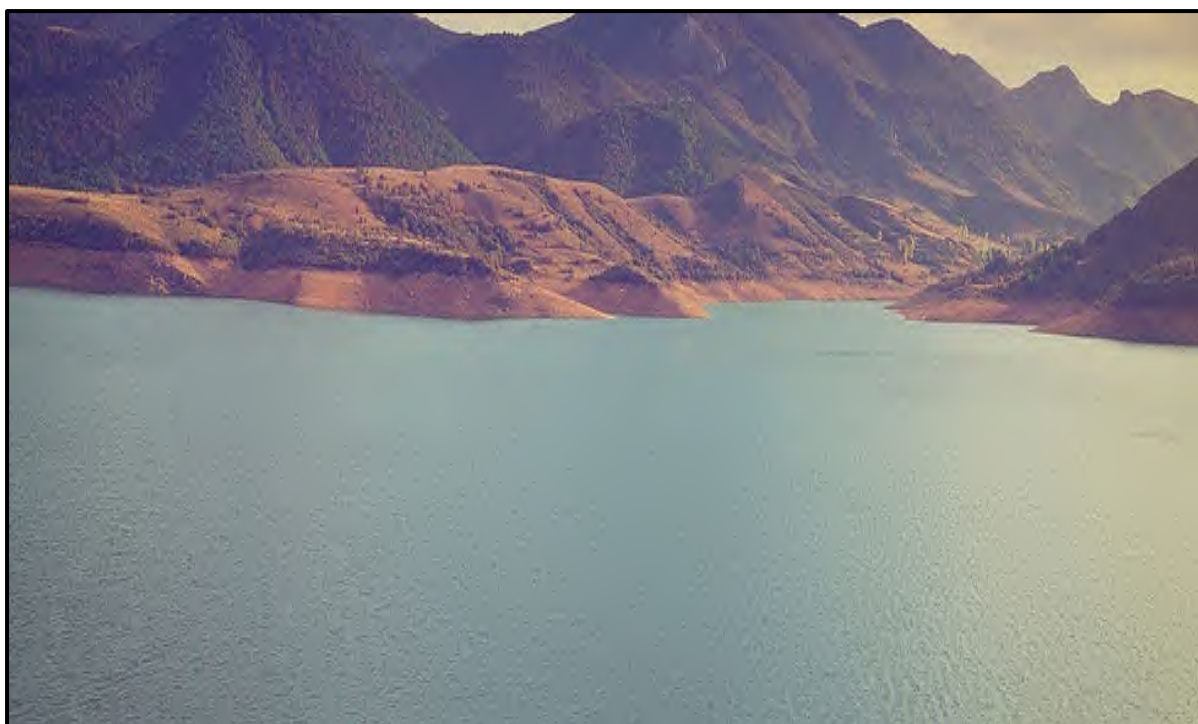




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Description	Basement Impact assessment
Site	33 Nightingale Lane, London, N8 7RA
Reference	A861.23 BIA rev n.1
Status	Final
Client	Basement Consulting Limited
Issue date	31/05/2023

Prepared and Reviewed by

Name	Mr Paolo Pitasi CEng MICE	<i>Paolo Pitasi</i>
Position	Director	
Date	31/05/2023	



- **General construction notes.**

The temporary stability of the structure is the responsibility of the builder during all stages of the construction.

These calculations are for building regulations purpose and do not constitute full working drawings /details for the project.

All beam lengths used in these calculations are design lengths and are not to be used for ordering. All beams /joists lengths are to be taken to suit the site dimensions. Foundation concrete to be minimum C20 mix in accordance with Building Regulations Approved Document A.

These calculations have been prepared based on architects plans and sections. Any connections or details shown are for guidance only. Final connection details to be designed steel by Fabricator based on the reaction given in these calculations, but to suit the site dimensions and relative levels that will be required during the construction stage.

This structural calculation and related drawings will be valid only if the client pays the agreed fee for this service as specified in the related invoice.

If the fee is not paid, these calculation and drawings are just a draft and cannot be used for being submitted to the local Authority Building Control and for starting the works. Also ,in this case ,the Building Control must know that he is checking just a draft and cannot be approved or taking in account it.

Approval of these calculations and drawings by the Local Authority Building Control should be obtained prior to any ordering of material or fabrication.

No liability is accepted for any changes that may be required as a result of work having commenced prior to such an approval having been obtained.

If unjustly a claim will be raised against this company, all the resulting expenses for its defence will be fully charged to the customer.

The project is composed by this structural calculation report, calculations and drawings that must be used all together for your purpose.

- **1. INTRODUCTION**

1.1 Basement Consulting Limited commissioned this Basement Impact Assessment as a supporting document to the planning application for the proposed basement at 33 Nightingale Lane, London, N8 7RA. The local planning authority is the London Borough of Haringey.

1.2 This document states that the assessment should address the impact of proposals on surface water flow and flooding, groundwater flow and structural stability, as well as the cumulative effect on the surrounding area, and identify suitable construction methods and mitigation measures, and a method for monitoring local ground conditions, water movement, subsidence, and drainage.

- **2.0 TOPOGRAPHIC SETTING.**

2.1 The new residential redevelopment is in an area relatively flat, with no significant topographical features located within the constituency of Hornsey which is part of the London Borough of Haringey.

2.2 The surrounding areas were found to be generally residential or commercial.

2.3 The new property has the entrance from Nightingale Lane consisting mostly of terraced properties.

- **3.0 PLANNING SEARCHES (HISTORICAL MAPS).**

The Old maps online indicate that:

3.1 Map published in the year 1822: the area was open land.



3.2 Map published in the year 1896: the area was open land.



3.2 Map published in the year 1914: the area was developed with terraced houses which remains unchanged over the years.



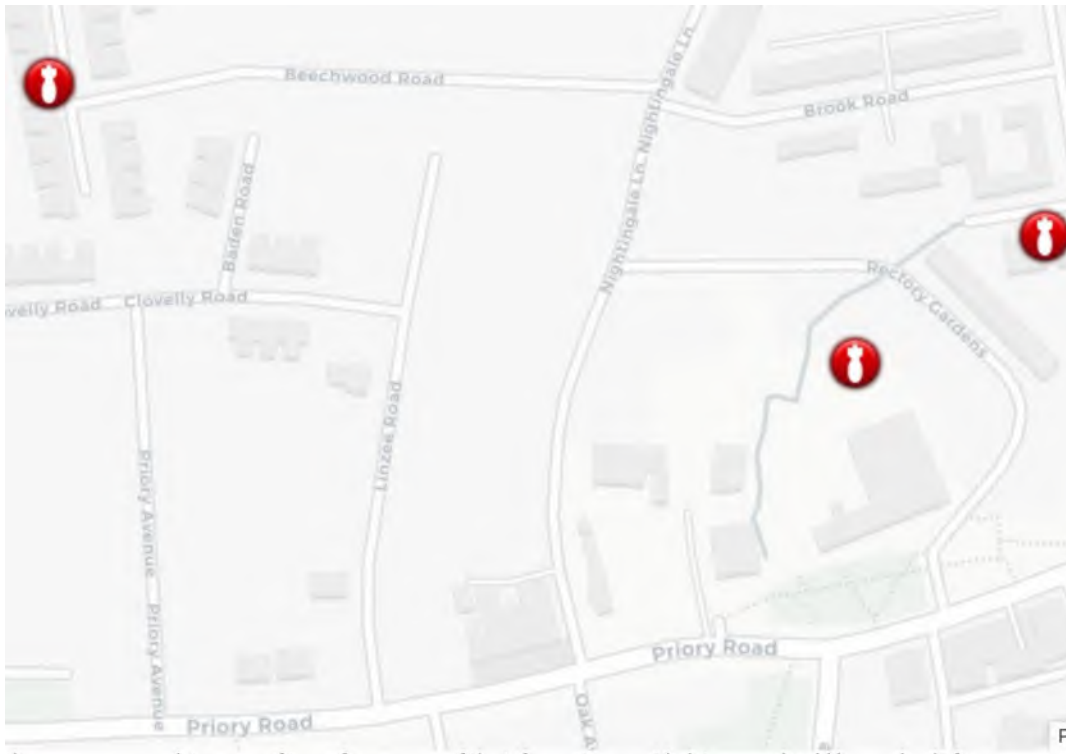
3.3 Aerial photograph taken from google map:



4.0 PLANNING SEARCHES: BOMB DAMAGE MAPS.

The London bomb map shown in attached figure (extracted from website www.bombsight.org) shows no bombs were dropped directly in the immediate vicinity of the proposed site. The nearest bomb was recorded about more than 100m away in the south east direction of the property.

The properties within 150m of 33 Nightingale Lane, London, N8 7RA did not suffer any bomb damage.



- **5.0 GENERAL INFORMATION.**

The following document: Groundsure Geo Insight report ref. GS-2CW-XC1-DQU-XMT of 27/03/2023 which provides high quality geo-environmental information of the site will be used as reference for drafting the Basement Impact assessment.

This document is attached at the end of this report.

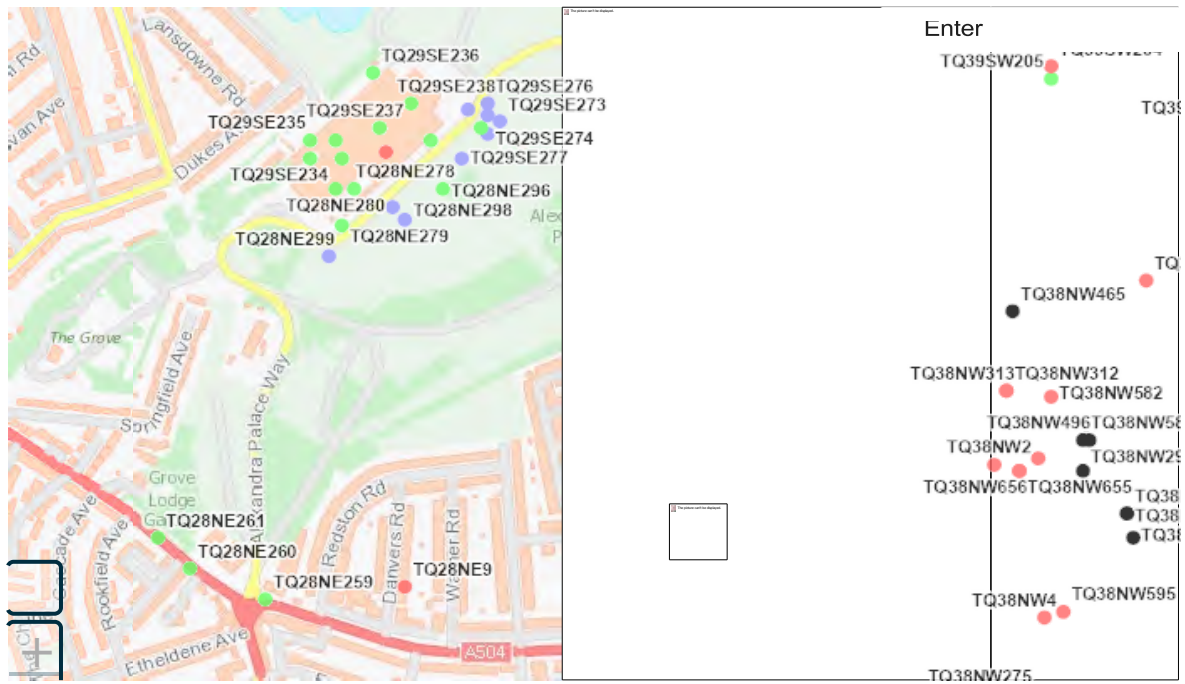
- **6.0 GEOLOGICAL SETTING.**

6.1 The published BGS Geological mapping 1:50000 indicates:

- Superficial deposit: found no information about it.
- Bedrock is formed by London Clay Formation - Clay, Silt and Sand. Sedimentary Bedrock formed approximately 48 to 56 million years ago in the Palaeogene Period.

6.2 The London Clay Formation is well documented (e.g. Ellison et al., 2004) as consisting of over-consolidated, firm to very stiff, grey to blueish grey, fissured, bioturbated, slightly calcareous, silty to very silty clay. It contains well-graded beds of clayey silt to fine silty sand, pyrite, and various sized carbonate concretions (claystone).

6.3 Examining the BGS Borehole Records, it is possible to state that a lot of exploratory boreholes were carried out in the neighbouring area of the site.



Ground Level 111.5.0D (+ 33.91m) Diameter of Boring 4"
Water Struck None observed Method Hand Auger
Standing Water Level None observed Start 19.4.71 Finish 19.4.71

Description of Strata		Thickness	Depth	Reduced Level	Disturbed Samples	Undisturbed Samples and Insitu Tests
Made	Topsoil	0'6"	0'6"	111.0		
Ground	Soil and bricks	1'0"		110.0		
Stiff brown clay		3'0"	4'6"	107.0	2'6" J19774	
Brown clay with some stones		1'6"		105.5	5'0" J19775	
Stiff brown clay		4'0"	10'0"		7'6" J19776	
					10'0" J19777	
Bottom of Borehole						
TOTALS		10'0"	10'0"			

J = Jar Sample B = Bulk Sample W = Water Sample

J = Jar Sample B = Bulk Sample W = Water Sample

U = Undisturbed Core Samples, 4 in. dia. x 18 in. long. Depth shown to top of sample. U* = Sample not recovered.

N = Number of blows per ft. penetration in Standard Penetration Test.

V Shear strength in lb/in.² given by Insitu Vane Test.

WESTFIELD ROAD

This and the other boreholes performed in this area and listed in the GeoIndex confirm that there is a Made ground (a layer of fill material considered to have little or no bearing capacity, consisting of a variety of materials, sands, gravels concrete and brick among other substances) overlying a bed rock formed by London clay.

6.4 n.2 trial pits were performed in site in the location as showed in the drawing n.2 that is attached at the end of this report.

The section of the existing foundation and their depth was detected and showed in attached drawings TP1 and TP2.

Some photos we attached at the end of this report.

These trial pits confirm that the existing foundation are laid on the London Clay.

• 7.0 HYDROLOGICAL SETTING (SURFACE WATER FLOODING)

7.1 The Environment Agency (EA) published a new map of 'Risk of Flooding from Surface Water' on their website in January 2014; This map identifies four levels of risk (high, medium, low, and very low).

7.2 The EA's definitions of the categories are:

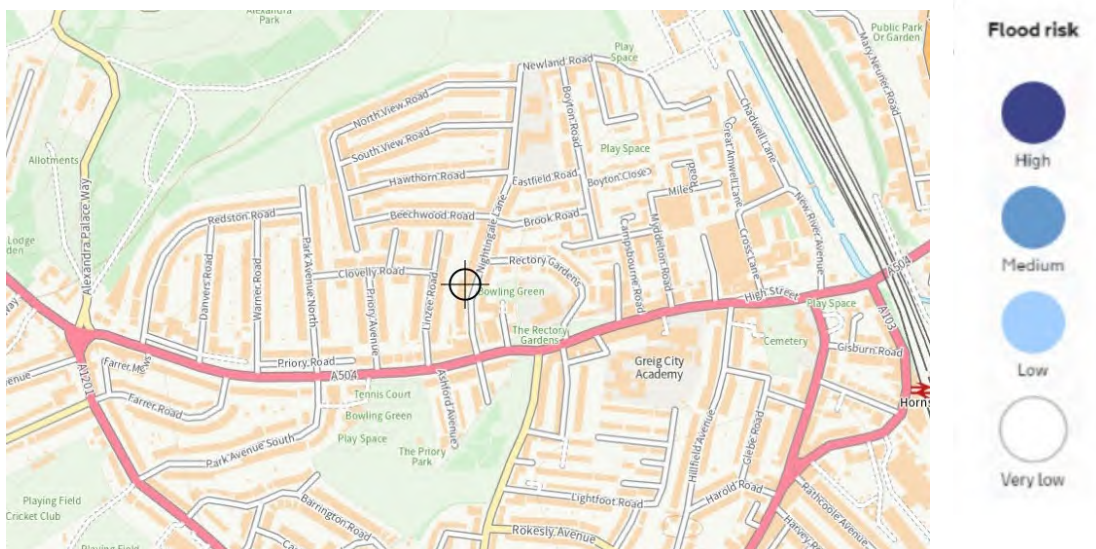
'Very low' risk: Each year, these areas have a chance of flooding of less than 1 in 1000 (0.1%).

