The samples were analysed for Waste Acceptance Criteria Testing in order to classify soils for disposal purposes.

For the purpose of waste disposal, the soil samples would be classified as follows:

Borehole 1 @ 0.50m *Non Hazardous Waste*
The sample exceeded the upper acceptance limits for Inert Waste for Fluoride

Borehole 2 @ 0.25m *Stable Non-reactive Hazardous Waste*

5.7 Conclusions

The findings of the Phase 2 site investigation have demonstrated that in the context of a proposed residential use of the site with private gardens, the contaminant of concern with respect to end-user protection was elevated concentrations of Lead encountered across the site as a whole, with the critical receptors being the end-users / residents (0-6 year old child) of the site, adjacent residents, site construction workers, potable water supply pipes and landscape planting.

It may be possible that the extent of remediation required on the site could be minimised if further investigation of the site was undertaken. Thereby the extent of contamination could be more accurately identified and removed, treated or encapsulated to avoid potential risks to end-users of the site.

There remains the potential for some level of end-user risk posed by the concentrations of contaminants encountered. It is anticipated that the protection of the end-user may be achieved by the following:

Areas of proposed hardstanding (e.g. building footprint, roadways etc.)

In areas of permanent hardstanding such as the building footprint and roadways etc., the development itself would adequately break exposure pathways to human health and therefore further remedial measures may not be required in these areas.

Sensitive end use areas (soft-landscaping etc.)

In areas of sensitive end use such as soft-landscaping etc. soils should be removed from the site to mitigate the risks to end-users and break exposure pathways. It would be recommended that the soils be excavated down to at least 600mm and replaced with a clean cohesive fill material of at least 600mm.

Any materials brought onto the site (soils and / or clay) should be validated either at source or once laid at site. Given the nature of the ground conditions, appropriate health and safety practices should be adhered to in order to protect site workers. Any waste material leaving site for off-site disposal (soil and / or water) should be handled in accordance with the current Waste Management and Duty of Care Regulations.

The above conclusions have been drawn on the results of the tests carried out on the soil samples analysed and address remediation issues for the protection of the end-user only. It is recommended that any remedial measures suggested in this report should be subject to formal approval by local Environmental Health and/or Planning Departments and approval should be obtained prior to any works being undertaken. The comments made in this report do not address any third party liability.

6.0 FOUNDATION DESIGN

6.1 General

It is proposed to demolish the existing building and construct a new four storey and single storey basement (approx. 3.5m deep) property in its place. Exact details of the structures, layouts and loadings were not available at the time of preparation of this report.

6.2 Site Preparation Works

The CDM Co-ordinator should be informed of the site conditions and risk assessment undertaken to comply with the Construction Design Management (CDM) regulations. Site personnel are to be made aware of the site conditions. A full statutory services search is recommended prior to any excavation works.

6.3 Conventional Spread Foundations

A result of the inherent variability of uncontrolled fill, (Made Ground) is that it is usually unpredictable in terms of bearing capacity and settlement characteristics. Foundations should therefore, be taken through any Made Ground and either into, or onto suitable underlying natural strata of adequate bearing characteristics.

It is understood that a piled solution is favoured by the appointed structural engineers to the scheme. However, based on the ground and groundwater conditions encountered in the boreholes it should be possible to support any shallow areas of the proposed development on basement raft foundations taken down below the Made Ground and any weak superficial soils and placed in the firm to stiff weathered London Clay deposits encountered at a depth of about 2.00m below existing ground level. Foundations should be placed in the natural deposits at a minimum depth of 1.00m below final ground level in order to avoid the zone affected by seasonal moisture content changes.

Using theory from Terzaghi (1943), strip foundations placed within natural soils may be designed to allowable net bearing pressures of the order of 200kN/m^2 at 2.00m depth increasing linearly to about 250kN/m^2 at 4.00m depth in order to allow for a factor of safety of about 2.5 against general shear failure.

The actual allowable bearing pressure applicable will depend on the form of foundation, its geometry and depth in accordance with classical analytical methods, details of which can be obtained from "Foundation Design and Construction", Seventh Edition, 2001 by M J Tomlinson (see references) or similar texts.

Any soft or loose pockets encountered within otherwise competent formations should be removed and replaced with well compacted granular fill.

In addition, foundations may need to be taken deeper should they be within the zones of influence of either existing or recently felled trees and any proposed tree planting. The depth of foundation required to avoid the zone likely to be affected by the root systems of trees is shown in the recommendations given in NHBC Standards, Chapter 4.2, April 2010, "Building near Trees" and it is considered that this document is relevant in this situation.

6.4 Piled Foundations

In the event that the use of conventional spread foundations proves either impracticable or uneconomical due to the size and depth of foundation required, a piled foundation will be required. In these ground conditions, it is considered that some form of bored and in-situ cast concrete piled foundation with reinforced concrete ground beams should prove satisfactory.

Driven piles could also be used and would develop much higher working loads approximately 2.5 to 3 times higher than bored piles of a similar diameter at the same depth. However, the close proximity of adjacent buildings will in all probability preclude their use due to noise and vibration.

The construction of a piled foundation is a specialist activity and the advice of a reputable contractor, familiar with the type of soil and groundwater conditions encountered at this site should be sought prior to finalising the foundation design. The actual pile working load will depend on the particular type of pile chosen and method of installation adopted.

To achieve the full bearing value a pile should penetrate the bearing stratum by at least five times the pile diameter.

Piling methods should be capable of advancing pile bores through the surface Made Ground into the underlying natural soils.

Where piles are to be constructed in groups the bearing value of each individual pile should be reduced by a factor of about 0.8 and a calculation made to check the factor of safety against block failure.

6.5 Basement Retaining Walls

6.5.1 General

Several methods of retaining wall construction could be considered. These may include retaining structures cast in an underpinning sequence, or the use of temporary or sacrificial works to facilitate the retaining structure's construction. The excavation of the basement must not compromise the integrity of adjacent structures.

To facilitate support of the excavation, consideration could be given to a contiguous, secant or a sheet piled wall. Generally, cantilevered piled walls have an open face to embedded ratio of about one to two, i.e. a supported face three metres in height would require a penetration into the ground of about six metres below the base of the excavation. Should the piled retaining wall be purely an unsupported cantilever, then it is likely that quite deep section sheet piles or large diameter bored piles would be required.

The section of the sheet or the diameter of the piles could be reduced by installing a braced waling to the wall. Piles placed as part of the permanent works would be propped by the roof to the basement and would not be acting purely as a cantilevered support in the long term.

To reduce the likelihood of loss of ground if a sheet piled wall was adopted when removing the sheets, it is considered that the sheet piles should be incorporated into the final wall design. Assuming that the earth retaining wall will be propped, i.e. have its base slab and first floor slab cast in place soon after excavation, it is unlikely that full if any earth pressures will act on the wall while it is not propped. The greatest force acting on the wall, in the short term, is likely to be from the hydrostatic head should water percolate and be retained to the rear of the earth retaining structure.

The design parameters for each element of soil recorded in the relevant exploratory holes are provided in the table below.

Founding Material	Depth to top (m)	Description	Critical Angle of Shearing Resistance (°) (Φ'_{crit})[1]	Coefficient active pressure (Ka)	Coefficient passive resistance (Kp)
Superficial Head	0.50m to 1.00m	Firm silty sandy slightly gravelly CLAY	25	0.41	2.46
London Clay	1.10m - 1.80m	Firm and then stiff becoming very stiff silty CLAY	21	0.47	2.12

Summary of design parameters for proposed basement foundation

Notes:

1. Calculated using guidance from BS8002
2. As the final depth and structural details of the proposed basement are unknown these values should be used as guidance only and should be seen as 'very cautious values' using guidance from Eurocode 7.

6.5.2 Ground Movements

The site lies above the London Clay Formation recorded in this investigation as having a high susceptibility to shrinkage and swelling movements with changes in moisture content, as defined by the NHBC Standards, Chapter 4.2 (2010).

The amount of movement will depend upon a number of factors including the construction timetable, ultimate loads and critically, the depth of the final excavation. Consideration should therefore be given to providing heave protection measures to the floor slab and foundations to mitigate this.

The main phase of uplift or heave will come immediately following the excavation of the basement when the greatest elastic rebound of the soil (caused by the loss of the overburden pressure) will occur. Heave can be reduced by proceeding with the excavation in stages and observing and recording any movement that occurs over a set period of time using strain gauges or similar following the guidance from Boscardin and Cording (1989).

It may be advantageous to delay the construction until an adequate proportion of the uplift has occurred. Once this monitoring period has elapsed and a suitably qualified engineer is confident that the majority of uplift has occurred, basement construction can commence.

These processes and other ways of dealing with ground movements are described at length in BS8004 (British Standard Code of Practice for Foundations).

A settlement calculation has been completed by Applied Geotechnical Engineering Limited and is contained in Appendix D to this report.

6.6 Excavations

Shallow excavations for foundations and services are likely to require nominal side support in the short term and groundwater is unlikely to be encountered in significant quantities once any accumulated surface water has been removed. Deeper and longer excavations below approximately 1.0m below existing ground level will require close side support and some seepages of groundwater could be encountered.

No particular difficulties are envisaged in removing such water by conventional internal pumping methods from open sumps.

Normal safety precautions should be taken if excavations are to be entered.

6.7 Chemical Attack on Buried Concrete

The results presented on Table 3 show the soil samples to have water soluble sulphate contents of up to 0.05g/litre associated with slightly acidic to near neutral pH values. The samples of Made Ground tested indicate the soils to have soluble sulphate contents of up to 0.32g/litre associated with near neutral to slightly alkaline pH values.

In these conditions, it is considered that deterioration of buried concrete due to sulphate or acid attack is unlikely to occur. The final design of buried concrete according to Tables C1 and C2 of BRE Special Digest 1:2005 should be in accordance with Class DS-1 conditions.

However, segregations of gypsum were noted within the London Clay and scattered small gypsum crystals were also noted at depth. Consequently, it is considered that any buried concrete at depth may be attacked by such sulphates in solution and that it would be prudent to design any such deep buried concrete in accordance with full Class DS-2.

7.0 GROUNDWATER FLOW AND HYDROGEOLOGY

7.1 Introduction

This section of the report addresses outstanding issues regarding subterranean groundwater flow below the site.

7.2 Aquifer Designations

The Environment Agency Groundwater Protection Policy uses aquifer designations that are consistent with the Water Framework Directive. These designations reflect the importance of aquifers in terms of groundwater as a resource (drinking water supply) and also their role in supporting surface water flows and wetland ecosystems.

As proven from the site investigation, the Bedrock geology underlying the site (solid permeable formations) has been classified as Unproductive Strata; rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow.

7.3 Groundwater Flow and Depth to Groundwater

The ground floor level of the proposed development is at a maximum depth of approximately 3.5m below existing lower ground floor level. Groundwater was measured at depths of between 5.60m and 6.17m below ground level over the monitoring period. It is considered that the water levels observed represent the accumulation of surface run-off accumulating within the relatively permeable Made Ground, Superficial Head and Weathered London Clay deposits perched on top of the essentially impermeable unweathered London Clay presentat depth.

Despite the basement construction being above the interpreted level of the local groundwater regime a seepage was recorded at a higher level of 1.80m below ground level during drilling operations. Despite the inaccuracies associated with the seepages during drilling (see Section 3.3) it still may be necessary to control water during the construction period originating from the Made Ground and upper permeable soils. Consideration could be given to the use of conventional internal pumping methods from open sumps to remove such water.

It is recommended that the water levels in the monitoring boreholes be periodically measured immediately prior to and during, the development. Should groundwater levels rise to within the excavation volume, or should significant groundwater inflow be observed during excavation, professional advice should be sought.

p.p. SITE ANALYTICAL SERVICES LIMITED

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Environmental Engineer

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Site Analytical Services Ltd.

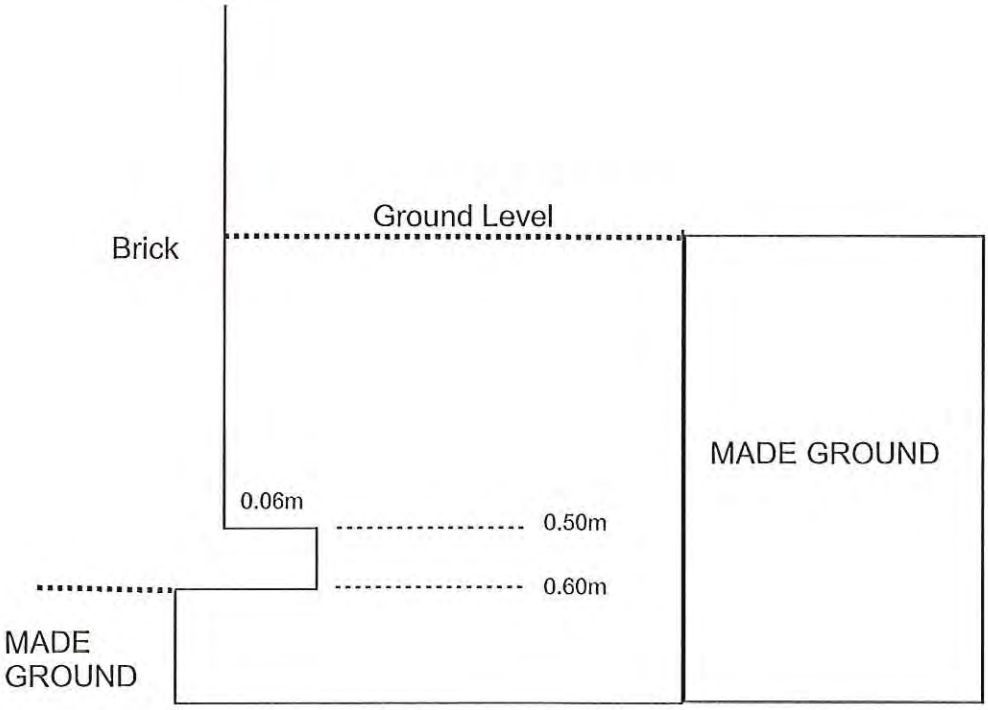
14/22518
5-7 Lancaster Grove
NW3 4HE

Site Plan

Figure 1
September 2014

Site Analytical Services Ltd.

