January 2017

ads consultancy

251 GOLDHURST TERRACE, LONDON, NW6 3EP

STRUCTURAL ENGINEER'S REPORT: BASEMENT IMPACT ASSESSMENT

The Institution of Structural Engineers

16198/R_004/AZ

1.0 Introduction

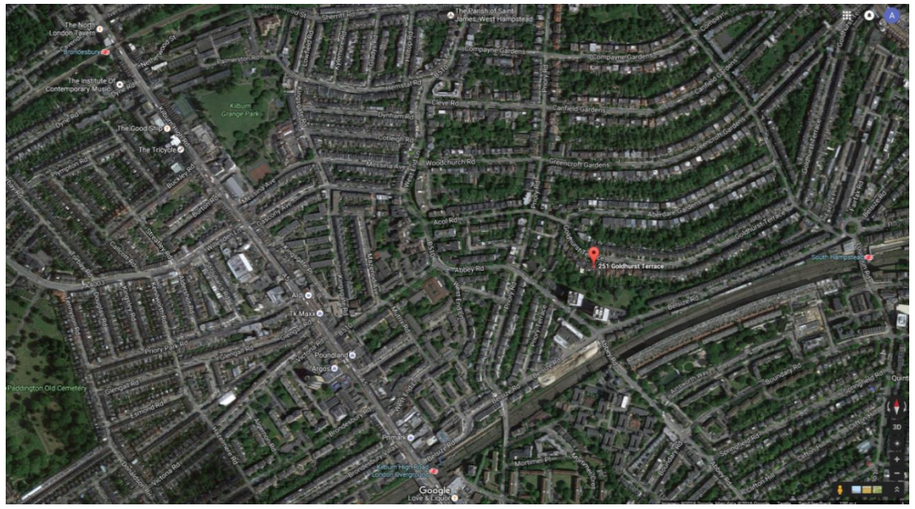
We, *ads consultancy*, were requested by *GML Architects* to compile a structural report consisting of a *Basement Impact Assessment (BIA)* for the proposed basement at 251 Goldhurst Terrace to supplement the planning application for the proposed development at the aforementioned site. To carry out our report, we have referred to ARUP's report *"Camden Geological, hydrogeological and hydrological study: Prepared for London Borough of Camden, November 2010"*. We are Chartered Engineers (Engineering Council UK) and Members of both the Institution of Structural Engineers and the Institution of Engineering and Technology. We have considerable experience in the design and construction of new build and retro-fitted basements in London and have worked on several prestigious basement developments with the UK's top basement Contractors as both Design and Build Engineers and Project Engineers for the Client.

2.0 Site Description

The site is situated on 251 Goldhurst Terrace, and comprises a three storey semi-detached residential property. The northerner boundary is formed by Goldhurst Terrace, the southern boundary is formed by gardens, the eastern boundary is formed by a terraced residential property. The site is circa 500m East of South Hampstead Overground Station and circa 800m West of Kilburn High Road Overground Station.

3.0 Scheme Proposal

The scheme consists of the demolition of the existing lower ground floor to the existing basement/cellar level and constructing a new basement at a slightly lower level with light wells at the front and rear of the property.. The scheme also proposes the part-refurbishment of the existing first floor and the construction of a new loft conversion on the third floor. The new lower ground floor excavated void will be formed via mass concrete underpins to the existing perimeter walls with a new reinforced concrete bearing slab. The underpins will be constructed in circa 1.0m sections and in a typical staggered underpinning sequence similar to that of typical underpinning. This would negate the need for major temporary works to the existing building and the existing solid masonry party walls. The "underpinned" retaining walls below the party walls will be detailed in such a way as to not obstruct the adjoining neighbouring buildings from creating basements below their properties in the future should that be required (refer to the attached drawings and sketches in the Drawing Appendix at the rear of this report).



Aerial View 251 Goldhurst Terrace (image taken from Google Maps)

4.0 Site Investigation

A detailed site investigation had been carried out on site in October 2016 to determine the structural characteristics of the soil along with determining whether any contaminants are present in the soil.

From consultation with the British Geological Survey (BGS) maps and the 2016 site investigation report, it appears that the site is located over the London clay formation. (http://mapapps.bgs.ac.uk/geologyofbritain/home.html)

In accordance with the ARUP report *"Camden Geological, hydrogeological and hydrological study: Prepared for London Borough of Camden, November 2010"* a desktop study screening has been carried out taking into account:

1. Ground conditions and flood risk / Groundwater flooding;
2. Construction techniques / Depth and location of basements;
3. Ground movements, respectively:

4.1 Ground Conditions and flood risk / Groundwater flooding

"Question 1: Is the site within the areas at risk from flooding from the Thames?"

No, the site does not fall with in an area at risk of flooding from the river Thames.

Question 2: As part of the proposed site drainage, will surface water flows (e.g. volume of rainfall and peak run-off) be materially changed from the existing route?"

No, the proposed site drainage will be reconnected into the existing outfall drain and hence follow the same route as existing.

"Question 3: Will the proposed basement development result in a change in the proportion of hard surfaced / paved external areas?"

No, proportion of hard surfaced or paved external areas will remain the same as existing.

"Question 4: Will the proposed basement result in changes to the profile of the inflows (instantaneous and long-term) of surface water being received by adjacent properties or downstream watercourses?"

No, the surface water collected by the proposed development (during construction and long-term) will not affect the profile of surface water inflow received by adjacent properties or downstream watercourses. The surface water will remain within the footprint of the property and discharge via the existing outfall drain mentioned in question 3 above and not be able to discharge to any adjoining properties.

"Question 5: Will the proposed basement result in changes to the quality of surface water being received by adjacent properties or downstream watercourses?"