'Low' risk: Each year, these areas have a chance of flooding of between 1 in 1000 (0.1%) and 1 in 100 (1%)

'Medium' risk: Each year, these areas have a chance of flooding of between 1 in 100 (1%) and 1 in 30 (3.3%).

'High' risk: Each year, these areas have a chance of flooding of greater than 1 in 30 (3.3%).

7.3 This modelling indicates that the area at 33 Nightingale Lane, London, N8 7RA has very low risk of flooding from rivers or sea and the related flood risks map is attached below:

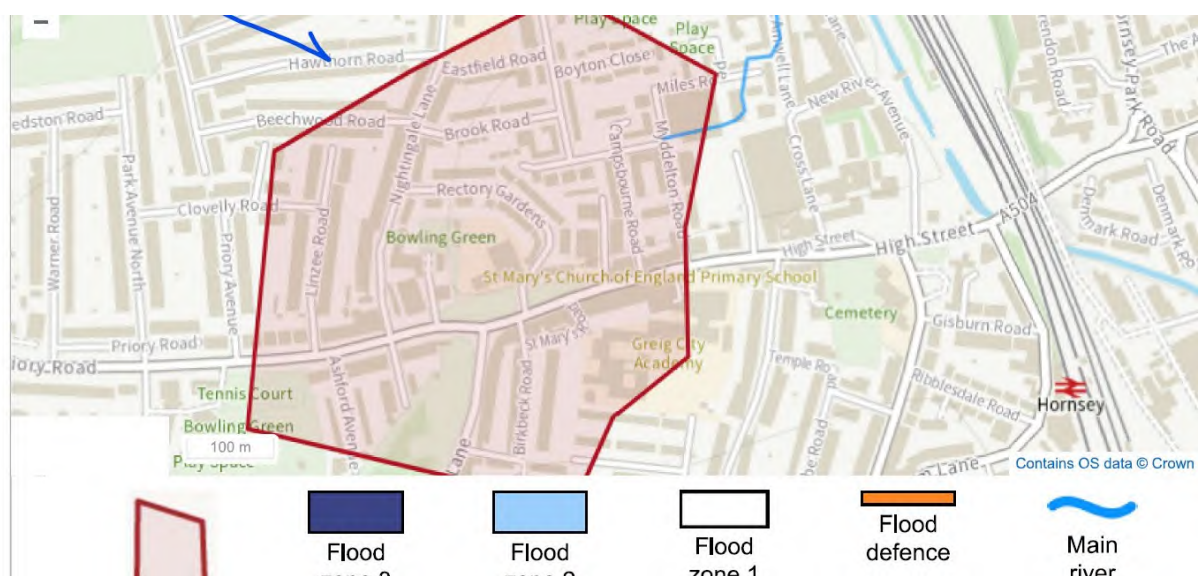


Instead, low risk from surface water or reservoirs and the related flood risks map is attached below:



Information taken in the web platform: Check *the long-term flood risk for an area in England*, states that this location is flood zone n.1

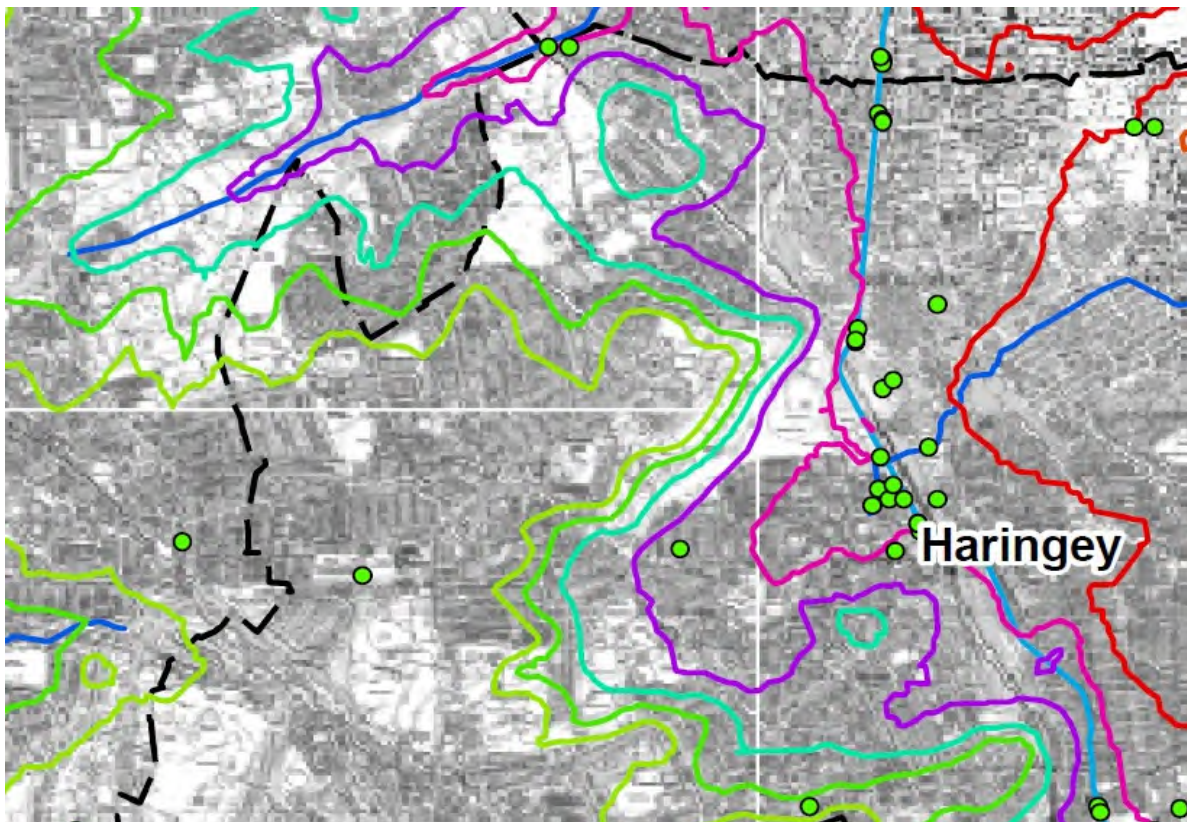
Flood zone 1 means that the land within flood zone 1 has a low probability of flooding from rivers and the sea. Most developments that are less than 1 hectare (ha) in flood zone 1 do not need a flood risk assessment (FRA) as part of the planning application.



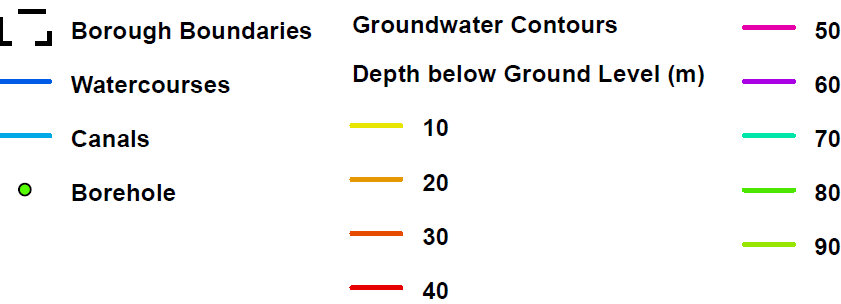
- **8.0 HYDROGEOLOGICAL SETTING (GROUNDWATER)**

North London SFRA: Haringey map n.12 indicates that the area is not at risk from groundwater flooding. The development of a basement is unlikely to detrimentally affect any groundwater which lies greater than 50m bgl.

In addition, there are no superficial cohesionless deposits overlying the London Clay which could hold perched water and the London Clay composing the bedrock is classified as unproductive strata with soils that have a low permeability and negligible significance to local water supply, as defined by the Environment Agency (EA). Therefore the probability of finding an aquifer in the area where the basement is built, will be very low.

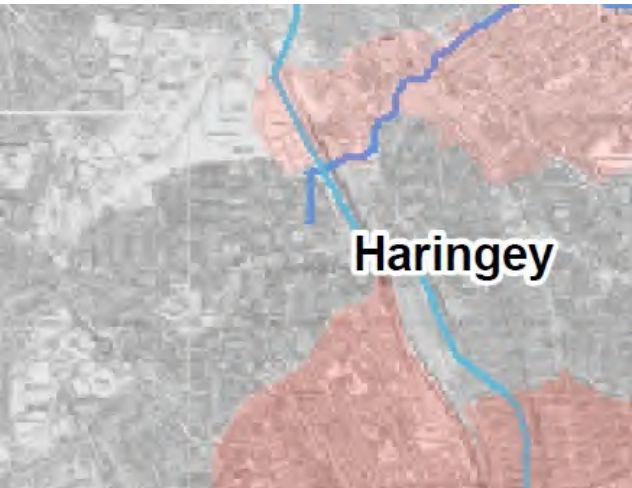


Legend

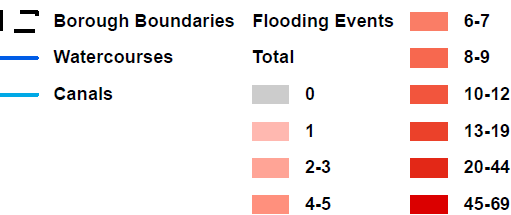


- 9.0 FLOODING FROM SEWERS.

North London SFRA: Haringey map n.13 Sewer Flooding Incidents indicates that this area did not suffer from sewer flooding.



Legend



- **10.0 IMPACT WITH EXISTING TREES.**

The basement construction will not be affected by the existing trees because its foundation base is placed at a suitable depth.

- **11.0 RAILWAYS, TUNNELS, AND UNDERGROUND STRUCTURE**

Railways, underground tunnels for transport do not pass below or close to the site.

Other underground infrastructure as human-made cavities under the main drainage, sewers, cables or communications might be present within the zone of influence of the proposed basement, so an appropriate services/utility search should be undertaken before carrying out the construction of the basement. If any such infrastructure is identified, then its potential influence on the proposed basement must be assessed.

- **12.0 LANDSLIDES**

The topography of the site and the surrounding land is relatively flat for which slope instability problems are unlikely to be present and no actions required to avoid problems due to landslides.

- **13.0 SHRINKING /SWELLING CLAYS.**

No testing on soil samples carried out to date to determine the susceptibility to shrinkage and swelling with changes of moisture although London clay is typically clay with a high shrinkage potential.

The London Clay formation is of high or very high plasticity and high-volume change potential. As a result, the clays undergo considerable volume changes in response to variations in natural moisture content (they shrink on drying and swell on subsequent rehydration). These changes can occur seasonally in response to normal climatic variations to depths of up to 1.5m, and much greater depths in the presence of trees whose roots abstract moisture from the clays. As the base of the basement is placed at a depth greater than 2.5m, it is not affected by this phenomenon.

The presence of London clay formation with high plasticity is confirmed by the document Groundsure Geo Insight report ref. GS-2CW-XC1-DQU-XMT of 27/03/2023.

The clays will swell also when unloaded by excavations such as those required for the construction of basements. For which the basement base is subjected to an uplift force to be considered during the calculation of the basement.

- **14.0 IMPACT OF THE PROPOSED DEVELOPMENT WITH THE EXISTING NEIGHBOURING SUPERSTRUCTURE AND MONITORING.**

The development of the basements may impact on adjacent properties placed at the sides. In fact, lateral movements associated with the basement excavations are possible, but they must be controlled during temporary and permanent works so as not to impact adversely on

the stability of the structures by an adequate temporary system.

For which if these mitigation measures are undertaken, it is not expected to exceed the following category of damage referred to in the Burland Scale. "Cat 0- Negligible - Hairline cracks of less than about 0.1 mm and Cat 1- Very slight Fine cracks.

Both types of damage can easily be repaired by a normal decoration.

In addition, it would be prudent to investigate the depth of foundations of the adjacent property before construction and to undertake a structural condition survey of adjacent properties of the site before work commences by the Party Wall Surveyor.

Being the pavement of Nightingale Lane far from the front of the basement about 3.5m, it will not be affected by the basement excavation.

Condition surveys of the neighboring properties are recommended before the works commencement in order to provide a factual record of any pre-existing damage. Such surveys are usually carried out while negotiating the Party Wall Award and are beneficial to all parties concerned.

Precise movement monitoring should be undertaken weekly throughout the period during which the basement walls and slab are constructed, with three sets of initial readings taken before excavation of the basement starts in order to assess the degree of existing movement.

Readings may revert to fortnightly once the basement structure has been completed.

This monitoring should be undertaken with a total station instrument and targets attached at a minimum of two levels. Target locations to be agreed prior to construction.

The accuracy of this system of monitoring is usually quoted as $\pm 2\text{mm}$. Thus, if recorded movements in either direction reach 5mm, then the frequency of readings should be increased as appropriate to the severity of the movement, and consideration should be given installing additional targets. If the recorded movements in either direction reach 8mm, then work should stop until new method statements have been prepared and approved by the appointed structural engineer.

If any structural cracks appear in the main loadbearing walls, then those cracks should be monitored using the Demec system (or similar) on the same frequency as the target monitoring.

- **15.0 Underground Concrete.**

As the London clay formation is a high sulphate content due to the selenite, sulphate resisting cement is recommended to be used in construction of underground concrete. The recommendations for design of underground concrete is ACEC class DS3-Ac-2s from Table C2 of BRE Special Digest 1 Part C (2005). This assumes a static water condition on natural strata.

- **16.0 PROPOSED DEVELOPMENT DESCRIPTION AND CONSTRUCTION STAGES.**

16.1 Architectural drawings are supplied in support of the planning application where the proposed new development is illustrated.

The proposed underground structure will extend beneath the ground floor until the front of the building and will be accessed via an internal flight of steps from the hall of the ground floor.

The proposed works include:

- Excavation of the existing basement to lower the finished floor level (FFL) to get a final internal height of the basement equal to 2.58m.

- Creating the lightwell at the rear of the house.

The scheme of the proposed basement will comprise shallow reinforced concrete (RC) underpinning with mass concrete heels, at a founding depth below the level of the existing foundation to get a final height equal to 2.58m.

Underpinning will be required beneath the foundation at the sides, rear, and the front of the house.

16.2 Use of shallow reinforced concrete (RC) underpinning with mass concrete is proposed within the existing basement to No.33, to increase the headroom.

RC underpinning will be required beneath the party walls of the buildings, at the front and at the rear of the existing building to create the proposed basement extension of the property.

Where the basement extends out beyond the rear of the building for the proposed lightwell, the perimeter walls should be constructed as cantilevered 'L' shaped RC retaining walls in panels not exceeding 1.0m in width, on the same 'hit and miss' basis as the underpinning. Underpinning method involves the excavation of the ground in short lengths (pins length less than 1m) by hand underneath the existing foundation and sequentially to enable the stresses in the ground to 'arch' onto the ground or completed underpinning on both sides of the excavation, together with the ability of stiff homogenous clays to stand un-supported for a limited period. Loads from the structure above will similarly arch across the excavation, provided that the structure is in good condition.

When the basement base level will be reached, then the reinforced concrete wall section will be erected and kept for curing before next excavation starts.

These bays with the following dimension: length 0.80m, variable depth, width 1.0m, are dug out individually and concreted as short as possible.

The boxes are staggered so that the building remains structurally sound always.

Between these bays of reinforced concrete retaining walls, steel reinforcing bars are placed to tie them together to act as one solid structure when completed.

16.3 Construction Sequence. The sequences of the works will be illustrated in the structural drawings n.2 and n.3 of the proposed basement attached at the end of this report.