14/22518
5-7 Lancaster Grove | Trial Pit 1 | 05/09/2014

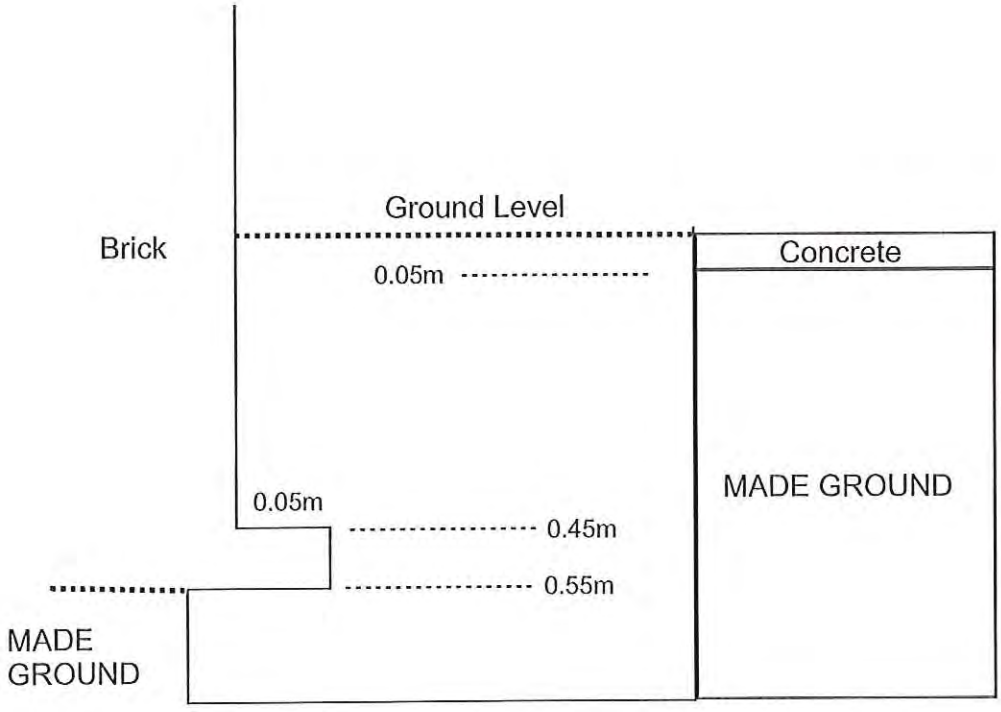


Underside at 0.60m

Figure 2

Site Analytical Services Ltd.

14/22518
5-7 Lancaster Grove | Trial Pit 2 | 05/09/2014



Underside at 0.55m

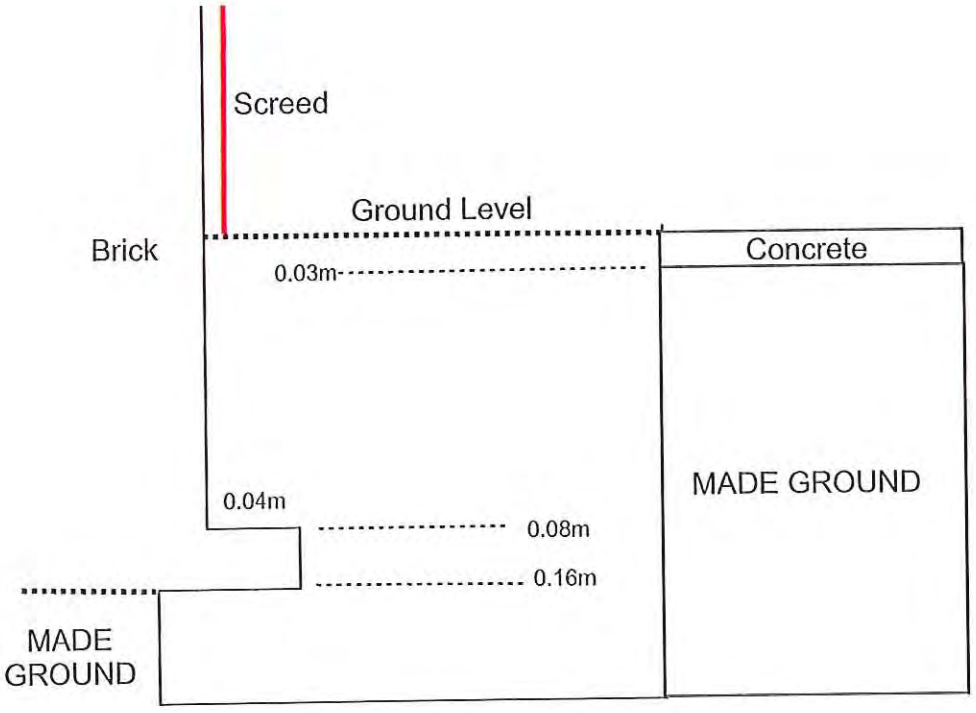
Figure 3

Site Analytical Services Ltd.

14/22518
5-7 Lancaster Grove

Trial Pit 3

05/09/2014



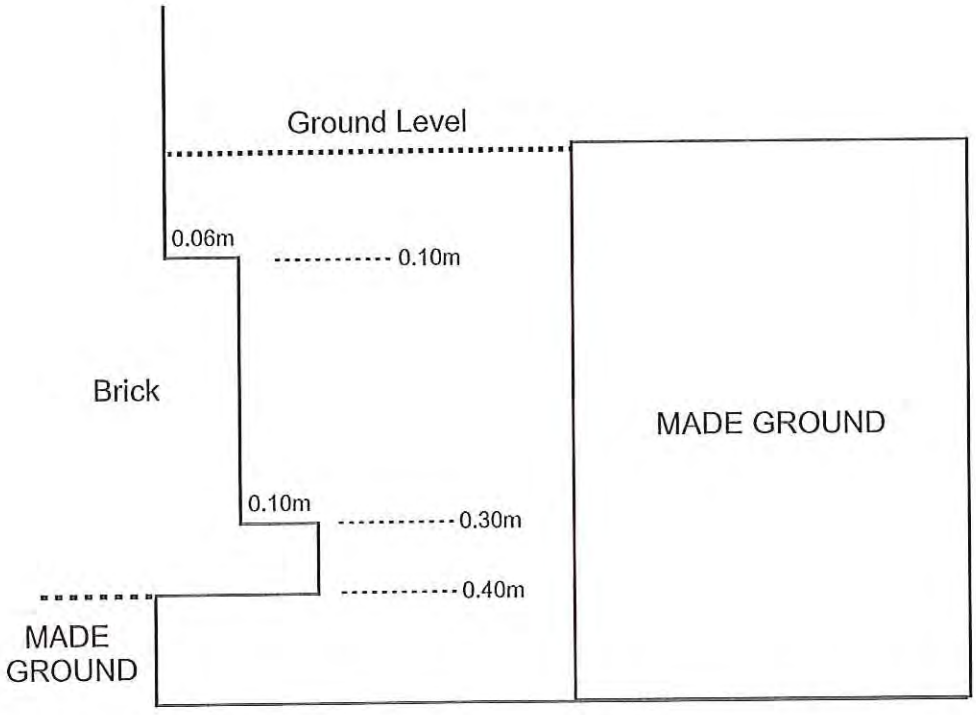
Underside at 0.16m

Figure 4

14/22518
5-7 Lancaster Grove

Trial Pit 4

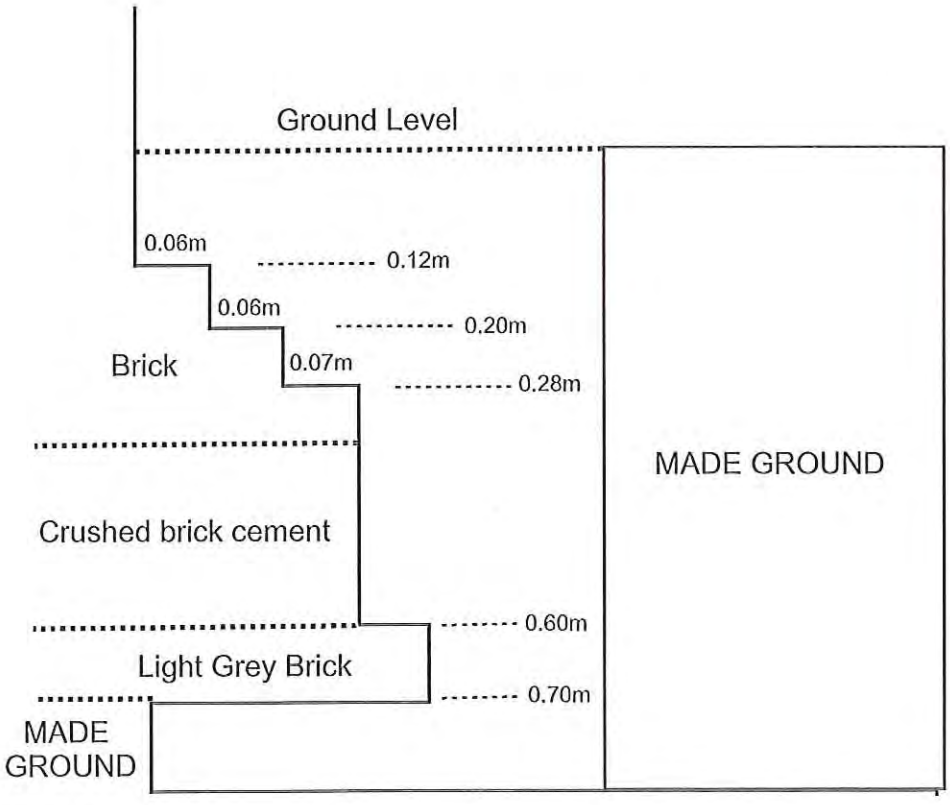
05/09/2014



Underside at 0.40m

Figure 5

14/22518
5-7 Lancaster Grove | Trial Pit 5 | 05/09/2014



Underside at 0.40m

Figure 6

APPENDIX `A'

Borehole / Trial Pit Logs

Site Analytical Services Ltd.

Site	Borehole Number
5-7 LANCASTER GROVE, LONDON, NW3 4HE	BH1

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
ROTARY PERCUSSION	127mm cased to 0.00m		OPTIC REALM	1422518
	Location TQ268846	**Dates** 05/09/2014	**Engineer** LYONS O'NEIL	**Sheet** 1/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						(0.20) 0.20	MADE GROUND - Grass over topsoil.		
0.25	D1						MADE GROUND - Firm brown silty sandy gravelly clay. Gravels are fine to coarse of angular to sub angular brick and concrete.		
0.50	D2					(0.80)			
0.75	D3					1.00			
1.00-1.45	SPT N=14			3,3/3,3,4,4			Firm mottled brown silty sandy slightly gravelly CLAY. Gravels are fine to coarse of angular to sub angular flint.		
1.00-1.45	D4					(0.80)			
1.75	D5			SEEPAGE(1) at 1.80m, no rise after 20 mins.		1.80	Firm becoming stiff mottled brown silty sandy CLAY. Colour change to blue, grey and brown between 2.50m and 5.00m. Large gypsum crystals up to 3mm in diameter observed from 7.50m.		▼1
2.00-2.45	U1			40 blows					
2.75	D6								
3.00-3.45	SPT N=13			2,3/3,3,4,3					
3.00-3.45	D7								
3.75	D8								
4.00-4.45	U2			70 blows					
4.75	D9								
5.00-5.45	SPT N=21			3,4/5,3,6,7		(6.70)			
5.00-5.45	D10								
6.00	D11								
6.50-6.95	U3			90 blows					
7.00	D12								
8.00-8.45	SPT N=32			5,6/7,8,8,9					
8.00-8.45	D13								
						8.50	Stiff becoming very stiff dark grey blue silty sandy fissured CLAY with scattered gypsum crystals.		
9.00	D14					(1.50)			
9.50-9.95	U4			110 blows					
						10.00			

Remarks
D = Disturbed Sample
U = Undisturbed 100mm Diameter Sample
S = Standard Cone Penetration Test
C = Dynamic Cone Penetration Test
Excavating from 0.00m to 1.00m for 1 hour.

Scale (approx)	Logged By
1:50	CDI

Figure No. 1422518.BH1

Site Analytical Services Ltd.

Site	Borehole Number
5-7 LANCASTER GROVE, LONDON, NW3 4HE	BH1

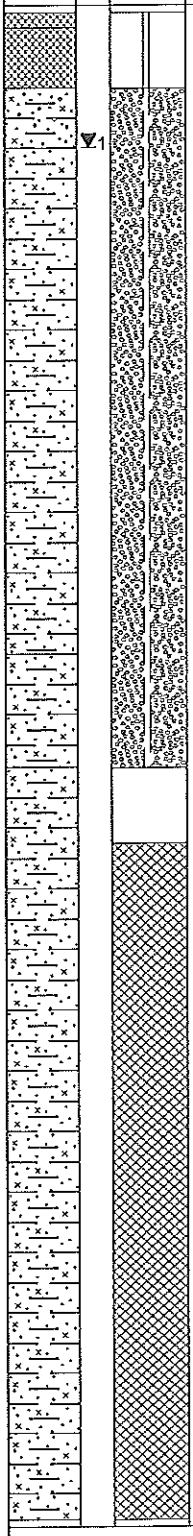
Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
ROTARY PERCUSSION	127mm cased to 0.00m		OPTIC REALM	1422518
	Location	**Dates**	**Engineer**	**Sheet**
	TQ268846	05/09/2014	LYONS O'NEIL	2/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
10.00	D15						Very stiff dark grey blue silty sandy fissured CLAY with scattered gypsum crystals.		
11.00-11.45	SPT N=42			7,8/10,10,11,11					
11.00-11.45	D16								
12.00	D17								
12.50-12.95	U5			140 blows					
13.50	D18								
14.00-14.45	SPT N=56			9,10/12,14,14,16					
14.00-14.45	D19								
15.00	D20					(10.00)			
15.50-15.95	U6			160 blows					
16.50	D21								
17.00-17.45	SPT N=60			11,12/14,15,15,16					
17.00-17.45	D22								
18.00	D23								
18.50-18.95	U7			180 blows					
19.25	D24								
19.55-20.00	SPT N=54			10,14/16,16,14,8					
19.55-20.00	D25			04/09/2014:DRY		20.00			

Remarks	Scale (approx)	Logged By
	1:50	CDI
	Figure No.	
	1422518.BH1	

Site Analytical Services Ltd.

