

Basement Impact Assessment

45 Cholmeley Crescent, London N6 5EX

August 2023

MAUND GEO-CONSULTING

Produced for:

Produced for: Mr & Mrs Podpolny

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Report Title	Basement Impact Assessment	Site Address	45 Cholmeley Crescent, London N6 5EX
Work Stage	Geotechnical Interpretative Report and Ground Movement Assessment	Report Date	August 2023
Brief Description of the Report Contents	Geotechnical interpretation of the ground and groundwater conditions, to provide a ground movement assessment, as part of a Basement Impact Assessment for 45 Cholmeley Crescent.		

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1 Non-Technical Summary

A basement impact assessment (BIA) has been undertaken for hydrogeology, surface water flood risk and land stability for the site at 45 Cholmeley Crescent, in the London Borough of Haringey. The property is located on sloping ground rising from 98m AOD at the highway to 100.5m AOD at the rear of the house, with the rear garden rising up further to about 104m AOD with an overall gradient of 1 in 8.

The proposed basement will extend an existing basement/lower ground floor garage to provide additional accommodation and occupy an area of approximately 105 m².

A ground investigation at the site was undertaken by Maund Geo-Consulting Ltd in July/August 2023 which comprised one borehole and two foundation trial pits. The borehole (BH01) was drilled to 5.65 m bgl, the trial pits to 0.75m bgl.

The ground investigation confirmed the ground conditions as a layer of Made Ground of gravelly clay composition to a depth of approximately 0.35m which overlies soft to firm silty fine sandy clay of the Claygate Member of the London Clay Formation to a depth of 5.45 m bgl. Groundwater was not encountered during the ground investigation to a depth of 5.45m bgl. Subsequent monitoring on three occasions after the investigation indicated groundwater in at a depth of 0.75m bgl (approx. 99.75m AOD).

An assessment of hydrogeology has shown that the strata underlying site is considered non-productive strata of very low permeability and is not designated as an aquifer within Environment Agency (EA) guidelines. Although groundwater is present the proposed basement will have a negligible impact on groundwater flow. To resist groundwater pressure acting on the basement a contiguous piled wall is proposed on the rear side of the basement.

The property is located in an area of low risk from surface water flooding and very low risk from flooding from rivers. However, it is recognised that drainage measures will be required to prevent downwash from the garden area during heavy rainfall impacting the basement.

An assessment of land stability has been made from the excavation and construction of the basement. It has been calculated that heave in the centre of the basement is not expected to exceed 31 mm resulting from the excavation and construction. The foundation formation will be able to accommodate a maximum load from the walls of up to 155 kPa, acting on a thickened perimeter slab, with net settlement of < 25 mm. The proposed basement has been designed to have negligible impact on land stability.

The maximum damage category for the adjacent properties has been calculated to be within Category 1 (very slight damage).

An appropriate monitoring regime should be adopted and maintained throughout construction to manage risk and potential damage to the neighbouring structures as construction progresses onsite.

2 Introduction

2.1 Terms of Reference

Maund Geo-Consulting Ltd (MGC) was instructed on 20/06/23 by Scenario Architecture Ltd (SA) on behalf Mr and Mrs Podpolny (the client) to undertake a Basement Impact Assessment (BIA) for the site at 45 Cholmeley Crescent, following on from a ground investigation, which was undertaken by MGC, on 03/07/23 and 03/08/23 and reported in a factual report referenced MGC-132-GIFR-V2 included in Appendix B.

2.2 Terms and Conditions

This report has been prepared for the client in consideration of the proposed further development of the site. The geotechnical information relates to the site only and should not be used in a different context without reference to MGC.

MGC has used reasonable skill, care and diligence in the investigation, calculations and design recommendations for the project. The inherent variation of ground conditions allows only definition of the actual conditions at the locations and depths at the time of the investigation. At intermediate locations, conditions can only be inferred. Furthermore, new information, changed practices or new legislation may necessitate revised interpretation of the report after the date of its submission.

2.3 Scope and Objective

This report has been written in general accordance with the Draft Basement Development Guidance Note (BDGN) June 2012 and Policy DM18 Adopted July 2017 downloaded from https://www.haringey.gov.uk/sites/haringeygovuk/files/final_haringey_dmp_dtp_online.pdf on 26/07/2023.

The guidance note requires a BIA to be undertaken for new basements in 5 stages:

1. Screening
2. Scoping
3. Site investigation
4. Impact assessment
5. Review and decision making (By HBC)

This report includes stages 1 to 4.

As a site investigation has already been undertaken as part of the BIA on 03/07/23 the screening part of the assessment has been assessed on the basis of existing information including the site investigation, so the project has been completed as a single report in the following sequence:

1. Background information
2. Site Investigation
3. Screening
4. Scoping
5. Impact Assessment

The scope and objective of the report is as follows:

- An assessment of land stability, hydrogeological and surface water risks associated with the proposed development.
- An assessment of the ground conditions at the site and derivation of geotechnical parameters to be used in the basement design and a ground movement assessment (GMA).
- Modelling of the ground movement in relation to the additional imposed loads from the proposed basement in general accordance with CIRIA C760,
- Determination of the Burland Damage Assessment Category.

2.4 Author

This report has been prepared by Dr Julian Maund, director of Maund Geo Consulting Ltd, who is a chartered engineer and chartered geologist with over 35 years' experience. Dr Maund is a UK and Ireland Registered Ground Engineering Adviser and a member of the Association of Geotechnical Specialists.

2.5 Sources of Information

Background information has been derived from the ground investigation report by MGC and sources of published information.

The list of information sources is shown below in Table 1.1:

Table 1.1 Information type and sources

Information Type	Source
Geological mapping	BGS/GI
Hydrogeological data	BGS / EA / GI
Ground and groundwater conditions	Geotechnical Factual Report 45 Cholmeley Crecent MGC-132-FR-V1
Historical Mapping	Groundsure Insights

Information Type	Source
Environmental designations	Groundsure Insights
Structural Drawings and Structural Method Statement	SD Engineers Ltd
Scheme Drawings	Scenario Architects Ltd

BGS-British Geological Survey

EA Environment Agency

Relevant scheme drawings are included in Appendix A.

Environmental information and historical maps are included in Appendix C.

3 Information on the Site

3.1 Location

45 Cholmeley Crescent is located in the Highgate area within the London Borough of Haringey with post code N6 5EX.

3.2 Description

The current building is a residential dwelling and forms a semi detached house comprising four storeys. Due to the change in ground level the ground floor at the front of the property comprising a garage, becoming a basement to the rear. The front elevation is indicated in Figure 3.1. The ground level ranges from approximately 98m AOD at the front of the house to 100.50m AOD at the rear. The garden rises up to approx 104.5m AOD. The length of the property is approx. 54m with an average gradient of 8°.



Figure 3.1 Front Elevation (July 2023).

3.3 Present use

A residential dwelling.

3.4 Proposed development

The proposed development is understood to provide a full basement and lightwell to the property. Drawings to show the existing ground floor/basement and proposed basement are included in Appendix A.

3.5 Geology

Geological information obtained from <http://mapapps.bgs.ac.uk/geologyofbritain3d/> British Geological Survey (BGS) mapping at 1 50 000 scale shows the site to be directly underlain by the Claygate Member of the London Clay Formation (LCF), which comprises a predominantly silty fine sandy clay, formed during the Tertiary period.

3.6 Natural Hazards

The assessment of natural and manmade hazards from the Groundsure Insights Report (Appendix C) is summarised in Table 3.1.

Table 3.1 Natural and Man Made Hazards- Summary

Hazard	Risk	Comment
Shrink-Swell	Moderate	The site is underlain by the Claygate Member which comprises low plasticity silty fine sandy clays. This material has potential shrink swell properties.
Running Sand	Very Low	Not applicable to the site geology, Running sand conditions are unlikely
Compressible Ground	Negligible	Clay soil of the LCF is subject to consolidation from additional imposed loads, which are limited by appropriate foundation design
Collapsible deposits	Very Low	Not applicable to the site geology
Landslide	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
Soluble Rock	Negligible	Not applicable to the site geology
Mining and ground workings	N/A	No mining or ground workings within 71m of the site
Natural Cavities	N/A	No natural cavities within 500m of the site
Radon	<1%	No Radon protection measures are necessary
Tunnels	N/A	There are no tunnels within 250m of the site

3.7 Designations

There are no environmental designations within at least 100m of the site. The site is within a visual and cultural designation as a conservation area.

3.8 Hydrogeology/groundwater

The property is located on the bedrock geology of the Claygate Member of the LCF which is classified as an 'unproductive stratum' which is effectively impermeable. The site does not lie within a ground water protection zone. The risk of groundwater flooding is assessed as negligible from the Groundsure Insights Report.

3.9 Surface Water and Flood risk

The site is located in Flood Zone 1, an area with a low probability of flooding from rivers. The Environment Agency indicate there is a very low risk of surface water flooding at the subject property as indicated in Figure 3.2.

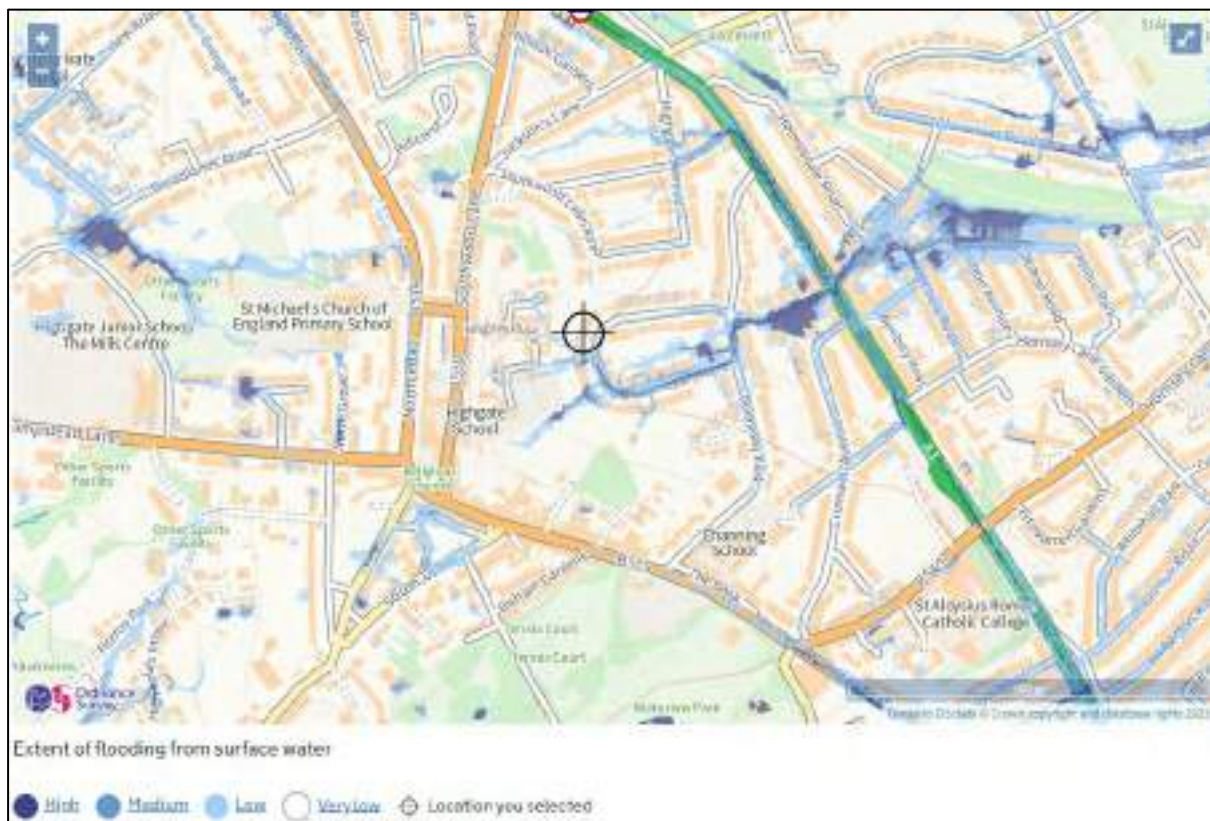


Figure 3.2 Extent of flooding from surface water

Figure 3.2 indicates an area of medium to high risk of flooding from surface water to the south of the site forming a linear SW- NE feature, which may relate to the hidden stream of Cholmeley Brook (Appendix 3 of the BDGN), however this feature does not impact on the subject site, and neither is it shown on the historical maps dating back to 1864 within at least

100m of the site. The route of the Cholmeley Brook has been culveted as indicated in the Haringey Council Strategic Flood Risk Assessment. Draft report Feb 2015.

Further assessment in the Groundsure Insights Report (Appendix C) has not identified the site as high risk of surface water flooding. However anecdotal information from the client has indicated in extreme wet weather surface water can impact on the rear of the property.

3.10 Site History

The area of the property is shown as woodland 1864 and 1870 1:2,500 surveys, and agricultural fields in 1896, 1914 surveys. The 1935 survey shows the presence of the semi-detached properties of 45 and 47 Cholmeley Crescent among others. Historical Maps are included in Appendix C.

There appears to be minor change to the building layout since to the present day. A swimming pool and rear extension to No. 47 appeared between 2006 and 2008 on Google Earth Images. There has been no significant change to the site environs since at least 1970.

3.11 Underground Services

Underground services provided by utility companies including Thames Water (water and sewage), Cadent (gas) run within the highway of Cholmeley Crescent . The information is provided in Appendix D. As the proposed basement is to the rear of the property at a distance of at least 12m from the excavation there will be no significant impact on these services from ground movement.

3.12 Tunnels / London Underground

Further to consultation with the TfL Property Asset Register, there are no tunnels within at least 500m of the site.

3.13 Trees

No trees will be felled as part of the proposed basement development.

3.14 Radon

A search by the UK Health Security Agency/ BGS was obtained for the site indicate the site is not in a Radon affected area. The report is included in Appendix C.

4 Ground Investigation

A ground investigation was undertaken by PM Sampling Ltd on behalf of MGC on 03/07/23. A further investigation with hand dug trial pits was also undertaken by PM Sampling on 03/08/23. The exploratory holes are indicated in Figure 4.1. The factual information of the exploratory holes records is included in Appendix B and laboratory testing results are included in Appendix B. The borehole and trial pits were located on a patio area to the rear of the house.

The site investigation comprised:

- 1 No. Inspection Pit to 1.00m
- 1 No. Nordmeyer modular rig borehole to 5.45 m bgl.
- 2 No. Hand dug Trial Pits
- The in-situ strengths determined by standard penetration testing.
- Disturbed soil samples were obtained from the exploratory holes for laboratory geotechnical testing and further examination.
- A 20 mm diameter groundwater monitoring well was installed to 4.0 m.



Table 4.1 Laboratory Testing

Test type	No. of tests	Test Method
Moisture Content	6	BS1377:1990
Plasticity Index - 1 point Liquid Limit	4	BS1377:1990
pH, and water-soluble sulphate,	2	BRE SD1
Standard Spectrum Suite: Asbestos Screen & ID , pH, TOC, Total Sulphate, Sulphide, Monohydric Phenols, Total Cyanide, W/S Boron, As, Cr, Cu, Pb, Se, Zn, Cd, Hg, Ni, Speciated PAH, TPH1 & TPH CWG	1	MCERTS
WAC Full Solid Suite	1	ISO 17025

The laboratory test reports are included in Appendix B.

4.2 Groundwater Monitoring

The groundwater level was monitored in the borehole installation on completion of drilling. On completion of drilling the borehole was dry to 5.45m. A groundwater monitoring installation was installed to 4.00m. The installation comprised a gravel pack from 4.00 to 2.0m depth with a slotted pipe from 4.0 to 2.00m and solid pipe in bentonite to soil ground level. The pipe had a rubber bung sealing the top and was protected by a stock cock cover. The results of the monitoring shown in Table 4.1 indicate the borehole while initially dry after drilling has groundwater to 0.75m bgl.

Table 4.1 Groundwater Monitoring

Date of Monitoring	Groundwater (depth metres below ground slab level)
02/07/23	Borehole dry to base of borehole at 5.45 m
14/07/23	0.96m (99.54m AOD approx.)
27/07/23	0.75m (99.75m AOD approx.)
03/08/23	0.75m (99.75m AOD approx.)

4.3 Foundations

The trial pits TP03 and TP04 were undertaken against the rear wall of the property. The trial pit records are included in Appendix B. The investigation showed the foundations were of corbelled brick to a depth of 0.35m bgl and extending 100mm from the wall in two rows. The brick foundation was on made ground which extended to a depth of approximately 0.75m. The made ground comprised fine to coarse very clayey sandy fine to medium gravel of flint and brick. It is possible this material represents a fill foundation subbase.

5 Ground Conditions

5.1 Stratigraphy

The ground conditions encountered are summarised in Table 5.1 below. For a full description refer to the exploratory record in Appendix B.

Table 5.1 Summary of ground conditions

Stratum	Description	Depth top Strata (mbgl)	at of level (m AOD)	Thickness of Stratum (m)	SPT Values	N
Made Ground	Stone slab 50mm thick over sandy clayey fine to coarse gravel of brick, concrete and flint.	0	100.50	0.35	n/a	
Claygate Member	Soft to firm brown mottled yellow silty fine sandy CLAY, becoming green grey from 1.10m and green grey from 2.5m	0.35	100.15	5.10 Proven	5 to 14	

5.2 Groundwater

Groundwater was not reported during drilling to a depth of 5.45m on 03/07/23, but the soil was noted as moist from 4.0m. Subsequent monitoring on the 27/07/23 and 03/08/23 indicated groundwater to the depth of 0.75m below slab level or approximately 99.75m AOD. Water seepage to 0.75m bgl was also observed in trial pits on 03/08/23.

5.3 Consideration of the individual stratum, with reference to the basement.

The anticipated level of the basement excavation will be approximately 3.6m below existing ground level at circa 96.90m AOD.

An overall ground model is illustrated in the conceptual model in Section 8 below.

5.3.1 Made Ground

Made Ground is present as a relatively thin deposit of 0.35m thickness at the rear of the house and is considered to represent a subbase for the patio. Due to its limited extend it is

not assigned any geotechnical properties. One sample of the Made Ground was tested for a broad suite of contamination, and for Waste Acceptance Criteria. The sample indicated disposal at an inert water landfill can be undertaken, subject to confirmation from the landfill operator. Asbestos was not detected within the material.

5.3.2 Claygate Member/ London Clay Formation

The Claygate Member (CM) is soft becoming firm brown to mottled grey, silty fine sandy clay. The SPT N values show a gradual increase from 8 at 1.00 m depth to 14 at 5.00m.

Five Atterberg Limit tests were undertaken. The tests have a PI of 25 to 39% shown in Figure 5.1, indicating medium to high plasticity with an average of 31%. Using the relationship between SPT N value and plasticity (Stroud and Butler 1975), with an f_1 of 5.0 an equivalent undrained shear strength (c_u) is extrapolated to range from 40 kPa at 3.00m to 60 kPa at 5.00m shown in Figure 5.2.

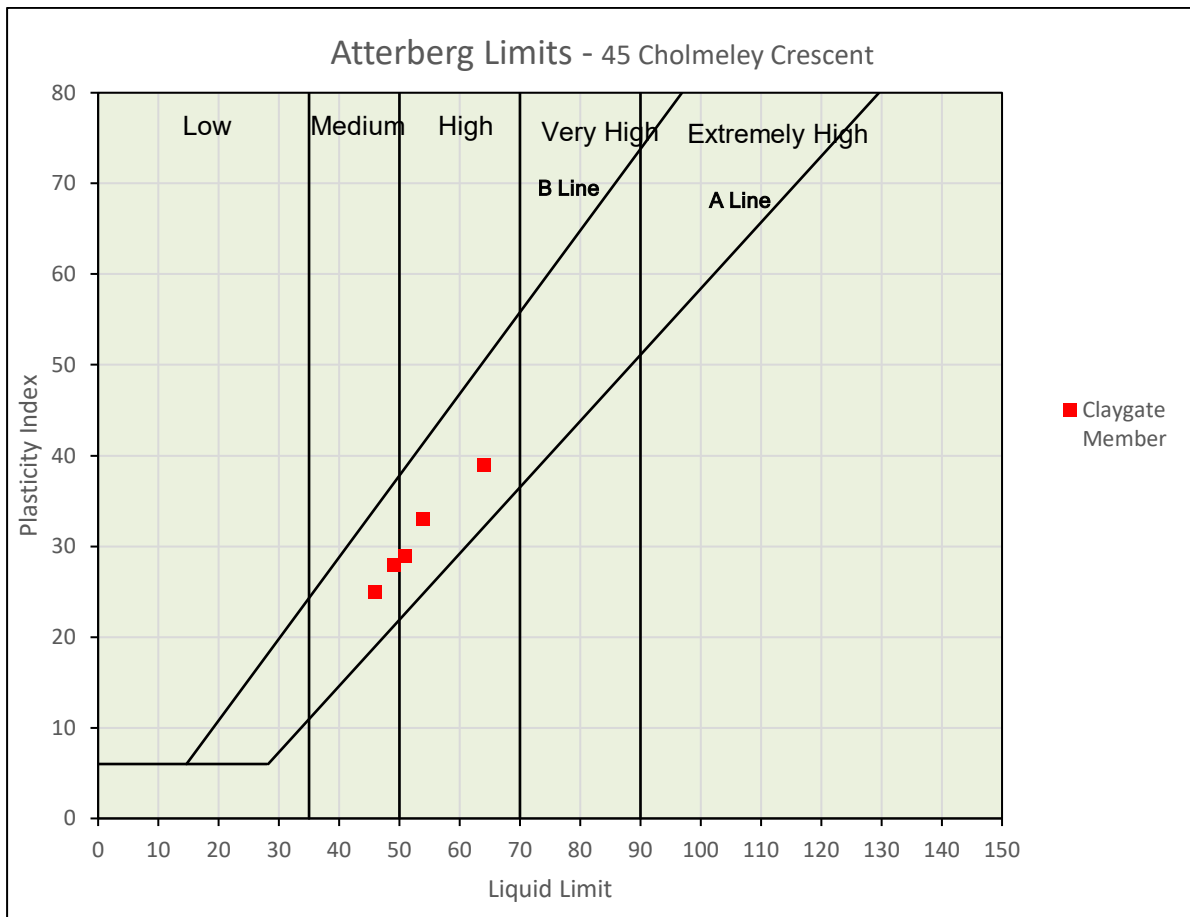


Figure 5.1 Atterberg Chart

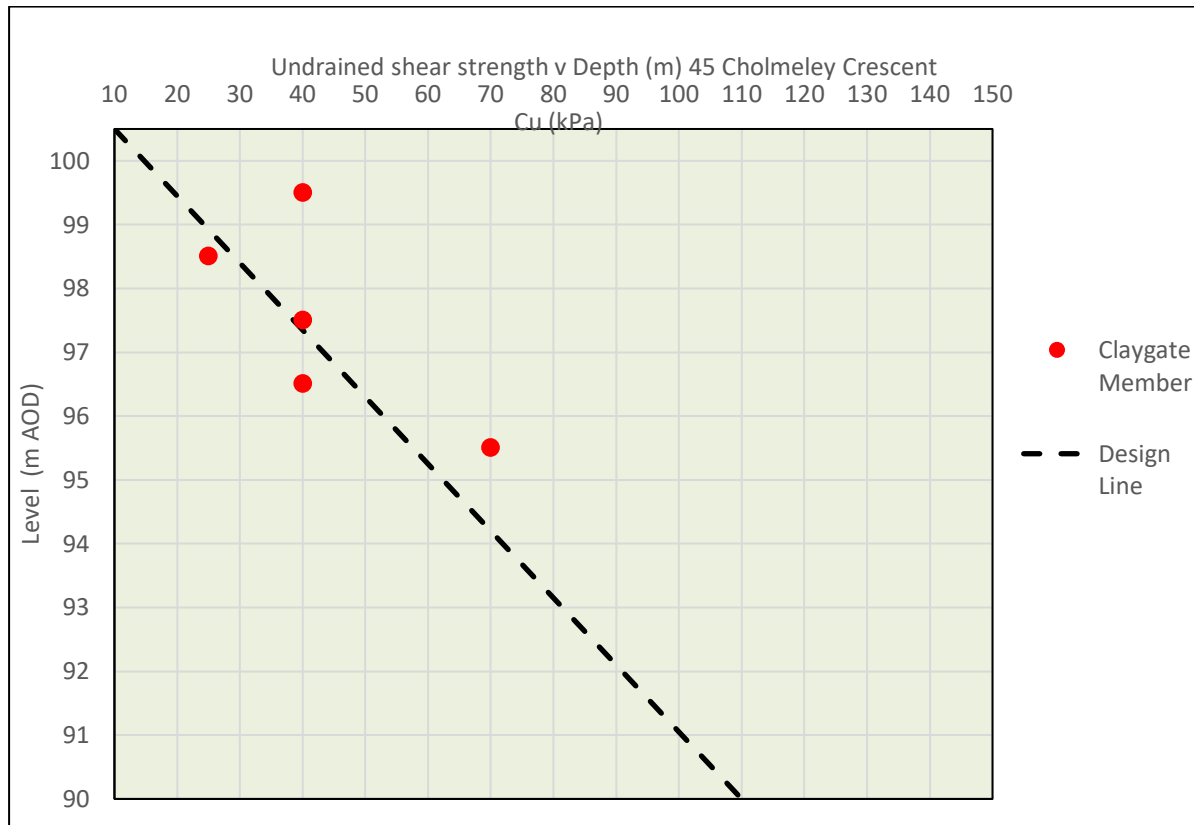


Figure 5.2 Undrained shear strength value against depth

The deformation moduli (E_u and E') of the CM has been cautiously estimated from the relationship between plasticity index and value where $E_u/N = 1$ MPa and $E'/N = 0.9$ after CIRIA 143 (1995).

The parameters used for purposes of settlement / heave modelling in Section 6 are shown in Table 5.2.

Table 5.2 Geotechnical Design Parameters

Parameter	Claygate Formation	Rationale
Design depth (m bgl)	0.35 -10	For settlement analysis
Unit Wt kN/m ³	20	BS8004 (2015)
Undrained Shear strength (kPa)	$10z + 10$	Derivation of SPT N values after Stroud and Butler (1975)
Angle of Friction ϕ'	23°	BS8004 (2015)
Cohesion (kPa)	0	BS8004 (2015)
Natural Moisture Content%	44%	Average from testing
Plasticity Index	33%	Cautious estimate from testing

Parameter	Claygate Formation	Rationale
Young's Modulus (E_u)	$2.5Z + 2$	CIRIA 143 (1995)
Young's Modulus (E')	$2.25Z + 1.8$	CIRIA 143 (1995)
Poisson's Ratio (ν')	0.2	Look (2014)

Notes:

* CIRIA 143

**BS8004 2015

The parameters in Table 5.2 are unfactored (Serviceability Limit State) and considered to be 'a cautious estimate.'

Groundwater is assumed to be at 0.75 m bgl or ~99.75 m AOD.

6 Geotechnical Assessment of Ground Conditions

6.1 Introduction

The information obtained from the ground investigation on the soil conditions in relation to the proposed basement construction has been assessed for impacts on existing building structures. The principal impacts are ground movements from the installation and excavation for the basement. These movements are vertical and horizontal movements of the foundation formation level from isostatic readjustment from the excavation and possible vertical and horizontal impacts of existing structures from the basement wall construction.

6.2 Presumed Bearing Resistance

The foundation formation level of the basement will be at approximately 96.9 m AOD or 3.6 m below ground level. At the formation level an undrained shear strength of the soil (Assumed CM) has been evaluated as 45 kPa.

Wall loads acting on a thickened base slab have been calculated by SD Engineers (SDE) to give a ground bearing pressure of between 70 and 155 kPa (combined DL + LL). The 250mm thick central basement slab load is assumed at less than 10 kPa. The wall loading is shown in Drawing 1711-SDS-B1-600 from SDE in Appendix A.

In consideration of net loading allowing for the removal of 3.6 m of soil of 70 kPa (based on a unit weight of 20 kN/m³) below the ground floor. This gives a net loading of between 0 and 85 kPa.

A net foundation load of 85 kPa can be accommodated by the indicated shear strength of 45 kPa without significant (<25 mm) settlement. The actual ground movement will however be determined from the net effect from the removal of soil during the basement excavation causing heave and the subsequent effect of construction which is considered in Section 10.

6.3 Effect Of Heave/Settlement From Soil Excavation And Construction Loading

Assuming an existing ground level of 100.50m AOD, the proposed basement will require the excavation from the existing ground level to approximately 96.9 m AOD (3.60m depth). For purposes of this assessment, it is assumed the unit weight of the soil (γ_k) to be removed is 20 kN/m³ giving an overall negative load of 70 kPa.

The effect of heave and settlement has been analysed using OASYS program PDisp version 20.12. PDisp assumes a linear elastic behaviour of the soil and a flexible structure. The finite stiffness of the structures will tend to redistribute or smooth out the movements, when compared to those predicted by PDisp. The settlement calculations therefore represent

free field movements unaffected by the stiffness of the structures and are likely to be conservative (i.e., the distortions of the structure would be less than those obtained from the predicted movements).

Dimensions of the excavation and construction is based on the SDE drawings included Appendix A.

The ground model is based on the ground conditions assessment in Section 5. The effects of short term un-drained and long term drained conditions have been considered cumulatively, which is a conservative assessment as a worst case. The long and cross sections have been drawing to intersect the greatest/least movement contours from the PDisp plot.

A maximum heave of up to 15.0 mm under short term undrained conditions within the centre of the excavation as shown in sections A-A and B-B in Figures 6.2 and 6.3. Long term drained conditions are shown in Figure 6.4, Figure 6.5 (Section A-A), Figure 6.6 (Section B-B) and Figure 6.7 (Section C-C) where up to 16 mm heave was determined.

At the boundary with 47 Cholmeley Crescent Short term movements indicate heave of 7mm, with no impact on No. 43. Long term movement showed settlement of between 1mm in Figure 6.7(Section C-C) and 3mm in Figure 6.6 (Section B-B) at boundary with No. 47.

These models have been used as a basis for the ground movement assessment and damage assessment in Section 9 , 10 and 11 respectively.

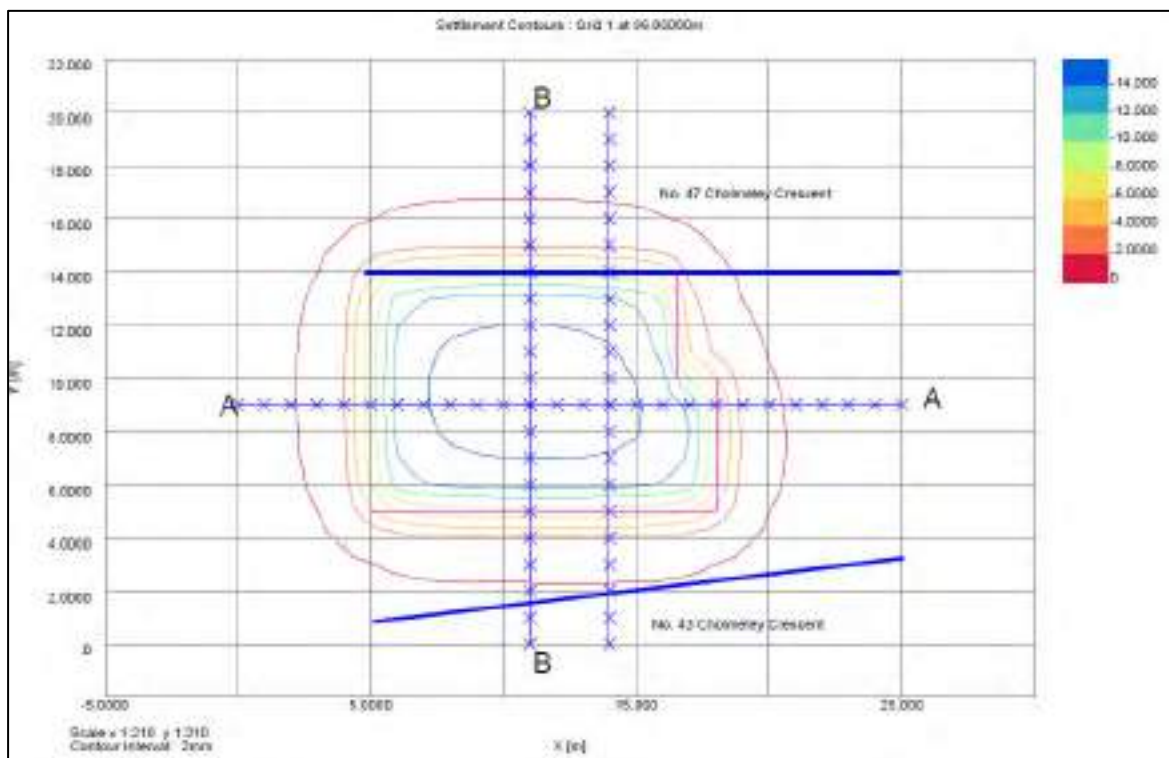


Figure 6.1 Heave- short term undrained condition

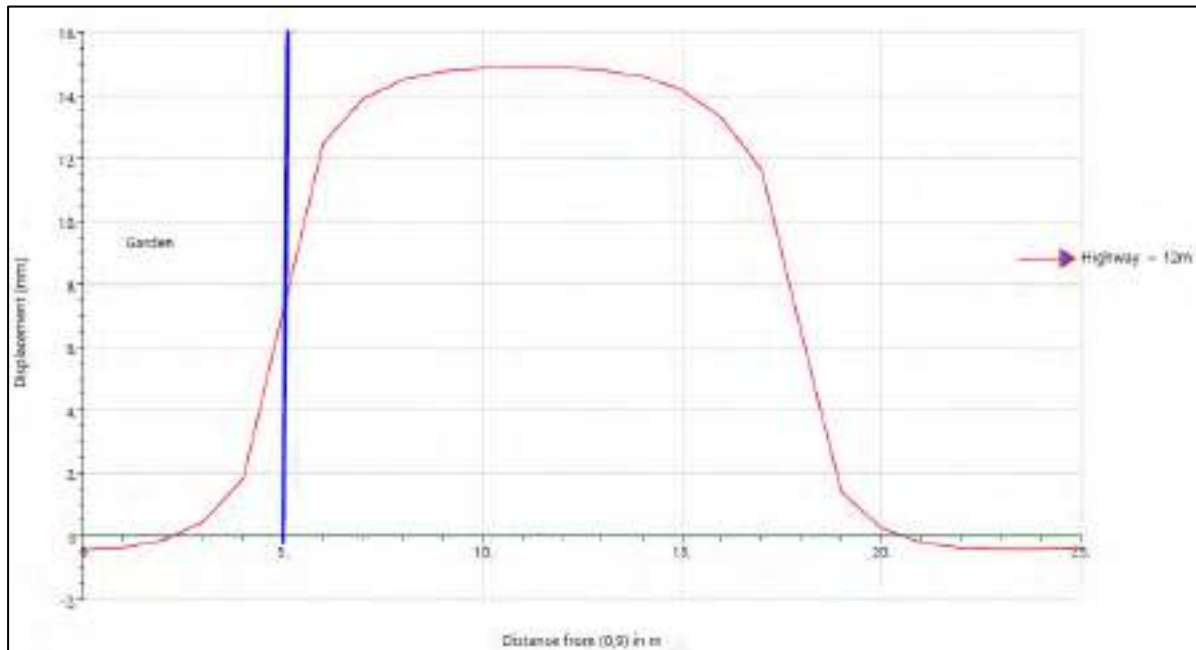


Figure 6.2 Heave- short term undrained condition in excavation- Section A-A

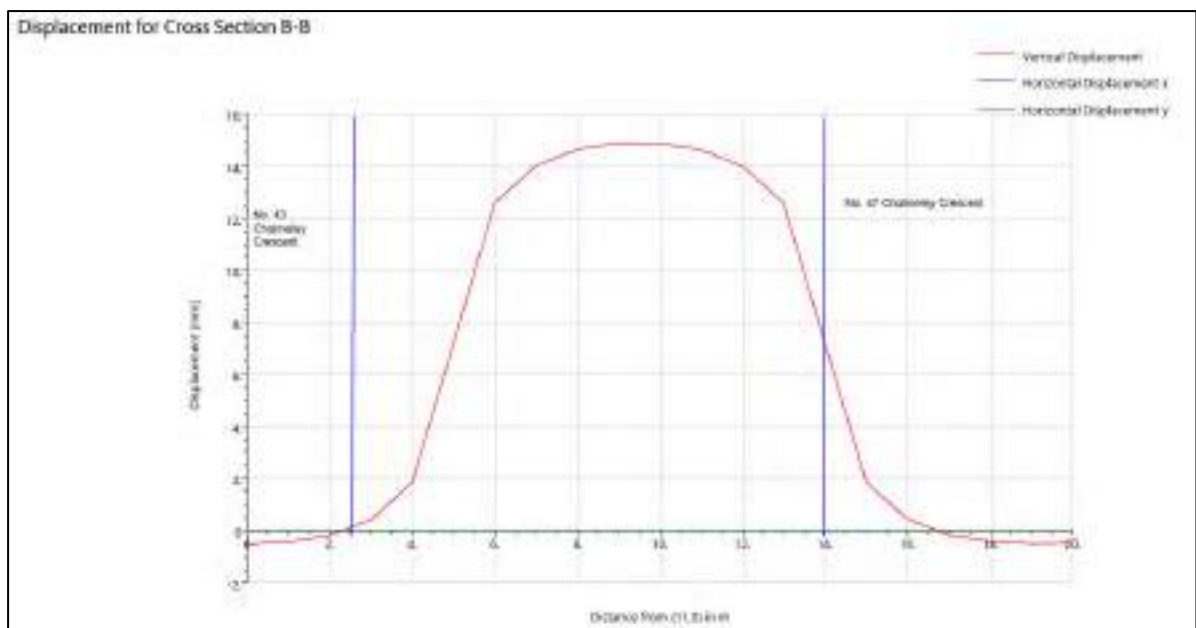


Figure 6.3 Heave- short term undrained condition in excavation- Section B-B

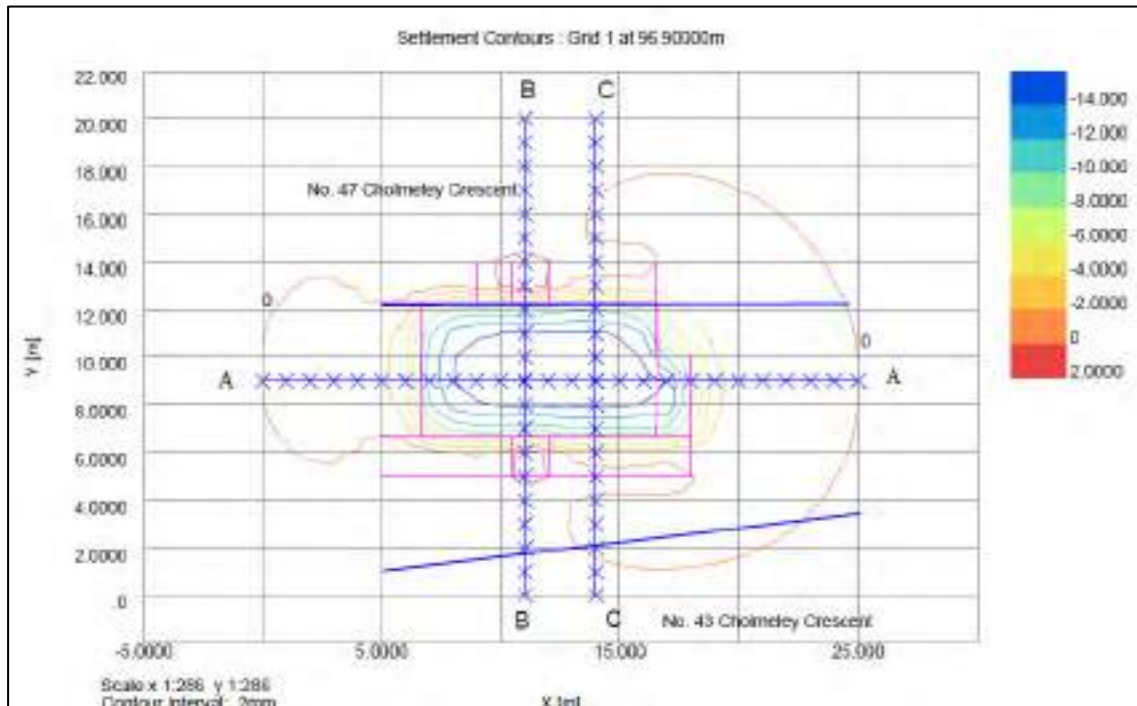


Figure 6.4 Heave- long term drained condition

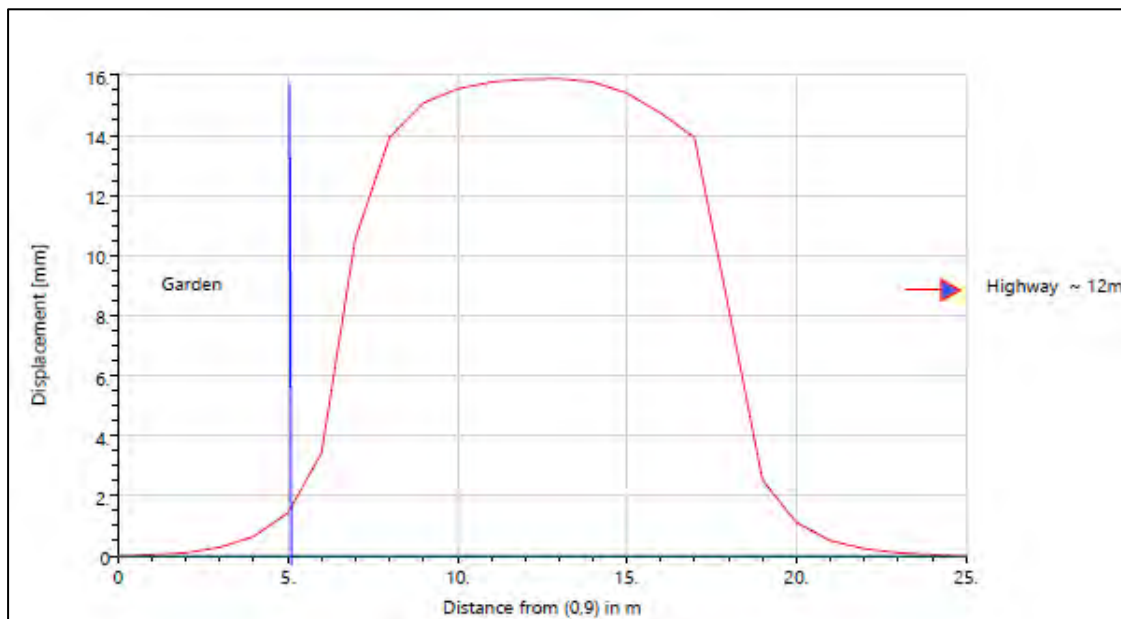


Figure 6.5 Heave- long term drained condition- Section A-A

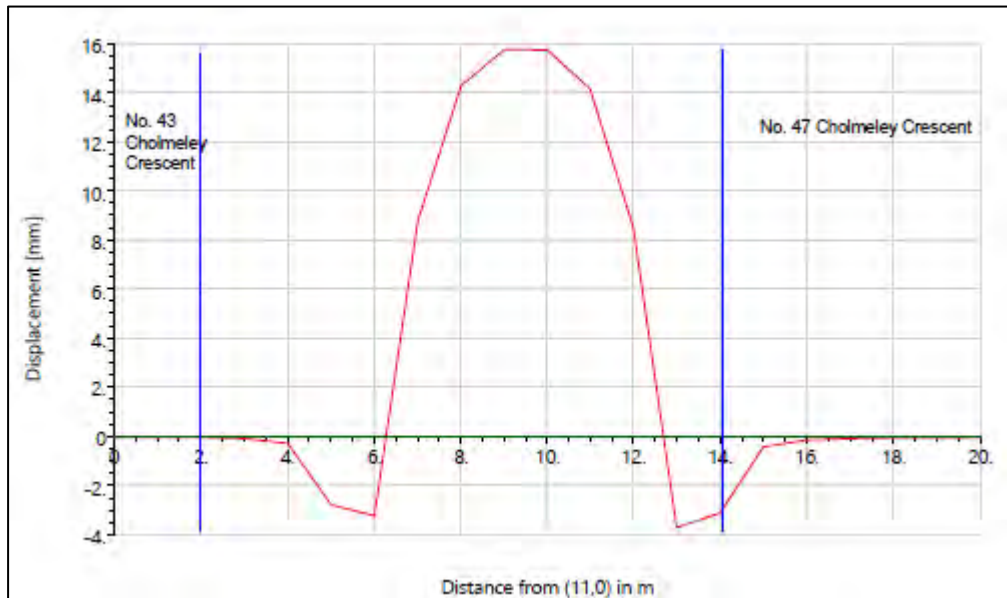


Figure 6.6 Heave- long term drained condition- Section B-B

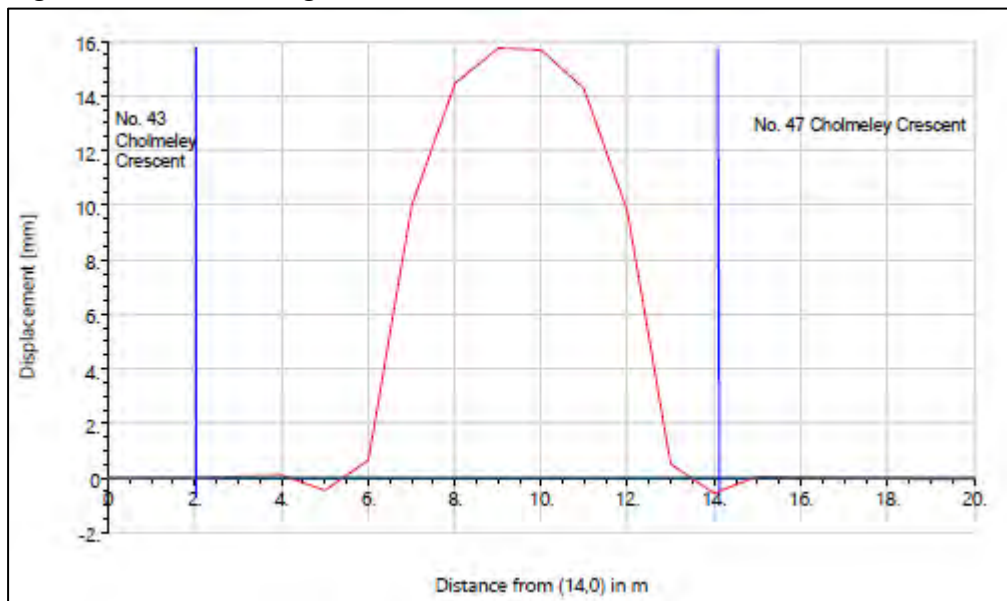


Figure 6.7 Heave- long term drained condition- Section C-C

6.4 Sub –surface Concrete

The results of lab testing for sulphate and pH are summarised below in Table 6.1. The full analysis is included in Appendix D.

Table 6.1 Sulphate and pH categories

Sample depth	Soil Type	Total Sulphate as S04	Sulphate S04 2:1 extract	pH	Sulphate Class (DS)	ACEC Class
0.2 to 0.35	Made ground	940 mg/kg	0.056 g/l	8.2	DS-1	AC1
1.0	Claygate Member		0.059 g/l	8.1	DS-1	AC1
3.0	Claygate Member		0.04 g/l	8.1	DS-1	AC1

It is recommended that an overall design sulphate class of DS-1 and an Aggressive Chemical Environment for Concrete (ACEC) class of AC1 is adopted for the basement slab and underpinning.

7 Screening

7.1 Introduction

Screening identifies if there are hydrogeological, surface water land stability issues associated with the proposed development that require detailed analysis and investigation. If there are no significant issues identified in the screening stage, then further stages are not required.

7.2 Subterranean (Groundwater) flow

The source of information for the assessment of subterranean flow is from the desk study information and the ground investigation undertaken at 45 Cholmeley Crescent on 03/07/23 and 03/08/23 (Appendix B).

Table 7.1: Responses to Subterranean Groundwater Flow

Question	Response	Action required
1a. Is the site located directly above an aquifer?	No. The site is underlain by the Claygate Member of the London Clay Formation. This is considered an unproductive stratum.	None
1b. Will the proposed basement extend beneath the water table surface?	Groundwater was not struck during investigation to 5.45m bgl. Post investigation monitoring indicated groundwater was encountered to a depth of 0.96m (approximately 99.54m AOD)	Assess the potential impact from groundwater
2. Is the site within 100m of a watercourse, well, or potential spring line?	No. There are no known wells or spring-lines within 100 m of the site ^{b,c} .	None
3. Will the proposed basement development result in a change in the proportion of hard surfaced/paved areas?	No The basement is entirely below the existing building and patio stone slabs	None

Question	Response	Action required
4. As part of site drainage, will more surface water than at present be discharged to ground (e.g., via soakaways and/or SUDS)?	No.	None. Due to the geology of the Claygate Member close to ground level, soakaway drainage will not be suitable
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 lines?	No. There are no recorded local ponds or spring lines within 250 m of the site	None

In summary, the site is located on the Claygate Member of the London Clay Formation. Post investigation monitoring of 1 No. boreholes drilled at the site to a depth of 5.45 m bgl indicated that groundwater was encountered at a depth of 0.96m bgl (~ 99.54 m AOD). Due to the low permeability characteristic of the Claygate formation groundwater flow will be very slow and not be impeded by the basement construction, which is at the same level as the existing basement and garage due to the slope of the ground at the property.

7.3 Surface Water and Flooding

The source of information for the assessment of surface water flooding is from the surface flood risk data in the Groundsure Insights Report (Appendix C).

Table 7.2: Responses to Surface water and Flooding

Question	Response	Action required
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. The rear garden is currently paved, and the proposed basement will therefore result in no increase in the amount of hardstanding.	None
2. Will the proposed basement development result in a change in the proportion of hard surfaced / paved external areas?	No. The garden where the proposed based is to be located is currently paved	None

Question	Response	Action required
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.	None
4. Will the proposed basement result in changes to the quality of surface water being received by adjacent properties or downstream watercourses?	No.	None
5. Is the site in an area identified to have surface water flood risk according to either the Local Flood Risk Management Strategy or the Strategic Flood Risk Assessment or is it at risk from flooding, for example because the proposed basement is below the static water level of nearby surface water feature.	No. The impact from surface water flooding is low risk, and very low risk from flooding by rivers. The property is on a gradient with the highway below the basement floor level	None

No specific risk has been identified from published information, with the property located within a Zone 1 (low Risk) of surface water flooding and very low risk of flooding from rivers. Therefore, there will be no change of impact on neighbours properties.

Anecdotal information from the client has indicated that after heavy rainfall water can accumulate temporarily on the patio area to the rear of the property, and water ingress to the kitchen area has been experienced on one occasion, which should be taken into account in the basement design.

7.4 Slope / Land Stability

The source of information for the assessment of subterranean flow is from the desk study information and the ground investigation undertaken at 45 Cholmeley Crescent on 03/07/23

Table 7.3: Responses to Slope / Land Stability

Question	Response	Action required
1. Does the site include slopes, natural or man-made, greater than about 1 in 8?	Yes. Rear garden increases in height away from the house at a gradient of 1 in 6 or 9.35°	Account for the additional active pressure from the slope in the basement design
2. Will the proposed re-profiling of the landscaping at site change slopes at the property boundary to greater than about 1 in 8?	No.	None
3. Does the development neighbour's land including railway cuttings and the like with a slope greater than about 1 in 8?	No No railway is present with 500m of the site	None.
4. Is the site within a wider hillside setting in which the general slope is greater than about 1 in 8?	No. The ground in the wider hillside slopes to the northwest at approximately 1 in 10	None
5. Is the London Clay the shallowest stratum on site?	Yes, on the basis the Claygate Member is the upper member of The London Clay Formation.	Determine heave and ground movement from the excavation of the soil and construction of basement walls.
6. Will any trees be felled as part of the proposed development and/or are any works proposed within any tree protection zones where trees are to be retained?	No trees will be felled.	None

Question	Response	Action required
7. Is there a history of shrink/swell subsidence in the local area and/or evidence of such at the site.	No records.	None
8. Is the site within 100 m of a watercourse or a potential spring line?	No ^{a,b} .	None
9. Is the site within an area of previously worked ground?	No. Historical mapping shows the area was orchard/ agricultural until the 1935 survey when the existing house is shown.	None
10. Is the site within an aquifer?	No. The site is underlain by the London Clay. Formation. This is considered an unproductive stratum in EA classifications.	None
12. Is the site within 5 m of a highway or pedestrian right of way?	No The proposed basement is to the rear of the property about 15m from the highway.	None.
13. Will the proposed basement significantly increase the differential depth of foundations relative to neighbouring properties?	Yes. While No. 47 has a partial basement at the same level, the proposed basement will also be against part of No. 47 which does not have a basement. While No. 43 is further from No. 45 this will be included in the GMA.	A ground movement assessment will be undertaken to assess impact (Burland Damage Assessment) as a precaution for No. 43 and 47 Cholmeley Crescent
14. Is the site over (or within the exclusion zone of) any tunnels?	No.	None.

In summary, the proposed basement will be founded within the Claygate Member of the London Clay Formation, which is present from 0.35 m depth below the site surface. The basement design will need to take account of the sloping ground behind the basement in the rear garden and the impact on neighbour's property from ground movements from the basement excavation. The impact of ground movement on the neighbours properties is considered in Section 9 to 11.

8 Scoping

8.1 Introduction

This section considers the output from the screening survey where further actions are required. It considers the scope of information required in addressing these actions and what the potential impacts are of the basement construction. The existing ground conditions and the location of the basement have been summarised in sketch conceptual site model sections as indicated in Figures 8.1 to 8.4.