16.4 Some ground movements are inevitable when an underground structure is constructed, and the magnitude of the movement depends on:

- the geology.
- the adequacy of temporary support that will be used during the underpinning excavations.
- the quality of workmanship when constructing the permanent structure.

In any case, the possible ground movement will not create any damage to the adjacent structures as discussed in the previous section.

16.5 It would be prudent to undertake a structural condition survey of adjacent properties on both sides of the site before work commences. This should be covered by the Party Wall Surveyor.

16.6 Temporary horizontal supports will be required when the mentioned retaining wall pins will be built and must be maintained until the pins have been completed, including allowing time for the concrete to gain adequate strength.

By conforming to normal health and safety good practice, the requirements for temporary support of any excavation must be assessed by a competent person at the start of every shift, and at each significant change in the geometry of the excavations as the work progresses.

16.7 The unloaded clays at/beneath formation level will readily absorb any available water which would lead to softening and loss of strength. It will, therefore, be essential to ensure that the clays at formation level (onto which the underpin/retaining wall bases and the basement slab will bear) are protected from all sources of water, with suitable channelling to sumps for any groundwater seeping into the excavations. The formation clays should be inspected and then blinded with concrete immediately after completion of final excavation to grade. Any unacceptably soft/weak areas must be excavated and replaced with concrete.

16.8 The time between excavation and placing of concrete to be kept as short as possible, but no longer than 24 hours unless by prior agreement. The excavations are to be protected from collapse, are to be kept clean and dry, and must be inspected by the competent person. The concrete is to be placed immediately after this inspection. Any collapse of the trench, standing water or softened trench base is to be removed and cleaned out before the placement of the concrete.

16.9 After constructing a concrete RC wall 'pin', allow a minimum of 48 hours min for the concrete to cure before excavating an adjacent pin.

16.10 It needs to incorporate 10 No. 600x10mm mild steel dowel bars between each pin (300mm embedment into each pin). For safety and access reasons and if they are returned to straight when casting, these bars may be bent out of the way during excavation. Minimum cover to all reinforcement to be 75mm. After that the pin of the reinforced concrete wall has cured, any gap between undersides of existing foundation and underpinning block to be filled with 1:2 cement/sharp sand, mixed as dry as possible with "Conbex 100" cement additive and then consolidated by ramming with a suitable blunt instrument until the space is filled. In this way, it is assured that the building load is transferred to the new pin.

Summarizing below the proposed sequence of the works:

- Stage n.1: Excavate a bay as specified above over full height to line with back of existing foundation to reach the basement base level.
- Stage n.1a: Provide any temporary trench sheeting as may be necessary to stabilise the excavations.
- Stage n.2: Cast the lean mix concrete at the bottom of trench.
- Stage n.2.a: Install formwork to prevent overspill and the reinforcement of steel bars.
- Stage 2.b: Cast new mass concrete underpin using the proposed Class concrete to no more than half height of full underpin.
- Stage 2.c: Once concrete has lost fluidity; second lift can be cast.
- Stage n.3: Dry pack.
- Stage n.4: Once each section of wall is installed, placing temporary shore during the excavation to ensure stability until permanent concrete slab at the basement base will be cast.
- Stage n.5: casting the concrete slab at the bottom of the new basement.

- **17.0 DRAINAGE SYSTEM.**

Drainage systems are designed to operate under 'surcharge' at times of peak rainfall, which means that the level of effluent in the sewers may rise to ground level. Non-return valves and pumped above ground loop systems must, therefore, be fitted on the drains serving the basement, courtyard and lightwell, to ensure that water from the mains sewer system cannot enter the basement when the adjacent sewer is operating under surcharge. All drains which discharge via the same outfall as the basement must be protected, including those carrying foul water and roof/surface water. A battery powered reserve pump should be fitted to ensure that the system remains functional during power cuts. The pumped above-ground loop must rise high enough above ground level to create sufficient pressure head to open the non-return valve when the sewer flow is surcharged to ground level. Otherwise, the basement would once again be vulnerable to flooding while the surcharged flow continues. If it is not possible to achieve a sufficient rise of the loop above ground level, then temporary interception storage should be provided as recommended above.

- **18.0 WATERPROOFING**

The proposed basement will need to be fully waterproofed to provide adequate long- term control of moisture ingress from the groundwater. Detailed recommendations for the waterproofing system are beyond the scope of this report although it is noted that, as a minimum, it would be prudent for the system to be designed in compliance with the requirements of BS8102:2022

The waterproofing measures must include sealing of all services which pass through the perimeter walls and floor of the basement, including the sumps for the drainage systems. The National House Building Council published new guidance on the waterproofing of basements in November 2014 (NHBC Standards, Chapter 5.4). Compliance would be compulsory if an NHBC warranty is required. Otherwise, it may provide a useful guide to best practice.

- **19.0 DESIGN STANDARDS**

The works shall be designed in accordance with all current prevailing British Standard Codes of Practice and current best practice including but not limited to:

- Loading: BS6399
- Concrete: BS8110
- Steel: BS5950
- Timber: BS5268
- Masonry: BS5628
- Retaining wall analysis and design (BS8002)
- Temporary Works: BS5975

The design of the basement retaining walls must take into consideration:

- Earth pressures from the surrounding ground.
- Dead and live loads from the structures above, including loads from the adjoining properties.
- Surcharge load.
- Swelling displacements/pressures from the underlying clays.

- A provisional design groundwater level at ground level.

- **19.0 ASSESSMENT METHODOLOGY**

19.1 The evaluation will be carried out at short term at long terms after the construction of the reinforced concrete retaining wall pin.

According to the BS codes, the retaining wall must be checked against the ultimate limit state and serviceability limit state.

For the ultimate limit, it needs to verify that relevant potential collapse mechanisms will occur and to check the external stability:

- a) Bearing capacity failure.
- b) Overturning.
- c) Forward sliding.
- d) Overall, rotational, or global slip surface stability.

19.2 For the serviceability limit state, it needs to verify that during working condition, the structure will retain its characteristics without the need for abnormal maintenance and to check the internal stability:

- a) Settlement.

19.3 It is suggested to use the following geotechnical parameters for the calculation of the retaining walls of the basement:

Design shear strength; $\phi'b = 24.2$ deg.

Angle of wall friction; $\delta = 18.2$ deg.

Design base friction; $\delta b = 18.2$ deg.

Allowable bearing pressure = 100 kN/m²

- **20 RECOMMENDATIONS**

20.1 The development of the basements is unlikely to impact on groundwater, surface water or flooding, unlikely to impact on drainage or ground infiltration of rainwater.

20.2 Use of sulphate resisting cement in underground concrete.

20.3 Watertight design to the basement.

20.4 Check on foundations to adjacent properties before construction.

20.5 Monitoring of any ground movements to ensure they are within expectations.

20.6 Construction of underpinned or other foundations on the unweathered London Clay. This may be achieved by ensuring best practice engineering and design of the proposed scheme by competent persons and in full accordance with the Construction (Design and Management) Regulations.

This will include:

- Determination of the most appropriate methods of construction of the proposed basement.
- Undertake pre-condition surveys of adjacent structures.
- Establishment of contingencies to deal with adverse performance.
- Ensuring quality of workmanship by competent persons.

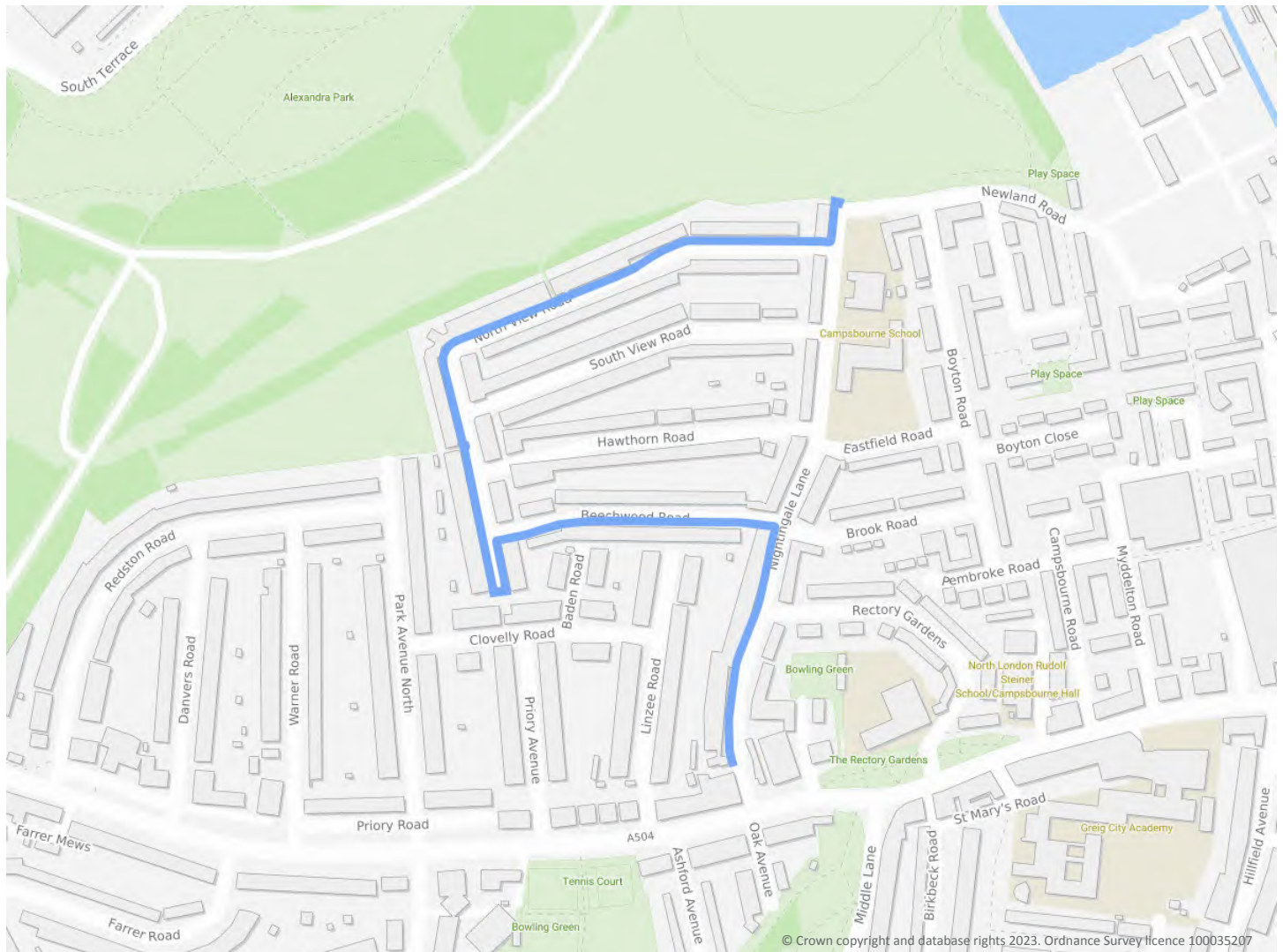
33, NIGHTINGALE LANE, HORNSEY, LONDON, N8 7RA

Order Details

Date: 27/03/2023
Your ref: a
Our Ref: GS-2CW-XC1-DQU-XMT

Site Details

Location: 530083 189311
Area: 0.31 ha
Authority: [London Borough of Haringey](#)



Summary of findings

p. 2 **Aerial image**

p. 5

OS MasterMap site plan

p.10 groundsure.com/insightuserguide

Summary of findings

Page	Section	Geology 1:10,000 scale	On site	0-50m	50-250m	250-500m	500-2000m
11	1.1	10k Availability	Identified (within 500m)				
13	1.2	Artificial and made ground (10k)	0	0	0	1	-
14	1.3	Superficial geology (10k)	0	0	0	2	-
15	1.4	Landslip (10k)	0	0	0	0	-
16	1.5	Bedrock geology (10k)	2	0	1	1	-
17	1.6	Bedrock faults and other linear features (10k)	0	0	0	0	-
Page	Section	Geology 1:50,000 scale	On site	0-50m	50-250m	250-500m	500-2000m
18	2.1	50k Availability	Identified (within 500m)				
19	2.2	Artificial and made ground (50k)	0	0	2	1	-
20	2.3	Artificial ground permeability (50k)	0	0	-	-	-
21	2.4	Superficial geology (50k)	0	0	0	1	-
22	2.5	Superficial permeability (50k)	None (within 50m)				
22	2.6	Landslip (50k)	0	0	0	0	-
22	2.7	Landslip permeability (50k)	None (within 50m)				
23	2.8	Bedrock geology (50k)	1	0	0	0	-
24	2.9	Bedrock permeability (50k)	Identified (within 50m)				
24	2.10	Bedrock faults and other linear features (50k)	0	0	0	0	-
Page	Section	Boreholes	On site	0-50m	50-250m	250-500m	500-2000m
25	3.1	BGS Boreholes	0	0	0	-	-
Page	Section	Natural ground subsidence					
26	4.1	Shrink swell clays	Moderate (within 50m)				
27	4.2	Running sands	Very low (within 50m)				
28	4.3	Compressible deposits	Negligible (within 50m)				
29	4.4	Collapsible deposits	Very low (within 50m)				
30	4.5	Landslides	Very low (within 50m)				
31	4.6	Ground dissolution of soluble rocks	Negligible (within 50m)				



Page	Section	Mining, ground workings and natural cavities	On site	0-50m	50-250m	250-500m	500-2000m
32	5.1	Natural cavities	0	0	0	0	-
33	5.2	BritPits	0	0	0	0	-
33	5.3	<u>Surface ground workings</u>	0	1	27	-	-
34	5.4	Underground workings	0	0	0	0	0
34	5.5	Historical Mineral Planning Areas	0	0	0	0	-
35	5.6	Non-coal mining	0	0	0	0	0
35	5.7	Mining cavities	0	0	0	0	0
35	5.8	JPB mining areas	None (within 0m)				
35	5.9	Coal mining	None (within 0m)				
35	5.10	Brine areas	None (within 0m)				
36	5.11	Gypsum areas	None (within 0m)				
36	5.12	Tin mining	None (within 0m)				
36	5.13	Clay mining	None (within 0m)				
Page	Section	Radon					
37	6.1	<u>Radon</u>	Less than 1% (within 0m)				
Page	Section	Soil chemistry	On site	0-50m	50-250m	250-500m	500-2000m
39	7.1	<u>BGS Estimated Background Soil Chemistry</u>	6	0	-	-	-
39	7.2	<u>BGS Estimated Urban Soil Chemistry</u>	13	15	-	-	-
41	7.3	BGS Measured Urban Soil Chemistry	0	0	-	-	-
Page	Section	Railway infrastructure and projects	On site	0-50m	50-250m	250-500m	500-2000m
42	8.1	Underground railways (London)	0	0	0	-	-
42	8.2	Underground railways (Non-London)	0	0	0	-	-
43	8.3	Railway tunnels	0	0	0	-	-
43	8.4	<u>Historical railway and tunnel features</u>	0	0	1	-	-
43	8.5	Royal Mail tunnels	0	0	0	-	-
43	8.6	Historical railways	0	0	0	-	-
44	8.7	Railways	0	0	0	-	-
44	8.8	Crossrail 1	0	0	0	0	-



