AHIG Ltd

152-156 Kentish Town Road

Basement Impact Basement

Parmarbrook

Job No: 1599

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Prepared by BP and RSC
Checked by BP
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Revision: 1

Contents

1 Executive Summary

1.1 Project Description

It is proposed to redevelop the site of 152-156 Kentish Town Road, which is currently occupied by a 2 storey multiple tenure commercial building.

The proposal will involve the demolition of the existing building and construction of a 4 storeys mixed use building plus a single storey basement which is within the proposed building footprint. As the existing building does not have a basement the proposal will involve the excavation of a new single storey basement.

1.2 Report Content

The proposal complies with the Basement Impact Assessment requirements of Camden Planning Guidance *CPG4 – Basements and Lightwells* issued in July 2015. The information in this document and its appendices outlines the engineering and construction challenges specific to the site and proposal, which have been identified, carefully considered, and mitigated. This documents includes:

1. A detailed Desk Study including site history, utilities, and existing buildings and structures.
2. Summary of the site specific Site Investigation including geology, hydrogeology, and hydrology. The full Investigation report can be found in Appendix E.
3. Appraisal of the issues related to the LUL tunnel.
4. Appraisal of the existing structure as it relates to the works and the final proposal.
5. Illustrative and quantitative details of the proposed structure to be further developed in the Detailed design phase.
6. Outline construction sequence to be further developed by the Contractor
7. Predicted ground movements, discussion of the implications, proposed monitoring regime, and movement trigger levels.
8. The Proposed Structural Drawings (Appendix A)
9. Results of the Thames Water Asset Search (Appendix B)
10. Below Ground Drainage Drawings (Appendix C)
11. Strategic Flood Assessment Maps (Appendix D)
12. GEA Site Investigation Report J15359A (Appendix E)
13. GEA Ground Movement Analysis Report J15359B (Appendix D)

1.3 Screening Results

A screening exercise was carried out in accordance with recommendation of CPG4 in respect of groundwater flow, land stability, and surface flow/flooding. Reference was made to the Camden Geological, Hydrogeology, and Hydrological Study and other data sources. The full Screening Assessment can be seen in Appendix E – Section 3 and a summary of relevant topics can be seen below.

1.3.1 Groundwater Flow

With respect to the groundwater flow, criteria Q1b. has been deemed relevant to the proposed scheme:

- Q1b. The proposed basement may extend beneath the water table surface.

1.3.2 Ground Stability

With regard to ground stability, criteria Q7, Q12, Q13, and Q14 have been deemed relevant to the proposed scheme:

- Q7. there is a history of seasonal shrink-swell.
- Q12. the site is within 5 m of a public highway.
- Q13. the development will increase the foundation depths relative to the neighbouring properties to a relatively significant extent.
- Q14. the site is within the exclusion zone of a London Underground tunnel.

1.3.3 Surface Flow and Flooding

With respect to the surface flow and flooding, no criteria have been identified as relevant to the proposal.

1.4 Scoping

The scoping exercise has carried out in accordance with CPG4 and has identified the primary risks to be mitigated in the design. The full Scoping Assessment can be seen in Appendix E – Section 4 which has been summarised below.

Potential Impact	Consequence
The proposed basement may extend beneath the water table surface.	The proposed basement level may be below the water table and this could increase flow paths and/or raise groundwater levels locally.
Seasonal shrink-swell can result in foundation movements.	If a new basement is not dug to below the depth likely to be affected by tree roots this could lead to damaging differential movement between the subject site and adjoining properties, however new trees do not form part of the proposed development.
Site within 5 m of a highway or pedestrian right of way.	Excavation of a basement may result in structural damage to the road or footway.
Founding depths relative to neighbours	If not designed and constructed appropriately, the excavation of a basement may result in structural damage to neighbouring buildings and structures.
The site is within the exclusion zone of a London Underground tunnel.	The proposed basement could impact upon the adjacent tunnel and damage the LUL asset. Heave generated as a result of the basement excavation could result in unacceptable pressures on the tunnel.