Site: 5-7 LANCASTER GROVE, LONDON, NW3 4HE			Borehole Number: BH1
Installation Type: MONITORING STANDPIPE	Dimensions: Internal Diameter of Tube [A] = 50 mm; Diameter of Filter Zone = 100 mm	Client: OPTIC REALM	Job Number: 1422518
	Location: TQ268846	Ground Level (mOD):	Engineer: LYONS O'NEIL
			Sheet: 1/1



Groundwater Strikes During Drilling

Date	Time	Depth Struck (m)	Casing Depth (m)	Inflow Rate	Readings 5 min	Readings 10 min	Readings 15 min	Readings 20 min	Depth Sealed (m)
05/09/14		1.80	0.00	SEEPAGE				1.80	

Groundwater Observations During Drilling

Date	Start of Shift: Time	Depth Hole (m)	Casing Depth (m)	Water Depth (m)	Water Level (mOD)	End of Shift: Time	Depth Hole (m)	Casing Depth (m)	Water Depth (m)	Water Level (mOD)
04/09/14				DRY			20.00		DRY	

Instrument Groundwater Observations

Inst. [A] Type : SINGLE STANDPIPE

Date	Instrument [A] Time	Depth (m)	Level (mOD)	Remarks

Remarks
Lockable cover set in concrete

Site Analytical Services Ltd.

Site	Borehole Number
5-7 LANCASTER GROVE, LONDON, NW3 4HE	BH2

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
ROTARY PERCUSSION	127mm cased to 0.00m		OPTIC REALM	1422518
	Location	**Dates**	**Engineer**	**Sheet**
	TQ268846	04/09/2014	LYONS O'NEIL	1/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						(0.10) 0.10	MADE GROUND - Grass over topsoil.		
0.25	D1					(0.40) 0.50	MADE GROUND - Grey sandy gravel. Gravels are fine to coarse of angular brick and concrete.		
0.50	D2						Stiff brown silty sandy gravelly CLAY. Gravels are fine to coarse of angular to subangular flint.		
0.75	D3					(0.60)			
1.00-1.45	CPT N=11			3,4/4,3,2,2		1.10	Firm becoming stiff mottled brown silty sandy CLAY. Colour change to light blue and grey from 3.50m to 4.50m and fine gypsum crystals from 6.00m.		
1.00-1.45	D4								
1.75	D5								
2.00-2.45	U1			30 blows					
2.75	D6								
3.00-3.45	SPT N=10			1,2/2,2,3,3					
3.00-3.45	D7								
3.75	D8								
4.00-4.45	U2			70 blows					
4.75	D9					(7.40)			
5.00-5.45	SPT N=13			2,3/3,3,3,4					
5.00-5.45	D10								
6.00	D11								
6.50-6.95	U3			100 blows					
7.50	D12								
8.00-8.45	SPT N=33			6,7/8,8,8,9					
8.00-8.45	D13								
9.00	D14					8.50 (1.50)	Stiff becoming very stiff dark grey and blue silty sandy fissured CLAY with scattered gypsum crystals.		
9.50-9.95	U4			140 blows		10.00			

Remarks
Groundwater was not encountered during drilling
C = Dynamic Cone Penetration Test
S = Standard Cone Penetration Test
U = Undisturbed 100mm Diameter Sample
D = Disturbed Sample

Scale (approx)	Logged By
1:50	CDI

Figure No.
1422518.BH2

Site Analytical Services Ltd.

Site	Borehole Number
5-7 LANCASTER GROVE, LONDON, NW3 4HE	BH2

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
ROTARY PERCUSSION	127mm cased to 0.00m		OPTIC REALM	1422518
	Location TQ268846	**Dates** 04/09/2014	**Engineer** LYONS O'NEIL	**Sheet** 2/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
10.00	D15						Very stiff dark grey and blue silty sandy fissured CLAY with scattered gypsum crystals.		
11.00-11.45	SPT N=41			6,9/9,10,11,11					
11.00-11.45	D16								
12.00	D17								
12.50-12.95	U5			180 blows		(5.00)			
13.75	D18								
14.55-15.00	SPT N=49			5,10/10,12,13,14					
14.55-15.00	D19								
				04/09/2014:DRY		15.00	Complete at 15.00m		

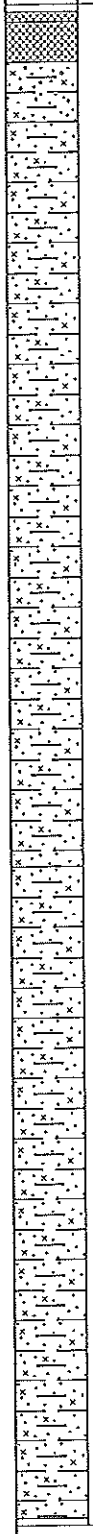
Remarks	Scale (approx)	Logged By
	1:50	CDI
	Figure No. 1422518.BH2	

Site Analytical Services Ltd.

Site	Borehole Number
5-7 LANCASTER GROVE, LONDON, NW3 4HE	BH2

Installation Type	Dimensions	Client	Job Number
MONITORING STANDPIPE	Internal Diameter of Tube [A] = 50 mm Diameter of Filter Zone = 100 mm	OPTIC REALM	1422518

Location	Ground Level (mOD)	Engineer	Sheet
TQ268846		LYONS O'NEIL	1/1



Legend	Water	Instr (A)	Level (mOD)	Depth (m)	Description
					Bentonite Seal
				1.00	
					Slotted Standpipe
				10.00	Bentonite Seal
				11.00	
					General Backfill
				15.00	

Groundwater Strikes During Drilling

Date	Time	Depth Struck (m)	Casing Depth (m)	Inflow Rate	Readings 5 min	Readings 10 min	Readings 15 min	Readings 20 min	Depth Sealed (m)

Groundwater Observations During Drilling

Date	Start of Shift Time	Start of Shift Depth Hole (m)	Start of Shift Casing Depth (m)	Start of Shift Water Depth (m)	Start of Shift Water Level (mOD)	End of Shift Time	End of Shift Depth Hole (m)	End of Shift Casing Depth (m)	End of Shift Water Depth (m)	End of Shift Water Level (mOD)
04/09/14				DRY			15.00		DRY	

Instrument Groundwater Observations

Inst. [A] Type : SINGLE STANDPIPE

Date	Instrument [A] Time	Instrument [A] Depth (m)	Instrument [A] Level (mOD)	Remarks

Remarks
Lockable cover set in concrete

Site Analytical Services Ltd.

Standard Penetration Test Results

Site : 5-7 LANCASTER GROVE, LONDON, NW3 4HE

Client : OPTIC REALM

Engineer: LYONS O'NEIL

Job Number 1422518

Sheet 1 / 1

Borehole Number	Base of Borehole (m)	End of Seating Drive (m)	End of Test Drive (m)	Test Type	Seating Blows per 75mm		Blows for each 75mm penetration				Result	Comments
					1	2	1	2	3	4		
BH1	1.00	1.15	1.45	SPT	3	3	3	3	4	4	N=14	
BH1	3.00	3.15	3.45	SPT	2	3	3	3	4	3	N=13	
BH1	5.00	5.15	5.45	SPT	3	4	5	3	6	7	N=21	
BH1	8.00	8.15	8.45	SPT	5	6	7	8	8	9	N=32	
BH1	11.00	11.15	11.45	SPT	7	8	10	10	11	11	N=42	
BH1	14.00	14.15	14.45	SPT	9	10	12	14	14	16	N=56	
BH1	17.00	17.15	17.45	SPT	11	12	14	15	15	16	N=60	
BH1	19.55	19.70	20.00	SPT	10	14	16	16	14	8	N=54	
BH2	1.00	1.15	1.45	CPT	3	4	4	3	2	2	N=11	
BH2	3.00	3.15	3.45	SPT	1	2	2	2	3	3	N=10	
BH2	5.00	5.15	5.45	SPT	2	3	3	3	3	4	N=13	
BH2	8.00	8.15	8.45	SPT	6	7	8	8	8	9	N=33	
BH2	11.00	11.15	11.45	SPT	6	9	9	10	11	11	N=41	
BH2	14.55	14.70	15.00	SPT	5	10	10	12	13	14	N=49	

Site Analytical Services Ltd.

Site: 5-7 LANCASTER GROVE, LONDON, NW3 4HE			Borehole Number: BH3
Boring Method: CONTINUOUS FLIGHT AUGER	Casing Diameter: 100mm cased to 0.00m	Ground Level (mOD):	Client: OPTIC REALM
	Location: TQ268846	Dates: 04/09/2014	Engineer: LYONS O'NEIL
			Job Number: 1422518
			Sheet: 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						(0.10) 0.10	MADE GROUND - Concrete		
0.25	D1					(0.30) 0.40	MADE GROUND - brown gravelly fine to coarse sand. Gravels are fine to coarse of angular brick and concrete		
0.50	D2						MADE GROUND - light brown silty sandy gravelly clay. Gravels are fine to coarse of angular to sub angular brick, concrete and flint.		
0.75	D3					(0.80)			
1.00	V1 82					1.20			
1.00	D4						Stiff mottled brown and light brown silty sandy CLAY.		
1.50	V2 110								
1.50	D5								
2.00	V3 130+					(1.80)			
2.00	D6								
2.50	V4 130+								
2.50	D7								
3.00	D8					3.00			
3.00	V5 130+			04/09/2014:DRY			Complete at 3.00m		

Remarks
D = Disturbed Sample
U = Undisturbed Sample
V = In Situ Vane Test (Result in kPa)
Groundwater was not encountered during drilling

Scale (approx)	Logged By
1:50	CDI

Figure No. 1422518.BH3

Site Analytical Services Ltd.

Site: 5-7 LANCASTER GROVE, LONDON, NW3 4HE			Trial Pit Number: TP1
Excavation Method: HAND EXCAVATION	Dimensions: 300 x 300	Ground Level (mOD):	Client: OPTIC REALM	Job Number: 1422518
	Location: TQ268846	Dates: 05/09/2014	Engineer: LYONS O'NEIL	Sheet: 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.30)	MADE GROUND - Dark brown sandy gravel. Gravel are fine to coarse angular brick and flint.		
0.25	D1				0.30			
					(0.30)	MADE GROUND - Brown mottled light brown clay. Gravels are fine to coarse of angular brick.		
0.60	D2				0.60			
0.60	V1 60		05/09/2014:DRY			Complete at 0.60m		

Plan

Remarks

V = In Situ Vane Test (Result in kPa)
D = Disturbed Sample
Groundwater was not encountered during the excavation

Scale (approx)	Logged By	Figure No.
1:50	CDI	1422518.TP1

Site Analytical Services Ltd.

Site 5-7 LANCASTER GROVE, LONDON, NW3 4HE			**Trial Pit Number** TP2
Excavation Method HAND EXCAVATION	**Dimensions** 300 x 300	**Ground Level (mOD)**	**Client** OPTIC REALM	**Job Number** 1422518
	Location TQ268846	**Dates** 05/09/2014	**Engineer** LYONS O'NEIL	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.30)	MADE GROUND - Dark brown sandy gravel. Gravels are fine to coarse angular brick and flint.		
0.25	D1				0.30 (0.25)			
0.55	M1 183/300		05/09/2014:DRY		0.55	MADE GROUND - Clayey silty gravelly sand. Gravels are fine to medium of crushed brick.		
0.55	D2					Complete at 0.55m		

Plan

Remarks

M = Mackintosh Prove Test - Result in kPa
D = Disturbed Sample
Groundwater was not encountered during the excavation

Scale (approx)	Logged By	Figure No.
1:50	CDI	1422518.TP2

Site Analytical Services Ltd.

Site: 5-7 LANCASTER GROVE, LONDON, NW3 4HE			Trial Pit Number: TP3
Excavation Method: HAND EXCAVATION	Dimensions: 300 x 300	Ground Level (mOD):	Client: OPTIC REALM	Job Number: 1422518
	Location: TQ268846	Dates: 05/09/2014	Engineer: LYONS O'NEIL	Sheet: 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.16 0.16	M1 31/300 D1		05/09/2014:DRY		(0.03) 0.03 (0.13) 0.16	MADE GROUND - Thin concrete cap MADE GROUND - Light brown silty sandy gravelly clay. Gravels are fine to coarse of brick and flint. Complete at 0.16m		

Plan

Remarks

Groundwater was not encountered during the excavation
D = Disturbed Sample
M = Mackintosh Probe Test - Result in kPa

Scale (approx)	Logged By	Figure No.
1:50	CDI	1422518.TP3

Site Analytical Services Ltd.

Site: 5-7 LANCASTER GROVE, LONDON, NW3 4HE			Trial Pit Number: TP4
Excavation Method: HAND EXCAVATION	Dimensions: 300 x 300	Ground Level (mOD):	Client: OPTIC REALM	Job Number: 1422518
	Location: TQ268846	Dates: 05/09/2014	Engineer: LYONS O'NEIL	Sheet: 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.25 0.40 0.40	D1 V1 51 D2		05/09/2014:DRY		(0.30) 0.30 (0.10) 0.40	MADE GROUND - Dark brown sandy gravel. Gravels of fine to coarse angular brick and flint. MADE GROUND - Light brown clay. Gravels of fine to coarse angular brick and flint. Complete at 0.60m		

Plan

Remarks

Groundwater was not encountered during the excavation
D = Disturbed Sample
V = In Situ Vane Test - Result in kPa

Scale (approx)	Logged By	Figure No.
1:50	CDI	1422518.TP4

Site Analytical Services Ltd.

Site: 5-7 LANCASTER GROVE, LONDON, NW3 4HE			Trial Pit Number: TP5
Excavation Method: HAND EXCAVATION	Dimensions: 300 X 300	Ground Level (mOD):	Client: OPTIC REALM	Job Number: 1422518
	Location: TQ268846	Dates: 05/09/2014	Engineer: LYONS O'NEIL	Sheet: 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.12) 0.12	MADE GROUND - Asphalt over concrete		
0.25	D1				(0.24) 0.36	MADE GROUND - Silty sandy fine to medium angular brick and flint gravel		
0.50	D2				(0.24) 0.60	MADE GROUND - Light brown mottled slighlly gravelly clay. Gravel is fine to coarse of angular brick, flint and concrete.		
0.70	D3							
0.70	V1 71		05/09/2014:DRY			Complete at 0.70m		

Plan

Remarks

V = In Situ Vane Test - Result in kPa
D = Disturbed Sample
Groundwater was not encountered during the excavation

Scale (approx)	Logged By	Figure No.
1:50	CDI	1422518.TP5

APPENDIX `B'

Laboratory Test and Groundwater Monitoring Data

Site Analytical Services Ltd.

