



Project Number: 23327
Project Name: 3 Curzon Road,
Muswell Hill
London
N10 2RB

Report Title: Basement Impact Assessment & Structural Method Statement

Client: Mayfair Trading Co. Ltd

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01	18.08.2023	Initial issue for comment
02	22.08.2023	Minor amendments
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Report By:

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1.0 Introduction

- 1.1 Braemar Structural Design Ltd have been appointed by Mayfair Trading Co. Ltd to provide a basement impact assessment and construction method statement for the planning application of the proposed development at 3 Curzon Road, Muswell Hill, London, N10 2BA. A site location map is included in Figure 1.1 with the site shown in red.



Figure 1.1 – Site Location Map

- 1.2 The proposed application seeks to provide a full footprint basement under the existing house and part of the existing garden which is to also have a ground floor extension above. The existing house and proposed extension will then provide 4 new residential units over basement, ground, first and second floors.
- 1.3 The purpose of this Structural Engineer's report is to set out the impact of the basement in relation to the expected ground conditions and neighbouring structures. The report considers the London Borough of Haringey Policy "DM18: Residential Basement Development and Light Wells".
- 1.4 An outline of the proposed structural method statement is included in this report. This is based on the desktop study findings of this report only.

2.0 Site History

- 2.1 The existing building is a two storey semi detached Victorian residential dwelling. The main external and internal loadbearing walls are assumed to be of solid masonry construction with timber internal floors. The existing pitched roof is also assumed to be timber framed with slate roof tiles.

- 2.2 There is a small cellar to the existing property located at the front of the property adjacent to the existing party wall with number 5 Curzon Road. The existing cellar is approximately 1.5m deep with the cellar floor being approximately 1.1m below the ground level to the front of the property.
- 2.3 The site is approximately rectangular in shape and is bounded to the front (East Elevation) by Curzon Road. Curzon Road itself predominantly comprises similar Victorian terraced and semi-detached properties.
- 2.4 The property is believed to have been constructed in the late 19th / early 20th century.

3.0 Historic Damage

- 3.1 Given the age of the structure and the surrounding properties being of a similar age and construction it is considered that there is unlikely to be any historical damage or unexploded ordnance (UXO) from WW2.
- 3.2 Given the extent of the excavation required to the rear of the property for the proposed basement and external sunken terrace we would recommend that a preliminary Unexploded Ordnance (UXO) assessment is carried out on the site prior to any groundworks being carried out on site by a specialist survey company.

4.0 Listed Buildings

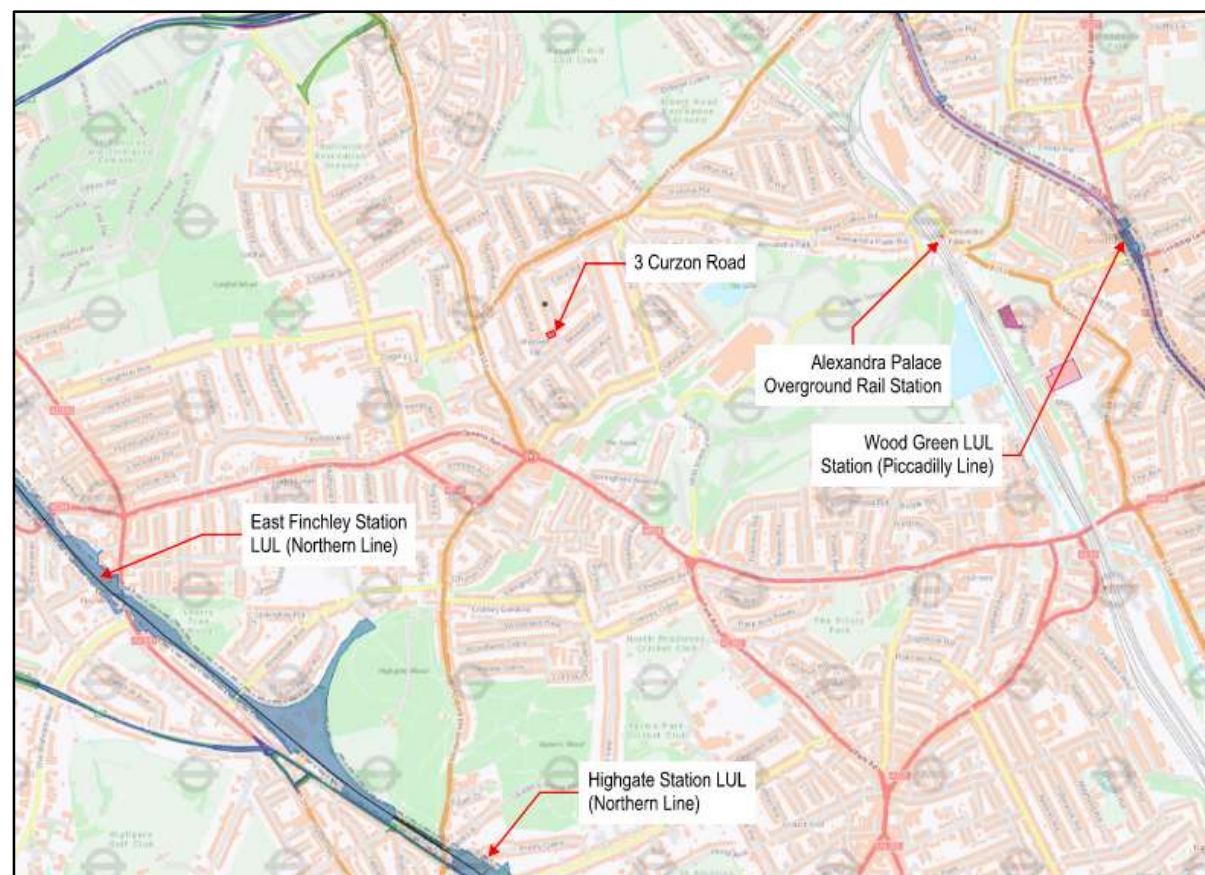
- 4.1 The illustration below in figure 4.1 is an extract from the Historic England website and confirms that there are no listed buildings, areas of archaeological priority or scheduled monuments on or within 100m of the site. The blue markers identify the listed buildings, the nearest to the site being the Muswell Hill Baptist Church (400m South) and Alexandra Palace & Gardens (600m East).
- 4.2 The proposed development is considered to be far enough from any listed buildings to have no structural impact on them.



