

66 PRIORY GARDENS N6 5QS

HARINGEY COUNCIL

**BASEMENT STRUCTURAL METHOD STATEMENT
(SMS)**

DRAFT

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1 INTRODUCTION

Walder Sharp Ltd have prepared the following report in accordance with Haringey Council Planning Guidance for the proposed subterranean development at 66 Priory Gardens, N6 5QS.

This document should be read in conjunction with the structural basement drawings and the information prepared by Russian For Fish Architects.

It is proposed to undertake remodelling and refurbishment works generally across the property. The new basement will cover the main body of the house and will not extend under the rear outrigger.

This report focuses on the practicalities of constructing the subterranean development. The report details the geology and hydrogeology local to the site, proposed forms of construction, sequencing of works and the impact the proposed works would have on the surrounding structures.

This report and accompanying drawings have been prepared for the purpose of the planning submission. For construction stage a full technical pack should be prepared by the Structural Engineer which the contractor should work to, along with the information produced by the Architect.

2 BASIS OF STRUCTURAL DESIGN

The present report is based on the following relevant standards:

- BS EN 1990:2002 + A1:2005 – Eurocode – Basis of structural design
- BS EN 1991-1-1:2002 + NA – Eurocode 1: Actions on structures – Part 1-1 : General actions – Densities, self-weight, imposed loads for buildings
- BS EN 1991-1-4:2005 + NA – Eurocode 1: Actions on structures – Part 1-4 : General actions – Wind actions
- BS EN 1991-1-7:2006 + NA – Eurocode 1 : Actions on structures – Part 1-7 : General actions – Accidental actions
- BS EN 1992-1-1 :2004 + NA – Eurocode 2 : Design of concrete structures – Part 1-1: General rules and rules for buildings
- BS EN 1993-1-1:2005 + NA – Eurocode 3: Design of steel structures – Part 1-1: General rules and rules for buildings
- BS EN 1993-1-8:2005 + NA – Eurocode 3: Design of steel structures – Part 1-8: Design of Joints
- BS EN 1994-1-1:2004 + NA – Eurocode 4: Design of composite steel and concrete structures – Part 1-1: General rules and rules for buildings
- Haringey Council – Final Basements Policy Jan 2015

3 THE SITE AND EXISTING BUILDINGS

Refer to figures 1, 2 and 3 in the appendices for the historic maps of the site surveyed in 1870, 1896 and 1913 respectively.

The existing building is a three-storey terraced property (ground plus two upper floors) with staggered floor construction towards the rear of the property, possibly to cover the difference in level between Priory Gardens road and the back garden.

The building is formed in traditional construction with load-bearing masonry walls supporting timber joist floors; it is assumed that the roof was originally a back to front dual pitch later converted to a rear dormer (see appendix for pictures and drawings)

Opening up works will be undertaken prior to construction to confirm the existing structural arrangement and its condition. We anticipate that floors are formed in timber joists spanning front to back, receiving support from the front and rear facades with intermediate support from the central spine wall.

Haringey Council's planning portal was reviewed for the property but no records are available. There is, however, a record for the adjacent property at 64 that shows permission granted for reducing the level of the basement, with an intervention similar to the one presented in this report.

3.1 GEOLOGY

The British Geological Survey (BGS) map database was reviewed as part of the desk top study. This indicates that the geology local to the site consists of London Clay Formation, London Clay Formation - Clay, silt and sand. Sedimentary bedrock formed between 56 and 47.8 million years ago during the Palaeogene period.

A review of nearby borehole logs and trial pits, presented in section 9 which are for investigations carried out within 200m of the site, identify a varying thickness of Made Ground, above firm silty clay above the stiff London Clay Formation.

Trial pits will be undertaken on site to confirm both the ground conditions and existing foundation depths.

For the initial design Clay Strata is assumed at basement/ LGF formation level. For the ground works and foundations, a conservative safe bearing pressure of 100 kN/m² at current formation level increasing to 150 kN/m² at basement level will be set for all design works.

3.2 HYDROGEOLOGY

Ground water was recorded in the nearby borehole logs at a depth of about 6m BGL, hence below the new formation level of the basement.

Given the proposed depths of the subterranean works we anticipate that the new basement slab will be founded on firm blue silty clay stratum above the London Clay formation.

Review of the Environmental Agency (EA) maps confirm that the property is located within Flood Zone 1, low probability of flooding – Land having a less than 1 in 1,000 annual probability of river or sea flooding. Refer to *figure 9* in the appendices 9 for the EA's flood risk map.

3.3 EXISTING DRAINAGE

The existing drainage on the site is yet to be surveyed.

A CCTV survey of the below ground drainage assets will be undertaken by a specialist third party to inform the technical design phase.

It is assumed that the drainage on site is via a combined sewage system connecting into the presumed main Thames Water Asset running below Priory Gardens at the front of the site.