Ref: 14/22518

UNDRAINED TRIAXIAL COMPRESSION TEST

LOCATION 5-7 Lancaster Grove, London NW3 4HE

BH/TP No.	MOISTURE CONTENT %	BULK DENSITY Mg/m^3	LATERAL PRESSURE kN/m^2	COMPRESSIVE STRENGTH kN/m^2	COHESION kN/m^2	ANGLE OF SHEARING RESISTANCE degrees	DEPTH m
BH1	25	1.89	80	222	111		4.25
	25	1.99	130	280	140		6.75
	22	2.05	250	422	211		12.75
	24	1.98	310	422	211		15.75
BH2	28	1.91	50	211	106		2.25
	24	2.03	130	265	133		6.75
	26	1.96	190	269	135		9.75
	24	2.00	250	385	193		12.75

Table 1

Ref: 14/22518

PLASTICITY INDEX & MOISTURE CONTENT DETERMINATIONS

LOCATION 5-7 Lancaster Grove, London NW3 4HE

BH/TP No.	Depth m	Natural Moisture %	Liquid Limit %	Plastic Limit %	Plasticity Index %	Passing 425 µm %	Class
BH1	2.75	30	72	18	54	100	CV
	3.75	29	71	24	47	100	CV
	4.75	26	63	19	44	100	CH
BH2	1.75	27	62	16	46	100	CH
	3.00	29	70	25	45	100	CH/CV
BH3	2.00	29	68	20	48	100	CH
	3.00	32	70	22	48	100	CH/CV

Table 2

Site Analytical Services Ltd.

Ref: 14/22518

SULPHATE & pH DETERMINATIONS

LOCATION 5-7 Lancaster Grove, London NW3 4HE

BH/TP No.	DEPTH BELOW GL m	SOIL SULPHATES AS SO_4 TOTAL %	SOIL SULPHATES AS SO_4 WATER SOL g/l	WATER SULPHATES AS SO_4 g/l	pH	CLASS	SOIL - 2mm %
BH1	3.00		0.05		6.1	DS-1	100
	16.50		0.02		5.7	DS-1	100
BH2	3.75		0.03		5.2	DS-1	100
	10.00		0.02		5.2	DS-1	100
BH3	2.50		0.01		5.2	DS-1	100

Classification – Tables C1 and C2 : BRE Special Digest 1 : 2005

Ref: 14/22518

GROUNDWATER MONITORING

LOCATION 5-7 Lancaster Grove, London NW3 4HE

MONITORING DATE 19th September 2014

BOREHOLE REF:		BH1	BH2
Water Level	(m.bgl)	5.94	6.50
Depth to Base of Well	(m.bgl)	10.00	10.16

Table 4

Site Analytical Services Ltd.

Ref: 14/22518

GROUNDWATER MONITORING

LOCATION 5-7 Lancaster Grove, London NW3 4HE

MONITORING DATE 24th September 2014

BOREHOLE REF:		**BH1**	**BH2**
Water Level	(m.bgl)	5.75	6.39
Depth to Base of Well	(m.bgl)	10.00	10.16

Table 4a

Site Analytical Services Ltd.

Ref: 14/22518

GROUNDWATER MONITORING

LOCATION 5-7 Lancaster Grove, London NW3 4HE

MONITORING DATE 1st October 2014

BOREHOLE REF:		**BH1**	**BH2**
Water Level	(m.bgl)	5.60	6.17
Depth to Base of Well	(m.bgl)	10.00	10.16

Table 4b

Client :	Site Analytical Services	Our Job/report no:	17429	Samples Rec :	10/09/2014	Testing Started:	24/09/2014
Project name:	5-7 Lancaster Grove, London, NW3 4HE	Project No:	14/22518	Project Started:	11/09/2014	Date reported:	29/09/2014

BH / TP No	Sample no / ref	Sample depth (m)	Description	Moisture content (%)	Bulk Density (Mg/m3)	Dry density (Mg/m3)	Cell Pressure (kPa)	Strain at failure (%)	Max Deviator Stress (kPa)	Mode of failure	Shear Strength (kPa)	Phi (deg)
BH1	U1	2.00 - 2.45	High strength brown and blue grey mottled CLAY with selenite crystals	31	1.84	1.40	100	9.8	199	Compound	100	NA
BH1	U4	9.50 - 9.95	High strength dark grey CLAY	29	1.86	1.44	300	5.9	260	Brittle	130	NA
BH1	U7	18.50 - 18.95	Very high strength dark grey CLAY	26	1.85	1.47	600	5.9	452	Brittle	226	NA
BH2	U2	4.00 - 4.45	High strength brown and blue grey mottled CLAY with occasional selenite crystals	31	1.81	1.38	120	7.3	241	Compound	121	NA

K4 SOILS

Summary of Undrained Triaxial Compression Testing

BS 1377 : Part 7 : Clause 8 : 1990

Checked and approved

Initials kp

K4 SOILS

Report of Undrained Triaxial Compression Test

BS 1377 : Part 7 : 1990 Clause 8.0

Project name:	5-7 Lancaster Grove, London, NW3 4HE			**Samples Received:**	10/09/2014
				Project Started:	11/09/2014
Client:	Site Analytical Services			**Testing Started:**	24/09/2014
Project no:	14/22518	**Our job /report no:**	17429	**Date Reported:**	29/09/2014
BH / TP no:	BH1	**Sample no:**	U1	**Depth (m):**	2.00-2.45

Soil Description: High strength brown and blue grey mottled CLAY with selenite crystals

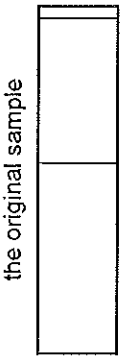
Sample Details — Specimen 1

Sample Condition		Undisturbed
Height	mm	205.0
Diameter	mm	106.0
Moisture Content	%	31
Bulk Density	Mg/m³	1.84
Dry Density	Mg/m³	1.40

Test Details

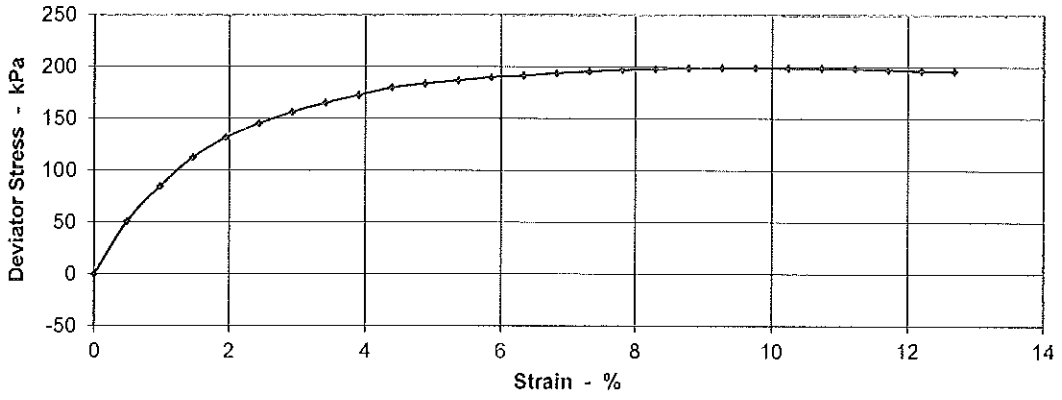
Membrane Thickness	mm	0.2
Membrane Correction	kPa	0.42
Rate of Axial Displacement	%/min	1.95
Cell Pressure	kPa	100
Strain at Failure	%	9.8
Maximum Deviator Stress	kPa	199
Shear Strength	kPa	100
Mode of Failure		Compound

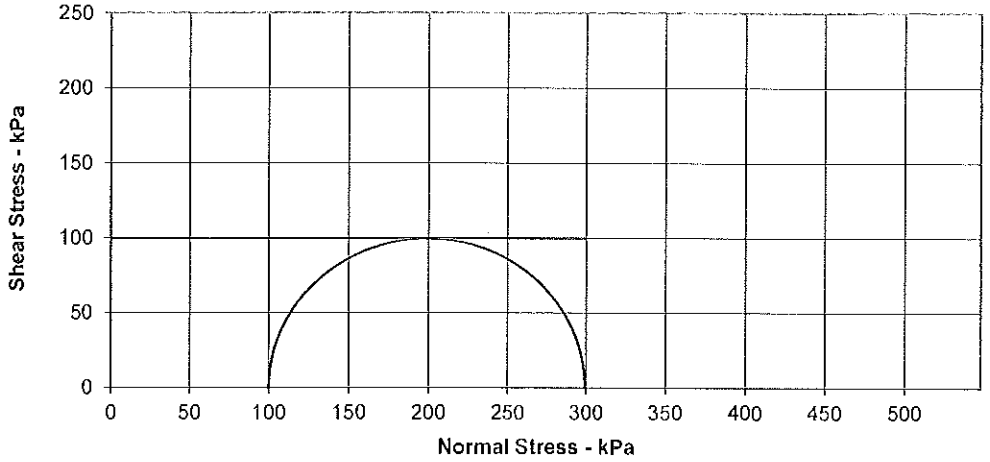
Position and orientation within the original sample



Shear Strength Parameters	
C	100 kPa
Phi	0.0 °

Specimen 1





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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
Initials: kp
Date: 29/09/2014

UKAS TESTING 2519

K4 SOILS

Report of Undrained Triaxial Compression Test

BS 1377 : Part 7 : 1990 Clause 8.0

Project name:	5-7 Lancaster Grove, London, NW3 4HE			**Samples Received:**	10/09/2014
				Project Started:	11/09/2014
Client:	Site Analytical Services			**Testing Started:**	24/09/2014
Project no:	14/22518	**Our job /report no:**	17429	**Date Reported:**	29/09/2014
BH / TP no:	BH1	**Sample no:**	U1	**Depth (m):**	2.00-2.45

Soil Description: High strength brown and blue grey mottled CLAY with selenite crystals

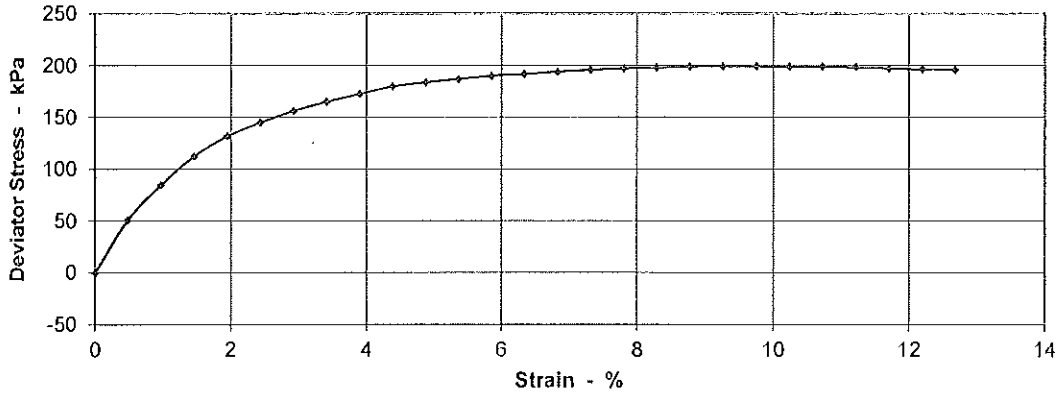
Sample Details		**Specimen 1**
Sample Condition		Undisturbed
Height	mm	205.0
Diameter	mm	106.0
Moisture Content	%	31
Bulk Density	Mg/m³	1.84
Dry Density	Mg/m³	1.40

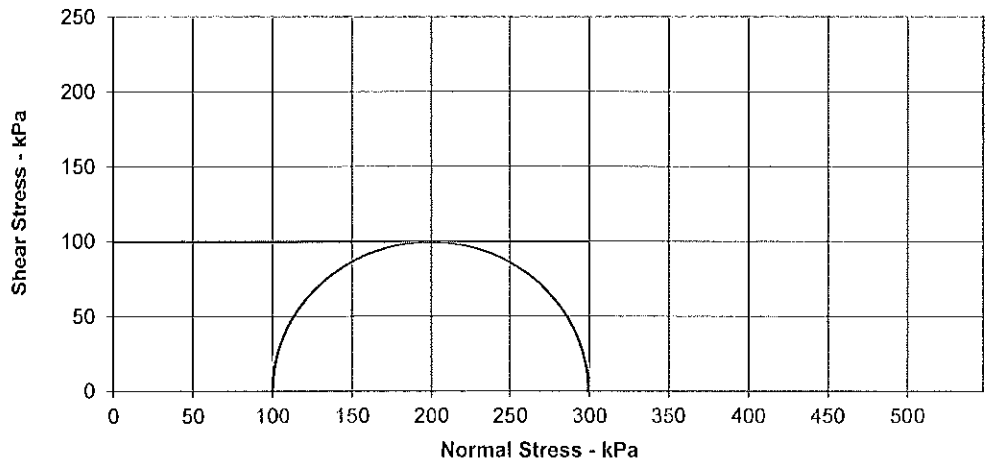
Position and orientation within the original sample

Test Details		
Membrane Thickness	mm	0.2
Membrane Correction	kPa	0.42
Rate of Axial Displacement	%/min	1.95
Cell Pressure	kPa	100
Strain at Failure	%	9.8
Maximum Deviator Stress	kPa	199
Shear Strength	kPa	100
Mode of Failure		Compound

Shear Strength Parameters	
C	100 kPa
Phi	0.0 °

Specimen 1





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UKAS TESTING 2519

K4 SOILS

Report of Undrained Triaxial Compression Test

BS 1377 : Part 7 : 1990 Clause 8.0

Project name:	5-7 Lancaster Grove, London, NW3 4HE			**Samples Received:**	10/09/2014
				Project Started:	11/09/2014
Client:	Site Analytical Services			**Testing Started:**	24/09/2014
Project no:	14/22518	**Our job /report no:**	17429	**Date Reported:**	29/09/2014
BH / TP no:	BH1	**Sample no:**	U4	**Depth (m):**	9.50-9.95

Soil Description: High strength dark grey CLAY

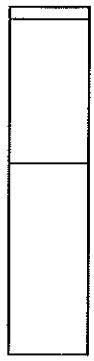
Sample Details **Specimen 1**

Sample Condition		Undisturbed
Height	mm	205.0
Diameter	mm	106.0
Moisture Content	%	29
Bulk Density	Mg/m³	1.86
Dry Density	Mg/m³	1.44

