

GEOTECHNICAL REPORT

Site Address:	12 Canning Crescent London N22 5SR
Report Date:	January 2026
Project No.:	20022
Prepared for:	Bilal Ustun Ltd



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SUMMARY

ADDRESS: 12 Canning Crescent London N22 5SR

SOILS PROFILE

Location	Made ground	Depth (m bgl)	Natural ground	Depth (m bgl)
WS1	Moderately compact dark brown slightly silty, slightly sandy topsoil FILL with sand, crushed concrete, brick and fine to medium gravel.	0.45m	Firm becoming stiff brown slightly silty, slightly sandy CLAY	4.00m+
	Loose yellow brown SAND & GRAVEL with much crushed brick FILL	1.00m		
	Firm dark brown slightly silty, sandy CLAY FILL with occasional crushed brick and fine to medium flint gravel	1.50m		
WS2	Moderately compact dark brown slightly silty, slightly sandy topsoil FILL with sand, crushed concrete, brick and fine to medium gravel.	0.70m	Firm becoming stiff brown slightly silty, slightly sandy CLAY	4.00m+
	Firm dark brown slightly silty, sandy CLAY FILL with occasional crushed brick and fine to medium flint gravel	1.00m		
WS3	Moderately compact dark brown slightly silty, slightly sandy topsoil FILL with sand, crushed concrete, brick and fine to medium gravel.	1.00m	Firm becoming stiff brown slightly silty, slightly sandy CLAY	4.00m+
WS4	Moderately compact dark brown slightly silty, slightly sandy topsoil FILL with sand, crushed concrete, brick and fine to medium gravel.	1.00m	Firm becoming stiff brown slightly silty, slightly sandy CLAY	4.00m+

ROOT SYSTEM OVERVIEW

Location	Depth Recorded (m bgl)	Identification (If completed)
WS1	0.50m	
WS2	1.70m	
WS3	3.00m	
WS4	2.50m	

GROUNDWATER OVERVIEW

Location	Depth Water Struck (m bgl)	Depth of Standing Water (m bgl)	Rate of Inflow
WS1	DRY		
WS2	DRY		
WS3	DRY		
WS4	DRY		

SOIL ANALYSIS: Cohesive Soils

Strength:	Hand Penetrometer tests 90-150+ kN/m ²	
Casagrande Plasticity Classification:	High to Very High	
Plasticity Index:	39-50%	
NHBC Shrinkability Classification:	High	
Significant Desiccation:	WS1	Significant desiccation at 1.00 meters
	WS2	Significant desiccation at 2.00 meters
	WS3	Significant desiccation at between 1.00-3.00 meters
	WS4	Only Slight desiccation
Sulphate Content:	DS-1/AC-1s	

1. Introduction

- 1.1** All site investigation works have been undertaken in accordance with BS5930:2015+A1:2020, (Code of Practice for Ground Investigations).
- 1.2** In accordance with your instructions, we visited the above site on the 9th December 2025.
- 1.3** The comments and opinions expressed are based purely on the soil and groundwater conditions identified within this report and the subsequent laboratory testing.
- 1.4** Some special condition may be present on site that, to date, has not been encountered within the scope of the site investigation works completed and therefore may not have been considered within the report. The findings of this report are based on the soil and groundwater sampling completed at the locations tested.
- 1.5** Unless otherwise stated, all groundwater recordings relate to short term observations and do not consider fluctuations in elevation due to seasonal, tidal, or other effects. It is possible that fluctuations in the groundwater elevation may have an impact on the proposed design and as such, it is recommended that long term monitoring is undertaken to obtain accurate information relevant to the proposed design in terms of the ground water elevation.

2. Description of Site

- 2.1** The site is formed by an existing residential house with small garden areas and access to the main garage from Newham Road.
- 2.2** The site is shown within the British Geological Survey Online Geology Viewer (Scale 1:50 000, Solid & Drift), which shows that the site situated with an area of London Clay Formation - Clay, Silt and Sand.

3. Fieldwork

- 3.1** In order to assess the site, the following site investigation works were implemented.
- 4No Dynamic Competitor Rig boreholes were sunk to a maximum depth of ## meters.
 - Geotechnical Laboratory Testing.
- 3.2** The location of these works is indicated on the site plan-forming Appendix 1.
- 3.3** The various strata encountered were noted and are recorded on the excavation logs forming Appendix 2.
- 3.4** Full ranges of samples were recovered as noted and retained for subsequent laboratory testing.