4 THE PROPOSED DEVELOPMENT

It is proposed to undertake renovation works throughout the existing property.

The proposal is to create a new basement below part of the main building footprint. This will be used as additional storage and it will be accessible from the lower level of the ground floor

4.1 THE PROPOSED SUBSTRUCTURE

The existing building foundations will be underpinned by approximately 2 m to allow for the excavation and construction of the single storey basement level.

It is proposed to construct the new basement level by removing the existing ground floor plate (timber joists spanning between party walls), underpinning the existing perimeter walls to basement formation level and constructing a new reinforced concrete (RC) box.

It is understood that the adjacent property at 64 Priory Gardens has already undergone a basement extension/renovation therefore one party wall may be underpinned to a certain depth.

It is unclear whether the new basement level will match the existing at No 64, should it be lower, then it will be necessary to underpin the existing underpinning wall assembly.

As a side note, due to the presence of cracks in the property that highlight the possibility of a differential settlement in the outrigger, it is intended to underpin the outrigger's existing foundations in order to stabilize the movement and increase the bearing capacity in view of the creation of a terrace at roof level with increase in both permanent and variable loads.

Typical of period buildings, the existing property foundations are assumed to be brick corbelled footings, founded at varying depths across the building.

In order to safely excavate to the proposed formation level and construct the new slab at lower level RC, retaining walls are to be constructed below building perimeter walls.

The underpinning sequence will be carried out in one stage in order to reduce the maximum excavation depth. Such stage will see the introduction of L-shaped RC pins that will complete the retaining walls to the basement structure and form the base foundation. Retaining walls will be designed to resist lateral earth and hydrostatic pressures assuming

ground water is at ground level to allow for rising water levels, in accordance with the latest design standards (Eurocodes). Due to the lack of working space and to reduce the extent of temporary works required the RC retaining walls are to be formed in an underpinning style and sequence of construction around the full building perimeter.

The new basement slab will be constructed in an RC slab which will be tied to the toe of the perimeter retaining walls which will prop the bottom of the structure.

This structural arrangement will form a stiff propped cantilever structure which will transfer lateral pressures across the building and resist global instabilities such as overturning and sliding. All retaining elements will be designed for worst case pressures including hydrology and vehicle surcharging.

4.2 THE PROPOSED DRAINAGE

Waterproofing is to be designed by a specialist subcontractor.

Typically 2 no forms of waterproofing are required; it is likely that one form of waterproofing defence for the basement structure will be via membrane cavity system which will discharge water into the existing network.

It is anticipated that the water will run via new drainage runs where required into the existing network before discharging into the main sewer assumed to be below Priory Gardens. Sumps and pumps may be required to connect back to the existing drainage network at street level. Drainage details will be confirmed at technical design stage following confirmation of the existing network and condition via a detailed below ground drainage CCTV survey.

5 SEQUENCE OF WORKS

The first phase of works after site set-up would be to demolish the ground floor plate and prepare an access platform in order to allow the excavator to access the area to be excavated. All excavation works will commence from the front part of the main house body out to the back of the house.

The access to the ground floor plate will have to be either through the main door or, if not possible due to the size of the excavator, possibly through the bay window, with prior removal of the sill and the supporting masonry underneath the window.

After the installation of the access platform, operations will commence with the first key pins¹ at the front boundary of the main house body. This will allow to support the bay window and front façade via the introduction of a steel beam between the opposite pins.

The key pins sequence will proceed under the party wall between numbers 66 and 68 with the installation of pins under the existing spine wall in the middle and then under the front façade. The underpinning will be carried out in a hit and miss sequence. An indicative sequence is shown on drawing 0500.

To avoid possible differential settlements between the new stiffer basement structure and the rest of the property it is considered to proceed with the underpinning sequence to the outrigger: from the main body on the pins will be gradually less deep.

The underpinning of the outrigger is advised in order to resolve the cracking event that recently occurred and increase the support capacity with the introduction of the new roof terrace

The section of the underpins will be formed in an L-shaped RC pin. A steel bar should be used to ram the concrete mix into the gap to ensure no voids are present and load transfer between the existing and new elements can occur.

Excavations for adjacent pins are not to be carried out for a minimum 72 hours after completion of the previous pin. To ensure the safety of the operatives carrying out the works and maintain ground stability proprietary side shutters are to be used.

¹ Considering the presence of the underpinning along the party wall with no 64, the key pin will be only between 66 and 68, although the formation level of the neighbouring basement will have to be surveyed in advance to confirm this.

The toe of the underpin and a kicker will be poured first, the stem of the wall poured after. To ensure sufficient lapping of the bars the contractor will need to ram the bars into the ground during the stem pours. When excavating down these will become exposed and enable the elements to be tied together. Along all joint lines the contractor is to introduce Hydrophilic strips which will seek to mitigate water penetration of the structure.