Test Details

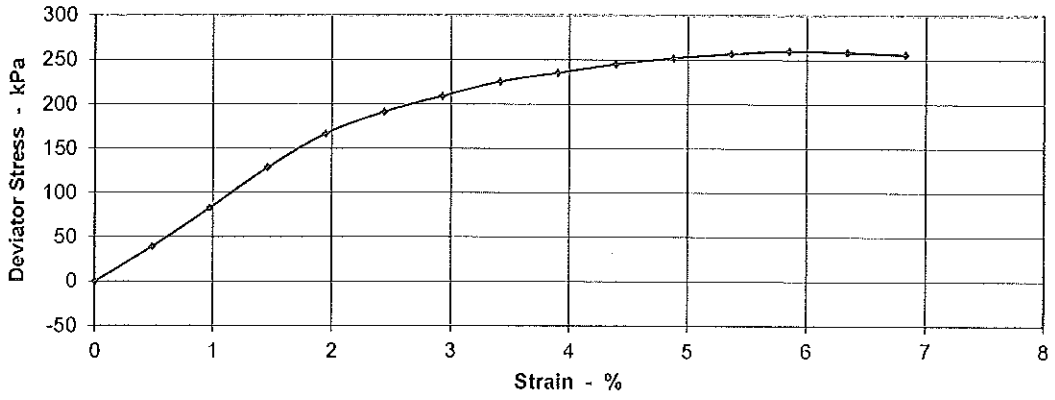
Membrane Thickness	mm	0.2
Membrane Correction	kPa	0.28
Rate of Axial Displacement	%/min	1.95
Cell Pressure	kPa	300
Strain at Failure	%	5.9
Maximum Deviator Stress	kPa	260
Shear Strength	kPa	130
Mode of Failure		Brittle

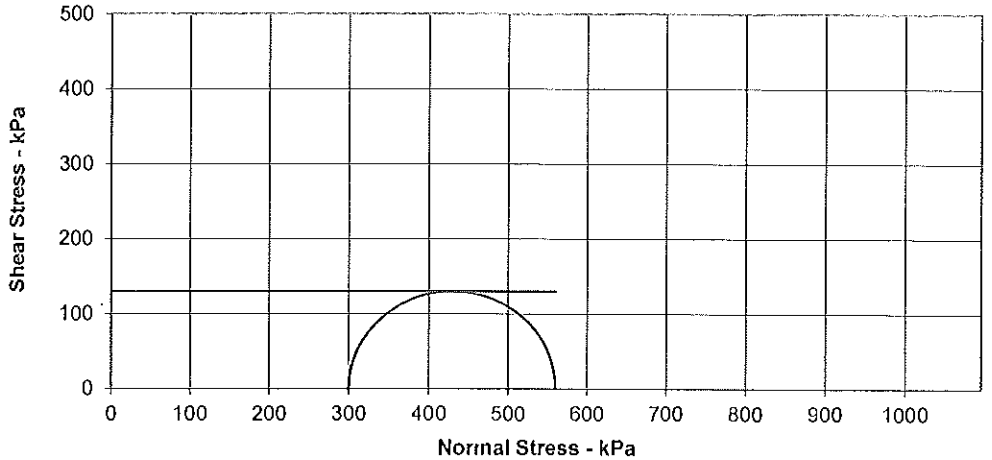
Position and orientation within the original sample



Shear Strength Parameters	
C	130 kPa
Phi	0.0 °

Specimen 1





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Test results relate only to the sample numbers shown above

Checked and Approved
Initials: kp
Date: 29/09/2014

UKAS TESTING 2519

K4 SOILS

Report of Undrained Triaxial Compression Test

BS 1377 : Part 7 : 1990 Clause 8.0

Project name:	5-7 Lancaster Grove, London, NW3 4HE			**Samples Received:**	10/09/2014
				Project Started:	11/09/2014
Client:	Site Analytical Services			**Testing Started:**	24/09/2014
Project no:	14/22518	**Our job /report no:**	17429	**Date Reported:**	29/09/2014
BH / TP no:	BH1	**Sample no:**	U7	**Depth (m):**	18.50-18.95

Soil Description: Very high strength dark grey CLAY

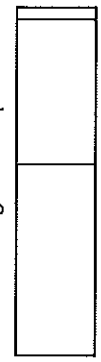
Sample Details — Specimen 1

Sample Condition		Undisturbed
Height	mm	205.0
Diameter	mm	106.0
Moisture Content	%	26
Bulk Density	Mg/m³	1.85
Dry Density	Mg/m³	1.47

Test Details

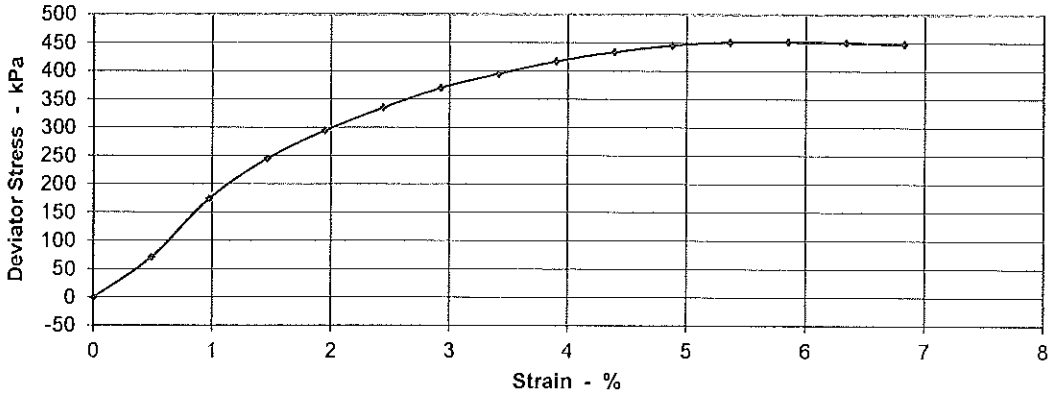
Membrane Thickness	mm	0.2
Membrane Correction	kPa	0.28
Rate of Axial Displacement	%/min	1.95
Cell Pressure	kPa	600
Strain at Failure	%	5.9
Maximum Deviator Stress	kPa	452
Shear Strength	kPa	226
Mode of Failure		Brittle

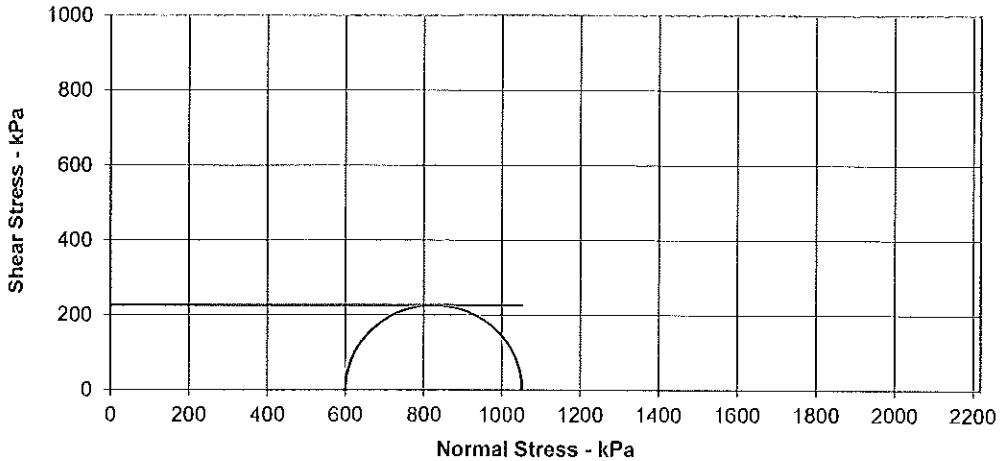
Position and orientation within the original sample



Shear Strength Parameters	
C	226 kPa
Phi	0.0 °

Specimen 1





K4 SOILS LABORATORY
Unit 8, Olds Close, 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
Initials: kp
Date: 29/09/2014

UKAS TESTING 2519

K4 SOILS

Report of Undrained Triaxial Compression Test

BS 1377 : Part 7 : 1990 Clause 8.0

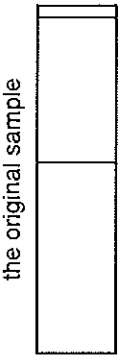
Project name:	5-7 Lancaster Grove, London, NW3 4HE			**Samples Received:**	10/09/2014
				Project Started:	11/09/2014
Client:	Site Analytical Services			**Testing Started:**	24/09/2014
Project no:	14/22518	**Our job /report no:**	17429	**Date Reported:**	29/09/2014
BH / TP no:	BH2	**Sample no:**	U2	**Depth (m):**	4.00-4.45

Soil Description: High strength brown and blue grey mottled CLAY with occasional selenite crystals

Sample Details	**Specimen**	**1**
Sample Condition		Undisturbed
Height	mm	205.0
Diameter	mm	106.0
Moisture Content	%	31
Bulk Density	Mg/m³	1.81
Dry Density	Mg/m³	1.38

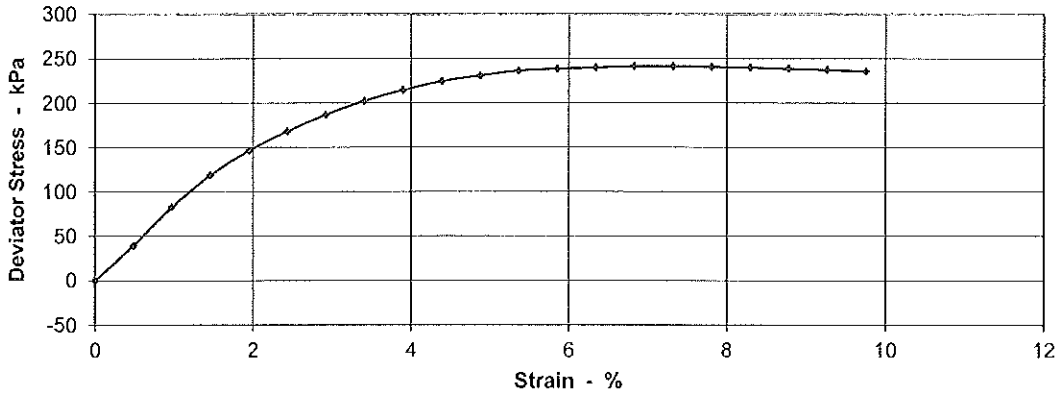
Test Details		
Membrane Thickness	mm	0.2
Membrane Correction	kPa	0.33
Rate of Axial Displacement	%/min	1.95
Cell Pressure	kPa	120
Strain at Failure	%	7.3
Maximum Deviator Stress	kPa	241
Shear Strength	kPa	121
Mode of Failure		Compound

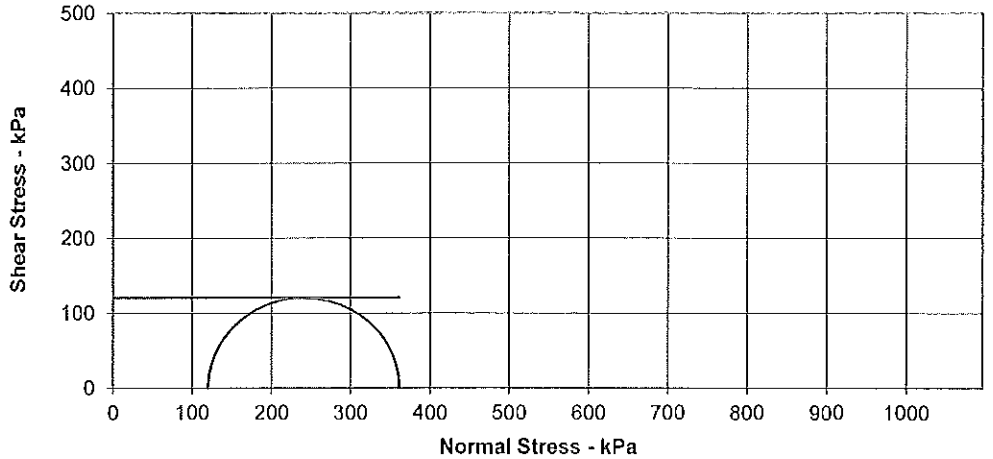
Position and orientation within the original sample



Shear Strength Parameters	
C	121 kPa
Phi	0.0 °

Specimen 1





K4 SOILS LABORATORY
Unit 8, Olds Close, 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
Initials: kp
Date: 29/09/2014

UKAS TESTING

2519

Client name & address:			**Samples Rec**	10/09/2014	**K4 SOILS**
Site Analytical Services			**Project Start**	11/09/2014	
Project Name:	5-7 Lancaster Grove, London, NW3 4HE		**Testing Start**	18/09/2014	
Project No:	14/22518	**Our Job / report no:** 17429	**Date Reported:**	29/09/2014	
Sample description:			**Sample no/ type:**	U	**BH no:** BH1
High strength brown and blue grey mottled CLAY with selenite crystals					**Depth (m):** 2.00

Trimmings		Detemination 1	Detemination 2
Wet wt. + tin	g	133.25	133.25
Dry wt. + tin	g	110.82	110.82
Wt. tin	g	38.67	38.67
Moisture content	%	31.1	31.1
Average moisture content	%	31.09	

Depth within original sample	m	2.1
Specimen preparation		Remoulded
Particle density	Mg/m3	2.72 Assumed
Laboratory Temperature	°C	22
Degree of saturation	%	99.1
Swelling pressure	kPa	
Equivalent height of solid particles	mm	10.14

Specimen details		Initial	Final
Height	mm	19.05	17.63
Ring diameter	mm	74.72	-
Wet wt. specimen + ring	g	277.49	273.54
Dry wt. specimen + ring	g	-	238.77
Wt. of ring	g	117.85	-
Bulk density	Mg/m3	1.911	2.014
Moisture content	%	32.0	28.8
Dry density	Mg/m3	1.448	1.564
Voids Ratio		0.8790	0.7389

*No allowance made for apparatus deformation!

