London Borough of Camden

Hampden Close, Central Somers Town

Phase 2 Geo-environmental and Geotechnical Site Investigation

1922663-R01 (00)

RSK GEOSCIENCES

FEBRUARY 2023

RSK GENERAL NOTES

Project No.: 1922663

Title: Phase 2 Geo-Environmental and Geotechnical Site Investigation: Hampden Close, Central Somers Town, Hampden Close, London NW1 1HW

Client: London Borough of Camden

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Office: RSK Environment Limited, 18 Frogmore Road, Hemel Hempstead, Herts, HP3 9RT. Tel 01442 437500

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Author	Leanne Rule Roseanna Bloxham	**Technical reviewer**	Ben Winch Duncan Sharp
Signature		Signature	
Project manager	Leanne Rule	**Quality reviewer**	Ellie Sanders
Signature		Signature	

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1 INTRODUCTION

1.1 Commissioning

RSK Environment Limited (RSK) was commissioned by Morgan Sindall, on behalf of the London Borough of Camden ('the client'), to carry out a Phase 2 Geo-environmental and Geotechnical Site Investigation of the land at Hampden Close, Central Somers Town Hampden Close, London NW1 1HW. The project was carried out to an agreed brief as set out in RSK's proposal (Ref. T1922663, dated 27 October 2022).

RSK's service constraints are shown in Appendix A.

The site in question is being considered for development for residential use.

1.2 Objectives

The objective of the work is:

- to confirm waste disposal classification of material removed from site as part of the development works
- to provide information on the foundations of the existing community hall building
- to provide geotechnical information on the shallow soils for use in determining a safe allowable bearing pressure of a proposed retaining wall as part of the new development.

1.3 Scope of works

The scope of this assessment has been developed in accordance with relevant British Standards and authoritative technical guidance as referenced through the report. The assessment of the contamination status of the site is in line with the technical approach presented in Land Contamination Risk Management (LCRM) (Environment Agency, 2021) – which supersedes CLR11 Model Procedures for Land Contamination – and in general accordance with BS 10175: 2011 + A2 2017 (BSI, 2017). It is also compliant with relevant planning policy and guidance.

The scope of the intrusive investigation has been designed in line with the recommendations of BS5930:2015+A1:2020 Code of practice for ground investigations (BSI, 2020), which maintains compliance with BS EN 1997-1 and 1997-2 and their related standards. It has also been developed in general accordance with BS 10175: 2011 + A2 2017. Ground gas assessment has been undertaken in general accordance with BS8576: 2013 and BS 8485:2015+A1:2019.

A brief summary of relevant legislation and policy relating to land contamination is given in Appendix C.

The scope of works for the assessment has included the following:

- Design and implementation of an intrusive investigation, in situ testing, soil sampling, laboratory geo-environmental and geotechnical testing.

- Interpretation of ground conditions and geotechnical data to provide preliminary recommendations with respect to foundations and infrastructure design.
- Preliminary assessment of the potential waste classification.
- Preparation of this factual and interpretative report.

1.4 Existing reports

The following reports detailing previous works at the site were made available for review:

- Pell Frischmann, Phase 1 Geo-environmental Desk Study, R12794/G001A, May 2013
- ESG, Factual and Interpretive Report on Ground Investigation, D5061-15/2, September 2016

1.5 Limitations

This report is subject to the RSK service constraints given in Appendix A and limitations that may be described through this document.

2 SITE DETAILS

2.1 Site location

Site location details are presented in **Table 1** and a site location plan is provided on Figure 1.

Table 1 Site location details

Site name	Hampden Close, Central Somers Town
Full site address and postcode	Hampden Close, London NW1 1HW
National Grid reference (centre of site)	529818, 183234

2.2 Site description

The site boundary and current site layout are shown on Figure 2. The site is currently occupied by a disused community hall and public open space which includes a play park.

The site is roughly rectangular in shape with uneven topography and is navigated via footpaths. There is a play park located centrally, and a substantial number of trees. The site is enclosed by a metal fence, with access being gained via Purchese Street to the west or Brill Place to the south.

2.3 Surrounding land uses

The site is located in London, within a predominantly residential and amenity setting. Immediate surrounding land uses are described in **Table 2**.

Table 2 Surrounding land uses

North	North of the site is Hampden Close, residential homes, a mosque and a community centre.
East	East of the site there is Coopers Lane and Neville Close, which both host residential housing. Moving further east across Pancras Road is St Pancras International.
South	South of the site is Brill Place, and on the other side of the road is the Francis Crick Institute which is a biomedical research centre.
West	West of the site is Purchese Street, some office space, residential homes, a nursery and a community centre.

2.4 Development plans

The proposed layout of the site, at the time of preparing this report, is shown in Appendix B.

The site for the purposes of this report forms part of a larger development, for which planning permission has been granted, and plot 5 and plot 6 will occupy the site. Plot 5 will comprise 20 residential units over a replacement community hall, and Plot 6 will comprise 14 residential units.

It is understood that there will be no private gardens, but there will be communal soft landscaping around the site. No information is currently known regarding planned service routes.

Planning application numbers 2015/2704/P and 2022/3485/P are active planning applications pertaining to the site, according to the Camden Council planning portal.

2.5 Summary of previous investigations

Report Details	1. **Phase 1 Geo-environmental desk study, Pell Frischmann, May 2013**
Site coverage	The Phase 1 desk study undertaken by Pell Frischmann included another parcel of land to the northwest of the site, as well as the site area under investigation in this Phase 2 report.
Summary scope of works	Phase 1 desk-based assessment
Does the client have reliance upon the report?	Yes

Key factual findings	The Phase 1 desk study identified the following potentially complete contaminant linkages: • Moderate risk - Inorganic contaminants being present across the site associated with uncontrolled made ground which itself is associated with the previous site development • High risk - Organic contaminants being present in the north-east of the site associated with the historic use as a coal depot • High risk- Asbestos associated with any uncontrolled made ground or possibility of use within the building fabric of the existing buildings on site. In addition, the desk study identified the following geotechnical hazards: • Uncontrolled made ground • Attack on buried concrete by aggressive ground conditions • Shrink/swell of clay • Low strength, compressible natural ground • Unexploded ordnance/bomb strikes • Regents Canal which is present within a culvert beneath the northern part of the site • Underground obstructions • Potential for tunnels to be close to the surface (tube tunnels, storm drainage)
Report Details	**2. Factual and Interpretive Report on Ground Investigation, ESG, September 2016**
Site coverage	The site investigation and subsequent report by ESG included the parcel of land to the northwest of the site, as well as the site area under investigation in this Phase 2 report.
Summary scope of works	• 11 cable percussive boreholes to a maximum depth of 30.30 mbgl. • 2 hand-dug trial pits to a maximum depth of 1.20 mbgl. • 2 machine-dug trial pits to a maximum depth of 2.20 mbgl. • 46 window sampler boreholes to a maximum depth of 7.65 mbgl.
Does the client have reliance upon the report?	Yes
Key factual findings	• Exceedances of lead, benzo(a)anthracene, benzo(a)pyrene, dibenzo(a,h)anthracene and TPH >C21-C35. • Detection of asbestos fibres in soil, albeit below the hazardous concentration thresholds.

	• An indicative waste classification classified the soils as non-hazardous in most cases, and as hazardous in a single sample in the north-western parcel (due to TPH concentrations). • Remedial action will be required in areas of proposed soft landscaping. • After six rounds of gas monitoring, the site was classified as Characteristic Situation 1 (CS1).

3 SITE INVESTIGATION STRATEGY & METHODOLOGY

3.1 Introduction

RSK carried out intrusive investigation works and subsequent monitoring of boreholes between 7 December 2022 and 9 December 2022.

3.2 Objectives

The specific objectives of the investigation were:

- to establish the ground conditions underlying the site including the extent and thickness of any made ground
- to establish the waste classification of any made ground
- to assess geotechnical properties of soils.

3.3 Selection of investigation methods

The techniques adopted for the investigation were chosen with consideration of the objectives and site constraints, which are described below.

Window sampling was chosen based on the targeted drill depth and the opportunity to collect disturbed samples. Hand-dug pits were chosen based on the requirement for samples of made ground, and the necessity to expose the foundations of the community hall.