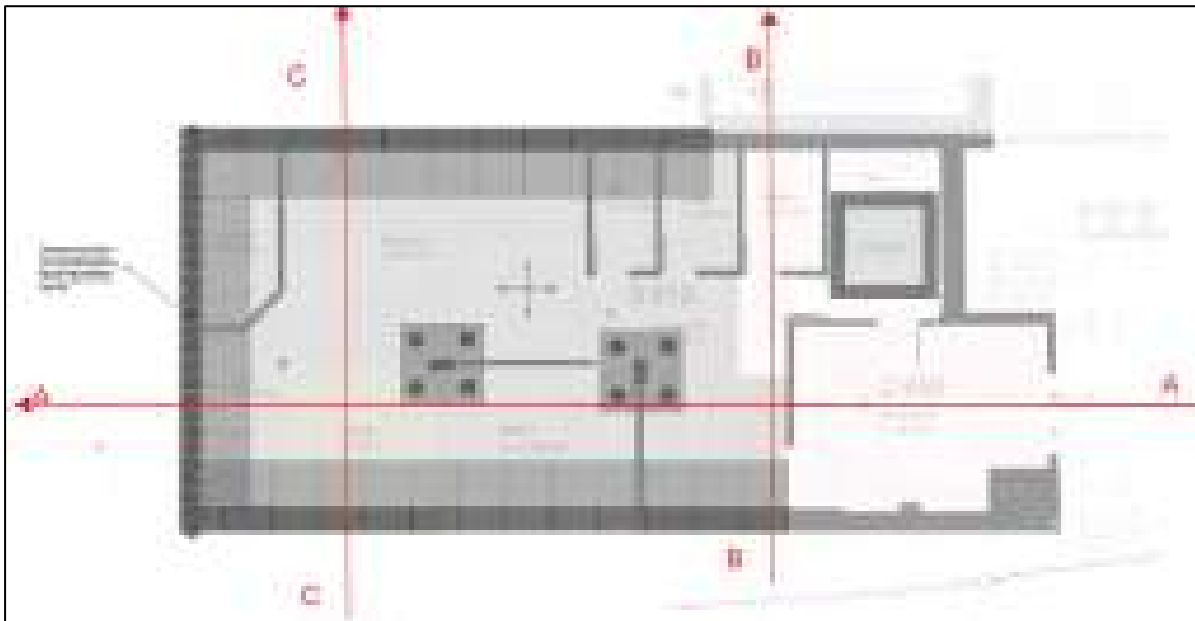


Figure 8.4 Conceptual Site Model - Section Key

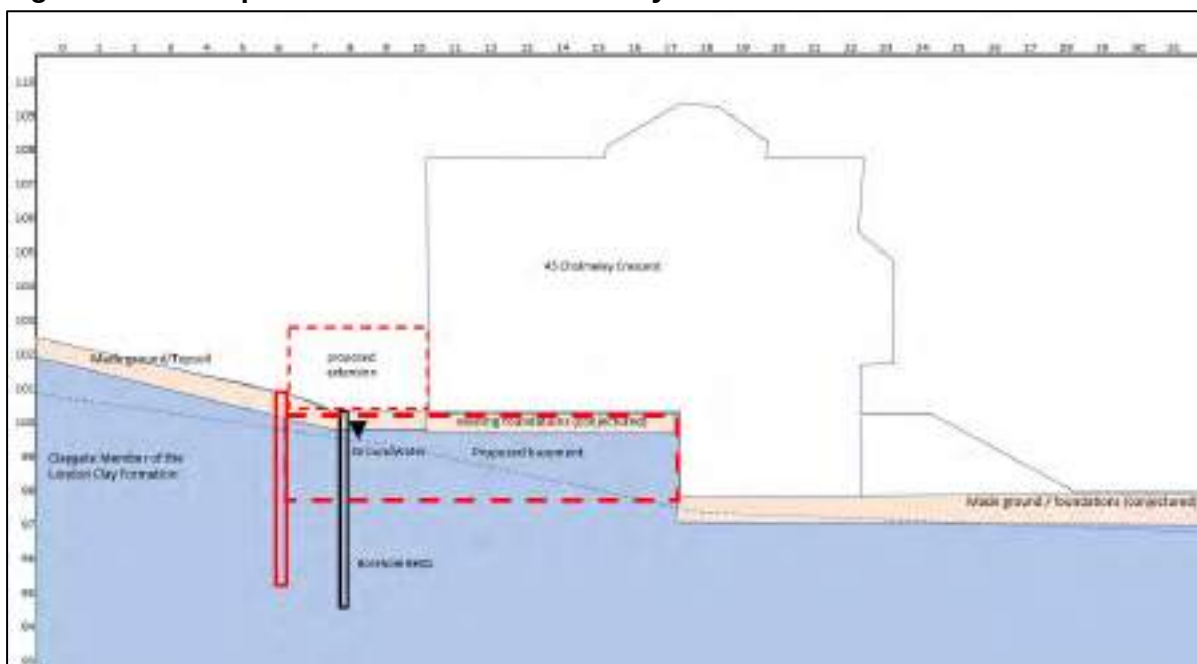


Figure 8.1 Conceptual Site Model Section A-A (Not to scale)

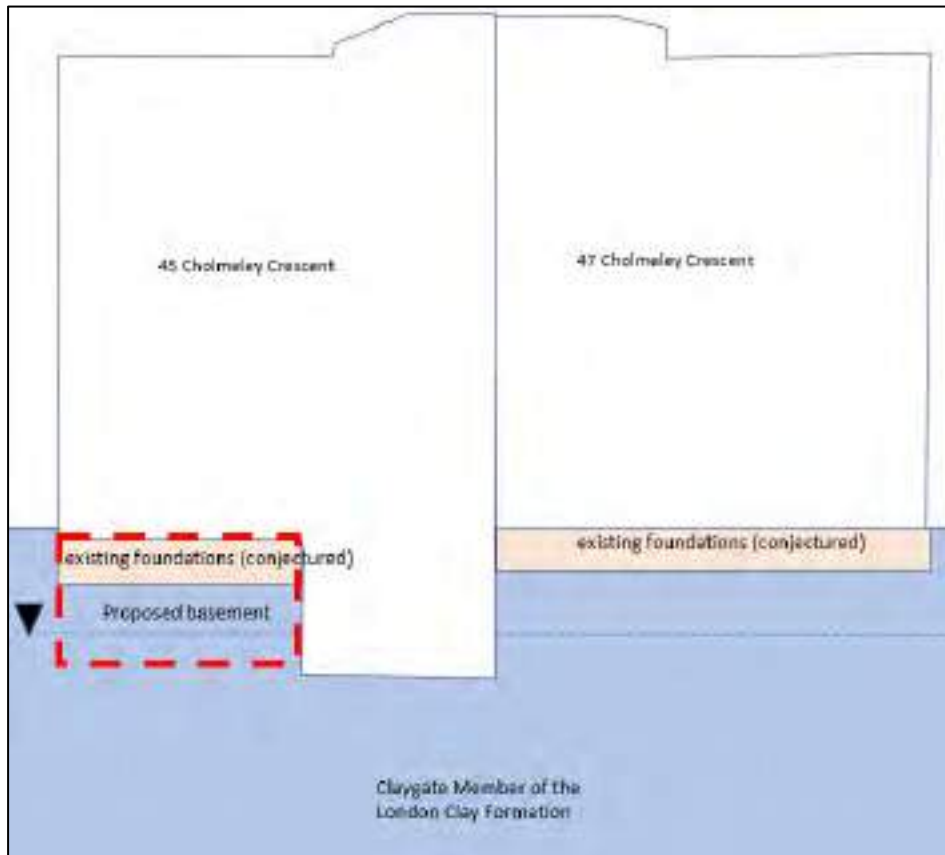


Figure 8.2 Conceptual Site Model Section B-B (Not to scale)

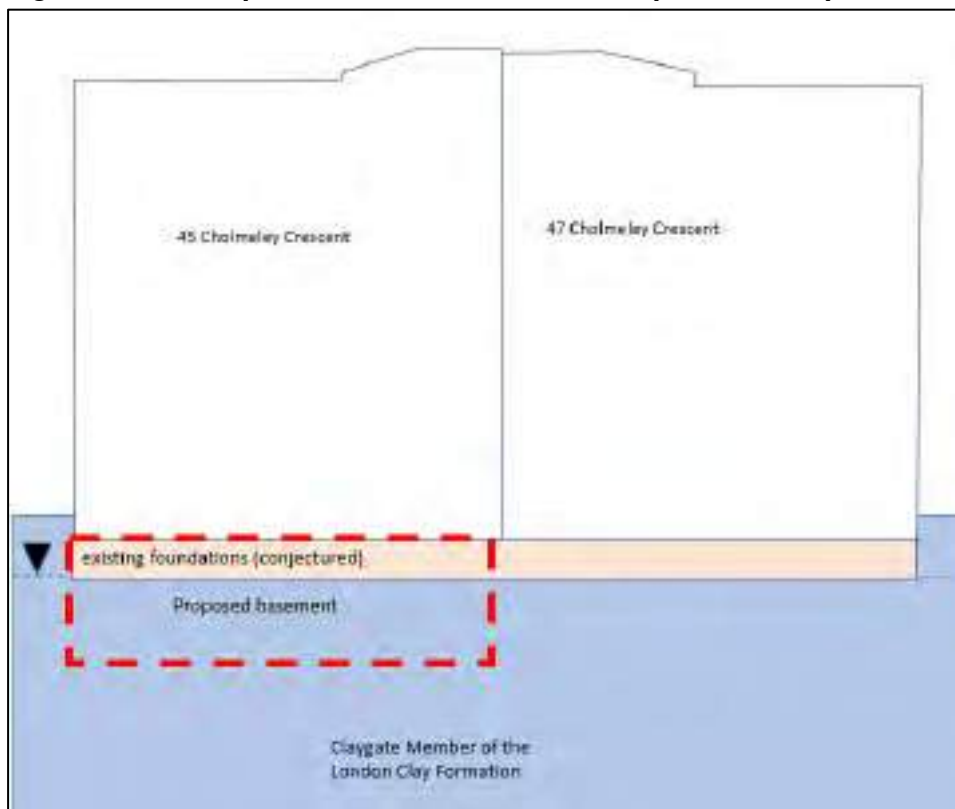


Figure 8.3 Conceptual Site Model Section C-C (Not to scale)

8.2 Groundwater

The risk identified with groundwater relates to the groundwater depth identified in the borehole at a depth of 0.96m bgl or 99.54m AOD shown in Table 8.1 taken from Table 7.1.

Table 8.1 Summary of Scoping Requirements - Hydrogeology

Screening questions of concern - Hydrogeology	Potential Impact	Mitigation
1b. Will the proposed basement extend beneath the water table surface?	Groundwater was not struck during investigation to 5.45m bgl. Post investigation monitoring indicated groundwater was encountered to a depth of 0.96m (approximately 99.54m AOD)	Assess the potential impact from groundwater

8.2.1 Mitigation for Query 1b

The impact of the groundwater impact on the proposed basement will be mitigated by the proposed installation of a contiguous piled wall to the rear of the basement shown on drawing SDS-GF-S-2002 included in Appendix A and CSM in Appendix X. The basement will require waterproofing to xx standard, indicated in the CSM.

8.3 Surface Water

There have been no surface water issues identified from the screening, however anecdotal information indicates account should be taken for heavy rainfall event on the subject property, to include cutoff drainage from the slope of the rear garden to prevent surface water impact on the proposed basement.

8.4 Land Stability

The land stability issue relates to the ground movements resulting from the excavation within the London Clay Formation which will be addressed by a ground movement analysis as summarised in Table 8.2 taken from Table 7.3.

Table 8.2 Summary of Scoping Requirements – Land Stability

Screening questions of concern – Land Stability	Potential Impact	Mitigation
1. Does the site include slopes, natural or man-made, greater than about 1 in 8?	Yes. Rear garden increases in height away from the house at a gradient of 1 in 6 or 9.35°	Account for the additional active pressure from the slope in the basement design
5. Is the London Clay the shallowest stratum on site?	Yes, on the basis the Claygate Member is the upper member of The London Clay Formation.	Determine heave and ground movement from the excavation of the soil and construction of basement walls.
13. Will the proposed basement significantly increase the differential depth of foundations relative to neighbouring properties?	Yes. No. 47 does not have a basement. While No. 43 is further from No. 45 this will be included in the GMA.	A ground movement assessment will be undertaken to assess impact (Burland Damage Assessment) as a precaution for No. 43 and 47 Cholmeley Crescent

8.4.1 Mitigation for Query 1

The impact of the sloping ground to the rear of the property on the proposed basement will be mitigated by the proposed installation of a contiguous piled wall to the rear of the basement shown on drawing SDS-GF-S-2002 included in Appendix A and SMS in Appendix E. The basement will require waterproofing to xx standard, indicated in the SMS.

The slope of the ground to the rear of the property is not considered to pose a risk to the stability of the slope above the proposed basement. The critical internal angle of friction for the Claygate Member has been established conservatively as 23° and the slope angle is 9.35°. There was no indication of slope instability from a walkover assessment on 03/07/23.

8.4.2 Mitigation for Queries 5 and 13

A ground movement assessment has been undertaken and is detailed in Sections 9 11. It has been determined that the Burland Damage Category for Nos. 43 and 47 Cholmeley Crescent is less than 1 or 'very slight'. A monitoring programme before, during construction and after is recommended.

9 Impact Assessment

9.1 Groundwater

The screening/scoping process has shown from borehole information that groundwater was encountered at a depth of 0.95m bgl approximately 99.54m AOD. The impact of the groundwater will be mitigated by a contiguous piled wall detailed in the SMS from SD Structures included in Appendix E.

As a consequence of the low permeability characteristics of the Claygate Member of the London Clay formation (typically 10^{-11} to 10^{-7} m/s or 'practically impermeable') it is anticipated that seepage can be dealt with conventional sump pumps.

Discharge of the groundwater could be made to the sewer subject to an agreement at detailed design stage from the local water company in terms of water quality, flow rate and quantity.

9.2 Land Stability

The screening process has identified three issues which require an impact assessment listed below from Table 8.2

- Rear garden increases in height away from the house at a gradient of 1 in 6 or 9.35°
- Presence of London Clay (Claygate Member) as the shallowest stratum (excepting granular made ground).
- Proximity of an adjacent structure with differential depth of foundations.

9.2.1 Presence of the London Clay Formation (Claygate Member)

The ground investigation indicates that the soil can be readily excavated using conventional plant appropriate for the access constraints imposed by the location of the property. Groundwater is not anticipated to be encountered, based on monitoring records from the site investigation for the full depth of the excavation, although allowance for seepage is recommended.

The impact of the excavation on ground heave has been assessed in Section 6 of this report, which concludes that total heave will be less than 31 mm, within the centre of the basement. For evaluation of all ground movements both short term during excavation and long term after construction it was considered necessary to undertake a Ground Movement Assessment, which is included in Section 10 of this report.

The ground movement assessment evaluates ground movement in relation to neighbouring properties No. 43 and 47 Cholmeley Crescent.

9.2.2 Stability of Temporary Excavations

It is proposed that the basement retaining walls will be constructed using a combination of a contiguous piles wall to the rear of the property combined with a hit and miss underpinning technique, with temporary propping supporting the excavation. The piled wall and underpins are shown in Drawings SDS-B1-S-2000 and SDS-GF-S-2002 included in Appendix A.

9.2.3 Monitoring of groundwater and ground movements

Groundwater levels if present should be monitored before the works as a precaution. Monitoring of adjacent structures and the highway should be carried out before, during and after construction.

10 Ground Movement Assessment

10.1 Introduction

This section provides an assessment of ground movement that may result from the construction of the basement and to determine how these may affect the adjacent building structures and the highway.

The proposed construction sequence for the basement is summarised in the Drawings by SD Engineers included in Appendix A.

The ground conditions of the site are essentially the Claygate Member of the London Clay Formation. A conceptual model of the proposed basement is shown in Figures 8.1 to 8.3.

Ground movements resulting from underpinning are not well documented and there is no specific method for assessing their magnitude. It should be noted that CIRIA C760 (2017), which is often used as a reference for ground movement assessments, is for embedded retaining walls and not concrete underpins.

When underpinning is carried out in a well-controlled manner, movements are typically small. A widely accepted movement from the installation of underpins is for 5mm of horizontal and vertical movement for a single stage underpinning, in addition to the global movements from excavation and subsequent settlement from the imposed loads acting on the underpins.

The ground conditions at 45 Cholmeley Crescent comprise Made Ground over the Claygate Member which will display heave from excavation and long term movement from the imposed loads, although CIRIA C760 indicate long term movement are limited beyond the excavation as indicated in Figure 10.1.

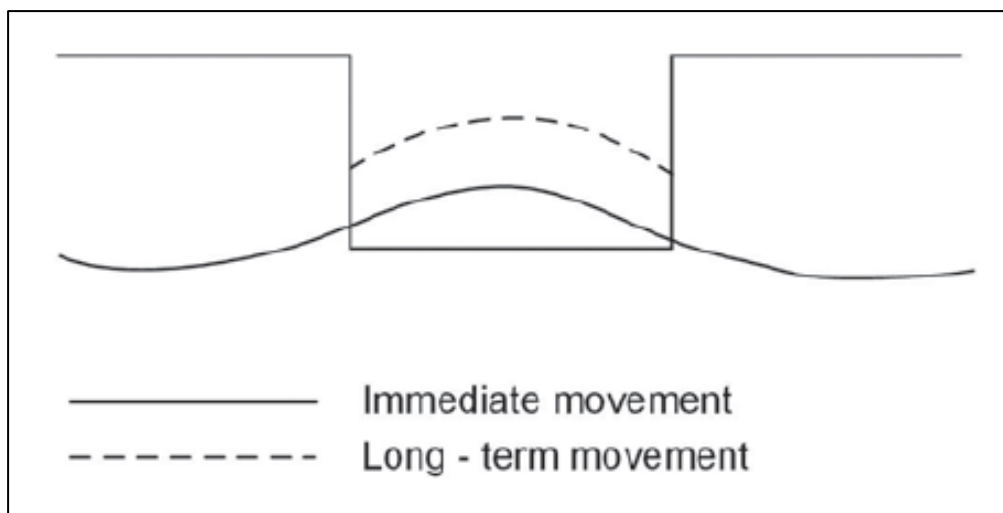


Figure 10.1 Impact of short term immediate undrained and long term movement (From CIRIA C760 Fig 6.10)

The following ground movements have been assessed:

- **Short term vertical heave / settlement movements:** London Clay and is susceptible to short term heave and time dependent swelling on unloading, which will occur because of basement excavation, generating upward ground movements. Short term heave has been analysed by Pdisp in the undrained condition.
- **Long term vertical ground movement in the drained condition:** The net loading / unloading on formation soils will generate ground movement, which could affect adjacent foundations which will happen over a period after construction. This has been modelled with Pdisp. This considers existing stress conditions, and the weight of soil removed and the load from the new basement.
- **Vertical and horizontal movement from underpin installation:** Underpins act as stiff concrete retaining walls, which limits the potential for wall deflection. However, deflections that do occur may generate surface settlements, which could impact adjacent properties. The impact on the neighbours' properties will be from the underpin walls, rather than the contiguous pile wall.
From experience within the industry, at least 5mm of additional ground movement (both vertical and horizontal) is typically anticipated for the proposed single stage underpinning.

10.2 Modelling of movements due to vertical and horizontal stress changes

The predicted ground response due to vertical unloading of the ground through excavation for the proposed basement has been modelled using the OASYS program PDisp version 20.12.

PDisp assumes a linear elastic behaviour of the soil and a flexible structure. The finite stiffness of the structures will tend to redistribute or smooth out the movements, when compared to those predicted by PDisp. The settlement calculations therefore represent free field movements unaffected by the stiffness of the structures and are likely to be conservative (i.e., the distortions of the structure would be less than those obtained from the predicted movements).

The analysis was undertaken for the combination of short-term undrained movements and long-term drained movements. The 'hard layer' base to the analysis was taken as 7 m below basement floor level. In addition, it has been assumed for ground modelling that the soil mass is removed in its entirety before the underpins are placed, when in reality this is an incremental process.

10.2.1 Vertical Movements due to excavation (Undrained/short term)

The excavation is assumed at 3.6m below the existing ground floor level.

A short term (undrained) analysis was undertaken using parameters in Table 5.2 above to determine the heave movements likely to arise as a result of the excavation (i.e., the movements likely to occur prior to the construction of the new structural elements and the consequential vertical loading of the soil). The analysis indicated a maximum heave

of 15 mm occurring centrally within the excavation (Figures 6.1, 6.2 & 6.3), with 7 mm at the boundary wall with No. 47 and 0mm at nearest building wall for No.43.

10.2.2 Vertical movements following construction of the new basement (drained/long-term)

The movements of the ground following construction are assessed for the long term (drained) case using parameters in Table 5.2 above.

The PDisp assessment indicates that peak heave movements in the long term again occur under the centre of the basement, with a magnitude of 16.0 mm occurring centrally (Figure 6.4, 6.5 & 6.6), with settlement of 3.0 mm at the boundary with No. 47 and 0 mm with the nearest building wall with No. 43.

10.2.3 Vertical deflection from underpin installation

As indicated above in Section 9.1, 5 mm of vertical movement is assumed for installation. The distance behind the wall to which negligible movement occurs has been assumed at 3.5 times the excavation depth after CIRIA C760.

10.2.4 Horizontal deflection from underpin installation

As indicated above in Section 9.1, 5mm of horizontal movement ($\delta_{\max}$) at the basement wall is assumed for installation. The distance behind the wall to which negligible movement occurs is assumed to be 4 times the height of the underpin of 3.60 m. δ_h is the difference between $\delta_{\max}$ and the movement of the far wall of the neighbouring property.

It should be reiterated that the movements due to vertical and horizontal stress changes do not occur in isolation to the other movements resulting from the basement construction process and the actual ground movements, particularly around and beyond the perimeter of the proposed basement, will be from the quality of workmanship during excavation and installation.

11 Damage Category Assessment

11.1 Introduction

The calculated ground movements have been used to assess potential 'damage categories' that may apply to neighbouring properties due to the proposed basement construction. The methodology proposed by Burland and Wroth and later supplemented by the work of Boscardin and Cording has been used, as described in *CIRIA Special Publication 200* and *CIRIA C760*. General damage categories are summarised in Table 11.1 below:

Table 11.1: Classification of damage visible to walls (reproduction of Table 6.4, CIRIA C760)

Category	Description	Approx. Crack Width (mm)	Limiting tensile Strain
0 (Negligible)	Negligible – hairline cracks	<0.1	0.0 – 0.05
1 (Very slight)	Fine cracks that can easily be treated during normal decoration	<1	0.05 – 0.075
2 (Slight)	Cracks easily filled; redecoration probably required. Some repointing may be required externally.	<5	0.075 – 0.15
3 (Moderate)	The cracks require some opening up and can be patched by a mason. Recurrent cracks can be masked by suitable linings. Repointing of external brickwork and possibly a small amount of brickwork to be replaced.	5 -15 or a number of cracks > 3	0.15 – 0.3
4 (Severe)	Extensive repair work involving breaking-out and replacing sections of walls, especially over doors and windows.	15-25 but also depends on number of cracks	> 0.3
5 (Very Severe)	This requires a major repair involving partial or complete re-building.	> 25 but also depends on number of cracks	

11.2 Damage Assessment Categories for neighbouring properties

Vertical ground movements for section C-C in Figure 8.1 (considered to represent the most onerous case) through No. 43 and 47 Cholmeley Crescent are shown in Figures 11.1 and 11.2 respectively. For these wall sections, the combined impact of short-term heave and long-term settlement/ heave and installation has been shown.

Table 11.2 and Figures 11.4 and 11.5 incorporates superimposed horizontal and vertical movements derived from the wall deflection and heave/settlement due to excavation as outlined in Section 10. The assessment has been based on the limiting tensile strain for Category 1 of a strain of 0.075 %.

Table 11.2: Summary of ground movements and corresponding damage category 29 and 31 Grove Place

Adjacent Property	43 Cholmeley Crescent	47 Cholmeley Crescent
Building width approx.- L (m)	8	8
Building height approx.- H (m)	10	10
L/H (approx.)	1.0	1.0
max deflection (Δ) in metres (from Figs 11.1-11.2)	0.0027	0.0031
Δ/L (%)	0.025	0.039
ϵ_{lim}	0.075	0.075
$\Delta/L/\epsilon_{lim}$	0.33	0.52
length to negligible horizontal movement - 4x increased wall height (m)	14.4	14.4
δh_{max} (m)	0.005	0.005
δh (m)	0.0029	0.0029
$\delta h/L$ (%) = ϵh	0.026	0.036
Damage Category	<0.5	<1.0

In summary the damage assessment has indicated a Damage category of < 0.5 (negligible) for 43 Cholmeley Crescent and <1.0 (very slight) for 47 Cholmeley Crescent.

The impact on the highway has not been assessed due to the distance from the proposed basement, therefore there will be no significant impact from the proposed basement on services within the highway.

12 Monitoring Strategy

The results of the ground movement analysis show that with good construction control, damage to adjacent structures generated by the assumed construction methods and sequence can be controlled to be within Category 1 'slight' damage. A formal monitoring strategy should be implemented on site in order to observe and control ground movements during construction.

The system should operate broadly in accordance with the 'Observational Method' as defined in CIRIA Report 185. Monitoring can be undertaken by installing survey targets to the top of the wall and face of the adjacent building. Baseline values should be established prior to commencement of works. Monitoring of these targets should be carried out at regular time intervals and the results should be analysed to determine if any horizontal translation of the wall or tilt/settlement of the neighbouring structure is occurring. Regular monitoring of these targets will allow ground movement trends to be detected early and a mitigation strategy can be implemented to control further movement. Monitoring data should be checked against predefined trigger limits and can also be further analysed to assess and manage the damage category of the adjacent buildings as construction progresses.

It is recommended that a condition survey is undertaken on an adjacent property prior to the works commencing and ideally when monitoring baseline values are established. Existing cracks or structural defects should be carefully recorded, documented and regularly inspected as construction progresses.

13 Conclusions

The results of this Basement Impact Assessment are supported by site investigation data and outline construction methods and sequence provided by the structural engineer.

The maximum damage category for the adjacent properties has been calculated to be within Category 1 (slight damage).

An appropriate monitoring regime should be adopted and maintained throughout construction to manage risk and potential damage to the neighbouring structures as construction progresses onsite.

14 References

London Borough of Haringey Draft basement development guidance note June 2012

Haringey Council Strategic Flood Risk Assessment Draft Report Feb 2015

Boscardin, M.D., and Cording, E.G., (1989). *Building response to excavation induced settlement*. J Geotech Eng, ASCE, 115 (1); pp 1-21

Burland, J.B., and Wroth, C.P. (1974). *Settlement of buildings and associated damage*, State of the art review. Conf on Settlement of Structures, Cambridge, Pentech Press, London, pp611-654

Burland, J. B. (2008) The assessment of the risk of damage to buildings due to tunnelling and excavations. Jornada Tecnica de Movimientos de Edificios Inducidos por Excavaciones, Barcelona 16/12/2008.

BS 1377:1990. British Standard Methods of test for soils for Civil engineering purposes. British Standards Institution.

BS 5930: 2015. *Code of practice for Ground Investigation*. British Standards Institution.

BS EN 1997-1 Eurocode 7 Geotech Design Part1 General Rules- inc. corrigendum Feb 2009

BS EN 1997-2 Eurocode 7 Geotechnical Design Part 2 Ground Investigation and Testing – inc. corrigendum 2010

BS 8002: 2015 Earth Retaining Structures

BS 8004: 2015 Code of practice for Foundations

BGS Geology of Britain Viewer (<http://mapapps.bgs.ac.uk/geologyofbritain/home.html>)

CIRIA C760 Guidance on Embedded retaining wall design 2017.

Figures 11.1 to 11.4

No. 43 Cholmeley Crescent



Client

Mr & Mrs Podpolny

MAUND GEO-CONSULTING

Project

45 Cholmeley Crescent N6 5EX

Job No.

MGC-132

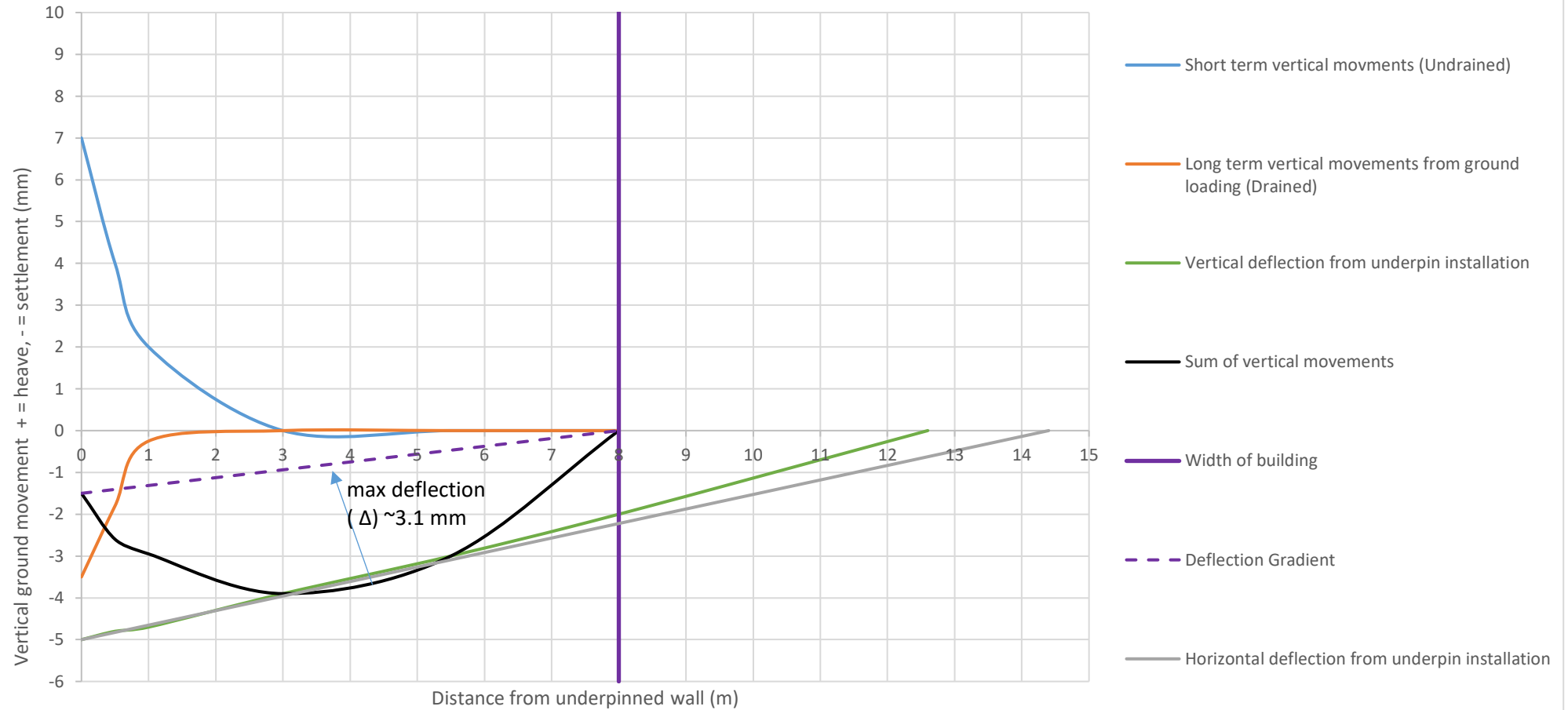
Title

Ground Movement Assessment 43 Cholmeley Crescent

Figure

10.1

No. 47 Cholmeley Crescent



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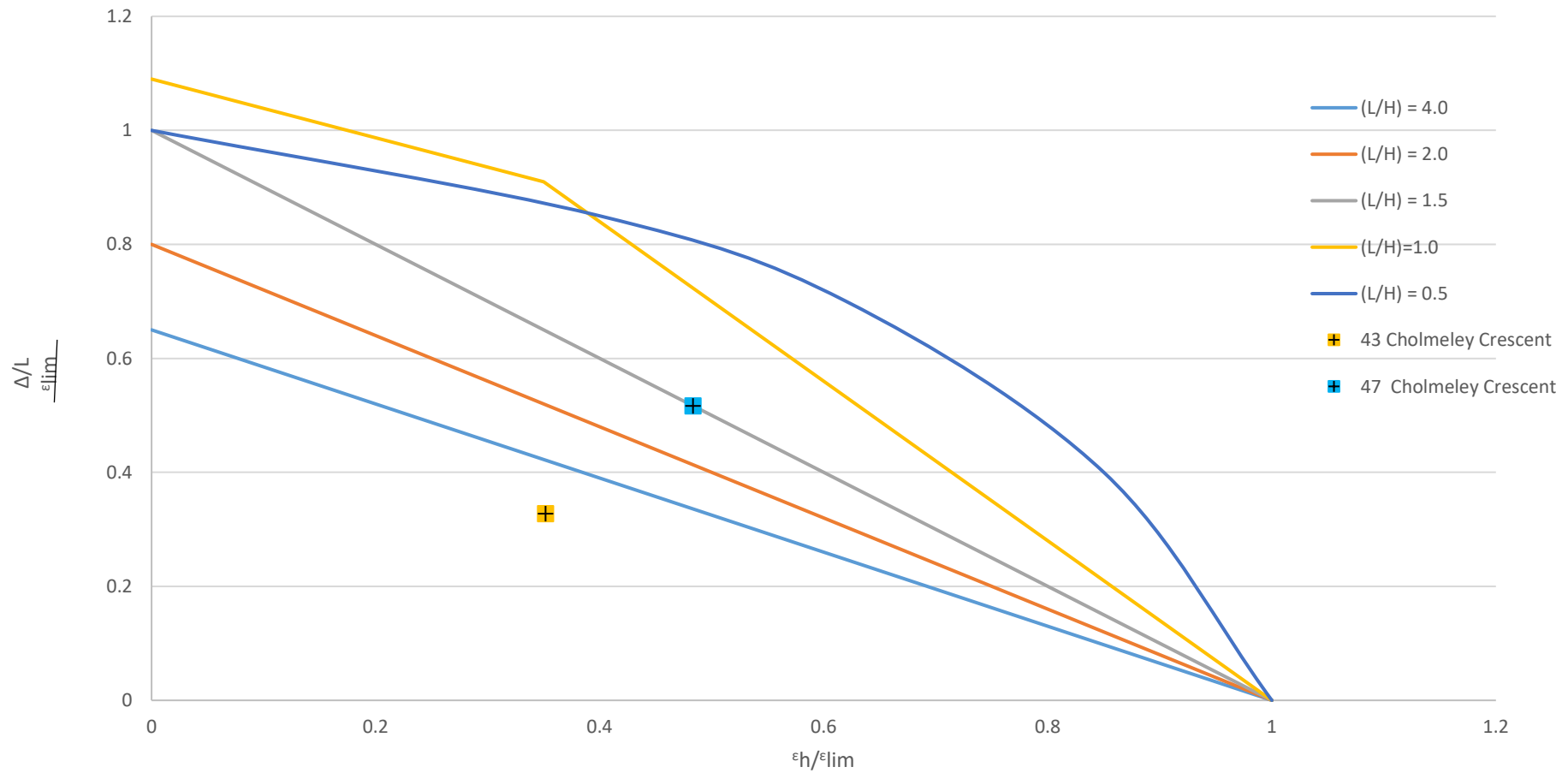
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Ground Movement Assessment 47 Cholmeley Crescent

Figure

10.2

Influence of Horizontal Strain on $(\Delta/L)/\epsilon_{lim}$



Client

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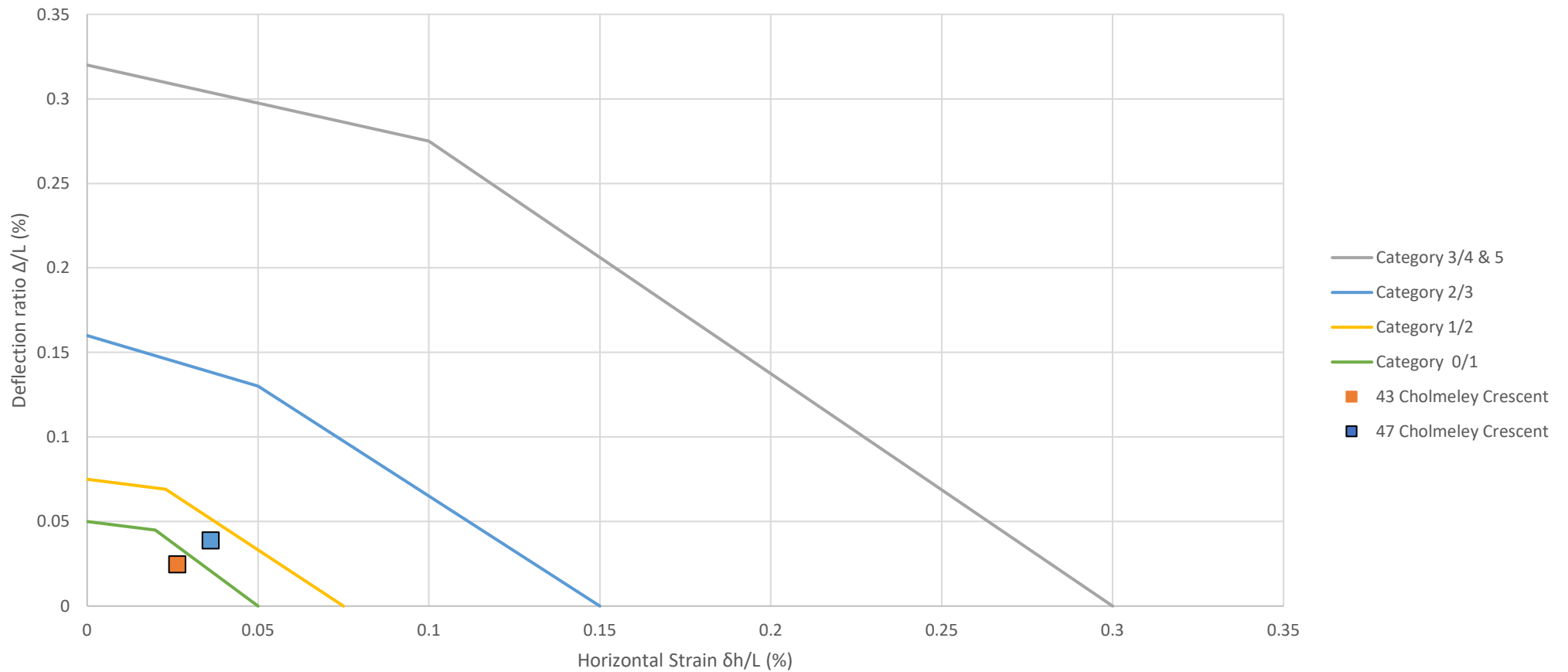
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Ground Movement Assessment Influence of Horizontal Strain

Figure

10.3

Damage Category (after Burland 2001) L/H 1.0



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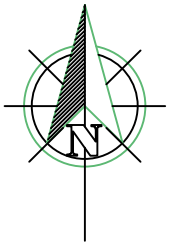
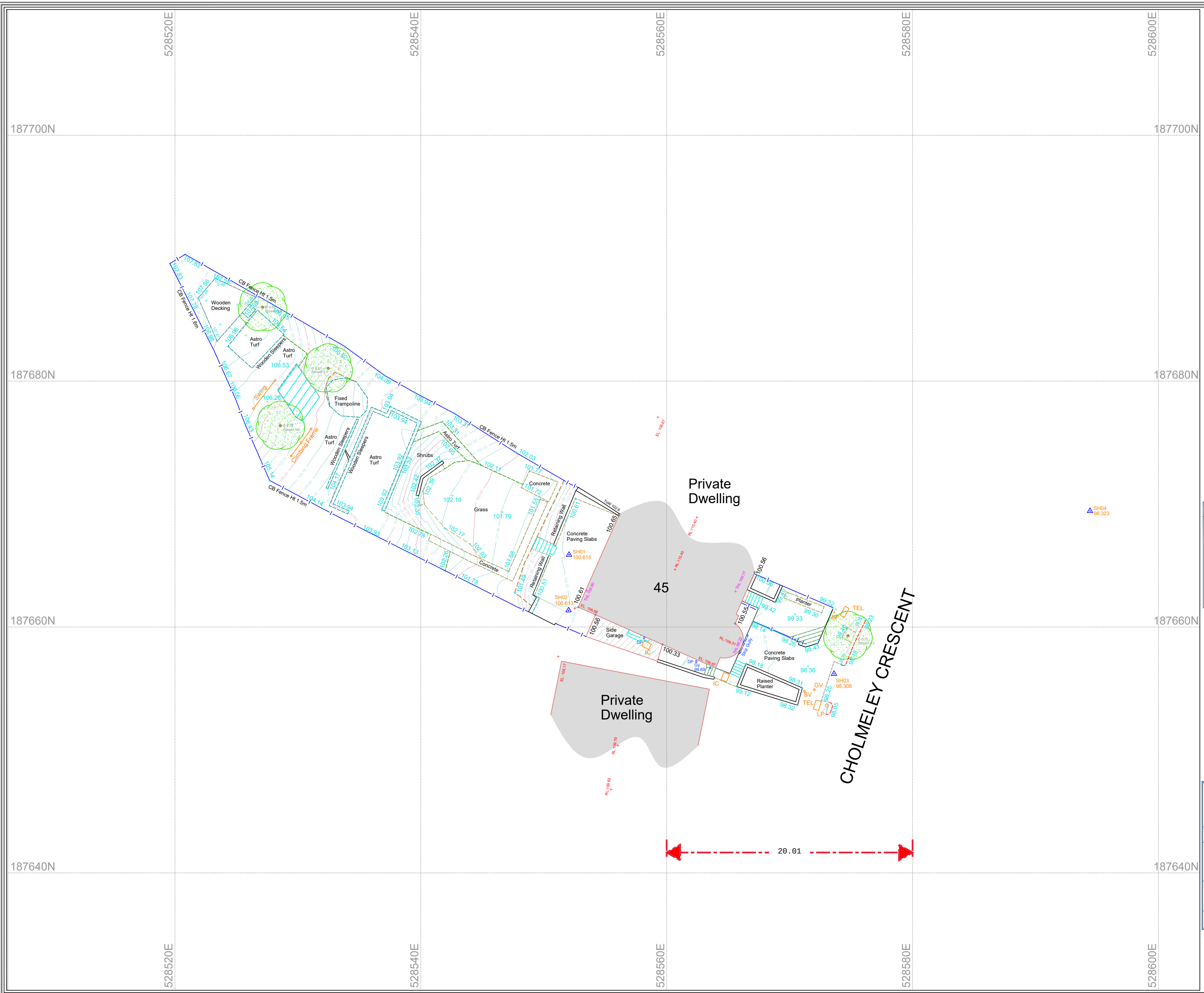
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Ground Movement Assessment Damage Category

Figure

10.4

Appendix A: Drawings

[illegible]

Boundary Line		Fence	
(Building Roof Line)		OS Detail	
Building		Steps	
Building Canopy		Trackway	
Edge of Scrub		Tree Canopy	
Edge of Vegetation		Verge	
Embankment Bottom		Verge Concrete	
Embankment Top		Verge Grass	
Kerb		Verge Tarmac	
Kerb - Drop		Wall	
Kerb - Top		Water Edge	
Suffixes			
(D) - Dilapidated	(L) - Illuminated	(R) - Retractable	(RF) - Reflective

Station	Easting (m)	Northing (m)	Level (m)
SH01	528552.056	187665.873	100.61
SH02	528552.024	187661.352	100.61
SH03	528573.613	187656.192	98.30
SH04	528594.439	187669.433	98.32

Survey Coordinates and Grid

Please note that the grid shown on this drawing is as follows;

- ☐ Arbitrary
- ☐ Arbitrary but approx. related to North
- ☐ Best fit to an Ordnance Survey Digital Sheet
- ☒ Related to the Ordnance Survey National GPS Network

Levels

Please note that the levels shown on this drawing are as follows;

- ☐ Arbitrary
- ☐ Related to an Ordnance Survey Bench Mark
- ☒ Related to the Ordnance Survey National GPS Network

		Nottingham Manchester London Head Office: 0115 741123 mail@surveyhub.co.uk www.surveyhub.co.uk	
Client		Dmitry Podpolny	
Project		45 Cholmeley Crescent London, N6 5EX	
Title		Topographical Survey - 2D	
Surveyed	ST	Checked	MC
Sheet No	1 of 1	Date	21/02/2023
		Scale	1:200@A2
Job No.	5864	Rev.	0

NOTES:

All critical measurements should be checked on site prior to design.

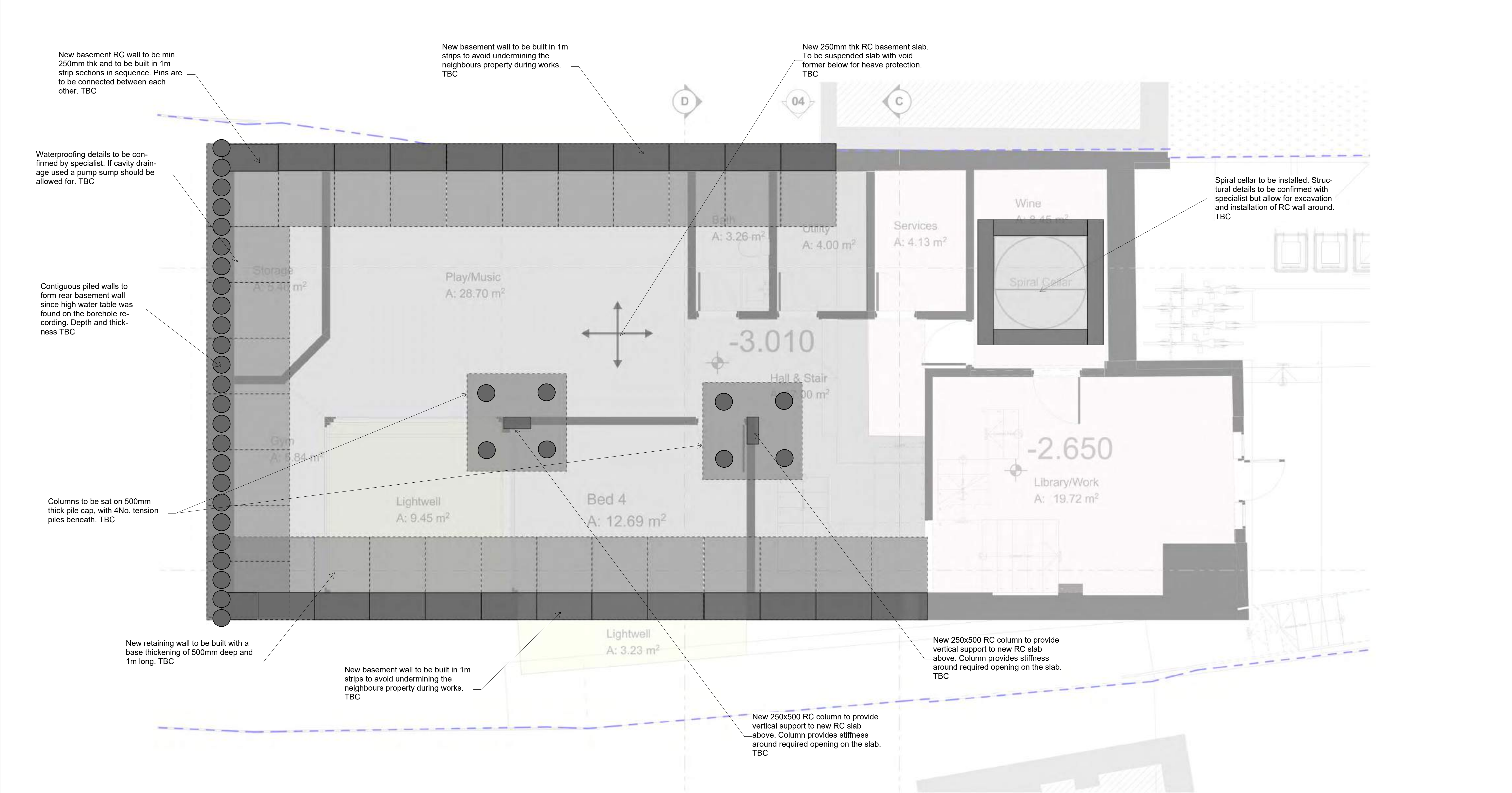
No liability will be taken for this plan if passed on to 3rd parties.

Some services/data may be omitted in areas of parked vehicles and vegetation.

THE SURVEY HAS BEEN ORIGINATED TO THE ORDINANCE SURVEY (O.S.) NATIONAL GRID (OSGB36) VIA A GLOBAL POSITION SYSTEM (GPS) AND THE O.S. ACTIVE NETWORK (OS.NET). A TRUE OSGB36 COORDINATE HAS BEEN ESTABLISHED NEAR TO THE SITE CENTRE VIA A TRANSFORMATION USING THE OSNTV3 & OSNTM3 TRANSFORMATION MODELS.

THE SURVEY HAS BEEN CORRELATED TO THIS POINT AND A FURTHER ONE OR MORE OSGB36 POINTS ESTABLISHED TO CREATE A TRUE O.S. BEARING FOR ANGLE ORIENTATION. NO SCALE FACTOR HAS BEEN APPLIED TO THE SURVEY THEREFORE THE COORDINATES ARE UNADJUSTED PLANE COORDINATES.

PLEASE REFER TO SURVEY STATION TABLE TO ENABLE ESTABLISHMENT OF THE ON-SITE GRID.

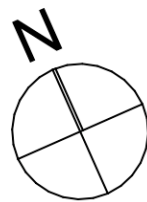


Basement Floor Plan
1:50

- Notes:
- These drawings are not to be used for setting out purposes. Refer to the latest Architects information and site measure as required.
 - Contact SD Structures in the event of any discrepancies between findings on site and these drawings.
 - Drawing is to be read in conjunction with the SD Structures Engineer's Specification and General Notes.
 - 3D views are indicative only and any conflicting 2D information should take precedence. If in doubt contact SD Structures prior to starting work

KEY					
	Existing	Concrete	Steel	Timber	Masonry
Beams	Ex beam				
Column / pier					
Wall					
Column / wall below					
Slab/floor	Ex				

KEY CONT'D	
	Foundation below
ps	Padstone
	Lintel above
DJ / TJ	Double / triple joist
⌵	Crank point
⌵	Lateral restraint strap



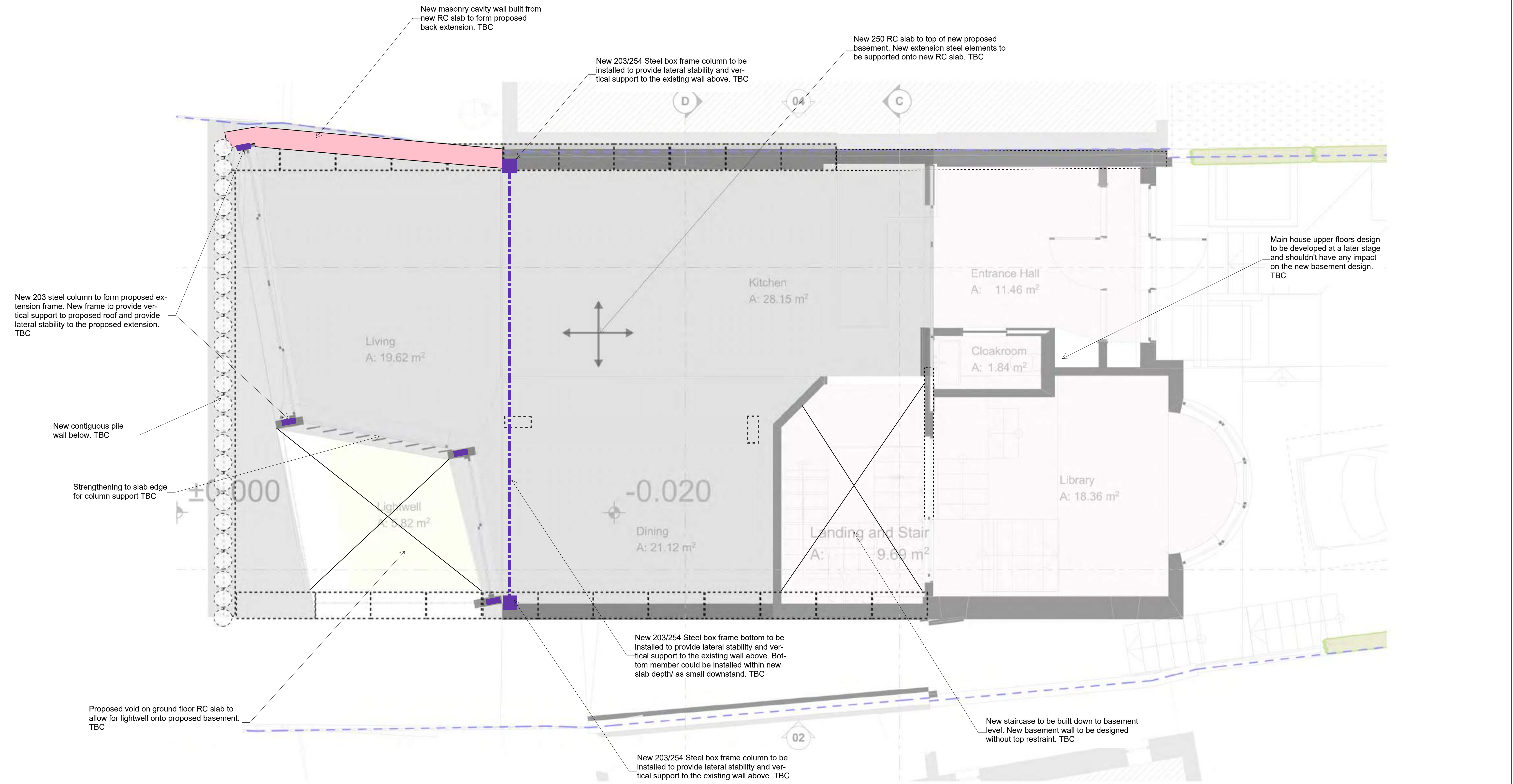
Hazards noted thus

SCALE 1:50
0 1000 2000 3000 4000 5000mm

P02	Issued for Coordination	21/07/2023	MF	MF
Rev	Amendment	Date	Drawn	Eng

Scale: As indicated
@A1

S1	Suitable for Coordination					
45 Chomeley Crescent 1711	Eng: MF Drawn: MF					
Basement Floor Plan						
Prg	Orig	Lev	Rol	No	Status	Rev
1711	-	SDS-B1-S-2000			S1	P02

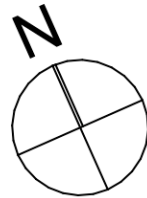


Ground Floor Plan
1:50

- Notes:
- 1. These drawings are not to be used for setting out purposes. Refer to the latest Architects information and site measure as required.
 - 2. Contact SD Structures in the event of any discrepancies between findings on site and these drawings.
 - 3. Drawing is to be read in conjunction with the SD Structures Engineer's Specification and General Notes.
 - 4. 3D views are indicative only and any conflicting 2D information should take precedence. If in doubt contact SD Structures prior to starting work

KEY					
	Existing	Concrete	Steel	Timber	Masonry
Beams	Ex beam				
Column / pier					
Wall					
Column / wall below					
Slab/floor	Ex				

KEY CONT'D	
	Foundation below
ps	Padstone
	Lintel above
DJ / TJ	Double / triple joist
CP	Crank point
	Lateral restraint strap



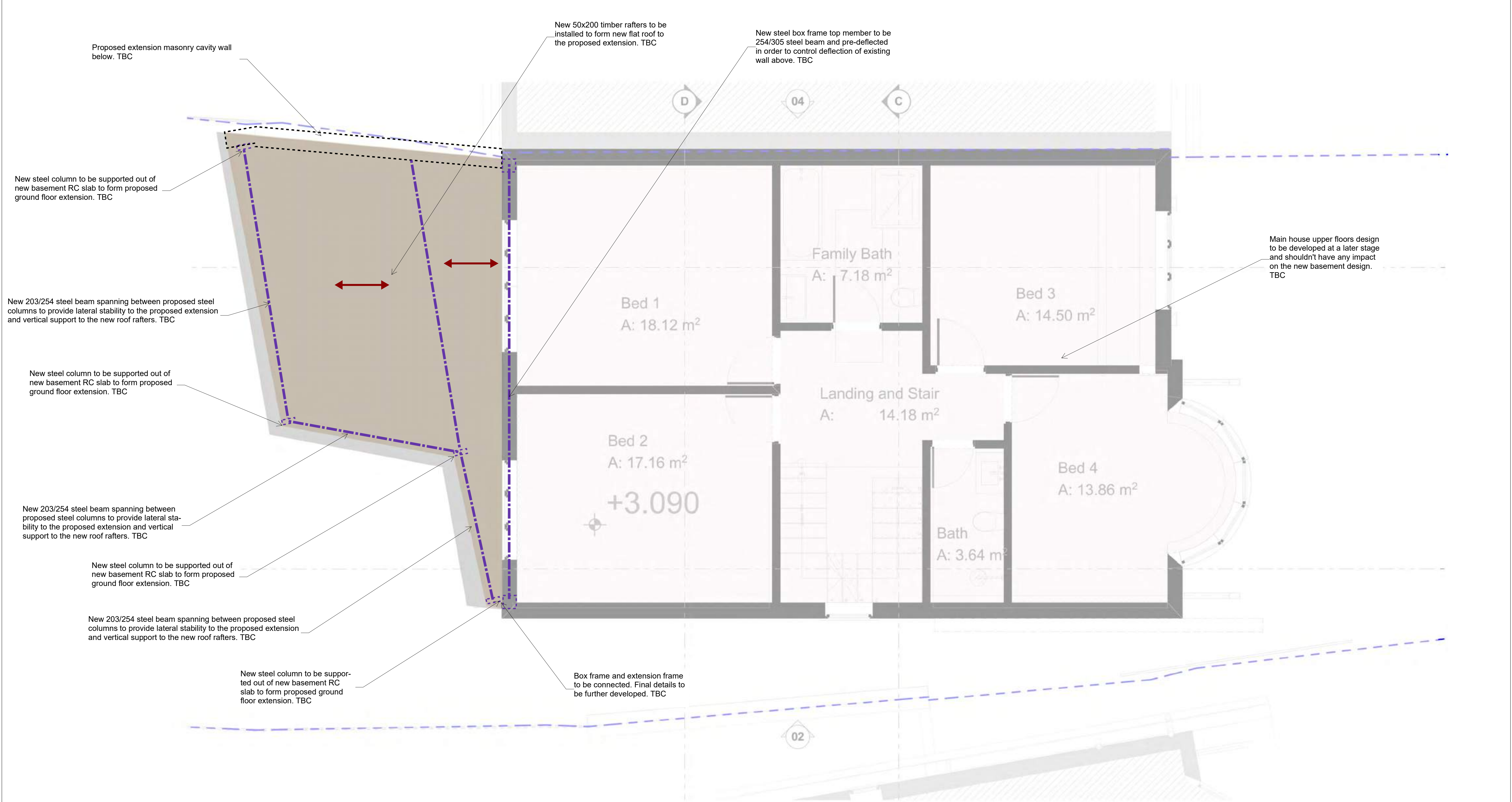
Hazards noted thus

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P02	Issued for Coordination	21/07/2023	MF	MF
Rev	Amendment	Date	Drawn	Eng

Scale: As indicated
@A1

S1	Suitable for Coordination					
45 Chomeley Crescent 1711	Eng: MF Drawn: MF					
Ground Floor Plan						
Proj	Orig	Lev	Rol	No	Status	Rev
1711	-	SDS-GF-S-2001			S1	P02

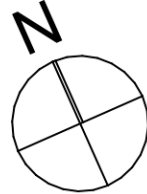


First Floor Plan
1:50

- Notes:
- These drawings are not to be used for setting out purposes. Refer to the latest Architects information and site measure as required.
 - Contact SD Structures in the event of any discrepancies between findings on site and these drawings.
 - Drawing is to be read in conjunction with the SD Structures Engineer's Specification and General Notes.
 - 3D views are indicative only and any conflicting 2D information should take precedence. If in doubt contact SD Structures prior to starting work

KEY					
	Existing	Concrete	Steel	Timber	Masonry
Beams	Ex beam				
Column / pier					
Wall					
Column / wall below					
Slab/floor	Ex				

KEY CONT'D	
	Foundation below
ps	Padstone
	Lintel above
DJ / TJ	Double / triple joist
CP	Crank point
	Lateral restraint strap



Hazards noted thus

SCALE 1:50
0 1000 2000 3000 4000 5000mm

P01	Issued for Coordination	08/05/2023	MF	MF
Rev	Amendment	Date	Drawn	Eng

Scale: As indicated @A1



SD STRUCTURES

S1		Suitable for Coordination	
45 Chomeley Crescent		Eng: MF	
1711		Drawn: MF	
First Floor Plan			
Proj	Orig	Lev	Rel
1711	-	SDS-GF-S-2002	
Status	Rev		
S1	P01		



S1 Suitable for Coordination

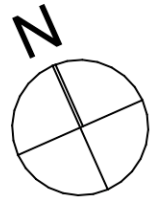
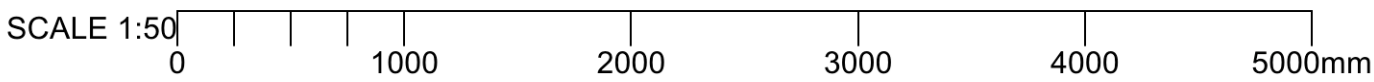
**45 Chomeley Crescent
1711** Eng: **MF**
Drawn: **MF**

First Floor Plan

Proj	Orig	Lev	Rev	No	Status	Rev
1711	-	SDS-GF-S-2002			S1	P02

P02	Issued for Coordination	21/07/2023	MF	MF
Rev	Amendment	Date	Drawn	Eng

Scale: As indicated
@A1



Hazards noted thus

**Section
1:50**

KEY					
	Existing	Concrete	Steel	Timber	Masonry
Beams	Ex beam				
Column / pier					
Wall					
Column / wall below					
Slab/floor	Ex				

KEY CONT'D	
	Foundation below
ps	Padstone
	Lintel above
DJ / TJ	Double / triple joist
CP	Crank point
LR	Lateral restraint strap

Notes:

- These drawings are not to be used for setting out purposes. Refer to the latest Architects information and site measure as required.
- Contact SD Structures in the event of any discrepancies between findings on site and these drawings.
- Drawing is to be read in conjunction with the SD Structures Engineer's Specification and General Notes.
- 3D views are indicative only and any conflicting 2D information should take precedence. If in doubt contact SD Structures prior to starting work

New steel box frame top member to be 254/305 steel beam and pre-deflected in order to control deflection of existing wall above. TBC

New 250 RC slab to top of new proposed basement. New extension steel elements to be supported onto new RC slab. TBC

New 250x500 RC column to provide vertical support to new RC slab above. TBC

Contiguous piled walls to form rear basement wall since high water table was found on the borehole recording. Depth and thickness TBC

Waterproofing details to be confirmed by specialist. If cavity drainage used a pump sump should be allowed for. TBC

Slab to have base thickening 500mm deep and 1m long. To be dowelled into piled wall. TBC

New 250mm thk RC basement slab. To be suspended slab with void former below for heave protection. TBC

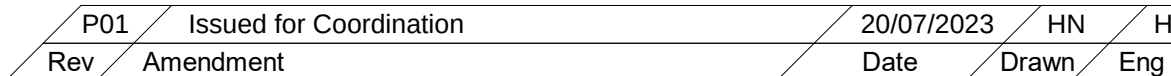
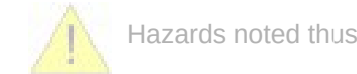
Column to be sat on 500mm thick pile cap, with 4No. tension piles beneath (in 2x2 layout). TBC

New 250x500 RC column to provide vertical support to new RC slab above. Column provides stiffness around required opening on the slab. TBC

Main house upper floors design to be developed at a later stage and shouldn't have any impact on the new basement design. TBC



KEY CONT'D	
	Foundation below
	Padstone
	Lintel above
DJ / TJ	Double / triple joist
	Crank point
	Lateral restraint strap



Proj	Orig	Lev	Rel	No	Status	Rev
1711	-	SDS-B1-S-6000			S1	P01



Basement Loading - Markup for BIA

Appendix B: Ground Investigation Factual Report

45 Cholmeley Crescent, London N6 5EX

Ground Investigation Factual Report

August 2023

MAUND GEO-CONSULTING

Produced for: Mr and Mrs Podpolny

Prepared by:

Julian Maund BSc PhD CEng MIMMM CGeol FGS
UK and Ireland Registered Ground Engineering Adviser

Maund Geo-Consulting Ltd
3 Coopers Square
Chipping Norton

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MGC-132-GIFR-V2

Document Control Sheet

Project Title 45 Cholmeley Crescent, London N6 5EX

Report Title Ground Investigation Factual report

Reference MGC-132-GIFR-V2

Revision 1

Status Final

Record of Issue

Issue	Status	Date	Author	
V1	Draft	28/07/23	Julian Maund BSc PhD CEng MIMMM CGeol FGS Registered Ground Engineering Adviser	
V2	Final	07/08/23	Julian Maund BSc PhD CEng MIMMM CGeol FGS Registered Ground Engineering Adviser	

Distribution

Organisation	Contact
Client	Dmitry and Marina Podpolny
Scenario Architects	Luca Dalmasso
SD Engineers	Mario Ferreira

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2.4	Proposed development	2
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Appendix A: Exploratory Hole Records

Appendix B: Laboratory Test Reports

1 Introduction

1.1 Terms of Reference

Maund Geo-Consulting Ltd (MGC) was instructed on 30/01/2023 by Scenario Architects , to undertake a ground investigation for the site at 45 Cholmeley Crescent. The objective of the ground investigation was to determine the ground conditions at the site for support of a Basement Impact Assessment (BIA) for the London Borough of Haringey.