After the underpin has been completed the contractor is to backfill and compact the ground removed. In the temporary case this will prevent global instabilities of the pin. This process is to be repeated until all existing perimeter walls (except where underpinning is already present at number 117) are underpinned. The ground level can be carefully reduced to the proposed levels to enable the pouring of the new basement RC slab.

Once all concrete has cured, temporary works can be removed and the waterproofing installed with the space fitted out to the Architect's details and specifications.

For basement construction sequencing refer to drawings -0500, 0700 and 0710

6 IMPACT ON SURROUNDING STRUCTURES

As part of the tender process due diligences will be carried out to ensure that the Contractor is reputable and has experience of working on projects of a similar nature. The method of construction adopted for the works are well tested and the design of the retaining elements will consider the worst-case possible loadings applied onto it during construction and once completed.

Providing the works are carried out in accordance with engineering specifications and to current standards and good building practices it is anticipated that the damage to the surrounding structures will be within Category 0 (ineligible) or Category 1 (very slight) on the basis of the classifications outlined in table 2.5 of CIRIA C580 report.

No visible change to the pavement or road is expected and no long-term movement is expected

7 UNDERPINNING SPECIFICATION

- Before starting the work the Contractor is to check for any services that could be damaged by the underpinning/ retaining wall formation work.
- The Contractor shall be responsible for ensuring that their operations do not in any way impair the safety or condition of the building both before and during the execution of the work. They shall immediately inform the Engineer if they consider that more stringent procedures than those specified are necessary.
- Underpinning is to be carried out in short sections not exceeding 1 metre in length. The bottoms of the foundation shall be inspected and approved by the Engineer and the Building Inspector before concrete is poured. The underpinning is to be carried out to the satisfaction of the Engineer and the Building Inspector.
- Projecting portions of the existing footings are to be carefully cut off where directed and the underside of the footings are to be cleaned and hacked free of dirt, soil or loose materials before underpinning.
- The body of the underpinning concrete is to be constructed in RC35 concrete and is to be cast to the widths shown unless otherwise directed by the Engineer. Excavation and concreting of any section of underpinning shall be carried out on the same day.
- The concrete is to be stopped off 75mm below the underside of the existing footing and the final pinning up over the whole of the footing is to be carried out with 1:3 mix cement to sharp sand dry pack mortar, well rammed in 24 hours after the concrete has been poured.
- Excavation to any section of underpinning shall not be started until at least 48 hours after completion of any adjacent sections of the work.
- The sides of the previous underpinning bays are to be roughened or keyed to the satisfaction of the Engineer and Building Inspector.
- Sequence of underpinning to be as shown. All sections marked 1 to be excavated, cast and dry packed before starting excavation of section marked 2 and all sections marked 2 to be complete before excavation for sections marked 3 etc.
- The Contractor is to keep a record of the sequence and dimensions of the underpinning actually carried out, including details of excavation, casting concrete and pinning up for each section.
- Excavated material intended for backfilling is to be kept protected from drying out or wetting and is to be placed in maximum 150mm layers, carefully compacted with a pneumatic or electric percussion tool with compacting plate.

8 CONCLUSIONS

- Desk top study indicates that the ground conditions are suitable for the proposed construction of the single storey basement below the existing building.
- The original building walls will be lowered using reinforced concrete (RC) underpins constructed in a traditional underpinning style and sequence as shown on Structural drawings.
- The new basement slab will be an RC ground bearing slab.
- A proposed sequence and method of construction is shown on drawings 0500, 0700, 0710
- Structural integrity of and stability of neighbouring buildings and assets will be maintained throughout the construction phase, providing an appropriate temporary works strategy is employed. Details of which will be confirmed between the appointed Contractor and Temporary Works Engineer.
- All works are to be undertaken in accordance with any Party Wall Awards and CDM regulations.