No, please refer to question 4 above.

"Question 6: Is the site in an area known to be at risk from surface water flooding?

The site does not directly fall in an area known to be at a high risk from surface water flooding. It lies within a very low risk from surface water flooding. Please refer to environment agency map on page 10. In addition, the site lies within "Flood Zone 1" for flooding for rivers & sea (refer to environmental agency map on page 11)

"Question 7: Is the site in any risk of flooding from sewers?

During periods of heavy rainfall, there is an increased risk of the drains being surcharged. All drainage connections from lower ground level will be fitted with one-way no return valves to prevent the sewage system flooding the property in the event of backflow.

"Question 8: Is the site in any risk of groundwater flooding?

The detailed site investigation will establish the level of the perched water table that might be present. In any case the ground level structure will be waterproofed based on the architect's details.

4.2 Construction Techniques / Depth and location of basements

"Question 1: Is the depth and type of the existing foundations of the walls to be underpinned known?"

Yes, the existing foundation at the front of the structure is consisted of 1470mm deep corbelled brick foundations followed by further 260mm deep of mass concrete strip foundation. The party wall foundations depth with the neighbour properties is unknown due to the existence of the lower ground floor level.

"Question 2: Will the proposed basement extend beneath the water table surface?"

From review of the borehole data from the old site investigation, it appears that the proposed basement will not extend below the water table surface. (http://mapapps2.bgs.ac.uk/geoindex/home.html)

"Question 3: Given the existing ground conditions, ground water conditions, the type of the existing structure and the depth of the proposed basement, which construction technique will be employed for the proposed basement?"

Based on the above, and especially the fact that the level of the lower ground floor will be lowered between 1.6-2.0m, underpinning sequence of the existing party walls should not have any significant impact on the existing structure or the neighbouring ones. Please refer to section 5.0 Construction Methodology on page 5.

4.3 Ground Movements and Slope Stability

"Question 1: Does the existing site include slopes, natural or manmade, greater than 7°? (approximately 1 in 8)"

Yes, the existing garden falls from front to rear garden.

"Question 2: Will the proposed re-profiling of landscaping at site change slopes at the property boundary to more than 7°? (approximately 1 in 8)"

No, the proposed site is relatively level.

"Question 3: Does the development neighbour land, including railway cuttings and the like, with a slope greater than 7°? (approximately 1 in 8)"

No, the existing adjoining properties, etc are relatively level.

"Question 4: Is the site within a wider hillside setting in which the general slope is greater than 7°? (approximately 1 in 8)"

No, the existing adjoining wider landscape, etc is relatively level.

"Question 5: Is the London Clay the shallowest strata at the site?"

Yes., from the review of the historical boreholes data, it is evident that there is a circa 1.0m of made ground over London Clay. This will be confirmed by the proposed detailed site investigation.

"Question 6: Will any tree/s be felled as part of the proposed development and/or are any works proposed within any tree protection zones where trees are to be retained?

No, there is no intension to cut any existing trees.

"Question 7: Is there a history of seasonal shrink-swell subsidence in the local area, and/or evidence of such effects at the site?"

There is no such evidence to indicate seasonal shrink-swell subsidence in the vicinity of the site.

"Question 8: Is the site within 100m of a watercourse or a potential spring line?"

No, the site is not within 100mm of a watercourse or a potential spring line (see attached Figure 4 on sheet 10).

"Question 9: Is the site within an area of previously worked ground?"

No. Based on the historical boreholes samples the site is not within an area of previously worked ground. This will be accurately determined after the proposed detailed site investigation has been carried out.

"Question 10: Is the site within an aquifer?"

No. Based on Figure 8-Sheet 12, the site falls within the unproductive strata.

"Question 11: Is the site within 50m of Hampstead Heath ponds?"

No, the site is not within 50m of Hampstead Heath ponds.

"Question 12: Is the site within 5m of a highway or pedestrian right of way?"

No. the site is not within 5m of a highway or pedestrian street.

"Question 13: Will the proposed basement significantly increase the differential depth of foundations relative to neighbouring properties?"

The property is a semi-detached residential building and therefore said neighbouring buildings will surcharge the proposed basement, so we will need to underpin neighbouring buildings foundations.

"Question 14: Is the site over (or within the exclusion zone of) any tunnels, e.g. railway lines?"

No.

5.0 Construction Methodology

1) Once the existing lower ground floor slab to the existing basement/cellar has been sufficiently demolished and the site is made safe, underpinning of the existing perimeter masonry walls from inside of the building will commence. The front & rear elevation load bearing masonry walls can be supported by means of steel box frames at ground floor level, thus can be demolished at basement level & rebuilt as required at a new level.

2) Provide temporary propping and associated bracing to all existing perimeter walls to prevent any potential movement.

3) Commence mass concrete underpinning of existing surrounding walls to the property as indicated on the proposed lower ground floor plan. Sequencing of underpinning is to be agreed with the Contractor and Structural Engineer prior to works commencing. Contractor must ensure that adequate temporary lateral supports are installed during construction sequence. This is to provide lateral stability to the new reinforced concrete pins and the adjoining structures.

4) At the same time, construction of the front and rear light wells can commence. The retaining walls along the boundaries of the property where it neighbours with 249 & 253 Goldhurst Terrace will be built in underpinning sequence. Then the soil between can be excavated & the remaining retaining walls (i.e. to the front & rear) constructed.

5) After all the underpinning works have been completed commence on the excavation of the remaining central section of the existing basement/cellar to the proposed formation level, ensuring at all times that adequate lateral supports have been installed and maintained at all stages. This is in order to maintain the lateral stability of the newly underpinned surrounding walls.