1.5 Impact Assessment

An assessment of the potential impacts identified during the scoping process has been made with mitigation measures where required.

Potential Impact	Site Investigation Conclusions
The proposed basement may extend beneath the water table surface.	The investigation has indicated that the basement may extend below the water table within the upper weathered horizon of the London Clay, however this should be confirmed by purging the standpipes and carrying out further monitoring. Consequently, there is potential for groundwater flow beneath the site. However, the gravelly clay stratum extends around the basement excavation such that groundwater should be able to flow around the outside of the excavation and should therefore not impact upon groundwater sensitive features.
Seasonal shrink-swell can result in foundation movements.	The London Clay is prone to seasonal shrink-swell and can cause structural damage. Desiccation was not encountered during the investigation. The proposed basement will extend to a depth of 4.6 m in general, therefore new foundations are likely to bypass any desiccated soils encountered, although consideration will need to be given in the foundation design to protecting against the effects of continued growth of the trees.
Site within 5 m of a highway or pedestrian right of way	The investigation has not indicated any specific problems, such as weak or unstable ground, voids, high water table, that would make working within 5 m of public infrastructure particularly problematic at this site, although best practice in design and construction will ensure the stability of the highway. The investigation has encountered a significant thickness of made ground however this is likely to be removed as part of the basement construction. The proposed retaining structure should minimise any potential movements that may impact the adjacent road.
Founding depths relative to neighbours.	The development will result in significantly increasing the foundation depth of the basement relative neighbouring properties of the site.
The site is within the exclusion zone of a London Underground tunnel.	The proposed development should consider the restrictions imposed due to the adjacent LU tunnel and permission should be sought from LU prior to construction commencing.

The conclusion of this process is that “the proposed development is unlikely to result in any specific land or slope stability issues, groundwater or surface water issues”. The full Impact Assessment can be seen in Appendix E – Section 10.0.

1.6 Further Investigation

At this stage there are a number of studies which are required to confirm the design which are usually undertaken post planning or once vacant possession is granted, these studies will be undertaken as soon as practically possible, they include:

1. Destructive and invasive works to ascertain the details of the existing structures and foundations, this will be undertaken once vacant possession is granted
2. Level-and-Line survey of the LUL tunnel and lines to be compared against the Ground Movement Analysis Results, this will be scheduled with LUL during the Design Development Stage.
3. Further details of temporary works, program and other items are to be confirmed once a contractor is appointed.

1.7 Review of Decision Making

The design of the retaining walls has carried out in order to minimise disturbance to the surrounding area. Measures which have been proposed to minimise disturbance are as follows:

1. CFA bored piles to limit ground disturbance and vibration.
2. Large 600mm diameter piles to limit deflection
3. Propping of the retaining wall during construction to limit deflection and ground disturbance
4. Temporary works to ensure stability of existing structures.
5. Movement monitoring and trigger levels

As a result of these measure the Ground Movement Analysis model has predicted movements of 6-7mm vertically and 11-12mm horizontally, these maximum figures take place at the face of the retaining walls with lesser movements being predicted at distances from this location (see Appendix F). The analysis of the result of these movements on the adjoining structures has been shown to be from Negligible (category zero) to Very Slight (category one) on the majority of walls, with 3 Walls predicting a damage classification of Slight (category two) as measured against the Burland Scale. According to the Burland scale this is likely to result in:

“Cracks easily filled. Redecoration probably required. Several slight fractures showing inside of building. Cracks visible externally and some repointing may be required externally to ensure weather tightness. Doors and window may stick slightly.”

To mitigate these risks, permanent tying of these walls prior to the basement works has been proposed. In accordance with CPG4, all structures that are classified as Very Slight (category one) and above are to be receive appropriate mitigation measures to be agreed with the contractor when appointed.

