



BASEMENT IMPACT ASSESSMENT

Ref: 25/41209-2 | Date: February 2026

**109 Rosebery Road
London
N10 2LD**

Prepared for:
Mr Rory Brown



Document Control

<i>Project</i>	109 Rosebery Road, London, N10 2LD
<i>Document Type</i>	Basement Impact Assessment
<i>Document Reference</i>	SAS 25/41209-2
<i>Document Status</i>	Final
<i>Revision</i>	-
<i>Changes</i>	-
<i>Date</i>	February 2026
<i>Document Version</i>	V1.0 – 3/21

Checked

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25/40704-2
February 2026



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1.0 INTRODUCTION

1.1 Project Objectives

The purpose of this assessment is to consider the effects of a proposed basement construction on the local slope stability, surface water and groundwater regime at the residential property at 109 Rosebery Road, London, N10 2LD.

The recommendations and comments given in this report are based on the information contained from the sources cited and may include information provided by the Client and other parties, including anecdotal information. It must be noted that there may be special conditions prevailing at the site which have not been disclosed by the investigation and which have not been taken into account in the report. No liability can be accepted for any such conditions.

This report does not constitute a full environmental audit of either the site or its immediate environs.

1.2 Planning Policy Context

The London Borough of Haringey policies on future developments in the borough are set out in the Council's Development Management DPD dated January 2016.

This document requires proposed developments to mitigate against the effects of ground and surface water flooding and to include drainage systems that do not impact neighbouring property of the site or the water environment by way of changing the groundwater regime.

This report is intended to address the issues set out in the council's basement policy. It will review existing site investigation data and provide a preliminary assessment of the issues identified by the Site Analytical Services Limited screening process.

This report also provides an impact assessment of the geo-environmental impacts on adjacent structures and the surrounding area based on available site investigation data.

As part of this guidance a subterranean (groundwater) flow screening chart is provided which follows current planning procedure for basements and lightwells adopted by other London Borough's, including Camden, Lambeth and Westminster.

1.3 Qualifications

The report has been prepared by Mr Thomas Murray, a Fellow of the Geological Society (FGS) with 11+ years' experience.

2.0 SITE DETAILS

2.1 Site Location

The site is located on the east side of Rosebery Road – approximately 510m to the north-east of the A504 Muswell Hill, in London, at approximate postcode N10. It is immediately bound by residential properties to all directions.

The site is rectangular in the northern half and triangular in the southern half and covers an approximate area of 0.05 Hectares.

The general area is under the authority of the London Borough of Haringey.

A location map is presented below in Figure 1:

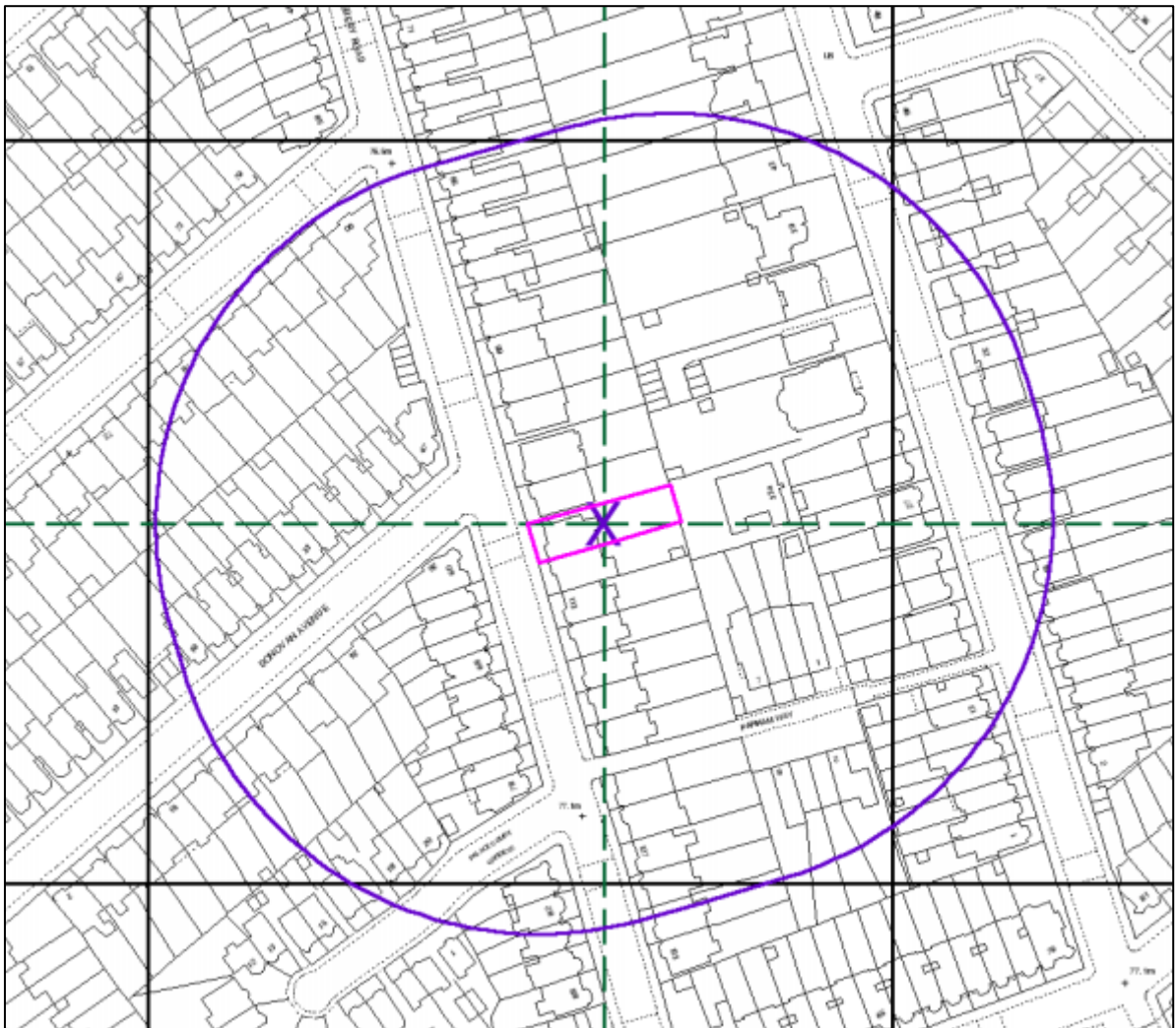


Figure 1. Site Location Plan

2.2 Site Layout and History

The site was attended on 16th January 2026 for the purposes of conducting the site investigation works and walkover.

The site comprises a 2-storey end of terrace building with associated private front and rear garden and a lower ground floor (Basement). There is a pond within the rear garden.

The site is 40% Hardstanding (90% buildings, 10% asphalt/concrete surfacing) and 60% Soft Landscaping (lawn and shrubberies/flowers).

The site appears to slope gently downwards from the west to the east and is similar in topography to the surrounding site.

In the front of the property there are 4 steps down towards the front, to a side passage to the rear of the property. The rear garden then steps down two steps into the lawn area.

From historical map evidence it would appear that the site was first built on prior to 1912, with no significant changes taking place to the property since its construction. A railway has been present within 250m.