<u>44</u>	<u>8.9</u>	<u>Crossrail 2</u>		0	0	0	1	-
44	8.10	HS2		0	0	0	0	-

Recent aerial photograph



Capture Date: 14/06/2021

Site Area: 0.31ha



Recent site history - 2019 aerial photograph

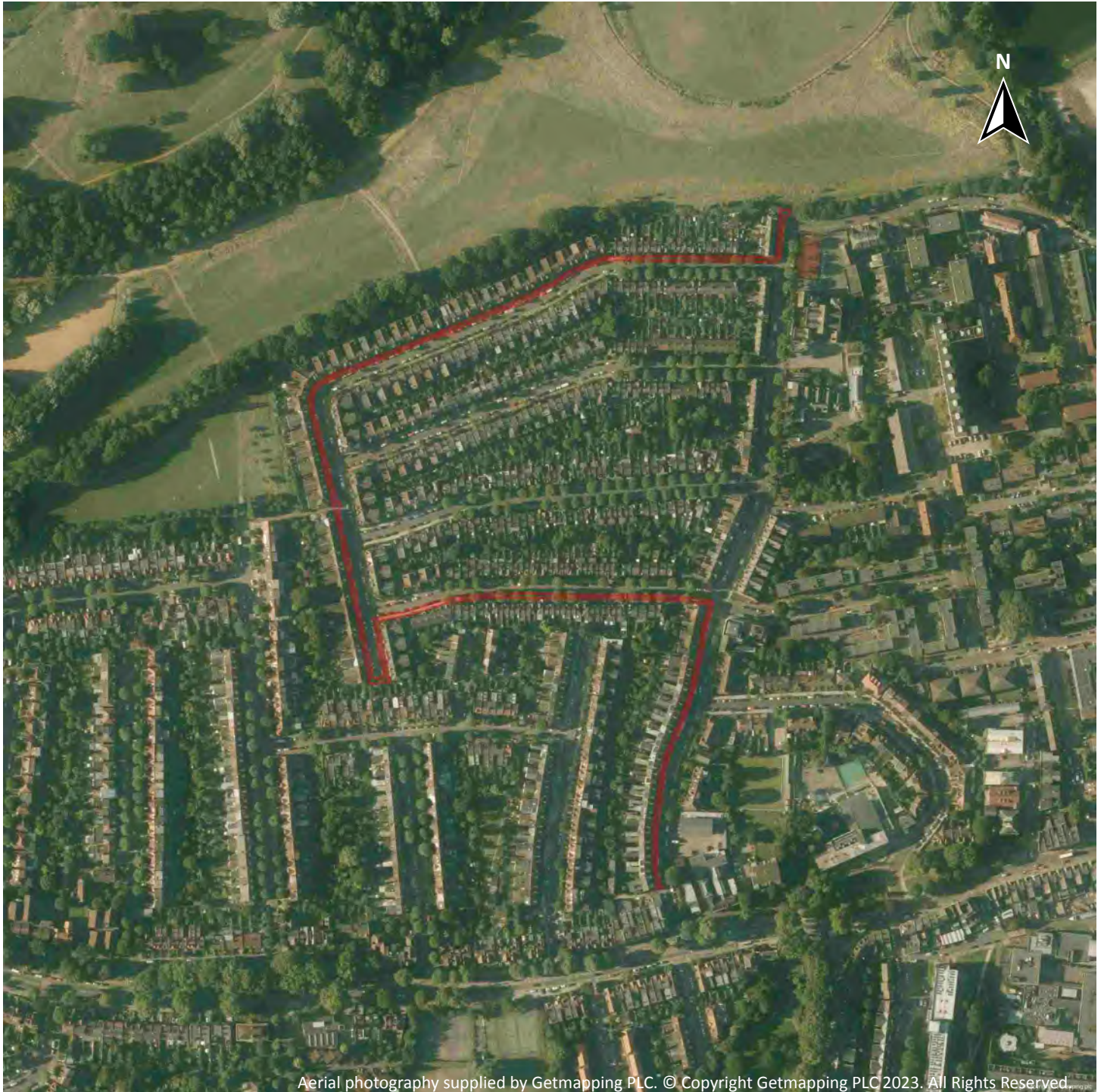


Capture Date: 29/06/2019

Site Area: 0.31ha



Recent site history - 2016 aerial photograph



Capture Date: 12/08/2016

Site Area: 0.31ha



Recent site history - 2013 aerial photograph



Capture Date: 28/04/2013

Site Area: 0.31ha



Recent site history - 1999 aerial photograph

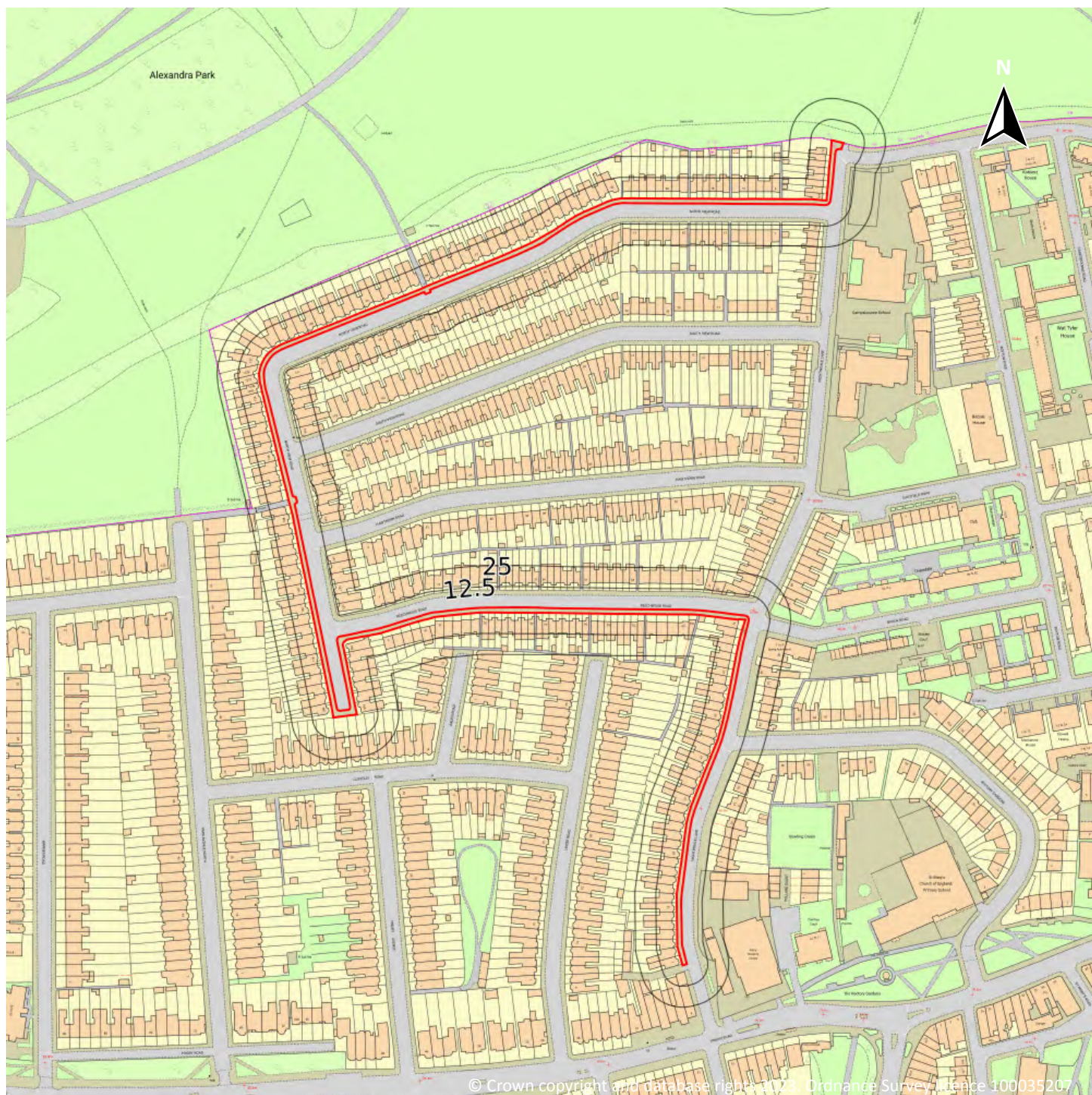


Capture Date: 04/09/1999

Site Area: 0.31ha



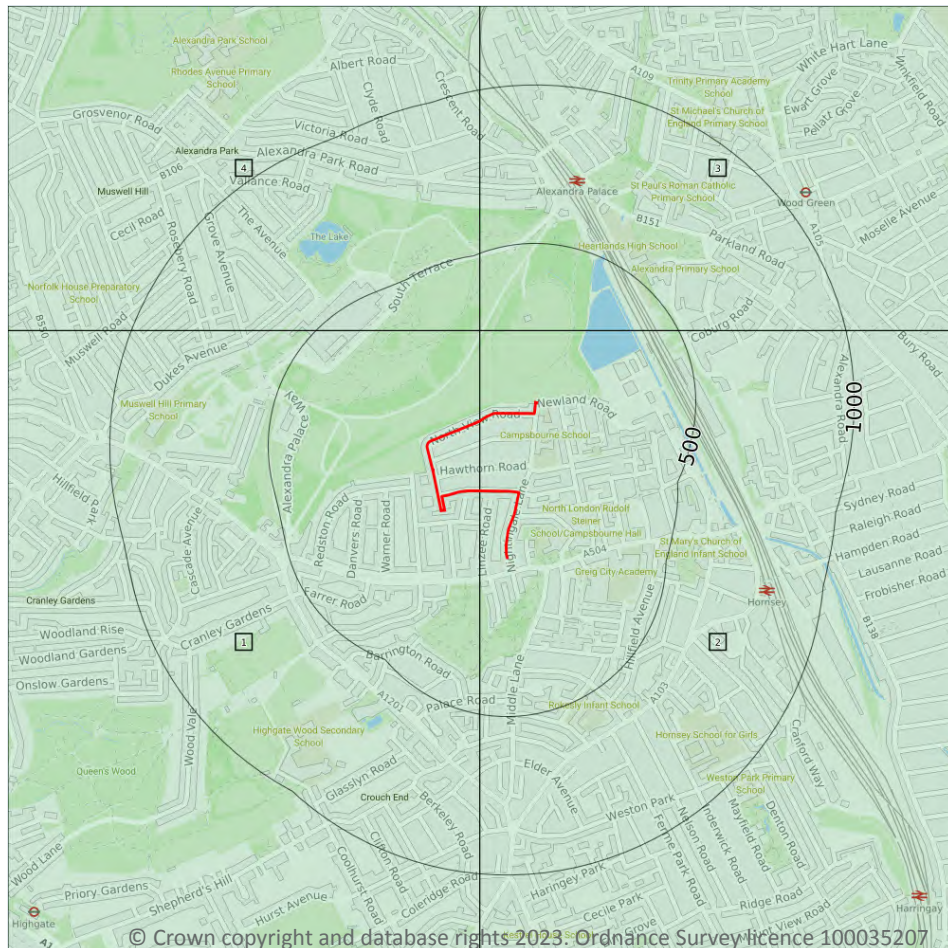
OS MasterMap site plan



Site Area: 0.31ha



1 Geology 1:10,000 scale - Availability



— Site Outline
Search buffers in metres (m)

- Full coverage
- Partial coverage
- No coverage

1.1 10k Availability

Records within 500m

4

An indication on the coverage of 1:10,000 scale geology data for the site, the most detailed dataset provided by the British Geological Survey. Either 'Full', 'Partial' or 'No coverage' for each geological theme.

Features are displayed on the Geology 1:10,000 scale - Availability map on **page 11**

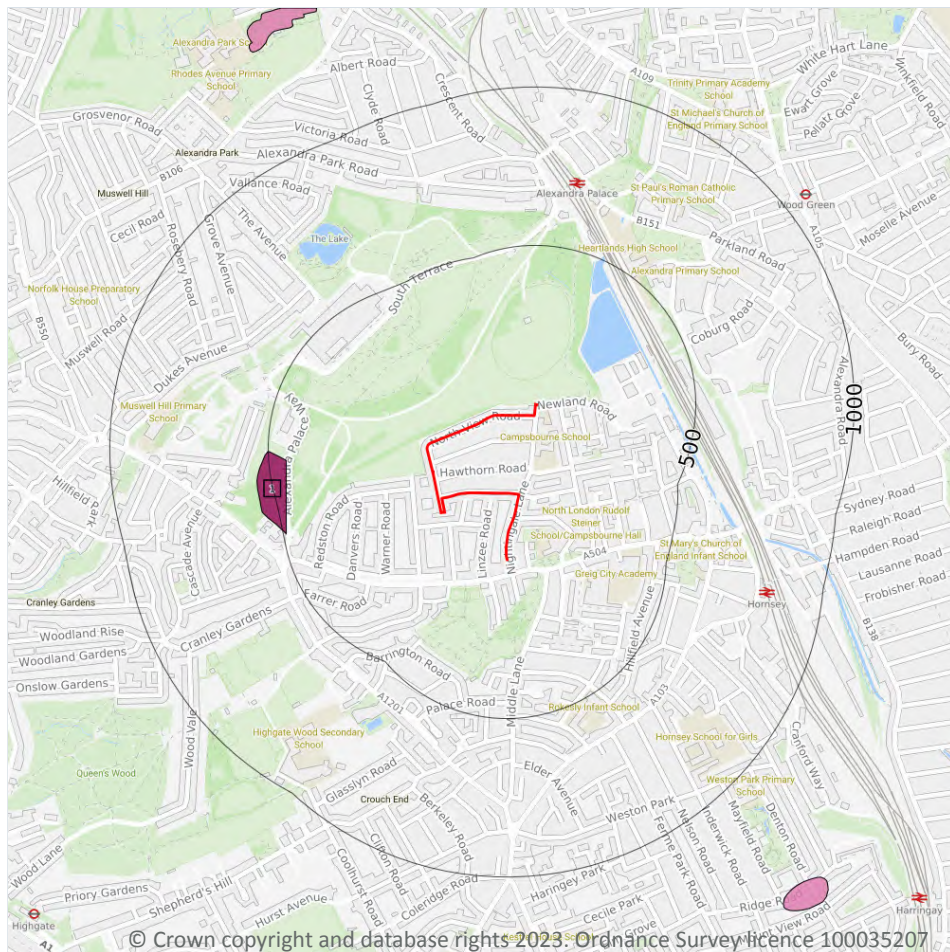
ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	Full	Full	Full	No coverage	TQ28NE
2	On site	Full	Full	Full	No coverage	TQ38NW
3	225m N	Full	Full	Full	No coverage	TQ39SW
4	264m N	Full	Full	Full	No coverage	TQ29SE



This data is sourced from the British Geological Survey.



Geology 1:10,000 scale - Artificial and made ground



— Site Outline
Search buffers in metres (m)

- Reclaimed ground
- Made ground
- Worked ground
- Infilled ground
- Disturbed ground
- Landscaped ground

1.2 Artificial and made ground (10k)

Records within 500m

1

Details of made, worked, infilled, disturbed and landscaped ground at 1:10,000 scale. Artificial ground can be associated with potentially contaminated material, unpredictable engineering conditions and instability.