1.2 Terms and Conditions

This report has been prepared for Mr and Mrs Podpolny in consideration of the proposed further development of the site. The geotechnical information relates to the site only and should not be used in a different context without reference to MGC.

The report has been prepared for the exclusive benefit of Mr and Mrs Podpolny. The report contents should only be used in that context. Furthermore, new information, changed practices or new legislation may necessitate revised interpretation of the report after the date of its submission.

MGC has used reasonable skill, care and diligence in the design of the investigation of the site. The inherent variation of ground conditions allows only definition of the actual conditions at the locations and depths at the time of the investigation. At intermediate locations, conditions can only be inferred.

2 Information on the Site

2.1 Location

45 Cholmeley Crescent is located within Highgate, within the London Borough of Haringey. The ground level is approximately 98.30 m AOD at the front of the property.

2.2 Description

The current building is a residential dwelling and forms a semi detached house comprising four storeys. Due to the change in ground level the ground floor at the front of the property comprising a garage, becoming a basement to the rear. The ground level ranges from approximately 98m AOD at the front of the house to 100.50m AOD at the rear.

2.3 Present use

A residential dwelling.

2.4 Proposed development

The proposed development is understood to provide an extension to the existing basement, extending to the rear of the property.

2.5 Geology

Geological information obtained from <http://mapapps.bgs.ac.uk/geologyofbritain3d/> British Geological Survey (BGS) mapping at 1 50 000 scale shows the site to be directly underlain by the Claygate Member of the London Clay Formation (LCF). The BGS Geoindex describes the Claygate Member to comprises dark grey clays with sand laminae, passing up into thin alternations of clays, silts and fine-grained sand, with beds of bioturbated silt.

2.6 Hydrogeology/groundwater

The property is located on the bedrock geology of the LCF which is classified as an 'unproductive stratum' which is effectively impermeable. The site does not lie within a ground water protection zone.

3 Ground Investigation

A ground investigation was undertaken by PM Sampling Ltd on behalf of MGC on 03/07/23. The exploratory holes are indicated in Figure 3.1. The factual information of the exploratory holes records is included in Appendix A and laboratory testing results are included in Appendix B.

The site investigation comprised:

- 1 No. Inspection Pit to 1.00m
- 1 No. modular Nordmeyer borehole to 5.45 m bgl.
- The in-situ strengths determined by standard penetration testing
- Disturbed soil samples were obtained from the exploratory holes for laboratory geotechnical testing and further examination.
- A 20 mm diameter groundwater monitoring well was installed to 4.0 m

The borehole was located to the rear of the property on the patio at a ground level of approximately 100.50 m AOD, as indicated in Figure 3.1.

A further investigation comprising two trial pits to expose existing foundations was undertaken on 03/08/23 by PM Sampling Ltd as indicated in Figure 3.1.



Figure 3.1 Exploratory Hole Location

4 Laboratory Testing

Laboratory tests to determine the geotechnical properties of the soil were scheduled by MGC and carried out by i2 Laboratories Ltd generally in accordance with BS1377:1990 and UKAS. The tests included:

Test type	No. of tests	Test Method
Moisture Content	5	BS1377:1990
Plasticity Index - 1 point Liquid Limit	5	BS1377:1990
pH, and water-soluble sulphate,	2	BRE SD1
Standard Spectrum Suite: Asbestos Screen & ID , pH, TOC, Total Sulphate, Sulphide, Monohydric Phenols, Total Cyanide, W/S Boron, As, Cr, Cu, Pb, Se, Zn, Cd, Hg, Ni, Speciated PAH, TPH1 & TPH CWG	1	MCERTS
WAC Full Solid Suite	1	ISO 17025

The laboratory test reports are included in Appendix B.

5 Groundwater Monitoring

The groundwater level was monitored in the borehole installation on completion of drilling. On completion of drilling the borehole was dry to 5.45m. A groundwater monitoring installation was installed to 4.00m. The installation comprised a gravel pack from 4.00 to 2.00m depth with a slotted pipe from 4.00 to 2.00m and solid pipe in bentonite to ground level. The pipe had a rubber bung sealing the top and was protected by a stock cock cover. The results of the monitoring shown in Table 5.1 indicate groundwater is at 0.75m bgl or about 99.75m AOD.

Table 5.1 Groundwater Monitoring

Date of Monitoring	Groundwater (depth metres below ground level)
03/07/23	Borehole was damp from 4.00m
14/07/23	0.94
27/08/23	0.75
03/08/23	0.75

6 References

BS 1377:1990. British Standard Methods of test for soils for Civil engineering purposes. British Standards Institution.

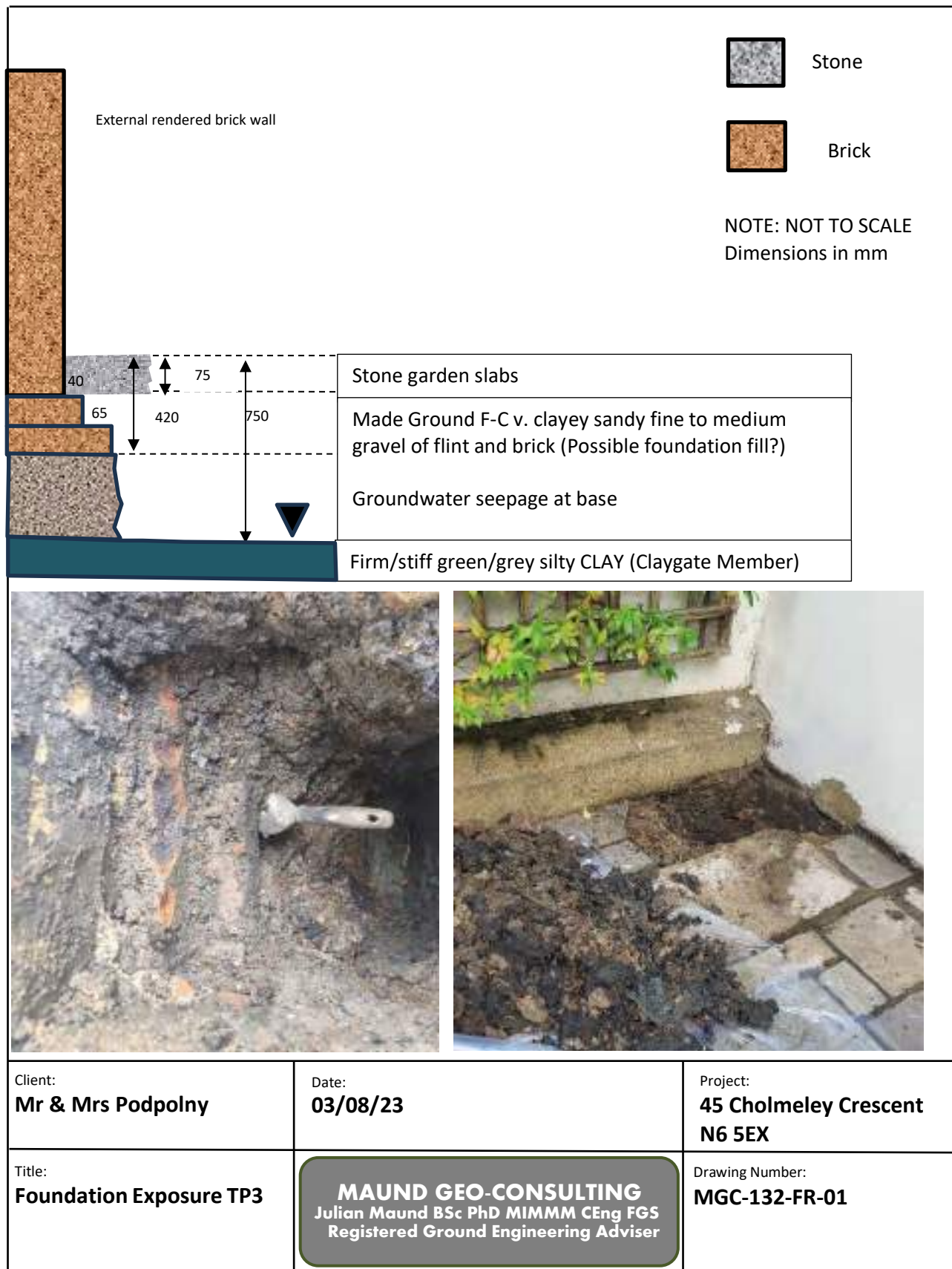
BS 5930: 2015. *Code of practice for Ground Investigation*. British Standards Institution.

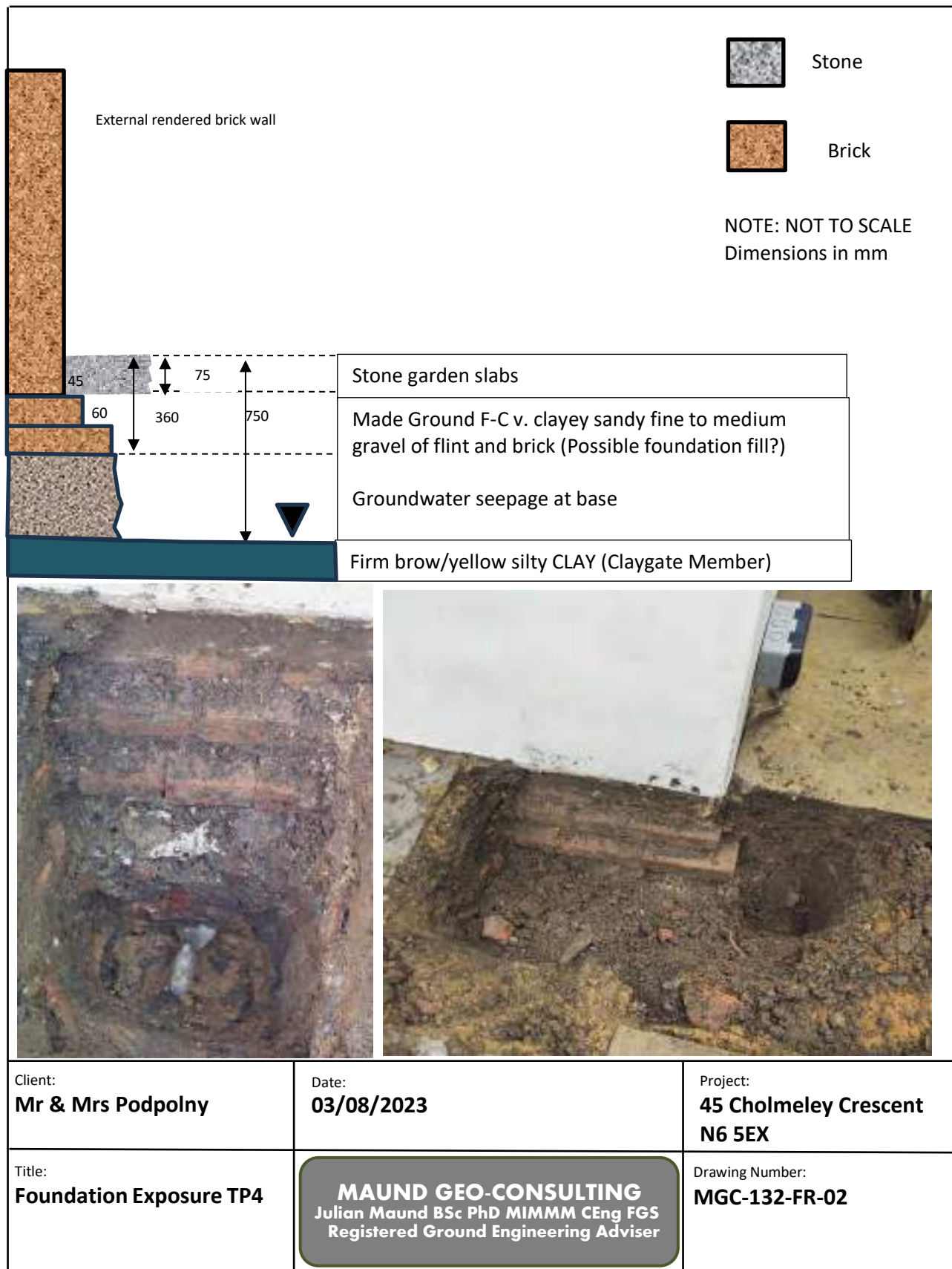
BS EN 1997-2 Eurocode 7 Geotechnical Design Part 2 Ground Investigation and Testing – inc. corrigendum 2010

BGS Geology of Britain Viewer (<http://mapapps.bgs.ac.uk/geologyofbritain/home.html>)

Appendix A: Exploratory Hole Records

MAUND GEO-CONSULTING Julian Maund BSc PhD MIMMM CEng FGS CGeol Registered Ground Engineering Adviser Maund Geo-Consulting Ltd 3 Coopers Square Chipping Norton OX7 5DG julian.maund@gmail.com					Borehole No. BH01 Sheet 1 of 1			
Project Name: 45 Cholmeley Crescent N6 5EX		Project No: MGC-132		Co-ords 528553 , 187665		Hole Type: Nordmeyer LMSR-H Modular		
Location: Rear garden terrace		Level: (m AOD) 100.50 (Approx.)		Hole Diameter: 100 mm				
Client: Ms M. Podpolny		Date Drilled: 03/07/2023		Logged By: JGM				
Well	Water Strikes	Sampling and Insitu Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.35	D1 + E1		0.35	100.15		Made Ground: Stone slab 50mm thick over sandy clayey fine to coarse gravel of brick, concrete and flint
		1.00	D2	N=8 (1/2, 2, 2, 2, 2)	1.10	99.40		Soft to firm brown mottled yellow silty fine sandy CLAY (Claygate Member)
		2.00	D3	N=5 (1/1, 1, 1, 1, 2)				Soft to firm brown grey silty fine sandy CLAY (Claygate Member)
		3.00	D4	N= 8 (2/2, 2, 2, 2, 2)				... becoming green grey silty fine sandy CLAY at 2.5m
		4.00	D5	N=8 (1/2, 1, 2, 2, 3)				... becoming moist from 4.0m
		5.00	D6	N= 14 (2/2, 3, 3, 4, 4)				
					5.45	95.05		Borehole complete at 5.45 m
Remarks Inspection pit to 1.0 m. Borehole showed slight seepage at 4.0m. Standpipe Piezometer installed to depth of 4.0m. Bentonite/clay seal from 2.0 to 0.3 m. Gas bung and flat cover								





Appendix B: Laboratory Test Reports

Client: Maund GeoConsulting Ltd
Client Address: 3 Coopers Square, Chipping Norton,
Oxfordshire, OX7 5DG

Contact: Julian Maund
Site Address: 45 Cholmeley Crescent N6 5EX

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Client Reference: MGC-132
Job Number: 23-43112-1
Date Sampled: 03/07/2023
Date Received: 04/07/2023
Date Tested: 13/07/2023
Sampled By: Not Given

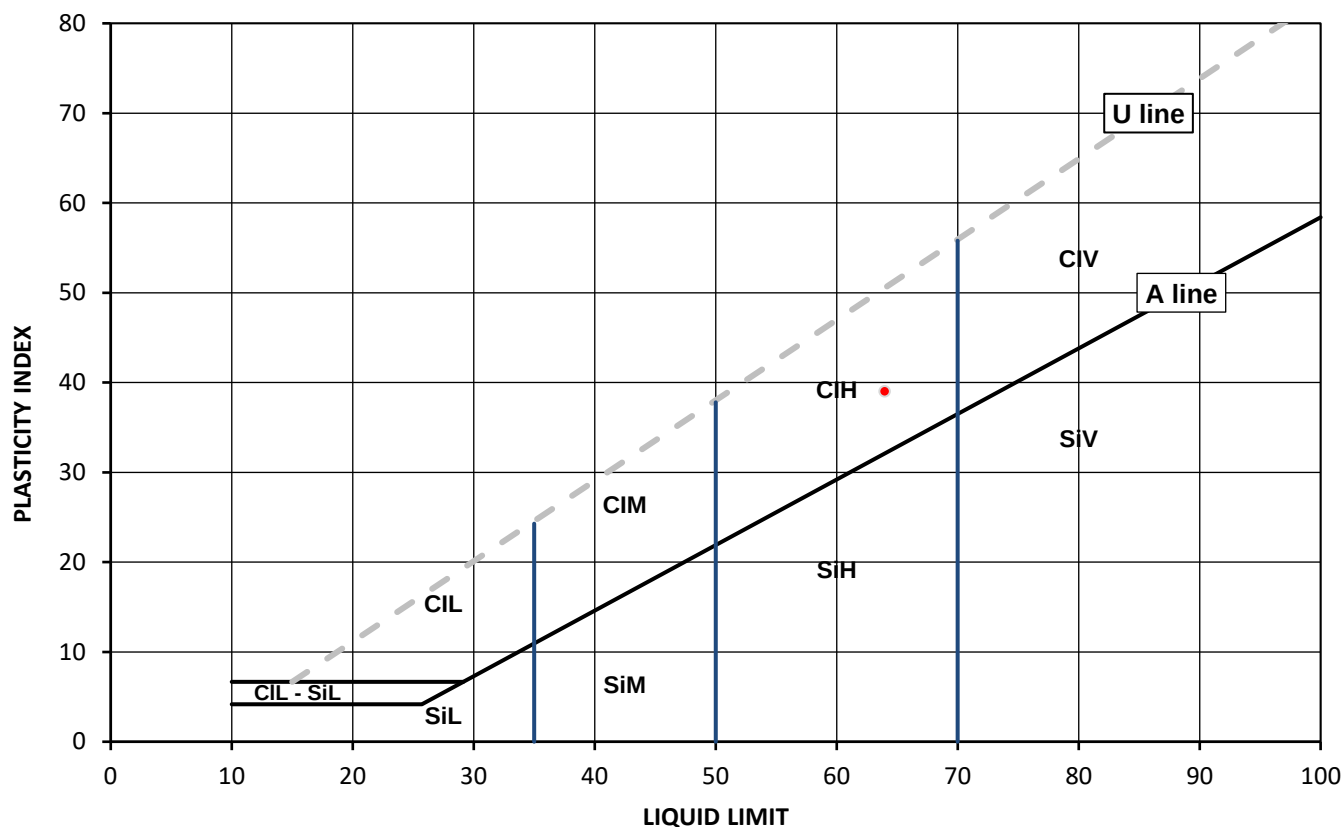
Test Results:

Laboratory Reference: 2736725
Hole No.: BH1
Sample Reference: Not Given
Sample Description: Brown slightly gravelly CLAY

Depth Top [m]: 1.00
Depth Base [m]: 1.45
Sample Type: D

Sample Preparation: Tested after >425 µm removed by hand

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
19	64	25	39	97



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

	Plasticity	Liquid Limit
Cl Clay	L Low	below 35
Si Silt	M Medium	35 to 50
	H High	50 to 70
	V Very high	exceeding 70
	O Organic	append to classification for organic material (eg CIHO)

Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

Katarzyna Koziel
Reporting Specialist
for and on behalf of i2 Analytical Ltd

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.

Client: Maund GeoConsulting Ltd
Client Address: 3 Coopers Square, Chipping Norton,
Oxfordshire, OX7 5DG

Contact: Julian Maund
Site Address: 45 Cholmeley Crescent N6 5EX

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Client Reference: MGC-132
Job Number: 23-43112-1
Date Sampled: 03/07/2023
Date Received: 04/07/2023
Date Tested: 13/07/2023
Sampled By: Not Given

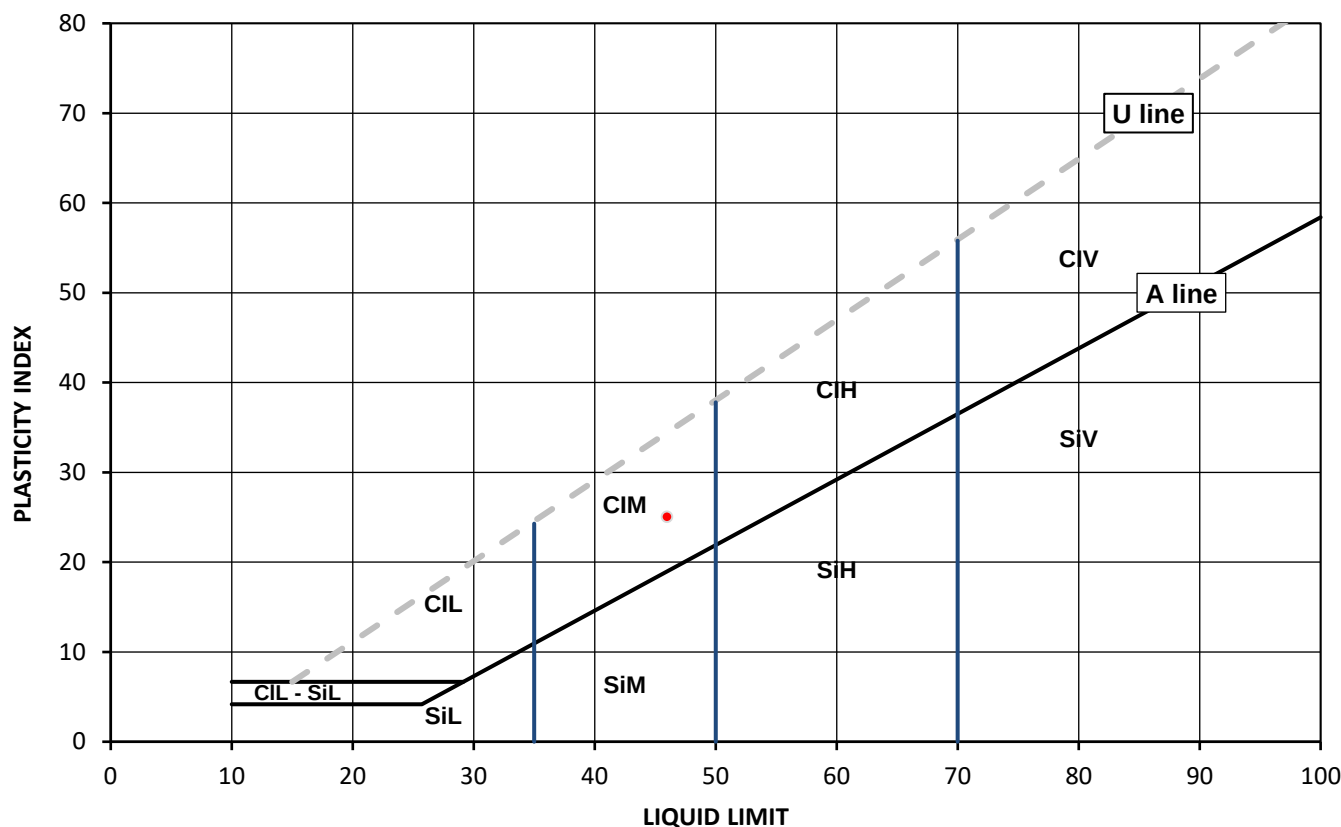
Test Results:

Laboratory Reference: 2736726
Hole No.: BH1
Sample Reference: Not Given
Sample Description: Brown slightly gravelly slightly sandy CLAY

Depth Top [m]: 2.00
Depth Base [m]: 2.45
Sample Type: D

Sample Preparation: Tested after >425 µm removed by hand

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
30	46	21	25	99



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

	Plasticity	Liquid Limit
Cl Clay	L Low	below 35
Si Silt	M Medium	35 to 50
	H High	50 to 70
	V Very high	exceeding 70
	O Organic	append to classification for organic material (eg CIHO)

Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

Katarzyna Koziel
Reporting Specialist
for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with: BS 1377-2:1990: Clause 4.4 and 5

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

Client: Maund GeoConsulting Ltd
Client Address: 3 Coopers Square, Chipping Norton,
Oxfordshire, OX7 5DG

Contact: Julian Maund
Site Address: 45 Cholmeley Crescent N6 5EX

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Client Reference: MGC-132
Job Number: 23-43112-1
Date Sampled: 03/07/2023
Date Received: 04/07/2023
Date Tested: 13/07/2023
Sampled By: Not Given

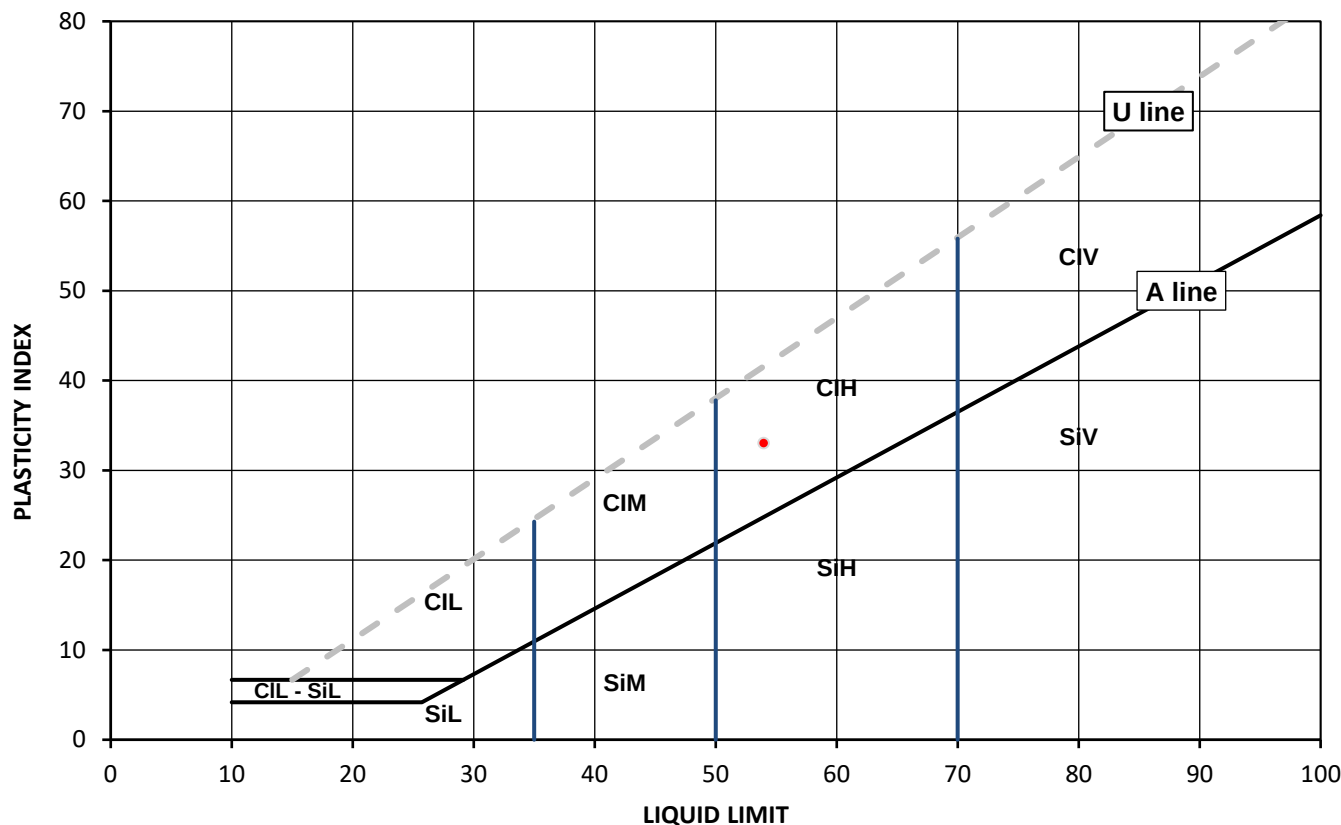
Test Results:

Laboratory Reference: 2736727
Hole No.: BH1
Sample Reference: Not Given
Sample Description: Brown slightly sandy CLAY

Depth Top [m]: 3.00
Depth Base [m]: 3.45
Sample Type: D

Sample Preparation: Tested in natural condition

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
28	54	21	33	100



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

	Plasticity	Liquid Limit
Cl Clay	L Low	below 35
Si Silt	M Medium	35 to 50
	H High	50 to 70
	V Very high	exceeding 70
	O Organic	append to classification for organic material (eg CIHO)

Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

Katarzyna Koziel
Reporting Specialist
for and on behalf of i2 Analytical Ltd

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Client: Maund GeoConsulting Ltd
Client Address: 3 Coopers Square, Chipping Norton,
Oxfordshire, OX7 5DG

Contact: Julian Maund
Site Address: 45 Cholmeley Crescent N6 5EX

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Client Reference: MGC-132
Job Number: 23-43112-1
Date Sampled: 03/07/2023
Date Received: 04/07/2023
Date Tested: 13/07/2023
Sampled By: Not Given

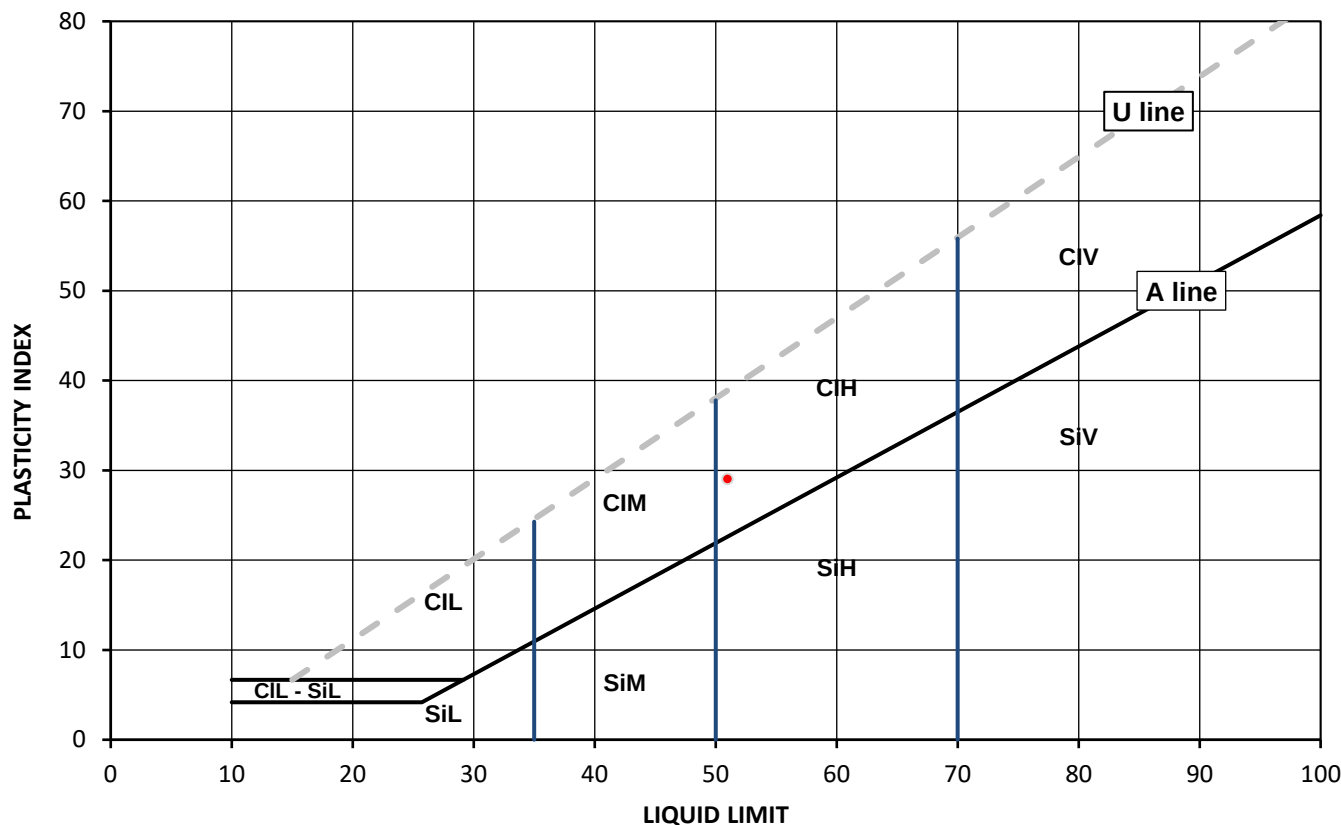
Test Results:

Laboratory Reference: 2736728
Hole No.: BH1
Sample Reference: Not Given
Sample Description: Brownish grey slightly sandy CLAY

Depth Top [m]: 4.00
Depth Base [m]: 4.45
Sample Type: D

Sample Preparation: Tested in natural condition

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
23	51	22	29	100



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

	Plasticity	Liquid Limit
Cl Clay	L Low	below 35
Si Silt	M Medium	35 to 50
	H High	50 to 70
	V Very high	exceeding 70
	O Organic	append to classification for organic material (eg CIHO)

Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

Katarzyna Koziel
Reporting Specialist
for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with: BS 1377-2:1990: Clause 4.4 and 5

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

Client: Maund GeoConsulting Ltd
Client Address: 3 Coopers Square, Chipping Norton,
Oxfordshire, OX7 5DG

Contact: Julian Maund
Site Address: 45 Cholmeley Crescent N6 5EX

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Client Reference: MGC-132
Job Number: 23-43112-1
Date Sampled: 03/07/2023
Date Received: 04/07/2023
Date Tested: 13/07/2023
Sampled By: Not Given

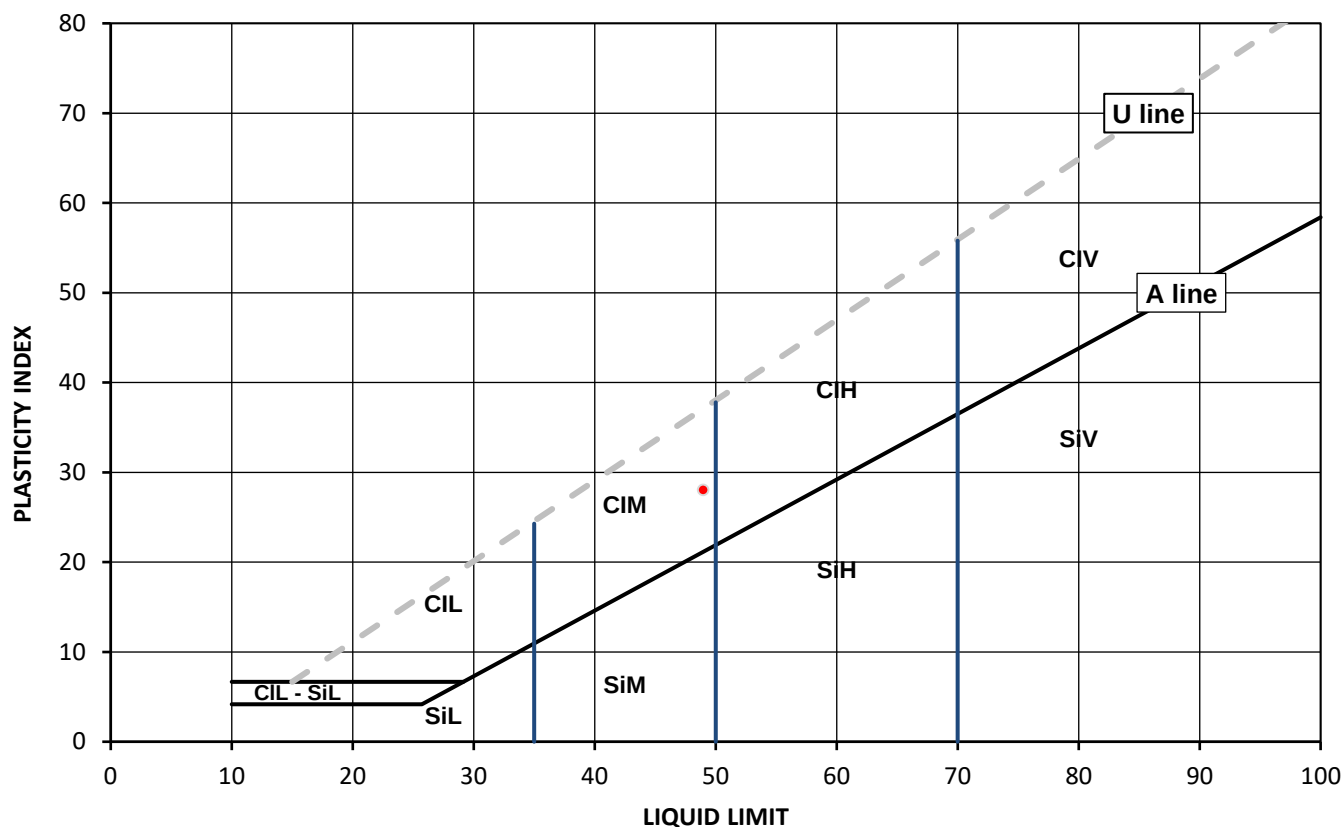
Test Results:

Laboratory Reference: 2736729
Hole No.: BH1
Sample Reference: Not Given
Sample Description: Brownish grey slightly sandy CLAY

Depth Top [m]: 5.00
Depth Base [m]: 5.45
Sample Type: D

Sample Preparation: Tested in natural condition

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
22	49	21	28	100



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

	Plasticity	Liquid Limit
Cl Clay	L Low	below 35
Si Silt	M Medium	35 to 50
	H High	50 to 70
	V Very high	exceeding 70
	O Organic	append to classification for organic material (eg CIHO)

Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

Katarzyna Koziel
Reporting Specialist
for and on behalf of i2 Analytical Ltd

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.



SUMMARY REPORT

SUMMARY OF CLASSIFICATION TEST RESULTS

Tested in Accordance with:

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



4041

Client: Maund GeoConsulting Ltd

Client Address: 3 Coopers Square, Chipping Norton,
Oxfordshire, OX7 5DG

Contact: Julian Maund

Site Address: 45 Cholmeley Crescent N6 5EX

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Water Content by BS 1377-2:1990: Clause 3.2 Atterberg by BS 1377-2: 1990:
Clause 4.3 (4 Point Test), Clause 4.4 (1 Point Test) and 5

Client Reference: MGC-132

Job Number: 23-43112-1

Date Sampled: 03/07/2023

Date Received: 04/07/2023

Date Tested: 13/07/2023

Sampled By: Not Given

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	Water Content BS 1377-2 [W] %	Water Content BS EN ISO 17892-1 [W] %	Atterberg				Density			Total Porosity# %		
		Reference	Depth Top m	Depth Base m	Type					% Passing 425um	WL	Wp	Ip	bulk Mg/m ³	dry Mg/m ³	PD Mg/m ³			
2736725	BH1	Not Given	1.00	1.45	D	Brown slightly gravelly CLAY	Atterberg 1 Point	19		97	64	25	39						
2736726	BH1	Not Given	2.00	2.45	D	Brown slightly gravelly slightly sandy CLAY	Atterberg 1 Point	30		99	46	21	25						
2736727	BH1	Not Given	3.00	3.45	D	Brown slightly sandy CLAY	Atterberg 1 Point	28		100	54	21	33						
2736728	BH1	Not Given	4.00	4.45	D	Brownish grey slightly sandy CLAY	Atterberg 1 Point	23		100	51	22	29						
2736729	BH1	Not Given	5.00	5.45	D	Brownish grey slightly sandy CLAY	Atterberg 1 Point	22		100	49	21	28						

Note: # Non accredited; NP - Non plastic

Comments:

Signed:

Katarzyna Koziel
Reporting Specialist
for and on behalf of i2 Analytical Ltd

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SUMMARY REPORT

DETERMINATION OF WATER CONTENT

Tested in Accordance with: BS 1377-2: 1990: Clause 3.2

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



4041

Client: Maund GeoConsulting Ltd

Client Address: 3 Coopers Square, Chipping Norton,
Oxfordshire, OX7 5DG

Contact: Julian Maund

Site Address: 45 Cholmeley Crescent N6 5EX

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Client Reference: MGC-132

Job Number: 23-43112-1

Date Sampled: 03/07/2023

Date Received: 04/07/2023

Date Tested: 13/07/2023

Sampled By: Not Given

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	WC	Sample preparation / Oven temperature at the time of testing			
		Reference	Depth Top m	Depth Base m	Type							
2736725	BH1	Not Given	1.00	1.45	D	Brown slightly gravelly CLAY		19	Sample was quartered, oven dried at 106.2 °C			
2736726	BH1	Not Given	2.00	2.45	D	Brown slightly gravelly slightly sandy CLAY		30	Sample was quartered, oven dried at 106.2 °C			
2736727	BH1	Not Given	3.00	3.45	D	Brown slightly sandy CLAY		28	Sample was quartered, oven dried at 106.2 °C			
2736728	BH1	Not Given	4.00	4.45	D	Brownish grey slightly sandy CLAY		23	Sample was quartered, oven dried at 106.2 °C			
2736729	BH1	Not Given	5.00	5.45	D	Brownish grey slightly sandy CLAY		22	Sample was quartered, oven dried at 106.2 °C			

Comments:

Signed:

Katarzyna Koziel
Reporting Specialist
for and on behalf of i2 Analytical Ltd

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Analytical Report Number : 23-43340

Project / Site name:	45 Cholmeley Crescent N6 5EX	Samples received on:	04/07/2023
Your job number:	MGC-132	Samples instructed on / Analysis started on:	04/07/2023
Your order number:		Analysis completed by:	11/07/2023
Report Issue Number:	1	Report issued on:	13/07/2023
Samples Analysed:	1 10:1 WAC sample		

Signed: _____

Dominika Warjan
Reporting Specialist
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

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

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.

i2 Analytical

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Waste Acceptance Criteria Analytical Results							
Report No:	23-43340						
					Client: MAUNDGEO		
Location	45 Cholmeley Crescent N6 5EX						
Lab Reference (Sample Number)	2737924 / 2737925				Landfill Waste Acceptance Criteria		
Sampling Date	03/07/2023				Limits		
Sample ID	BH1				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Depth (m)	0.00-0.35						
Solid Waste Analysis							
TOC (%)**	0.5				3%	5%	6%
Loss on Ignition (%) **	2.4				--	--	10%
BTEX (µg/kg)**	-				6000	--	--
Sum of PCBs (mg/kg)**	-				1	--	--
Mineral Oil (mg/kg) BH_1D_OU_AL	-				500	--	--
Total PAH (WAC-17) (mg/kg)	-				100	--	--
pH (units)**	7.8				--	>6	--
Acid Neutralisation Capacity (mmol / kg)	2.9				--	To be evaluated	To be evaluated
Eluate Analysis	10:1			10:1	Limit values for compliance leaching test		
(BS EN 12457 - 2 preparation utilising end over end leaching procedure)	mg/l			mg/kg	using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic *	0.0057			0.0438	0.5	2	25
Barium *	0.0209			0.161	20	100	300
Cadmium *	< 0.0001			< 0.0008	0.04	1	5
Chromium *	0.0076			0.058	0.5	10	70
Copper *	0.0093			0.072	2	50	100
Mercury *	< 0.0005			< 0.0050	0.01	0.2	2
Molybdenum *	0.0010			0.0078	0.5	10	30
Nickel *	0.0015			0.012	0.4	10	40
Lead *	0.040			0.31	0.5	10	50
Antimony *	< 0.0017			< 0.017	0.06	0.7	5
Selenium *	< 0.0040			< 0.040	0.1	0.5	7
Zinc *	0.024			0.18	4	50	200
Chloride *	0.48			3.7	800	15000	25000
Fluoride*	0.39			3.0	10	150	500
Sulphate *	6.7			52	1000	20000	50000
TDS*	43			330	4000	60000	100000
Phenol Index (Monohydric Phenols) *	< 0.010			< 0.10	1	-	-
DOC	7.70			59.1	500	800	1000
Leach Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	0.50						
Dry Matter (%)	85						
Moisture (%)	15						
Results are expressed on a dry weight basis, after correction for moisture content where applicable.				* = UKAS accredited (liquid eluate analysis only)			
Stated limits are for guidance only and i2 cannot be held responsible for any discrepancies with current legislation				** = MCERTS accredited			

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes as defined by the Waste (England and Wales) Regulations 2011 (as amended) and EA Guidance WM3.
This analysis is only applicable for landfill acceptance criteria (The Environmental Permitting (England and Wales) Regulations) and does not give any indication as to whether a waste may be hazardous or non-hazardous.



Analytical Report Number : 23-43340

Project / Site name: 45 Cholmeley Crescent N6 5EX

* 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 *
2737924	BH1	None Supplied	0.00-0.35	Brown clay and sand with gravel.

Analytical Report Number : 23-43340
Project / Site name: 45 Cholmeley Crescent N6 5EX

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
BS EN 12457-2 (10:1) Leachate Prep	10:1 (as recieved, moisture adjusted) end over end extraction with water for 24 hours. Eluate filtered prior to analysis.	In-house method based on BSEN12457-2.	L043-PL	W	NONE
Acid neutralisation capacity of soil	Determination of acid neutralisation capacity by addition of acid or alkali followed by electronic probe.	In-house method based on Guidance an Sampling and Testing of Wastes to Meet Landfill Waste Acceptance""	L046-PL	W	NONE
Loss on ignition of soil @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace.	In house method.	L047-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
pH at 20oC in soil	Determination of pH in soil by addition of water followed by electrometric measurement.	In house method.	L005-PL	W	MCERTS
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.	L019-UK/PL	D	NONE
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
Metals in leachate by ICP-OES	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil""	L039-PL	W	ISO 17025
Chloride 10:1 WAC	Determination of Chloride colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260.	L082-PL	W	ISO 17025
Fluoride 10:1 WAC	Determination of fluoride in leachate by 1:1ratio with a buffer solution followed by Ion Selective Electrode.	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination"	L033B-PL	W	ISO 17025
Sulphate 10:1 WAC	Determination of sulphate in leachate by ICP-OES	In-house method based on MEWAM 1986 Methods for the Determination of Metals in Soil""	L039-PL	W	ISO 17025
Total dissolved solids 10:1 WAC	Determination of total dissolved solids in water by EC probe using a factor of 0.6.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L031	W	ISO 17025
Monohydric phenols 10:1 WAC	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	ISO 17025
Dissolved organic carbon 10:1 WAC	Determination of dissolved inorganic carbon in leachate by TOC/DOC NDIR Analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	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 30oC.



Analytical Report Number : 23-43340
Project / Site name: 45 Cholmeley Crescent N6 5EX

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
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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.



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Analytical Report Number : 23-43339

Project / Site name:	45 Cholmeley Crescent N6 5EX	Samples received on:	04/07/2023
Your job number:	MGC-132	Samples instructed on / Analysis started on:	04/07/2023
Your order number:		Analysis completed by:	12/07/2023
Report Issue Number:	1	Report issued on:	13/07/2023
Samples Analysed:	1 soil sample		

Signed: _____

Dominika Warjan
Reporting Specialist
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

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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: 23-43339

Project / Site name: 45 Cholmeley Crescent N6 5EX

Lab Sample Number				2737923
Sample Reference				BH1
Sample Number				None Supplied
Depth (m)				0.00-0.35
Date Sampled				03/07/2023
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status	
Stone Content	%	0.1	NONE	< 0.1
Moisture Content	%	0.01	NONE	15
Total mass of sample received	kg	0.001	NONE	0.5

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	DSO

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.2
Total Cyanide	mg/kg	1	MCERTS	< 1.0
Total Sulphate as SO ₄	mg/kg	50	MCERTS	940
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.056
Sulphide	mg/kg	1	MCERTS	< 1.0
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	0.5

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	0.13
Acenaphthene	mg/kg	0.05	MCERTS	0.69
Fluorene	mg/kg	0.05	MCERTS	0.44
Phenanthrene	mg/kg	0.05	MCERTS	4.3
Anthracene	mg/kg	0.05	MCERTS	0.78
Fluoranthene	mg/kg	0.05	MCERTS	5.5
Pyrene	mg/kg	0.05	MCERTS	4.8
Benzo(a)anthracene	mg/kg	0.05	MCERTS	2.5
Chrysene	mg/kg	0.05	MCERTS	2.3
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	2.8
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	0.93
Benzo(a)pyrene	mg/kg	0.05	MCERTS	2.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	1
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.32
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	1.3

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	29.9
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	14
Boron (water soluble)	mg/kg	0.2	MCERTS	0.7
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	34
Copper (aqua regia extractable)	mg/kg	1	MCERTS	47
Lead (aqua regia extractable)	mg/kg	1	MCERTS	460
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	22
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	180

Analytical Report Number: 23-43339

Project / Site name: 45 Cholmeley Crescent N6 5EX

Lab Sample Number	2737923			
Sample Reference	BH1			
Sample Number	None Supplied			
Depth (m)	0.00-0.35			
Date Sampled	03/07/2023			
Time Taken	None Supplied			
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status	

Monoaromatics & Oxygenates

Benzene	µg/kg	5	MCERTS	< 5.0~
Toluene	µg/kg	5	MCERTS	< 5.0~
Ethylbenzene	µg/kg	5	NONE	< 5.0^
p & m-xylene	µg/kg	5	NONE	< 5.0^
o-xylene	µg/kg	5	NONE	< 5.0^
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	< 5.0~

Petroleum Hydrocarbons

TPH C10 - C40 _{EH, CU, 1D, TOTAL}	mg/kg	10	MCERTS	39
--	-------	----	--------	----

TPH-CWG - Aliphatic >EC5 - EC6 _{HS, 1D, AL}	mg/kg	0.001	NONE	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 _{HS, 1D, AL}	mg/kg	0.001	NONE	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 _{HS, 1D, AL}	mg/kg	0.001	NONE	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 _{EH, CU, 1D, AL}	mg/kg	1	MCERTS	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 _{EH, CU, 1D, AL}	mg/kg	2	MCERTS	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 _{EH, CU, 1D, AL}	mg/kg	8	MCERTS	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 _{EH, CU, 1D, AL}	mg/kg	8	MCERTS	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35) _{EH, CU+HS, 1D, AL}	mg/kg	10	NONE	< 10

TPH-CWG - Aromatic >EC5 - EC7 _{HS, 1D, AR}	mg/kg	0.001	NONE	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 _{HS, 1D, AR}	mg/kg	0.001	NONE	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 _{HS, 1D, AR}	mg/kg	0.001	NONE	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 _{EH, CU, 1D, AR}	mg/kg	1	MCERTS	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 _{EH, CU, 1D, AR}	mg/kg	2	MCERTS	3.1
TPH-CWG - Aromatic >EC16 - EC21 _{EH, CU, 1D, AR}	mg/kg	10	MCERTS	13
TPH-CWG - Aromatic >EC21 - EC35 _{EH, CU, 1D, AR}	mg/kg	10	MCERTS	23
TPH-CWG - Aromatic (EC5 - EC35) _{EH, CU+HS, 1D, AR}	mg/kg	10	NONE	39

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



Analytical Report Number : 23-43339

Project / Site name: 45 Cholmeley Crescent N6 5EX

* 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 *
2737923	BH1	None Supplied	0.00-0.35	Brown clay and sand with gravel.