6) Once the excavations have been completed complete construction of the new reinforced concrete raft slabs as indicated on the proposed drawings.

7) Remove all lateral supports in the new basement ensuring at all times that Health and Safety Procedures have been adhered to.

8) In the event that minor ingress of ground water occurs during the execution of the works this will be dealt with by the use of temporary sump pumps. In the permanent condition waterproofing to the new basement will be based on the Architects proposed details.

Examples of Temporary Support to Underpins and Construction of raft slab

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Drawing Appendix

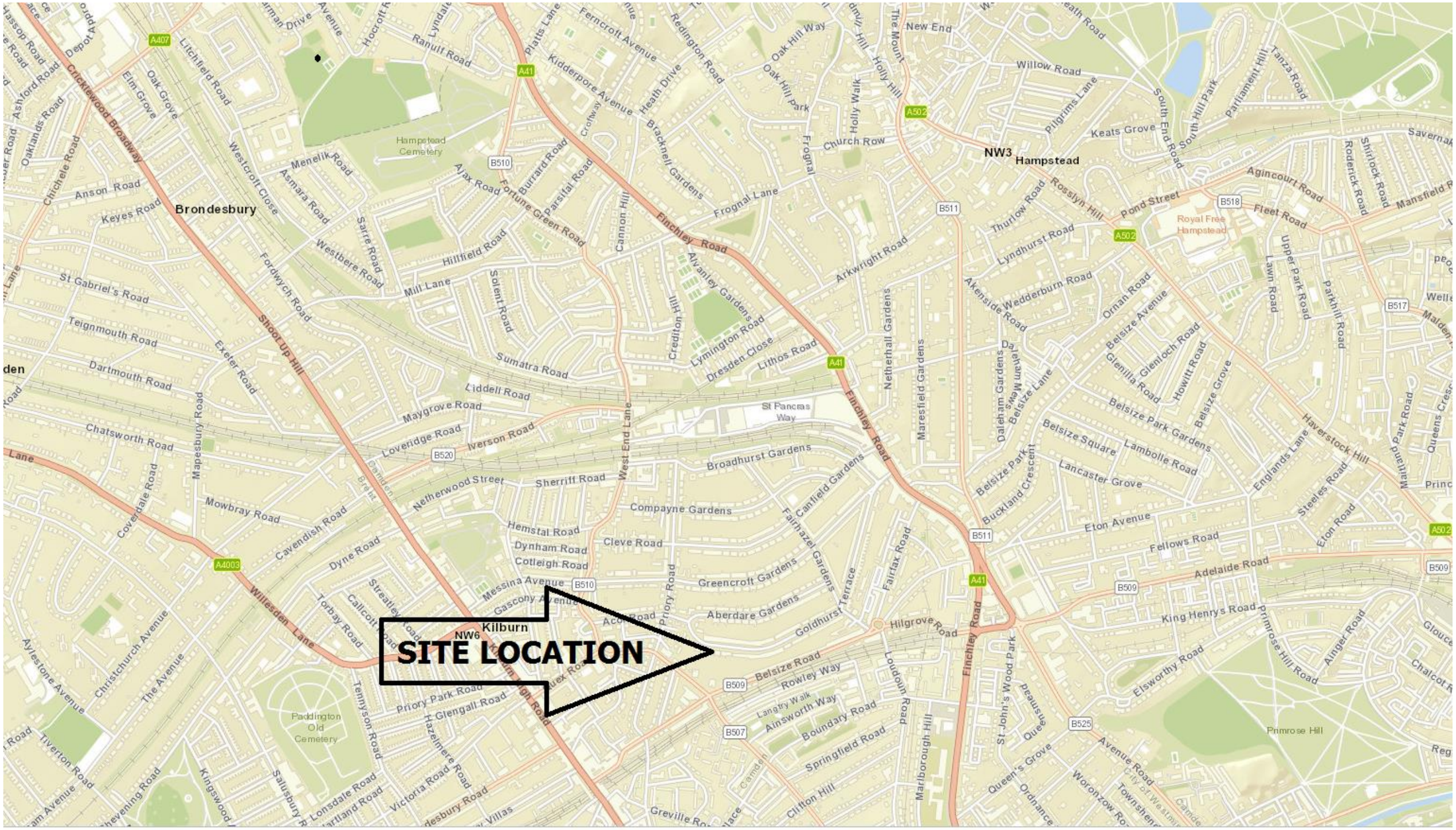

Figure 1: The site's location within London Borough of Camden.

(Extract from ARUP report *"Camden Geological, hydrogeological and hydrological study: Prepared for London Borough of Camden, November 2010")*