Consolidation Stage

Stage Number	Applied Pressure kPa	Specimen ht. At start of stage mm	Initial height gauge reading	Final height gauge reading	Curve fitting method t50/t90	Specimen ht.at end of stage mm	Voids Ratio	Coefficient of Consolidation m2/year	Coefficeint of Compressibility m2/MN
	100	19.05	-2299	-2404	4.00	18.840	0.8583	9.96	0.110
	200	18.84	-2404	-2520	7.84	18.608	0.8354	4.96	0.123
	400	18.61	-2520	-2766	64.00	18.116	0.7869	0.58	0.132
	800	18.12	-2766	-3126	129.96	17.396	0.7159	0.27	0.099
	400	17.40	-3126	-3010	64.00	17.628	0.7388	0.53	0.033

UKAS TESTING 2519

One-Dimensional Consolidation Test

BS 1377 : Part 5 : Clause 3 & 4 : 1990

Determination of the one-dimensional consolidation properties

Approved by

Initials : kp

Date : 29/09/2014

Client name & address:		**Samples Received**	10/09/2014
Site Analytical Services		**Project Started**	11/09/2014
Project Name:	5-7 Lancaster Grove, London, NW3 4HE	**Testing Started**	18/09/2014
Project No:	14/22518 **Our Job / report no:** 17429	**Date Reported:**	29/09/2014
Sample description:		**Sample no/ type:**	U1
High strength brown and blue grey mottled CLAY with selenite crystals			

K4 SOILS

BH no: BH1

Depth (m): 2.00-2.45

Test details

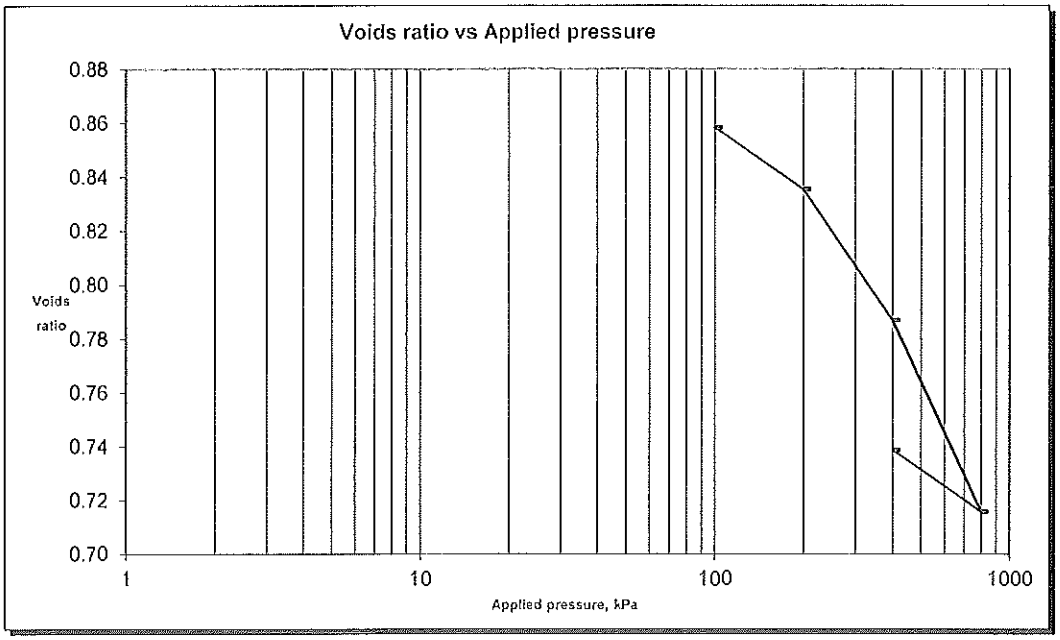
Depth within original sample m : 2.10 Orientation within original sample : Vertical

Specimen details

		Initial	Final
Height	mm :	19.05	17.63
Diameter	mm :	75	-
Bulk density	Mg/m3 :	1.91	2.01
Moisture content	% :	32	29
Dry density	Mg/m3 :	1.45	1.56
Voids Ratio	:	0.88	0.74
Degree of saturation	% :	99.1	-
Particle density	Mg/m3 :	2.72	-
Swelling pressure	kPa :	-	-

Consolidation Stage

Stage number	Applied Pressure kPa	Voids Ratio	Coefficient of Consolidation m2/year	Coefficient of Compressibility m2/MN	Stage number	Applied Pressure kPa	Voids Ratio	Coefficient of Consolidation m2/year	Coefficient of Compressibility m2/MN
1	100	0.8583	9.96	0.110	11				
2	200	0.8354	4.96	0.123	12				
3	400	0.7869	0.58	0.132	13				
4	800	0.7159	0.27	0.099	14				
5	400	0.7388	0.53	0.033	15				
6					16				
7					17				
8					18				
9					19				
10					20				



One-Dimensional Consolidation Test

BS 1377 : Part 5 : Clause 3 & 4 : 1990

Determination of the one-dimensional consolidation properties

UKAS TESTING 2519

Approved by

Initials : kp

Date : 29/09/2014

Client name & address:			**Samples Rec**	10/09/2014	**K4 SOILS**
Site Analytical Services			**Project Start**	11/09/2014	
Project Name:	5-7 Lancaster Grove, London, NW3 4HE		**Testing Start**	18/09/2014	
Project No:	14/22518	**Our Job / report no:** 17429	**Date Reported:**	29/09/2014	
Sample description:			**Sample no/ type:**	U	**BH no:** BH1
High strength dark grey CLAY					**Depth (m):** 9.50

Trimmings		Determination 1	Determination 2
Wet wt. + tin	g	147.72	147.72
Dry wt. + tin	g	125.70	125.70
Wt. tin	g	38.72	38.72
Moisture content	%	25.3	25.3
Average moisture content	%	25.32	

Depth within original sample	m	9.6
Specimen preparation		Remoulded
Particle density	Mg/m3	2.72 Assumed
Laboratory Temperature	°C	22
Degree of saturation	%	101.7
Swelling pressure	kPa	
Equivalent height of solid particles	mm	10.65

Specimen details		Initial	Final
Height	mm	19.01	18.45
Ring diameter	mm	74.79	-
Wet wt. specimen + ring	g	282.16	281.10
Dry wt. specimen + ring	g	-	244.79
Wt. of ring	g	117.57	-
Bulk density	Mg/m3	1.971	2.018
Moisture content	%	29.4	28.5
Dry density	Mg/m3	1.523	1.570
Voids Ratio		0.7856	0.7330

*No allowance made for apparatus deformation!

Consolidation Stage

Stage Number	Applied Pressure kPa	Specimen ht. At start of stage mm	Initial height gauge reading	Final height gauge reading	Curve fitting method t50/t90	Specimen ht.at end of stage mm	Voids Ratio	Coefficient of Consolidation m2/year	Coefficeint of Compressibility m2/MN
	100	19.01	-1416	-1454	1.69	18.934	0.7784	23.64	0.040
	200	18.93	-1454	-1479	9.00	18.884	0.7737	4.41	0.026
	400	18.88	-1479	-1570	20.25	18.702	0.7566	1.94	0.048
	800	18.70	-1570	-1815	92.16	18.212	0.7106	0.41	0.066
	400	18.21	-1815	-1698	92.16	18.446	0.7326	0.40	0.032

UKAS TESTING 2519

One-Dimensional Consolidation Test

BS 1377 : Part 5 : Clause 3 & 4 : 1990

Determination of the one-dimensional consolidation properties

Approved by

Initials : kp

Date : 29/09/2014

Client name & address:			Samples Received	10/09/2014	K4 SOILS
Site Analytical Services			Project Started	11/09/2014	
Project Name:	5-7 Lancaster Grove, London, NW3 4HE		Testing Started	18/09/2014	
Project No:	14/22518 Our Job / report no:	17429	Date Reported:	29/09/2014	
Sample description:			Sample no/ type:	U4	BH no: BH1
High strength dark grey CLAY					Depth (m): 9.50-9.95

Test details

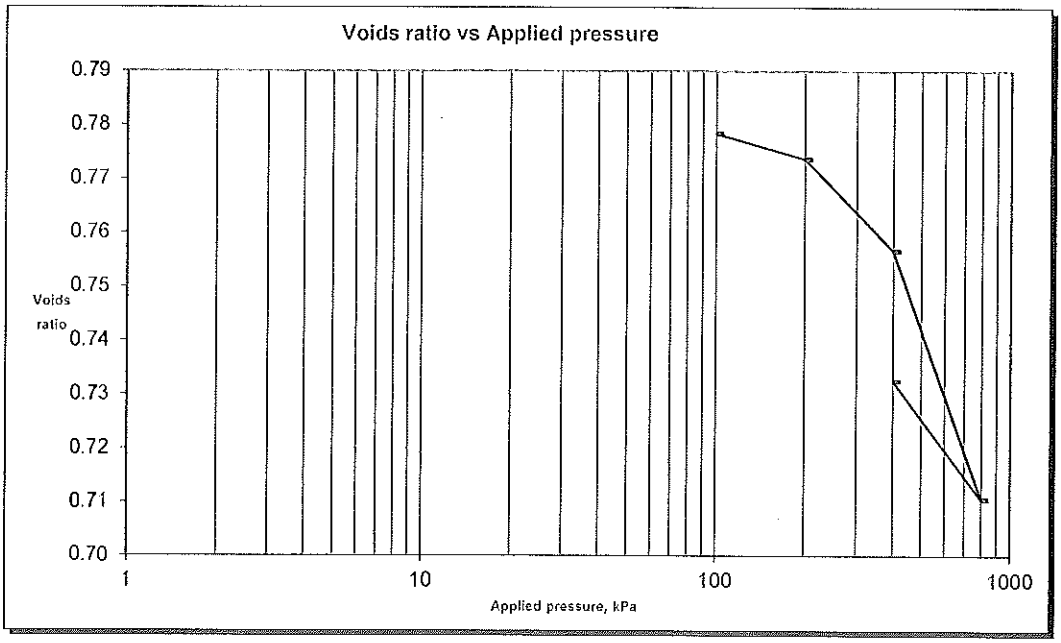
Depth within original sample m : 9.60 Orientation within original sample : Vertical

Specimen details

		Initial	Final
Height	mm :	19.01	18.45
Diameter	mm :	75	-
Bulk density	Mg/m3 :	1.97	2.02
Moisture content	% :	29	29
Dry density	Mg/m3 :	1.52	1.57
Voids Ratio	:	0.79	0.73
Degree of saturation	% :	101.7	-
Particle density	Mg/m3 :	2.72	-
Swelling pressure	kPa :	-	-

Consolidation Stage

Stage number	Applied Pressure kPa	Voids Ratio	Coefficient of Consolidation m2/year	Coefficient of Compressibility m2/MN	Stage number	Applied Pressure kPa	Voids Ratio	Coefficient of Consolidation m2/year	Coefficient of Compressibility m2/MN
1	100	0.7784	23.64	0.040	11				
2	200	0.7737	4.41	0.026	12				
3	400	0.7566	1.94	0.048	13				
4	800	0.7106	0.41	0.066	14				
5	400	0.7326	0.40	0.032	15				
6					16				
7					17				
8					18				
9					19				
10					20				



UKAS TESTING 2519

One-Dimensional Consolidation Test

BS 1377 : Part 5 : Clause 3 & 4 : 1990

Determination of the one-dimensional consolidation properties

Approved by

Initials : kp

Date : 29/09/2014

Client name & address:		**Samples Rec** 10/09/2014	**K4 SOILS**
Site Analytical Services		**Project Start** 11/09/2014	
Project Name:	5-7 Lancaster Grove, London, NW3 4HE	**Testing Start** 18/09/2014	
Project No:	14/22518 **Our Job / report no:** 17429	**Date Reported:** 29/09/2014	
Sample description:		**Sample no/ type:** U	**BH no:** BH1
Very high strength dark grey CLAY			**Depth (m):** 18.50

Trimmings		Detemination 1	Detemination 2
Wet wt. + tin	g	120.01	120.01
Dry wt. + tin	g	100.43	100.43
Wt. tin	g	38.73	38.73
Moisture content	%	31.7	31.7
Average moisture content	%	31.73	

Depth within original sample	m	18.6
Specimen preparation		Remoulded
Particle density	Mg/m3 2.72	Assumed
Laboratory Temperature	°C	22
Degree of saturation	%	102.4
Swelling pressure	kPa	
Equivalent height of solid particles	mm	10.72

Specimen details		Initial	Final
Height	mm	19.03	18.36
Ring diameter	mm	74.64	-
Wet wt. specimen + ring	g	284.59	284.15
Dry wt. specimen + ring	g	-	247.34
Wt. of ring	g	119.76	-
Bulk density	Mg/m3	1.980	2.046
Moisture content	%	29.2	28.9
Dry density	Mg/m3	1.532	1.588
Voids Ratio		0.7752	0.7127

*No allowance made for apparatus deformation!

Consolidation Stage

Stage Number	Applied Pressure kPa	Specimen ht. At start of stage mm	Initial height gauge reading	Final height gauge reading	Curve fitting method t50/t90	Specimen ht.at end of stage mm	Voids Ratio	Coefficient of Consolidation m2/year	Coefficeint of Compressibility m2/MN
	100	19.03	-2314	-2383	0.81	18.892	0.7624	49.27	0.073
	200	18.89	-2383	-2418	4.84	18.822	0.7558	8.15	0.037
	400	18.82	-2418	-2526	33.64	18.606	0.7357	1.16	0.057
	800	18.61	-2526	-2766	57.76	18.126	0.6909	0.65	0.064
	400	18.13	-2766	-2651	79.21	18.356	0.7124	0.47	0.032

UKAS TESTING 2519

One-Dimensional Consolidation Test

BS 1377 : Part 5 : Clause 3 & 4 : 1990

Determination of the one-dimensional consolidation properties

Approved by

Initials : kp

Date : 29/09/2014

Client name & address:		**Samples Received**	10/09/2014	**K4 SOILS**	
Site Analytical Services		**Project Started**	11/09/2014		
Project Name:	5-7 Lancaster Grove, London, NW3 4HE	**Testing Started**	18/09/2014		
Project No:	14/22518 **Our Job / report no:** 17429	**Date Reported:**	29/09/2014		
Sample description:		**Sample no/ type:**	U7	**BH no:**	BH1
Very high strength dark grey CLAY				**Depth (m):**	18.50-18.95

Test details

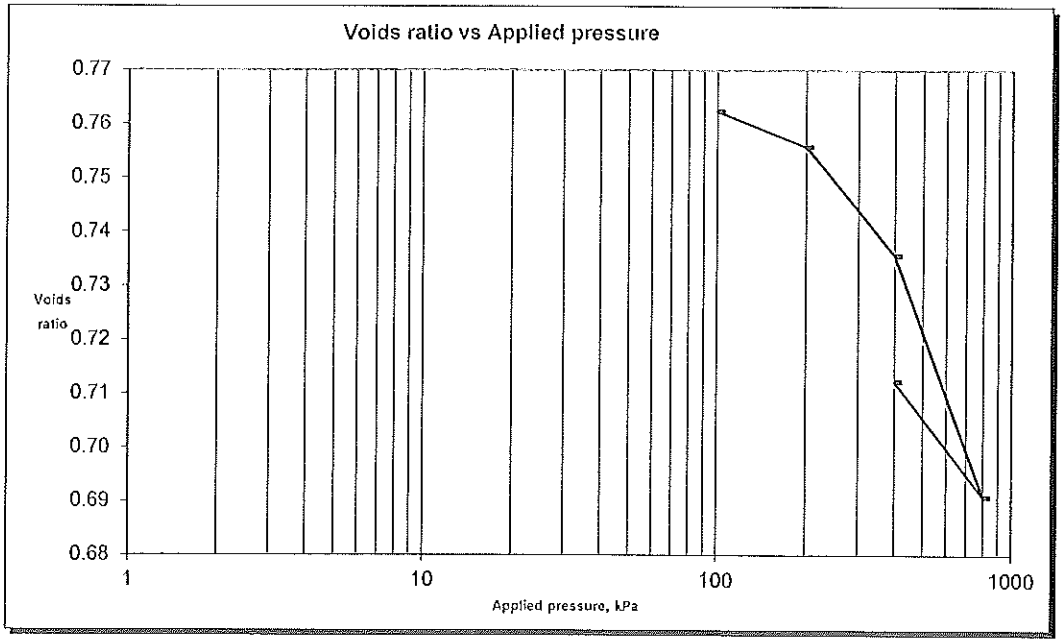
Depth within original sample m : 18.60 Orientation within original sample : Vertical