Prior to conducting intrusive works, utility service plans were obtained and buried service clearance undertaken in line with RSK's health and safety procedures. Copies of statutory service records obtained by RSK as part of the agreed scope of works are contained in Appendix D.

3.4 Investigation strategy

The ground investigation was carried out using intrusive ground investigation techniques in general accordance with the recommendations of BS5930:2015+A1:2020, which maintains compliance with BS EN 1997-1 and 1997-2 and their related standards. Whilst every attempt was made to record full details of the strata encountered in the boreholes, techniques of hole formation and sampling will inevitably lead to disturbance, mixing or loss of material in some soils and rocks.

The investigation strategy involved targeted and hand-dug pits. The investigation comprised an exploratory investigation, focussing on the areas that are the footprints for the future residential buildings, and the proposed location of the future retaining wall.

The constraints to the investigation were:

- underground services
- concrete obstruction within one of the boreholes (WS2)

- uneven topography which comprised small hills of a steep gradient.

Details of the investigation locations, installations and rationale are presented in **Table 3**. Two window sample boreholes were progressed to a maximum depth of 5.45 meters below ground level (mbgl) before being backfilled with arisings, and eight hand-dug trial pits were progressed to a maximum depth of 1.32 mbgl before being backfilled with arisings.

WS1 and WS3 were abandoned due to a combination of steep slopes and the presence of services.

An exploratory hole location plan Is shown on Figure 3.

Table 3 Exploratory hole and monitoring well location rationale

Investigation type	Number	Designation	Monitoring well installation	Rationale
Boreholes by window sampling methods	2	WS2 and WS4	N/A	To determine the depth to the London Clay, and to obtain disturbed samples and geotechnical data.
Trial-pits excavated by hand	5	HP1 to HP5	N/A	To accurately log the upper strata in targeted locations beneath the site, principally beneath the future building footprints. To collect samples from the shallow made ground soils for waste classification purposes.
Foundation inspection pits excavated by hand	3	FP1a, FP1b and FP2	N/A	To expose the foundations of the existing community hall in order to determine foundation depth and dimensions. To accurately log the upper strata and to collect samples from the shallow Made Ground soils.

3.4.1 Implementation of investigation works

The exploratory holes were logged by an engineer in general accordance with the recommendations of BS5930:2015+A1:2020 (which incorporates the requirements of BS EN ISO 14688-1, 14688-2 and 14689-1).

The soil sampling and analysis strategy was designed to characterise each encountered soil strata, permit an assessment of potential contaminant linkages and investigate the geotechnical characteristics. In addition, samples were taken to allow for geo-environmental and geotechnical testing to be undertaken.

Soils collected for laboratory analysis were placed in a variety of containers appropriate to the anticipated testing suite required. They were dispatched to the laboratory in cool boxes under chain of custody documentation. Samples were stored in accordance with

the RSK quality procedures to maintain sample integrity and preservation and to minimise the chance of cross contamination.

Selected samples were placed in polythene bags for headspace screening with a photo-ionisation detector (PID) fitted with a 10.6 eV bulb. The PID screening results are presented on the exploratory hole records.

3.5 Laboratory testing

Laboratory testing was undertaken at a UKAS accredited laboratory with ISO17025 and MCERTS accredited test methods were specified where applicable for contamination testing and as shown in the laboratory test certificates appended.

3.5.1 Chemical analysis of soil samples

The soil sampling strategy was designed to characterise made ground and/or natural strata typically within the upper 1.0 m of the ground profile whilst also characterising deeper strata and the potential for contaminant migration.

The programme of chemical tests undertaken on soil samples obtained from the intrusive investigation is presented in **Table 4** with the laboratory testing results contained in Appendix I.

Table 4 Summary of chemical testing of soil samples

Stratum	Tests undertaken	No. of tests
Made Ground	Hazardous Waste Suite (pH, metals 9, hex Cr, TPH with I.D. PAH 17, moisture content and Asbestos screen)	5
	WAC-E (WAC inert, SNRHW + hazardous landfills)	5

3.5.2 Geotechnical analysis of soils

Where appropriate disturbed, bulk and undisturbed soil samples were taken for geotechnical classification testing with the depth and nature of samples detailed within the exploratory hole records.

Where appropriate, testing was undertaken in accordance with BS 1377:1990 Method of Tests for Soils for Civil Engineering Purposes or, where superseded, by the relevant part of BS EN ISO 17892:2014 Geotechnical investigation and testing–- Laboratory Testing of Soil. Tests carried out in order to classify the concrete class required on-site have been undertaken following the procedures within BRE SD1:2005.

The program of geotechnical tests undertaken on samples obtained from the intrusive investigation is presented in **Table 5**. The results and UKAS accreditation of tests methods are shown in Appendix J.

Table 5 Summary of geotechnical testing undertaken

Strata	Tests undertaken	No. of tests
London Clay	Natural Water Content %	5
	Liquid/ plastic limits	5
	BRE Suite (Brownfield Pyritic)	3

4 SITE INVESTIGATION FACTUAL FINDINGS

The results of the intrusive investigation and subsequent geo-environmental and geotechnical laboratory analysis undertaken are detailed below.

4.1 Ground conditions encountered

The descriptions of the strata encountered, notes regarding visual or olfactory evidence of contamination, list of samples taken, field observations of soil and groundwater, in-situ testing and details of monitoring well installations are included on the exploratory hole records presented in Appendix G.

The exploratory holes revealed that the site is underlain by a variable thickness of made ground over the London Clay Formation, which confirms the anticipated stratigraphical succession.

For the purpose of discussion, the ground conditions encountered during the fieldworks are summarised in **Table 6** with the strata discussed in subsequent subsections.

Table 6 General succession of strata encountered

Stratum	Exploratory holes encountered	Depth to top of stratum m bgl	Proven thickness (m)
Made ground	All exploratory holes	0.00	0.60 to >2.10
London Clay Formation	HP1, HP4 and WS4	0.60 to >2.10	Thickness not proven. London Clay Formation encountered to the full depth of the investigation in HP1, HP4 and WS4.

4.1.1 Made ground

The made ground generally comprised either a brown gravelly sand or a gravelly slightly sandy clay with a significant proportion of anthropogenic material, primarily fragments and cobbles of red brick but also frequent concrete, and occasional ceramic and asphalt.

A summary of the in-situ and laboratory test results recorded in the stratum are presented in **Table 7**.

Table 7 Summary of in-situ and laboratory test results for made ground

Soil parameters	Min. Value	Max. Value	Reference
SPT 'N' values	6		Appendix G
Undrained shear strength measured by shear vane testing (kN/m^2)	68		Appendix G

Soil parameters	Min. Value	Max. Value	Reference
Undrained shear strength inferred from SPT 'N' values (kN/m^2)*	34.2		-
Consistency term from field description	soft		Appendix G
Notes: *derived using a Stroud Factor of 5.7.			

4.1.2 London Clay Formation

This stratum was encountered from beneath the made ground and comprised a layer of stiff to very stiff brownish grey and light grey mottled clay.

A summary of the in-situ and laboratory test results recorded in the stratum are presented in **Table 8**.

Table 8 Summary of in-situ and laboratory test results for London Clay Formation

Soil parameters	Min. Value	Max. Value	Reference
Moisture content (%)	23.7	32.1	Appendix J
Modified moisture content (%)	23.7	32.1	Appendix J
Liquid limit (%)	68	79	Appendix J
Plasticity limit (%)	24	28	Appendix J
Plasticity index (%)	40	52	Appendix J
Modified plasticity index (%)	40	52	Appendix J
Plasticity term	High	Very high	Appendix J
Volume change potential	High		Appendix J
SPT 'N' values	13	25	Appendix G
Undrained shear strength inferred from SPT 'N' values (kN/m^2)*	74.1	142.5	-
Undrained shear strength measured by shear vane testing (kN/m^2)	82	<130	Appendix G
Consistency term from field description	Stiff	Very stiff	Appendix G
Strength term	High		-
Notes: *derived using a Stroud Factor of 5.7.			

4.1.3 Visual/olfactory evidence of soil contamination

Other than the high quantity of anthropogenic material within the made ground, there was no visual or olfactory evidence of contamination within made ground deposits and underlying natural strata.

No visual evidence of asbestos was encountered.