2 Introduction

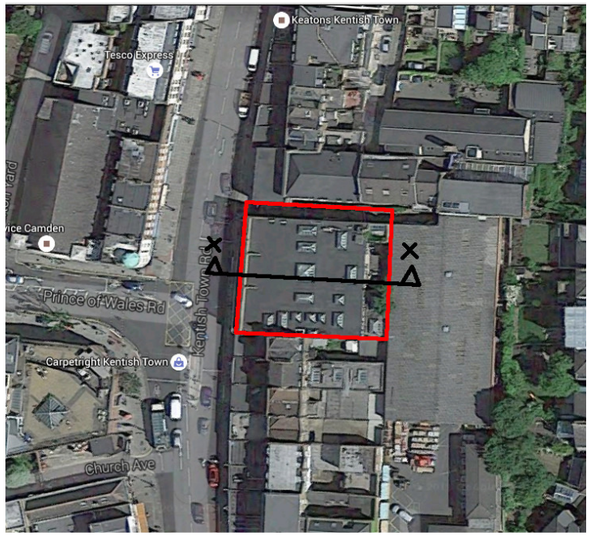
Parmarbrook Ltd. are appointed as the Consulting Civil and Structural Engineers by AHIG Ltd. for their proposed redevelopment at 152-156 Kentish Town Road, London, NW1 9QB, with Marek Wojciechowski appointed as the Architects. This report has been prepared by a Chartered Structural Engineer as a supporting document for the main planning application for the redevelopment of the property.

The proposal will involve the demolition of the existing building and construction of a 4 storeys mixed use building plus a single storey basement which is within the proposed building footprint. As the existing building does not have a basement the proposal will involve the excavation of a new single storey basement.

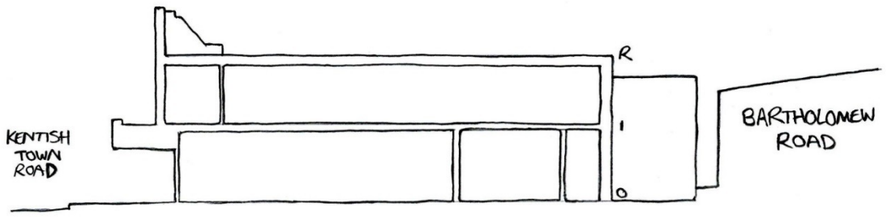
This document states the structural design philosophy for the proposed new buildings. It is intended to be a document to support the planning application, and act as a reference during the development of the project. It will be issued to all relevant parties including the Client, relevant authorities, and design team members. The Quantity Surveyor should also issue this document as part of the contractor's contract documentation.

Various assumptions have been made in the design, these are stated in relevant sections of text and until comments are received it is assumed that they are accepted by all members of the project team as a basis for the detailed design. The philosophy outlined in this document relates to the project as it stands at preplanning status design and should be read in conjunction with the drawings. Changes to the detail of this scheme will be highlighted in future revisions. This philosophy should also be read in conjunction with the architects, services engineers and relevant trade contractor's drawings, specifications and reports.

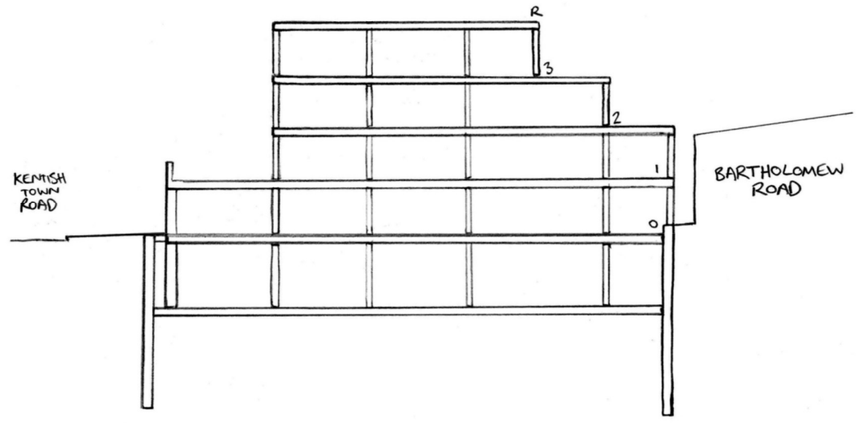
This document addresses the specific key issues in DPG4 as described in Camden Planning Guidance CPG4 (July 2015 edition)