Analytical Report Number : 23-43339

Project / Site name: 45 Cholmeley Crescent N6 5EX

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
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
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
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.	L019-UK/PL	D	NONE
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS. Individual components MCERTS accredited	In-house method based on USEPA8260	L073B-PL	W	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS

Analytical Report Number : 23-43339
Project / Site name: 45 Cholmeley Crescent N6 5EX

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
TPH Banding in Soil by FID	Determination of hexane extractable hydrocarbons in soil by GC-FID.	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	MCERTS

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.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
-	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

~ - Quality control surrogate recovery outside of limits, other checks applied prior to reporting the data have been accepted. The result should be considered as being deviating and may be compromised.

^ - Data reported unaccredited due to quality control parameter failure associated with this result; The result should be considered as being deviating and may be compromised.

Sample Deviation Report



Analytical Report Number : 23-43339

Project / Site name: 45 Cholmeley Crescent N6 5EX

This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis. Please note that the associated result(s) may be unreliable and should be interpreted with care.

Key: a - No sampling date b - Incorrect container c - Holding time d - Headspace e - Temperature

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
BH1	None Supplied	S	2737923	b	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	b
BH1	None Supplied	S	2737923	b	TPHCWG (Soil)	L088/76-PL	b



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Analytical Report Number : 23-43113

Project / Site name:	45 Cholmeley Crescent N6 5EX	Samples received on:	04/07/2023
Your job number:	MGC-132	Samples instructed on / Analysis started on:	04/07/2023
Your order number:		Analysis completed by:	16/07/2023
Report Issue Number:	1	Report issued on:	22/07/2023
Samples Analysed:	2 soil samples		

Signed: _____

Anna Goc
PL Head of Reporting Team
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

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

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: 23-43113

Project / Site name: 45 Cholmeley Crescent N6 5EX

Lab Sample Number				2736730	2736731
Sample Reference				BH1	BH1
Sample Number				None Supplied	None Supplied
Depth (m)				1.00-1.45	3.00-3.45
Date Sampled				03/07/2023	03/07/2023
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
Stone Content	%	0.1	NONE	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	13	18
Total mass of sample received	kg	0.001	NONE	0.2	0.2

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.1	8.1
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.059	0.04

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



Analytical Report Number : 23-43113

Project / Site name: 45 Cholmeley Crescent N6 5EX

* 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 *
2736730	BH1	None Supplied	1.00-1.45	Brown clay and sand.
2736731	BH1	None Supplied	3.00-3.45	Brown clay and sand.

Analytical Report Number : 23-43113

Project / Site name: 45 Cholmeley Crescent N6 5EX

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
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
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.	L019-UK/PL	D	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 30oC.

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.

Appendix C: Groundsure Insights Report

45, CHOLMELEY CRESCENT, HORNSEY, LONDON, N6 5EX

Order Details

Date: 22/07/2023
Your ref: MGC-132
Our Ref: HMD-Q4Z-B31-XWS-1SB

Site Details

Location: 528558 187663
Area: 0.05 ha
Authority: [London Borough of Haringey](#) ↗



Summary of findings

[p. 2 >](#) **Aerial image**

[p. 9 >](#)

OS MasterMap site plan

[p.14 >](#) groundsure.com/insightuserguide ↗

Contact us with any questions at:

info@groundsure.com ↗

01273 257 755

Summary of findings

Page	Section	Past land use >	On site	0-50m	50-250m	250-500m	500-2000m
15 >	1.1 >	Historical industrial land uses >	0	0	18	55	-
18 >	1.2 >	Historical tanks >	0	0	0	8	-
19 >	1.3 >	Historical energy features >	0	0	9	11	-
20	1.4	Historical petrol stations	0	0	0	0	-
20 >	1.5 >	Historical garages >	0	0	11	3	-
21	1.6	Historical military land	0	0	0	0	-
Page	Section	Past land use - un-grouped >	On site	0-50m	50-250m	250-500m	500-2000m
22 >	2.1 >	Historical industrial land uses >	0	0	25	79	-
26 >	2.2 >	Historical tanks >	0	0	0	15	-
27 >	2.3 >	Historical energy features >	0	0	19	26	-
29	2.4	Historical petrol stations	0	0	0	0	-
29 >	2.5 >	Historical garages >	0	0	15	6	-
Page	Section	Waste and landfill >	On site	0-50m	50-250m	250-500m	500-2000m
31	3.1	Active or recent landfill	0	0	0	0	-
31	3.2	Historical landfill (BGS records)	0	0	0	0	-
32	3.3	Historical landfill (LA/mapping records)	0	0	0	0	-
32	3.4	Historical landfill (EA/NRW records)	0	0	0	0	-
32 >	3.5 >	Historical waste sites >	0	0	0	1	-
32	3.6	Licensed waste sites	0	0	0	0	-
33 >	3.7 >	Waste exemptions >	0	0	0	1	-
Page	Section	Current industrial land use >	On site	0-50m	50-250m	250-500m	500-2000m
34 >	4.1 >	Recent industrial land uses >	0	0	9	-	-
35 >	4.2 >	Current or recent petrol stations >	0	0	1	0	-
35 >	4.3 >	Electricity cables >	0	0	3	6	-
36	4.4	Gas pipelines	0	0	0	0	-
37	4.5	Sites determined as Contaminated Land	0	0	0	0	-



37	4.6	Control of Major Accident Hazards (COMAH)	0	0	0	0	-
37	4.7	Regulated explosive sites	0	0	0	0	-
37	4.8	Hazardous substance storage/usage	0	0	0	0	-
37	4.9	Historical licensed industrial activities (IPC)	0	0	0	0	-
38	4.10	Licensed industrial activities (Part A(1))	0	0	0	0	-
38 >	4.11 >	<u>Licensed pollutant release (Part A(2)/B) ></u>	0	0	1	6	-
39	4.12	Radioactive Substance Authorisations	0	0	0	0	-
39 >	4.13 >	<u>Licensed Discharges to controlled waters ></u>	0	0	0	1	-
39	4.14	Pollutant release to surface waters (Red List)	0	0	0	0	-
40 >	4.15 >	<u>Pollutant release to public sewer ></u>	0	0	0	1	-
40	4.16	List 1 Dangerous Substances	0	0	0	0	-
40	4.17	List 2 Dangerous Substances	0	0	0	0	-
40	4.18	Pollution Incidents (EA/NRW)	0	0	0	0	-
41	4.19	Pollution inventory substances	0	0	0	0	-
41	4.20	Pollution inventory waste transfers	0	0	0	0	-
41	4.21	Pollution inventory radioactive waste	0	0	0	0	-
Page	Section	Hydrogeology	On site	0-50m	50-250m	250-500m	500-2000m
42	5.1	Superficial aquifer	None (within 500m)				
43 >	5.2 >	<u>Bedrock aquifer ></u>	Identified (within 500m)				
44 >	5.3 >	<u>Groundwater vulnerability ></u>	Identified (within 50m)				
45	5.4	Groundwater vulnerability- soluble rock risk	None (within 0m)				
45	5.5	Groundwater vulnerability- local information	None (within 0m)				
46	5.6	Groundwater abstractions	0	0	0	0	0
46	5.7	Surface water abstractions	0	0	0	0	0
46	5.8	Potable abstractions	0	0	0	0	0
46	5.9	Source Protection Zones	0	0	0	0	-
47	5.10	Source Protection Zones (confined aquifer)	0	0	0	0	-
Page	Section	Hydrology >	On site	0-50m	50-250m	250-500m	500-2000m
48	6.1	Water Network (OS MasterMap)	0	0	0	-	-



48	6.2	Surface water features	0	0	0	-	-
49 >	6.3 >	WFD Surface water body catchments >	1	-	-	-	-
49 >	6.4 >	WFD Surface water bodies >	0	0	0	-	-
49	6.5	WFD Groundwater bodies	0	-	-	-	-
Page	Section	River and coastal flooding	On site	0-50m	50-250m	250-500m	500-2000m
51	7.1	Risk of flooding from rivers and the sea	None (within 50m)				
51	7.2	Historical Flood Events	0	0	0	-	-
51	7.3	Flood Defences	0	0	0	-	-
52	7.4	Areas Benefiting from Flood Defences	0	0	0	-	-
52	7.5	Flood Storage Areas	0	0	0	-	-
53	7.6	Flood Zone 2	None (within 50m)				
53	7.7	Flood Zone 3	None (within 50m)				
Page	Section	Surface water flooding >					
54 >	8.1 >	Surface water flooding >	1 in 30 year, 0.3m - 1.0m (within 50m)				
Page	Section	Groundwater flooding >					
56 >	9.1 >	Groundwater flooding >	Negligible (within 50m)				
Page	Section	Environmental designations >	On site	0-50m	50-250m	250-500m	500-2000m
57 >	10.1 >	Sites of Special Scientific Interest (SSSI) >	0	0	0	0	2
58	10.2	Conserved wetland sites (Ramsar sites)	0	0	0	0	0
58	10.3	Special Areas of Conservation (SAC)	0	0	0	0	0
58	10.4	Special Protection Areas (SPA)	0	0	0	0	0
58	10.5	National Nature Reserves (NNR)	0	0	0	0	0
59 >	10.6 >	Local Nature Reserves (LNR) >	0	0	0	1	3
59 >	10.7 >	Designated Ancient Woodland >	0	0	0	0	3
59	10.8	Biosphere Reserves	0	0	0	0	0
60	10.9	Forest Parks	0	0	0	0	0
60	10.10	Marine Conservation Zones	0	0	0	0	0
60	10.11	Green Belt	0	0	0	0	0
60	10.12	Proposed Ramsar sites	0	0	0	0	0



60	10.13	Possible Special Areas of Conservation (pSAC)	0	0	0	0	0
61	10.14	Potential Special Protection Areas (pSPA)	0	0	0	0	0
61	10.15	Nitrate Sensitive Areas	0	0	0	0	0
61	10.16	Nitrate Vulnerable Zones	0	0	0	0	0
62 >	10.17 >	SSSI Impact Risk Zones >	1	-	-	-	-
63 >	10.18 >	SSSI Units >	0	0	0	0	3
Page	Section	Visual and cultural designations >	On site	0-50m	50-250m	250-500m	500-2000m
65	11.1	World Heritage Sites	0	0	0	-	-
66	11.2	Area of Outstanding Natural Beauty	0	0	0	-	-
66	11.3	National Parks	0	0	0	-	-
66 >	11.4 >	Listed Buildings >	0	0	25	-	-
67 >	11.5 >	Conservation Areas >	1	0	0	-	-
68	11.6	Scheduled Ancient Monuments	0	0	0	-	-
68	11.7	Registered Parks and Gardens	0	0	0	-	-
Page	Section	Agricultural designations >	On site	0-50m	50-250m	250-500m	500-2000m
69 >	12.1 >	Agricultural Land Classification >	Urban (within 250m)				
70	12.2	Open Access Land	0	0	0	-	-
70	12.3	Tree Felling Licences	0	0	0	-	-
70	12.4	Environmental Stewardship Schemes	0	0	0	-	-
70	12.5	Countryside Stewardship Schemes	0	0	0	-	-
Page	Section	Habitat designations >	On site	0-50m	50-250m	250-500m	500-2000m
71 >	13.1 >	Priority Habitat Inventory >	0	1	3	-	-
72	13.2	Habitat Networks	0	0	0	-	-
72	13.3	Open Mosaic Habitat	0	0	0	-	-
72	13.4	Limestone Pavement Orders	0	0	0	-	-
Page	Section	Geology 1:10,000 scale >	On site	0-50m	50-250m	250-500m	500-2000m
73 >	14.1 >	10k Availability >	Identified (within 500m)				
74 >	14.2 >	Artificial and made ground (10k) >	0	0	2	2	-
76	14.3	Superficial geology (10k)	0	0	0	0	-

76	14.4	Landslip (10k)	0	0	0	0	-
77 >	14.5 >	Bedrock geology (10k) >	1	1	0	1	-
78	14.6	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
79 >	15.1 >	50k Availability >	Identified (within 500m)				
80 >	15.2 >	Artificial and made ground (50k) >	0	0	0	1	-
81	15.3	Artificial ground permeability (50k)	0	0	-	-	-
82	15.4	Superficial geology (50k)	0	0	0	0	-
82	15.5	Superficial permeability (50k)	None (within 50m)				
82	15.6	Landslip (50k)	0	0	0	0	-
82	15.7	Landslip permeability (50k)	None (within 50m)				
83 >	15.8 >	Bedrock geology (50k) >	1	1	0	1	-
84 >	15.9 >	Bedrock permeability (50k) >	Identified (within 50m)				
84	15.10	Bedrock faults and other linear features (50k)	0	0	0	0	-
Page	Section	Boreholes	On site	0-50m	50-250m	250-500m	500-2000m
85	16.1	BGS Boreholes	0	0	0	-	-
Page	Section	Natural ground subsidence >					
86 >	17.1 >	Shrink swell clays >	Moderate (within 50m)				
87 >	17.2 >	Running sands >	Low (within 50m)				
89 >	17.3 >	Compressible deposits >	Negligible (within 50m)				
90 >	17.4 >	Collapsible deposits >	Very low (within 50m)				
91 >	17.5 >	Landslides >	Low (within 50m)				
93 >	17.6 >	Ground dissolution of soluble rocks >	Negligible (within 50m)				
Page	Section	Mining and ground workings >	On site	0-50m	50-250m	250-500m	500-2000m
95	18.1	BritPits	0	0	0	0	-
96 >	18.2 >	Surface ground workings >	0	0	9	-	-
96 >	18.3 >	Underground workings >	0	0	0	14	3
97	18.4	Underground mining extents	0	0	0	0	-
97	18.5	Historical Mineral Planning Areas	0	0	0	0	-



98	18.6	Non-coal mining	0	0	0	0	0
98	18.7	JPB mining areas	None (within 0m)				
98	18.8	The Coal Authority non-coal mining	0	0	0	0	-
98 >	18.9 >	Researched mining >	0	0	1	5	-
99	18.10	Mining record office plans	0	0	0	0	-
99	18.11	BGS mine plans	0	0	0	0	-
99	18.12	Coal mining	None (within 0m)				
99	18.13	Brine areas	None (within 0m)				
100	18.14	Gypsum areas	None (within 0m)				
100	18.15	Tin mining	None (within 0m)				
100	18.16	Clay mining	None (within 0m)				
Page	Section	Ground cavities and sinkholes	On site	0-50m	50-250m	250-500m	500-2000m
101	19.1	Natural cavities	0	0	0	0	-
101	19.2	Mining cavities	0	0	0	0	0
101	19.3	Reported recent incidents	0	0	0	0	-
101	19.4	Historical incidents	0	0	0	0	-
102	19.5	National karst database	0	0	0	0	-
Page	Section	Radon >					
103 >	20.1 >	Radon >	Less than 1% (within 0m)				
Page	Section	Soil chemistry >	On site	0-50m	50-250m	250-500m	500-2000m
105 >	21.1 >	BGS Estimated Background Soil Chemistry >	1	2	-	-	-
105 >	21.2 >	BGS Estimated Urban Soil Chemistry >	1	5	-	-	-
106	21.3	BGS Measured Urban Soil Chemistry	0	0	-	-	-
Page	Section	Railway infrastructure and projects	On site	0-50m	50-250m	250-500m	500-2000m
107	22.1	Underground railways (London)	0	0	0	-	-
107	22.2	Underground railways (Non-London)	0	0	0	-	-
107	22.3	Railway tunnels	0	0	0	-	-
107	22.4	Historical railway and tunnel features	0	0	0	-	-
107	22.5	Royal Mail tunnels	0	0	0	-	-



108	22.6	Historical railways	0	0	0	-	-
108	22.7	Railways	0	0	0	-	-
108	22.8	Crossrail 1	0	0	0	0	-
108	22.9	Crossrail 2	0	0	0	0	-
108	22.10	HS2	0	0	0	0	-



Recent aerial photograph



Capture Date: 14/06/2021

Site Area: 0.05ha



Recent site history - 2019 aerial photograph



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Capture Date: 29/06/2019

Site Area: 0.05ha



Recent site history - 2013 aerial photograph



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Capture Date: 20/04/2013

Site Area: 0.05ha



Recent site history - 2008 aerial photograph



Aerial photography supplied by Getmapping PLC. © Copyright Getmapping PLC 2023. All Rights Reserved.

Capture Date: 15/04/2008

Site Area: 0.05ha



Recent site history - 1999 aerial photograph



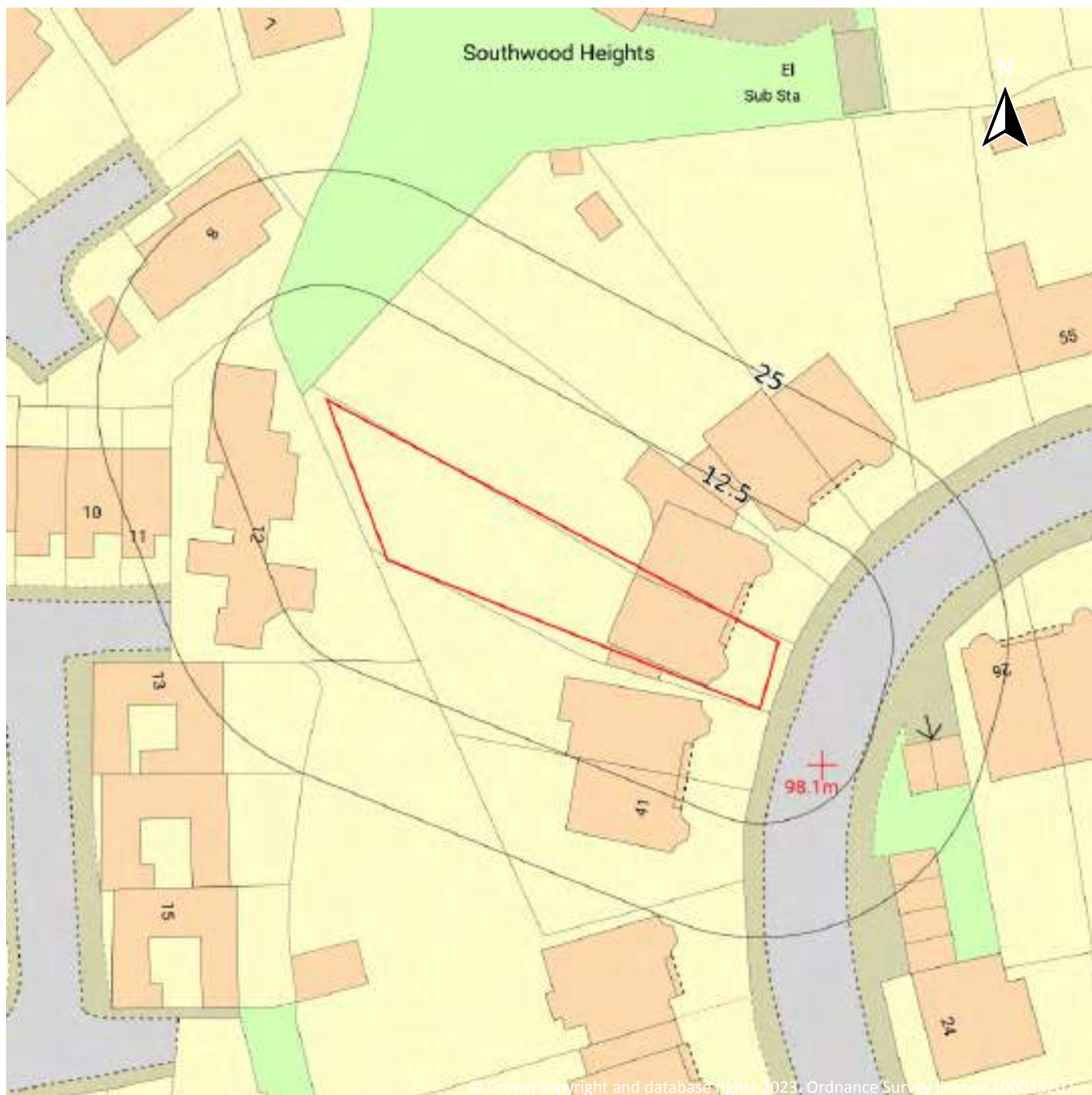
Aerial photography supplied by Getmapping PLC. © Copyright Getmapping PLC 2023. All Rights Reserved.

Capture Date: 04/09/1999

Site Area: 0.05ha



OS MasterMap site plan



Site Area: 0.05ha



1 Past land use



- Site Outline
- Search buffers in metres (m)
- Historical industrial land uses
- Historical tanks
- Historical energy features
- Historical garages

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1.1 Historical industrial land uses

Records within 500m

73

Potentially contaminative land use features digitised from historical Ordnance Survey mapping at 1:10,000 and 1:10,560 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on [page 15 >](#)

ID	Location	Land use	Dates present	Group ID
2	66m NW	Hospital	1965 - 1996	2186316



ID	Location	Land use	Dates present	Group ID
A	71m W	Unspecified Pit	1949	2125331
B	71m S	Unspecified Heap	1965 - 1996	2294348
B	73m SW	Unspecified Heap	1958	2213649
C	73m S	Nursery	1996	2207223
C	93m S	Nursery	1920	2241515
C	99m S	Nursery	1949	2208133
C	116m S	Nursery	1938	2213484
D	129m E	Unspecified Pit	1869	2183785
D	129m E	Unspecified Pit	1879	2219173
E	142m S	Nursery	1920 - 1938	2241516
E	145m S	Nursery	1958	2182972
E	145m S	Nurseries	1965 - 1974	2231172
4	198m SE	Nursery	1920 - 1938	2210702
G	211m W	Fire Engine Station	1938	2140095
5	214m W	Fire Station	1920	2128163
I	247m NE	Unspecified Pit	1879	2179929
I	247m NE	Unspecified Pit	1869	2190504
J	267m SW	Police Station	1869	2282205
8	278m W	Nursery	1958	2161366
J	318m SW	Police Station	1879	2264457
M	356m E	Brick Field	1879	2240003
M	356m E	Brick Field	1869	2275407
N	361m SE	Hospital	1949	2248153
N	361m SE	Hospital	1958	2282310
9	369m W	Unspecified Ground Workings	1894	2133661
P	374m SW	Water Works	1869	2169552
P	374m SW	Water Works	1879	2268780
Q	387m N	Cuttings	1920	2278593



ID	Location	Land use	Dates present	Group ID
R	389m NE	Cuttings	1894 - 1938	2254272
Q	390m N	Cuttings	1879	2210378
Q	390m N	Cuttings	1869	2222299
N	392m SE	Hospital	1894	2262814
R	399m NE	Cuttings	1879	2225193
R	399m NE	Cuttings	1869	2236935
R	401m NE	Cuttings	1949	2173476
R	401m NE	Cuttings	1958 - 1996	2202529
Q	411m N	Cuttings	1949	2263766
Q	414m N	Cuttings	1958 - 1996	2197196
R	415m NE	Cuttings	1949	2243122
Q	416m N	Cuttings	1938	2235152
Q	419m N	Cuttings	1869	2184919
Q	419m N	Cuttings	1879	2286285
T	423m S	Cemetery	1894	2235187
10	424m S	Unspecified Ground Workings	1949	2133664
Q	424m N	Cuttings	1894	2193120
U	424m NE	Tunnel	1869	2179796
U	424m NE	Tunnel	1879	2188510
T	425m S	Cemetery	1920 - 1996	2261094
R	425m NE	Railway Building	1949	2149005
U	426m NE	Tunnels	1958	2196692
U	426m NE	Tunnels	1965 - 1996	2270249
R	427m NE	Railway Sidings	1938	2128661
T	429m S	Cemetery	1879	2201583
T	429m S	Cemetery	1869	2288298
P	431m SW	Unspecified Pit	1869	2204763
P	431m SW	Unspecified Pit	1879	2265121



ID	Location	Land use	Dates present	Group ID
Q	438m N	Railway Station	1958	2244448
Q	442m N	Railway Station	1894 - 1920	2195764
Q	446m N	Cuttings	1920	2284318
Q	453m N	Railway Station	1879	2200476
Q	453m N	Cuttings	1869	2204973
Q	453m N	Railway Station	1869	2214035
Q	453m N	Cuttings	1879	2241153
Q	455m N	Railway Station	1938	2207105
Q	456m N	Railway Station	1949	2260800
Q	463m N	London Transport Station	1965	2261910
Q	465m N	Cuttings	1958 - 1996	2278527
Q	476m N	London Transport Station	1974 - 1996	2291327
13	483m SE	Unspecified Heap	1958	2136553
W	499m N	Tunnel	1879	2249934
W	499m N	Tunnel	1869	2258925
W	499m N	Tunnels	1958 - 1996	2203641

This data is sourced from Ordnance Survey / Groundsure.

1.2 Historical tanks

Records within 500m

8

Tank features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original ungrouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on [page 15 >](#)

ID	Location	Land use	Dates present	Group ID
I	258m NE	Unspecified Tank	1870	364720
P	382m SW	Unspecified Tank	1896	364775



ID	Location	Land use	Dates present	Group ID
P	385m SW	Unspecified Tank	1951 - 1991	409859
P	390m SW	Unspecified Tank	1870	364774
S	422m NE	Unspecified Tank	1951	401960
S	423m NE	Unspecified Tank	1962	387989
S	424m NE	Unspecified Tank	1967	404496
Q	481m N	Unspecified Tank	1950 - 1991	389183

This data is sourced from Ordnance Survey / Groundsure.

1.3 Historical energy features

Records within 500m	20
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Energy features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original ungrouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on [page 15 >](#)

ID	Location	Land use	Dates present	Group ID
1	53m NE	Electricity Substation	1973 - 1996	289941
A	125m SW	Electricity Substation	1967	252519
A	125m SW	Electricity Substation	1977	255069
A	125m SW	Electricity Substation	1968	255538
A	129m SW	Electricity Substation	1991	252021
F	189m SE	Electricity Substation	1973 - 1991	276694
F	219m SE	Electricity Substation	1996	245021
E	220m S	Electricity Substation	1986 - 1996	277916
6	233m NW	Electricity Substation	1967 - 1991	279148
G	287m W	Electricity Substation	1991	270975
G	290m W	Electricity Substation	1950 - 1977	262524
K	325m W	Electricity Substation	1967 - 1977	291505

ID	Location	Land use	Dates present	Group ID
K	335m W	Electricity Substation	1991	262751
O	361m NW	Electricity Substation	1991	279472
O	362m NW	Electricity Substation	1950 - 1977	284107
R	404m NE	Electricity Substation	1951	245020
11	471m E	Electricity Substation	1991	245022
12	477m NE	Electricity Substation	1973 - 1991	264860
V	489m E	Electricity Substation	1951 - 1991	265602
V	490m E	Electricity Substation	1997	270958

This data is sourced from Ordnance Survey / Groundsure.

1.4 Historical petrol stations

Records within 500m

0

Petrol stations digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original ungrouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

This data is sourced from Ordnance Survey / Groundsure.

1.5 Historical garages

Records within 500m

14

Garages digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original ungrouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on [page 15 >](#)

ID	Location	Land use	Dates present	Group ID
3	172m W	Garage	1977	73345
E	215m S	Garage	1967	78986
E	231m S	Garage	-	72995



ID	Location	Land use	Dates present	Group ID
E	232m S	Garage	1986 - 1991	85264
E	232m S	Garage	1992	76140
E	232m S	Garage	1967	81296
E	234m S	Garage	-	72854
H	235m W	Garage	1967	78810
H	235m W	Garage	1968	74542
E	237m S	Garage	1967	77039
H	238m W	Garage	1962 - 1977	83676
7	260m N	Garages	1950	74157
L	329m NE	Garage	1962 - 1996	82206
L	330m NE	Garage	1967	76970

This data is sourced from Ordnance Survey / Groundsure.

1.6 Historical military land

Records within 500m

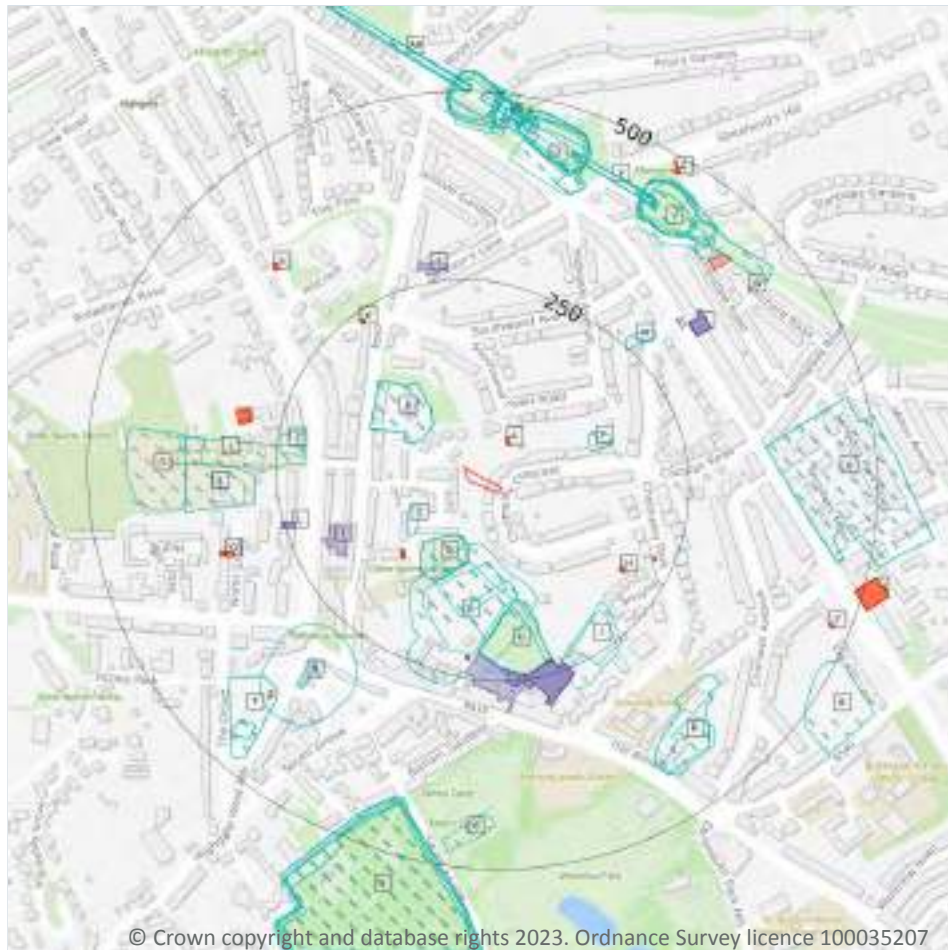
0

Areas of military land digitised from multiple sources including the National Archives, local records, MOD records and verified other sources, intelligently grouped into contiguous features.

This data is sourced from Ordnance Survey / Groundsure / other sources.



2 Past land use - un-grouped



- Site Outline
- Search buffers in metres (m)
- Historical industrial land uses
- Historical tanks
- Historical energy features
- Historical garages

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2.1 Historical industrial land uses

Records within 500m

104

Potentially contaminative land use features digitised from historical Ordnance Survey mapping at 1:10,000 and 10,560 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on [page 22](#) >

ID	Location	Land Use	Date	Group ID
B	66m NW	Hospital	1965	2186316
B	66m NW	Hospital	1974	2186316
B	66m NW	Hospital	1996	2186316



ID	Location	Land Use	Date	Group ID
C	71m W	Unspecified Pit	1949	2125331
D	71m S	Unspecified Heap	1965	2294348
D	71m S	Unspecified Heap	1974	2294348
D	71m S	Unspecified Heap	1996	2294348
D	73m SW	Unspecified Heap	1958	2213649
E	73m S	Nursery	1996	2207223
E	93m S	Nursery	1920	2241515
E	99m S	Nursery	1949	2208133
E	116m S	Nursery	1938	2213484
F	129m E	Unspecified Pit	1869	2183785
F	129m E	Unspecified Pit	1879	2219173
G	142m S	Nursery	1938	2241516
G	145m S	Nurseries	1965	2231172
G	145m S	Nurseries	1974	2231172
G	145m S	Nursery	1958	2182972
G	152m S	Nursery	1920	2241516
I	198m SE	Nursery	1938	2210702
I	205m SE	Nursery	1920	2210702
J	211m W	Fire Engine Station	1938	2140095
2	214m W	Fire Station	1920	2128163
M	247m NE	Unspecified Pit	1869	2190504
M	247m NE	Unspecified Pit	1879	2179929
N	267m SW	Police Station	1869	2282205
4	278m W	Nursery	1958	2161366
N	318m SW	Police Station	1879	2264457
Q	356m E	Brick Field	1869	2275407
Q	356m E	Brick Field	1879	2240003
R	361m SE	Hospital	1949	2248153



ID	Location	Land Use	Date	Group ID
R	361m SE	Hospital	1958	2282310
5	369m W	Unspecified Ground Workings	1894	2133661
T	374m SW	Water Works	1869	2169552
T	374m SW	Water Works	1879	2268780
U	387m N	Cuttings	1920	2278593
V	389m NE	Cuttings	1920	2254272
U	390m N	Cuttings	1879	2210378
U	390m N	Cuttings	1869	2222299
R	392m SE	Hospital	1894	2262814
V	399m NE	Cuttings	1879	2225193
V	399m NE	Cuttings	1869	2236935
V	401m NE	Cuttings	1965	2202529
V	401m NE	Cuttings	1974	2202529
V	401m NE	Cuttings	1996	2202529
V	401m NE	Cuttings	1949	2173476
V	401m NE	Cuttings	1958	2202529
V	403m NE	Cuttings	1938	2254272
V	408m NE	Cuttings	1894	2254272
U	411m N	Cuttings	1949	2263766
U	414m N	Cuttings	1965	2197196
U	414m N	Cuttings	1974	2197196
U	414m N	Cuttings	1996	2197196
U	414m N	Cuttings	1958	2197196
V	415m NE	Cuttings	1949	2243122
U	416m N	Cuttings	1938	2235152
U	419m N	Cuttings	1879	2286285
U	419m N	Cuttings	1869	2184919
X	423m S	Cemetery	1894	2235187



ID	Location	Land Use	Date	Group ID
6	424m S	Unspecified Ground Workings	1949	2133664
U	424m N	Cuttings	1894	2193120
Y	424m NE	Tunnel	1879	2188510
Y	424m NE	Tunnel	1869	2179796
X	425m S	Cemetery	1965	2261094
X	425m S	Cemetery	1974	2261094
X	425m S	Cemetery	1996	2261094
X	425m S	Cemetery	1949	2261094
X	425m S	Cemetery	1958	2261094
V	425m NE	Railway Building	1949	2149005
X	425m S	Cemetery	1938	2261094
Y	426m NE	Tunnels	1965	2270249
Y	426m NE	Tunnels	1974	2270249
Y	426m NE	Tunnels	1996	2270249
Y	426m NE	Tunnels	1958	2196692
V	427m NE	Railway Sidings	1938	2128661
X	429m S	Cemetery	1879	2201583
X	429m S	Cemetery	1869	2288298
T	431m SW	Unspecified Pit	1869	2204763
T	431m SW	Unspecified Pit	1879	2265121
X	434m S	Cemetery	1920	2261094
U	438m N	Railway Station	1958	2244448
U	442m N	Railway Station	1920	2195764
U	446m N	Cuttings	1920	2284318
U	453m N	Railway Station	1869	2214035
U	453m N	Railway Station	1879	2200476
U	453m N	Cuttings	1879	2241153
U	453m N	Cuttings	1869	2204973



ID	Location	Land Use	Date	Group ID
U	455m N	Railway Station	1938	2207105
U	456m N	Railway Station	1949	2260800
U	463m N	Railway Station	1894	2195764
U	463m N	London Transport Station	1965	2261910
U	465m N	Cuttings	1965	2278527
U	465m N	Cuttings	1974	2278527
U	465m N	Cuttings	1996	2278527
U	465m N	Cuttings	1958	2278527
U	476m N	London Transport Station	1974	2291327
U	476m N	London Transport Station	1996	2291327
8	483m SE	Unspecified Heap	1958	2136553
AB	499m N	Tunnel	1879	2249934
AB	499m N	Tunnel	1869	2258925
AB	499m N	Tunnels	1965	2203641
AB	499m N	Tunnels	1974	2203641
AB	499m N	Tunnels	1996	2203641
AB	499m N	Tunnels	1958	2203641

This data is sourced from Ordnance Survey / Groundsure.

2.2 Historical tanks

Records within 500m

15

Tank features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on [page 22 >](#)

ID	Location	Land Use	Date	Group ID
M	258m NE	Unspecified Tank	1870	364720
T	382m SW	Unspecified Tank	1896	364775
T	385m SW	Unspecified Tank	1991	409859



ID	Location	Land Use	Date	Group ID
T	386m SW	Unspecified Tank	1967	409859
T	386m SW	Unspecified Tank	1951	409859
T	390m SW	Unspecified Tank	1870	364774
W	422m NE	Unspecified Tank	1951	401960
W	423m NE	Unspecified Tank	1962	387989
W	424m NE	Unspecified Tank	1967	404496
U	481m N	Unspecified Tank	1991	389183
U	481m N	Unspecified Tank	1973	389183
U	481m N	Unspecified Tank	1962	389183
U	481m N	Unspecified Tank	1950	389183
U	481m N	Unspecified Tank	1969	389183
U	481m N	Unspecified Tank	1950	389183

This data is sourced from Ordnance Survey / Groundsure.

2.3 Historical energy features

Records within 500m

45

Energy features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on [page 22 >](#)

ID	Location	Land Use	Date	Group ID
A	53m NE	Electricity Substation	1996	289941
A	54m NE	Electricity Substation	1973	289941
A	55m NE	Electricity Substation	1991	289941
C	125m SW	Electricity Substation	1967	252519
C	125m SW	Electricity Substation	1977	255069
C	125m SW	Electricity Substation	1968	255538
C	129m SW	Electricity Substation	1991	252021
H	189m SE	Electricity Substation	1991	276694



ID	Location	Land Use	Date	Group ID
H	189m SE	Electricity Substation	1973	276694
H	219m SE	Electricity Substation	1996	245021
G	220m S	Electricity Substation	1996	277916
G	220m S	Electricity Substation	1992	277916
G	220m S	Electricity Substation	1986	277916
G	220m S	Electricity Substation	1986	277916
G	220m S	Electricity Substation	1991	277916
K	233m NW	Electricity Substation	1991	279148
K	233m NW	Electricity Substation	1977	279148
K	233m NW	Electricity Substation	1968	279148
K	234m NW	Electricity Substation	1967	279148
J	287m W	Electricity Substation	1991	270975
J	290m W	Electricity Substation	1977	262524
J	290m W	Electricity Substation	1968	262524
J	290m W	Electricity Substation	1950	262524
J	290m W	Electricity Substation	1967	262524
J	290m W	Electricity Substation	1951	262524
O	325m W	Electricity Substation	1977	291505
O	325m W	Electricity Substation	1968	291505
O	335m W	Electricity Substation	1991	262751
O	336m W	Electricity Substation	1967	291505
S	361m NW	Electricity Substation	1991	279472
S	362m NW	Electricity Substation	1977	284107
S	362m NW	Electricity Substation	1968	284107
S	362m NW	Electricity Substation	1950	284107
S	362m NW	Electricity Substation	1967	284107
S	362m NW	Electricity Substation	1951	284107
V	404m NE	Electricity Substation	1951	245020



ID	Location	Land Use	Date	Group ID
7	471m E	Electricity Substation	1991	245022
Z	477m NE	Electricity Substation	1973	264860
Z	477m NE	Electricity Substation	1991	264860
AA	489m E	Electricity Substation	1978	265602
AA	489m E	Electricity Substation	1951	265602
AA	489m E	Electricity Substation	1951	265602
AA	490m E	Electricity Substation	1997	270958
AA	490m E	Electricity Substation	1985	265602
AA	490m E	Electricity Substation	1991	265602

This data is sourced from Ordnance Survey / Groundsure.

2.4 Historical petrol stations

Records within 500m

0

Petrol stations digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

This data is sourced from Ordnance Survey / Groundsure.

2.5 Historical garages

Records within 500m

21

Garages digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on [page 22 >](#)

ID	Location	Land Use	Date	Group ID
1	172m W	Garage	1977	73345
G	215m S	Garage	1967	78986
G	231m S	Garage	-	72995
G	232m S	Garage	1986	85264



ID	Location	Land Use	Date	Group ID
G	232m S	Garage	1991	85264
G	232m S	Garage	1986	85264
G	232m S	Garage	1992	76140
G	232m S	Garage	1967	81296
G	233m S	Garage	1967	81296
G	234m S	Garage	-	72854
L	235m W	Garage	1967	78810
L	235m W	Garage	1968	74542
G	237m S	Garage	1967	77039
L	238m W	Garage	1977	83676
L	238m W	Garage	1962	83676
3	260m N	Garages	1950	74157
P	329m NE	Garage	1996	82206
P	329m NE	Garage	1962	82206
P	329m NE	Garage	1973	82206
P	329m NE	Garage	1991	82206
P	330m NE	Garage	1967	76970

This data is sourced from Ordnance Survey / Groundsure.



3 Waste and landfill



- Site Outline
- Search buffers in metres (m)
- Historical waste sites
- Waste exemptions

3.1 Active or recent landfill

Records within 500m

0

Active or recently closed landfill sites under Environment Agency/Natural Resources Wales regulation.

This data is sourced from the Environment Agency and Natural Resources Wales.

3.2 Historical landfill (BGS records)

Records within 500m

0

Landfill sites identified on a survey carried out on behalf of the DoE in 1973. These sites may have been closed or operational at this time.

This data is sourced from the British Geological Survey.

3.3 Historical landfill (LA/mapping records)

Records within 500m**0**

Landfill sites identified from Local Authority records and high detail historical mapping.

This data is sourced from the Ordnance Survey/Groundsure and Local Authority records.

3.4 Historical landfill (EA/NRW records)

Records within 500m**0**

Known historical (closed) landfill sites (e.g. sites where there is no PPC permit or waste management licence currently in force). This includes sites that existed before the waste licensing regime and sites that have been licensed in the past but where a licence has been revoked, ceased to exist or surrendered and a certificate of completion has been issued.

This data is sourced from the Environment Agency and Natural Resources Wales.

3.5 Historical waste sites

Records within 500m**1**

Waste site records derived from Local Authority planning records and high detail historical mapping.

Features are displayed on the Waste and landfill map on [page 31 >](#)

ID	Location	Address	Further Details	Date
1	275m SE	Site Address: Furnival House, 50 Cholmeley Park, London, Central London, N6 5EH	Type of Site: Recycling Facility Planning application reference: HGY/2014/0254 Description: Scheme comprises construction of new recycling and refuse store and condenser housing to the rear of Furnival House adjacent to the rear service entrance and car park access road. Data source: Historic Planning Application Data Type: Point	05/06/2014

This data is sourced from Ordnance Survey/Groundsure and Local Authority records.

3.6 Licensed waste sites

Records within 500m**0**

Active or recently closed waste sites under Environment Agency/Natural Resources Wales regulation.

This data is sourced from the Environment Agency and Natural Resources Wales.



3.7 Waste exemptions

Records within 500m

1

Activities involving the storage, treatment, use or disposal of waste that are exempt from needing a permit. Exemptions have specific limits and conditions that must be adhered to.

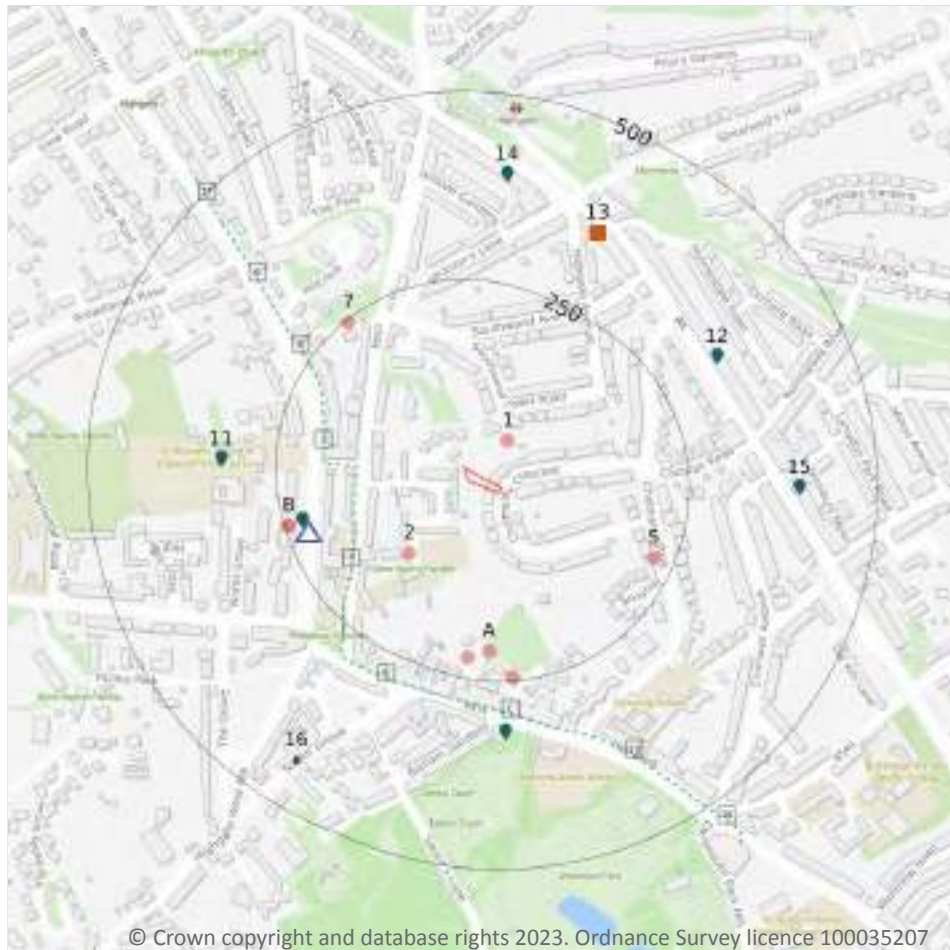
Features are displayed on the Waste and landfill map on [page 31 >](#)

ID	Location	Site	Reference	Category	Sub-Category	Description
2	318m SW	-	WEX357493	Treating waste exemption	Not on a farm	Sorting and de-naturing of controlled drugs for disposal

This data is sourced from the Environment Agency and Natural Resources Wales.



4 Current industrial land use



- Site Outline
- Search buffers in metres (m)
- Recent industrial land uses
- △ Current or recent petrol stations
- Electricity cables
- Licensed pollutant release (Part A(2)/B)
- Licensed Discharges to controlled waters
- Pollutant release to public sewer

4.1 Recent industrial land uses

Records within 250m

9

Current potentially contaminative industrial sites.

Features are displayed on the Current industrial land use map on [page 34](#) >

ID	Location	Company	Address	Activity	Category
1	59m NE	Electricity Sub Station	Greater London, N6	Electrical Features	Infrastructure and Facilities
2	124m SW	Electricity Sub Station	Greater London, N6	Electrical Features	Infrastructure and Facilities



ID	Location	Company	Address	Activity	Category
A	210m S	Mast (Telecommu nication)	Greater London, N6	Telecommunications Features	Infrastructure and Facilities
A	222m S	Electricity Sub Station	Greater London, N6	Electrical Features	Infrastructure and Facilities
5	223m SE	Electricity Sub Station	Greater London, N6	Electrical Features	Infrastructure and Facilities
A	245m S	Radiant	10, Broadbent Close, Hornsey, London, Greater London, N6 5JW	Lampshades and Lighting	Consumer Products
B	245m W	John Nichol Cars Ltd	31, North Road, Hornsey, London, Greater London, N6 4BE	Secondhand Vehicles	Motoring
B	245m W	John Nichol Cars	Petrol Filling Station 31-33, North Road, Hornsey, London, Greater London, N6 4BE	Petrol and Fuel Stations	Road and Rail
7	247m NW	Electricity Sub Station	Greater London, N6	Electrical Features	Infrastructure and Facilities

This data is sourced from Ordnance Survey.

4.2 Current or recent petrol stations

Records within 500m

1

Open, closed, under development and obsolete petrol stations.

Features are displayed on the Current industrial land use map on [page 34 >](#)

ID	Location	Company	Address	LPG	Status
B	224m W	GULF	31-33, North Road, Highgate, London, Inner London, N6 4BE	No	Open

This data is sourced from Experian.

4.3 Electricity cables

Records within 500m

9

High voltage underground electricity transmission cables.

Features are displayed on the Current industrial land use map on [page 34 >](#)



ID	Location	Cable Set	Cable Route	Details	
3	142m W	DC DECOMMISSIONED CABLE SECTION 28	FINCHLEY - ISLINGTON	Cable Make: - Cable Type: CBL_UNKNOWN Operating Voltage (kV): 66	Year of installation: Not specified Cable in tunnel? Not specified
4	149m W	DC DECOMMISSIONED CABLE SECTION 27	FINCHLEY - ISLINGTON	Cable Make: - Cable Type: CBL_UNKNOWN Operating Voltage (kV): 66	Year of installation: Not specified Cable in tunnel? Not specified
6	246m NW	DC DECOMMISSIONED CABLE SECTION 29	FINCHLEY - ISLINGTON	Cable Make: - Cable Type: CBL_UNKNOWN Operating Voltage (kV): 66	Year of installation: Not specified Cable in tunnel? Not specified
8	256m SW	DC DECOMMISSIONED CABLE SECTION 26	FINCHLEY - ISLINGTON	Cable Make: - Cable Type: CBL_UNKNOWN Operating Voltage (kV): 66	Year of installation: Not specified Cable in tunnel? Not specified
C	281m S	DC DECOMMISSIONED CABLE SECTION 25	FINCHLEY - ISLINGTON	Cable Make: - Cable Type: CBL_UNKNOWN Operating Voltage (kV): 66	Year of installation: Not specified Cable in tunnel? Not specified
9	288m NW	DC DECOMMISSIONED CABLE SECTION 30	FINCHLEY - ISLINGTON	Cable Make: - Cable Type: CBL_UNKNOWN Operating Voltage (kV): 66	Year of installation: Not specified Cable in tunnel? Not specified
10	322m S	DC DECOMMISSIONED CABLE SECTION 24	FINCHLEY - ISLINGTON	Cable Make: - Cable Type: CBL_UNKNOWN Operating Voltage (kV): 66	Year of installation: Not specified Cable in tunnel? Not specified
17	457m NW	DC DECOMMISSIONED CABLE SECTION 31	FINCHLEY - ISLINGTON	Cable Make: - Cable Type: CBL_UNKNOWN Operating Voltage (kV): 66	Year of installation: Not specified Cable in tunnel? Not specified
18	489m SE	DC DECOMMISSIONED CABLE SECTION 23	FINCHLEY - ISLINGTON	Cable Make: - Cable Type: CBL_UNKNOWN Operating Voltage (kV): 66	Year of installation: Not specified Cable in tunnel? Not specified

This data is sourced from National Grid.

4.4 Gas pipelines

Records within 500m

0

High pressure underground gas transmission pipelines.

This data is sourced from National Grid.



4.5 Sites determined as Contaminated Land

Records within 500m**0**

Contaminated Land Register of sites designated under Part 2a of the Environmental Protection Act 1990.

This data is sourced from Local Authority records.

4.6 Control of Major Accident Hazards (COMAH)

Records within 500m**0**

Control of Major Accident Hazards (COMAH) sites. This data includes upper and lower tier sites, and includes a historical archive of COMAH sites and Notification of Installations Handling Hazardous Substances (NIHHS) records.

This data is sourced from the Health and Safety Executive.

4.7 Regulated explosive sites

Records within 500m**0**

Sites registered and licensed by the Health and Safety Executive under the Manufacture and Storage of Explosives Regulations 2005 (MSER). The last update to this data was in April 2011.

This data is sourced from the Health and Safety Executive.

4.8 Hazardous substance storage/usage

Records within 500m**0**

Consents granted for a site to hold certain quantities of hazardous substances at or above defined limits in accordance with the Planning (Hazardous Substances) Regulations 2015.

This data is sourced from Local Authority records.

4.9 Historical licensed industrial activities (IPC)

Records within 500m**0**

Integrated Pollution Control (IPC) records of substance releases to air, land and water. This data represents a historical archive as the IPC regime has been superseded.

This data is sourced from the Environment Agency and Natural Resources Wales.



4.10 Licensed industrial activities (Part A(1))

Records within 500m

0

Records of Part A(1) installations regulated under the Environmental Permitting (England and Wales) Regulations 2016 for the release of substances to the environment.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.11 Licensed pollutant release (Part A(2)/B)

Records within 500m

7

Records of Part A(2) and Part B installations regulated under the Environmental Permitting (England and Wales) Regulations 2016 for the release of substances to the environment.

Features are displayed on the Current industrial land use map on [page 34 >](#)

ID	Location	Address	Details	
B	225m W	John Nichol Service Station, 31-33 North Road, Highgate, N6 4BE	Process: Unloading of Petrol into Storage at Service Stations Status: Current Permit Permit Type: Part B	Enforcement: No Enforcement Notified Date of enforcement: No Enforcement Notified Comment: No Enforcement Notified
C	316m S	First Choice, 5 Highgate High Street, London, N6 5JR	Process: Dry Cleaning Status: Current Permit Permit Type: Part B	Enforcement: No Enforcement Notified Date of enforcement: No Enforcement Notified Comment: No Enforcement Notified
C	316m S	First Choice, 5 Highgate High Street, N6 5JR	Process: Dry Cleaning Status: Historical Permit Permit Type: Part B	Enforcement: No Enforcement Notified Date of enforcement: No Enforcement Notified Comment: No Enforcement Notified
11	322m W	North Rd Serv Stn, North Rd, N6 4BE	Process: Petrol Vapour Recovery Status: Historical Permit Permit Type: Part B	Enforcement: No Enforcement Notified Date of enforcement: No Enforcement Notified Comment: No Enforcement Notified
12	335m NE	Highgate Dry Cleaners & Laundry, 246 Archway Road, Highgate, N6 5AX	Process: Dry Cleaning Status: Current Permit Permit Type: Part B	Enforcement: No Enforcement Notified Date of enforcement: No Enforcement Notified Comment: No Enforcement Notified
14	394m N	Prestige Dry Cleaners, 289 Archway Road, Highgate, N6 5AA	Process: Dry Cleaning Status: Current Permit Permit Type: Part B	Enforcement: No Enforcement Notified Date of enforcement: No Enforcement Notified Comment: No Enforcement Notified



ID	Location	Address	Details	
15	396m E	Archway Dry Cleaners, 194 Archway Road, Highgate, N6 5BB	Process: Dry Cleaning Status: Current Permit Permit Type: Part B	Enforcement: No Enforcement Notified Date of enforcement: No Enforcement Notified Comment: No Enforcement Notified

This data is sourced from Local Authority records.

4.12 Radioactive Substance Authorisations

Records within 500m	0
----------------------------	----------

Records of the storage, use, accumulation and disposal of radioactive substances regulated under the Radioactive Substances Act 1993.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.13 Licensed Discharges to controlled waters

Records within 500m	1
----------------------------	----------

Discharges of treated or untreated effluent to controlled waters under the Water Resources Act 1991.

