¹				<0.1
Total PCBs (7 congeners)	2811	N		mg kg ⁻¹	1			<1
Naphthalene	2700	M	91203	mg kg ⁻¹				<0.1
Acenaphthylene	2700	M	208968	mg kg ⁻¹				0.2
Acenaphthene	2700	M	83329	mg kg ⁻¹				0.4
Fluorene	2700	M	86737	mg kg ⁻¹				0.4
Phenanthrene	2700	M	85018	mg kg ⁻¹				3.9
Anthracene	2700	M	120127	mg kg ⁻¹				1
Fluoranthene	2700	M	206440	mg kg ⁻¹				6.8
Pyrene	2700	M	129000	mg kg ⁻¹				6.1
Benzo[a]anthracene	2700	M	56553	mg kg ⁻¹				2.7
Chrysene	2700	M	218019	mg kg ⁻¹				2.9
Benzo[b]fluoranthene	2700	M	205992	mg kg ⁻¹				2.4
Benzo[k]fluoranthene	2700	M	207089	mg kg ⁻¹				1.3
Benzo[a]pyrene	2700	M	50328	mg kg ⁻¹				2.8
Dibenzo[a,h]anthracene	2700	M	53703	mg kg ⁻¹				1.7
Indeno[1,2,3-cd]pyrene	2700	M	193395	mg kg ⁻¹				<0.1
Benzo[g,h,i]perylene	2700	M	191242	mg kg ⁻¹				1.7
Coronene	2700	N	191071	mg kg ⁻¹				<0.1
Total (of 17) PAHs	2700	N		mg kg ⁻¹	100			34
pH	2010	M		-		>6		7.6
Acid Neutralisation Capacity	2015	N	ANC	mol kg ⁻¹		To evaluate	To evaluate	< 0.002
TPH Total WAC	2670	N		mg kg ⁻¹	500			89

All tests undertaken between 24-Oct-2009 and 2-Nov-2009

Column page 1

* Accreditation status

Report page 1 of 2

Report sample ID range AE41750 to AE41751

LABORATORY TEST REPORT

Waste Acceptance Criteria BS EN 12457 Part 3 2 Stage

Listers Geotechnical Consultants
 Slapton Hill Barn, Blakesley Road
 Slapton, Towcester
 Northamptonshire
 NN12 8QD
 FAO Emelye Towell

Results of analysis of 1 sample
 received 22 October 2009
 09-09-011/475 - Church Street Brixworth

Report Date
 02 November 2009

Login Batch No

Chemtest LIMS ID

Sample ID

Sample No

Depth

Matrix

Determinand↓

SOP↓

*

CAS No↓

Units↓

Inert waste
landfill

Limit values

Stable
non-reactive
hazardous
waste in
non-hazardous
landfill

Hazardous
waste landfill

79239

AE41751

TP1

1

LEACHATE

Determinand↓	SOP↓	*	CAS No↓	Units↓	Inert waste landfill	Limit values Stable non-reactive hazardous waste in non-hazardous landfill	Hazardous waste landfill	79239 AE41751 TP1 1 LEACHATE
As (arsenic) L/S=2	1450	N	7440382	mg kg ⁻¹				<0.05
Ba (barium) L/S=2	1450	N	7440393	mg kg ⁻¹				<0.5
Cd (cadmium) L/S=2	1450	N	7440439	mg kg ⁻¹				<0.01
Cr (chromium) L/S=2	1450	N	7440473	mg kg ⁻¹				<0.05
Cu (copper) L/S=2	1450	N	7440508	mg kg ⁻¹				<0.05
Hg (mercury) L/S=2	1450	N	7439976	mg kg ⁻¹				<0.005
Mo (molybdenum) L/S=2	1450	N	7439987	mg kg ⁻¹				<0.05
Ni (nickel) L/S=2	1450	N	7440020	mg kg ⁻¹				<0.05
Pb (lead) L/S=2	1450	N	7439921	mg kg ⁻¹				<0.05
Sb (antimony) L/S=2	1450	N	7440360	mg kg ⁻¹				0.01
Se (selenium) L/S=2	1450	N	7782492	mg kg ⁻¹				<0.01
Zn (zinc) L/S=2	1450	N	7440666	mg kg ⁻¹				<0.5
Cl (chloride) L/S=2	1220	N	16887006	mg kg ⁻¹				6.2
F (fluoride) L/S=2	1220	N	16984488	mg kg ⁻¹				1.18
SO4 (sulfate) L/S=2	1220	N	14808798	mg kg ⁻¹				66
Total Dissolved Solids L/S=2	1610	N	TDS	mg kg ⁻¹				360
Phenol index L/S=2	1920	N	108952	mg kg ⁻¹				<0.5
Dissolved Organic Carbon L/S=2	1610	N	DOC	mg kg ⁻¹				<50
As (arsenic) L/S=10	1450	N	7440382	mg kg ⁻¹	0.5	2	25	<0.05
Ba (barium) L/S=10	1450	N	7440393	mg kg ⁻¹	20	100	300	<0.5
Cd (cadmium) L/S=10	1450	N	7440439	mg kg ⁻¹	0.04	1	5	<0.01
Cr (chromium) L/S=10	1450	N	7440473	mg kg ⁻¹	0.5	10	70	<0.05
Cu (copper) L/S=10	1450	N	7440508	mg kg ⁻¹	2	50	100	<0.05
Hg (mercury) L/S=10	1450	N	7439976	mg kg ⁻¹	0.01	0.2	2	<0.005
Mo (molybdenum) L/S=10	1450	N	7439987	mg kg ⁻¹	0.5	10	30	<0.05
Ni (nickel) L/S=10	1450	N	7440020	mg kg ⁻¹	0.4	10	40	<0.05
Pb (lead) L/S=10	1450	N	7439921	mg kg ⁻¹	0.5	10	50	<0.05
Sb (antimony) L/S=10	1450	N	7440360	mg kg ⁻¹	0.06	0.7	5	0.01
Se (selenium) L/S=10	1450	N	7782492	mg kg ⁻¹	0.1	0.5	7	<0.01
Zn (zinc) L/S=10	1450	N	7440666	mg kg ⁻¹	4	50	200	<0.5
Cl (chloride) L/S=10	1220	N	16887006	mg kg ⁻¹	800	15000	25000	10.6
F (fluoride) L/S=10	1220	N	16984488	mg kg ⁻¹	10	150	500	6.08
SO4 (sulfate) L/S=10	1220	N	14808798	mg kg ⁻¹	1000	20000	50000	94.5
Total Dissolved Solids L/S=10	1610	N	TDS	mg kg ⁻¹	4000	60000	100000	1080
Phenol index L/S=10	1920	N	108952	mg kg ⁻¹	1			<0.5
Dissolved Organic Carbon L/S=10	1610	N	DOC	mg kg ⁻¹	500	800	1000	80.2

All tests undertaken between 24-Oct-2009 and 2-Nov-2009

Column page 1

* Accreditation status

Report page 2 of 2

Report sample ID range AE41750 to AE41751