Figure 4.1 – Extract from historicengland.org.uk (Site location indicated)

5.0 London Underground Infrastructure

- 5.1 The site is well served by nearby overground and underground rail with the Piccadilly Line to the east and the Northern Line to the South West. The nearest overground station is Alexandra Palace which is located to the east of the site.
- 5.2 The Nearest London underground asset is the Northern Line which runs through East Finchley Station and is located approximately 1.9 km to the South-West of the site.
- 5.3 The nearest Piccadilly line station is Wood Green which is located 2.15 km to the East of the Site.
- 5.4 The nearest above ground rail line runs through Alexandra Palace Station and is approximately 1.46 km to the North East of the site.
- 5.5 The locations of the nearest stations and the existing rail lines are shown on the below image taken from the Transport for London Property Asset Register Public Web Map.



- 5.6 The proposed development and basement construction are therefore deemed to be far enough from any TFL or overground rail assets for the proposed works to not have an impact on either of these.

6.0 Site Geology

- 6.1 The following is based on a Desk study of the existing site and assumed ground conditions. No intrusive investigations have been carried out on site in preparing this report. A full site specific geotechnical

investigation will need to be carried out by a specialist Geotechnical contractor prior to the detailed design phase of the project.

- 6.2 The desk top study suggests that the site will likely be London Clay from ground (or just below ground) level to a significant depth as is common across much of London. There are nearby occurrences of Dollis Hill Gravel (Sand & Gravel) as can be seen from the below extract from the British Geological Society viewer. These appear to be located at higher elevations near to the site as the ground rises up towards Muswell Hill. If the Dollis hill gravel layer is encountered on site it is assumed to be relatively shallow and the proposed basement construction which likely extend through this into the London Clay below.
- 6.3 The main bearing strata under the site into which the basement will extend is therefore assumed to be London Clay with an anticipated thickness of 15m+.
- 6.4 Below is an extract from the British Geological Society (BGS) Geology Viewer (figure 6.1) showing the above noted ground conditions. Local borehole records have also been reviewed and while none were in close proximity of the site they generally agreed with the above assumptions.



Figure 6.1 – Extract from BGS Online Geology Viewer

7.0 Hydrogeology & Flood Risk

- 7.1 The site is located within Flood risk zone 1, defined as "little or no" risk of flooding from river, tidal or coastal sources (<0.1%). Figure 5 below for an extract from the Government's Flood Map for Planning website. showing the flood risk across the borough.