2.3 Geology

The Geological Survey of Great Britain (England and Wales) covering the area indicates the site to be underlain by the London Clay Formation at depth.

- The London Clay mainly comprises bioturbated or poorly laminated, blue-grey or grey-brown, slightly calcareous, silty to very silty clay, clayey silt and sometimes silt, with some layers of sandy clay. It commonly contains thin courses of carbonate concretions ('cementstone nodules') and disseminated pyrite. It also includes a few thin beds of shells and fine sand partings or pockets of sand, which commonly increase towards the base and towards the top of the formation. At the base, and at some other levels, thin beds of black rounded flint gravel occur in places. Glauconite is present in some of the sands and in some clay beds, and white mica occurs at some levels.

The British Geological Survey maintains an archive of historical exploratory borehole logs throughout the UK. SAS Limited has searched the database and has not found a borehole located within 250m of the site.

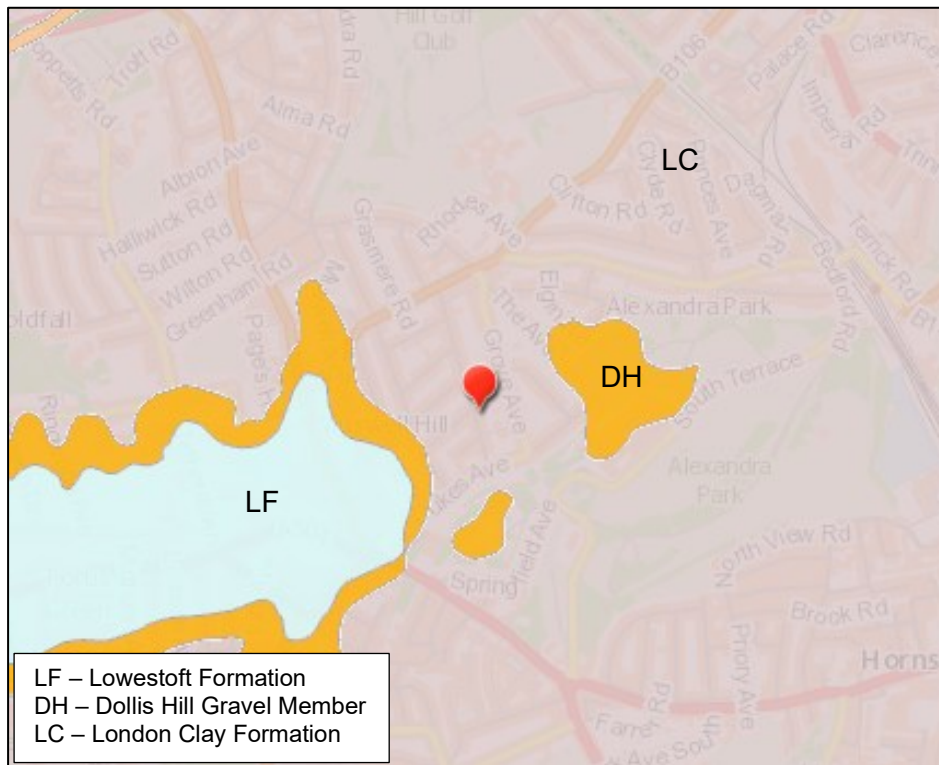


Figure 2. Superficial and Bedrock geology of the Site (Ref. BGS Geoindex)

2.4 Hydrology and drainage

2.4.1 Rainfall and run-off

According to climatic information online using the nearest long-term Haringey/London Borough datasets rainfall in the local area averages around 620mm to 720mm per year and is less than the national average of around 900mm.

According to publications regarding Lost Rivers of London (Barton, 1992) and (Talling, 2011), the site is not within 100m of a former river or watercourse. The closest is the Fleet located over 1km to the south of the site. The closest surface water feature is a lake, located 328m to the north-east of the site at Alexandra Park.

The area located immediately around the site is a residential area with an estimated 75% of the surface covered with hardstanding. Some of the rainfall in the area will run-off hard surface areas and be collected by the local sewer network the rest will be absorbed through ground infiltration.

2.4.2 Drainage

Surface drainage from the site is assumed to be directed to drains along Rosebery Road towards the north.



2.4.3 Flood Risk

River or Tidal flooding

The site is not currently located within 1 kilometre of areas at risk from extreme flooding from rivers or sea without defences (Zone 2) or areas at risk from rivers or sea without defences (Zone 3).

Surface water flooding

Modelling of surface water flooding has been undertaken by the Environment Agency and was published on its website in January 2014; an extract from their model is presented within the Envirocheck Site Sensitivity maps. Whilst this map identifies three levels of risk (high, medium and low) it is understood that it is based at least in part on depths of flooding. The modelling shows no risk of flooding across the site. Areas of low to high risk of flooding are located 10m-20m to the north-west, south and east of the site.