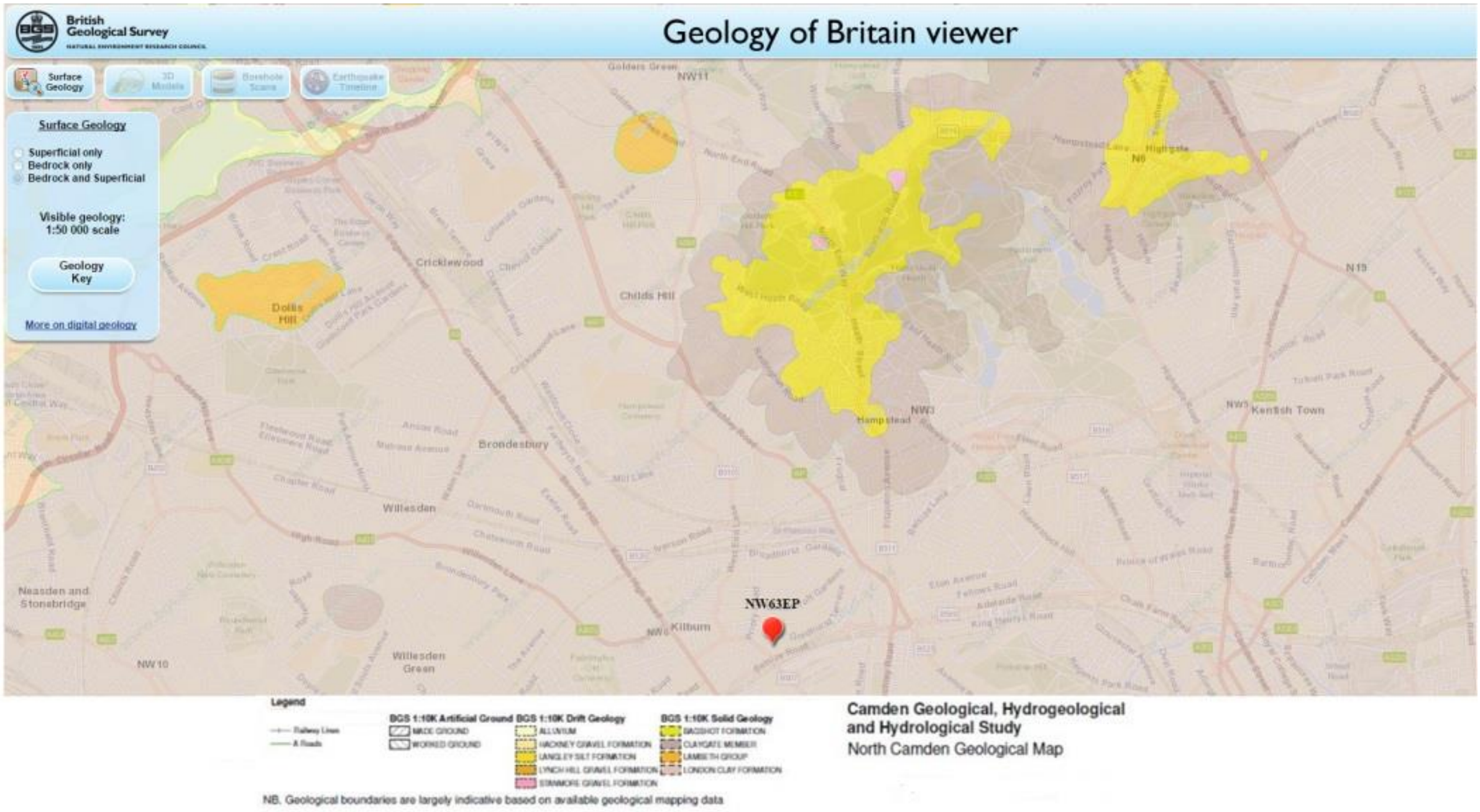

Figure 2: General Topography/Geology within London Borough of Camden.

(Extract from ARUP report *"Camden Geological, hydrogeological and hydrological study: Prepared for London Borough of Camden, November 2010")*

Figure 3: Risk of flooding from reservoir within London Borough of Camden.

(Extract from ARUP report *"Camden Geological, hydrogeological and hydrological study: Prepared for London Borough of Camden, November 2010")*

Figure 4: Risk of flooding from surface water within London Borough of Camden.

(Extract from ARUP report *"Camden Geological, hydrogeological and hydrological study: Prepared for London Borough of Camden, November 2010"*)

Figure 5: Flood risk zone for rivers and sea within London Borough of Camden.

(Extract from ARUP report *"Camden Geological, hydrogeological and hydrological study: Prepared for London Borough of Camden, November 2010")*