9 APPENDICES



Figure 1 - Google Earth View of the property

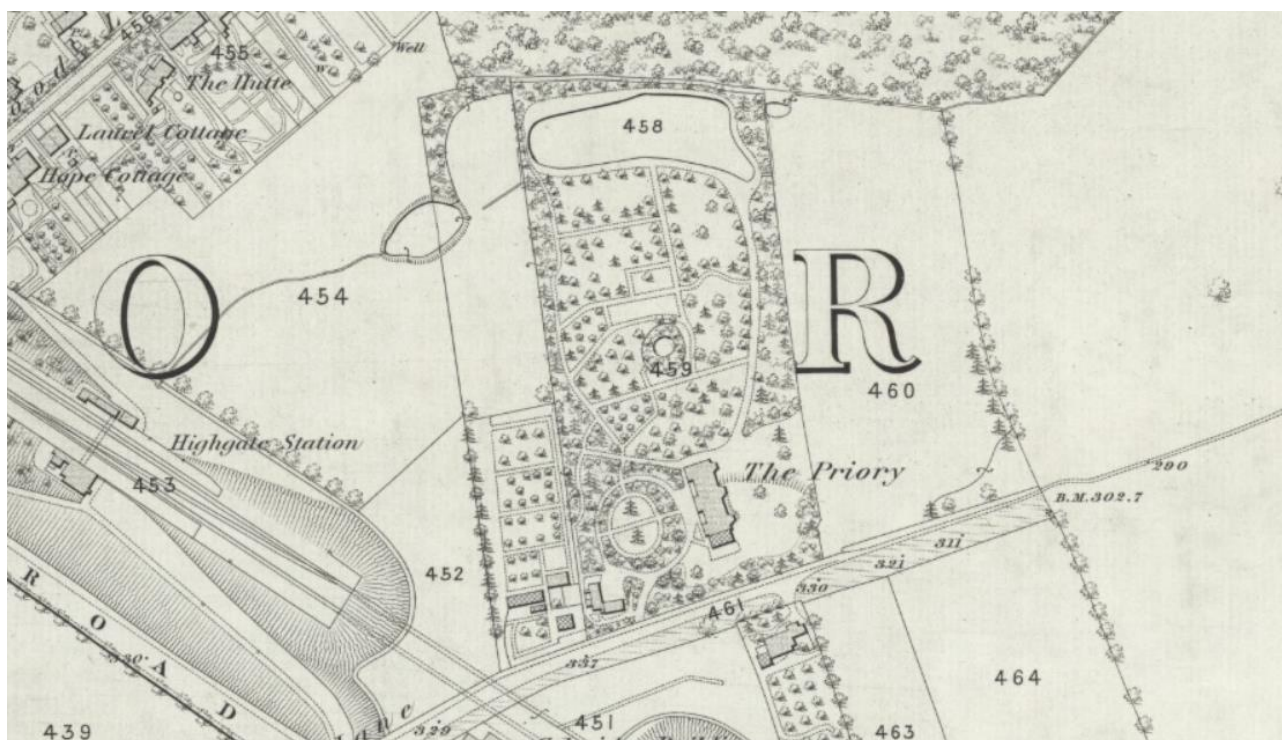


Figure 2 - 1870 25 inch ordnance survey map

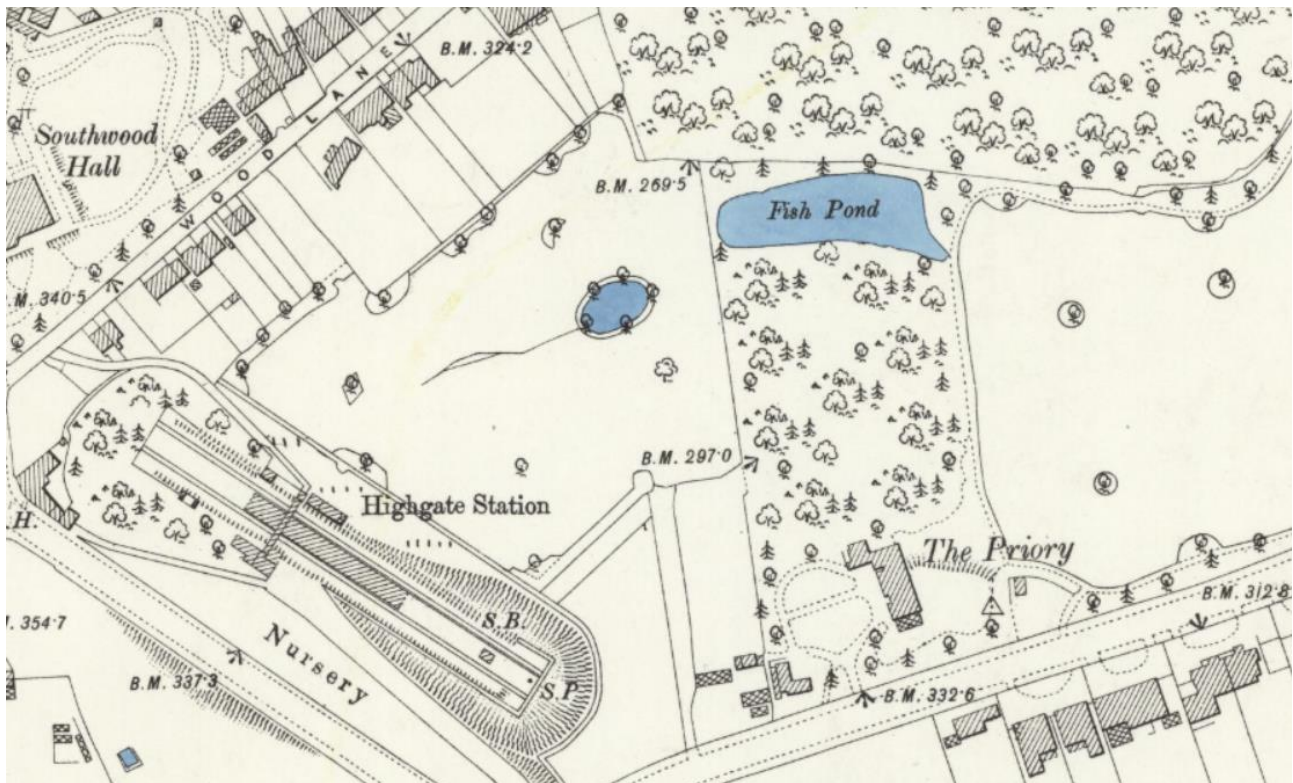


Figure 3 - 1896 25 inch ordnance survey map