Arial Photo - Site



Existing Section X-X

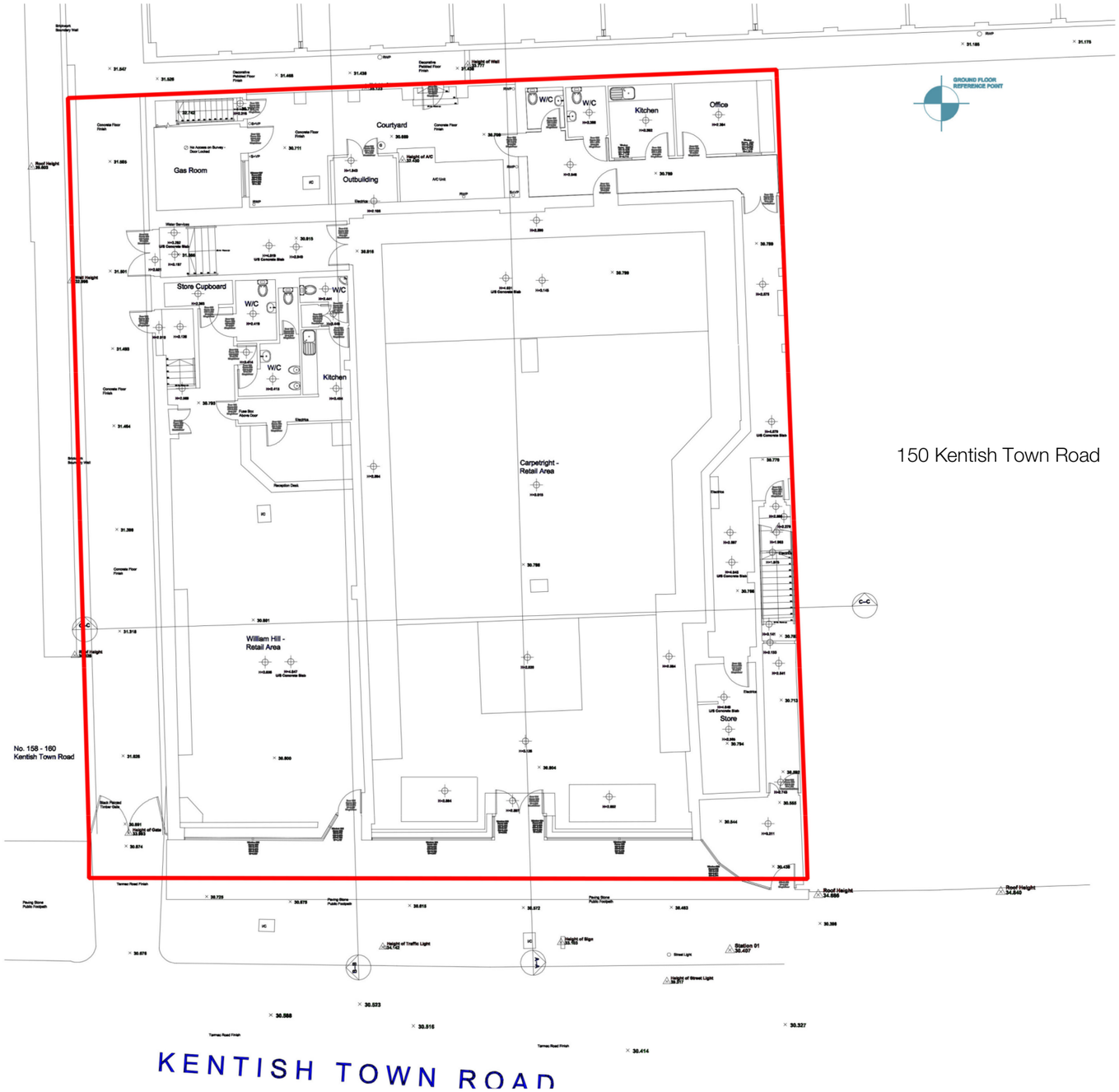


Proposed Section X-X

2a Bartholomew Road

158 – 160 Kentish Town Road

150 Kentish Town Road



Existing Building with Site Boundary as per survey

3 Site Information

1870s
Ordnance Survey Map
152-156 Kentish Town Road
& Surroundings
(Current site boundary in red)