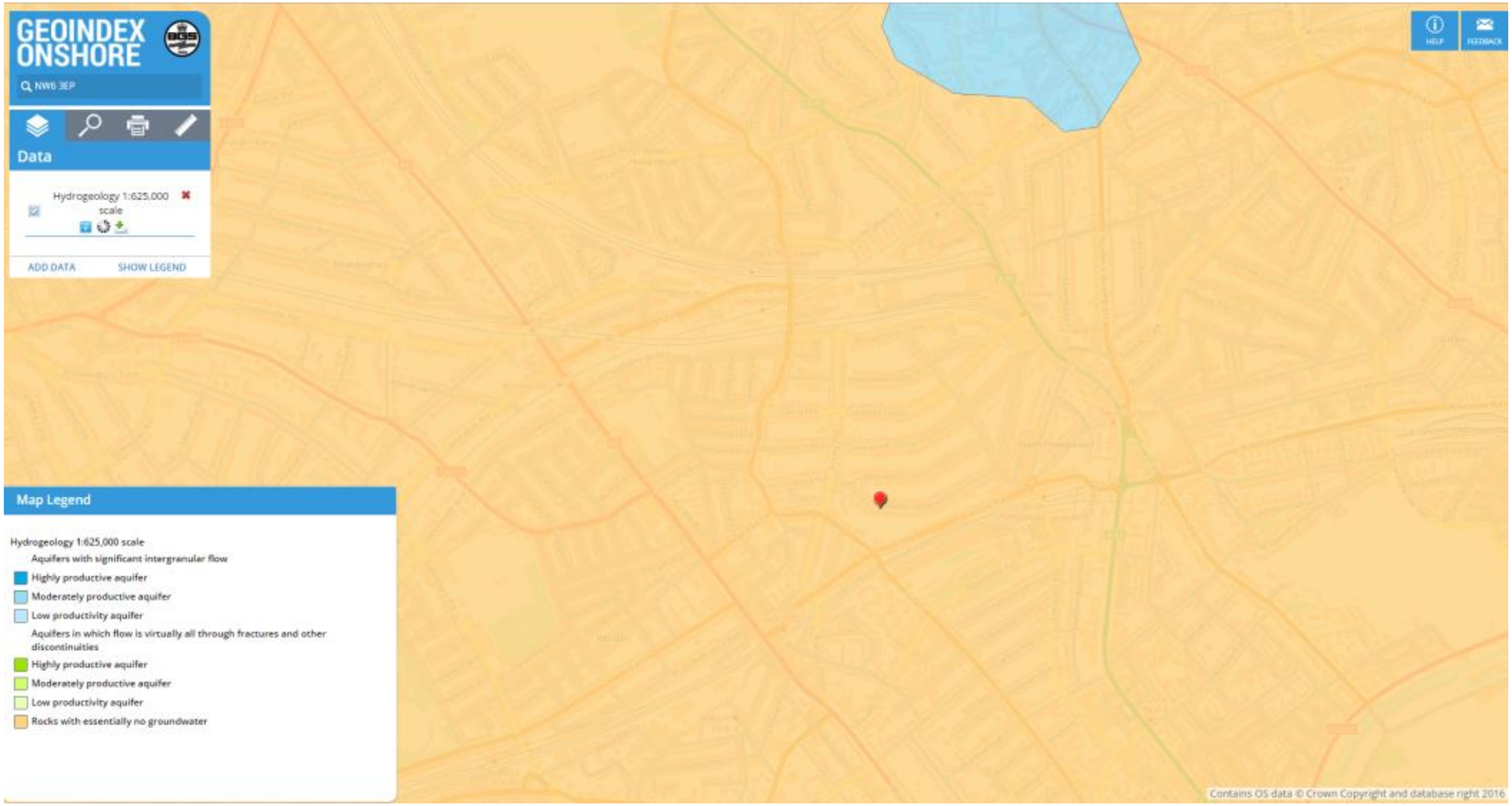

Figure 6: Aquifer Designation map within London Borough of Camden.

(Extract from ARUP report *"Camden Geological, hydrogeological and hydrological study: Prepared for London Borough of Camden, November 2010")*

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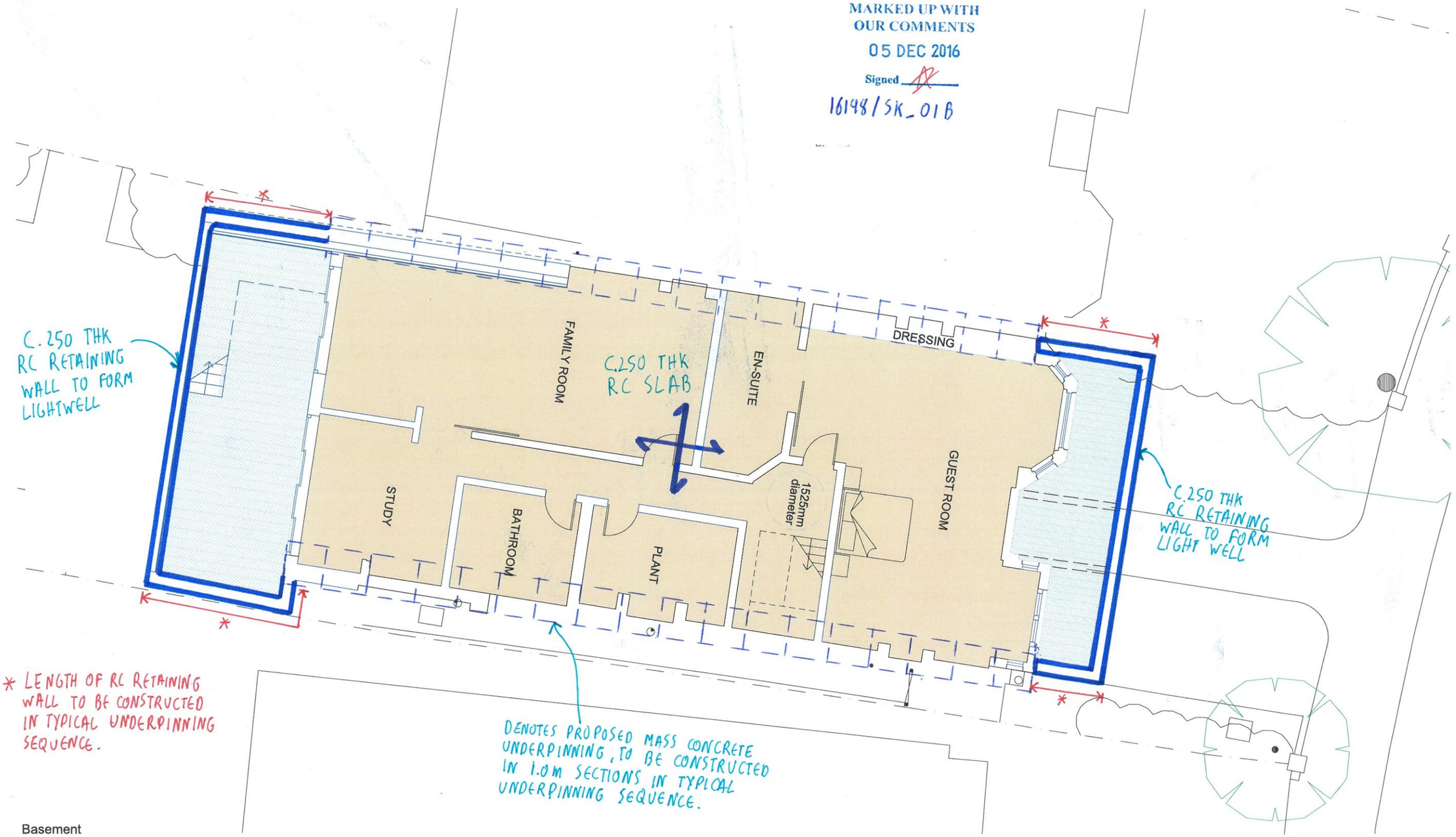