Table 9 PID Results

Location & Depth	PID Result (ppm)	Location & Depth	PID Result (ppm)
FP1a ES1, 0.30 – 0.40	0.00	HP2 ES1, 0.20 – 0.30	0.1
FP1b ES1, 0.00 - 0.20	0.2	HP2 ES2, 0.50 – 0.60	0.4
FP2 ES1, 0.20 – 0.40	0.0	HP3 ES1, 0.40 – 0.50	0.1
HP1 ES1, 0.00 – 0.10	0.8	HP3 ES2, 1.00 – 1.20	0.00
HP1 ES2, 0.20 – 0.30	0.2	HP4 ES1, 0.10 – 0.30	0.1
HP5 ES1, 0.00 – 0.20	0.2	HP5 ES3, 0.50 – 0.60	0.1
HP5 ES2, 0.30 – 0.50	0.1	HP5 ES4, 0.90 – 1.10	0.1

4.2 Groundwater and surface water

4.2.1 Groundwater encountered during intrusive works

Groundwater was encountered in one exploratory location during the intrusive investigation works as detailed on the logs in Appendix G. This is thought to be perched water, as the site is located on unproductive strata.

A programme of long-term monitoring would be required to establish the full range of groundwater conditions, including any seasonal variations.

4.3 Existing foundations

Three foundation inspection pits (FP1A, FP1B and FP2) were excavated against the western and southern elevations of the community building to provide information on the existing foundations.

The trial pits identified concrete footings extending to depths of between 0.65m and 1.32m below ground level, bearing within cohesive made ground. FP1b (excavated on the boundary of the building and garden wall) encountered mass concrete overspill that could not be penetrated.

Foundation drawings are included as Appendix H.

4.4 Chemical laboratory results

The soil testing results are presented in Appendix I.

No asbestos was detected in soil screening.

4.5 Geotechnical laboratory results

The results of the geotechnical testing are discussed in Section 6 and presented in Appendix J.

5 PRELIMINARY WASTE ASSESSMENT

In accordance with the definition provided in the Waste Framework Directive (WFD), materials are only considered waste if 'they are discarded, intended to be discarded or required to be discarded, by the holder'. Naturally occurring soils are not considered waste if reused on the site of origin for the purposes of development. Soils such as made ground that are not of clean and natural origin (irrespective of whether they are contaminated or not) and other materials such as recycled aggregate, do not become waste until the criteria above are met. Further background information is provided in Appendix F.

Excavation arisings from the development may therefore be classified as waste if surplus to requirements or unsuitable for reuse. The following assessments assume the material tested is classified subsequently as waste.

5.1 Hazardous waste assessment

Appendix D of Technical Guidance WM3 (EA, 2021) sets out requirements for waste sampling. It is a legal requirement to correctly assess and classify waste. The level of sampling should be proportionate to the volume of waste and its heterogeneity. The preliminary assessment provided below is based only upon the available sample results and may not be sufficient to adequately classify the waste.

5.1.1 Chemical contaminants

Envirolab, an RSK company, has developed a waste soils characterisation assessment tool (HASWASTE), which follows the guidance within Technical Guidance WM3. The analytical results have been assessed using this tool to assess the hazardous properties to support potential off-site disposal of materials in the future. Note that it is ultimately for landfills to confirm what wastes they are able to accept within the constraints of their permit.

No samples were found to have hazardous properties based on this assessment, Appendix L. This suggests that if applicable the waste would require disposal at a suitably permitted inert or non-hazardous waste landfill.

5.1.2 Asbestos within waste soils

Technical Guidance WM3 requires that within a mixed waste the separately identifiable wastes be assessed separately.

For instance, where waste soil contains identifiable pieces of asbestos (visible to the naked eye) the asbestos should, where feasible, be separated from the soil and classified separately. This should be disposed of within a hazardous, stable non-reactive hazardous waste landfill or a special cell in a non-hazardous waste landfill.

5No. samples were collected from site and analysed for the presence of asbestos, the results of which are presented in Appendix L. Analysis confirmed that asbestos is not present within samples HP1 ES2, HP2 ES2, HP3 ES2, HP4 ES1 or HP5 ES2. Visible asbestos containing material was not identified on-site.

5.2 WAC assessment

Samples HP1 ES2, HP2 ES2, HP3 ES2, HP4 ES1, HP5 ES2 were submitted for waste acceptance criteria (WAC) testing, the results of which are presented in Appendix L.

HP1 ES2 shows Total Organic Carbon (TOC) at 3.27%, which exceeds the inert maximum threshold of 3%. HP3 ES2 shows a concentration of 10.0mg/kg of fluoride leachate, which is at the threshold limit for inert waste and is therefore unlikely to be accepted into an inert landfill. Both HP4 ES1 and HP5 ES2 show an exceedance of lead leachate.

On the whole, the results of the WAC testing indicate that the leaching limit values and total content of organic parameters for inert waste have been exceeded and therefore the waste is not suitable for disposal within an inert landfill but should be disposed of at a landfill or treatment facility which is permitted to take non-hazardous waste. Whilst one of the samples was found to pass the inert threshold, the made ground is considered variable in nature and it is not possible to zone this to any particular area.

It should also be noted that across the remainder of the site, previous investigation encountered asbestos fibres in 3No locations, albeit below the hazardous threshold of 0.1%. This also suggests that the made ground material would be suitable for disposal as a non-hazardous waste. It is recommended that this report and the laboratory results (including from previous investigations) be provided to the receiving landfill.

RSK also recommends that a Sampling Plan be prepared to support any waste classifications and hazardous waste assessments, prior to any material being excavated. Given the level of data obtained, scale of the development and heterogeneity of the site soils, the following assessment should be considered indicative and further assessment should be undertaken following the preparation of a waste sampling plan.

6 GEOTECHNICAL ASSESSMENT

6.1 Proposed development

It is understood that the proposed development is to involve the construction of two residential apartment blocks, for which foundation parameters have already been provided (report ref: D5061-15/2, dated September 2016), with an associated retaining wall along the western boundary.

6.2 Design class

BS EN 1997-1 defines three different Geotechnical Categories that structures may fall into, which are summarised as follows:

- Category 1: Small and relatively simple structures for which it is possible to ensure that the fundamental requirements will be satisfied on the basis of experience and qualitative geotechnical investigations; with negligible risk
- Category 2: Conventional types of structure and foundation with no exceptional risk or difficult ground or loading conditions
- Category 3: Structures or part of structures, which fall outside limits of Geotechnical Categories 1 and 2. Examples include very large or unusual structures; structures involving abnormal risks, or unusual or exceptionally difficult ground or loading conditions; structures in highly seismic areas; structures in areas of probable site instability or persistent ground movements that require separate investigation or special measures.

Based on the information provided above on the proposed development and in view of the anticipated ground conditions, a Geotechnical Category 2 has been assumed for the purposes of designing the geotechnical investigation. This should be reviewed at all stages of the investigation and revised where necessary.

6.3 Preliminary geotechnical hazards assessment

The key risks identified from the available ground investigation data are discussed below:

- Variable / locally significant depths of made ground
- Oversteepening of slopes during redevelopment
- Shrinkable clay soils of high-volume potential
- Silt-rich soils susceptible to rapid loss of strength on wetting
- Sand lenses within the London Clay Formation
- Existing tunnels and structures
- Potential for remnant substructures, utilities and obstructions
- adverse ground chemistry due to elevated sulphates in the London Clay

6.4 Ground model and characteristic values for spread foundations

Two window samples were completed during the current investigation and encountered similar conditions to those presented in the previous report (D5061). The ground conditions beneath the line of the proposed retaining wall is represented in the previous report by BH8 and BH9 and the new information by WS4. Made ground was encountered between 0.6 m and 2.7 m in these locations and was predominantly granular in nature, in WS4 comprised of brown slightly gravelly silty fine to medium SAND. 2.7 m thickness has been taken as the worst-case thickness for calculation purposes. Notwithstanding the above, cohesive made ground was encountered within WS4 and within the made ground soils encountered during previous investigations conducted across wider areas of the site.

The London Clay Formation was encountered to sub crop beneath the made ground to depths ranging between 19.30m (-0.79mAOD) and 19.60m (-0.83mAOD) in boreholes BH8 and BH9, respectively. The stratum was generally encountered as grey silty clay; however, bands and intrusions of fine orange sand and silt were noted throughout it depth. It's likely these bands are the cause of the multiple water strikes encountered within the previous investigation.