Features are displayed on the Current industrial land use map on [page 34 >](#)

ID	Location	Address	Details	
16	435m SW	Highgate, Highgate	Effluent Type: TRADE DISCHARGES - UNSPECIFIED Permit Number: TEMP.0148 Permit Version: 1 Receiving Water: RIVER THAMES	Status: REVOKED - UNSPECIFIED Issue date: 15/09/1989 Effective Date: 15/09/1989 Revocation Date: 05/10/2000

This data is sourced from the Environment Agency and Natural Resources Wales.

4.14 Pollutant release to surface waters (Red List)

Records within 500m	0
----------------------------	----------

Discharges of specified substances under the Environmental Protection (Prescribed Processes and Substances) Regulations 1991.

This data is sourced from the Environment Agency and Natural Resources Wales.



4.15 Pollutant release to public sewer

Records within 500m**1**

Discharges of Special Category Effluents to the public sewer.

Features are displayed on the Current industrial land use map on [page 34](#) >

ID	Location	Address	Details	
13	358m NE	J BULL, 265 ARCHWAY ROAD, 265 ARCHWAY ROAD, LONDON, LONDON, N6 5BS	Permission reference: AR7670 Local Authority: LONDON BOROUGH OF HARINGEY First received date: 01/01/2015	Last received date: 01/01/2015 Status: RECEIVED

This data is sourced from the Environment Agency and Natural Resources Wales.

4.16 List 1 Dangerous Substances

Records within 500m**0**

Discharges of substances identified on List I of European Directive E 2006/11/EC, and regulated under the Environmental Damage (Prevention and Remediation) Regulations 2015.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.17 List 2 Dangerous Substances

Records within 500m**0**

Discharges of substances identified on List II of European Directive E 2006/11/EC, and regulated under the Environmental Damage (Prevention and Remediation) Regulations 2015.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.18 Pollution Incidents (EA/NRW)

Records within 500m**0**

Records of substantiated pollution incidents. Since 2006 this data has only included category 1 (major) and 2 (significant) pollution incidents.

This data is sourced from the Environment Agency and Natural Resources Wales.



4.19 Pollution inventory substances

Records within 500m**0**

The pollution inventory (substances) includes reporting on annual emissions of certain regulated substances to air, controlled waters and land. A reporting threshold for each substance is also included. Where emissions fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.

4.20 Pollution inventory waste transfers

Records within 500m**0**

The pollution inventory (waste transfers) includes reporting on annual transfers and recovery/disposal of controlled wastes from a site. A reporting threshold for each waste type is also included. Where releases fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.

4.21 Pollution inventory radioactive waste

Records within 500m**0**

The pollution inventory (radioactive wastes) includes reporting on annual releases of radioactive substances from a site, including the means of release. Where releases fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.



5 Hydrogeology - Superficial aquifer

5.1 Superficial aquifer

Records within 500m

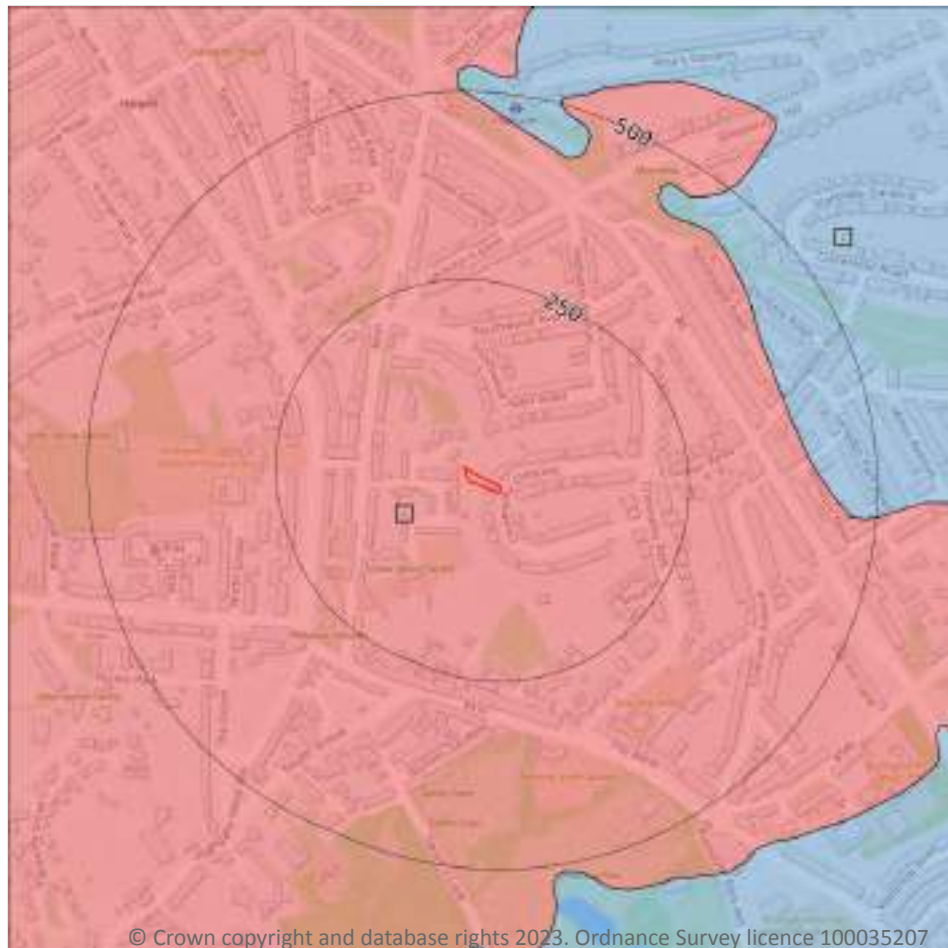
0

Aquifer status of groundwater held within superficial geology.

This data is sourced from the British Geological Survey, the Environment Agency and Natural Resources Wales.



Bedrock aquifer



- Site Outline
- Search buffers in metres (m)
- Principal
 - Secondary A
 - Secondary B
 - Secondary Undifferentiated
 - Unproductive

5.2 Bedrock aquifer

Records within 500m

2

Aquifer status of groundwater held within bedrock geology.

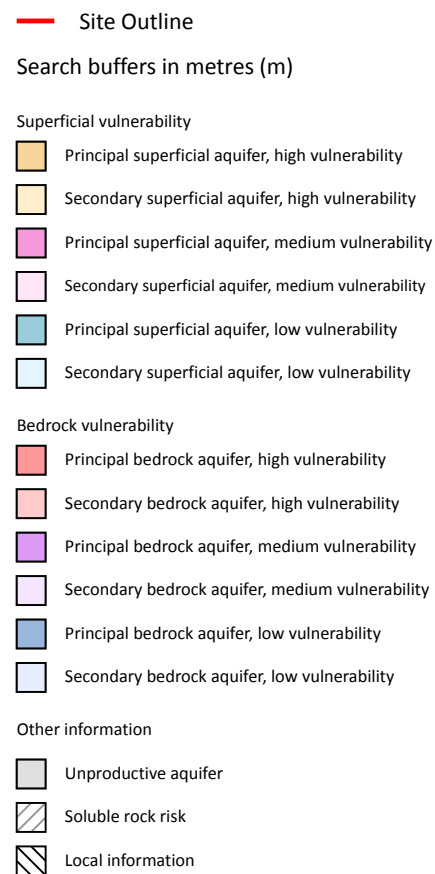
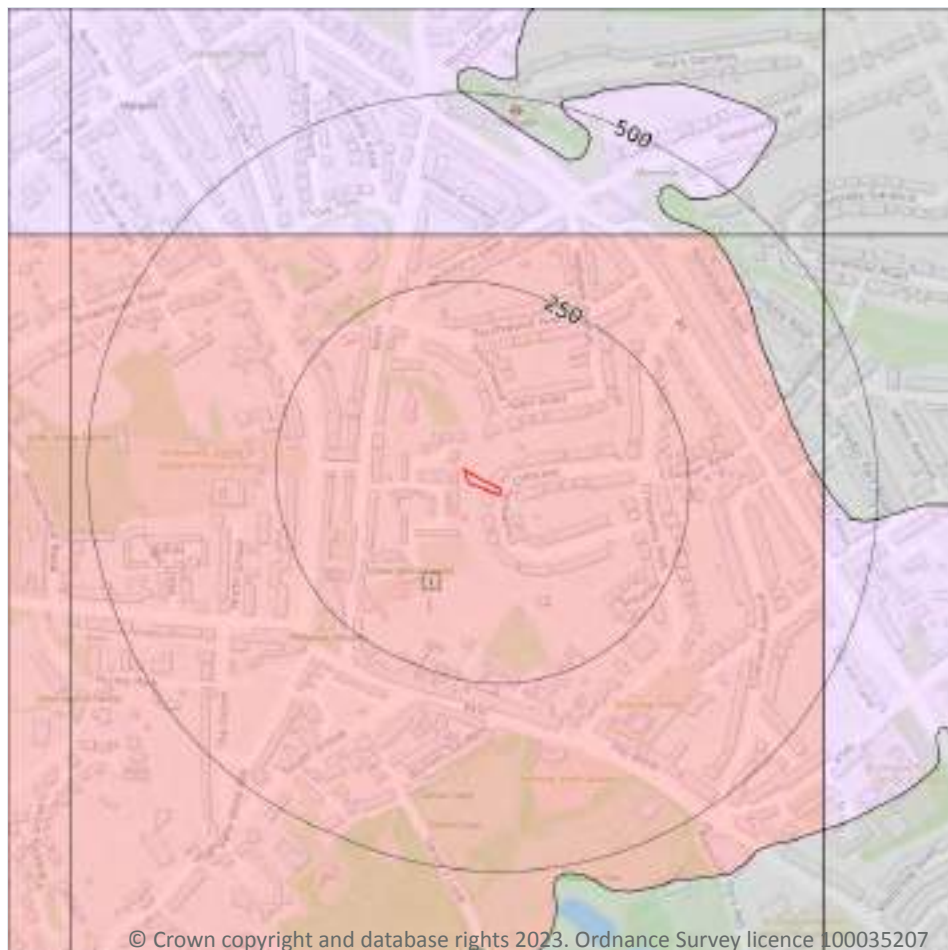
Features are displayed on the Bedrock aquifer map on [page 43](#) >

ID	Location	Designation	Description
1	On site	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
2	392m E	Unproductive	These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow

This data is sourced from the British Geological Survey, the Environment Agency and Natural Resources Wales.



Groundwater vulnerability



5.3 Groundwater vulnerability

Records within 50m

1

An assessment of the vulnerability of groundwater to a pollutant discharged at ground level based on the hydrological, geological, hydrogeological and soil properties within a one kilometre square grid. Groundwater vulnerability is described as High, Medium or Low as follows:

- High - Areas able to easily transmit pollution to groundwater. They are likely to be characterised by high leaching soils and the absence of low permeability superficial deposits.
- Medium - Intermediate between high and low vulnerability.
- Low - Areas that provide the greatest protection from pollution. They are likely to be characterised by low leaching soils and/or the presence of superficial deposits characterised by a low permeability.

Features are displayed on the Groundwater vulnerability map on [page 44](#) >

ID	Location	Summary	Soil / surface	Superficial geology	Bedrock geology
1	On site	Summary Classification: Secondary bedrock aquifer - High Vulnerability Combined classification: Productive Bedrock Aquifer, No Superficial Aquifer	Leaching class: Intermediate Infiltration value: >70% Dilution value: 300- 550mm/year	Vulnerability: - Aquifer type: - Thickness: <3m Patchiness value: <90% Recharge potential: No Data	Vulnerability: High Aquifer type: Secondary Flow mechanism: Mixed

This data is sourced from the British Geological Survey, the Environment Agency and Natural Resources Wales.

5.4 Groundwater vulnerability- soluble rock risk

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

This dataset identifies areas where solution features that enable rapid movement of a pollutant may be present within a 1km grid square.

This data is sourced from the British Geological Survey and the Environment Agency.

5.5 Groundwater vulnerability- local information

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

This dataset identifies areas where additional local information affecting vulnerability is held by the Environment Agency. Further information can be obtained by contacting the Environment Agency local Area groundwater team through the Environment Agency National Customer Call Centre on 03798 506 506 or by email on enquiries@environment-agency.gov.uk ↗.

This data is sourced from the British Geological Survey and the Environment Agency.

Abstractions and Source Protection Zones

5.6 Groundwater abstractions

Records within 2000m

0

Licensed groundwater abstractions for sites extracting more than 20 cubic metres of water a day and includes active and historical records. The data may be for a single abstraction point, between two points (line data) or a larger area.

This data is sourced from the Environment Agency and Natural Resources Wales.

5.7 Surface water abstractions

Records within 2000m

0

Licensed surface water abstractions for sites extracting more than 20 cubic metres of water a day and includes active and historical records. The data may be for a single abstraction point, a stretch of watercourse or a larger area.

This data is sourced from the Environment Agency and Natural Resources Wales.

5.8 Potable abstractions

Records within 2000m

0

Licensed potable water abstractions for sites extracting more than 20 cubic metres of water a day and includes active and historical records. The data may be for a single abstraction point, a stretch of watercourse or a larger area.

This data is sourced from the Environment Agency and Natural Resources Wales.

5.9 Source Protection Zones

Records within 500m

0

Source Protection Zones define the sensitivity of an area around a potable abstraction site to contamination.

This data is sourced from the Environment Agency and Natural Resources Wales.



5.10 Source Protection Zones (confined aquifer)

Records within 500m

0

Source Protection Zones in the confined aquifer define the sensitivity around a deep groundwater abstraction to contamination. A confined aquifer would normally be protected from contamination by overlying geology and is only considered a sensitive resource if deep excavation/drilling is taking place.

This data is sourced from the Environment Agency and Natural Resources Wales.



6 Hydrology



- Site Outline
- Search buffers in metres (m)
- Water Network (OS MasterMap)
- Surface water features (wider than 5m)
- Surface water features (narrower than 5m)
- ⋯ WFD River, canal and surface water transfer water bodies
- WFD Lake water bodies
- WFD Transitional and coastal water bodies
- WFD Surface water body catchments boundaries
- WFD Groundwater body boundaries

6.1 Water Network (OS MasterMap)

Records within 250m

0

Detailed water network of Great Britain showing the flow and precise central course of every river, stream, lake and canal.

This data is sourced from the Ordnance Survey.

6.2 Surface water features

Records within 250m

0

Covering rivers, streams and lakes (some overlap with OS MasterMap Water Network data in previous section) but additionally covers smaller features such as ponds. Rivers and streams narrower than 5m are represented as a single line. Lakes, ponds and rivers or streams wider than 5m are represented as polygons.



This data is sourced from the Ordnance Survey.

6.3 WFD Surface water body catchments

Records on site	1
------------------------	----------

The Water Framework Directive is an EU-led framework for the protection of inland surface waters, estuaries, coastal waters and groundwater through river basin-level management planning. In terms of surface water, these basins are broken down into smaller units known as management, operational and water body catchments.

Features are displayed on the Hydrology map on [page 48](#) >

ID	Location	Type	Water body catchment	Water body ID	Operational catchment	Management catchment
1	On site	River	Moselle Brook	GB106038027920	Lee Lower Rivers and Lakes	London

This data is sourced from the Environment Agency and Natural Resources Wales.

6.4 WFD Surface water bodies

Records identified	1
---------------------------	----------

Surface water bodies under the Directive may be rivers, lakes, estuary or coastal. To achieve the purpose of the Directive, environmental objectives have been set and are reported on for each water body. The progress towards delivery of the objectives is then reported on by the relevant competent authorities at the end of each six-year cycle. The river water body directly associated with the catchment listed in the previous section is detailed below, along with any lake, canal, coastal or artificial water body within 250m of the site. Click on the water body ID in the table to visit the EA Catchment Explorer to find out more about each water body listed.

Features are displayed on the Hydrology map on [page 48](#) >

ID	Location	Type	Name	Water body ID	Overall rating	Chemical rating	Ecological rating	Year
-	2595m NE	River	Moselle Brook	GB106038027920 ↗	Moderate	Fail	Moderate	2019

This data is sourced from the Environment Agency and Natural Resources Wales.

6.5 WFD Groundwater bodies

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

Groundwater bodies are also covered by the Directive and the same regime of objectives and reporting detailed in the previous section is in place. Click on the water body ID in the table to visit the EA Catchment Explorer to find out more about each groundwater body listed.



This data is sourced from the Environment Agency and Natural Resources Wales.



7 River and coastal flooding

7.1 Risk of flooding from rivers and the sea

Records within 50m**0**

The chance of flooding from rivers and/or the sea in any given year, based on cells of 50m within the Risk of Flooding from Rivers and Sea (RoFRaS)/Flood Risk Assessment Wales (FRAW) models. Each cell is allocated one of four flood risk categories, taking into account flood defences and their condition. The risk categories for RoFRaS for rivers and the sea and FRAW for rivers are; Very low (less than 1 in 1000 chance in any given year), Low (less than 1 in 100 but greater than or equal to 1 in 1000 chance), Medium (less than 1 in 30 but greater than or equal to 1 in 100 chance) or High (greater than or equal to 1 in 30 chance). The risk categories for FRAW for the sea are; Very low (less than 1 in 1000 chance in any given year), Low (less than 1 in 200 but greater than or equal to 1 in 1000 chance), Medium (less than 1 in 30 but greater than or equal to 1 in 200 chance) or High (greater than or equal to 1 in 30 chance).

This data is sourced from the Environment Agency and Natural Resources Wales.

7.2 Historical Flood Events

Records within 250m**0**

Records of historic flooding from rivers, the sea, groundwater and surface water. Records began in 1946 when predecessor bodies started collecting detailed information about flooding incidents, although limited details may be included on flooding incidents prior to this date. Takes into account the presence of defences, structures, and other infrastructure where they existed at the time of flooding, and includes flood extents that may have been affected by overtopping, breaches or blockages.

This data is sourced from the Environment Agency and Natural Resources Wales.

7.3 Flood Defences

Records within 250m**0**

Records of flood defences owned, managed or inspected by the Environment Agency and Natural Resources Wales. Flood defences can be structures, buildings or parts of buildings. Typically these are earth banks, stone and concrete walls, or sheet-piling that is used to prevent or control the extent of flooding.

This data is sourced from the Environment Agency and Natural Resources Wales.



7.4 Areas Benefiting from Flood Defences

Records within 250m

0

Areas that would benefit from the presence of flood defences in a 1 in 100 (1%) chance of flooding each year from rivers or 1 in 200 (0.5%) chance of flooding each year from the sea.

This data is sourced from the Environment Agency and Natural Resources Wales.

7.5 Flood Storage Areas

Records within 250m

0

Areas that act as a balancing reservoir, storage basin or balancing pond to attenuate an incoming flood peak to a flow level that can be accepted by the downstream channel or to delay the timing of a flood peak so that its volume is discharged over a longer period.

This data is sourced from the Environment Agency and Natural Resources Wales.



River and coastal flooding - Flood Zones

7.6 Flood Zone 2

Records within 50m

0

Areas of land at risk of flooding, when the presence of flood defences are ignored. Covering land between Flood Zone 3 (see next section) and the extent of the flooding from rivers or the sea with a 1 in 1000 (0.1%) chance of flooding each year.

This data is sourced from the Environment Agency and Natural Resources Wales.

7.7 Flood Zone 3

Records within 50m

0

Areas of land at risk of flooding, when the presence of flood defences are ignored. Covering land with a 1 in 100 (1%) or greater chance of flooding each year from rivers or a 1 in 200 (0.5%) or greater chance of flooding each year from the sea.

This data is sourced from the Environment Agency and Natural Resources Wales.



8 Surface water flooding



— Site Outline

Search buffers in metres (m)

1 in 1000 return period

- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

1 in 250 return period

- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

1 in 100 return period

- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

1 in 30 return period

- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

8.1 Surface water flooding

Highest risk on site

Negligible

Highest risk within 50m

1 in 30 year, 0.3m - 1.0m

Ambiental Risk Analytics surface water (pluvial) FloodMap identifies areas likely to flood as a result of extreme rainfall events, i.e. land naturally vulnerable to surface water ponding or flooding. This data set was produced by simulating 1 in 30 year, 1 in 100 year, 1 in 250 year and 1 in 1,000 year rainfall events. Modern urban drainage systems are typically built to cope with rainfall events between 1 in 20 and 1 in 30 years, though some older ones may flood in a 1 in 5 year rainfall event.

Features are displayed on the Surface water flooding map on [page 54 >](#)

The data shown on the map and in the table above shows the highest likelihood of flood events happening at the site. Lower likelihood events may have greater flood depths and hence a greater potential impact on a site.

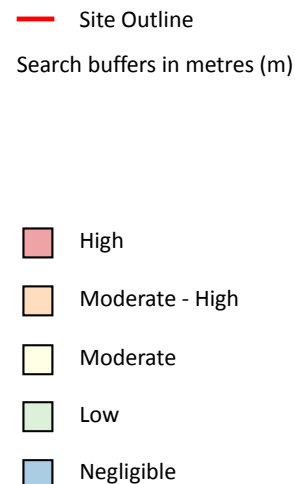
The table below shows the maximum flood depths for a range of return periods for the site.

Return period	Maximum modelled depth
1 in 1000 year	Negligible
1 in 250 year	Negligible
1 in 100 year	Negligible
1 in 30 year	Negligible

This data is sourced from Ambiantal Risk Analytics.



9 Groundwater flooding



9.1 Groundwater flooding

Highest risk on site

Negligible

Highest risk within 50m

Negligible

Groundwater flooding is caused by unusually high groundwater levels. It occurs when the water table rises above the ground surface or within underground structures such as basements or cellars. Groundwater flooding tends to exhibit a longer duration than surface water flooding, possibly lasting for weeks or months, and as a result it can cause significant damage to property. This risk assessment is based on a 1 in 100 year return period and a 5m Digital Terrain Model (DTM).

Features are displayed on the Groundwater flooding map on [page 56 >](#)

This data is sourced from Ambiantal Risk Analytics.

10 Environmental designations



- Site Outline
- Search buffers in metres (m)
- Sites of Special Scientific Interest (SSSI)
- + Local Nature Reserves (LNR)
- X Designated Ancient Woodland

10.1 Sites of Special Scientific Interest (SSSI)

Records within 2000m

2

Sites providing statutory protection for the best examples of UK flora, fauna, or geological or physiographical features. Originally notified under the National Parks and Access to the Countryside Act 1949, SSSIs were re-notified under the Wildlife and Countryside Act 1981. Improved provisions for the protection and management of SSSIs were introduced by the Countryside and Rights of Way Act 2000 (in England and Wales) and (in Scotland) by the Nature Conservation (Scotland) Act 2004 and the Wildlife and Natural Environment (Scotland) Act 2010.

Features are displayed on the Environmental designations map on [page 57](#) >

ID	Location	Name	Data source
B	1282m SW	Hampstead Heath Woods	Natural England



ID	Location	Name	Data source
-	1341m W	Hampstead Heath Woods	Natural England

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.2 Conserved wetland sites (Ramsar sites)

Records within 2000m	0
-----------------------------	----------

Ramsar sites are designated under the Convention on Wetlands of International Importance, agreed in Ramsar, Iran, in 1971. They cover all aspects of wetland conservation and wise use, recognizing wetlands as ecosystems that are extremely important for biodiversity conservation in general and for the well-being of human communities. These sites cover a broad definition of wetland; marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, and even some marine areas.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.3 Special Areas of Conservation (SAC)

Records within 2000m	0
-----------------------------	----------

Areas which have been identified as best representing the range and variety within the European Union of habitats and (non-bird) species listed on Annexes I and II to the Directive. SACs are designated under the EC Habitats Directive.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.4 Special Protection Areas (SPA)

Records within 2000m	0
-----------------------------	----------

Sites classified by the UK Government under the EC Birds Directive, SPAs are areas of the most important habitat for rare (listed on Annex I to the Directive) and migratory birds within the European Union.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.5 National Nature Reserves (NNR)

Records within 2000m	0
-----------------------------	----------

Sites containing examples of some of the most important natural and semi-natural terrestrial and coastal ecosystems in Great Britain. They are managed to conserve their habitats, provide special opportunities for scientific study or to provide public recreation compatible with natural heritage interests.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.6 Local Nature Reserves (LNR)

Records within 2000m

4

Sites managed for nature conservation, and to provide opportunities for research and education, or simply enjoying and having contact with nature. They are declared by local authorities under the National Parks and Access to the Countryside Act 1949 after consultation with the relevant statutory nature conservation agency.

Features are displayed on the Environmental designations map on [page 57 >](#)

ID	Location	Name	Data source
1	400m NE	Parkland Walk	Natural England
A	632m N	Queen's Wood	Natural England
-	1457m N	Parkland Walk	Natural England
-	1901m NE	Alexandra Palace & Park	Natural England

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.7 Designated Ancient Woodland

Records within 2000m

3

Ancient woodlands are classified as areas which have been wooded continuously since at least 1600 AD. This includes semi-natural woodland and plantations on ancient woodland sites. 'Wooded continuously' does not mean there is or has previously been continuous tree cover across the whole site, and not all trees within the woodland have to be old.

Features are displayed on the Environmental designations map on [page 57 >](#)

ID	Location	Name	Woodland Type
2	560m N	Queens Wood	Ancient & Semi-Natural Woodland
A	632m N	Queens Wood	Ancient & Semi-Natural Woodland
B	1282m SW	Ken Wood	Ancient & Semi-Natural Woodland

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.8 Biosphere Reserves

Records within 2000m

0

Biosphere Reserves are internationally recognised by UNESCO as sites of excellence to balance conservation and socioeconomic development between nature and people. They are recognised under the Man and the Biosphere (MAB) Programme with the aim of promoting sustainable development founded on the work of the



local community.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.9 Forest Parks

Records within 2000m

0

These are areas managed by the Forestry Commission designated on the basis of recreational, conservation or scenic interest.

This data is sourced from the Forestry Commission.

10.10 Marine Conservation Zones

Records within 2000m

0

A type of marine nature reserve in UK waters established under the Marine and Coastal Access Act (2009). They are designated with the aim to protect nationally important, rare or threatened habitats and species.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.11 Green Belt

Records within 2000m

0

Areas designated to prevent urban sprawl by keeping land permanently open.

This data is sourced from the Ministry of Housing, Communities and Local Government.

10.12 Proposed Ramsar sites

Records within 2000m

0

Ramsar sites are areas listed as a Wetland of International Importance under the Convention on Wetlands of International Importance especially as Waterfowl Habitat (the Ramsar Convention) 1971. The sites here supplied have a status of 'Proposed' having been identified for potential adoption under the framework.

This data is sourced from Natural England.

10.13 Possible Special Areas of Conservation (pSAC)

Records within 2000m

0

Special Areas of Conservation are areas which have been identified as best representing the range and variety within the European Union of habitats and (non-bird) species listed on Annexes I and II to the Directive. SACs are designated under the EC Habitats Directive. Those sites supplied here are those with a status of 'Possible' having been identified for potential adoption under the framework.



This data is sourced from Natural England and Natural Resources Wales.

10.14 Potential Special Protection Areas (pSPA)

Records within 2000m

0

Special Protection Areas (SPAs) are areas designated (or 'classified') under the European Union Wild Birds Directive for the protection of nationally and internationally important populations of wild birds. Those sites supplied here are those with a status of 'Potential' having been identified for potential adoption under the framework.

This data is sourced from Natural England.

10.15 Nitrate Sensitive Areas

Records within 2000m

0

Areas where nitrate concentrations in drinking water sources exceeded or was at risk of exceeding the limit of 50 mg/l set by the 1980 EC Drinking Water Directive. Voluntary agricultural measures as a means of reducing the levels of nitrate were introduced by DEFRA as MAFF, with payments being made to farmers who complied. The scheme was started as a pilot in 1990 in ten areas, later implemented within 32 areas. The scheme was closed to further new entrants in 1998, although existing agreements continued for their full term. All Nitrate Sensitive Areas fell within the areas designated as Nitrate Vulnerable Zones (NVZs) in 1996 under the EC Nitrate Directive (91/676/EEC).

This data is sourced from Natural England.

10.16 Nitrate Vulnerable Zones

Records within 2000m

0

Areas at risk from agricultural nitrate pollution designated under the EC Nitrate Directive (91/676/EEC). These are areas of land that drain into waters polluted by nitrates. Farmers operating within these areas have to follow mandatory rules to tackle nitrate loss from agriculture.

This data is sourced from Natural England and Natural Resources Wales.



SSSI Impact Zones and Units



- Site Outline
- Search buffers in metres (m)
- SSSI Impact Risk Zones
- SSSI Units
- Not recorded
- Favourable
- Unfavourable - Recovering
- Unfavourable - No change
- Unfavourable - Declining
- Partially destroyed
- Destroyed

10.17 SSSI Impact Risk Zones

Records on site

1

Developed to allow rapid initial assessment of the potential risks to SSSIs posed by development proposals. They define zones around each SSSI which reflect the particular sensitivities of the features for which it is notified and indicate the types of development proposal which could potentially have adverse impacts.

Features are displayed on the SSSI Impact Zones and Units map on [page 62](#) >

ID	Location	Type of developments requiring consultation
1	On site	Infrastructure - Pipelines and underground cables, pylons and overhead cables. Any transport proposal including road, rail and by water (excluding routine maintenance). Airports, helipads and other aviation proposals. Minerals, Oil and Gas - Planning applications for quarries, including: new proposals, Review of Minerals Permissions (ROMP), extensions, variations to conditions etc. Oil & gas exploration/extraction. Air pollution - Any industrial/agricultural development that could cause AIR POLLUTION (incl: industrial processes, livestock & poultry units with floorspace > 500m², slurry lagoons & digestate stores > 200m², manure stores > 250t). Combustion - General combustion processes >20MW energy input. Incl: energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/ combustion. Waste - Landfill. Incl: inert landfill, non-hazardous landfill, hazardous landfill. Composting - Any composting proposal with more than 75000 tonnes maximum annual operational throughput. Incl: open windrow composting, in-vessel composting, anaerobic digestion, other waste management. Discharges - Any discharge of water or liquid waste of more than 20m³/day to ground (ie to seep away) or to surface water, such as a beck or stream. Water supply - Large infrastructure such as warehousing / industry where total net additional gross internal floorspace following development is 1,000m² or more.

This data is sourced from Natural England.

10.18 SSSI Units

Records within 2000m	3
-----------------------------	----------

Divisions of SSSIs used to record management and condition details. Units are the smallest areas for which Natural England gives a condition assessment, however, the size of units varies greatly depending on the types of management and the conservation interest.

Features are displayed on the SSSI Impact Zones and Units map on [page 62 >](#)

ID: 12
 Location: 1282m SW
 SSSI name: Hampstead Heath Woods
 Unit name: 2
 Broad habitat: Broadleaved, Mixed And Yew Woodland - Lowland
 Condition: Favourable
 Reportable features:

Feature name	Feature condition	Date of assessment
Lowland mixed deciduous woodland	Favourable	18/05/2018



ID: -
Location: 1341m W
SSSI name: Hampstead Heath Woods
Unit name: 2
Broad habitat: Broadleaved, Mixed And Yew Woodland - Lowland
Condition: Favourable
Reportable features:

Feature name	Feature condition	Date of assessment
Lowland mixed deciduous woodland	Favourable	18/05/2018

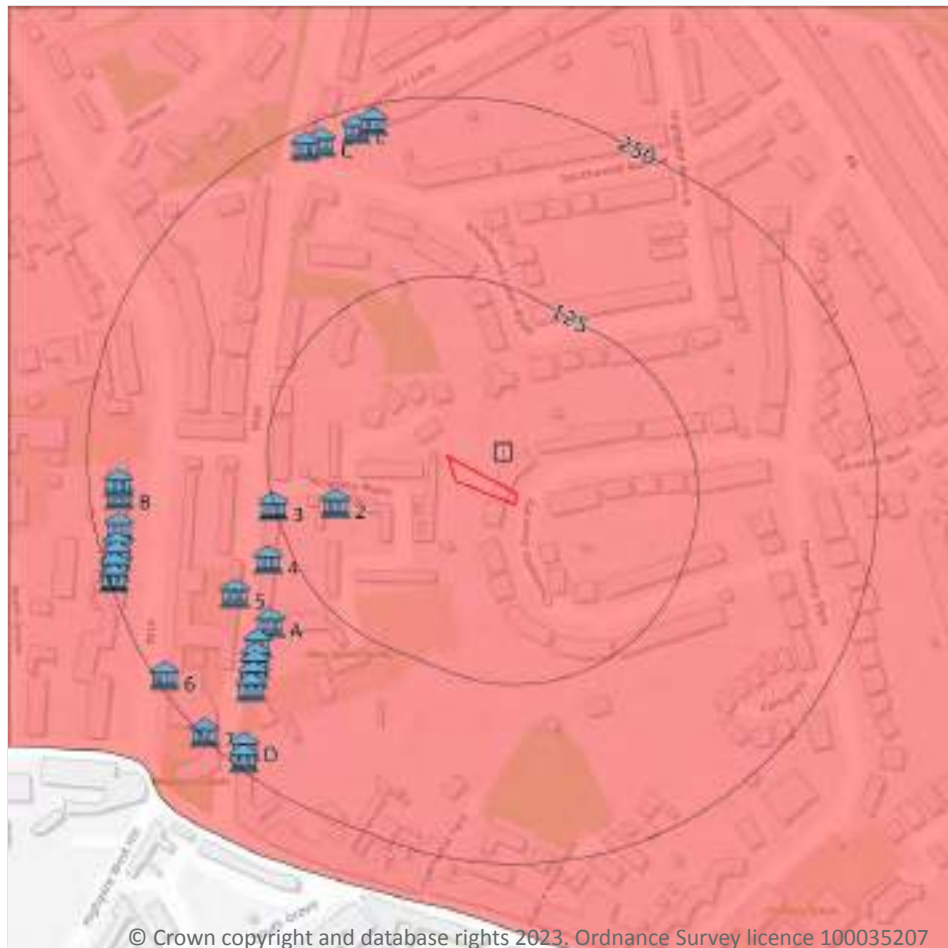
ID: -
Location: 1622m W
SSSI name: Hampstead Heath Woods
Unit name: 1
Broad habitat: Fen, Marsh And Swamp - Lowland
Condition: Favourable
Reportable features:

Feature name	Feature condition	Date of assessment
Spring/flush fen (lowland)	Favourable	18/05/2018

This data is sourced from Natural England and Natural Resources Wales.



11 Visual and cultural designations



- Site Outline
- Search buffers in metres (m)
- Listed buildings
- Conservation areas
- Conservation areas - no data
- National Parks
- Areas of Outstanding Natural Beauty
- Registered parks and gardens
- Scheduled Monuments
- World Heritage Sites

11.1 World Heritage Sites

Records within 250m

0

Sites designated for their globally important cultural or natural interest requiring appropriate management and protection measures. World Heritage Sites are designated to meet the UK's commitments under the World Heritage Convention.

This data is sourced from Historic England, Cadw and Historic Environment Scotland.

11.2 Area of Outstanding Natural Beauty

Records within 250m

0

Areas of Outstanding Natural Beauty (AONB) are conservation areas, chosen because they represent 18% of the finest countryside. Each AONB has been designated for special attention because of the quality of their flora, fauna, historical and cultural associations, and/or scenic views. The National Parks and Access to the Countryside Act of 1949 created AONBs and the Countryside and Rights of Way Act, 2000 added further regulation and protection. There are likely to be restrictions to some developments within these areas.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

11.3 National Parks

Records within 250m

0

In England and Wales, the purpose of National Parks is to conserve and enhance landscapes within the countryside whilst promoting public enjoyment of them and having regard for the social and economic well-being of those living within them. In Scotland National Parks have the additional purpose of promoting the sustainable use of the natural resources of the area and the sustainable social and economic development of its communities. The National Parks and Access to the Countryside Act 1949 established the National Park designation in England and Wales, and The National Parks (Scotland) Act 2000 in Scotland.

This data is sourced from Natural England, Natural Resources Wales and the Scottish Government.

11.4 Listed Buildings

Records within 250m

25

Buildings listed for their special architectural or historical interest. Building control in the form of 'listed building consent' is required in order to make any changes to that building which might affect its special interest. Listed buildings are graded to indicate their relative importance, however building controls apply to all buildings equally, irrespective of their grade, and apply to the interior and exterior of the building in its entirety, together with any curtilage structures.

Features are displayed on the Visual and cultural designations map on [page 65 >](#)

ID	Location	Name	Grade	Reference Number	Listed date
2	84m W	Southwood Lodge	II	1189059	10/05/1974
3	126m W	50 And 54, Southwood Lane N6	II	1079166	10/05/1974
4	142m W	24-48, Southwood Lane N6	II	1079165	10/05/1974
A	162m SW	22, Southwood Lane N6	II	1079164	10/05/1974
5	172m SW	Sir John Woolaston's Almshouses	II	1189375	19/03/1951
A	178m SW	The Highgate Tabernacle	II	1358876	10/05/1974



ID	Location	Name	Grade	Reference Number	Listed date
A	185m SW	20a, Southwood Lane N6	II	1079163	10/05/1974
A	189m SW	20, Southwood Lane N6	II	1079162	10/05/1974
A	195m SW	18, Southwood Lane N6	II	1358875	10/05/1974
A	203m SW	16, Southwood Lane N6	II	1079161	10/05/1974
B	229m W	47 And 49, North Road N6	II	1079196	10/05/1974
B	229m W	Gloucester House	II	1358850	10/05/1974
B	233m W	37-43, North Road N6	II	1189311	10/05/1974
C	235m NW	Garden Walls To North And East Of Bank Point Cottage	II	1358859	10/05/1974
D	236m SW	12, Southwood Lane N6	II	1358874	10/05/1974
E	237m N	Wall To South Of Hillside	II	1079215	10/05/1974
C	237m NW	Bank Point Cottage	II	1189054	10/05/1974
B	237m W	35, North Road N6	II	1358849	10/05/1974
E	238m N	Hillside	II	1079214	10/05/1974
B	240m W	33 And 33a, North Road N6	II	1294348	10/05/1974
D	243m SW	10, Southwood Lane N6	II	1079160	19/03/1951
B	243m W	31, North Road N6	II	1079195	10/05/1974
6	244m SW	Gas Lamp	II	1249712	17/10/1995
B	247m W	27 And 29, North Road N6	II	1358888	10/05/1974
7	247m SW	Highgate School, Old School Building	II	1263619	02/12/1994

This data is sourced from Historic England, Cadw and Historic Environment Scotland.

11.5 Conservation Areas

Records within 250m

1

Local planning authorities are obliged to designate as conservation areas any parts of their own area that are of special architectural or historic interest, the character and appearance of which it is desirable to preserve or enhance. Designation of a conservation area gives broader protection than the listing of individual buildings. All the features within the area, listed or otherwise, are recognised as part of its character. Conservation area designation is the means of recognising the importance of all factors and of ensuring that planning decisions address the quality of the landscape in its broadest sense.

Features are displayed on the Visual and cultural designations map on [page 65 >](#)



ID	Location	Name	District	Date of designation
1	On site	Highgate, Haringey	Haringey	21/12/1967

This data is sourced from Historic England, Cadw and Historic Environment Scotland.

11.6 Scheduled Ancient Monuments

Records within 250m	0
----------------------------	----------

A scheduled monument is an historic building or site that is included in the Schedule of Monuments kept by the Secretary of State for Digital, Culture, Media and Sport. The regime is set out in the Ancient Monuments and Archaeological Areas Act 1979. The Schedule of Monuments has c.20,000 entries and includes sites such as Roman remains, burial mounds, castles, bridges, earthworks, the remains of deserted villages and industrial sites. Monuments are not graded, but all are, by definition, considered to be of national importance.

This data is sourced from Historic England, Cadw and Historic Environment Scotland.

11.7 Registered Parks and Gardens

Records within 250m	0
----------------------------	----------

Parks and gardens assessed to be of particular interest and of special historic interest. The emphasis being on 'designed' landscapes, rather than on planting or botanical importance. Registration is a 'material consideration' in the planning process, meaning that planning authorities must consider the impact of any proposed development on the special character of the landscape.

This data is sourced from Historic England, Cadw and Historic Environment Scotland.

12 Agricultural designations



- Site Outline
- Search buffers in metres (m)
- Grade 1 - excellent quality
- Grade 2 - very good quality
- Grade 3 - good to moderate quality
- Grade 3a - good quality
- Grade 3b - moderate quality
- Grade 4 - poor quality
- Grade 5 - very poor quality
- Non-agricultural land
- Urban land
- Exclusion land
- Tree felling licences
- Open Access land

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12.1 Agricultural Land Classification

Records within 250m

1

Classification of the quality of agricultural land taking into consideration multiple factors including climate, physical geography and soil properties. It should be noted that the categories for the grading of agricultural land are not consistent across England, Wales and Scotland.

Features are displayed on the Agricultural designations map on [page 69](#) >

ID	Location	Classification	Description
1	On site	Urban	-

This data is sourced from Natural England.

12.2 Open Access Land

Records within 250m

0

The Countryside and Rights of Way Act 2000 (CROW Act) gives a public right of access to land without having to use paths. Access land includes mountains, moors, heaths and downs that are privately owned. It also includes common land registered with the local council and some land around the England Coast Path. Generally permitted activities on access land are walking, running, watching wildlife and climbing.

This data is sourced from Natural England and Natural Resources Wales.

12.3 Tree Felling Licences

Records within 250m

0

Felling Licence Application (FLA) areas approved by Forestry Commission England. Anyone wishing to fell trees must ensure that a licence or permission under a grant scheme has been issued by the Forestry Commission before any felling is carried out or that one of the exceptions apply.

This data is sourced from the Forestry Commission.

12.4 Environmental Stewardship Schemes

Records within 250m

0

Environmental Stewardship covers a range of schemes that provide financial incentives to farmers, foresters and land managers to look after and improve the environment. The schemes identified may be historical schemes that have now expired, or may still be active.

This data is sourced from Natural England.

12.5 Countryside Stewardship Schemes

Records within 250m

0

Countryside Stewardship covers a range of schemes that provide financial incentives to farmers, foresters and land managers to look after and improve the environment. Main objectives are to improve the farmed environment for wildlife and to reduce diffuse water pollution.

This data is sourced from Natural England.

13 Habitat designations



- Site Outline
- Search buffers in metres (m)
- Priority Habitat Inventory
- Open Mosaic Habitat
- Limestone Pavement Orders
- Habitat Networks
- Primary Habitat
- Restorable Habitat
- Associated Habitats
- Habitat Restoration-Creation
- Network Enhancement Zone 1
- Network Enhancement Zone 2

13.1 Priority Habitat Inventory

Records within 250m

4

Habitats of principal importance as named under Natural Environment and Rural Communities Act (2006) Section 41.

Features are displayed on the Habitat designations map on [page 71 >](#)

ID	Location	Main Habitat	Other habitats
1	49m SW	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
2	148m S	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
3	149m S	Deciduous woodland	Main habitat: DWOOD (INV > 50%)
4	182m S	Deciduous woodland	Main habitat: DWOOD (INV > 50%)



This data is sourced from Natural England.

13.2 Habitat Networks

Records within 250m

0

Habitat networks for 18 priority habitat networks (based primarily, but not exclusively, on the priority habitat inventory) and areas suitable for the expansion of networks through restoration and habitat creation.

This data is sourced from Natural England.

13.3 Open Mosaic Habitat

Records within 250m

0

Sites verified as Open Mosaic Habitat. Mosaic habitats are brownfield sites that are identified under the UK Biodiversity Action Plan as a priority habitat due to the habitat variation within a single site, supporting an array of invertebrates.

This data is sourced from Natural England.

13.4 Limestone Pavement Orders

Records within 250m

0

Limestone pavements are outcrops of limestone where the surface has been worn away by natural means over millennia. These rocks have the appearance of paving blocks, hence their name. Not only do they have geological interest, they also provide valuable habitats for wildlife. These habitats are threatened due to their removal for use in gardens and water features. Many limestone pavements have been designated as SSSIs which affords them some protection. In addition, Section 34 of the Wildlife and Countryside Act 1981 gave them additional protection via the creation of Limestone Pavement Orders, which made it a criminal offence to remove any part of the outcrop. The associated Limestone Pavement Priority Habitat is part of the UK Biodiversity Action Plan priority habitat in England.

This data is sourced from Natural England.



14 Geology 1:10,000 scale - Availability



- Site Outline
- Search buffers in metres (m)
- Full coverage
 - Partial coverage
 - No coverage

14.1 10k Availability

Records within 500m

1

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.

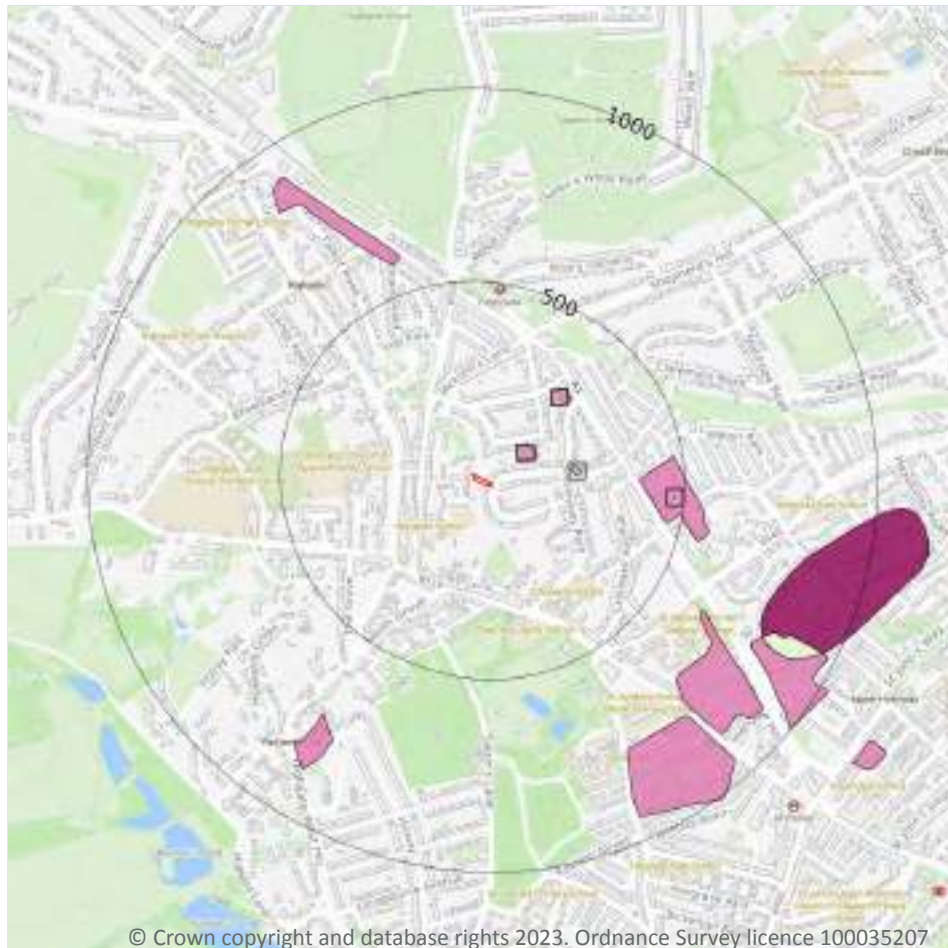
Features are displayed on the Geology 1:10,000 scale - Availability map on [page 73](#) >

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	Full	Full	Full	No coverage	TQ28NE

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

14.2 Artificial and made ground (10k)

Records within 500m

4

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 74 >](#)

ID	Location	LEX Code	Description	Rock description
1	94m NE	WGR-UNKNOWN	Worked Ground (Undivided)	Unknown/unclassified Entry
2	212m E	WGR-UNKNOWN	Worked Ground (Undivided)	Unknown/unclassified Entry
3	256m NE	WGR-UNKNOWN	Worked Ground (Undivided)	Unknown/unclassified Entry
4	383m E	WGR-UNKNOWN	Worked Ground (Undivided)	Unknown/unclassified Entry



This data is sourced from the British Geological Survey.



Geology 1:10,000 scale - Superficial

14.3 Superficial geology (10k)

Records within 500m

0

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.

This data is sourced from the British Geological Survey.

14.4 Landslip (10k)

Records within 500m

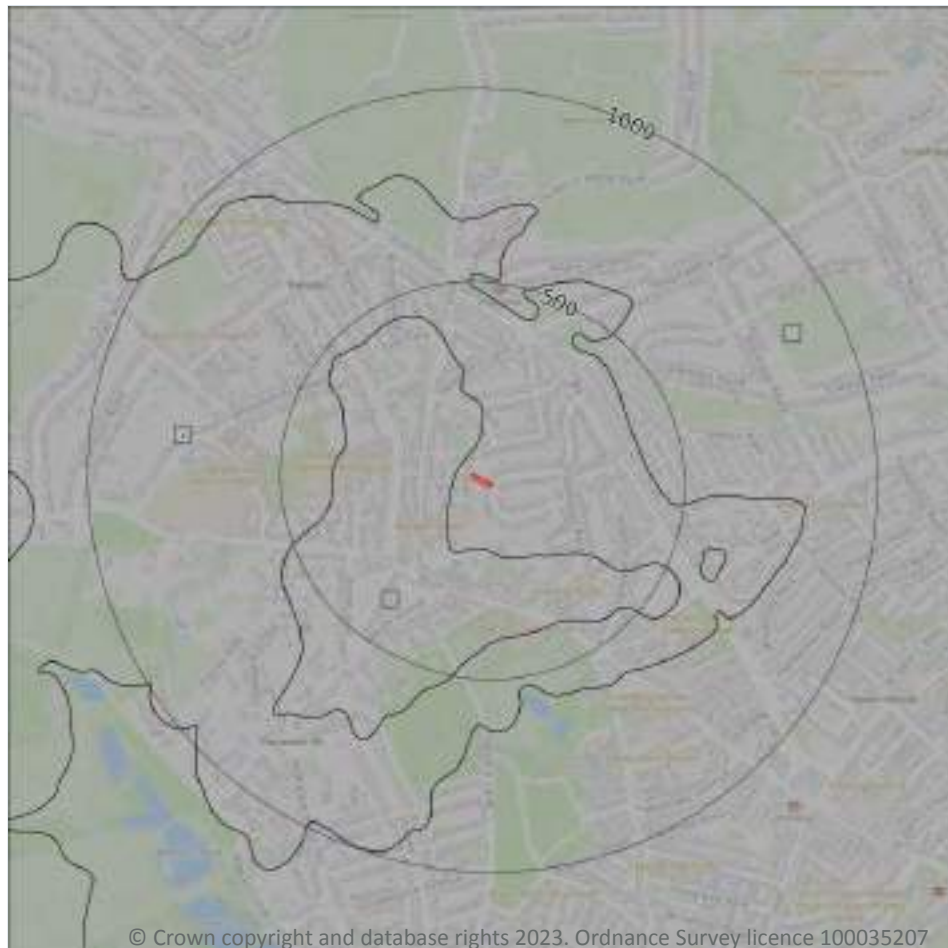
0

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.

14.5 Bedrock geology (10k)

Records within 500m

3

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 77 >](#)

ID	Location	LEX Code	Description	Rock age
1	On site	CLGB-SDST	Claygate Member - Sandstone	Eocene Epoch
2	39m NW	BGS-SANDU	Bagshot Formation - Sand	Eocene Epoch
3	388m E	LC-CLAY	London Clay Formation - Clay	Eocene Epoch

This data is sourced from the British Geological Survey.



14.6 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.



15 Geology 1:50,000 scale - Availability



- Site Outline
- Search buffers in metres (m)
- ☐ Geological map tile

15.1 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.

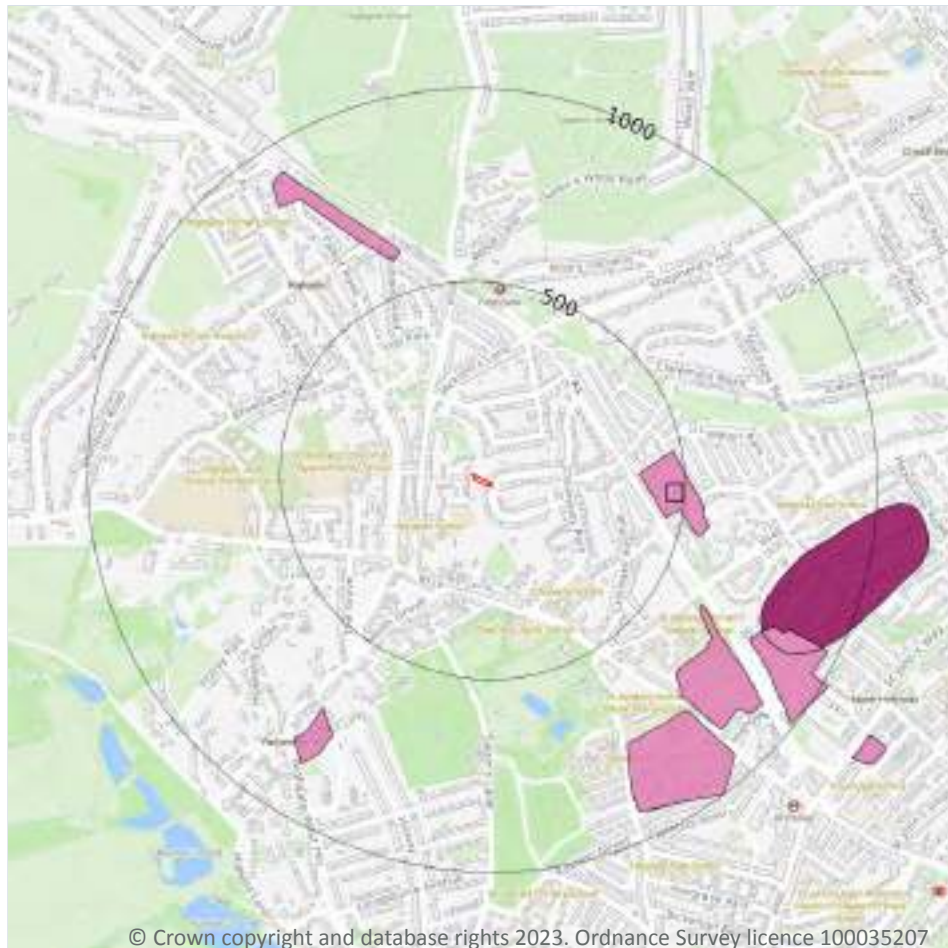
Features are displayed on the Geology 1:50,000 scale - Availability map on [page 79](#) >

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

15.2 Artificial and made ground (50k)

Records within 500m

1

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 80](#) >

ID	Location	LEX Code	Description	Rock description
1	383m E	WGR-VOID	WORKED GROUND (UNDIVIDED)	VOID

This data is sourced from the British Geological Survey.

15.3 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

15.4 Superficial geology (50k)

Records within 500m

0

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.

This data is sourced from the British Geological Survey.

15.5 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.

15.6 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.

15.7 Landslip permeability (50k)

Records within 50m

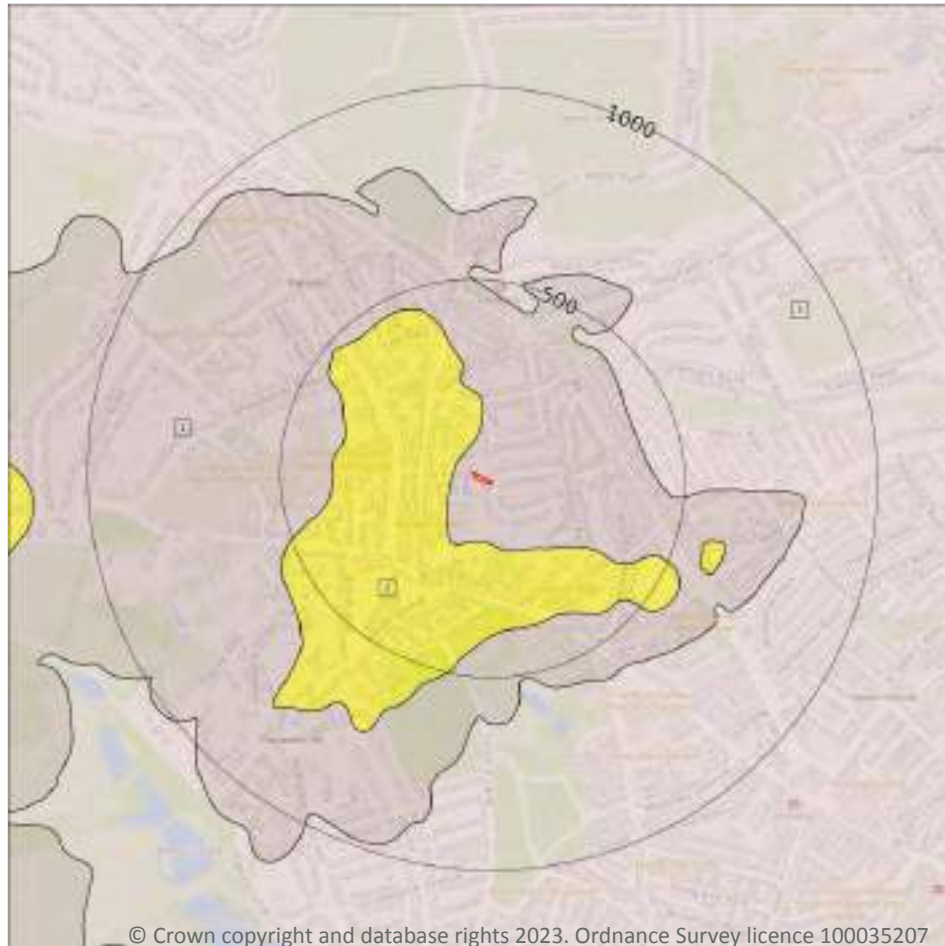
0

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.