4. Laboratory Testing

- 4.1** Laboratory testing has been undertaken in accordance with BS 1377-2:2022, (Methods for Tests for Soils for Civil Engineering Purposes), the results of which are enclosed.
- 4.2** Selected samples were recovered to determine their Atterberg Limits, Hand Penetrometer Testing, Soluble Sulphate value and pH.
- 4.3** The results of this laboratory testing are enclosed and form Appendix 3.

5. Fieldwork Results

- 5.1** Based on the borehole logs which can be found forming Appendix 2, it can be seen that the geology at the site recorded slightly increased depths of made ground present to depths of between 1.00-1.50 meters where a Clay soil is recorded in place. This is present to depths of 4.00 meters.
- 5.2** No groundwater was identified within the scope of the site investigation works.
- 5.3** Groundwater records, unless otherwise stated, are based on short-term observations, and do not allow for or consider seasonal or other fluctuations, global warming, or periods of excessive wet or dry weather. All groundwater records are noted at the time of the drilling works and any other subsequent groundwater readings taken which, if present, are shown. Should the development be reliant on groundwater impacting on either below ground excavations, basements or short- or long-term excavations, HESI would recommend the installation of standpipes to depths relevant to any proposed excavation works and a period of either short- or long-term monitoring. This can be completed on request.
- 5.4** Roots were encountered within the boreholes based on examination of the soil samples across the site as shown below and recorded within the attached sample logs in Appendix 2. Roots were identified to depths of between 0.50-3.00 meters.

6. Results

- 6.1** By inspection of the borehole logs and from a visual assessment of the samples recovered, a scheme of laboratory testing has been undertaken. The results are enclosed within Appendix 3 and prove the following:
- 6.2** Hand Penetrometer tests have been undertaken disturbed samples recovered from the site works. From the information gathered, it is recorded that allowable bearing capacity values of between 90-150+ kN/m² were achieved.
- 6.3** SPT N-Values have been completed within the boreholes completed at the site. It is confirmed within the borehole logs forming Appendix 2 of this report that SPT N-Values of 12 were achieved. This would indicate an approximate allowable bearing capacity of 120kN/m² would be recognized. If groundwater is present within close proximity to the proposed founding depths, any allowable bearing capacity identified as a result of calculations undertaken as a result of the site investigation should be halved.
- 6.4** Where the SPT N-Value test is completed in fine grained soils, the displacement of the pore water pressure is reduced due to permeability and as such, artificially high. As such, any SPT N-Value test completed in fine grained soils should be halved.
- 6.5** Atterberg Limits tests proved the clay soils to be of high to very high plasticity, (PI= 40-50 %), which indicates a high susceptibility to movement associated with moisture content change.
- 6.6** A measurement of the potential desiccation has been completed using Driscoll's Method of Desiccation Analysis which uses a comparison of moisture content profiles measures against the liquid limit measured in the Atterberg Limits test. This makes an assumption as to the state of the soil moisture content against the state of the soil in its liquid state to assess desiccation. Driscoll makes a comparison that the soils would likely be in a state of slight desiccation if the moisture content of the soil was less than 0.5 multiplied by the liquid limit state of the soil, (slight desiccation being a level of desiccation at which overburden pressure may influence), and significant desiccation if the moisture content of the soil was less than 0.4 multiplied by the liquid limit, (significant desiccation being a level which would be un-natural to reduce to and therefore influenced by surrounding trees or vegetation). This is a mathematical representation of the state of the clay and does not consider overburden pressure which may form a factor in this calculation.

- 6.7** If the state of desiccation is a driving factor to consider foundation design, HESI would recommend the use of soil suction analysis utilising a control borehole as a comparison against desiccation levels which will provide a more accurate depiction of tree influence at that time.
- 6.8** Utilizing Driscoll's method of assessment, significant desiccation is identified at depths of between 100 meters in WS1, at 2.00 meters in WS2 and throughout WS3 meters which would indicate that the underlying clay soils have been impacted on by the presence of the surrounding trees and vegetation to such an extent as to excessively dry out the soil. The materials identified as Significantly desiccated are not suitable for founding on and as such, would suggest that foundations must as a simple rule of thumb, extend to depths more than 3.00 meters.
- 6.9** Included within the laboratory testing was sulphate analysis, which can determine the use of sulphate resisting cement within the foundation design for the development. The results are enclosed and prove the classification in accordance with ACEC to be DS- 2 /AC-1S.