Specimen details

		Initial	Final
Height	mm :	19.03	18.36
Diameter	mm :	75	-
Bulk density	Mg/m3 :	1.98	2.05
Moisture content	% :	29	29
Dry density	Mg/m3 :	1.53	1.59
Voids Ratio	:	0.78	0.71
Degree of saturation	% :	102.4	-
Particle density	Mg/m3 :	2.72	-
Swelling pressure	kPa :	-	-

Consolidation Stage

Stage number	Applied Pressure kPa	Voids Ratio	Coefficient of Consolidation m2/year	Coefficient of Compressibility m2/MN	Stage number	Applied Pressure kPa	Voids Ratio	Coefficient of Consolidation m2/year	Coefficient of Compressibility m2/MN
1	100	0.7624	49.27	0.073	11				
2	200	0.7558	8.15	0.037	12				
3	400	0.7357	1.16	0.057	13				
4	800	0.6909	0.65	0.064	14				
5	400	0.7124	0.47	0.032	15				
6					16				
7					17				
8					18				
9					19				
10					20				



UKAS TESTING 2519

One-Dimensional Consolidation Test

BS 1377 : Part 5 : Clause 3 & 4 : 1990

Determination of the one-dimensional consolidation properties

Approved by

Initials : kp

Date : 29/09/2014

Client name & address:			**Samples Rec**	10/09/2014	**K4 SOILS**
Site Analytical Services			**Project Start**	11/09/2014	
Project Name:	5-7 Lancaster Grove, London, NW3 4HE		**Testing Start**	18/09/2014	
Project No:	14/22518	**Our Job / report no:** 17429	**Date Reported:**	29/09/2014	
Sample description:			**Sample no/ type:**	U	**BH no:** BH2
High strength brown and blue grey mottled CLAY with occasional selenite crystals					**Depth (m):** 4.00

Trimmings		Detemination 1	Detemination 2
Wet wt. + tin	g	147.91	147.91
Dry wt. + tin	g	122.68	122.68
Wt. tin	g	38.26	38.26
Moisture content	%	29.9	29.9
Average moisture content	%	29.89	

Depth within original sample	m	4.1
Specimen preparation		Remoulded
Particle density	Mg/m3	2.72 Assumed
Laboratory Temperature	°C	22
Degree of saturation	%	90.0
Swelling pressure	kPa	
Equivalent height of solid particles	mm	10.07

Specimen details		Initial	Final
Height	mm	19.88	18.83
Ring diameter	mm	74.82	-
Wet wt. specimen + ring	g	278.27	276.42
Dry wt. specimen + ring	g	-	239.47
Wt. of ring	g	119.00	-
Bulk density	Mg/m3	1.822	1.901
Moisture content	%	32.2	30.7
Dry density	Mg/m3	1.378	1.455
Voids Ratio		0.9735	0.8692

*No allowance made for apparatus deformation!

Consolidation Stage

Stage Number	Applied Pressure kPa	Specimen ht. At start of stage mm	Initial height gauge reading	Final height gauge reading	Curve fitting method t50/t90	Specimen ht.at end of stage mm	Voids Ratio	Coefficient of Consolidation m2/year	Coefficeint of Compressibility m2/MN
	100	19.88	-808	-924	0.81	19.648	0.9504	53.53	0.117
	200	19.65	-924	-997	4.41	19.502	0.9360	9.64	0.074
	400	19.50	-997	-1159	36.00	19.178	0.9038	1.15	0.083
	800	19.18	-1159	-1438	100.00	18.620	0.8484	0.40	0.073
	400	18.62	-1438	-1335	81.00	18.826	0.8688	0.48	0.028

UKAS TESTING 2519

One-Dimensional Consolidation Test

BS 1377 : Part 5 : Clause 3 & 4 : 1990

Determination of the one-dimensional consolidation properties

Approved by

Initials : kp

Date : 29/09/2014

Client name & address:		Samples Received	10/09/2014
Site Analytical Services		Project Started	11/09/2014
Project Name:	5-7 Lancaster Grove, London, NW3 4HE	Testing Started	18/09/2014
Project No:	14/22518 Our Job / report no: 17429	Date Reported:	29/09/2014
Sample description:		Sample no/ type:	U2
High strength brown and blue grey mottled CLAY with occasional selenite crystals			

K4 SOILS

BH no: BH2

Depth (m): 4.00-4.45

Test details

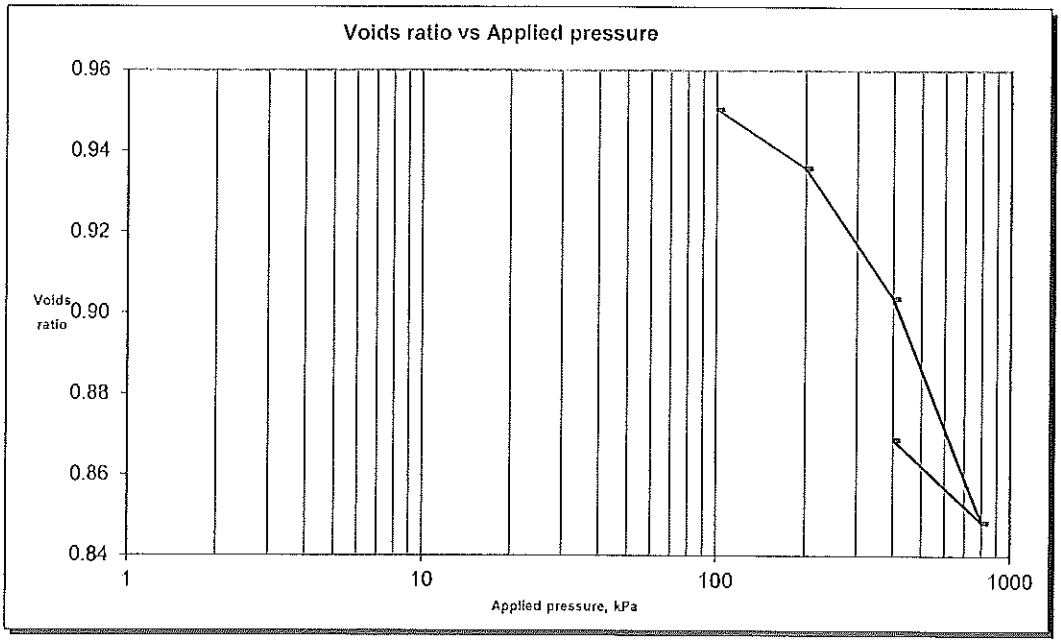
Depth within original sample m : 4.10 Orientation within original sample : Vertical

Specimen details

		Initial	Final
Height	mm :	19.88	18.83
Diameter	mm :	75	-
Bulk density	Mg/m3 :	1.82	1.90
Moisture content	% :	32	31
Dry density	Mg/m3 :	1.38	1.46
Voids Ratio	:	0.97	0.87
Degree of saturation	% :	90.0	-
Particle density	Mg/m3 :	2.72	-
Swelling pressure	kPa :	-	-

Consolidation Stage

Stage number	Applied Pressure kPa	Voids Ratio	Coefficient of Consolidation m2/year	Coefficient of Compressibility m2/MN	Stage number	Applied Pressure kPa	Voids Ratio	Coefficient of Consolidation m2/year	Coefficient of Compressibility m2/MN
1	100	0.9504	53.53	0.117	11				
2	200	0.9360	9.64	0.074	12				
3	400	0.9038	1.15	0.083	13				
4	800	0.8484	0.40	0.073	14				
5	400	0.8688	0.48	0.028	15				
6					16				
7					17				
8					18				
9					19				
10					20				



UKAS TESTING 2519

One-Dimensional Consolidation Test

BS 1377 : Part 5 : Clause 3 & 4 : 1990

Determination of the one-dimensional consolidation properties

Approved by

Initials : kp

Date : 29/09/2014

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Croxley Green Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 14-59768

Project / Site name:	5-7 Lancaster Grove	**Samples received on:**	11/09/2014
Your job number:	14-22518	**Samples instructed on:**	11/09/2014
Your order number:	20807	**Analysis completed by:**	18/09/2014
Report Issue Number:	1	**Report issued on:**	18/09/2014
Samples Analysed:	6 soil samples		

Signed:

Thurstan Plummer
Organics Technical Manager
For & on behalf of i2 Analytical Ltd.

Signed:

Rexona Rahman
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Other office located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting
asbestos - 6 months from reporting

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Analytical Report Number: 14-59768
Project / Site name: 5-7 Lancaster Grove
Your Order No: 20807

Lab Sample Number				371656	371657	371658	371659	371660
Sample Reference				BH1	BH3	TP1	TP2	TP3
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.25	0.50	0.25	0.55	0.16
Date Sampled				11/09/2014	11/09/2014	11/09/2014	11/09/2014	11/09/2014
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Moisture Content	%	N/A	NONE	10	18	11	8.2	18
Total mass of sample received	kg	0.001	NONE	0.44	0.50	0.40	0.58	0.43
Whole Sample Crushed		N/A	NONE	Crushed	Crushed	Crushed	Crushed	Crushed
Asbestos in Soil Screen	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
General Inorganics								
pH	pH Units	N/A	MCERTS	7.9	7.6	7.2	8.1	8.1
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Complex Cyanide	mg/kg	1	NONE	< 1	< 1	< 1	< 1	< 1
Free Cyanide	mg/kg	1	NONE	< 1	< 1	< 1	< 1	< 1
Total Sulphate as SO_4	mg/kg	100	ISO 17025	660	1200	1200	1800	560
Water Soluble Sulphate (Soil Equivalent)	g/l	0.0025	MCERTS	0.025	0.64	0.28	0.15	0.064
Water Soluble Sulphate (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.012	0.32	0.14	0.073	0.032
Sulphide	mg/kg	1	MCERTS	2.4	< 1.0	< 1.0	1.5	< 1.0
Total Organic Carbon (TOC)	%	0.1	MCERTS	0.2	0.9	1.9	< 0.1	0.6
Total Phenols								
Total Phenols (monohydric)	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	mg/kg	0.1	MCERTS	0.42	< 0.10	0.36	< 0.10	< 0.10
Pyrene	mg/kg	0.1	MCERTS	0.38	< 0.10	0.32	< 0.10	< 0.10
Benzo(a)anthracene	mg/kg	0.1	MCERTS	0.23	< 0.10	0.24	< 0.10	< 0.10
Chrysene	mg/kg	0.05	MCERTS	0.22	< 0.05	0.18	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	0.47	< 0.10	0.45	< 0.10	< 0.10
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	0.13	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(a)pyrene	mg/kg	0.1	MCERTS	0.30	< 0.10	0.22	< 0.10	< 0.10
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	2.15	< 1.60	1.77	< 1.60	< 1.60
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	13	9.9	21	15	8.7
Boron (total)	mg/kg	1	MCERTS	13	9.0	12	13	9.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.2	< 0.2	0.7	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	30	31	32	25	26
Copper (aqua regia extractable)	mg/kg	1	MCERTS	39	21	63	62	19
Lead (aqua regia extractable)	mg/kg	1	MCERTS	200	410	470	410	93
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	1.8	< 0.3	0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	25	16	24	14	13
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	110	44	620	75	78

Analytical Report Number: 14-59768
Project / Site name: 5-7 Lancaster Grove
Your Order No: 20807

Lab Sample Number				371656	371657	371658	371659	371660
Sample Reference				BH1	BH3	TP1	TP2	TP3
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.25	0.50	0.25	0.55	0.16
Date Sampled				11/09/2014	11/09/2014	11/09/2014	11/09/2014	11/09/2014
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0	36	< 8.0	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	36	< 10	< 10
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	< 10	13	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	13	< 10	< 10

Analytical Report Number: 14-59768
Project / Site name: 5-7 Lancaster Grove
Your Order No: 20807

Lab Sample Number				371661				
Sample Reference				TP4				
Sample Number				None Supplied				
Depth (m)				0.40				
Date Sampled				11/09/2014				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Moisture Content	%	N/A	NONE	3.1				
Total mass of sample received	kg	0.001	NONE	0.75				
Whole Sample Crushed		N/A	NONE	Crushed				
Asbestos in Soil Screen	Type	N/A	ISO 17025	Not-detected				
General Inorganics								
pH	pH Units	N/A	MCERTS	8.1				
Total Cyanide	mg/kg	1	MCERTS	< 1				
Complex Cyanide	mg/kg	1	NONE	< 1				
Free Cyanide	mg/kg	1	NONE	< 1				
Total Sulphate as SO_4	mg/kg	100	ISO 17025	360				
Water Soluble Sulphate (Soil Equivalent)	g/l	0.0025	MCERTS	0.053				
Water Soluble Sulphate (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.027				
Sulphide	mg/kg	1	MCERTS	2.0				
Total Organic Carbon (TOC)	%	0.1	MCERTS	< 0.1				
Total Phenols								
Total Phenols (monohydric)	mg/kg	2	MCERTS	< 2.0				
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05				
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10				
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10				
Fluorene	mg/kg	0.1	MCERTS	< 0.10				
Phenanthrene	mg/kg	0.1	MCERTS	< 0.10				
Anthracene	mg/kg	0.1	MCERTS	< 0.10				
Fluoranthene	mg/kg	0.1	MCERTS	< 0.10				
Pyrene	mg/kg	0.1	MCERTS	< 0.10				
Benzo(a)anthracene	mg/kg	0.1	MCERTS	< 0.10				
Chrysene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	< 0.10				
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	< 0.10				
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.10				
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	< 0.10				
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10				
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05				
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	< 1.60				
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	5.6				
Boron (total)	mg/kg	1	MCERTS	1.5				
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2				
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0				
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	13				
Copper (aqua regia extractable)	mg/kg	1	MCERTS	11				
Lead (aqua regia extractable)	mg/kg	1	MCERTS	70				
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3				
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	6.5				
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0				
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	40				