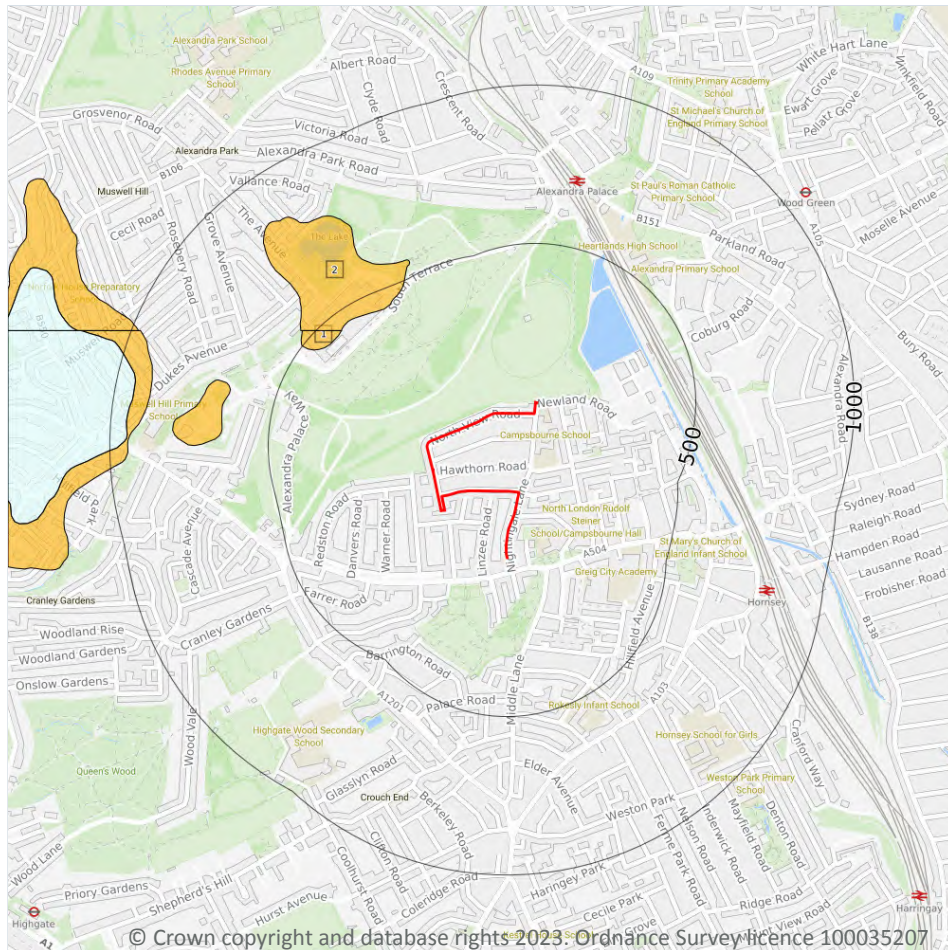
Features are displayed on the Geology 1:10,000 scale - Artificial and made ground map on **page 13**

ID	Location	LEX Code	Description	Rock description
1	444m W	MGR-UNKNOWN	Made Ground (Undivided)	Unknown/unclassified Entry

This data is sourced from the British Geological Survey.



Geology 1:10,000 scale - Superficial



Site Outline

Search buffers in metres (m)

Landslip (10k)

Superficial geology (10k)
Please see table for more details.

1.3 Superficial geology (10k)

Records within 500m

2

Superficial geological deposits at 1:10,000 scale. Also known as 'drift', these are the youngest geological deposits, formed during the Quaternary. They rest on older deposits or rocks referred to as bedrock.

Features are displayed on the Geology 1:10,000 scale - Superficial map on **page 14**

ID	Location	LEX Code	Description	Rock description
1	438m NW	DHGR-XSV	Dollis Hill Gravel Member - Sand And Gravel	Sand And Gravel
2	440m NW	DHGR-XSV	Dollis Hill Gravel Member - Sand And Gravel	Sand And Gravel

This data is sourced from the British Geological Survey.



1.4 Landslip (10k)

Records within 500m

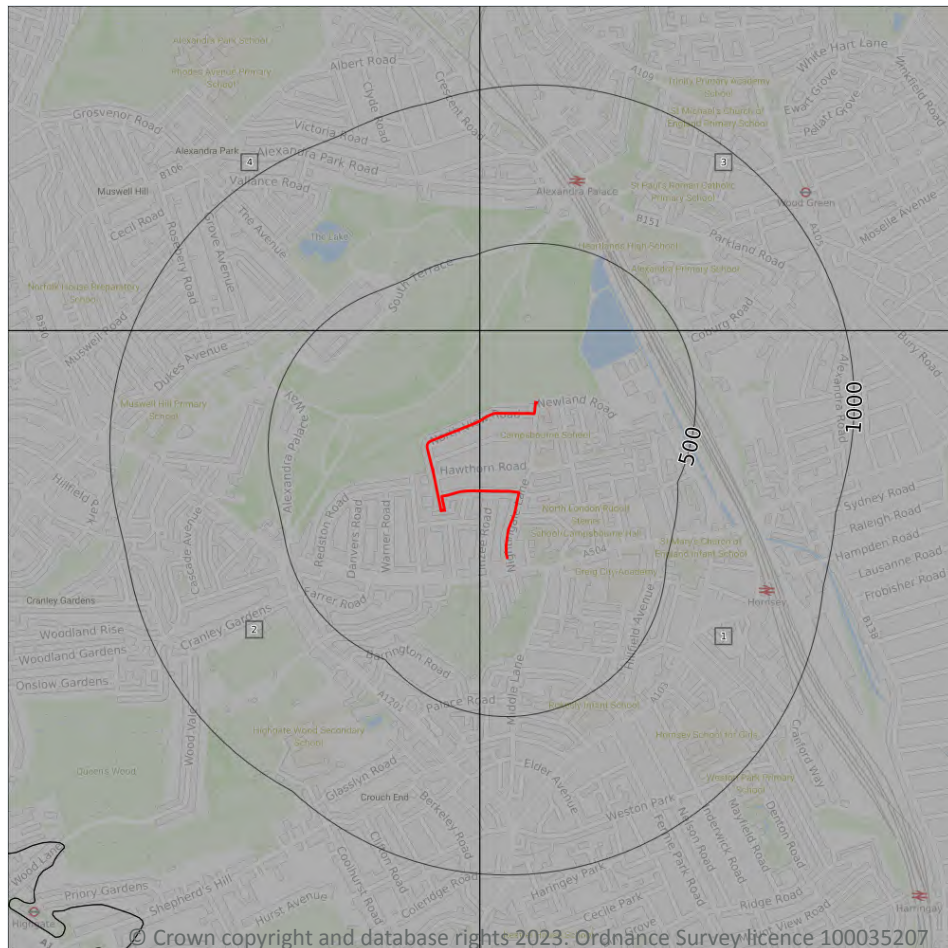
0

Mass movement deposits on BGS geological maps at 1:10,000 scale. Primarily superficial deposits that have moved down slope under gravity to form landslips. These affect bedrock, other superficial deposits and artificial ground.

This data is sourced from the British Geological Survey.



Geology 1:10,000 scale - Bedrock



— Site Outline

Search buffers in metres (m)

.... Bedrock faults and other linear features (10k)

Bedrock geology (10k)
Please see table for more details.

1.5 Bedrock geology (10k)

Records within 500m

4

Bedrock geology at 1:10,000 scale. The main mass of rocks forming the Earth and present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

Features are displayed on the Geology 1:10,000 scale - Bedrock map on **page 16**

ID	Location	LEX Code	Description	Rock age
1	On site	LC-CLAY	London Clay Formation - Clay	Eocene Epoch
2	On site	LC-CLAY	London Clay Formation - Clay	Eocene Epoch
3	225m N	LC-CLAY	London Clay Formation - Clay	Eocene Epoch
4	264m N	LC-CLAY	London Clay Formation - Clay	Eocene Epoch



This data is sourced from the British Geological Survey.

1.6 Bedrock faults and other linear features (10k)

Records within 500m

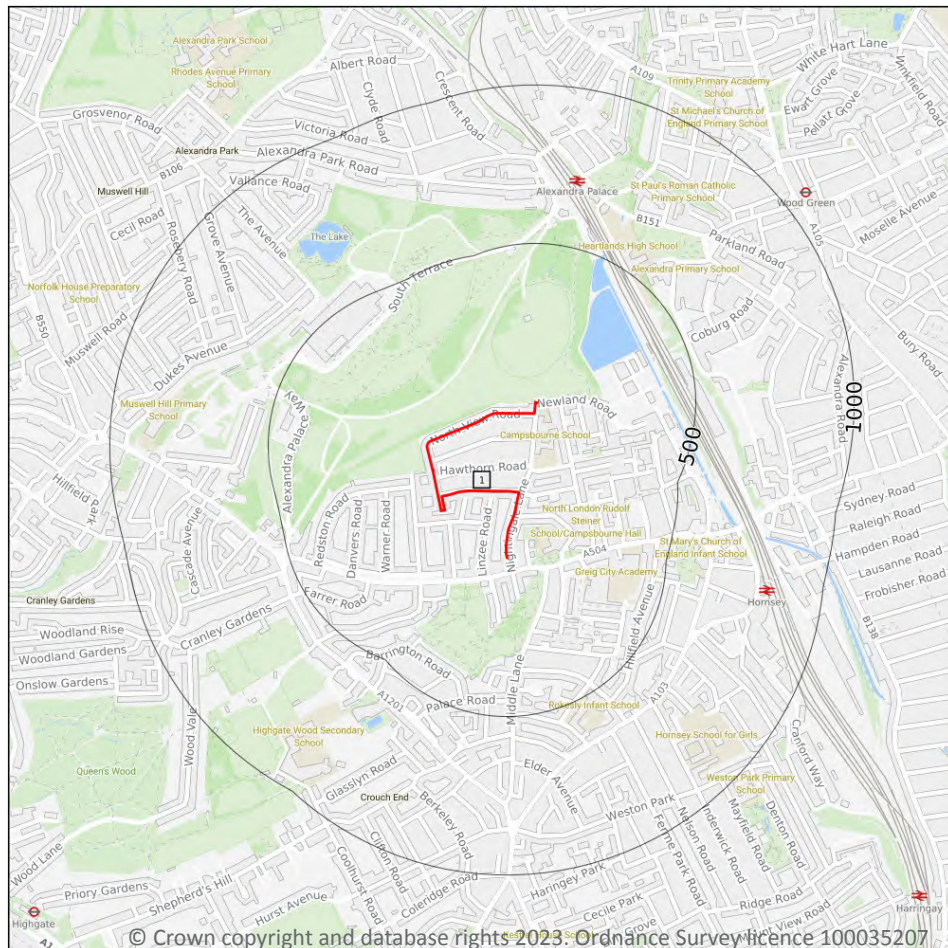
0

Linear features at the ground or bedrock surface at 1:10,000 scale of six main types; rock, fault, fold axis, mineral vein, alteration area or landform. Features are either observed or inferred, and relate primarily to bedrock.

This data is sourced from the British Geological Survey.



2 Geology 1:50,000 scale - Availability



— Site Outline

Search buffers in metres (m)

□ Geological map tile

2.1 50k Availability

Records within 500m

1

An indication on the coverage of 1:50,000 scale geology data for the site. Either 'Full' or 'No coverage' for each geological theme.

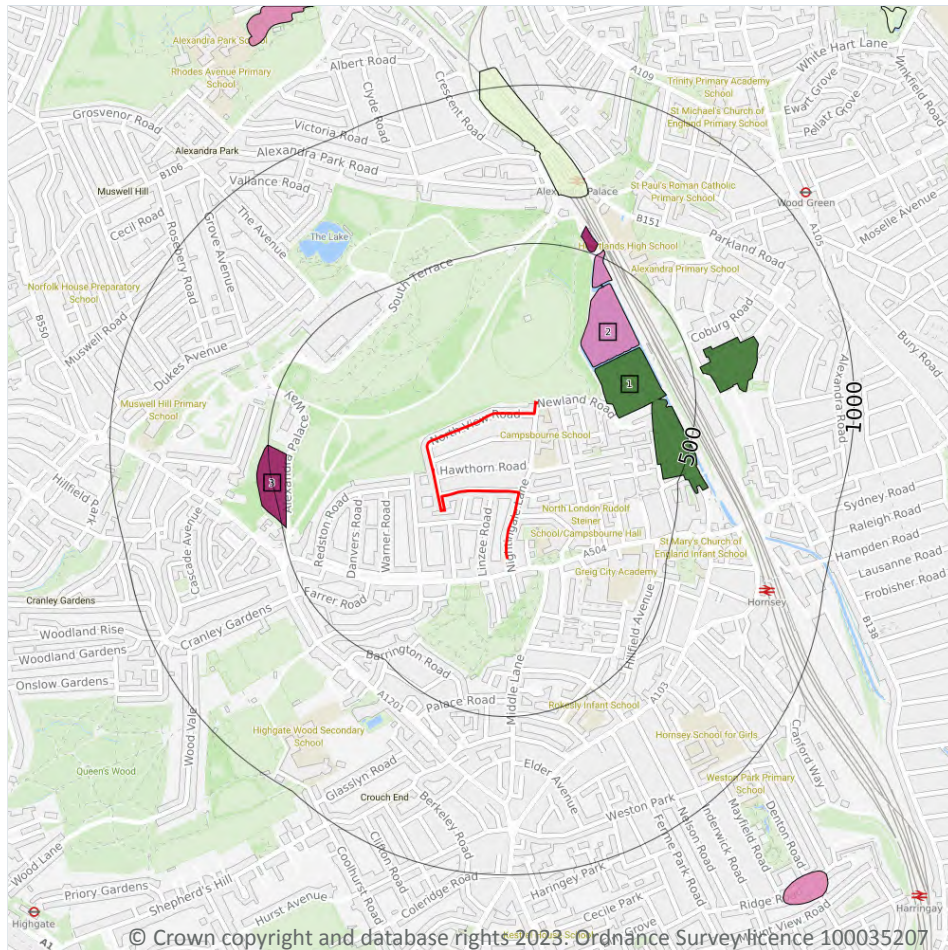
Features are displayed on the Geology 1:50,000 scale - Availability map on **page 18**

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	Full	Full	Full	Full	EW256_north_london_v4

This data is sourced from the British Geological Survey.



Geology 1:50,000 scale - Artificial and made ground



— Site Outline
Search buffers in metres (m)

- Made ground
- Worked ground
- Infilled ground
- Disturbed ground
- Landscaped ground

2.2 Artificial and made ground (50k)

Records within 500m

3

Details of made, worked, infilled, disturbed and landscaped ground at 1:50,000 scale. Artificial ground can be associated with potentially contaminated material, unpredictable engineering conditions and instability.

Features are displayed on the Geology 1:50,000 scale - Artificial and made ground map on **page 19**

ID	Location	LEX Code	Description	Rock description
1	206m NE	LSGR-ARTGR	LANDSCAPED GROUND (UNDIVIDED)	ARTIFICIALLY MODIFIED GROUND
2	208m NE	WGR-VOID	WORKED GROUND (UNDIVIDED)	VOID
3	444m W	MGR-ARTDP	MADE GROUND (UNDIVIDED)	ARTIFICIAL DEPOSIT

This data is sourced from the British Geological Survey.



2.3 Artificial ground permeability (50k)

Records within 50m

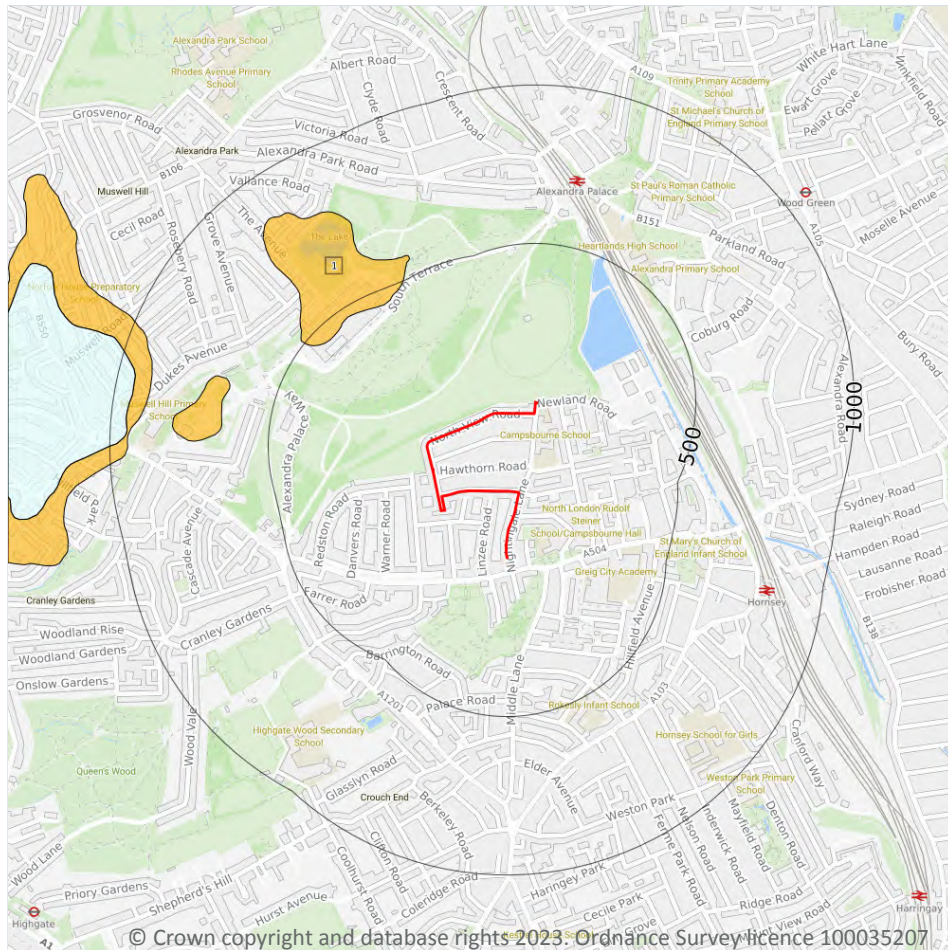
0

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any artificial deposits (the zone between the land surface and the water table).