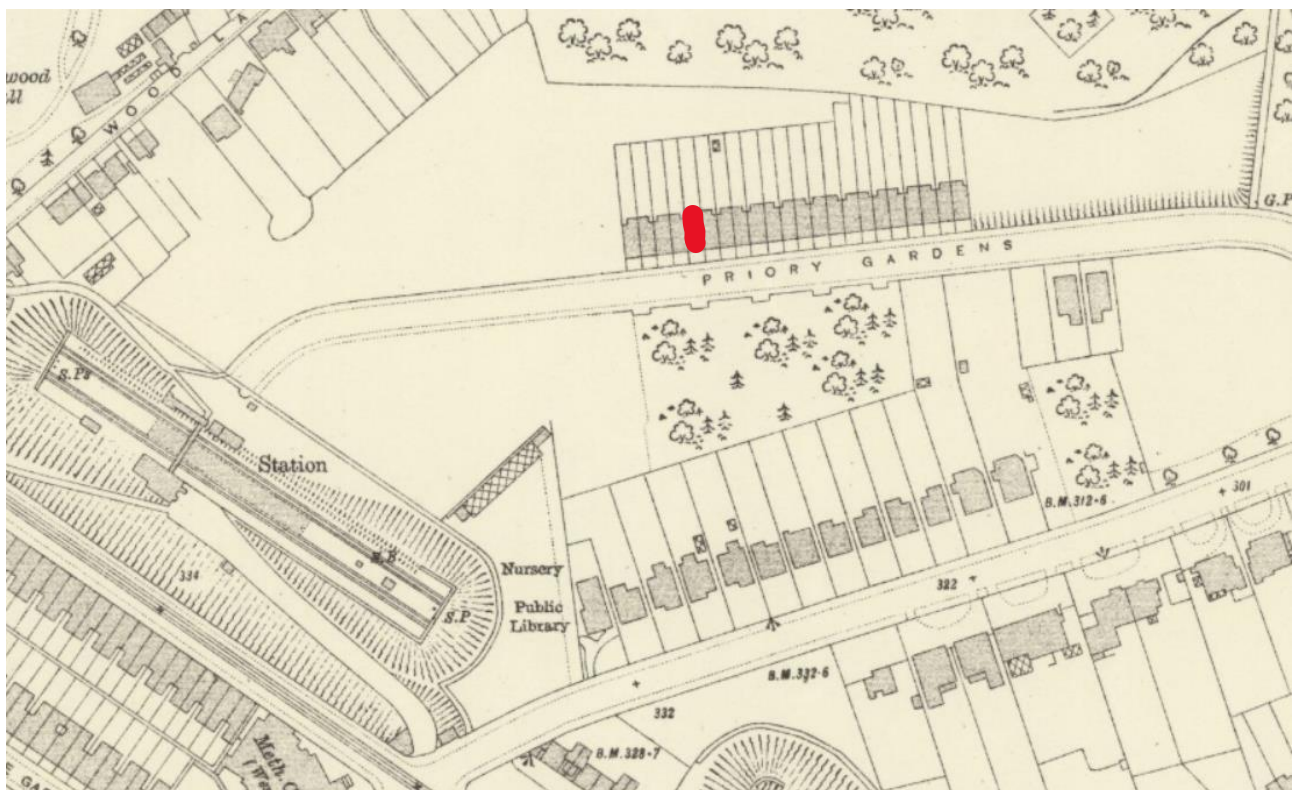


Figure 4 - 1913 25 inch ordnance survey map

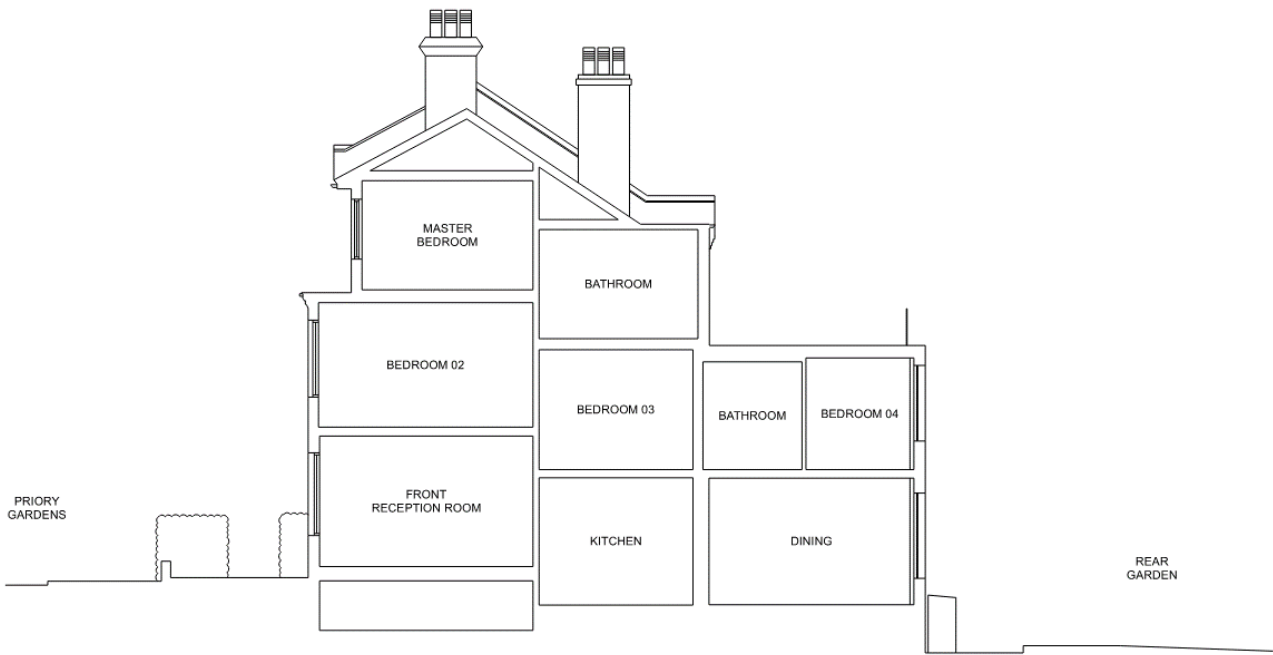


Figure 5 - Existing Section

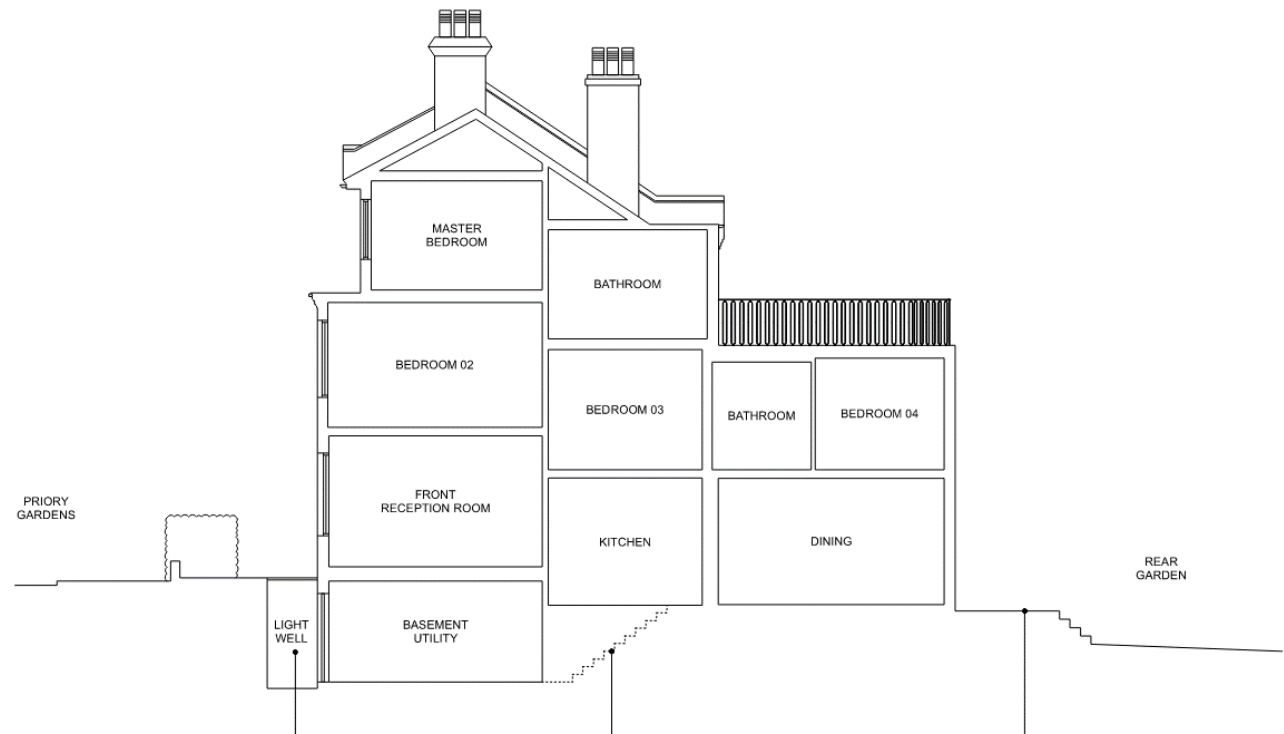


Figure 6 - Proposed section