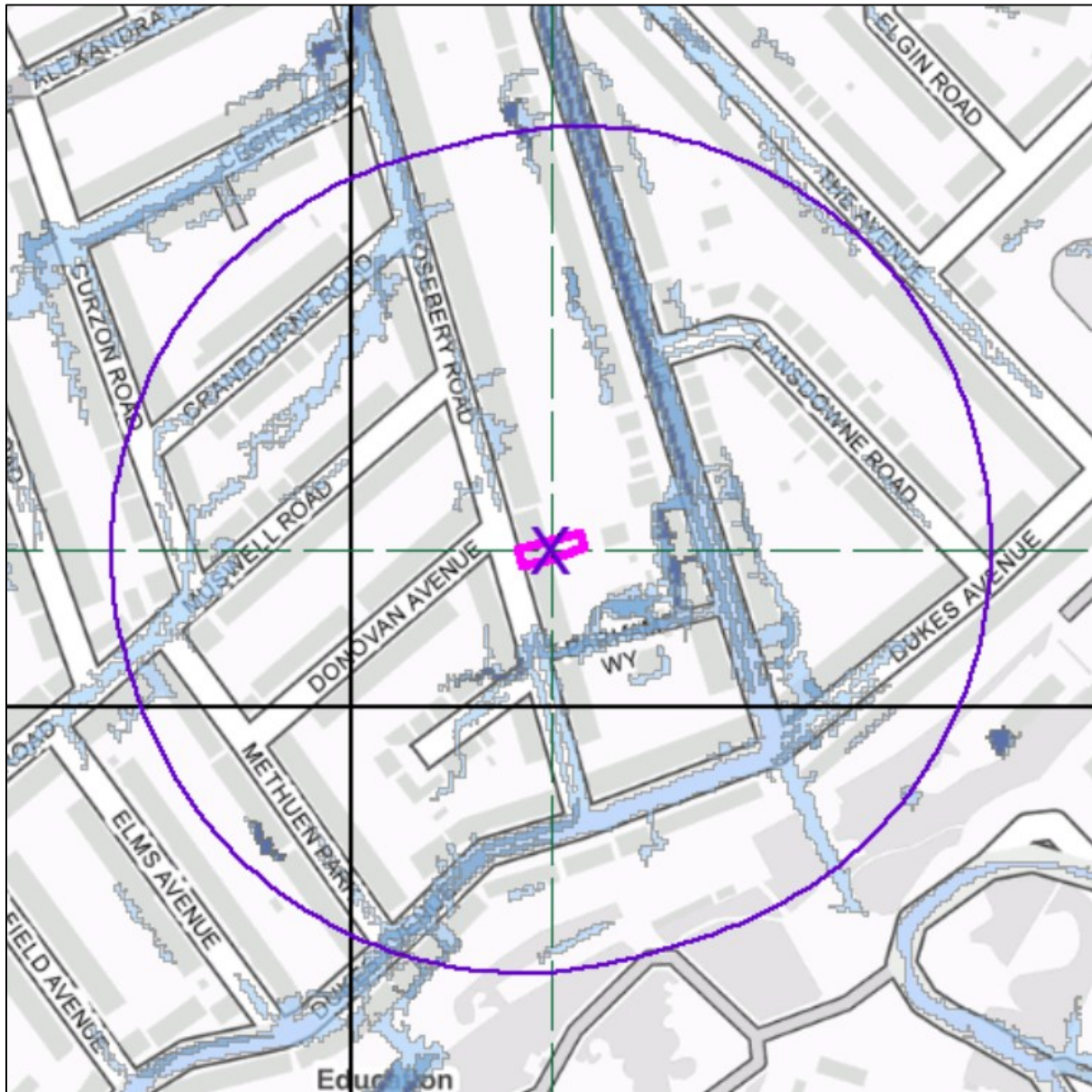


**Figure 3. Extract from the Environment Agency's 'Risk of Flooding from Surface Water'.
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Sewer flooding

The London Regional Flood Risk Appraisal (2009) advises that foul sewer flooding is most likely to occur where properties are connected to the sewer system at a level below the hydraulic level of the sewage flow, which in general are often basement flats or premises in low lying areas. There is no record of sewer flooding having occurred at Rosebery Road and therefore the risk of sewer flooding is considered low.

2.5 Hydrogeology

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.

The Bedrock geology underlying the site 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.

Other hydrogeological data obtained from the Desktop Study (SAS Report Ref: 25/41209) for the site include:

Other hydrogeological data obtained and contained in Appendix B for the site include:

- The site is located within 766m to the east of a Zone II (Outer Protection Zone), 766m to the east of a Zone I (Inner Protection) Groundwater SPZ.
- There are two water abstraction licences within 1 kilometre of the site. The closest is located 794m to the north of the site.

2.6 Previous Reports

The results from a Desktop Study and Factual results from a Site Investigation are presented under separate cover in Site Analytical Services Limited reports (Project Nos. 25/41209 / 25/41209-1), dated January and February 2026. The relevant findings from these reports are described in this basement impact assessment.

2.7 Proposed Development

It is proposed to refurbish the existing basement and construct a basement extension to the rear with associated hard landscaping. Current plans (at time of writing this report) assume the basement level will be approximately 3.00m below existing ground level.

2.8 Results of Basement Impact Assessment Screening

A screening process has been undertaken for the site and the results are summarised in Table 1 below:

**Table 1: Summary of screening results**

Item	Description	Response	Comment
Sub-terranean (Ground water Flow)	1a. Is the site located directly above an aquifer.	No	The site has been classified as being situated above an unproductive (negligibly permeable) formation (London Clay) that is generally regarded as containing insignificant quantities of groundwater.
	1b. Will the proposed basement extend beneath the water table surface.	Unknown – to be confirmed by Ground Investigation	Given the presence of a non-aquifer below the site it is unlikely that groundwater will be encountered during any excavations for the proposed basement, however this will be confirmed by the ground investigation.
	2. Is the site within 100m of a watercourse, well (used / disused) or potential spring line.	No	According to publications regarding Lost Rivers of London (Barton, 1992) and (Talling, 2011), the site is not within 100m of a former river or watercourse. The closest is the Fleet located over 1km to the south of the site. The closest surface water feature is a lake, located 328m to the north-east of the site at Alexandria Park. From the British Geological Society 'Geoindex' the nearest water well is located approximately 600m north of the site.
	3. Will the proposed basement development result in a change in the proportion of hard surfaced / paved areas.	Yes	The amount of hardstanding on-site is expected to increase.
	4. As part of site drainage, will more surface water (e.g. rainfall and run-off) than at present be discharged to the ground (e.g. via soakaways and/or SUDS).	No	Existing drainage paths are to be utilised where possible. The proposed basement will be beneath the existing building footprint. Whether soakaways/SUDS are used on the proposed development is to be confirmed (beyond the scope of this report). An appropriately qualified engineer should be engaged to ensure mandatory requirements are met.
	5. Is the lowest point of the proposed excavation (allowing for any drainage and foundation space under the basement floor) close to, or lower than, the mean water level in any local pond or spring line.	No	According to publications regarding Lost Rivers of London (Barton, 1992) and (Talling, 2011), the site is not within 100m of a former river or watercourse. The closest is the Fleet located over 1km to the south of the site. The closest surface water feature is a lake, located 328m to the north-east of the site at Alexandria Park. From the British Geological Society 'Geoindex' the nearest water well is located approximately 600m north of the site.



Item	Description	Response	Comment
Slope Stability	1. Does the existing site include slopes, natural or man-made greater than 7 degrees (approximately 1 in 8).	No	The site appears to step down slightly from the front to the bank, but there are no slopes.
	2. Will the proposed re-profiling of landscaping at the site change slopes at the property boundary to more than 7 degrees (approximately 1 in 8).	No	Re-profiling of landscaping at the site is not proposed.
	3. Does the development neighbor land, including railway cuttings and the like, with a slope greater than 7 degrees (approximately 1 in 8).	No	The surrounding area is essentially flat.
	4. Is the site within a wider hillside setting in which the general slope is greater than 7 degrees (approximately 1 in 8).	No	There is no discernible slope across the area.
	5. Is the London Clay the shallowest strata at the site.	Yes	With reference to available BGS records, the London Clay Formation is expected to be encountered from ground level.
	6. Will any trees be felled as part of the development and/or are any works proposed within any tree protection zones where trees are to be retained.	No	It is understood that no trees are to be felled as part of the development.
	7. Is there a history of seasonal shrink-swell subsidence in the local area and/or evidence of such effects at the site.	Yes	The site lies above the London Clay Formation well known as having a high tendency to shrink and swell.
	8. Is the site within 100m of a watercourse or a potential spring line.	No	According to publications regarding Lost Rivers of London (Barton, 1992) and (Talling, 2011), the site is not within 100m of a former river or watercourse. The closest is the Fleet located over 1km to the south of the site. The closest surface water feature is a lake, located 328m to the north-east of the site at Alexandria Park. From the British Geological Society 'Geoindex' the nearest water well is located approximately 600m north of the site.
	9. Is the site within an area of previously worked ground.	No	According to the records held by the BGS the site is not underlain by any worked ground, Made Ground, infilled ground or landscaped ground.