Soils of the Lambeth Group were encountered beneath the London Clay in boreholes BH8 and BH9 and extended beyond the terminal depth of the investigations (25m below existing ground level).

The preliminary ground model summarised in **Table 10** has been adopted for the bearing capacity recommendations.

Table 10 Preliminary ground model from WS4, BH8 and BH9

Stratum	Depth at top of stratum	Range in thickness (m)
Made ground	0.00	0.60 to 2.70
London Clay Formation	0.60 to 2.70	16.90 to 19.30
*not encountered during this investigation, minimum value taken as worst case from previous report (D5061)		

Groundwater was not encountered during this investigation, however, from previous investigations it was identified that perched water was present within the made ground at around 2.10 m depth.

The geotechnical design parameters presented in **Table 11** are based on the results of previous and current fieldwork, in-situ and laboratory testing, and reflect RSK's understanding of the proposed construction at the time this report was written. The designer should assess the applicability of the characteristic values provided below for the design situation under consideration and to ensure that it is a cautious estimate of the value affecting the occurrence of relevant limit state(s).

Table 11 Summary of characteristic geotechnical design parameters for shallow foundations

Design parameter	Stratum
	London Clay Formation
Unit weight - $\gamma_{,k}$ (kN/m^3)	20
Undrained shear strength – c_u, (kN/m^2) – (For assessment of shallow bases only)	50[2]
Undrained shear strength – c_u, (kN/m^2) where z is the depth below 2.7 m.	50 + 5.5z^2
[1]Assumed empirical values in the absence of testing [2]Calulated using data taken from the previous report	

6.5 Ultimate limit state bearing resistance

6.5.1 Analysis method

An assessment of ULS bearing resistance of the London Clay beneath the spread foundations to the proposed retaining wall has been undertaken in accordance with BS EN 1997-1:2004 to determine a design ULS gross bearing resistance value using Design Approach 1 Combination 1 (DA1-1) and Design Approach 1 Combination 2 (DA1-2) partial factors.

BS EN 1997-1:2004 principle 2.4.7.3.4.2 requires the following sets of partial factors to be applied to actions (A), materials (M) and resistance (R) for spread foundations:

- DA1-1: A1 + M1 + R1.
- DA1-2: A2 + M2 + R1.

Partial factor A1 has been applied for DA1-1 and partial factor A2 has been applied for DA1-2, as given in **Table 12**.

Partial factors M1 and R1 have been applied for DA1-1 and partial factors M2 and R1 have been applied for DA1-2, as given in **Table 13**.

Table 12 BS EN 1997-1 action partial factors

Parameter	Symbol	A1	A2
Permanent unfavourable action	γG	1.35	1.00
Permanent favourable action	γGf	1.00	1.00
Variable unfavourable action	γQ	1.50	1.30
Variable favourable action	γQf	0.00	0.00

Table 13 BS EN 1997-1 material and resistance partial factors

Parameter	Symbol	M1	M2	R1
Coefficient of shearing resistance (tanφ)	γ_φ	1.00	1.25	1.00

Effective cohesion (c´)	$\gamma_{c'}$	1.00	1.25	1.00
Undrained strength (c_u)	γ_{cu}	1.00	1.40	1.00
Weight density (γ)	γ_{γ}	1.00	1.00	1.00

6.5.2 Analysis results

The Eurocode 7 assessment (BS EN 1997-1) considers Design Approach 1 – Combination 1 (DA1-C1) and Combination 2 (DA1-C2) partial factors and the results are summarised in **Table 14**. Analysis has been completed assuming bearing on the London Clay Formation, for a strip foundation of 10 m in length.

Table 14 Comparison of ULS Design Resistance and Design Pressures

Estimated Foundation Dimensions (m)			ULS Design Resistance		Net Ultimate Bearing Capacity (kN/m^2)	
Width	Length	Depth	C1	C2	C1	C2
0.5	10	2.1	314	260	239	185
0.75	10	2.1	315	261	240	186
1	10	2.1	316	262	241	187
1.5	10	2.1	319	265	243	189
2	10	2.1	321	267	245	191

Serviceability limit state analysis (SLS) analysis has been carried out to estimate the limiting bearing pressure based 25 mm and 40 mm settlement beneath the proposed retaining structures. It remains the designer's responsibility to determine the serviceability limits of the proposed structure.

Table 15 Comparison of SLS Limiting Bearing Pressures

Foundation Width (m)	SLS - Assuming 25mm Settlement (kN/m^2)	SLS - Assuming 40mm Settlement (kN/m^2)
0.50	102	163
0.75	74	119
1.00	60	96
1.50	44	71
2.00	36	58

All foundation excavations should be inspected, and any made ground and soft, organic or otherwise unsuitable materials removed and replaced with mass concrete.

The London Clay formation is relatively silt rich, hence susceptible to rapid softening once exposed, hence all foundation excavations should immediately be blinded with concrete, or the full foundation constructed.

6.6 Characteristic soil parameters for retaining walls

It is understood that a cantilever retaining wall is proposed to facilitate the construction of residential properties on plots 5 and 6. It should be noted that limited information was collected during the investigation and further investigation may be required.

On the basis of the ground investigation information to date, the soil parameters in **Table 16** may be used for preliminary design purposes.

Table 16 Retaining wall design parameters

Soil Type	Unit weight (kN/m^3)	Short Term Parameters		Long Term Parameters	
		$c_{u,k}$ (kN/m^2)	$\phi_{cv,k}$ (°)	$c'_{,k}$ (kN/m^2)	$\phi'_{cv,k}$ (°)
Made Ground - Granular	18.0	-	28[3]	0	28[3]
Made Ground - Cohesive	19.0	34	-	0	19[3]
London Clay	20.0	50	-	0	22[2]

[1]Assumed from soil descriptions, published literature and/or previous experience

[2]Estimated using Table 2 for fine soils from BS 8002:2015 using laboratory testing

[3]Assumed from SPT 'N' value using Terzhagi and Peck (1967)

The groundwater data from the previous investigation (D5061) indicates the presence of perched groundwater within the made ground, therefore allowance should be made for hydrostatic pressures acting behind retaining structures. The design groundwater level should take account for any potential future rise in groundwater levels and accidental events, such as a burst water main.

In order to prevent damage to adjacent road infrastructure, the design of the retaining wall must address the risk of excessive deformation of the wall. Bracing may be required to ensure that horizontal and vertical soil movement remain within acceptable levels.

6.7 Chemical attack on buried concrete

This assessment of the potential for chemical attack on buried concrete at the site is based on BRE Special Digest 1: Concrete in aggressive ground, which represents the most up-to-date guidance on this topic currently available in the UK.

The desk study and site reconnaissance indicate that, for the purposes of assessing the aggressive chemical environment of the site, the site should be considered as comprising natural ground likely to contain pyrite.

Based on testing results, **Table 17** gives the characteristic pH, water-soluble and total sulphate content values for soils from each of the geological units and groundwater encountered on-site.

Table 17 Characteristic pH, water soluble sulphate and total sulphate values

Stratum	pH	Water Soluble Sulphate (mg/l)	Total Potential Sulphate (%)
London Clay	8.1	1000 to 1400	0.57 to 9.6

Based on the results above and following the steps outlined in the BRE guidance, the Design Sulphate Classes and Aggressive Chemical Environment for Concrete classifications are summarised in **Table 18**, on the basis of water-soluble sulphate and total potential sulphate, respectively.

Table 18 Concrete design class

Stratum	Ground water	Water Soluble Sulphate		Total Potential Sulphate	
		DS Class	AC Class	DS Class	AC Class
London Clay Formation	Mobile	DS-2	AC-2	DS-4	AC-4s

Should disturbed ground be limited to prevent oxidation the recommended ACEC Classification is AC-2 with a Design Sulphate Class of DS-2.

However, if the proposals include the reuse of the pyritic London Clay Formation, i.e., cutting and filling, or excavation and backfill, the recommended ACEC Classification will increase to AC-4s with a Design Sulphate Class of DS-4.

6.8 Assessment of Desiccation

As assessment of the extent of desiccation has been made based on a comparison of, measured moisture contents with Driscoll's Criteria and modified moisture content with NHBC guidance.