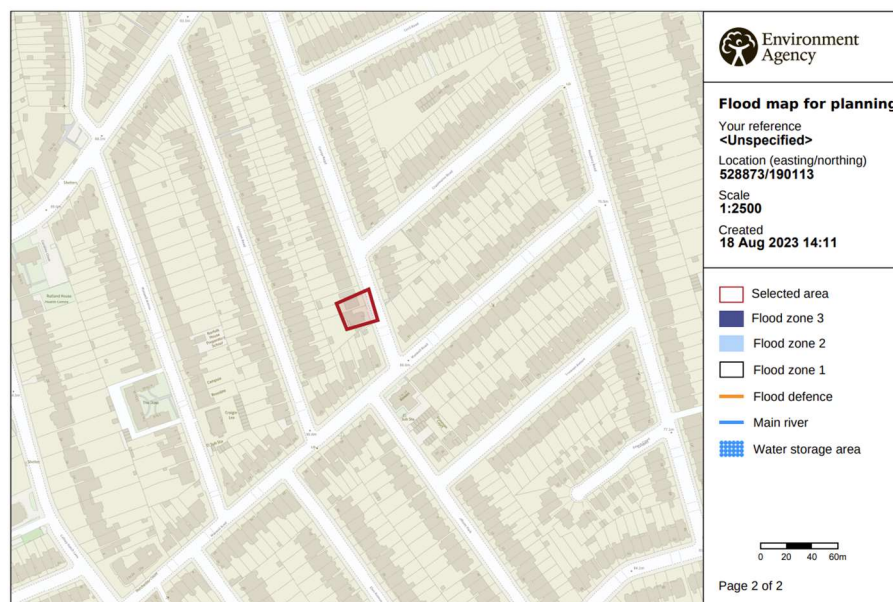


Figure 5 – Extract from Environment Agency Flood Map for Planning

- 7.2 A review of the Lost rivers of London has shown that there is an underground stream (Muswell stream) in the vicinity that rises on Muswell Road close to the site. We were unable to ascertain the exact location of the spring but understand that the main stream has been diverted and culverted along Muswell Road and under Rosebery Road and Grove Avenue to the North East of the site. Given the topography of the area it is likely that the watercourse runs to the south of the site under Muswell Road.
- 7.3 The site is also not located within an area designated as an aquifer (either principal or Secondary). The BGS Aquifer designation map also indicates that the site is in an area of “Low” to “unproductive” groundwater vulnerability.

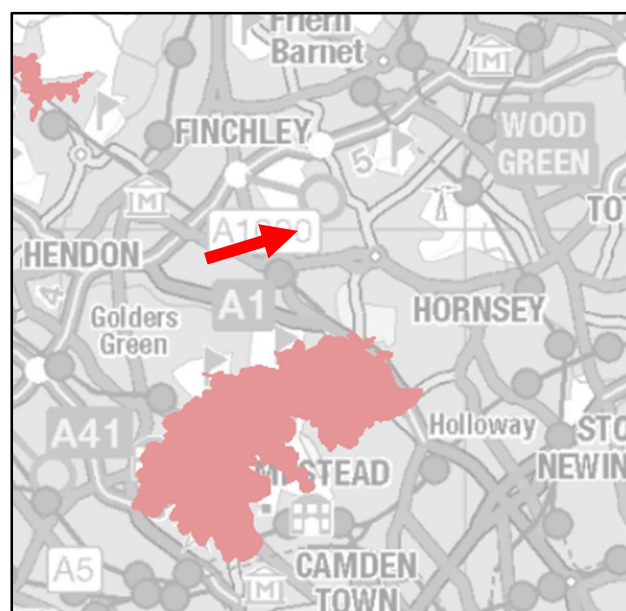


Figure 6 – Extract from BGS Aquifer Designation Map

- 7.4 Based on the above, it is considered that the site is at low risk of causing any significant diversions to groundwater flows. The depth of the proposed construction will likely extend into the London clay strata which has a very low permeability and will present a minimal risk of significant diversions to any groundwater flows that may be present.
- 7.5 There will be some risk of perched water tables above the London Clay strata which will need to be managed during the excavation of the proposed basement.
- 7.6 A suitable internal drainage system within the proposed basements will also be implemented as part of the new development to manage any groundwater flows into the site.