7. General Foundation Requirements

Any new foundations should be seated at a minimum depth of 0.90 metres below existing ground level to mitigate the effects of weathering. Final foundation depth and design will be influenced by several factors, including (but not limited to):

- Uniformity of the founding material with respect to volume change, future movement, and differential settlement
- Depth and extent of made ground
- Allowable bearing capacity of the soils
- Proposed structural loads
- Groundwater conditions
- Presence, removal, or future growth of trees and vegetation
- Site topography
- Structural solution features

Foundations must be seated in ***suitable, undisturbed natural ground*** capable of supporting the proposed loads.

7.1 Tree and Vegetation Influence

All foundations must extend to depths beyond the zone of influence of any trees or vegetation, whether existing, recently removed, or proposed. An assessment of root depth has been undertaken based on limited ground investigations as shown within this report; however, due to the restricted number of observations, this assessment cannot be uniformly applied across the site and should be used with caution.

As such, NHBC Chapter 4.2 (Building Near Trees) should be used as a guideline to determine foundation depths, taking into account tree species, mature height, clay shrink-ability, and proximity to foundations.

7.2 Design Guidance in Relation to Trees

- Foundations should be taken to depths exceeding the influence of surrounding trees and vegetation.
- A minimum foundation depth of 0.90m is recommended as a baseline.
- NHBC Chapter 4.2 should be used as a design and costing guide only; actual foundation depths must be confirmed on site.
- For trees that have been or will be removed, the original height of the vegetation should be used when assessing foundation depth requirements.
- For trees that will remain and mature, mature tree height should be used in NHBC calculations.

- Strip foundation depths will vary depending on proximity to trees, with greater depths required closer to vegetation.
- Foundation depths may exceed those identified in this report where tree influence is significant.

7.3 Suitability of Founding Soils

For soils to be considered suitable as founding material, the following conditions must be met:

- Completion of NHBC Chapter 4.2 design assessments
- Confirmation that soil bearing capacity is compatible with structural loading requirements
- Excavations undertaken under a watching brief to identify roots, variable ground, or soft spots
- Foundations must extend below all fill, reworked ground, and existing features (e.g. old foundations)

7.4 Soil Desiccation and Shrinkage

Ground investigations indicate that the upper clay soils have been significantly desiccated due to the influence of surrounding trees and vegetation. Foundations should therefore extend beyond the depth of desiccation and tree influence and be seated in soils with sufficient allowable bearing capacity.

7.5 Recommended Foundation Solutions

Highly shrinkable clay has been identified to depths of 2.0–3.0 metres. Given this, the following foundation solutions are considered appropriate:

- Deep strip foundations, or
- Piled foundations with ground beams

7.6 Additional Clay-Related Design Considerations

- Strip foundation depths may exceed 2.0 metres, depending on tree proximity or identified root systems.
- Variability in upper soils (including granular or FILL layers) may result in differential movement.
- Where piles are adopted, pile depths should be determined using:
 - a) SPT N-values
 - b) Soil strength parameters
 - c) Structural loading calculations
 - d) A likely requirement for a deep borehole to say 20 meters.

7.7 Heave and Floor Construction

- Upper 3–4 metres of piles should be sleeved to mitigate heave risk.
- Heave and shrinkage protection must comply with NHBC Chapter 4.2.
- A suspended floor is recommended where:
 - a) Foundation depths exceed 1.50 metres, or
 - b) Made ground/compressible soils exceed 0.60 metres, unless proven uniform and competent

7.8 Ground Bearing Slabs

Where excessive made ground is present:

- Local removal of poor material and old foundations is required
- Replacement with engineered granular fill compacted to a specification provided by the structural engineer

- Plate bearing tests are recommended to confirm design assumptions

7.9 Structural Responsibility

All foundations must be designed by a suitably qualified structural engineer, taking full account of:

- Ground conditions
- Groundwater
- Structural loading
- Heave and settlement risks

If any aspect of this report is unclear, clarification should be sought prior to finalising the foundation design. The ultimate selection of foundation type and depth rests with the structural engineer.