1910s
Ordnance Survey Map
152-156 Kentish Town Road
& Surroundings
(Current site boundary in red)

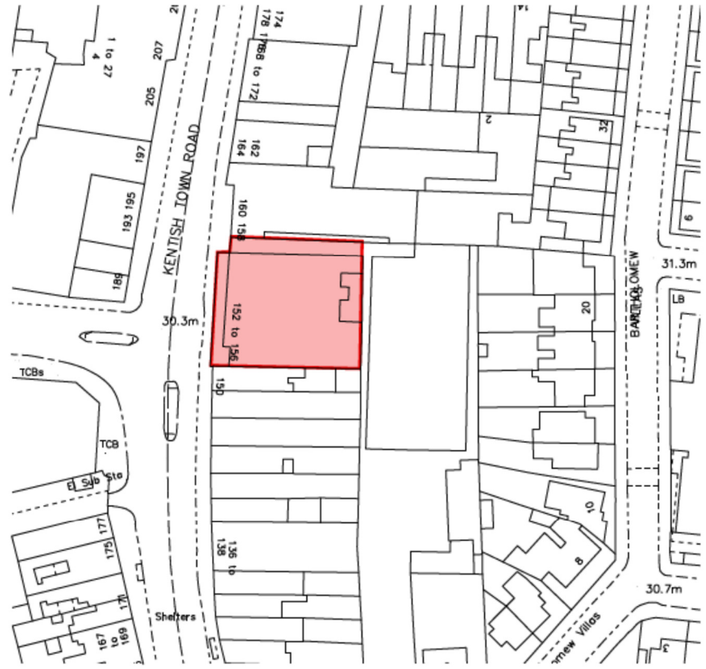
1890s
Ordnance Survey Map
152-156 Kentish Town Road
& Surroundings
(Current site boundary in red)

1950s
Ordnance Survey Map
152-156 Kentish Town Road
& Surroundings
(Current site boundary in red)

3.1 Site History

The historic Ordnance Survey Data shown left describes a distinct shift in the grain of the area over the past 150 years. Beginning as a series of smaller, predominantly residential units (such as those still surviving at nos.140-150 Kentish Town Road neighbouring) the site gave way to a larger scale development after the 1910s. This was typified by the North Western Polytechnic building opposite to the application site, which was completed in 1929.

As can be seen to the left, a number of buildings were cleared prior to the 1950s, to make way for the current property at no.152-156 Kentish Town Road.



2015
Current Ordnance Survey Map

3.2 Site Location

The site is located at 152-156 Kentish Town Road, London, NW1 9QB in the borough of Camden. The area is a mixed urban environment, with both residential and commercial properties in the immediate vicinity.

The site is bordered on 3 sides by a mix of commercial and residential buildings, with a heavily trafficked main road on the remaining side. The site does not fall within a conservation area and is not listed.