This data is sourced from the British Geological Survey.



Geology 1:50,000 scale - Superficial



- Site Outline
- Search buffers in metres (m)
- Landslip (50k)
- Superficial geology (50k)
Please see table for more details.

2.4 Superficial geology (50k)

Records within 500m

1

Superficial geological deposits at 1:50,000 scale. Also known as 'drift', these are the youngest geological deposits, formed during the Quaternary. They rest on older deposits or rocks referred to as bedrock.

Features are displayed on the Geology 1:50,000 scale - Superficial map on **page 21**

ID	Location	LEX Code	Description	Rock description
1	448m NW	DHGR-XSV	DOLLIS HILL GRAVEL MEMBER	SAND AND GRAVEL

This data is sourced from the British Geological Survey.



2.5 Superficial permeability (50k)

Records within 50m

0

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any superficial deposits (the zone between the land surface and the water table).

This data is sourced from the British Geological Survey.

2.6 Landslip (50k)

Records within 500m

0

Mass movement deposits on BGS geological maps at 1:50,000 scale. Primarily superficial deposits that have moved down slope under gravity to form landslips. These affect bedrock, other superficial deposits and artificial ground.

This data is sourced from the British Geological Survey.

2.7 Landslip permeability (50k)

Records within 50m

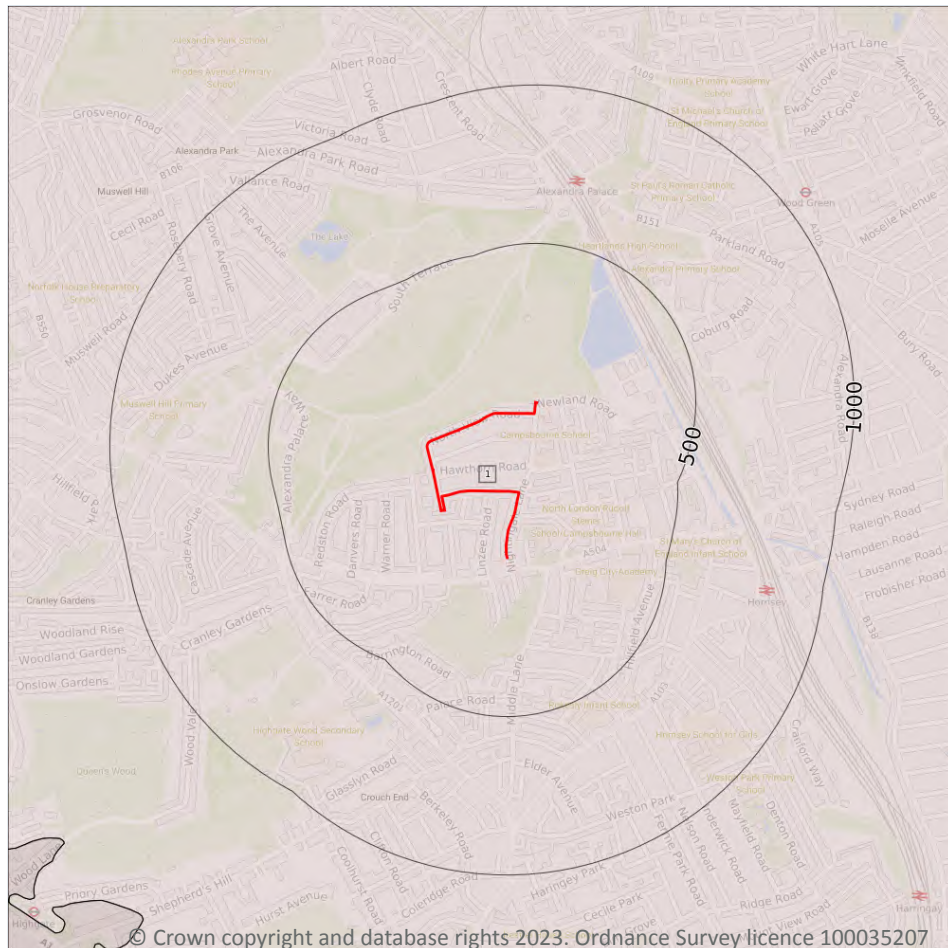
0

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any landslip deposits (the zone between the land surface and the water table).

This data is sourced from the British Geological Survey.



Geology 1:50,000 scale - Bedrock



Site Outline

Search buffers in metres (m)

.... Bedrock faults and other linear features (50k)

Bedrock geology (50k)
Please see table for more details.

2.8 Bedrock geology (50k)

Records within 500m

1

Bedrock geology at 1:50,000 scale. The main mass of rocks forming the Earth and present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

Features are displayed on the Geology 1:50,000 scale - Bedrock map on **page 23**

ID	Location	LEX Code	Description	Rock age
1	On site	LC-XCZS	LONDON CLAY FORMATION - CLAY, SILT AND SAND	YPRESIAN

This data is sourced from the British Geological Survey.



2.9 Bedrock permeability (50k)

Records within 50m**2**

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of bedrock (the zone between the land surface and the water table).

Location	Flow type	Maximum permeability	Minimum permeability
On site	Mixed	Moderate	Very Low
On site	Mixed	Moderate	Very Low

This data is sourced from the British Geological Survey.

2.10 Bedrock faults and other linear features (50k)

Records within 500m**0**

Linear features at the ground or bedrock surface at 1:50,000 scale of six main types; rock, fault, fold axis, mineral vein, alteration area or landform. Features are either observed or inferred, and relate primarily to bedrock.

This data is sourced from the British Geological Survey.



3 Boreholes

3.1 BGS Boreholes

Records within 250m

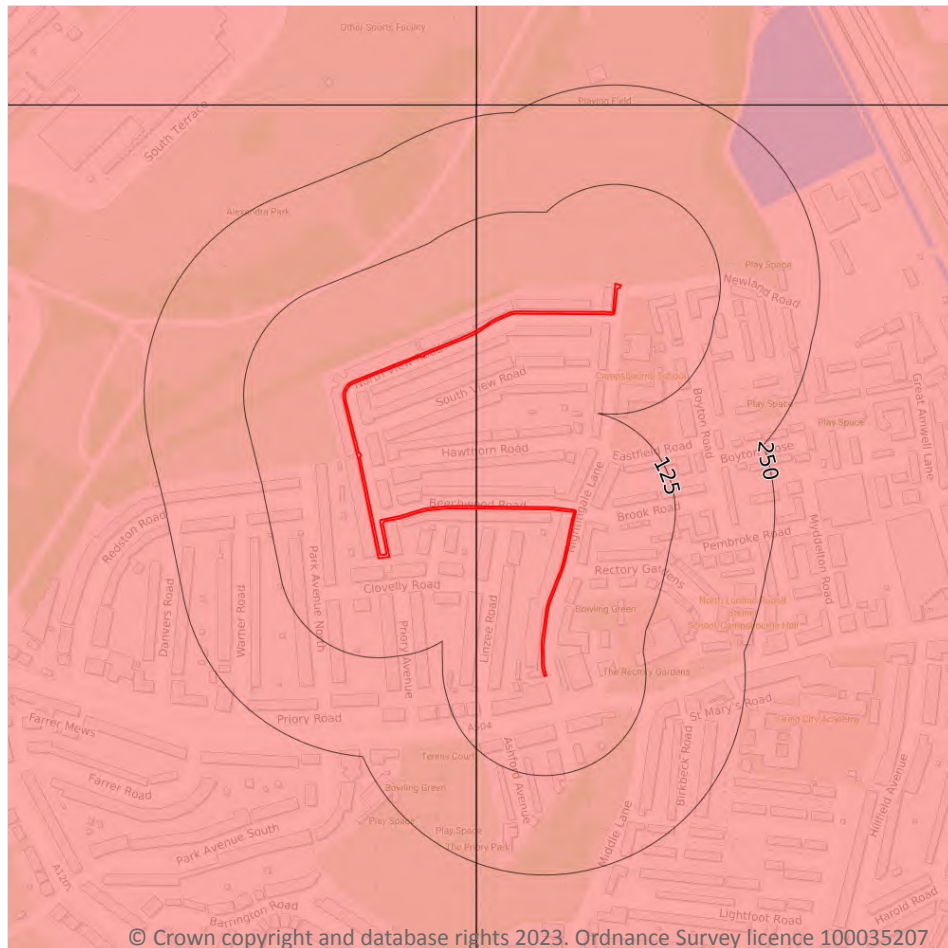
0

The Single Onshore Boreholes Index (SOBI); an index of over one million records of boreholes, shafts and wells from all forms of drilling and site investigation work held by the British Geological Survey. Covering onshore and nearshore boreholes dating back to at least 1790 and ranging from one to several thousand metres deep.

This data is sourced from the British Geological Survey.



4 Natural ground subsidence - Shrink swell clays



— Site Outline
Search buffers in metres (m)

- ☐ No data
- ☐ Negligible
- ☐ Very low
- ☐ Low
- ☐ Moderate
- ☐ High

4.1 Shrink swell clays

Records within 50m

1

The potential hazard presented by soils that absorb water when wet (making them swell), and lose water as they dry (making them shrink). This shrink-swell behaviour is controlled by the type and amount of clay in the soil, and by seasonal changes in the soil moisture content (related to rainfall and local drainage).

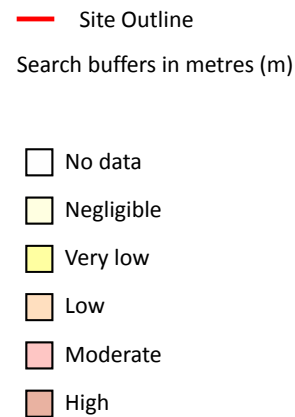
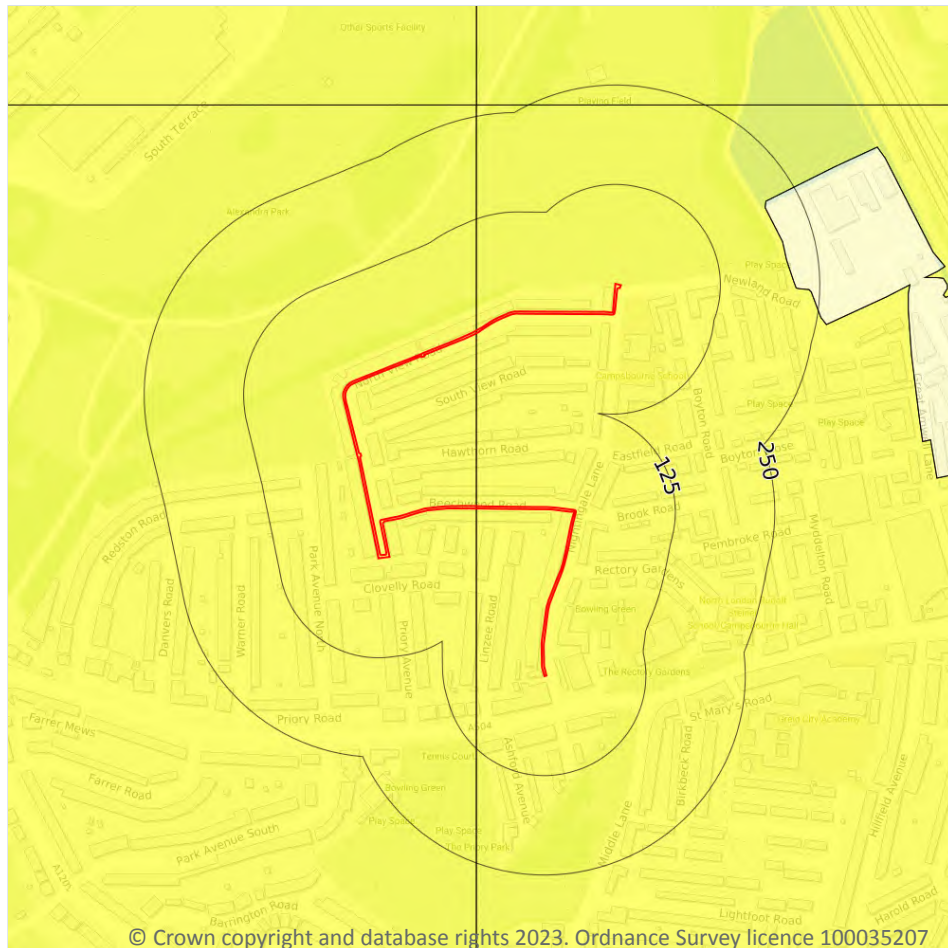
Features are displayed on the Natural ground subsidence - Shrink swell clays map on **page 26**

Location	Hazard rating	Details
On site	Moderate	Ground conditions predominantly high plasticity.

This data is sourced from the British Geological Survey.



Natural ground subsidence - Running sands



4.2 Running sands

Records within 50m

1

The potential hazard presented by rocks that can contain loosely-packed sandy layers that can become fluidised by water flowing through them. Such sands can 'run', removing support from overlying buildings and causing potential damage.

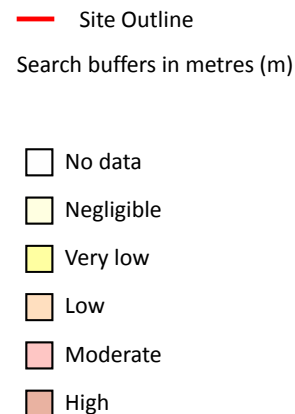
Features are displayed on the Natural ground subsidence - Running sands map on **page 27**

Location	Hazard rating	Details
On site	Very low	Running sand conditions are unlikely. No identified constraints on land use due to running conditions unless water table rises rapidly.

This data is sourced from the British Geological Survey.



Natural ground subsidence - Compressible deposits



4.3 Compressible deposits

Records within 50m

1

The potential hazard presented by types of ground that may contain layers of very soft materials like clay or peat and may compress if loaded by overlying structures, or if the groundwater level changes, potentially resulting in depression of the ground and disturbance of foundations.

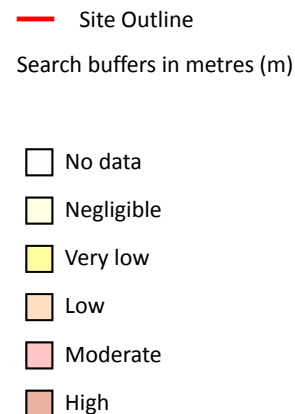
Features are displayed on the Natural ground subsidence - Compressible deposits map on **page 28**

Location	Hazard rating	Details
On site	Negligible	Compressible strata are not thought to occur.

This data is sourced from the British Geological Survey.



Natural ground subsidence - Collapsible deposits



4.4 Collapsible deposits

Records within 50m

1

The potential hazard presented by natural deposits that could collapse when a load (such as a building) is placed on them or they become saturated with water.