Basement

0 1 2 3 5 10

NOTES:
Do not scale from this drawing

PLANNING APPLICATION
251 GOLDHURST TERRACE
Proposed Basement Plan

December 2016

G M L Architects
UNIT 3,1-4 Christina Street, London EC2A 4PA
Tel: 020 7729 9595 Fax: 020 7729 1801 info@gmlarchitects.co.uk

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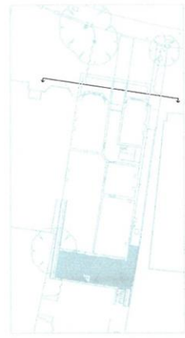
251 Goldhurst Terrace
NW6 3EP



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Note:
New glazing - Timber frame windows to match existing at front, and aluminium frame to rear.

1. Brick (to match existing)
2. New Glazing
3. Timber Balustrade
4. Glass Balustrade
5. Roof Tiles (to match existing)
6. Metal Balustrade (to be wrought in iron late Victorian era in style)
7. Brick Soldier course lintels

0 1 2 3 5 10

NOTES:
Do not scale from this drawing

PLANNING APPLICATION
251 GOLDHURST TERRACE
Proposed Front Elevation

December 2016

G M L A r c h i t e c t s
UNIT 3,1-4 Christina Street, London EC2A 4PA
Tel: 020 7729 9595 Fax: 020 7729 1801 info@gmlarchitects.co.uk

SCALE: 1:100@A3, 1:50@A1
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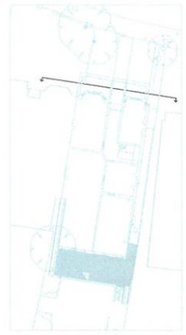
251 Goldhurst Terrace
NW6 3EP



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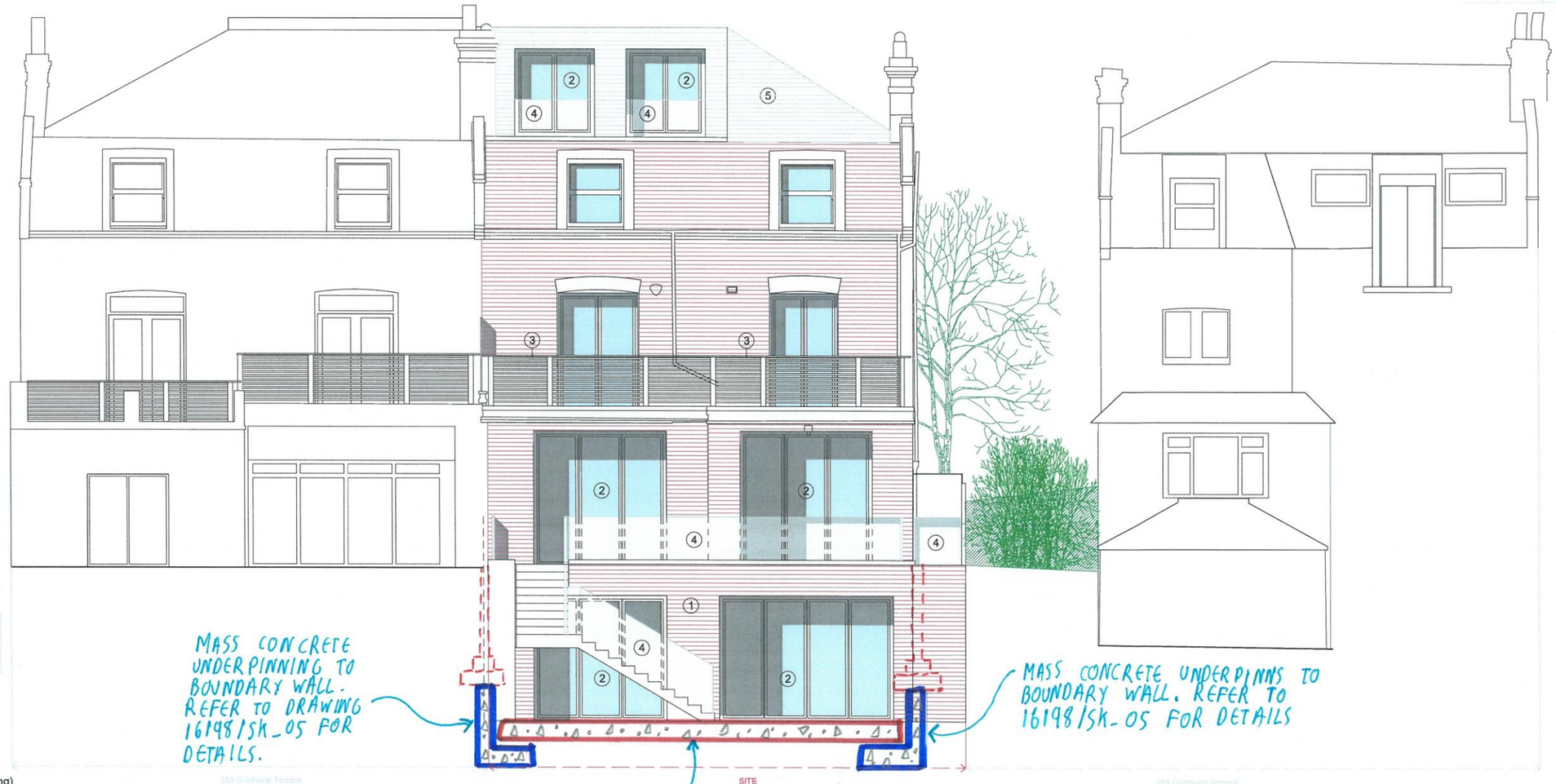

Note:
New glazing - Timber frame windows to match existing at front, and aluminium frame to rear.