Item	Description	Response	Comment
	10. Is the site within an aquifer. If so, will the proposed basement extend beneath the water table such that dewatering may be required during construction.	Unknown – to be confirmed by Ground Investigation	Given the presence of an aquifer below the site it is possible that groundwater will be encountered during any excavations for the proposed basement, however this will be confirmed by the ground investigation.
	11. Is the site within 5m of a highway or pedestrian right of way.	Yes	The site lies within 5m of Rosebery Road.
	12. Will the proposed basement significantly increase the differential depth of foundations relative to neighbouring properties.	Yes	The development will increase the depths of foundation at the site, although the foundation depths of adjacent properties are not known.
	13. Is the site over (or within the exclusion zone of) any tunnels, e.g. railway lines.	No	No TfL or London Underground Assets runs are within close proximity to the site.
Surface Water and Flooding	1. As part of the proposed site drainage, will surface water flows (e.g. volume of rainfall and peak run-off) be materially changed from the existing route.	No	No – any additional surface water generated from an increased hardstanding area will be attenuated to ensure they are not increased or altered.
	2. Will the proposed basement development result in a change in the proportion of hard surfaced / paved external areas.	Yes	Yes, there will be a small change in the area of hard surfacing. The surface permeability will be affected with a slight increase in the amount of paved surface in relation to the total site.
	3. Will the proposed basement result in changes to the profile of the inflows (instantaneous and long-term) of surface water being received by adjacent properties or downstream watercourses.	No	All surface water for the site will be contained within the site boundaries and collected as described above; hence there will be no change from the development on the quantity or quality of surface water being received by adjoining sites.
	4. Will the proposed basement result in changes to the quality of surface water being received by adjacent properties or downstream watercourses.	No	The surface water quality will not be affected by the development, as in the permanent condition collected surface water will generally be from roofs, or domestic hard landscaping.
	5. Is the site in an area known to be at risk from surface water flooding.	No	According to Figure 3 from Environment Agency's 'Risk of Flooding from Surface Water' the area at very low to negligible risk from surface water flooding.

The Screening Exercise has identified the following potential issues which will be carried forward to the Scoping Phase

Subterranean Groundwater Flow

- Will the proposed basement extend beneath the water table surface?
- Will the proposed basement development result in a change in the proportion of hard surfaced/paved areas?

Slope Stability

- Is the London Clay the shallowest strata at the site.
- Is there a history of seasonal shrink-swell subsidence in the local area and/or evidence of such effects at the site.
- Is the site within 5m of a highway or pedestrian right of way?
- Will the proposed basement significantly increase the differential depth of foundations relative to neighbouring properties.

Surface water and flooding

- Will the proposed basement development result in a change in the proportion of hard surfaced / paved external areas?

3.0 SCOPING PHASE

The purpose of the scoping phase is to assess in more detail the factors to be investigated in the impact assessment. Potential impacts are assessed for each of the identified impact factors and recommendations are stated.

A conceptual ground model is usually compiled at the scoping stage however, because the ground investigation has already been undertaken for this project, the conceptual ground model including the findings of the ground investigation is described under Chapter 4.

Subterranean (Groundwater Flow)

Potential Issue (Screening Question)		Potential impacts and actions
1b	Will the proposed basement extend beneath the water table surface?	Potential impact: Local restriction of groundwater flows (perched groundwater or below groundwater table). Action: Ground investigation required, then review.
3	Will the proposed basement development result in a change in the proportion of hard surfaced / paved external areas.	Potential impact: May increase flow rates to sewer, and thus increase the risk of flooding. Action: Assess net change in hard surfaced/paved areas and, if required, recommend appropriate types of SUDS for use as site-specific mitigation.

Slope Stability

5	Is the London Clay the shallowest strata at the site?	Potential impact: The London Clay is prone to seasonal shrink-swell (subsidence and heave). Action: Ground investigation required, then review.
7	Is there a history of seasonal shrink-swell subsidence in the local area and/or evidence of such effects at the site?	Potential Impact: Ground movements will occur during and after the basement construction. Action: Ground investigation required, then review.
11	Is the site within 5m of a highway or a pedestrian right of way?	Potential impact: Excavation of basement causes loss of support to footway/highway and damage to the services beneath them. Action: Ensure adequate temporary and permanent support by use of best practice working methods.
12	Will the proposed basement substantially increase the differential depth of foundations relative to neighbouring properties?	Potential impact: Loss of support to the ground beneath the foundations to the surrounding properties if basement excavations are inadequately supported. Action: Ensure adequate temporary and permanent support by use of best practice methods.

Subterranean (Surface Water Flooding)

Potential Issue (Screening Question)		Potential impacts and actions
2	Will the proposed basement development result in a change in the proportion of hard surfaced / paved external areas.	Potential impact: May increase flow rates to sewer and thus increase the risk of flooding. Action: Assess net change in hard surfaced/paved areas and, if required, recommend appropriate types of SUDS for use as site-specific mitigation.

These potential impacts have been further assessed through the ground investigation, as detailed in Section 4 below.

4.0 SITE INVESTIGATION DATA

4.1 Records of site investigations

The borehole was completed at existing ground level and revealed ground conditions that were generally consistent with the geological records and known history of the area and comprised Made Ground up to 0.90m in thickness) resting on the London Clay formation at depth.

These ground conditions are summarised in the following table. For detailed information on the ground conditions encountered reference should be made to the exploratory hole records presented in Appendix A.

Strata	Depth to top of strata (mbgl)	Depth to base of strata (mbgl)	Description
Made Ground	0.00	0.90	Slab and concrete over silty sandy clay containing brick and concrete fragments.
London Clay Formation	0.90	15.00 (max depth of drilling)	Stiff silty sandy clay containing partings of silty fine sand and gypsum crystals.

Summary of Ground Conditions in Exploratory Hole

4.2 Groundwater

Groundwater was not encountered in Borehole 1 and the material remained essentially dry throughout.

It must be noted that the speed of excavation is such that there may well be insufficient time for further light seepages of groundwater to enter the borehole and hence be detected, particularly within more cohesive soils.

Groundwater was encountered at a depth of 0.48m below ground level in Borehole 1 during the final return monitoring visit.

Given the presence of a non-aquifer below the site it is likely that the groundwater recorded within these soils relates to perched water within the Made Ground and is recharged via intermittent seepages from surface water associated with weather conditions rather than any large-scale subterranean groundwater flow. As a result, the impact on excavations carried out at the site from this perched water is expected to be minimal.

Isolated pockets of groundwater may also be present perched within any less permeable material found at shallower depth on other parts of the site especially within any Made Ground.

It should be noted that the comments on groundwater conditions are based on observations made at the time of the investigation (December 2025 to January 2026) and that changes in the groundwater level could occur due to seasonal effects and also changes in drainage conditions.

5.0 FOUNDATION DESIGN

5.1 General

It is proposed to refurbish the existing basement and construct a basement extension to the rear with associated hard landscaping. Current plans (at time of writing this report) assume the basement level will be approximately 3.00m below existing ground level.

5.2 Site Preparation Works

The main contractor should be informed of the site conditions and risk assessments should be undertaken to comply with the Construction Design Management (CDM) regulations. Site personnel are to be made aware of the site conditions. It is recommended that extensive searches of existing man-made services are undertaken over the site prior to final design works.