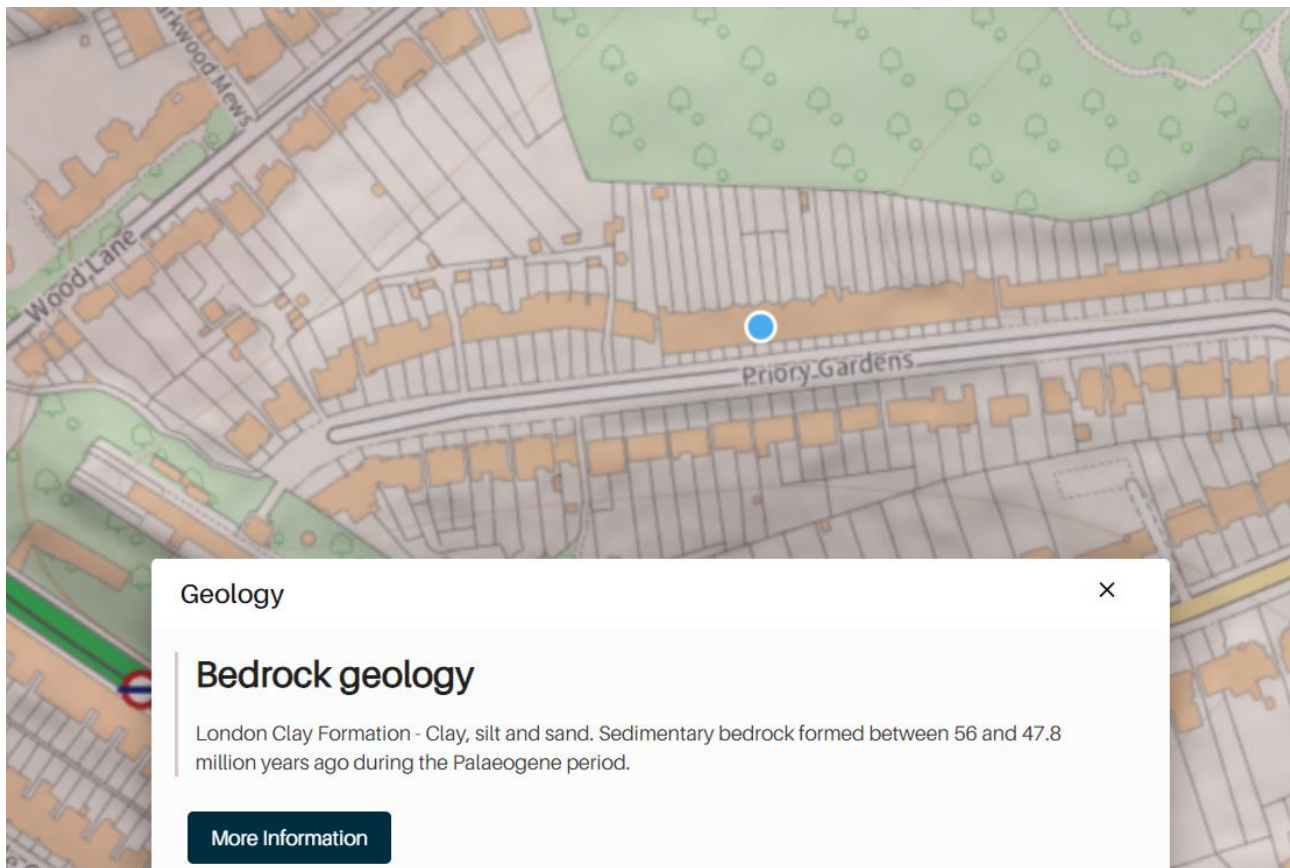


Figure 7 - BGS geology

Figure 8 – First Borehole log in the vicinity from BGS

TA/28NE/81
2855 2815

BOREHOLE No. B

Contract Name ARCHWAY ROAD..... **Report No.** 3874/SJB

Client London Borough of Haringey..... **Site Address**

Address Hornsey Town Hall..... Highgate.....
The Broadway..... London, N.W.6.
Crouch End, N.8.....

Standing Water Level 14'9"..... **Method of Boring** Shell/Auger.....

Water Struck 20'0"..... **Diameter** 6 inches.....