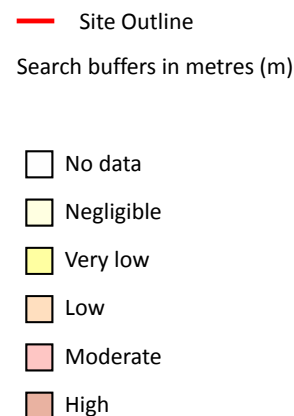
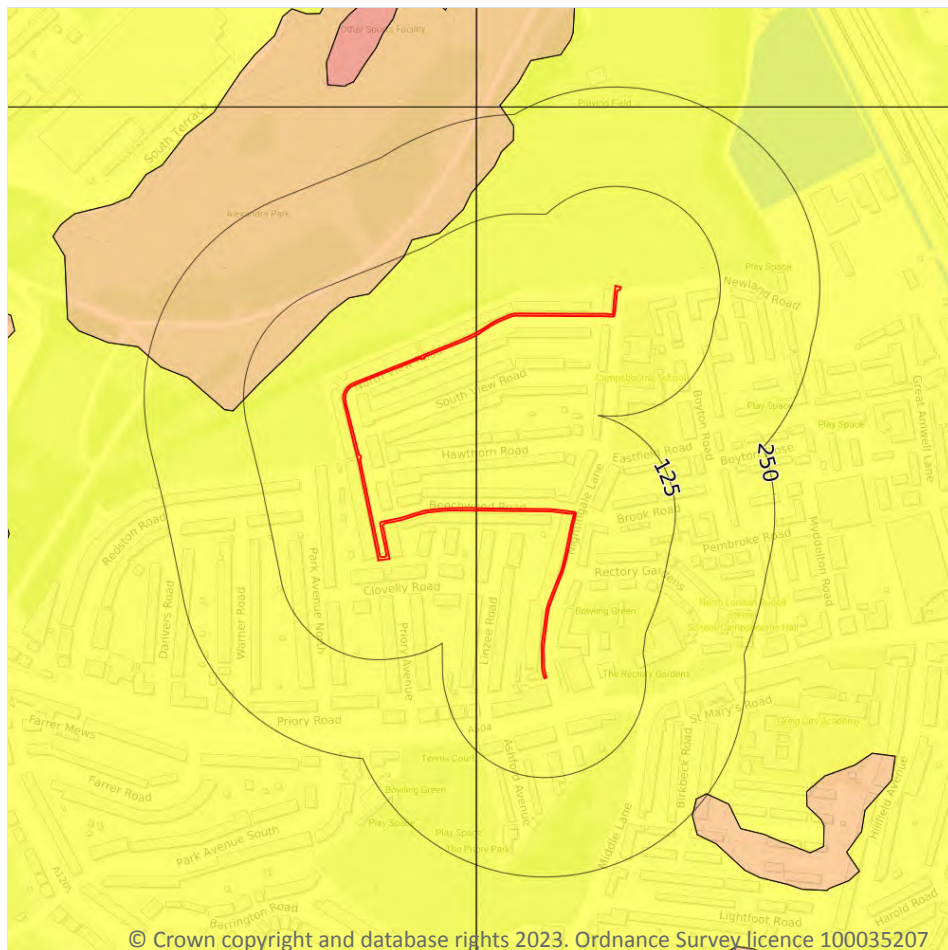
Features are displayed on the Natural ground subsidence - Collapsible deposits map on **page 29**

Location	Hazard rating	Details
On site	Very low	Deposits with potential to collapse when loaded and saturated are unlikely to be present.

This data is sourced from the British Geological Survey.



Natural ground subsidence - Landslides



4.5 Landslides

Records within 50m

1

The potential for landsliding (slope instability) to be a hazard assessed using 1:50,000 scale digital maps of superficial and bedrock deposits, combined with information from the BGS National Landslide Database and scientific and engineering reports.

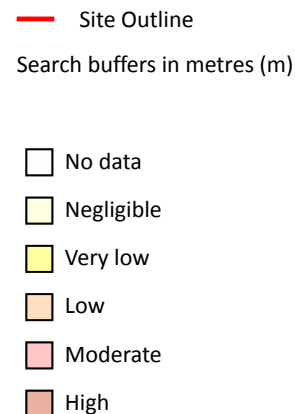
Features are displayed on the Natural ground subsidence - Landslides map on **page 30**

Location	Hazard rating	Details
On site	Very low	Slope instability problems are not likely to occur but consideration to potential problems of adjacent areas impacting on the site should always be considered.

This data is sourced from the British Geological Survey.



Natural ground subsidence - Ground dissolution of soluble rocks



4.6 Ground dissolution of soluble rocks

Records within 50m

1

The potential hazard presented by ground dissolution, which occurs when water passing through soluble rocks produces underground cavities and cave systems. These cavities reduce support to the ground above and can cause localised collapse of the overlying rocks and deposits.

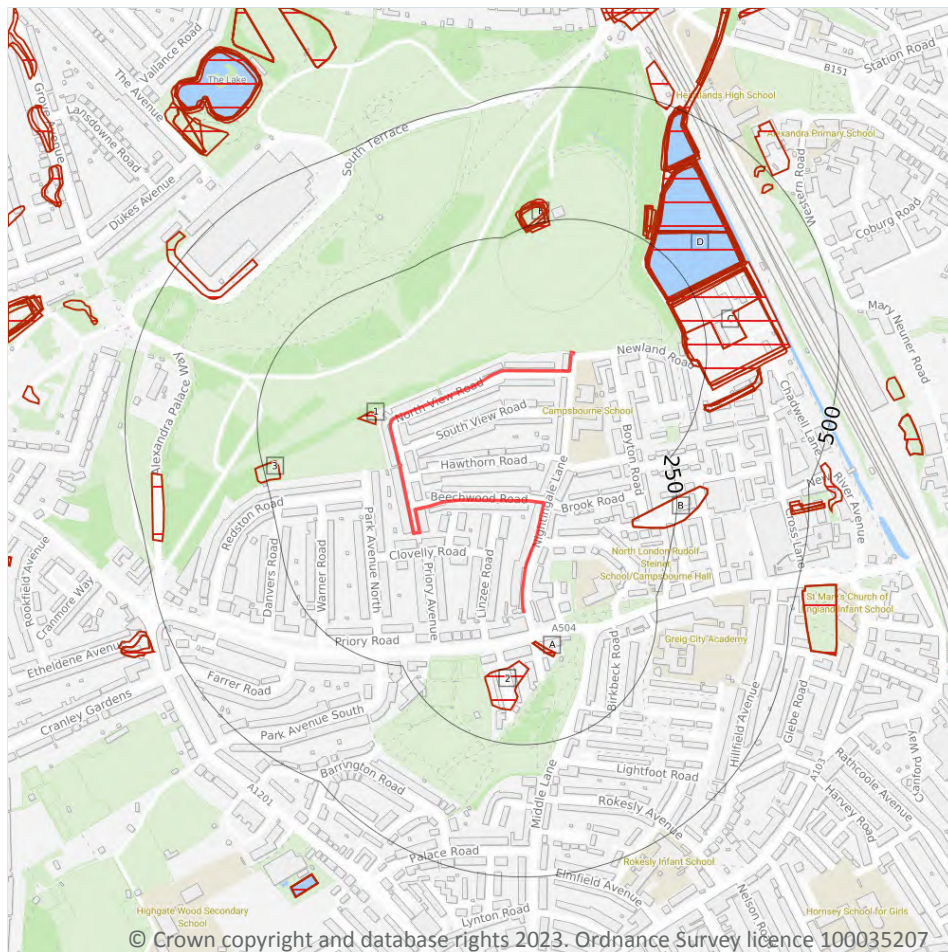
Features are displayed on the Natural ground subsidence - Ground dissolution of soluble rocks map on **page 31**

Location	Hazard rating	Details
On site	Negligible	Soluble rocks are either not thought to be present within the ground, or not prone to dissolution. Dissolution features are unlikely to be present.

This data is sourced from the British Geological Survey.



5 Mining, ground workings and natural cavities



- Site Outline
- Search buffers in metres (m)
- Natural cavities (Area)
- Natural cavities (Point)
- BritPits
- Surface ground workings
- Underground workings
- Historical Mineral Planning Areas
- Mining Cavities
- Non Coal Mining
- Sporadic underground mining of restricted extent possible
- Localised small scale underground mining possible
- Small scale mining possible
- Underground mining known or likely within or in close proximity
- Underground mining known within or in very close proximity

5.1 Natural cavities

Records within 500m

0

Industry recognised national database of natural cavities. Sinkholes and caves are formed by the dissolution of soluble rock, such as chalk and limestone, gulls and fissures by cambering. Ground instability can result from movement of loose material contained within these cavities, often triggered by water.

This data is sourced from Stantec UK Ltd.



5.2 BritPits

Records within 500m

0

BritPits (an abbreviation of British Pits) is a database maintained by the British Geological Survey of currently active and closed surface and underground mineral workings. Details of major mineral handling sites, such as wharfs and rail depots are also held in the database.

This data is sourced from the British Geological Survey.

5.3 Surface ground workings

Records within 250m

28

Historical land uses identified from Ordnance Survey mapping that involved ground excavation at the surface. These features may or may not have been subsequently backfilled.

Features are displayed on the Mining, ground workings and natural cavities map on **page 32**

ID	Location	Land Use	Year of mapping	Mapping scale
1	27m NW	Unspecified Pit	1949	1:10560
A	60m S	Ponds	1879	1:10560
A	60m S	Ponds	1869	1:10560
2	92m S	Pond	1911	1:10560
B	170m E	Water Body	1879	1:10560
B	170m E	Water Body	1869	1:10560
C	199m NE	Filter Beds	1911	1:10560
C	200m NE	Filter Beds	1920	1:10560
D	200m NE	Reservoir	1920	1:10560
D	201m NE	Reservoir	1982	1:10000
D	201m NE	Reservoir	1989	1:10000
D	201m NE	Reservoir	1975	1:10000
D	201m NE	Pond	1967	1:10560
D	201m NE	Reservoirs	1879	1:10560
D	201m NE	Reservoirs	1869	1:10560
D	201m NE	Reservoir	1894	1:10560
D	202m NE	Reservoir	1911	1:10560



ID	Location	Land Use	Year of mapping	Mapping scale
D	202m NE	Pond	1962	1:10560
C	203m NE	Filtering Beds	1894	1:10560
C	204m NE	Reservoirs	1879	1:10560
C	204m NE	Reservoirs	1869	1:10560
D	205m NE	Reservoir	1938	1:10560
C	205m NE	Filter Beds	1938	1:10560
3	222m W	Unspecified Ground Workings	1949	1:10560
E	237m N	Unspecified Pit	1951	1:10560
E	241m N	Unspecified Pit	1920	1:10560
E	242m N	Unspecified Pit	1894	1:10560
E	247m N	Unspecified Pit	1911	1:10560

This is data is sourced from Ordnance Survey/Groundsure.

5.4 Underground workings

Records within 1000m

0

Historical land uses identified from Ordnance Survey mapping that indicate the presence of underground workings e.g. mine shafts.

This is data is sourced from Ordnance Survey/Groundsure.

5.5 Historical Mineral Planning Areas

Records within 500m

0

Boundaries of mineral planning permissions for England and Wales. This data was collated between the 1940s (and retrospectively to the 1930s) and the mid 1980s. The data includes permitted, withdrawn and refused permissions.

This data is sourced from the British Geological Survey.



5.6 Non-coal mining

Records within 1000m

0

The potential for historical non-coal mining to have affected an area. The assessment is drawn from expert knowledge and literature in addition to the digital geological map of Britain. Mineral commodities may be divided into seven general categories - vein minerals, chalk, oil shale, building stone, bedded ores, evaporites and 'other' commodities (including ball clay, jet, black marble, graphite and chert).

This data is sourced from the British Geological Survey.

5.7 Mining cavities

Records within 1000m

0

Industry recognised national database of mining cavities. Degraded mines may result in hazardous subsidence (crown holes). Climatic conditions and water escape can also trigger subsidence over mine entrances and workings.

This data is sourced from Stantec UK Ltd.

5.8 JPB mining areas

Records on site

0

Areas which could be affected by former coal and other mining. This data includes some mine plans unavailable to the Coal Authority.

This data is sourced from Johnson Poole and Bloomer.

5.9 Coal mining

Records on site

0

Areas which could be affected by past, current or future coal mining.

This data is sourced from the Coal Authority.

5.10 Brine areas

Records on site

0

The Cheshire Brine Compensation District indicates areas that may be affected by salt and brine extraction in Cheshire and where compensation would be available where damage from this mining has occurred. Damage from salt and brine mining can still occur outside this district, but no compensation will be available.

This data is sourced from the Cheshire Brine Subsidence Compensation Board.



5.11 Gypsum areas

Records on site	0
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Generalised areas that may be affected by gypsum extraction.

This data is sourced from British Gypsum.

5.12 Tin mining

Records on site	0
-----------------	---

Generalised areas that may be affected by historical tin mining.

This data is sourced from Groundsure.

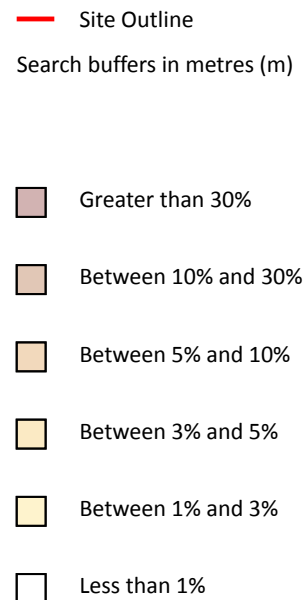
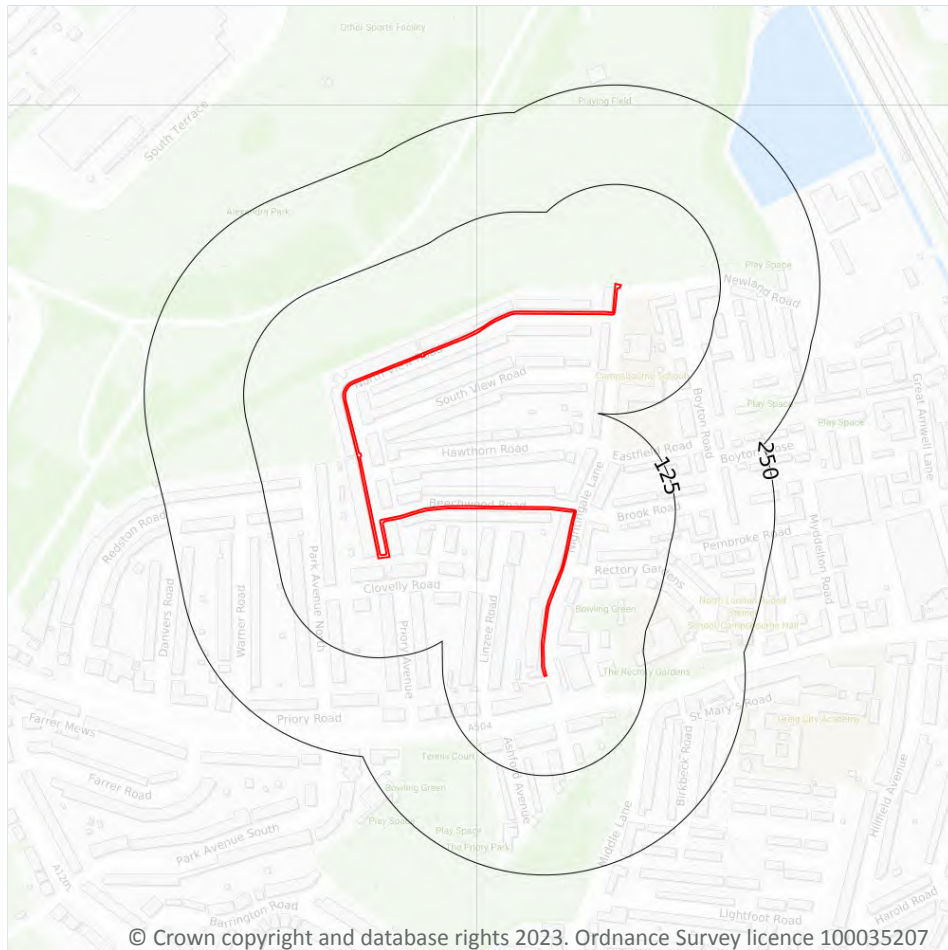
5.13 Clay mining

Records on site	0
-----------------	---

Generalised areas that may be affected by kaolin and ball clay extraction.