5.3 Foundation Design

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 a suitable underlying natural stratum of adequate bearing characteristics.

Based on the ground and groundwater conditions encountered in the borehole, it could, in theory, be possible to support lighter loaded areas of the proposed new development on conventional strip foundations taken down below the Made Ground and any weak superficial soils and placed in the natural stiff silty sandy clay deposits which occur at a depth of 0.90m across the site.

Using theory from Terzaghi (1943), strip foundations placed within natural soils may be designed to allowable net bearing pressures of approximately 155kN/m^2 at 1.00m depth below ground level increasing to 240kN/m^2 at 3.00m depth below ground level in order to allow for a factor of safety of 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.

5.4 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, then a piled foundation may 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.

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.

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.

5.5 Ground Movement

The upward movement of the base of an excavation occurs because of unloading and may be considered as consisting of two parts:

1. A short-term movement called heave which occurs because of elastic rebound and may typically occur during the construction period
2. A long-term movement called swell which occurs because of the absorption of water into the pores of the soils as the ground adjusts to new stress conditions.

The site lies above the London Clay Formation known to have a high susceptibility to shrinkage and swelling movements with changes in moisture content, as defined by the NHBC Standards, Chapter 4.2 (2026).

Excavations will encounter London Clay and the contractor should account for these upward ground movements such as providing heave protection measures to the floor slab.

The actual amount of movement will depend upon a number of factors, including the construction timetable, ultimate loads and critically, the depth of the final excavation.

5.6 Basement Floor Slabs

Due to the presence of soils assessed to be of medium swelling and shrinkage potential below, it is recommended that ground slabs should be fully suspended.

Within the zone of influence of trees, either retained or removed, floor slabs should incorporate either underfloor voids or suitable depths of compressible material in accordance with NHBC requirements, for soils with high volume change potential.

5.7 Excavations

Given the presence of a non-aquifer below the site, it is likely that the groundwater recorded within these soils relates to perched water within the Made Ground and is recharged via intermittent seepages from surface water associated with weather conditions rather than any large-scale subterranean groundwater flow. As a result, the impact on excavations carried out at the site from this perched water is expected to be minimal.

However, it may still be necessary to control this water during the construction period and consideration could be given to conventional internal pumping methods from open sumps.

It is recommended that the water levels in the monitoring borehole 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.

6.0 BASEMENT IMPACT ASSESSMENT

6.1 Summary

The screening identified a number of potential impacts. The table below summarises the previously identified potential impacts and the additional information that is now available from the site investigation in consideration of each impact.

Potential Impact	Site Investigation conclusions	Impact sufficiently addressed without further justification?
The proposed basement extends beneath the water table surface.	Groundwater was encountered at a depth of 0.48m below ground level in Borehole 1 during the final return monitoring visit. Due to the nature of the geology encountered on-site, it is likely that this is purely surface water infiltrating into the standpipe and being unable to escape and not true groundwater and therefore the influence of the development on groundwater is expected to be minimal.	Yes
There is a history of seasonal shrink-swell subsidence in the local area and/or evidence of such effects at the site.	The London Clay was proven below the site and was recorded as having a medium susceptibility to shrinkage and swelling. However, the base of proposed basement will extend well below the potential depth of root action.	Yes
The site is within 5m of a highway or pedestrian right of way.	The proposed basement is not to be extended below Rosebery Road and therefore it is suggested that the impact on these access roads is likely to be minimal. There is nothing unusual in the proposed development that would give rise to any concerns with regard to the stability of public highways.	Yes.
The proposed basement will significantly increase the differential depth of foundations relative to neighbouring properties.	The development will result in the extension of the foundation depth of the basement relative to neighbouring properties.	No – see below for further details.
The proposed basement development result in a change in the proportion of hard surfaced / paved external areas.	There is an increase in impermeable area on-site following development, which equates to a decrease in the rate of run-off from the site.	No – see below for further details.

6.2 Outstanding Risks and Issues

The significant impacts which require further information have been described in detail below in order to assess the likelihood of them occurring and the scope for reasonable engineering mitigation.

The proposed basement will significantly increase the differential depth of foundations relative to neighbouring properties.

The excavation and construction of the basement at the site has the potential to cause some movements in the surrounding ground if not effectively managed. However, it is understood that ground movements and/or instability will be managed through the proper design and construction of mitigation measures during the works. This will require close collaboration with the appointed contractor's temporary works coordinator.

The Party Wall Act (1996) will apply to this development because neighbouring houses lie within a defined space around the proposed building works. The party wall process should be followed and adhered to during this development.

A monitoring plan should be set out at design stage and should include a monitoring strategy, instrumentation and monitoring plans and action plans. Trigger levels on movements will need to be defined. Precise levelling or reflective survey targets should be installed at the garden walls and neighbouring buildings. Monitoring should take place in advance of the proposed works as a base-line survey, during the works and for a period following the completion of the works, to understand the long-term effects.

Hard Surfaced / Paved External Areas

As identified during the initial screening and scoping stages, the proposed development will result in a nominal increase in impermeable area. Most of the basement extension is located beneath areas of existing hardstanding and therefore does not materially alter the surface water run-off characteristics of the site.

At the time of writing, the detailed surface water drainage design has not been finalised; however, it is currently understood that surface water run-off will be discharged to the existing local sewer network within Dynevor Road, subject to confirmation of capacity and approval by the relevant statutory undertaker. The drainage strategy will be developed in consultation with the Local Planning Authority and the Environment Agency, and, where required, Thames Water, to ensure that the proposed development does not result in an increased risk of sewer surcharge or flooding, either on-site or to third-party land.

Given the limited scale of the development and the slight increase in impermeable area, it is anticipated that any additional run-off can be appropriately managed through controlled discharge, and where feasible, the incorporation of proportionate surface water management measures in accordance with best practice.

On this basis, and subject to detailed drainage design at the next stage, the proposed scheme is considered to be compliant with the surface water management and flood risk requirements of the National Planning Policy Framework (NPPF) and the relevant London Borough of Richmond upon Thames local planning policies, with no significant adverse effects anticipated.

7.0 BIA CONCLUSIONS

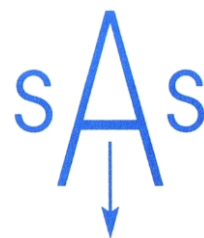
1. It is proposed to refurbish the existing basement and construct a basement extension to the rear with associated hard landscaping. Current plans (at time of writing this report) assume the basement level will be approximately 3.00m below existing ground level.
2. Conditions at the site were investigated by Site Analytical Services Limited in December 2025 to February 2026 (SAS Report Reference 25/41209-1). The borehole was completed at existing ground level and revealed ground conditions that were generally consistent with the geological records and known history of the area and comprised Made Ground (up to 0.90m in thickness) resting on the London Clay formation at depth.
3. Groundwater was encountered at a depth of 0.48m below ground level in Borehole 1 during the final return monitoring visit. Due to the nature of the geology encountered on-site, it is likely that this is purely surface water infiltrating into the standpipe and being unable to escape and not true groundwater and therefore the influence of the development on groundwater is expected to be minimal.
4. 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.
5. The proposed development will result in only a minor increase in impermeable area, with the basement extending beneath existing hardstanding. As such, the development is not expected to materially alter existing surface water run-off characteristics. Subject to detailed design, surface water run-off can be safely managed through controlled discharge to the local sewer network, with the drainage strategy to be developed in consultation with the Local Planning Authority, Environment Agency and statutory undertaker to ensure there is no increased risk of flooding on- or off-site.
6. Potential ground movements affecting adjacent structures can be minimised through the proper design and implementation of temporary works, coordinated by the contractor's Temporary Works Coordinator and supported by an appropriate monitoring regime.
7. The requirements of the Party Wall etc. Act 1996 will apply and, if followed, will provide an additional mechanism for managing risks to neighbouring properties.
8. Subject to the implementation of the recommended monitoring, groundwater control and temporary works measures, the proposed development is considered to be acceptable in geotechnical, groundwater and flood risk terms, and compliant with the relevant provisions of the National Planning Policy Framework and London Borough of Havering's planning policies, with no significant adverse effects anticipated.