I hope the foregoing is sufficient for your requirements, although please do not hesitate to contact us should require any further information regarding the above.

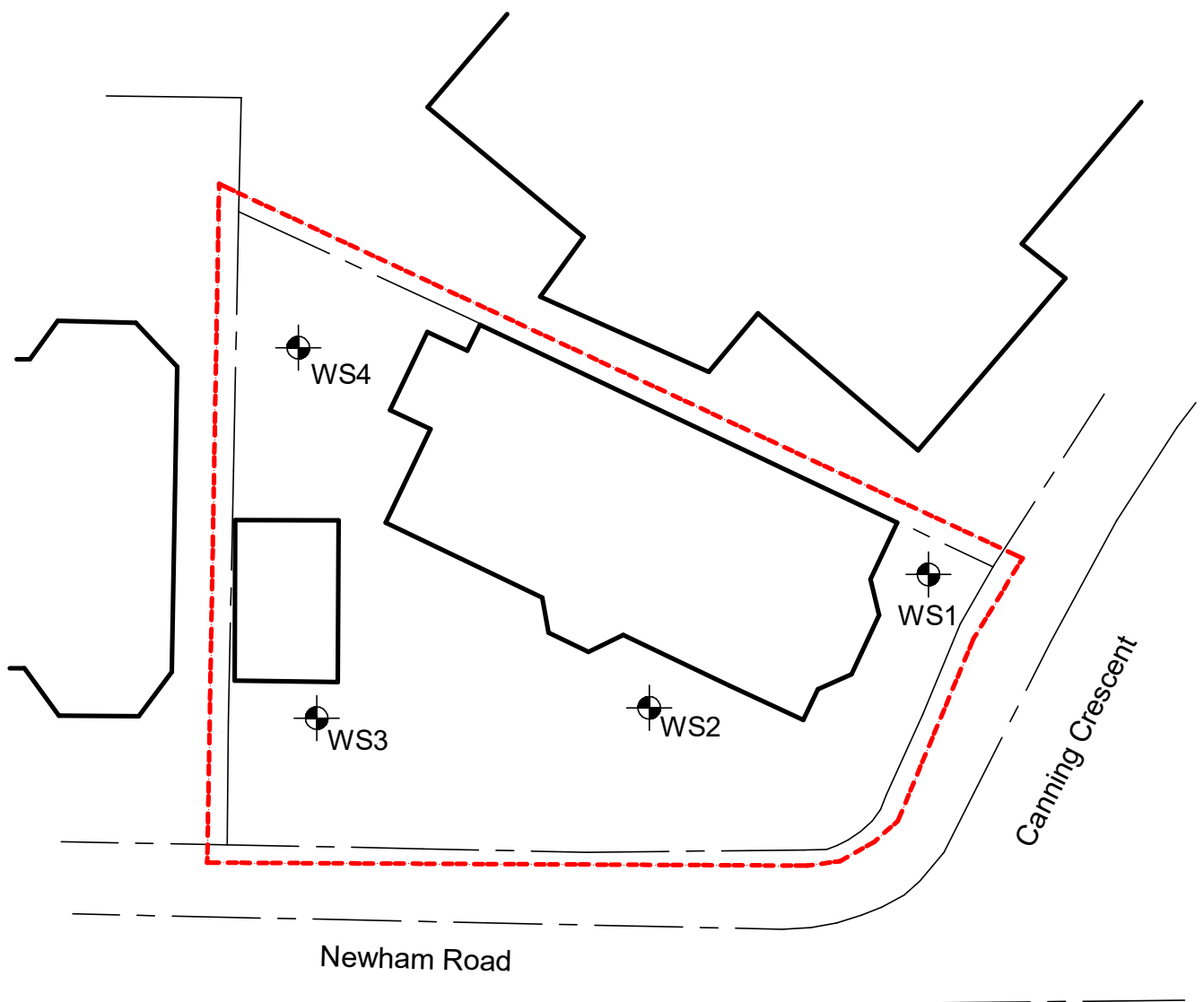
Yours Faithfully



C. S. Gray PG Dip, PG Cert, M.Sc.
Managing Director

12 Canning Crescent London N22 5SR

Site Plan



12 Canning Crescent London N22 5SR

Window Sampler One

Description Of Stratum	Legend	Depth	Thickness (m)	Water Level	Samples			S.P.T N-Value or Vane Strength	VOC's (ppm)	Installations	Casing Depth, (m)
					No	Type	Depth (m)				
Moderately compact dark brown slightly silty, slightly sandy topsoil FILL with sand, crushed concrete, brick and fine to medium gravel.		0.45	0.45	DRY	1	U	GL - 1.00	N=12			
Loose yellow brown SAND & GRAVEL with much crushed brick FILL		1.00	0.55		2	U	1.00-2.00				
Firm dark brown slightly silty, sandy CLAY FILL with occasional crushed brick and fine to medium flint gravel		1.50	0.50		1	N	1.00				1.00
Firm becoming stiff brown slightly silty, slightly sandy CLAY			2.50		3	U	2.00-3.00	N=12			
					2	N	2.00				
					4	U	3.00-4.00				
Borehole Closed at 4.00m		4.00									

Remarks

Scale 1 : 25

Key : U - Undisturbed Sample
(100mm diameter)

B - Bulk Sample
 - Water Struck

D - Disturbed Sample
 - Water Standing

W - Water Sample
T - Chemical Tub

N - SPT N-Value
V - Vane Test, (kN.m²)

12 Canning Crescent London N22 5SR

Window Sampler Two

Description Of Stratum	Legend	Depth	Thickness (m)	Water Level	Samples			S.P.T N-Value or Vane Strength	VOC's (ppm)	Installations	Casing Depth, (m)
					No	Type	Depth (m)				
Moderately compact dark brown slightly silty, slightly sandy topsoil FILL with sand, crushed concrete, brick and fine to medium gravel.			0.70	DRY	1	U	GL - 1.00				
		0.70									
Firm dark brown slightly silty, sandy CLAY FILL with occasional crushed brick and fine to medium flint gravel		1.00	0.30		2	U	1.00-2.00				1.00