The comparison of natural moisture contents against those using Driscoll's criteria, based on soil index properties, infers desiccation throughout the London Clay soils in WS4.

The modified moisture content values indicate that foundations should be designed for shrinkable soils of a high-volume change potential (i.e., greater than 40%) below any signs of desiccation. Designs should take into account normal precautions, including minimum founding depths to minimise the risk of future foundation movements in accordance with NHBC standards or similar.

7 CONCLUSIONS AND RECOMMENDATIONS

7.1 Preliminary Waste Assessment

Based on the results of the soil chemical analysis, it is considered that the shallow made ground likely to be excavated as part of development works will be suitable for disposal at a landfill or treatment facility which is permitted to take non-hazardous waste. It is noted that asbestos fibres were recorded in previous investigations (below hazardous concentrations), although these were located outside the area of development in the southern part of the parcel.

7.2 Geotechnical assessment

The key findings of the initial geotechnical assessment are as follows:

- Foundations could be designed on the London Clay Formation; it remains the designer's responsibility to determine the serviceability limits of the proposed structure.
- If new concrete is poured in contact with the existing ground, then a design sulphate class of DS-2 and ACEC classification of AC-2 is recommended.

7.3 Recommendations

The geotechnical element of works was heavily constrained as steep topography and the presence of services at the base of the slopes meant that two of the proposed borehole locations could not be carried out. In addition, the presence of a concrete obstruction within WS2 resulted in premature refusal.

Due to the limited information provided by the remaining boreholes, there remains some uncertainty with respect to the depth of the made ground / London Clay interface along the route of the proposed retaining wall. It is recommended that additional shallow boreholes utilising hand-held equipment may be able to advance boreholes on the slope itself and provide further information on ground conditions.

A watching brief should be maintained throughout development works and should any visible asbestos contamination be encountered; works should cease immediately pending advice from a suitably experienced environmental consultant. Any impacted material would be required to be stockpiled separately pending further assessment and classification.

It is recommended that a copy of this report and all chemical results be forwarded on to the receiving landfill for their comment and approval.

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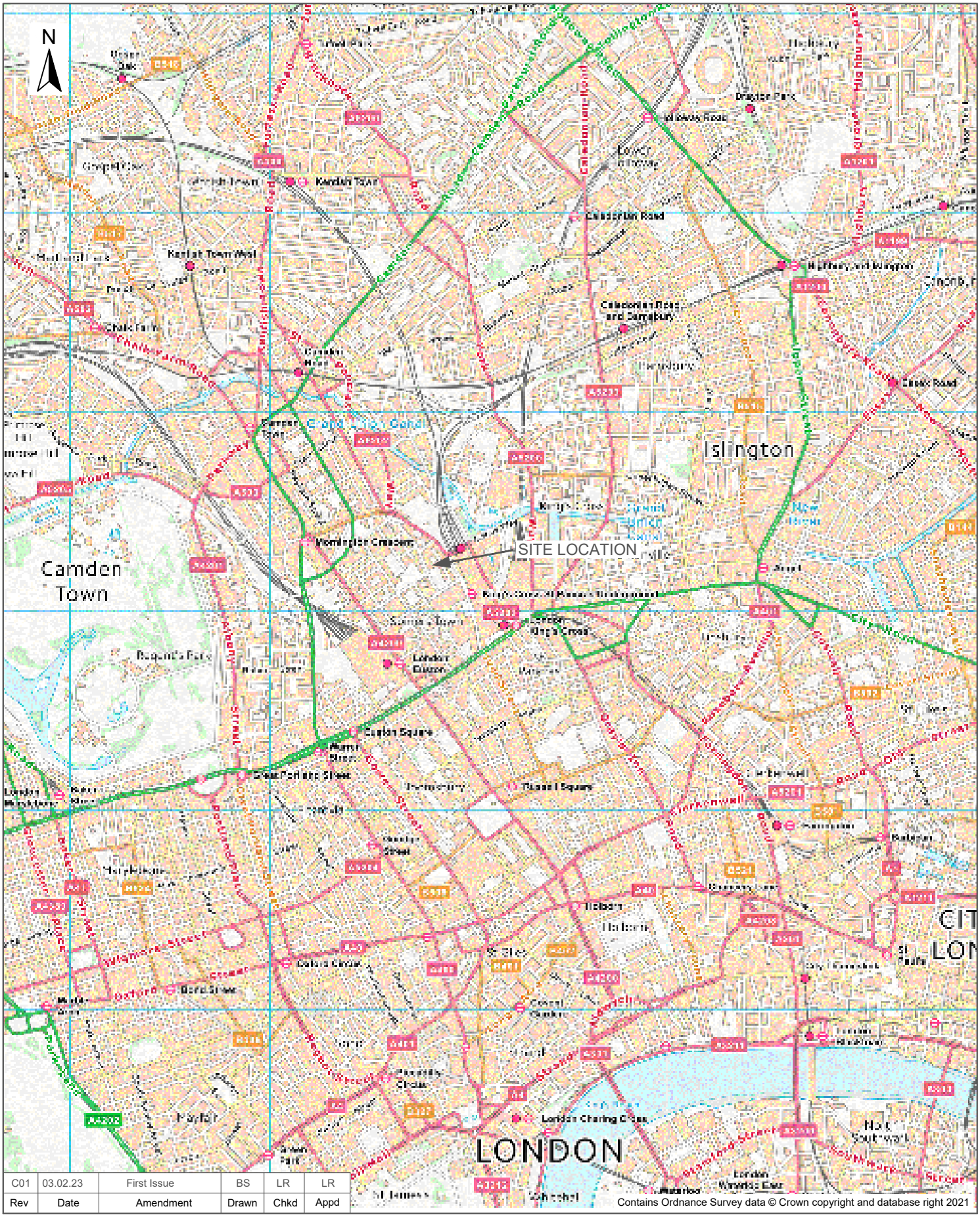
FIGURES

FIGURE 1 SITE LOCATION PLAN



Rev	Date	Amendment	Drawn	Chkd	Appd
C01	03.02.23	First Issue	BS	LR	LR

RSK GEOSCIENCES
18 Frogmore Road
Hemel Hempstead
Hertfordshire
HP3 9RT
Tel: +44(0)1442 437500
Email: info@rsk.co.uk
Web: www.rsk.co.uk

Client: Camden London Borough Council

Project Name: Central Somers Town

Description: Site Location Plan

Dimension	Size	Scale	Geolocation	Project ID	Drawing no.	Rev	File name
m	A4	1:25,000	529818,183234	1922663	11101	C01	1922663-HH-111-SS-D-C-11101-C01

FIGURE 2 SITE LAYOUT PLAN

LEGEND

Site boundary

Rev	Date	Amendment	Drawn	Chkd	Appd
C01	03.02.23	First Issue	BS	LR	LR

RSK GEOSCIENCES
18 Frogmore Road
Hemel Hempstead
Hertfordshire
HP3 9RT
Tel: +44(0)1442 437500
Email: info@rsk.co.uk
Web: www.rsk.co.uk