1. Brick (to match existing)
2. New Glazing
3. Timber Balustrade
4. Glass Balustrade
5. Roof Tiles (to match existing)
6. Metal Balustrade (to be wrought in iron late Victorian era in style)
7. Brick Soldier course lintels

0 1 2 3 5 10

NOTES:
Do not scale from this drawing

PLANNING APPLICATION
251 GOLDHURST TERRACE
Proposed Rear Elevation

December 2016

G M L Architects
UNIT 3,1-4 Christina Street, London EC2A 4PA
Tel: 020 7729 9595 Fax: 020 7729 1801 info@gmlarchitects.co.uk

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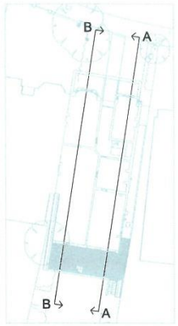

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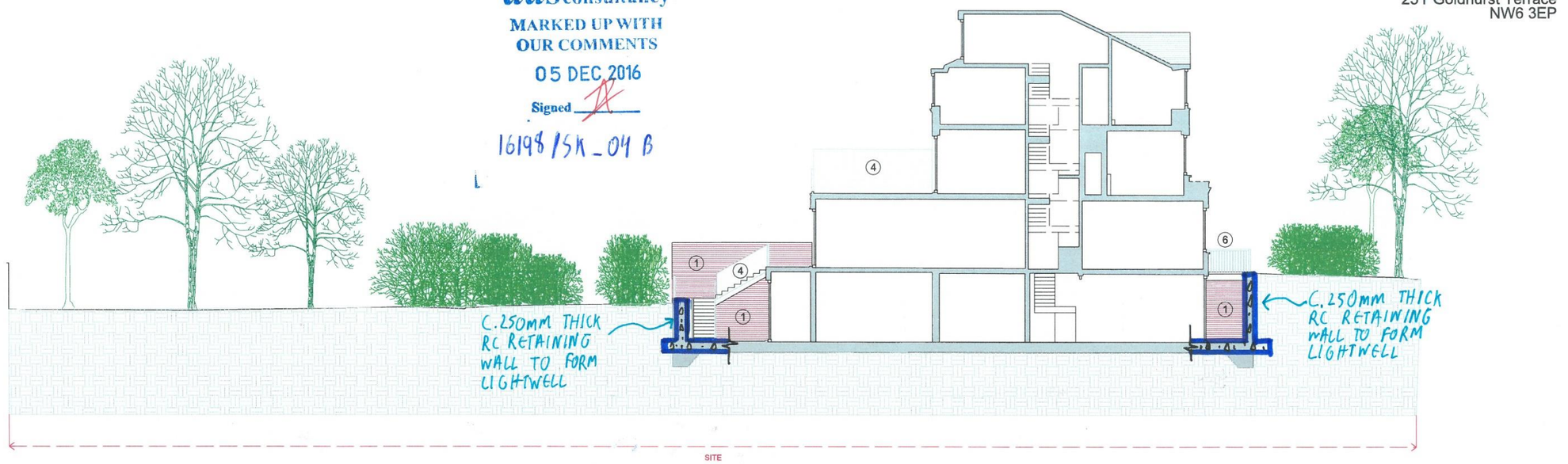
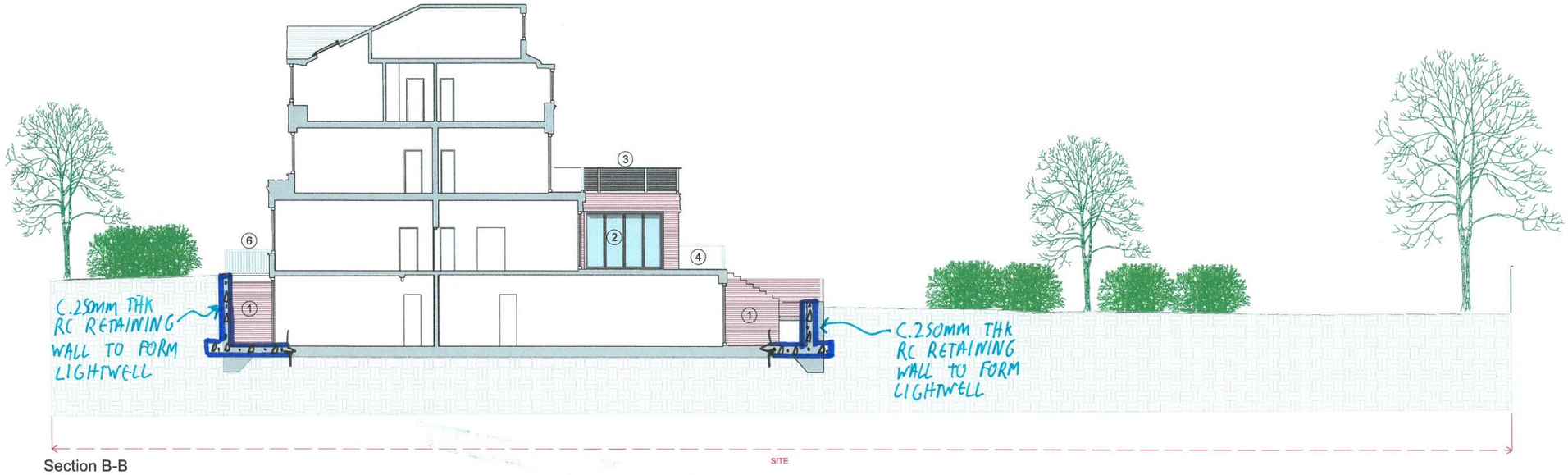