Firm becoming stiff brown slightly silty, slightly sandy CLAY					3	U	2.00-3.00				
			3.00		4	U	3.00-4.00				
		4.00									
Borehole Closed at 4.00m											

Remarks

Scale 1 : 25

Key : U - Undisturbed Sample
(100mm diameter)

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 - Water Standing

W - Water Sample
T - Chemical Tub

N - SPT N-Value
V - Vane Test, (kN.m²)

12 Canning Crescent London N22 5SR

Window Sampler Three

Description Of Stratum	Legend	Depth	Thickness (m)	Water Level	Samples			S.P.T N-Value or Vane Strength	VOC's (ppm)	Installations	Casing Depth, (m)
					No	Type	Depth (m)				
Moderately compact dark brown slightly silty, slightly sandy topsoil FILL with sand, crushed concrete, brick and fine to medium gravel.		1.00	1.00	DRY	1	U	GL - 1.00				
Firm becoming stiff brown slightly silty, slightly sandy CLAY					2	U	1.00-2.00				1.00
					3	U	2.00-3.00				
			3.00		4	U	3.00-4.00				
Borehole Closed at 4.00m		4.00									
Remarks											

Scale 1 : 25

Key : U - Undisturbed Sample
(100mm diameter)

B - Bulk Sample
 - Water Struck

D - Disturbed Sample
 - Water Standing

W - Water Sample
T - Chemical Tub

N - SPT N-Value
V - Vane Test, (kN.m²)

12 Canning Crescent London N22 5SR

Window Sampler Four

Description Of Stratum	Legend	Depth	Thickness (m)	Water Level	Samples			S.P.T N-Value or Vane Strength	VOC's (ppm)	Installations	Casing Depth, (m)
					No	Type	Depth (m)				
Moderately compact dark brown slightly silty, slightly sandy topsoil FILL with sand, crushed concrete, brick and fine to medium gravel.		1.00	1.00	DRY	1	U	GL - 1.00				
Firm becoming stiff brown slightly silty, slightly sandy CLAY					2	U	1.00-2.00				1.00
					3	U	2.00-3.00				
			3.00		4	U	3.00-4.00				
Borehole Closed at 4.00m		4.00									
Remarks											