8.0 REFERENCES

1. CIRIA (2019). Groundwater control – design and practice. CIRIA C750, Construction Industry Research and Information Association, London.
2. Environment Agency (2016). The London Basin Chalk Aquifer: Status and Management. Environment Agency, Bristol.
3. British Standards Institution (2015). Code of practice for ground investigations. BS 5930:2015, BSI, London.
4. British Standards Institution (2015). Code of practice for foundations. BS 8004:2015+A1:2020, BSI, London.
5. British Standards Institution (2022). Protection of below ground structures against water ingress. BS 8102:2022, BSI, London.
6. CIRIA (2015). The SuDS Manual. CIRIA C753, Construction Industry Research and Information Association, London.
7. Environment Agency (2013). Managing groundwater levels in the London Basin Chalk Aquifer. Environment Agency, Bristol.
8. NHBC (2026). NHBC Standards, Chapter 4.1: Land quality – managing ground conditions. National House-Building Council, Milton Keynes.
9. Met Office (2021). UK Climate Averages 1991–2020. Met Office, Exeter.
10. NHBC (2026). NHBC Standards, Chapter 4.2: Building near trees. National House-Building Council, Milton Keynes.
11. Environment Agency (2024). Flood Map for Planning (Rivers and Sea). Environment Agency, available online.



9.0 APPENDIX A – GROUND INVESTIGATION REPORT



Factual Report on a **GEOTECHNICAL GROUND INVESTIGATION**

Ref: 26/41209-1 | Date: February 2026

**109 Rosebery Road
London
N10 2LD**

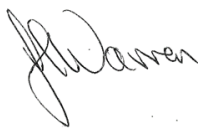
Prepared for:
Mr Rory Brown

DOCUMENT CONTROL

<i>Project</i>	109 Rosebery Road, London, N10 2LD
<i>Document Type</i>	Factual Report on a Geotechnical Ground Investigation
<i>Document Reference</i>	SAS 26/41209-1
<i>Document Status</i>	FINAL
<i>Revision</i>	0
<i>Changes</i>	-
<i>Date</i>	February 2026
<i>Document Version</i>	V1.0 – 3/21

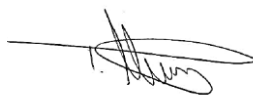
Checked

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🌐 www.siteanalyticalgroup.co.uk



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APPENDIX A

BOREHOLE LOGS

APPENDIX B

LABORATORY TEST & GROUNDWATER MONITORING DATA

1.0 Introduction

1.1 Outline and Limitations of Report

At the request of Mr Rory Brown, a ground investigation was carried out in connection with a proposed basement development at the above site. A Phase 1 Desk Study is presented under a separate cover in Site Analytical Services Limited Report Reference 25/41209, dated January 2026.

The information was required for the design and construction of foundations and infrastructure for the proposed development at the existing site, which includes the refurbishment of the basement and construction of a basement extension.

The recommendations and comments given in this report are based on the ground conditions encountered in the exploratory holes made during the investigation and the results of the tests made in the field and the laboratory. It must be noted that there may be special conditions prevailing at the site remote from the exploratory hole locations which have not been disclosed by the investigation and which have not been taken into account in the report. No liability can be accepted for any such conditions.

2.0 Site Details

(National Grid Reference: TQ 291 900)

2.1 Site Location

The site is located on the east side of Rosebery Road – approximately 510m to the north-east of the A504 Muswell Hill, in London, at approximate postcode N10. It is immediately bound by residential properties to all directions.

The site is rectangular in the northern half and triangular in the southern half and covers an approximate area of 0.05 Hectares.

The general area is under the authority of the London Borough of Haringey.

2.2 Published Geology

The Geological Survey of Great Britain (England and Wales) covering the area indicates the site to be underlain by deposits of London Clay Formation at depth. A surface cover of Made Ground should also be expected.

3.0 Scope of Work

3.1 Site Works

The proposed scope of works was agreed by the client prior to the commencement of the investigations. To achieve this, the following works were undertaken:-

- The drilling of one continuous flight auger borehole to a depth of 15.00m below ground level (Borehole 1).
- The installation of a groundwater monitoring standpipe to an approximate depth of 6.00m in Borehole 1, together with two return monitoring visits.
- Sampling and in-situ testing as appropriate to the ground conditions encountered in the exploratory hole.
- Laboratory testing to determine the engineering properties of the soils encountered in the exploratory hole.

3.2 Ground Conditions

The approximate location of the exploratory hole is illustrated on the site investigation plan, Figure 1 below.

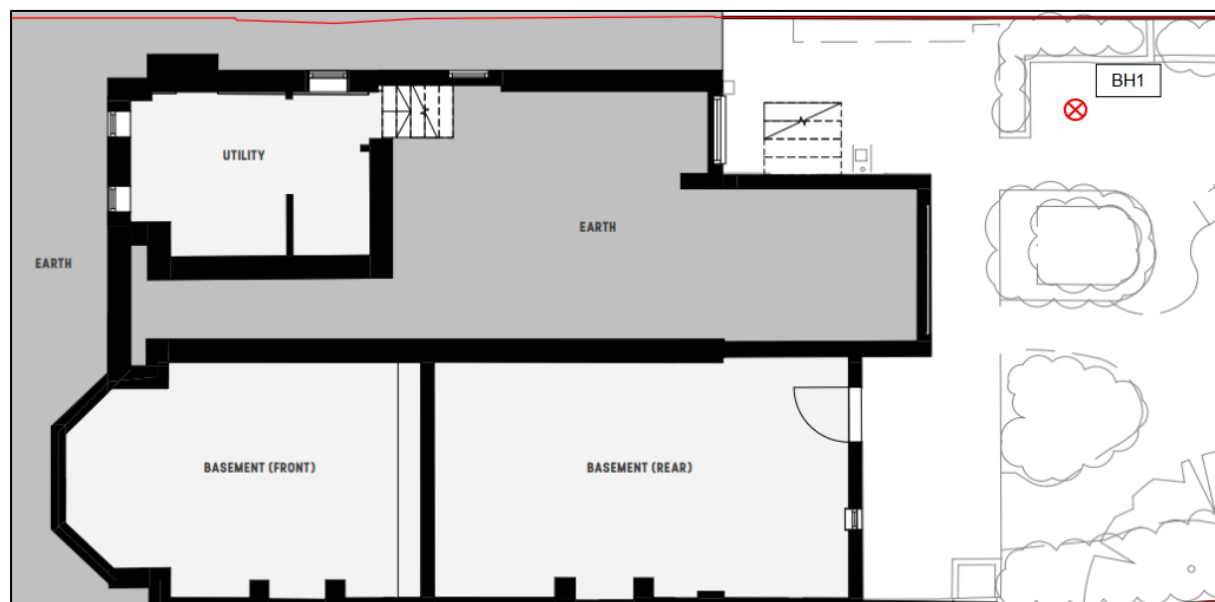


Figure 1. Site Investigation Plan

The borehole was completed at existing ground level and revealed ground conditions that were generally consistent with the geological records and known history of the area and comprised Made Ground up to 0.90m in thickness) resting on the London Clay formation at depth.