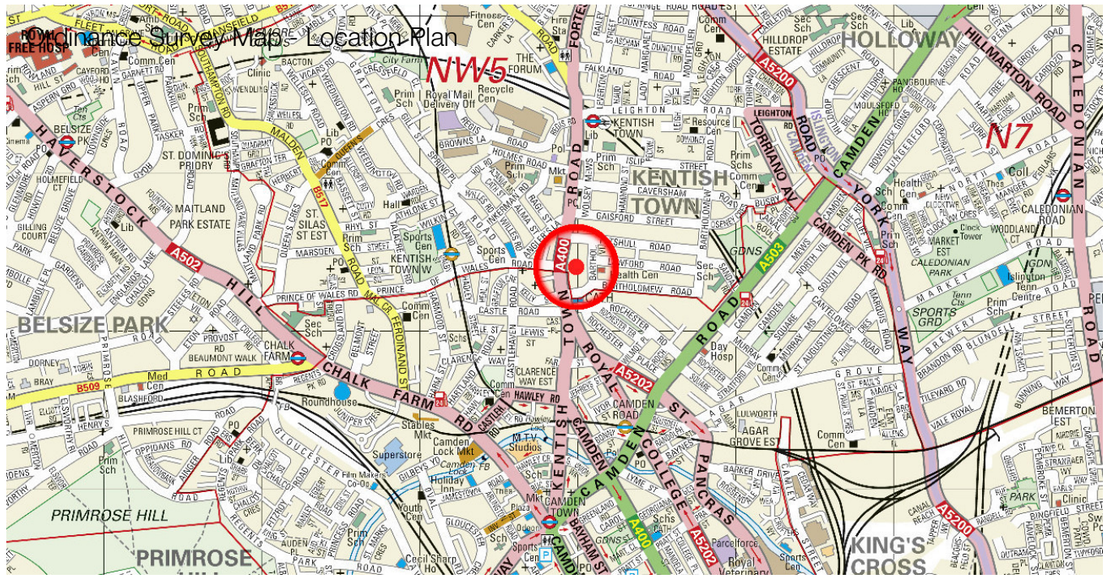
3.3 Existing Buildings and Boundary Conditions

3.3.1 Overview

The existing site is reasonably level with exception of an approximately 1m level change between the East alley and building, basements are not present within the building and are not anticipated on the neighbouring sites as they have no sign of significant renovation in recent times in which a basement renovation would have been commercially viable, this will need to be confirmed. There are a range of structural materials used on and adjacent to the site including concrete, timber masonry and steel.

3.3.2 150 Kentish Town Road (South Boundary)

The historical maps show that the original building was built in the late 1800s and believed to be built of traditional terraced construction. The building has a load bearing masonry façade, and internal partitioning most likely made of a mix of timber stud and masonry. The front extension is a retail premises and was built at a later date. The foundations are likely to be either traditional masonry corbel strips or concrete strip foundations. The north side of this building shares a foundation and party wall with 152-156 Kentish Town Road.



Ordnance Survey Map - Location Plan

OS Map showing Site Location

3.3.3 152-156 Kentish Town Road

The building is a 2 storeys concrete frame founded on either traditional masonry corbel strips or concrete strip foundations. Parts of the original building (believed to have been build prior to 1900) still remain integrated with the 1950s construction in various locations. The shared foundation on the south of 152-156 is thought to be as a result of the partial rebuild of the 1950s structure.

3.3.4 158-160 Kentish Town Road (North Boundary)

The existing building was previously used as a school and built in traditional masonry construction, which was later modified for commercial purposes. The building exists in a structurally independent state from our site with a clearance of several meters.

3.3.5 2a Bartholomew Road (East Boundary)

The warehouse building currently occupied by a Builders Merchant has been built since the 1950s and appears to be relatively new. The external envelop is made of masonry walls and the roof is a steel portal frame. There is an alleyway between our site and the warehouse building which is approximately 1.2m wide.