15.8 Bedrock geology (50k)

Records within 500m

3

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 83](#) >

ID	Location	LEX Code	Description	Rock age
1	On site	CLGB-XCZS	CLAYGATE MEMBER - CLAY, SILT AND SAND	YPRESIAN
2	47m NW	BGS-S	BAGSHOT FORMATION - SAND	YPRESIAN
3	392m E	LC-XCZS	LONDON CLAY FORMATION - CLAY, SILT AND SAND	YPRESIAN

This data is sourced from the British Geological Survey.



15.9 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	High	Very Low
47m NW	Intergranular	High	High

This data is sourced from the British Geological Survey.

15.10 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.



16 Boreholes

16.1 BGS Boreholes

Records within 250m

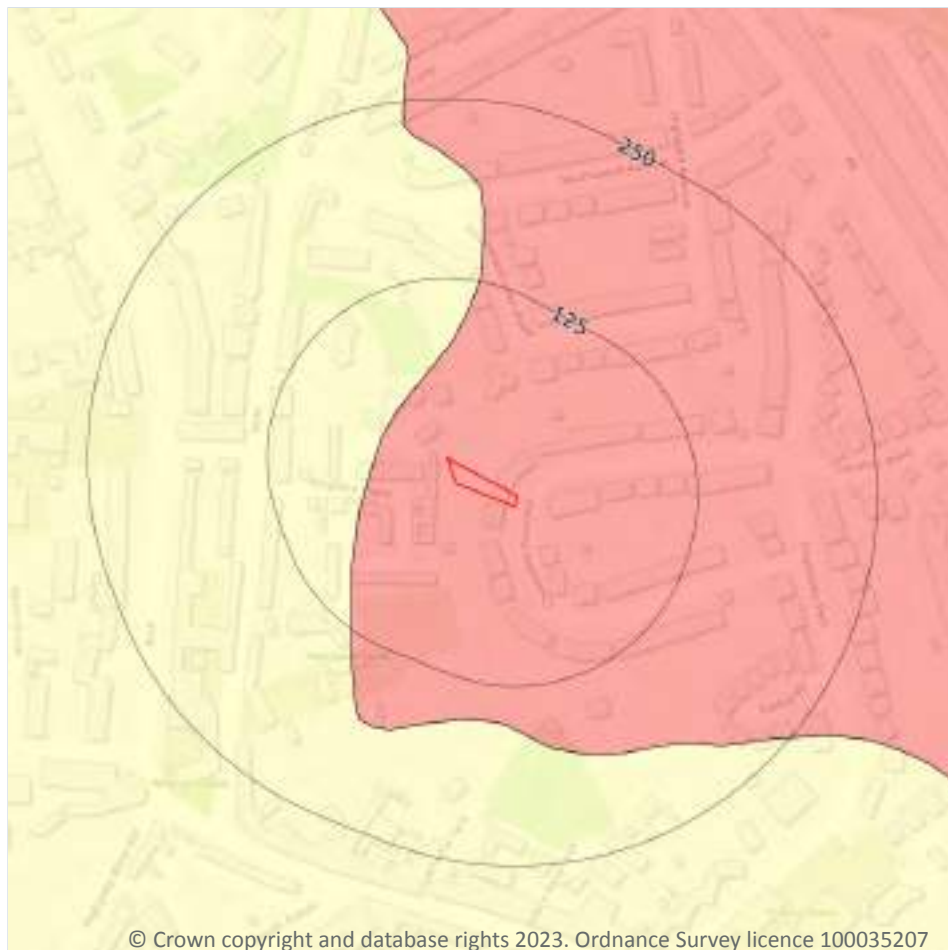
0

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.



17 Natural ground subsidence - Shrink swell clays



- Site Outline
- Search buffers in metres (m)
- ☐ No data
 - ☐ Negligible
 - ☐ Very low
 - ☐ Low
 - ☐ Moderate
 - ☐ High

17.1 Shrink swell clays

Records within 50m

2

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).

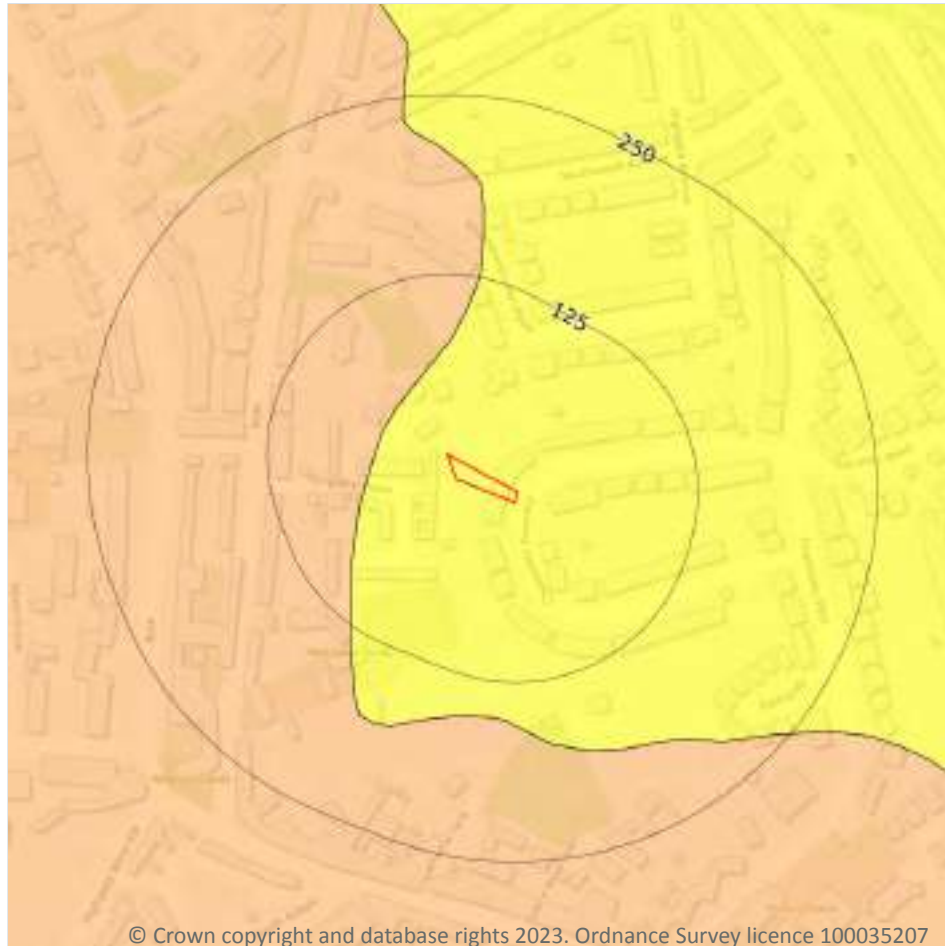
Features are displayed on the Natural ground subsidence - Shrink swell clays map on [page 86 >](#)

Location	Hazard rating	Details
On site	Moderate	Ground conditions predominantly high plasticity.
47m NW	Negligible	Ground conditions predominantly non-plastic.

This data is sourced from the British Geological Survey.



Natural ground subsidence - Running sands



- Site Outline
- Search buffers in metres (m)
- ☐ No data
 - ☐ Negligible
 - ☒ Very low
 - ☐ Low
 - ☐ Moderate
 - ☐ High

17.2 Running sands

Records within 50m

2

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 87 >](#)

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.



Location	Hazard rating	Details
47m NW	Low	Running sand conditions may be present. Constraints may apply to land uses involving excavation or the addition or removal of water.

This data is sourced from the British Geological Survey.



Natural ground subsidence - Compressible deposits



- Site Outline
- Search buffers in metres (m)
- ☐ No data
 - ☐ Negligible
 - ☐ Very low
 - ☐ Low
 - ☐ Moderate
 - ☐ High

17.3 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.

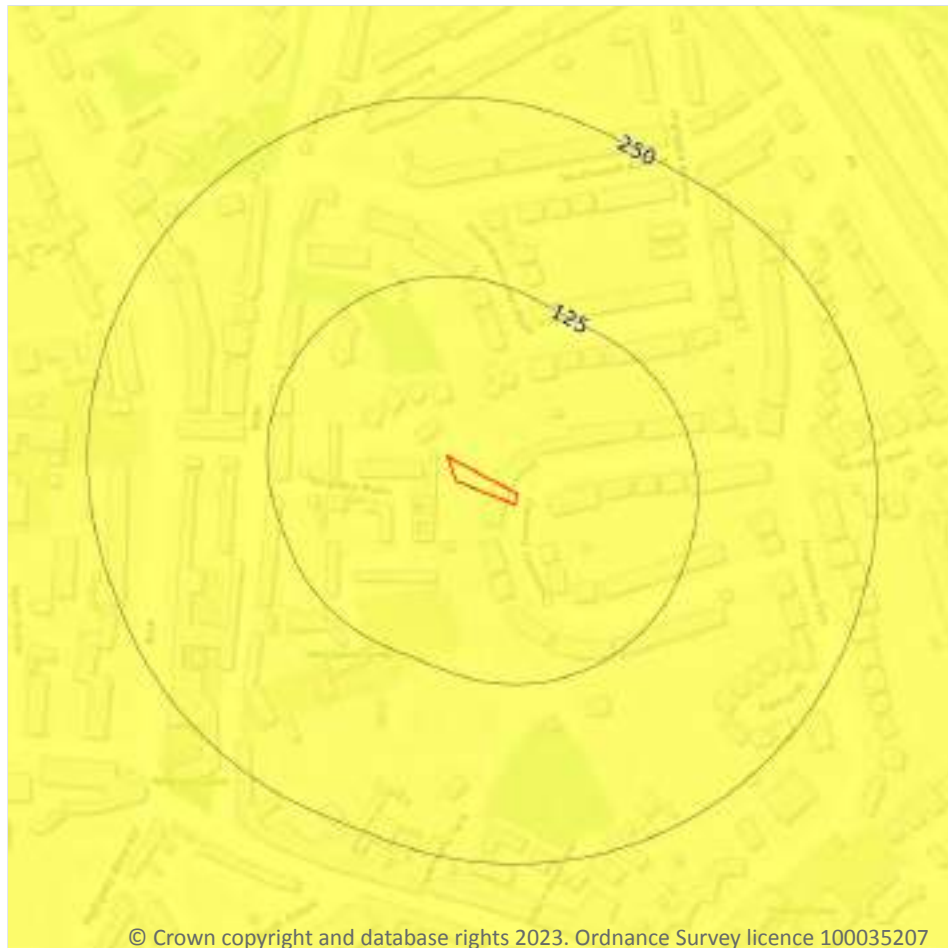
Features are displayed on the Natural ground subsidence - Compressible deposits map on [page 89](#) >

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



- Site Outline
- Search buffers in metres (m)
- ☐ No data
 - ☐ Negligible
 - ☐ Very low
 - ☐ Low
 - ☐ Moderate
 - ☐ High

17.4 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.

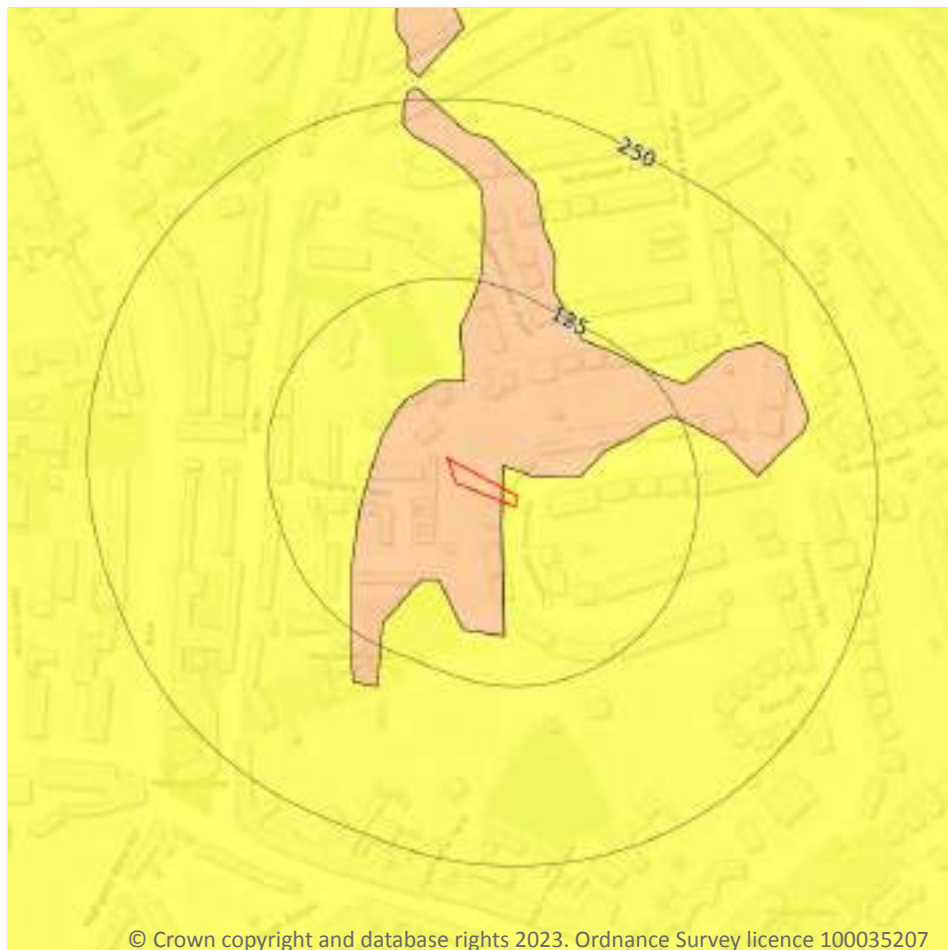
Features are displayed on the Natural ground subsidence - Collapsible deposits map on [page 90](#) >

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



- Site Outline
- Search buffers in metres (m)
- ☐ No data
 - ☐ Negligible
 - ☐ Very low
 - ☐ Low
 - ☐ Moderate
 - ☐ High

17.5 Landslides

Records within 50m

2

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 91](#) >

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.

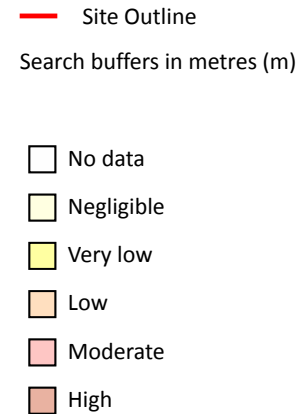


Location	Hazard rating	Details
On site	Low	Slope instability problems may be present or anticipated. Site investigation should consider specifically the slope stability of the site.

This data is sourced from the British Geological Survey.



Natural ground subsidence - Ground dissolution of soluble rocks



17.6 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 93](#) >

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.



18 Mining and ground workings



- Site Outline
- Search buffers in metres (m)
- BritPits
- ▨ Surface ground workings
- ▨ Underground workings
- ▨ Underground mining extents
- ▨ Historical mineral planning areas
- ▨ TCA non-coal mining
- 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

18.1 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.

18.2 Surface ground workings

Records within 250m

9

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 and ground workings map on [page 95 >](#)

ID	Location	Land Use	Year of mapping	Mapping scale
1	71m W	Unspecified Pit	1949	1:10560
A	71m S	Unspecified Heap	1965	1:10560
A	71m S	Unspecified Heap	1974	1:10000
A	71m S	Unspecified Heap	1996	1:10000
A	73m SW	Unspecified Heap	1958	1:10560
B	129m E	Unspecified Pit	1869	1:10560
B	129m E	Unspecified Pit	1879	1:10560
C	247m NE	Unspecified Pit	1869	1:10560
C	247m NE	Unspecified Pit	1879	1:10560

This is data is sourced from Ordnance Survey/Groundsure.

18.3 Underground workings

Records within 1000m

17

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

Features are displayed on the Mining and ground workings map on [page 95 >](#)

ID	Location	Land Use	Year of mapping	Mapping scale
L	424m NE	Tunnel	1869	1:10560
L	424m NE	Tunnel	1879	1:10560
L	424m NE	Tunnel	1879	1:10560
L	426m NE	Tunnels	1965	1:10560
L	426m NE	Tunnels	1974	1:10000
L	426m NE	Tunnels	1995	1:10000



ID	Location	Land Use	Year of mapping	Mapping scale
L	426m NE	Tunnels	1958	1:10560
O	499m N	Tunnel	1869	1:10560
O	499m N	Tunnel	1879	1:10560
O	499m N	Tunnel	1879	1:10560
O	499m N	Tunnels	1965	1:10560
O	499m N	Tunnels	1974	1:10000
O	499m N	Tunnels	1995	1:10000
O	499m N	Tunnels	1958	1:10560
N	546m SE	Unspecified Shaft	1965	1:10560
N	546m SE	Unspecified Shaft	1974	1:10000
N	546m SE	Unspecified Shaft	1995	1:10000

This is data is sourced from Ordnance Survey/Groundsure.

18.4 Underground mining extents

Records within 500m

0

This data identifies underground mine workings that could present a potential risk, including adits and seam workings. These features have been identified from BGS Geological mapping and mine plans sourced from the BGS and various collections and sources.

This data is sourced from Groundsure.

18.5 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.



18.6 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.

18.7 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.

18.8 The Coal Authority non-coal mining

Records within 500m

0

This data provides an indication of the potential zone of influence of recorded underground non-coal mining workings. Any and all analysis and interpretation of Coal Authority Data in this report is made by Groundsure, and is in no way supported, endorsed or authorised by the Coal Authority. The use of the data is restricted to the terms and provisions contained in this report. Data reproduced in this report may be the copyright of the Coal Authority and permission should be sought from Groundsure prior to any re-use.

This data is sourced from The Coal Authority.

18.9 Researched mining

Records within 500m

6

This data indicates areas of potential mining identified from alternative or archival sources, including; BGS Geological paper maps, Lidar data, aerial photographs (from World War II onwards), archaeological data services, websites, Tithe maps, and various text/plans from collected books and reports. Some of this data is approximate and Groundsure have interpreted the resultant risk area and, where possible, specific areas of risk have been captured.

Location	Mineral type
94m NE	Stone
315m NW	Unspecified



Location	Mineral type
380m NW	Unspecified
385m NW	Unspecified
393m NW	Unspecified
430m SE	Stone

This data is sourced from Groundsure.

18.10 Mining record office plans

Records within 500m	0
----------------------------	----------

This dataset is representative of Mining Record Office and/or plan extents held by Groundsure and should be considered approximate. Where possible, plans have been located and any specific areas of risk they depict have been captured.

This data is sourced from Groundsure.

18.11 BGS mine plans

Records within 500m	0
----------------------------	----------

This dataset is representative of BGS mine plans held by Groundsure and should be considered approximate. Where possible, plans have been located and any specific areas of risk they depict have been captured.

This data is sourced from Groundsure.

18.12 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.

18.13 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.



18.14 Gypsum areas

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

Generalised areas that may be affected by gypsum extraction.

This data is sourced from British Gypsum.

18.15 Tin mining

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

Generalised areas that may be affected by historical tin mining.

This data is sourced from Groundsure.

18.16 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).



19 Ground cavities and sinkholes

19.1 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.

19.2 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.

19.3 Reported recent incidents

Records within 500m

0

This data identifies sinkhole information gathered from media reports and Groundsure's own records. This data goes back to 2014 and includes relative accuracy ratings for each event and links to the original data sources. The data is updated on a regular basis and should not be considered a comprehensive catalogue of all sinkhole events. The absence of data in this database does not mean a sinkhole definitely has not occurred during this time.

This data is sourced from Groundsure.

19.4 Historical incidents

Records within 500m

0

This dataset comprises an extract of 1:10,560, 1:10,000, 1:2,500 and 1:1,250 scale historical Ordnance Survey maps held by Groundsure, dating back to the 1840s. It shows shakeholes, deneholes and other 'holes' as noted on these maps. Dene holes are medieval chalk extraction pits, usually comprising a narrow shaft with a number of chambers at the base of the shaft. Shakeholes are an alternative name for suffusion sinkholes, most commonly found in the limestone landscapes of North Yorkshire but also extensively noted around the Brecon Beacons National Park.

Not all 'holes' noted on Ordnance Survey mapping will necessarily be present within this dataset.



This data is sourced from Groundsure.

19.5 National karst database

Records within 500m

0

This is a comprehensive database of national karst information gathered from a wide range of sources. BGS have collected data on five main types of karst feature: Sinkholes, stream links, caves, springs, and incidences of associated damage to buildings, roads, bridges and other engineered works.

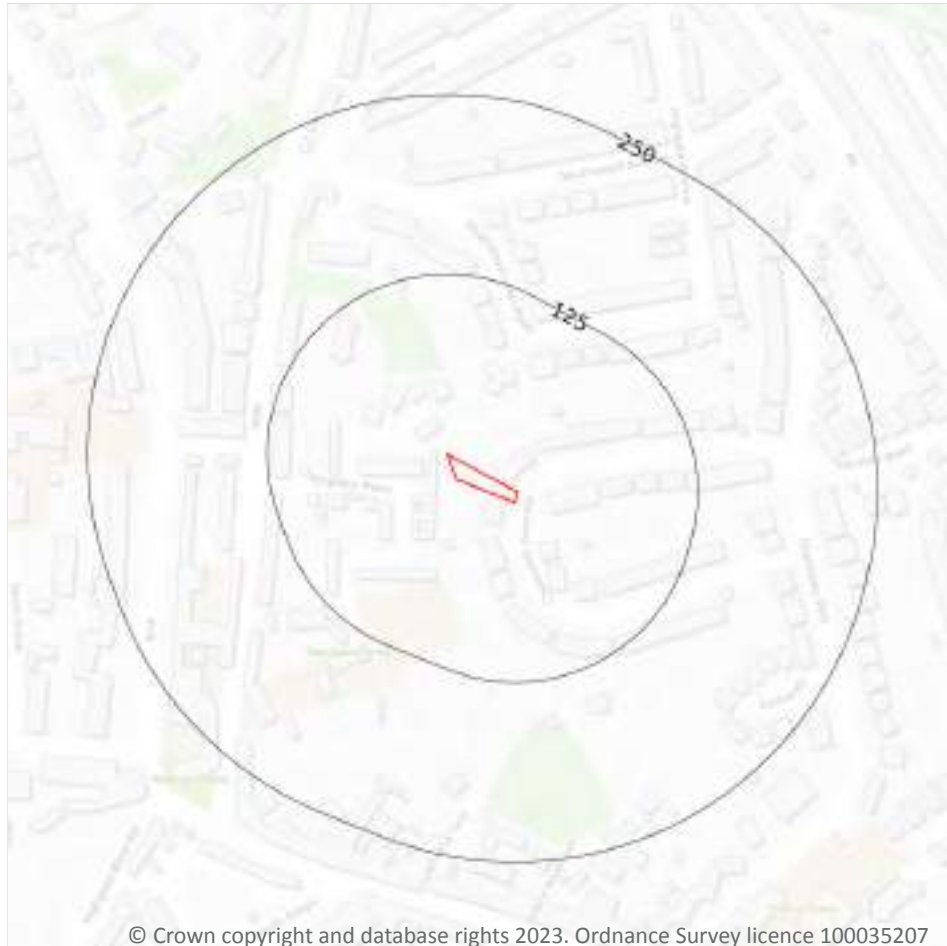
Since the database was set up in 2002 data covering most of the evaporite karst areas of the UK have now been added, along with data covering about 60% of the Chalk, and 35% of the Carboniferous Limestone outcrops. Many of the classic upland karst areas have yet to be included. Recorded so far are: Over 800 caves, 1300 stream sinks, 5600 springs, 10,000 sinkholes.

The database is not yet complete, and not all records have been verified. The absence of data does not mean that karst features are not present at a site. A reliability rating is included with each record.

This data is sourced from the British Geological Survey.



20 Radon



— Site Outline
Search buffers in metres (m)

- Greater than 30%
- Between 10% and 30%
- Between 5% and 10%
- Between 3% and 5%
- Between 1% and 3%
- Less than 1%

20.1 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 103](#) >

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.



21 Soil chemistry

21.1 BGS Estimated Background Soil Chemistry

Records within 50m

3

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
23m W	No data	No data	No data	No data	No data	No data	No data
47m NW	No data	No data	No data	No data	No data	No data	No data

This data is sourced from the British Geological Survey.

21.2 BGS Estimated Urban Soil Chemistry

Records within 50m

6

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	17	3	379	260	0.8	77	75	26	28
12m NW	17	3	391	269	0.8	79	78	26	31
23m W	18	3.2	528	363	0.8	79	81	28	40
26m NW	18	3.2	603	414	0.8	80	86	29	47
28m E	16	2.8	292	201	0.9	76	77	26	21
48m NE	16	2.8	291	200	0.9	76	80	26	22



This data is sourced from the British Geological Survey.

21.3 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.



22 Railway infrastructure and projects

22.1 Underground railways (London)

Records within 250m**0**

Details of all active London Underground lines, including approximate tunnel roof depth and operational hours.

This data is sourced from publicly available information by Groundsure.

22.2 Underground railways (Non-London)

Records within 250m**0**

Details of the Merseyrail system, the Tyne and Wear Metro and the Glasgow Subway. Not all parts of all systems are located underground. The data contains location information only and does not include a depth assessment.

This data is sourced from publicly available information by Groundsure.

22.3 Railway tunnels

Records within 250m**0**

Railway tunnels taken from contemporary Ordnance Survey mapping.

This data is sourced from the Ordnance Survey.

22.4 Historical railway and tunnel features

Records within 250m**0**

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.

This data is sourced from Ordnance Survey/Groundsure.

22.5 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.

22.6 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.

22.7 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.

22.8 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.

22.9 Crossrail 2

Records within 500m

0

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

This data is sourced from publicly available information by Groundsure.

22.10 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

Groundsure's Terms and Conditions can be accessed at this link: <https://www.groundsure.com/terms-and-conditions-april-2023/> ↗.



Site Details:

45, CHOLMELEY CRESCENT,
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Client Ref: MGC-132
Report Ref: HMD-WGY-V45-D6L-WE5
Grid Ref: 528547, 187671

Map Name: County Series

Map date: 1864

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1864
Revised 1884
Edition N/A
Copyright N/A
Levelled N/A

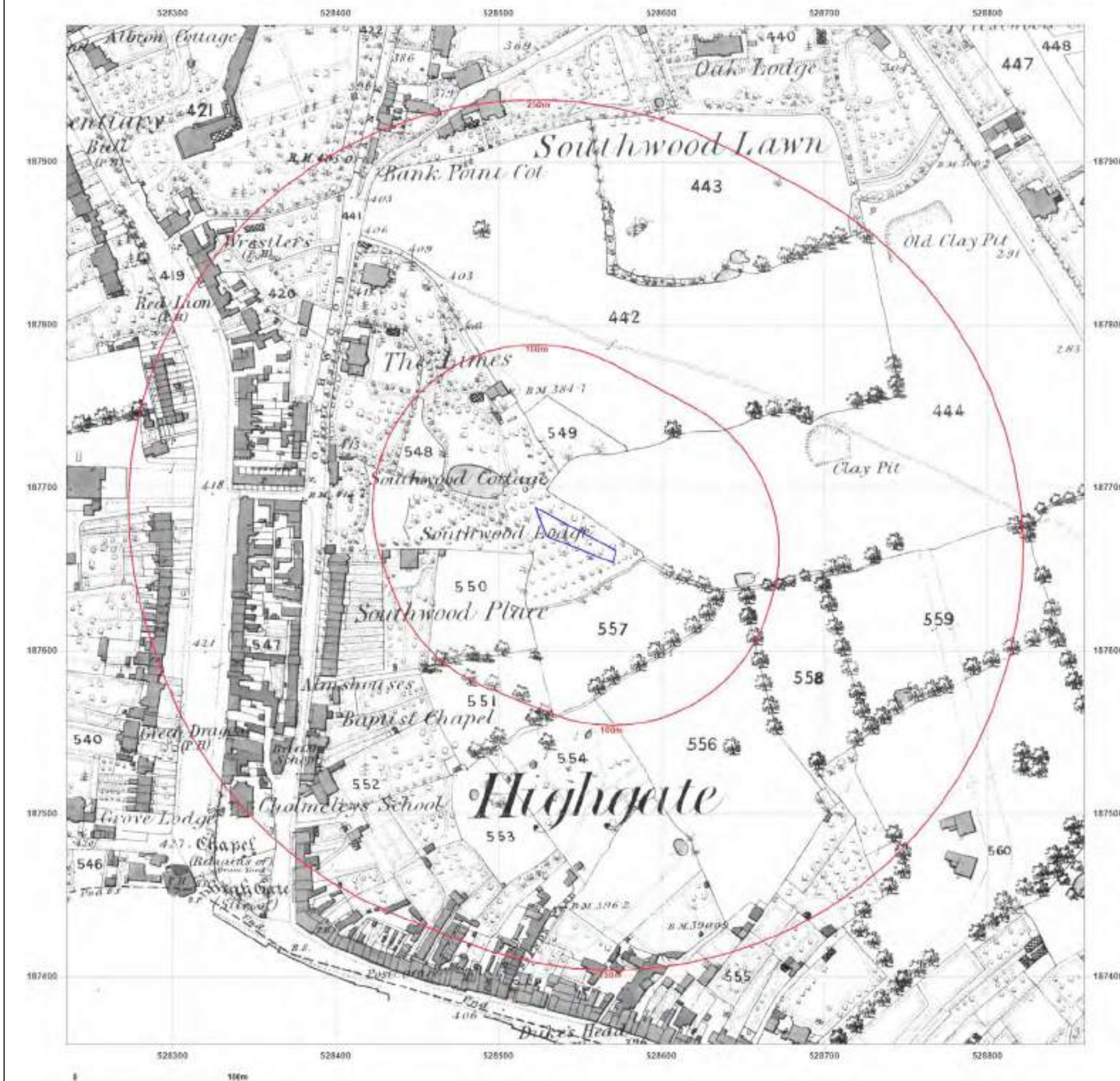


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Client Ref: MGC-132
Report Ref: HMD-WGY-V45-D6L-WE5
Grid Ref: 528547, 187671

Map Name: County Series

Map date: 1870

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1865
Revised N/A
Edition 1970
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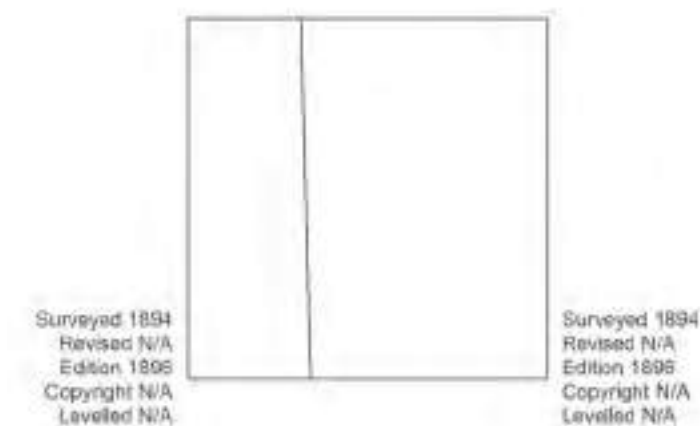
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Report Ref: HMD-WGY-V45-D6L-WE5
Grid Ref: 528547, 187671

Map Name: 1056 Scale Town Plan

Map date: 1896

Scale: 1:1,056

Printed at: 1:1,056

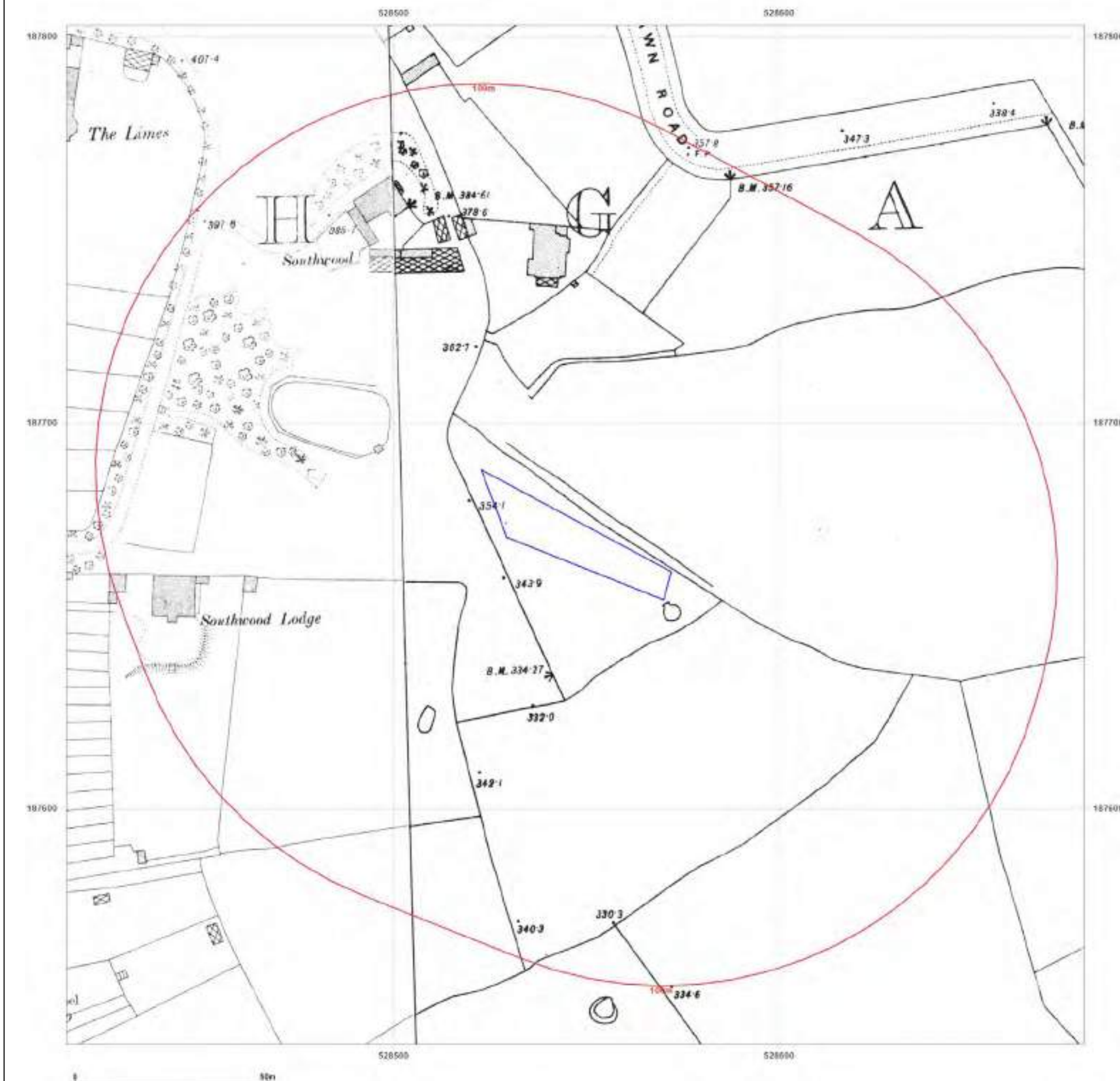


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Client Ref: MGC-132
Report Ref: HMD-WGY-V45-D6L-WE5
Grid Ref: 528547, 187671

Map Name: County Series

Map date: 1914

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1914
Revised 1914
Edition N/A
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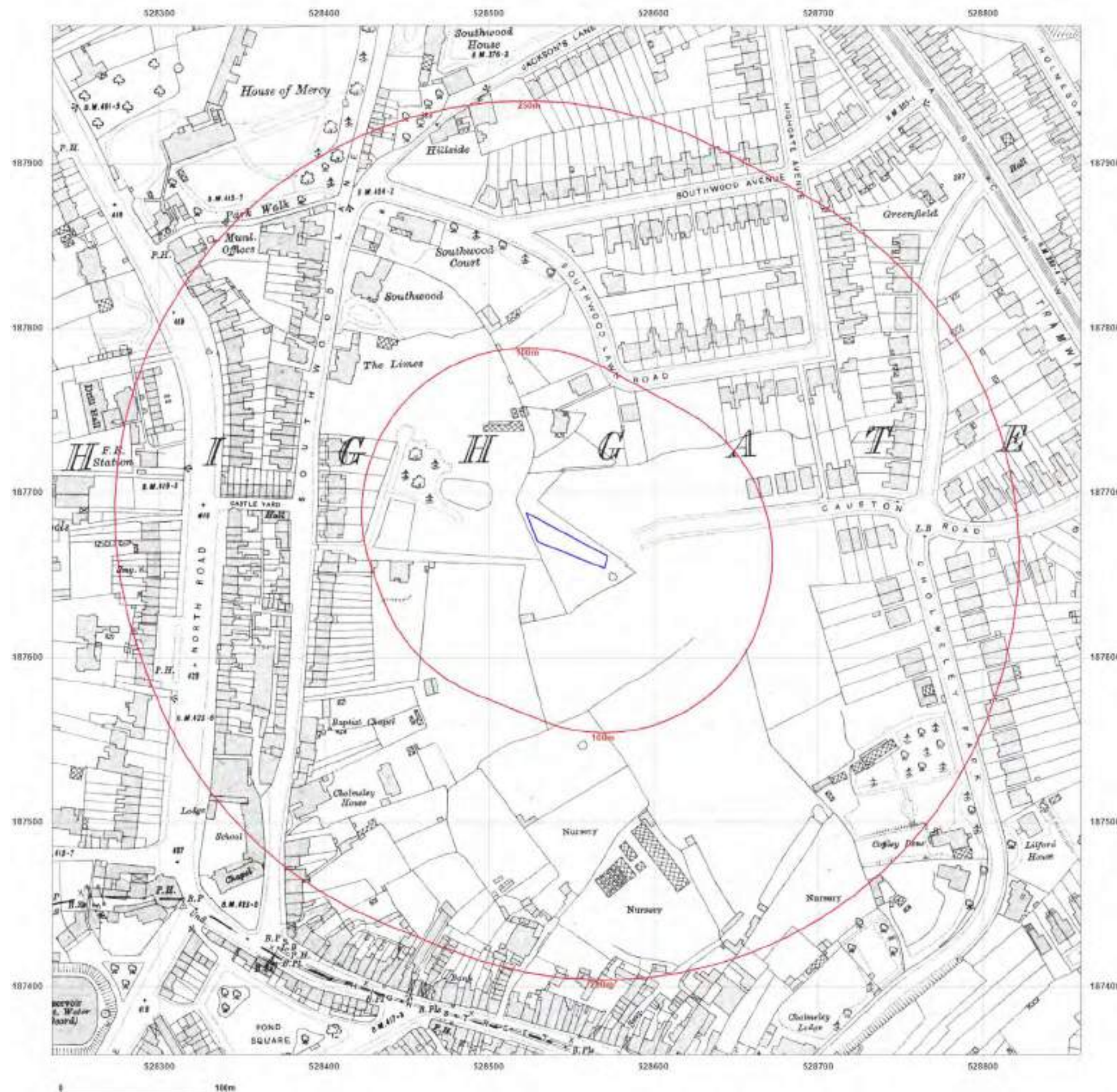


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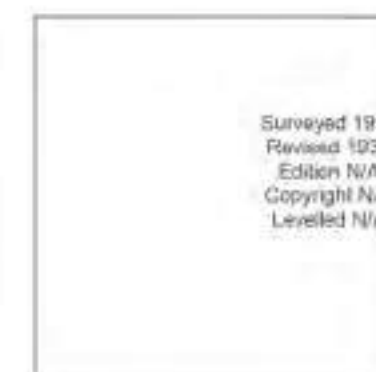
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Report Ref: HMD-WGY-V45-D6L-WE5
Grid Ref: 528547, 187671

Map Name: County Series

Map date: 1935

Scale: 1:2,500

Printed at: 1:2,500



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Client Ref: MGC-132
Report Ref: HMD-WGY-V45-D6L-WE5
Grid Ref: 528547, 187671

Map Name: National Grid

Map date: 1970

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1960
Revised 1968
Edition N/A
Copyright 1970
Levelled 1954



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Client Ref: MGC-132
Report Ref: HMD-WGY-V45-D6L-WE5
Grid Ref: 528547, 187671

Map Name: National Grid

Map date: 1986-1991

Scale: 1:1,250

Printed at: 1:2,000



Surveyed 1991
Revised 1991
Edition N/A
Copyright 1991
Levelled N/A

Surveyed 1991
Revised 1991
Edition N/A
Copyright 1991
Levelled N/A

Surveyed 1991
Revised 1991
Edition N/A
Copyright 1991
Levelled N/A

Surveyed 1975
Revised 1986
Edition N/A
Copyright 1986
Levelled 1975

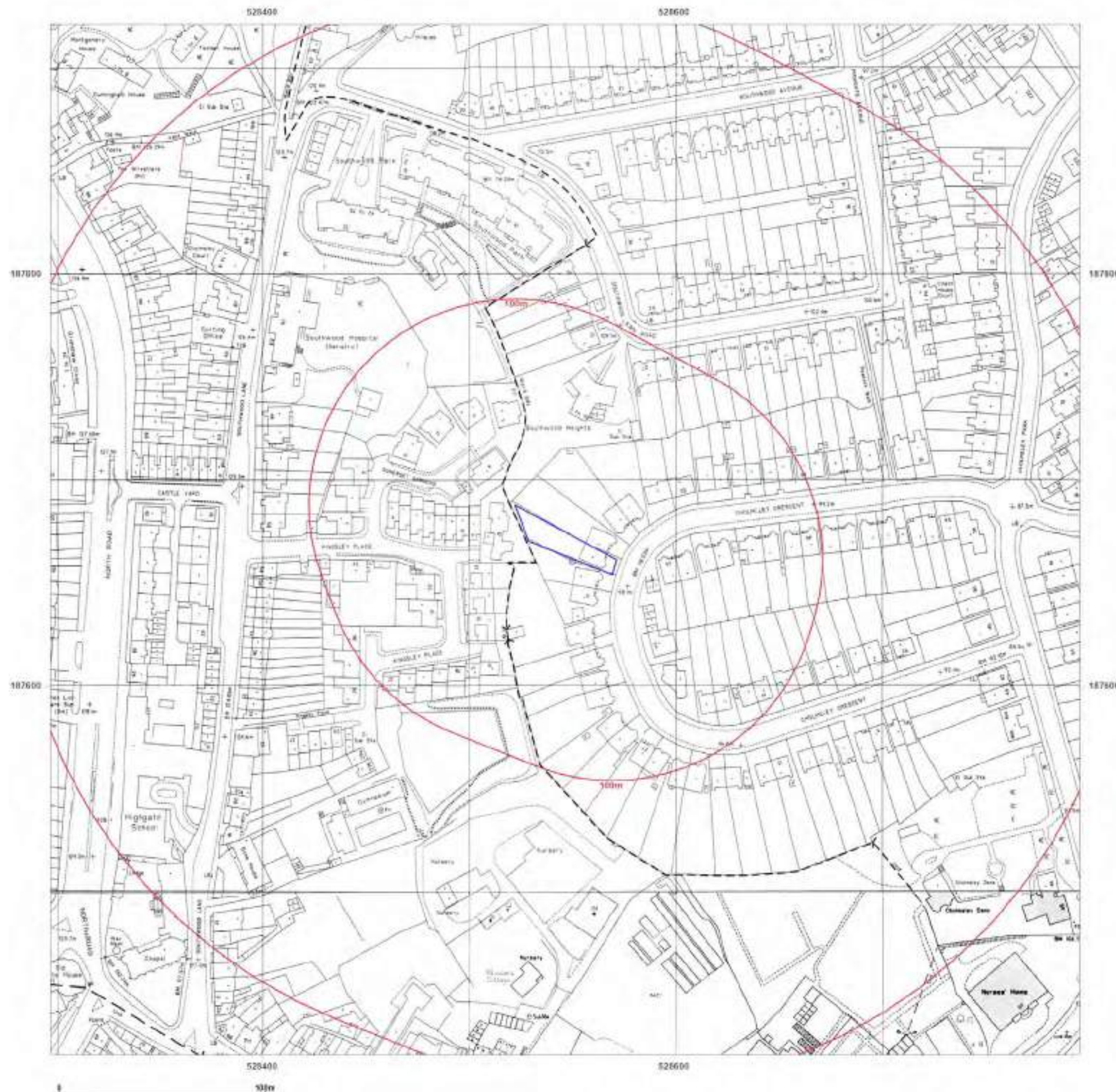


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Client Ref: MGC-132
Report Ref: HMD-WGY-V45-D6L-WE5
Grid Ref: 528547, 187671

Map Name: LandLine

Map date: 2003

Scale: 1:1,250

Printed at: 1:1,250

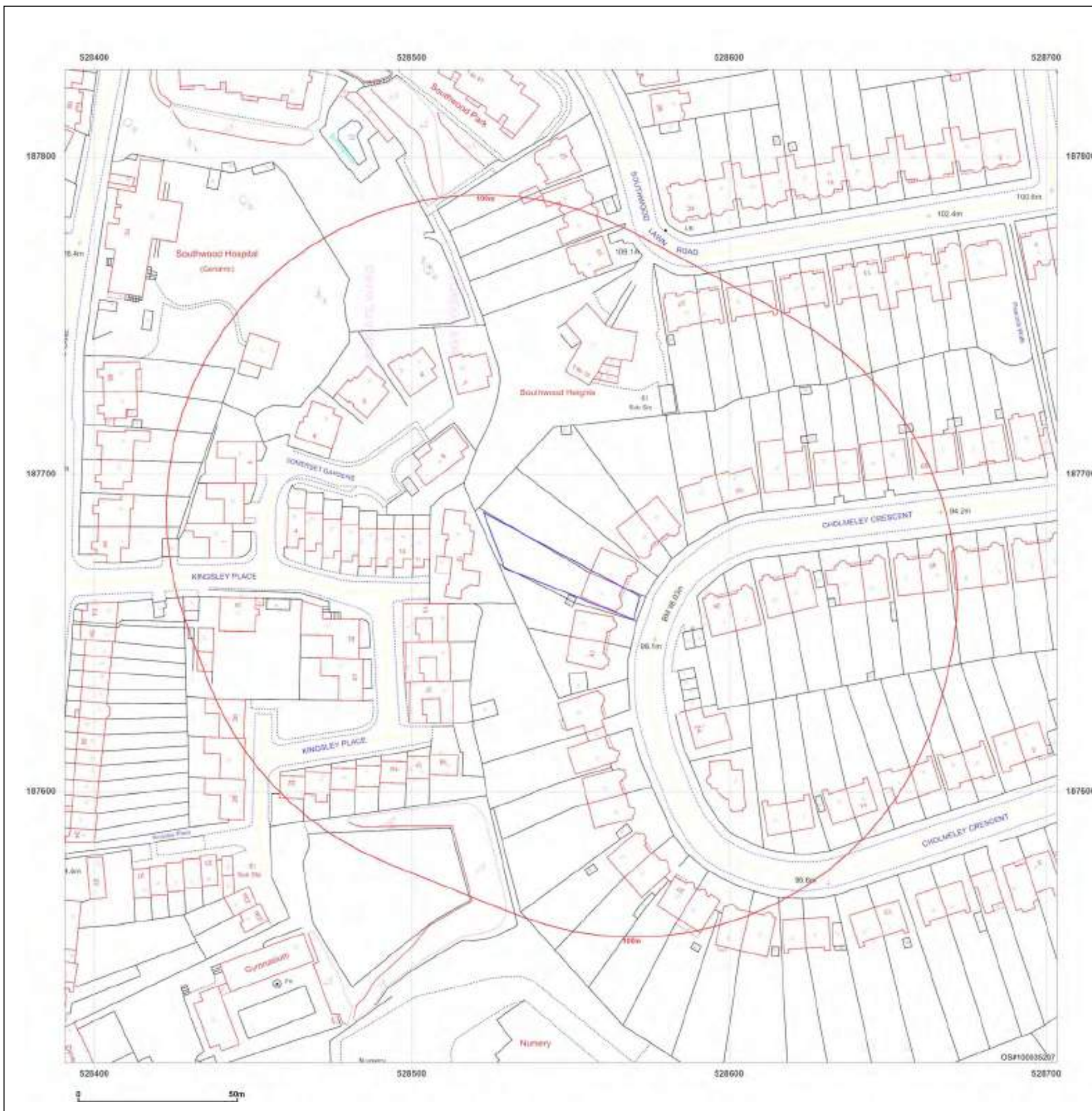


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Appendix D: Thames Water and Cadent Gas Asset Drawings

Maund Geo Consulting Ltd

CHIPPING NORTON
OX7 5DG

Search address supplied 45
Cholmeley Crescent
London
N6 5EX

Your reference MGC-132 45 Cholmeley Crescent N6 5EX

Our reference ALS/ALS Standard/2023_4855514

Search date 10 July 2023

Notification of Price Changes

From 1st April 2023 Thames water Property Searches will be increasing the prices of its CON29DW, CommercialDW Drainage & Water Enquiries and Asset Location Searches. Historically costs would rise in line with RPI but as this currently sits at 14.2%, we are capping it at 10%.

Customers will be emailed with the new prices by January 1st 2023.

Any orders received with a higher payment prior to the 1st April 2023 will be non-refundable. For further details on the price increase please visit our website at www.thameswater-propertysearches.co.uk



Thames Water Utilities Ltd
Property Searches, PO Box 3189, Slough SL1 4WW



searches@thameswater.co.uk
www.thameswater-propertysearches.co.uk



0800 009 4540

Search address supplied: 45, Cholmeley Crescent, London, N6 5EX

Dear Sir / Madam

An Asset Location Search is recommended when undertaking a site development. It is essential to obtain information on the size and location of clean water and sewerage assets to safeguard against expensive damage and allow cost-effective service design.

The following records were searched in compiling this report: - the map of public sewers & the map of waterworks. Thames Water Utilities Ltd (TWUL) holds all of these.

This search provides maps showing the position, size of Thames Water assets close to the proposed development and also manhole cover and invert levels, where available.

Please note that none of the charges made for this report relate to the provision of Ordnance Survey mapping information. The replies contained in this letter are given following inspection of the public service records available to this company. No responsibility can be accepted for any error or omission in the replies.

You should be aware that the information contained on these plans is current only on the day that the plans are issued. The plans should only be used for the duration of the work that is being carried out at the present time. Under no circumstances should this data be copied or transmitted to parties other than those for whom the current work is being carried out.

Thames Water do update these service plans on a regular basis and failure to observe the above conditions could lead to damage arising to new or diverted services at a later date.

Contact Us

If you have any further queries regarding this enquiry please feel free to contact a member of the team on 0800 009 4540, or use the address below:

Thames Water Utilities Ltd
Property Searches
PO Box 3189
Slough
SL1 4WW

Email: searches@thameswater.co.uk
Web: www.thameswater-propertysearches.co.uk

Waste Water Services

Please provide a copy extract from the public sewer map.

Enclosed is a map showing the approximate lines of our sewers. Our plans do not show sewer connections from individual properties or any sewers not owned by Thames Water unless specifically annotated otherwise. Records such as "private" pipework are in some cases available from the Building Control Department of the relevant Local Authority.

Where the Local Authority does not hold such plans it might be advisable to consult the property deeds for the site or contact neighbouring landowners.

This report relates only to sewerage apparatus of Thames Water Utilities Ltd, it does not disclose details of cables and or communications equipment that may be running through or around such apparatus.

The sewer level information contained in this response represents all of the level data available in our existing records. Should you require any further Information, please refer to the relevant section within the 'Further Contacts' page found later in this document.

For your guidance:

- The Company is not generally responsible for rivers, watercourses, ponds, culverts or highway drains. If any of these are shown on the copy extract they are shown for information only.
- Any private sewers or lateral drains which are indicated on the extract of the public sewer map as being subject to an agreement under Section 104 of the Water Industry Act 1991 are not an 'as constructed' record. It is recommended these details be checked with the developer.

Clean Water Services

Please provide a copy extract from the public water main map.

Enclosed is a map showing the approximate positions of our water mains and associated apparatus. Please note that records are not kept of the positions of individual domestic supplies.

For your information, there will be a pressure of at least 10m head at the outside stop valve. If you would like to know the static pressure, please contact our Customer Centre on 0800 316 9800. The Customer Centre can also arrange for a full flow and pressure test to be carried out for a fee.

For your guidance:

- Assets other than vested water mains may be shown on the plan, for information only.
- If an extract of the public water main record is enclosed, this will show known public water mains in the vicinity of the property. It should be possible to estimate the likely length and route of any private water supply pipe connecting the property to the public water network.

Payment for this Search

A charge will be added to your suppliers account.

Further contacts:

Waste Water queries

Should you require verification of the invert levels of public sewers, by site measurement, you will need to approach the relevant Thames Water Area Network Office for permission to lift the appropriate covers. This permission will usually involve you completing a TWOSA form. For further information please contact our Customer Centre on Tel: 0845 920 0800. Alternatively, a survey can be arranged, for a fee, through our Customer Centre on the above number.