8.0 Proposed Basement Construction

- 8.1 The existing structure is to be underpinned around the full perimeter in order to provide the required basement. The underpinning will be reinforced and will also act as a retaining wall to maintain stability to the surrounding ground and structures.
- 8.2 The proposed basement will be constructed by utilising sectional underpinning techniques to all of the perimeter and internal load bearing walls. Appendix A contains a drawings showing the proposed sequence of works for carrying out underpinning works to the existing property.
- 8.3 The basement walls will be excavated in 1m wide sections in a hit / miss sequence (to be determined during the detailed design stage). Each section will be cast with a mass concrete foundation and a reinforced concrete retaining wall which will provide the vertical and lateral support to the surrounding ground and properties.
- 8.4 Upon completion of each section, and given sufficient curing time, the next stage in the sequence will be carried out until the full perimeter and the internal loadbearing walls of the basement have been underpinned.
- 8.5 Upon completion of the full underpinning works, the remainder of the basement can be excavated and the remaining section of basement raft slab installed throughout.
- 8.6 Temporary propping will be required and installed throughout the full excavation and construction of the proposed basement. Refer to section 11 below for further details.
- 8.7 Additional reinforced concrete retaining walls will be cast around the proposed lightwell to the front of the property, the sunken terrace to the rear as well as the new lowered side access between No.3 and No. 1 Curzon Road. These will be constructed in a similar manner to the underpinning and will be carried out in sections to minimize any potential ground movements while the works are carried out.
- 8.8 Utilising this method of construction will minimise the potential for significant settlements of the existing property and the adjacent properties. It will also ensure that the vertical support is maintained to all structural elements throughout the construction process. This method has also been constructed on numerous developments across the borough and wider city of London and is generally accepted for the purposes of underpinning existing structures to form basements.

9.0 Drainage

- 9.1 The drainage design is to be carried out by others however an assumed basement drainage scheme is as follows.
- 9.2 A CCTV survey of the existing drainage from the site will be carried out in order to determine the foul and surface water sewer from the site. It is likely that the new below ground drainage to the basement and sub-basement areas will require a pumped solution, due to the lowest part of the proposed basement being approximately 3.0m below the existing ground floor level.
- 9.3 The flow from the upper levels will route out under gravity to the front of the site as per the assumed existing condition.
- 9.4 Where possible the connection back to the main sewer within the street will be maintained, with a new connection formed onto this within the property boundary.

10.0 Design Criteria

- 10.1 The proposed structure is to be designed in accordance with the latest Eurocodes and Building Regulations.
 - 10.2 Deflections:
 - 10.2.1 The deflections of the new structure will be designed to meet the following criteria:
 - Concrete Elements (in-situ and precast):
Vertical deflection of floor slabs and beams will be limited to deflections under total loads:
Continuous = $[\text{span} / 250]$
Cantilevers = $[\text{span} / 125]$
 - Deflections under live loads:
Internal = $[\text{span} / 360]^*$
Perimeter = $[\text{span} / 500]^*$
Cantilevers = $[\text{span} / 175]^*$
*or 20mm whichever is the lesser
Differential deflection between any two floors = +20mm
 - Steelwork Elements:
Vertical deflection of beams will be limited to:
Deflections under total load
simply supported = $[\text{span} / 250]$
cantilever = $[\text{span} / 125]$
 - Deflections under live loads:
simply supported = $[\text{span} / 360]^*$
cantilever = $[\text{span} / 180]^*$
perimeter = $[\text{span} / 500]^*$
*or 20mm whichever is the lesser
- All cladding finishes and services must be designed and detailed to accommodate the worst combination of these.

- 10.3 Durability:
 - 10.3.1 Long term durability of the concrete structure will be achieved by providing adequate cover to reinforcement as recommended in BS EN 1992. A detailed phase II site Investigation will be carried out in order to determine the BRE design class (DS) and an ACEC class (AC) for concrete elements in contact with the ground.
 - 10.3.2 Corrosion protection of the steel structure will be achieved by a suitable paint system which provides a life to first major maintenance of 10 to 15 years.
 - 10.3.3 Timber achieves a 50-year lifespan when located in an internal heated environment, detailed architecturally to allow the structure to breathe using vapour control layers.
- 10.4 Fire Protection:
 - 10.4.1 It is assumed that the fire rating for the structure to the proposed building will be 90mins, although this is subject to confirmation from the fire consultant / Architect.
 - 10.4.2 Fire protection to new reinforced concrete structure will be achieved by providing cover to the reinforcement and minimum concrete section sizes as recommended in BS EN 1992.
 - 10.4.3 Fire protection to steelwork elements is to be determined by the Architect. This may take the form of spray applied systems, fire boarding or intumescent paints.
- 10.5 Tolerances:
 - 10.5.1 The frame will be constructed to be within the tolerances set down in the technical specifications and the recommendations of BS 5606. All finishes, cladding, services, internal partitions are required to be detailed to accommodate the worst combination of these.
- 10.6 Structural Robustness:
 - 10.6.1 The new basements of the buildings will be designed in accordance with the relevant design standards to satisfy the requirements for robustness. The basements fall within Consequence class 1 according to the Building Regulations.