Client
Camden London Borough Council

Project Name
Central Somers Town

Description
Site Layout Plan

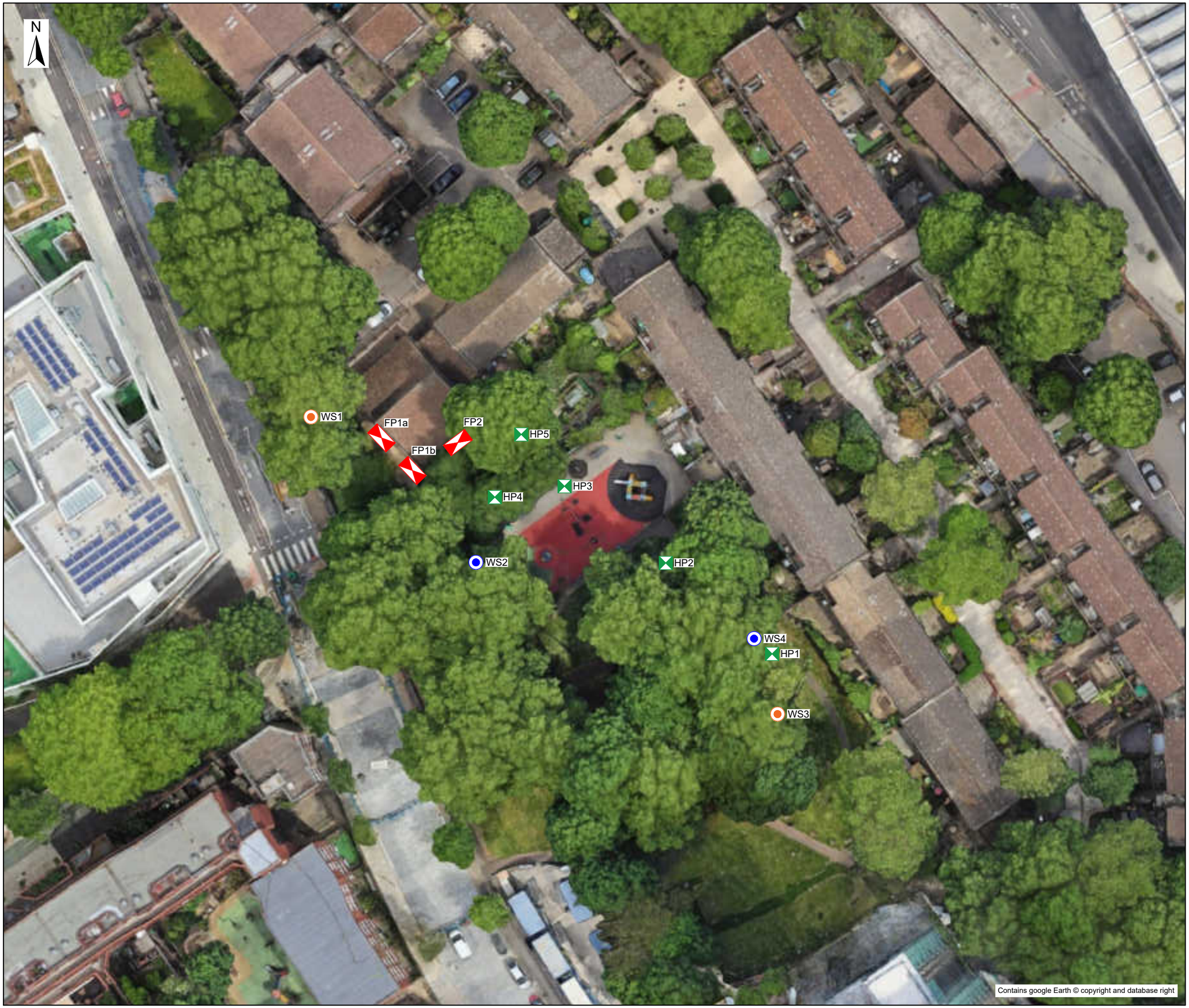
Project ID	Drawing no.	Revision
1922663	11201	C01

File name
1922663-HH-112-SS-D-C-11201-C01

Dimensions	Scale	Size
m	1:500	A3

0 5 10 15 20 25m

FIGURE 3 EXPLORATORY HOLE LOCATION PLAN



LEGEND

- Hand Pit Location
- Foundation Inspection Pit Location
- Unfeasible Window Sample Location
- Window Sample Location

Rev	Date	Amendment	Drawn	Chkd	Appd
C01	03.02.23	First Issue	AE	LR	LR

RSK GEOSCIENCES
18 Frogmore Road
Hemel Hempstead
Hertfordshire
HP3 9RT
Tel: +44(0)1442 437500
Email: info@rsk.co.uk
Web: www.rsk.co.uk

Client
Camden London Borough Council

Project Name
Central Somers Town

Description
Exploratory Hole Location Plan

Project ID	Drawing no.	Revision
1922663	22201	C01

File name
1922663-HH-222-SS-D-C-22201-C01

Dimensions	Scale	Size
m	1:500	A3

0 5 10 15 20 25m

APPENDICES

APPENDIX A
SERVICE CONSTRAINTS

1. This report and the site investigation carried out in connection with the report (together the "Services") were compiled and carried out by RSK Environment Limited (RSK) for London Borough of Camden (the "Client") in accordance with the terms of a contract [RSK Environment Standard Terms and Conditions] between RSK and the Client, dated 27th October 2022. The Services were performed by RSK with the reasonable skill and care ordinarily exercised by an environmental consultant at the time the Services were performed. Further, and in particular, the Services were performed by RSK taking into account the limits of the scope of works required by the client, the time scale involved and the resources, including financial and manpower resources, agreed between RSK and the Client.
2. Other than that, expressly contained in paragraph 1 above, RSK provides no other representation or warranty whether express or implied, in relation to the Services.
3. Unless otherwise agreed in writing, the Services were performed by RSK exclusively for the purposes of the Client. RSK is not aware of any interest of or reliance by any party other than the Client in or on the Services. Unless expressly provided in writing, RSK does not authorise, consent or condone any party other than the client relying upon the Services. Should this report or any part of this report, or otherwise details of the Services or any part of the Services be made known to any such party, and such party relies thereon that party does so wholly at its own and sole risk and RSK disclaims any liability to such parties. **Any such party would be well advised to seek independent advice from a competent environmental consultant and/or lawyer.**
4. It is RSK's understanding that this report is to be used for the purpose described in the introduction to the report. That purpose was a significant factor in determining the scope and level of the Services. Should the purpose for which the report is used, or the proposed use of the site change, this report may no longer be valid and any further use of or reliance upon the report in those circumstances by the client without RSK 's review and advice shall be at the client's sole and own risk. Should RSK be requested to review the report after the date of this report, RSK shall be entitled to additional payment at the then existing rates, or such other terms as agreed between RSK and the client.
5. The passage of time may result in changes in site conditions, regulatory or other legal provisions, technology or economic conditions which could render the report inaccurate or unreliable. The information and conclusions contained in this report should not be relied upon in the future without the written advice of RSK. In the absence of such written advice of RSK, reliance on the report in the future shall be at the Client's own and sole risk. Should RSK be requested to review the report in the future, RSK shall be entitled to additional payment at the then existing rate, or such other terms as may be agreed between RSK and the client.
6. The observations and conclusions described in this report are based solely upon the Services which were provided pursuant to the agreement between the Client and RSK. RSK has not performed any observations, investigations, studies or testing not specifically set out or required by the contract between the client and RSK. RSK is not liable for the existence of any condition, the discovery of which would require performance of services not otherwise contained in the Services. For the avoidance of doubt, unless otherwise expressly referred to in the introduction to this report, RSK did not seek to evaluate the presence on or off site of asbestos, invasive plants, electromagnetic fields, lead paint, heavy metals, radon gas, persistent, bioaccumulative or toxic chemicals (including PFAS compounds) or other radioactive or hazardous materials, unless specifically identified in the Services.
7. The Services are based upon RSK's observations of existing physical conditions at the Site gained from a visual inspection of the site together with RSK's interpretation of information, including documentation, obtained from third parties and from the Client on the history and usage of the site,

unless specifically identified in the Services or accreditation system (such as UKAS ISO 17020:2012 clause 7.1.6):

a. The Services were based on information and/or analysis provided by independent testing and information services or laboratories upon which RSK was reasonably entitled to rely.

b. The Services were limited by the accuracy of the information, including documentation, reviewed by RSK and the observations possible at the time of the visual inspection.

c. The Services did not attempt to independently verify the accuracy or completeness of information, documentation or materials received from the client or third parties, including laboratories and information services, during the performance of the Services.

RSK is not liable for any inaccurate information or conclusions, the discovery of which inaccuracies required the doing of any act including the gathering of any information which was not reasonably available to RSK and including the doing of any independent investigation of the information provided to RSK save as otherwise provided in the terms of the contract between the Client and RSK.

8. The intrusive environmental site investigation aspects of the Services are a limited sampling of the site at pre-determined locations based on the known historic / operational configuration of the site. The conclusions given in this report are based on information gathered at the specific test locations and can only be extrapolated to an undefined limited area around those locations. The extent of the limited area depends on the properties of the materials adjacent and local conditions, together with the position of any current structures and underground utilities and facilities, and natural and other activities on site. In addition, chemical analysis was carried out for a limited number of parameters (as stipulated in the scope between the client and RSK, based on an understanding of the available operational and historical information) and it should not be inferred that other chemical species are not present.