If you have any questions regarding sewer connections, budget estimates, diversions, building over issues or any other questions regarding operational issues please direct them to our service desk. Which can be contacted by writing to:

Developer Services (Waste Water)
Thames Water
Clearwater Court
Vastern Road
Reading
RG1 8DB

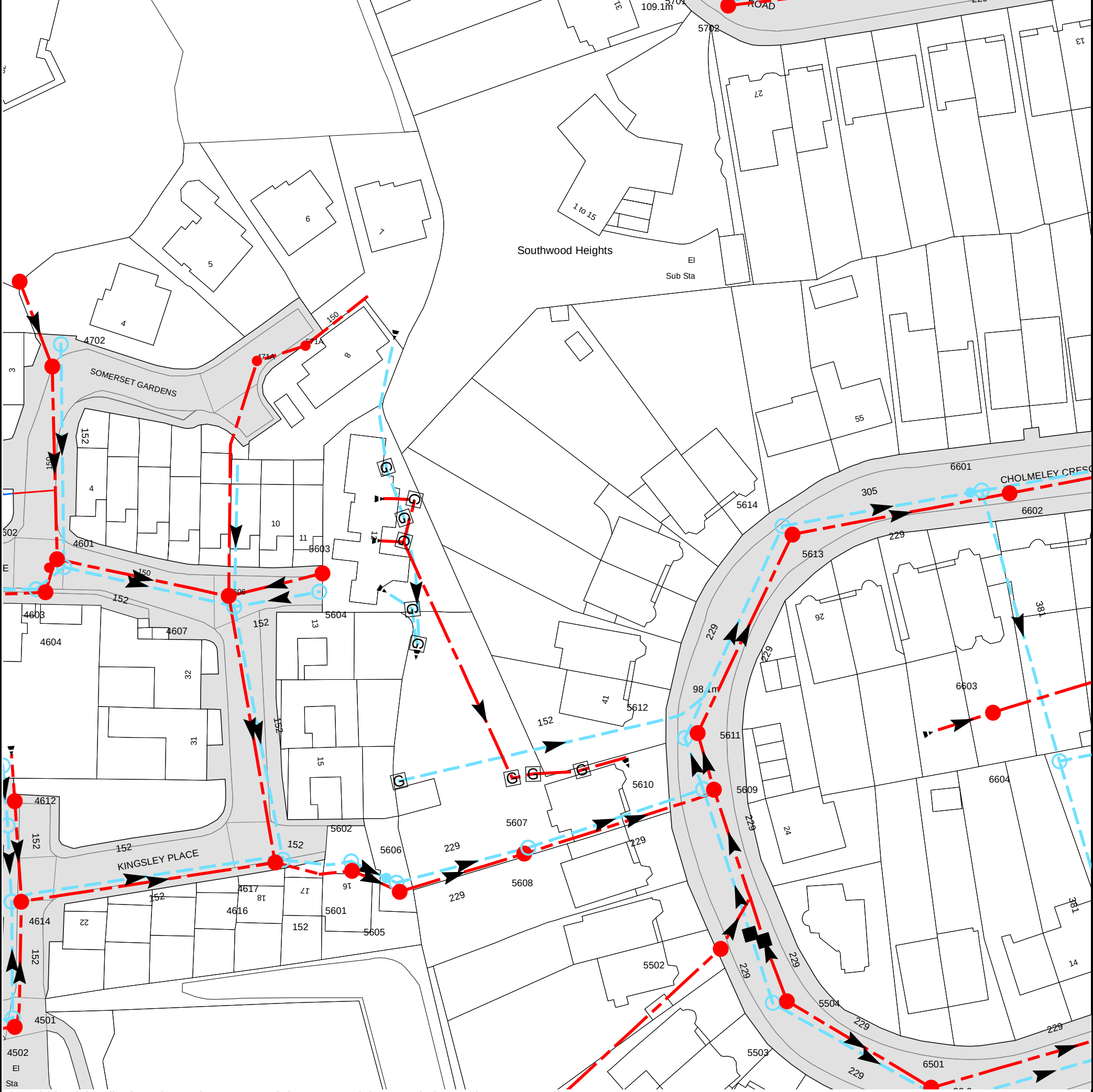
Tel: 0800 009 3921
Email: developer.services@thameswater.co.uk

Clean Water queries

Should you require any advice concerning clean water operational issues or clean water connections, please contact:

Developer Services (Clean Water)
Thames Water
Clearwater Court
Vastern Road
Reading
RG1 8DB

Tel: 0800 009 3921
Email: developer.services@thameswater.co.uk



The width of the displayed area is 200 m and the centre of the map is located at OS coordinates 528547,187672
The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

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NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

Manhole Reference	Manhole Cover Level	Manhole Invert Level
5602	106.74	104.57
5601	106.73	n/a
5606	104.84	102.65
5605	105.19	n/a
5608	n/a	n/a
5607	n/a	n/a
5612	98.04	94.93
5611	98.08	93.99
5610	97.96	95.04
5609	97.92	94.13
5502	97.73	95.79
5503	97.47	95.52
5614	98.58	94.37
5504	97.44	94.75
5613	98.57	93.29
6501	96.96	93.78
6601	96.91	89.7
6603	95.98	85.92
6602	96.54	93.01
6604	95.26	88.41
4502	113.95	111.8
4501	113.88	111.72
4614	112.59	111.09
4615	112.68	111.21
4616	108.02	105.76
4617	107.93	105.76
4613	112.75	111.64
4612	112.78	111.8
4611	n/a	n/a
4607	110.26	106.75
4606	110.39	106.81
4604	115.68	114.56
5604	108.57	107.44
4603	115.92	114.41
5603	108.55	107.54
4601	115.35	112.85
4602	115.28	112.69
4703	115.28	114.3
4701	116.16	114.7
4702	115.28	114.45
471A	n/a	n/a
571A	n/a	n/a
5702	108.74	105.28
The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.		



Asset Location Search - Sewer Key

Public Sewer Types (Operated and maintained by Thames Water)

	Foul Sewer: A sewer designed to convey waste water from domestic and industrial sources to a treatment works.
	Surface Water Sewer: A sewer designed to convey surface water (e.g. rain water from roofs, yards and car parks) to rivers or watercourses.
	Combined Sewer: A sewer designed to convey both waste water and surface water from domestic and industrial sources to a treatment works.
	Storm Sewer
	Sludge Sewer
	Foul Trunk Sewer
	Surface Trunk Sewer
	Combined Trunk Sewer
	Foul Rising Main
	Surface Water Rising Main
	Combined Rising Main
	Vacuum
	Thames Water Proposed
	Vent Pipe
	Gallery

Other Sewer Types (Not operated and maintained by Thames Water)

	Sewer
	Culverted Watercourse
	Proposed
	Decommissioned Sewer
	Content of this drainage network is currently unknown
	Ownership of this drainage network is currently unknown

Notes:

- 1) All levels associated with the plans are to Ordnance Datum Newlyn.
- 2) All measurements on the plan are metric.
- 3) Arrows (on gravity fed sewers) or flecks (on rising mains) indicate the direction of flow.
- 4) Most private pipes are not shown on our plans, as in the past, this information has not been recorded.

Sewer Fittings

A feature in a sewer that does not affect the flow in the pipe. Example: a vent is a fitting as the function of a vent is to release excess gas.

	Air Valve		Meter
	Dam Chase		Vent
	Fitting		

Operational Controls

A feature in a sewer that changes or diverts the flow in the sewer. Example: A hydrobrake limits the flow passing downstream.

	Ancillary		Drop Pipe
	Control Valve		Well

End Items

End symbols appear at the start or end of a sewer pipe. Examples: an Undefined End at the start of a sewer indicates that Thames Water has no knowledge of the position of the sewer upstream of that symbol. Outfall on a surface water sewer indicates that the pipe discharges into a stream or river.

	Inlet		Outfall
	Undefined End		

Other Symbols

Symbols used on maps which do not fall under other general categories.

	Change of Characteristic Indicator		Public / Private Pumping Station
	Invert Level		Summit

Areas

Lines denoting areas of underground surveys, etc.

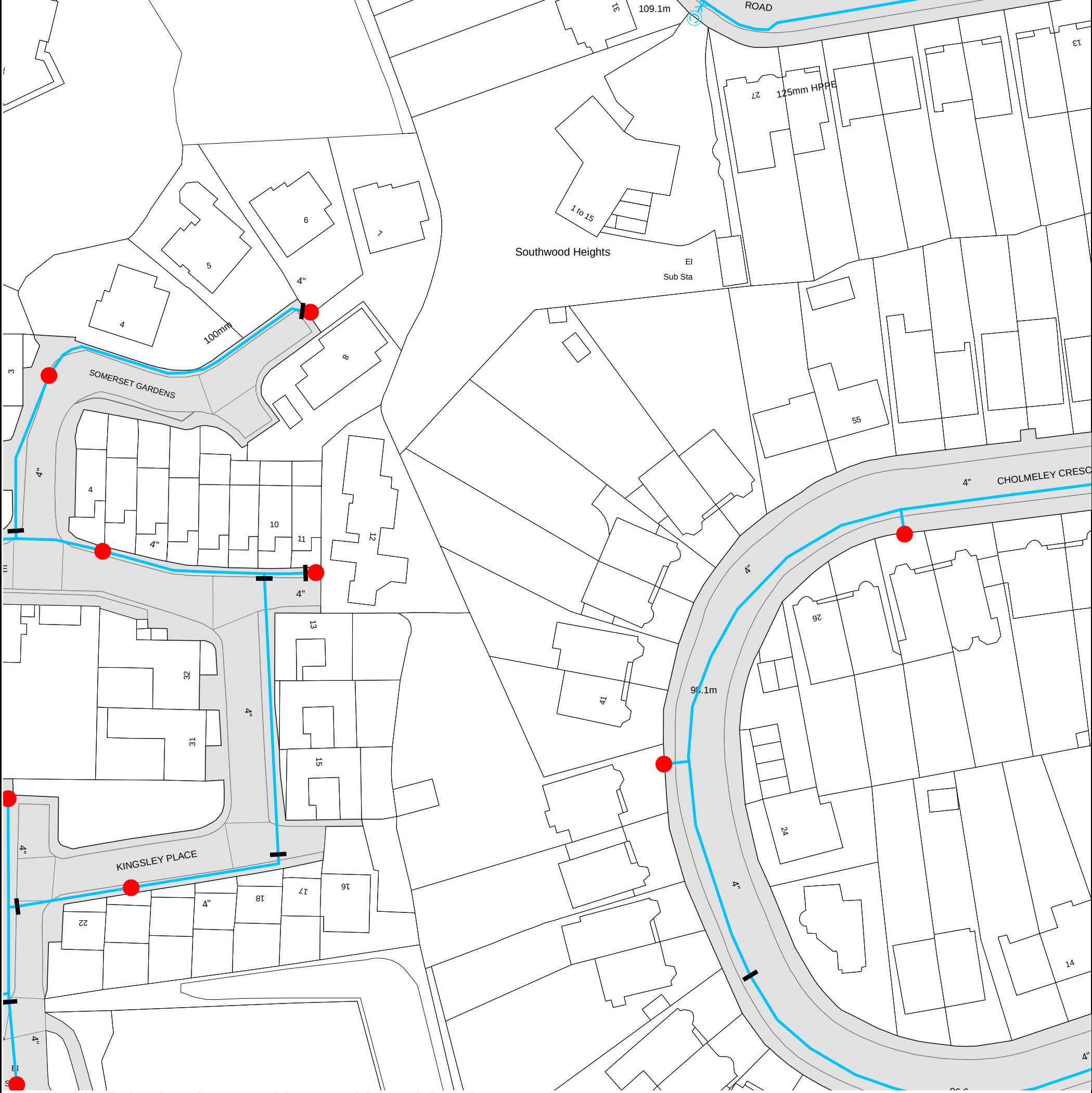
	Agreement
	Chamber
	Operational Site

Ducts or Crossings

	Casement	Ducts may contain high voltage cables. Please check with Thames Water.
	Conduit Bridge	
	Subway	
	Tunnel	

5) 'na' or '0' on a manhole indicates that data is unavailable.

6) The text appearing alongside a sewer line indicates the internal diameter of the pipe in millimeters. Text next to a manhole indicates the manhole reference number and should not be taken as a measurement. If you are unsure about any text or symbology, please contact Property Searches on 0800 009 4540.



The width of the displayed area is 200 m and the centre of the map is located at OS coordinates 528547, 187672.
The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.
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Asset Location Search - Water Key

Water Pipes (Operated & Maintained by Thames Water)

-  **Distribution Main:** The most common pipe shown on water maps. With few exceptions, domestic connections are only made to distribution mains.
-  **Trunk Main:** A main carrying water from a source of supply to a treatment plant or reservoir, or from one treatment plant or reservoir to another. Also a main transferring water in bulk to smaller water mains used for supplying individual customers.
-  **Supply Main:** A supply main indicates that the water main is used as a supply for a single property or group of properties.
-  **Fire Main:** Where a pipe is used as a fire supply, the word FIRE will be displayed along the pipe.
-  **Metered Pipe:** A metered main indicates that the pipe in question supplies water for a single property or group of properties and that quantity of water passing through the pipe is metered even though there may be no meter symbol shown.
-  **Transmission Tunnel:** A very large diameter water pipe. Most tunnels are buried very deep underground. These pipes are not expected to affect the structural integrity of buildings shown on the map provided.
-  **Proposed Main:** A main that is still in the planning stages or in the process of being laid. More details of the proposed main and its reference number are generally included near the main.

PIPE DIAMETER	DEPTH BELOW GROUND
Up to 300mm (12")	300mm (3')
300mm - 600mm (12" - 24")	1100mm (3' 6")
600mm and bigger (24" and over)	1200mm (4')

Valves

-  General Purpose Valve
-  Air Valve
-  Pressure Control Valve
-  Customer Valve

Hydrants

-  Single Hydrant

Meters

-  Meter

End Items

Symbol indicating what happens at the end of a water main.

-  Blank Flange
-  Capped End
-  Emptying Pit
-  Undefined End
-  Manifold
-  Customer Supply
-  Fire Supply

Operational Sites

-  Booster Station
-  Other
-  Other (Proposed)
-  Pumping Station
-  Service Reservoir
-  Shaft Inspection
-  Treatment Works
-  Unknown
-  Water Tower

Other Symbols

-  Data Logger
-  **Casement:** Ducts may contain high voltage cables. Please check with Thames Water.

Other Water Pipes (Not Operated or Maintained by Thames Water)

-  **Other Water Company Main:** Occasionally other water company water pipes may overlap the border of our clean water coverage area. These mains are denoted in purple and in most cases have the owner of the pipe displayed along them.
-  **Private Main:** Indicates that the water main in question is not owned by Thames Water. These mains normally have text associated with them indicating the diameter and owner of the pipe.

Payment Terms and Conditions

All sales are made in accordance with Thames Water Utilities Limited (TWUL) standard terms and conditions unless previously agreed in writing.

1. All goods remain in the property of Thames Water Utilities Ltd until full payment is received.
2. Provision of service will be in accordance with all legal requirements and published TWUL policies.
3. All invoices are strictly due for payment within 14 days of the date of the invoice. Any other terms must be accepted/agreed in writing prior to provision of goods or service or will be held to be invalid.
4. Penalty interest may be invoked by TWUL in the event of unjustifiable payment delay. Interest charges will be in line with UK Statute Law 'The Late Payment of Commercial Debts (Interest) Act 1998'.
5. Interest will be charged in line with current Court Interest Charges, if legal action is taken.
6. A charge may be made at the discretion of the company for increased administration costs.

A copy of Thames Water's standard terms and conditions are available from the Commercial Billing Team (cashoperations@thameswater.co.uk).

We publish several Codes of Practice including a guaranteed standards scheme. You can obtain copies of these leaflets by calling us on 0800 316 9800.

If you are unhappy with our service, you can speak to your original goods or customer service provider. If you are still not satisfied with the outcome provided, we will refer the matter to a Senior Manager for resolution who will provide you with a response.

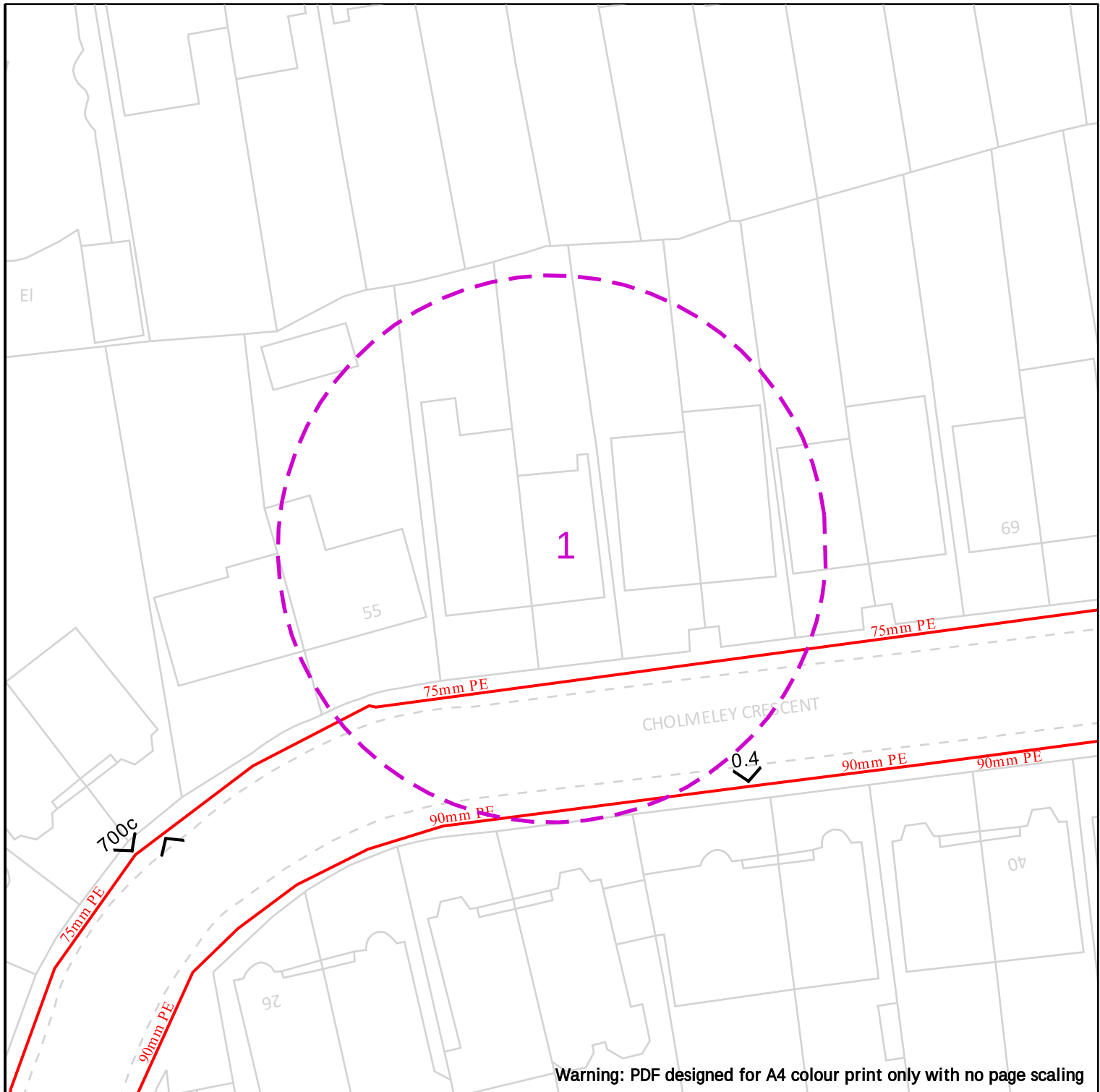
If you are still dissatisfied with our final response, and in certain circumstances such as you are buying a residential property or commercial property within certain parameters, The Property Ombudsman will investigate your case and give an independent view. The Ombudsman can award compensation of up to £25,000 to you if he finds that you have suffered actual financial loss and/or aggravation, distress, or inconvenience because of your search not keeping to the Code. Further information can be obtained by visiting www.tpos.co.uk or by sending an email to admin@tpos.co.uk.

If the Goods or Services covered by this invoice falls under the regulation of the 1991 Water Industry Act, and you remain dissatisfied you can refer your complaint to Consumer Council for Water on 0300 034 2222 or write to them at Consumer Council for Water, 1st Floor, Victoria Square House, Victoria Square, Birmingham, B2 4AJ.

Ways to pay your bill

Credit Card	BACS Payment	Telephone Banking
Please Call 0800 009 4540 quoting your invoice number starting CBA or ADS	Account number 90478703 Sort code 60-00-01 A remittance advice must be sent to: Thames Water Utilities Ltd., PO Box 3189, Slough SL1 4WW. or email ps.billing@thameswater.co.uk	By calling your bank and quoting: Account number 90478703 Sort code 60-00-01 and your invoice number

Thames Water Utilities Ltd Registered in England & Wales No. 2366661 Registered Office Clearwater Court, Vastern Rd, Reading, Berks, RG1 8DB.



25m

Dig Sites

Area:



Line:



LP Mains



MP Mains



IP Mains



LHP Mains



Valve



Depth of cover



Syphon



Diameter Change



Material Change



Out of Standard Service



Date Requested: 31/07/2023

Job Reference: 30350642

Site Location: 528621 187699

Requested by: Dr Julian Maund

Your Scheme/Reference: MGC-132

View extent: 100m, 100m

Scale: 1:500 (When plotted at A4)

IMPORTANT NOTICES

This plan shows these pipes owned by Cadent Gas Limited in its role as a Licensed Gas Transporter (GT). Gas pipes owned by other GT's or otherwise privately owned may be present in this area. Information with regards to such pipes should be obtained from the relevant owners. The information shown on this plan is given without warranty, the accuracy thereof cannot be guaranteed. Service pipes, valves, syphons, stub connections etc. are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Cadent Gas Limited or their agents, servants or contractors for any errors or omission. Safe digging practices, in accordance with HS(G)47, must be used to verify and establish the actual position of mains, pipes, services and other apparatus on site before any mechanical plant is used. It is your responsibility to ensure that this information is provided to all persons (either direct labour or contractors) working for you on or near gas apparatus. The information included on this plan should not be referred to beyond a period of 28 days from the date of issue.

In case of emergency call - 0800 111 999

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Appendix E: SD Engineering SMS

Structural Method Statement

45 Cholmeley Crescent

SD Engineers Project Reference
SDS1711

Issuing Date
08/08/2023

Revision Number
1

Document Reference
RP01





Document Control

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MEng

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MSc BSc (Hons)

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1. Introduction

This document is provided in accordance with Haringey Councils' SPD, to support a planning submission for an extension to the rear of the property's existing lower ground floor, below the existing main house. This document should be read in conjunction with document *MGC-132-BIA-V1* produced by Maund Geo-Consulting LTD which contains a detailed desk study, basement impact assessment and the findings from the intrusive site-specific investigation to understand the existing ground conditions.

This document summarises the structural design principles for both the basement and superstructure works, while commenting on anticipated methods of construction and methods for managing and mitigating any effects associated with the works.

1.1. Existing Property

45 Cholmeley Crescent is a semi-detached property located in Haringey, London. The building is assumed to be of traditional construction with solid brick walls, brick corbel footings and timber joisted floors. There is an existing loft conversion that makes up the second floor of the property. The existing roof is a hipped timber roof, with existing dormers to the rear, front and side. The property is built into a slope that extends from low level at the front, to high level towards the rear. Because of this, the property has an existing lower ground floor beneath only the front half of the property. This is to be extended as a basement during the proposed works.

1.2. Proposed Works

The proposal is to refurbish the existing property with a single storey rear extension above ground, internal alterations throughout, and to extend the existing lower ground floor to a basement across the entire layout of the property (including the new rear extension). It should be noted that the proposals shown in this document may be refined during the design process, but the principles for minimising ground movement and avoiding adverse effects on neighbouring structure will remain the same.

1.3. Site

The site is located at 45 Cholmeley Crescent, N6 5EX, in the London Borough of Haringey and is a semi-detached property. The site is approximately 11.5m wide on the house area and 55m long (inclusive of the back garden). There is approximately a 2m level difference between the ground levels to the front and rear of the property.



Figure 1: Site Location



2. Desk Basement Construction

The proposed methodology and construction sequence for constructing the basement are detailed in the following section and on drawings 1711-SDS-B1-S- 7000-7001 found in Appendix A. It is proposed to extend the existing lower ground floor to the rear under the full footprint of the house (including the new footprint of the rear extension). The new basement is proposed to be formed using a contiguous piled wall to the rear and underpinning the existing party wall, external loadbearing walls and existing shared garden wall down to formation level, with new walls built in 'pins'. The proposed underpins and piled wall will provide a vertical support to the existing / proposed superstructure above, maintaining the existing load path and will also have a retaining function, supporting the horizontal forces imposed by the soil pressure.

Due to the sloping ground level from the rear of the property to the front, the basement is globally unbalanced. It fully retains to the rear and has no retaining function to the front where the ground level sits at a reduced level. Borehole findings on site found the water table to be at approximately 1m BGL to the rear of the property. Hence the basement will be prone to sliding as there is little to no soil resistance at the front.

A contiguous piled wall will be installed to the rear face of the basement. The piled wall is to cantilever to prevent sliding from soil and water pressures and ensure global equilibrium is established. Once the piled wall has been constructed, the relatively impermeable clay will help to resist water ingress in the temporary construction case, whilst dewatering is carried out and a concrete liner wall is installed. The liner wall will resist the hydrostatic forces in the permanent case and be tied back to the contiguous piled wall so that the forces can be redistributed into the ground. The liner wall will also provide a solid surface for construction and waterproofing.

All global checks for equilibrium will be carried out for the basement system as a whole, before detailed retaining wall checks will be carried out for the individual side underpins' bearing pressures and rebar designs. Preliminary calculations to check initial equilibrium and strength checks for the basement's structural members can be found in Appendix C.

2.1. Basement Form, Construction and Load Path

2.1.1. Contiguous Piled Wall Construction

It is proposed to form the rear basement wall using a contiguous piled wall. This is to be installed from the existing patio level and designed to resist soil pressures during the temporary construction case, and soil and water pressures in the permanent case. In the temporary case, the clay will be relatively impermeable and will limit water ingress during the construction works.

Once the contiguous piled wall has been constructed, a capping beam will be constructed at ground level which will be laterally propped in the temporary case. The ground in front can then be excavated down to basement formation level. Dewatering in the temporary construction case will likely be required due to the high water table recorded in the borehole undertaken on site. All works are to be carried out by a competent contractor.

Once the basement slab is installed against the piles, a liner wall is to be cast in front of the piles - spanning between the basement slab and capping beam/ground slab above. This will resist water pressures in the permanent case in order to provide global equilibrium. The liner wall is to be fixed back to the contiguous piled wall so that the



hydrostatic forces can be transferred back into the piles, and resisted by the ground. Once water tightness and strength has been achieved, the rest of the basement construction works can be carried out.

2.1.2. Underpinning Construction

It is proposed to form the basement side walls with a combination of L-shaped reinforced concrete underpins. The reinforced underpins are to be cast in a typical 1-3-5-2-4 sequence to ensure stability of the masonry in the temporary case. The underpins are to be cast prior to the slab and propped across each other in the temporary case.

The underpinning is to be carefully sequenced to minimise the vertical and horizontal movement of the ground and structures, while the excavated pins are to be a maximum 1m wide to ensure the masonry above can arch sufficiently.

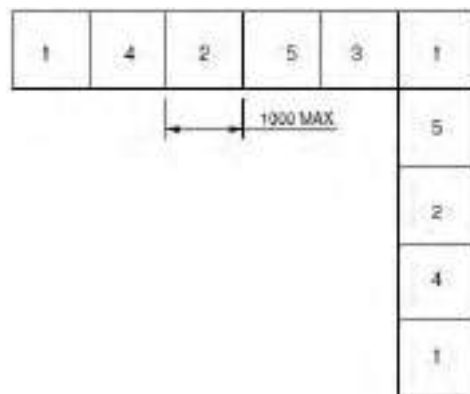


Figure 2: 1-3-5-2-4 Typical Underpinning Sequence

In the permanent case, the reinforced concrete walls will support the vertical loads from the superstructure above, as well as resisting the lateral loads applied behind the wall from the earth, surcharge loads, and water pressure that may occur. All reinforced concrete walls are designed as cantilevers.

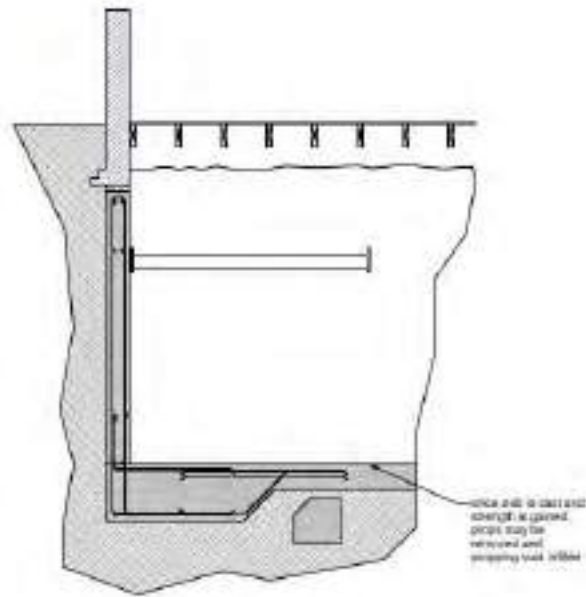


Figure 3: Typical RC Section

All underpins are to be cast prior to the construction of the concrete basement floor slab, so that the base of the walls can be propped off each other in accordance with the attached sequence of construction (found in Appendix A). Once the floor slab is cast and sufficient strength is gained, all temporary propping can be struck.

2.2. Basement Slab & Heave Protection

Given the depth of excavation and the underlying clay, there is the likelihood that the clay will heave with the relaxation of the load due to the removal of soil. As such, the slab is to be designed as suspended, spanning between thickenings acting as foundations. Heave protection to the underside of the slab will allow the heave to occur to limit additional stress to the slab.

Due to the water found on site, the basement will need to be designed to accommodate uplift from buoyancy in the permanent case. To counteract this uplift force, the basement slab will be suspended between party walls, internal tension piles and the rear piled wall. Preliminary calculations to verify the viability of the scheme designed this way can be found in Appendix C.

2.3. Ground Bearing Pressures

Site specific investigation has been undertaken by Maund Geo-Consulting LTD and according to their findings the existing soil is suitable for shallow foundations. For the basement foundations, spread foundations are suitable and a bearing pressure of 125-150kN/m² can be considered for design purposes.



2.4. Contamination

From the investigation works and laboratory testing, no significant contamination has been identified. See document *MGC-132-B/A-V1* produced by Maund Geo-Consulting LTD for all required measurements.

2.5. Waterproofing

The borehole undertaken by Maund Geo-Consulting found groundwater approximately 1m BGL to the rear of the property. The basement in the permanent case is to be suitably waterproofed with a two-system solution, provided by an integral solution such as waterproof concrete or internal tanking, as well as a secondary measure such as a cavity drain.



3. Superstructure

Below is an overview of the principles of the design for the superstructure. Preliminary structural drawings are provided in Appendix B.

3.1. Vertical Loading

Where existing walls and support to existing floor joists are to be removed in the property, new steel or timber beams (dependent on the wall construction and size) will be specified to reinstate this support. Where possible, beams will be supported on padstones on the existing walls, but where forces on the masonry are beyond the acceptable limits, steel columns are used.

3.2. Stability

Where a large section of masonry wall has been removed to the existing rear elevation of the main portion of the property, a steel frame will be installed to reinstate the lateral stability.

When designing the stability frame, lateral wind loads are calculated assuming the adjacent building was at some time removed (as required by the building regulations). Sheltering from the remaining building has been considered.

Columns are designed to be restrained in plane by the incoming steel beams. Out of plane restraint is achieved by fixing columns into the adjacent masonry walls, or where applicable via stiff connections to the floor. In all instances, the steels are to be appropriately tied into the floor and walls to ensure that they act as a diaphragm and transfer loads into the frame.

3.3. Steel Supporting Masonry Walls

New beams supporting existing masonry walls and new cavity walls are designed to limit deflection to $\text{span}/500$ or 10mm whichever is less. Where secondary beams are supported on primary beams the compound deflection is checked to ensure this limit is not reached.

3.4. Padstones

Stresses below beams supported on masonry walls are checked both directly under the beam, to determine the requirements for padstones, and the walls are also checked globally. Local stresses for brickwork are limited to typically agreed limits of $0.42\text{N/mm}^2 \times 1.5$ local enhance factor $\times 1.5$ FoS (as designing to limit state) $= 1\text{ N/mm}^2$. This is different for new brickwork and the allowable stress limits are given in individual calculations.

3.5. Disproportionate Collapse

The property is a 4 storey single occupancy residential property and so falls into consequence class 1. Hence, no additional measures are required.

3.6. Design Codes Used

All calculations have been carried to the requirements of the current building regulations and Eurocode standards.



4. Designer Response to Investigations

This section notes how the proposed designs discussed in the preceding sections respond to the findings of the site survey and desk study undertaken.

4.1. Ground Conditions and Ground Water

The desk study and borehole undertaken on site showed that the basement will be constructed in the Claygate Member, comprised of silty fine sandy clay. As such, there is a risk of heave due to the de-loading of the soil. Hence, the slab will be designed as suspended with suitable heave protection.

The footings will be designed as thickenings to the edge of the slab and be ground bearing as the weight of the concrete and retaining wall will reinstate the weight of soil removed, meaning heave will not affect the footings.

Within the borehole to the rear of the proposed basement, water was recorded at approximately 1m BGL. As this is above ground level to the front of the property, it is unlikely that this is the ground water level under the entirety of the property, but it cannot be confirmed whether this water is merely perched. Hence all retaining members will be designed in the permanent case for this water level, and fully retaining water to ground level in the accidental case.

Due to the potential high water table, considerations for dewatering of the site during construction will be carried out.

The structural members will also be suitably sized to resist the possible uplift forces of any water pressure acting on the slab. The basement slab acts as suspended between party walls, internal tension piles, and the rear piled wall. The weight of the existing and proposed members will be accounted for when designing for the net uplift force. Where the load being transferred downwards is not sufficient to resist the uplift force, the slab and thickenings will be designed to span onto the internal piles and back piled wall to ensure the distribution back to the piles and the piles will be designed for the net uplift force with a tension force to ensure equilibrium.

4.2. Existing Trees and Infrastructure

To the front and rear of the property there are trees of significant size. To the front of the property, there is a tree of approximately 20m in height. However, this is approximately 18m away from the nearest part of the proposed basement. To the rear of the property the closest tree is approximately 9m from the rear of the proposed basement. However, this tree is approximately only 4m in height. Hence both are assumed to be outside any root protection zones.

No works are proposed to take place adjacent to existing infrastructure or highways and therefore an AIP will not be required.

4.3. Drainage

A full CCTV is recommended to be carried out to confirm the details of the existing drainage system.

A provision will be made for a surface water pump for drainage to the proposed bathroom and utilities within the basement. If possible, the drainage will be kept to a gravity system if the existing levels in the private / public realm allow for it in order to reduce maintenance requirements.



All other drainage will remain gravity based and connect into the existing system, renewing where necessary if the system is found to be not in a good state of repair. This will outfall into the existing sewer in the road.

If any sewers are found to be public (serving two or more properties), and it is proposed to build within 3m or over these, a build over agreement with Thames Water will be required.

4.4. Flooding

The desk study confirmed that there is a low risk of flooding on site. The works are not considered to have an impact on local flooding.

4.5. Ground Movement and Damage Assessment to Adjacent Properties

During the project, it is critical to ensure that the works undertaken do not cause undue levels of vertical and horizontal movement to adjacent structures.

The majority of the basement is to be formed using underpinning to the existing footings and masonry walls. To limit movement, this will be carried out in the sequence as shown indicatively on SD Engineers' drawings. As previously stated, no underpin will be greater than 1m in width to ensure the masonry above can arch suitably in the temporary case. The rear of excavations must not be left unsupported when the site is unattended. No adjacent sections of underpinning will be excavated within 48 hours of each other.

In some areas, if the pins are greater than 1m below the existing foundation level, transition pins may be required to avoid any hard spots that can cause differential settlements issues in the future.

Each underpin will be the full width of the existing wall above. Underpins are to be dry packed up tight to the underside of the existing masonry 48 hours after pouring.

Due to the proposed basement underpinning the neighbouring property's party wall, an assessment has been carried out on the predicted ground movements that could be expected during the works and the impact this would have on the neighbouring property. The findings from this assessment can be found in Maund Geo-Consulting LTD's document *MGC-132-BIA-V1*.

To ensure best practice, a competent contractor experienced in basement construction, must be appointed. The Contractor will be required to design any temporary works to comply with BS5975:2019 Code of Practice for Temporary Works.

4.6. CDM

Method statements are required from the contractor for the following;

- Creating openings greater than 3m in existing walls
- Underpinning of existing footings
- Construction of the RC retaining wall
- Construction of the basement retaining wall

Suggested sequences are provided for the;

- Construction of the basement retaining wall



5. Construction monitoring

5.1. Movement

Construction monitoring will be required to ensure that there is no sudden or unexpected movement of any walls during construction of the basement. The following suggested monitoring procedure is intended as an indicative guidance document to establish a base level for monitoring. All items noted must be confirmed a specialist monitoring contractor.

5.2. Monitoring Required

It is advised that to aid in the assessment of movement during construction, the following items are included:

- Schedules of condition at the neighbouring property prior to commencement of works and upon completion
- Visual inspections of the walls being underpinned at regular intervals
- Vertical monitoring measurements
- Horizontal monitoring methods

These will aid in ensuring that no excessive movement takes place while acting as an early warning indicator to mitigate any damage.

5.3. Methods of Monitoring

Methods of monitoring can include but are not limited to:

- General visual surveys
- Cracking to party walls - Tell-Tails on any existing cracks
- Settlement monitoring – use of levelling equipment and targets
- Lateral monitoring – measurement of distance between external wall with targets/ relative differences between walls

The number and positioning of targets should be agreed between the contractor and monitoring specialist to ensure appropriate numbers are maintained at all times.

5.4. Structural Monitoring

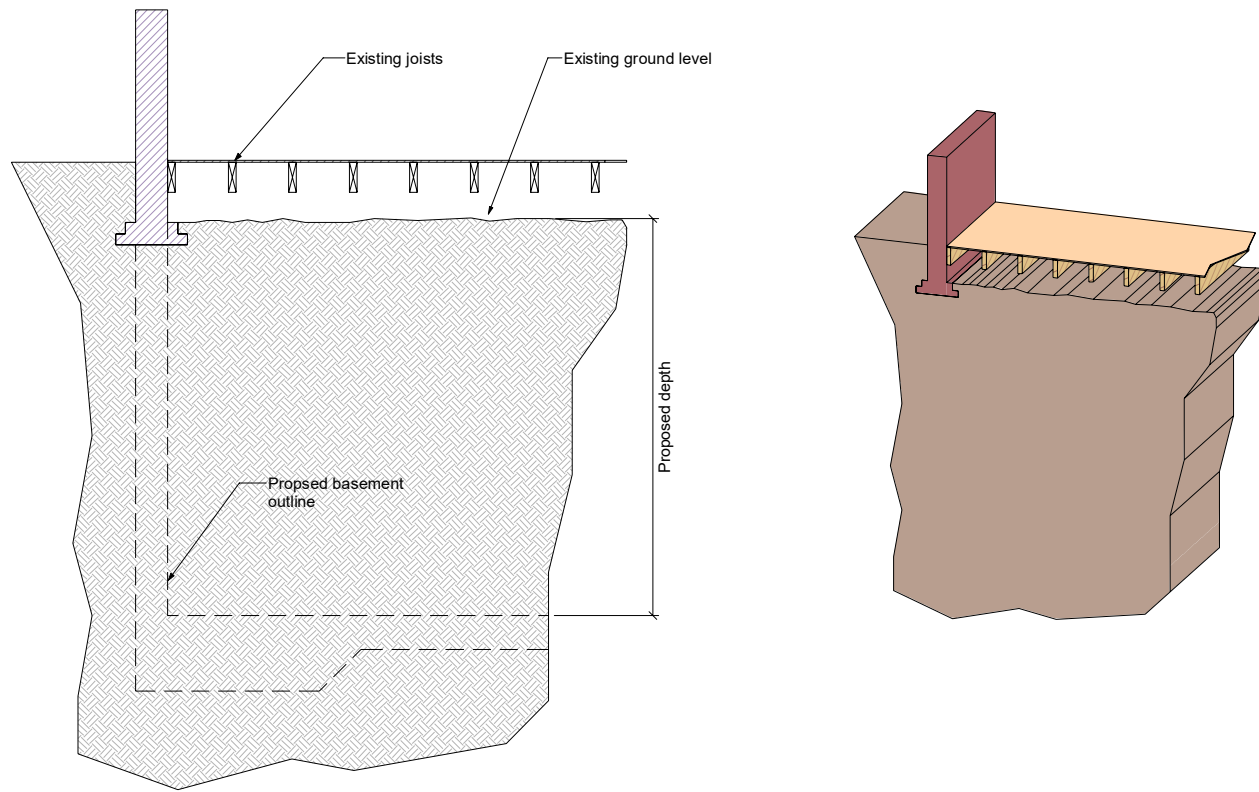
Further to the monitoring of movement, the construction of the basement should be monitored by an appropriate person at key stages.

Key stages at this stage are considered as:

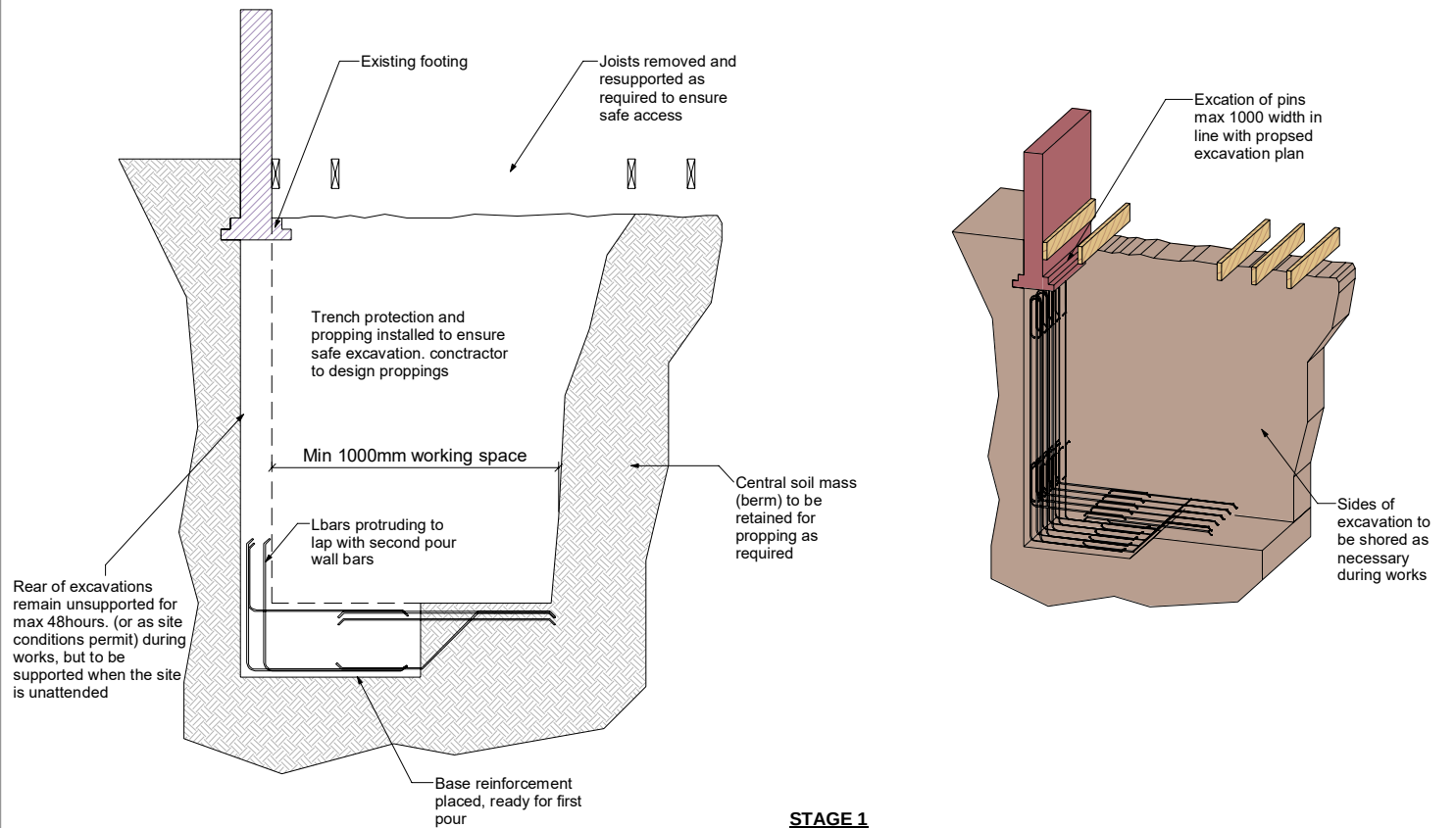
- Excavation of first underpin
- First L-shaped RC underpin pour
- Prior to pouring of floor slab



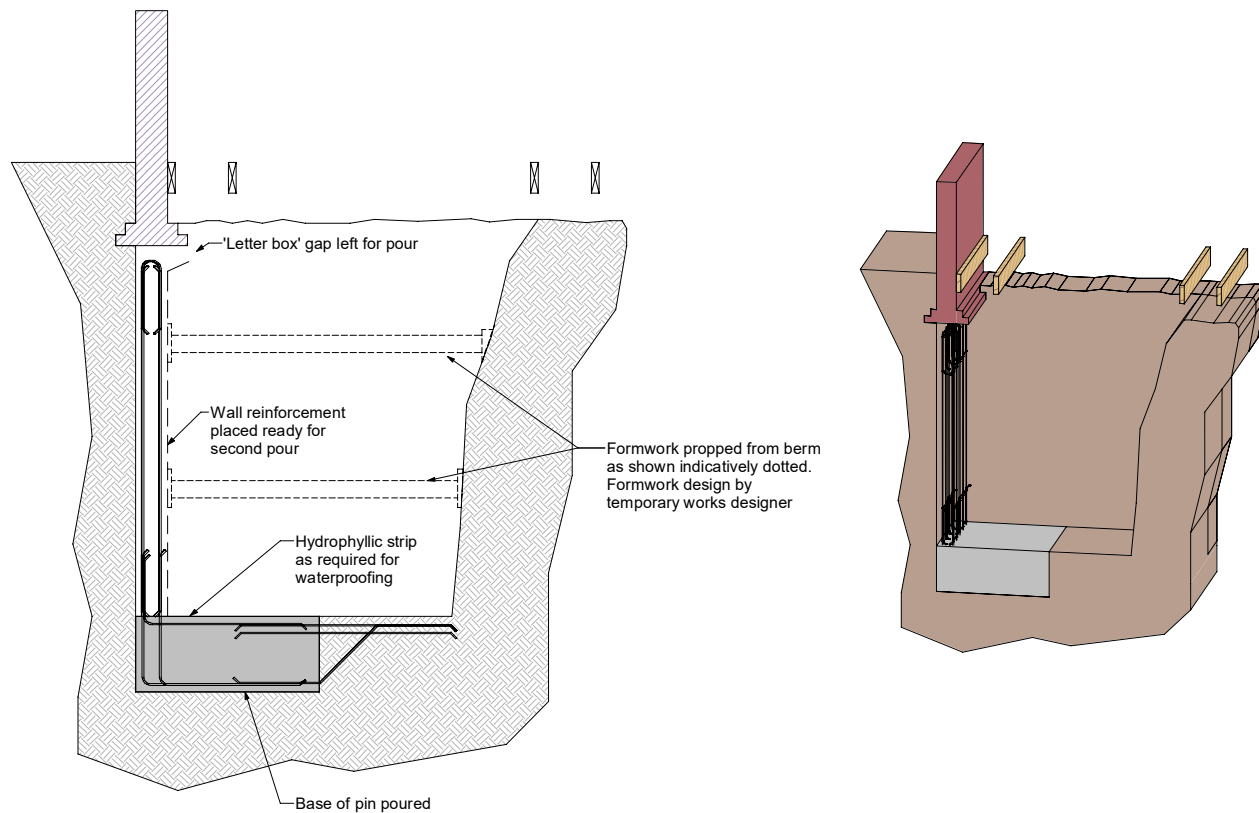
Appendix A - Basement Sequence



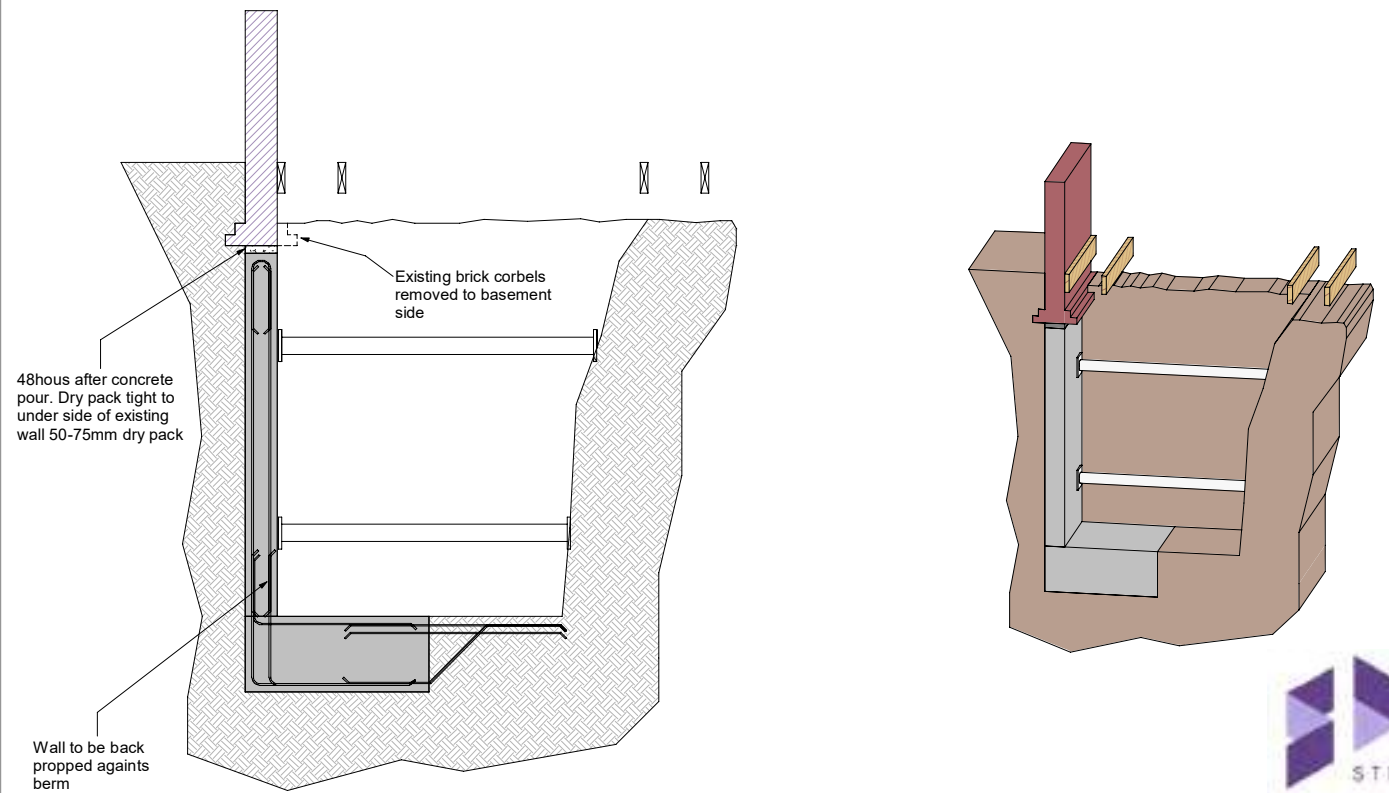
EXISTING
NOT TO SCALE



STAGE 1
NOT TO SCALE



STAGE 2
NOT TO SCALE

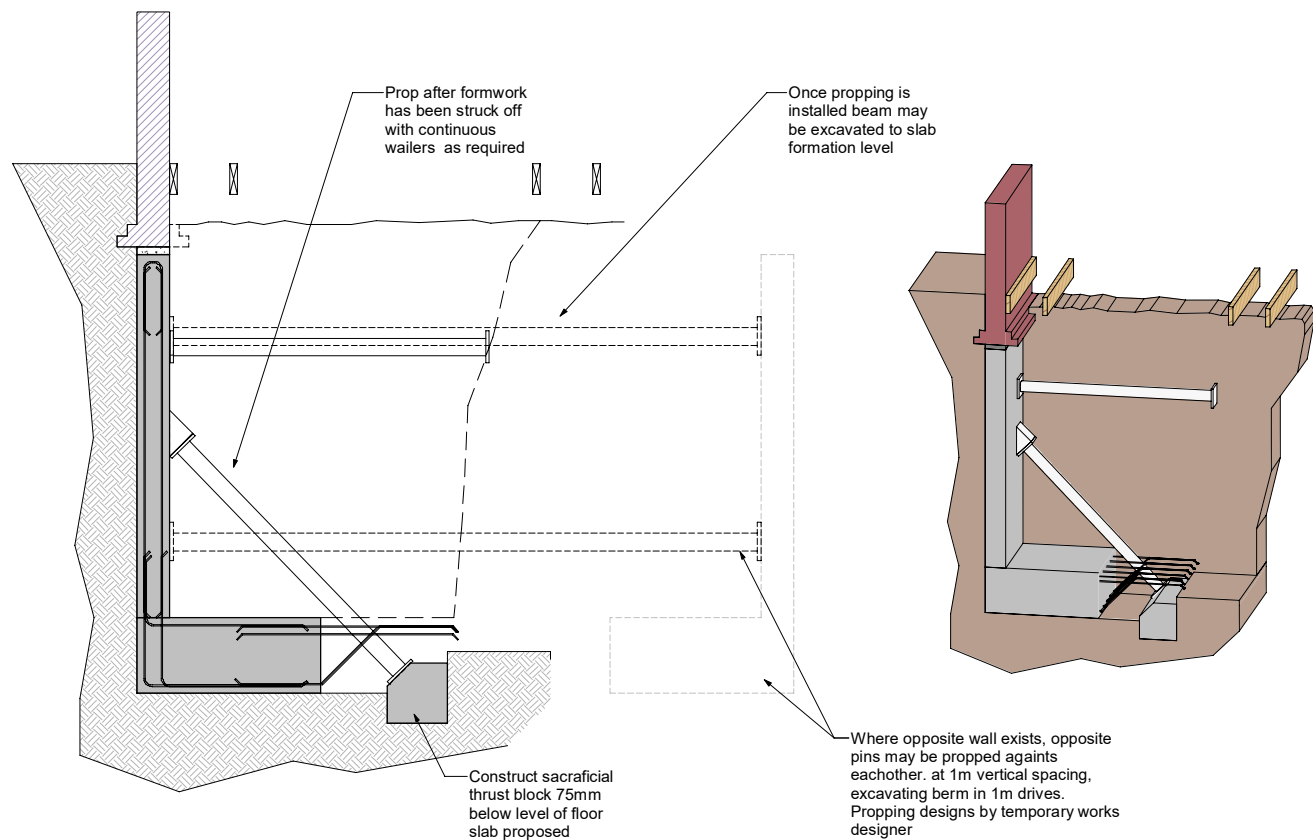


STAGE 3
NOT TO SCALE

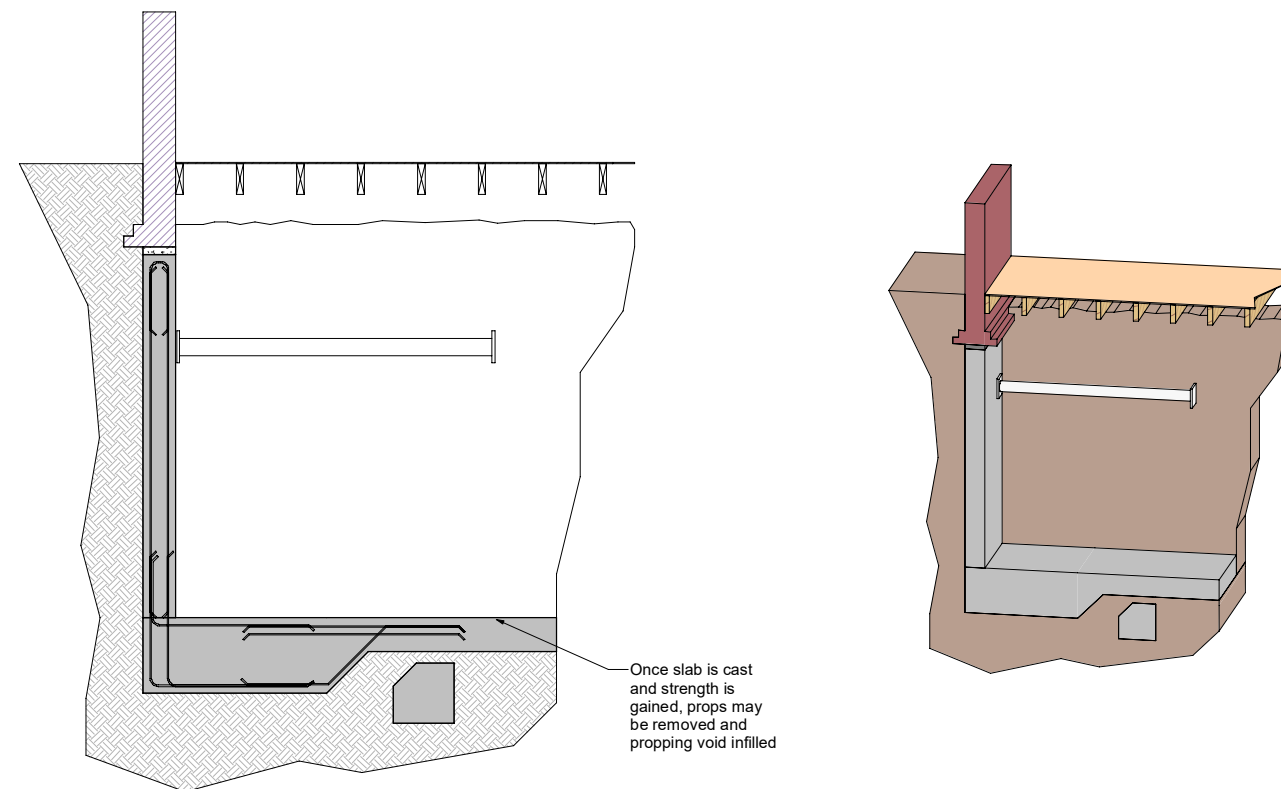
Drawings should read
in conjunction with
the BIA report submit-
ted to planning