11.0 Party Wall Act

- 11.1 The proposed development falls within the scope of the Party Wall Act 1996. Procedures under the Act will be dealt with by the client's party wall surveyor. The party wall surveyor will prepare necessary notices under the provisions of the Act and agree party wall awards.
- 11.2 The contractor will be required to provide the party wall surveyor with appropriate drawings, method statements and all other relevant information covering the works that are notifiable under the Act, which will necessitate confirmation of existing footing profiles for each condition. The resolution of matters under the Act and provision of the party wall awards will protect the interests of all owners.
- 11.3 Where required, condition surveys of the adjoining and nearby properties will be undertaken prior to commencement of the site works.
- 11.4 The proposed works to form the basements will be designed and detailed so that any movement of any existing structures is no worse than "Category 2", defined as slight within the BRE digest 251 table 1 and Ciria 580 (Burland et al). This will be agreed as part of the party wall process.

12.0 Temporary Works

- 12.1 The design of the temporary works and the temporary stability of any existing structures or ground to be retained as part of the permanent works is entirely the responsibility of the contractor. The contractor is to submit an overall Method Statement a minimum of four weeks prior to a site start and detailed drawings and calculations a minimum of four weeks prior, which are to include an assessment of the anticipated ground movement due to temporary works and piling, this is to cover each stage of construction, initial excavation, propping, full excavation etc.
- 12.2 The contractor will be required to appoint a Temporary Works Co-ordinator for the duration of the contract.

13.0 Movement & Monitoring Strategy

- 13.1 It is not anticipated that any movement of the basement during its formation will cause significant damage to the buildings surrounding the site and will be limited to a maximum category 2 as set out in CIRIA report 580 'Embedded Retaining Walls'. It is anticipated that, as part of the Party Wall process, movement monitoring will be required to all adjoining structures and a full monitoring regime will be put in place prior to any construction activities on site.
- 13.2 Possible method of monitoring movement is set out below:

Movement Category	Measured Movement	Action
Green	Movement recorded below predicted limits	Continue Work
Amber	Movement recorded approaching predicted limits	The Contractor is to notify the Engineer and review the construction sequence
Red	Movement recorded is beyond the predicted limits	The Contractor is to immediately cease the construction works and install temporary support as required to prevent further adverse movement. Notify the Engineer immediately., These measures are to be kept in place until such time as they have been reviewed and deemed safe to be removed.

- 13.3 The contractor is to monitor the site during all phases of the construction works. A minimum of daily full visual inspections of all temporary works and surrounding structures and a twice weekly measured survey of the proposed basement structure using survey points as agreed with the Party Wall surveyors.
- 13.4 The nature and frequency of monitoring should be appropriate to the phase of the works and include readings prior to commencement of the works (to be used as a base reading) and once the construction stage is complete.
- 13.5 The movement measured by survey points are to be in both the horizontal and vertical directions. The limits of any movement may be set against the colours green, amber and red.

14.0 Conclusions

- 14.1 The findings of this report show that the proposed basement can be constructed in accordance with best practice. The report has highlighted no novel or contentious issues.
- 14.2 The proposed basement will require underpinning works to be carried out to the property in question as well as to the properties on either side. These works will need to obtain separate party wall awards prior to any works being carried out on site.
- 14.3 The underlying geology is assumed to be predominantly London clay from near ground level to a significant depth. A full site specific geotechnical investigation will be required prior to the detailed design of the proposed basement and superstructure.
- 14.4 The site is not considered to be in an area with raised ground water levels or in a significant flood risk zone.
- 14.5 There are no areas of archaeological interest or scheduled monuments in the vicinity of the site that could be affected by the works.
- 14.6 There are no listed buildings in the vicinity of the site that could be affected by the works.
- 14.7 A full utilities search will determine any services within the site boundary.
- 14.8 The construction sequence indicated within this document allows for the basement to be constructed in a manner that is safe and economic considering the scale of the proposed building.