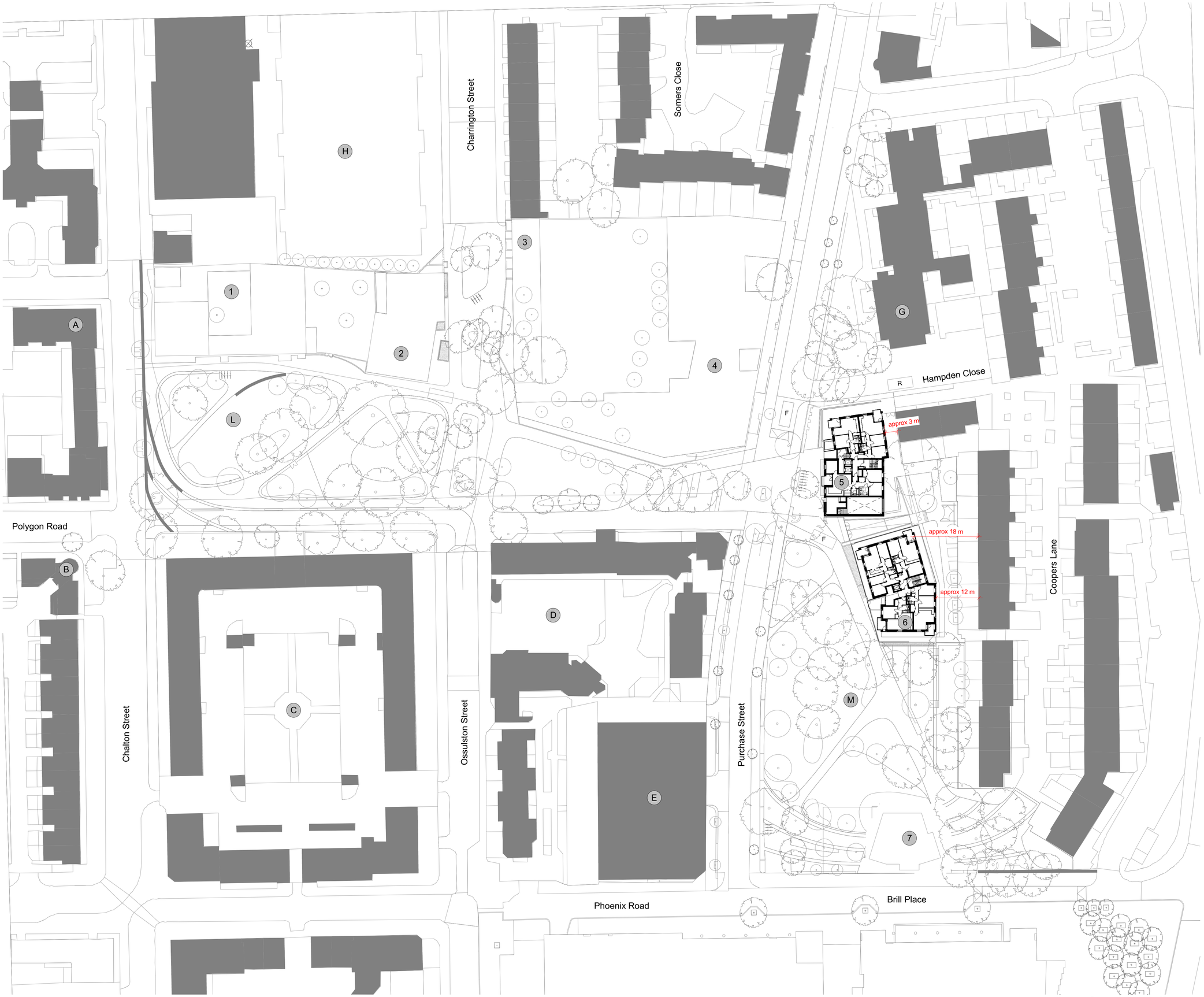
9. Any site drawing(s) provided in this report is (are) not meant to be an accurate base plan but is (are) used to present the general relative locations of features on, and surrounding, the site. Features (intrusive and sample locations etc) annotated on site plans are not drawn to scale but are centred over the approximate location. Such features should not be used for setting out and should be considered indicative only.

10. The comments given in this report and the opinions expressed are based on the ground conditions encountered during the site work and on the results of tests made in the field and in the laboratory. However, there may be conditions pertaining to the site that have not been disclosed by the investigation and therefore could not be taken into account. In particular, it should be noted that there may be areas of made ground not detected due to the limited nature of the investigation or the thickness and quality of made ground across the site may be variable. In addition, groundwater levels and ground gas concentrations and flows, may vary from those reported due to seasonal, or other, effects and the limitations stated in the data should be recognised.

11. Asbestos is often observed to be present in soils in discrete areas. Whilst asbestos-containing materials may have been locally encountered during the fieldworks or supporting laboratory analysis, the history of brownfield and demolition sites indicates that asbestos fibres may be present more widely in soils and aggregates, which could be encountered during more extensive ground works.

12. Unless stated otherwise, only preliminary geotechnical recommendations are presented in this report and these should be verified in a Geotechnical Design Report, once proposed construction and structural design proposals are confirmed.

APPENDIX B
DEVELOPMENT DRAWINGS



Notes

1. Do not scale this drawing.
2. All dimensions must be checked on site and any discrepancies verified with the architect.
3. Unless shown otherwise, all dimensions are to structural surfaces.
4. Drawing to be read with all other issued information. Any discrepancies to be brought to the attention of the architect.
5. This drawing is the copyright of Levitt Bernstein and may not be copied, altered or reproduced in any form, or passed to a third party without license or written consent.
6. This document is prepared for the sole use of London Borough of Camden and no liability to any other persons is accepted by Levitt Bernstein. Levitt Bernstein accepts no liability for use of this drawing by parties other than the party for whom it was prepared or for purposes other than those for which it was prepared.

This is not a construction drawing, it is unsuitable for the purpose of construction and must on no account be used as such.

- 1 Community facilities by Adam Kahn Architects
- 2 Plot 2 Housing
- 3 Housing by Hayhurst & Co
- 4 Edith Neville Primary School by Hayhurst & Co
- 5 Plot 5 Housing by LBA
- 6 Plot 6 Housing by LBA
- 7 Housing by dRMM

- A Phyllis Hodges House
- B Oakshott Court
- C Walker House
- D Monica Shaw Court
- E Phoenix Court
- G Clyde Court
- H Regent High School
- L Polygon Road Open Space
- M Purchase Street Open Space

- F Fire Vehicle
- R Refuse Vehicle

Rev	Date	Description	Drawn / Checked
P01	2022/05/20	Stage 2 Issue	SH|RP

Project name

Central Somers Town, plot 5&6
Camden Residential Development

Drawing number — Rev

3873 - LBA - ZZ - ZZ - DR - A - 110500 **P01**

Drawing

Proposed Site Plan

Purpose of issue
Information

Scale — First issue date

1 : 500 @ A1 — xx/xx/xxxx

Client
London Borough of Camden

London
Thane Studios
2-4 Thane Villas
London N7 7PA
+44 (0)20 7275 7676

Manchester
Bonded Warehouse
18 Lower Byrom Street
Manchester M3 4AP
+44 (0)161 669 8740

Levitt Bernstein
levittbernstein.co.uk

C:\Revit Local\3873-Architecture-R22-Central_rebekka.perkins.rvt

notes

Site Boundary

Highways Boundary

0 10 20 50m

PLANNING

rev	date	check	comments

DSDHA
357 Kennington Lane, Vauxhall, SE11 5QY
T 020 7703 3555
F 020 7703 3890
E info@dsdha.co.uk
W www.dsdha.co.uk

project

Central Somers Town

drawing title

Central Somers Town - Lot 4
Proposed Rendered Site Masterplan

drawn	size	date	scale
EH	A1	27 11 15	1:500

drawing number	revision
246-110-P-51	-

APPENDIX C
SUMMARY OF LEGISLATION AND POLICY RELATING TO LAND CONTAMINATION

Part IIA of the Environmental Protection Act 1990

Part IIA of the Environmental Protection Act 1990 (Part IIA) and its associated Contaminated Land Regulations 2000 (SI 2000/227), which came into force in England on 1 April 2000, formed the basis for the current regulatory framework and the statutory regime for the identification and remediation of contaminated land. Part IIA of the EPA 1990 defines contaminated land as 'any land which appears to the Local Authority in whose area it is situated to be in such a condition by reason of substances in, on or under the land, that significant harm is being caused, or that there is significant possibility of significant harm being caused, or that pollution of controlled waters is being or is likely to be caused'. Controlled waters are considered to include all groundwater, inland waters and estuaries.