Street level view of West façade from North West

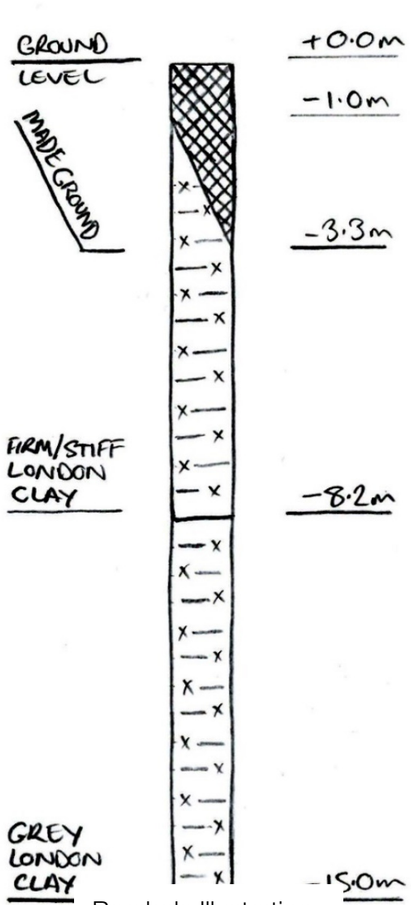
4 Ground Conditions

4.1 Geology

A site investigation specific to the proposed development has been carried out by GEA Ltd at the site which included one 15m borehole, two window samples, and gas and water monitoring wells. This revealed the stratigraphy to be made ground overlying London Clay at depths exceeding 15m depth. The site investigations confirmed the stratigraphical succession suggested by the published geological records.

Detailed geographical data as well the logged records of the boreholes and window samples are available in the full site investigation report prepared by GEA Ltd in Appendix E. This document should be reviewed when using geological information for design purposes, the summary included in this document is for general information only.

Description	Constituents	Depth to top of strata (m)	Thickness (m)
Topsoil / Made Ground	Made ground comprises Concrete, brick hardcore with gravel and sand, brick foundations (localised in BH1)	Ground Level	1.0~3.3
Firm becoming Stiff London Clay	Slightly silty slightly sandy clay with orange-brown clayey silty sand partings	1.0~3.3	4.9
London Clay	Grey Clay	8.2	15+



Borehole Illustration

4.2 Soil Parameters

GEA have defined the following design parameters for the London Clay:

Stratum	Bulk Density (kg/m3)	Effective Cohesion (c' – kN/m2)	Effective Friction Angle (Φ' – degrees)
Made Ground	1700	Zero	27
London Clay	1950	Zero	25

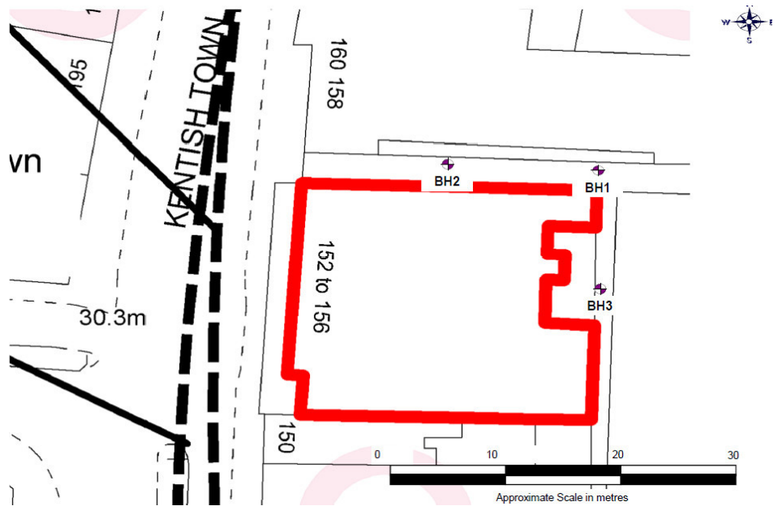
Refer to GEA report J15359A for further details on testing techniques and the sample selected.

4.3 Ground Water

Groundwater was encountered within the London Clay at depths of 6.10 m and 5.50 m in Borehole Nos 2 and 3 during drilling respectively. Three groundwater monitoring standpipes were installed and groundwater has subsequently been monitored prior to the installation of a standpipe in Borehole No1, within Borehole Nos 2 and 3 on a single occasion, approximately two weeks after installation, during which groundwater was measured at depths of 1.81 m and 1.37 m in Borehole Nos 2 and 3 respectively. Further monitoring will be carried out.

4.4 Ground Contamination

The desk study findings indicate the site not to have had a potentially contaminative history having been occupied by terraced buildings and the existing building for its entire developed history. Three samples of the made ground have been sent for precautionary contamination testing and the results will be provided.



Borehole Location Plan