End of report

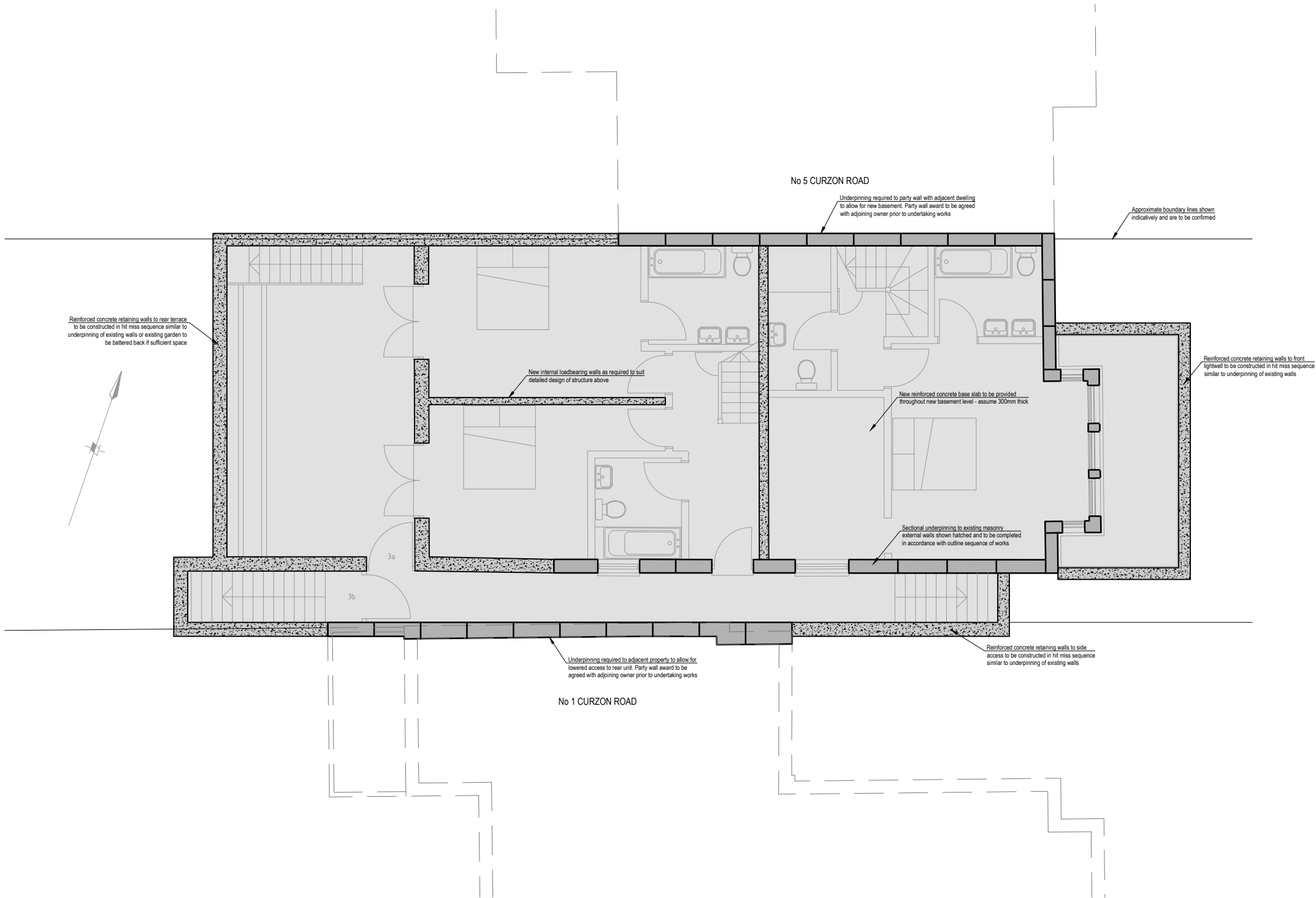
Appendix A: Indicative Structural Basement GA & Underpinning Sequence

General Notes:

All dimensions shown are in millimetres unless otherwise stated. They should not be scaled from the drawings and must be checked on site, by the Contractor, from the actual work wherever possible.

These notes shall be read directly in conjunction with other relevant Braemar SD drawings and the Architect's details, together with any subsequent revisions and amendments.

The Contractor shall be responsible for all temporary and permanent support works necessary.