These ground conditions are summarised in the following table. For detailed information on the ground conditions encountered in the borehole, reference should be made to the exploratory hole records presented in Appendix B.

Strata	Depth to top of strata (mbgl)	Depth to base of strata (mbgl)	Description
Made Ground	0.00	0.90	Slab and concrete over silty sandy clay containing brick and concrete fragments.
London Clay Formation	0.90	15.00 (max depth of drilling)	Stiff silty sandy clay containing partings of silty fine sand and gypsum crystals.

Summary of Ground Conditions in Exploratory Hole

3.3 Groundwater

Groundwater was not encountered in Borehole 1 and the material remained essentially dry throughout.

It must be noted that the speed of excavation is such that there may well be insufficient time for further light seepages of groundwater to enter the borehole and hence be detected, particularly within more cohesive soils.

Groundwater was encountered at a depth of 0.48m below ground level in Borehole 1 during the final return monitoring visit.

Given the presence of a non-aquifer below the site it is likely that the groundwater recorded within these soils relates to perched water within the Made Ground and is recharged via intermittent seepages from surface water associated with weather conditions rather than any large-scale subterranean groundwater flow. As a result, the impact on excavations carried out at the site from this perched water is expected to be minimal.

Isolated pockets of groundwater may also be present perched within any less permeable material found at shallower depth on other parts of the site especially within any Made Ground.

It should be noted that the comments on groundwater conditions are based on observations made at the time of the investigation (December 2025 to January 2026) and that changes in the groundwater level could occur due to seasonal effects and also changes in drainage conditions.

4.0 In-Situ and Laboratory Tests

4.1 In-Situ Tests

In the essentially cohesive natural soils encountered at the site, in-situ shear vane tests were made at regular depth increments in order to assess the undrained shear strength of the materials. The results indicate that the natural soils are of a generally high strength in accordance with BS 5930 (2015).

The results of the in-situ tests are shown on the appropriate exploratory hole records contained in Appendix B.

4.2 Classification Tests

Atterberg Limit tests were conducted on three selected samples taken from the cohesive portion of the natural soils in Borehole 1 and showed the samples tested to fall into Class CH according to the British Soil Classification System.

These are fine grained silty clay soils of high plasticity and as such generally have a low permeability and a medium susceptibility to shrinkage and swelling movements with changes in moisture content, as defined by the NHBC Standards, Chapter 4.2. The results indicated Modified Plasticity Index values of between 32% and 39%, with all samples being below the 40% boundary between soils assessed as being of medium volume change potential and those assessed as being of high volume change potential.

The results of the tests are presented on Table 1, contained in Appendix B.

4.3 Chemical Attack on Buried Concrete

Using the results contained in Appendix B, the following table provides the highest values encountered for the BRE SD1 Suite D specification and the equivalent DS and ACEC classes, based on static groundwater:

Strata	pH	2:1 Water Soluble SO ₄ (mg/l)	2:1 Water Soluble Chloride (mg/l)	2:1 Water Soluble Nitrate (mg/l)	Total Sulphur (%)	Magnesium (mg/l)	DS Class	ACEC Class
London Clay formation	7.8-8.1	3310	37	<5.0	0.851	390	DS-4	AC-3s

Worst case DS and ACEC classes based on the BRE SD1 Suite D results

5.0 List of Appendices

Appendix A – Borehole and Trial Pit Logs

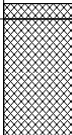
Appendix B – Laboratory Test & Groundwater Monitoring Data

6.0 References

1. CIRIA (2019). Groundwater control – design and practice. CIRIA C750, Construction Industry Research and Information Association, London.
2. Environment Agency (2016). The London Basin Chalk Aquifer: Status and Management. Environment Agency, Bristol.
3. British Standards Institution (2015). Code of practice for ground investigations. BS 5930:2015, BSI, London.
4. British Standards Institution (2015). Code of practice for foundations. BS 8004:2015+A1:2020, BSI, London.
5. British Standards Institution (2022). Protection of below ground structures against water ingress. BS 8102:2022, BSI, London.
6. NHBC (2026). NHBC Standards, Chapter 4.1: Land quality – managing ground conditions. National House-Building Council, Milton Keynes.
7. NHBC (2026). NHBC Standards, Chapter 4.2: Building near trees. National House-Building Council, Milton Keynes.

APPENDIX A

Borehole Logs

Site Analytical Services Ltd.							Site 109 ROSEBERY ROAD, LONDON, N10 2LD		Borehole Number BH1	
Boring Method CONTINUOUS FLIGHT AUGER		Casing Diameter 100mm cased to 0.00m			Ground Level (mOD)		Client MR RORY BROWN		Job Number 2541209	
		Location TQ291900			Dates 16/12/2025		Engineer STRUCTUAL DESIGN STUDIO		Sheet 1/2	
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	
0.25 0.50 0.75	D1 D2 D3					0.10	MADE GROUND: Slabs over concrete			
						(0.80)	MADE GROUND: Medium to dark brown silty sandy clay containing brick and concrete fragments			
						0.90	Stiff, medium brown orange slightly grey veined silty CLAY			
1.00 1.00	D4 V1 81									
1.50 1.50	D5 V2 108									
2.00 2.00	D6 V3 124									
2.50 2.50	D7 V4 135									
3.00 3.00	D8 V5 140+									
3.50 3.50	D9 V6 140+									
4.00 4.00	D10 V7 140+									
4.50 4.50	D11 V8 140+									
5.00 5.00	D12 V9 140+									
6.00 6.00	D13 V10 140+					(9.10)	Claystone obstruction			
										
										
7.00 7.00	D14 V11 140+									
8.00 8.00	D15 V12 140+						Claystone obstruction			
										
										
9.00 9.00	D16 V13 140+									
Remarks Unable to complete due to a claystone obstruction Groundwater was not encountered during boring/excavation V= Vane Test - Results in kPa D= Disturbed Sample Excavating from 0.00m to 1.00m for 1 hour.								Scale (approx) 1:50	Logged By EW	
								Figure No. 2541209.BH1		

Site Analytical Services Ltd.							Site 109 ROSEBERY ROAD, LONDON, N10 2LD		Borehole Number BH1	
Boring Method CONTINUOUS FLIGHT AUGER		Casing Diameter 100mm cased to 0.00m			Ground Level (mOD)		Client MR RORY BROWN		Job Number 2541209	
		Location TQ291900			Dates 16/12/2025		Engineer STRUCTUAL DESIGN STUDIO		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 10.00	D17 V14 140+					10.00	Stiff, grey silty CLAY containing partings of silty fine sand.			
11.00 11.00	D18 V15 140+									
12.00 12.00	D19 V16 140+									
13.00 13.00	D20 V17 140+									
14.00 14.00	D21 V18 140+									
15.00 15.00	D22 V19 140+									
										
										
										
										
										
										
										
										
										
										
										
										
										
										
										
										
										
										
										
										
										
										
										
										
										
										
										
Remarks Unable to complete due to a claystone obstruction Groundwater was not encountered during boring/excavation V= Vane Test - Results in kPa D= Disturbed Sample								Scale (approx) 1:50	Logged By EW	
								Figure No. 2541209.BH1		

Site Analytical Services Ltd.