PRELIMINARY		
45 Cholmeley Crescent	Eng: HN	
SDS1711	Drawn: HN	
Construction Sequences Sheet 1		



STAGE 4
NOT TO SCALE



STAGE 5
NOT TO SCALE

Drawings should read
in conjunction with
the BIA report submit-
ted to planning

Rev	Amendment	Date	Drawn	Eng	Scales: uno NTS	1711-SDS-B1-S-7001	Rev: P01

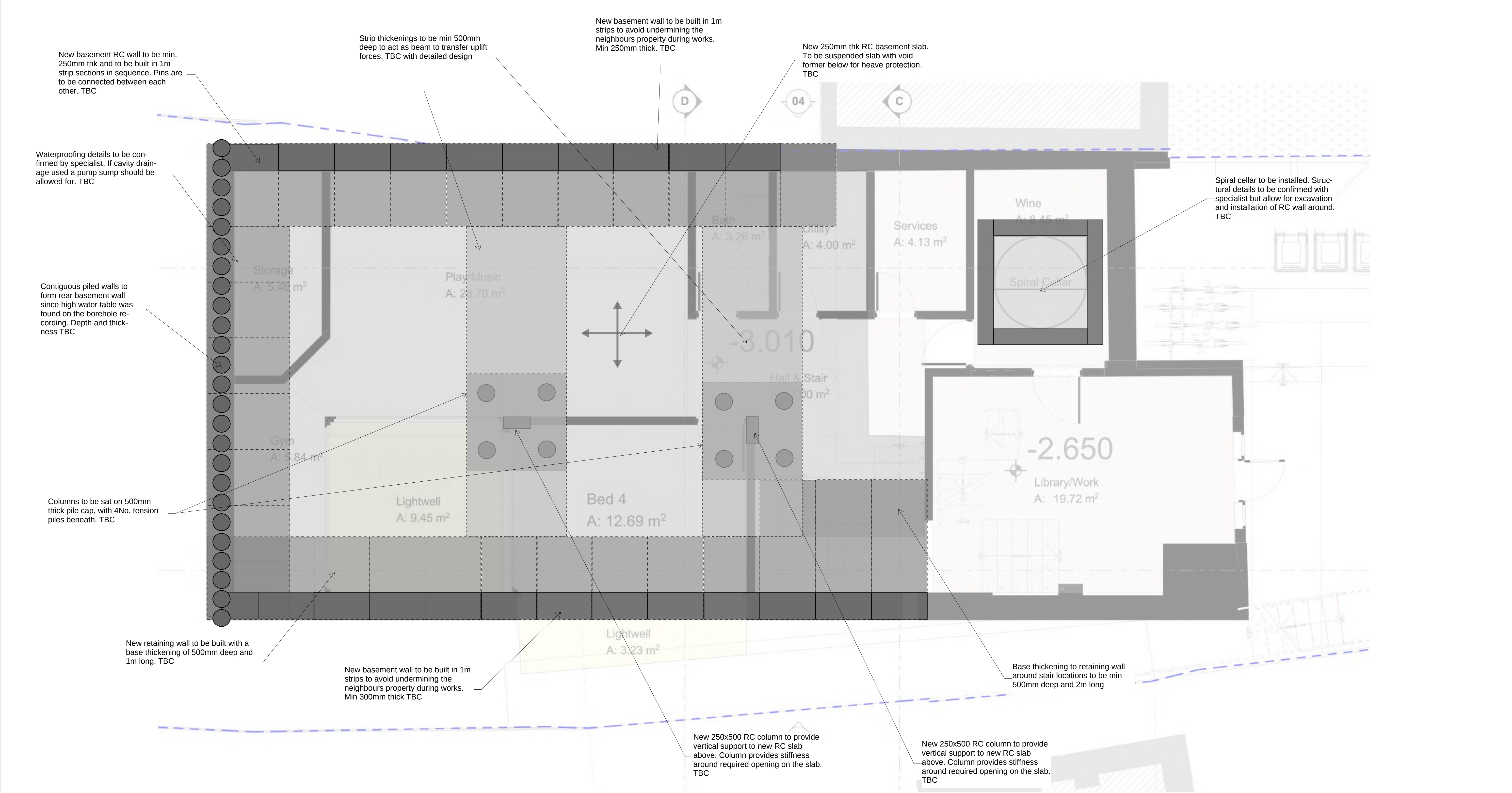


PRELIMINARY

45 Cholmeley Crescent SDS1711	Eng: HN Drawn: HN
Construction Sequences Sheet 2	



Appendix B - Preliminary Structural Drawings



Basement Floor Plan
1:50

- Notes:
- These drawings are not to be used for setting out purposes. Refer to the latest Architects information and site measure as required.
 - Contact SD Structures in the event of any discrepancies between findings on site and these drawings.
 - Drawing is to be read in conjunction with the SD Structures Engineer's Specification and General Notes.
 - 3D views are indicative only and any conflicting 2D information should take precedence. If in doubt contact SD Structures prior to starting work

KEY					
	Existing	Concrete	Steel	Timber	Masonry
Beams	Ex beam				
Column / pier					
Wall					
Column / wall below					
Slab/floor	Ex				

KEY CONT'D	
	Foundation below
ps	Padstone
	Lintel above
DJ / TJ	Double / triple joist
CP	Crank point
	Lateral restraint strap



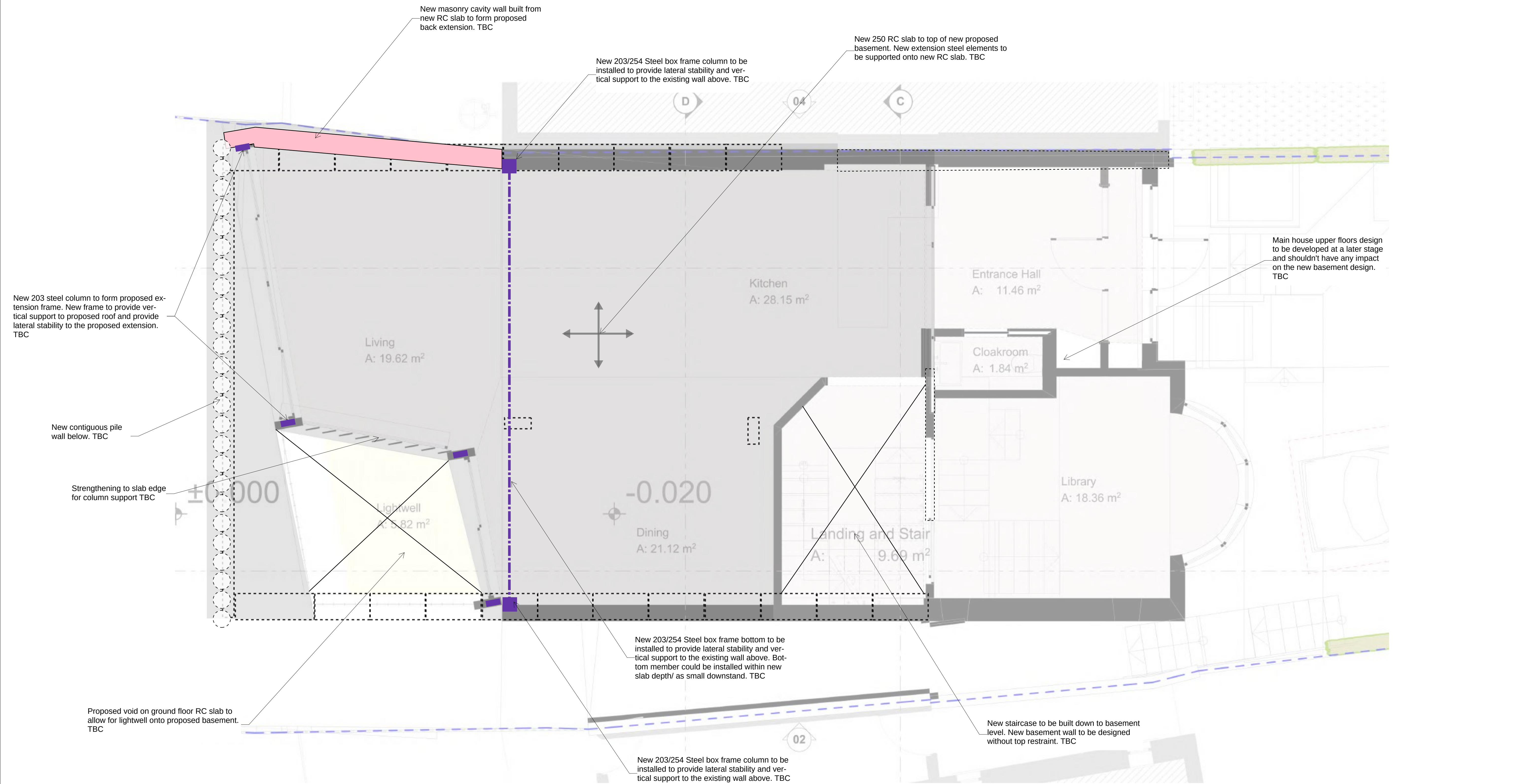
Hazards noted thus

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P02	Issued for Coordination	21/07/2023	MF	MF
Rev	Amendment	Date	Drawn	Eng

Scale: As indicated @A1

S1	Suitable for Coordination					
45 Chomeley Crescent 1711	Eng: MF Drawn: MF					
Basement Floor Plan						
Proj	Orig	Lev	Rev	No	Status	Rev
1711	-	SDS-B1-S-2000			S1	P02



Ground Floor Plan
1:50

- Notes:
- These drawings are not to be used for setting out purposes. Refer to the latest Architects information and site measure as required.
 - Contact SD Structures in the event of any discrepancies between findings on site and these drawings.
 - Drawing is to be read in conjunction with the SD Structures Engineer's Specification and General Notes.
 - 3D views are indicative only and any conflicting 2D information should take precedence. If in doubt contact SD Structures prior to starting work

KEY					
	Existing	Concrete	Steel	Timber	Masonry
Beams	Ex beam				
Column / pier					
Wall					
Column / wall below					
Slab/floor	Ex				

KEY CONT'D	
	Foundation below
ps	Padstone
	Lintel above
DJ / TJ	Double / triple joist
CP	Crank point
	Lateral restraint strap



Hazards noted thus

SCALE 1:50
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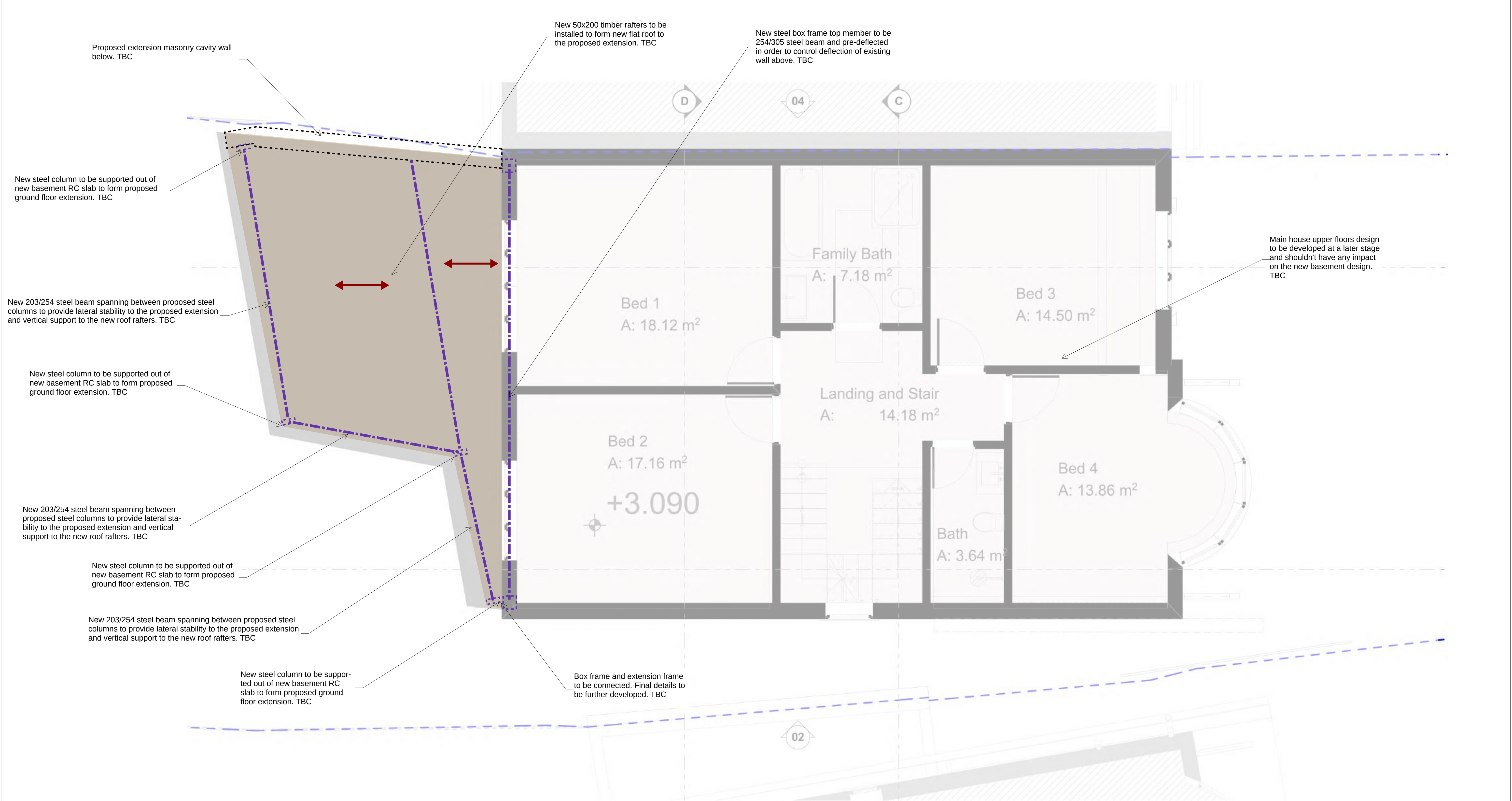
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Rev	Amendment	Date	Drawn	Eng	Scale: @A1	1711	-	SDS-GF-S-2001			S1	P02



S1 Suitable for Coordination

45 Chomeley Crescent
1711
Eng: MF
Drawn: MF

Ground Floor Plan



First Floor Plan
1:50

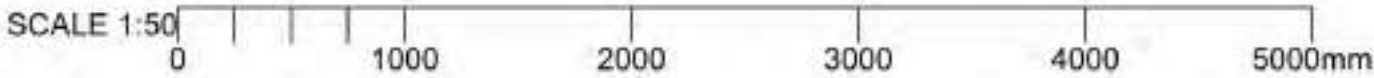
- Notes:
1. These drawings are not to be used for setting out purposes. Refer to the latest Architects information and site measure as required.
 2. Contact SD Structures in the event of any discrepancies between findings on site and these drawings.
 3. Drawing is to be read in conjunction with the SD Structures Engineer's Specification and General Notes.
 4. 3D views are indicative only and any conflicting 2D information should take precedence. If in doubt contact SD Structures prior to starting work

KEY					
	Existing	Concrete	Steel	Timber	Masonry
Beams	Ex beam				
Column / pier					
Wall					
Column / wall below					
Slab/floor	Ex				

KEY CONT'D	
	Foundation below
ps	Padstone
	Lintel above
DJ / TJ	Double / triple joist
CP	Crank point
	Lateral restraint strap



Hazards noted thus



P01	Issued for Coordination	08/05/2023	MF	MF
Rev	Amendment	Date	Drawn	Eng

Scale: As indicated @A1

S1 Suitable for Coordination	
45 Chomeley Crescent 1711	Eng: MF Drawn: MF
First Floor Plan	
Proj Orig Lev Rol No	Status Rev
1711 - SDS-GF-S-2002	S1 P01



S1 Suitable for Coordination

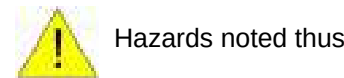
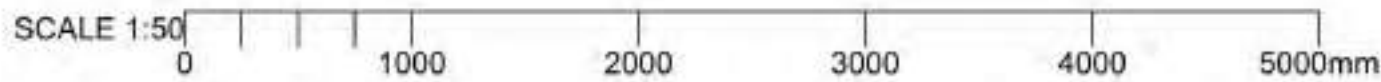
**45 Chomeley Crescent
1711** Eng: **MF**
Drawn: **MF**

First Floor Plan

Proj	Orig	Lev	Rev	No	Status	Rev
1711	-	SDS-GF-S-2002			S1	P02

P02	Issued for Coordination	21/07/2023	MF	MF
Rev	Amendment	Date	Drawn	Eng

Scale: As indicated
@A1



Hazards noted thus

**Section
1:50**

KEY					
	Existing	Concrete	Steel	Timber	Masonry
Beams	Ex beam				
Column / pier					
Wall					
Column / wall below					
Slab/floor	Ex				

KEY CONT'D	
	Foundation below
ps	Padstone
	Lintel above
DJ / TJ	Double / triple joist
CP	Crank point
	Lateral restraint strap

Notes:

- These drawings are not to be used for setting out purposes. Refer to the latest Architects information and site measure as required.
- Contact SD Structures in the event of any discrepancies between findings on site and these drawings.
- Drawing is to be read in conjunction with the SD Structures Engineer's Specification and General Notes.
- 3D views are indicative only and any conflicting 2D information should take precedence. If in doubt contact SD Structures prior to starting work

New steel box frame top member to be 254/305 steel beam and pre-deflected in order to control deflection of existing wall above. TBC

New 250 RC slab to top of new proposed basement. New extension steel elements to be supported onto new RC slab. TBC

New 250x500 RC column to provide vertical support to new RC slab above. TBC

Contiguous piled walls to form rear basement wall since high water table was found on the borehole re-cording. Depth and thick-ness TBC

Waterproofing details to be confirmed by specialist. If cavity drainage used a pump sump should be allowed for. TBC

Slab to have base thickening 500mm deep and 1m long. To be dowelled into piled wall. TBC

New 250mm thk RC base-ment slab. To be suspended slab with void former below for heave protection. TBC

Column to be sat on 500mm thick pile cap, with 4No. tension piles beneath (in 2x2 layout). TBC

New 250x500 RC column to provide vertical support to new RC slab above. Column provides stiffness around required opening on the slab. TBC

Main house upper floors design to be developed at a later stage and shouldn't have any impact on the new basement design. TBC



Appendix C - Preliminary Calculations

250mm thick retaining wall preliminary calculation

RETAINING WALL ANALYSIS

In accordance with EN1997-1:2004 incorporating Corrigendum dated February 2009 and the UK National Annex incorporating Corrigendum No.1

Tedds calculation version 2.9.15

Retaining wall details

Stem type Propped cantilever
Stem height $h_{\text{stem}} = 2700 \text{ mm}$
Prop height $h_{\text{prop}} = 2700 \text{ mm}$
Stem thickness $t_{\text{stem}} = 250 \text{ mm}$
Angle to rear face of stem $\alpha = 90 \text{ deg}$
Stem density $\gamma_{\text{stem}} = 25 \text{ kN/m}^3$
Toe length $l_{\text{toe}} = 1000 \text{ mm}$
Base thickness $t_{\text{base}} = 500 \text{ mm}$
Base density $\gamma_{\text{base}} = 25 \text{ kN/m}^3$
Height of retained soil $h_{\text{ret}} = 2700 \text{ mm}$ Angle of soil surface $\beta = 0 \text{ deg}$
Depth of cover $d_{\text{cover}} = 0 \text{ mm}$
Height of water $h_{\text{water}} = 1700 \text{ mm}$
Water density $\gamma_w = 9.8 \text{ kN/m}^3$

Retained soil properties

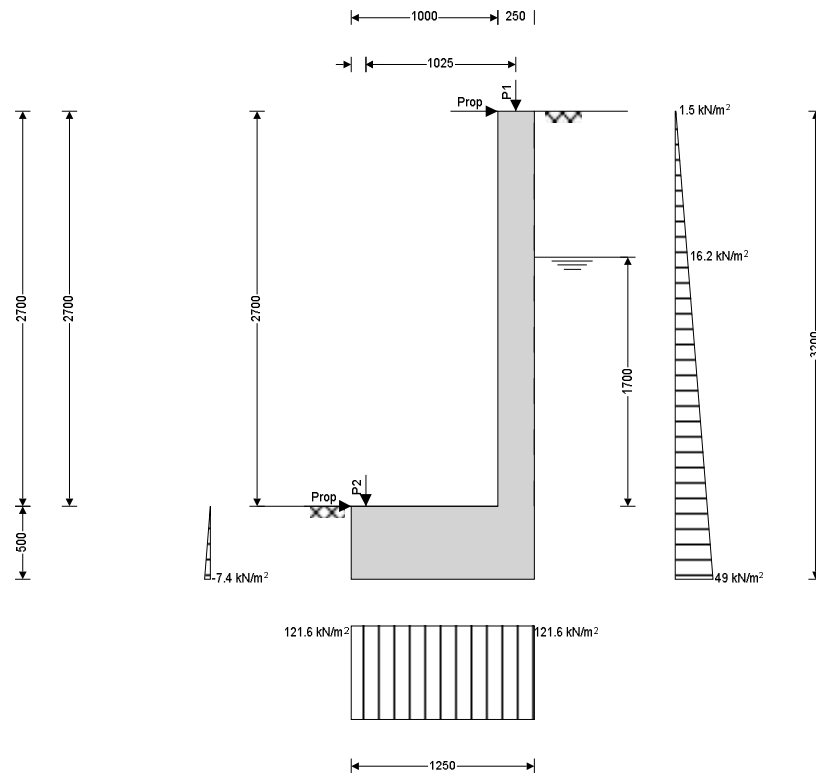
Soil type Organic silty clay
Moist density $\gamma_{\text{mr}} = 15 \text{ kN/m}^3$
Saturated density $\gamma_{\text{sr}} = 15 \text{ kN/m}^3$
Characteristic effective shear resistance angle $\phi'_{r,k} = 22 \text{ deg}$
Characteristic wall friction angle $\delta_{r,k} = 11 \text{ deg}$

Base soil properties

Soil type Organic silty clay
Soil density $\gamma_b = 15 \text{ kN/m}^3$
Characteristic effective shear resistance angle $\phi'_{b,k} = 22 \text{ deg}$
Characteristic wall friction angle $\delta_{b,k} = 11 \text{ deg}$
Characteristic base friction angle $\delta_{bb,k} = 14.7 \text{ deg}$
Presumed bearing capacity $P_{\text{bearing}} = 150 \text{ kN/m}^2$

Loading details

Variable surcharge load Surcharge_Q = 1.5 kN/m^2
Vertical line load at 1125 mm $P_{G1} = 86.7 \text{ kN/m}$
 $P_{Q1} = 21.7 \text{ kN/m}$
Vertical line load at 100 mm $P_{G2} = 9.1 \text{ kN/m}$
 $P_{Q2} = 2.1 \text{ kN/m}$



General arrangement - sketch pressures relative to bearing check

Calculate retaining wall geometry

Base length $l_{base} = 1250$ mm

Saturated soil height $h_{sat} = 1700$ mm

Moist soil height $h_{moist} = 1000$ mm

Length of surcharge load $l_{sur} = 0$ mm

Vertical distance $x_{sur_v} = 1250$ mm

Effective height of wall $h_{eff} = 3200$ mm

Horizontal distance $x_{sur_h} = 1600$ mm

Area of wall stem $A_{stem} = 0.675$ m² Vertical distance $x_{stem} = 1125$ mm

Area of wall base $A_{base} = 0.625$ m² Vertical distance $x_{base} = 625$ mm

For undrained soils - Annex C.1(2)

Active pressure coefficient $K_A = 1.000$

Passive pressure coefficient

$K_P = 1.000$

Bearing pressure check

Vertical forces on wall

Total $F_{total_v} = F_{stem} + F_{base} + F_{P_v} + F_{water_v} = 152$ kN/m

Horizontal forces on wall

Total $F_{total_h} = F_{sur_h} + F_{sat_h} + F_{water_h} + F_{moist_h} + F_{pass_h} = 78.7$ kN/m

Moments on wall

Total $M_{total} = M_{stem} + M_{base} + M_{sur} + M_P + M_{sat} + M_{water} + M_{moist} = 63.4$ kNm/m

Check bearing pressure

Propping force to stem $F_{prop_stem} = 9.9$ kN/m Propping force to base $F_{prop_base} = 68.8$ kN/m

Bearing pressure at toe $q_{toe} = 121.6$ kN/m² Bearing pressure at heel $q_{heel} = 121.6$ kN/m²

Factor of safety $FoS_{bp} = 1.234$

PASS - Allowable bearing pressure exceeds maximum applied bearing pressure

RETAINING WALL DESIGN

In accordance with EN1992-1-1:2004 incorporating Corrigendum dated January 2008 and the UK National Annex incorporating National Amendment No.1

Tedds calculation version 2.9.15

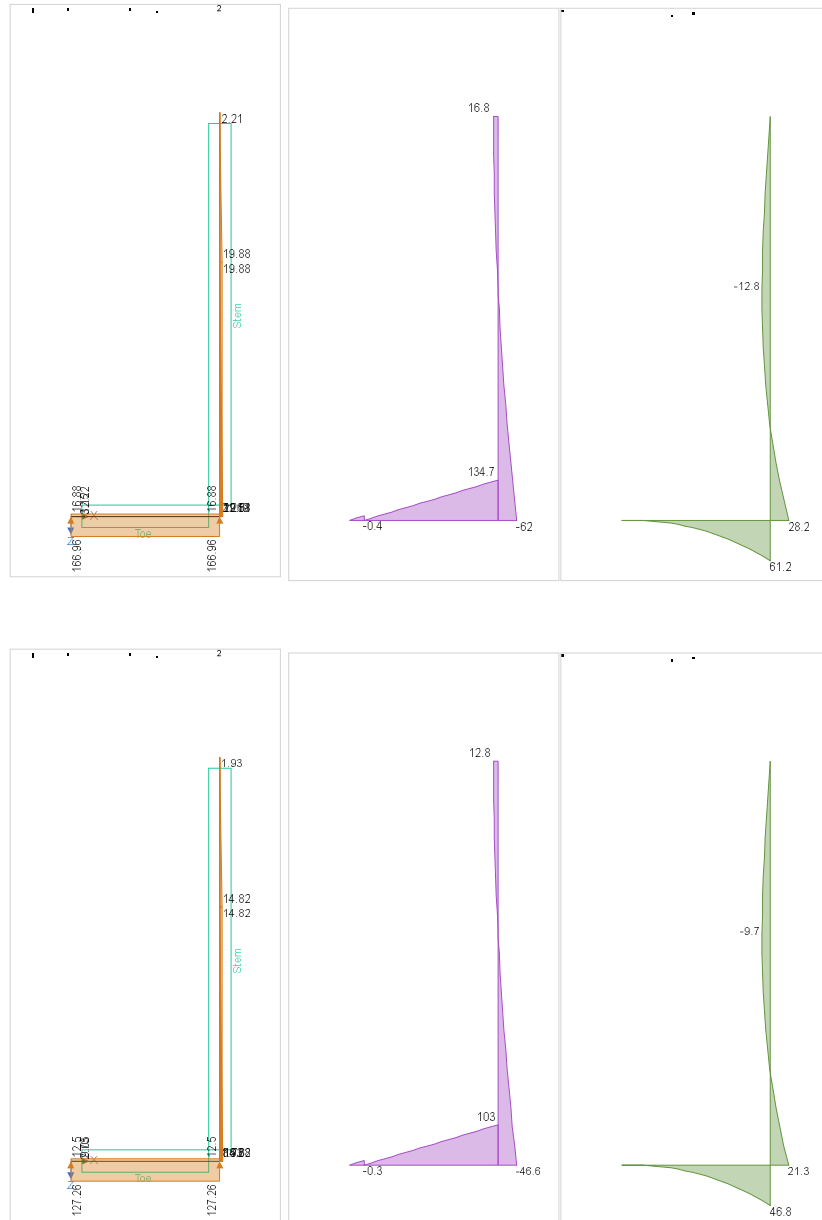
Concrete details - Table 3.1 - Strength and deformation characteristics for concrete

Concrete strength class C30/37

Char.comp.cylinder strength $f_{ck} = 30$ N/mm² Mean axial tensile strength $f_{ctm} = 2.9$ N/mm²



Secant modulus of elasticity $E_{cm} = 32837 \text{ N/mm}^2$ Maximum aggregate size $h_{agg} = 20 \text{ mm}$
 Design comp.concrete strength $f_{cd} = 17.0 \text{ N/mm}^2$ Partial factor $\gamma_C = 1.50$
Reinforcement details
 Characteristic yield strength $f_{yk} = 500 \text{ N/mm}^2$ Modulus of elasticity $E_s = 200000 \text{ N/mm}^2$
 Design yield strength $f_{yd} = 435 \text{ N/mm}^2$ Partial factor $\gamma_S = 1.15$
Cover to reinforcement
 Front face of stem $c_{sf} = 40 \text{ mm}$ Rear face of stem $c_{sr} = 50 \text{ mm}$
 Top face of base $c_{bt} = 50 \text{ mm}$ Bottom face of base $c_{bb} = 75 \text{ mm}$



Check stem design at 1258 mm

Depth of section $h = 250 \text{ mm}$

Rectangular section in flexure - Section 6.1

Design bending moment $M = 12.8 \text{ kNm/m}$ $K = 0.011$

$K' = 0.207$

$K' > K$ - No compression reinforcement is required

Tens.reinforcement required $A_{sfM.req} = 159 \text{ mm}^2/\text{m}$

Tens.reinforcement provided 10 dia.bars @ 200 c/c

Tens.reinforcement provided

$A_{sfM.prov} = 393 \text{ mm}^2/\text{m}$

Min.area of reinforcement $A_{sfM.min} = 294 \text{ mm}^2/\text{m}$

Max.area of reinforcement $A_{sfM.max} = 10000 \text{ mm}^2/\text{m}$

PASS - Area of reinforcement provided is greater than area of reinforcement required



Library item: Rectangular single summary

Deflection control - Section 7.4

Limiting span to depth ratio 40 Actual span to depth ratio 13.8

PASS - Span to depth ratio is less than deflection control limit

Crack control - Section 7.3

Limiting crack width $w_{max} = 0.3$ mm Maximum crack width $w_k = 0.173$ mm

PASS - Maximum crack width is less than limiting crack width Check stem design at base of stem

Depth of section $h = 250$ mm

Rectangular section in flexure - Section 6.1

Design bending moment $M = 28.2$ kNm/m $K = 0.025$ $K' = 0.207$

$K' > K$ - No compression reinforcement is required

Tens.reinforcement required $A_{sr.req} = 352$ mm²/m

Tens.reinforcement provided 12 dia.bars @ 200 c/c Tens.reinforcement provided

$A_{sr.prov} = 565$ mm²/m

Min.area of reinforcement $A_{sr.min} = 292$ mm²/m Max.area of reinforcement $A_{sr.max} = 10000$ mm²/m

PASS - Area of reinforcement provided is greater than area of reinforcement required

Library item: Rectangular single summary

Deflection control - Section 7.4

Limiting span to depth ratio 40 Actual span to depth ratio 13.9

PASS - Span to depth ratio is less than deflection control limit

Crack control - Section 7.3

Limiting crack width $w_{max} = 0.3$ mm Maximum crack width $w_k = 0.257$ mm

PASS - Maximum crack width is less than limiting crack width Rectangular section in shear - Section 6.2

Design shear force $V = 62$ kN/m

Rectangular section in shear - Section 6.2

Design shear force $V = 62$ kN/m Design shear resistance $V_{Rd.c} = 105.2$ kN/m

PASS - Design shear resistance exceeds design shear force

Check stem design at prop

Depth of section $h = 250$ mm

Rectangular section in shear - Section 6.2

Design shear force $V = 16.8$ kN/m

Rectangular section in shear - Section 6.2

Design shear force $V = 16.8$ kN/m Design shear resistance $V_{Rd.c} = 105.2$ kN/m

PASS - Design shear resistance exceeds design shear force

Horizontal reinforcement parallel to face of stem - Section 9.6

Min.area of reinforcement $A_{sx.req} = 250$ mm²/m Max.spacing of reinforcement $S_{sx.max} = 400$ mm

Trans.reinforcement provided 10 dia.bars @ 200 c/c Trans.reinforcement provided

$A_{sx.prov} = 393$ mm²/m

PASS - Area of reinforcement provided is greater than area of reinforcement required

Check base design at toe

Depth of section $h = 500$ mm

Rectangular section in flexure - Section 6.1

Design bending moment $M = 61.2$ kNm/m $K = 0.012$ $K' = 0.207$

$K' > K$ - No compression reinforcement is required

Tens.reinforcement required $A_{bb.req} = 355$ mm²/m

Tens.reinforcement provided 16 dia.bars @ 200 c/c Tens.reinforcement provided

$A_{bb.prov} = 1005$ mm²/m

Min.area of reinforcement $A_{bb.min} = 628$ mm²/m Max.area of reinforcement $A_{bb.max} = 20000$ mm²/m

PASS - Area of reinforcement provided is greater than area of reinforcement required

Library item: Rectangular single summary

Crack control - Section 7.3

Limiting crack width $w_{max} = 0.3$ mm Maximum crack width $w_k = 0.225$ mm

PASS - Maximum crack width is less than limiting crack width Rectangular section in shear - Section 6.2

Design shear force $V = 134.7$ kN/m

Rectangular section in shear - Section 6.2

Design shear force $V = 134.7$ kN/m Design shear resistance $V_{Rd.c} = 176$ kN/m

PASS - Design shear resistance exceeds design shear force

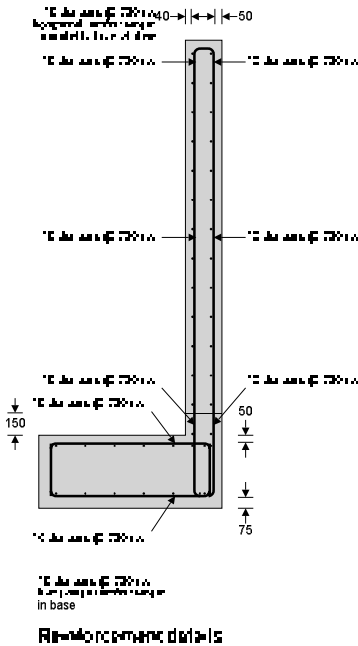
Secondary transverse reinforcement to base - Section 9.3

Min.area of reinforcement $A_{bx.req} = 201$ mm²/m Max.spacing of reinforcement $S_{bx.max} = 450$ mm

Trans.reinforcement provided 10 dia.bars @ 200 c/c Trans.reinforcement provided

$A_{bx.prov} = 393$ mm²/m

PASS - Area of reinforcement provided is greater than area of reinforcement required



Passes all strength and equilibrium checks for permanent case (water 1m BGL) and accidental case (water at GL) .



300mm thick retaining wall preliminary calculation

RETAINING WALL ANALYSIS

In accordance with EN1997-1:2004 incorporating Corrigendum dated February 2009 and the UK National Annex incorporating Corrigendum No.1

Tedds calculation version 2.9.15

Retaining wall details

Stem type Cantilever
Stem height $h_{\text{stem}} = 2700$ mm
Stem thickness $t_{\text{stem}} = 300$ mm
Angle to rear face of stem $\alpha = 90$ deg
Stem density $\gamma_{\text{stem}} = 25$ kN/m³
Toe length $l_{\text{toe}} = 2000$ mm
Base thickness $t_{\text{base}} = 500$ mm
Base density $\gamma_{\text{base}} = 25$ kN/m³
Height of retained soil $h_{\text{ret}} = 2700$ mm Angle of soil surface $\beta = 0$ deg
Depth of cover $d_{\text{cover}} = 0$ mm
Height of water $h_{\text{water}} = 1700$ mm
Water density $\gamma_w = 9.8$ kN/m³

Retained soil properties

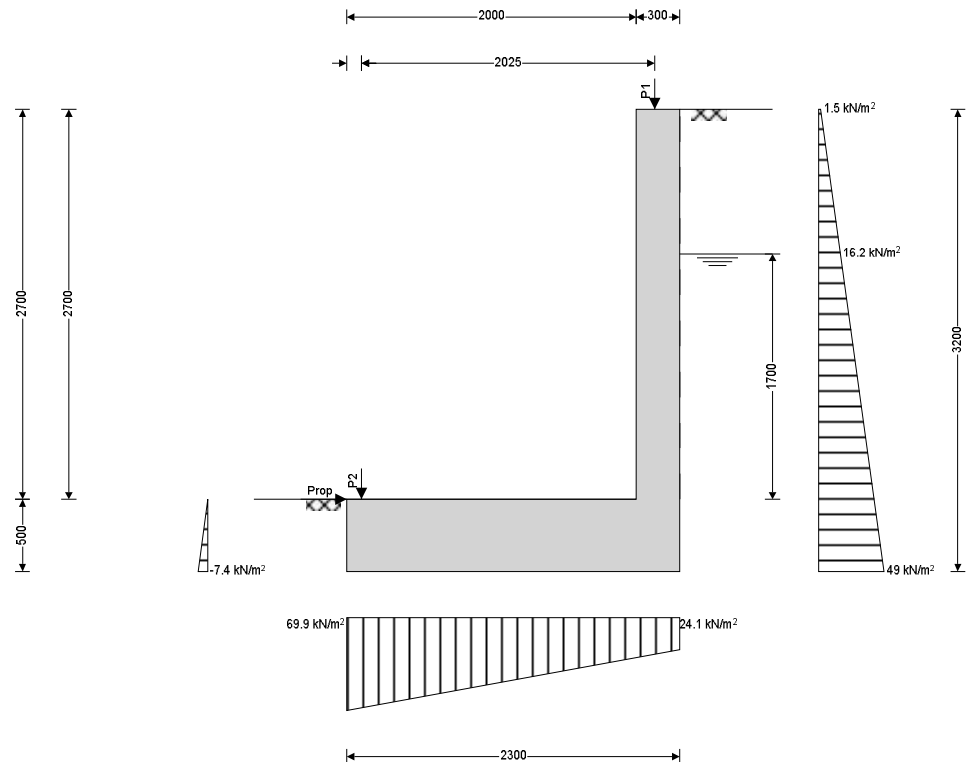
Soil type Organic silty clay
Moist density $\gamma_{\text{mr}} = 15$ kN/m³
Saturated density $\gamma_{\text{sr}} = 15$ kN/m³
Characteristic effective shear resistance angle $\phi'_{r,k} = 22$ deg
Characteristic wall friction angle $\delta_{r,k} = 11$ deg

Base soil properties

Soil type Organic silty clay
Soil density $\gamma_b = 15$ kN/m³
Characteristic effective shear resistance angle $\phi'_{b,k} = 22$ deg
Characteristic wall friction angle $\delta_{b,k} = 11$ deg
Characteristic base friction angle $\delta_{bb,k} = 14.7$ deg
Presumed bearing capacity $P_{\text{bearing}} = 100$ kN/m²

Loading details

Variable surcharge load Surcharge_Q = 1.5 kN/m²
Vertical line load at 2125 mm $P_{G1} = 42.5$ kN/m
 $P_{Q1} = 11.8$ kN/m
Vertical line load at 100 mm $P_{G2} = 3.9$ kN/m
 $P_{Q2} = 0.9$ kN/m



General arrangement - sketch pressures relate to bearing check

Calculate retaining wall geometry

Base length $l_{base} = 2300$ mm

Saturated soil height $h_{sat} = 1700$ mm

Moist soil height $h_{moist} = 1000$ mm

Length of surcharge load $l_{sur} = 0$ mm

Vertical distance $x_{sur_v} = 2300$ mm

Effective height of wall $h_{eff} = 3200$ mm

Horizontal distance $x_{sur_h} = 1600$ mm

Area of wall stem $A_{stem} = 0.81$ m² Vertical distance $x_{stem} = 2150$ mm

Area of wall base $A_{base} = 1.15$ m² Vertical distance $x_{base} = 1150$ mm

For undrained soils - Annex C.1(2)

Active pressure coefficient $K_A = 1.000$

Passive pressure coefficient

$K_P = 1.000$

Bearing pressure check

Vertical forces on wall

Total $F_{total_v} = F_{stem} + F_{base} + F_{P_v} + F_{water_v} = 108.1$ kN/m

Horizontal forces on wall

Total $F_{total_h} = F_{sur_h} + F_{sat_h} + F_{water_h} + F_{moist_h} + F_{pass_h} = 78.7$ kN/m

Moments on wall

Total $M_{total} = M_{stem} + M_{base} + M_{sur} + M_P + M_{sat} + M_{water} + M_{moist} = 104.1$ kNm/m

Check bearing pressure

Propping force $F_{prop_base} = 78.7$ kN/m

Bearing pressure at toe $q_{toe} = 69.9$ kN/m² Bearing pressure at heel $q_{heel} = 24.1$ kN/m²

Factor of safety $FoS_{bp} = 1.432$

PASS - Allowable bearing pressure exceeds maximum applied bearing pressure

RETAINING WALL DESIGN

In accordance with EN1992-1-1:2004 incorporating Corrigendum dated January 2008 and the UK National Annex incorporating National Amendment No.1

Tedds calculation version 2.9.15

Concrete details - Table 3.1 - Strength and deformation characteristics for concrete

Concrete strength class C30/37

Char.comp.cylinder strength $f_{ck} = 30$ N/mm² Mean axial tensile strength $f_{ctm} = 2.9$ N/mm²

Secant modulus of elasticity $E_{cm} = 32837$ N/mm² Maximum aggregate size $h_{agg} = 20$ mm

Design comp.concrete strength $f_{cd} = 17.0$ N/mm² Partial factor $\gamma_C = 1.50$



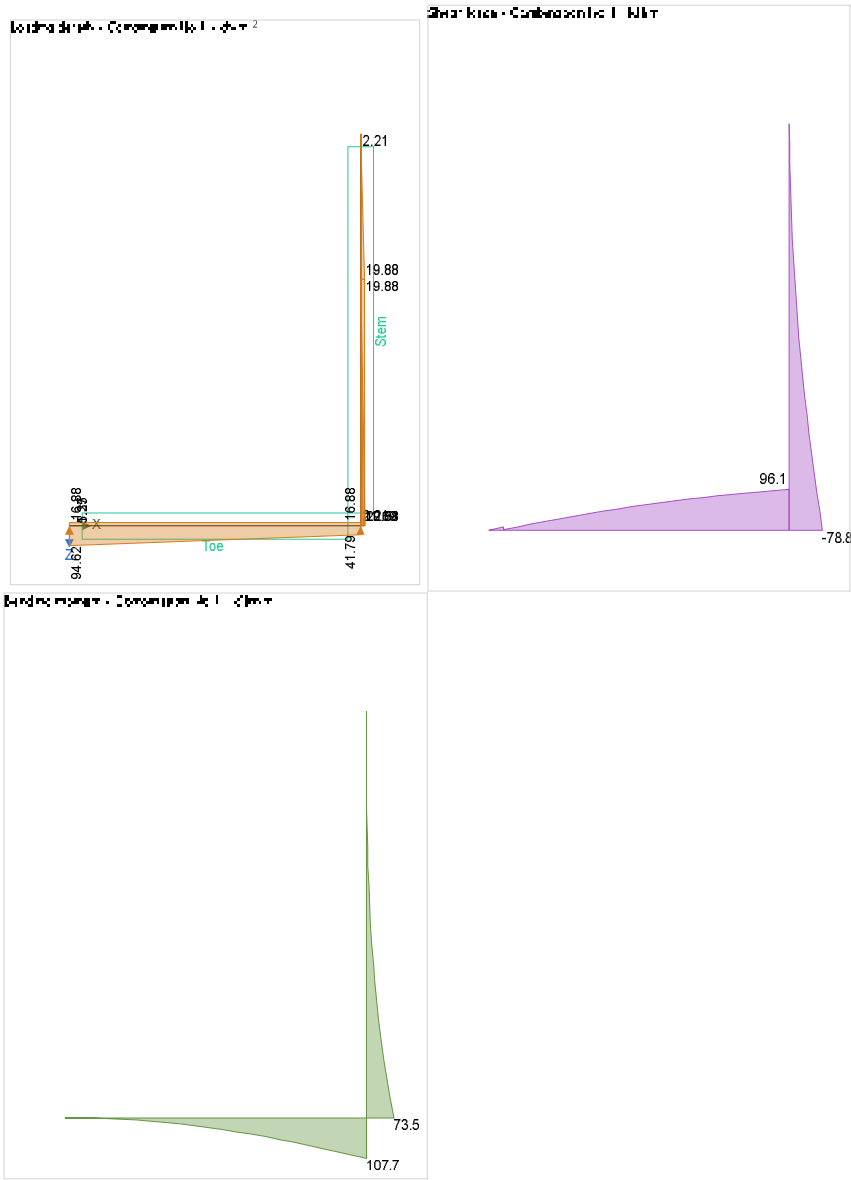
Reinforcement details

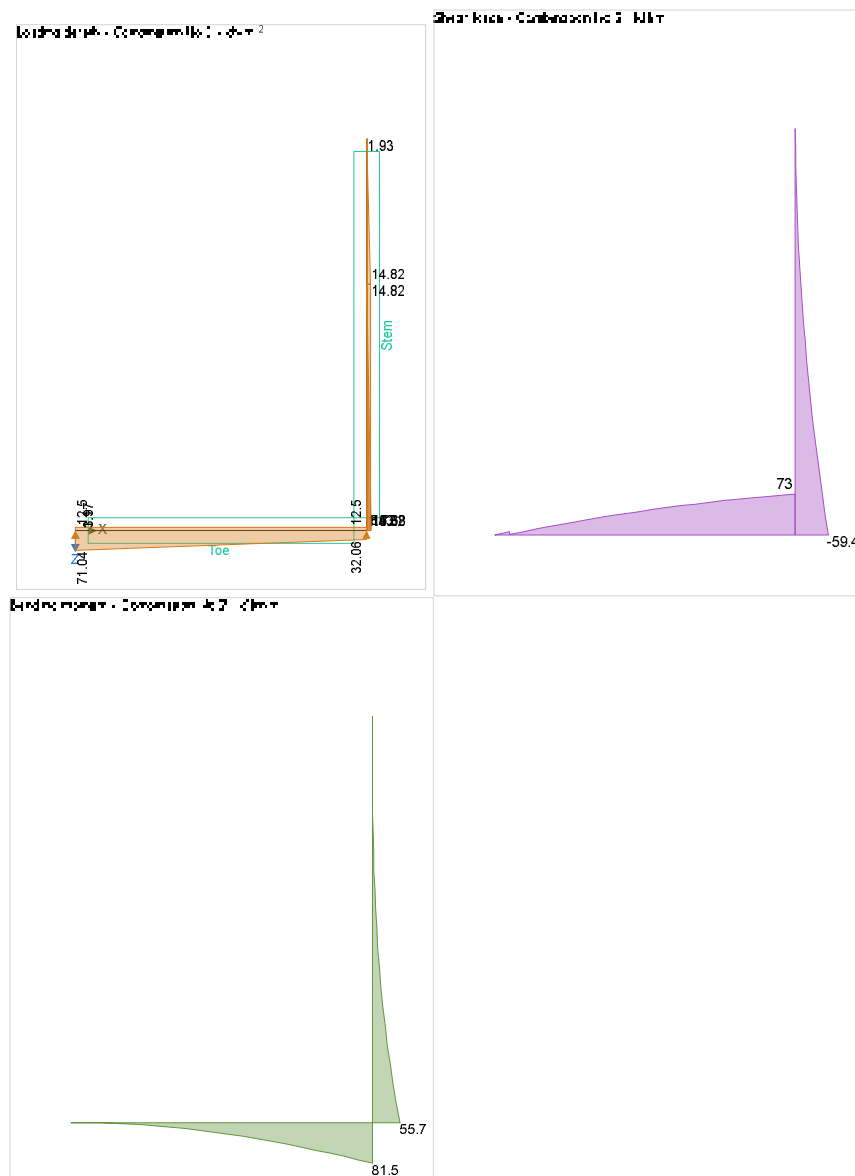
Characteristic yield strength $f_{yk} = 500 \text{ N/mm}^2$ Modulus of elasticity $E_s = 200000 \text{ N/mm}^2$

Design yield strength $f_{yd} = 435 \text{ N/mm}^2$ Partial factor $\gamma_s = 1.15$

Cover to reinforcement

Front face of stem $c_{sf} = 40 \text{ mm}$ Rear face of stem $c_{sr} = 50 \text{ mm}$
Top face of base $c_{bt} = 50 \text{ mm}$ Bottom face of base $c_{bb} = 75 \text{ mm}$





Check stem design at base of stem

Depth of section $h = 300$ mm

Rectangular section in flexure - Section 6.1

Design bending moment $M = 73.5$ kNm/m $K = 0.043$

$K' = 0.207$

$K' > K$ - No compression reinforcement is required

Tens.reinforcement required $A_{sr,req} = 741$ mm²/m

Tens.reinforcement provided 20 dia.bars @ 200 c/c

Tens.reinforcement provided

$A_{sr,prov} = 1571$ mm²/m

Min.area of reinforcement $A_{sr,min} = 361$ mm²/m

Max.area of reinforcement $A_{sr,max} = 12000$ mm²/m

PASS - Area of reinforcement provided is greater than area of reinforcement required

Library item: Rectangular single summary

Deflection control - Section 7.4

Limiting span to depth ratio 16 Actual span to depth ratio 11.3

PASS - Span to depth ratio is less than deflection control limit

Crack control - Section 7.3

Limiting crack width $w_{max} = 0.3$ mm Maximum crack width $w_k = 0.158$ mm

PASS - Maximum crack width is less than limiting crack width

Design shear force $V = 78.8$ kN/m

Rectangular section in shear - Section 6.2

Design shear force $V = 78.8$ kN/m Design shear resistance $V_{Rd,c} = 148.6$ kN/m

PASS - Design shear resistance exceeds design shear force

Horizontal reinforcement parallel to face of stem - Section 9.6



Min.area of reinforcement $A_{sx.req} = 393 \text{ mm}^2/\text{m}$ Max.spacing of reinforcement $S_{sx_max} = 400 \text{ mm}$
Trans.reinforcement provided 10 dia.bars @ 200 c/c Trans.reinforcement provided
 $A_{sx.prov} = 393 \text{ mm}^2/\text{m}$

PASS - Area of reinforcement provided is greater than area of reinforcement required

Check base design at toe

Depth of section $h = 500 \text{ mm}$

Rectangular section in flexure - Section 6.1

Design bending moment $M = 107.7 \text{ kNm/m}$ $K = 0.021$ $K' = 0.207$

$K' > K$ - No compression reinforcement is required

Tens.reinforcement required $A_{bb.req} = 628 \text{ mm}^2/\text{m}$

Tens.reinforcement provided 20 dia.bars @ 200 c/c Tens.reinforcement provided

$A_{bb.prov} = 1571 \text{ mm}^2/\text{m}$

Min.area of reinforcement $A_{bb.min} = 625 \text{ mm}^2/\text{m}$ Max.area of reinforcement $A_{bb.max} = 20000 \text{ mm}^2/\text{m}$

PASS - Area of reinforcement provided is greater than area of reinforcement required

Library item: Rectangular single summary

Crack control - Section 7.3

Limiting crack width $w_{max} = 0.3 \text{ mm}$ Maximum crack width $w_k = 0.223 \text{ mm}$

PASS - Maximum crack width is less than limiting crack width

Rectangular section in shear - Section 6.2

Design shear force $V = 96.1 \text{ kN/m}$

Rectangular section in shear - Section 6.2

Design shear force $V = 96.1 \text{ kN/m}$ Design shear resistance $V_{Rd.c} = 189.6 \text{ kN/m}$

PASS - Design shear resistance exceeds design shear force

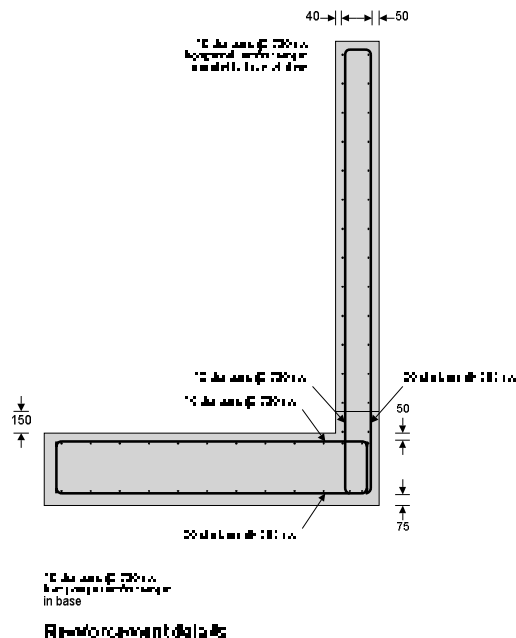
Secondary transverse reinforcement to base - Section 9.3

Min.area of reinforcement $A_{bx.req} = 314 \text{ mm}^2/\text{m}$ Max.spacing of reinforcement $S_{bx_max} = 450 \text{ mm}$

Trans.reinforcement provided 10 dia.bars @ 200 c/c Trans.reinforcement provided

$A_{bx.prov} = 393 \text{ mm}^2/\text{m}$

PASS - Area of reinforcement provided is greater than area of reinforcement required



Passes all strength and equilibrium checks for permanent case (water 1m BGL) and accidental case (water at GL) .



Water uplift check

Accidental case - water at ground level
Hence uplift force = $2.7 \times 10 = 27 \text{ kN/m}^2$

Alternatively: for heave acting independently:
Allow 50% to dissipate before construction
Uplift = $18 \times 2.7 \times 0.5 = 24.3 \text{ kN/m}^2$ (< water force, hence design for water uplift)

Net downwards load:
250mm thick RC slab: $DL = 0.25 \times 25 = 5.0 \text{ kN/m}^2$
50mm screed: $DL = 0.05 \times 24 = 1.2 \text{ kN/m}^2$
Finishes: $DL = 0.2 \text{ kN/m}^2$

Hence total downwards load: $DL = 6.4 \text{ kN/m}^2$

Net uplift = $27 - (6.4 \times 0.9) = 21.2 \text{ kN/m}^2$

Slab to span one way between slab thickenings / piles.
Span of slab = 3.15m
Slab top reinforcement to be designed to resist upwards induced UDL.
Load to be resisted at perimeter = $21.2 \times 3.15 \times 0.5 = 33.4 \text{ kN/m}$

Rear wall:
Weight of thickening: $DL = 0.5 \times 1.25 \times 25 = 15.6 \text{ kN /m}$
Hence piles to be designed to resist: $33.4 - (15.6 \times 0.9) = 19.4 \text{ kN/m uplift}$

Intermediate footings: to act as beam between tension piles and perimeter thickenings
Weight of strip footing: $DL = 0.5 \times 0.6 \times 25 = 7.5 \text{ kN/m}$
Hence uplift force = $33.4 - (7.5 \times 0.9) = 26.7 \text{ kN/m uplift}$
Beam top reinforcement to be designed to resist upwards induced UDL.
Reaction at edges: $DL = 26.7 \times 2.65 \times 0.5 = 35.4 \text{ kN uplift}$

Side walls:
Weight of thickening: $DL = 0.5 \times 1.25 \times 25 = 15.6 \text{ kN /m}$
Weight of wall: $DL = 0.25 \times 2.7 \times 25 = 16.9 \text{ kN /m}$
Plus loads above: $DL = 55.6 \text{ kN/m}$
Hence no net uplift force. Thickenings and wall sufficient.

Pad foundations:
Weight of thickening: $DL = 0.5 \times 1.8 \times 1.8 \times 25 = 40.5 \text{ kN}$
Column reaction: $DL = 75.4 \text{ kN}$

Uplift reaction from slab: $DL = 33.4 \times 1.8 = 60.1 \text{ kN}$
Uplift reaction from 2 strip thickening 'beams': $DL = 2 \times 35.4 = 70.8 \text{ kN}$

Hence net uplift force = $(60.1 + 70.8) - (0.9 \times (40.5 + 75.4)) = 26.6 \text{ kN}$
Hence each pile to be designed to resist: $26.6 / 2 = 13.3 \text{ kN uplift}$

All piles to resist tension forces created by water uplift.

All concrete top reinforcement to be designed to take induced UDL with detailed design.



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