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Client: Mayfair Trading Co. Limited			
Drawing Title: Planning Application Indicitive Basement Structural Scheme			
Scale: 1:100 @ A3	Drawn: CB	Date: 18.08.23	
Drawing Number: 23327 - DR - S - 01 - 009			Revision: 01

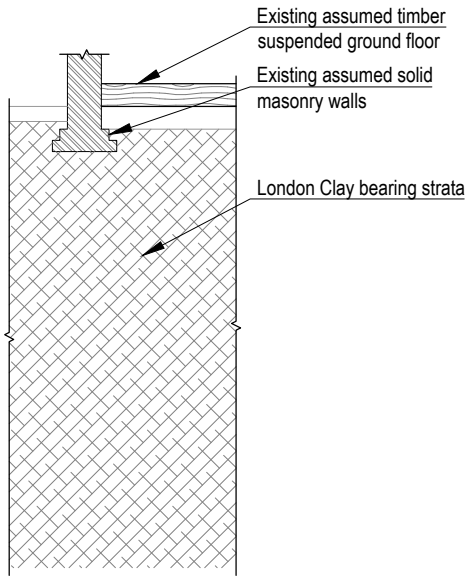
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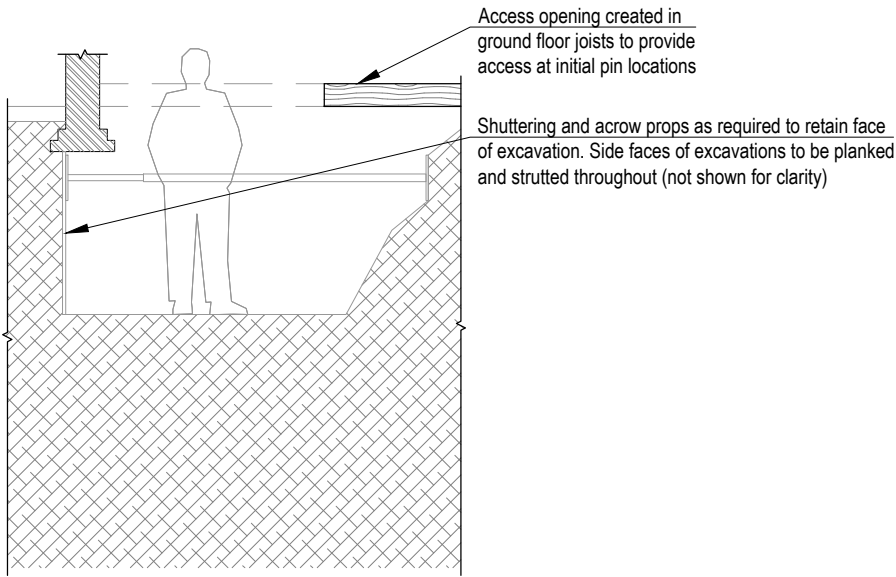
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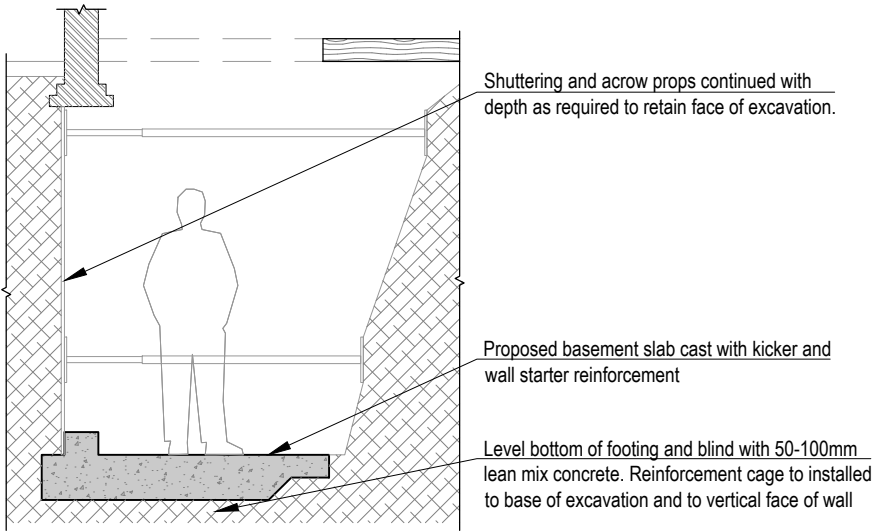
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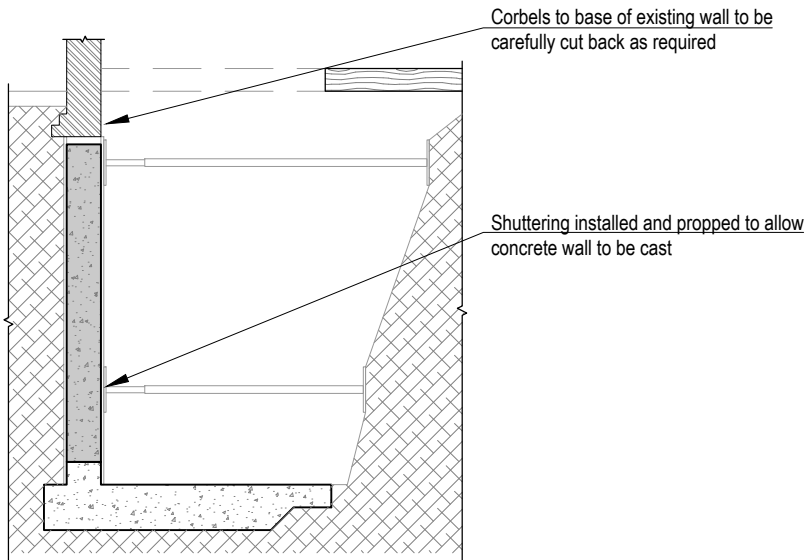
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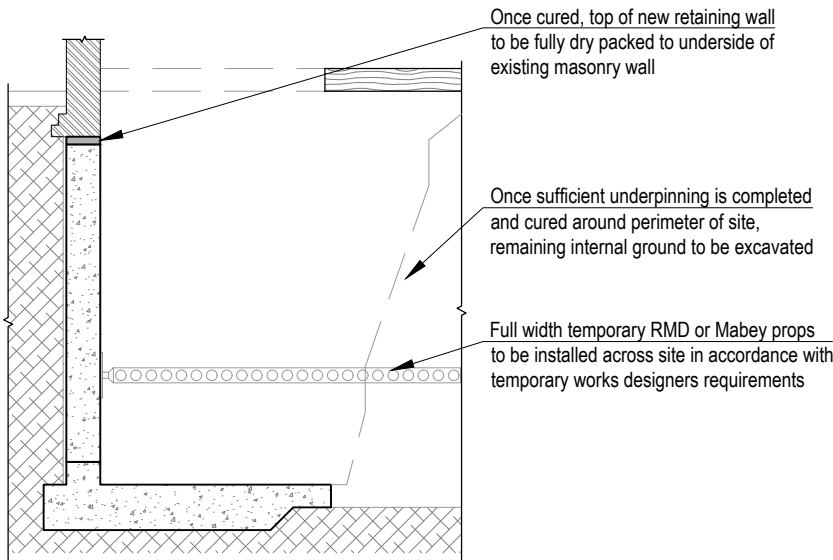