Ground Level 322.2 (+98.10)..... **Start** 20.12.66..... **Finish** 23.12.66.....

Remarks

JARS		CORES		BULK	
4228 2'0"	4250 50'0"	4230 3'6"			
4229 2'6"	4251 Water	4232 8'6"			
4231 7'6"		4234 13'6"			
4233 10'0"		4236 18'6"			
4235 15'6"		4238 23'6"			
4237 20'6"		4241 28'6"			
4239 25'0"		4243 33'6"			
4240 26'0"		4245 38'6"			
4242 30'6"		4247 43'6"			
4244 35'6"		4249 48'6"			
4246 40'6"					
4248 45'6"					

Description		Thickness	Depth
MGRO	Wide ground.	2'0"	2'0" 0-41
CB	Firm brown clay with occasional pebbles.	6'6"	8'6" 2-51
	Firm blue/grey mottled silty clay.	5'0"	13'6" 4-12
LC	Stiff green/brown mottled silty clay.	5'0"	18'6" 5-41
	Firm brown/blue mottled silty clay	7'0"	25'6" 7-72
	Firm blue silty clay	4'6"	30'0" 9-14
	Stiff blue fissured clay	20'0"	50'0" 15-29
TOTALS		50'0"	50'0"

Figure 9 - Second borehole log in the vicinity from BGS

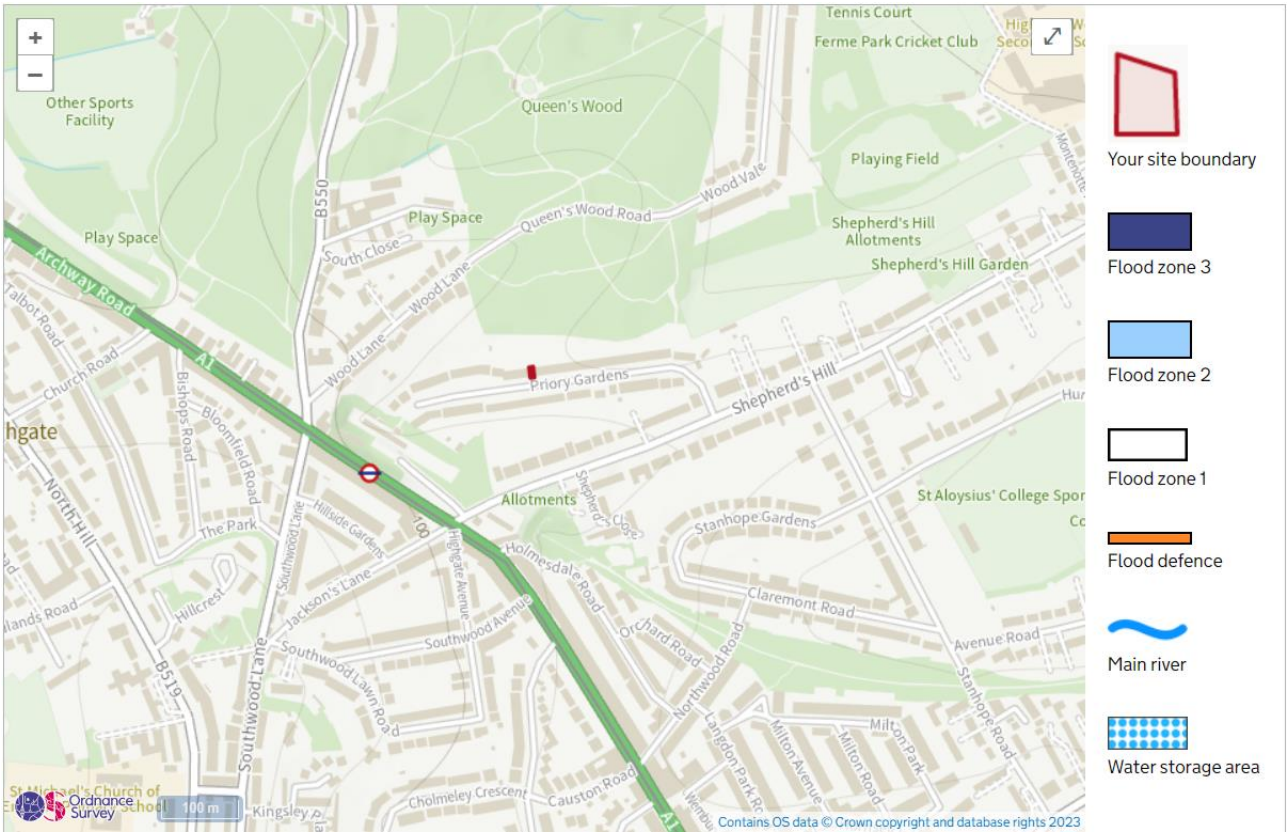


Figure 10 - Environmental Agency - Flood map for planning