Site	Borehole Number
109 ROSEBERY ROAD, LONDON, N10 2LD	BH1

Installation Type
Single Installation

Dimensions
Internal Diameter of Tube [A] = 50 mm
Diameter of Filter Zone = 100 mm

Client
MR RORY BROWN

**Job
Number**
2541209

Location
TQ291900

Ground Level (mOD)

Engineer

STRUCTURAL DESIGN STUDIO

Sheet
1/1

[illegible]

Remarks
Lockable cover set in cement

APPENDIX B

Laboratory Test & Groundwater Monitoring Data

PLASTICITY INDEX & MOISTURE CONTENT DETERMINATIONS

BH/TP No.	Depth (m)	Natural Moisture (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 μ m (%)	Modified Plasticity Index (%)	Class
BH1	1.00	30	61	27	34	100	34	CH
	2.00	29	62	30	32	100	32	CH
	3.00	30	68	29	39	100	39	CH

Table 1

GROUNDWATER MONITORING

GROUNDWATER MONITORING RECORD			
Date	Weather Conditions	Ground Conditions	Temperature (°C)
13/01/2026	Raining	Wet	11.0
Monitoring Point Location	Depth to water (mBGL)		Depth to Base of well (mBGL)
BH1	0.63		6.18

Table 2

GROUNDWATER MONITORING RECORD			
Date	Weather Conditions	Ground Conditions	Temperature (°C)
22/01/2026	Raining	Wet	9.0
Monitoring Point Location	Depth to water (mBGL)		Depth to Base of well (mBGL)
BH1	0.48		6.18

Table 2a

Site Analytical Services Ltd
Units 14 -15
River Road Business Park
33 River Road
Barking
Essex
IG11 0EA

t: 0208 5948134

e: services@siteanalytical.co.uk; lizw@siteanalytical.co.uk; jimw@siteanalytical.co.uk;
Maddiepotter@siteanalytical.co.uk

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404

f: 01923 237404

e: info-i2analytical@normecgroup.com

Analytical Report Number : 25-068086

Project / Site name: 109 Rosebery Road, London N10 2LD

Samples received on: 17/12/2025

Your job number: 25 41209

**Samples instructed on/
Analysis started on:** 17/12/2025

Your order number: 17300

Analysis completed by: 23/12/2025

Report Issue Number: 1

Report issued on: 23/12/2025

Samples Analysed: 3 soil samples



Signed:

Rafał Szczepańczyk
Technical Reviewer
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

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
air	- once the analysis is complete

Excel copies of reports are only valid when accompanied by this PDF certificate.

Retention period for records and reports is minimum 6 years from the date of issue of the final report.
Some records may be kept for longer according to other legal/best practice requirements.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 25-068086

Project / Site name: 109 Rosebery Road, London N10 2LD

Your Order No: 17300

Lab Sample Number				785239	785240	785241
Sample Reference				BH1	BH1	BH1
Sample Number				D5	D7	D10
Water Matrix				N/A	N/A	N/A
Depth (m)				1.50	2.50	4.00
Date Sampled				16/12/2025	16/12/2025	16/12/2025
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Test Limit of detection	Test Accreditation Status			
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	21	21	21
Total mass of sample received	kg	0.1	NONE	1.6	1.5	1.7

General Inorganics

pH (L099)	pH Units	N/A	MCERTS	8.1	7.8	8
Total Sulphate as SO ₄	%	0.005	MCERTS	0.081	3.13	0.92
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	780	4900	6600
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	392	2450	3310
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	3.8	6.2	37
Total Sulphur	mg/kg	50	MCERTS	520	8500	3000
Total Sulphur	%	0.005	MCERTS	0.052	0.851	0.302
Water Soluble Nitrate (2:1) as NO ₃	mg/kg	2	NONE	< 2.0	< 2.0	< 2.0
Water Soluble Nitrate (2:1) as NO ₃ (leachate equivalent)	mg/l	5	NONE	< 5.0	< 5.0	< 5.0

Heavy Metals / Metalloids

Magnesium (water soluble)	mg/kg	5	NONE	120	440	770
Magnesium (leachate equivalent)	mg/l	2.5	NONE	61	220	390

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number : 25-068086

Project / Site name: 109 Rosebery Road, London N10 2LD

* 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 loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
785239	BH1	D5	1.5	Brown clay and sand
785240	BH1	D7	2.5	Brown clay and sand
785241	BH1	D10	4	Brown clay and sand

Analytical Report Number : 25-068086

Project / Site name: 109 Rosebery Road, London N10 2LD

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters Heating/Cooling (PrW) DI Process Water (DI PrW)

Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight	In-house method based on British Standard Methods and MCERTS requirements.	L019B	D	NONE
Magnesium, water soluble, in soil	Determination of water soluble magnesium by extraction with water followed by ICP-OES	In-house method based on TRL 447	L038B	D	NONE
Total sulphate (as SO ₄ in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES	In-house method	L038B	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Sulphate, water soluble, in soil (16hr extraction)	In-house method	L038B	D	MCERTS
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES	In-house method	L038B	D	MCERTS
Water Soluble Nitrate (leachate equivalent)	Determination of nitrate by reaction with sodium salicylate and colorimetry	In-house method based on Examination of Water and Wastewater & Polish Standard Method PN-82/C-04579.08, 2:1 extraction	L078-PL	W	NONE
Nitrate, water soluble, in soil	Determination of nitrate by reaction with sodium salicylate and colorimetry	In-house method based on Examination of Water and Wastewater & Polish Standard Method PN-82/C-04579.08, 2:1 extraction	L078-PL	W	NONE
Chloride, water soluble, in soil	Determination of Chloride colorimetrically by discrete analyser	In-house method	L082B	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement	In-house method	L099-PL	D	MCERTS
Soil Descriptions	Textural classification	In-house method	L019B	W	NONE

For method numbers ending in 'UK' or 'A' analysis have been carried out in our laboratory in the United Kingdom (Watford).

For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).

For method numbers ending in 'PL' or 'B' 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 30°C.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Quality control parameter failure associated with individual result applies to calculated sum of individuals.

The result for sum should be interpreted with caution