In August 2006, the Contaminated Land (England) Regulations 2006 (SI 2006/1380) were implemented, which extended the statutory regime to include Part IIA of the EPA as originally introduced on 1 April 2000, together with changes intended chiefly to address land that is contaminated by virtue of radioactivity. These have been replaced subsequently by the Contaminated Land (England) (Amendment) Regulations 2012, which now exclude land that is contaminated by virtue of radioactivity.

The intention of Part IIA is to deal with contaminated land issues that are considered to cause significant harm on land that is not undergoing development (see Environmental Protection Act 1990: Part 2A Contaminated Land Statutory Guidance, April 2012). This document replaces Annex III of Defra Circular 01/2006, published in September 2006 (the remainder of this document is now obsolete).

Planning Policy

Land contamination is often addressed via the planning process during redevelopment of sites. This approach was documented in Planning Policy Statement: Planning and Pollution Control PPS23, which states that it remains the responsibility of the landowner and developer to identify land affected by contamination and carry out sufficient remediation to render the land suitable for use. PPS23 was withdrawn early in 2012 and has been replaced by much reduced guidance within the National Planning Policy Framework (NPPF), reference ISBN: 978-1-5286-1033-9, July 2021. For sites in Wales, reference should be made to Planning Policy Wales (Welsh Government. Edition 11, February 2021).

The new framework has limited guidance on contaminated land, as follows:

Chapter 11. Making effective use of land

117 Planning policies and decisions should promote an effective use of land in meeting the need for homes and other uses, while safeguarding and improving the environment and ensuring safe and healthy living conditions. Strategic policies should set out a clear strategy for accommodating objectively assessed needs, in a way that makes as much use as possible of previously developed or 'brownfield' land.

118. Planning policies and decisions should:

c) give substantial weight to the value of using suitable brownfield land within settlements for homes and other identified needs, and support appropriate opportunities to remediate despoiled, degraded, derelict, contaminated or unstable land.

Chapter 15. Conserving and enhancing the natural environment

170. Planning policies and decisions should contribute to and enhance the natural and local environment by:

e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans; and

f) remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate.

Ground conditions and pollution

178. Planning policies and decisions should ensure that:

a) a site is suitable for its proposed use taking account of ground conditions and any risks arising from land instability and contamination. This includes risks arising from natural hazards or former activities such as mining, and any proposals for mitigation including land remediation (as well as potential impacts on the natural environment arising from that remediation).

b) after remediation, as a minimum, land should not be capable of being determined as contaminated land under Part 2A of the Environmental Protection Act 1990; and

c) adequate site investigation information, prepared by a competent person, is available to inform these assessments.

179. Where a site is affected by contamination or land stability issues, responsibility for securing a safe development rests with the developer and/or landowner.

Water Resources Act (WRA)

The Water Resources Act 1991 (Amendment) (England and Wales) Regulations 2009 updated the Water Resources Act 1991, which introduced the offence of causing or knowingly permitting pollution of controlled waters. The Act provides the Environment Agency with powers to implement remediation necessary to protect controlled waters and recover all reasonable costs of doing so.

Water Framework Directive (WFD)

The Water Framework Directive 2000/60/EC is designed to:

- enhance the status and prevent further deterioration of aquatic ecosystems and associated wetlands that depend on the aquatic ecosystems
- promote the sustainable use of water
- reduce pollution of water, especially by ‘priority’ and ‘priority hazardous’ substances
- ensure progressive reduction of groundwater pollution.

The WFD requires a management plan for each river basin be developed every six years.

Groundwater Directive (GWD)

The 1980 Groundwater Directive 80/68/EEC and the 2006 Groundwater Daughter Directive 2006/118/EC of the WFD are the main European legislation in place to protect groundwater. The 1980 Directive is due to be repealed in December 2013. The European legislation has been transposed into national legislation by regulations and directions to the Environment Agency.

Priority Substances Directive (PSD)

The Priority Substances Directive 2008/105/EC is a 'Daughter' Directive of the WFD, which sets out a priority list of substances posing a threat to or via the aquatic environment. The PSD establishes environmental quality standards for priority substances, which have been set at concentrations that are safe for the aquatic environment and for human health. In addition, there is a further aim of reducing (or eliminating) pollution of surface water (rivers, lakes, estuaries and coastal waters) by pollutants on the list. The WFD requires that countries establish a list of dangerous substances that are being discharged and EQS for them. In England and Wales, this list is provided in the River Basin Districts Typology, Standards and Groundwater threshold values (Water Framework Directive) (England and Wales) Directions 2010. In order to achieve the objectives of the WFD, classification schemes are used to describe where the water environment is of good quality and where it may require improvement.

Environmental Permitting Regulations (EPR)

The Environmental Permitting (England and Wales) Regulations 2016 (as amended) provide a single regulatory framework that streamlines and integrates waste management licensing, pollution prevention and control, water discharge consenting, groundwater authorisations, and radioactive substances regulation. Schedule 22, paragraph 6 of EPR 2016 states: 'the regulator must, in exercising its relevant functions, take all necessary measures - (a) to prevent the input of any hazardous substance to groundwater; and (b) to limit the input of non-hazardous pollutants to groundwater so as to ensure that such inputs do not cause pollution of groundwater.'

Notes:

1. *The above information is provided for background but does not constitute site-specific advice*
2. *The above summary applies to England only. Variations exist within other countries of the United Kingdom*

APPENDIX D
UTILITY SERVICE PLANS

Morgan Sindall

Hampden Close

Desk Based Utility Report

Project no. 2191555

RSK GEOSCIENCES

DECEMBER 2022

RSK GENERAL NOTES

Project No.: 2191555-DB-R01(00)

Title: Desk Based Utility Report, Hampden Close

Client: Morgan Sindall

Date: 20th December 2022

Office: RSK, 18 Frogmore Road, Hemel Hempstead, Herts, HP3 9RT
Tel: +44 (0)1442 416652
https://rskgroup.com

Status: Draft/Final — Final

Project Manager Review: Gerwyn Leigh

Compiled: Lisa Ward

Signature 

Date: 20th December 2022

RSK GEOSCIENCES	**SITE LOCATION PLAN**	**Client: Morgan Sindall**	**Figure No: 1**
		Site: Hampden Close	**Job No: 2191555**
		Scale: Not to scale	**Source: Google Earth**

Utility Company Underground Services Status Report

Your Ref: 1922663
Our Ref: 2191555

Site address at: Hampden Close
Post Code: NW1 1HW
OSGR: 529824 183227
Date Requested: 25th November 2022
Date Collated: 20th December 2022
Client: Morgan Sindall

AFFECTED SERVICES

Utility Company	Responded
WATER & SEWER	
Foul & Surface Water Drainage - Thames Water	✓
Potable Water - Thames Water	✓
ELECTRICITY	
UKPN	✓
GAS	
Cadent Gas	✓
TELECOMS	
BT (Openreach)	✓
Virgin Media	✓

NOT AFFECTED SERVICES

Utility Company	Responded
WATER	
GTC – Independent Water Networks Ltd	✓
ELECTRICITY	
GTC – Electricity Networks Company	✓
GTC – Independent Power Networks Ltd	✓
GAS	
Equans (Engie)	✓
GTC Pipelines Ltd	✓
GTC – Independent Pipelines Ltd	✓
GTC – Quadrant Pipelines	✓
GTC – Independent Community Heating Ltd	✓
TELECOMS	
Arelion	✓
Atkins Global – Vodafone	✓
C A Telecoms	✓
City Fibre Holdings Limited	✓
Instalcom – Lumen Technologies	✓
GTC – Open Fibre Networks Ltd	✓
MBNL	✓
Sky	✓
Sota Solutions	✓
Utility Assets	✓
Verizon Business	✓
RAIL	
London Underground	Awaiting Response
Network Rail	✓