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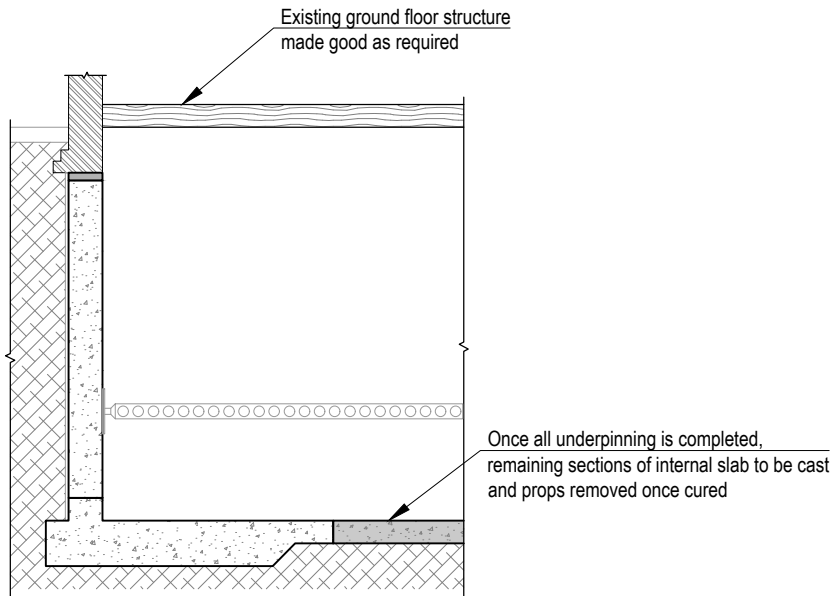
Underpinning Stage 3
Scale (1:50)



Underpinning Stage 4
Scale (1:50)



Underpinning Stage 5
Scale (1:50)



Underpinning Stage 6
Scale (1:50)



Project: 3 Curzon Road, Muswell Hill London, N10 2RB			
Client: Mayfair Trading Co. Limited			
Drawing Title: Planning Application Basement Underpinning Sequence			
Scale: 1:50 @ A3	Drawn: CB	Date: 18.08.23	
Drawing Number: 23327 - DR - S - 02 - 020			Revision: 01

01	18.08.23	Issued for Planning Application Purposes Only	CB	CB
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