Section A-A



Section B-B

(1) Brick (to match existing)
(2) New Glazing
(3) Timber Balustrade
(4) Glass Balustrade
(5) Roof Tiles (to match existing)
(6) Metal Balustrade

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NOTES:
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PLANNING APPLICATION
251 GOLDHURST TERRACE
Proposed Sections

December 2016

G M L A r c h i t e c t s
UNIT 3,1-4 Christina Street, London EC2A 4PA
Tel: 020 7729 9595 Fax: 020 7729 1801 info@gmlarchitects.co.uk

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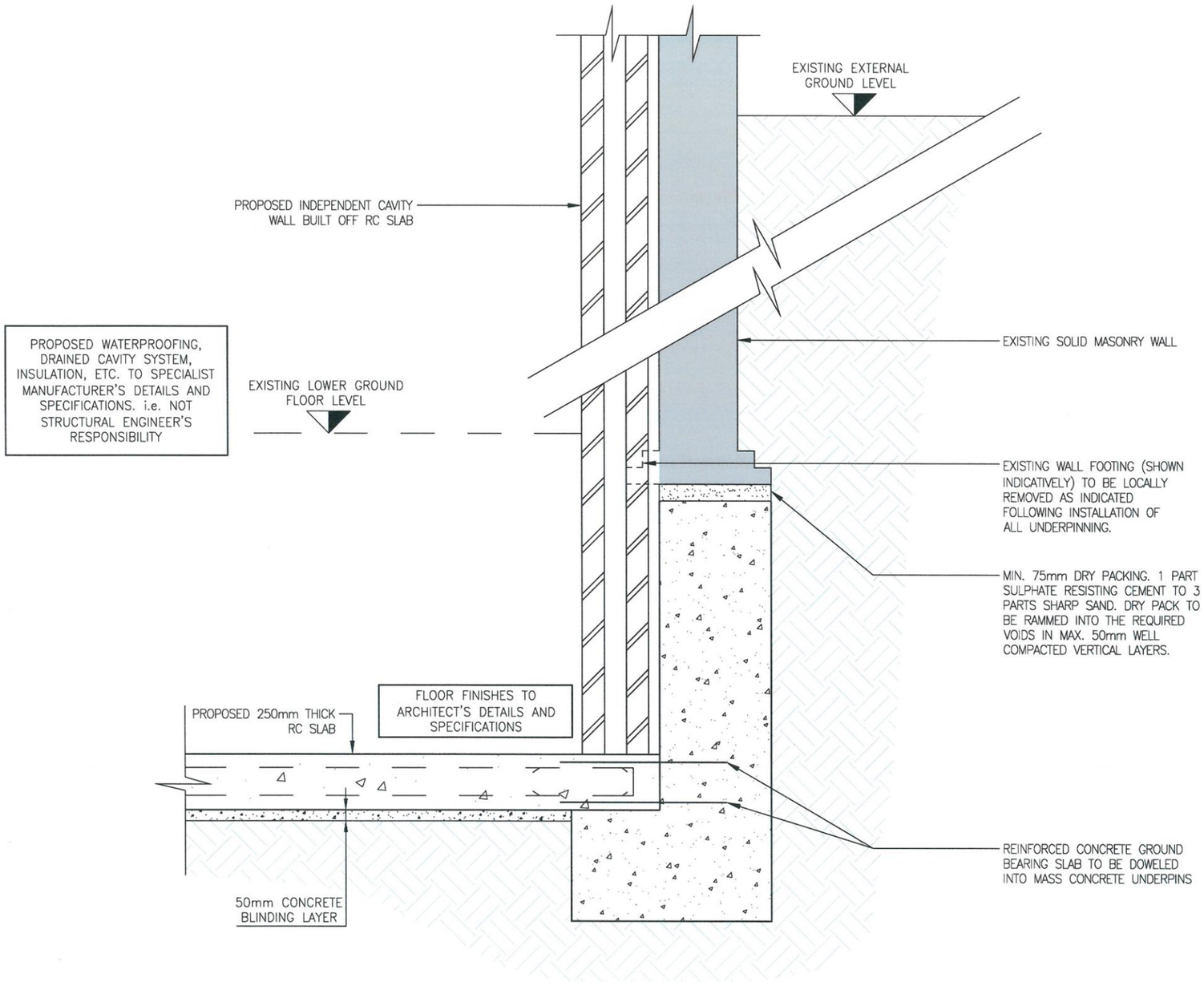

TYPICAL MASS CONCRETE UNDERPIN WALL DETAIL

SCALE 1:20 @ A3

Revision	Description	By	Appd.	Date

Drawing Status: PRELIMINARY

ads consultancy
consulting structural engineers
130 East Barnet Road
New Barnet
Herts EN4 8RE
tel : 020 8441 4123
fax: 020 8441 7114
mail@adsconsultancy.com

Client: 483 NCR Ltd

Architect: GML Architects

Project: 251 Goldhurst Terrace LONDON, NW6 3EP

Title: TYPICAL UNDERPIN WALL DETAIL

Drawn:	Chkd/Appd:	Date:
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Drawing Number: 16198/SK05		Revision: P1