Scale 1 : 25

Key : U - Undisturbed Sample
(100mm diameter)

B - Bulk Sample
 - Water Struck

D - Disturbed Sample
 - Water Standing

W - Water Sample
T - Chemical Tub

N - SPT N-Value
V - Vane Test, (kN.m²)



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Geotechnical Assessments | Environmental Assessments | Desktop Studies | Contamination Analysis

APPENDIX

SHEET

JOB NUMBER

DATE

3

1

20022

Dec-25

LOCATION 12 Canning Crescent, London N22 5SR

HAND PENETROMETER STRENGTH TEST RESULTS

Excavation Location Number	Depth (m)	Sample	Natural Moisture Content (%)	Hand Penetrometer (Undrained)	Estimated Allowable Bearing Capacity (kN/m ²)	Notes
WS1	1.00	U	25			
WS1	1.50	U	34	45	90	
WS1	2.00	U	32	45	90	
WS1	2.50	U	30	78	150+	
WS1	3.00	U	30	93	150+	
WS1	4.00	U	29	105	150+	
WS2	1.00	U	32	69	138	
WS2	1.50	U	31	69	138	
WS2	2.00	U	27	75	150	
WS2	2.50	U	29	90	150+	
WS2	3.00	U	30	99	150+	
WS2	4.00	U	29	117	150+	
WS3	1.00	U	31	84	150+	
WS3	1.50	U	28	84	150+	
WS3	2.00	U	29	90	150+	
WS3	2.50	U	28	105	150+	
WS3	3.00	U	29	90	150+	
WS3	4.00	U	30	120	150+	
WS4	1.00	U	32	81	150+	
WS4	1.50	U	30	81	150+	
WS4	2.00	U	28	75	150	
WS4	2.50	U	28	87	150+	
WS4	3.00	U	27	96	150+	
WS4	4.00	U	29	114	150+	



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APPENDIX 3
SHEET 2
JOB NUMBER 20022
DATE Dec-25

LOCATION 12 Canning Crescent, London N22 5SR

ATTERBERG LIMITS TEST DATA

Excavation Location Number	Depth (m)	Sample	Natural Moisture Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Group Symbol	Amended Plasticity Index (%)	Desiccation Profile	Percentage Retained on 425 Micron Sieve (%)
WS1	1.00	U	25						Significant	
WS1	1.50	U	34	78	30	48	CV	47	Slight	3
WS1	2.00	U	32						Slight	
WS1	2.50	U	30	78	30	48	CV	47	Slight	2
WS1	3.00	U	30						Slight	
WS1	4.00	U	29						-	
WS2	1.00	U	32	69	28	41	CH	39	Slight	4
WS2	1.50	U	31						Slight	
WS2	2.00	U	27	69	28	41	CH	40	Significant	2
WS2	2.50	U	29						Slight	
WS2	3.00	U	30						Slight	
WS2	4.00	U	29						-	
WS3	1.00	U	31	78	30	48	CV	45	Significant	6
WS3	1.50	U	28						Significant	
WS3	2.00	U	29						Significant	
WS3	2.50	U	28	73	29	44	CV	44	Significant	0
WS3	3.00	U	29						Significant	
WS3	4.00	U	30						-	
WS4	1.00	U	32	69	28	41	CH	40	Slight	3
WS4	1.50	U	30						Slight	
WS4	2.00	U	28	69	28	41	CH	40	Slight	2
WS4	2.50	U	28						Slight	
WS4	3.00	U	27						Slight	
WS4	4.00	U	29	80	30	50	CV	50	-	0

LOCATION	12 Canning Crescent, London N22 5SR
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SULPHATE ANALYSIS

Excavation Location Number	Depth (m)	Sample	Concentrations of Soluble Sulphate			Classification	pH
			Soil		Groundwater		
			Total SO4 (%)	SO4 in 2:1 Water:soil (g/l)			
WS1	1.50	U		0.30		DS-1 / AC-1s	7.48
WS3	2.50	U		0.63		DS-2 / AC-1s	7.98
WS4	1.00	U		0.19		DS-1 / AC-1s	7.60