Analytical Report Number: 14-59768
Project / Site name: 5-7 Lancaster Grove
Your Order No: 20807

Lab Sample Number				371661				
Sample Reference				TP4				
Sample Number				None Supplied				
Depth (m)				0.40				
Date Sampled				11/09/2014				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	µg/kg	1	MCERTS	< 1.0				
Toluene	µg/kg	1	MCERTS	< 1.0				
Ethylbenzene	µg/kg	1	MCERTS	< 1.0				
p & m-xylene	µg/kg	1	MCERTS	< 1.0				
o-xylene	µg/kg	1	MCERTS	< 1.0				
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0				

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	< 0.1				
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	< 0.1				
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1				
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0				
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0				
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0				
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0				
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10				

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	< 0.1				
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	< 0.1				
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1				
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0				
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0				
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10				
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10				
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10				

Analytical Report Number : 14-59768

Project / Site name: 5-7 Lancaster Grove

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and topsoil/loam soil types. Data for unaccredited types of solid should be interpreted with care.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
371656	BH1	None Supplied	0.25	Brown clay and sand with gravel and rubble.
371657	BH3	None Supplied	0.50	Brown clay and sand with gravel and vegetation.
371658	TP1	None Supplied	0.25	Brown sandy topsoil with gravel and vegetation.
371659	TP2	None Supplied	0.55	Light brown rubble with brick and stones. **
371660	TP3	None Supplied	0.16	Brown clay and sand with gravel.
371661	TP4	None Supplied	0.40	Light grey rubble with stones. **

** Non MCerts Matrix

Analytical Report Number : 14-59768

Project / Site name: 5-7 Lancaster Grove

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
BTEX and MTBE in soil	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073S-PL	W	MCERTS
Complex cyanide in soil	Determination of complex cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	NONE
Crush Whole Sample	Either: Client specific preparation instructions - sample(s) crushed whole prior to analysis; OR Sample unsuitable for standard preparation and therefore crushed whole prior to analysis.	In house method, applicable to dry samples only.	L019-UK	D	NONE
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	NONE
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
pH in soil	Determination of pH in soil by addition of water followed by electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L005-PL	W	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Stones not passing through a 10 mm sieve is determined gravimetrically and reported as a percentage of the dry weight. Sample results	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil	Determination of water soluble sulphate by extraction with water followed by ICP-OES. Results reported corrected for extraction ratio (soil equivalent) as g/l and mg/kg; and upon the 2:1	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS

Analytical Report Number : 14-59768

Project / Site name: 5-7 Lancaster Grove

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Total organic carbon in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L023-PL	D	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	ISO 17025
TPHCWG (Soil)	Determination of pentane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L076-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Aubrey Davidson
Site Analytical Services Ltd
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QTS Environmental Report No: 14-24800

Site Reference:	5-7 Lancaster Grove, London NW3 4HE
Project / Job Ref:	14/22518
Order No:	20811
Sample Receipt Date:	12/09/2014
Sample Scheduled Date:	12/09/2014
Report Issue Number:	1
Reporting Date:	18/09/2014

Authorised by:

Russell Jarvis
Director
On behalf of QTS Environmental Ltd

Authorised by:

Kevin Old
Director
On behalf of QTS Environmental Ltd

QTS Environmental Ltd
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Kent ME17 2JN
Tel : 01622 850410

mCERTS THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME

UKAS TESTING 4480

Soil Analysis Certificate							
QTS Environmental Report No: 14-24800	Date Sampled	11/09/14	11/09/14				
Site Analytical Services Ltd	Time Sampled	None Supplied	None Supplied				
Site Reference: 5-7 Lancaster Grove, London NW3	TP / BH No	BH1	BH2				
Project / Job Ref: 14/22518	Additional Refs	D2	D1				
Order No: 20811	Depth (m)	0.50	0.25				
Reporting Date: 18/09/2014	QTSE Sample No	117662	117663				

Determinand	Unit	RL	Accreditation					
Asbestos Screen	N/a	N/a	ISO17025	Not Detected	Not Detected			
pH	pH Units	N/a	MCERTS	7.6	7.5			
Total Cyanide	mg/kg	< 2	NONE	< 2	< 2			
Complex Cyanide	mg/kg	< 2	NONE	< 2	< 2			
Free Cyanide	mg/kg	< 2	NONE	< 2	< 2			
Total Sulphate as SO_4	mg/kg	< 200	NONE	1045	3559			
W/S Sulphate as SO4 (2:1)	g/l	< 0.01	MCERTS	0.14	0.06			
Sulphide	mg/kg	< 5	NONE	< 5	< 5			
Organic Matter	%	< 0.1	NONE	1.6	3.3			
Total Organic Carbon (TOC)	%	< 0.1	NONE	0.9	1.9			
Arsenic (As)	mg/kg	< 2	MCERTS	8	22			
W/S Boron	mg/kg	< 1	NONE	< 1	1			
Cadmium (Cd)	mg/kg	< 0.5	MCERTS	< 0.5	0.6			
Chromium (Cr)	mg/kg	< 2	MCERTS	33	43			
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2	< 2			
Copper (Cu)	mg/kg	< 4	MCERTS	18	76			
Lead (Pb)	mg/kg	< 3	MCERTS	65	1460			
Mercury (Hg)	mg/kg	< 1	NONE	< 1	1.3			
Nickel (Ni)	mg/kg	< 3	MCERTS	23	24			
Selenium (Se)	mg/kg	< 3	NONE	< 3	< 3			
Zinc (Zn)	mg/kg	< 3	MCERTS	61	327			
Total Phenols (monohydric)	mg/kg	< 2	NONE	< 2	< 2			

Analytical results are expressed on a dry weight basis where samples are dried at less than 30°C

Analysis carried out on the dried sample is corrected for the stone content

The samples have been examined to identify the presence of asbestiform minerals by polarising light microscopy and dispersion staining technique to In-House Procedures QTSE600 Determination of Asbestos in Bulk Materials; Asbestos in Soils/Sediments (fibre screening and identification)

This report refers to samples as received, and QTS Environmental Ltd, takes no responsibility for the accuracy or competence of sampling by others.

The material description shall be regarded as tentative and is not included in our scope of UKAS Accreditation.

Opinions and interpretations expressed herein are outside the scope of UKAS Accreditation.

Asbestos Analyst: Piotr Lipski

RL: Reporting Limit

Pinch Test: Where pinch test is positive it is reported "Loose Fibres - PT" with type(s).

Subcontracted analysis [5]

QTS Environmental Ltd
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Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410

4480

Soil Analysis Certificate - Speciated PAHs							
QTS Environmental Report No: 14-24800	Date Sampled	11/09/14	11/09/14				
Site Analytical Services Ltd	Time Sampled	None Supplied	None Supplied				
Site Reference: 5-7 Lancaster Grove, London NW3 4HE	TP / BH No	BH1	BH2				
Project / Job Ref: 14/22518	Additional Refs	D2	D1				
Order No: 20811	Depth (m)	0.50	0.25				
Reporting Date: 18/09/2014	QTSE Sample No	117662	117663				

Determinand	Unit	RL	Accreditation					
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Acenaphthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Fluorene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Phenanthrene	mg/kg	< 0.1	MCERTS	< 0.1	0.14			
Anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	0.32			
Pyrene	mg/kg	< 0.1	MCERTS	< 0.1	0.27			
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	0.15			
Chrysene	mg/kg	< 0.1	MCERTS	< 0.1	0.18			
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	0.23			
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	0.16			
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Coronene	mg/kg	< 0.1	NONE	< 0.1	< 0.1			
Total Oily Waste PAHs	mg/kg	< 1	MCERTS	< 1	< 1			
Total Dutch 10 PAHs	mg/kg	< 1	MCERTS	< 1	< 1			
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	< 1.6	< 1.6			
Total WAC-17 PAHs	mg/kg	< 1.7	NONE	< 1.7	< 1.7			

Analytical results are expressed on a dry weight basis where samples are dried at less than 30°C

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Soil Analysis Certificate - TPH CWG Banded						
QTS Environmental Report No: 14-24800	Date Sampled	11/09/14	11/09/14			
Site Analytical Services Ltd	Time Sampled	None Supplied	None Supplied			
Site Reference: 5-7 Lancaster Grove, London NW3 4HE	TP / BH No	BH1	BH2			
Project / Job Ref: 14/22518	Additional Refs	D2	D1			
Order No: 20811	Depth (m)	0.50	0.25			
Reporting Date: 18/09/2014	QTSE Sample No	117662	117663			

Determinand	Unit	RL	Accreditation					
Aliphatic >C5 - C6	mg/kg	< 0.01	NONE	< 0.01	< 0.01			
Aliphatic >C6 - C8	mg/kg	< 0.05	NONE	< 0.05	< 0.05			
Aliphatic >C8 - C10	mg/kg	< 1	NONE	< 1	< 1			
Aliphatic >C10 - C12	mg/kg	< 1	NONE	< 1	< 1			
Aliphatic >C12 - C16	mg/kg	< 1	NONE	< 1	< 1			
Aliphatic >C16 - C21	mg/kg	< 1	NONE	< 1	< 1			
Aliphatic >C21 - C34	mg/kg	< 6	NONE	< 6	< 6			
Aliphatic (C5 - C34)	mg/kg	< 12	NONE	< 12	< 12			
Aromatic >C5 - C7	mg/kg	< 0.01	NONE	< 0.01	< 0.01			
Aromatic >C7 - C8	mg/kg	< 0.05	NONE	< 0.05	< 0.05			
Aromatic >C8 - C10	mg/kg	< 1	NONE	< 1	< 1			
Aromatic >C10 - C12	mg/kg	< 1	NONE	< 1	< 1			
Aromatic >C12 - C16	mg/kg	< 1	NONE	< 1	< 1			
Aromatic >C16 - C21	mg/kg	< 1	NONE	< 1	7			
Aromatic >C21 - C35	mg/kg	< 6	NONE	< 6	14			
Aromatic (C5 - C35)	mg/kg	< 12	NONE	< 12	22			
Total >C5 - C35	mg/kg	< 24	NONE	< 24	< 24			

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Soil Analysis Certificate - BTEX / MTBE						
QTS Environmental Report No: 14-24800	Date Sampled	11/09/14	11/09/14			
Site Analytical Services Ltd	Time Sampled	None Supplied	None Supplied			
Site Reference: 5-7 Lancaster Grove, London NW3 4HE	TP / BH No	BH1	BH2			
Project / Job Ref: 14/22518	Additional Refs	D2	D1			
Order No: 20811	Depth (m)	0.50	0.25			
Reporting Date: 18/09/2014	QTSE Sample No	117662	117663			

Determinand	Unit	RL	Accreditation					
Benzene	ug/kg	< 2	MCERTS	< 2	< 2			
Toluene	ug/kg	< 5	MCERTS	< 5	< 5			
Ethylbenzene	ug/kg	< 10	MCERTS	< 10	< 10			
p & m-xylene	ug/kg	< 10	MCERTS	< 10	< 10			
o-xylene	ug/kg	< 10	MCERTS	< 10	< 10			
MTBE	ug/kg	< 5	MCERTS	< 5	< 5			

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MCERTS THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME
UKAS TESTING 4480

Waste Acceptance Criteria Analytical Certificate - BS EN 12457/3

QTS Environmental Report No: 14-24800		Date Sampled	11/09/14				Landfill Waste Acceptance Criteria Limits	
Site Analytical Services Ltd		Time Sampled	None Supplied			Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Site Reference: 5-7 Lancaster Grove, London NW3 4HE		TP / BH No	BH1					
Project / Job Ref: 14/22518		Additional Refs	D2					
Order No: 20811		Depth (m)	0.50					
Reporting Date: 18/09/2014		QTSE Sample No	117662					
Determinand	**Unit**	**MDL**						
TOC	%	< 0.1	0.9			3%	5%	6%
Loss on Ignition	%	< 0.01	4.40			--	--	10%
BTEX[MU]	mg/kg	< 0.05	< 0.05			6	--	--
Sum of PCBs	mg/kg	< 0.7	< 0.7			1	--	--
Mineral Oil	mg/kg	< 6	< 6			500	--	--
Total PAH[MU]	mg/kg	< 1.7	< 1.7			100	--	--
pH[MU]	pH Units	N/a	7.6			--	>6	--
Acid Neutralisation Capacity	mol/kg (+/-)	< 1	< 1			--	To be evaluated	To be evaluated

Eluate Analysis	**2:1 mg/l**	**8:1 mg/l**		**Cumulative 10:1 mg/kg**	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg (mg/kg)**		
Arsenic	< 0.01	< 0.01		< 0.2	0.5	2	25
Barium	< 0.02	< 0.02		< 0.1	20	100	300
Cadmium	< 0.0005	< 0.0005		< 0.02	0.04	1	5
Chromium	< 0.005	< 0.005		< 0.20	0.5	10	70
Copper	< 0.01	< 0.01		< 0.5	2	50	100
Mercury	< 0.005	< 0.005		< 0.01	0.01	0.2	2
Molybdenum	0.020	0.012		0.1	0.5	10	30
Nickel	< 0.007	< 0.007		< 0.2	0.4	10	40
Lead	< 0.005	< 0.005		< 0.2	0.5	10	50
Antimony	< 0.005	< 0.005		< 0.06	0.06	0.7	5
Selenium	< 0.005	< 0.005		< 0.1	0.1	0.5	7
Zinc	< 0.005	< 0.005		< 0.2	4	50	200
Chloride[U]	1	< 1		< 12	800	15000	25000
Fluoride[U]	1.8	1.1		11.7	10	150	500
Sulphate[U]	9	3		31	1000	20000	50000
TDS	118	94		958	4000	60000	100000
Phenol Index	< 0.01	< 0.01		< 0.5	1	-	-
DOC	8.6	4.8		50.5	500	800	1000
Leach Test Information							
Sample Mass (kg)	0.21						
Dry Matter (%)	84.7						
Moisture (%)	18.2						
Stage 1							
Volume Eluate L2 (litres)	0.32						
Filtered Eluate VE1 (litres)	0.13						

Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and QTS Environmental cannot be held responsible for any discrepencies with current legislation
M Denotes MCERTS accredited test
U Denotes ISO17025 accredited test