This data is sourced from the Kaolin and Ball Clay Association (UK).

6 Radon



6.1 Radon

Records on site

1

The Radon Potential data classifies areas based on their likelihood of a property having a radon level at or above the Action Level in Great Britain. The dataset is intended for use at 1:50,000 scale and was derived from both geological assessments and indoor radon measurements (more than 560,000 records). A minimum 50m buffer should be considered when searching the maps, as the smallest detectable feature at this scale is 50m. The findings of this section should supersede any estimations derived from the Indicative Atlas of Radon in Great Britain (1:100,000 scale).

Features are displayed on the Radon map on **page 37**

Location	Estimated properties affected	Radon Protection Measures required
On site	Less than 1%	None



This data is sourced from the British Geological Survey and UK Health Security Agency.



7 Soil chemistry

7.1 BGS Estimated Background Soil Chemistry

Records within 50m

6

The estimated values provide the likely background concentration of the potentially harmful elements Arsenic, Cadmium, Chromium, Lead and Nickel in topsoil. The values are estimated primarily from rural topsoil data collected at a sample density of approximately 1 per 2 km². In areas where rural soil samples are not available, estimation is based on stream sediment data collected from small streams at a sampling density of 1 per 2.5 km²; this is the case for most of Scotland, Wales and southern England. The stream sediment data are converted to soil-equivalent concentrations prior to the estimation.

Location	Arsenic	Bioaccessible Arsenic	Lead	Bioaccessible Lead	Cadmium	Chromium	Nickel
On site	No data	No data	No data	No data	No data	No data	No data
On site	No data	No data	No data	No data	No data	No data	No data
On site	No data	No data	No data	No data	No data	No data	No data
On site	No data	No data	No data	No data	No data	No data	No data
On site	No data	No data	No data	No data	No data	No data	No data
On site	No data	No data	No data	No data	No data	No data	No data

This data is sourced from the British Geological Survey.

7.2 BGS Estimated Urban Soil Chemistry

Records within 50m

28

Estimated topsoil chemistry of Arsenic, Cadmium, Chromium, Copper, Nickel, Lead, Tin and Zinc and bioaccessible Arsenic and Lead in 23 urban centres across Great Britain. These estimates are derived from interpolation of the measured urban topsoil data referred to above and provide information across each city between the measured sample locations (4 per km²).

Location	Arsenic (mg/kg)	Bioaccessible Arsenic (mg/kg)	Lead (mg/kg)	Bioaccessible Lead (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Copper (mg/kg)	Nickel (mg/kg)	Tin (mg/kg)
On site	24	4.2	470	323	0.7	90	95	38	44
On site	24	4.2	377	259	0.6	103	83	39	34
On site	24	4.2	671	461	0.6	101	130	46	70



Location	Arsenic (mg/kg)	Bioaccessible Arsenic (mg/kg)	Lead (mg/kg)	Bioaccessible Lead (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Copper (mg/kg)	Nickel (mg/kg)	Tin (mg/kg)
On site	25	4.4	405	278	0.6	103	93	41	39
On site	26	4.6	454	312	0.7	96	96	40	44
On site	26	4.6	452	311	0.6	99	102	42	46
On site	28	4.9	553	380	0.7	88	112	41	62
On site	30	5.3	617	424	0.7	86	124	42	81
On site	30	5.3	705	484	0.7	98	171	50	90
On site	32	5.6	676	464	0.7	82	127	42	98
On site	32	5.6	672	462	0.7	84	134	43	100
On site	33	5.8	720	495	0.7	79	134	42	111
On site	35	6.1	788	541	0.7	78	142	42	137
4m S	28	4.9	506	348	0.7	93	109	42	55
4m S	30	5.3	567	390	0.7	91	124	43	69
6m SE	32	5.6	616	423	0.7	90	139	45	82
12m N	30	5.3	542	372	0.7	95	129	45	64
12m S	36	6.3	827	568	0.7	76	143	42	162
18m NE	34	5.9	681	468	0.7	97	189	52	94
24m NW	23	4	321	221	0.6	112	73	40	26
25m NE	29	5.1	748	514	0.7	100	172	51	91
30m SW	25	4.4	505	347	0.8	87	100	38	45
32m NE	33	5.8	695	477	0.7	97	187	52	94
32m W	21	3.7	316	217	0.6	108	71	37	25
33m SW	28	4.9	574	394	0.7	86	112	40	63
36m NE	32	5.6	612	420	0.7	95	156	48	80
39m W	22	3.8	381	262	0.6	98	81	37	33
46m NE	34	5.9	652	448	0.7	94	173	49	88

This data is sourced from the British Geological Survey.



7.3 BGS Measured Urban Soil Chemistry

Records within 50m

0

The locations and measured total concentrations (mg/kg) of Arsenic, Cadmium, Chromium, Copper, Nickel, Lead, Tin and Zinc in urban topsoil samples from 23 urban centres across Great Britain. These are collected at a sample density of 4 per km².

This data is sourced from the British Geological Survey.



This data is sourced from publicly available information by Groundsure.

8.3 Railway tunnels

Records within 250m

0

Railway tunnels taken from contemporary Ordnance Survey mapping.

This data is sourced from the Ordnance Survey.

8.4 Historical railway and tunnel features

Records within 250m

1

Railways and tunnels digitised from historical Ordnance Survey mapping as scales of 1:1,250, 1:2,500, 1:10,000 and 1:10,560.

Features are displayed on the Railway infrastructure and projects map on **page 42**

Location	Land Use	Year of mapping	Mapping scale
226m E	Railway Sidings	1991	1250

This data is sourced from Ordnance Survey/Groundsure.

8.5 Royal Mail tunnels

Records within 250m

0

The Post Office Railway, otherwise known as the Mail Rail, is an underground railway running through Central London from Paddington Head District Sorting Office to Whitechapel Eastern Head Sorting Office. The line is 10.5km long. The data includes details of the full extent of the tunnels, the depth of the tunnel, and the depth to track level.

This data is sourced from Groundsure/the Postal Museum.

8.6 Historical railways

Records within 250m

0

Former railway lines, including dismantled lines, abandoned lines, disused lines, historic railways and razed lines.

This data is sourced from OpenStreetMap.



8.7 Railways

Records within 250m

0

Currently existing railway lines, including standard railways, narrow gauge, funicular, trams and light railways.

This data is sourced from Ordnance Survey and OpenStreetMap.

8.8 Crossrail 1

Records within 500m

0

The Crossrail railway project links 41 stations over 100 kilometres from Reading and Heathrow in the west, through underground sections in central London, to Shenfield and Abbey Wood in the east.

This data is sourced from publicly available information by Groundsure.

8.9 Crossrail 2

Records within 500m

1

Crossrail 2 is a proposed railway linking the national rail networks in Surrey and Hertfordshire via an underground tunnel through London.

Features are displayed on the Railway infrastructure and projects map on **page 42**

Location	Route Type	Name	Under consultation
463m NE	Tunnelled route	Option via Turnpike Lane and Alexandra Palace	Yes

This data is sourced from publicly available information by Groundsure.

8.10 HS2

Records within 500m

0

HS2 is a proposed high speed rail network running from London to Manchester and Leeds via Birmingham. Main civils construction on Phase 1 (London to Birmingham) of the project began in 2019, and it is currently anticipated that this phase will be fully operational by 2026. Construction on Phase 2a (Birmingham to Crewe) is anticipated to commence in 2021, with the service fully operational by 2027. Construction on Phase 2b (Crewe to Manchester and Birmingham to Leeds) is scheduled to begin in 2023 and be operational by 2033.

This data is sourced from HS2 Ltd.



Data providers

Groundsure works with respected data providers to bring you the most relevant and accurate information. To find out who they are and their areas of expertise see <https://www.groundsure.com/sources-reference>.

Terms and conditions

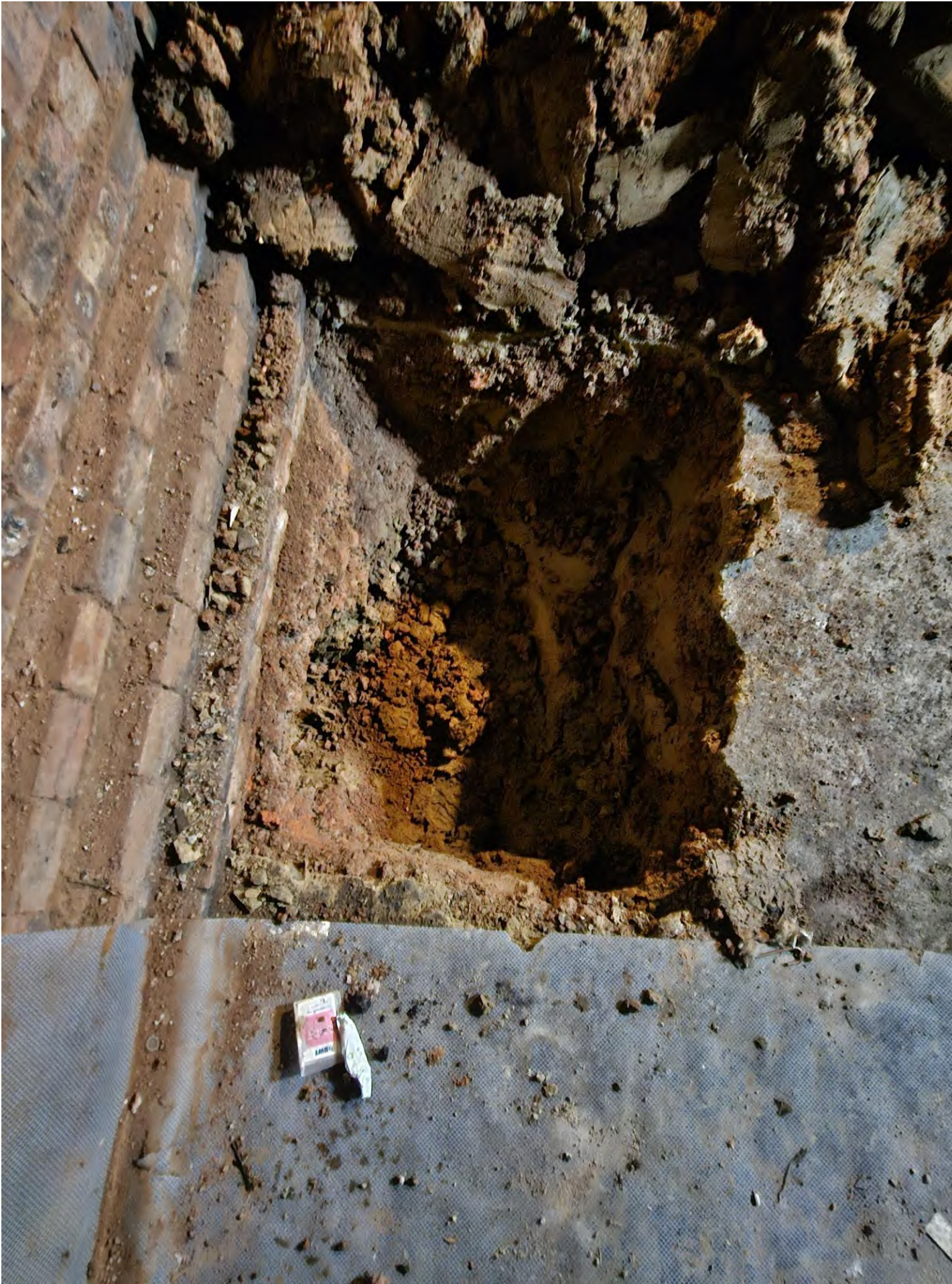
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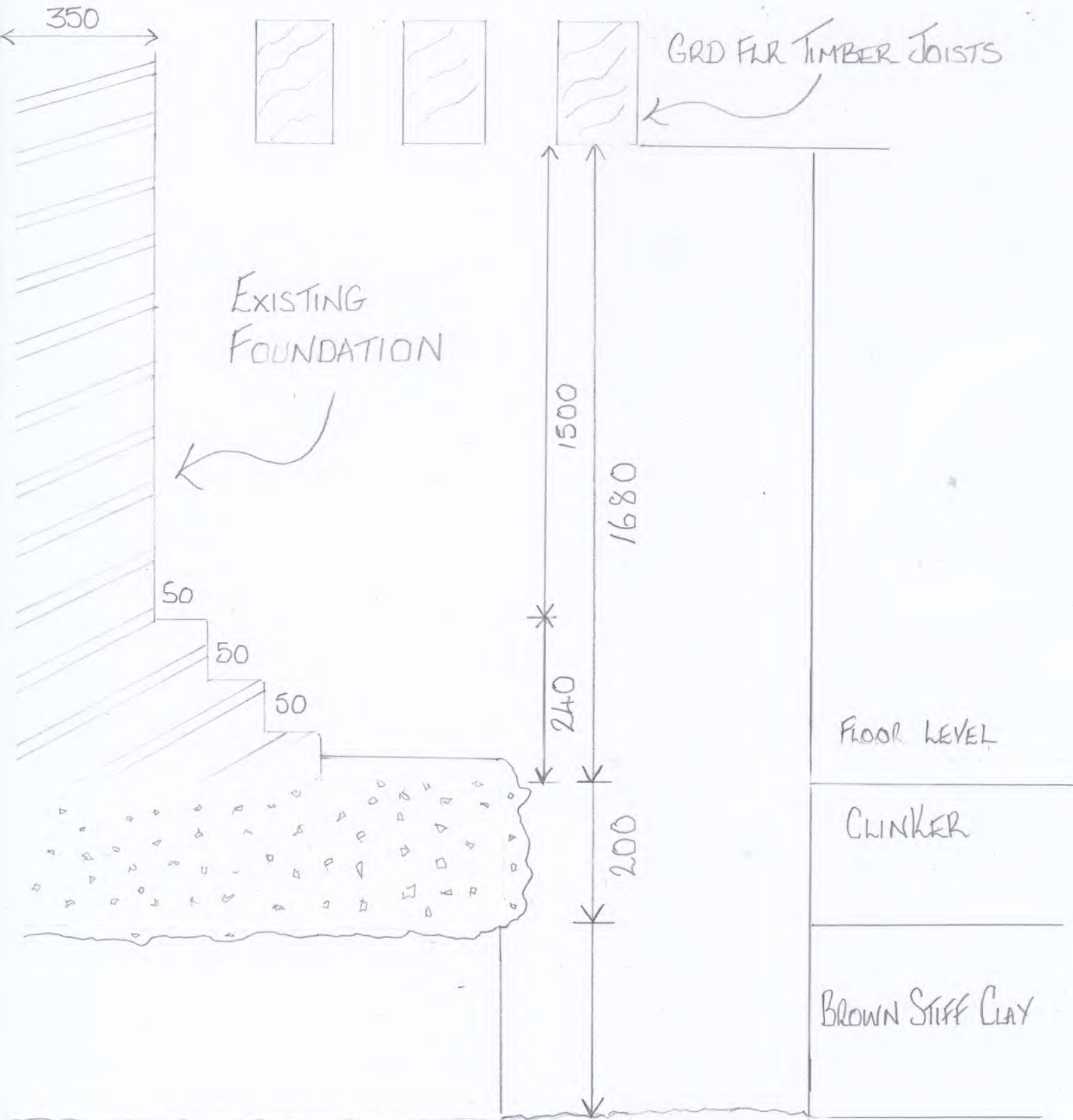
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